Appendix B

Trail Ridge Landfill - Closure Phase 3

MESKEL & ASSOCIATES ENGINEERING

COMPLETE TESTING SUMMARY



Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL CONSTRUCTION TESTING & INSPECTION

Appendix B
Trail Ridge Landfill - Closure Phase 3

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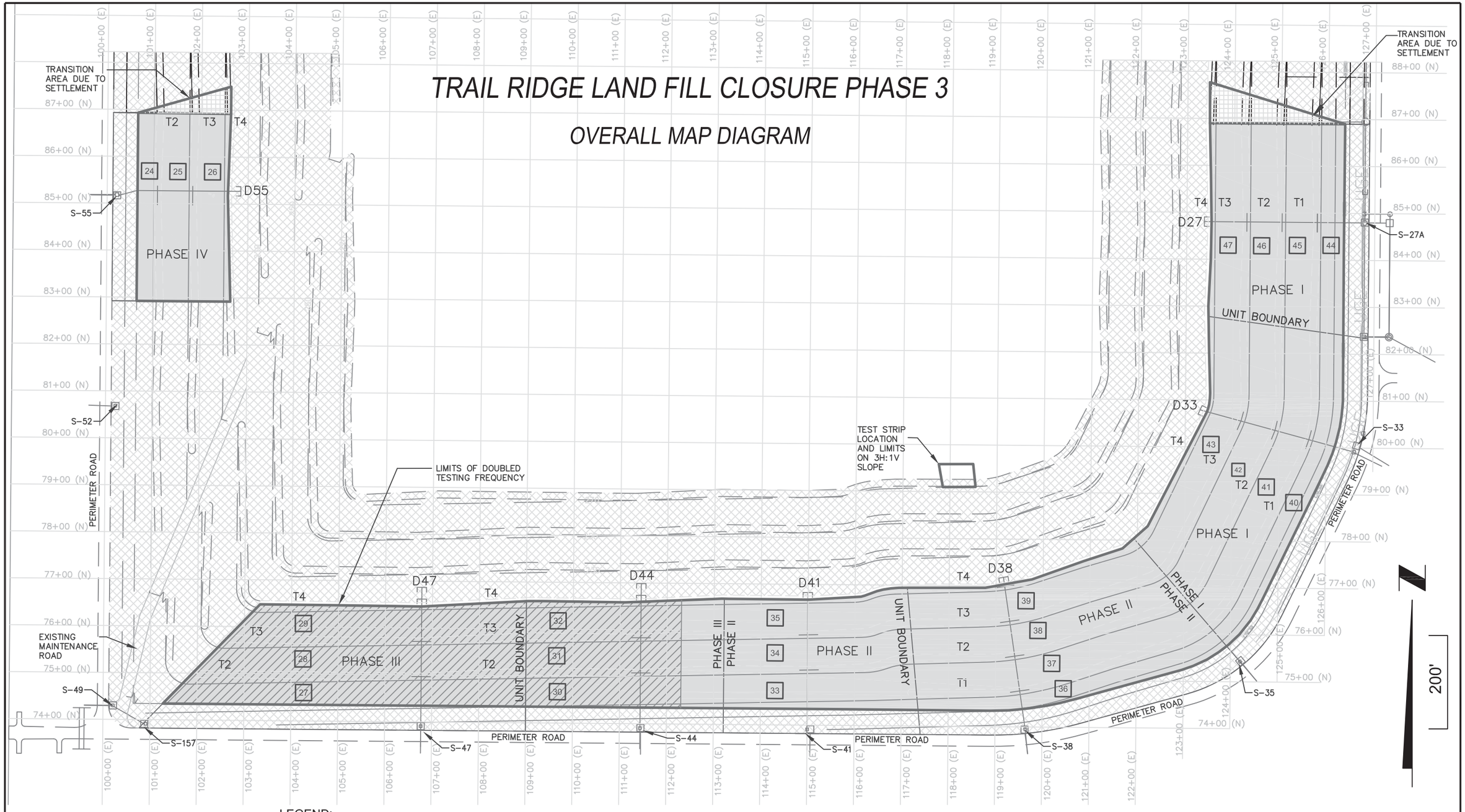
Trail Ridge Landfill - Closure Phase 3

Overall Map Diagram of all Phase 3

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL CONSTRUCTION TESTING & INSPECTION

TRAIL RIDGE LAND FILL CLOSURE PHASE 3

OVERALL MAP DIAGRAM



Phase I	Units 40, 41, 42, 43 Units 44, 45, 46, 47
Phase II	Units 33, 34, 35 Units 36, 37, 38, 39
Phase III	Units 27, 28, 29 Units 30, 31, 32
Phase IV	Units 24, 25, 26

LEGEND:

- Transition Area
- # Unit
- Slope and Swale Outside Closure (No Testing Performed)
- T Terrace
- Limits of Closure
- Doubled Testing Frequency Within Limits of Closure

Meskel & Associates Engineering, PLLC
FL Certificate of Authorization No. 28142
8936 Western Way, Suite 12, Jacksonville, FL

CLIENT: ETM
VISION - EXPERIENCE - RESULTS
ENGLAND - THIMS & MILLER, INC.

Jacksonville Where Florida Begins.

SHEET TITLE: OVERALL MAP DIAGRAM

PROJECT NAME: TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

SHEET NO. -

Trail Ridge Landfill - Closure Phase 3

INITIAL COVER LAYER

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

September 04, 2012

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

Mr. Scott Lockwood, P.E.
England-Thims & Miller, Inc.
14775 Old St. Augustine Road
Jacksonville, Florida 32258

Subject: Final Initial Cover Layer Certification
Trail Ridge Landfill – Phase 3 Construction QA/QC Services
Jacksonville, Florida
MAE Project No. 0006-0006

Dear Mr. Lockwood:

MESKEL & ASSOCIATES ENGINEERING, PLLC (MAE) has completed the monitoring and testing of the initial cover/ clay subgrade layer at the subject site. The initial cover/ clay subgrade layer was tested for:

- Thickness at a minimum frequency of 4 tests per acre per layer at 12"
- Density at a minimum frequency of 2 tests per acre per layer at 90% of the Modified Proctor. As stated in the approved QA/ QC plan section 2.c(3)(a) and in accordance with Rule 62-701.400 (8)(e)1.a. The liner (clay layer) subgrade shall be compacted to the specified density. Density tests shall be conducted at a minimum rate of two tests per acre.
- Moisture at a minimum frequency of 2 tests per acre per layer

All test results within the tables and the map diagrams meets or exceeds the minimum requirements in the plans, specifications and / or the QA/QC plan. Additionally, in accordance with the QA/QC plan the first five acres of the first phase (Phase III units 27, 28, 29, 30, 31, 32), the testing frequency was doubled. The field and laboratory results with the locations are identified in the tables and the map diagrams for Phases I, II, II and IV.

However, some tests performed failed to meet the minimum requirements. Upon failure, the contractor reworked the areas and additional tests were performed in the same location or within five feet of the original test location. The additional retests that meet the minimum requirements are identified with an "R" after the test number: I-004R, I-047R, I-059R, I-061R, I-074R, I-077R and I-080R.

Based on these results, we consider the initial cover / clay subgrade layer acceptable. The number of passing tests performed meets or exceeds the minimum requirements in the plans, specifications and / or the QA/QC plan.

We appreciate the opportunity to assist England-Thims & Miller, Inc. on this project. If you have any questions concerning this report, please contact us.

Sincerely,
MESKEL & ASSOCIATES ENGINEERING, PLLC

COPY

Samuel E. Lansdale
Quality Control Monitor

Antoinette (Tina) D. Meskel, P.E.
Quality Assurance Engineer
Licensed, Florida No. 56999

Attachments: Table of Results Phases I, II, III, IV
Map Diagrams Phases I, II, III, IV

8936 Western Way, Suite 12
Jacksonville, Florida 32256
Phone: (904)519-6990 Fax: (904)519-6992

November 9, 2011
Revised, September 10, 2012

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

Mr. Scott Lockwood, P.E.
England-Thims & Miller, Inc.
14775 Old St. Augustine Road
Jacksonville, Florida 32258

Subject: Initial Cover
Trail Ridge Landfill – Phase 3 Construction QA/QC Services
Jacksonville, Florida
MAE Project No. 0006-0006

Dear Mr. Lockwood:

In accordance with the project QA/QC plans, **MESKEL & ASSOCIATES ENGINEERING, PLLC (MAE)** has completed the laboratory testing of the Intermediate Cover soils which will be imported from the Trail Ridge on-site borrow pit. Based on visual observation of the Intermediate Cover soils, the soils were observed to be free of brush, weeds and other litter, and free of roots, stumps, stones and other extraneous and/or toxic materials.

Laboratory testing results are attached and include Modified Proctor, percent fines and Triaxial Shear Strength testing.

A calculation was performed to determine the Factor of Safety against internal shearing of the Intermediate Cover soils using the attached Triaxial Shear Strength test results. In addition, a Direct Shear Test was performed using the Intermediate Cover soil sample and the Clay Cover soil. This test included the Intermediate Cover in one half of the shear box and clay soils in the other half, and shearing was forced along the interface of the two soils. Test results were used to determine the Factor of Safety against interface sliding. Direct shear test results and the associated interface sliding calculations are included in this report attached to the Clay Borrow Source Pre-Qualification letter.

Test results indicate Factors of Safety greater than 1.5 for internal shearing of the Intermediate Cover material and Intermediate Cover/Clay Layer interface sliding. Based on the shear test results, and visual observation of the soils, we consider Intermediate Cover material to be suitable for use for the project.

We appreciate the opportunity to assist England-Thims & Miller, Inc. on this phase of your project. If you have any questions concerning this report, please contact us.

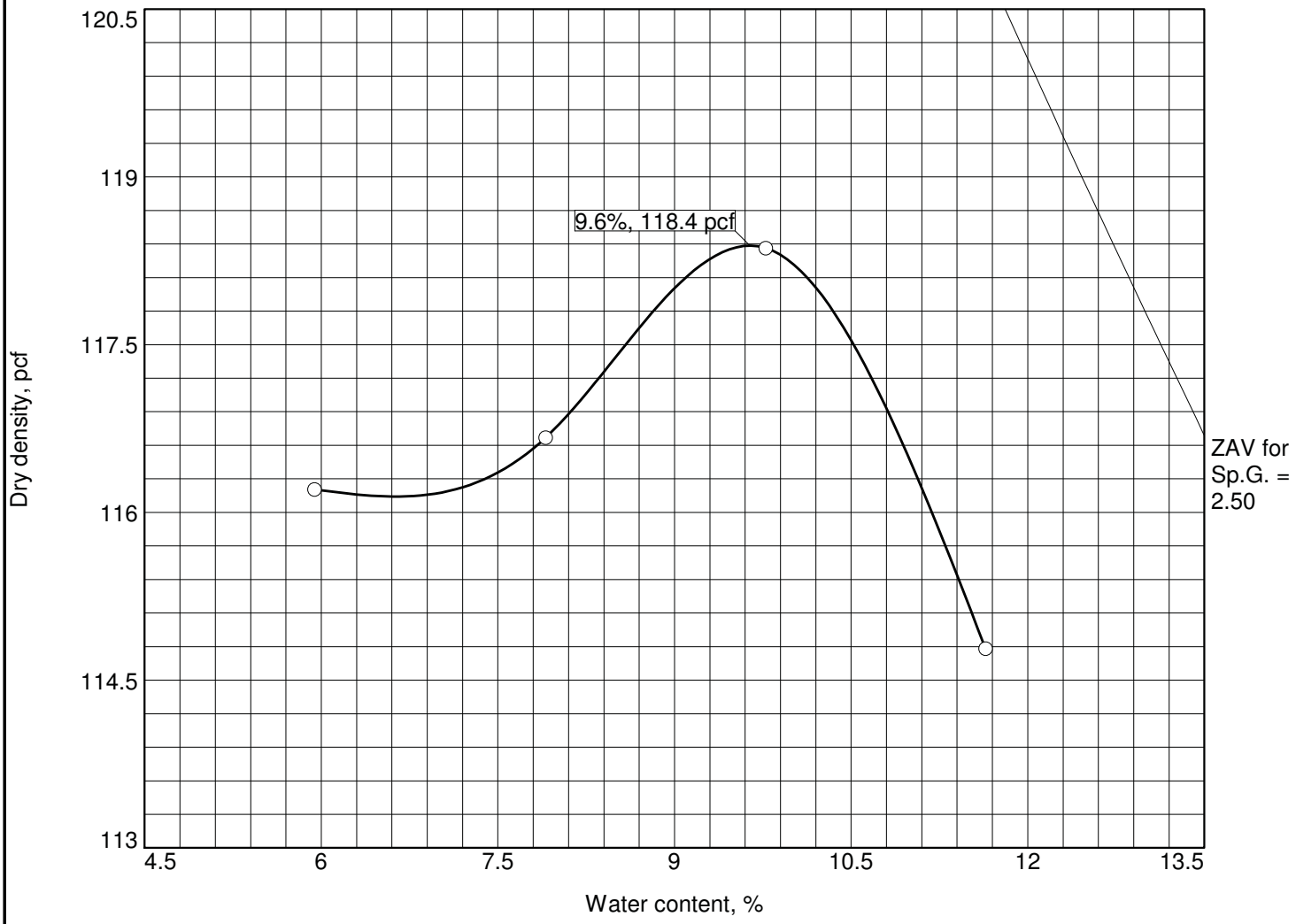
Sincerely,
MESKEL & ASSOCIATES ENGINEERING, PLLC

COPY

Antoinette (Tina) D. Meskel, P.E.
Quality Assurance Engineer
Licensed, Florida No. 56999

8936 Western Way, Suite 12
Jacksonville, Florida 32256
Phone: (904)519-6990 Fax: (904)519-6992

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
	SP-SM	A-3			NP	NP	0.0	10.1

TEST RESULTS

Maximum dry density = 118.4 pcf

Optimum moisture = 9.6 %

MATERIAL DESCRIPTION

Dark Gray Slightly Silty Medium to Fine SAND

Project No. 6736115123 **Client:** Meskel & Associates

Project: Trailridge Landfill Closure

○ **Source of Sample:** Intermediate Cover **Sample Number:** IC-1

AMEC E&I

Jacksonville, Florida

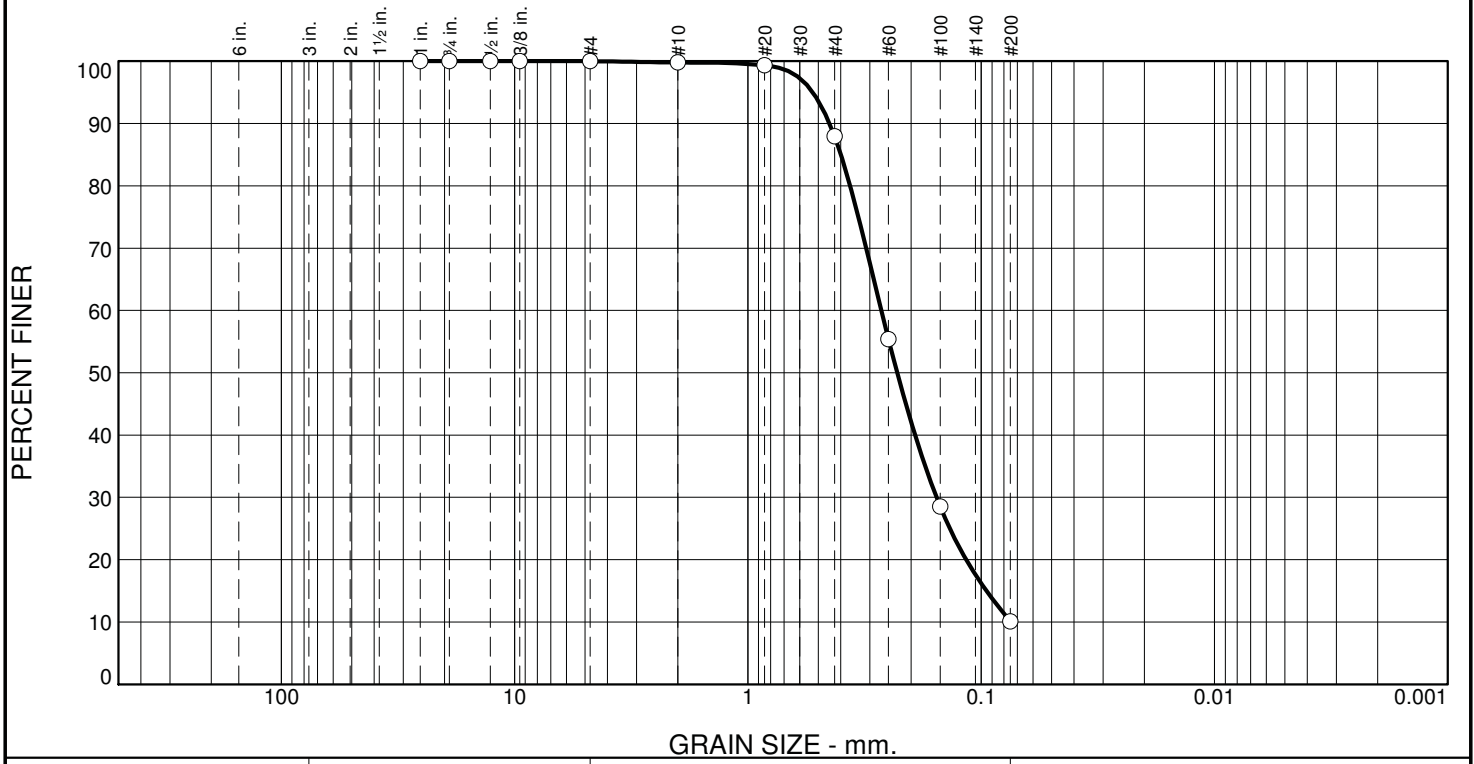
Remarks:

Date tested: 9-24-11

Figure

Tested By: MC

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	11.8	77.9	10.1	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	99.8		
#20	99.3		
#40	88.0		
#60	55.4		
#100	28.6		
#200	10.1		

* (no specification provided)

Material Description

Dark Gray Slightly Silty Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NP **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.4466 D_{85}= 0.3994 D_{60}= 0.2681
D_{50}= 0.2293 D_{30}= 0.1555 D_{15}= 0.0949
D_{10}= C_u= C_c=

Remarks

Side Slope #41

Date Received: 9-22-11 **Date Tested:** 9-27-11

Tested By: MC

Checked By:

Title:

Source of Sample: Intermediate Cover
Sample Number: IC-1

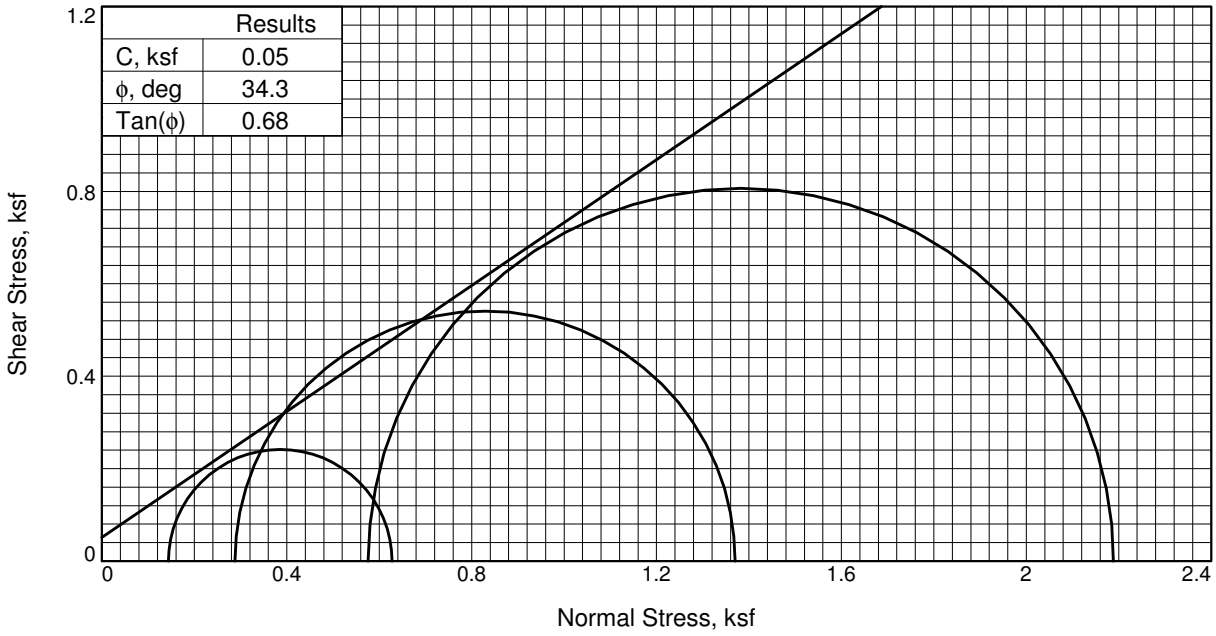
Date Sampled: 9-22-11

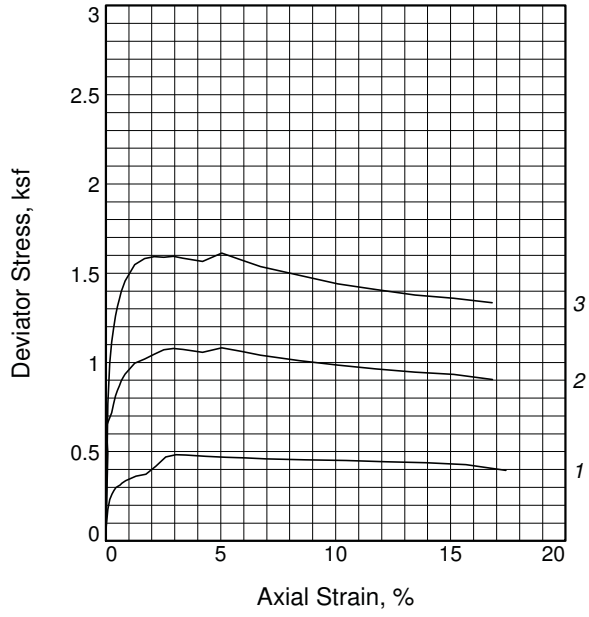
AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates
Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**





Sample No.		1	2	3
Initial	Water Content, %	13.9	13.7	14.0
	Dry Density, pcf	107.5	106.7	106.8
	Saturation, %	68.6	66.2	68.0
	Void Ratio	0.5348	0.5461	0.5448
	Diameter, in.	2.87	2.87	2.92
	Height, in.	5.80	6.01	5.97
At Test	Water Content, %	18.5	18.8	20.0
	Dry Density, pcf	110.8	110.2	107.9
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4898	0.4970	0.5294
	Diameter, in.	2.84	2.84	2.91
	Height, in.	5.74	5.95	5.95
Strain rate, in./min.		0.03	0.03	0.03
Back Pressure, psi		50.00	50.00	50.00
Cell Pressure, psi		51.00	52.00	54.00
Fail. Stress, ksf		0.48	1.08	1.61
Ult. Stress, ksf				
σ_1 Failure, ksf		0.63	1.37	2.19
σ_3 Failure, ksf		0.14	0.29	0.58

Type of Test:
Consolidated Drained

Sample Type: Remolded

Description: Dark Gray Slightly Silty Medium to Fine SAND

LL= NP **PI=** NP

Specific Gravity= 2.643

Remarks:

Figure _____

Client: Meskel & Associates

Project: Trailridge Landfill Closure

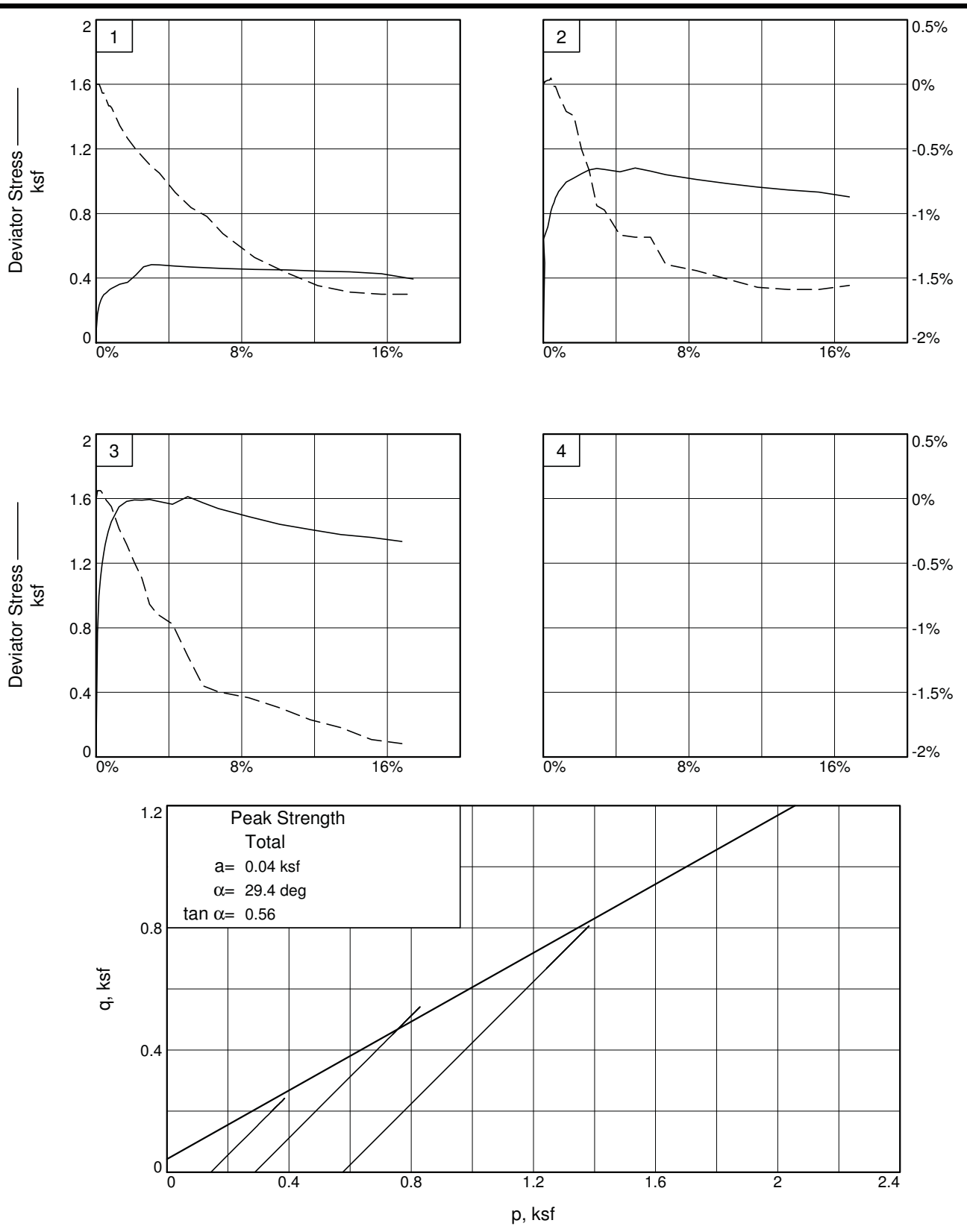
Source of Sample: Intermediate Cover

Sample Number: IC-1

Proj. No.: 6736115123 **Date Sampled:** 9-22-11

TRIAXIAL SHEAR TEST REPORT
AMEC E&I
Jacksonville, Florida

Tested By: FB



Client: Meskel & Associates
Project: Trailridge Landfill Closure
Source of Sample: Intermediate Cover **Sample Number:** IC-1
Project No.: 6736115123 **Figure** _____

AMEC E&I

Tested By: FB

INTERMEDIATE COVER SLIDING CALCULATION

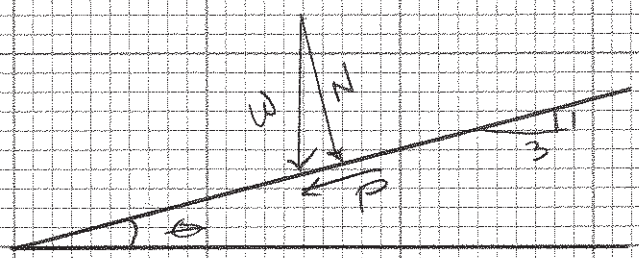
~~ASSUME~~ TRUE

$\gamma_{dry} = 107.4$ pcf

$\phi = 10.6°$

$\theta = 18.4°$

% fines < 30%
(Modified Proctor)



$P = W \sin\theta$

Triaxial Test:

$\gamma_{D\ @\ test\ Avg} = 107.0$ pcf (Dry Density)

Water Content, $w_{Avg} = 13.9\%$

$\gamma_{sat} = 107.0(1.139) = 121.8$ pcf (Saturated Density)

Sliding at Mid layer:

Intermediate cover $\Rightarrow (0.5ft)(121.8)(0.90)^{(1)} = 54.81$ psf

Clay layer $\Rightarrow (1ft)(89\ pcf)(0.80)^{(2)}(1.31) = 93.27$ psf

Vegetative cover $\Rightarrow (2')(112\ pcf)(0.90)^{(1)}(1.135) = 228.82$ psf

$W = 54.81 + 93.27 + 228.82 = 376.9$ psf

Driving Force $= P = W \sin\theta$

$= 376.9 (\sin 18.4) = 118.97$ psf

RESISTING FORCE $= \tau_f$ = shear Strength from TRIAXIAL Test

$\tau_f = \sigma_f \tan\phi + C$ $\quad \sigma_f = \frac{\sigma_1 - \sigma_3}{2}$

$\sigma_{1\ Avg} = 1.40$ ksf

$\sigma_{3\ Avg} = 0.34$ ksf

$\phi = 34.3°$, $C = 0$

$\tau_f = (530\ psf)\tan(34.3°) = 361.5$ psf

$$FS = \frac{361.5}{118.97} = 3.0 > 1.5 \text{ ok}$$

(1) At 90% Compaction
(2) At 80% Compaction

October 21, 2011
Revised, September 10, 2012

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION MATERIALS TESTING

England-Thims & Miller, Inc.
14775 St. Augustine Road
Jacksonville, Florida 32258

Attention: Mr. Scott Lockwood, P.E.

Reference: Deviation from the QA/QC Plan
Shear Strength Testing – Intermediate and Vegetative Cover Soils
Trail Ridge Landfill – Phase 3 Construction Review services; Phase 4 Closure Design Services and FDEP Solid Waste Permit Modification
Jacksonville, Florida
MAE Project No. 0006-0006

Dear Mr. Lockwood:

The QA/QC specifications for the subject project require that the Intermediate and Vegetative Cover soils be tested for shear strength in the laboratory using the ASTM D-4767 method. This test method is designed to measure the shear strength of cohesive soils under undrained conditions. Because the Intermediate and Vegetative Cover materials are non-cohesive and free-draining sandy soils, it is our opinion that ASTM D-4767 is not an appropriate test method for these materials.

Consolidated-Drained (CD or S-Test) loading procedures are typically used to determine the shear strength parameters of freely draining soils. It is our opinion that the US Army Corps of Engineers (USACE) S-Test method is the correct test method for these types of soils. Pages from the USACE Laboratory Soils Testing Engineer Manual (EM 110-2-1906), which describe procedures for sample preparation and testing, are attached for your review.

Based on the above information, we request that a deviation to the project specifications be granted for shear strength testing of the Intermediate and Vegetative Cover materials, from ASTM D-4767 to the attached USACE S-Test method.

MAE appreciates the opportunity to be of continued service to you on this project. If you have any questions concerning this information, please contact me at (904)519-6990.

Sincerely,
MESKEL & ASSOCIATES ENGINEERING, PLLC
MAE FL Certificate of Authorization No. 28142

COPY

Antoinette (Tina) D. Meskel, P.E.
Quality Assurance Engineer
Licensed, Florida No. 56999

Distribution: Mr. Scott Lockwood, P.E. – England-Thims & Miller, Inc. 1 copy; 1 pdf

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REPRINT WITH CORRECTED COPIES INCORPORATED,

ENGINEER MANUAL

E M 1110-2-1906

30 November 1970

Change 2 dated 20 August 1986
has been inserted.

ENGINEERING AND DESIGN

LABORATORY SOILS TESTING



HEADQUARTERS, DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS

APPENDIX X:

TRIAXIAL COMPRESSION TESTS

1. PRINCIPLES OF THE TRIAXIAL COMPRESSION TEST. The triaxial compression test is used to measure the shear strength of a soil under controlled drainage conditions. In the basic triaxial test, a cylindrical specimen of soil encased in a rubber membrane is placed in a triaxial compression chamber, subjected to a confining fluid pressure, and then loaded axially to failure. Connections at the ends of the specimen permit controlled drainage of pore water from the specimen. The procedures presented herein apply only to the basic test conducted with limited drainage conditions, and do not include special types or variants of this test. In general, a minimum of three specimens, each under a different confining pressure, are tested to establish the relation between shear strength and normal stress. The test is called "triaxial" because the three principal stresses are known and controlled. Prior to shear, the three principal stresses are equal to the chamber fluid pressure. During shear, the major principal stress, σ_1, is equal to the applied axial stress (P/A) plus the chamber pressure, σ_3 (see Fig. 1). The applied axial stress, $\sigma_1 - \sigma_3$, is termed the "deviator stress." The

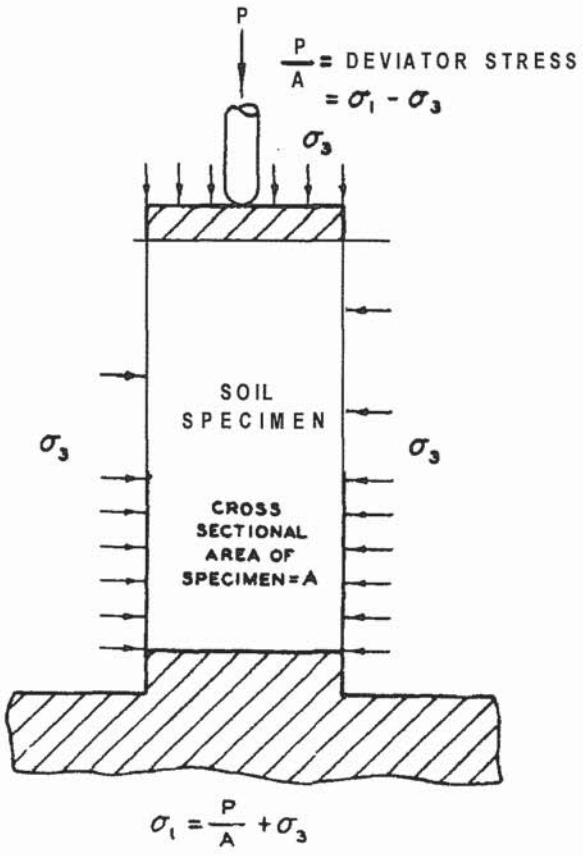


Figure 1. Diagram showing stresses during triaxial compression test

intermediate principal stress, σ_2, and the minor principal stress, σ_3, are identical in the test, and are equal to the confining or chamber pressure hereafter referred to as σ_3.

A soil mass may be considered as a compressible skeleton of solid particles. In saturated soils the void spaces are completely filled with water; in partially saturated soils the void spaces are filled with both water and air. Shear stresses are carried only by the skeleton of solid particles, whereas the normal stress on any plane is carried by both the solid particles and the pore water. In a triaxial test, the shear strength is determined in terms of the total stress (intergranular stress plus pore water pressure), unless (a) complete drainage is provided during the test so that the pore pressure is equal to zero at failure, or (b) measurements of pore pressure are made during the test. When the pore pressure at failure is known, the shear strength can be computed in terms of the stress carried by the soil particles (termed effective or intergranular stress). In recent years, significant advances have been made in the techniques of measuring pore pressures in the triaxial test and in the interpretation of the data obtained; however, difficulties still exist in this respect. Pore pressure measurements during shear are seldom required in routine investigations, as the basic triaxial tests are sufficient to furnish shear strengths for the limiting conditions of drainage. Procedures for measuring pore pressures in the triaxial test during shear are discussed elsewhere† and are beyond the scope of this manual.

2. TYPES OF TESTS. The three types of basic triaxial compression tests are unconsolidated-undrained, consolidated-undrained, and consolidated-drained, subsequently referred to as the Q, R, and S tests, respectively. As these names imply, they are derived from the drainage conditions allowed to prevail during the test. The type of test is selected

† A. W. Bishop and D. J. Henkel, The Measurement of Soil Properties in the Triaxial Test, 2nd ed. (London, Edward Arnold Ltd., 1962).

to closely simulate, or to bracket, the conditions anticipated in the field. In the basic tests, the initial principal stresses are equal; that is, no attempt is made to duplicate stress systems in the field in which the principal stresses are not equal.

a. Q Test. In the Q test the water content of the test specimen is not permitted to change during the application of the confining pressure or during the loading of the specimen to failure by increasing the deviator stress. The Q test is usually applicable only to soils which are not free-draining, that is, to soils having a permeability less than 10 $\times 10^{-4}$ cm per sec.

b. R Test. In the R test, complete consolidation of the test specimen is permitted under the confining pressure. Then, with the water content held constant, the specimen is loaded to failure by increasing the deviator stress. Specimens must as a general rule be completely saturated before application of the deviator stress.

c. S Test. In the S test, complete consolidation of the test specimen is permitted under the confining pressure and during the loading of the specimen to failure by increasing the deviator stress. Consequently, no excess pore pressures exist at the time of failure.

3. APPARATUS. a. Loading Devices. Various devices may be used to apply axial load to the specimen. These devices can be classified as either apparatus in which axial loads are measured outside the triaxial chamber or apparatus in which axial loads are measured inside the triaxial chamber by using a proving ring or frame, an electrical transducer, or a pressure capsule. Any- equipment used should be calibrated to permit determination of loads actually applied to the soil specimen.

Loading devices can be further grouped under controlled-strain or controlled-stress types. In controlled-strain tests, the specimen is strained axially at a predetermined rate; in controlled-stress tests, predetermined increments of load are applied to the specimen at fixed intervals of time. Controlled-strain loading devices, such as commercial

stored in an airtight container for at least 16 hr. The desired density may be produced by either (1) kneading or tamping each layer until the accumulative weight of soil placed in the mold is compacted to a known volume or (2) adjusting the number of layers, the number of tamps per layer, and the force per tamp. For the latter method of control, special constant-force tampers (such as the Harvard miniature compactor for 1.4-in.-diameter specimens† or similar compactors for 2.8-in.-diameter and larger specimens‡) are necessary. After each specimen compacted to finished dimensions has been removed from the mold, proceed in accordance with steps (c) through (e) of paragraph 4a(1).

b. Cohesionless Soils Containing Negligible Amounts of Gravel. Soils which possess little or no cohesion are difficult if not impossible to trim into a specimen. If undisturbed samples of such materials are available in sampling tubes, satisfactory specimens can usually be obtained by freezing the sample to permit cutting out suitable specimens. Samples should be drained before freezing. The frozen specimens are placed in the triaxial chamber, allowed to thaw after application of the chamber pressure, and then tested as desired. Some slight disturbance probably occurs as a result of the freezing, but the natural stratification and structure of the material are retained. In most cases, however, it is permissible to test cohesionless soils in the remolded state by forming the specimen at the desired density or at a series of densities which will permit interpolation to the desired density. Specimens prepared in this

---

† A. Casagrande, J. M. Corso, and S. D. Wilson, Report to Waterways Experiment Station on the 1949-1950 Program of Investigation of Effect of Long-Time Loading on the Strength of Clays and Shales at Constant Water Content, Harvard University (Cambridge, Mass., July 1950).

‡ A. Casagrande and R. C. Hirschfeld, Second Progress Report on Investigation of Stress-Deformation and Strength Characteristics of Compacted Clays, Soil Mechanics Series No. 65, Harvard University (Cambridge, Mass., April 1962).

manner should generally be 2.8 in. in diameter or larger, depending on the maximum particle size. The procedure for forming the test specimen shall consist of the following steps:

(1) Oven-dry and weigh an amount of material sufficient to provide somewhat more than the desired volume of specimen.

(2) Place the forming jacket, with the membrane inside, over the specimen base of the triaxial compression device.

(3) Evacuate the air between the membrane and the inside face of the forming jacket.

(4) After mixing the dried material to avoid segregation, place the specimen, by means of a funnel or the special spoon, inside the forming jacket in equal layers. For 2.8-in.-diameter specimens, 10 layers of equal thickness are adequate. Starting with the bottom layer, compact each layer by blows with a tamping hammer, increasing the number of blows per layer linearly with the height of the layer above the bottom layer.† The total number of blows required for a specimen of a given material will depend on the density desired. Considerable experience is usually required to establish the proper procedure for compacting a material to a desired uniform density by this method. A specimen formed properly in the above-specified manner, when confined and axially loaded, will deform symmetrically with respect to its midheight, indicating that a uniform density has been obtained along the height of the specimen.

(5) As an alternate procedure, the entire specimen may be placed in a loose condition by means of a funnel or special spoon. The desired density may then be achieved by vibrating the specimen in the forming jacket to obtain a specimen of predetermined height and corresponding density. A specimen formed properly in this manner, when

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† Liang-Sheng Chen, "An investigation of stress strain and strength characteristics of cohesionless soils by triaxial compression tests," Proceedings, Second International Conference on Soil Mechanics and Foundation Engineering, vol. V (Rotterdam, 1948), pp. 35-43.

confined and axially loaded, will deform symmetrically with respect to its midheight.

(6) Subtract weight of unused material from original weight of the sample to obtain weight of material in the specimen.

(7) After the forming jacket is filled to the desired height, place the specimen cap on the top of the specimen, roll the ends of the, membrane over the specimen cap and base, and fasten the ends with rubber bands or O-rings. Apply a low vacuum to the specimen through the base and remove the forming jacket.

(8) Measure height and diameter as specified in paragraph 4a(1)(e).

c. Soils Containing Gravel. The size of specimens containing appreciable amounts of gravel is governed by the requirements of paragraph4. If the material to be tested is in an undisturbed state, the specimens shall be prepared according to the applicable requirements of paragraphs 4a and 4b, with the size of specimen based on anestimate of the largest particle size. In testing compacted soils, the largest particle size is usuallyknown, and the entire sample should be tested, whenever possible, without removing any of the coarser particles. However, it may be necessaryto remove the particles larger than a certain size to comply with the requirements for specimen size, though such practice will result in lower measured values of the shear strength and should be avoided if possible. Oversize particles should be removed and, if comprising more than 10 percent by weight of the sample, be replaced by anequalpercentage by weight of material retained on the No. 4 sieve and passing the maximum allowable sieve size. The percentage of material finer than the No. 4 sieve thus remains constant (see paragraph 2b of Appendix VI, COMPACTION TESTS). It will generally be necessary to prepare compacted samples of material containing gravel inside a forming jacket placed on the specimen base. If the material is cohesionless, it should be oven-dried and compacted in layers inside the membrane and forming jacket using the procedure in paragraph 4b as a guide. When specimens of very high density are required, the

routine laboratory work. Therefore, S tests of fine-grained impervious materials should normally be performed with direct shear equipment (see Appendix IX DRAINED (S) DIRECT SHEAR TEST). However, if scheduling permits, it may be desirable to perform companion S triaxial tests of impervious soils to compare the results with those from S direct shear tests. If the soil to be tested is relatively impervious and contains gravel which would preclude the use of direct shear equipment, consideration should. be given to using triaxial equipment with pore pressure measurements in order to obtain the drained shear strength parameters within a reasonable length of time. All specimens must be completely saturated before application of the deviator stress in the S test.

a. Apparatus. The apparatus used to perform the R test, as illustrated in Figure 16, will usually be satisfactory for the S test, though the equipment for saturation by back pressure will not be necessary for relatively pervious soils. In general, controlled-strain testing should be used for relatively pervious soils, and controlled-stress testing should be used for relatively impervious soils.

b. Procedure. The procedure for the S test shall consist of the following steps:

(1) For soils requiring saturation by back pressure, proceed as outlined in paragraphs 6b(1) through 6b(6). For pervious soils which can be effectively saturated by seepage, that is, by water percolating through the specimen under a small hydraulic head, omit the back pressure equipment described in paragraph 6a and proceed as follows:

(a) Proceed as outlined in paragraphs 5a(1) through 5a(4), with the exception that specimen bases and caps with porous inserts and drainage connections should be used and the apparatus should include a water supply container and a calibrated burette with a vacuum connection as shown in Figure 16. For specimens of cohesionless soil prepared as described in paragraph 4b, the porous inserts and drainage lines (including the burette) should be dry, and a low vacuum (less than 5 psi) should be

maintained at both the specimen base and cap (with valves D and G closed) to support the specimen while assembling and filling the triaxial chamber.

(b) Keeping valves A and C closed, adjust the pressure regulator for a chamber pressure of about 5 psi and then open valve A to apply this pressure to the chamber.

(c) With valves E and G closed, maintain a low vacuum through the burette to the specimen cap. Then open valve D and elevate the water supply container so that a hydrostatic head of 1 to 2 ft is applied to the base of the specimen.

(d) When the saturation water rises into the burette, disconnect the vacuum from the burette. Permit seepage under the small head to continue until the rate of flow into the burette is constant, and then close valve D.

(2) With valves E and F open (see Fig. 16), lower the piston into contact with the specimen cap and increase the axial load at a relatively slow rate so that a fully drained condition exists at failure with controlled-strain loading or after each increment of load with controlled-stress application. As for the direct shear test, considerable experience and judgment are generally required in determining the proper rate of axial load application (see Appendix IX, DRAINED (S) DIRECT SHEAR TEST). Theoretical formulas are also available† for estimating the time required for failure in S tests. Special precautions may be necessary for tests requiring an axial loading duration in excess of a few hours to insure that the chamber pressure (as well as the back pressure, if used) is maintained constant, that temperature fluctuations are minimized, and that evaporation or aeration of the water in the burette is reduced as much as possible. Placing about 1 cc of oil or dyed kerosene over the water surface in the burette will minimize evaporation.

(3) Record the dial indicator and burette readings at

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† Bishop and Henkel, op. cit., pp. 124-127, 204-206.

increasing intervals of elapsed time under each increment of load. For relatively impervious soils, plot either or both of these readings versus the logarithm of elapsed time, as shown in Figure 5 of Appendix VIII, CONSOLIDATION TEST, to establish when primary consolidation has been essentially completed for each increment of load. Record the final dial indicator and burette readings for each axial load increment on a form similar to Plate X-6 prior to applying the next increment. With controlled-strain loading, periodically observe and record (Plate X-6) the resulting load and the dial indicator and burette readings; sufficient readings should be taken to completely define the shape of the stress-strain curve, Continue the test until an axial strain of 15 percent has been reached; however, when the deviator stress decreases after attaining a maximum value and is continuing to decrease at 15 percent strain, the test shall be continued to 20 percent strain (see Fig. 12).

(4) Upon completion of axial loading, close valves E and F and proceed as outlined in paragraphs 5a(8) through 5a(10), except measure the specimen diameter, as described in paragraph 4a(1)(e), after the compression chamber has been dismantled. While considerable difficulty may be encountered in measuring the diameter of the specimen after the test, such measurements will permit the most reliable computations of the specimen properties at failure.

c. Computations. The computations shall consist of the following steps:

(1) From the observed data, compute and record on the data sheet (Plate X-1) the initial water content, volume of soilds, initial void ratio, initial degree of saturation, and initial dry density using the formulas previously presented.

(2) Compute the cross-sectional area of the specimen, A_c, after completion of consolidation using the formulas presented in paragraph 6c(2).

(3) Using the dimensions of the specimen after consolidation

and the changes in volume as measured with the burette, compute the void ratio and degree of saturation after consolidation using the formulas previously presented.

(4) Compute and record on the data sheet (Plate X-6) the axial strain, the corrected area, and the deviator stress corresponding to the final readings under each increment of load for controlled-stress loading or for convenient intervals of strain for controlled-strain loading using the following formulas:

$$\text{Axial strain, } \varepsilon = \frac{\Delta H}{H_c}$$

$$\text{Area of specimen corrected for strain and volume change, } A'_{corr}, \text{ sq cm} = \frac{A_c}{1 - C\varepsilon}$$

$$\text{Deviator stress, tons per sq ft} = \frac{P}{A'_{corr}} \times 0.465$$

where C = correction for volume change during shear $= \frac{A_f}{A_e}$

A_f = area of specimen after test based on measurements

$$= \frac{\pi D_f^2}{4} = 0.7854\ D_f^2$$

A_e = area of specimen at end of test computed on basis of constant volume

$$= \frac{A_c}{1 - \varepsilon_e}$$

ε_e = axial strain at end of test $= \frac{H_c - H_f}{H_c}$

P = net applied axial load, lb (see paragraph 5b(2))

(5) Record the time to failure on the data sheet (Plate X-6).

(6) Correct the maximum deviator stress, if necessary, for the effect of membrane restraint (see paragraph 5b(4)).

d. Presentation of Results. The results of the S test shall be presented on the report form shown as Plate X-3, as described in paragraph 5c. If volume changes of the specimens during shear were measured, plot the volumetric strain versus axial strain for each specimen below the stress-strain curves.

9. POSSIBLE ERRORS. Following are possible errors that would cause inaccurate determinations of strength and stress -deformation characteristics :

a. Apparatus. (1) Leakage of chamber fluid into specimen. Such leakage might occur through or around the ends of the membrane or through the drainage connections and it would decrease the effective stress in a specimen during undrained shear, Very little leakage is needed to cause a very large change in effective stress, and the longer the period of undrained shear, the greater the amount of leakage. (Leakage will not influence the effective stress during periods of specimen drainage, but it will introduce errors in volume change measurements,)

(2) Leakage of pore water out of specimen. This leakage might occur through fittings or valves and it would increase the effective stress in a specimen during undrained shear.

(3) Permeability of porous inserts too low.

(4) Restraint caused by membrane and filter paper strips.

(5) Piston friction.

b. Preparation of Specimens. (1) Specimen disturbed while trimming. Disturbance of the natural soil structure does not always result in strength measurements which are too low, that is, on the safe side; disturbed specimens will consolidate more under the effective consolidation pressure in R or S tests and the measured strengths will be too high.

(2) Specimen disturbed while enclosing with membrane. The techniques of placing the membrane around the specimen illustrated in Figures 9 and 10 may not be satisfactory for sensitive undisturbed soils since the specimen would tend to be flexed while binding the membrane to the unsupported cap. Alternatively, the specimen can be set upon an inverted cap clamped to a ringstand and the membrane placed over the specimen and bound to the cap; then the specimen and cap can be inverted onto the base and the lower end of the membrane secured.

(3) Specimen dimensions not measured precisely. Dial gages or micrometers are helpful in obtaining precise measurements. When the specimen diameter is measured after being enclosed by the membrane, twice the thickness of the membrane must be subtracted from the measurement. The cross-section area of large specimens may be determined most satisfactorily from circumference measurements.

c. Q Test. (1) Changes in specimen dimensions upon application of chamber pressure. Partially saturated specimens will compress under the chamber pressure so the change in height, ΔH_o, due to the application of chamber height should be recorded. When this change in height is significant, the area of specimen before shear, A_c, should be computed according to the formula:

$$A_c = A_o \frac{H_o - 2\Delta H_o}{H_o}$$

as given in paragraph 6c(2).

(2) Rate of strain too fast.

(3) Water content determination after test not representative. Friction between the soil and the cap and base restrains the radial deformation at the ends of the specimen and this end restraint induces a non-uniform pore pressure distribution which, in turn, causes pore water migration within the specimen. For relatively impervious soils, a

Trail Ridge Landfill - Closure Phase 3

INITIAL COVER

Phase I, II, III, IV, Downcommers Test Results Tables

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Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

Compaction Minimum Value: **90.0% of Modified Proctor** **Thickness Minimum: 12.0"**

Legend: **I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested**

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
Phase IV: Units 24, 25, 26 = 1.9 Acres								
I-147	100+85E, 83+50N	24	T	20.0	x	x	x	PASS
I-148	101+50E, 83+50N	25	DMT	18.0	111.8	94.9	8.3	PASS
I-149	102+50E, 83+15N	26	T	16.0	x	x	x	PASS
I-150	101+50E, 84+50N	25	T	18.0	x	x	x	PASS
I-151	102+25E, 84+00N	26	DMT	16.0	107.7	95.1	8.2	PASS
I-152	100+90E, 85+50N	24	T	17.0	x	x	x	PASS
I-153	101+50E, 86+00N	25	DMT	20.0	108.4	95.7	8.5	PASS
I-154	102+25E, 85+50N	26	T	18.0	x	x	x	PASS
I-155	101+00E, 86+75N	24	T	18.0	x	x	x	PASS
I-156	101+80E, 86+65N	26	T	18.0	x	x	x	PASS
I-157	102+50E, 86+75N	26	DMT	18.0	102.9	90.8	10.9	PASS
I-108	102+50E, 85+15N	26	DMT	16.0	111.1	98.8	7.7	PASS
I-109	102+00E, 85+15N	26	DMT	15.0	107.5	95.6	6.5	PASS
I-110	101+50E, 85+15N	25	DMT	14.0	103.8	92.3	5.2	PASS
I-111	101+00E, 85+15N	24	DMT	16.0	109.8	97.6	6.1	PASS
Phase IV: Units 24, 25, 26: Tests Required				**7.6**	**3.8**		**3.8**	
Phase IV: Units 24, 25, 26: Tests Performed				**15.0**	**8.0**		**8.0**	**PASS**
Phase III: Units 27, 28, 29 = 3.53 Acres *testing frequency doubled*								
I-001	102+00E, 74+50N	27	DMT	12+	108.3	96.3	7.2	PASS
I-002	101+75E, 74+75N	27	DMT	12+	111.7	99.3	8.6	PASS
I-003	102+50E, 74+75N	28	DMT	12+	108.0	96.0	7.5	PASS
I-004R	103+00E, 74+50N	27	DMT	12+	107.3	95.4	15.8	PASS

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Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

Compaction Minimum Value: **90.0% of Modified Proctor** **Thickness Minimum: 12.0"**

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
I-005	103+50E, 74+75N	27	DMT	12+	109.8	97.6	6.3	PASS
I-006	104+00E, 74+90N	27	DMT	12+	106.0	94.2	5.9	PASS
I-007	103+75E, 75+20N	28	DMT	12+	111.7	98.6	6.5	PASS
I-008	103+50E, 75+50N	29	DMT	12+	110.4	97.4	3.3	PASS
I-009	103+00E, 75+00N	28	DMT	12+	111.6	98.5	10.9	PASS
I-010	102+50E, 75+25N	28	DMT	12+	103.6	91.4	5.9	PASS
I-011	103+50E, 76+45N	29	DMT	12+	105.4	93.0	10.5	PASS
I-012	104+00E, 76+25N	29	DMT	12+	109.3	96.5	4.9	PASS
I-013	104+50E, 76+00N	29	DMT	12+	110.3	97.4	7.5	PASS
I-014	105+00E, 75+75N	29	DMT	12+	103.5	91.4	10.7	PASS
I-015	104+50E, 74+50N	27	DMT	12+	111.7	94.9	10.4	PASS
I-016	105+00E, 74+75N	27	DMT	12+	111.3	94.5	10.0	PASS
I-017	105+50E, 74+50N	27	DMT	12+	108.8	92.4	13.6	PASS
I-018	106+00E, 74+40N	27	DMT	12+	109.3	92.8	7.8	PASS
I-019	106+50E, 74+90N	27	DMT	12+	109.3	92.8	13.0	PASS
I-020	106+25E, 75+25N	28	DMT	12+	109.2	92.7	9.8	PASS
I-021	105+75E, 75+00N	28	DMT	12+	106.0	90.1	10.9	PASS
I-022	105+50E, 75+50N	28	DMT	12+	109.0	92.6	12.1	PASS
I-023	106+00E, 76+00N	29	DMT	12+	105.9	90.0	12.2	PASS
I-024	106+25E, 76+50N	29	DMT	12+	106.4	90.4	12.1	PASS
I-025	104+50E, 75+25N	28	DMT	12+	109.0	92.6	7.6	PASS
I-026	107+15E, 76+25N	29	T	12+	x	x	x	PASS
I-027	107+50E, 76+00N	29	DMT	12+	112.4	95.5	6.5	PASS
I-028	108+00E, 76+25N	29	T	12+	x	x	x	PASS
I-029	108+75E, 76+40N	29	DMT	12+	108.7	92.4	6.4	PASS

Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

Compaction Minimum Value: **90.0% of Modified Proctor** **Thickness Minimum: 12.0"**

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
I-044	108+50E, 75+50N	29	DMT	12+	111.5	94.7	9.0	PASS
I-045	108+00E, 75+00N	28	T	12+	x	x	x	PASS
I-046	107+50E, 75+25N	28	DMT	12+	106.3	90.3	8.4	PASS
I-047R	107+00E, 75+50N	28	DMT	12+	117.7	91.4	13.1	PASS
I-048	107+00E, 74+75N	27	DMT	12+	111.8	95.0	6.8	PASS
I-049	108+25E, 74+75N	27	DMT	12+	107.5	91.3	10.6	PASS
I-051	107+50E, 74+50N	27	T	12+	x	x	x	PASS
I-052	108+75E, 74+50N	27	T	12+	x	x	x	PASS
I-059R	106+75E, 74+50N	27	DMT	12+	110.9	94.2	9.6	PASS
I-060	106+70E, 74+75N	27	T	12+	x	x	x	PASS
I-061R	106+70E, 75+15N	28	DMT	12+	105.5	90.0	8.2	PASS
I-062	106+75E, 75+45N	28	T	12+	x	x	x	PASS
I-063	106+70E, 75+80N	29	T	12+	x	x	x	PASS
I-064	106+70E, 76+40N	29	DMT	12+	109.4	92.9	12.3	PASS
Phase III: Units 27, 28, 29: Tests Required				**28.2**	**14.1**		**14.1**	
Phase III: Units 27, 28, 29: Tests Performed				**41.0**	**35.0**		**35.0**	**PASS**
Phase III: Units 30, 31, 32 = 2.30 Acres *testing frequency doubled*								
I-030	109+25E, 75+75N	32	T	12+	x	x	x	PASS
I-031	109+75E, 76+00N	32	T	12+	x	x	x	PASS
I-032	110+00E, 76+50N	32	T	12+	x	x	x	PASS
I-033	111+00E, 76+00N	32	DMT	12+	118.1	100.3	10.4	PASS
I-034A	112+00E, 76+50N	32	T	12+	x	x	x	PASS
I-034B	112+00E, 76+00N	32	T	12+	x	x	x	PASS

Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

Compaction Minimum Value: **90.0% of Modified Proctor** **Thickness Minimum: 12.0"**

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
I-035	113+00E, 76+00N	32	DMT	12+	111.1	94.4	8.6	PASS
I-036	113+00E, 75+00N	31	T	12+	x	x	x	PASS
I-037	112+15E, 75+50N	31	DMT	12+	107.0	90.9	6.3	PASS
I-038	112+00E, 75+00N	31	DMT	12+	110.2	93.6	11.4	PASS
I-039	111+00E, 75+50N	31	T	12+	x	x	x	PASS
I-040	110+50E, 75+50N	31	DMT	12+	113.1	96.1	5.3	PASS
I-041	110+00E, 75+25N	31	T	12+	x	x	x	PASS
I-042	109+50E, 75+00N	31	T	12+	x	x	x	PASS
I-043	108+95E, 75+25N	31	T	12+	x	x	x	PASS
I-050	111+00E, 74+25N	30	DMT	12+	113.6	96.5	8.8	PASS
I-053	109+50E, 74+50N	30	T	12+	x	x	x	PASS
I-054	110+50E, 74+50N	30	T	12+	x	x	x	PASS
I-055	112+00E, 74+50N	30	T	12+	x	x	x	PASS
I-065	111+45E, 74+50N	30	DMT	12+	108.3	92.0	8.7	PASS
I-066	111+45E, 75+20N	31	DMT	12+	107.2	91.1	8.5	PASS
I-067	111+45E, 75+85N	31	DMT	12+	108.8	92.4	6.9	PASS
I-068	111+45E, 76+50N	32	DMT	12.0	107.9	91.7	9.0	PASS
Phase III: Units 30, 31, 32: Tests Required				**18.4**	**9.2**		**9.2**	
Phase III: Units 30, 31, 32: Tests Performed				**23.0**	**10.0**		**10.0**	**PASS**
Phase II: Units 33, 34, 35 = 2.32 Acres								
I-056	114+00E, 75+50N	34	T	12+	x	x	x	PASS
I-057	114+50E, 75+15N	34	DMT	12+	111.8	95.0	8.4	PASS
I-058	114+00E, 74+50N	33	DMT	12+	105.4	93.0	12.4	PASS

Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

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Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
I-069	115+50E, 75+75N	35	DMT	13.0	103.9	91.7	10.3	PASS
I-074R	117+00E, 75+40N	33	DMT	12.0	106.2	90.2	9.2	PASS
I-075	116+50E, 75+75N	34	DMT	13.0	107.9	91.7	8.4	PASS
I-076	116+00E, 74+75N	33	DMT	13.0	106.3	90.3	7.8	PASS
I-092	115+00E, 74+75N	33	DMT	12.0	110.0	93.5	10.1	PASS
I-093	115+00E, 75+50N	34	DMT	13.0	102.7	91.3	8.2	PASS
I-094	115+00E, 75+75N	34	DMT	14.0	104.2	92.6	8.5	PASS
I-095	115+00E, 76+25N	35	DMT	12.0	104.9	93.2	8.3	PASS
Phase II: Units 33, 34, 35: Tests Required				**9.3**	**4.6**		**4.6**	
Phase II: Units 33, 34, 35: Tests Performed				**11.0**	**10.0**		**10.0**	**PASS**
Phase II: Units 36, 37, 38, 39 = 3.89 Acres								
I-070	117+50E, 76+75N	39	DMT	13.0	107.3	91.2	8.0	PASS
I-071	118+75E, 76+75N	39	DMT	14.0	108.5	92.2	10.7	PASS
I-072	117+75E, 75+75N	39	T	14.0	x	x	x	PASS
I-073	118+75E, 75+75N	38	DMT	13.0	106.2	90.2	10.4	PASS
I-077R	117+50E, 74+75N	36	DMT	12.0	106.9	90.8	8.6	PASS
I-078R	118+00E, 75+25N	37	DMT	12.0	110.9	94.2	11.9	PASS
I-079	119+00E, 75+25N	37	T	13.0	x	x	x	PASS
I-080R	118+50E, 74+40N	36	DMT	14.0	106.4	90.4	10.6	PASS
I-081	120+25E, 77+00N	39	DMT	12.0	103.8	91.6	6.7	PASS
I-082	121+00E, 77+50N	39	DMT	13.0	106.4	90.4	4.6	PASS
I-083	122+25E, 77+50N	39	DMT	12.0	108.4	92.1	4.1	PASS
I-084	122+50E, 77+00N	38	DMT	12.0	108.0	91.8	5.8	PASS

Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

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Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
I-085	121+50E, 76+50N	38	T	12.0	x	x	x	PASS
I-086	120+75E, 75+85N	38	T	12.0	x	x	x	PASS
I-087	120+00E, 76+25N	38	DMT	13.0	112.6	95.7	5.5	PASS
I-088	121+50E, 75+25N	36	DMT	13.0	107.0	90.9	7.9	PASS
I-089	122+00E, 76+00N	37	DMT	14.0	111.3	94.6	9.6	PASS
I-090	123+00E, 76+50N	37	DMT	12.0	111.3	94.6	7.3	PASS
I-091	123+50E, 76+00N	36	DMT	13.0	106.5	90.5	5.5	PASS
I-096	119+55E, 74+60N	36	DMT	13.0	102.2	90.8	10.6	PASS
I-097	119+45E, 75+25N	37	DMT	13.0	110.2	98.0	7.0	PASS
I-098	119+35E, 76+00N	38	DMT	13.0	112.6	100.1	6.1	PASS
I-099	119+25E, 76+40N	39	DMT	13.0	107.7	95.7	8.8	PASS
Phase II: Units 36, 37, 38, 39: Tests Required				**15.6**	**7.8**		**7.8**	
Phase II: Units 36, 37, 38, 39:Tests Performed				**23.0**	**19.0**		**19.0**	**PASS**
Phase I: Units 40, 41, 42, 43 = 4.27 Acres								
I-112	124+00E, 76+75N	41	T	14+	x	x	x	PASS
I-113	123+50E, 77+50N	42	DMT	14+	112.9	99.9	8.7	PASS
I-114	123+00E, 78+00N	43	T	14+	x	x	x	PASS
I-115	122+50E, 78+50N	43	T	14+	x	x	x	PASS
I-116	123+00E, 79+50N	43	DMT	14+	105.2	93.1	10.0	PASS
I-117	124+00E, 79+00N	42	T	14+	x	x	x	PASS
I-118	124+25E, 78+25N	41	T	14+	x	x	x	PASS
I-119	123+50E, 80+25N	43	T	14+	x	x	x	PASS
I-120	124+50E, 80+00N	42	DMT	14+	102.1	90.4	9.1	PASS

Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

Compaction Minimum Value: **90.0% of Modified Proctor** **Thickness Minimum: 12.0"**

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
I-121	124+75E, 79+25N	41	T	14+	x	x	x	PASS
I-122	125+00E, 78+50N	41	DMT	14+	111.1	98.4	7.7	PASS
I-123	125+40E, 79+50N	41	T	14+	x	x	x	PASS
I-124	124+00E, 81+50N	43	DMT	13.0	112.6	99.6	7.4	PASS
I-125	124+50E, 81+25N	42	DMT	13.0	108.8	96.3	14.6	PASS
I-126	125+25E, 80+75N	41	DMT	13.0	110.2	97.5	9.7	PASS
I-127	123+65E, 82+50N	43	T	14.0	x	x	x	PASS
I-128	124+75E, 82+50N	42	T	14.0	x	x	x	PASS
I-129	125+35E, 81+75N	41	T	14.0	x	x	x	PASS
I-130	125+75E, 82+25N	41	DMT	14.0	109.8	97.2	8.1	PASS
I-100	125+85E, 80+20N	40	DMT	12+	105.5	93.4	8.0	PASS
I-101	125+15E, 80+40N	41	DMT	12+	112.4	99.5	6.3	PASS
I-102	124+45E, 80+60N	42	DMT	12+	112.3	99.4	7.3	PASS
I-103	123+50E, 80+75N	43	DMT	12+	113.0	94.1	8.3	PASS
Phase I: Units 40, 41, 42, 43: Tests Required				**17.1**	**8.5**		**8.5**	
Phase I: Units 40, 41, 42, 43: Tests Performed				**23.0**	**12.0**		**12.0**	**PASS**
Phase I: Units 44, 45, 46, 47 = 3.09 Acres								
I-131	124+00E, 83+00N	47	T	14.0	x	x	x	PASS
I-132	125+15E, 83+00N	45	T	14.0	x	x	x	PASS
I-133	126+25E, 82+75N	44	T	14.0	x	x	x	PASS
I-134	124+25E, 84+50N	47	T	14.0	x	x	x	PASS
I-135	124+75E, 84+00N	46	DMT	14.0	113.0	94.2	15.8	PASS
I-136	125+50E, 84+50N	45	T	14.0	x	x	x	PASS

Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

Compaction Minimum Value: **90.0% of Modified Proctor** **Thickness Minimum: 12.0"**

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
I-137	126+00E, 84+00N	44	DMT	12.0	108.5	96.0	9.3	PASS
I-138	123+75E, 85+25N	47	DMT	12+	103.5	91.6	8.8	PASS
I-139	124+50E, 85+50N	46	DMT	12+	110.0	97.3	3.9	PASS
I-140	125+00E, 85+00N	46	T	12+	x	x	x	PASS
I-141	126+25E, 85+50N	44	DMT	12+	105.1	93.0	4.1	PASS
I-142	124+00E, 86+25N	47	T	12+	x	x	x	PASS
I-143	124+75E, 86+50N	46	T	12+	x	x	x	PASS
I-144	125+50E, 86+00N	45	T	12+	x	x	x	PASS
I-145	125+35E, 86+75N	45	DMT	12+	106.0	93.8	11.5	PASS
I-146	126+25E, 86+50N	44	T	12+	x	x	x	PASS
I-104	126+00E, 84+55N	44	DMT	12+	105.2	93.1	10.7	PASS
I-105	125+15E, 84+55N	45	DMT	12+	107.8	95.4	13.3	PASS
I-106	124+50E, 84+55N	46	DMT	12+	102.7	90.9	14.5	PASS
I-107	123+75E, 84+55N	47	DMT	12+	103.0	91.2	12.7	PASS
Phase I: Units 44, 45, 46, 47: Tests Required				**12.4**	**6.2**		**6.2**	
Phase I: Units 44, 45, 46, 47: Tests Performed				**20.0**	**10.0**		**10.0**	**PASS**
All Phases Totals = 21.30Acres (5.83Acres Doubled)								
All Phases: Tests Required				**133.5**	**79.3**		**79.3**	
All Phases: Tests Performed				**156.0**	**104.0**		**104.0**	**PASS**
Phase I: Downcomer D-27								
I-104	126+00E, 84+55N	44	DMT	12+	105.2	93.1	10.7	PASS

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Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

Compaction Minimum Value: **90.0% of Modified Proctor** **Thickness Minimum: 12.0"**

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
I-105	125+15E, 84+55N	45	DMT	12+	107.8	95.4	13.3	PASS
I-106	124+50E, 84+55N	46	DMT	12+	102.7	90.9	14.5	PASS
I-107	123+75E, 84+55N	47	DMT	12+	103.0	91.2	12.7	PASS
Phase I: Downcommer D-27: Tests Required				**4.0**	**4.0**		**4.0**	
Phase I: Downcommer D-27: Tests Performed				**4.0**	**4.0**		**4.0**	**PASS**
Phase I: Downcomer D-33								
I-100	125+85E, 80+20N	40	DMT	12+	105.5	93.4	8.0	PASS
I-101	125+15E, 80+40N	41	DMT	12+	112.4	99.5	6.3	PASS
I-102	124+45E, 80+60N	42	DMT	12+	112.3	99.4	7.3	PASS
I-103	123+50E, 80+75N	43	DMT	12+	113.0	94.1	8.3	PASS
Phase I: Downcommer D-33: Tests Required				**4.0**	**4.0**		**4.0**	
Phase I: Downcommer D-33: Tests Performed				**4.0**	**4.0**		**4.0**	**PASS**
Phase II: Downcomer D-38								
I-096	119+55E, 74+60N	36	DMT	13.0	102.2	90.8	10.6	PASS
I-097	119+45E, 75+25N	37	DMT	13.0	110.2	98.0	7.0	PASS
I-098	119+35E, 76+00N	38	DMT	13.0	112.6	100.1	6.1	PASS
I-099	119+25E, 76+40N	39	DMT	13.0	107.7	95.7	8.8	PASS
Phase II: Downcommer D-38: Tests Required				**4.0**	**4.0**		**4.0**	
Phase II: Downcommer D-38: Tests Performed				**4.0**	**4.0**		**4.0**	**PASS**

Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

Compaction Minimum Value: **90.0% of Modified Proctor** **Thickness Minimum: 12.0"**

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
Phase II: Downcomer D-41								
I-092	115+00E, 74+75N	33	DMT	12.0	110.0	93.5	10.1	PASS
I-093	115+00E, 75+50N	34	DMT	13.0	102.7	91.3	8.2	PASS
I-094	115+00E, 75+75N	34	DMT	14.0	104.2	92.6	8.5	PASS
I-095	115+00E, 76+25N	35	DMT	12.0	104.9	93.2	8.3	PASS
Phase II: Downcommer D-41: Tests Required				**3.0**	**3.0**		**3.0**	
Phase II: Downcommer D-41: Tests Performed				**4.0**	**4.0**		**4.0**	**PASS**
Phase III: Downcomer D-44								
I-065	111+45E, 74+50N	30	DMT	12+	108.3	92.0	8.7	PASS
I-066	111+45E, 75+20N	31	DMT	12+	107.2	91.1	8.5	PASS
I-067	111+45E, 75+85N	31	DMT	12+	108.8	92.4	6.9	PASS
I-068	111+45E, 76+50N	32	DMT	12.0	107.9	91.7	9.0	PASS
Phase III: Downcommer D-44: Tests Required				**3.0**	**3.0**		**3.0**	
Phase III: Downcommer D-44: Tests Performed				**4.0**	**4.0**		**4.0**	**PASS**
Phase III: Downcomer D-47								
I-059R	106+75E, 74+50N	27	DMT	12+	110.9	94.2	9.6	PASS
I-060	106+70E, 74+75N	27	T	12+	x	x	x	PASS
I-061R	106+70E, 75+15N	28	DMT	12+	105.5	90.0	8.2	PASS
I-062	106+75E, 75+45N	28	T	12+	x	x	x	PASS
I-063	106+70E, 75+80N	29	T	12+	x	x	x	PASS

Trail Ridge Landfill - Closure Phase 3
INITIAL COVER TEST RESULTS

Compaction Minimum Value: **90.0% of Modified Proctor** **Thickness Minimum: 12.0"**

Legend: **I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested**

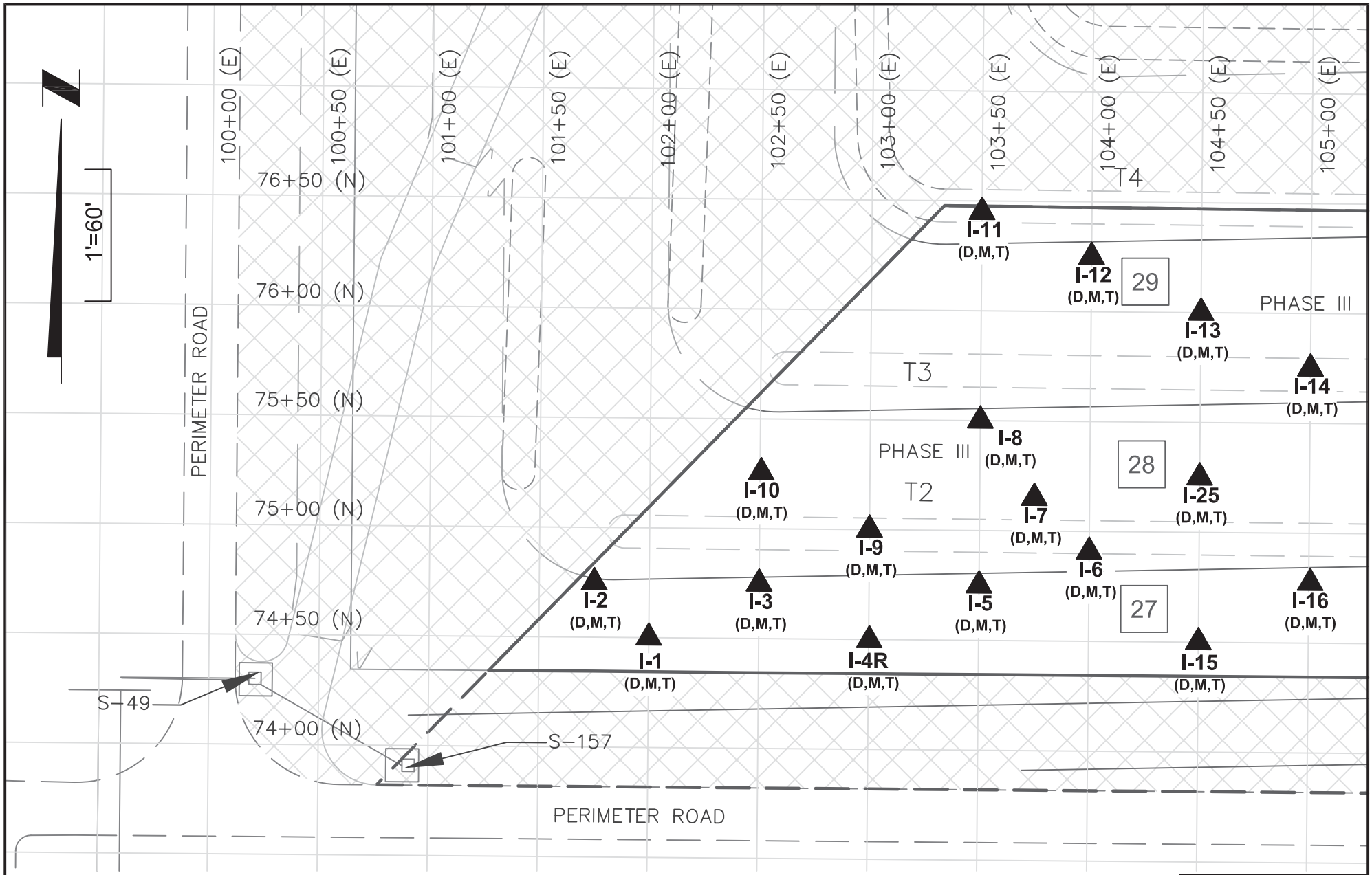
Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Field Moisture Content (%)	Test Result
I-064	106+70E, 76+40N	29	DMT	12+	109.4	92.9	12.3	PASS
Phase III: Downcommer D-47: Tests Required				**3.0**	**3.0**		**3.0**	
Phase III: Downcommer D-47: Tests Performed				**6.0**	**3.0**		**3.0**	**PASS**
Phase IV: Downcomer D-55								
I-108	102+50E, 85+15N	26	DMT	16.0	111.1	98.8	7.7	PASS
I-109	102+00E, 85+15N	26	DMT	15.0	107.5	95.6	6.5	PASS
I-110	101+50E, 85+15N	25	DMT	14.0	103.8	92.3	5.2	PASS
I-111	101+00E, 85+15N	24	DMT	16.0	109.8	97.6	6.1	PASS
Phase IV: Downcommer D-55: Tests Required				**4.0**	**4.0**		**4.0**	
Phase IV: Downcommer D-55: Tests Performed				**4.0**	**4.0**		**4.0**	**PASS**

Trail Ridge Landfill - Closure Phase 3

INITIAL COVER

Phase I, II, III, IV, Downcommers Map Diagrams

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Legend:
T=Thickness
D=Density
P=Permeability
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
27	1.10
28	1.20
29	1.23

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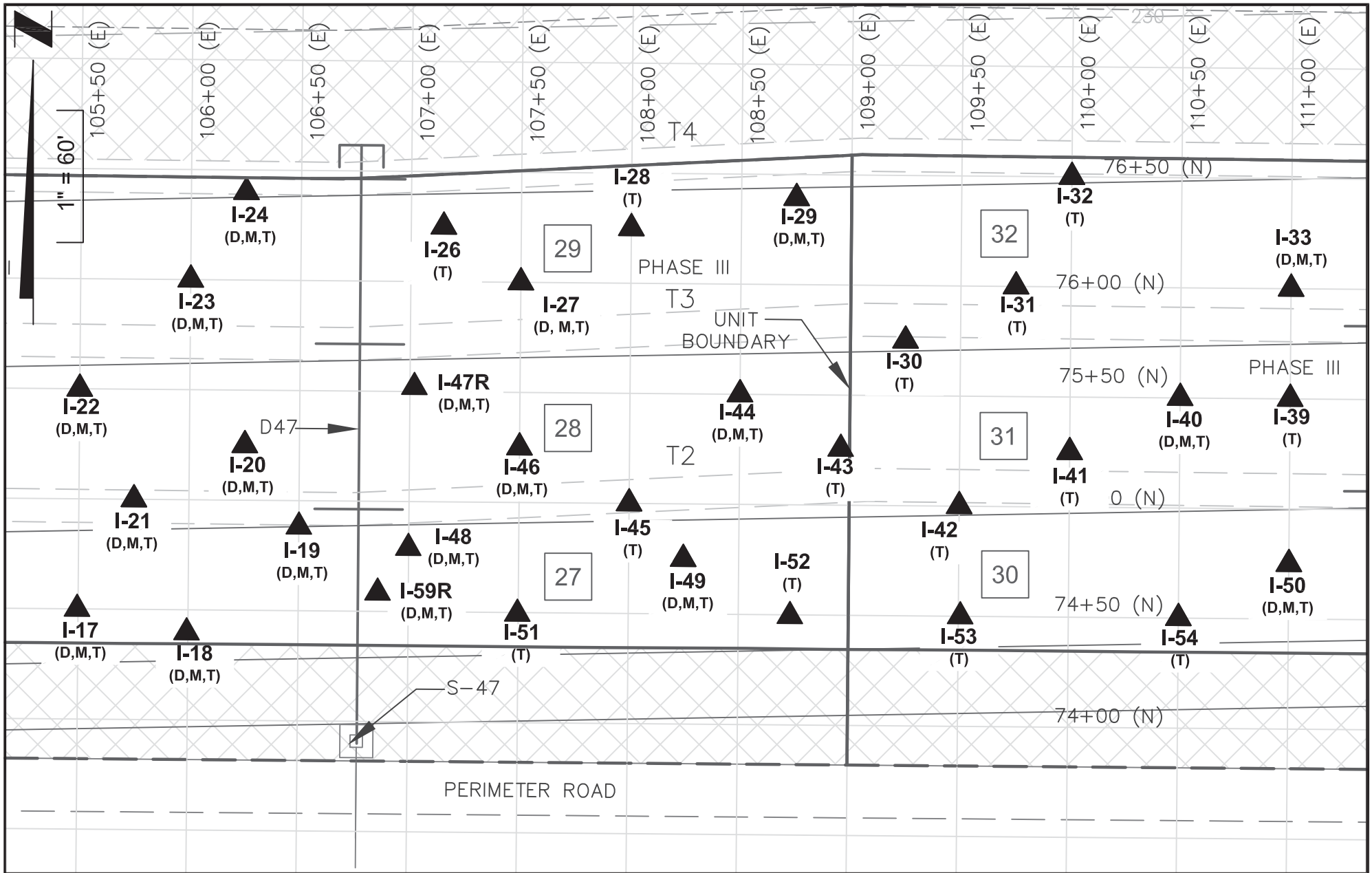
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FIGURE NO.
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Legend:

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F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

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UNIT NO.	*ACRES±	UNIT NO.	*ACRES±
27	1.10	30	0.74
28	1.20	31	0.73
29	1.23	32	0.83

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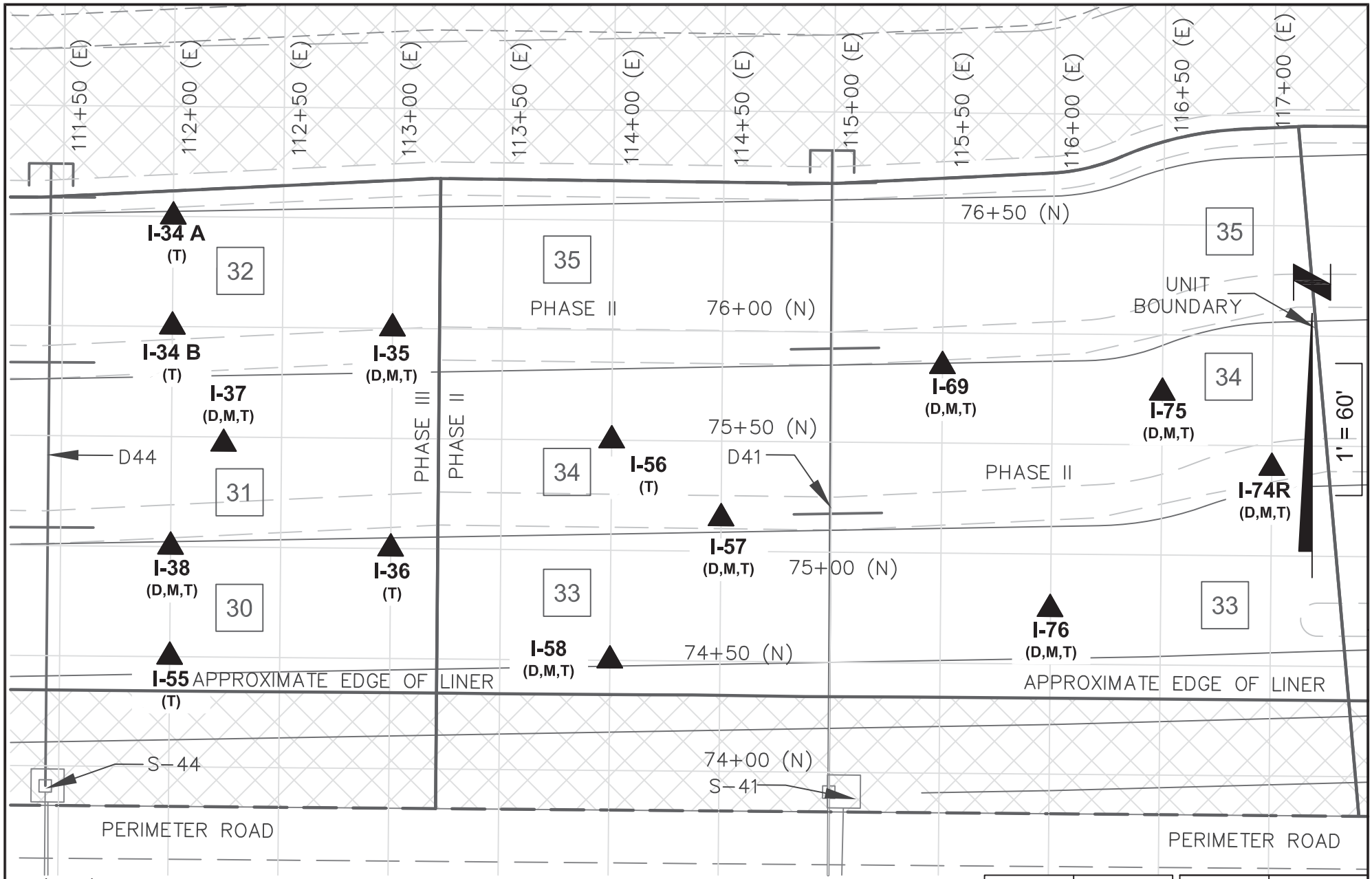
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FIGURE NO.
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Legend:

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M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

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UNIT NO.	*ACRES±	UNIT NO.	*ACRES±
30	0.74	33	0.84
31	0.73	34	0.70
32	0.83	35	0.78

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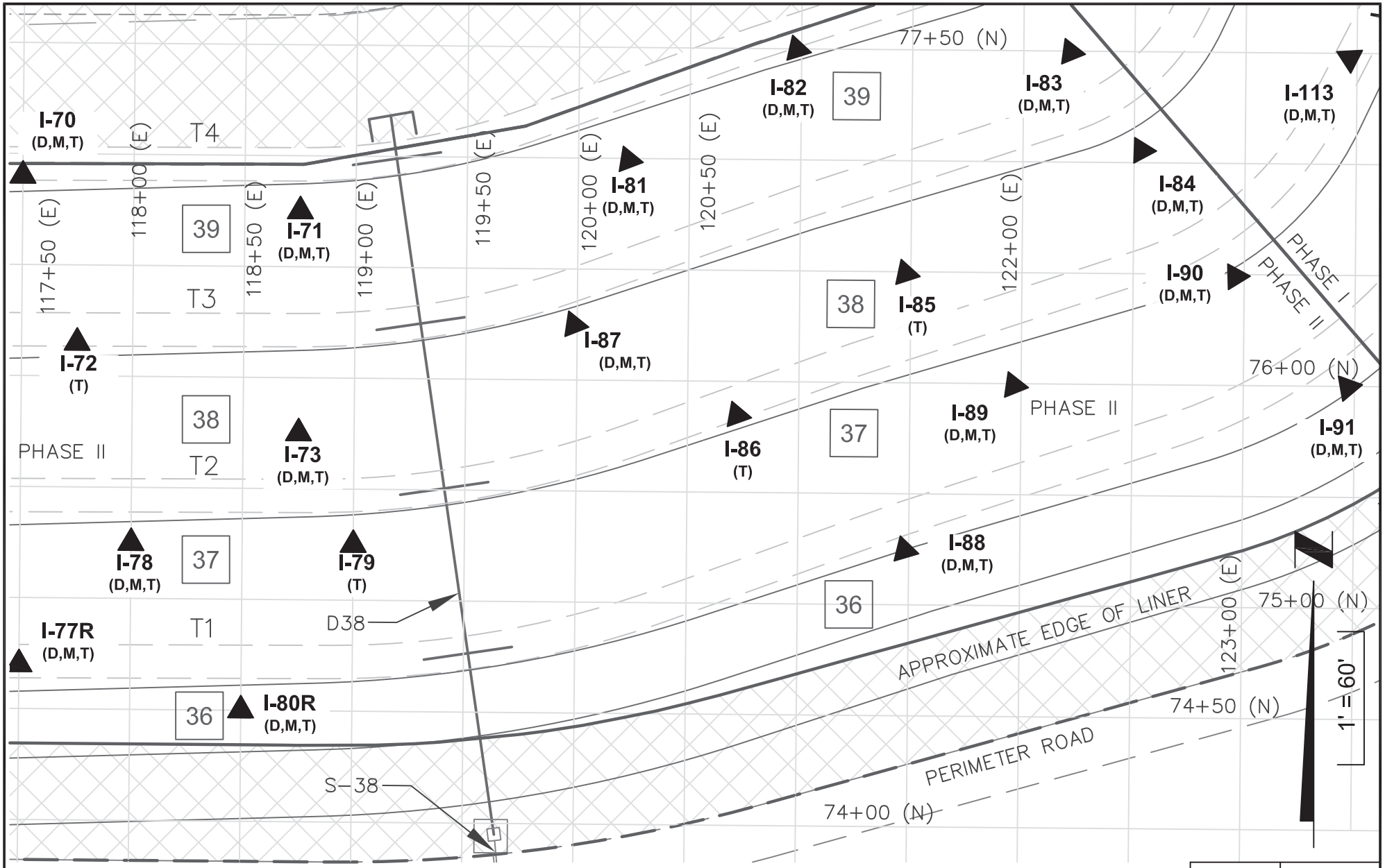
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0006-0006

FIGURE NO.

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Legend:
T=Thickness
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M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
36	0.72
37	1.09
38	1.01
39	1.07

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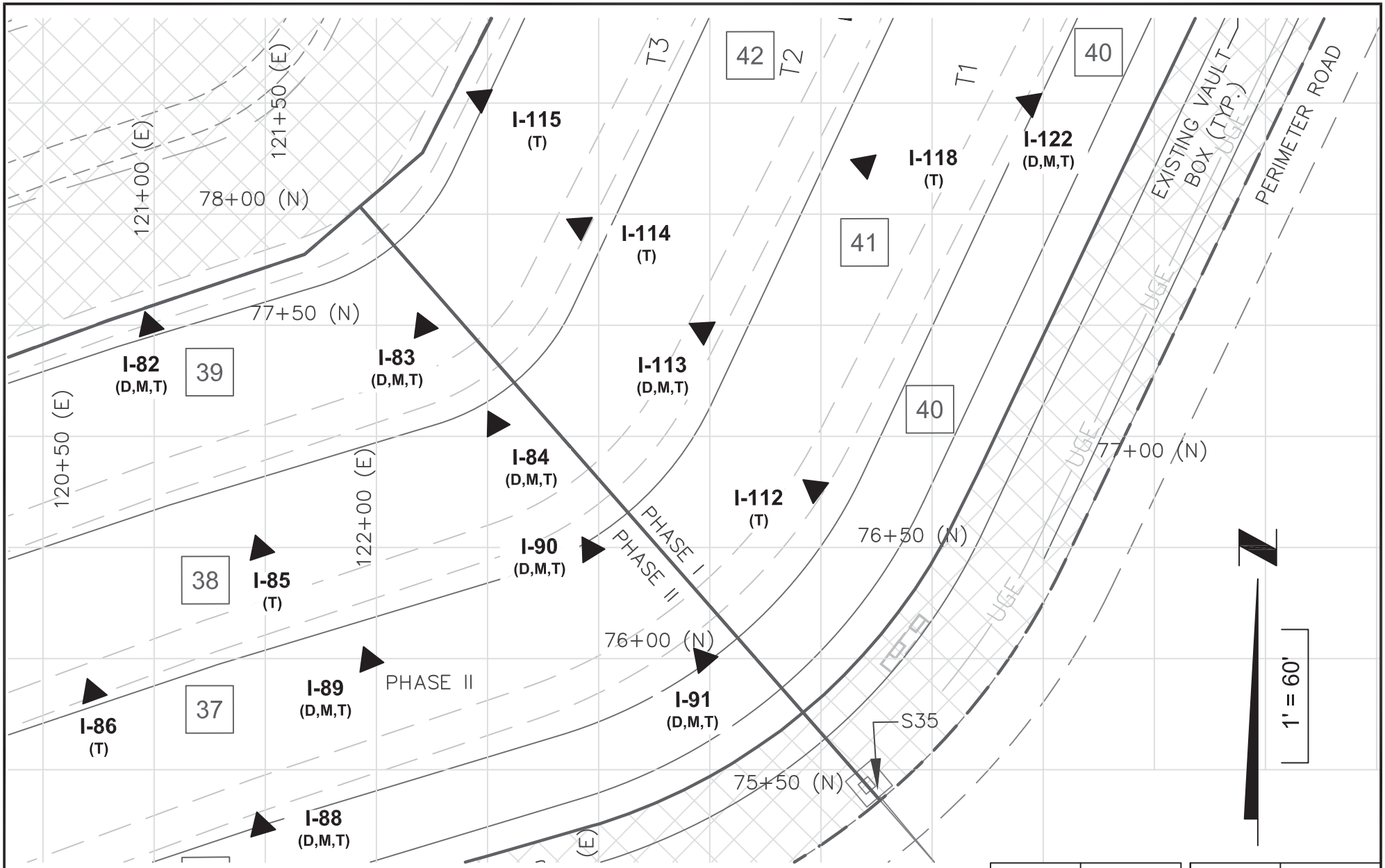
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Legend:
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M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
36	0.72
37	1.09
38	1.01
39	1.07

UNIT NO.	*ACRES±
40	0.98
41	1.14
42	1.05
43	1.10

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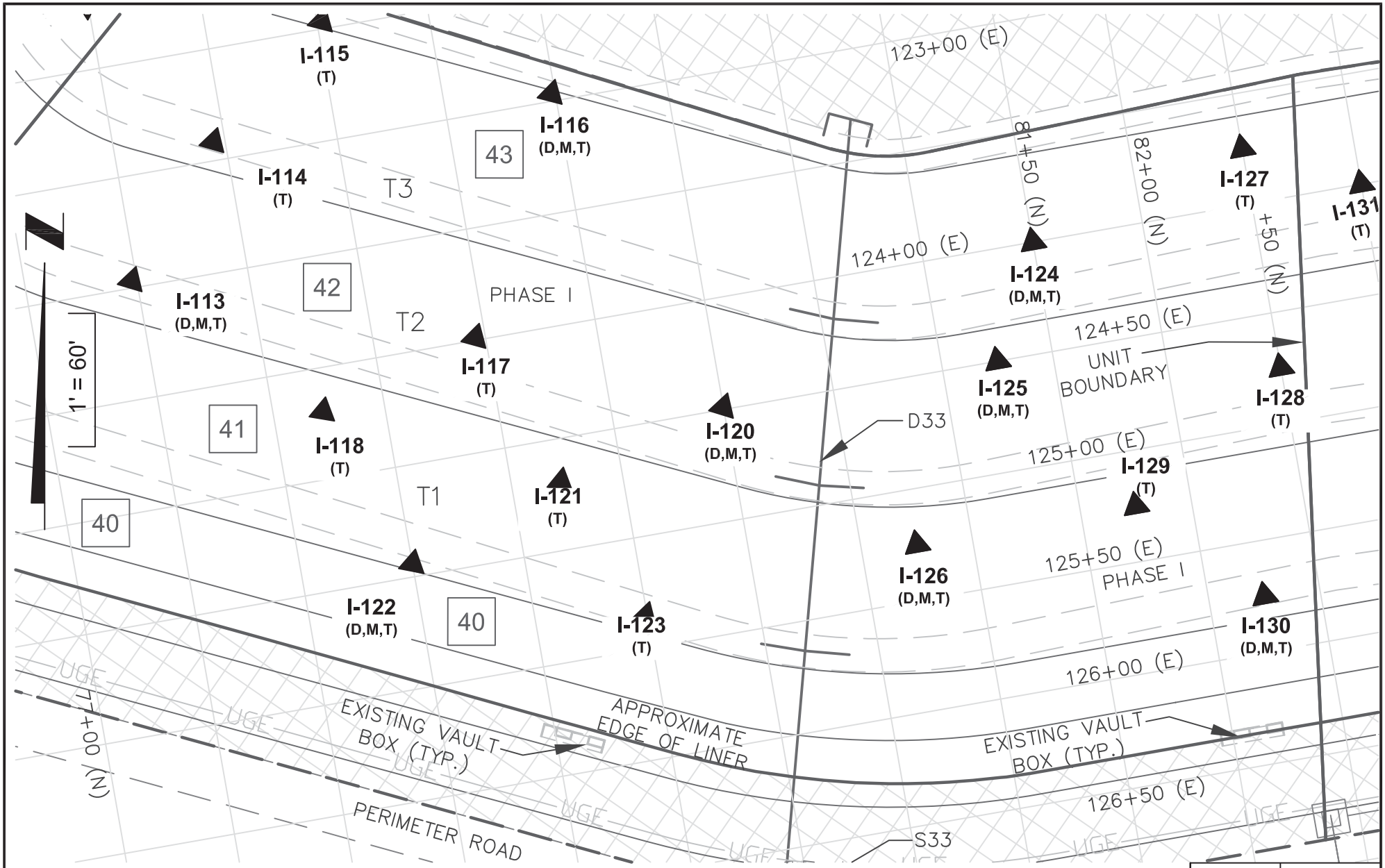
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FIGURE NO.
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Legend:
T=Thickness
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A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
40	0.98
41	1.14
42	1.05
43	1.10

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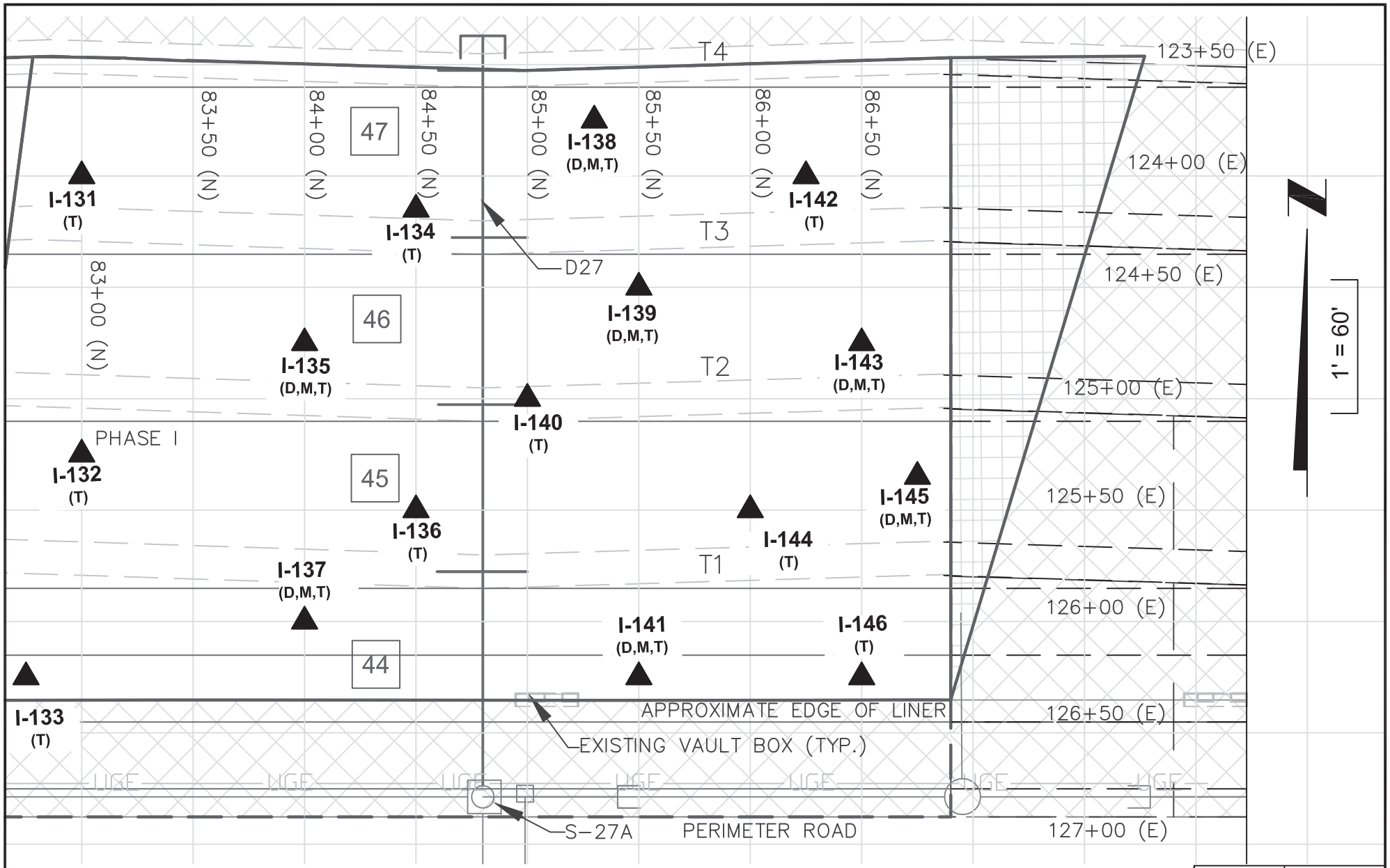
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Legend:
T=Thickness
D=Density
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A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
44	0.62
45	0.79
46	0.80
47	0.88

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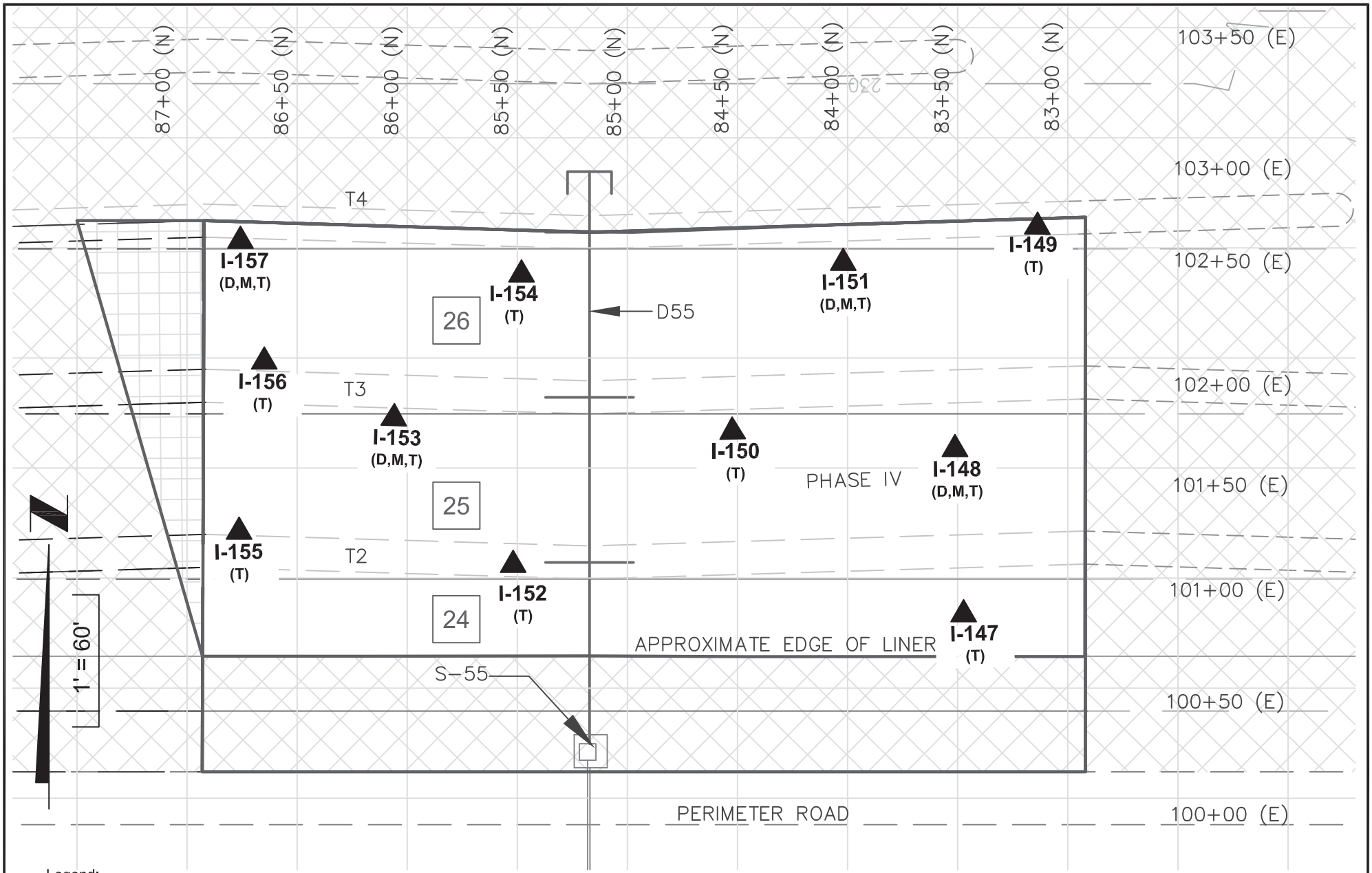
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FIGURE NO.
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Legend:
T=Thickness
D=Density
P=Perm
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A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
24	0.34
25	0.73
26	0.83

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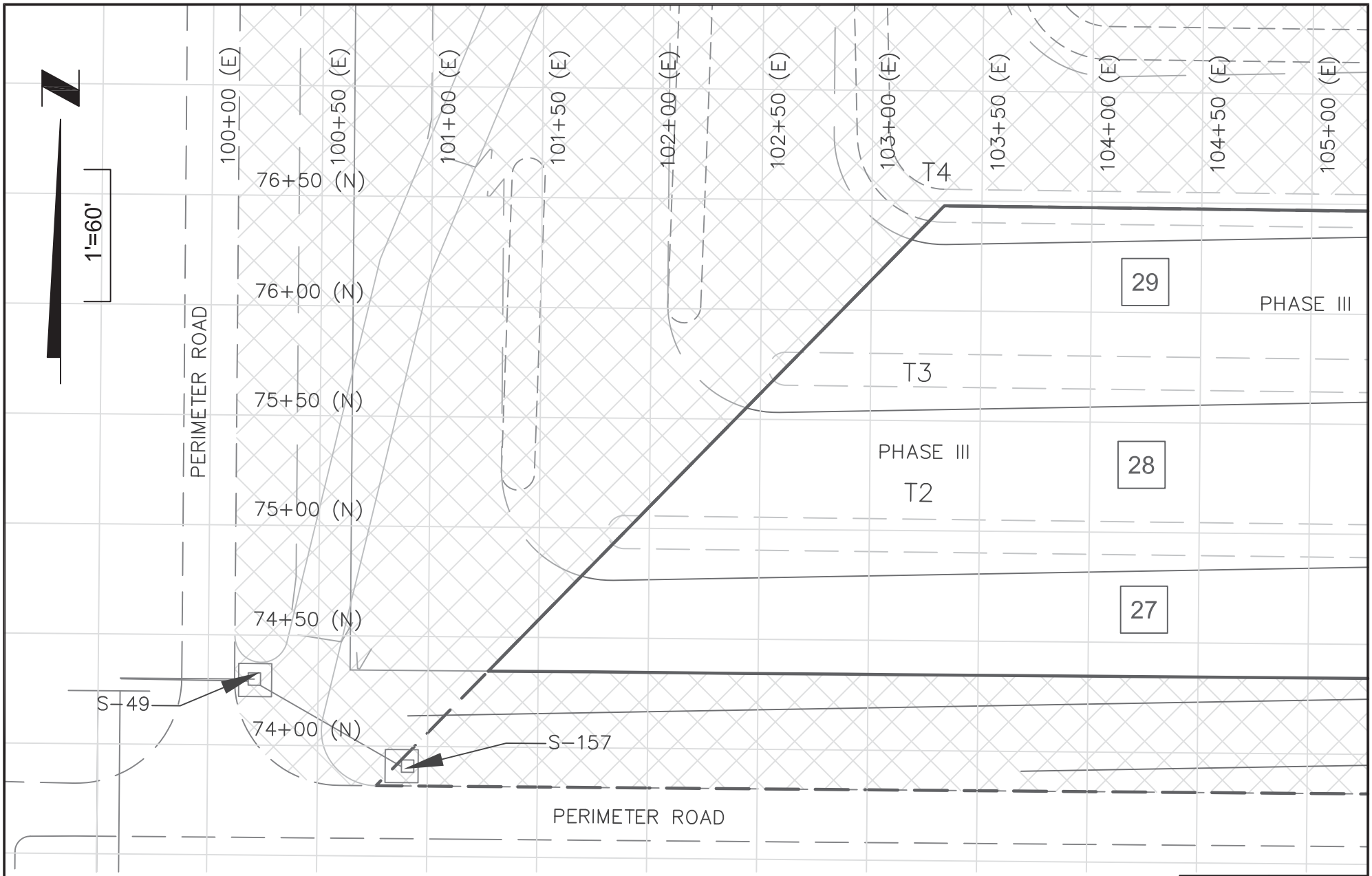
CLIENT:
ETM
VISION - EXPERIENCE - RESULTS
ENGLAND - THIMS & MILLER, INC.

Jacksonville
Where Florida Begins.

SHEET TITLE:
INITIAL COVER DENSITY/THICKNESS TESTING

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
-



Legend:
T=Thickness
D=Density
P=Permeability
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
27	1.10
28	1.20
29	1.23

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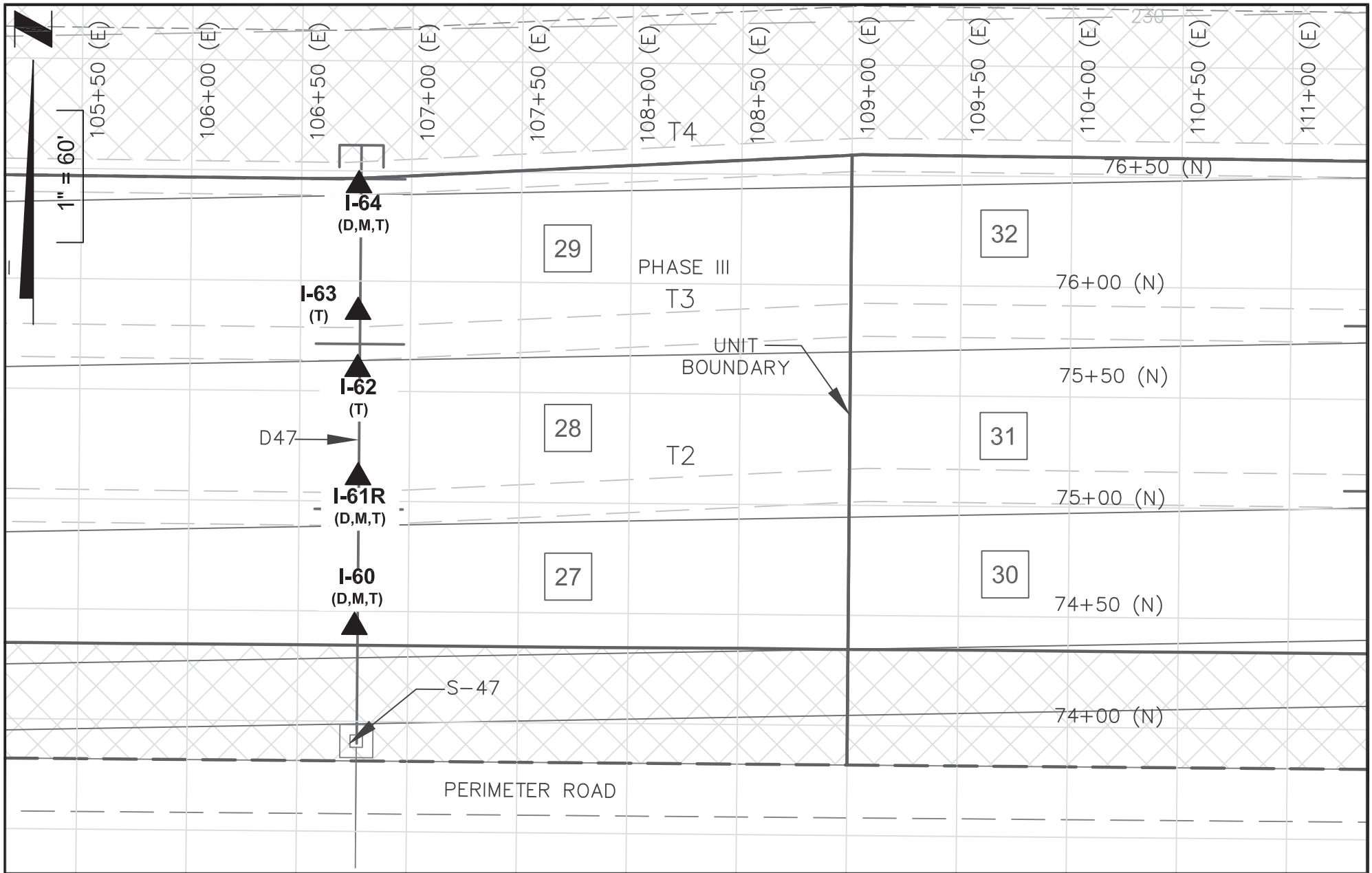
Jacksonville
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SHEET TITLE:
DOWNCOMMER: INITIAL COVER DENSITY/THICKNESS TESTING

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida

0006-0006

FIGURE NO.
-



Legend:

T=Thickness
D=Density
P=Permeability
R=Retest

A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
27	1.10
28	1.20
29	1.23

UNIT NO.	*ACRES±
30	0.74
31	0.73
32	0.83

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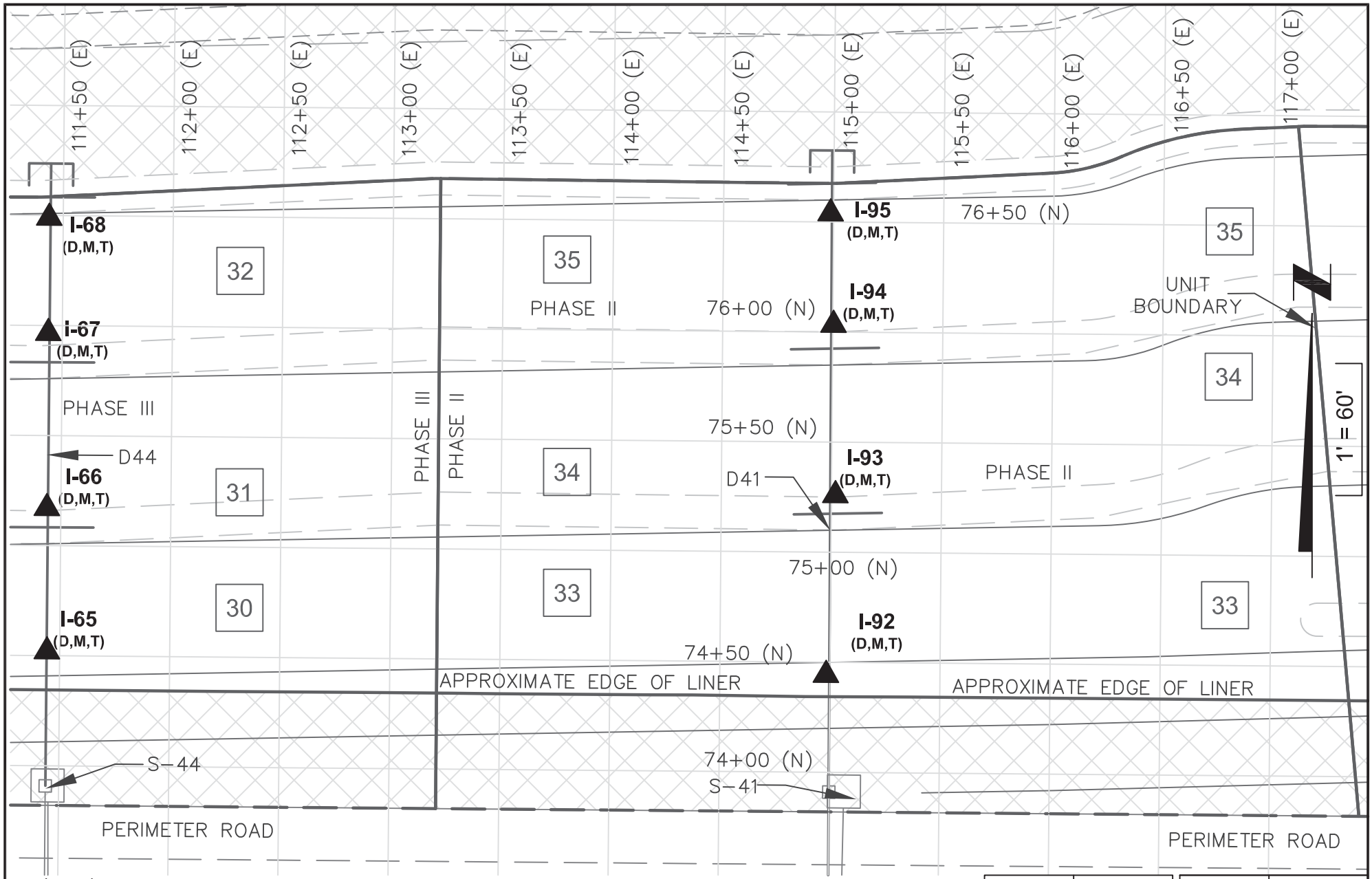
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DOWNCOMMER: INITIAL COVER DENSITY/THICKNESS TESTING

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida

0006-0006

FIGURE NO.
-



Legend:
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D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±	UNIT NO.	*ACRES±
30	0.74	33	0.84
31	0.73	34	0.70
32	0.83	35	0.78

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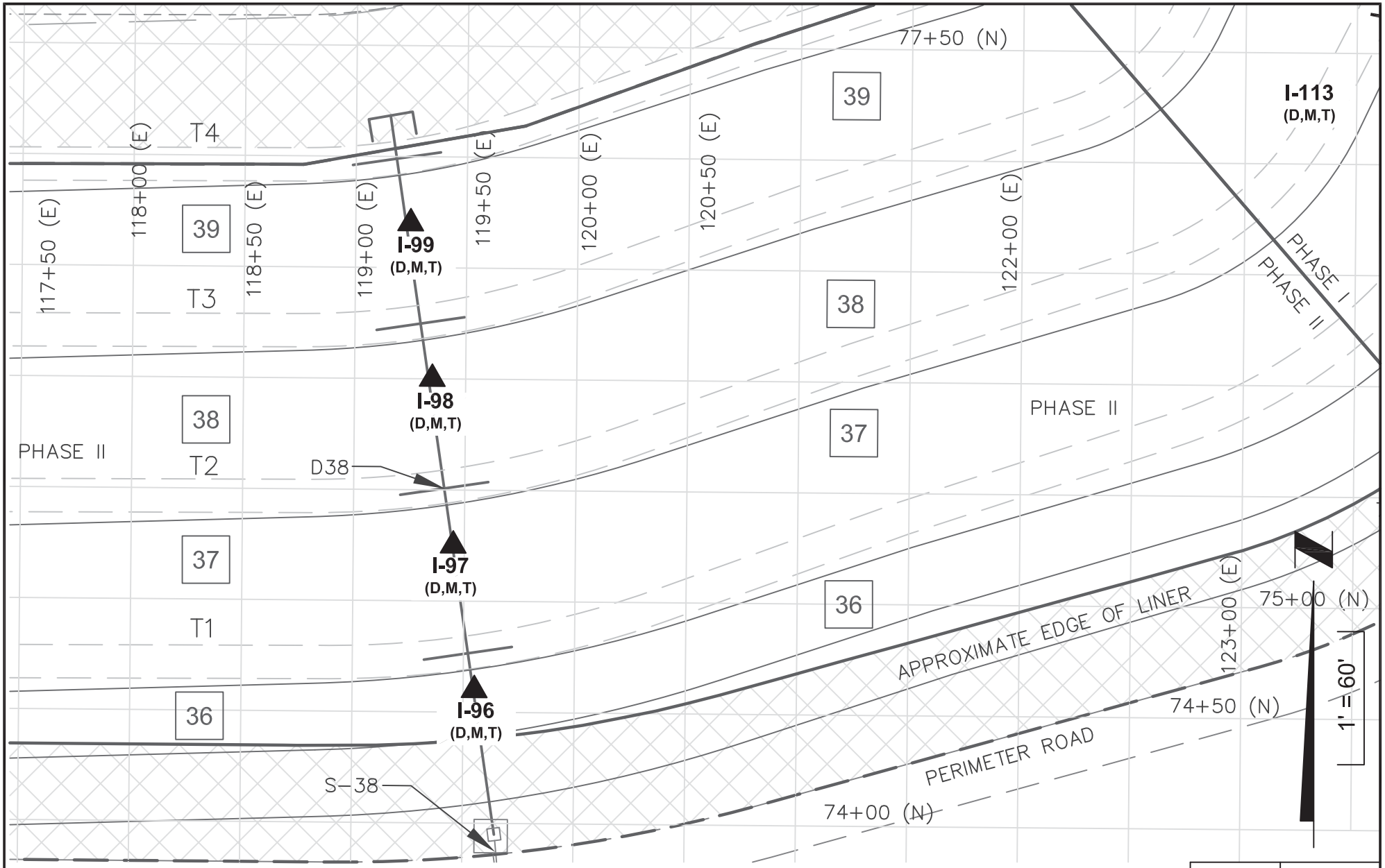
Jacksonville
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SHEET TITLE:
DOWNCOMMER: INITIAL COVER DENSITY/THICKNESS TESTING

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida

0006-0006

FIGURE NO.
-



Legend:

T=Thickness
D=Density
P=Perm
R=Retest

A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
36	0.72
37	1.09
38	1.01
39	1.07

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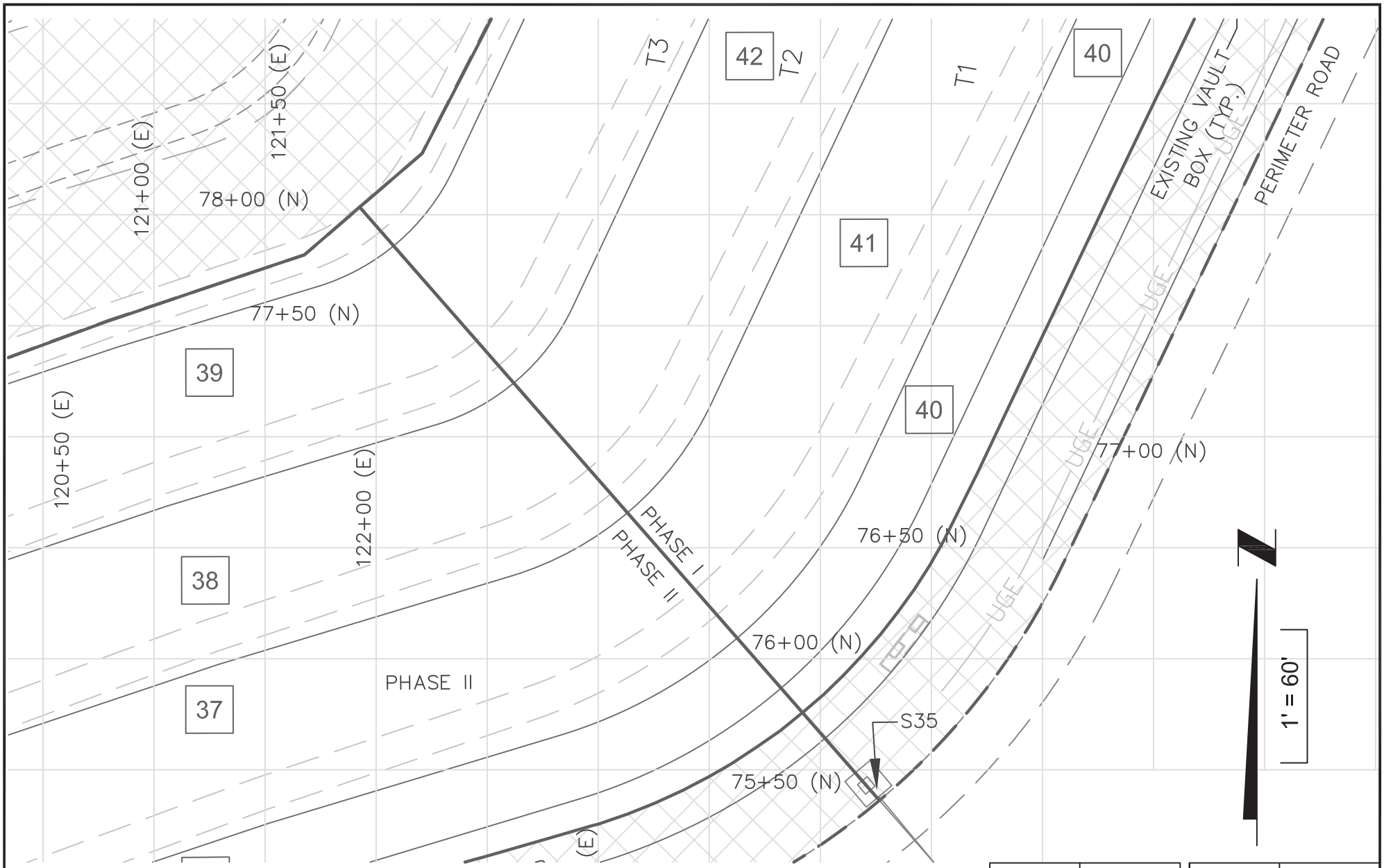
Jacksonville
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SHEET TITLE:
DOWNCOMMER: INITIAL COVER DENSITY/THICKNESS TESTING

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida

0006-0006

FIGURE NO.
-



Legend:
T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
36	0.72
37	1.09
38	1.01
39	1.07

UNIT NO.	*ACRES±
40	0.98
41	1.14
42	1.05
43	1.10

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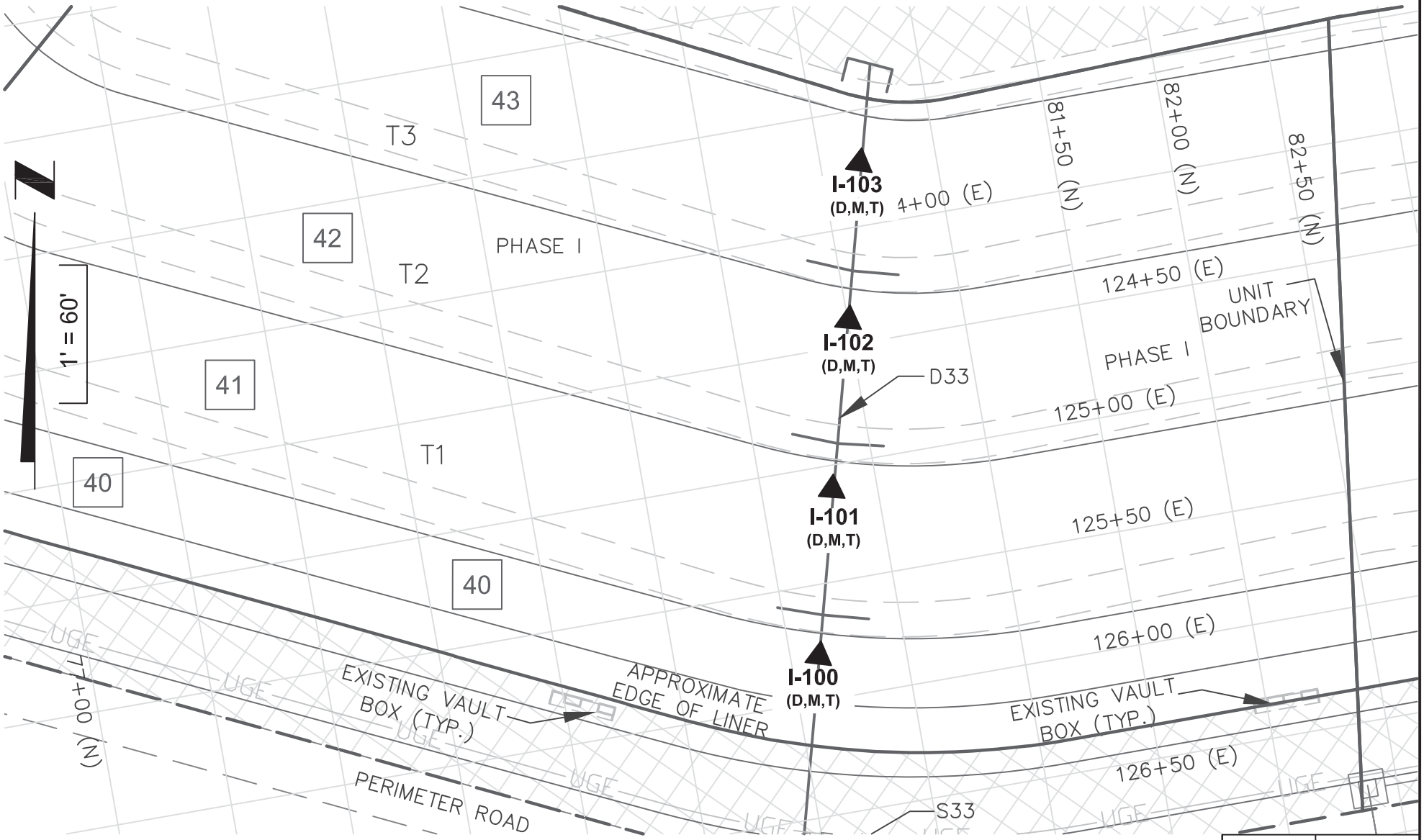
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SHEET TITLE:
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PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
-



Legend:
T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
40	0.98
41	1.14
42	1.05
43	1.10

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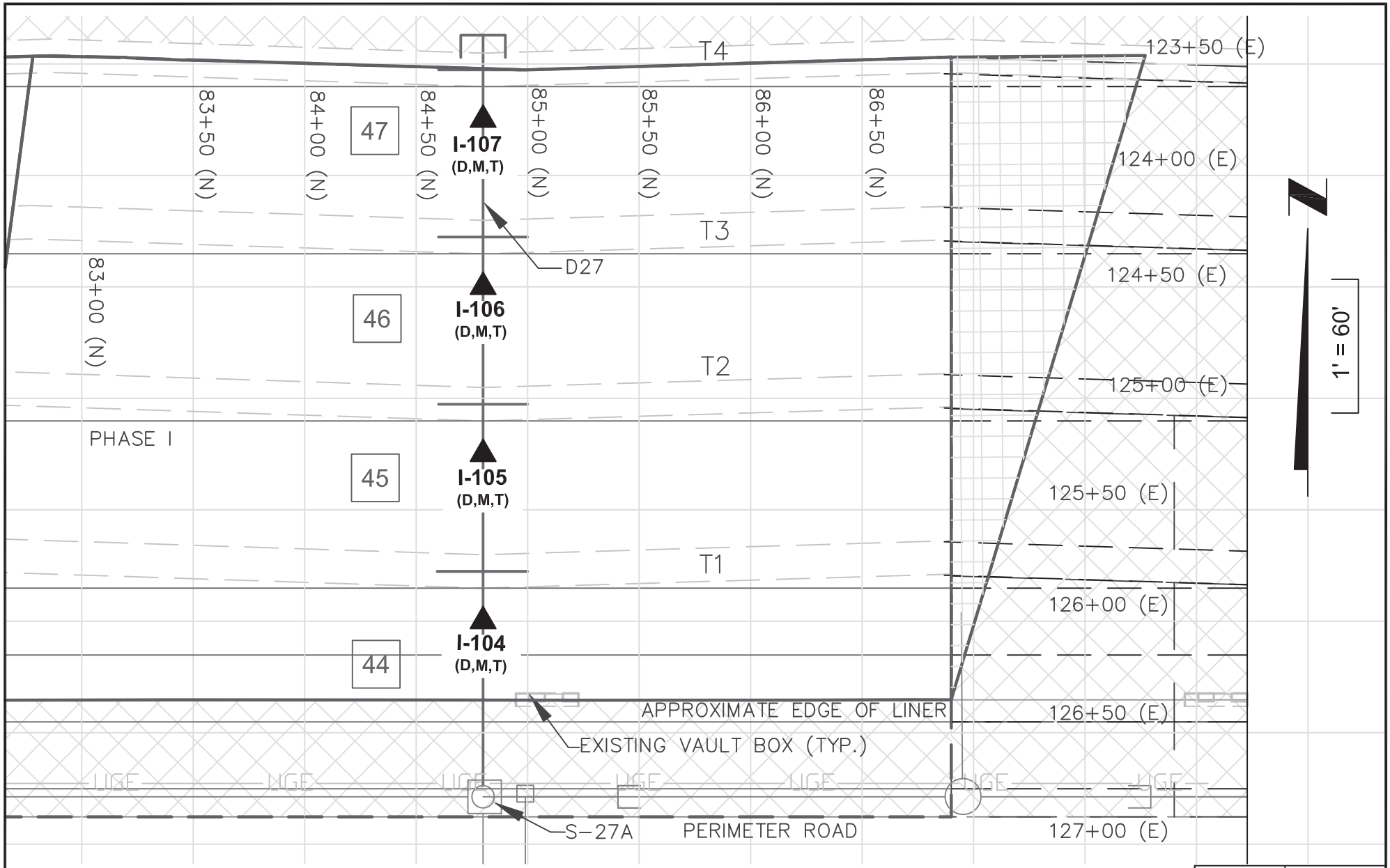
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SHEET TITLE:
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PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
-



Legend:
T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
44	0.62
45	0.79
46	0.80
47	0.88

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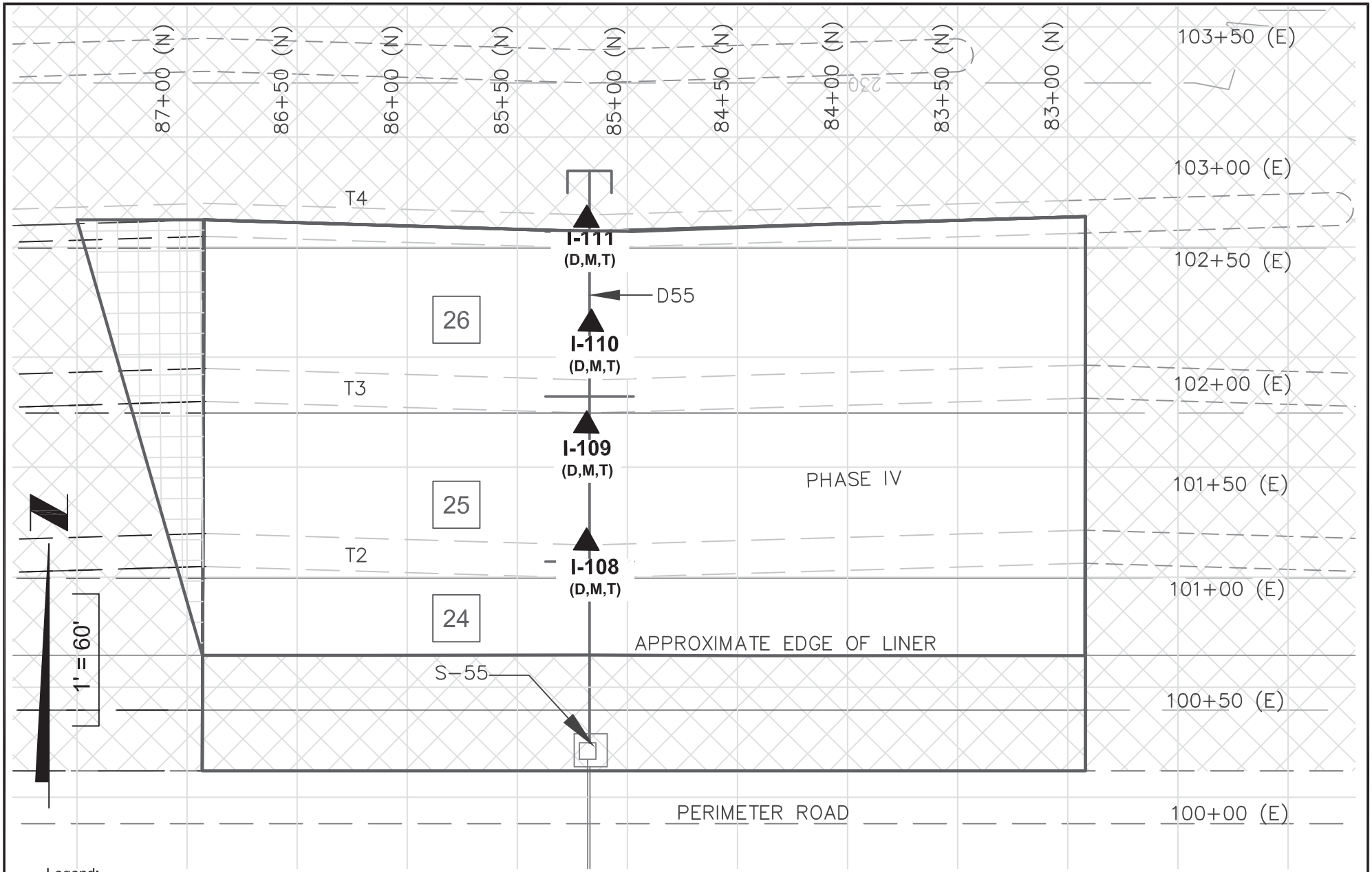
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SHEET TITLE:
DOWNCOMMER: INITIAL COVER DENSITY/THICKNESS TESTING

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
-



Legend:
T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
24	0.34
25	0.73
26	0.83

MAE
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SHEET TITLE:
DOWNCOMMER: INITIAL COVER DENSITY/THICKNESS TESTING

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
-

Trail Ridge Landfill - Closure Phase 3

CLAY LAYER



September 04, 2012

Mr. Scott Lockwood, P.E.
England-Thims & Miller, Inc.
14775 Old St. Augustine Road
Jacksonville, Florida 32258

Subject: Final Clay Layer Certification
Trail Ridge Landfill – Phase 3 Construction QA/QC Services
Jacksonville, Florida
MAE Project No. 0006-0006

Dear Mr. Lockwood:

MESKEL & ASSOCIATES ENGINEERING, PLLC (MAE) has completed the monitoring and testing of the clay layer at the subject site. The clay material source was tested and prequalified prior to clay material placement on site and laboratory test results for Permeability Testing, Proctor Testing, Triaxial and Direct Shear Tests, and index property testing performed and for sliding resistance. A clay test strip was constructed and the tests results determined the minimum density; those letters along with test results are subsequently attached. During prequalification and construction the clay was constructed and tested in two 6" lifts in accordance with the QA/QC plan for:

- Thickness at a minimum frequency of 4 tests per acre per 6" layer.
- Hydraulic Conductivity at a minimum frequency of 1 test per acre per 6" layer at 6.67E-08cm/sec
- Atterberg Limits at a minimum frequency of 1 test per acre per 6" layer.
- Density at a minimum frequency of 2 tests per acre per 6" layer at 80% of the Standard Proctor.
- Moisture at a minimum frequency of 2 tests per acre per 6" layer.
- Percent Fines passing the No.200 sieve at a minimum frequency of 2 tests per acre per 6" layer.

All test results within the tables and the map diagrams meet or exceed the minimum requirements in the plans, specifications and or the QA/QC plan. Additionally, in accordance with the QA/QC plan the first five acres of the first phase (Phase III units 27, 28, 29, 30, 31, 32), the testing frequency was doubled. The field and laboratory results with the locations are identified in the tables and the map diagrams for Phases I, II, II and IV.

However, some tests performed failed to meet the minimum requirements. Upon failure, the contractor reworked the area and additional tests were performed five feet in each direction of the original test location to meet requirements, at the 95% confidence level in accordance with the QA/QC Plan. The retest locations are identified with an "R" after the test number: C1-80RA, C1-80RB, C1-80RC, C1-80RD.

Additionally, some tests had to be retaken due to several storm events which eroded the clay in the area of D-33 and D-27. The original tests performed met the minimum requirements but the clay erosion caused by the storms had to be reworked by contractor and therefore retested at the following locations: C1-86R2, C1-88R2, C1-90R2, C1-92R2, C2-83R2, C2-85R2, C2-87R2, C2-89R2, C1-94R, C1-96R, C2-91R, C2-93R.

Based on these results, we consider the clay layer acceptable. The number of passing tests performed meets or exceeds the minimum requirements in the plans, specifications and / or the QA/QC plan.

We appreciate the opportunity to assist England-Thims & Miller, Inc. on this project. If you have any questions concerning this report, please contact us.

Sincerely,
MESKEL & ASSOCIATES ENGINEERING, PLLC

COPY

Samuel E. Lansdale
Quality Control Monitor

Antoinette (Tina) D. Meskel, P.E.
Quality Assurance Engineer
Licensed, Florida No. 56999

Attachments: Table of Results Phases I, II, III, IV
Map Diagrams Phases I, II, III, IV

November 2, 2011
Revised, September 10, 2012

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

Mr. Scott Lockwood, P.E.
England-Thims & Miller, Inc.
14775 Old St. Augustine Road
Jacksonville, Florida 32258

Subject: Clay Borrow Source Pre-Qualification
Trail Ridge Landfill – Phase 3 Construction QA/QC Services
Jacksonville, Florida
MAE Project No. 0006-0006

Dear Mr. Lockwood:

MESKEL & ASSOCIATES ENGINEERING, PLLC (MAE) has completed the pre-qualification testing for the potential clay borrow source for the subject project. Attached are a site location map (Figure 1), Test Pit Exploration Plan (Figure 2), completed Pre-Qualification Form, Test Pit Logs, and laboratory test results for Permeability Testing, Proctor Testing, Triaxial and Direct Shear Tests, and index property testing performed. In addition, calculations performed for sliding resistance are also attached.

The proposed clay borrow source, designated the Jacob's Pit, is located north of County Road 225, approximately 2.5 miles west of US 301 in the town of Lawtey, Bradford County, Florida. As part of the site evaluation, 2 test pits were performed within an on-site stockpile of blended clay soils (TP-1 & TP-2), and six test pits were excavated within the borrow pit area (TP-3 through TP-8). The approximate locations of the test pits are shown on Figure 2. At the time of our field work, the borrow pit area had been cleared and grubbed. As shown on the attached logs, clayey soils encountered at the test pit locations generally consisted of two strata. The upper material, which varied in thickness from 3 to 7 feet, consisted of grayish to orangish brown clayey to very clayey fine sand (SC). This material was underlain by grayish brown to greenish gray clay with sand to sandy clay and very clayey silt (CH, MH) extending to 15 to 20 feet bgs. Both strata contain sand seams of varying thicknesses. Four samples were submitted for standard Proctor, index property and permeability testing. The results of this testing are as follows:

	***TP-1 Sample CL-1**	**TP-3 Sample TP-3-2**	**TP-4 Sample TP-4-3**	**TP-8 Sample TP-8-1**
Sample Description	Gray Brown Very Sandy Clay (CH)	Gray Very Sandy Clay with Silt (CH)	Gray Very Sandy Clayey Silt (MH)	Clayey Fine Sand (SC)
Sample Depth, ft. bgs	4 to 5	8 to 13.5	9 to 15.5	3 to 9.5
Maximum Dry Density Standard Proctor, pcf	89.0	89.4	81.5	120.6
Optimum Moisture Content Standard Proctor, %	29.9	32.3	31.8	11.9
Plasticity Index	65	68	58	18
Percent Fines, %	62.5	70.6	63.7	34.6
Coefficient of Permeability, cm/s	7.3×10^{-9}	2.1×10^{-8}	1.7×10^{-8}	5.1×10^{-7}
Percent Compaction Standard Proctor, pcf	83.7	82.3	73.3	112.1
Moisture Content at Compaction, %	32.8	34.0	44.3	11.7

*Stockpile Sample

8936 Western Way, Suite 12
Jacksonville, Florida 32256
Phone: (904)519-6990 Fax: (904)519-6992

As required by the project specifications, shear testing was performed including triaxial testing of the clay soil and direct shear testing of the interface between the Initial Cover and the Clay Layer, as well as the interface between the Clay Layer and the proposed Vegetative Cover material (Jacob's and Spencer Borrow Pits). Results of these tests are attached to this report. Using these test results, calculations were performed to evaluate the potential for sliding for both interfaces as well as for the clay material itself. These calculations are attached. Factors of safety (FS) calculated are summarized below.

Triaxial Shear Test: Clay Cover Material	*FS = 4.5
Direct Shear Test: Intermediate. Cover/Clay Cover	*FS = 3.5
Direct Shear Test: Vegetative Cover (Jacob's Pit)/Clay Cover	*FS = 4.4
Direct Shear Test: Vegetative Cover (Spencer Pit)/Clay Cover	*FS = 3.9

*A FS of 1.5 is required by the project specifications.

Based on the permeability test results, it is our opinion that the upper clayey to very clayey fine sand (SC) is not suitable for use as the Clay Layer material unless blended with the lower clayey soils, as in the stockpile soils. Permeability test results for the clay with sand to sandy clay and very clayey silt (CH, MH), and the blended clayey stockpile soils (CH) indicate that these materials are are considered acceptable for use as the Clay Layer material.

Based on the results of the shear testing and safety factors against sliding, it is our opinion that the blended stockpile soils are suitable for use a Clay Layer material for the project.

Care should be taken when mixing the clayey soil strata from the borrow pit to ensure larger sand seams present in the material are properly mixed or avoided, in order to avoid permeability problems during construction.

We appreciate the opportunity to be of continuing service on this phase of your project. If you have any questions concerning this report, please contact us.

Sincerely,
MESKEL & ASSOCIATES ENGINEERING, PLLC

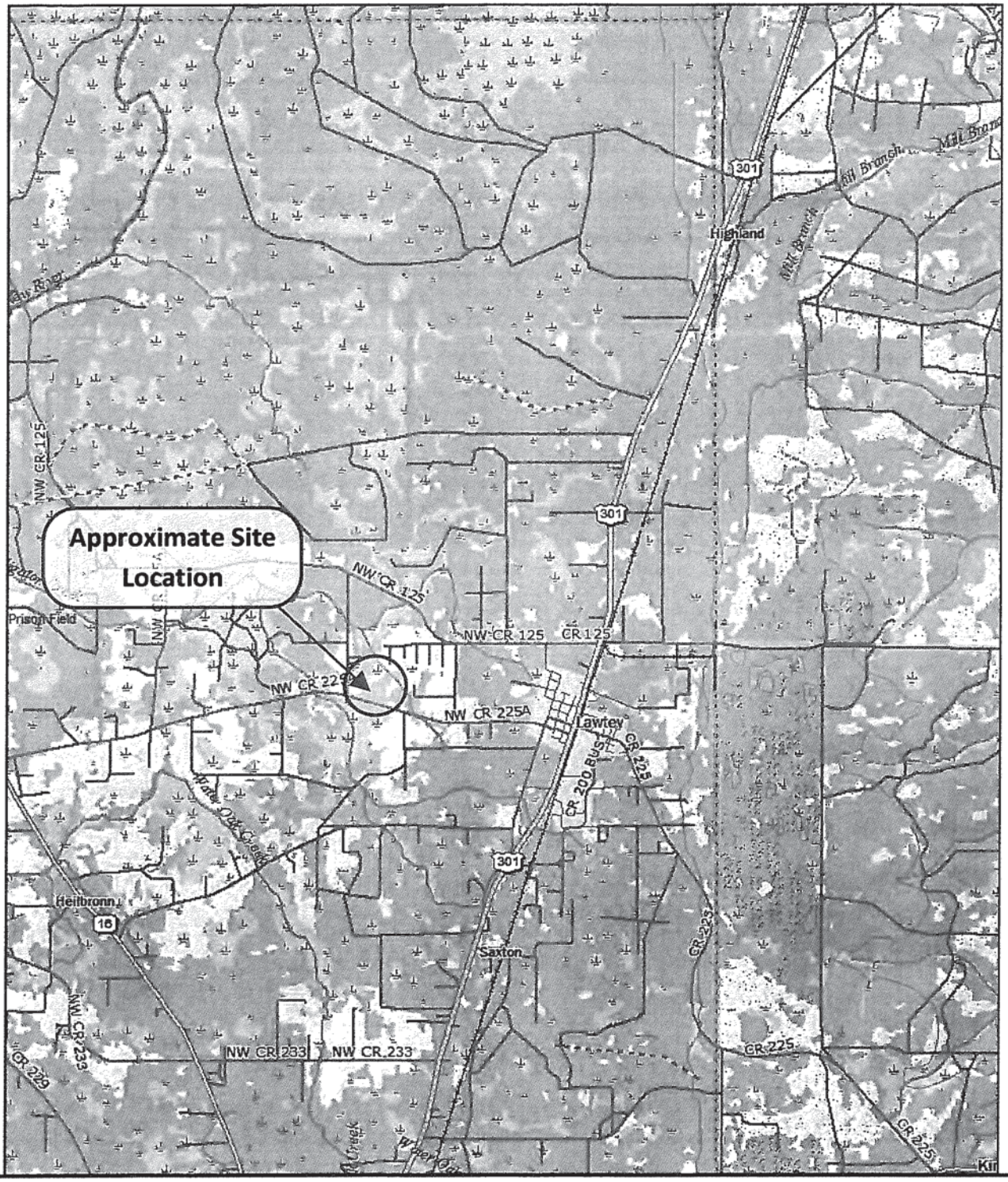
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Antoinette (Tina) D. Meskel, P.E.
Quality Assurance Engineer
Licensed, Florida No. 56999

Attachments:

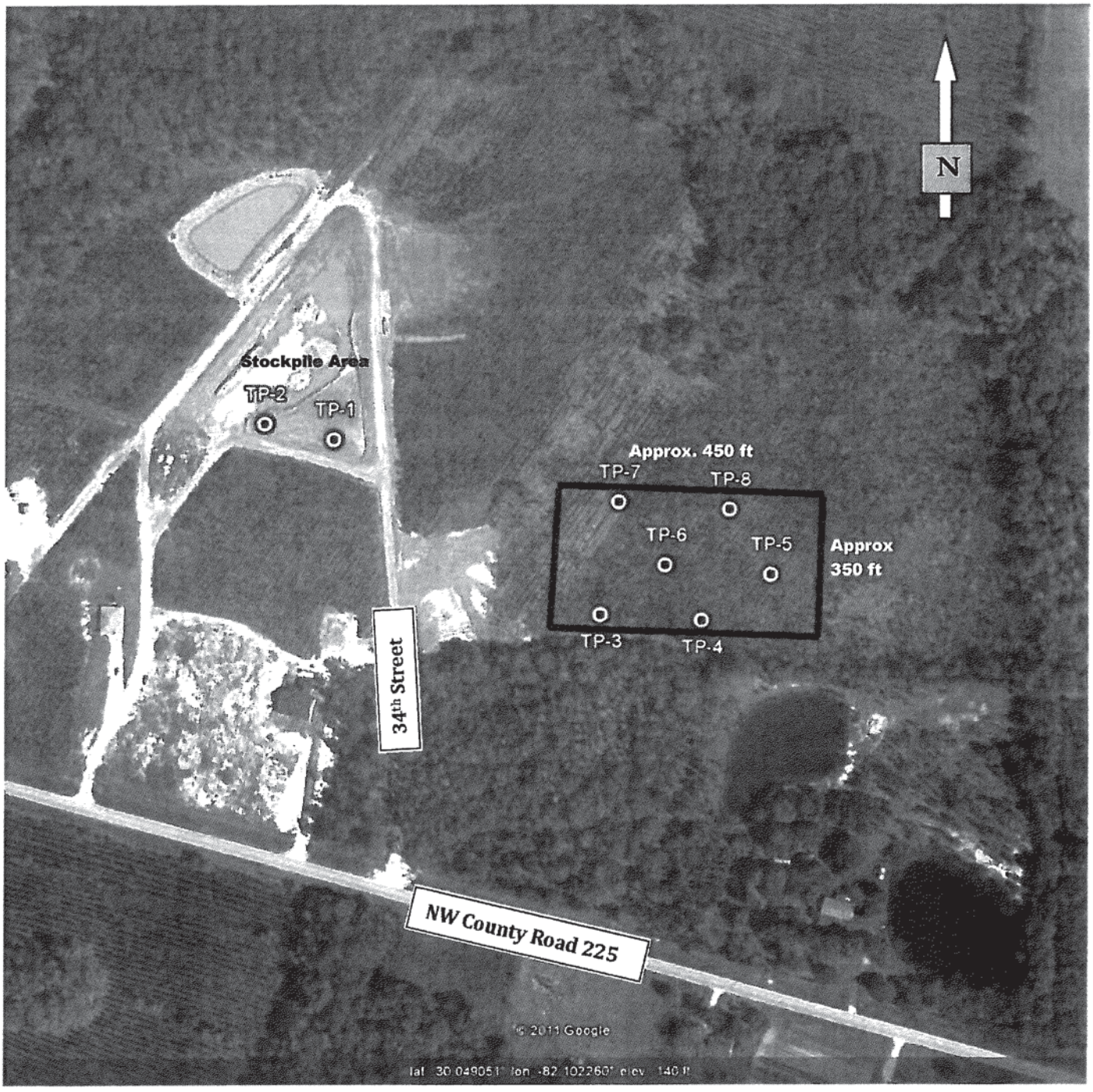
Figures:	Site Location Plan (Figure 1)
	Field Exploration Plan (Figure 2)
Appendix A:	Pre-Qualification Form
Appendix B:	Test Pit Logs
Appendix C:	Laboratory Test Results
Appendix D:	Calculations

Figures



Site Location Map

PREPARED BY	PROJECT NAME	
MAE	Trail Ridge Landfill Jacobs Borrow Pit Jacksonville, Florida	
	REFERERENCE	SCALE
	Delorme XMap 7.0	NTS
PREPARED FOR	MAE PROJECT NO.	FIGURE NO.
England-Thims & Miller, Inc.	0006-0006	1



Test Pit Exploration Plan "Jacob's Pit"

PREPARED BY	PROJECT NAME	
MAE	Trail Ridge Landfill Jacksonville, Florida	
	REFERERENCE	SCALE
	Delorme XMap 7.0	NTS
PREPARED FOR	MAE PROJECT NO.	FIGURE NO.
England-Thims & Miller, Inc.	0006-0006	2

Appendix A

TRAIL RIDGE LANDFILL CLOSURE
CLAY BORROW SOURCE - "Jacob's Pit"
PRE-QUALIFICATION FORM

CLAY SOURCE: Jacobs Pit
LOCATION*: See Attached Plan

DISTANCE FROM PROJECT SITE: Approximately 16 miles
ESTIMATED PROJECT QUANTITY: Approximtely 36,000 cubic yards
ESTIMATED SOURCE QUANTITY: Approximately 70,000 cubic yards including stockpiled clayey soils
NUMBER OF TEST PITS: See Attached

*Attach a map showing the location of the clay borrow source and the horizontal and vertical extent of the clay borrow. Also include the location and approximate depth of all test pits.

TEST RESULTS:

A. TEST PIT NO. TP-1, Clayey Soil Stockpile

Sample No. Cl-1

Clay Stratum Description: Gray Brown Very Sandy Clay
USC Soil Classification: CH
Depth Below Surface 4 to 5 feet
Percent Fines: 62.5%
Atterberg Limits: LL=89, PL=24, PI=65
Moisture Content:
Standard Proctor Test: Maximum Dry Density = 89.0
Optimum Moisture = 29.9%
Hydraulic Conductivity: (cm/sec)
@ 80% Standard Proctor
@ 85% Standard Proctor
@ 90% Standard Proctor 7.3×10^{-9} cm/s
Triaxial Shear Test: Clay Cover FS = 4.5
Direct Shear Test: Int. Cover/Clay FS = 3.4
Direct Shear Test: Clay/Veg. Cover FS = 3.2

B. TEST PIT NO. TP-2, Clayey Soil Stockpile

Sample No. TP-2-1:

Clay Stratum Description: Grayish Brown Very Sandy CLAY
USC Soil Classification: CH
Depth Below Surface 4 to 5 feet
Percent Fines: 56.5%
Atterberg Limits: LL=60, PL=23, PI=37
Moisture Content: 30.9%
Standard Proctor Test: Maximum Dry Density = ??
Optimum Moisture = ??
Hydraulic Conductivity: (cm/sec)
@ 80% Standard Proctor
@ 85% Standard Proctor
@ 90% Standard Proctor

Approved by Contractor
Approved by QC Monitor
Approved by the QA Engineer

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

TRAIL RIDGE LANDFILL CLOSURE
CLAY BORROW SOURCE - "Jacob's Pit"
PRE-QUALIFICATION FORM

TEST RESULTS:

A. TEST PIT NO. TP-3

Sample No. TP-3-1:

Clay Stratum Description:	Orangish Brown Very Clayey Fine SAND
USC Soil Classification:	SC
Depth Below Surface	5 to 8 feet
Percent Fines:	43.9%
Atterberg Limits:	LL=43, PL=18, PI=25
Moisture Content:	23.6%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Sample No. TP-3-2:

Clay Stratum Description:	Gray Very Sandy CLAY with Silt
USC Soil Classification:	CH
Depth Below Surface	8 to 13.5 feet
Percent Fines:	70.6%
Atterberg Limits:	LL=99, PL=31, PI=68
Moisture Content:	49.5%
Standard Proctor Test:	Maximum Dry Density = 89.4 pcf
	Otimum Moisture = 32.3%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	2.1×10^{-8} cm/s

Sample No. TP-3-3:

Clay Stratum Description:	Gray Very Sandy CLAY with Silt
USC Soil Classification:	CH
Depth Below Surface	13.5 to 18 feet
Percent Fines:	65.2%
tterberg Limits:	LL=123, PL=29, PI=94
Moisture Content:	73.0%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Approved by Contractor
Approved by QC Monitor
Approved by the QA Engineer

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

TRAIL RIDGE LANDFILL CLOSURE
CLAY BORROW SOURCE - "Jacob's Pit"
PRE-QUALIFICATION FORM

TEST RESULTS:

A. TEST PIT NO. TP-4

Sample No. TP-4-1:

Clay Stratum Description:	Grayish Brown Very Clayey Fine SAND
USC Soil Classification:	SC
Depth Below Surface	0 to 7 feet
Percent Fines:	44.7%
Atterberg Limits:	LL=26, PL=13, PI=13
Moisture Content:	18.7%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Sample No. TP-4-2:

Clay Stratum Description:	Gray Sandy Silty CLAY
USC Soil Classification:	CH
Depth Below Surface	7 to 9 feet
Percent Fines:	85.6%
Atterberg Limits:	LL=93, PL=28, PI=65
Moisture Content:	53.6%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Sample No. TP-4-3:

Clay Stratum Description:	Gray Very Sandy Clayey SILT
USC Soil Classification:	MH
Depth Below Surface	9 to 15.5 feet
Percent Fines:	63.7%
Atterberg Limits:	LL=109, PL=51, PI=58
Moisture Content:	66.3%
Standard Proctor Test:	Maximum Dry Density = 81.5 pcf
	Optimum Moisture = 31.8%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	1.7×10^{-8} cm/s

Approved by Contractor

Approved by QC Monitor

Approved by the QA Engineer

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

TRAIL RIDGE LANDFILL CLOSURE
CLAY BORROW SOURCE - "Jacob's Pit"
PRE-QUALIFICATION FORM

TEST RESULTS:

A. TEST PIT NO. TP-5

Sample No. TP-5-1:

Clay Stratum Description:	Gray Brown Clayey Fine SAND
USC Soil Classification:	SC
Depth Below Surface	0 to 6 feet
Percent Fines:	35.8%
Atterberg Limits:	LL=29, PL=15, PI=14
Moisture Content:	13.9%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Sample No. TP-5-2:

Clay Stratum Description:	Gray Very Silty CLAY, Trace Sand
USC Soil Classification:	CH
Depth Below Surface	6 to 10 feet
Percent Fines:	98.8%
Atterberg Limits:	LL=145, PL=52, PI=93
Moisture Content:	77.6%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Sample No. TP-5-3:

Clay Stratum Description:	Greenish Gray Sandy CLAY with Silt
USC Soil Classification:	CH
Depth Below Surface	10 to 15.5 feet
Percent Fines:	84.1%
Atterberg Limits:	LL=128, PL=24, PI=104
Moisture Content:	71.8%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Approved by Contractor _____
Approved by QC Monitor _____
Approved by the QA Engineer _____

MAE Meskel & Associates ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

TRAIL RIDGE LANDFILL CLOSURE
CLAY BORROW SOURCE - "Jacob's Pit"
PRE-QUALIFICATION FORM

TEST RESULTS:

A. TEST PIT NO. TP-6

Sample No. TP-6-1:

Clay Stratum Description:	Dark Grayish Brown Clayey Fine SAND
USC Soil Classification:	SC
Depth Below Surface	0.5 to 9.5 feet
Percent Fines:	34.9%
Atterberg Limits:	LL=26, PL=14, PI=12
Moisture Content:	15.7%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Sample No. TP-6-2:

Clay Stratum Description:	Grayish Brown Very Sandy Silty CLAY
USC Soil Classification:	CH
Depth Below Surface	9 to 14.5 feet
Percent Fines:	63.1%
Atterberg Limits:	LL=69, PL=24, PI=45
Moisture Content:	33.4%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Sample No. TP-6-3:

Clay Stratum Description:	Greenish Gray Brown Very Clayey SILT with Sand
USC Soil Classification:	MH
Depth Below Surface	14.5 to 20 feet
Percent Fines:	73.8%
Atterberg Limits:	LL=128, PL=51, PI=77
Moisture Content:	56.5%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Approved by Contractor
Approved by QC Monitor
Approved by the QA Engineer

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TRAIL RIDGE LANDFILL CLOSURE
CLAY BORROW SOURCE - "Jacob's Pit"
PRE-QUALIFICATION FORM

TEST RESULTS:

A. TEST PIT NO. TP-7

Sample No. TP-7-1:

Clay Stratum Description:	Dark Grayish Brown Clayey Fine SAND
USC Soil Classification:	SC
Depth Below Surface	3 to 10 feet
Percent Fines:	31.8%
Atterberg Limits:	LL=29, PL=15, PI=14
Moisture Content:	12.4%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Sample No. TP-7-2:

Clay Stratum Description:	Gray Very Clayey SILT with Sand
USC Soil Classification:	MH
Depth Below Surface	10 to 13 feet
Percent Fines:	90.5%
Atterberg Limits:	LL=103, PL=47, PI=56
Moisture Content:	46.4%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Sample No. TP-7-3:

Clay Stratum Description:	Grayish Brown Sandy, Very Clayey SILT
USC Soil Classification:	MH
Depth Below Surface	13 to 17.5 feet
Percent Fines:	80.1%
Atterberg Limits:	LL=169, PL=61, PI=108
Moisture Content:	69.7%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Approved by Contractor _____

Approved by QC Monitor _____

Approved by the QA Engineer _____

Meskel & Associates
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GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

TRAIL RIDGE LANDFILL CLOSURE
CLAY BORROW SOURCE - "Jacob's Pit"
PRE-QUALIFICATION FORM

TEST RESULTS:

A. TEST PIT NO. TP-8

Sample No. TP-8-1:

Clay Stratum Description:	Dark Grayish Brown Clayey Fine SAND
USC Soil Classification:	SC
Depth Below Surface	3 to 9.5 feet
Percent Fines:	34.6%
Atterberg Limits:	LL=32, PL=14, PI=18
Moisture Content:	13.4%
Standard Proctor Test:	Maximum Dry Density = 120.6 pcf
	Optimum Dry Density = 11.9%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	5.1×10^{-7} cm/s

Sample No. TP-8-2:

Clay Stratum Description:	Grayish Brown Very Sandy CLAY with Silt
USC Soil Classification:	CH
Depth Below Surface	9.5 to 14 feet
Percent Fines:	57.9%
Atterberg Limits:	LL=109, PL=37, PI=72
Moisture Content:	34.5%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Sample No. TP-8-3:

Clay Stratum Description:	Grayish Brown Sandy, Very Clayey SILT
USC Soil Classification:	MH
Depth Below Surface	14 to 17.5
Percent Fines:	81.6%
Atterberg Limits:	LL=123, PL=49, PI=74
Moisture Content:	59.7%
Hydraulic Conductivity:	(cm/sec)
@ 80% Standard Proctor	
@ 85% Standard Proctor	
@ 90% Standard Proctor	

Approved by Contractor
Approved by QC Monitor
Approved by the QA Engineer

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

Appendix B

Meskel & Associates Engineering, PLLC
FL Certificate of Authorization No. 28142
8936 Western Way, Suite 12
Jacksonville, FL 32256
P: (904)519-6990 F: (904)519-6992

meskelengineering.com

TEST PIT TP-1

PROJECT NO. 0006-0006

PROJECT NAME Trail Ridge Landfill Clay Layer Prequalification - Test Pit Exploration

PROJECT LOCATION Jacksonville, Florida **CLIENT** England-Thims & Miller, Inc.

DATE STARTED 9/19/11 **COMPLETED** 9/19/11 **LATITUDE** 30.04962 N **LONGITUDE** 82.10365 W

EXCAVATION CONTRACTOR ERC General Contracting Services, Inc. **EXCAVATION METHOD** Backhoe

LOGGED BY S.Collie **CHECKED BY** T.Meskel **GROUND ELEVATION** _____ **HAMMER TYPE** _____

DEPTH (ft)	SAMPLE DEPTH	NUMBER	MATERIAL DESCRIPTION	USCS	GRAPHIC LOG	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)	LIQUID LIMIT	PLASTICITY INDEX	REMARKS
0											
5		1	Gray Brown Very Sandy CLAY (Stockpile)	CH			62.5		89	65	

Bottom of test pit at 8.0 feet.

NOTES _____

GROUND WATER LEVELS	
▽ AT TIME OF DRILLING	▼
Not Encountered	–

MAE TEST PIT WITH LAT/LONG - MESKEL.GDT - 9/28/11 10:01 - F:\GINT\GINT FILES\PROJECTS\0006-0006\TRAIL RIDGE LANDFILL.GPJ

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TEST PIT TP-2

PROJECT NO. 0006-0006

PROJECT NAME Trail Ridge Landfill Clay Layer Prequalification - Test Pit Exploration

PROJECT LOCATION Jacksonville, Florida **CLIENT** England-Thims & Miller, Inc.

DATE STARTED 9/20/11 **COMPLETED** 9/20/11 **LATITUDE** 30.04970 N **LONGITUDE** 82.10407 W

EXCAVATION CONTRACTOR ERC General Contracting Services, Inc. **EXCAVATION METHOD** Backhoe

LOGGED BY S.Collie **CHECKED BY** T.Meskel **GROUND ELEVATION** _____ **HAMMER TYPE** _____

DEPTH (ft)	SAMPLE DEPTH	NUMBER	MATERIAL DESCRIPTION	USCS	GRAPHIC LOG	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)	LIQUID LIMIT	PLASTICITY INDEX	REMARKS
0											
5		1	Grayish Brown Very Sandy CLAY (Stockpile)	CH		31	56.5		60	37	
10											

Bottom of test pit at 11.0 feet.

NOTES _____

GROUND WATER LEVELS

▽ AT TIME OF DRILLING	▼
Not Encountered	—

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TEST PIT TP-3

PROJECT NO. 0006-0006

PROJECT NAME Trail Ridge Landfill Clay Layer Prequalification - Test Pit Exploration

PROJECT LOCATION Jacksonville, Florida **CLIENT** England-Thims & Miller, Inc.

DATE STARTED 9/20/11 **COMPLETED** 9/20/11 **LATITUDE** 30.04870 N **LONGITUDE** 82.10204 W

EXCAVATION CONTRACTOR ERC General Contracting Services, Inc. **EXCAVATION METHOD** Backhoe

LOGGED BY S.Collie **CHECKED BY** T.Meskel **GROUND ELEVATION** _____ **HAMMER TYPE** _____

DEPTH (ft)	SAMPLE DEPTH NUMBER	MATERIAL DESCRIPTION	USCS	GRAPHIC LOG	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)	LIQUID LIMIT	PLASTICITY INDEX	REMARKS
0		Brown Fine SAND to Fine Sand with Clay	SP, SP-SC							
5	1	Orangish Brown Very Clayey Fine SAND	SC		24	43.9		43	25	
10	2	Gray Very Sandy CLAY with Silt	CH		50	70.6		99	68	
15	3	Gray Very Sandy CLAY with Silt	CH		73	65.2		123	94	
		Gray and Brown Fine SAND to Fine Sand with Clay	SP, SP-SC							

Bottom of test pit at 19.0 feet.

NOTES _____

GROUND WATER LEVELS	
▽ AT TIME OF DRILLING	▼
Not Encountered	—

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TEST PIT TP-4

PROJECT NO. 0006-0006

PROJECT NAME Trail Ridge Landfill Clay Layer Prequalification - Test Pit Exploration

PROJECT LOCATION Jacksonville, Florida **CLIENT** England-Thims & Miller, Inc.

DATE STARTED 9/20/11 **COMPLETED** 9/20/11 **LATITUDE** 30.04867 N **LONGITUDE** 82.10143 W

EXCAVATION CONTRACTOR ERC General Contracting Services, Inc. **EXCAVATION METHOD** Backhoe

LOGGED BY S.Collie **CHECKED BY** T.Meskel **GROUND ELEVATION** _____ **HAMMER TYPE** _____

DEPTH (ft)	SAMPLE DEPTH NUMBER	MATERIAL DESCRIPTION	USCS	GRAPHIC LOG	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)	LIQUID LIMIT	PLASTICITY INDEX	REMARKS
0										
	1	Grayish Brown Very Clayey Fine SAND	SC		19	44.7		26	13	
5										
	2	Gray Sandy Silty CLAY	CH		54	85.6		93	65	
10										
	3	Gray Very Sandy Clayey SILT	MH		66	63.7		109	58	
15										
		Gray and Brown Fine SAND	SP							

Bottom of test pit at 16.0 feet.

NOTES _____

GROUND WATER LEVELS	
▽AT TIME OF DRILLING	▼
Not Encountered	—

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TEST PIT TP-5

PROJECT NO. 0006-0006

PROJECT NAME Trail Ridge Landfill Clay Layer Prequalification - Test Pit Exploration

PROJECT LOCATION Jacksonville, Florida **CLIENT** England-Thims & Miller, Inc.

DATE STARTED 9/20/11 **COMPLETED** 9/20/11 **LATITUDE** 30.04891 N **LONGITUDE** 82.10101 W

EXCAVATION CONTRACTOR ERC General Contracting Services, Inc. **EXCAVATION METHOD** Backhoe

LOGGED BY S.Collie **CHECKED BY** T.Meskel **GROUND ELEVATION** _____ **HAMMER TYPE** _____

DEPTH (ft)	SAMPLE DEPTH NUMBER	MATERIAL DESCRIPTION	USCS	GRAPHIC LOG	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)	LIQUID LIMIT	PLASTICITY INDEX	REMARKS
0		Grayish Brown Fine SAND	SP							
	1	Gray and Brown Clayey Fine SAND	SC		14	35.8		29	14	
5										
	2	Gray Very Silty CLAY, Trace Sand	CH		78	98.8		145	93	
10										
	3	Greenish Gray Sandy CLAY with Silt	CH		72	84.1		128	104	
15										
		Gray Fine SAND	SP							

Bottom of test pit at 16.5 feet.

NOTES _____

GROUND WATER LEVELS	
▽ AT TIME OF DRILLING	▼
Not Encountered	---

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TEST PIT TP-6

PROJECT NO. 0006-0006

PROJECT NAME Trail Ridge Landfill Clay Layer Prequalification - Test Pit Exploration

PROJECT LOCATION Jacksonville, Florida **CLIENT** England-Thims & Miller, Inc.

DATE STARTED 9/20/11 **COMPLETED** 9/20/11 **LATITUDE** 30.04896 N **LONGITUDE** 82.10165 W

EXCAVATION CONTRACTOR ERC General Contracting Services, Inc. **EXCAVATION METHOD** Backhoe

LOGGED BY S.Collie **CHECKED BY** T.Meskel **GROUND ELEVATION** _____ **HAMMER TYPE** _____

DEPTH (ft)	SAMPLE DEPTH NUMBER	MATERIAL DESCRIPTION	USCS	GRAPHIC LOG	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)	LIQUID LIMIT	PLASTICITY INDEX	REMARKS
0		Brown and Dark Brown Fine SAND with Clay and Organic Materials	SP-SC							
5	1	Dark Grayish Brown Clayey Fine SAND	SC		16	34.9		26	12	
10	2	Grayish Brown Very Sandy, Silty CLAY	CH		33	63.1		69	45	
15	3	Greenish Gray Brown Very Clayey SILT with Sand	MH		57	73.8		128	77	
20		Grayish Brown Fine SAND	SP							

Bottom of test pit at 21.0 feet.

NOTES _____

GROUND WATER LEVELS

▽ AT TIME OF DRILLING	▼
Not Encountered	---

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TEST PIT TP-7

PROJECT NO. 0006-0006

PROJECT NAME Trail Ridge Landfill Clay Layer Prequalification - Test Pit Exploration

PROJECT LOCATION Jacksonville, Florida **CLIENT** England-Thims & Miller, Inc.

DATE STARTED 9/20/11 **COMPLETED** 9/20/11 **LATITUDE** 30.04929 N **LONGITUDE** 82.10193 W

EXCAVATION CONTRACTOR ERC General Contracting Services, Inc. **EXCAVATION METHOD** Backhoe

LOGGED BY S.Collie **CHECKED BY** T.Meskel **GROUND ELEVATION** _____ **HAMMER TYPE** _____

DEPTH (ft)	SAMPLE DEPTH NUMBER	MATERIAL DESCRIPTION	USCS	GRAPHIC LOG	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)	LIQUID LIMIT	PLASTICITY INDEX	REMARKS
0		Light Gray Fine SAND	SP							
5	1	Grayish Brown Clayey Fine SAND	SC		12	31.8		29	14	
10	2	Gray Very Clayey SILT with Sand	MH		46	90.5		103	56	
15	3	Grayish Brown Sandy, Very Clayey SILT	MH		70	80.1		169	108	
		Gray and Brown Fine SAND	SP							

Bottom of test pit at 18.0 feet.

NOTES _____

GROUND WATER LEVELS

▽ AT TIME OF DRILLING	▼
Not Encountered	—

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TEST PIT TP-8

PROJECT NO. 0006-0006

PROJECT NAME Trail Ridge Landfill Clay Layer Prequalification - Test Pit Exploration

PROJECT LOCATION Jacksonville, Florida **CLIENT** England-Thims & Miller, Inc.

DATE STARTED 9/20/11 **COMPLETED** 9/20/11 **LATITUDE** 30.04925 N **LONGITUDE** 82.10126 W

EXCAVATION CONTRACTOR ERC General Contracting Services, Inc. **EXCAVATION METHOD** Backhoe

LOGGED BY S.Collie **CHECKED BY** T.Meskel **GROUND ELEVATION** _____ **HAMMER TYPE** _____

DEPTH (ft)	SAMPLE DEPTH NUMBER	MATERIAL DESCRIPTION	USCS	GRAPHIC LOG	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)	LIQUID LIMIT	PLASTICITY INDEX	REMARKS
0		Light Brown and Gray Fine SAND, Trace Roots	SP							
5	1	Grayish Brown Clayey Fine SAND	SC		13	34.6		32	18	
10	2	Grayish Brown Very Sandy CLAY with Silt	CH		35	57.9		109	72	
15	3	Grayish Brown Sandy, Very Clayey SILT	MH		60	81.6		123	74	
		Gray Fine SAND	SP							

Bottom of test pit at 18.0 feet.

NOTES _____

GROUND WATER LEVELS

▽ AT TIME OF DRILLING	▼
Not Encountered	—

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Appendix C

amec

REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** October 3, 2011

Sample Number: CL-1

Sample Information: Initial / Final

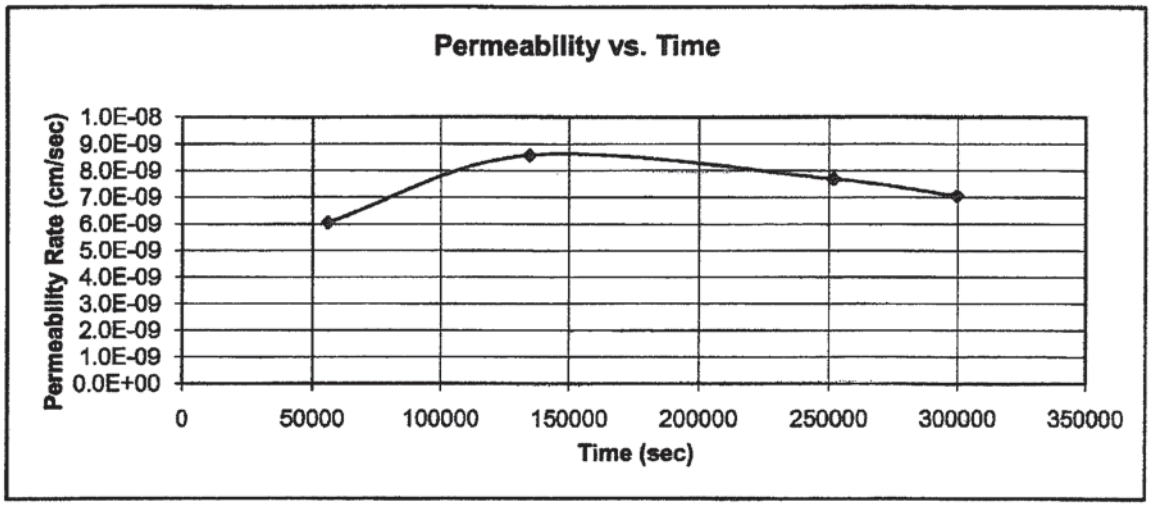
Dia. (in.)	2.86	0.00	**Length (in)**	5.92	0.00	**Weight (gr)**	1109.6	0
Wet Density (pcf)	111.2		**Moisture Content (%)**	32.8		**Dry Density (pcf)**	83.7
Final WD (pcf)			**Final Moisture (%)**			**Final DD (pcf)**	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	20.2	**Minimum Hydraulic Gradient**	10.1
Maximum Consolidation Stress (psi)	6.1	**Minimum Consolidation Stress (psi)**	2.1

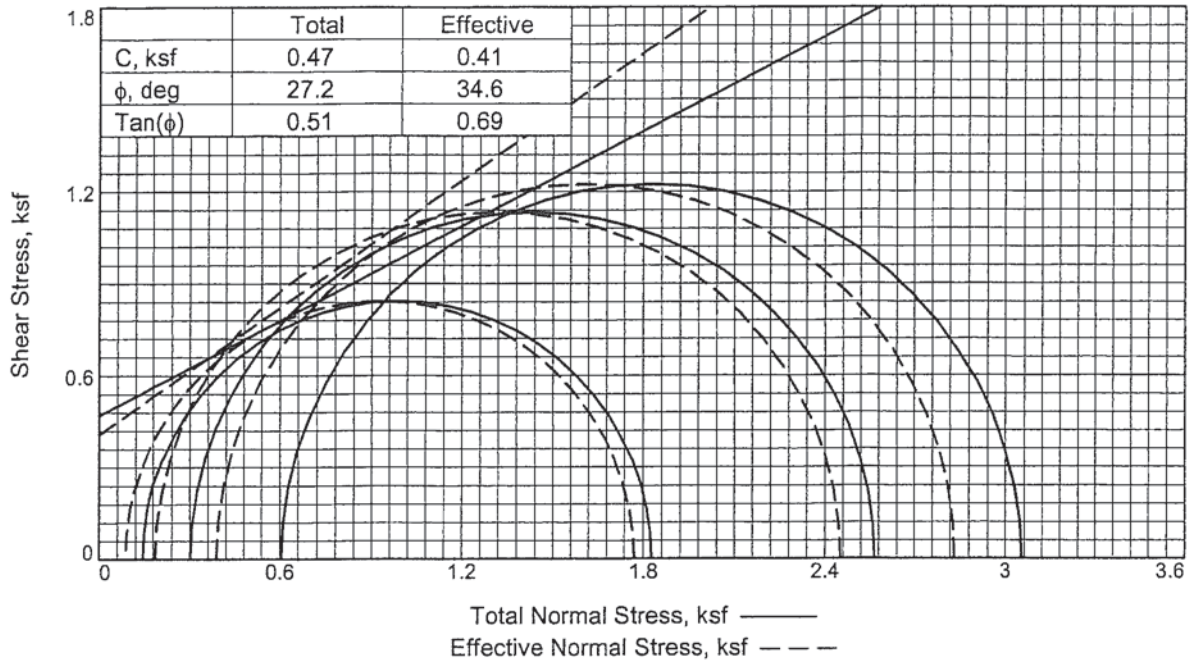
Permeability Rate

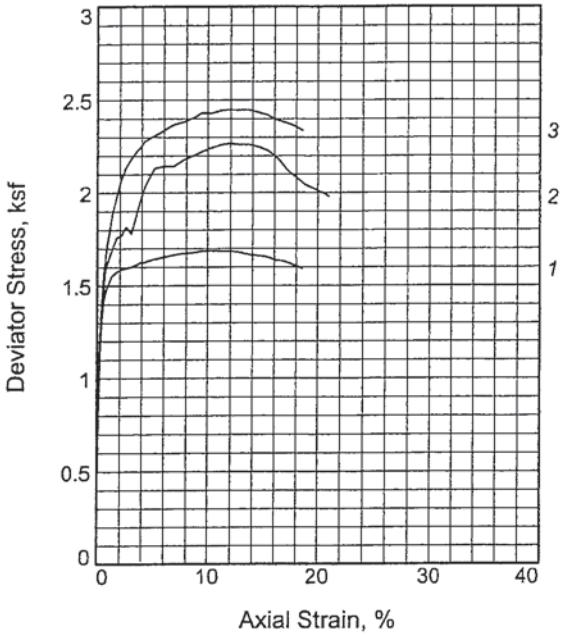
7.3E-09



Reviewed By:

For Mike Holm, P.E.
With Permission





Sample No.		1	2	3
Initial	Water Content, %	32.6	32.8	32.7
	Dry Density, pcf	82.4	81.8	81.0
	Saturation, %	84.2	83.6	81.5
	Void Ratio	1.0466	1.0600	1.0816
	Diameter, in.	2.85	2.86	2.83
	Height, in.	6.04	5.92	5.96
At Test	Water Content, %	34.7	36.5	36.7
	Dry Density, pcf	87.0	84.9	84.7
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.9382	0.9845	0.9902
	Diameter, in.	2.80	2.82	2.79
	Height, in.	5.94	5.85	5.87
Strain rate, in./min.		0.01	0.01	0.01
Back Pressure, psi		80.00	80.00	80.00
Cell Pressure, psi		81.00	82.10	84.20
Fail. Stress, ksf		1.68	2.26	2.45
Total Pore Pr., ksf		11.58	11.64	11.74
Ult. Stress, ksf				
Total Pore Pr., ksf				
$\bar{\sigma}_1$ Failure, ksf		1.77	2.45	2.84
$\bar{\sigma}_3$ Failure, ksf		0.09	0.19	0.39

Type of Test:
CU with Pore Pressures
Sample Type: Remolded
Description: Gray-Brown Very Sandy CLAY

LL= 89 **PL=** 24 **PI=** 65
Specific Gravity= 2.7
Remarks:

Figure _____

Client: Meskel & Associates

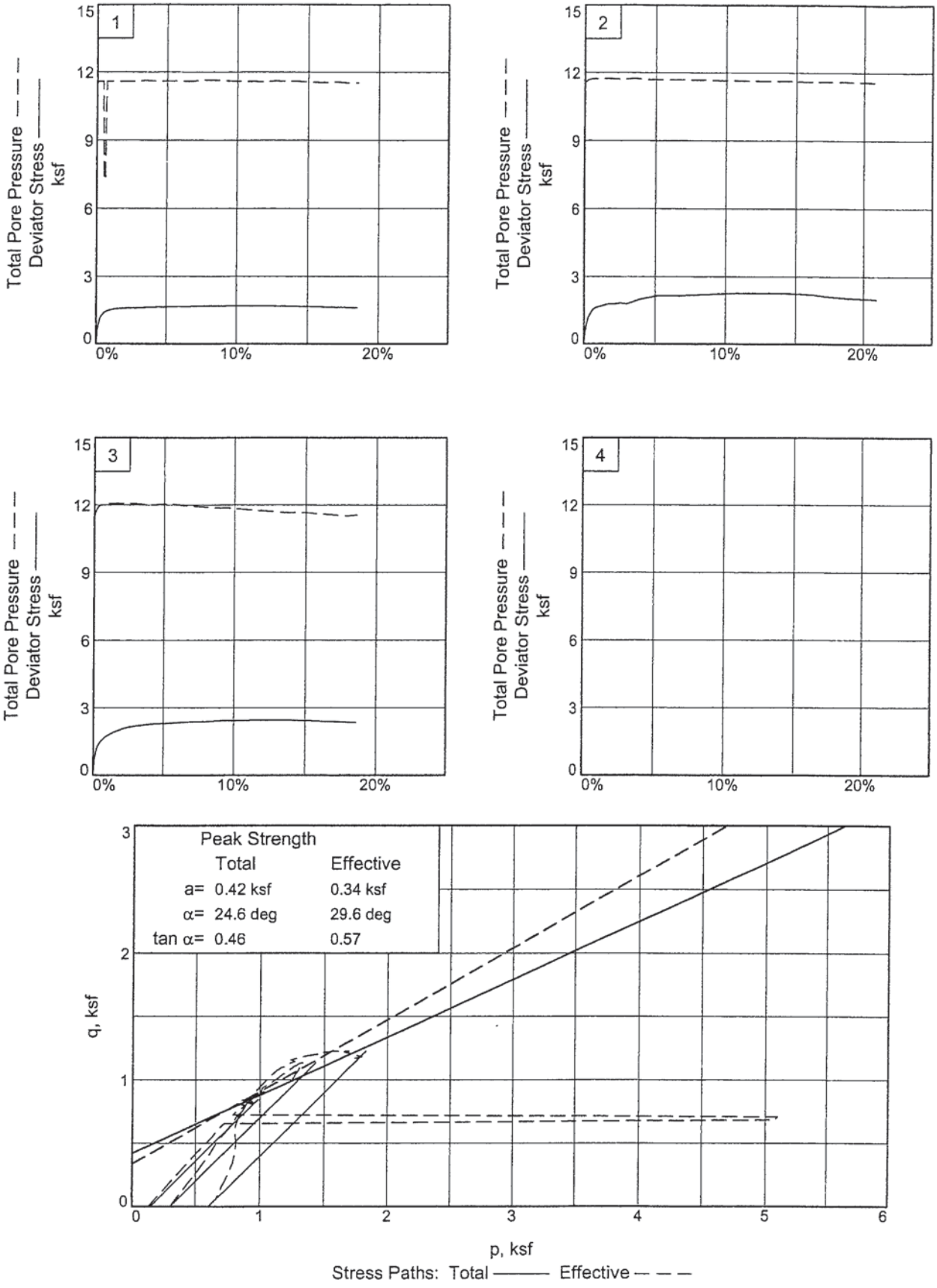
Project: Trailridge Landfill Closure

Source of Sample: Clay Liner **Depth:** stockpile
Sample Number: CL-1
Proj. No.: 6736115123 **Date Sampled:** 9-19-11

TRIAXIAL SHEAR TEST REPORT
AMEC E&I
Jacksonville, Florida

10/7/16

Michael J. Holm

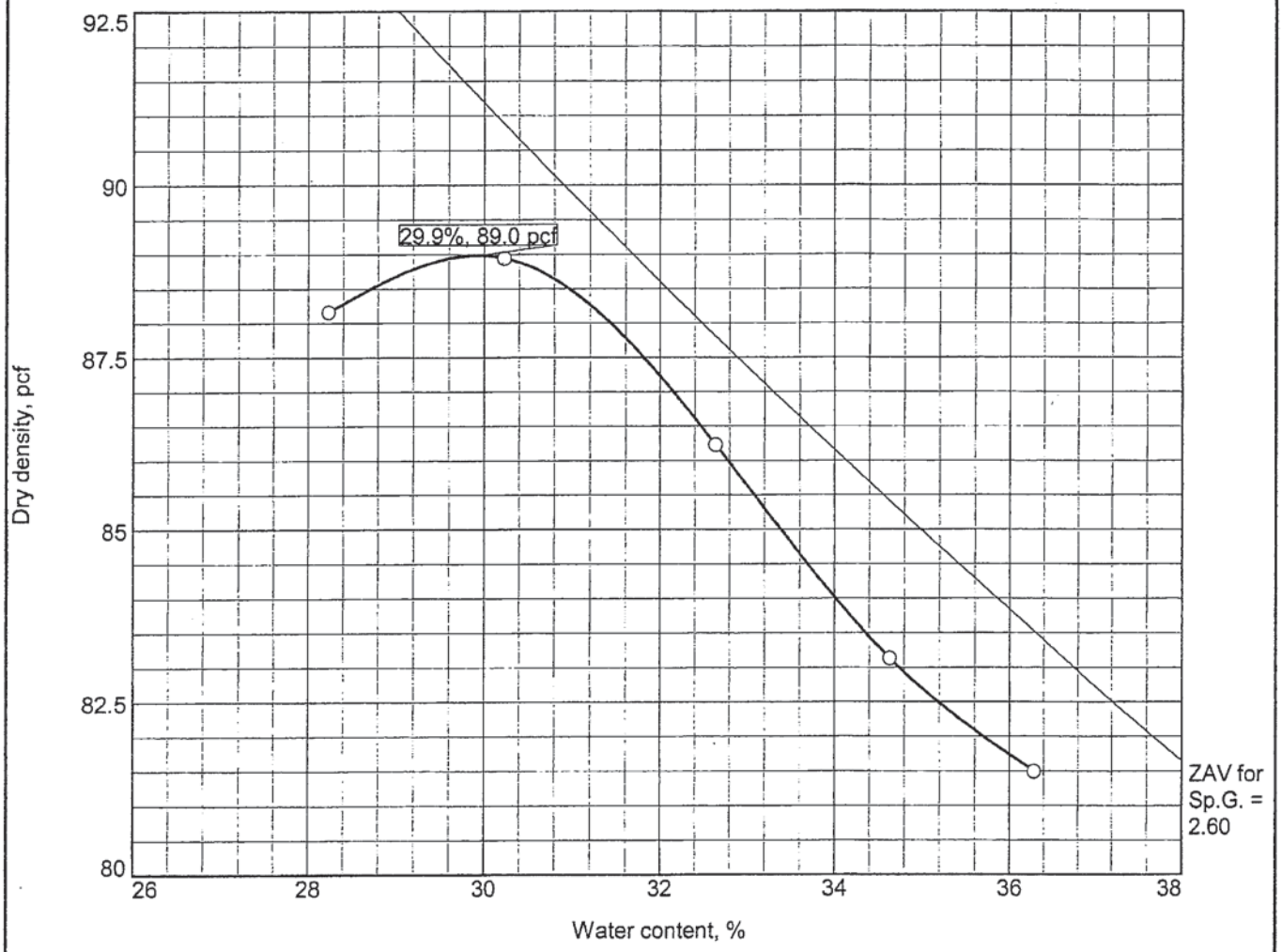


Client: Meskel & Associates
Project: Trailridge Landfill Closure
Source of Sample: Clay Liner **Depth:** stockpile **Sample Number:** CL-1
Project No.: 6736115123 **Figure** _____

AMEC E&I

Michael J. Holt 7/11

COMPACTION TEST REPORT



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
stockpile	CH	A-7-6(38)			89	65	0.0	62.5

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 89.0 pcf Optimum moisture = 29.9 %	Gray-Brown Very Sandy CLAY

Project No. 6736115123 **Client:** Meskel & Associates
Project: Trailridge Landfill Closure

○ **Sample Source:** Clay Liner **Depth:** stockpile **Sample No.:** CL-1

AMEC E&I

Jacksonville, Florida

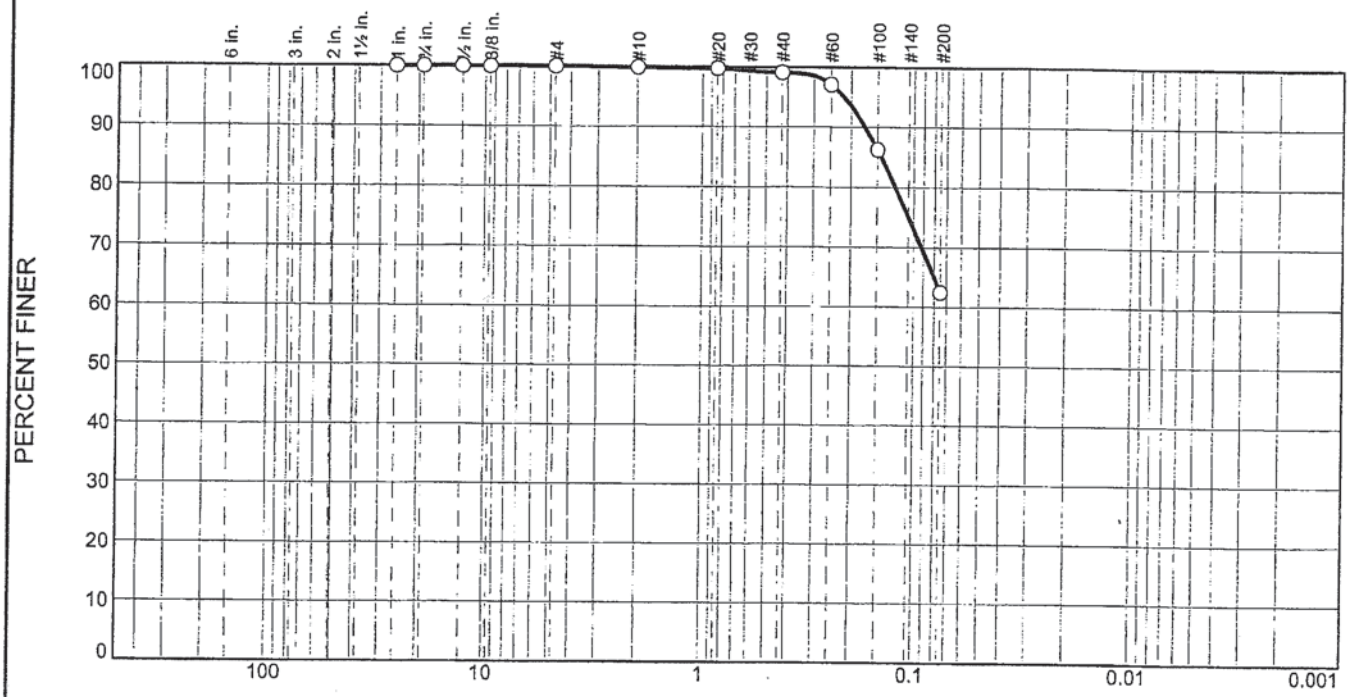
Remarks:
Date Tested: 9-23-11

Figure

Tested By: MC

MJH 9/27/11
Michael J. Hol

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.9	36.5	62.5	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	99.0		
#60	97.1		
#100	86.2		
#200	62.5		

* (no specification provided)

Material Description

Gray-Brown Very Sandy CLAY

Atterberg Limits (ASTM D 4318)

PL= 24 LL= 89 PI= 65

Classification

USCS (D 2487)= CH AASHTO (M 145)= A-7-6(38)

Coefficients

D_{90}= 0.1722 D_{85}= 0.1439 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 9-19-11 **Date Tested:** 9-23-11

Tested By: MC

Checked By:

Title: PE 9/23/11

Michael J. Holm

Source of Sample: Clay Liner **Depth:** stockpile **Date Sampled:** 9-19-11

Sample Number: CL-1

AMEC E&I

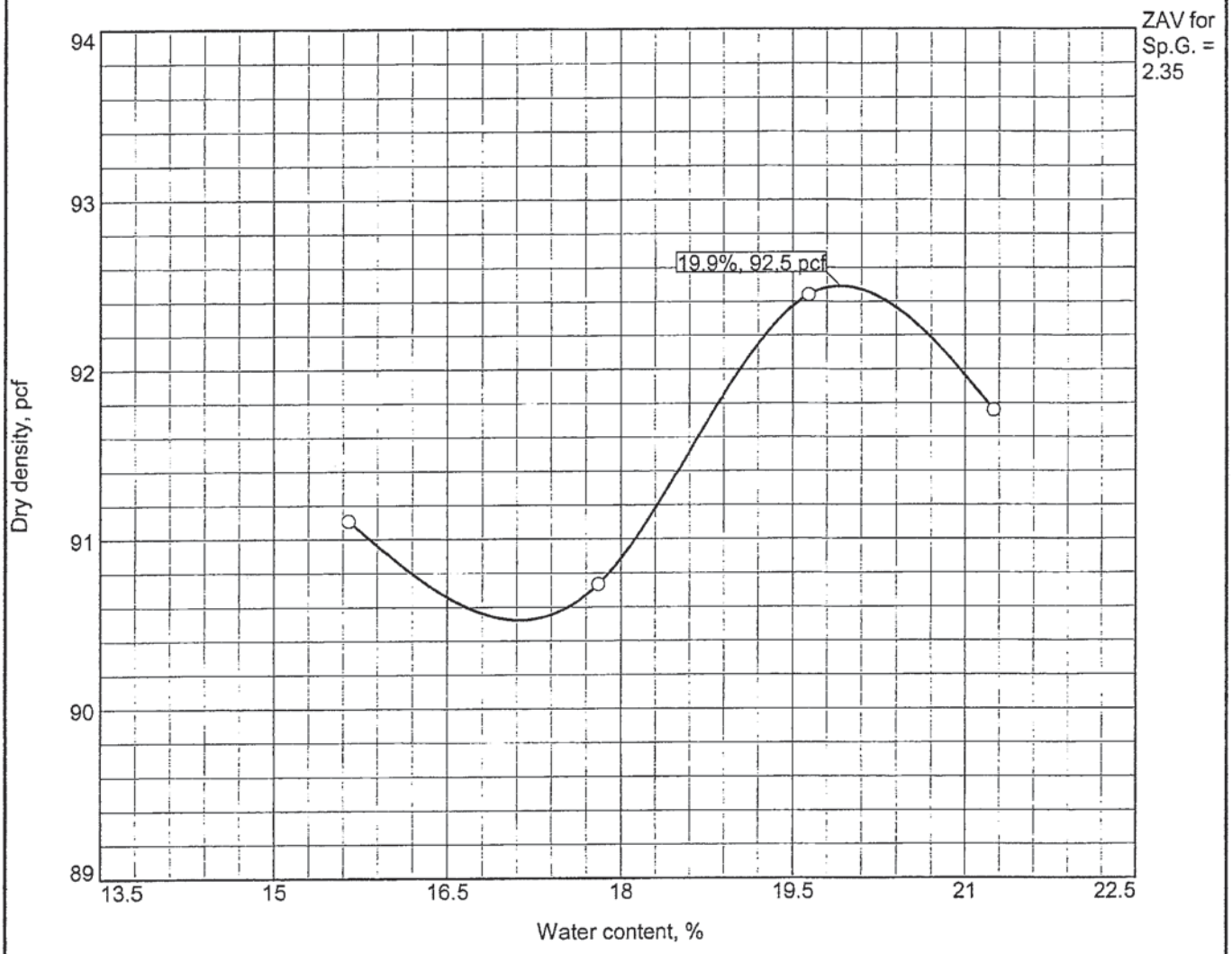
Jacksonville, Florida

Client: Meskel & Associates

Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
							0.0	60.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 92.5 pcf Optimum moisture = 19.9 %	Gray and Brown Very Sandy CLAY

Project No. 6736115123 **Client:** Meskel & Associates
Project: Trailridge Landfill Closure

○ **Source of Sample:** Clay Liner **Sample Number:** TP-2-1

AMEC E&I

Jacksonville, Florida

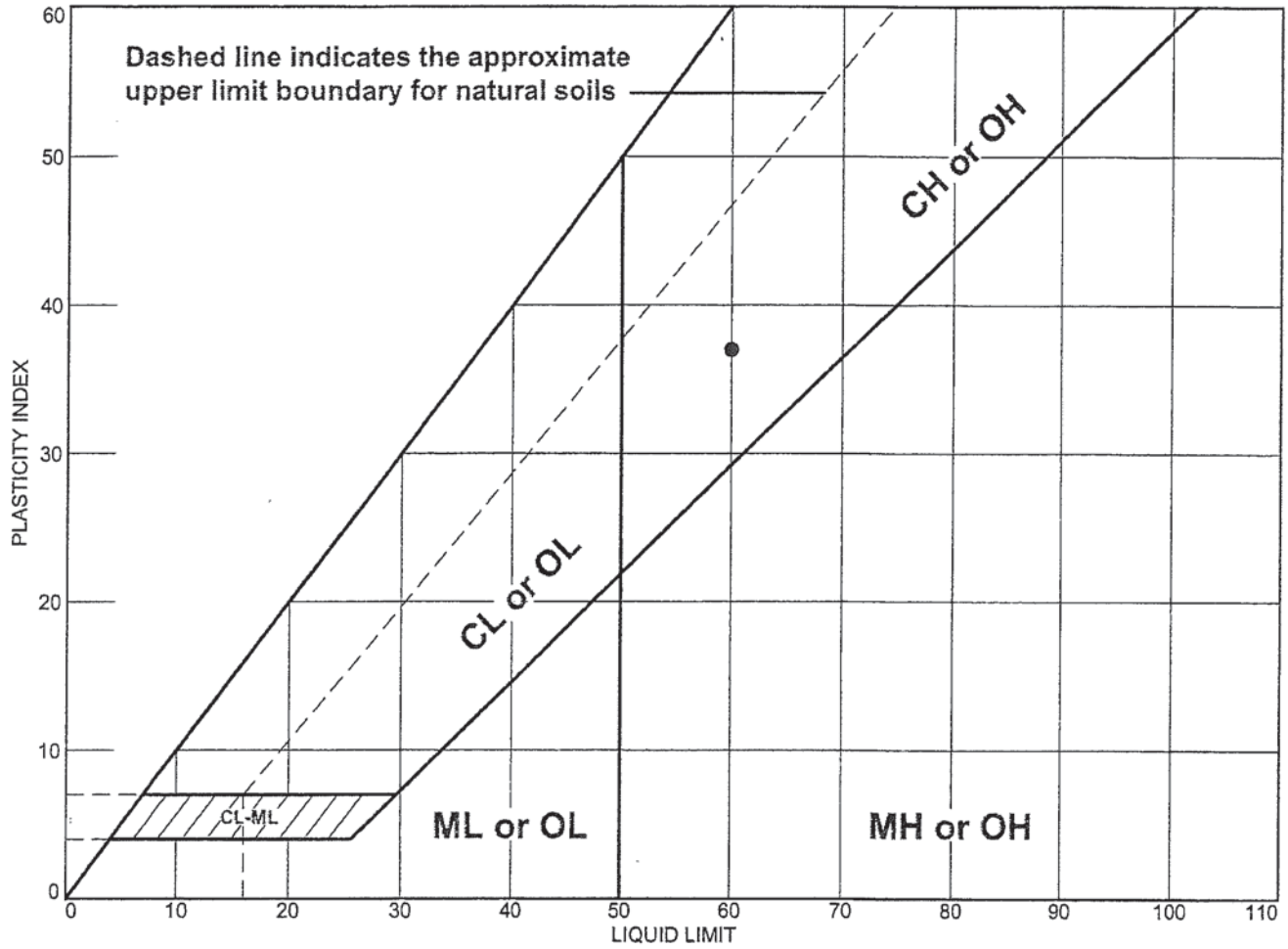
Remarks:
Date tested: 10-2-11

Figure

Michael J. Holm

Tested By: JT

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grayish Brown Very Sandy CLAY	60	23	37		56.5	

Project No. 6736115123 **Client:** Meskel & Associates

Project: Trailridge Landfill Closure

● **Source of Sample:** Borrow Pit (EMC) **Sample Number:** TP-2-1

Remarks:

AMEC E&I

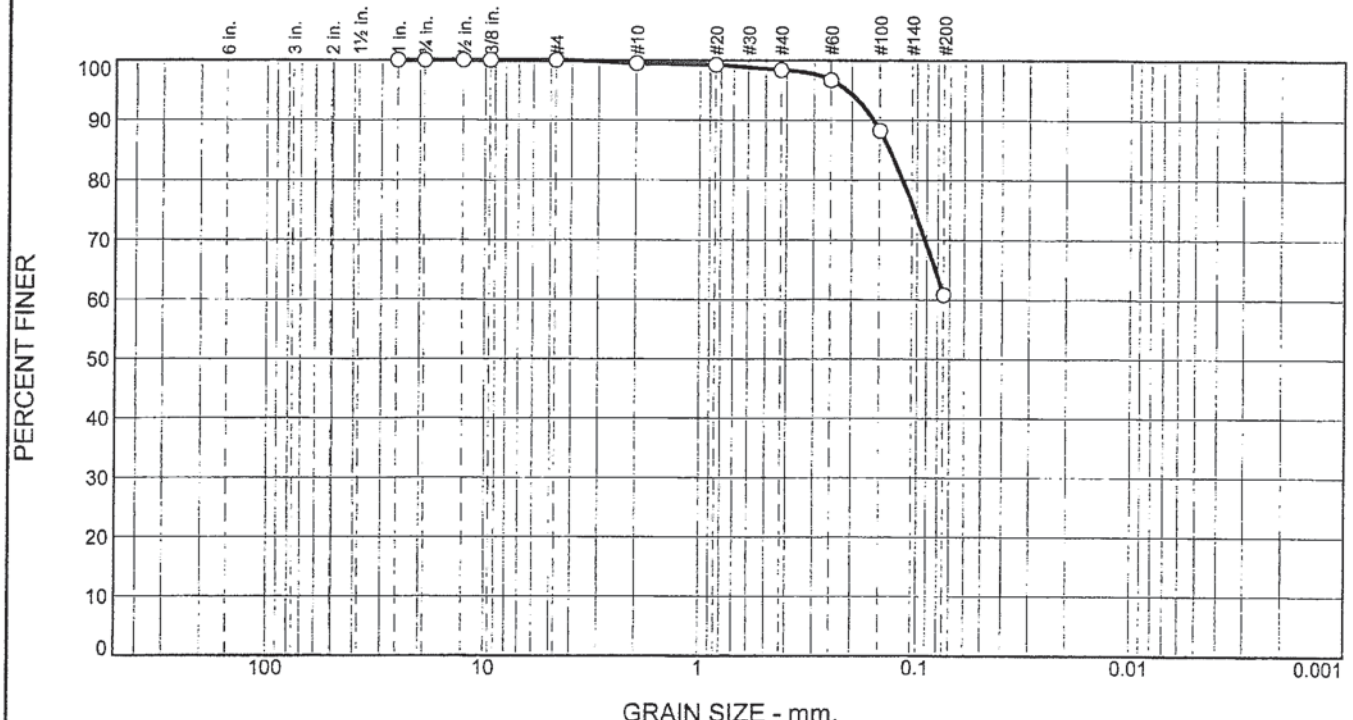
Jacksonville, Florida

Figure

Tested By: MC

Michael J. Holm

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	1.1	37.6	60.8	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	99.5		
#20	99.2		
#40	98.4		
#60	96.7		
#100	88.3		
#200	60.8		

* (no specification provided)

Material Description

Gray and Brown Very Sandy CLAY

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.1605 D_{85}= 0.1347 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 9-20-11 **Date Tested:** 10-4-11

Tested By: JT

Checked By:

Title:

Michael J. Holm

Source of Sample: Clay Liner **Date Sampled:** 9-20-11

Sample Number: TP-2-1

AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates

Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**

amec

REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** October 3, 2011

Sample Number: TP 3-2

Sample Information: Initial / Final

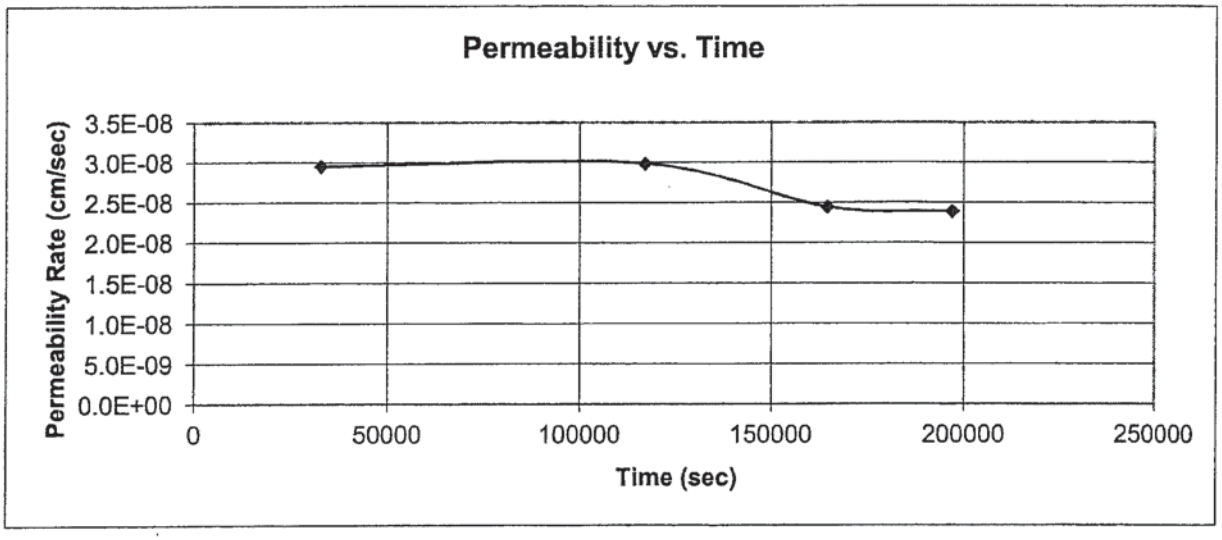
Dia. (in.)	2.87	2.86	**Length (in)**	3.14	3.14	**Weight (gr)**	586.1	597.3
Wet Density (pcf)	110.4		**Moisture Content (%)**		34.0	**Dry Density (pcf)**		82.3
Final WD (pcf)	112.8		**Final Moisture (%)**		38.7	**Final DD (pcf)**		81.3

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	11.6	**Minimum Hydraulic Gradient**	5.8
Maximum Consolidation Stress (psi)	3	**Minimum Consolidation Stress (psi)**	2

Permeability Rate

2.7E-08

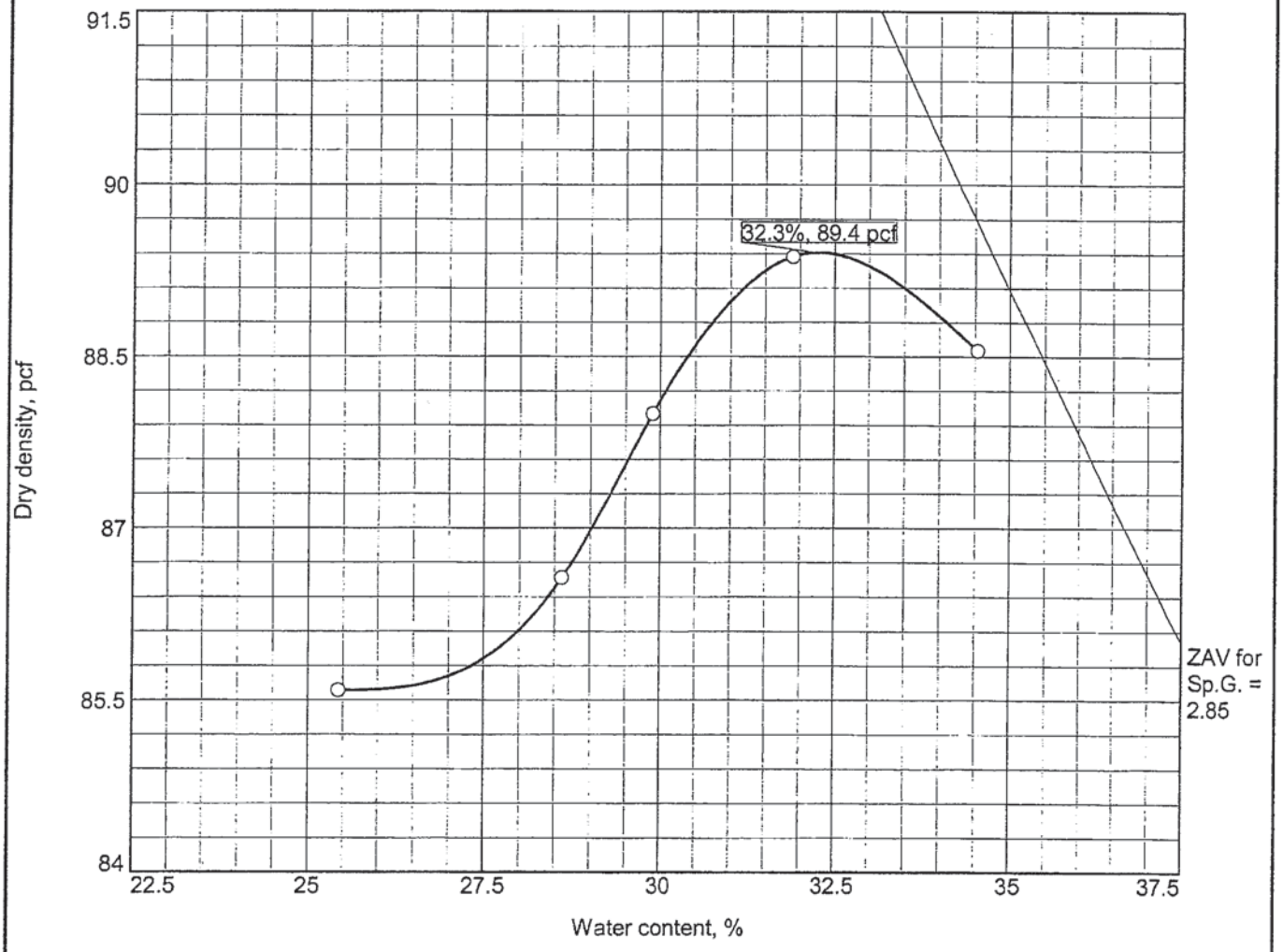


Reviewed By:

~~Kelly Marshall, E.I.~~

Michael J. Holm

COMPACTION TEST REPORT



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
							0.3	65.5

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 89.4 pcf Optimum moisture = 32.3 %	Gray and Brown Very Sandy CLAY

Project No. 6736115123 **Client:** Meskel & Associates
Project: Trailridge Landfill Closure

○ **Source of Sample:** Clay Liner **Sample Number:** TP-3-2

AMEC E&I

Jacksonville, Florida

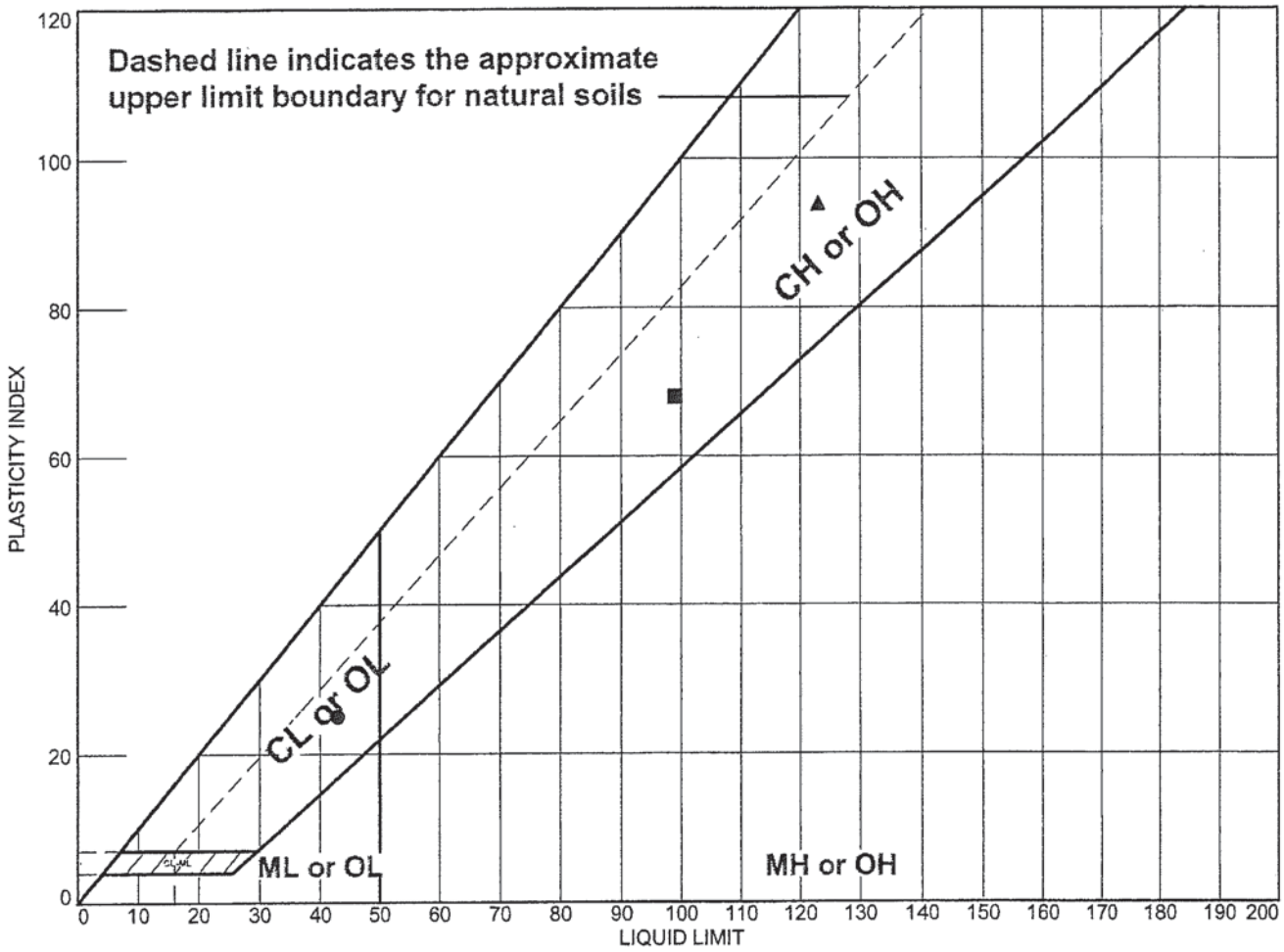
Remarks:
Date Tested: 9-26-11

Figure

Tested By: MC

Michael J. Holm

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Orange Brown Very Clayey Fine SAND	43	18	25		43.9	CL
■	Gray Very Sandy CLAY	99	31	68	0	70.6	CH
▲	Gray Very Sandy CLAY	123	29	94		65.2	CH

Project No. 6736115123 **Client:** Meskel & Associates

Project: Trailridge Landfill Closure

● **Sample Source:** Borrow Pit (EMC) **Depth:** 5'-8' **Sample No.:** TP-3-1

■ **Sample Source:** Borrow Pit (EMC) **Depth:** 8'-13.5' **Sample No.:** TP-3-2

▲ **Sample Source:** Borrow Pit (EMC) **Depth:** 13.5'-18' **Sample No.:** TP-3-3

Remarks:

AMEC E&I

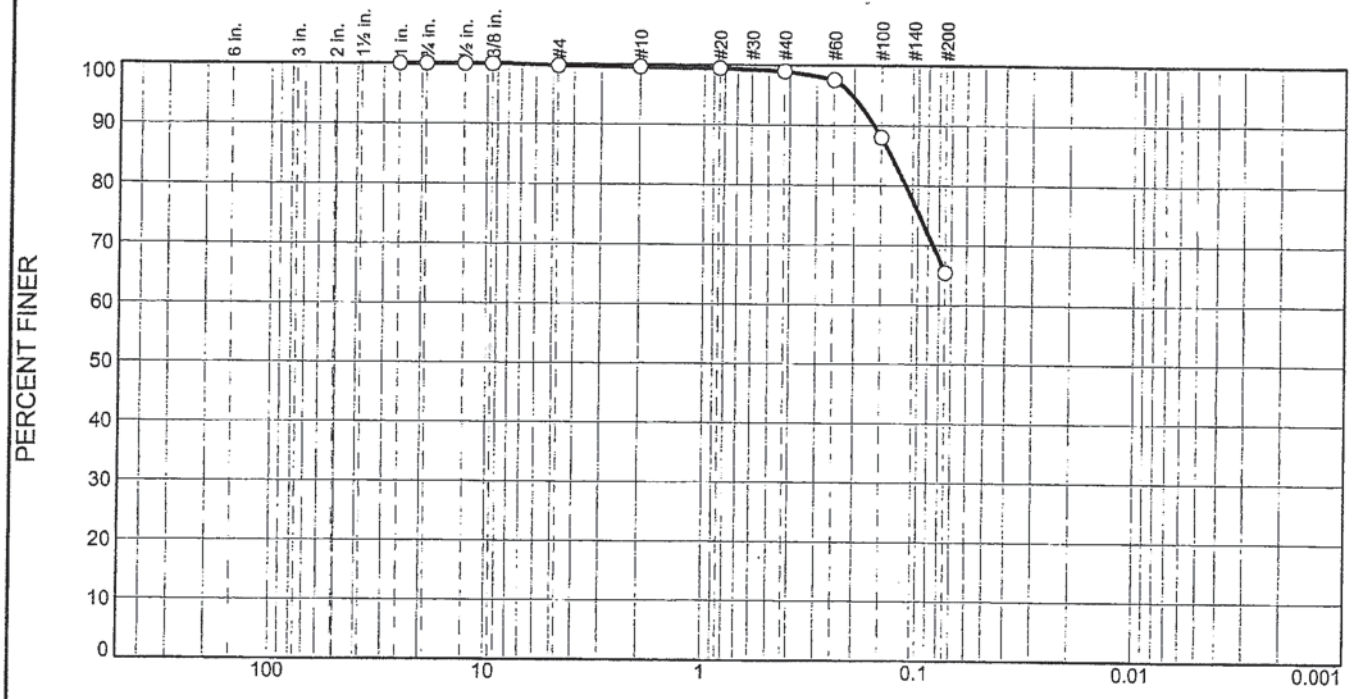
Jacksonville, Florida

Figure

Michael J. Hoop

Tested By: MC

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.2	0.6	33.4	65.5	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.7		
#10	99.5		
#20	99.4		
#40	98.9		
#60	97.5		
#100	88.0		
#200	65.5		

* (no specification provided)

Material Description

Gray and Brown Very Sandy CLAY

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.1623 D_{85}= 0.1348 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 9-20-11 **Date Tested:** 10-5-11

Tested By: MC

Checked By: Michael Holm

Title: Project Engineer 10/7/11

Michael J. Holm

Source of Sample: Clay Liner **Date Sampled:** 9-20-11

Sample Number: TP-3-2

AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates

Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**

amec

REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** October 7, 2011

Sample Number: TP 4-3

Sample Information: Initial / Final

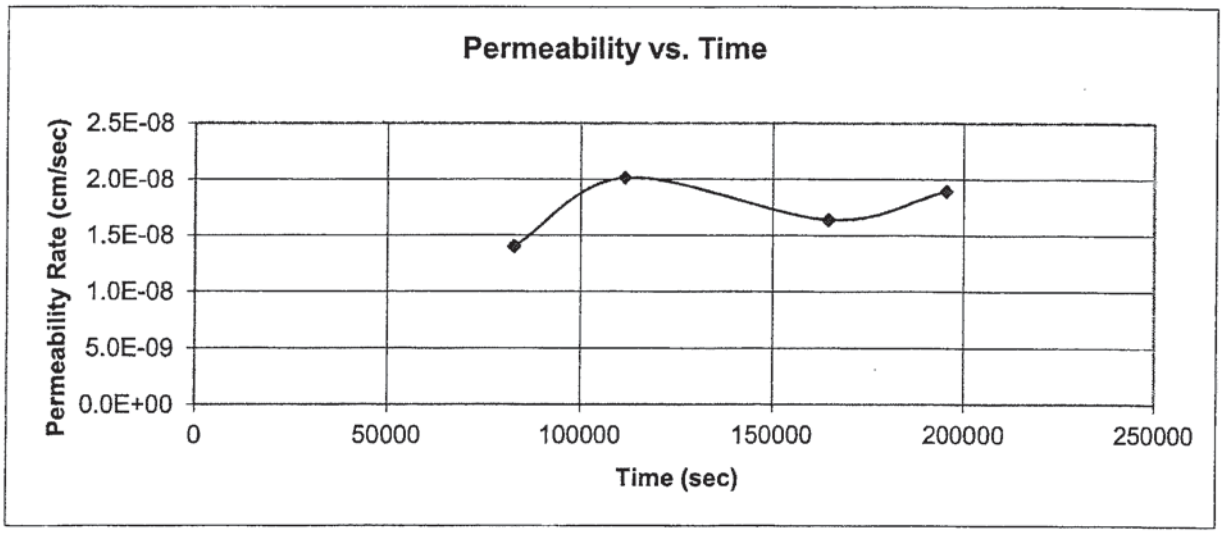
Dia. (in.)	2.86	2.86	**Length (in)**	3.92	3.92	**Weight (gr)**	698.7	715.9
Wet Density (pcf)	105.8		**Moisture Content (%)**	44.3		**Dry Density (pcf)**	73.3	
Final WD (pcf)	108.4		**Final Moisture (%)**	48.4		**Final DD (pcf)**	73.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	23.4	**Minimum Hydraulic Gradient**	11.6
Maximum Consolidation Stress (psi)	4.7	**Minimum Consolidation Stress (psi)**	2

Permeability Rate

1.7E-08

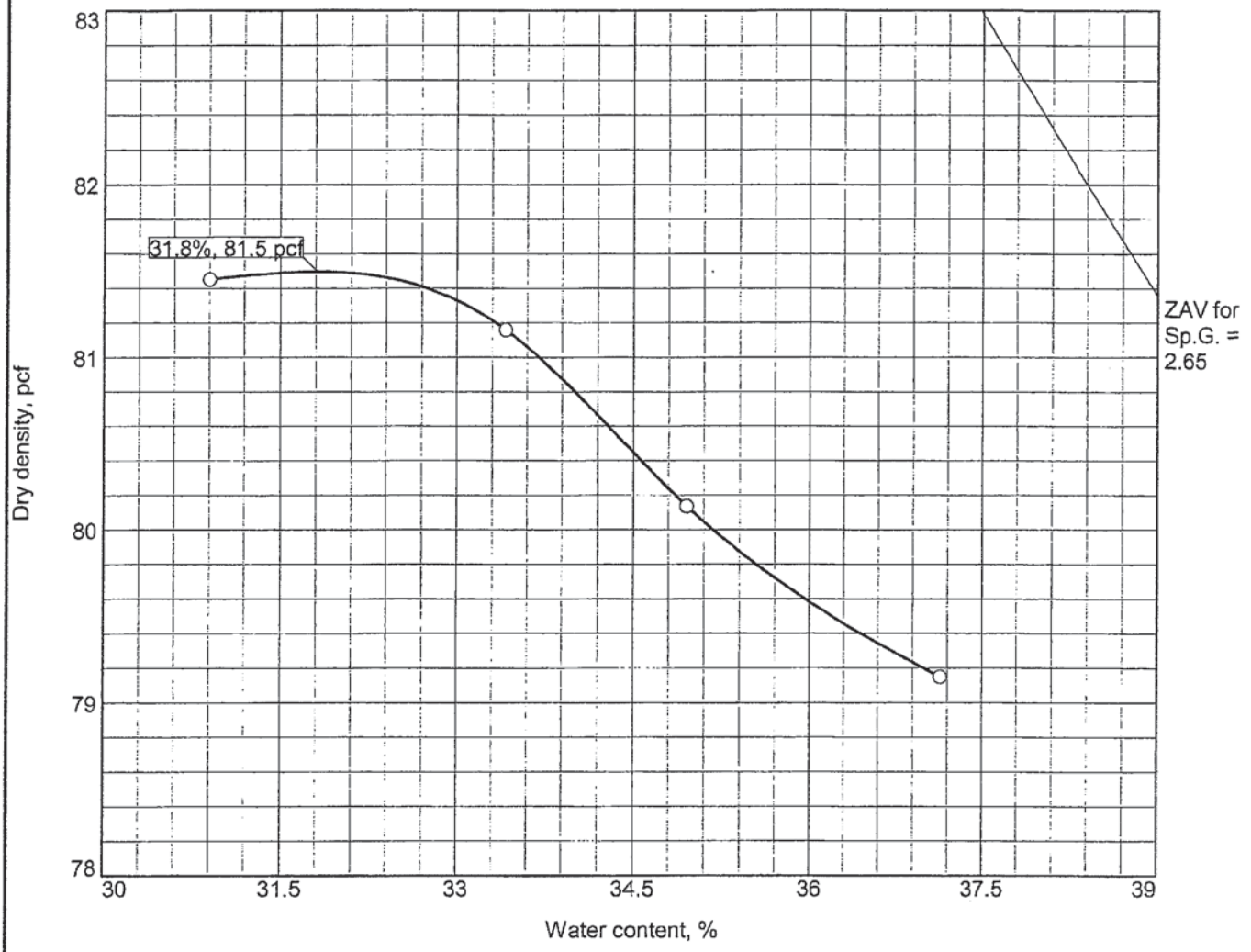


Reviewed By:

Kelly Marshall, E.I.

Michael J. Holm

COMPACTION TEST REPORT



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
							0.0	64.1

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 81.5 pcf Optimum moisture = 31.8 %	Gray and Brown Very Sandy CLAY

Project No. 6736115123 **Client:** Meskel & Associates
Project: Trailridge Landfill Closure

○ **Source of Sample:** Clay Liner **Sample Number:** TP-4-3

AMEC E&I

Jacksonville, Florida

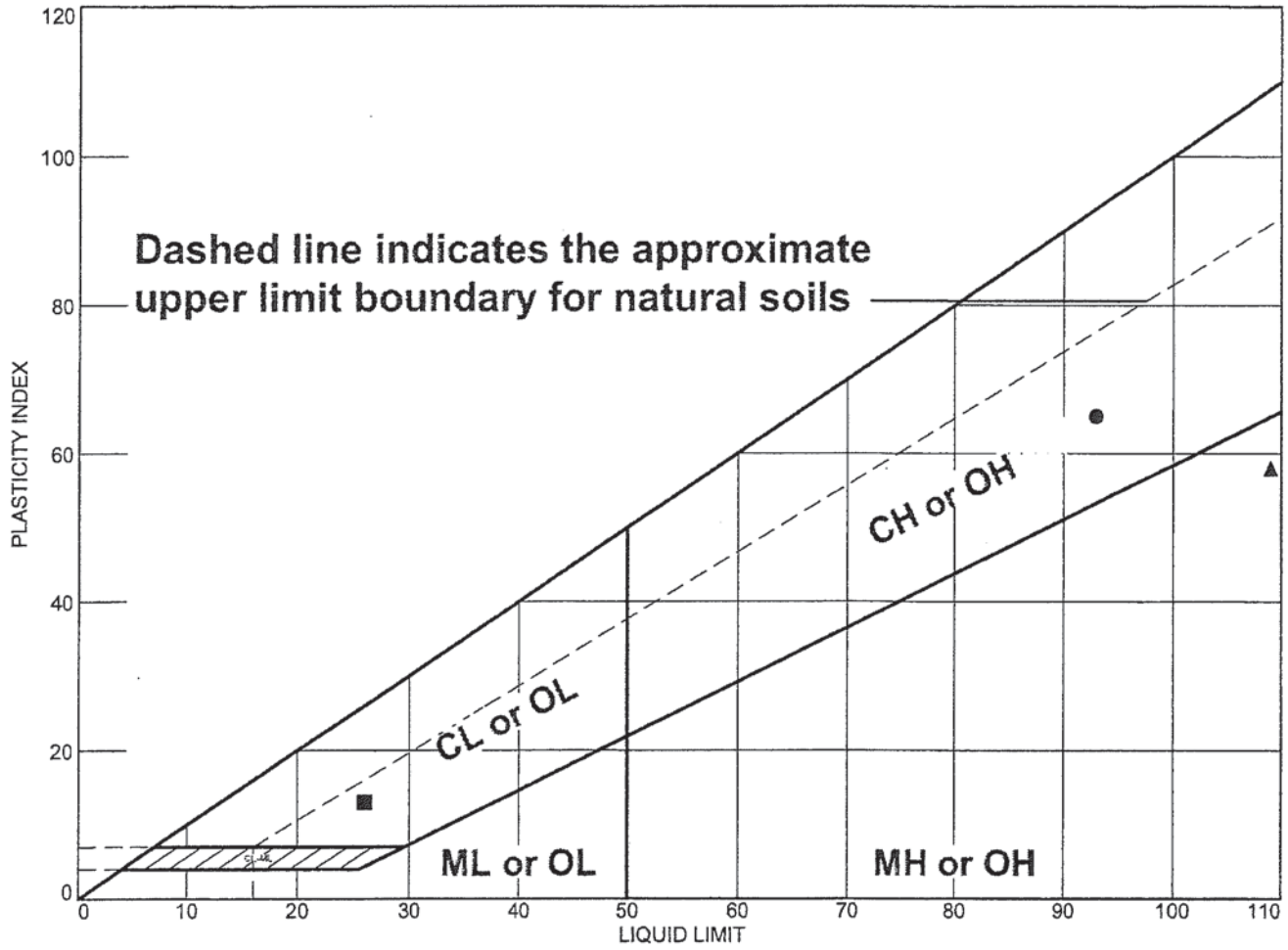
Remarks:
Date Tested: 9-24-11

Figure 10/7/11

Michael J. Holm

Tested By: MC

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray Very Sandy CLAY	93	28	65		85.6	CH
■	Gray Brown Very Clayey Fine SAND	26	13	13		44.7	CL
▲	Light Brown Very Sandy Elastic SILT	109	51	58		63.7	MH

Project No. 6736115123 **Client:** Meskel & Associates

Project: Trailridge Landfill Closure

● **Sample Source:** Borrow Pit (EMC) **Depth:** 7'-9' **Sample No.:** TP-4-2

■ **Sample Source:** Borrow Pit (EMC) **Depth:** 0'-7' **Sample No.:** TP-4-1

▲ **Sample Source:** Borrow Pit (EMC) **Depth:** 9'-15.3' **Sample No.:** TP-4-3

AMEC E&I

Jacksonville, Florida

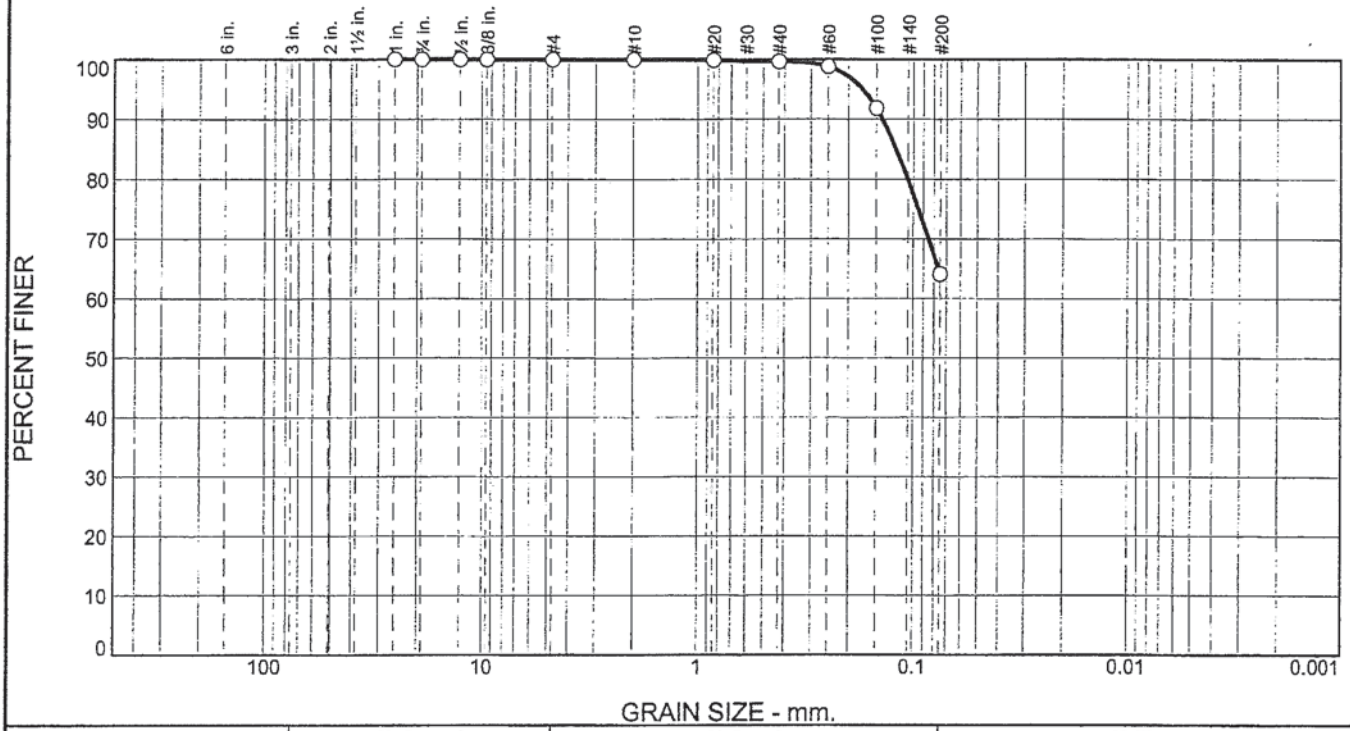
Remarks:

Figure

Tested By: MC

Michael J. Holm 9/27/16

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	35.5	64.1	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.6		
#60	98.8		
#100	91.9		
#200	64.1		

* (no specification provided)

Material Description

Gray and Brown Very Sandy CLAY

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.1402 D_{85}= 0.1208 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 9-20-11 **Date Tested:** 10-5-11

Tested By: MC

Checked By: _____

Title: _____

Source of Sample: Clay Liner **Date Sampled:** 9-20-11
Sample Number: TP-4-3

AMEC E&I

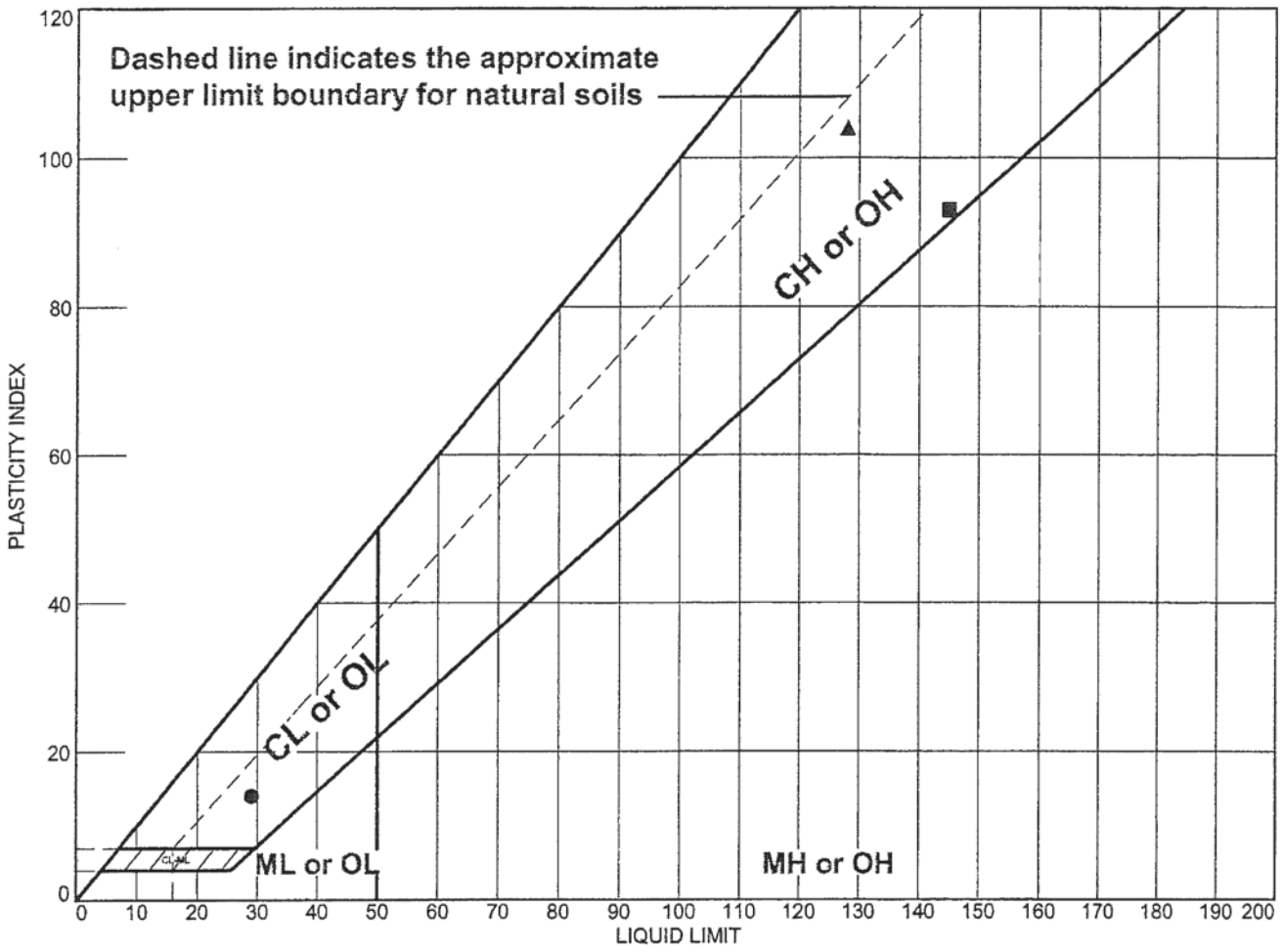
Jacksonville, Florida

Client: Meskel & Associates
Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**

Michael J. Holm

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray Brown Very Clayey Fine SAND	29	15	14		35.8	CL
■	Gray Very Sandy CLAY	145	52	93		98.8	CH
▲	Greenish Gray Very Sandy CLAY	128	24	104		84.1	CH

Project No. 6736115123 **Client:** Meskel & Associates

Project: Trailridge Landfill Closure

● **Sample Source:** Borrow Pit (EMC) **Depth:** 0'-6' **Sample No.:** TP-5-1

■ **Sample Source:** Borrow Pit (EMC) **Depth:** 6'-10' **Sample No.:** TP-5-2

▲ **Sample Source:** Borrow Pit (EMC) **Depth:** 10'-15.5' **Sample No.:** TP-5-3

AMEC E&I

Jacksonville, Florida

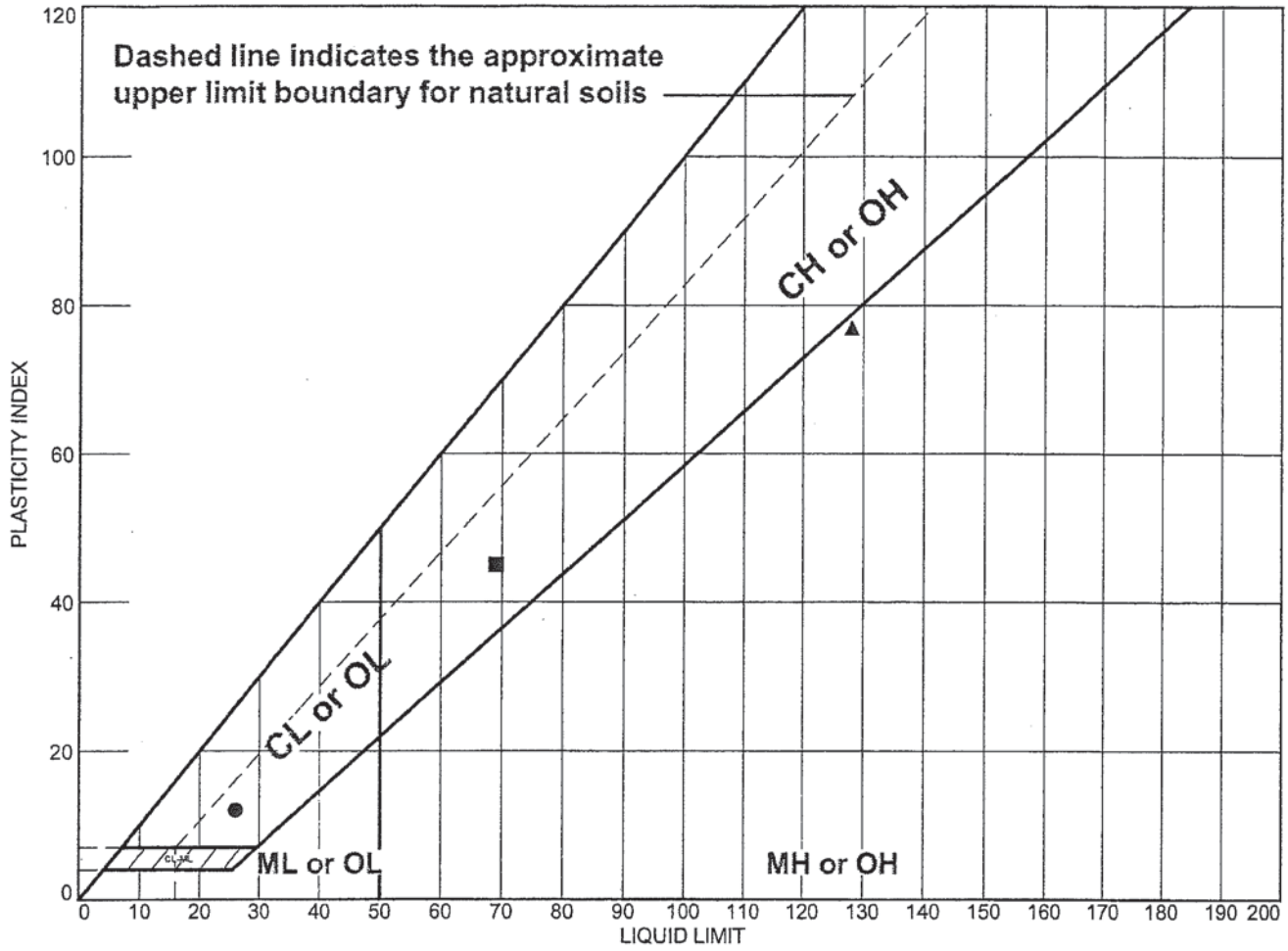
Remarks:

Figure

Michael J. Holm

Tested By: MC

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark Gray Brown Very Clayey Fine SAND	26	14	12		34.9	CL
■	Gray Brown Very Sandy CLAY	69	24	45		63.1	CH
▲	Greenish Gray Brown Very Sandy Elastic SILT	128	51	77		73.8	CH

Project No. 6736115123 **Client:** Meskel & Associates

Project: Trailridge Landfill Closure

● **Sample Source:** Borrow Pit (EMC) **Depth:** 4"-9.3' **Sample No.:** TP-6-1

■ **Sample Source:** Borrow Pit (EMC) **Depth:** 9.3'-14.5' **Sample No.:** TP-6-2

▲ **Sample Source:** Borrow Pit (EMC) **Depth:** 14.5'-20' **Sample No.:** TP-6-3

Remarks:

AMEC E&I

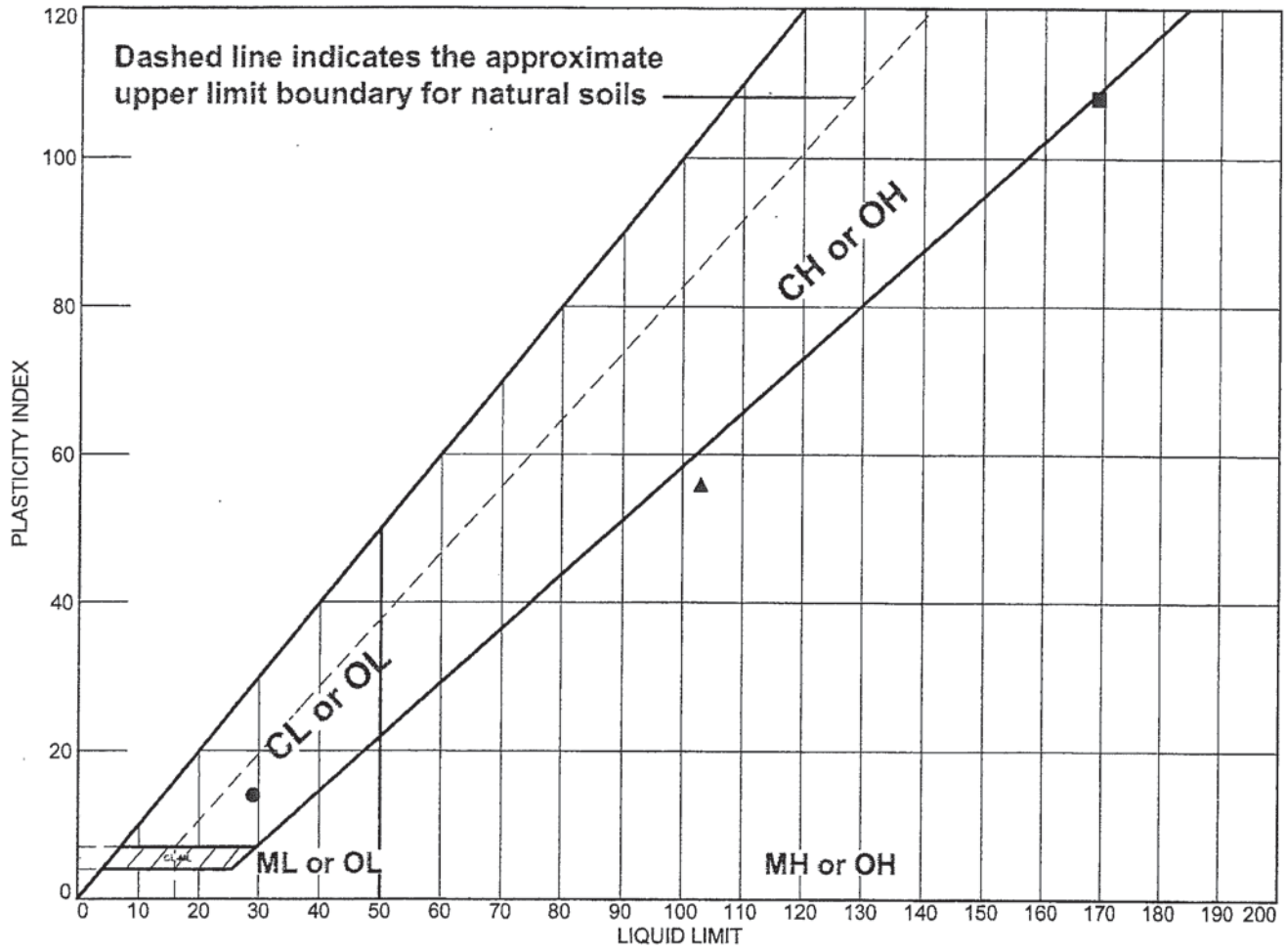
Jacksonville, Florida

Figure

Michael J. Holm

Tested By: MC

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray Brown Clayey Fine SAND	29	15	14		31.8	CL
■	Gray Brown Sandy CLAY	169	61	108		80.1	CH
▲	Gray Slightly Sandy Elastic SILT	103	47	56		90.5	MH

Project No. 6736115123 **Client:** Meskel & Associates

Project: Trailridge Landfill Closure

● **Sample Source:** Borrow Pit (EMC) **Depth:** 3'-10' **Sample No.:** TP-7-1

■ **Sample Source:** Borrow Pit (EMC) **Depth:** 13'-17.5' **Sample No.:** TP-7-3

▲ **Sample Source:** Borrow Pit (EMC) **Depth:** 10'-13' **Sample No.:** TP-7-2

Remarks:

AMEC E&I

Jacksonville, Florida

Figure

Tested By: MC

Michael J. Holm 2/7/14

REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** October 3, 2011

Sample Number: TP 8-1

Sample Information: Initial / Final

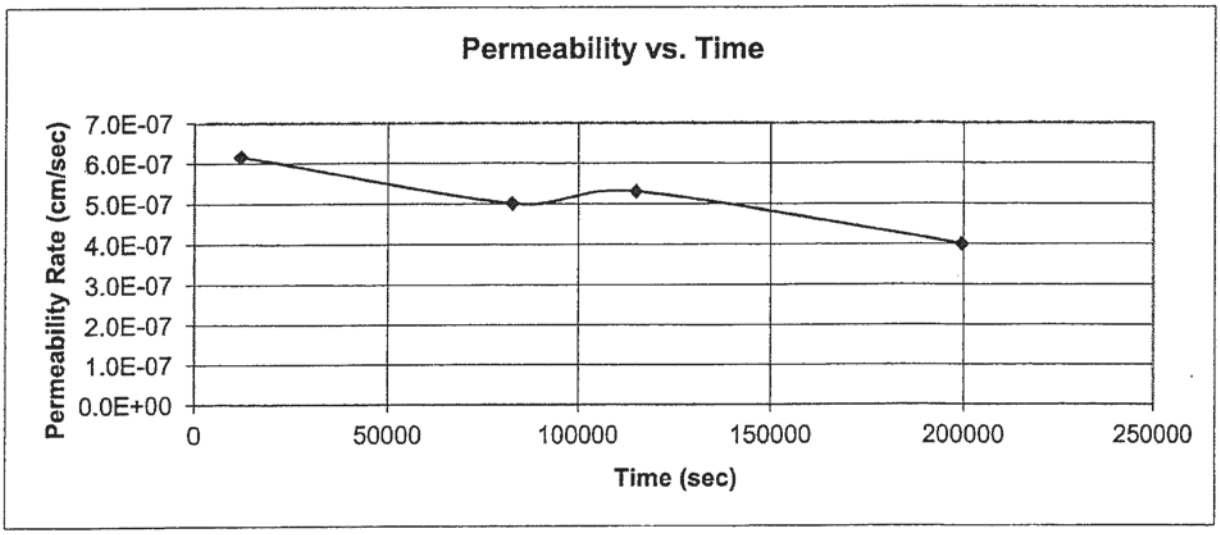
Dia. (in.)	2.86	2.83	**Length (in)**	3.25	3.22	**Weight (gr)**	684.7	702.7
Wet Density (pcf)	125.2		**Moisture Content (%)**	11.7		**Dry Density (pcf)**	112.1	
Final WD (pcf)	132.6		**Final Moisture (%)**	15.2		**Final DD (pcf)**	115.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	2.7	**Minimum Hydraulic Gradient**	1.3
Maximum Consolidation Stress (psi)	2	**Minimum Consolidation Stress (psi)**	2

Permeability Rate

5.1E-07

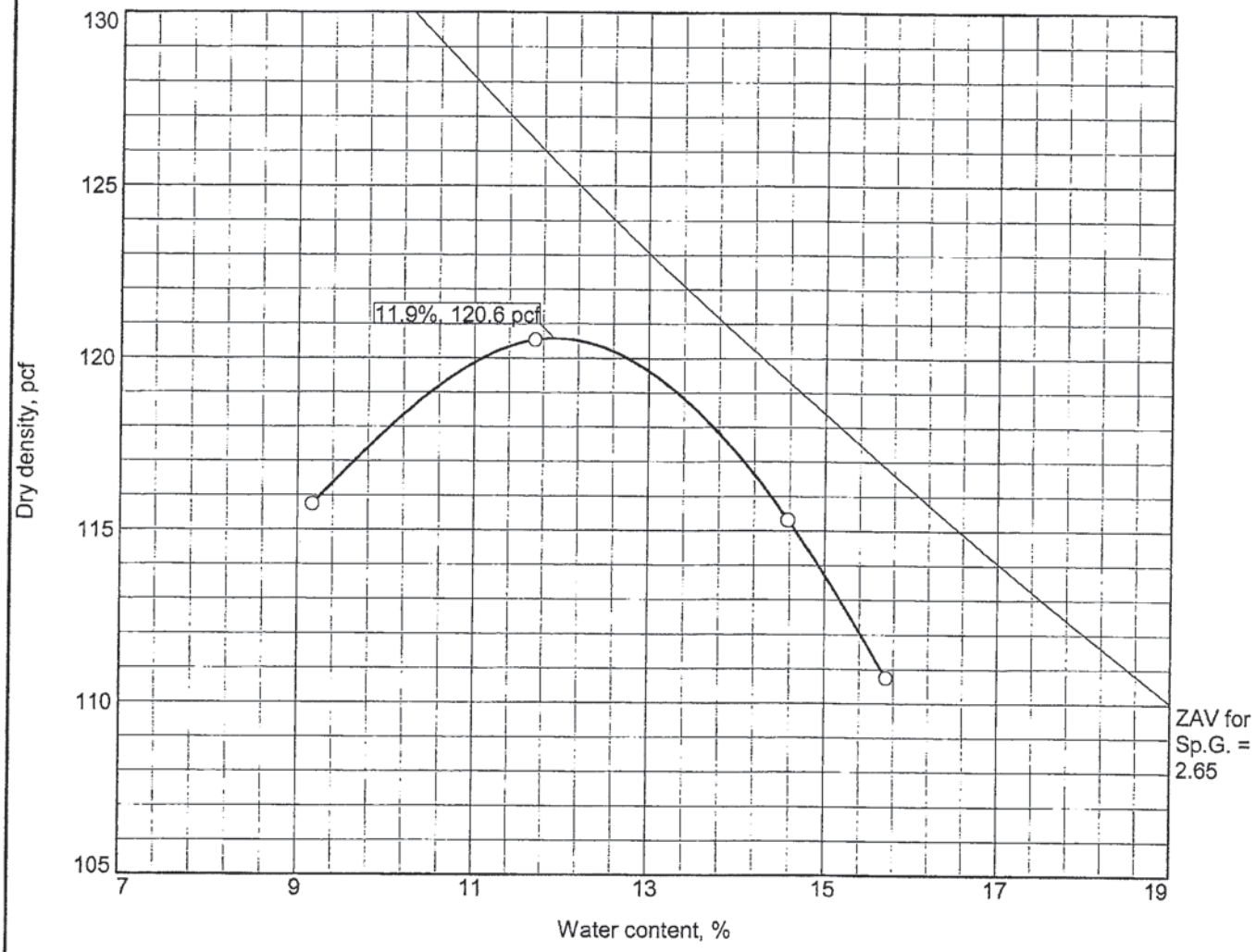


Reviewed By:

Kelly Marshall, E.I.

Michael J. Holm

COMPACTION TEST REPORT



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
							0.0	30.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 120.6 pcf Optimum moisture = 11.9 %	Gray and Brown Clayey Fine SAND

Project No. 6736115123 **Client:** Meskel & Associates
Project: Trailridge Landfill Closure

○ **Source of Sample:** Clay Liner **Sample Number:** TP-8-1

AMEC E&I

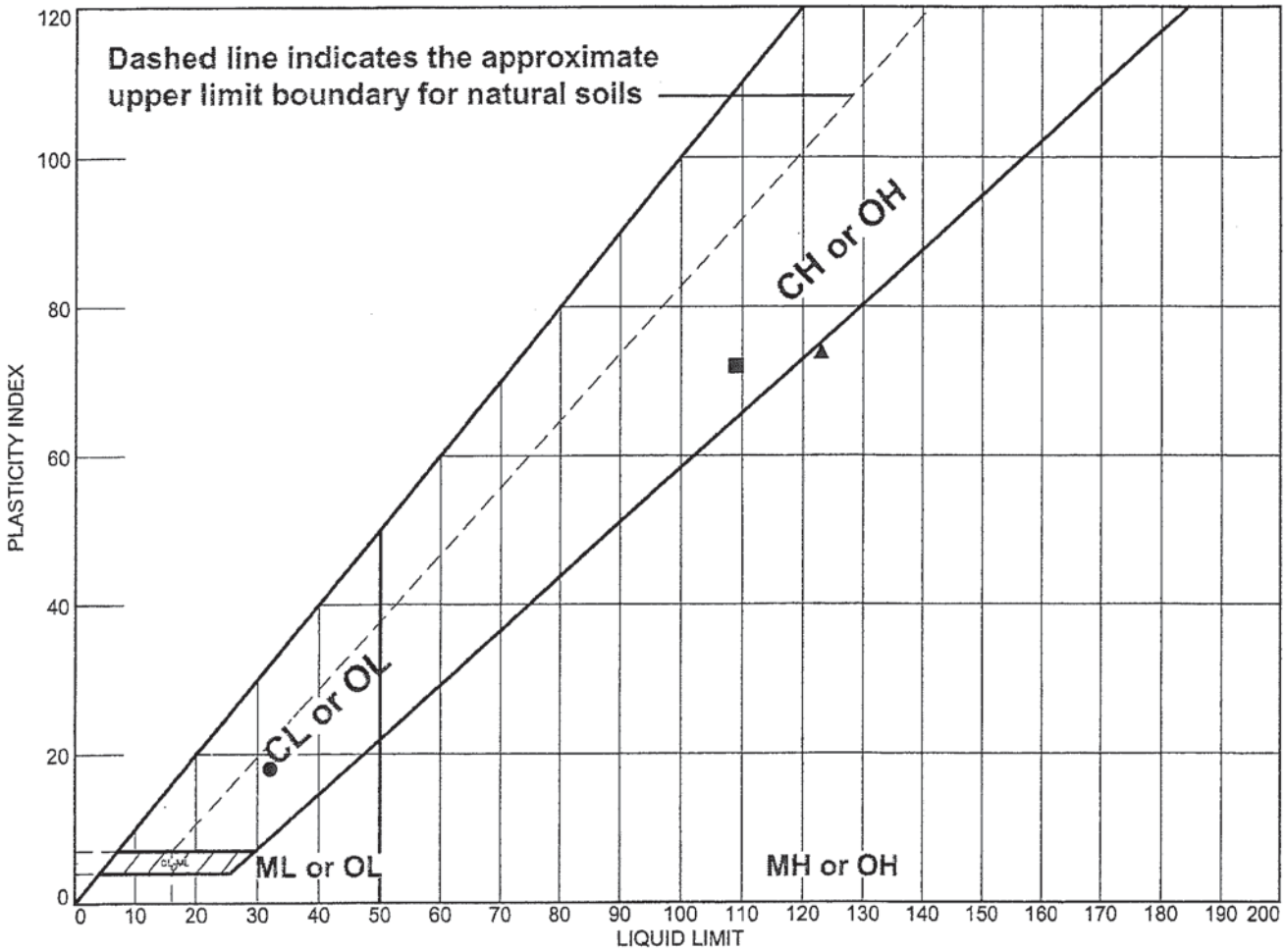
Jacksonville, Florida

Remarks:
Date Tested: 9-28-11

Figure

Tested By: JT

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark Gray Brown Clayey Fine SAND	32	14	18		34.6	CL
■	Gray Brown Very Sandy CLAY	109	37	72		57.9	CH
▲	Gray Brown Sandy CLAY	123	49	74		81.6	CH

Project No. 6736115123 **Client:** Meskel & Associates

Project: Trailridge Landfill Closure

● **Sample Source:** Borrow Pit (EMC) **Depth:** 3'-9.5' **Sample No.:** TP-8-1

■ **Sample Source:** Borrow Pit (EMC) **Depth:** 9.5'-14' **Sample No.:** TP-8-2

▲ **Sample Source:** Borrow Pit (EMC) **Depth:** 14'-17.5' **Sample No.:** TP-8-3

Remarks:

AMEC E&I

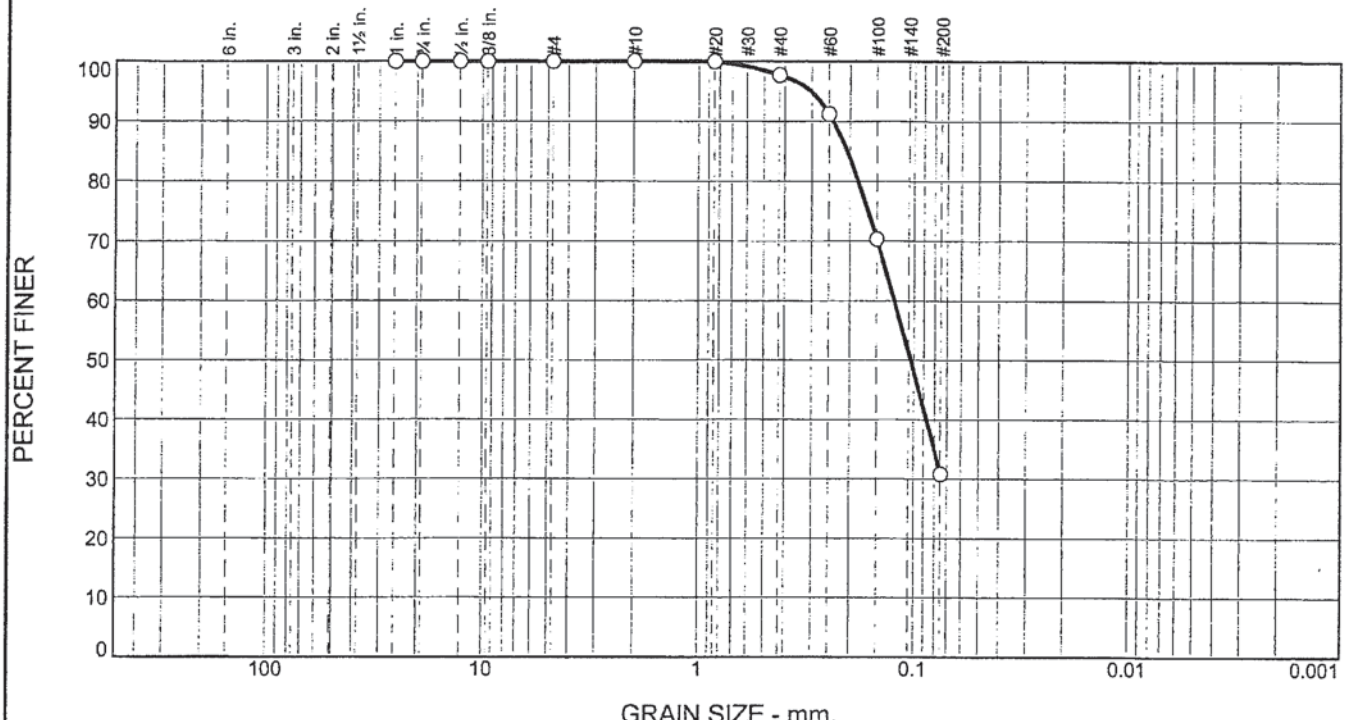
Jacksonville, Florida

Figure

Michael J. Holtzman

Tested By: MC

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.3	66.9	30.8	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	97.7		
#60	91.2		
#100	70.3		
#200	30.8		

* (no specification provided)

Material Description

Gray and Brown Clayey Fine SAND

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.2394 D_{85}= 0.2066 D_{60}= 0.1236
D_{50}= 0.1037 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 9-20-11 **Date Tested:** 10-5-11

Tested By: MC

Checked By: Michael J. Holm

Title: Project Engineer 10/7/11

Source of Sample: Clay Liner **Date Sampled:** 9-20-11

Sample Number: TP-8-1

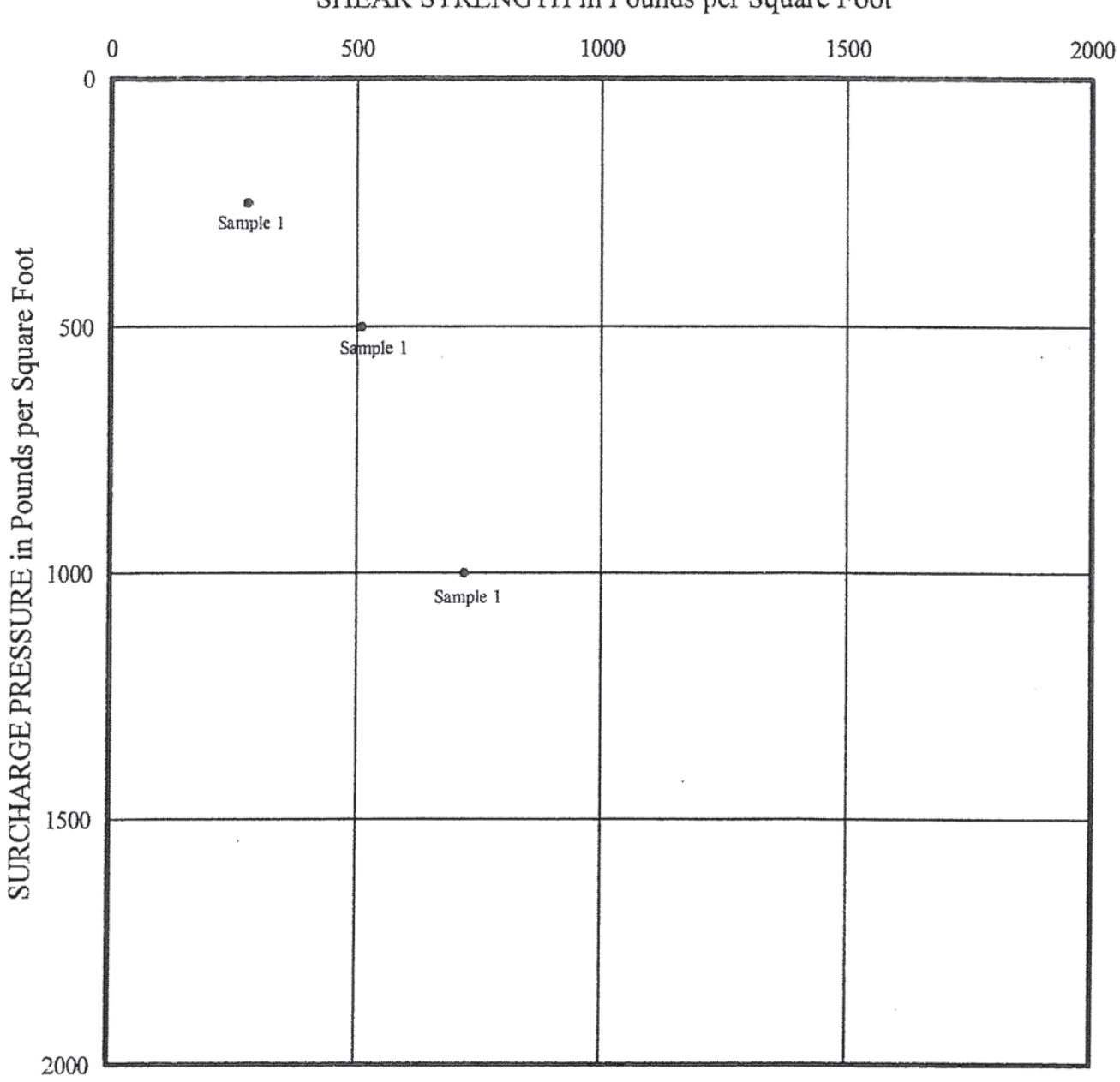
AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates

Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**

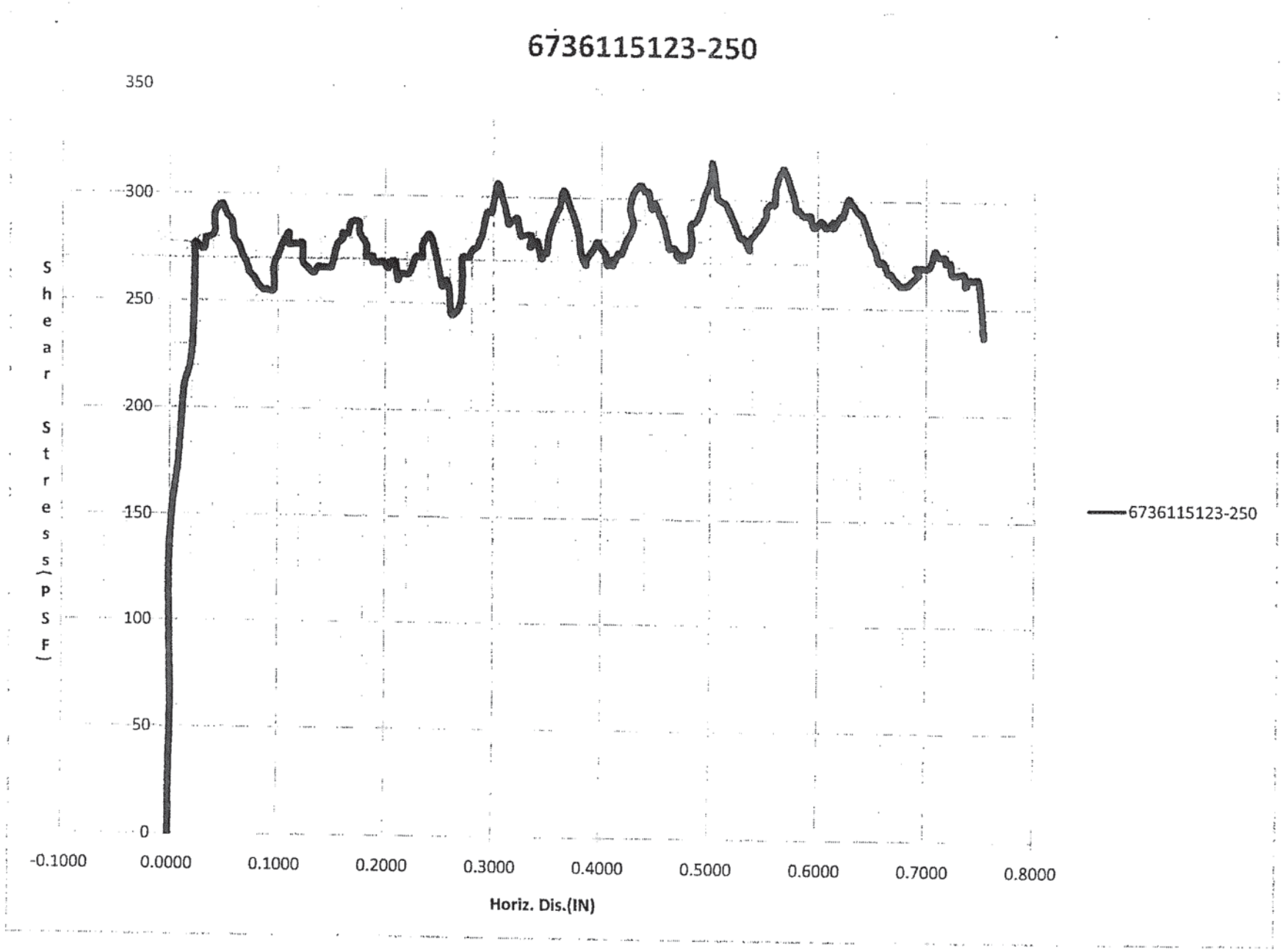


● Remolded samples (clay and sand combined) tested at field moisture content

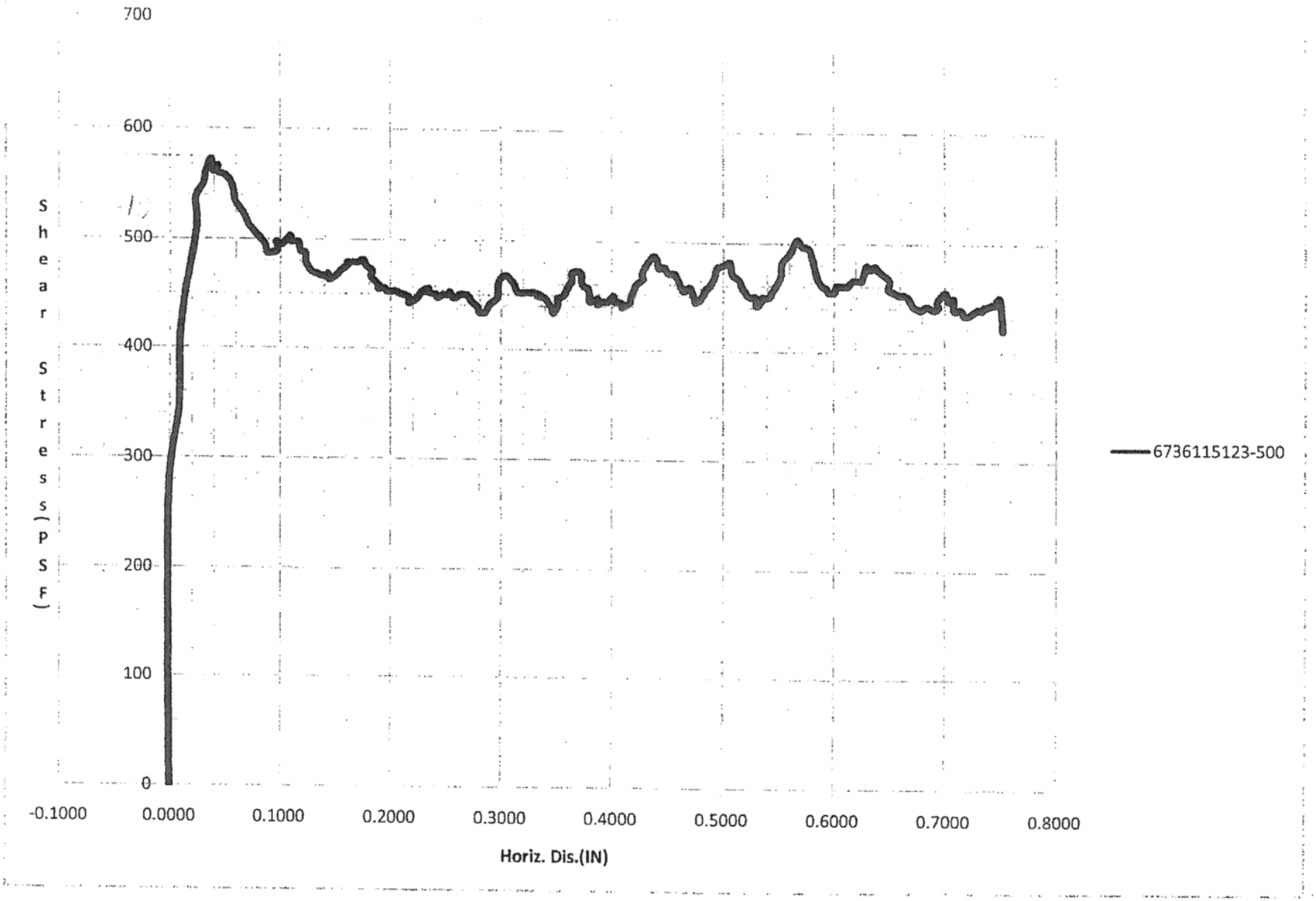
Clay vs Intermediate

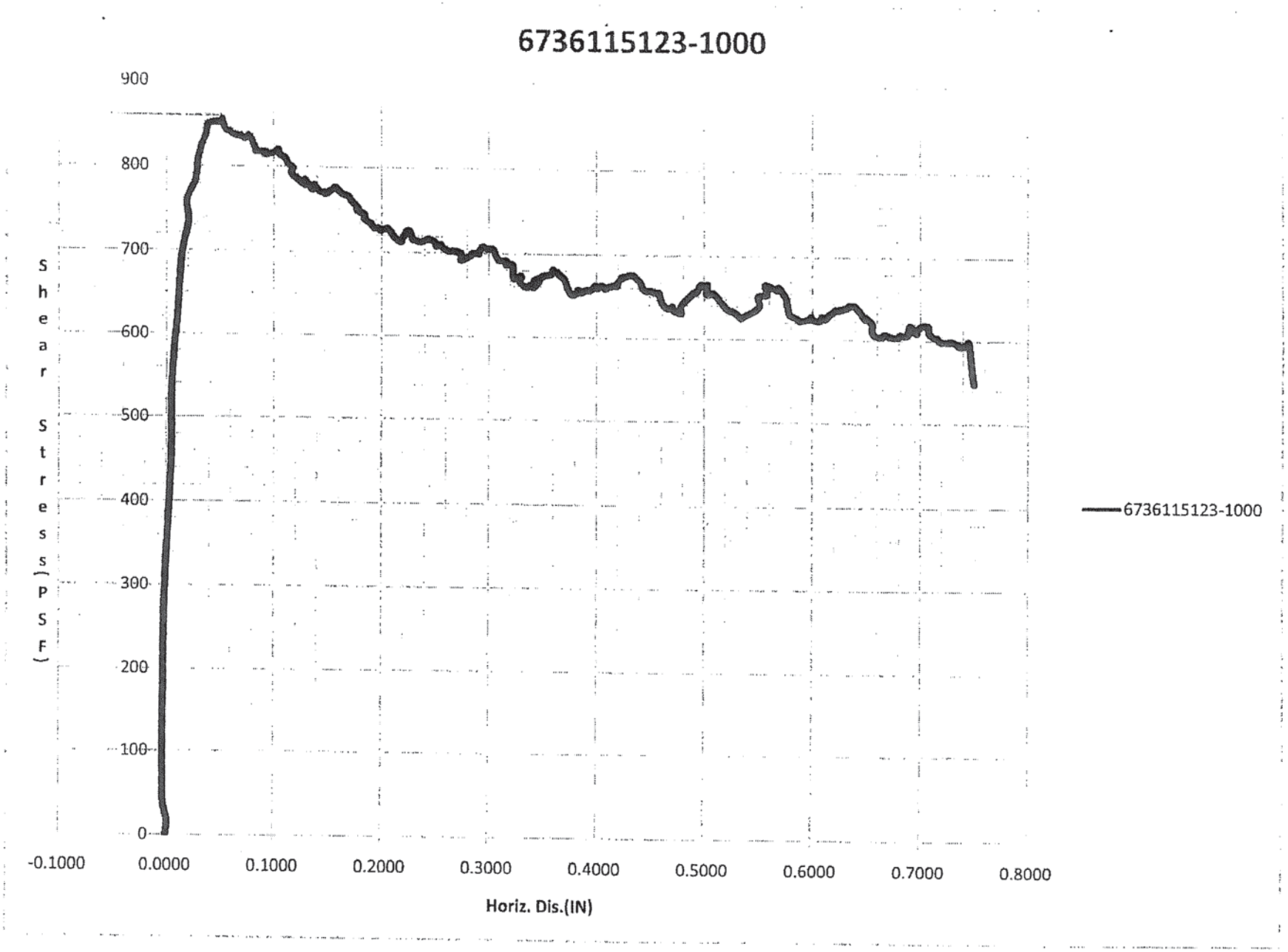
Prepared/Date: LH 10/5/11
Checked/Date: ET 10/5/11

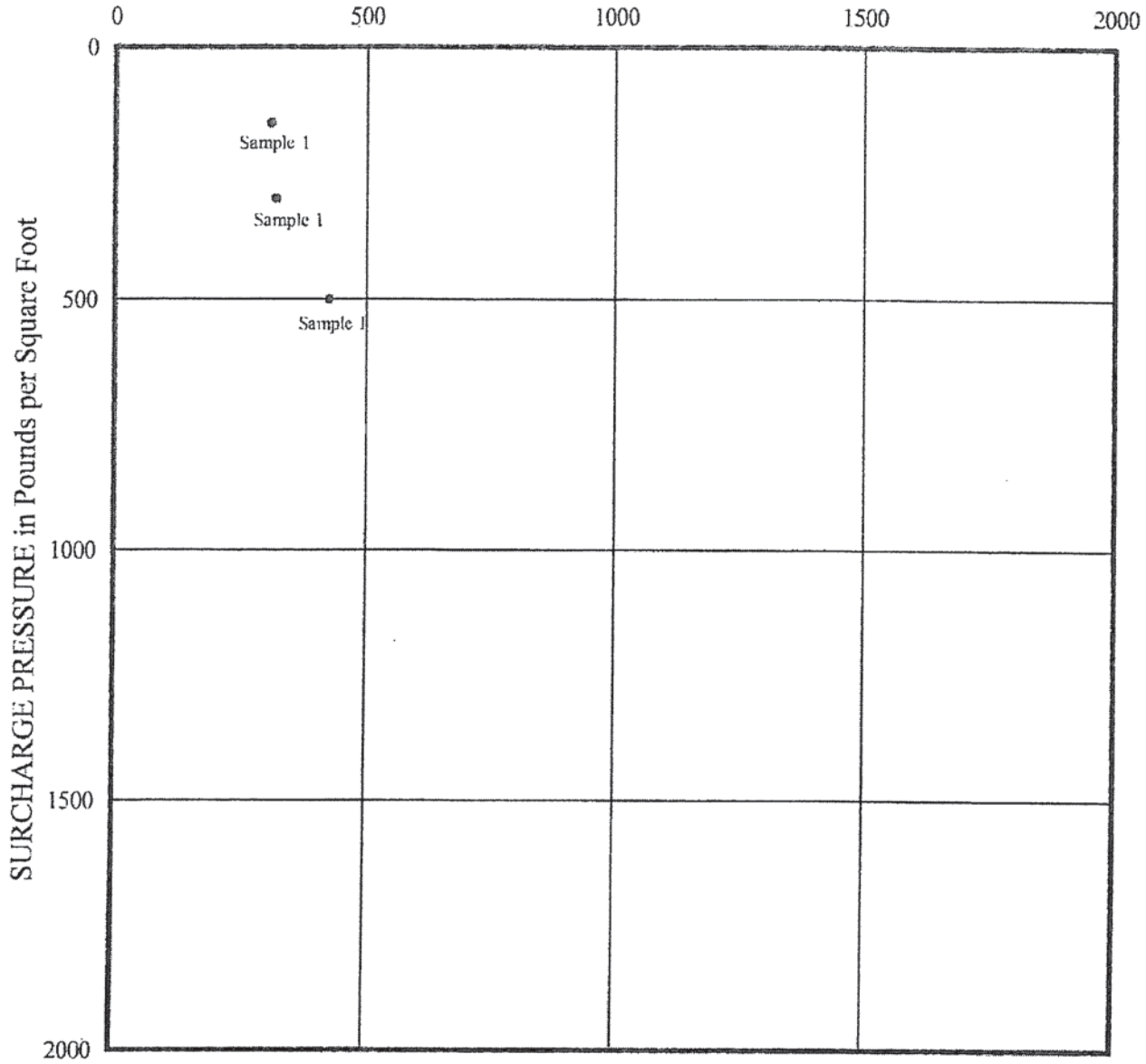
Trail Ridge Closure	amec	DIRECT SHEAR TEST DATA Project No. 6736-11-5123 Figure A-


6736115123-250
350
300
250
200
150
100
50
0
Shear Stress (PSF)
-0.1000
0.0000
0.1000
0.2000
0.3000
0.4000
0.5000
0.6000
0.7000
0.8000
Horiz. Dis.(IN)
6736115123-250

6736115123-500




6736115123-1000
900
800
700
600
500
400
300
200
100
0
Shear Stress (PSF)
-0.1000
0.0000
0.1000
0.2000
0.3000
0.4000
0.5000
0.6000
0.7000
0.8000
Horiz. Dis.(IN)
6736115123-1000



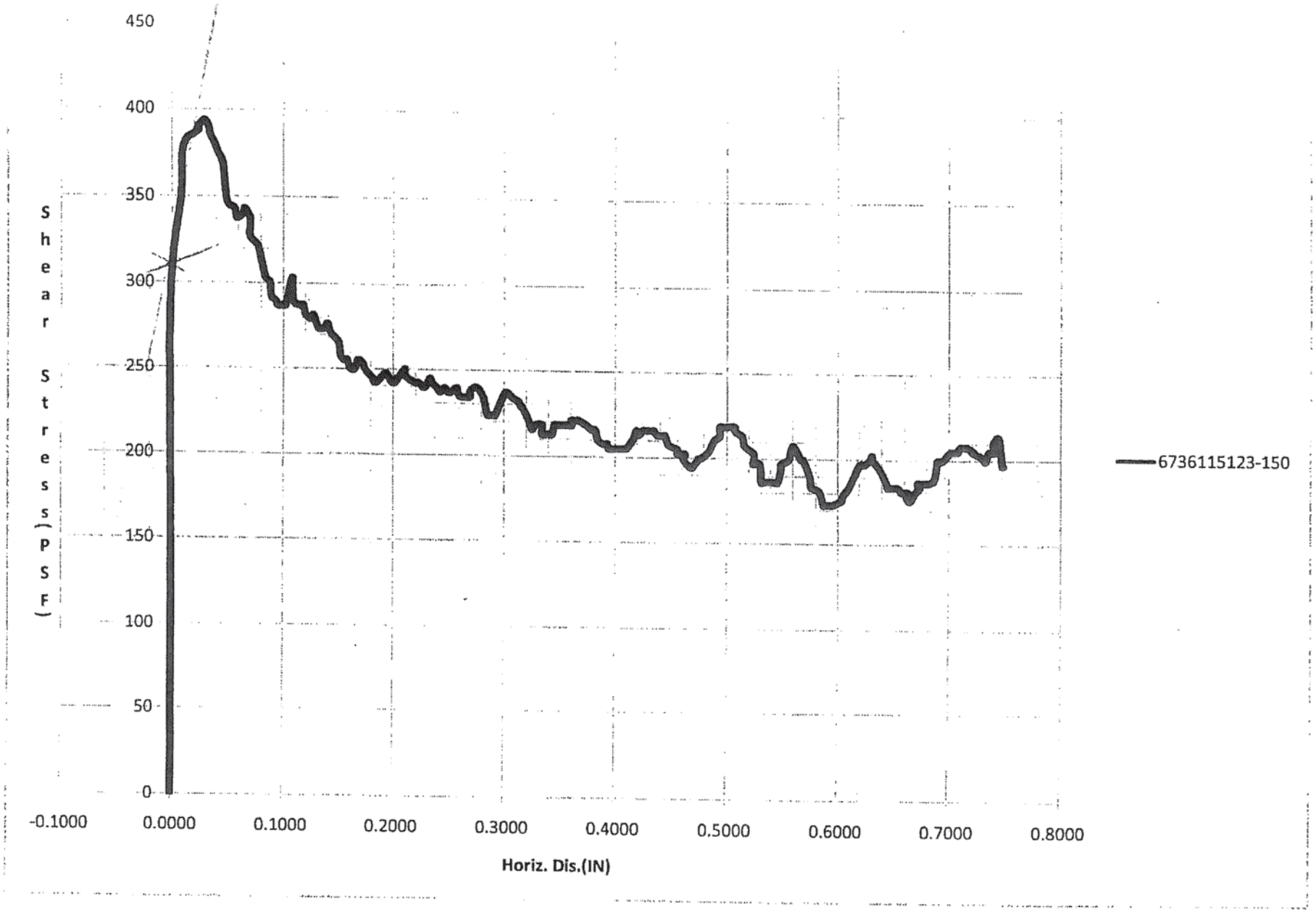
● Remolded samples (clay and sand combined) tested at field moisture content

Clay vs. Top Soil (TS-1)
Jacob Borrow Pit
Vegetative Cover

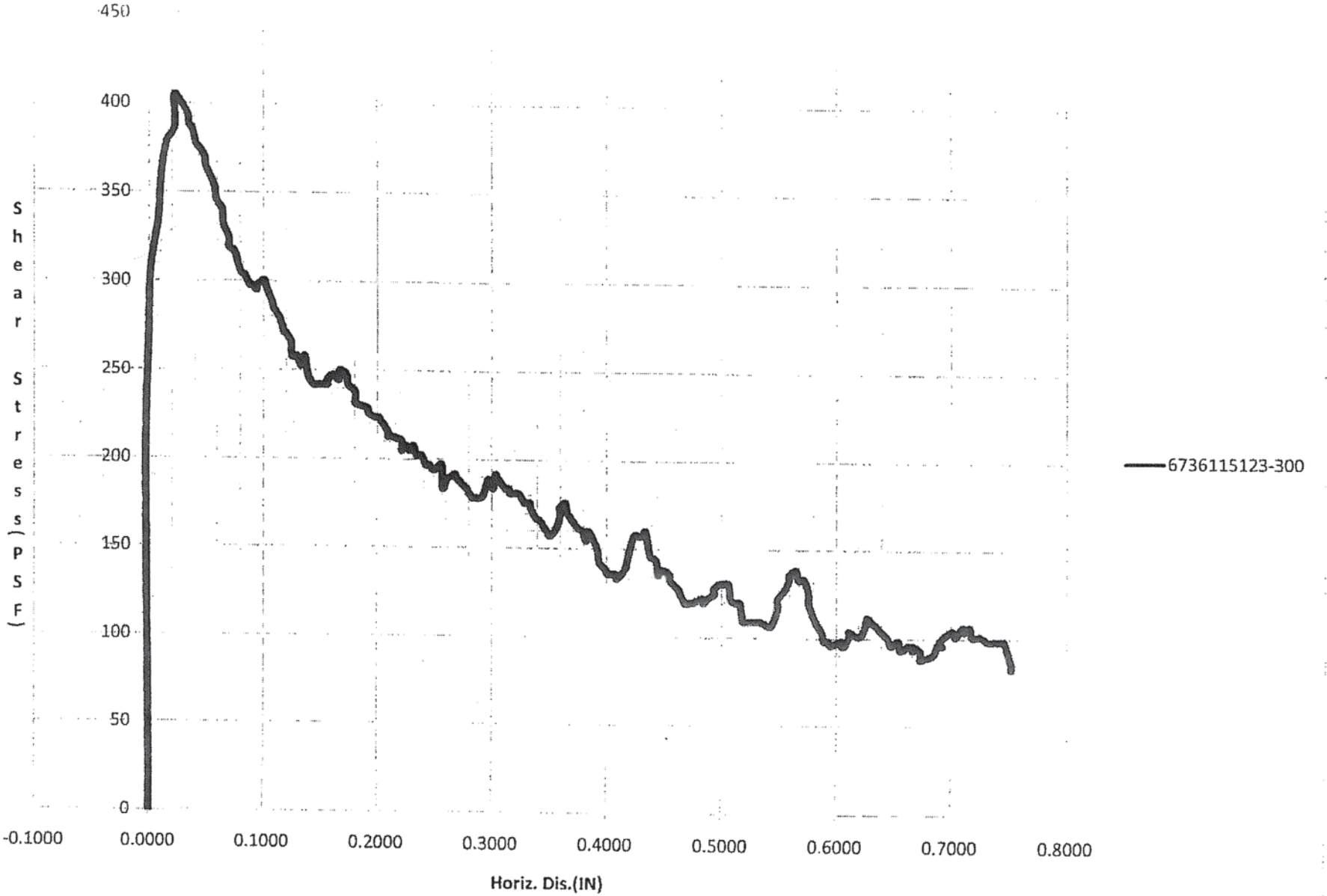
Prepared/Date: LH 10/21/11
Checked/Date: MTH 10/26/11

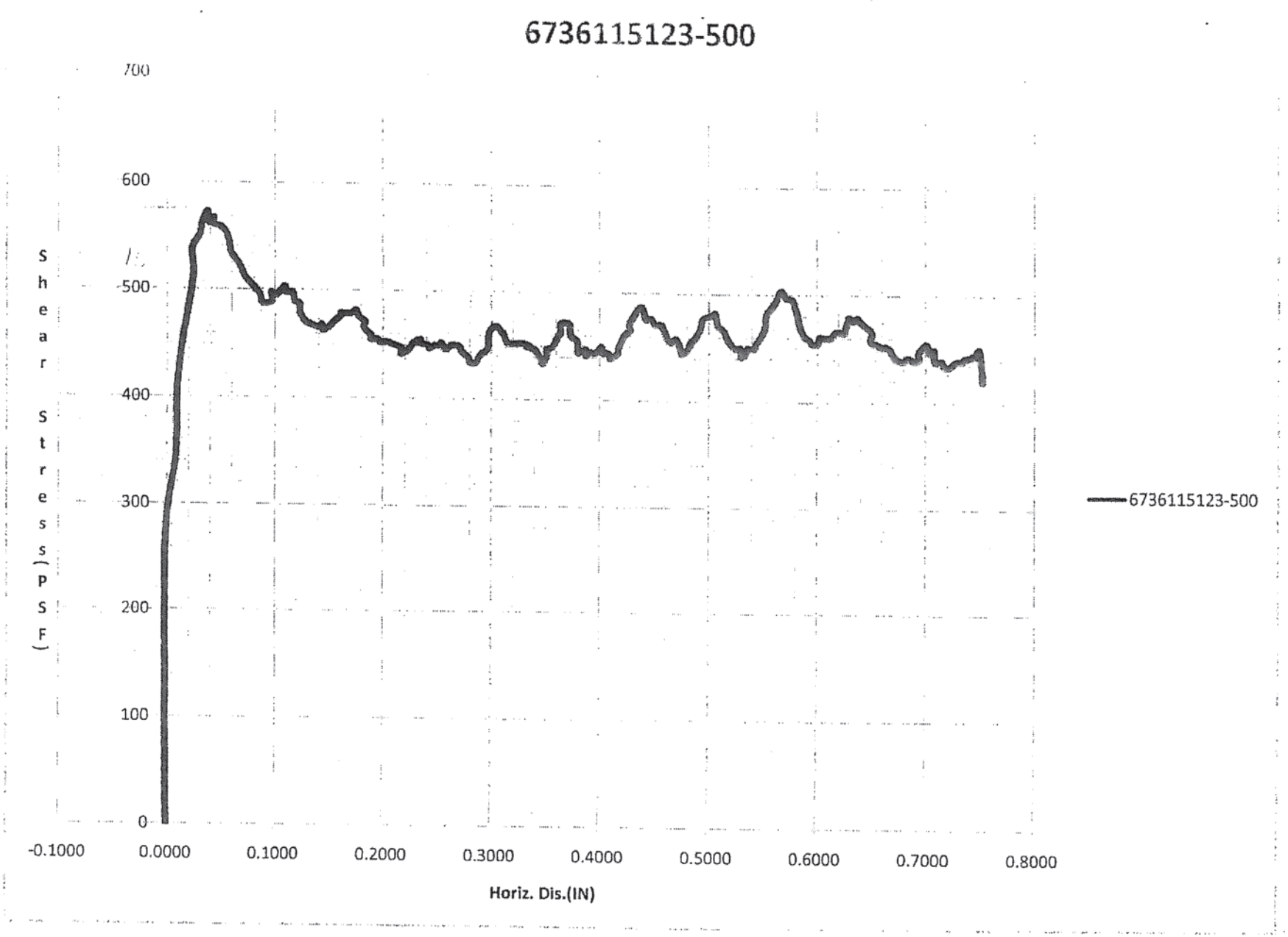
Trail Ridge Closure	amec	DIRECT SHEAR TEST DATA Project No. 6736-11-5123 Figure A-

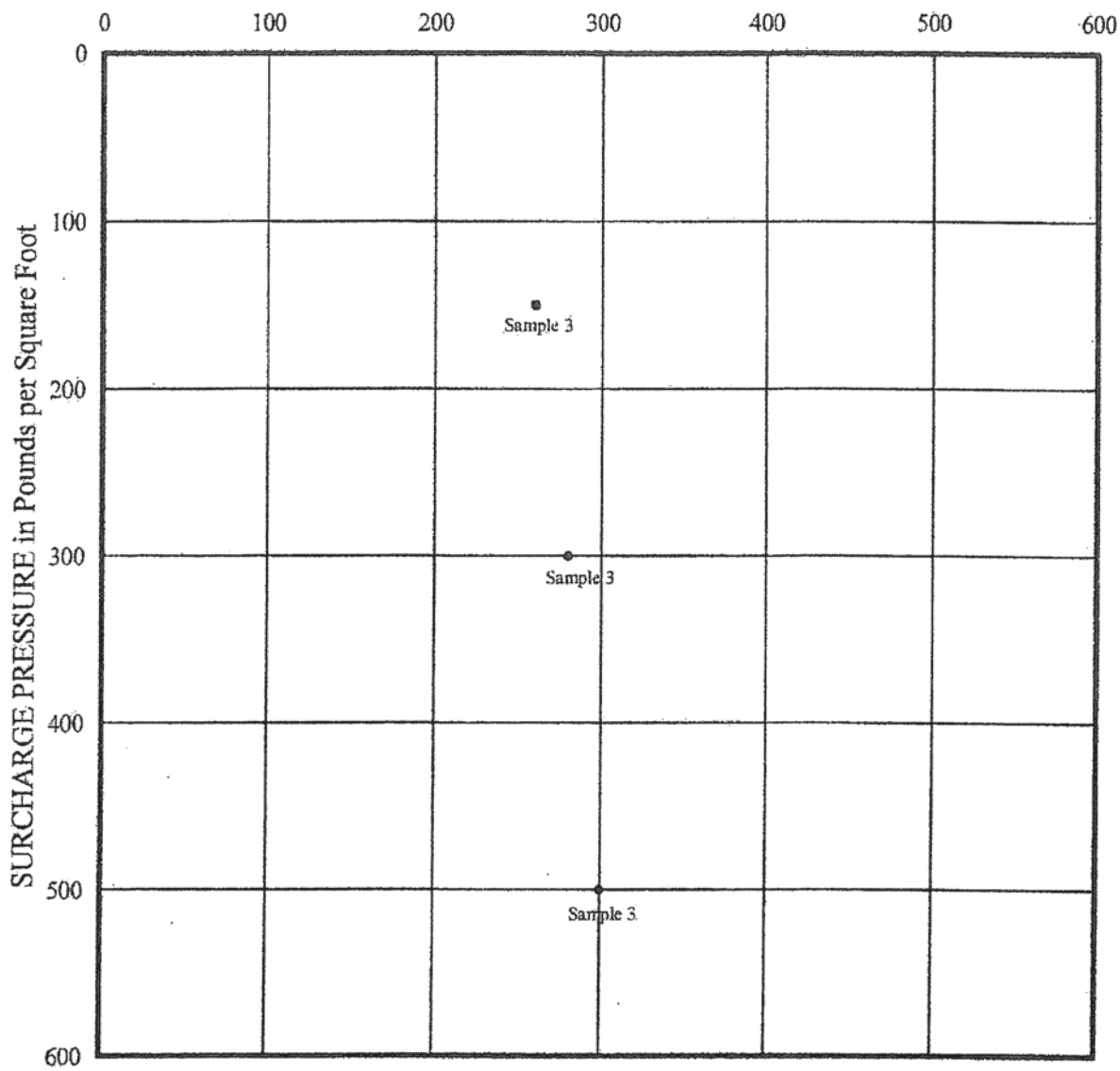
6736115123-150



6736115123-300




6736115123-500
700
600
500
400
300
200
100
0
Shear Stress (PSF)
-0.1000
0.0000
0.1000
0.2000
0.3000
0.4000
0.5000
0.6000
0.7000
0.8000
Horiz. Dis.(IN)
6736115123-500



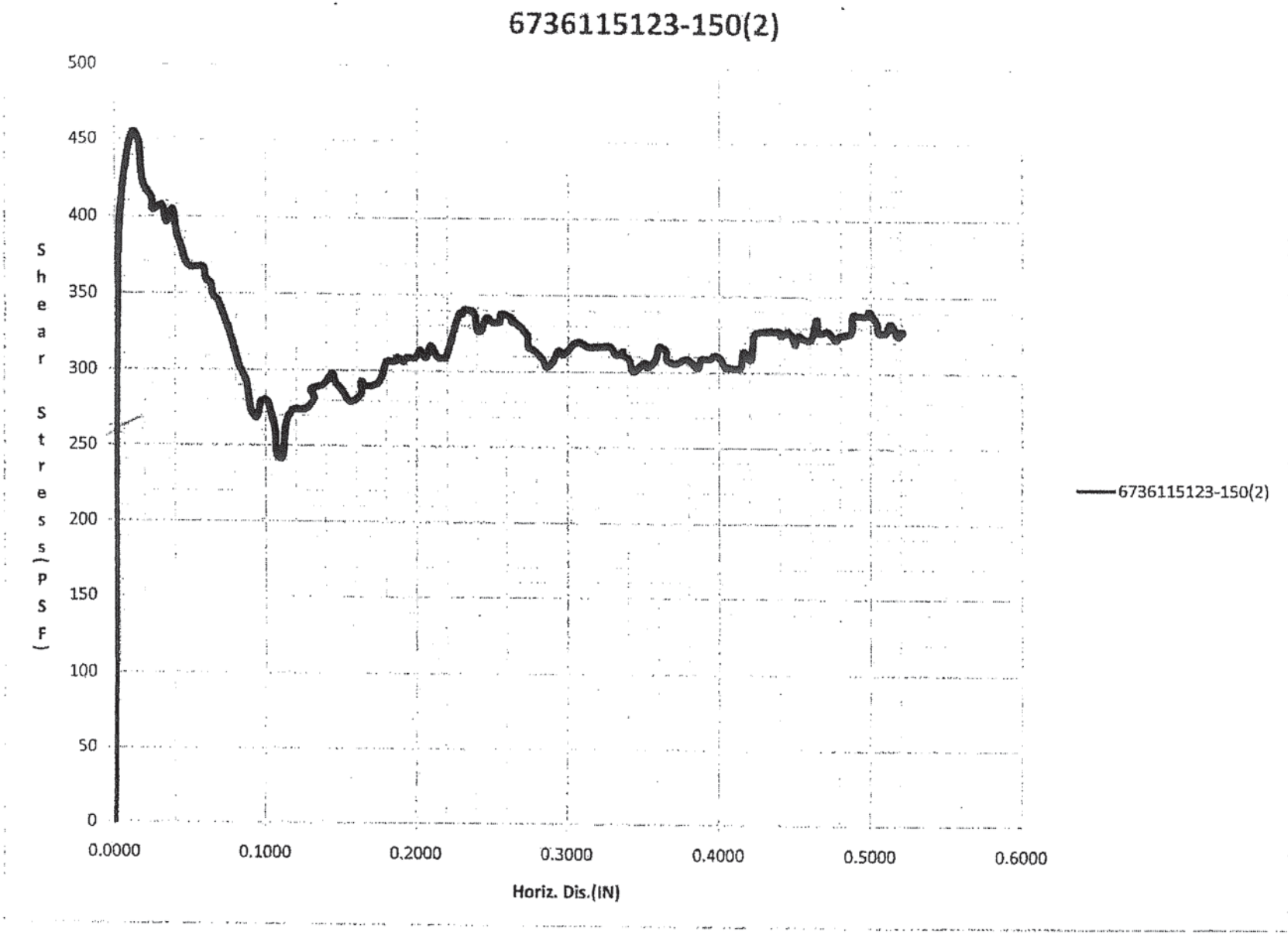
- Shearing at the interlining of the clay and sand. Each of the clay and sand sample was remolded to 90% of the optimum compaction. Test was performed at field moisture.

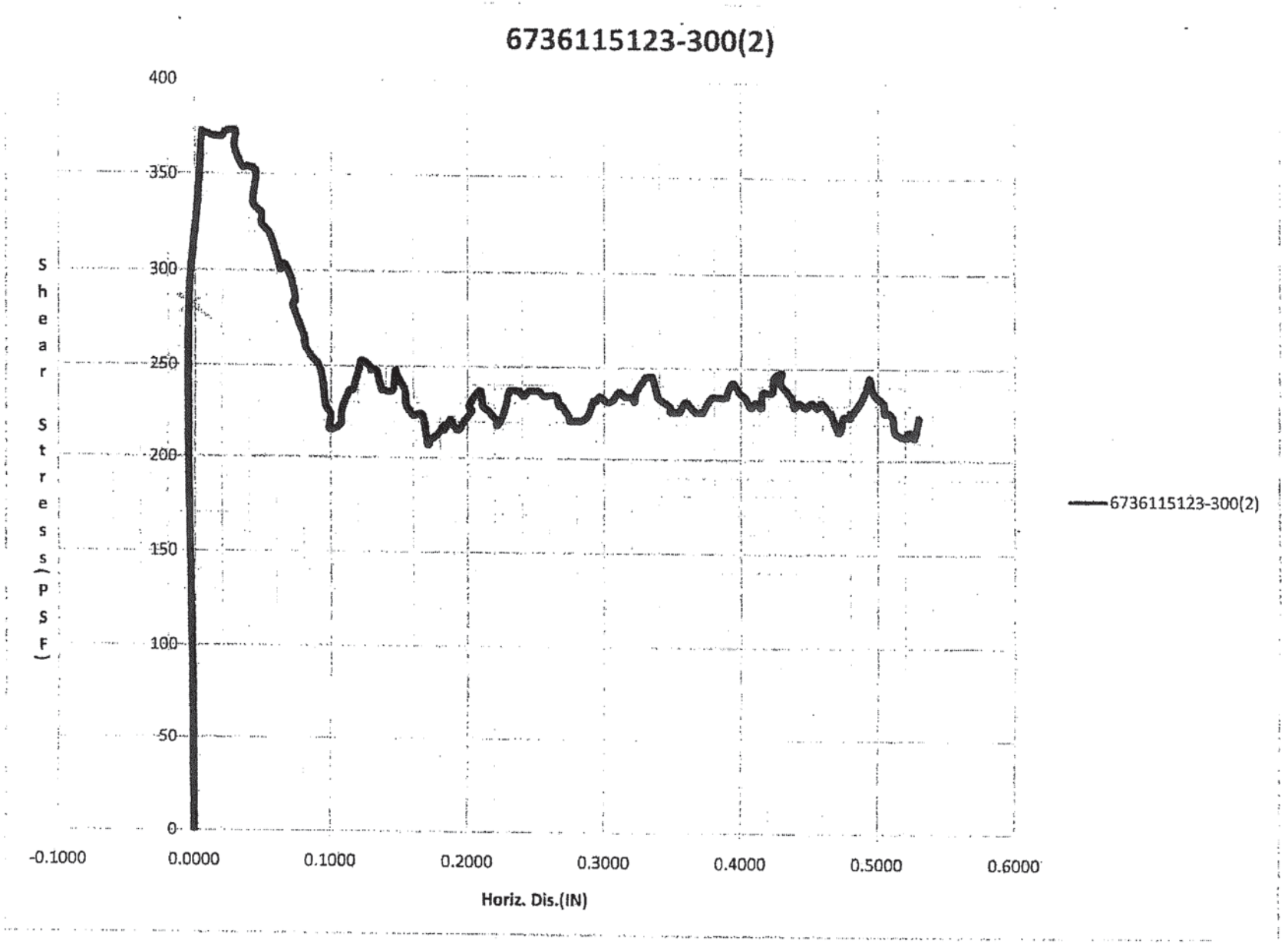
Spencer Borrow Pit
Vegetative Cover

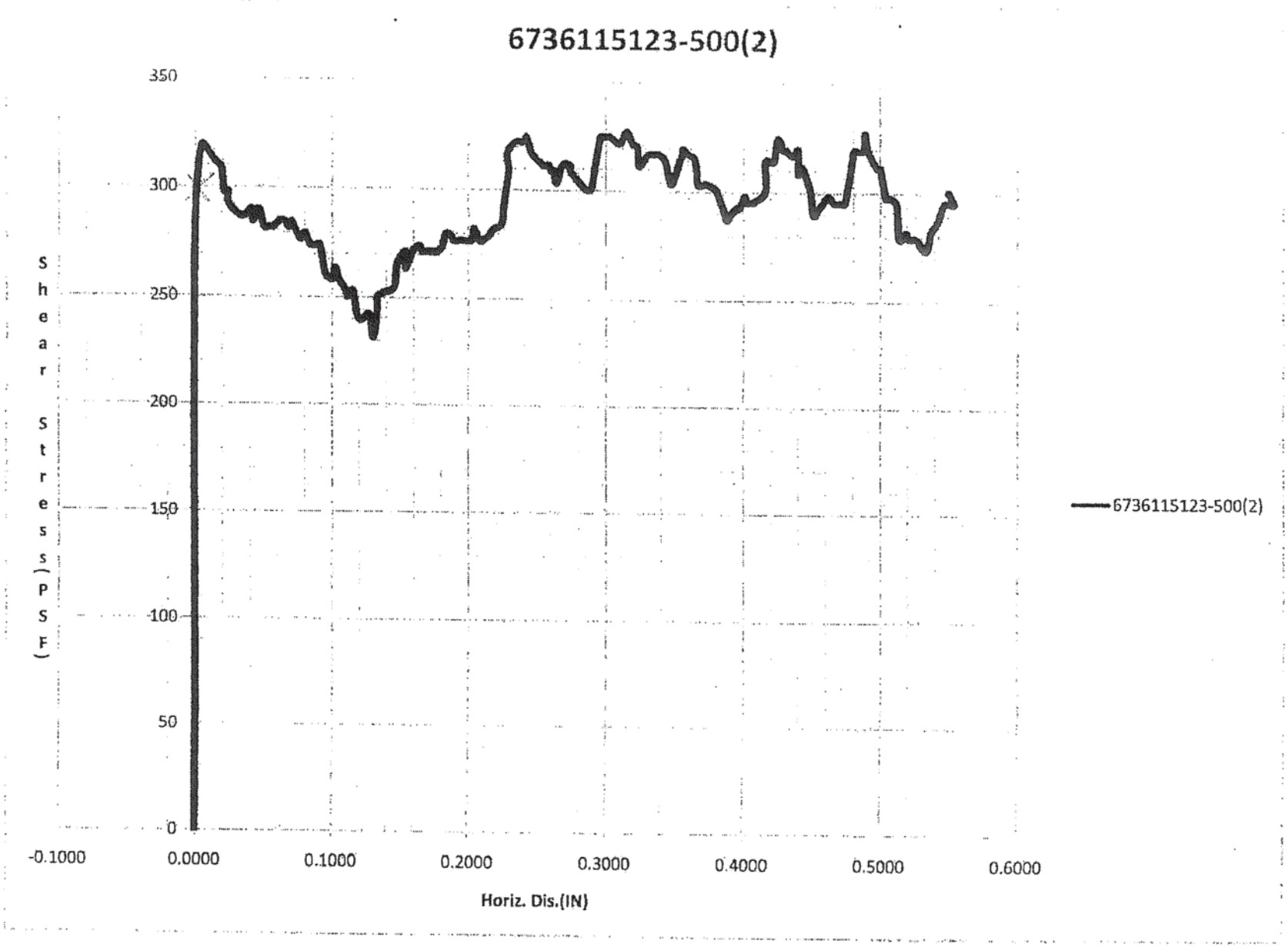
TS-2, Spencer Pit

Prepared/Date: LH 10/31/11
Checked/Date: ET 10/31/11

Trail Ridge Closure	amec	DIRECT SHEAR TEST DATA Project No. 6736-11-5123


6736115123-150(2)
500
450
400
350
300
250
200
150
100
50
0
Shear Stress (PSF)
0.0000
0.1000
0.2000
0.3000
0.4000
0.5000
0.6000
Horiz. Dis.(IN)
6736115123-150(2)

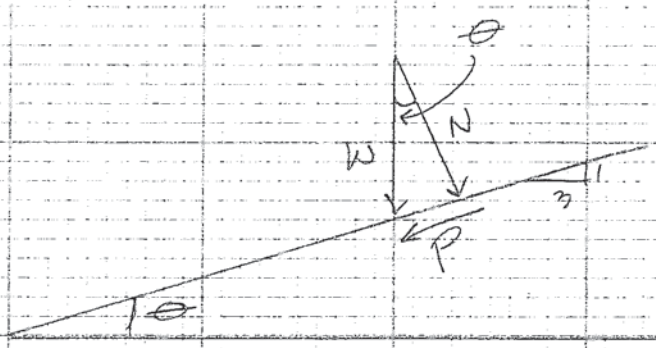

6736115123-300(2)
400
350
300
250
200
150
100
50
0
Shear Stress (PSF)
-0.1000
0.0000
0.1000
0.2000
0.3000
0.4000
0.5000
0.6000
Horiz. Dis.(IN)
6736115123-300(2)


6736115123-500(2)
350
300
250
200
150
100
50
0
Shear Stress (PSF)
-0.1000
0.0000
0.1000
0.2000
0.3000
0.4000
0.5000
0.6000
Horiz. Dis.(IN)
6736115123-500(2)

Appendix D

Clay Layer Sliding Calculations – Triaxial Shear Test Results

KBM
TRLF 10/24/2011



$P = (W)\sin\theta$

$\theta = 18.4°$

Clay Cover ⇒ Triaxial Test Results (Attached)

✱ $\gamma_{D@test} = 85.5$ pcf Average, $w = 36\%$ Average ⇒ $\gamma_{sat} = 85.5(1.36) = 116.3$ pcf

✱ Assume Sliding at Mid Clay Layer:

Cohesion, $C' = 0.41$ ksf ⇒ 410 psf ⇒ (Triaxial Test Results)

Adhesion (clay to clay) = 1 = α

W ⇒ Veg. Cover ⇒ 229 psf = (2')(112 pcf)(0.90)(1.135)

Clay ⇒ 0.5'(116.3 pcf) = 58.1 psf

$W = 229 + 58.1 = 287.1$ psf

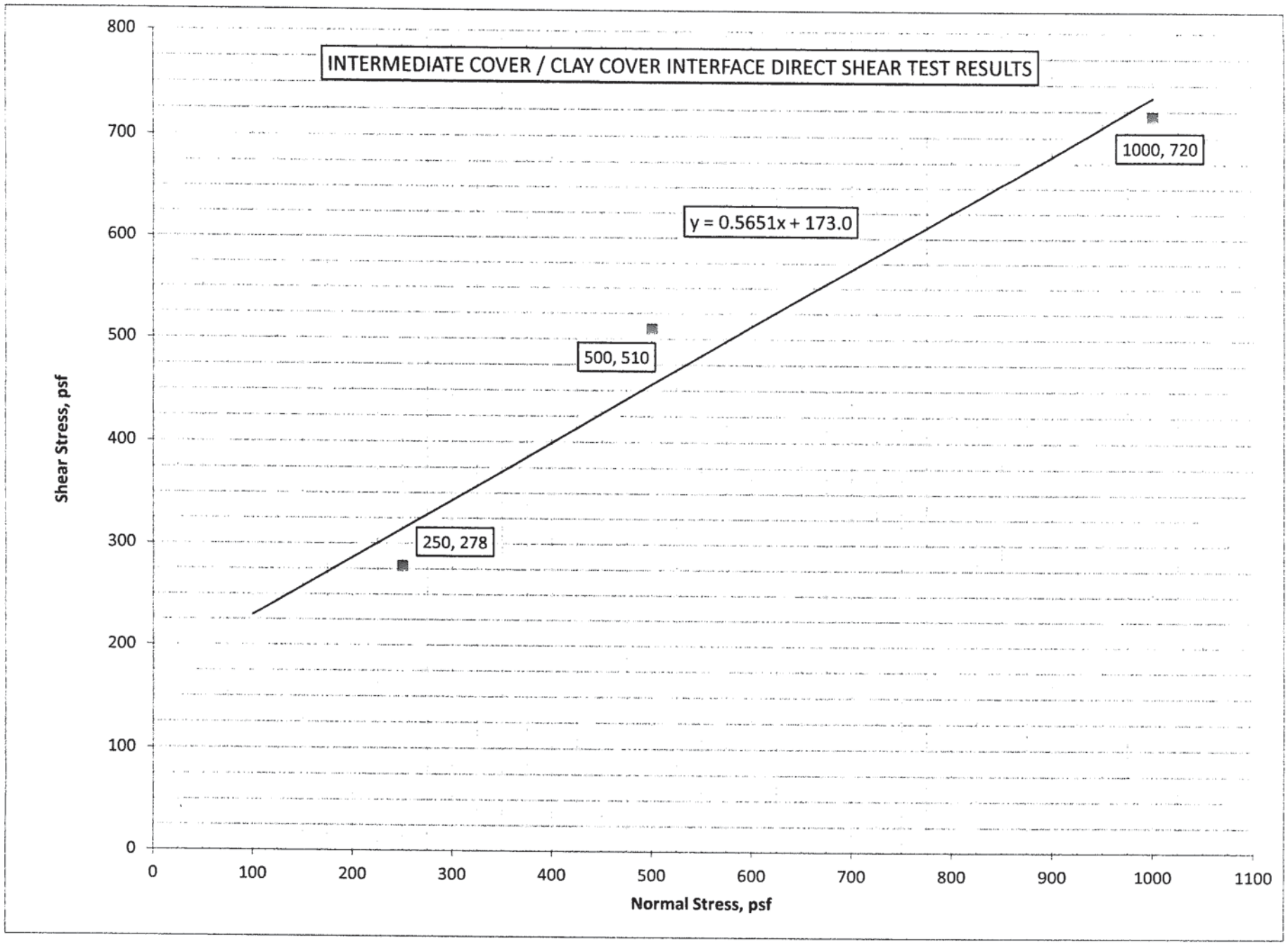
Driving Force = $P = 287.1(\sin 18.4) = 90.6$ psf

Resisting Force = $\alpha \cdot C = (1)(410) = 410$ psf

$FS = \frac{410}{90.6} = 4.5$ OK

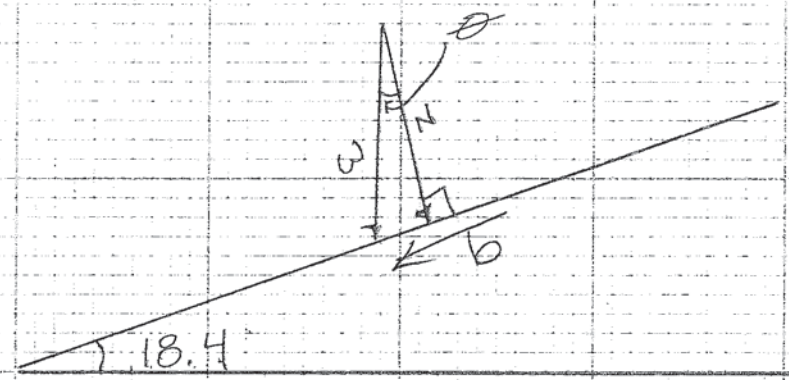
for FS = 1.5 = $\frac{C'}{90.6\text{ psf}}$ ⇒ $C' = 136$ psf

✱ Avg on test strip ⇒ $\gamma_D = 83$ pcf, $w = 33\%$ $\gamma_{sat} = 110.4$


INTERMEDIATE COVER / CLAY COVER INTERFACE DIRECT SHEAR TEST RESULTS
y = 0.5651x + 173.0
1000, 720
500, 510
250, 278
Shear Stress, psf
Normal Stress, psf
0
100
200
300
400
500
600
700
800
900
1000
1100

AFlom
10/23/2011
TRUF
DIRECT
Shear
Tests

DIRECT SHEAR TESTS ⇒ INTERFACE SLIDING CALCULATIONS



$b = W \sin\theta$

$\theta = 18.4°$

INITIAL COVER / Clay Layer

Veg. Cover ⇒ $(2') * (102.2 pcf)^{(1)} (0.9) * 1.149^{(1)} = 211.4$ psf

Clay Cover ⇒ $1 * 89^{(1)} * 0.80 * 1.31 = 93.3$ psf

$W = 211.4 + 93.3 = \underline{304.70}$ psf

⇒ NORMAL FORCE = $304.70 (\cos 18.4°) = 289.12$ psf

⇒ Resisting Force = From Direct Shear Test Attached @ N = 289.12 psf ⇒

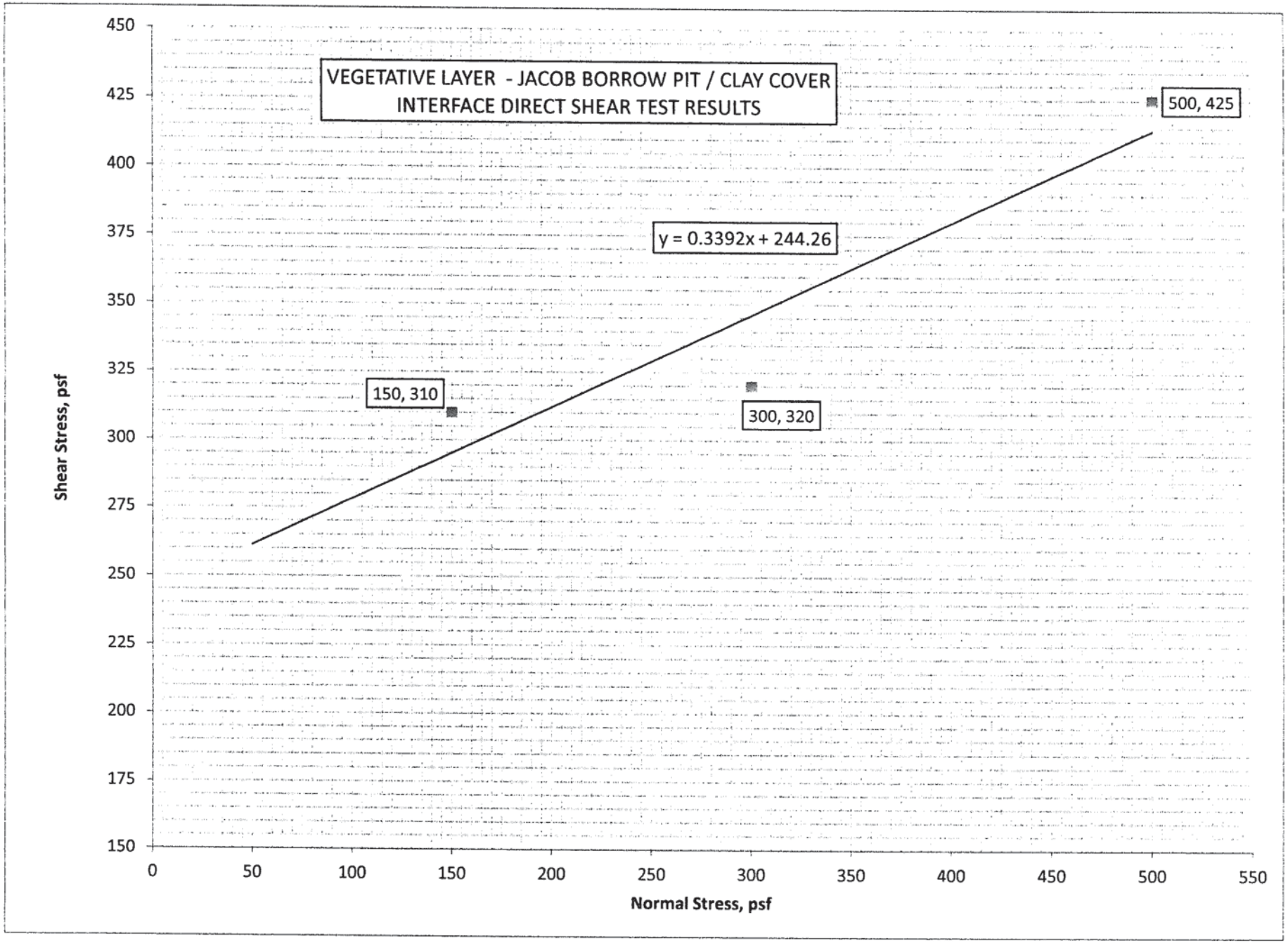
Shear Stress =

$= 0.505(289.12) + 173 = \underline{336.4}$ psf

⇒ DRIVING FORCE = $304.70 (\sin 18.4°) = \underline{96.18}$ psf

$$FS = \frac{336.4}{96.18} = 3.5 > 1.5 \Rightarrow OK$$

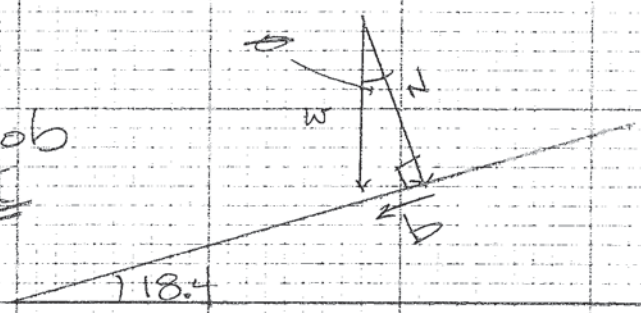
(1) From Proctor Testing


VEGETATIVE LAYER - JACOB BORROW PIT / CLAY COVER INTERFACE DIRECT SHEAR TEST RESULTS
y = 0.3392x + 244.26
500, 425
300, 320
150, 310
Shear Stress, psf
Normal Stress, psf
450
425
400
375
350
325
300
275
250
225
200
175
150
0
50
100
150
200
250
300
350
400
450
500
550

DIRECT SHEAR TESTS ⇒ INTERFACE SLIDING CALCULATIONS

Job 10/23/2011
TRLF
DIRECT SHEAR TESTS

Jacob Pit



$\sin\theta = \frac{b}{W}$

$\theta = 18.4°$

Vegetative/clay Layer (USE AVG TEST RESULTS) ≥ 24" Thickness

Veg. Cover ⇒ $\frac{24}{12} * 112^{(1)}\ pcf * 0.90^{(2)} + 1.135^{(1)} = 229\ psf$

$W = 229\ psf$

NORMAL FORCE, N =

$N = 229(\cos 18.4) = 217.3\ psf$

⇒ RESISTING FORCE = FROM DIRECT SHEAR TEST RESULTS PLOT Attached

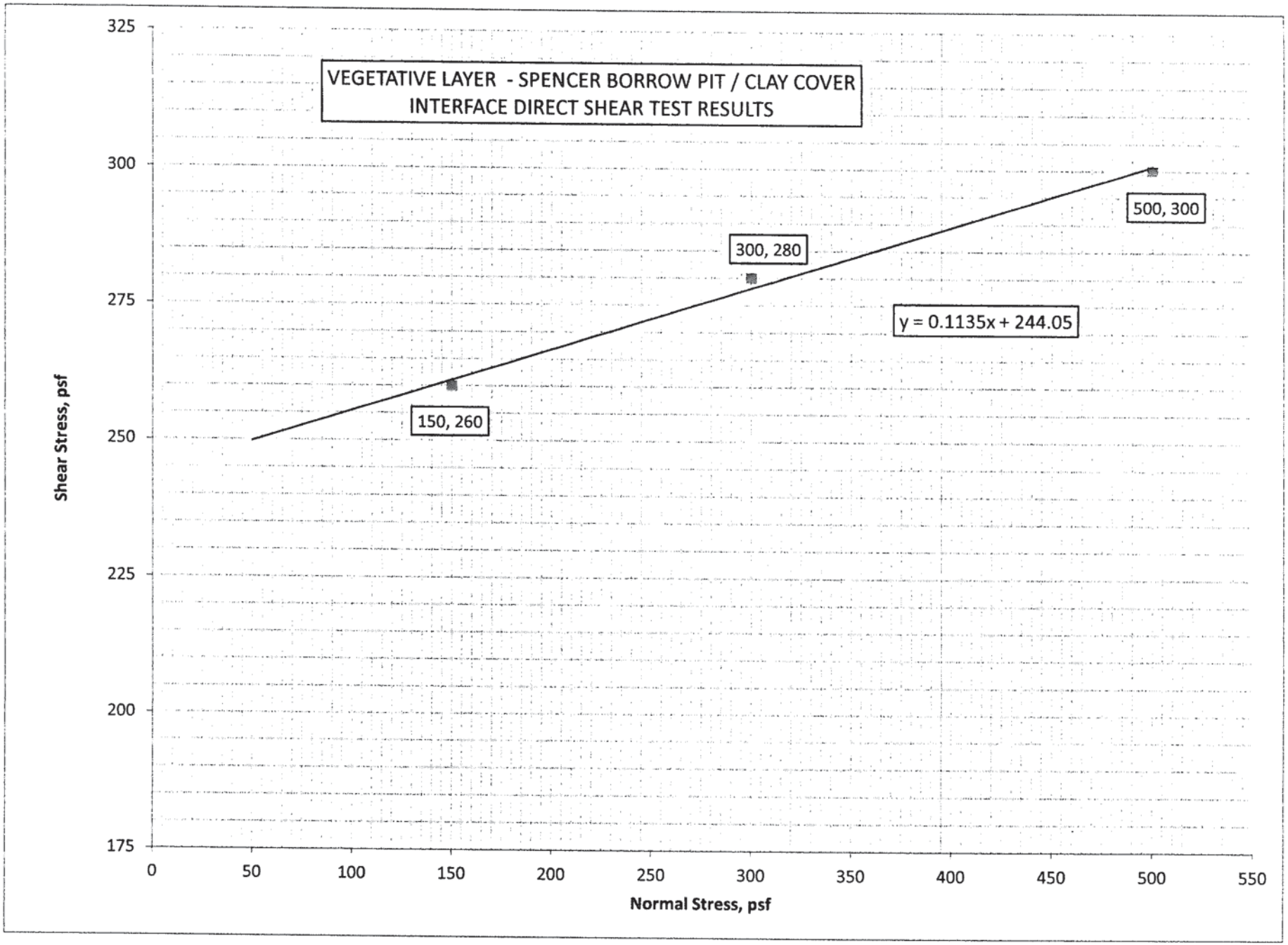
@ $N = 217.3\ psf$

Shear Stress = $0.3392(217.3) + 244.26 = 317.97\ psf$

⇒ DRIVING FORCE ⇒ $229\ psf (\sin 18.4°) = 72.3\ psf$

⇒ $FS = \frac{317.97}{72.3} = 4.4 > 1.5$ OK

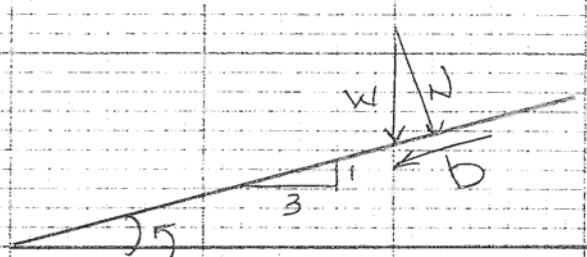
(1) Proctor Test Results
(2) Compaction to 90% of Modified Proctor


VEGETATIVE LAYER - SPENCER BORROW PIT / CLAY COVER
INTERFACE DIRECT SHEAR TEST RESULTS
Shear Stress, psf
Normal Stress, psf
325
300
275
250
225
200
175
0
50
100
150
200
250
300
350
400
450
500
550
150, 260
300, 280
500, 300
y = 0.1135x + 244.05

Direct Shear Test ⇒ Interface Sliding Calculations

ATR 11/2/11
ff 11/15/11

Spencer Pit



$\cos\theta = \frac{N}{W}$

$\sin\theta = \frac{b}{W}$

$\theta = 18.4°$

Veg Cover ⇒ 24" thickness

$\frac{24}{12} * 102.2\,pcf^{(1)} * 0.90^{(2)} * (1.149^{(1)}) = 211.4\,psf$

$W = 211.4\,psf$

NORMAL FORCE, N

$N = 211.4\,psf\,(\cos 18.4°) = 200.59$

$=$

⇒ Resisting force ⇒ From Direct Shear Test Results plot attached

@ N = 200.6 psf

Shear Stress = 0.1135(200.6) + 244.05

= 266.8 psf

⇒ Driving force = 211.4 (SIN 18.4°) = 66.7 psf

⇒ $FS = \frac{266.8}{66.7} = 3.9 > 1.5$ ok

(1) from Proctor test results
(2) compact to 90% of Modified Proctor

November 9, 2011

Mr. Scott Lockwood, P.E.
England-Thims & Miller, Inc.
14775 Old St. Augustine Road
Jacksonville, Florida 32258

Subject: Clay Test Strip Qualification
Trail Ridge Landfill – Phase 3 Construction QA/QC Services
Jacksonville, Florida
MAE Project No. 0006-0006

Dear Mr. Lockwood:

MESKEL & ASSOCIATES ENGINEERING, PLLC (MAE) has completed the monitoring and testing of the clay test strip placement at the subject site. The test strip was constructed on October 12, 2011, along a 3:1 section of the landfill outside the project limits at approximately Terrace 7, above Unit 39. The test strip was constructed in 2 lifts (6" minimum). Each lift was checked in the field for thickness and density, and samples were obtained for index property and permeability testing in the lab. The field and laboratory results are shown in the table and test strip form attached.

Based on the results, we consider the test strip construction acceptable and recommend a minimum density requirement for clay placement of 80 percent of the Standard Proctor Maximum Dry Density (ASTM D698).

We appreciate the opportunity to assist England-Thims & Miller, Inc. on this phase of your project. If you have any questions concerning this report, please contact us.

Sincerely,
MESKEL & ASSOCIATES ENGINEERING, PLLC

COPY

Samuel E Lansdale
Quality Control Monitor

Antoinette (Tina) D. Meskel, P.E.
Quality Assurance Engineer
Registered, Florida No. 56999

Attachments: Test Strip Form
Table of Results
Test Strip Location Diagram
Test Results

TRAIL RIDGE LANDFILL
TEST STRIP FORM

Test Strip No.: 1 **Date:** 1st Lift: 10/12/11; 2nd Lift: 10/13/11

Location: 70' E to W and 50' N to S. Coordinates: (N2142189.396, E326775.692), (N2142189.198, E326795.541), (N2142140.442, E326711.022), (N2142140.839, E326780.790), along a 3:1 section of the landfill outside the project limits at approximately Terrace 7, above Unit 39

Size (40' x 60' Minimum): 50' x 70'

Type of Equipment Used: JD-650 Dozer, 84" Smooth Drum Roller, 54" Pad Foot Roller, 84" Pad Foot Roller

Pass/Fail?: Pass

TEST RESULTS:

Lift No.:	1	Lift No:	2
Percent Fines:	56.8% - 72.7%	Percent Fines:	57.6% - 62.1%
Atterberg Limits:	PI 47 to 59	Atterberg Limits:	PI 49 to 60
Moisture Content:	29.6% to 55.3%	Moisture Content:	28.4% to 38.6%

Field Density (%): (at 8 locations)

P-1	89
P-2	89
P-3	93
P-4	90
P-5	91
P-6	85
P-7	89
P-8	92

Field Density (%): (at 8 locations)

P-9	92
P-10	88
P-11	90
P-12	94
P-13	94
P-14	92
P-15	90
P-16	90

Thickness (in): (at 8 locations)

P-1	11.5
P-2	13.0
P-3	7.0
P-4	12.0
P-5	6.0
P-6	11.0
P-7	6.5
P-8	9.3

Thickness (in): (at 8 locations)

P-9	16.0
P-10	18.0
P-11	17.1
P-12	17.5
P-13	15.3
P-14	14.0
P-15	16.3
P-16	16.3

Hydraulic Conductivity: (at 8 locations)	
P-1	3.0E-09
P-2	7.9E-09
P-3	5.5E-09
P-4	5.6E-09
P-5	2.6E-09
P-6	6.8E-09
P-7	6.1E-09
P-8	6.1E-09

Hydraulic Conductivity: (at 8 locations)	
P-9	1.5E-08
P-10	1.0E-08
P-11	9.7E-09
P-12	7.1E-09
P-13	7.4E-09
P-14	6.5E-09
P-15	6.6E-09
P-16	1.4E-08

Attach sampling results as needed.

Approved by Contractor _____

Approved by QC Monitor _____

Approved by QA Engineer _____

Trail Ridge Landfill - Closure Phase 3
TEST STRIP CLAY TEST RESULTS

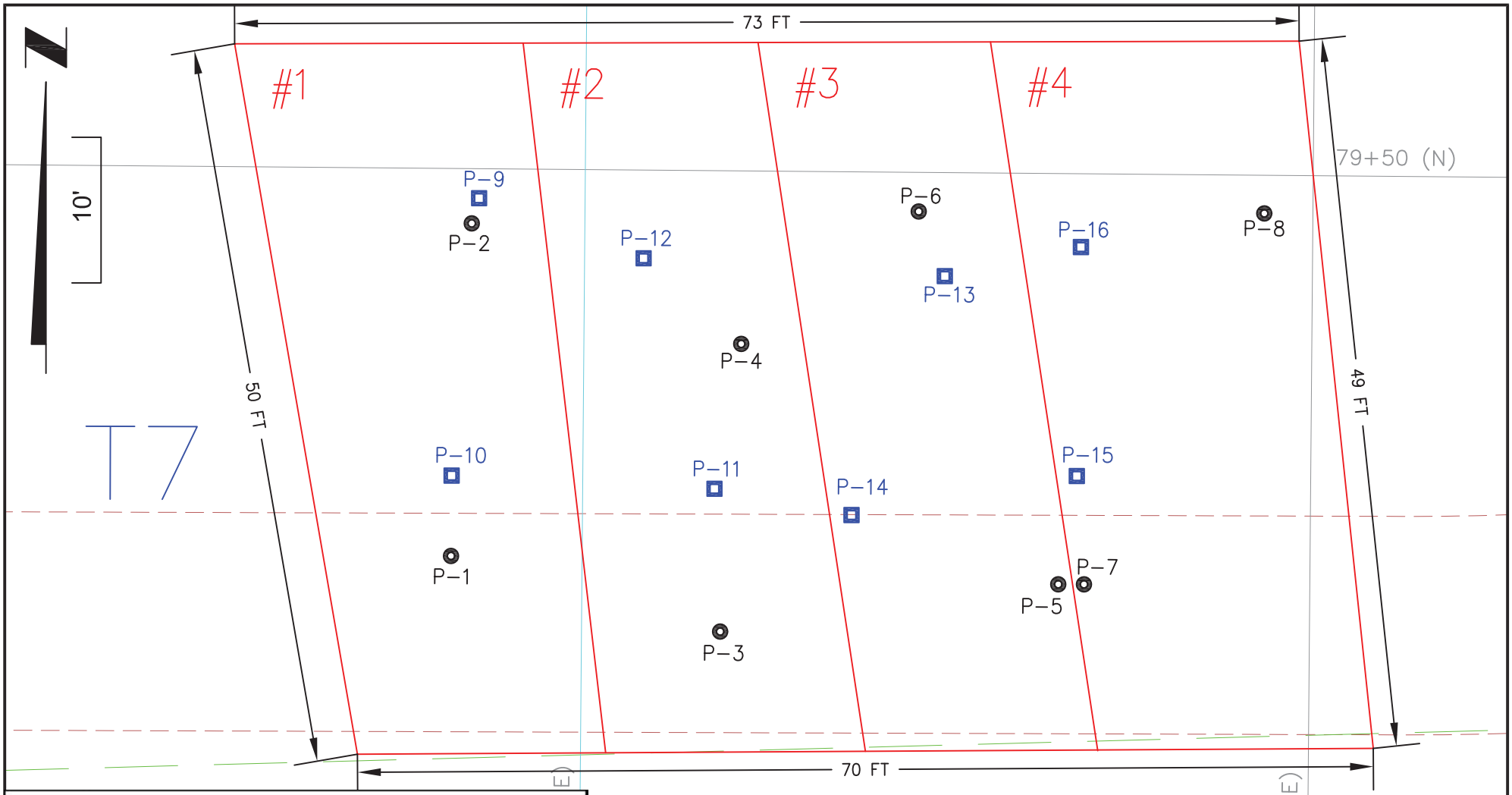
Compaction Minimum Value: **80.0% of Standard Proctor** **Permeability Minimum: 6.67x10-8cm/sec**

Location / Limits of Test Strip: **70' E to W and 50' N to S. Coordinates: (N2142189.396, E326775.692), (N2142189.198, E326795.541), (N2142140.442, E326711.022), (N2142140.839, E326780.790), along a 3:1 section of the landfill outside the project limits at approximately Terrace 7, above Unit 39.**

Legend: P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, X=Not Tested, R=Retest

Sample Number		Location by Station	Tests	Compaction Method	Field Thickness (in)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
LIFT 1	P-1	N2142154.050, E326717.445	PADMFT	2 passes with JD-650 Dozer	11.5	89	45.3	3.0E-09	85	30	55	65.4	**PASS**
	P-2	N2142176.882, E326718.869	PADMFT	19,750 lbs operating weight	13.0	89	36.0	7.9E-09	89	30	59	62.3	**PASS**
	P-3	N2142148.858, E326735.932	PADMFT	2 passes with Hamm 84" smooth drum roller, static only	7.0	93	32.4	5.5E-09	82	28	54	58.7	**PASS**
	P-4	N2142168.611, E326737.379	PADMFT	22,730 lbs operating weight	12.0	90	29.6	5.6E-09	90	33	57	56.8	**PASS**
	P-5	N2142152.105, E326759.150	PADMFT	2 passes with SD-45 pad foot roller, static only	6.0	91	42.6	2.6E-09	77	27	50	62.4	**PASS**
	P-6	N2142177.703, E326749.569	PADMFT	22,730 lbs operating weight	11.0	85	37.6	6.8E-09	75	28	47	62.8	**PASS**
	P-7	N2142152.102, E326760.920	PADMFT	2 passes with SD-100 84" pad foot roller, static only	6.5	89	36.1	6.1E-09	82	29	53	60.5	**PASS**
	P-8	N2142177.568, E326773.304	PADMFT	24,350 lbs operating weight	9.3	92	55.3	6.1E-09	77	25	52	72.7	**PASS**
Lift 2	P-9	N2142178.608, E326719.378	PADMFT	2 passes with JD-650 Dozer	16.0	92	28.8	1.5E-08	82	22	60	58.4	**PASS**
	P-10	N2142159.583, E326717.482	PADMFT	19,750 lbs operating weight	18.0	88	34.1	1.0E-08	81	23	58	60.8	**PASS**
	P-11	N2142158.678, E326735.532	PADMFT	2 passes with Hamm 84" smooth drum roller, static only	17.1	90	28.4	9.7E-09	79	27	52	57.6	**PASS**
	P-12	N2142174.522, E326730.666	PADMFT	22,730 lbs operating weight	17.5	94	31.0	7.1E-09	83	29	54	57.9	**PASS**
	P-13	N2142173.295, E326751.350	PADMFT	2 passes with SD-45 pad foot roller, static only	15.3	94	38.6	7.4E-09	77	28	49	67.4	**PASS**
	P-14	N2142156.831, E326744.920	PADMFT	22,730 lbs operating weight	14.0	92	29.8	6.5E-09	78	22	56	58.1	**PASS**
	P-15	N214259.571, E326760.419	PADMFT	2 passes with SD-100 84" pad foot roller, static only	16.3	90	36.4	6.6E-09	85	34	51	62.1	**PASS**
	P-16	N2142175.291, E326760.702	PADMFT	24,350 lbs operating weight	16.3	90	33.7	1.4E-08	87	27	60	61.3	**PASS**

Meskel & Associates ENGINEERING, PLLC
GEOTECHNICAL CONSTRUCTION TESTING & INSPECTION



Compaction Effort per Section	
#1:	2 passes with JD-650 Dozer 19,750 lbs operating weight
#2:	2 passes with Hamm 84" smooth drum roller, static only 22,730 lbs operating weight
#3:	2 passes with SD-45 pad foot roller, static only 22,730 lbs operating weight
#4:	2 passes with SD-100 84" pad foot roller, static only 24,350 lbs operating weight

Legend:		
10/12/2011	Lift 1 – 6" Clay	P-1 - P-8
10/13/2011	Lift 2 – 6" Clay	P-9 - P-16

ANTOINETTE D. MESKEL, P.E. P.E. NO.: 56999
MAE
Meskel & Associates Engineering, PLLC
FL Certificate of Authorization No. 28142
8936 Western Way, Suite 12, Jacksonville, FL

CLIENT: England-Thims & Miller, Inc.

LOCATION	MAE PROJECT NO.
Jacksonville, Florida	0006-0006

SHEET TITLE: TEST STRIP FOR INITIAL COVER AND CLAY

PROJECT NAME: TRAIL RIDGE LANDFILL PHASE 3

FIGURE NO. 1

Trail Ridge Landfill - Closure Phase 3

CLAY LAYER

Phase I, II, III, IV, Downcommers Test Results Tables

(Clay first lift)

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL CONSTRUCTION TESTING & INSPECTION

Trail Ridge Landfill - Closure Phase 3
CLAY FIRST LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 6.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
Phase IV: Units 24, 25, 26 = 1.90 Acres													
C1-168	101+00E, 83+00N	24	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-169	101+50E, 83+50N	25	T	6.0	x	x	x	x	x	x	x	x	PASS
C1-170	102+50E, 83+50N	26	PADMFT	8.0	85.2	95.7	28.3	5.50E-09	79.0	21.0	58.0	52.0	PASS
C1-171	101+80E, 84+00N	26	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-172	102+00E, 84+50N	26	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-173	101+00E, 86+00N	24	PADMFT	8.0	90.2	101.3	19.8	4.40E-09	80.0	28.0	52.0	50.2	PASS
C1-174	101+75E, 85+75N	25	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-175	102+50E, 86+00N	26	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-176	101+75E, 86+50N	25	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-177	102+50E, 86+75N	26	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-102	102+50E, 85+35N	26	PADMFT	10.0	90.2	101.3	27.3	1.90E-09	72.0	20.0	52.0	48.4	PASS
C1-103	102+00E, 85+35N	26	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-104	101+50E, 85+35N	25	PADMFT	11.0	80.6	90.6	33.1	3.60E-09	74.0	23.0	50.0	50.7	PASS
C1-105	101+15E, 85+35N	25	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-106	101+00E, 85+35N	24	PADMFT	12.0	81.7	91.8	33.9	4.60E-09	81.0	25.0	56.0	52.5	PASS
C1-107	100+75E, 85+35N	24	T	14.0	x	x	x	x	x	x	x	x	PASS
Phase IV: Units 24, 25, 26: Tests Required				**7.6**	**3.8**		**3.8**	**1.9**			**1.9**	**3.8**	
Phase IV: Units 24, 25, 26: Tests Performed				**16.0**	**5.0**		**5.0**	**5.0**			**5.0**	**5.0**	**PASS**
Phase III: Units 27, 28, 29 = 3.53 Acres *testing frequency doubled*													
C1-001	101+75E, 74+75N	27	DMT	8.0	86.9	97.6	28.8	x	x	x	x	x	PASS
C1-002	102+00E, 75+00N	28	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-003	102+50E, 75+50N	28	DMT	8.0	87.6	98.4	27.3	x	x	x	x	x	PASS
C1-004	103+00E, 76+00N	29	FT	8.0	x	x	x	x	x	x	x	47.2	PASS
C1-005	103+50E, 76+00N	29	PFAT	8.0	88.4	x	27.7	8.50E-09	x	x	x	47.9	PASS
C1-006	104+00E, 75+50N	28	DMT	8.0	88.9	99.9	25.3	x	x	x	x	x	PASS
C1-007	103+75E, 75+25N	28	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-008	103+50E, 75+00N	28	DMT	8.0	84.4	94.8	28.9	x	x	x	x	x	PASS
C1-009	104+00E, 74+75N	27	FT	8.0	x	x	x	x	x	x	x	50.6	PASS

Trail Ridge Landfill - Closure Phase 3
CLAY FIRST LIFT TEST RESULTS

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Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C1-010	103+00E, 74+75N	27	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-011	103+00E, 75+00N	27	PAFT	8.0	84.9	x	36.8	4.70E-09	69.0	26.0	43.0	56.8	PASS
C1-012	104+50E, 75+00N	28	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-013	104+50E, 76+25N	29	DMT	8.0	89.5	100.6	34.5	x	x	x	x	x	PASS
C1-014	105+50E, 76+00N	29	DMT	6.0	79.2	89.0	29.7	x	x	x	x	x	PASS
C1-015	105+75E, 76+25N	29	PADMFT	8.0	89.8	100.9	29.0	5.10E-09	65.0	19.0	46.0	49.6	PASS
C1-016	106+25E, 76+75N	29	FT	7.0	x	x	28.8	x	71.0	23.0	48.0	49.3	PASS
C1-017	105+50E, 75+00N	28	PADMFT	7.0	89.2	100.2	27.9	3.30E-09	79.0	23.0	56.0	50.0	PASS
C1-018	106+00E, 75+50N	28	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-019	106+25E, 75+25N	28	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-020	105+00E, 75+50N	28	DMT	7.0	90.8	102.0	27.0	x	x	x	x	x	PASS
C1-021	105+00E, 74+75N	27	FT	6.0	x	x	21.2	x	83.0	22.0	60.0	49.0	PASS
C1-022	106+25E, 74+75N	27	DMT	7.0	91.7	103.0	30.3	x	x	x	x	x	PASS
C1-023	105+50E, 74+50N	27	T	6.0	x	x	x	x	x	x	x	x	PASS
C1-024	107+00E, 75+75N	29	DMFT	8.0	91.8	103.1	34.4	x	x	x	x	52.6	PASS
C1-025	107+50E, 76+50N	29	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-026	107+50E, 76+00N	29	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-027	108+00E, 76+00N	29	T	6.0	x	x	x	x	x	x	x	x	PASS
C1-028	108+50E, 76+25N	29	PADMFT	6.0	93.4	104.9	14.7	1.90E-09	74.0	23.0	51.0	46.4	PASS
C1-029	109+00E, 76+00N	29	T	6.0	x	x	x	x	x	x	x	x	PASS
C1-039	109+00E, 75+25N	28	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-040	108+00E, 75+00N	28	DMFT	6.0	85.2	95.7	28.1	x	x	x	x	45.4	PASS
C1-041	107+50E, 75+50N	28	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-042	108+50E, 75+50N	28	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-043	107+50E, 74+75N	27	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-044	108+25E, 74+75N	27	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-045	108+50E, 74+50N	27	PADMFT	8.0	89.7	100.8	30.3	2.00E-08	75.0	20.0	54.0	56.0	PASS
C1-049	106+75E, 74+50N	27	PADMFT	10.0	88.4	99.3	27.8	6.90E-09	78.0	23.0	55.0	49.1	PASS
C1-050	106+75E, 74+85N	27	T	13.0	x	x	x	x	x	x	x	x	PASS
C1-051	106+75E, 75+25N	28	PADMFT	12.0	90.1	101.2	31.9	9.20E-09	76.0	26.0	50.0	55.4	PASS
C1-052	106+75E, 75+50N	28	T	11.0	x	x	x	x	x	x	x	x	PASS
C1-053	106+75E, 76+00N	29	PADMFT	6.0	91.1	102.4	35.9	7.20E-09	82.0	26.0	56.0	51.3	PASS

Trail Ridge Landfill - Closure Phase 3
CLAY FIRST LIFT TEST RESULTS

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Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C1-054	106+75E, 76+45N	29	T	10.0	x	x	x	x	x	x	x	x	PASS
Phase III: Units 27, 28, 29: Tests Required				**28.2**	**14.1**		**14.1**	**7.1**			**7.1**	**14.1**	
Phase III: Units 27, 28, 29: Tests Performed				**40.0**	**19.0**		**21.0**	**9.0**			**10.0**	**15.0**	**PASS**
Phase III: Units 30, 31, 32 = 2.30 Acres *testing frequency doubled*													
C1-030	109+75E, 76+00N	32	DMFT	7.0	89.4	100.4	22.6	x	x	x	x	45.1	PASS
C1-031	110+00E, 76+50N	32	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-032	110+50E, 76+00N	32	PADMFT	7.0	88.7	99.7	32.7	1.60E-08	70.0	21.0	50.0	55.1	PASS
C1-033	111+00E, 76+50N	32	T	8.0	93.5	105.1	x	x	x	x	x	x	PASS
C1-034	111+00E, 76+00N	32	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-035	110+50E, 76+50N	31	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-036	111+00E, 75+15N	31	PADMFT	7.0	93.5	105.1	40.6	5.40E-09	75.0	23.0	52.0	60.9	PASS
C1-037	110+00E, 75+50N	31	T	6.0	x	x	x	x	x	x	x	x	PASS
C1-038	109+50E, 75+15N	31	T	6.0	x	x	x	x	x	x	x	x	PASS
C1-046	109+25E, 74+50N	30	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-047	110+50E, 74+50N	30	DMFT	8.0	94.5	106.2	27.6	x	x	x	x	47.6	PASS
C1-048	111+00E, 74+75N	30	T	6.0	x	x	x	x	x	x	x	x	PASS
C1-055	112+00E, 74+50N	30	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-056A	112+00E, 75+00N	30	PADMFT	7.0	91.7	103.0	30.4	1.60E-08	83.0	27.0	56.0	44.5	PASS
C1-056B	112+00E, 75+00N	30	MF	7.0	x	x	32.7	x	x	x	x	51.3	PASS
C1-057	112+00E, 75+50N	31	T	6.0	x	x	x	x	x	x	x	x	PASS
C1-058	112+00E, 76+50N	32	PADMFT	7.0	85.3	95.8	32.7	9.20E-09	81.0	25.0	57.0	50.4	PASS
C1-062	112+50E, 75+50N	31	DMFT	6.0	106.8	88.6	32.2	x	x	x	x	53.7	PASS
C1-063	113+00E, 75+00N	30	DMFT	7.0	93.0	104.5	31.4	x	x	x	x	46.8	PASS
C1-065	112+00E, 76+00N	32	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-066	111+45E, 74+50N	30	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-067	111+45E, 74+90N	30	PADMFT	10.0	83.0	93.3	31.6	4.30E-09	75.0	25.0	50.0	47.5	PASS
C1-068	111+45E, 75+25N	31	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-069	111+45E, 75+65N	31	PADMFT	10.0	84.1	94.5	30.7	4.60E-09	81.0	25.0	56.0	47.7	PASS
C1-070	111+45E, 76+00N	32	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-071	111+45E, 76+50N	32	PADMFT	10.0	83.4	93.7	29.6	2.10E-08	69.0	24.0	45.0	48.4	PASS

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Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
Phase III: Units 30, 31, 32: Tests Required				**18.4**	**9.2**		**9.2**	**4.6**			**4.6**	**9.2**	
Phase III: Units 30, 31, 32: Tests Performed				**26.0**	**12.0**		**12.0**	**7.0**			**7.0**	**12.0**	**PASS**
Phase II: Units 33, 34, 35 = 2.32 Acres													
C1-059	113+50E, 76+50N	35	DMFT	7.0	87.4	98.2	34.9	x	x	x	x	48.7	PASS
C1-060	114+50E, 76+00N	35	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-061	114+00E, 75+50N	34	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-064	114+00E, 74+75N	33	PADMFT	7.5	82.9	93.1	42.9	3.10E-09	76.0	25.0	50.0	54.1	PASS
C1-108	115+50E, 76+50N	35	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-109	116+00E, 75+50N	34	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-110	115+75E, 74+60N	33	PADMFT	8.0	89.8	100.9	32.7	3.70E-09	89.0	32.0	57.0	50.0	PASS
C1-111	116+50E, 76+00N	35	PADMFT	7.0	87.1	97.9	44.5	2.00E-08	87.0	33.0	54.0	50.7	PASS
C1-112	117+00E, 75+00N	33	DMFT	10.0	85.6	96.2	30.1	x	x	x	x	44.2	PASS
C1-113	117+00E, 76+50N	35	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-072	115+00E, 74+75N	33	PADMFT	11.5	77.8	87.4	36.5	3.10E-09	86.0	27.0	59.0	51.2	PASS
C1-073	115+00E, 75+10N	33	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-074	115+00E, 75+50N	34	PADMFT	10.0	82.3	92.5	39.4	4.20E-09	78.0	25.0	54.0	53.7	PASS
C1-075	115+00E, 75+80N	34	T	13.0	x	x	x	x	x	x	x	x	PASS
C1-076	115+00E, 76+25N	35	PADMFT	12.0	72.2	81.1	36.0	1.80E-09	86.0	24.0	62.0	47.4	PASS
C1-077	115+00E, 76+55N	35	T	10.0	x	x	x	x	x	x	x	x	PASS
Phase II: Units 33, 34, 35: Tests Required				**9.3**	**4.6**		**4.6**	**2.3**			**2.3**	**4.6**	
Phase II: Units 33, 34, 35: Tests Performed				**14.0**	**8.0**		**8.0**	**6.0**			**6.0**	**8.0**	**PASS**
Phase II: Units 36, 37, 38, 39 = 3.89 Acres													
C1-114	118+00E, 76+00N	38	DMFT	7.0	90.9	102.1	29.3	x	x	x	x	43.3	PASS
C1-115	118+00E, 74+75N	37	T	6.0	x	x	x	x	x	x	x	x	PASS
C1-116	118+75E, 76+75N	39	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-117	118+50E, 75+50N	38	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-118	118+50E, 74+60N	36	PADMFT	8.0	86.9	97.6	36.0	3.10E-09	79.0	27.0	52.0	51.8	PASS
C1-119	119+00E, 75+00N	37	T	6.0	x	x	x	x	x	x	x	x	PASS

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Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C1-120	120+00E, 76+50N	39	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-121	120+50E, 77+00N	39	PADMFT	9.0	86.3	97.0	34.6	7.40E-09	81.0	21.0	60.0	52.4	PASS
C1-122	121+00E, 76+00N	38	PADMFT	8.0	82.2	92.4	37.2	6.20E-09	80.0	20.0	60.0	49.4	PASS
C1-123	121+50E, 75+50N	37	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-124	121+50E, 77+75N	39	T	8.5	x	x	x	x	x	x	x	x	PASS
C1-125	121+50E, 77+00N	39	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-126	122+00E, 77+50N	39	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-127	122+50E, 77+00N	38	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-128	122+25E, 76+00N	37	PADMFT	7.0	85.7	96.3	31.8	4.90E-09	72.0	20.0	52.0	49.3	PASS
C1-129	123+00E, 76+25N	37	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-130	123+00E, 75+50N	36	T	6.0	x	x	x	x	x	x	x	x	PASS
C1-078	119+60E, 74+45N	36	PADMFT	7.0	83.1	93.4	34.4	8.20E-09	72.0	19.0	53.0	76.3	PASS
C1-079	119+55E, 74+60N	36	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-080RA	119+50E, 74+85N	37	PADMFT	10.0	84.1	94.5	33.2	3.90E-08	73.0	24.0	49.0	50.6	PASS
C1-080RB	119+50E, 74+90N	37	PADMFT	10.0	79.5	89.3	43.7	6.30E-09	79.0	26.0	53.0	63.7	PASS
C1-080RC	119+40E, 75+10N	37	PADMFT	9.0	78.5	88.2	29.1	2.30E-08	77.0	25.0	52.0	55.1	PASS
C1-080RD	119+50E, 75+15N	37	PAMFT	10.0	x	x	29.2	6.60E-09	76.0	25.0	51.0	51.6	PASS
C1-081	119+45E, 75+25N	37	T	11.0	x	x	x	x	x	x	x	x	PASS
C1-082	119+40E, 75+70N	38	PADMFT	8.0	82.0	92.1	33.0	3.30E-09	74.0	20.0	54.0	60.6	PASS
C1-083	119+30E, 76+00N	38	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-084	119+20E, 76+35N	39	PADMFT	7.0	81.6	91.7	31.2	4.40E-09	80.0	21.0	59.0	52.0	PASS
C1-085	119+15E, 76+65N	39	T	8.0	x	x	x	x	x	x	x	x	PASS
Phase II: Units 36, 37, 38, 39: Tests Required				**15.6**	**7.8**		**7.8**	**3.9**			**3.9**	**7.8**	
Phase II: Units 36, 37, 38, 39:Tests Performed				**29.0**	**11.0**		**12.0**	**11.0**			**11.0**	**12.0**	**PASS**
Phase I: Units 40, 41, 42, 43 = 4.27 Acres													
C1-131	122+50E, 78+75N	43	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-132	123+25E, 79+25N	43	T	11.0	x	x	x	x	x	x	x	x	PASS
C1-133	123+00E, 77+50N	42	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-134	124+00E, 76+50N	40	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-135	123+50E, 78+50N	42	PADMFT	10.0	77.2	86.7	28.6	1.50E-09	80.0	31.0	49.0	58.9	PASS

Trail Ridge Landfill - Closure Phase 3
CLAY FIRST LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 6.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C1-136	124+00E, 79+00N	42	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-137	124+50E, 78+50N	41	T	11.0	x	x	x	x	x	x	x	x	PASS
C1-138	125+00E, 78+00N	40	PADMFT	10.0	78.0	87.6	26.9	2.10E-09	76.0	27.0	49.0	57.7	PASS
C1-139	123+50E, 80+00N	43	PADMFT	8.0	78.9	88.7	31.2	3.70E-09	69.0	23.0	47.0	55.7	PASS
C1-140	124+50E, 79+50N	42	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-141	125+50E, 79+00N	40	PADMFT	9.0	78.1	87.8	25.7	2.00E-09	84.0	25.0	59.0	60.2	PASS
C1-142	124+00E, 81+50N	43	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-143	124+50E, 81+25N	42	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-144	125+00E, 81+00N	42	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-145	126+00E, 80+50N	40	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-146	123+50E, 82+50N	43	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-147	124+50E, 82+25N	42	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-148	125+25E, 81+75N	41	PADMFT	8.0	85.3	95.8	33.9	6.90E-09	91.0	21.0	70.0	53.6	PASS
C1-149	126+00E, 82+00N	40	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-180	124+00E, 82+50N	43	PADMFT	7.0	76.2	85.6	42.3	4.70E-09	94.0	32.0	61.0	50.5	PASS
C1-086R2	126+15E, 80+15N	40	PADMFT	8.0	72.2	81.1	36.8	2.10E-09	92.0	23.0	69.0	69.4	PASS
C1-087	125+85E, 80+20N	40	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-088R2	125+45E, 80+25N	41	PADMFT	10.0	76.8	86.3	33.5	2.50E-09	87.0	24.0	63.0	53.3	PASS
C1-089	125+15E, 80+40N	41	T	12.0	x	x	x	x	x	x	x	x	PASS
C1-90R2	124+80E, 80+50N	42	PADMFT	9.0	77.0	86.5	33.8	2.40E-09	87.0	23.0	65.0	50.2	PASS
C1-091	124+45E, 80+60N	42	T	13.0	x	x	x	x	x	x	x	x	PASS
C1-92R2	124+15E, 80+65N	43	PADMFT	9.0	75.2	84.5	38.8	2.20E-09	85.0	24.0	61.0	55.1	PASS
C1-093	123+50E, 80+50N	43	T	15.0	x	x	x	x	x	x	x	x	PASS
Phase I: Units 40, 41, 42, 43: Tests Required				**17.1**	**8.5**		**8.5**	**4.3**			**4.3**	**8.5**	
Phase I: Units 40, 41, 42, 43: Tests Performed				**27.0**	**10.0**		**10.0**	**10.0**			**10.0**	**10.0**	**PASS**
Phase I: Units 44, 45, 46, 47 = 3.09 Acres													
C1-150	124+00E, 83+50N	47	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-151	125+00E, 83+25N	46	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-152	125+50E, 82+50N	45	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-153	126+00E, 83+00N	44	T	9.0	x	x	x	x	x	x	x	x	PASS

Trail Ridge Landfill - Closure Phase 3
CLAY FIRST LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 6.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C1-154	123+55E, 84+50N	47	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-155	124+50E, 84+00N	46	PADMFT	8.0	88.9	99.9	26.6	5.70E-09	85.0	25.0	60.0	52.7	PASS
C1-156	125+00E, 84+50N	46	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-157	125+75E, 84+50N	45	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-158	126+25E, 84+00N	44	PADMFT	9.0	81.3	91.3	35.4	2.90E-09	88.0	23.0	65.0	51.6	PASS
C1-159	123+55E, 85+50N	47	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-160	124+50E, 85+75N	46	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-161	125+00E, 85+25N	46	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-162	125+80E, 86+00N	45	PADMFT	6.0	73.3	82.4	37.7	4.70E-09	93.0	31.0	63.0	65.4	PASS
C1-163	126+00E, 85+50N	44	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-164	124+00E, 86+75N	47	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-165	125+00E, 86+50N	46	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-166	125+50E, 86+75N	45	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-167	126+25E, 86+75N	44	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-178	123+60E, 87+25N	47	PADMFT	7.0	76.1	85.5	42.8	5.40E-09	92.0	27.0	65.0	65.3	PASS
C1-179	124+50E, 87+00N	46	PADMFT	8.0	75.4	84.7	36.7	2.00E-09	99.0	29.0	70.0	68.2	PASS
C1-094R	126+25E, 84+75N	44	PADMFT	15.0	74.9	83.3	35.2	2.60E-09	91.0	22.0	70.0	54.0	PASS
C1-095	126+00E, 84+75N	44	T	14.0	x	x	x	x	x	x	x	x	PASS
C1-096R	125+60E, 84+75N	45	PADMFT	12.0	73.4	81.6	32.7	2.60E-09	91.0	23.0	68.0	50.5	PASS
C1-097	125+20E, 84+75N	45	T	12.0	x	x	x	x	x	x	x	x	PASS
C1-098	124+90E, 84+75N	46	PADMFT	12.0	81.7	91.8	56.0	3.70E-09	93.0	26.0	67.0	78.7	PASS
C1-099	124+50E, 84+75N	47	T	12.0	x	x	x	x	x	x	x	x	PASS
C1-100	124+20E, 84+75N	47	PADMFT	15.0	80.1	90.0	34.6	6.40E-09	86.0	20.0	66.0	49.7	PASS
C1-101	123+65E, 84+75N	47	T	15.0	x	x	x	x	x	x	x	x	PASS
Phase I: Units 44, 45, 46, 47: Tests Required				**12.4**	**6.2**		**6.2**	**3.1**			**3.1**	**6.2**	
Phase I: Units 44, 45, 46, 47: Tests Performed				**28.0**	**9.0**		**9.0**	**9.0**			**9.0**	**9.0**	**PASS**
All Phases Totals = 21.30Acres (5.83Acres Doubled)													
All Phases: Tests Required				**108.5**	**54.3**		**54.3**	**27.1**			**27.1**	**54.3**	
All Phases: Tests Performed				**180.0**	**74.0**		**77.0**	**57.0**			**58.0**	**71.0**	**PASS**

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Trail Ridge Landfill - Closure Phase 3
CLAY FIRST LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 6.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
Phase I: Downcomer D-27													
C1-094R	126+25E, 84+75N	44	PADMFT	15.0	74.9	83.3	35.2	2.60E-09	91.0	22.0	70.0	54.0	PASS
C1-095	126+00E, 84+75N	44	T	14.0	x	x	x	x	x	x	x	x	PASS
C1-096R	125+60E, 84+75N	45	PADMFT	12.0	73.4	81.6	32.7	2.60E-09	91.0	23.0	68.0	50.5	PASS
C1-097	125+20E, 84+75N	45	T	12.0	x	x	x	x	x	x	x	x	PASS
C1-098	124+90E, 84+75N	46	PADMFT	12.0	81.7	91.8	56.0	3.70E-09	93.0	26.0	67.0	78.7	PASS
C1-099	124+50E, 84+75N	47	T	12.0	x	x	x	x	x	x	x	x	PASS
C1-100	124+20E, 84+75N	47	PADMFT	15.0	80.1	90.0	34.6	6.40E-09	86.0	20.0	66.0	49.7	PASS
C1-101	123+65E, 84+75N	47	T	15.0	x	x	x	x	x	x	x	x	PASS
Phase I: Downcommer D-27: Tests Required				**8.0**	**4.0**		**4.0**	**4.0**			**0.0**	**0.0**	
Phase I: Downcommer D-27: Tests Performed				**8.0**	**4.0**		**4.0**	**4.0**			**4.0**	**4.0**	**PASS**
Phase I: Downcomer D-33													
C1-086R2	126+15E, 80+15N	40	PADMFT	8.0	72.2	81.1	36.8	2.10E-09	92.0	23.0	69.0	69.4	PASS
C1-087	125+85E, 80+20N	40	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-088R2	125+45E, 80+25N	41	PADMFT	10.0	76.8	86.3	33.5	2.50E-09	87.0	24.0	63.0	53.3	PASS
C1-089	125+15E, 80+40N	41	T	12.0	x	x	x	x	x	x	x	x	PASS
C1-90R2	124+80E, 80+50N	42	PADMFT	9.0	77.0	86.5	33.8	2.40E-09	87.0	23.0	65.0	50.2	PASS
C1-091	124+45E, 80+60N	42	T	13.0	x	x	x	x	x	x	x	x	PASS
C1-92R2	124+15E, 80+65N	43	PADMFT	9.0	75.2	84.5	38.8	2.20E-09	85.0	24.0	61.0	55.1	PASS
C1-093	123+50E, 80+50N	43	T	15.0	x	x	x	x	x	x	x	x	PASS
Phase I: Downcommer D-33: Tests Required				**8.0**	**4.0**		**4.0**	**4.0**			**0.0**	**0.0**	
Phase I: Downcommer D-33: Tests Performed				**8.0**	**4.0**		**4.0**	**4.0**			**4.0**	**4.0**	**PASS**
Phase II: Downcomer D-38													
C1-078	119+60E, 74+45N	36	PADMFT	7.0	83.1	93.4	34.4	8.20E-09	72.0	19.0	53.0	76.3	PASS
C1-079	119+55E, 74+60N	36	T	7.0	x	x	x	x	x	x	x	x	PASS
C1-080RA	119+50E, 74+85N	37	PADMFT	10.0	84.1	94.5	33.2	3.90E-08	73.0	24.0	49.0	50.6	PASS

Trail Ridge Landfill - Closure Phase 3
CLAY FIRST LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 6.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C1-080RB	119+50E, 74+90N	37	PADMFT	10.0	79.5	89.3	43.7	6.30E-09	79.0	26.0	53.0	63.7	PASS
C1-080RC	119+40E, 75+10N	37	PADMFT	9.0	78.5	88.2	29.1	2.30E-08	77.0	25.0	52.0	55.1	PASS
C1-080RD	119+50E, 75+15N	37	PAMFT	10.0	x	x	29.2	6.60E-09	76.0	25.0	51.0	51.6	PASS
C1-081	119+45E, 75+25N	37	T	11.0	x	x	x	x	x	x	x	x	PASS
C1-082	119+40E, 75+70N	38	PADMFT	8.0	82.0	92.1	33.0	3.30E-09	74.0	20.0	54.0	60.6	PASS
C1-083	119+30E, 76+00N	38	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-084	119+20E, 76+35N	39	PADMFT	7.0	81.6	91.7	31.2	4.40E-09	80.0	21.0	59.0	52.0	PASS
C1-085	119+15E, 76+65N	39	T	8.0	x	x	x	x	x	x	x	x	PASS
Phase II: Downcommer D-38: Tests Required				**8.0**	**4.0**		**4.0**	**4.0**			**0.0**	**0.0**	
Phase II: Downcommer D-38: Tests Performed				**12.0**	**7.0**		**8.0**	**8.0**			**8.0**	**8.0**	**PASS**
Phase II: Downcomer D-41													
C1-072	115+00E, 74+75N	33	PADMFT	11.5	77.8	87.4	36.5	3.10E-09	86.0	27.0	59.0	51.2	PASS
C1-073	115+00E, 75+10N	33	T	9.0	x	x	x	x	x	x	x	x	PASS
C1-074	115+00E, 75+50N	34	PADMFT	10.0	82.3	92.5	39.4	4.20E-09	78.0	25.0	54.0	53.7	PASS
C1-075	115+00E, 75+80N	34	T	13.0	x	x	x	x	x	x	x	x	PASS
C1-076	115+00E, 76+25N	35	PADMFT	12.0	72.2	81.1	36.0	1.80E-09	86.0	24.0	62.0	47.4	PASS
C1-077	115+00E, 76+55N	35	T	10.0	x	x	x	x	x	x	x	x	PASS
Phase II: Downcommer D-41: Tests Required				**6.0**	**3.0**		**3.0**	**3.0**			**0.0**	**0.0**	
Phase II: Downcommer D-41: Tests Performed				**6.0**	**3.0**		**3.0**	**3.0**			**3.0**	**3.0**	**PASS**
Phase III: Downcomer D-44													
C1-066	111+45E, 74+50N	30	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-067	111+45E, 74+90N	30	PADMFT	10.0	83.0	93.3	31.6	4.30E-09	75.0	25.0	50.0	47.5	PASS
C1-068	111+45E, 75+25N	31	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-069	111+45E, 75+65N	31	PADMFT	10.0	84.1	94.5	30.7	4.60E-09	81.0	25.0	56.0	47.7	PASS
C1-070	111+45E, 76+00N	32	T	8.0	x	x	x	x	x	x	x	x	PASS
C1-071	111+45E, 76+50N	32	PADMFT	10.0	83.4	93.7	29.6	2.10E-08	69.0	24.0	45.0	48.4	PASS
Phase III: Downcommer D-44: Tests Required				**6.0**	**3.0**		**3.0**	**3.0**			**0.0**	**0.0**	

Trail Ridge Landfill - Closure Phase 3
CLAY FIRST LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 6.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
Phase III: Downcommer D-44: Tests Performed				**6.0**	**3.0**		**3.0**	**3.0**			**3.0**	**3.0**	**PASS**
Phase III: Downcomer D-47													
C1-049	106+75E, 74+50N	27	PADMFT	10.0	88.4	99.3	27.8	6.90E-09	78.0	23.0	55.0	49.1	PASS
C1-050	106+75E, 74+85N	27	T	13.0	x	x	x	x	x	x	x	x	PASS
C1-051	106+75E, 75+25N	28	PADMFT	12.0	90.1	101.2	31.9	9.20E-09	76.0	26.0	50.0	55.4	PASS
C1-052	106+75E, 75+50N	28	T	11.0	x	x	x	x	x	x	x	x	PASS
C1-053	106+75E, 76+00N	29	PADMFT	6.0	91.1	102.4	35.9	7.20E-09	82.0	26.0	56.0	51.3	PASS
C1-054	106+75E, 76+45N	29	T	10.0	x	x	x	x	x	x	x	x	PASS
Phase III: Downcommer D-47: Tests Required				**6.0**	**3.0**		**3.0**	**3.0**			**0.0**	**0.0**	
Phase III: Downcommer D-47: Tests Performed				**6.0**	**3.0**		**3.0**	**3.0**			**3.0**	**3.0**	**PASS**
Phase IV: Downcomer D-55													
C1-102	102+50E, 85+35N	26	PADMFT	10.0	90.2	101.3	27.3	1.90E-09	72.0	20.0	52.0	48.4	PASS
C1-103	102+00E, 85+35N	26	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-104	101+50E, 85+35N	25	PADMFT	11.0	80.6	90.6	33.1	3.60E-09	74.0	23.0	50.0	50.7	PASS
C1-105	101+15E, 85+35N	25	T	10.0	x	x	x	x	x	x	x	x	PASS
C1-106	101+00E, 85+35N	24	PADMFT	12.0	81.7	91.8	33.9	4.60E-09	81.0	25.0	56.0	52.5	PASS
C1-107	100+75E, 85+35N	24	T	14.0	x	x	x	x	x	x	x	x	PASS
Phase IV: Downcommer D-55: Tests Required				**6.0**	**3.0**		**3.0**	**3.0**			**0.0**	**0.0**	
Phase IV: Downcommer D-55: Tests Performed				**6.0**	**3.0**		**3.0**	**3.0**			**3.0**	**3.0**	**PASS**

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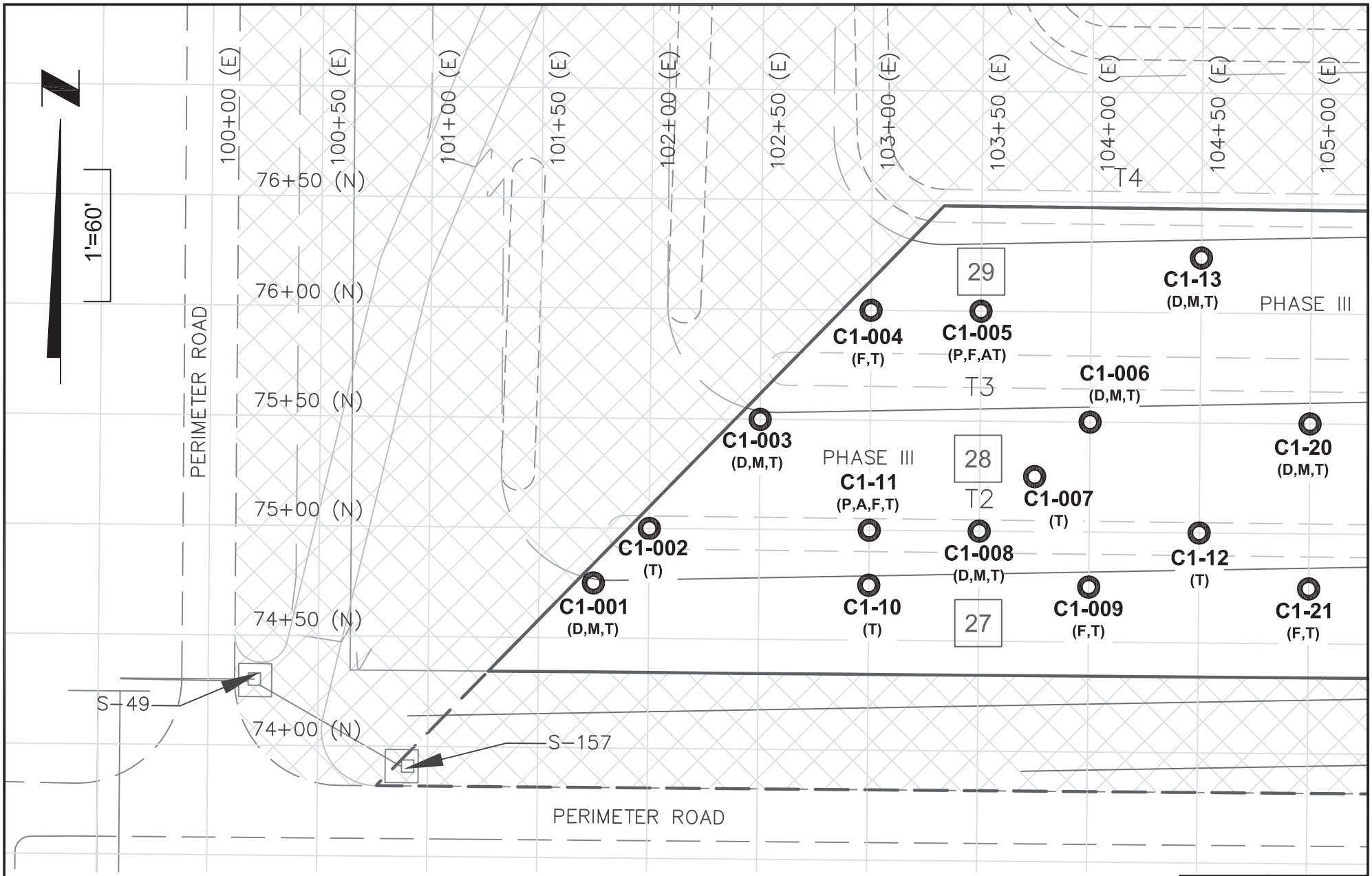
Trail Ridge Landfill - Closure Phase 3

CLAY LAYER

Phase I, II, III, IV, Downcommers Map Diagrams

(Clay first lift)

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Legend:

T=Thickness
D=Density
P=Permeability
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
27	1.10
28	1.20
29	1.23

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SHEET TITLE:

CLAY THICKNESS/DENSITY TESTING - 1ST LIFT

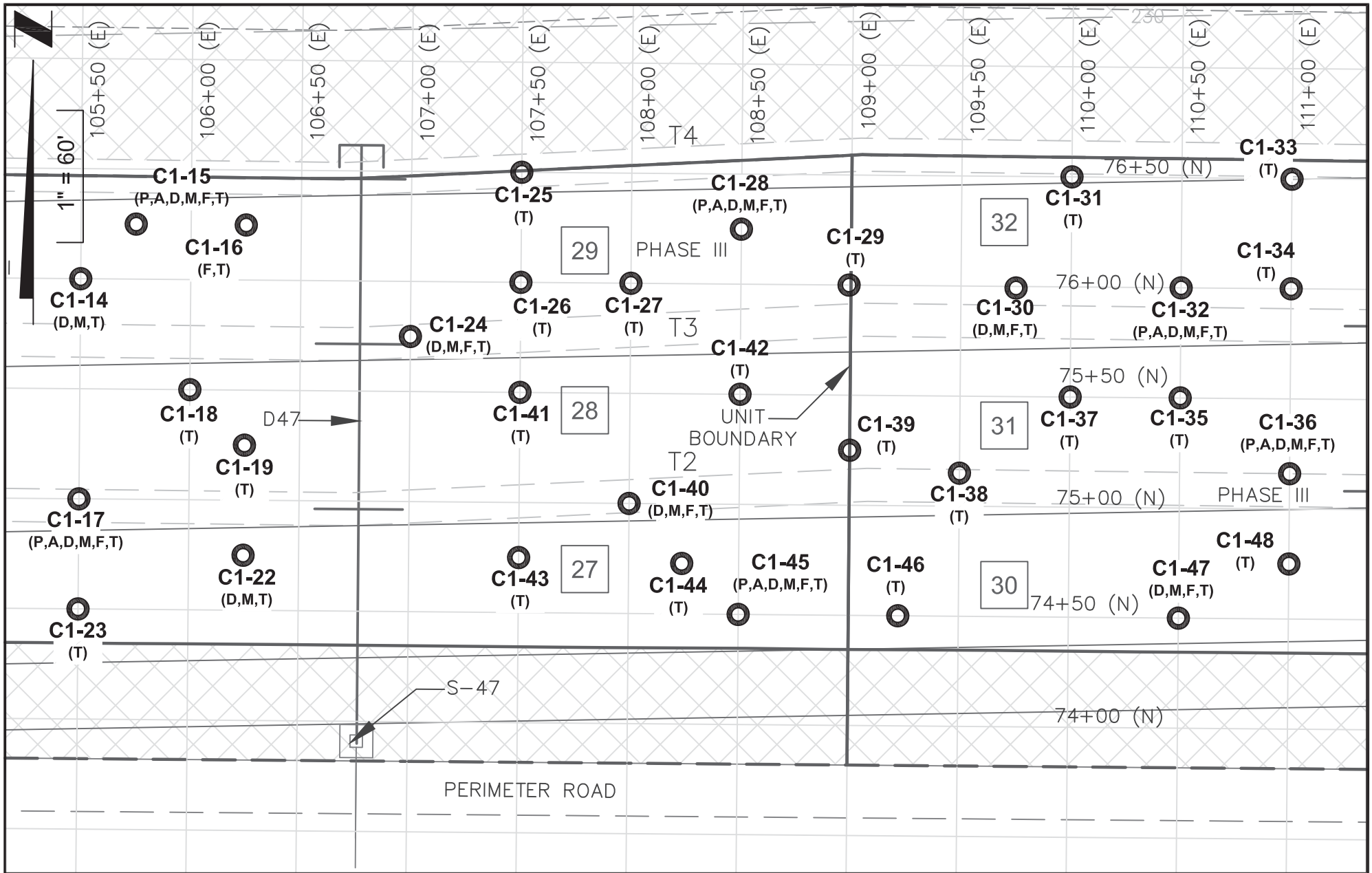
PROJECT NAME:

TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida

0006-0006

FIGURE NO.

-



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UNIT NO.	*ACRES±	UNIT NO.	*ACRES±
27	1.10	30	0.74
28	1.20	31	0.73
29	1.23	32	0.83

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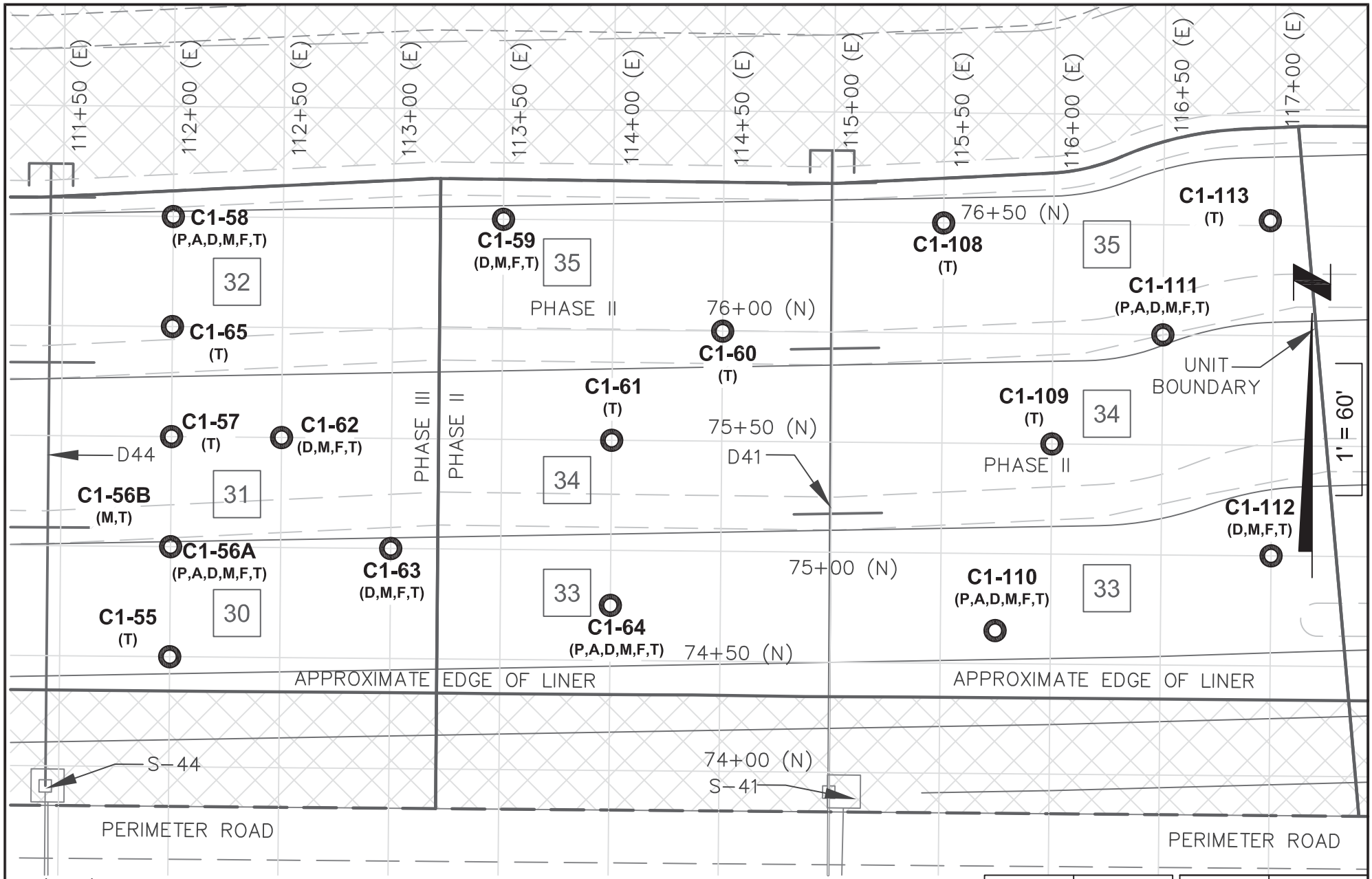
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Jacksonville, Florida
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UNIT NO.	*ACRES±	UNIT NO.	*ACRES±
30	0.74	33	0.84
31	0.73	34	0.70
32	0.83	35	0.78

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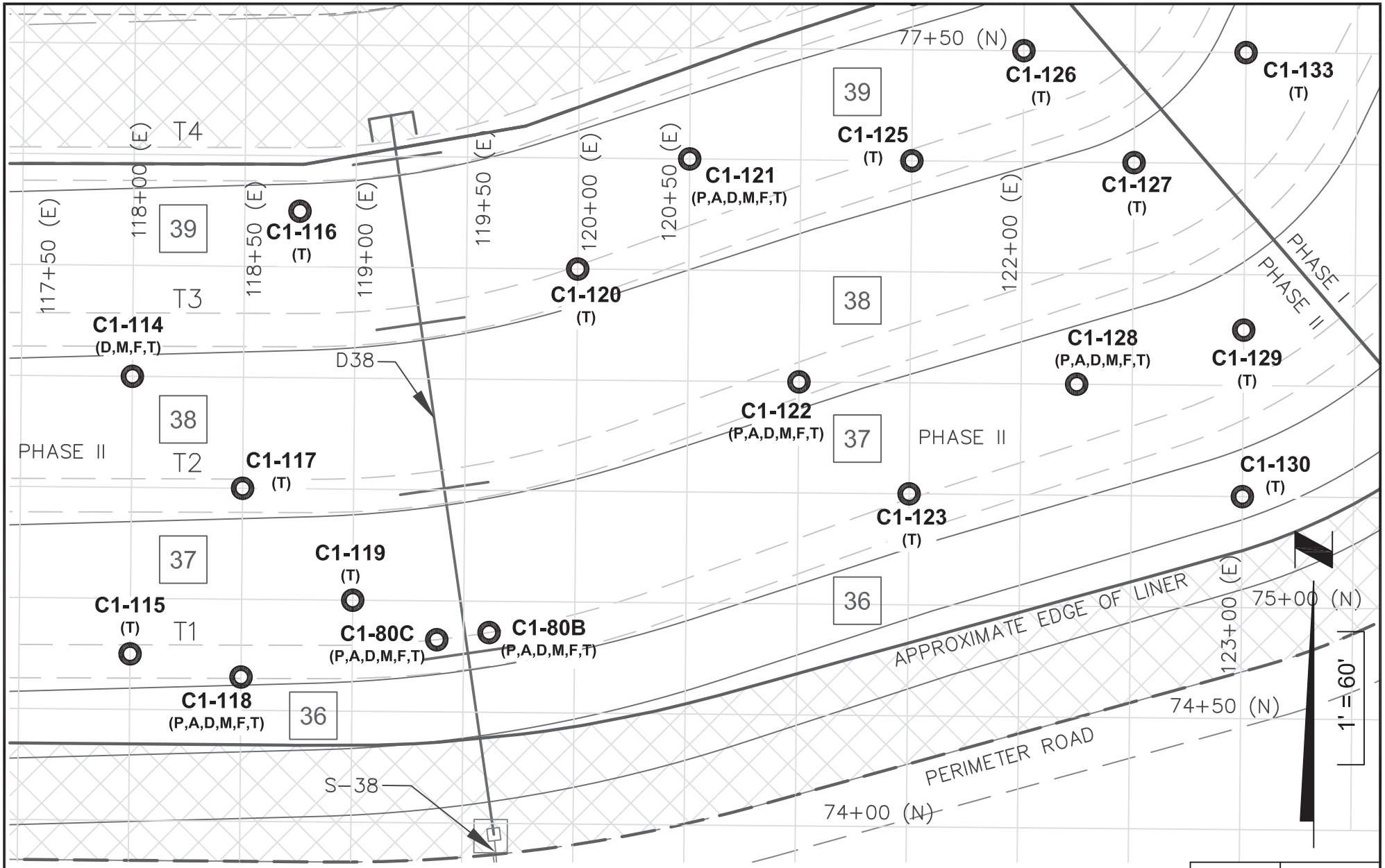
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UNIT NO.	*ACRES±
36	0.72
37	1.09
38	1.01
39	1.07

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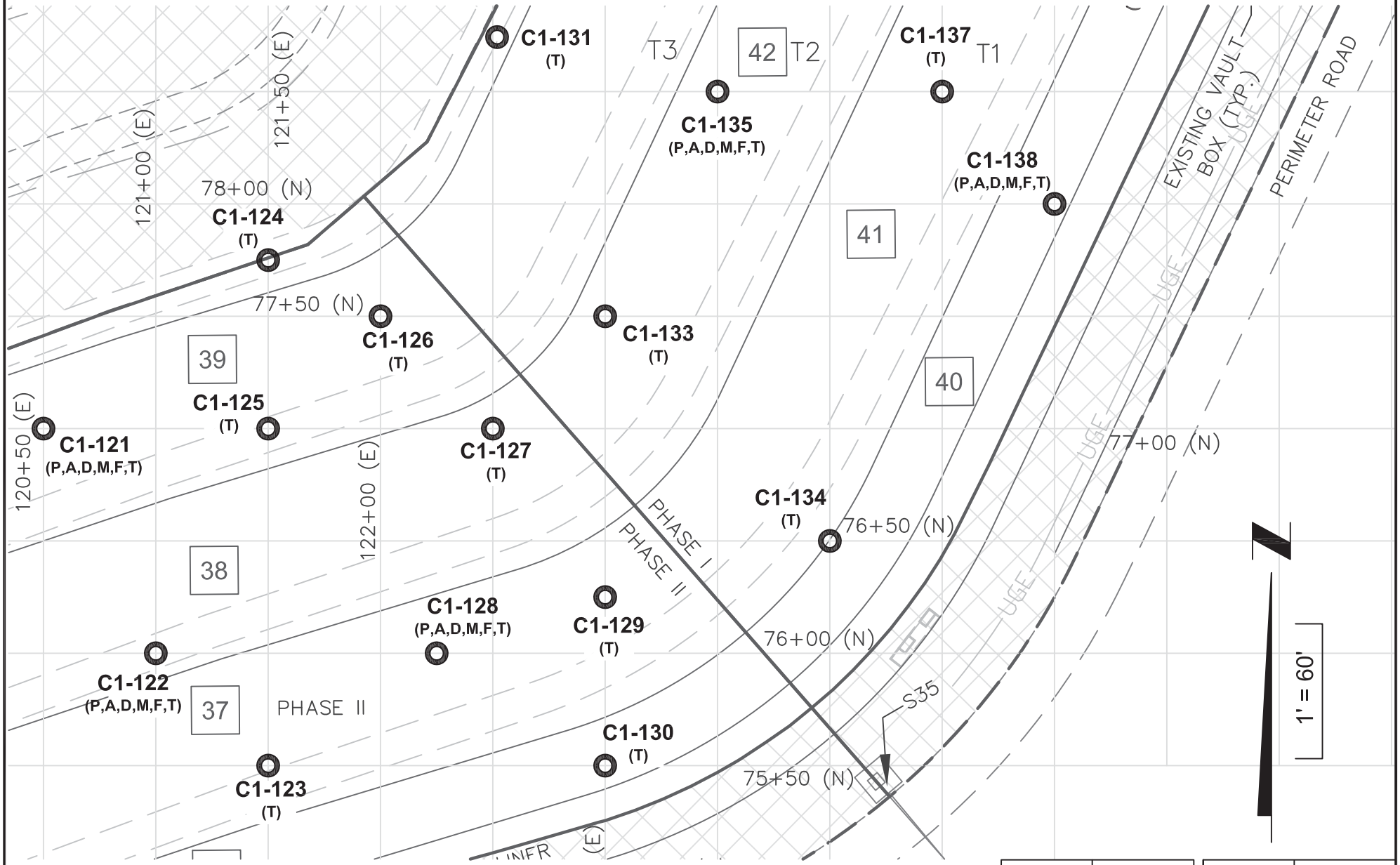
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Jacksonville, Florida
0006-0006

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39	1.07

UNIT NO.	*ACRES±
40	0.98
41	1.14
42	1.05
43	1.10

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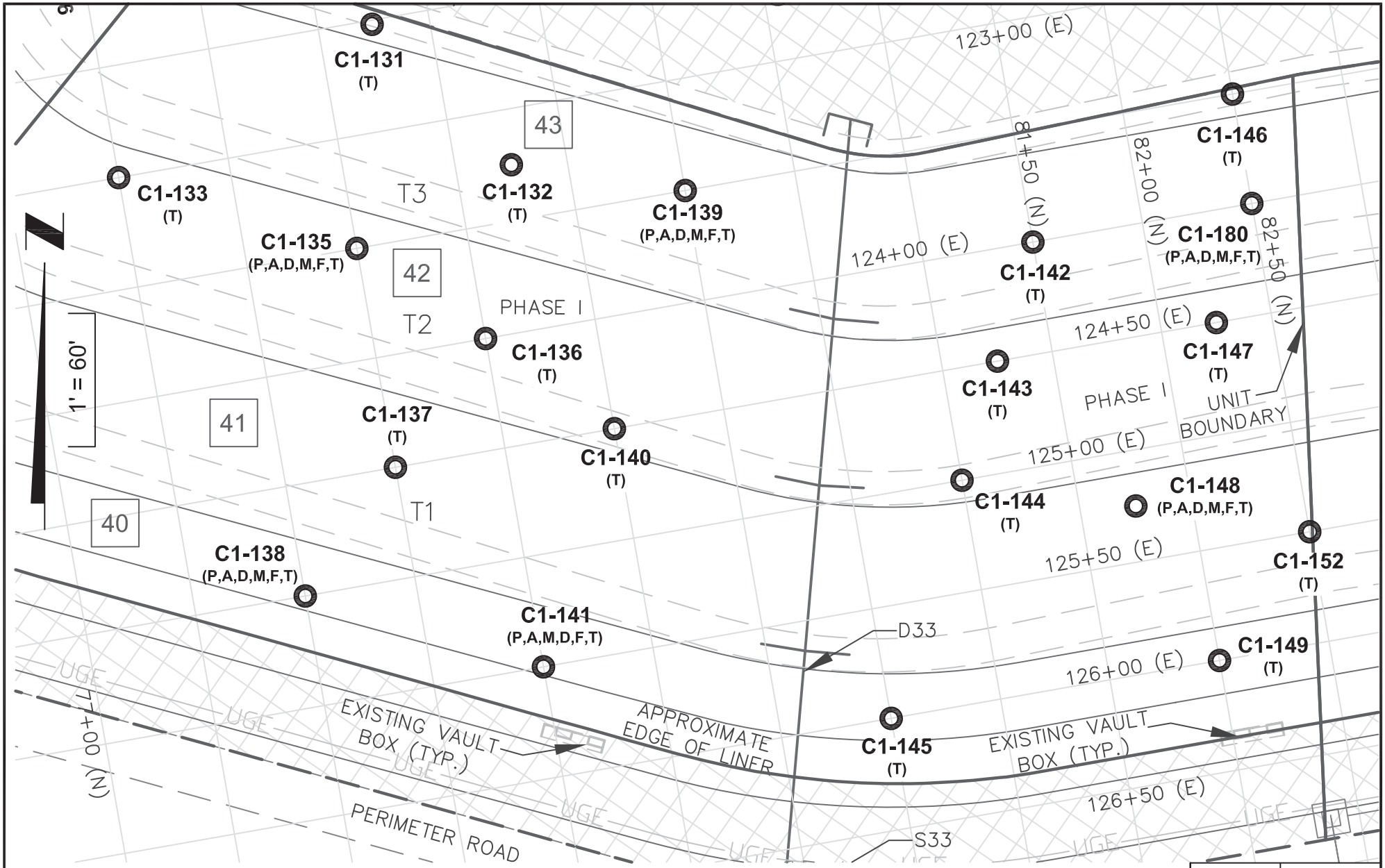
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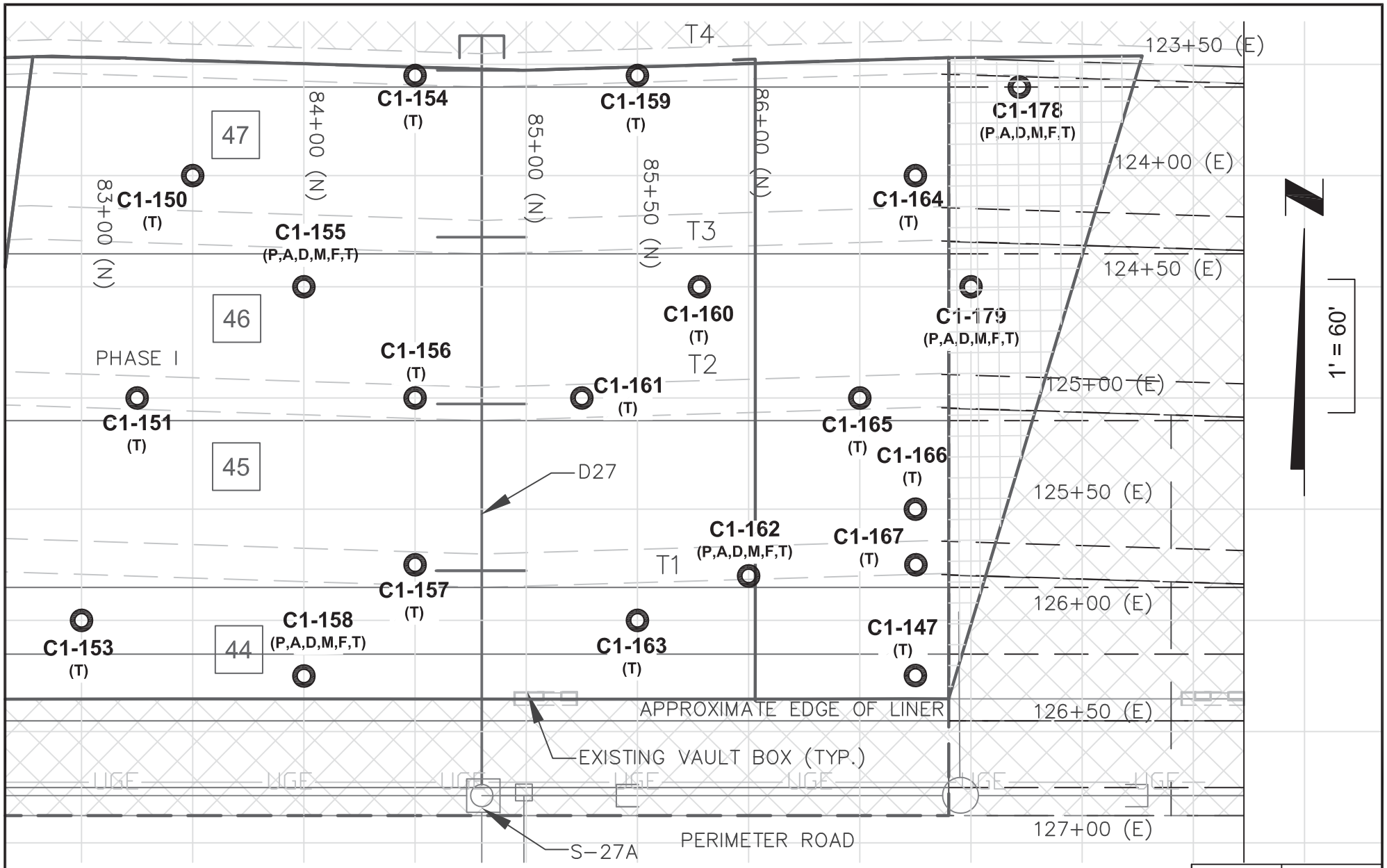
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44	0.62
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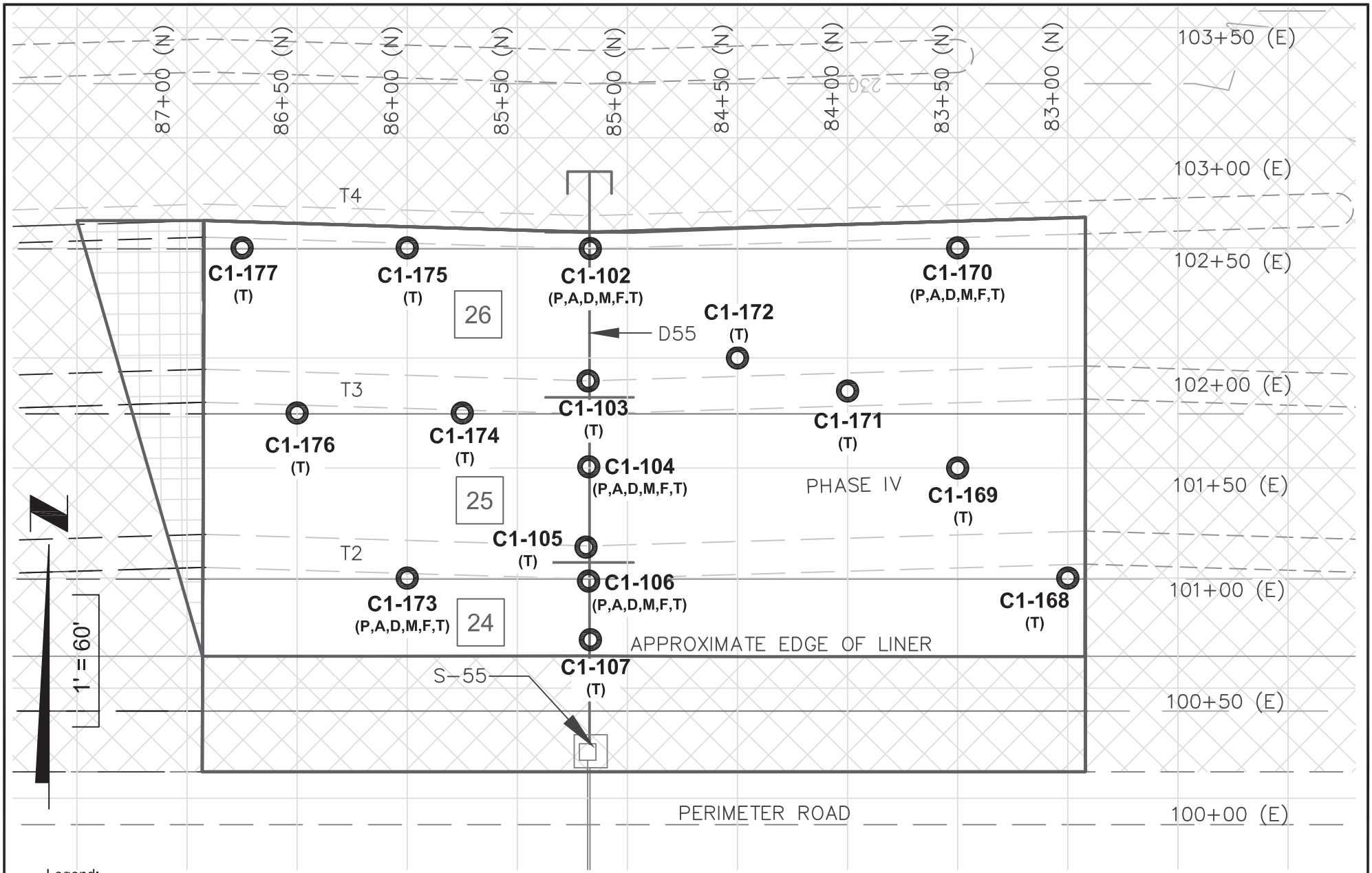
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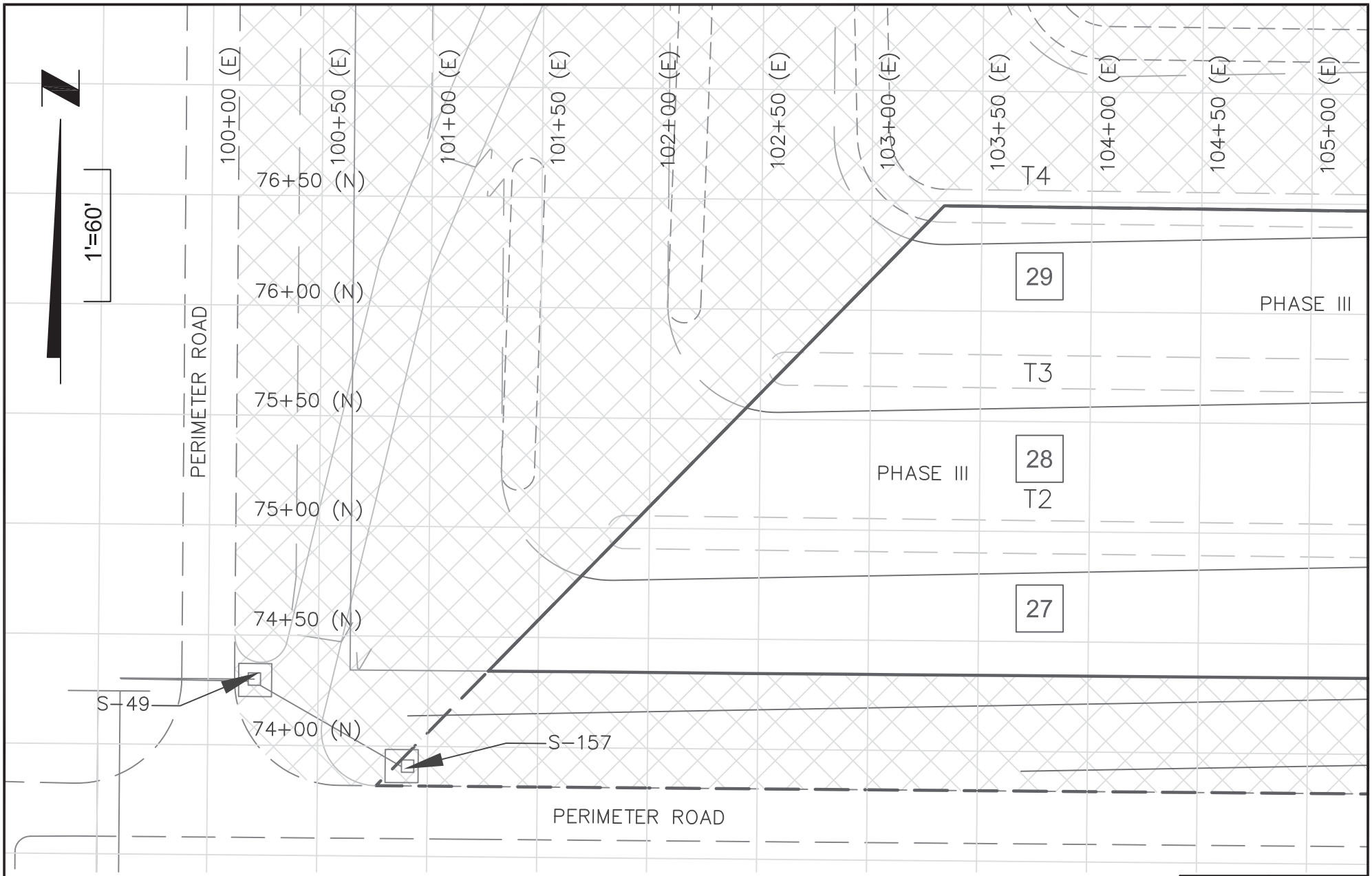
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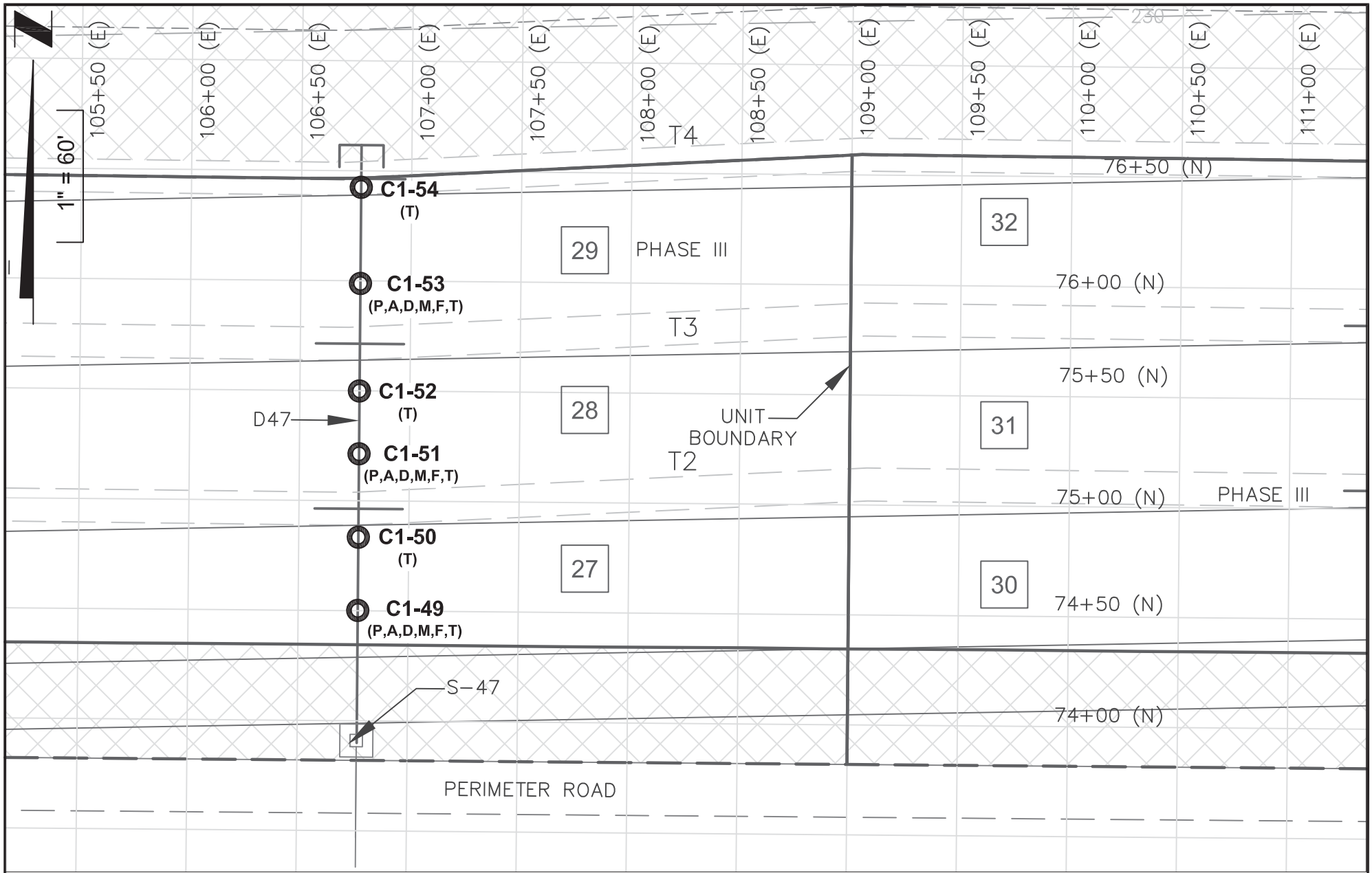
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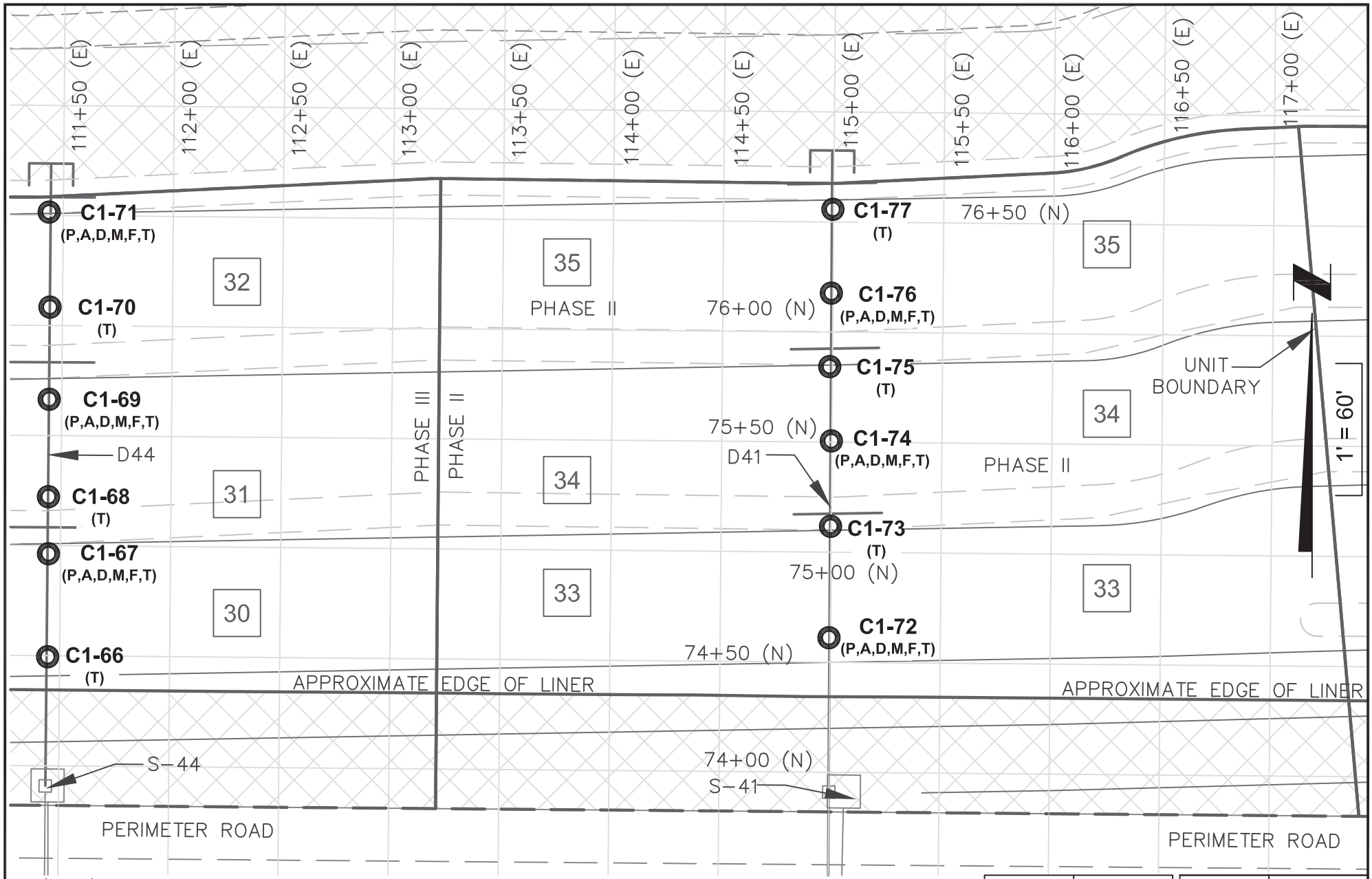
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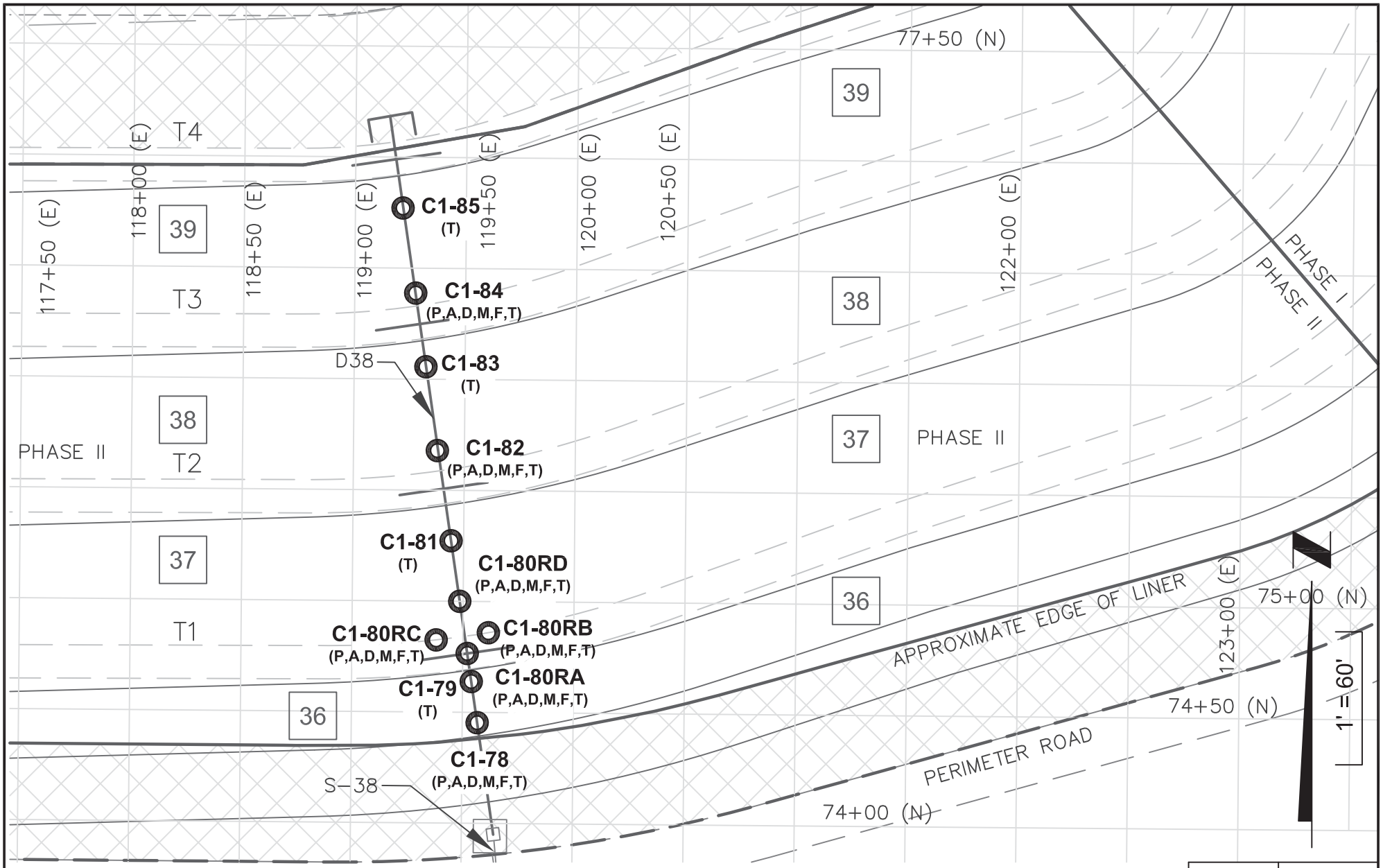
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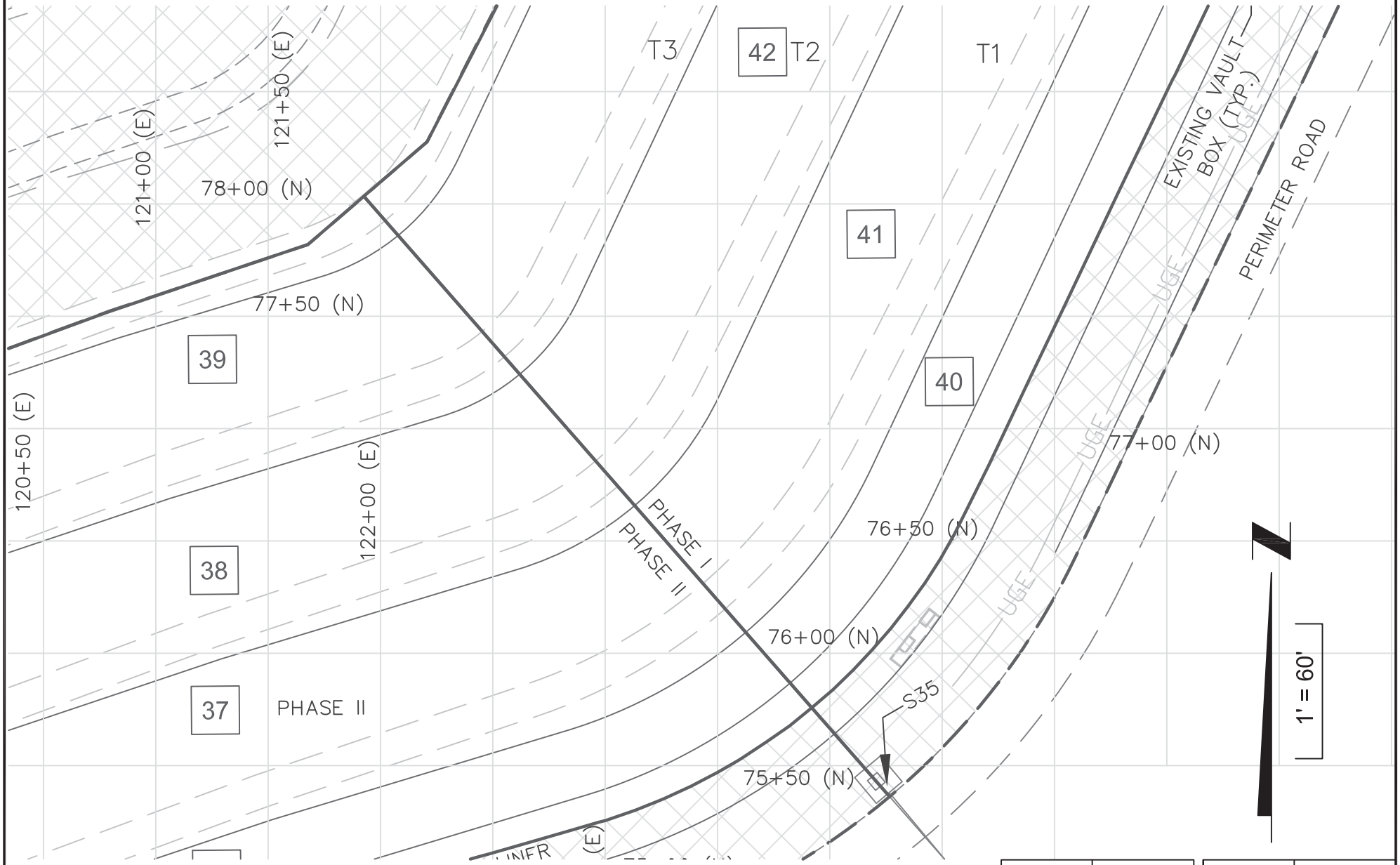
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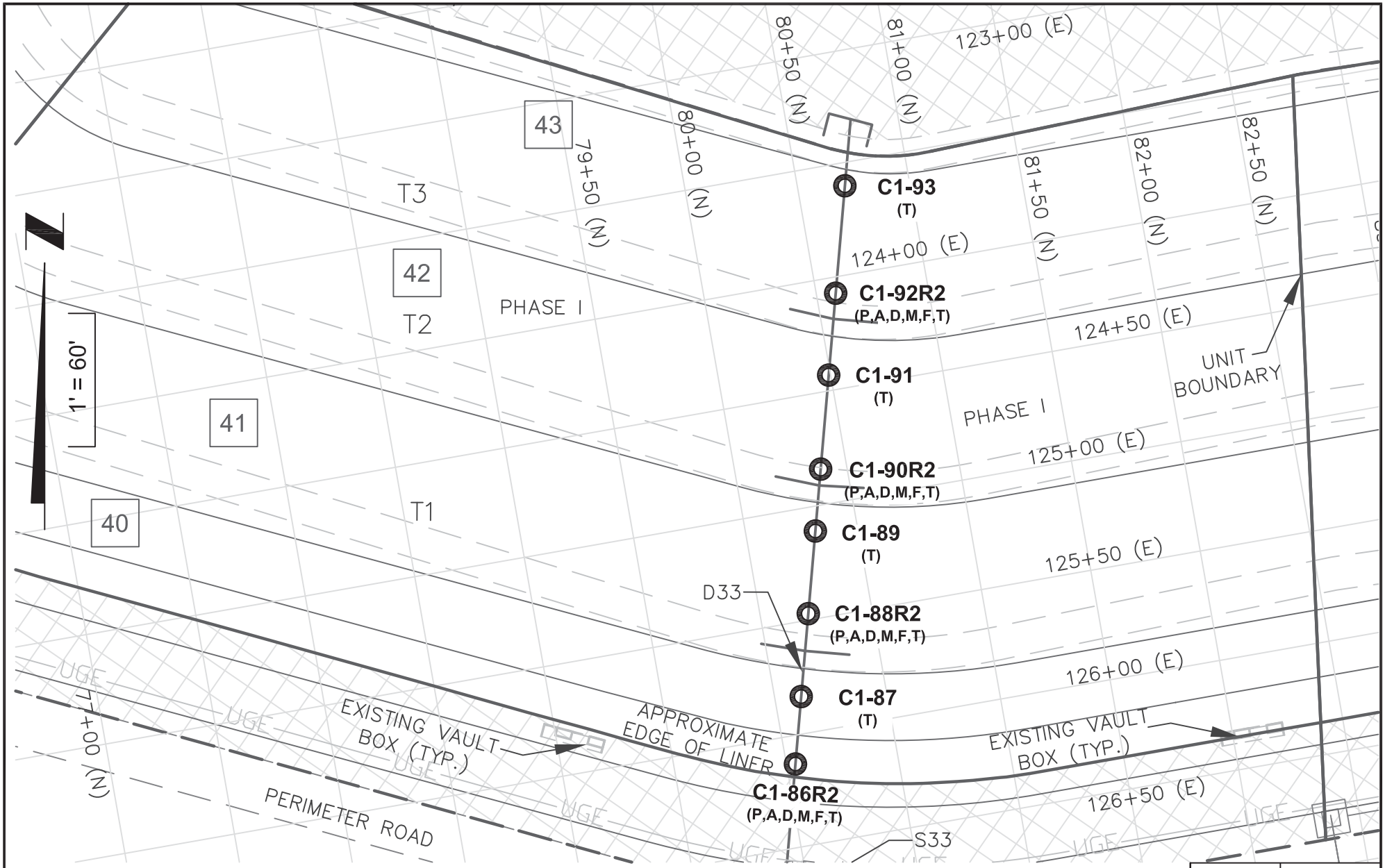
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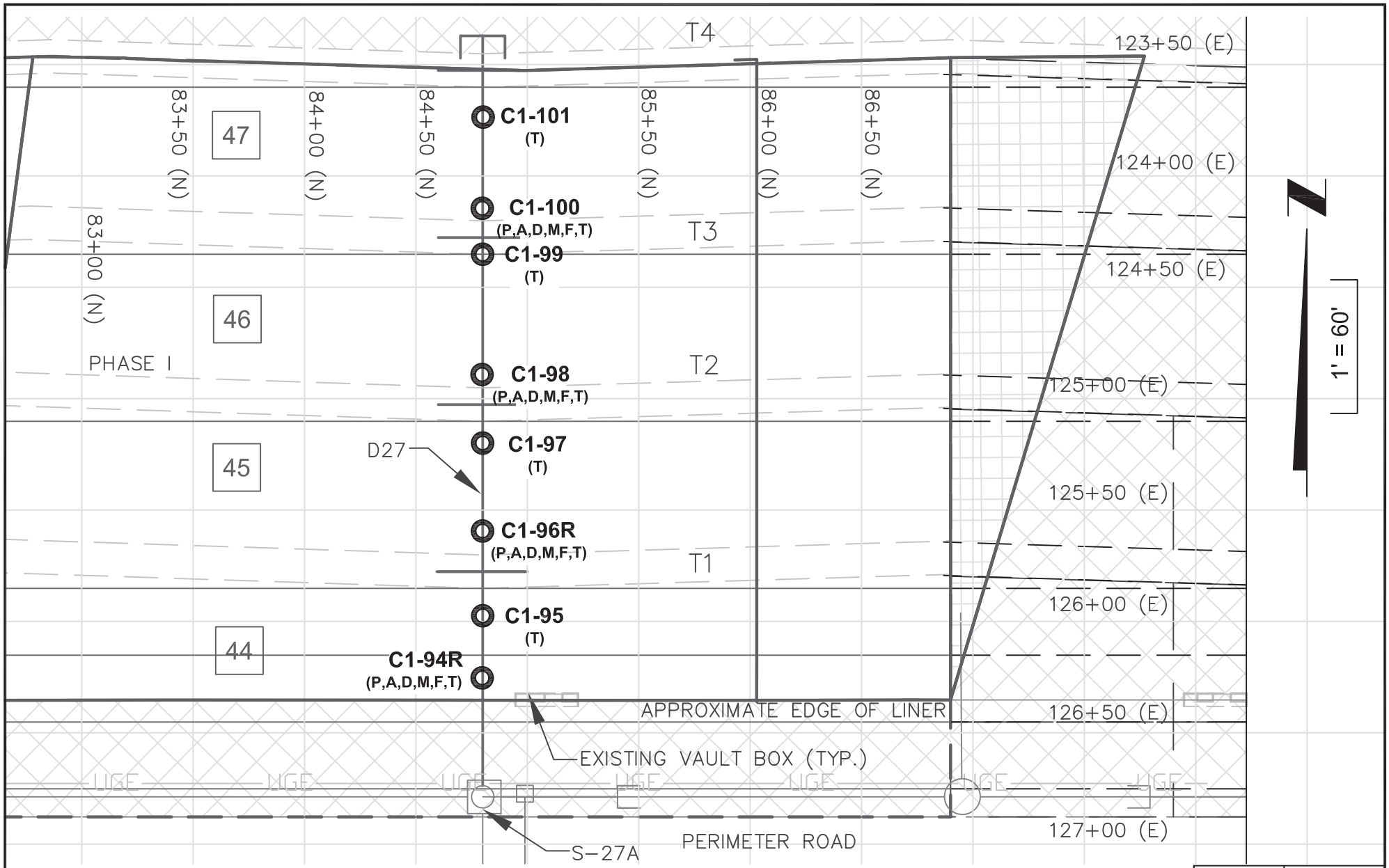
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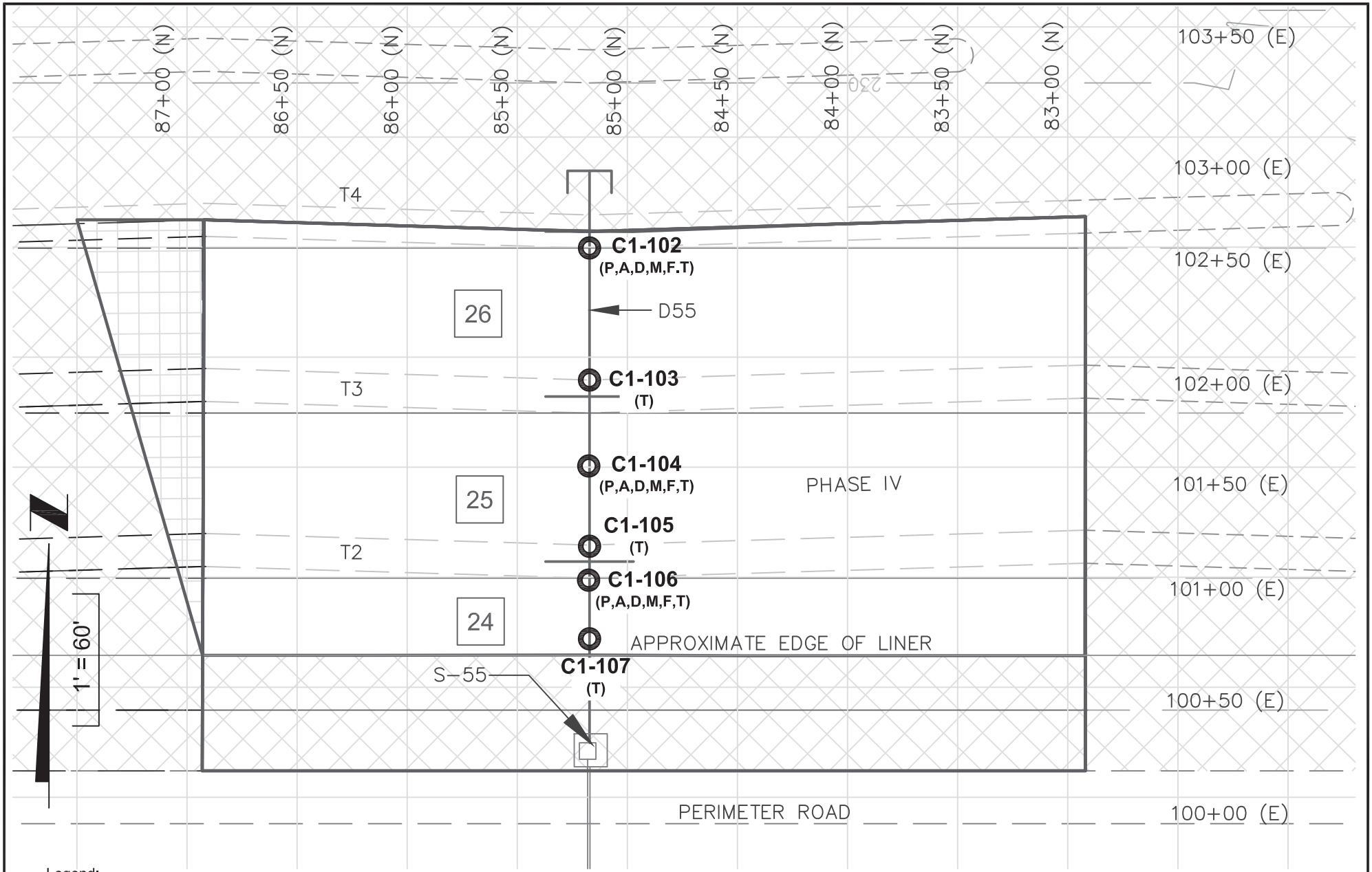
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PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
-

Trail Ridge Landfill - Closure Phase 3

CLAY LAYER

Phase I, II, III, IV, Downcommers Test Results Tables

(Clay second lift)

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Trail Ridge Landfill - Closure Phase 3
CLAY SECOND LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 12.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
Phase IV: Units 24, 25, 26 = 1.9 Acres													
C2-166	101+00E, 83+50N	24	PADMFT	13.0	89.9	90.5	34.3	4.60E-09	75.0	18.0	56.0	49.1	PASS
C2-167	101+50E, 84+00N	25	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-168	102+00E, 84+00N	26	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-169	102+25E, 83+50N	26	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-170	101+50E, 84+75N	25	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-171	102+25E, 84+50N	26	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-172	101+15E, 86+25N	24	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-173	101+50E, 86+50N	25	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-174	102+00E, 86+00N	26	PADMFT	15.0	90.8	102.0	25.6	2.70E-08	86.0	23.0	63.0	51.8	PASS
C2-175	102+50E, 86+50N	26	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-098	102+50E, 85+15N	26	T	22.0	x	x	x	x	x	x	x	x	PASS
C2-099	102+00E, 85+15N	26	PADMFT	24.0	90.4	101.6	27.5	3.40E-09	80.0	16.0	64.0	45.8	PASS
C2-100	101+50E, 85+15N	25	T	24.0	x	x	x	x	x	x	x	x	PASS
C2-101	101+20E, 85+15N	25	PADMFT	23.0	84.6	95.1	32.2	3.50E-09	74.0	23.0	51.0	48.9	PASS
C2-102	101+00E, 85+15N	25	T	24.0	x	x	x	x	x	x	x	x	PASS
C2-103	100+75E, 85+15N	24	PADMFT	24.0	73.2	82.2	38.8	6.20E-09	80.0	18.0	62.0	50.5	PASS
Phase IV: Units 24, 25, 26: Tests Required				**7.6**	**3.8**		**3.8**	**1.9**			**1.9**	**3.8**	
Phase IV: Units 24, 25, 26: Tests Performed				**16.0**	**5.0**		**5.0**	**5.0**			**5.0**	**5.0**	**PASS**
Phase III: Units 27, 28, 29 = 3.53 Acres *testing frequency doubled*													
C2-001	102+00E, 74+75N	27	DT	13.0	87.6	98.4	26.9	x	x	x	x	x	PASS
C2-002	102+50E, 75+00N	28	FT	14.0	x	x	28.8	x	85.0	20.0	66.0	47.7	PASS
C2-003	102+50E, 75+50N	28	PADMFT	12.0	91.0	102.2	23.7	6.10E-09	90.0	24.0	66.0	51.4	PASS
C2-004	103+00E, 76+00N	29	DT	15.0	91.7	103.0	27.9	x	x	x	x	x	PASS
C2-005	103+00E, 75+00N	28	DT	12.0	89.4	100.4	25.1	x	x	x	x	x	PASS
C2-006	103+00E, 75+50N	28	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-007	103+50E, 75+75N	29	FAT	12.0	x	x	30.3	x	88.0	23.0	65.0	47.9	PASS
C2-008	104+00E, 76+40N	29	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-009	104+00E, 75+75N	29	DT	13.0	86.4	97.1	30.1	x	x	x	x	x	PASS
C2-010	103+50E, 74+75N	27	T	13.0	x	x	x	x	x	x	x	x	PASS

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Trail Ridge Landfill - Closure Phase 3
CLAY SECOND LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 12.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C2-011	104+00E, 74+75N	27	PADMFT	12.0	86.9	97.6	31.5	3.70E-09	85.0	22.0	63.0	50.3	PASS
C2-012	104+50E, 75+50N	28	MFT	13.0	x	x	25.4	x	x	x	x	45.7	PASS
C2-013	105+00E, 75+00N	27	MFT	13.0	x	x	36.8	x	x	x	x	55.4	PASS
C2-014	105+00E, 75+50N	28	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-015	105+00E, 76+40N	29	DMT	15.0	90.0	101.1	28.3	x	x	x	x	x	PASS
C2-016A	105+50E, 75+50N	28	PADMFT	13.0	89.8	100.9	29.9	3.40E-09	65.0	19.0	46.0	52.1	PASS
C2-016B	105+50E, 75+50N	28	M	x	x	x	30.1	x	x	x	x	x	PASS
C2-017	105+50E, 75+00N	28	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-018	105+50E, 74+50N	27	DMT	13.0	84.9	95.4	26.4	x	x	x	x	x	PASS
C2-019	106+00E, 76+45N	29	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-020	106+00E, 75+75N	29	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-021A	106+25E, 76+00N	29	PADMFT	14.0	82.7	92.9	22.9	8.60E-09	64.0	19.0	45.0	49.3	PASS
C2-021B	106+25E, 76+00N	29	M	x	x	x	27.0	x	x	x	x	x	PASS
C2-034	107+25E, 76+25N	29	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-035	107+50E, 75+75N	29	DMFT	15.0	88.4	99.3	26.0	x	x	x	x	54.3	PASS
C2-036	108+00E, 76+50N	29	PADMFT	13.0	87.5	98.3	29.2	5.90E-10	85.0	22.0	63.0	47.2	PASS
C2-037	108+50E, 76+00N	29	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-056	108+50E, 75+00N	28	DMFT	12.0	93.8	105.4	28.8	x	x	x	x	49.7	PASS
C2-057	108+00E, 75+50N	28	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-058	107+50E, 75+00N	28	PADMFT	15.0	86.8	97.5	23.5	6.90E-10	86.0	26.0	60.0	51.3	PASS
C2-059	108+00E, 74+50N	27	DMFT	13.0	92.6	104.0	24.9	x	x	x	x	48.4	PASS
C2-060	108+50E, 74+50N	27	PADMFT	12.0	93.8	105.4	29.6	8.40E-09	85.0	23.0	61.0	51.2	PASS
C2-061	109+00E, 74+50N	27	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-022	106+75E, 74+50N	27	PADMFT	13.0	81.8	91.9	34.7	1.00E-08	82.0	23.0	58.0	45.9	PASS
C2-023	106+75E, 74+90N	27	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-024	106+75E, 75+25N	28	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-025	106+75E, 75+50N	28	PADMFT	14.0	77.0	86.5	28.0	7.10E-09	77.0	25.0	53.0	48.9	PASS
C2-026	106+75E, 76+00N	29	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-027	106+75E, 76+45N	29	PADMFT	13.0	81.1	91.1	30.1	2.70E-09	83.0	26.0	57.0	45.9	PASS
Phase III: Units 27, 28, 29: Tests Required				**28.2**	**14.1**		**14.1**	**7.1**			**7.1**	**14.1**	
Phase III: Units 27, 28, 29: Tests Performed				**37.0**	**19.0**		**25.0**	**10.0**			**12.0**	**17.0**	**PASS**

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Trail Ridge Landfill - Closure Phase 3
CLAY SECOND LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 12.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
Phase III: Units 30, 31, 32 = 2.30 Acres *testing frequency doubled*													
C2-038	109+00E, 76+25N	32	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-039	109+50E, 76+50N	32	PADMFT	12.0	89.1	100.1	40.1	7.30E-09	87.0	30.0	57.0	63.7	PASS
C2-040	110+00E, 76+00N	32	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-041	110+50E, 76+00N	32	DMFT	12.0	91.6	102.9	25.2	x	x	x	x	53.0	PASS
C2-042	111+00E, 76+50N	32	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-043	112+00E, 76+50N	32	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-044	112+25E, 76+25N	32	PADMFT	13.0	92.7	104.2	32.3	5.60E-09	89.0	28.0	61.0	48.0	PASS
C2-045	113+00E, 76+25N	32	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-049	112+50E, 75+50N	31	DMFT	13.0	91.9	103.3	31.9	x	x	x	x	51.5	PASS
C2-050	112+00E, 75+50N	31	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-051	111+00E, 75+50N	31	PADMFT	14.0	88.0	98.9	32.8	4.70E-09	79.0	23.0	56.0	53.4	PASS
C2-052	110+50E, 75+00N	31	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-053	110+00E, 75+50N	31	DMFT	13.0	93.3	104.8	32.3	x	x	x	x	52.1	PASS
C2-054	109+50E, 75+50N	31	PADMFT	13.0	94.0	105.6	44.5	4.00E-09	89.0	24.0	64.0	59.0	PASS
C2-055	109+00E, 75+50N	31	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-062	110+00E, 74+50N	30	DMFT	13.0	88.0	98.9	33.8	x	x	x	x	51.2	PASS
C2-063	111+00E, 74+50N	30	PADMFT	12.0	97.2	105.1	29.8	5.30E-09	90.0	27.0	63.0	51.2	PASS
C2-064	112+00E, 74+75N	30	DMFT	14.0	91.6	102.9	34.3	x	x	x	x	49.3	PASS
C2-065	112+75E, 74+50N	30	PADMFT	15.0	89.4	100.4	25.0	6.90E-09	84.0	25.0	59.0	50.1	PASS
C2-028	111+40E, 74+50N	30	PADMFT	14.0	80.7	90.7	32.6	3.20E-09	75.0	24.0	51.0	50.3	PASS
C2-029	111+40E, 74+90N	30	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-030	111+40E, 75+25N	31	PADMFT	14.0	85.3	95.8	31.6	1.60E-09	76.0	26.0	50.0	52.1	PASS
C2-031	111+40E, 75+65N	31	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-032	111+40E, 76+00N	32	PADMFT	14.0	73.2	82.2	32.6	4.60E-08	78.0	26.0	52.0	49.8	PASS
C2-033	111+40E, 76+50N	32	T	13.0	x	x	x	x	x	x	x	x	PASS
Phase III: Units 30, 31, 32: Tests Required				**18.4**	**9.2**		**9.2**	**4.6**			**4.6**	**9.2**	
Phase III: Units 30, 31, 32: Tests Performed				**25.0**	**14.0**		**14.0**	**9.0**			**9.0**	**14.0**	**PASS**
Phase II: Units 33, 34, 35 = 2.32 Acres													
C2-046	114+00E, 76+00N	35	PADMFT	12.0	92.8	104.3	28.3	1.20E-09	85.0	26.0	59.0	49.3	PASS

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Trail Ridge Landfill - Closure Phase 3
CLAY SECOND LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 12.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C2-047	114+50E, 76+50N	35	DMFT	12.0	83.6	93.9	28.8	x	x	x	x	54.5	PASS
C2-048	113+50E, 75+50N	34	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-066	113+50E, 74+50N	33	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-067	114+00E, 75+00N	33	DMFT	12.0	88.9	99.9	35.7	x	x	x	x	51.8	PASS
C2-104	115+75E, 76+50N	35	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-105	116+00E, 75+75N	34	PADMFT	16.0	82.2	92.4	32.3	3.80E-09	71.0	23.0	48.0	50.3	PASS
C2-106	115+50E, 75+00N	33	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-107	116+50E, 76+75N	35	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-108	117+00E, 76+50N	35	T	17.0	x	x	x	x	x	x	x	x	PASS
C2-109	117+00E, 75+50N	34	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-110	116+50E, 75+00N	33	PADMFT	16.0	81.7	91.8	50.7	3.40E-08	101.0	33.0	68.0	73.0	PASS
C2-068	115+00E, 74+75N	33	T	19.0	x	x	x	x	x	x	x	x	PASS
C2-069	115+00E, 75+10N	33	PADMFT	17.0	76.1	85.5	44.7	1.90E-09	77.0	25.0	52.0	64.1	PASS
C2-070	115+00E, 75+50N	34	T	16.0	x	x	x	x	x	x	x	x	PASS
C2-071	115+00E, 75+80N	34	PADMFT	20.0	77.5	87.1	32.4	1.10E-08	75.0	22.0	53.0	48.0	PASS
C2-072	115+00E, 76+25N	35	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-073	115+00E, 76+10N	35	PADMFT	16.0	82.6	92.8	27.7	3.20E-09	74.0	22.0	52.0	42.6	PASS
Phase II: Units 33, 34, 35: Tests Required				**9.3**	**4.6**		**4.6**	**2.3**			**2.3**	**4.6**	
Phase II: Units 33, 34, 35: Tests Performed				**18.0**	**8.0**		**8.0**	**6.0**			**6.0**	**8.0**	**PASS**
Phase II: Units 36, 37, 38, 39 = 3.89 Acres													
C2-111	118+00E, 76+50N	39	PADMFT	16.0	84.9	95.4	34.5	4.50E-09	98.0	27.0	70.0	53.0	PASS
C2-112	118+00E, 75+00N	37	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-113	118+75E, 76+75N	39	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-114	118+50E, 76+00N	38	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-115	118+50E, 74+50N	36	PADMFT	13.0	72.5	81.5	33.2	2.30E-09	96.0	25.0	70.0	52.3	PASS
C2-116	119+00E, 75+00N	37	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-117	120+00E, 77+20N	39	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-118	120+50E, 76+00N	38	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-119	121+00E, 75+00N	36	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-120	121+00E, 77+00N	39	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-121	121+50E, 76+50N	38	PADMFT	12.0	85.3	95.8	24.9	7.00E-09	81.0	23.0	58.0	56.5	PASS

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Trail Ridge Landfill - Closure Phase 3
CLAY SECOND LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 12.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C2-122	122+00E, 75+50N	37	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-123	121+50E, 77+50N	39	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-124	122+00E, 77+25N	39	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-125	122+50E, 77+00N	38	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-126	122+50E, 76+00N	37	PADMFT	12.0	71.7	80.6	30.3	7.10E-09	77.0	21.0	55.0	58.8	PASS
C2-127	123+00E, 76+50N	37	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-128	123+00E, 75+50N	36	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-074	119+60E, 74+45N	36	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-075	119+55E, 74+60N	36	PADMFT	14.0	86.2	96.9	31.4	2.40E-09	71.0	19.0	51.0	49.2	PASS
C2-076	119+50E, 75+00N	37	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-077	119+40E, 75+25N	37	PADMFT	17.0	82.3	92.5	30.6	2.70E-08	69.0	20.0	49.0	47.7	PASS
C2-078	119+40E, 75+70N	38	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-079	119+30E, 76+00N	38	PADMFT	20.0	81.3	91.3	29.5	5.40E-09	74.0	20.0	54.0	51.4	PASS
C2-080	119+25E, 76+65N	39	T	22.0	x	x	x	x	x	x	x	x	PASS
C2-081	119+20E, 76+70N	39	PADMFT	20.0	82.4	92.6	35.3	5.90E-09	79.0	21.0	57.0	51.7	PASS
Phase II: Units 36, 37, 38, 39: Tests Required				**15.6**	**7.8**		**7.8**	**3.9**			**3.9**	**7.8**	
Phase II: Units 36, 37, 38, 39:Tests Performed				**26.0**	**8.0**		**8.0**	**8.0**			**8.0**	**8.0**	**PASS**
Phase I: Units 40, 41, 42, 43 = 4.27 Acres													
C2-129	123+00E, 78+50N	43	PADMFT	13.0	89.5	100.6	37.0	1.50E-09	87.0	21.0	66.0	55.5	PASS
C2-130	123+00E, 77+50N	42	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-131	124+00E, 76+00N	40	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-132	123+00E, 79+50N	43	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-133	123+75E, 79+00N	42	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-134	124+00E, 78+00N	41	PADMFT	14.0	84.7	95.2	29.7	4.20E-09	89.0	23.0	66.0	61.0	PASS
C2-135	124+50E, 79+00N	41	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-136	123+50E, 80+00N	43	PADMFT	15.0	84.7	95.2	33.3	2.90E-09	92.0	21.0	71.0	57.0	PASS
C2-137	125+00E, 78+50N	40	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-138	125+00E, 79+75N	41	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-139	125+50E, 79+00N	40	PADMFT	16.0	80.3	90.2	33.4	4.80E-09	90.0	22.0	68.0	59.8	PASS
C2-140	123+50E, 81+50N	43	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-141	124+50E, 81+50N	42	PADMFT	14.0	92.1	103.5	36.3	2.40E-09	84.0	22.0	62.0	51.3	PASS

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Trail Ridge Landfill - Closure Phase 3
CLAY SECOND LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 12.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C2-142	125+50E, 81+00N	41	PADMFT	14.0	90.1	101.2	33.6	2.40E-09	83.0	24.0	59.0	55.6	PASS
C2-143	126+00E, 80+50N	40	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-144	123+75E, 82+50N	43	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-145	124+50E, 82+50N	42	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-146	125+25E, 81+75N	41	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-147	126+00E, 82+00N	40	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-082	126+10E, 80+15N	40	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-083R2	125+85E, 80+20N	40	PADMFT	16.0	83.1	93.4	24.3	1.80E-08	82.0	20.0	63.0	51.6	PASS
C2-084	125+45E, 80+30N	41	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-085R2	125+15E, 80+40N	41	PADMFT	17.0	72.8	81.8	29.1	3.00E-09	84.0	24.0	60.0	53.9	PASS
C2-086	124+85E, 80+50N	42	T	19.0	x	x	x	x	x	x	x	x	PASS
C2-087R2	124+45E, 80+60N	42	PADMFT	16.0	76.8	86.3	33.1	3.00E-09	88.0	26.0	62.0	50.7	PASS
C2-088	124+15E, 80+65N	43	T	20.0	x	x	x	x	x	x	x	x	PASS
C2-089R2	123+75E, 80+75N	43	PADMFT	16.0	86.3	97.0	20.5	1.90E-09	82.0	22.0	59.0	50.7	PASS
Phase I: Units 40, 41, 42, 43: Tests Required				**17.1**	**8.5**		**8.5**	**4.3**			**4.3**	**8.5**	
Phase I: Units 40, 41, 42, 43: Tests Performed				**27.0**	**10.0**		**10.0**	**10.0**			**10.0**	**10.0**	**PASS**
Phase I: Units 44, 45, 46, 47 = 3.09 Acres													
C2-148	123+75E, 83+50N	47	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-149	124+50E, 83+20N	46	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-150	125+50E, 82+50N	45	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-151	126+00E, 83+00N	44	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-152	124+00E, 84+50N	47	PADMFT	15.0	85.8	96.4	39.9	1.60E-09	86.0	23.0	63.0	54.4	PASS
C2-153	125+00E, 84+00N	46	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-154	126+00E, 84+00N	44	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-155	125+00E, 84+50N	46	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-156	126+00E, 84+50N	44	PADMFT	15.0	85.5	96.1	40.1	4.20E-09	90.0	28.0	62.0	58.2	PASS
C2-157	123+75E, 85+50N	47	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-158	124+50E, 86+00N	46	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-159	125+00E, 85+50N	46	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-160	125+50E, 86+00N	45	PADMFT	12.0	72.3	81.2	32.1	5.00E-09	99.0	27.0	72.0	69.9	PASS
C2-161	126+00E, 85+50N	44	T	13.0	x	x	x	x	x	x	x	x	PASS

Trail Ridge Landfill - Closure Phase 3
CLAY SECOND LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 12.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C2-162	124+00E, 86+50N	47	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-163	125+00E, 86+50N	46	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-164	125+50E, 86+75N	45	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-165	126+00E, 86+75N	44	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-176	123+75E, 87+25N	47	PADMFT	14.0	72.0	80.9	32.8	5.80E-09	96.0	31.0	65.0	65.1	PASS
C2-177	124+75E, 87+00N	46	PADMFT	16.0	79.3	89.1	19.4	2.90E-09	96.0	30.0	66.0	53.5	PASS
C2-090	126+20E, 84+80N	44	T	20.0	x	x	x	x	x	x	x	x	PASS
C2-091R	126+00E, 84+80N	44	PADMFT	20.0	72.3	80.4	37.9	2.00E-09	92.0	20.0	72.0	52.5	PASS
C2-092	125+60E, 84+80N	45	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-093R	125+25E, 84+80N	45	PADMFT	17.0	75.6	84.1	40.5	3.10E-09	93.0	22.0	71.0	55.5	PASS
C2-094	124+90E, 84+80N	46	T	20.0	x	x	x	x	x	x	x	x	PASS
C2-095	124+50E, 84+80N	46	PADMFT	20.0	80.7	90.7	38.0	5.20E-09	83.0	21.0	62.0	54.6	PASS
C2-096	124+20E, 84+80N	47	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-097	123+75E, 84+80N	47	PADMFT	18.0	81.1	91.1	44.9	6.30E-09	80.0	23.0	57.0	57.7	PASS
Phase I: Units 44, 45, 46, 47: Tests Required				**12.4**	**6.2**		**6.2**	**3.1**			**3.1**	**6.2**	
Phase I: Units 44, 45, 46, 47: Tests Performed				**28.0**	**9.0**		**9.0**	**9.0**			**9.0**	**9.0**	**PASS**
All Phases Totals = 21.30Acres (5.83Acres Doubled)													
All Phases: Tests Required				**108.5**	**54.3**		**54.3**	**27.1**			**27.1**	**54.3**	
All Phases: Tests Performed				**177.0**	**73.0**		**79.0**	**57.0**			**59.0**	**71.0**	**PASS**
Phase I: Downcomer D-27													
C2-090	126+20E, 84+80N	44	T	20.0	x	x	x	x	x	x	x	x	PASS
C2-091R	126+00E, 84+80N	44	PADMFT	20.0	72.3	80.4	37.9	2.00E-09	92.0	20.0	72.0	52.5	PASS
C2-092	125+60E, 84+80N	45	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-093R	125+25E, 84+80N	45	PADMFT	17.0	75.6	84.1	40.5	3.10E-09	93.0	22.0	71.0	55.5	PASS
C2-094	124+90E, 84+80N	46	T	20.0	x	x	x	x	x	x	x	x	PASS
C2-095	124+50E, 84+80N	46	PADMFT	20.0	80.7	90.7	38.0	5.20E-09	83.0	21.0	62.0	54.6	PASS
C2-096	124+20E, 84+80N	47	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-097	123+75E, 84+80N	47	PADMFT	18.0	81.1	91.1	44.9	6.30E-09	80.0	23.0	57.0	57.7	PASS
Phase I: Downcommer D-27: Tests Required				**8.0**	**4.0**		**4.0**	**4.0**			**0.0**	**0.0**	

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Trail Ridge Landfill - Closure Phase 3
CLAY SECOND LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 12.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
Phase I: Downcommer D-27: Tests Performed				**8.0**	**4.0**		**4.0**	**4.0**			**4.0**	**4.0**	**PASS**
Phase I: Downcomer D-33													
C2-082	126+10E, 80+15N	40	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-083R2	125+85E, 80+20N	40	PADMFT	16.0	83.1	93.4	24.3	1.80E-08	82.0	20.0	63.0	51.6	PASS
C2-084	125+45E, 80+30N	41	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-085R2	125+15E, 80+40N	41	PADMFT	17.0	72.8	81.8	29.1	3.00E-09	84.0	24.0	60.0	53.9	PASS
C2-086	124+85E, 80+50N	42	T	19.0	x	x	x	x	x	x	x	x	PASS
C2-087R2	124+45E, 80+60N	42	PADMFT	16.0	76.8	86.3	33.1	3.00E-09	88.0	26.0	62.0	50.7	PASS
C2-088	124+15E, 80+65N	43	T	20.0	x	x	x	x	x	x	x	x	PASS
C2-089R2	123+75E, 80+75N	43	PADMFT	16.0	86.3	97.0	20.5	1.90E-09	82.0	22.0	59.0	50.7	PASS
Phase I: Downcommer D-33: Tests Required				**8.0**	**4.0**		**4.0**	**4.0**			**0.0**	**0.0**	
Phase I: Downcommer D-33: Tests Performed				**8.0**	**4.0**		**4.0**	**4.0**			**4.0**	**4.0**	**PASS**
Phase II: Downcomer D-38													
C2-074	119+60E, 74+45N	36	T	14.0	x	x	x	x	x	x	x	x	PASS
C2-075	119+55E, 74+60N	36	PADMFT	14.0	86.2	96.9	31.4	2.40E-09	71.0	19.0	51.0	49.2	PASS
C2-076	119+50E, 75+00N	37	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-077	119+40E, 75+25N	37	PADMFT	17.0	82.3	92.5	30.6	2.70E-08	69.0	20.0	49.0	47.7	PASS
C2-078	119+40E, 75+70N	38	T	18.0	x	x	x	x	x	x	x	x	PASS
C2-079	119+30E, 76+00N	38	PADMFT	20.0	81.3	91.3	29.5	5.40E-09	74.0	20.0	54.0	51.4	PASS
C2-080	119+25E, 76+65N	39	T	22.0	x	x	x	x	x	x	x	x	PASS
C2-081	119+20E, 76+70N	39	PADMFT	20.0	82.4	92.6	35.3	5.90E-09	79.0	21.0	57.0	51.7	PASS
Phase II: Downcommer D-38: Tests Required				**8.0**	**4.0**		**4.0**	**4.0**			**0.0**	**0.0**	
Phase II: Downcommer D-38: Tests Performed				**8.0**	**4.0**		**4.0**	**4.0**			**4.0**	**4.0**	**PASS**
Phase II: Downcomer D-41													
C2-068	115+00E, 74+75N	33	T	19.0	x	x	x	x	x	x	x	x	PASS
C2-069	115+00E, 75+10N	33	PADMFT	17.0	76.1	85.5	44.7	1.90E-09	77.0	25.0	52.0	64.1	PASS
C2-070	115+00E, 75+50N	34	T	16.0	x	x	x	x	x	x	x	x	PASS

Trail Ridge Landfill - Closure Phase 3
CLAY SECOND LIFT TEST RESULTS

Compaction Minimum Value: 80.0% of Standard Proctor **Permeability Minimum:** 6.67x10-8cm/sec **Thickness Minimum:** 12.0"

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C2-071	115+00E, 75+80N	34	PADMFT	20.0	77.5	87.1	32.4	1.10E-08	75.0	22.0	53.0	48.0	PASS
C2-072	115+00E, 76+25N	35	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-073	115+00E, 76+10N	35	PADMFT	16.0	82.6	92.8	27.7	3.20E-09	74.0	22.0	52.0	42.6	PASS
Phase II: Downcommer D-41: Tests Required				**6.0**	**3.0**		**3.0**	**3.0**			**0.0**	**0.0**	
Phase II: Downcommer D-41: Tests Performed				**6.0**	**3.0**		**3.0**	**3.0**			**3.0**	**3.0**	**PASS**
Phase III: Downcomer D-44													
C2-028	111+40E, 74+50N	30	PADMFT	14.0	80.7	90.7	32.6	3.20E-09	75.0	24.0	51.0	50.3	PASS
C2-029	111+40E, 74+90N	30	T	12.0	x	x	x	x	x	x	x	x	PASS
C2-030	111+40E, 75+25N	31	PADMFT	14.0	85.3	95.8	31.6	1.60E-09	76.0	26.0	50.0	52.1	PASS
C2-031	111+40E, 75+65N	31	T	15.0	x	x	x	x	x	x	x	x	PASS
C2-032	111+40E, 76+00N	32	PADMFT	14.0	73.2	82.2	32.6	4.60E-08	78.0	26.0	52.0	49.8	PASS
C2-033	111+40E, 76+50N	32	T	13.0	x	x	x	x	x	x	x	x	PASS
Phase III: Downcommer D-44: Tests Required				**6.0**	**3.0**		**3.0**	**3.0**			**0.0**	**0.0**	
Phase III: Downcommer D-44: Tests Performed				**6.0**	**3.0**		**3.0**	**3.0**			**3.0**	**3.0**	**PASS**
Phase III: Downcomer D-47													
C2-022	106+75E, 74+50N	27	PADMFT	13.0	81.8	91.9	34.7	1.00E-08	82.0	23.0	58.0	45.9	PASS
C2-023	106+75E, 74+90N	27	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-024	106+75E, 75+25N	28	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-025	106+75E, 75+50N	28	PADMFT	14.0	77.0	86.5	28.0	7.10E-09	77.0	25.0	53.0	48.9	PASS
C2-026	106+75E, 76+00N	29	T	13.0	x	x	x	x	x	x	x	x	PASS
C2-027	106+75E, 76+45N	29	PADMFT	13.0	81.1	91.1	30.1	2.70E-09	83.0	26.0	57.0	45.9	PASS
Phase III: Downcommer D-47: Tests Required				**6.0**	**3.0**		**3.0**	**3.0**			**0.0**	**0.0**	
Phase III: Downcommer D-47: Tests Performed				**6.0**	**3.0**		**3.0**	**3.0**			**3.0**	**3.0**	**PASS**
Phase IV: Downcomer D-55													
C2-098	102+50E, 85+15N	26	T	22.0	x	x	x	x	x	x	x	x	PASS
C2-099	102+00E, 85+15N	26	PADMFT	24.0	90.4	101.6	27.5	3.40E-09	80.0	16.0	64.0	45.8	PASS

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Trail Ridge Landfill - Closure Phase 3
CLAY SECOND LIFT TEST RESULTS

Compaction Minimum Value: **80.0% of Standard Proctor** **Permeability Minimum: 6.67x10-8cm/sec** **Thickness Minimum: 12.0"**

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Field Dry Density (PCF)	Percent Compaction (%)	Lab Moisture Content (%)	Coefficient of Permeability (cm/sec)	Liquid Limit	Plastic Limit	Plastic Index	Percent Passing #200 Sieve	Test Result
C2-100	101+50E, 85+15N	25	T	24.0	x	x	x	x	x	x	x	x	PASS
C2-101	101+20E, 85+15N	25	PADMFT	23.0	84.6	95.1	32.2	3.50E-09	74.0	23.0	51.0	48.9	PASS
C2-102	101+00E, 85+15N	25	T	24.0	x	x	x	x	x	x	x	x	PASS
C2-103	100+75E, 85+15N	24	PADMFT	24.0	73.2	82.2	38.8	6.20E-09	80.0	18.0	62.0	50.5	PASS
Phase IV: Downcommer D-55: Tests Required				**6.0**	**3.0**		**3.0**	**3.0**			**0.0**	**0.0**	
Phase IV: Downcommer D-55: Tests Performed				**6.0**	**3.0**		**3.0**	**3.0**			**3.0**	**3.0**	**PASS**

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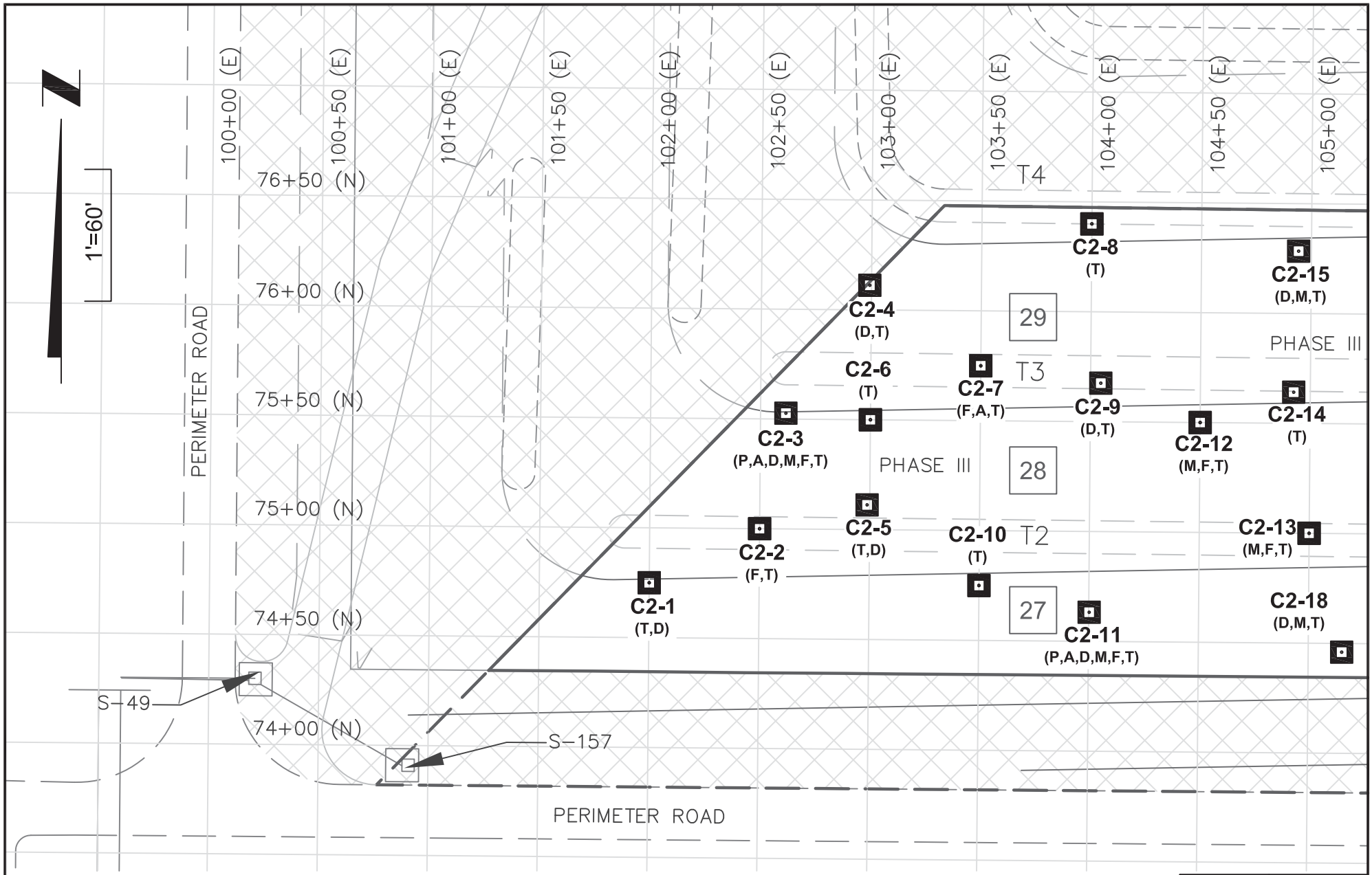
Trail Ridge Landfill - Closure Phase 3

CLAY LAYER

Phase I, II, III, IV, Downcommers Map Diagrams

(Clay second lift)

MAE Meskel & Associates ENGINEERING, PLLC
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Legend:
T=Thickness
D=Density
P=Permeability
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
27	1.10
28	1.20
29	1.23

MAE
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FL Certificate of Authorization No. 28142
8936 Western Way, Suite 12, Jacksonville, FL

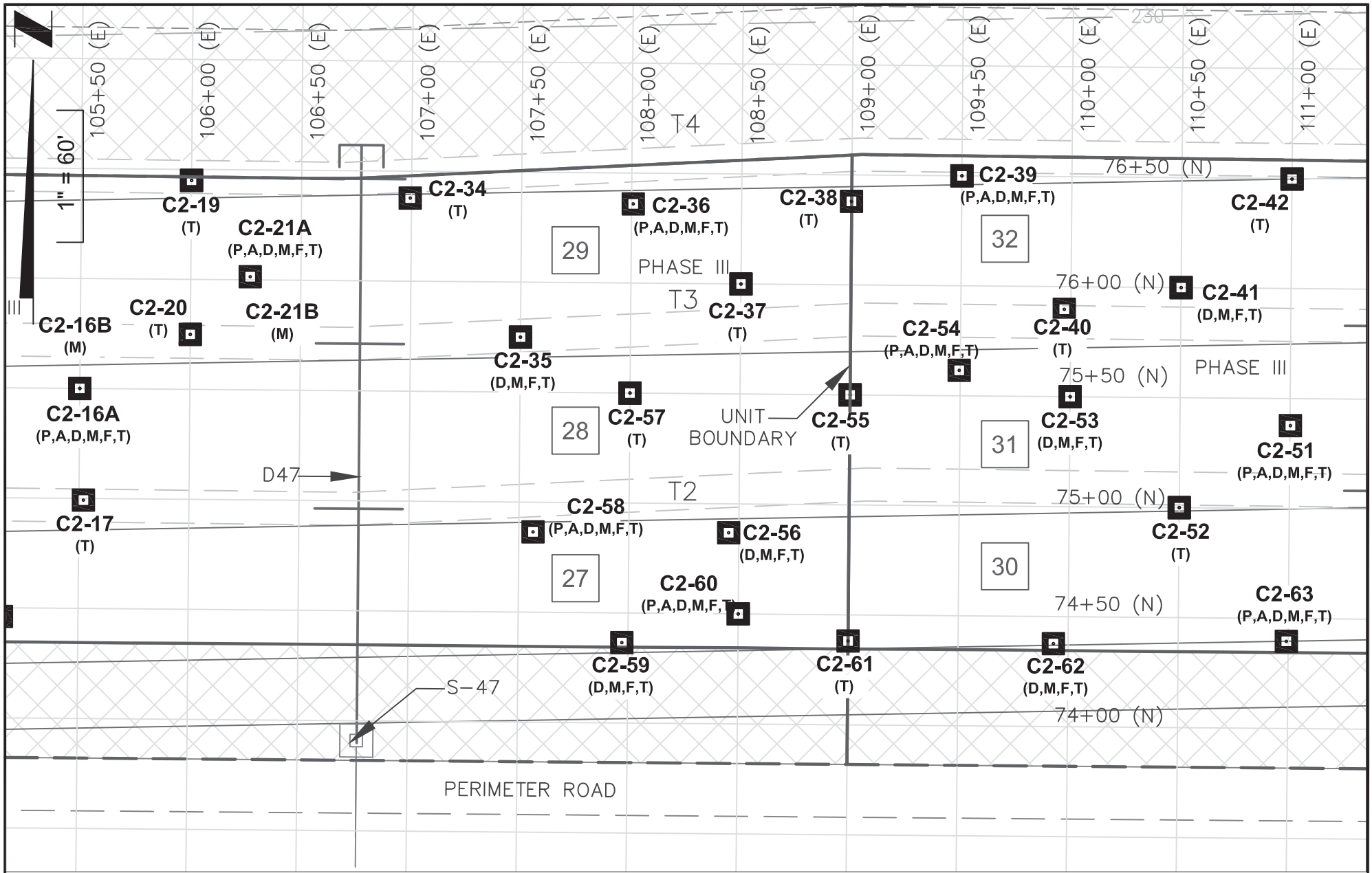
CLIENT:
ETM
VISION - EXPERIENCE - RESULTS
ENGLAND - THIMS & MILLER, INC.

Jacksonville
Where Florida Begins.

SHEET TITLE:
CLAY THICKNESS/DENSITY TESTING - 2ND LIFT

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
-



Legend:

T=Thickness
D=Density
P=Permeability
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±	UNIT NO.	*ACRES±
27	1.10	30	0.74
28	1.20	31	0.73
29	1.23	32	0.83

MAE
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FL Certificate of Authorization No. 28142
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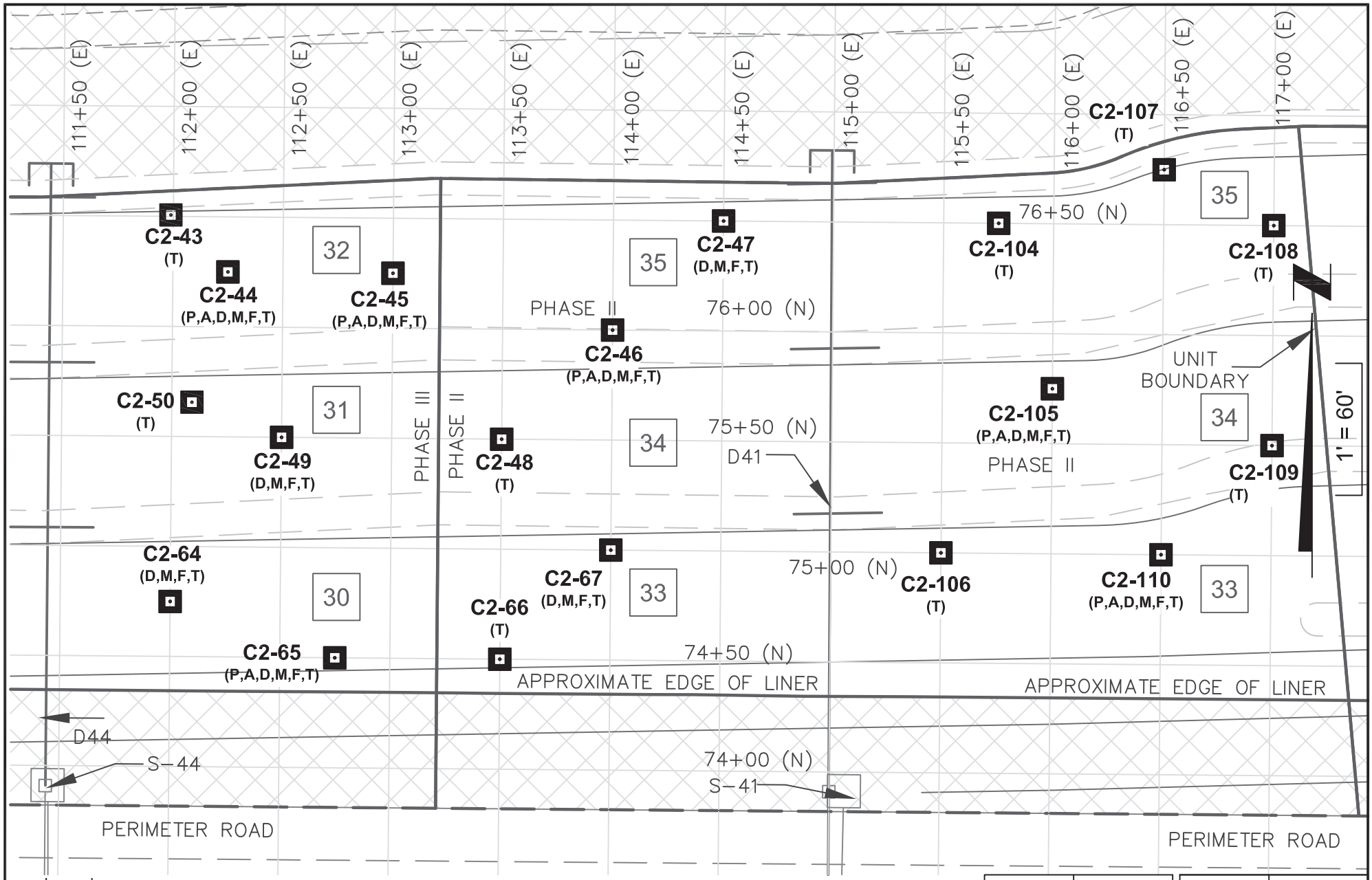
CLIENT:
ETM
VISION - EXPERIENCE - RESULTS
ENGLAND - THIMS & MILLER, INC.

Jacksonville
Where Florida Begins.

SHEET TITLE:
CLAY THICKNESS/DENSITY TESTING - 2ND LIFT

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
-



Legend:
T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±	UNIT NO.	*ACRES±
30	0.74	33	0.84
31	0.73	34	0.70
32	0.83	35	0.78

MAE
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FL Certificate of Authorization No. 28142
8936 Western Way, Suite 12, Jacksonville, FL

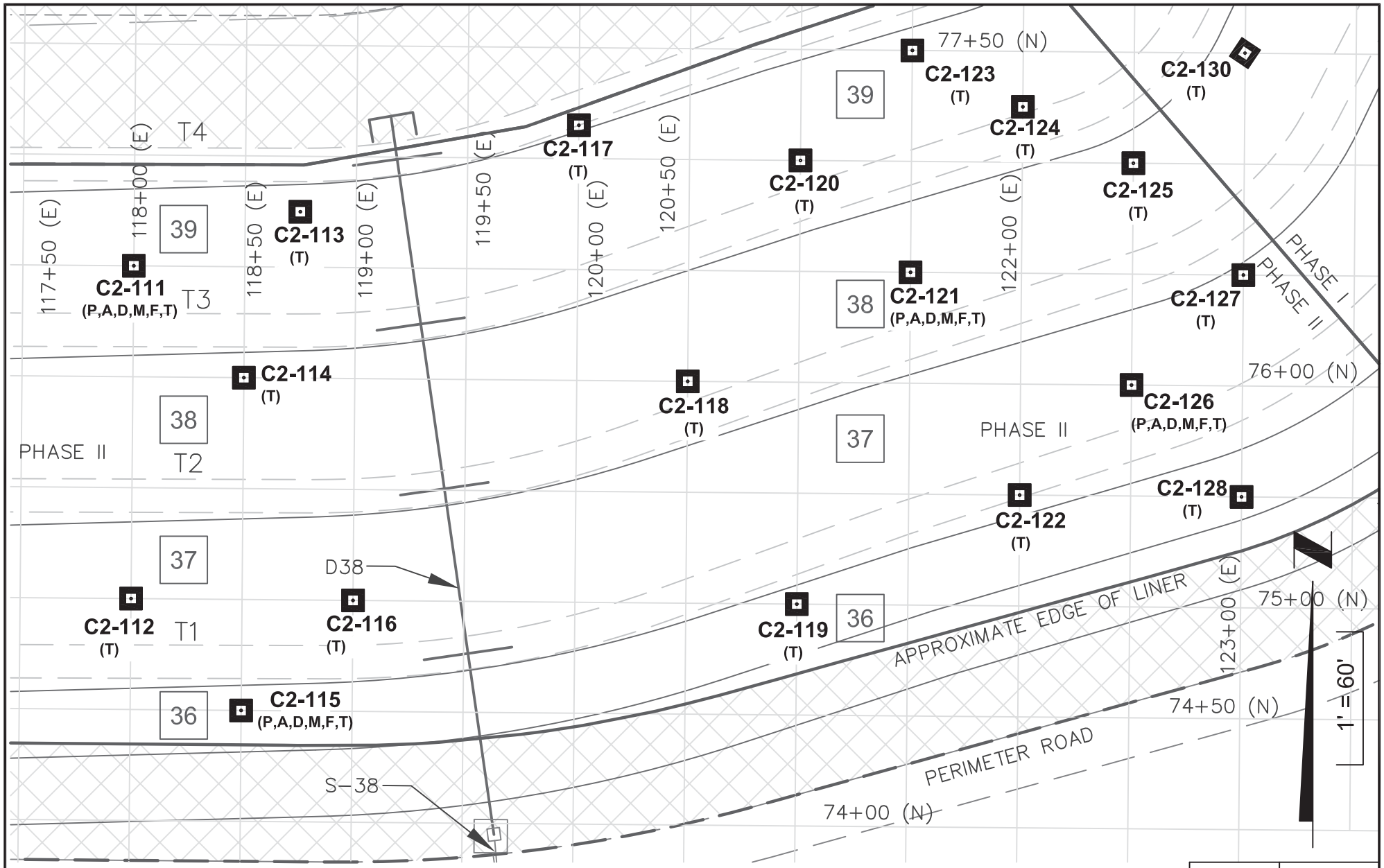
CLIENT:
ETM
VISION - EXPERIENCE - RESULTS
ENGLAND - THIMS & MILLER, INC.

Jacksonville
Where Florida Begins.

SHEET TITLE:
CLAY THICKNESS/DENSITY TESTING - 2ND LIFT

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
-



Legend:

T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
36	0.72
37	1.09
38	1.01
39	1.07

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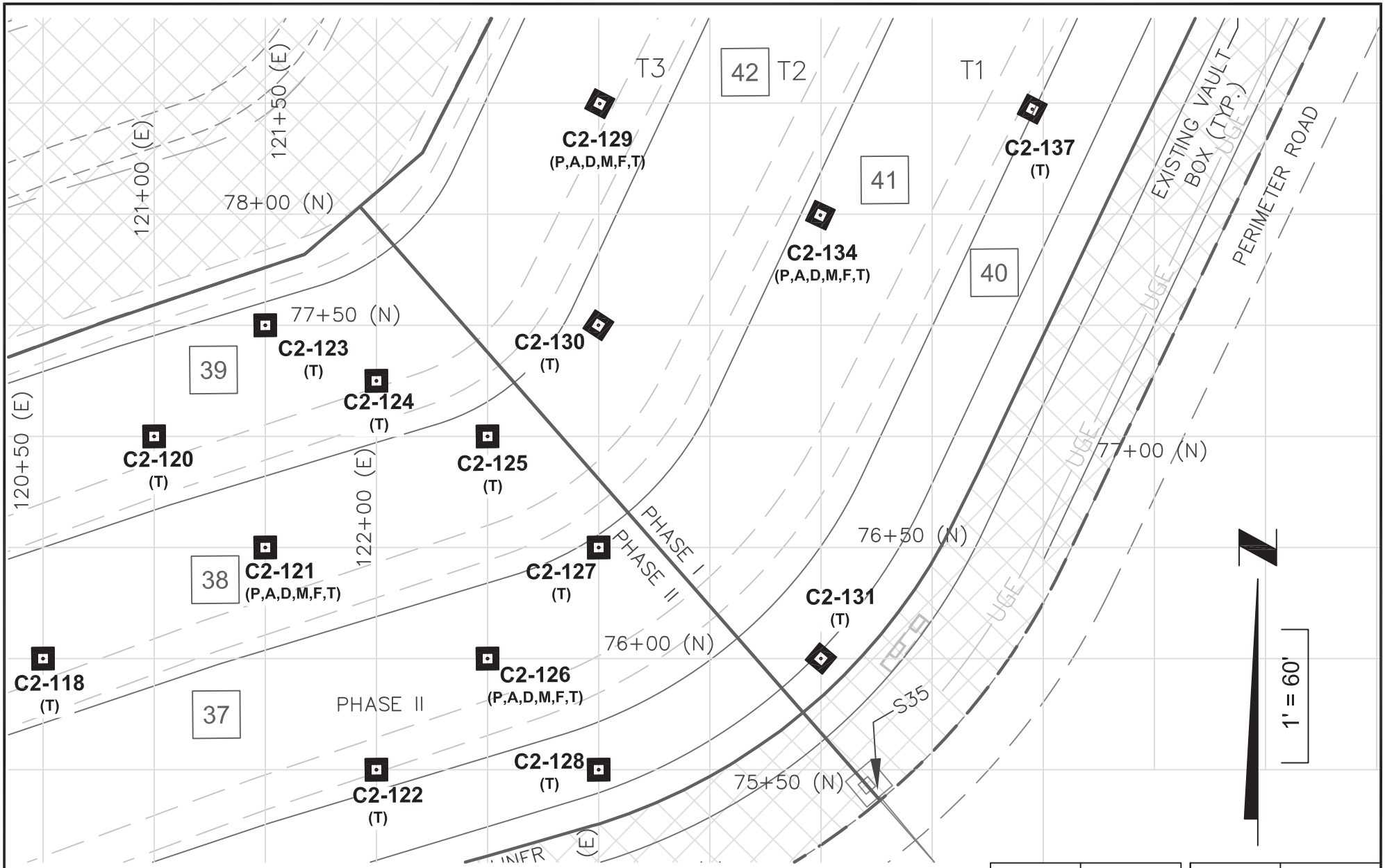
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UNIT NO.	*ACRES±
36	0.72
37	1.09
38	1.01
39	1.07

UNIT NO.	*ACRES±
40	0.98
41	1.14
42	1.05
43	1.10

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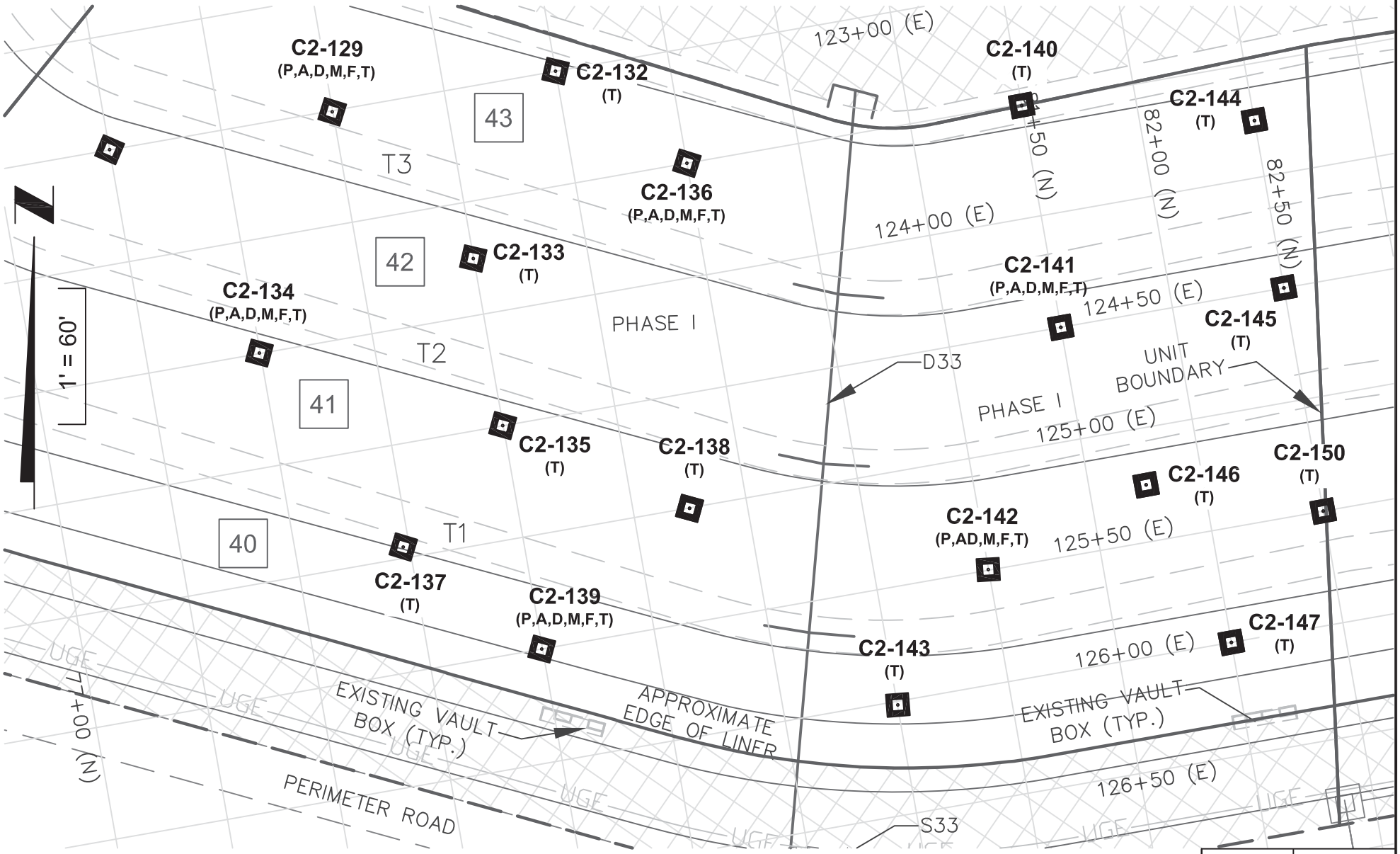
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40	0.98
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42	1.05
43	1.10

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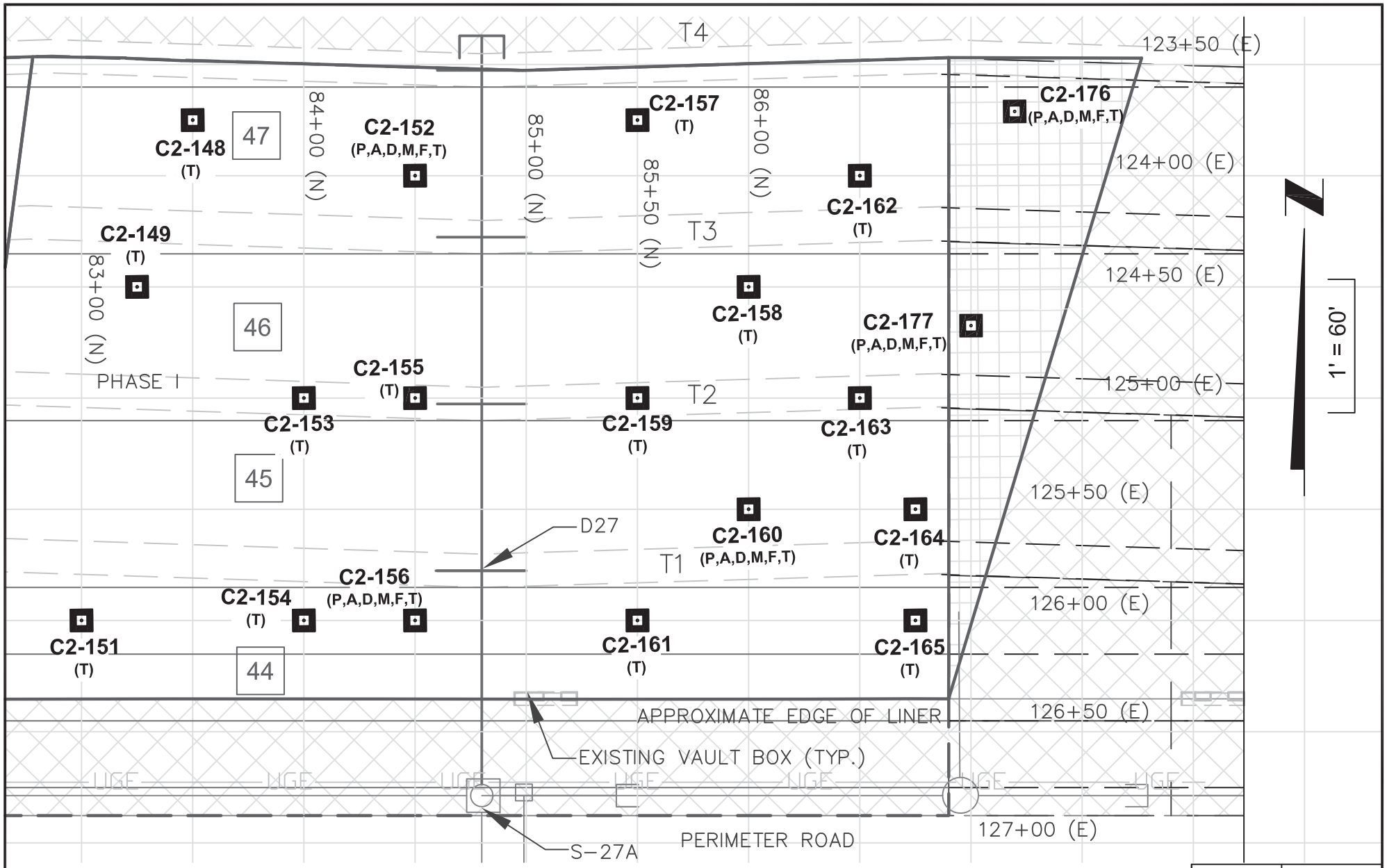
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UNIT NO.	*ACRES±
44	0.62
45	0.79
46	0.80
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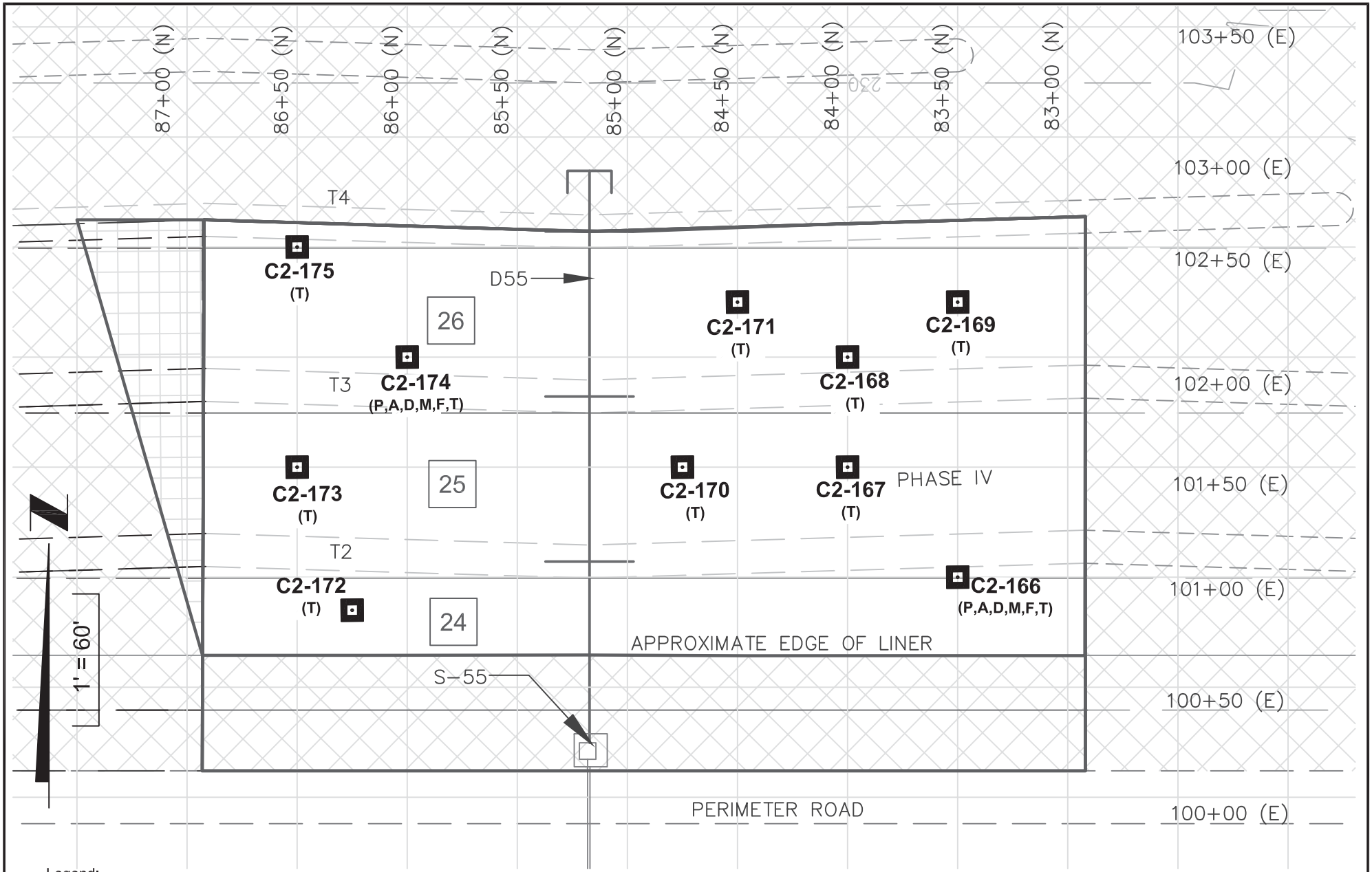
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*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
24	0.34
25	0.73
26	0.83

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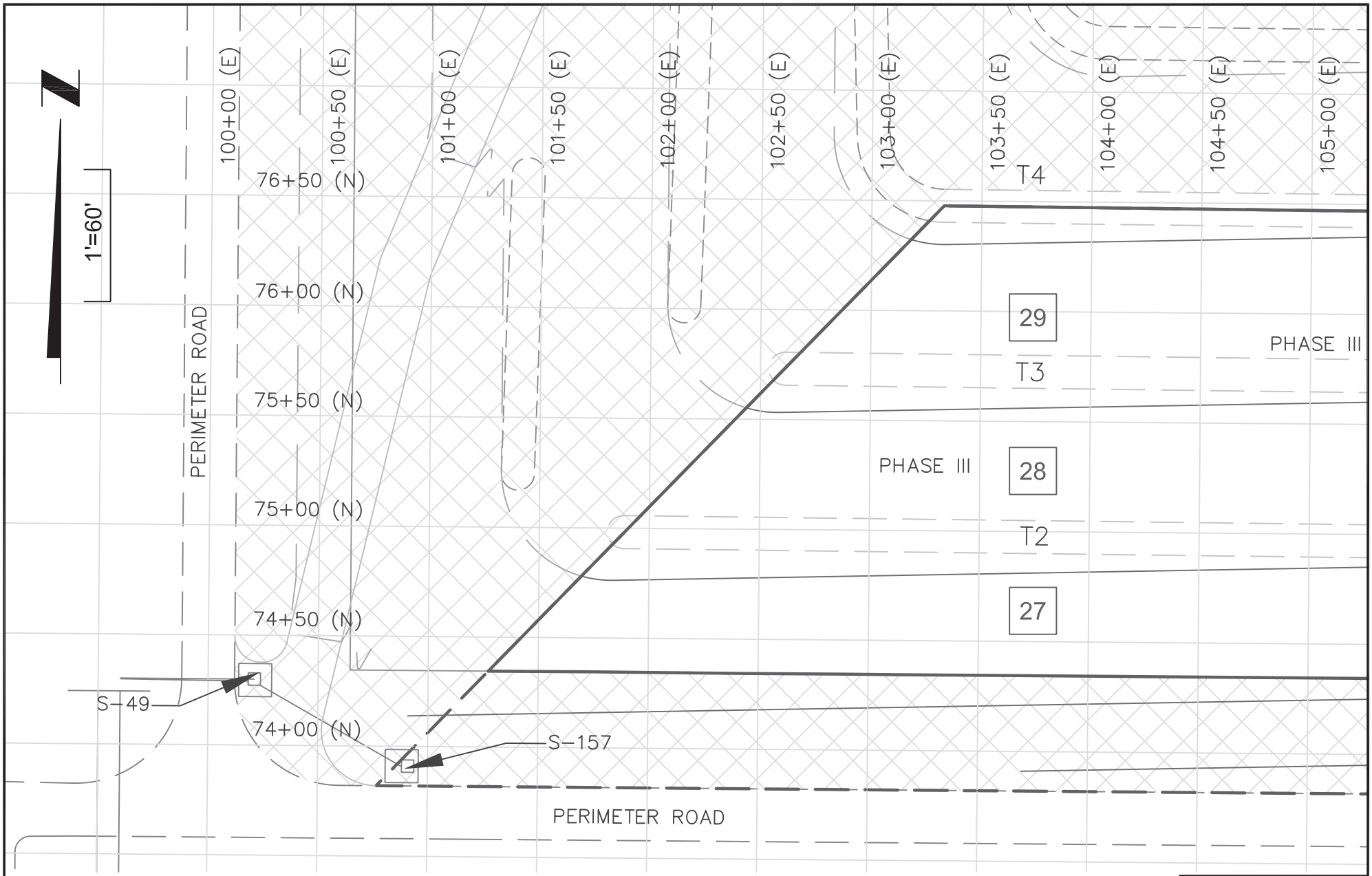
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FIGURE NO.
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Legend:
T=Thickness
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A=Atterbergs
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F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
27	1.10
28	1.20
29	1.23

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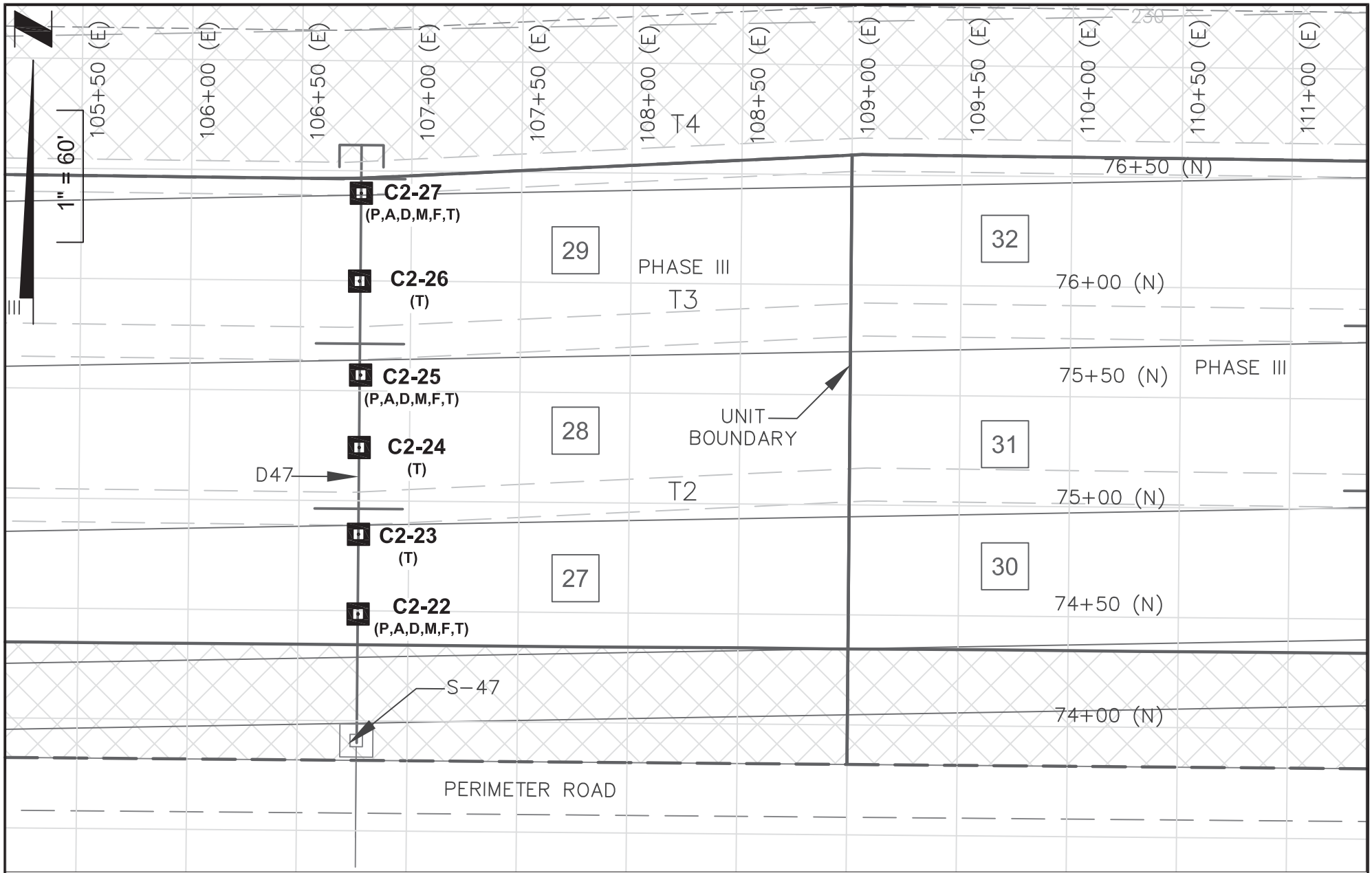
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UNIT NO.	*ACRES±	UNIT NO.	*ACRES±
27	1.10	30	0.74
28	1.20	31	0.73
29	1.23	32	0.83

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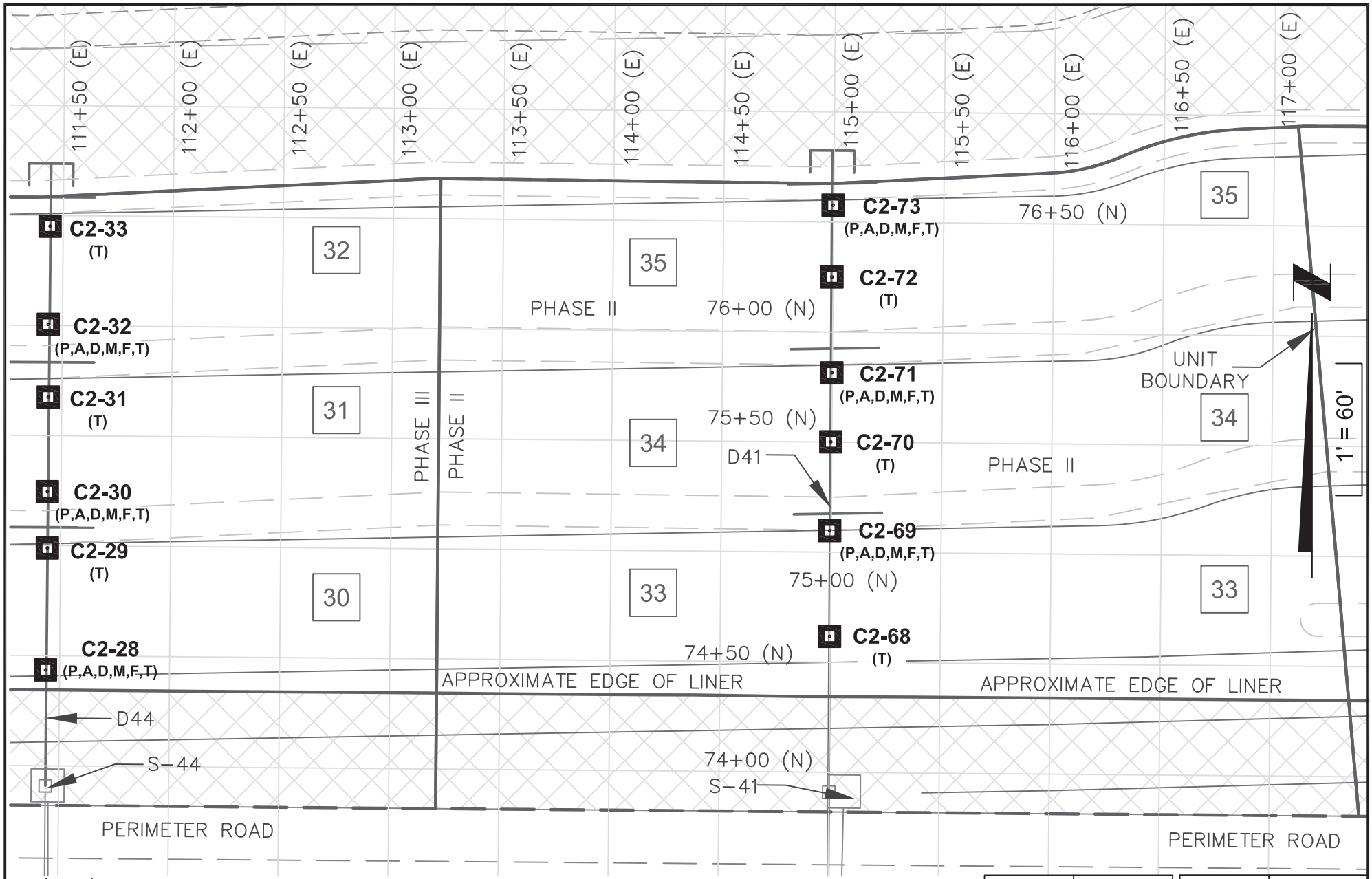
Jacksonville
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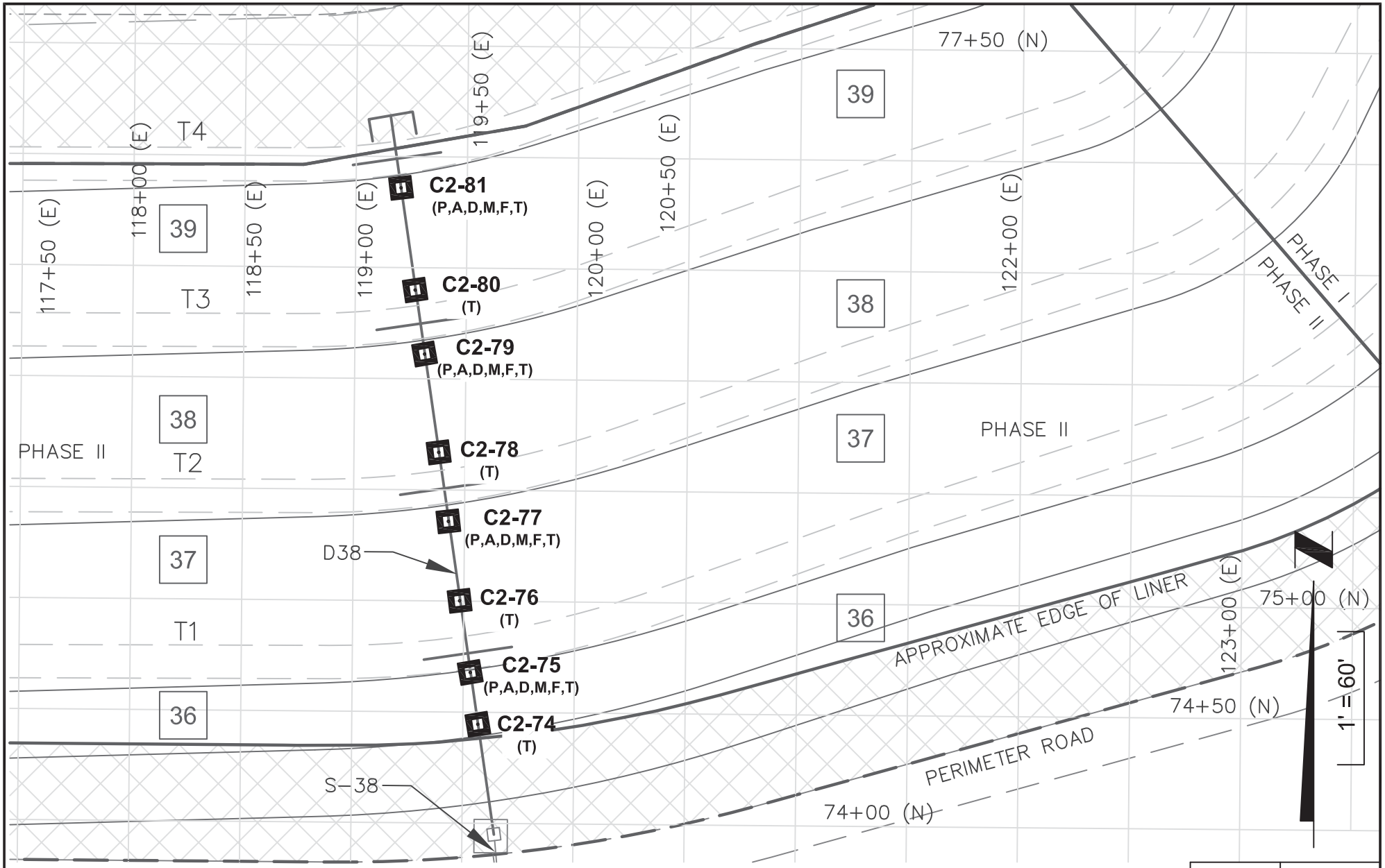
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36	0.72
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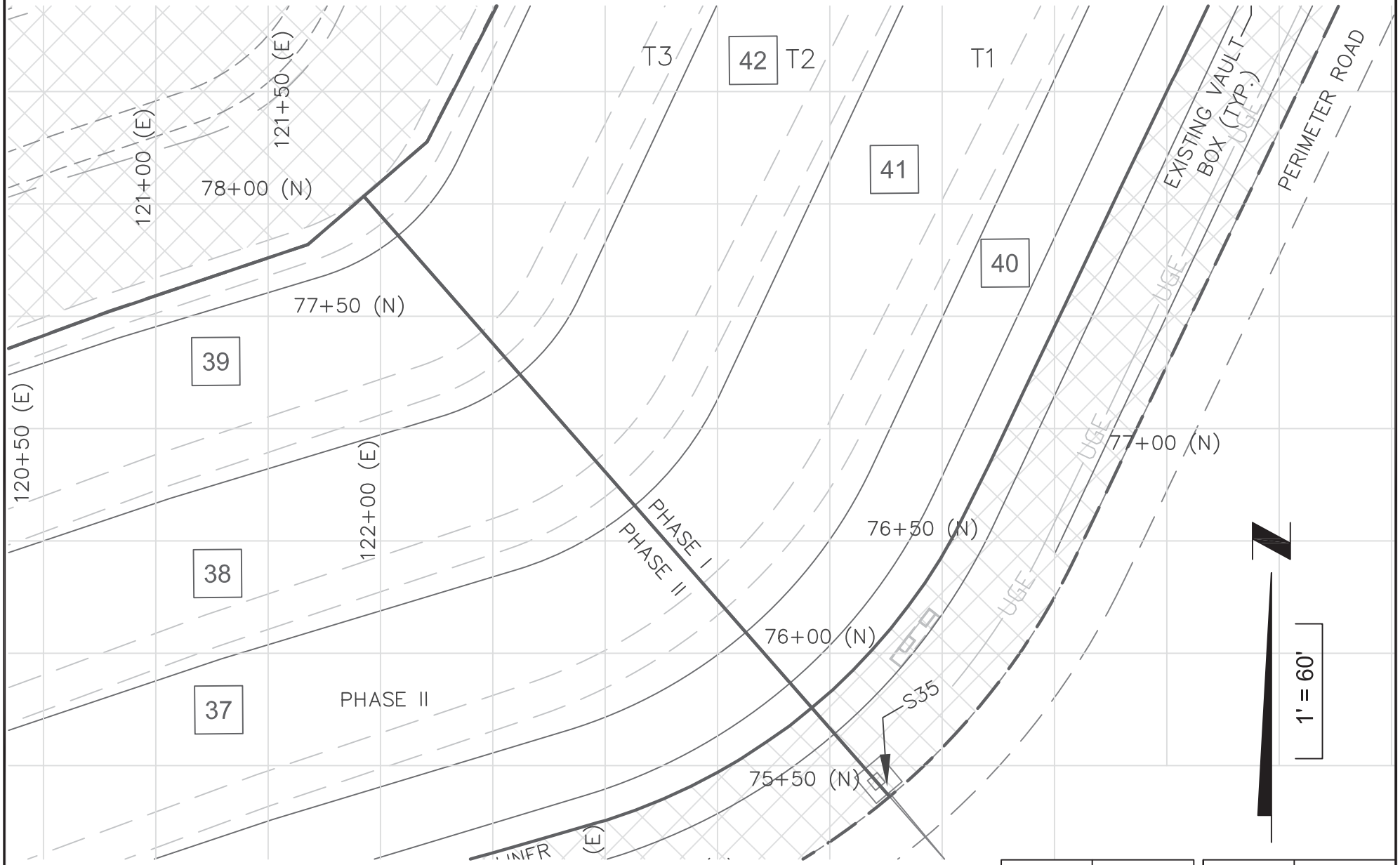
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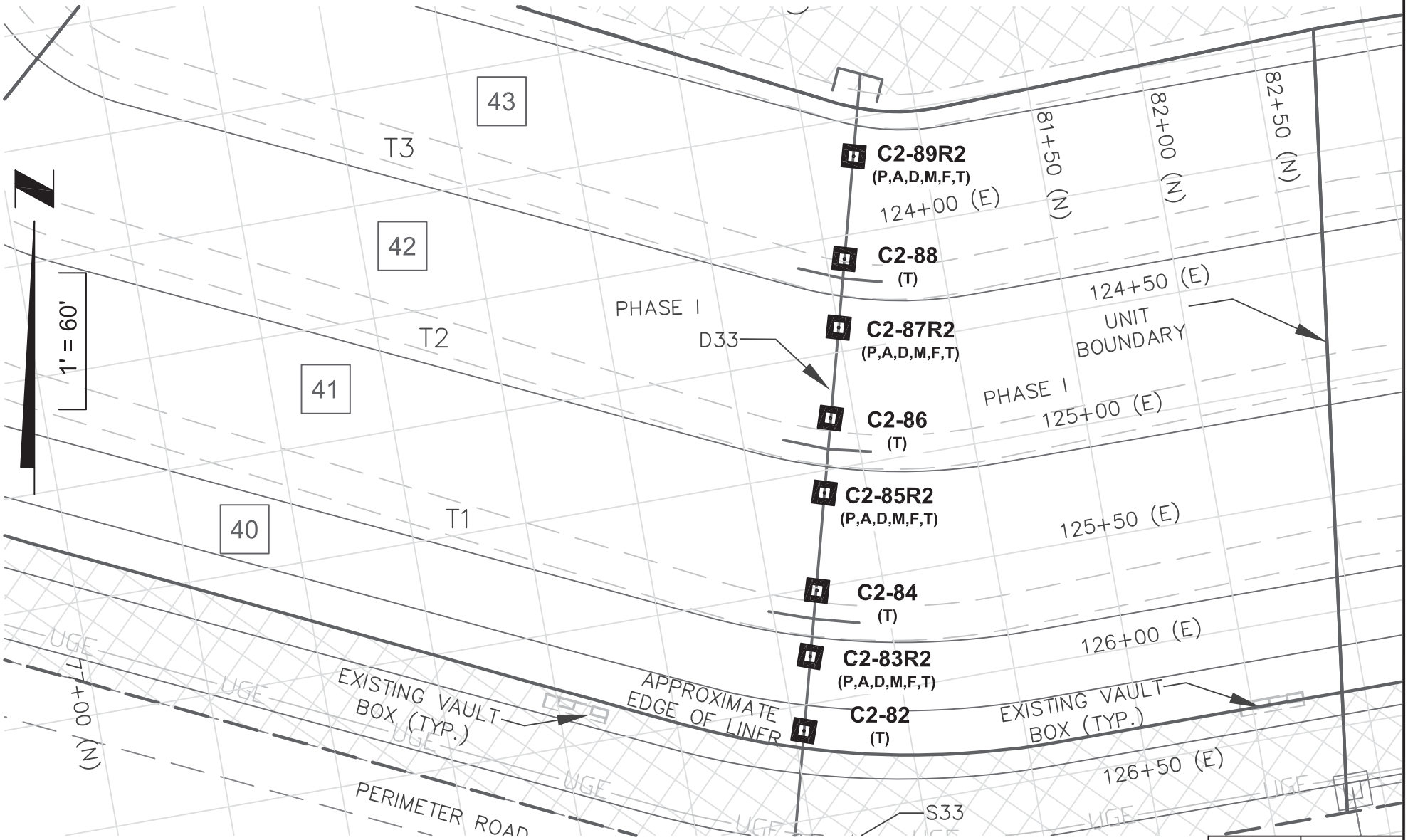
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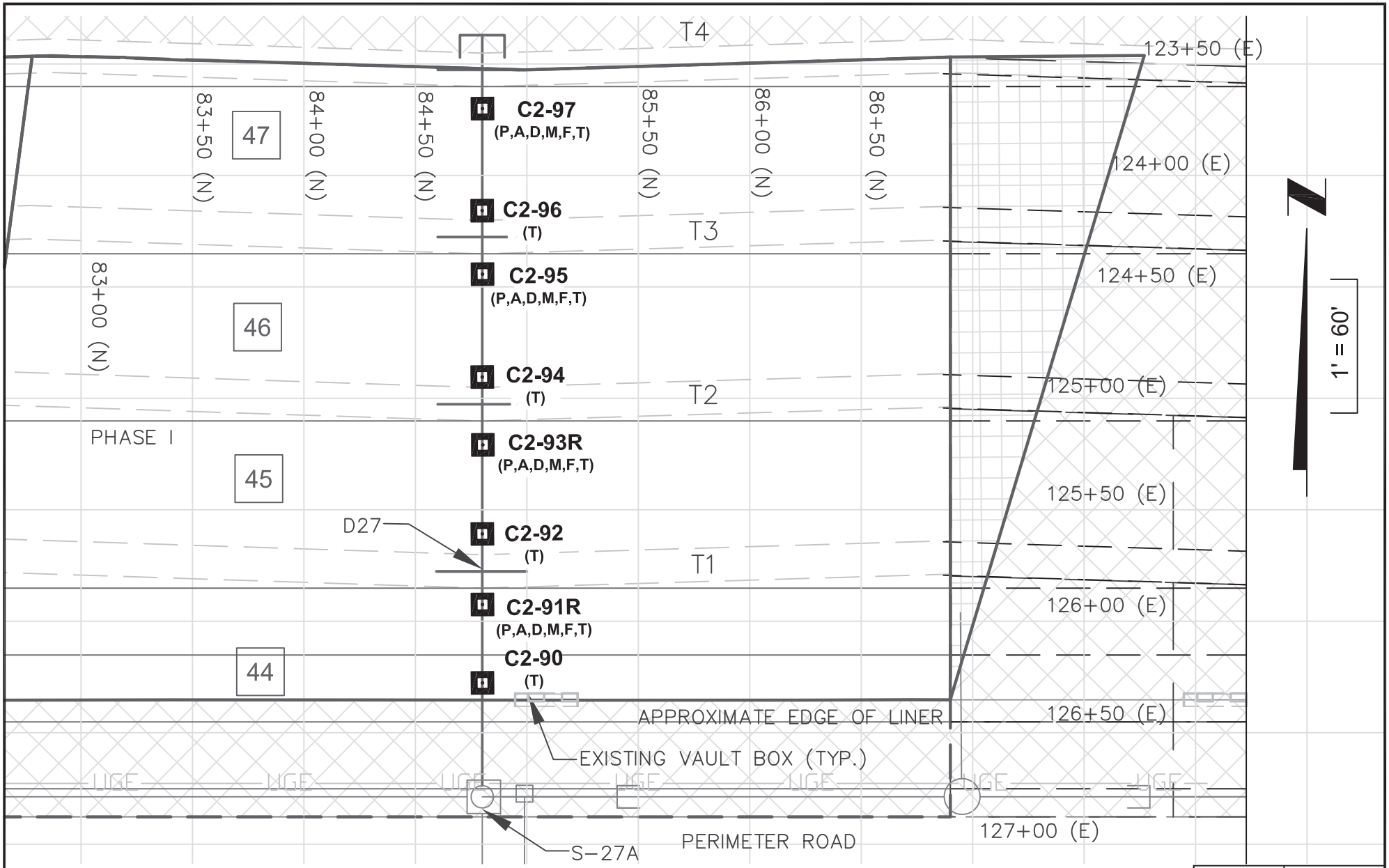
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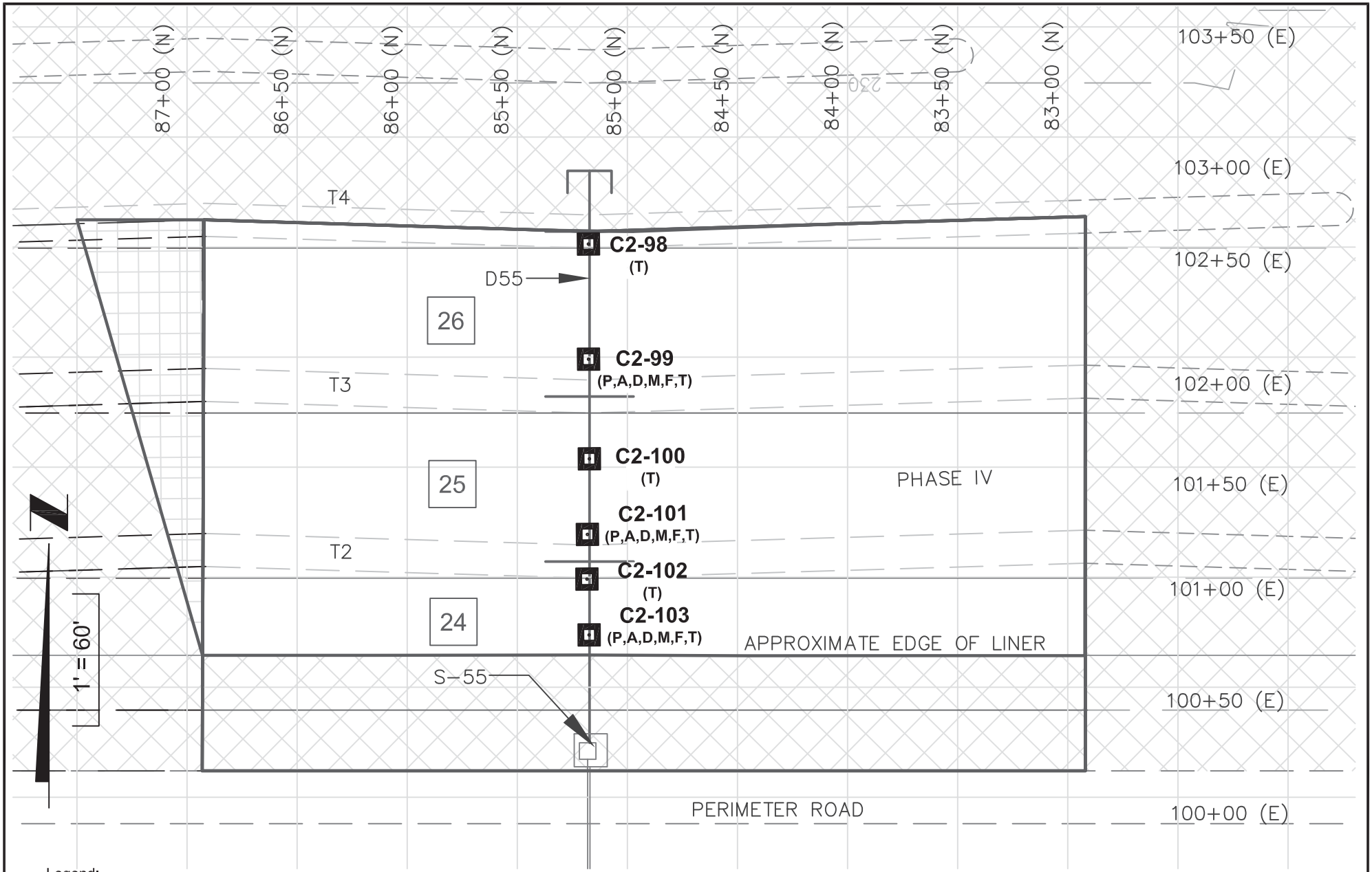
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Jacksonville, Florida
0006-0006

FIGURE NO.
-

Trail Ridge Landfill - Closure Phase 3

UNDERDRAIN SAND

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL CONSTRUCTION TESTING & INSPECTION

September 04, 2012

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

Mr. Scott Lockwood, P.E.
England-Thims & Miller, Inc.
14775 Old St. Augustine Road
Jacksonville, Florida 32258

Subject: Final Underdrain Sand Certification
Trail Ridge Landfill – Phase 3 Construction QA/QC Services
Jacksonville, Florida
MAE Project No. 0006-0006

Dear Mr. Lockwood:

MESKEL & ASSOCIATES ENGINEERING, PLLC (MAE) has completed the monitoring and testing of the underdrain sand at the subject site. The sand material source was tested and prequalified prior to the sand material placement on site; those letters along with test results are subsequently attached. During prequalification and construction the underdrain sand was tested in accordance with the QA/QC plan for:

- Uniformity Coefficient of 1.5 at a minimum frequency of 1 test per 500CY
- Effective Grain Size of 0.2mm to 0.5mm at a minimum frequency of 1 test per 500CY
- Hydraulic Conductivity at a minimum frequency of 1 test 500CY at 1.0E-03cm/sec

All test results within the tables and the map diagrams meets or exceeds the minimum requirements in the plans, specifications and / or the QA/QC plan. The field and laboratory results with the locations are identified in the tables.

No additional tests were required due to failures.

Based on these results, we consider the underdrain sand acceptable. The number of passing tests performed meets or exceeds the minimum requirements in the plans, specifications and / or the QA/QC plan.

We appreciate the opportunity to assist England-Thims & Miller, Inc. on this project. If you have any questions concerning this report, please contact us.

Sincerely,
MESKEL & ASSOCIATES ENGINEERING, PLLC

COPY

Samuel E. Lansdale
Quality Control Monitor

Antoinette (Tina) D. Meskel, P.E.
Quality Assurance Engineer
Licensed, Florida No. 56999

Attachments: Table of Results Underdrain Sand

8936 Western Way, Suite 12
Jacksonville, Florida 32256
Phone: (904)519-6990 Fax: (904)519-6992

December 5, 2011

Mr. Scott Lockwood, P.E.
England-Thims & Miller, Inc.
14775 Old St. Augustine Road
Jacksonville, Florida 32258

Subject: Underdrain Sand Source Pre-Qualification
Trail Ridge Landfill – Phase 3 Construction QA/QC Services
Jacksonville, Florida
MAE Project No. 0006-0006

Dear Mr. Lockwood:

MESKEL & ASSOCIATES ENGINEERING, PLLC (MAE) has completed the pre-qualification testing for the potential underdrain sand borrow source for the subject project. Attached are a site location map (Figure 1), and laboratory test results for modified Proctor, permeability, grain distribution and grain uniformity, testing.

The proposed underdrain sand source, designated the Sybonney Aggregates Stokes Road Pit, is located north of US-90 and west of US 301 in the town of St. George, Charlton County, Georgia. The approximate site location is shown on Figure 1. As part of the site evaluation, sand was sampled from a stockpile on-site (UD-3). The material looked clean and refined white. One sample was submitted to AMEC for laboratory permeability, grain size, and modified Proctor testing.

Based on the test results, it is our opinion that the underdrain sand collected from the Sybonney Aggregates Stokes Road Pit meets the minimum project specifications, and is suitable for use.

We appreciate the opportunity to be of continuing service on this phase of your project. If you have any questions concerning this report, please contact us.

Sincerely,
MESKEL & ASSOCIATES ENGINEERING, PLLC

COPY

Samuel E Lansdale
Quality Control Monitor

Antoinette (Tina) D. Meskel, P.E.
Quality Assurance Engineer
Registered, Florida No. 56999

Attachments:
Figures: Site Location Plan (Figure 1)
Appendix A: Laboratory Test Results

8936 Western Way, Suite 12
Jacksonville, Florida 32256
Phone: (904)519-6990 Fax: (904)519-6992

amec

REPORT OF SOIL PERMEABILITY TESTING

Project: Trailridge **Project Number:** 6736-11-5123

Client City of Jacksonville **Date Completed:** November 15, 2011

Sample Number: Underdrain #3

The sample was remolded to 100% of fill material proctor maximum density 107.8 at optimum moisture of 12.4%. The compacted sample was tested for permeability and the results are outlined below.

Sample Information:

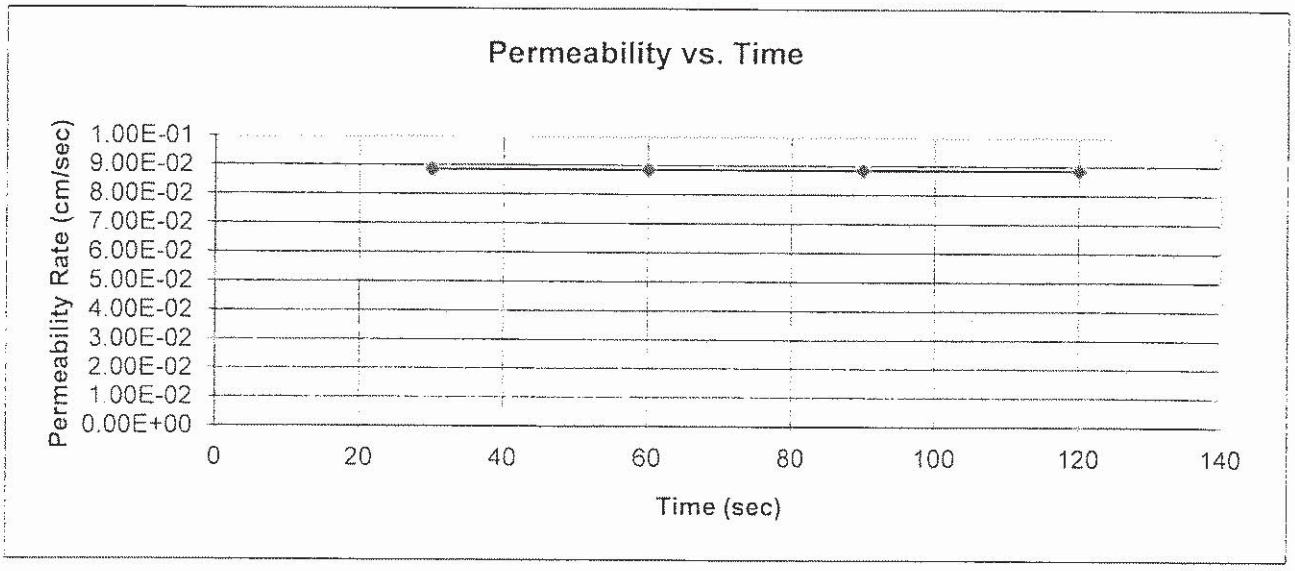
Dia. (in.)	3.99	**Length (in)**	4.59	**Weight (gr)**	1826
Wet Density (pcf)	121.5	**Moisture Content (%)**	12.5	**Dry Density (pcf)**	108.0

Test Parameters

Test Method Used:	ASTM D-2434	**Permeant Fluid:**	Tap water

Permeability Rate

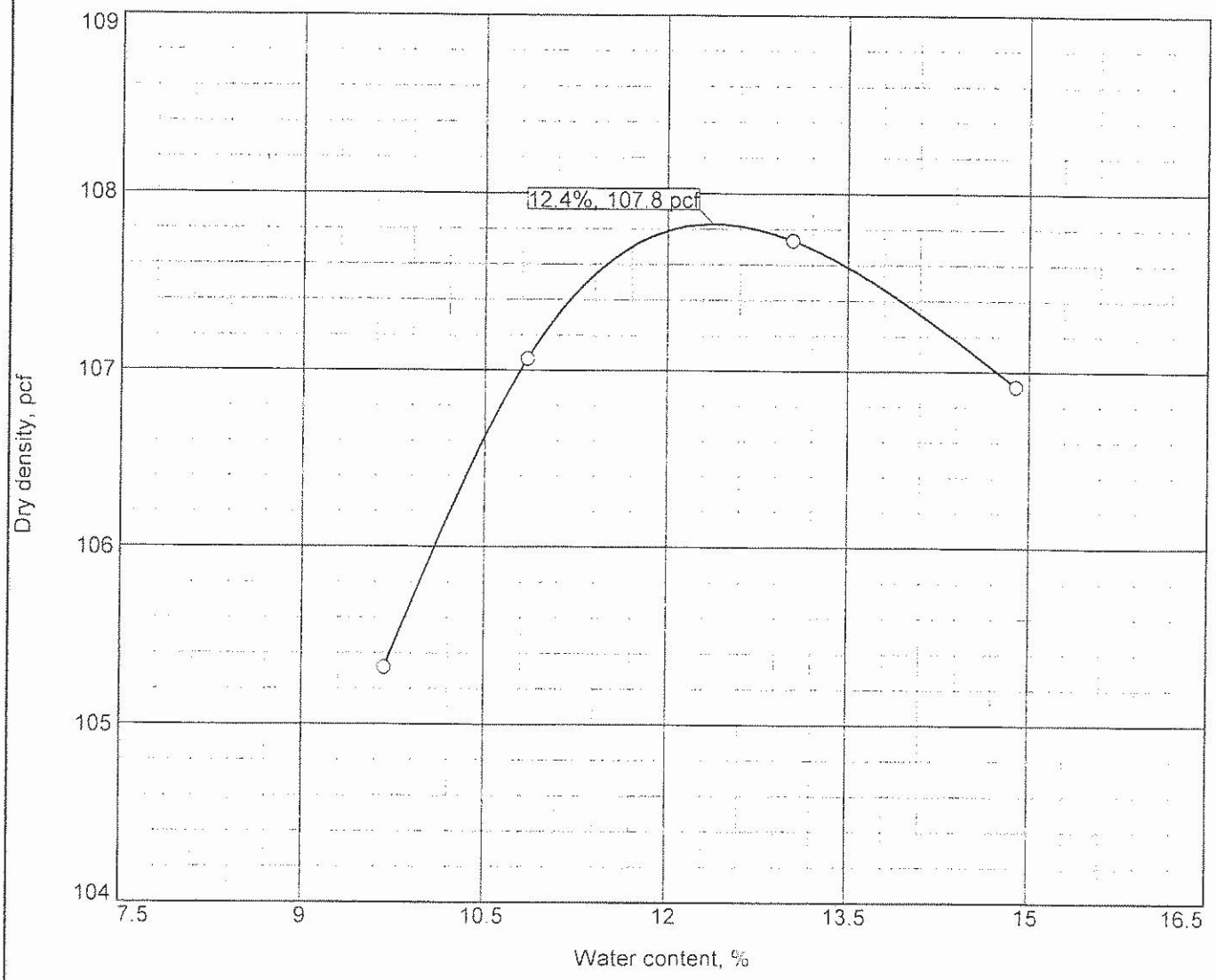
8.9E-02



Reviewed By:

Mike Holm, P.E.

COMPACTION TEST REPORT



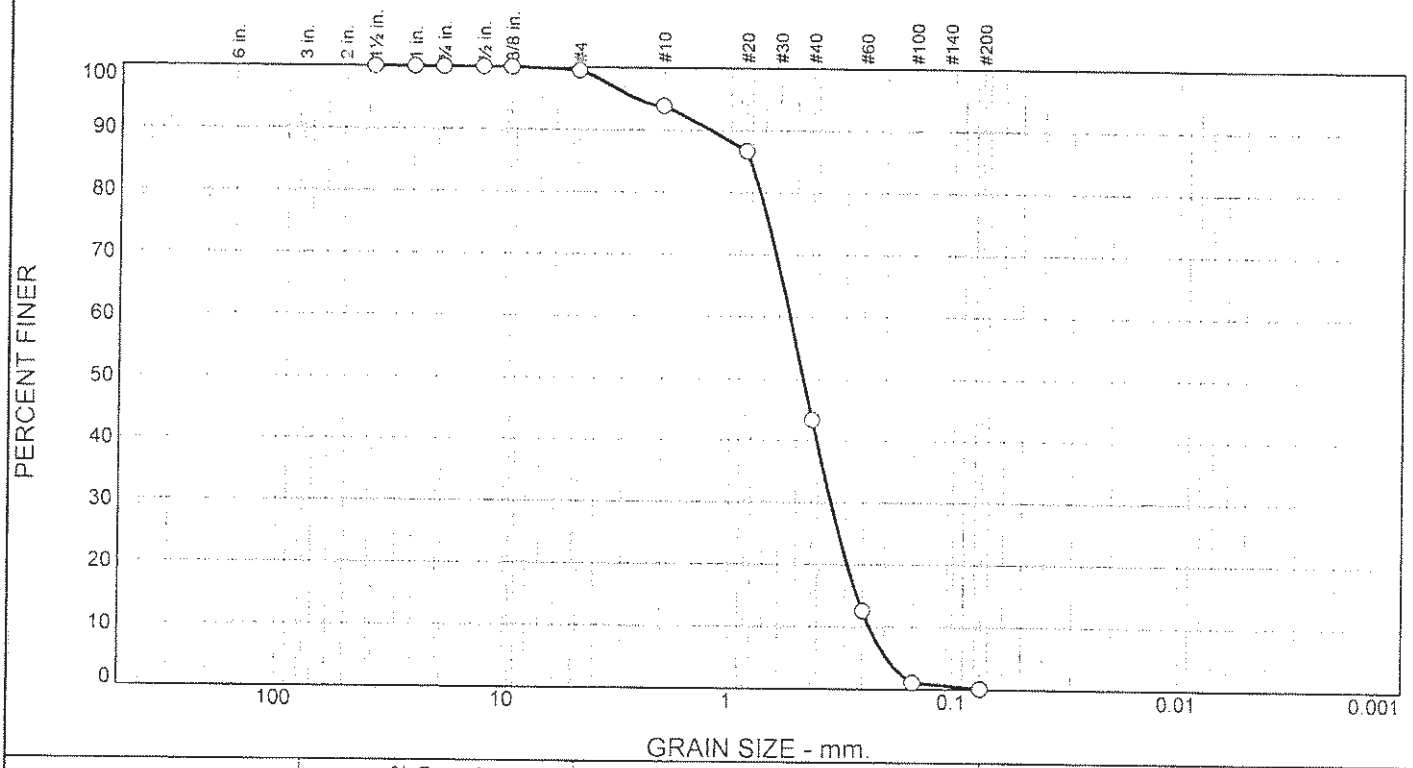
Test specification: ASTM D 1557-07 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
	SP	A-1-b			NP	NP	0.5	0.2

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 107.8 pcf Optimum moisture = 12.4 %	Light Gray Fine SAND
Project No. 6736115123 **Client:** Meskel & Associates **Project:** Trailridge Landfill Closure **Location:** Siboney Aggregates, Stokes Rd. **Sample Number:** 3	**Remarks:**
AMEC E&I Jacksonville, Florida	Figure

Tested By: CM

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	5.6	50.5	43.2	0.2	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.5		
#10	93.9		
#20	86.7		
#40	43.4		
#60	12.6		
#100	1.1		
#200	0.2		

* (no specification provided)

Material Description

Light Gray Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SP AASHTO (M 145)= A-1-b

Coefficients

D_{90}= 1.2288 D_{85}= 0.8150 D_{60}= 0.5365
D_{50}= 0.4665 D_{30}= 0.3480 D_{15}= 0.2643
D_{10}= 0.2330 C_u= 2.30 C_c= 0.97

Remarks

Date Received: 11/9/11 Date Tested: 11/10/11

Tested By: CM

Checked By: _____

Title: _____

Location: Siboney Aggregates, Stokes Rd.
Sample Number: 3

Date Sampled: 11/9/11

AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates
Project: Trailridge Landfill Closure

Project No: 6736115123

Figure MSH



Site Location Map

PREPARED BY	PROJECT NAME	
MAE meskelengineering.com	**Trail Ridge Landfill Jacksonville, Florida**	
	REFERERENCE	SCALE
	Delorme XMap 7.0	NTS
PREPARED FOR	MAE PROJECT NO.	**FIGURE NO.**
England-Thims & Miller, Inc.	0006-0006	1

Trail Ridge Landfill - Closure Phase 3

UNDERDRAIN SAND

All Phases Test Results Table

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL CONSTRUCTION TESTING & INSPECTION

Trail Ridge Landfill - Closure Phase 3
UNDERDRAIN SAND TEST RESULTS

Uniformity Coefficient Minimum: 1.5 **Effective Grain Size:** 0.2mm to 0.5mm

Permeability Minimum: 1.0x10-3cm/sec **Frequency:** Once per 500CY

Legend: I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested

Sample Number	Location	Tests	Uniformity Coefficient	Effective Grain Size	Coefficient of Permeability (cm/sec)	Test Result
All Phases						
Prequalification underdrain sample #3	Sybonney Aggregates	PEU	2.3	0.233	8.90E-02	PASS
Production Sample #1	Sybonney Aggregates	PEU	2.42	0.21	8.40E-03	PASS
Production Sample #2	Sybonney Aggregates	PEU	2.11	0.21	4.60E-02	PASS
Production Sample #3	Sybonney Aggregates	PEU	2.47	0.21	1.70E-01	PASS
All Phases Tests Required			**2.5**	**2.5**	**2.5**	
All Phases Tests Performed			**3.0**	**3.0**	**3.0**	**PASS**

* Approximate Length of sand 8287' x Approximate width of sand 4' x Approximate depth of sand 1' = Approximately 1227CY

Trail Ridge Landfill - Closure Phase 3

VEGETATIVE COVER LAYER



September 04, 2012

Mr. Scott Lockwood, P.E.
England-Thims & Miller, Inc.
14775 Old St. Augustine Road
Jacksonville, Florida 32258

Subject: Final Vegetative Cover Layer Certification
Trail Ridge Landfill – Phase 3 Construction QA/QC Services
Jacksonville, Florida
MAE Project No. 0006-0006

Dear Mr. Lockwood:

Meskel & Associates Engineering, Pllc (MAE) has completed the monitoring and testing of the vegetative cover layer at the subject site. The vegetative cover layer was tested for:

- Thickness at a minimum frequency of 4 tests per acre per layer at 24"

All test results as shown in the tables and the map diagrams meets or exceeds the minimum requirements in the plans, specifications and / or the QA/QC plan. Additionally, in accordance with the QA/QC plan the first five acres of the first phase (Phase III units 27, 28, 29, 30, 31, 32), the testing frequency was doubled. The field and laboratory results with the locations are identified in the tables and the map diagrams for Phases I, II, II and IV.

No additional tests were performed and there were no failures.

Based on these results, we consider the vegetative cover layer acceptable and reasonably free of brush, weeds and other litter, relatively free of roots, stumps, stones and other extraneous material or toxic matter that is harmful to plants (QA/QC plan 4b). The number of passing tests performed meets or exceeds the minimum requirements in the plans, specifications and / or the QA/QC plan.

We appreciate the opportunity to assist England-Thims & Miller, Inc. on this project. If you have any questions concerning this report, please contact us.

Sincerely,
MESKEL & ASSOCIATES ENGINEERING, PLLC

COPY

Samuel E. Lansdale
Quality Control Monitor

Antoinette (Tina) D. Meskel, P.E.
Quality Assurance Engineer
Licensed, Florida No. 56999

Attachments: Table of Results Phase I, II, III, IV
Map Diagrams Phase I, II, III, IV

8936 Western Way, Suite 12
Jacksonville, Florida 32256
Phone: (904)519-6990 Fax: (904)519-6992

November 9, 2011
Revised, September 10, 2012

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

Mr. Scott Lockwood, P.E.
England-Thims & Miller, Inc.
14775 Old St. Augustine Road
Jacksonville, Florida 32258

Subject: Vegetative Cover – Jacob's and Spencer Borrow Pits
Trail Ridge Landfill – Phase 3 Construction QA/QC Services
Jacksonville, Florida
MAE Project No. 0006-0006

Dear Mr. Lockwood:

In accordance with the project QA/QC plans, **MESKEL & ASSOCIATES ENGINEERING, PLLC (MAE)** has completed the laboratory testing of the vegetative cover soils which will be imported to the project site from the Jacob's and Spencer Borrow Pits. The approximate borrow pit locations are shown on the attached Figures 1 and 2.

Test results are attached and include Modified Proctor, organic content, pH, and Triaxial Shear Strength testing. As can be seen from the pH test results attached, the pH value for the soils obtained from the Jacob's pit is lower than the minimum 5.0 required by the project QA/QC Plan. Therefore, the upper six inches of the Vegetative Cover material will be imported from the Spencer Borrow Pit. The pH test results from this pit are also attached and indicate a pH of 5.3.

Triaxial Shear Strength test results are attached for the Jacob's and Spencer Borrow Pit soils. Calculations against internal shearing using these test results are also attached. In addition, 2 Direct Shear Tests were performed using the borrow pit samples and Clay Cover material. Each test included vegetative cover soils from either the Jacob's or Spencer pit in one half of the shear box and clay soils in the other half, and shearing was forced along the interface of the two soils. Test results were used to determine the Factors of Safety against interface sliding. Direct shear test results and the associated interface sliding calculations for both borrow pit materials were included with the Clay Borrow Source Pre-Qualification letter (also included in this submittal).

Test results indicate Factors of Safety greater than 1.5 for internal shearing of the Vegetative Cover material, and Vegetative Cover/Clay Layer interface sliding. Based on these shear test and pH testing results, we consider vegetative material obtained from the Jacob's and Spencer Borrow Pits to be suitable for use for the project.

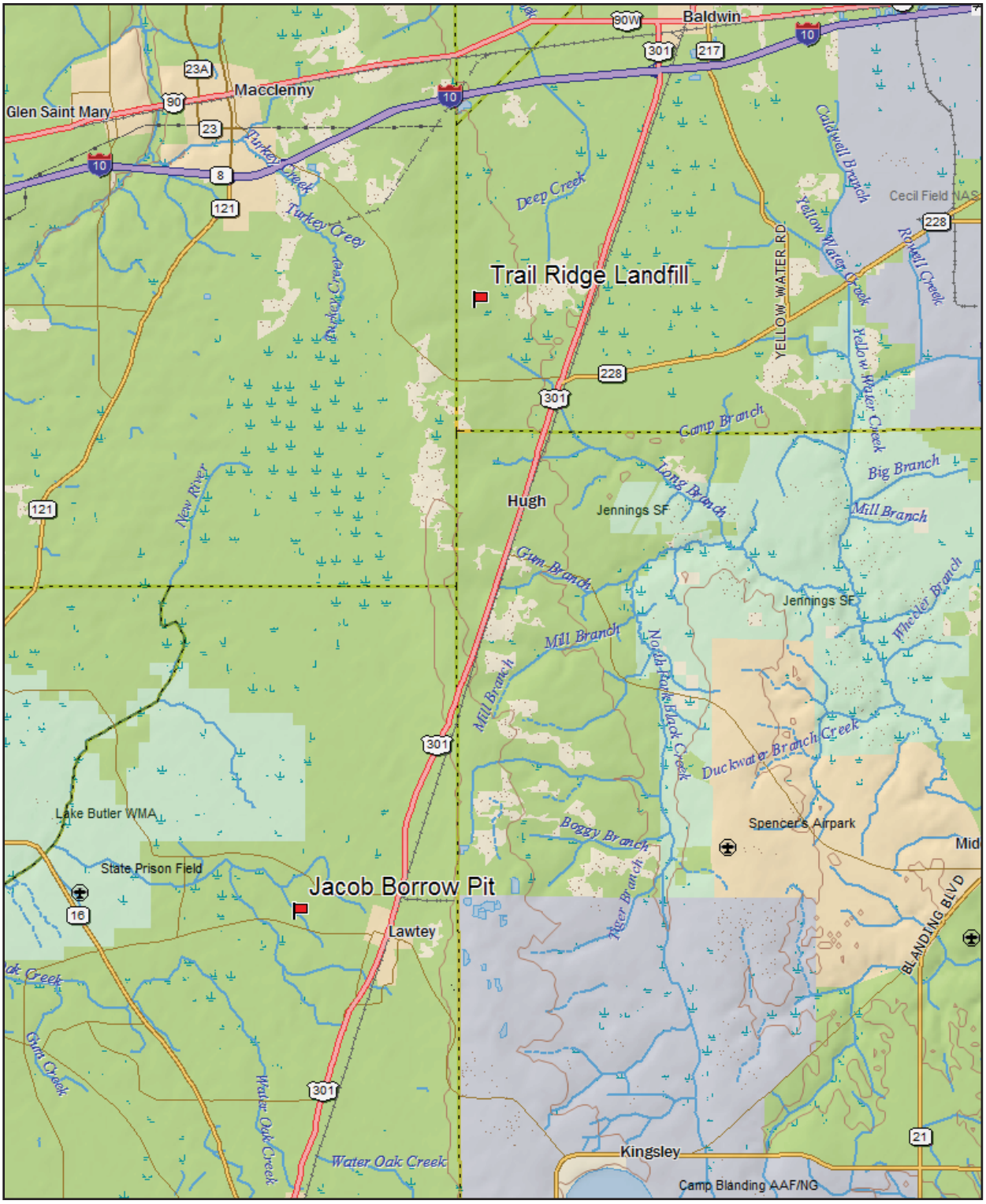
We appreciate the opportunity to assist England-Thims & Miller, Inc. on this phase of your project. If you have any questions concerning this report, please contact us.

Sincerely,
MESKEL & ASSOCIATES ENGINEERING, PLLC

COPY

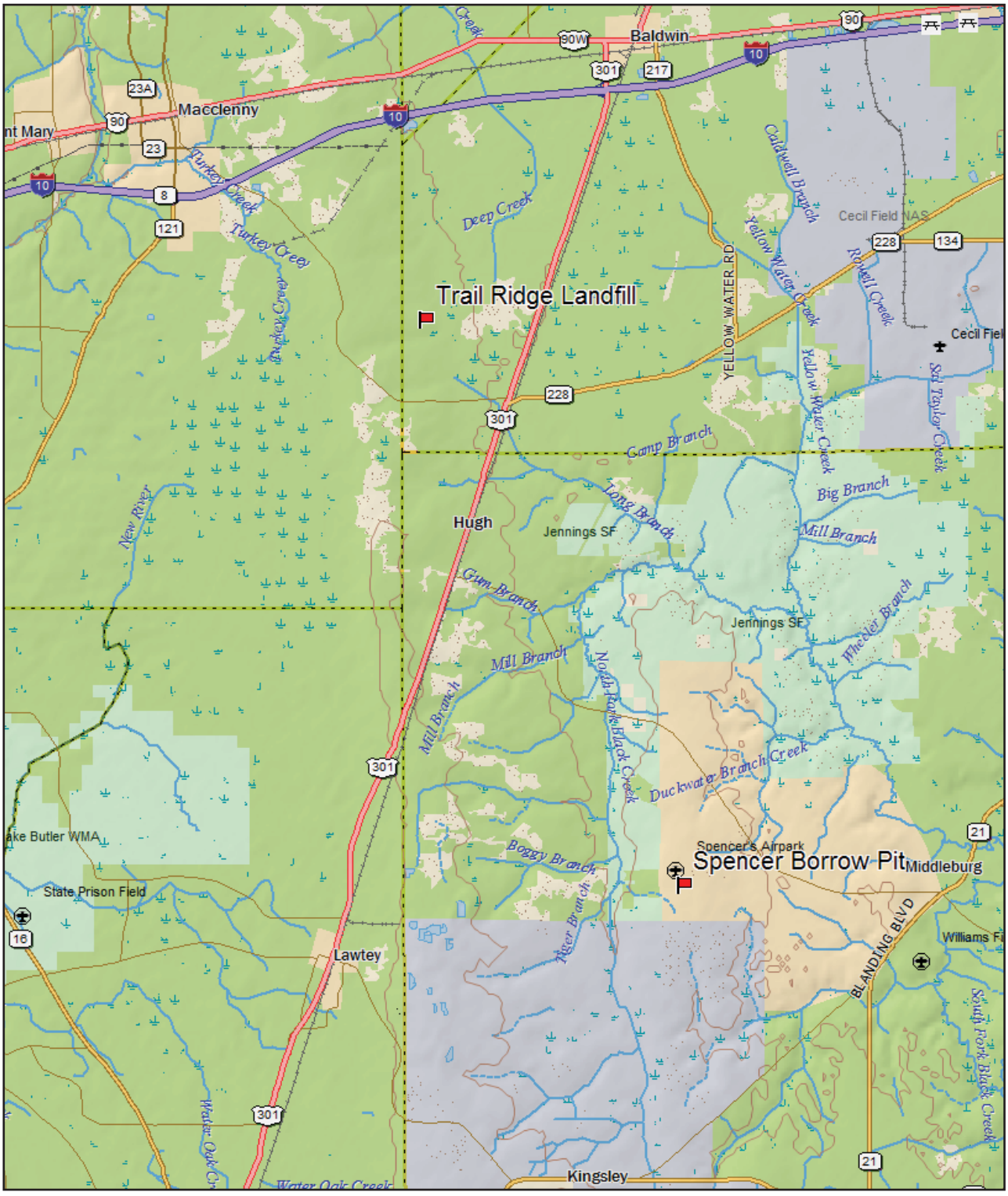
Antoinette (Tina) D. Meskel, P.E.
Quality Assurance Engineer
Licensed, Florida No. 56999

8936 Western Way, Suite 12
Jacksonville, Florida 32256
Phone: (904)519-6990 Fax: (904)519-6992



Site Location Map

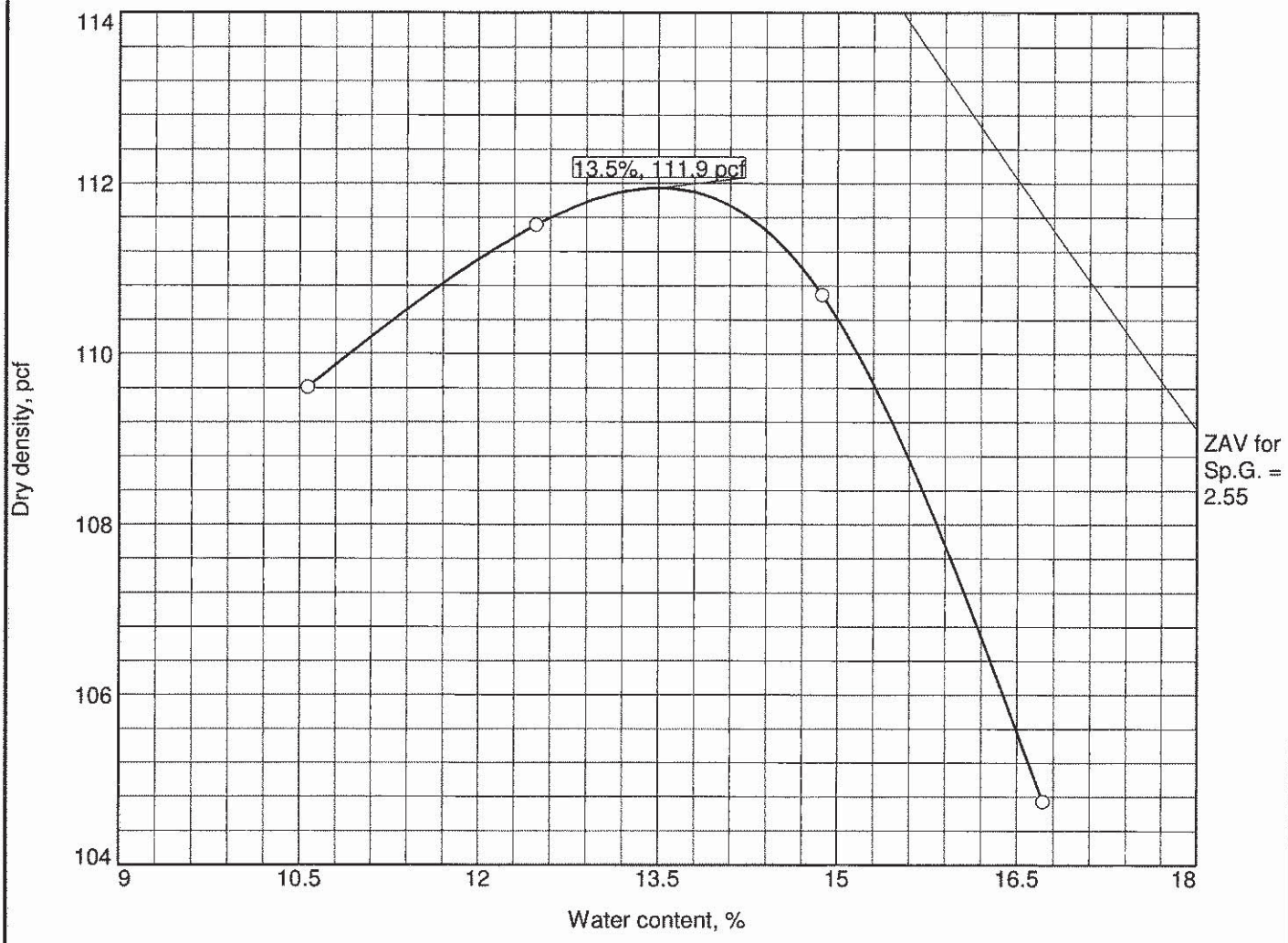
PREPARED BY	PROJECT NAME	
MAE meskelengineering.com	**Trail Ridge Landfill Jacksonville, Florida**	
	REFERERENCE	SCALE
	Delorme XMap 7.0	NTS
PREPARED FOR	MAE PROJECT NO.	**FIGURE NO.**
England-Thims & Miller, Inc.	0006-0006	1



Site Location Map

PREPARED BY	PROJECT NAME	
MAE meskelengineering.com	**Trail Ridge Landfill Jacksonville, Florida**	
	REFERERENCE	SCALE
	Delorme XMap 7.0	NTS
PREPARED FOR	MAE PROJECT NO.	**FIGURE NO.**
England-Thims & Miller, Inc.	0006-0006	2

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 111.9 pcf Optimum moisture = 13.5 %	Brown and Gray Slightly Silty Fine SAND

Project No. 6736115123 **Client:** Meskel & Associates

Project: Trailridge Landfill Closure

Jacob Pit

○ **Source of Sample:** Vegatative Cover (Top Soil) **Sample Number:** TS-1

AMEC E&I

Jacksonville, Florida

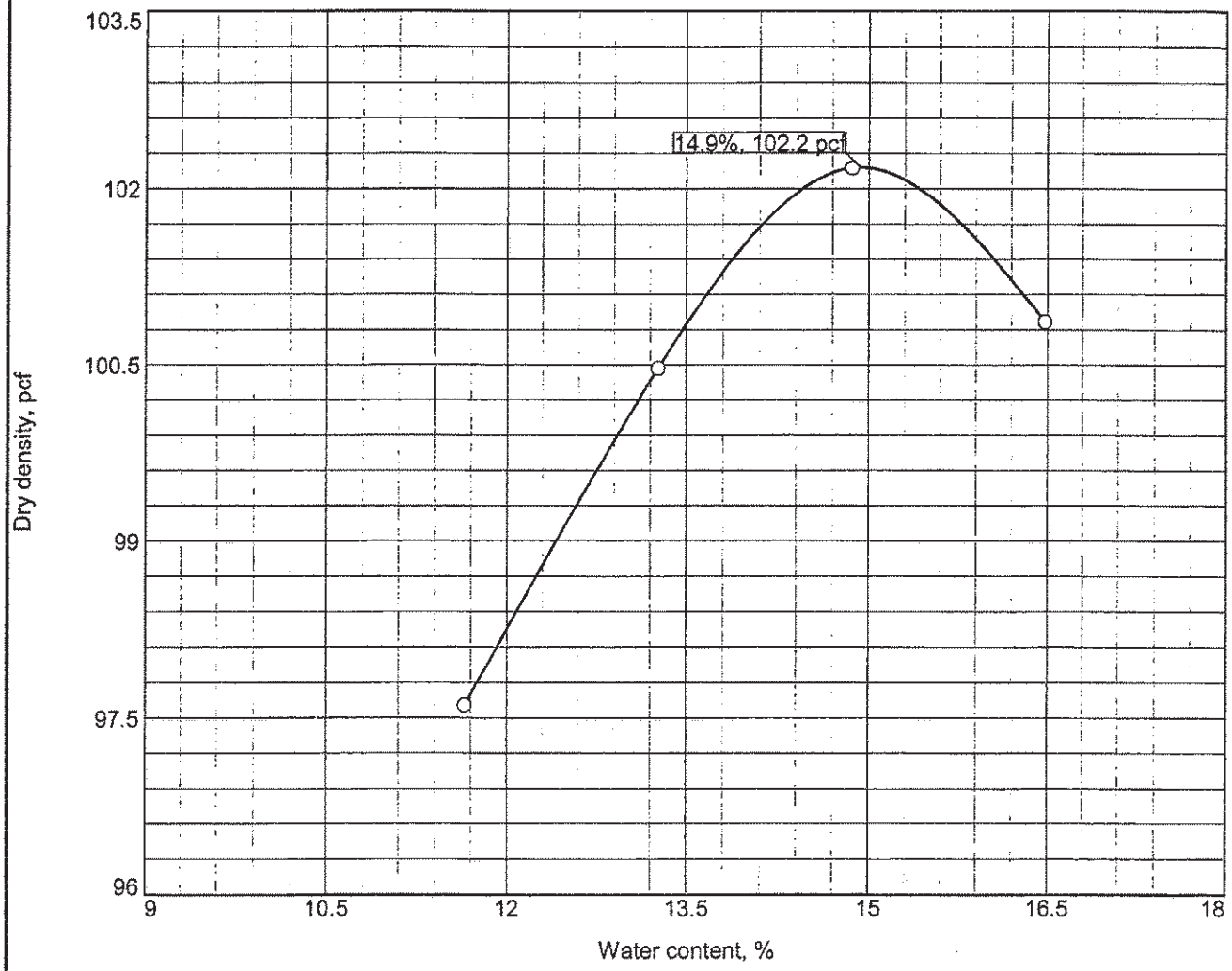
Remarks:

Date Tested: 10-5-11

Figure

Tested By: MC

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
	SP	A-3			NP	NP	0.1	2.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 102.2 pcf Optimum moisture = 14.9 %	Dark Gray Fine SAND
Project No. 6736115123 **Client:** Meskel & Associates **Project:** Trailridge Landfill Closure ○ **Source of Sample:** Vegatative Cover (Top Soil) Spencer Pit **Sample Number:** TS-2 **AMEC E&I** **Jacksonville, Florida**	**Remarks:** **Figure**

Tested By: CM

Michael J. Holm

REPORT OF SOIL TESTING

As requested, AMEC E&I has completed organic and pH testing of four proposed topsoil samples delivered to our Jacksonville office on September 27, 2011. The samples were tested in generel accordance with ASTM D-2974 (loss on ignition) and D-4972 (pH). The results are outlined below.

Project: Trailridge Phase III Closure

Project Number: 6736-11-5123

Client: Meskel & Associates

Date: 9/28/2011

Location: Proposed Top Soil from Borrow Source - Jacob Pit

Sample Number	pH	Can Weight	Dry Weight	After Burn Weight	Percent Organic
TS-3A	3.6	115.41	175.48	172.96	4.2%
TS-3B	4.1	110.43	148.66	145.56	8.1%

Performed By

M. Coleman

Reviewed By

Mike Holm, P.E.

REPORT OF SOIL TESTING

As requested, AMEC E&I has completed organic and pH testing of one proposed topsoil sample delivered to our Jacksonville office on October 3, 2011. The sample was tested in generel accordance with ASTM D-2974 (loss on ignition) and D-4972 (pH). The results are outlined below.

Project: Trailridge Phase III Closure

Project Number: 6736-11-5123

Client: Meskel & Associates

Date: 10/5/2011

Location: Proposed Top Soil from Borrow Source - Spencer Pit

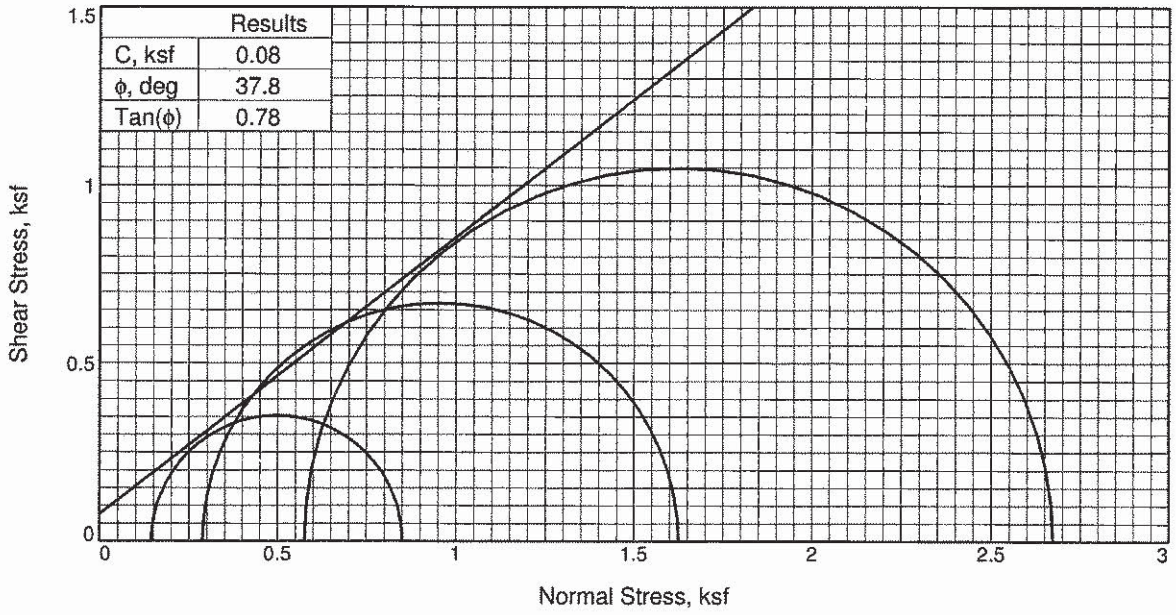
Sample Number	pH	Can Weight	Dry Weight	After Burn Weight	Percent Organic
TS-6	5.3	107.64	134.74	133.93	3.0%

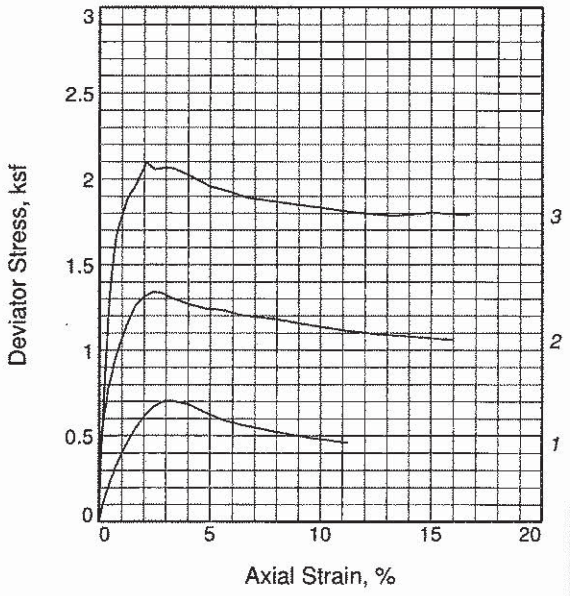
Performed By

M. Coleman

Reviewed By

Mike Holm, P.E.





Sample No.		1	2	3
Initial	Water Content, %	12.2	12.3	12.5
	Dry Density, pcf	96.4	97.1	95.8
	Saturation, %	58.0	59.9	58.5
	Void Ratio	0.4796	0.4684	0.4894
	Diameter, in.	2.83	2.84	2.84
	Height, in.	6.30	6.34	6.13
At Test	Water Content, %	19.0	18.4	16.9
	Dry Density, pcf	99.5	100.4	102.9
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4341	0.4201	0.3869
	Diameter, in.	2.80	2.81	2.77
	Height, in.	6.23	6.27	5.99
Strain rate, in./min.		0.03	0.03	0.03
Back Pressure, psi		50.00	50.00	50.00
Cell Pressure, psi		51.00	52.00	54.00
Fail. Stress, ksf		0.71	1.34	2.10
Ult. Stress, ksf				
σ_1 Failure, ksf		0.85	1.63	2.67
σ_3 Failure, ksf		0.14	0.29	0.58

Type of Test: Consolidated Drained

Sample Type:

Description: Brown and Gray Slightly Silty Fine SAND

Specific Gravity= 2.285

Remarks:

Figure _____

Client: Meskel & Associates

Project: Trailridge Landfill Closure

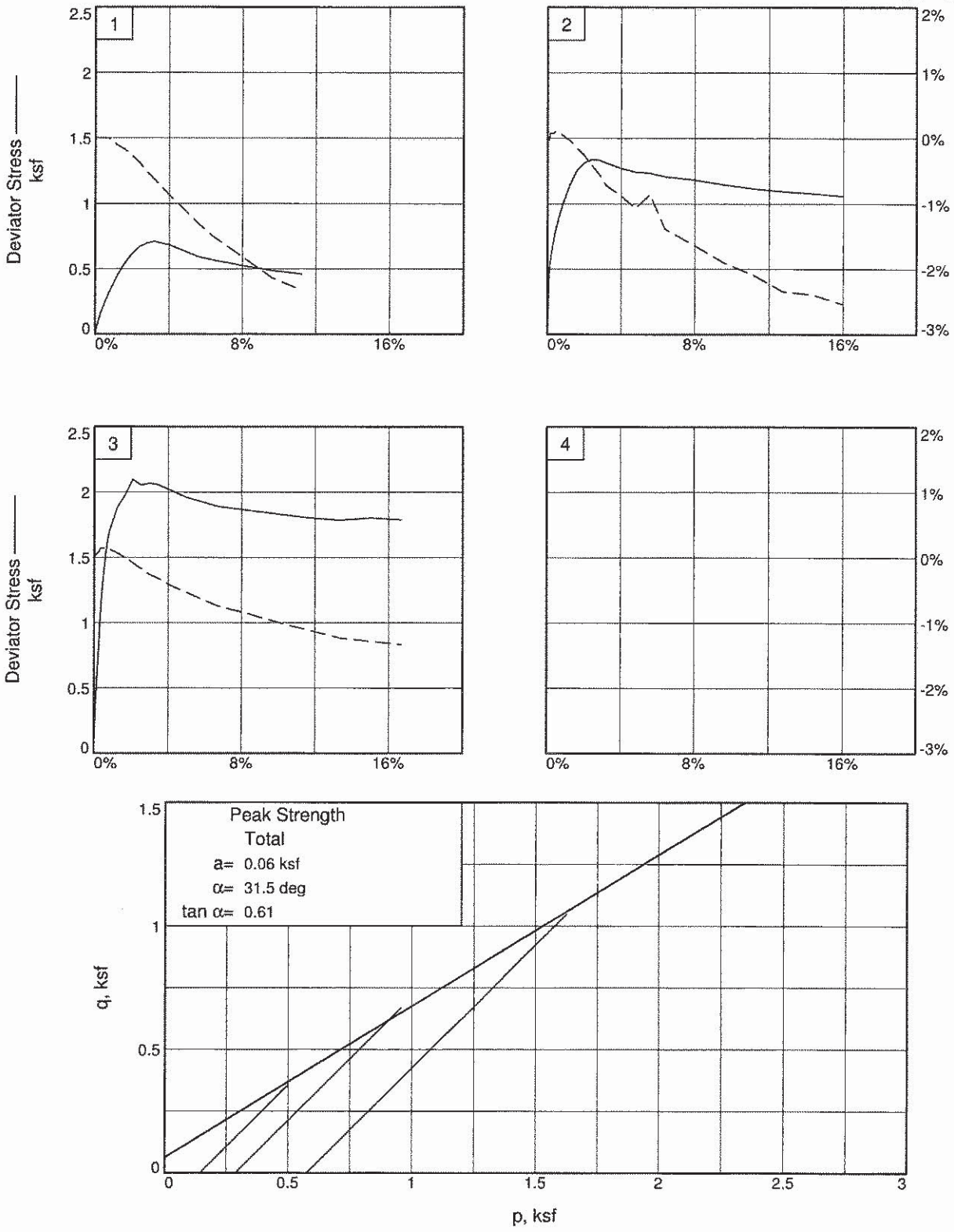
Source of Sample: Vegatative Cover (Top Soil)

Sample Number: TS-1 Jacob Pit

Proj. No.: 6736115123 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
AMEC E&I
Jacksonville, Florida

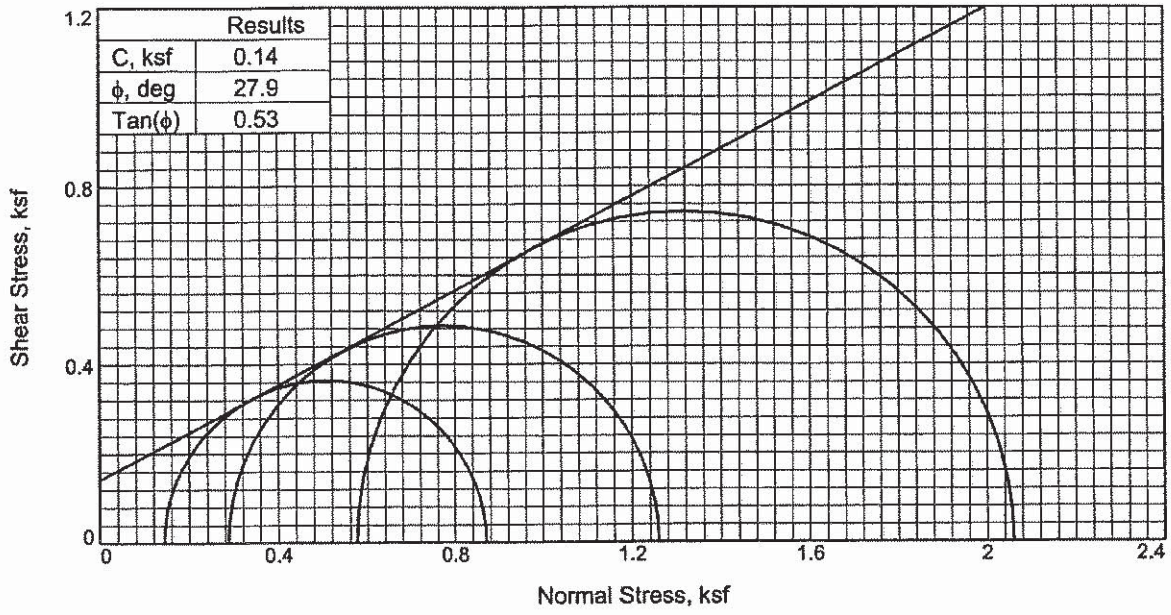
Tested By: MC

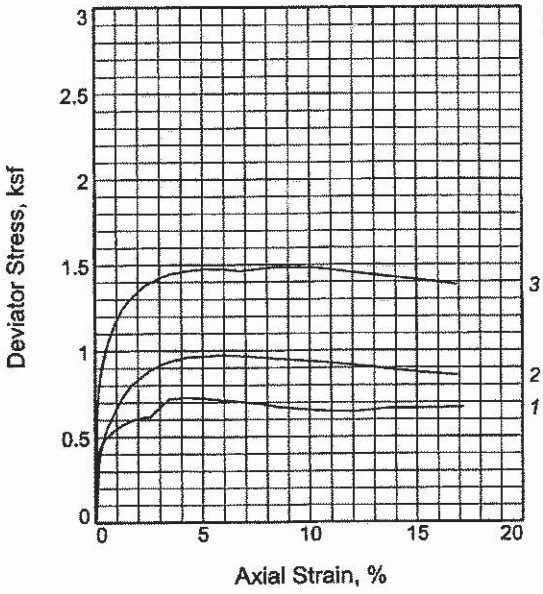


Client: Meskel & Associates
Project: Trailridge Landfill Closure
Source of Sample: Vegatative Cover (Top Soil) **Sample Number:** TS-1
Project No.: 6736115123 **Figure** _____

AMEC E&I

Tested By: MC





Sample No.		1	2	3
Initial	Water Content, %	12.2	12.1	11.0
	Dry Density, pcf	93.3	92.4	93.8
	Saturation, %	41.6	40.4	38.3
	Void Ratio	0.7763	0.7930	0.7668
	Diameter, in.	2.84	2.84	2.84
	Height, in.	5.86	5.99	5.98
At Test	Water Content, %	27.7	27.4	27.1
	Dry Density, pcf	95.5	96.0	96.5
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7347	0.7271	0.7184
	Diameter, in.	2.82	2.80	2.81
	Height, in.	5.81	5.92	5.93
Strain rate, in./min.		0.03	0.03	0.03
Back Pressure, psi		50.00	50.00	50.00
Cell Pressure, psi		51.00	52.00	54.00
Fail. Stress, ksf		0.73	0.97	1.48
Ult. Stress, ksf				
σ_1 Failure, ksf		0.87	1.26	2.06
σ_3 Failure, ksf		0.14	0.29	0.58

Type of Test:
Consolidated Drained
Sample Type: Bulk
Description: Dark Gray Fine SAND

LL= NP **PI=** NP
Specific Gravity= 2.655
Remarks:

Client: Meskel & Associates

Project: Trailridge Landfill Closure

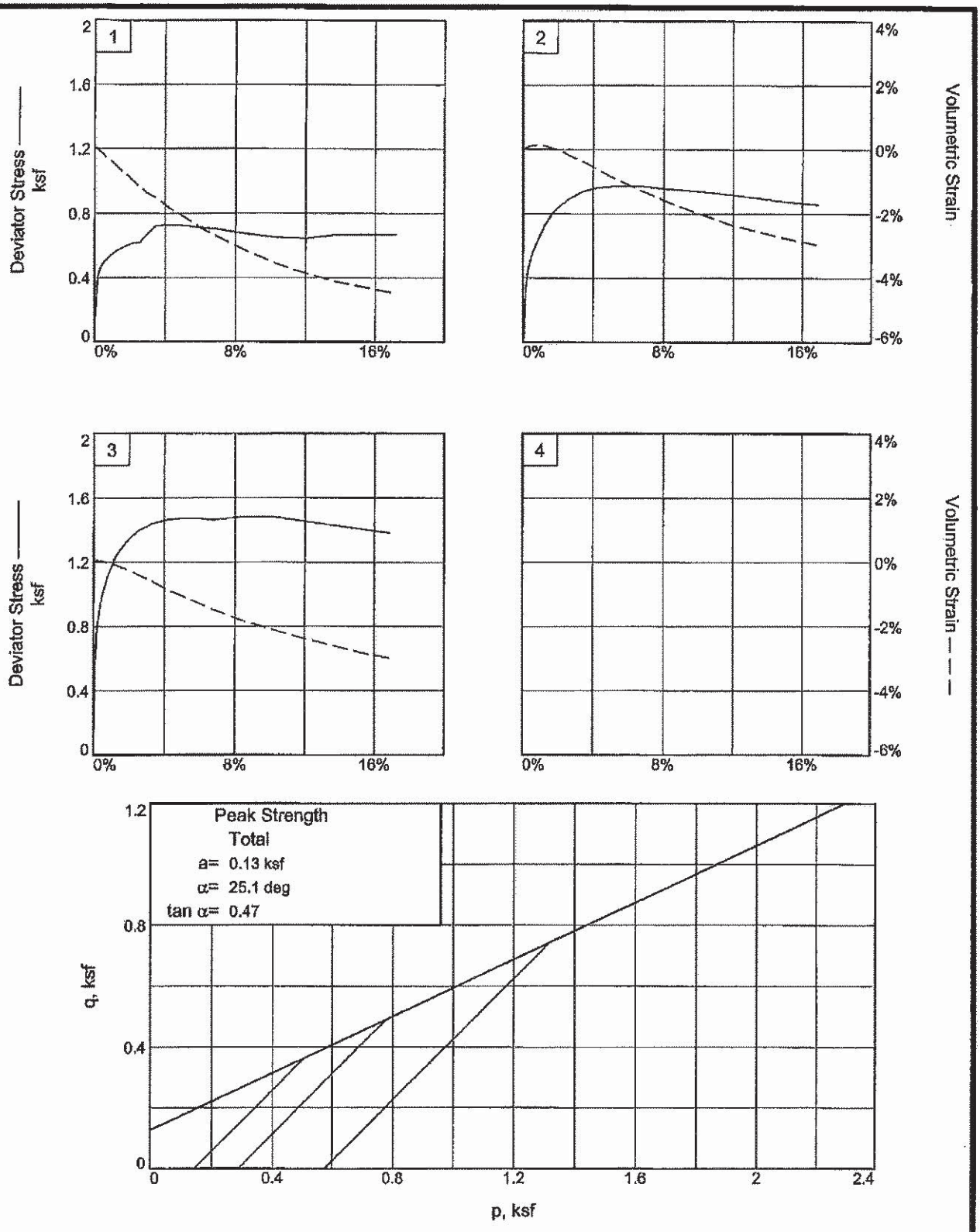
Source of Sample: Vegatative Cover (Top Soil)
Sample Number: TS-2 Spencer Pit
Proj. No.: 6736115123 **Date Sampled:** 10/11/11

TRIAXIAL SHEAR TEST REPORT
AMEC E&I
Jacksonville, Florida

Figure _____

Michael J. Holm

Tested By: FB



Client: Meskel & Associates

Project: Trailridge Landfill Closure

Source of Sample: Vegatative Cover (Top Soil) **Sample Number:** TS-2

Project No.: 6736115123 **Figure** _____

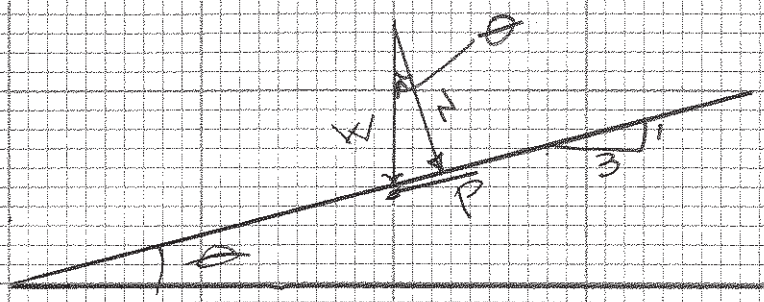
AMEC E&I

Michael J. Holm

Tested By: FB

Vegetative Cover - Internal Sliding Calculations - TRIAXIAL Shear Test Results

ADM 11/2/2011



$\theta = 18.4°$ 1/2

$P = W \sin\theta$

① Jacob Pit = TRIAXIAL Test Results

$\gamma_{D@test} = 96.4$ pcf Avg

Water Content, $w_{Avg} = 12.3\%$

$\gamma_{sat} = 96.4(1.123) = \underline{108.3 \text{ pcf}}$

SLIDING AT MID layer →

$W = 108.3 \text{ pcf} * 1 \text{ ft} = \underline{108.3 \text{ psf}}$

P = Driving Force $= (108.3 \text{psf}) \sin 18.4°$

$= \underline{34.3 \text{ psf}}$

RESISTING FORCE ⇒ Shear Strength from TRIAXIAL Shear test, T_f

$T_f = \sigma_f \tan\phi + c$

σ_f = Normal force applied = $\frac{\sigma_1 - \sigma_3}{2}$

ϕ = measured ∠ of internal friction

$c = \phi$

σ_f @ lowest normal stress = $\left(\frac{0.85 - 0.14}{2}\right) * 1000 = \underline{355 \text{ psf}}$

$T_f = 355 \text{psf} (\tan 37.8) + \phi$

$= \underline{275 \text{ psf}}$

$FS = \frac{275}{34.3} = \underline{8.0} > \underline{1.5 \text{ REQ'D}}$ ✓

Vegetative Cover (cont)

② Spencer Pit

$\gamma_{pdtest} = 93.2$ Avg

$W_{avg} = 11.8\%$ Avg

$\gamma_{sat} = 93.2(1.118) = \underline{104.1}$ pcf

Sliding at Midlayer ⇒

$V = 104.1 * 1 = \underline{104.1}$ psf

P = Driving Force $= (104.1) \sin 18.4° = \underline{32.9}$ psf

Resisting Force - From Triaxial test:

$\sigma_f = \sigma_f \tan\phi + c^o$

$\sigma_f = \left(\frac{0.87 - 0.44}{2}\right) * 1000 = \underline{730.0}$ psf

$\sigma_f = 730 (\tan 27.9°) + \phi$

$= \underline{386.5}$ psf

$FS = \frac{386.5}{32.9} = \underline{11.7} >> \underline{1.5}$ Req'd ✓

Trail Ridge Landfill - Closure Phase 3

VEGETATIVE COVER LAYER

Phase I, II, III, IV Test Results Tables

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

Trail Ridge Landfill - Closure Phase 3
VEGETATIVE COVER TEST RESULTS

Thickness Minimum: **24.0"**

Legend: **I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested**

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Test Result
Phase IV: Units 24, 25, 26 = 1.9 Acres					
V-117	101+00E, 83+00N	24	T	26	PASS
V-118	101+50E, 83+50N	25	T	26	PASS
V-119	102+50E, 83+50N	26	T	26	PASS
V-120	101+85E, 84+00N	25	T	26	PASS
V-121	102+00E, 84+50N	26	T	26	PASS
V-122	101+00E, 86+00N	24	T	25	PASS
V-123	101+75E, 85+75N	25	T	26	PASS
V-124	102+50E, 86+00N	26	T	26	PASS
V-125	101+75E, 86+50N	25	T	28	PASS
V-126	102+50E, 86+75N	26	T	28	PASS
Phase IV: Units 24, 25, 26: Tests Required				**7.6**	
Phase IV: Units 24, 25, 26: Tests Performed				**10.0**	**PASS**
Phase III: Units 27, 28, 29 = 3.53 Acres *testing frequency doubled*					
V-001	101+75E, 74+75N	27	T	27.0	PASS
V-002	102+00E, 75+00N	28	T	26.0	PASS
V-003	102+50E, 75+50N	28	T	27.0	PASS
V-004	103+00E, 76+00N	29	T	26.0	PASS
V-005	103+50E, 76+00N	29	T	26.0	PASS
V-006	104+50E, 76+25N	29	T	27.0	PASS
V-007	105+50E, 76+00N	29	T	26.0	PASS
V-008	105+75E, 74+75N	29	T	27.0	PASS
V-009	106+25E, 74+75N	29	T	26.0	PASS

Trail Ridge Landfill - Closure Phase 3
VEGETATIVE COVER TEST RESULTS

Thickness Minimum: **24.0"**

Legend: **I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested**

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Test Result
V-010	106+00E, 75+50N	28	T	26.0	PASS
V-011	106+25E, 75+25N	28	T	28.0	PASS
V-012	105+50E, 75+00N	28	T	24.0	PASS
V-013	105+00E, 75+50N	28	T	26.0	PASS
V-014	104+50E, 75+00N	28	T	25.0	PASS
V-015	104+00E, 75+50N	28	T	26.0	PASS
V-016	103+75E, 75+25N	28	T	26.0	PASS
V-017	103+50E, 75+00N	28	T	24.0	PASS
V-018	103+00E, 75+00N	28	T	26.0	PASS
V-019	103+00E, 74+75N	27	T	28.0	PASS
V-020	104+00E, 74+75N	27	T	25.0	PASS
V-021	105+00E, 74+75N	27	T	24.0	PASS
V-022	105+50E, 74+50N	27	T	25.0	PASS
V-023	106+25E, 76+50N	27	T	26.0	PASS
V-024	107+50E, 76+50N	29	T	26.0	PASS
V-025	107+50E, 76+00N	29	T	26.0	PASS
V-026	107+00E, 75+75N	29	T	27.0	PASS
V-027	107+50E, 75+50N	28	T	24.0	PASS
V-028	107+50E, 74+75N	27	T	25.0	PASS
V-029	108+00E, 76+00N	29	T	28.0	PASS
V-030	108+00E, 75+00N	28	T	28.0	PASS
V-031	108+50E, 76+25N	29	T	27.0	PASS
V-032	108+50E, 75+50N	28	T	25.0	PASS
V-033	108+50E, 74+50N	27	T	24.0	PASS
Phase III: Units 27, 28, 29: Tests Required				**28.2**	

Meskel & Associates ENGINEERING, PLLC
GEOTECHNICAL ▼ CONSTRUCTION TESTING & INSPECTION

Trail Ridge Landfill - Closure Phase 3
VEGETATIVE COVER TEST RESULTS

Thickness Minimum: **24.0"**

Legend: **I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested**

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Test Result
Phase III: Units 27, 28, 29: Tests Performed				**33.0**	**PASS**
Phase III: Units 30, 31, 32 = 2.30 Acres *testing frequency doubled*					
V-034	109+00E, 75+25N	31	T	24.0	PASS
V-035	110+00E, 76+50N	32	T	25.0	PASS
V-036	109+75E, 76+00N	32	T	25.0	PASS
V-037	110+00E, 75+50N	31	T	25.0	PASS
V-038	109+50E, 75+15N	31	T	26.0	PASS
V-039	110+50E, 76+00N	32	T	26.0	PASS
V-040	110+50E, 75+50N	31	T	25.0	PASS
V-041	110+50E, 74+50N	30	T	25.0	PASS
V-042	111+00E, 76+50N	32	T	26.0	PASS
V-043	111+00E, 76+00N	32	T	24.0	PASS
V-044	111+00E, 75+00N	31	T	25.0	PASS
V-045	111+00E, 74+75N	30	T	25.0	PASS
V-046	112+00E, 76+50N	32	T	25.0	PASS
V-047	112+00E, 76+00N	32	T	26.0	PASS
V-048	112+00E, 75+50N	31	T	25.0	PASS
V-049	112+00E, 75+00N	31	T	25.0	PASS
V-050	112+00E, 74+50N	30	T	24.0	PASS
V-051	112+50E, 75+50N	31	T	25.0	PASS
V-052	113+00E, 75+00N	30	T	25.0	PASS
Phase III: Units 30, 31, 32: Tests Required				**18.4**	
Phase III: Units 30, 31, 32: Tests Performed				**19.0**	**PASS**

Trail Ridge Landfill - Closure Phase 3
VEGETATIVE COVER TEST RESULTS

Thickness Minimum: **24.0"**

Legend: **I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested**

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Test Result
Phase II: Units 33, 34, 35 = 2.32 Acres					
V-053	113+50E, 76+50N	35	T	25.0	PASS
V-054	114+00E, 75+50N	34	T	25.0	PASS
V-055	114+00E, 74+75N	33	T	25.0	PASS
V-056	114+50E, 76+00N	35	T	24.0	PASS
V-057	115+50E, 76+50N	35	T	26.0	PASS
V-058	116+00E, 75+50N	34	T	26.0	PASS
V-059	115+75E, 74+65N	33	T	24.0	PASS
V-060	116+50E, 76+00N	35	T	25.0	PASS
V-061	117+00E, 76+50N	35	T	27.0	PASS
V-062	117+00E, 75+00N	33	T	28.0	PASS
Phase II: Units 33, 34, 35: Tests Required				**9.3**	
Phase II: Units 33, 34, 35: Tests Performed				**10.0**	
Phase II: Units 36, 37, 38, 39 = 3.89 Acres					
V-063	118+00E, 76+00N	38	T	26.0	PASS
V-064	118+00E, 74+75N	37	T	25.0	PASS
V-065	118+75E, 76+75N	39	T	27.0	PASS
V-066	118+50E, 75+50N	38	T	26.0	PASS
V-067	118+50E, 74+70N	36	T	26.0	PASS
V-068	119+00E, 75+00N	37	T	26.0	PASS
V-069	120+00E, 76+50N	39	T	24.0	PASS

Trail Ridge Landfill - Closure Phase 3
VEGETATIVE COVER TEST RESULTS

Thickness Minimum: **24.0"**

Legend: **I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested**

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Test Result
V-070	120+50E, 77+00N	39	T	24.0	PASS
V-071	121+00E, 76+00N	38	T	27.0	PASS
V-072	121+50E, 75+50N	37	T	26.0	PASS
V-073	121+50E, 77+75N	39	T	28.0	PASS
V-074	121+50E, 77+00N	39	T	26.0	PASS
V-075	122+25E, 76+00N	37	T	26.0	PASS
V-076	123+00E, 75+50N	36	T	24.0	PASS
V-077	122+00E, 77+50N	39	T	27.0	PASS
V-078	122+50E, 77+00N	38	T	28.0	PASS
V-079	123+00E, 76+25N	37	T	27.0	PASS
Phase II: Units 36, 37, 38, 39: Tests Required				**15.6**	
Phase II: Units 36, 37, 38, 39:Tests Performed				**17.0**	**PASS**
Phase I: Units 40, 41, 42, 43 = 4.27 Acres					
V-080	122+50E, 78+75N	43	T	26.0	PASS
V-081	123+00E, 77+50N	42	T	26.0	PASS
V-082	124+00E, 76+50N	40	T	27.0	PASS
V-083	123+25E, 79+25N	43	T	26.0	PASS
V-084	123+50E, 78+50N	42	T	27.0	PASS
V-085	124+00E, 79+00N	42	T	28.0	PASS
V-086	124+50E, 78+50N	41	T	28.0	PASS
V-087	125+00E, 78+00N	40	T	26.0	PASS
V-088	123+50E, 80+00N	43	T	26.0	PASS
V-089	124+50E, 79+50N	42	T	26.0	PASS

Trail Ridge Landfill - Closure Phase 3
VEGETATIVE COVER TEST RESULTS

Thickness Minimum: **24.0"**

Legend: **I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested**

Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Test Result
V-090	125+50E, 79+00N	40	T	26.0	PASS
V-091	124+00E, 81+50N	43	T	26.0	PASS
V-092	124+50E, 81+25N	42	T	26.0	PASS
V-093	125+00E, 81+00N	42	T	28.0	PASS
V-094	126+00E, 80+50N	40	T	26.0	PASS
V-095	123+50E, 82+50N	43	T	26.0	PASS
V-096	124+50E, 82+25N	42	T	26.0	PASS
V-097	125+25E, 81+75N	41	T	26.0	PASS
V-098	126+00E, 82+00N	40	T	26.0	PASS
Phase I: Units 40, 41, 42, 43: Tests Required				**17.1**	
Phase I: Units 40, 41, 42, 43: Tests Performed				**19.0**	**PASS**
Phase I: Units 44, 45, 46, 47 = 3.09 Acres					
V-099	124+00E, 83+50N	47	T	25.0	PASS
V-100	125+00E, 83+25N	46	T	26.0	PASS
V-101	125+50E, 82+50N	45	T	26.0	PASS
V-102	126+00E, 83+00N	44	T	26.0	PASS
V-103	123+55E, 84+50N	47	T	26.0	PASS
V-104	124+50E, 84+00N	46	T	26.0	PASS
V-105	125+00E, 84+50N	46	T	26.0	PASS
V-106	125+75E, 84+50N	45	T	25.0	PASS
V-107	126+40E, 84+00N	44	T	25.0	PASS
V-108	123+55E, 85+50N	47	T	26.0	PASS
V-109	124+50E, 85+75N	46	T	25.0	PASS

Trail Ridge Landfill - Closure Phase 3
VEGETATIVE COVER TEST RESULTS

Thickness Minimum: **24.0"**

Legend: **I=Initial Cover, C1=Clay First Lift, C2=Clay Second Lift, V=Vegatative Cover, P=Permability, A=Atterbergs, D=Density, M=Moisture, F=%Fines, T=Thickness, E=Effective Grain Size, U=Uniformity Coefficent, R=Retest, X=Not Tested**

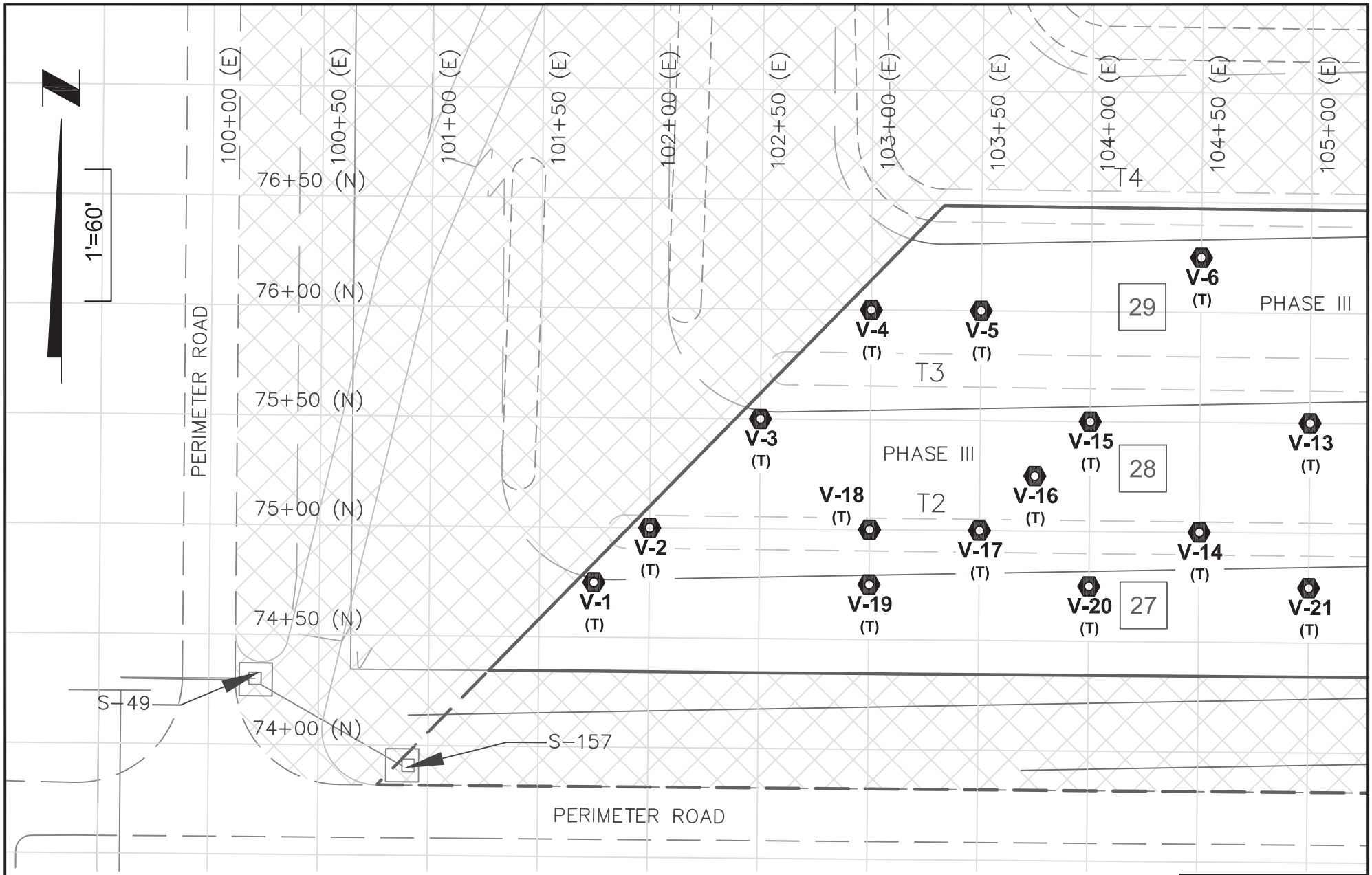
Sample Number	Location by Station	Unit Location	Tests	Field Thickness (in)	Test Result
V-110	125+00E, 85+25N	46	T	26.0	PASS
V-111	125+50E, 86+00N	45	T	26.0	PASS
V-112	126+00E, 85+50N	44	T	25.0	PASS
V-113	124+00E, 86+75N	47	T	26.0	PASS
V-114	125+00E, 86+50N	46	T	26.0	PASS
V-115	125+50E, 86+75N	45	T	25.0	PASS
V-116	126+40E, 86+75N	44	T	26.0	PASS
Phase I: Units 44, 45, 46, 47: Tests Required				**12.4**	
Phase I: Units 44, 45, 46, 47: Tests Performed				**18.0**	**PASS**
All Phases Totals = 21.30Acres (5.83Acres Doubled)					
All Phases: Tests Required				**108.5**	
All Phases: Tests Performed				**126.0**	**PASS**

Trail Ridge Landfill - Closure Phase 3

VEGETATIVE COVER LAYER

Phase I, II, III, IV Map Diagrams

Meskel & Associates
ENGINEERING, PLLC
GEOTECHNICAL CONSTRUCTION TESTING & INSPECTION



Legend:
T=Thickness
D=Density
P=Permeability
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
27	1.10
28	1.20
29	1.23

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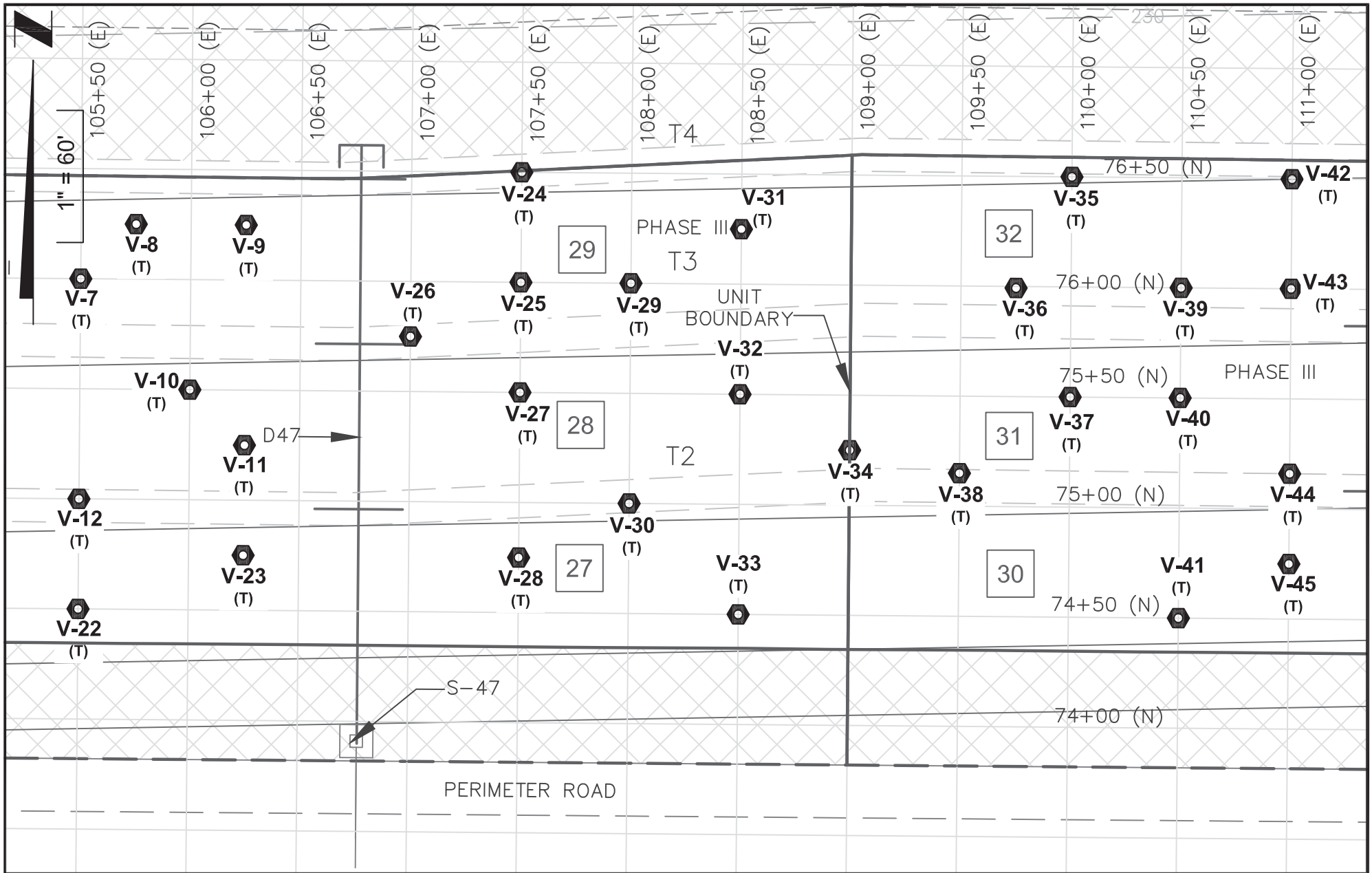
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Jacksonville
Where Florida Begins.

SHEET TITLE:
VEGETATIVE COVER THICKNESS TESTING

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
-



Legend:

T=Thickness
D=Density
P=Permeability
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±	UNIT NO.	*ACRES±
27	1.10	30	0.74
28	1.20	31	0.73
29	1.23	32	0.83

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SHEET TITLE:

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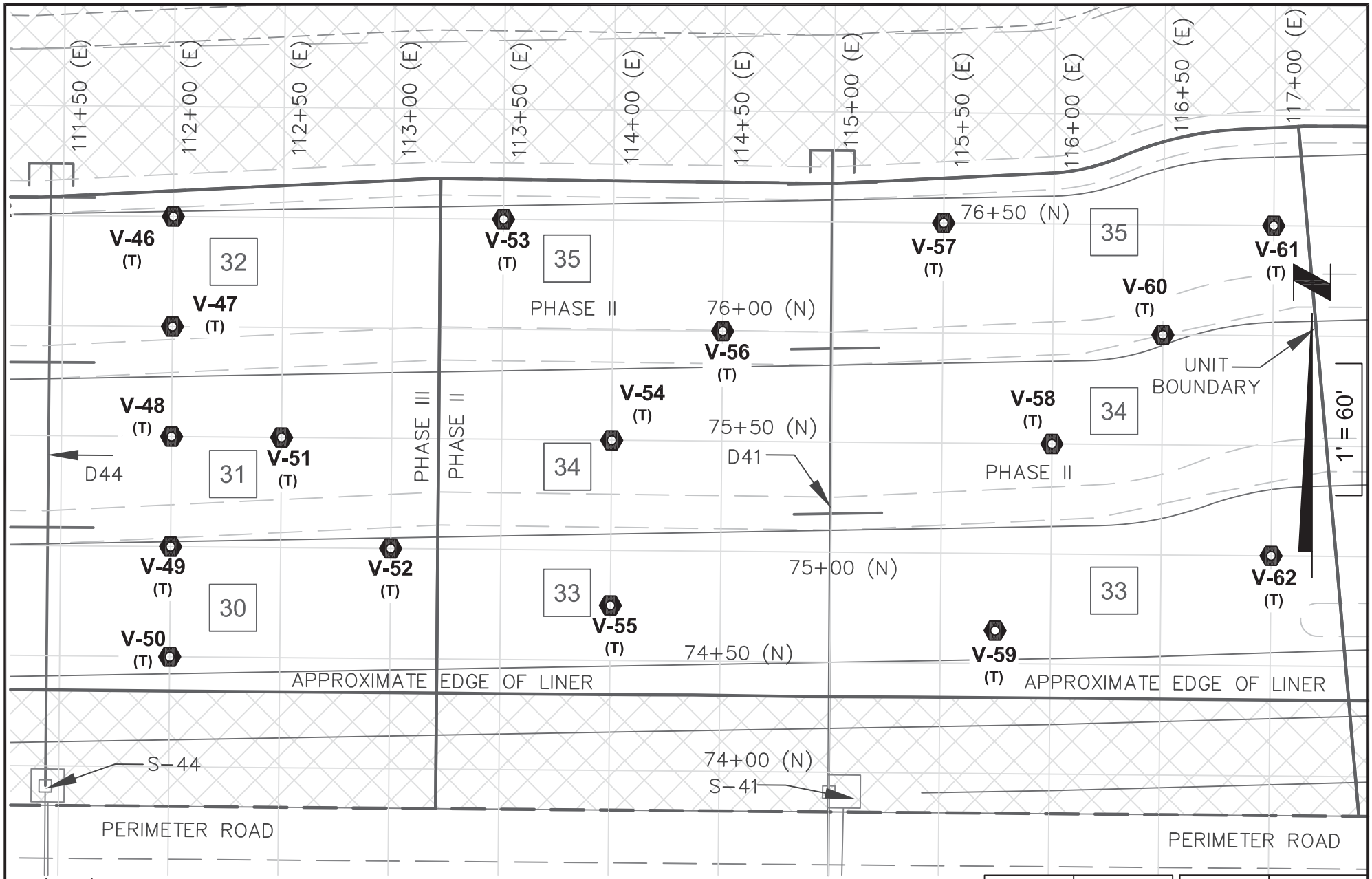
PROJECT NAME:

TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida

0006-0006

FIGURE NO.

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Legend:
T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±	UNIT NO.	*ACRES±
30	0.74	33	0.84
31	0.73	34	0.70
32	0.83	35	0.78

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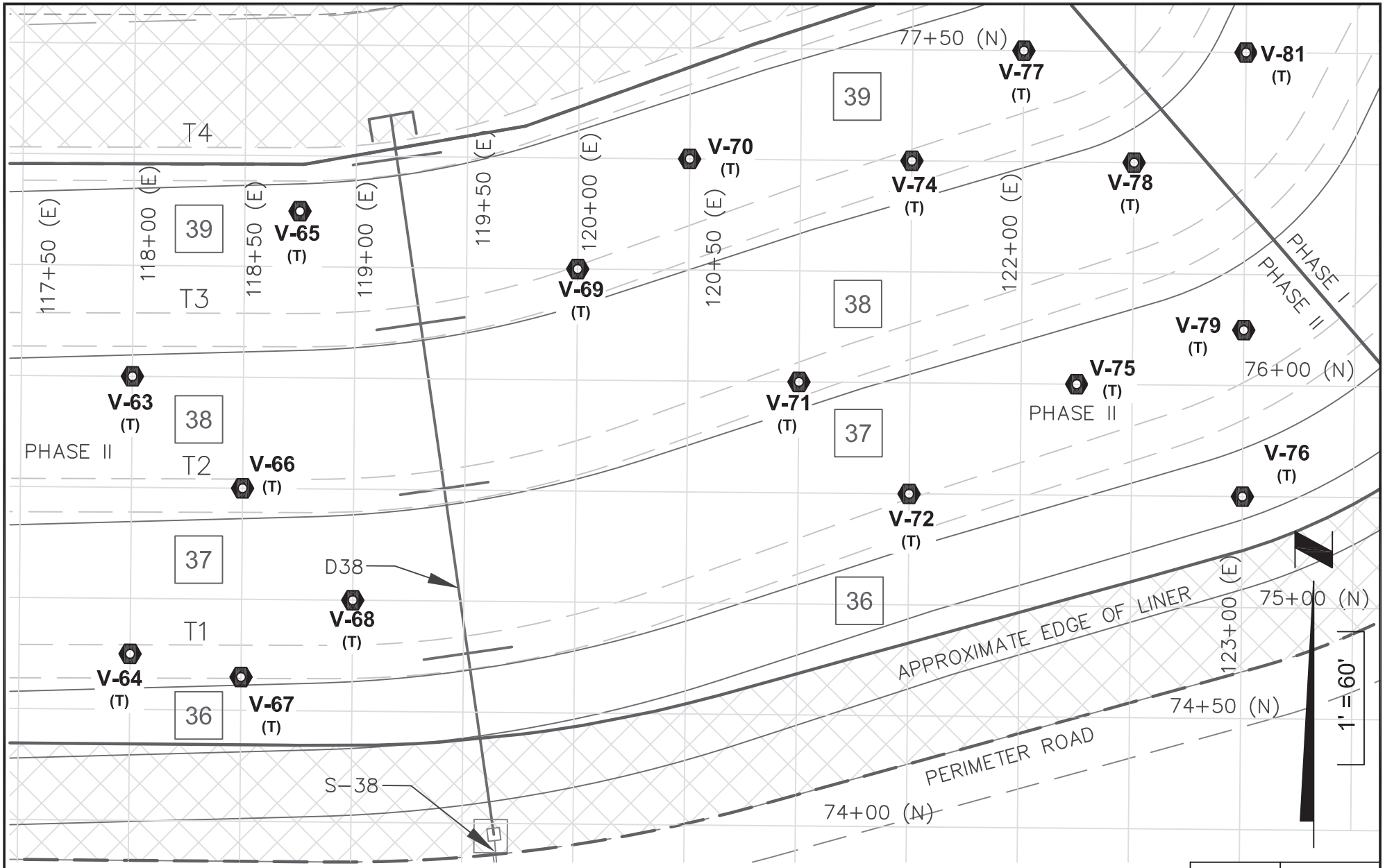
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Jacksonville, Florida
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FIGURE NO.
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Legend:

T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
36	0.72
37	1.09
38	1.01
39	1.07

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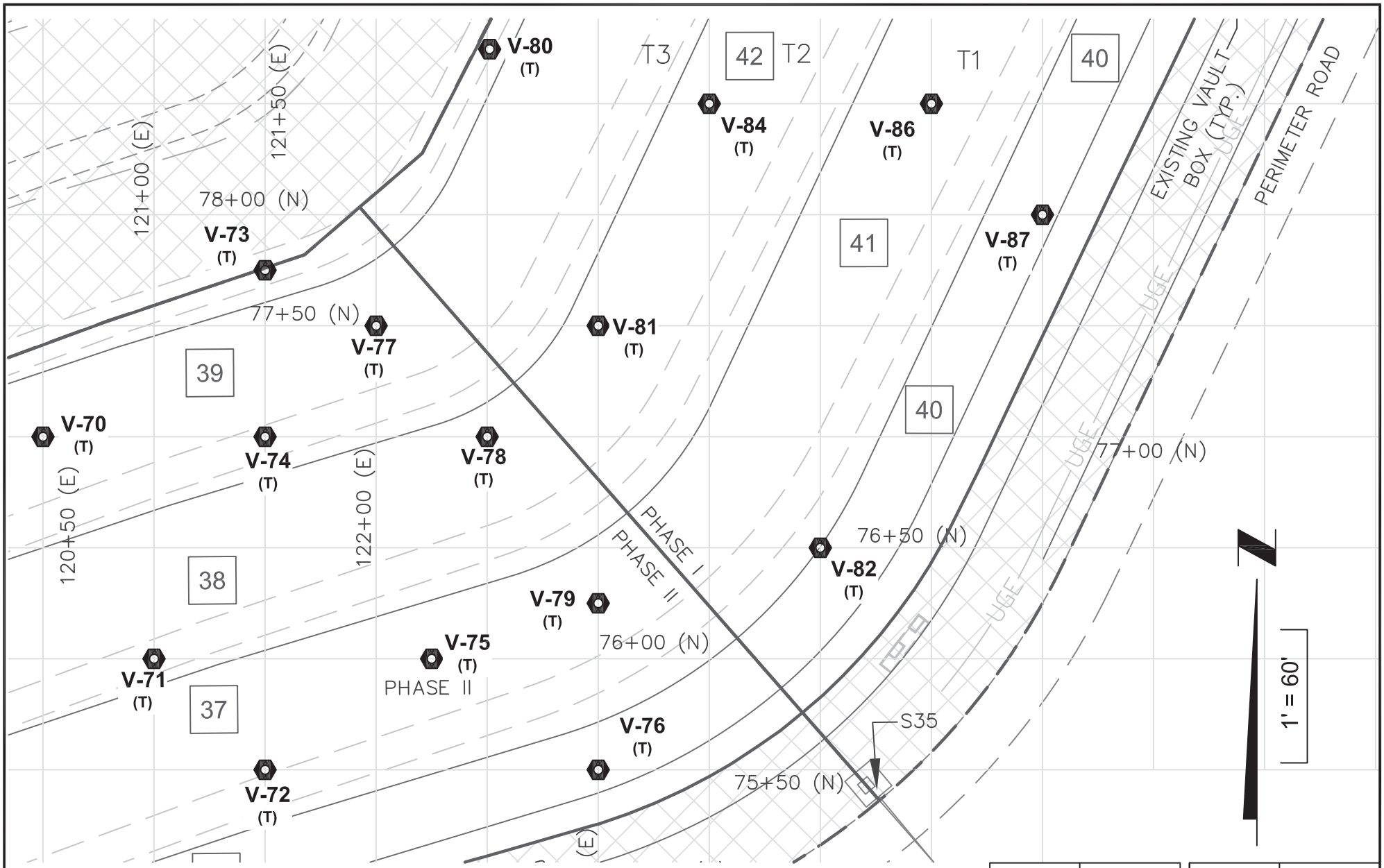
PROJECT NAME:

TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida

0006-0006

FIGURE NO.

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Legend:
T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
36	0.72
37	1.09
38	1.01
39	1.07

UNIT NO.	*ACRES±
40	0.98
41	1.14
42	1.05
43	1.10

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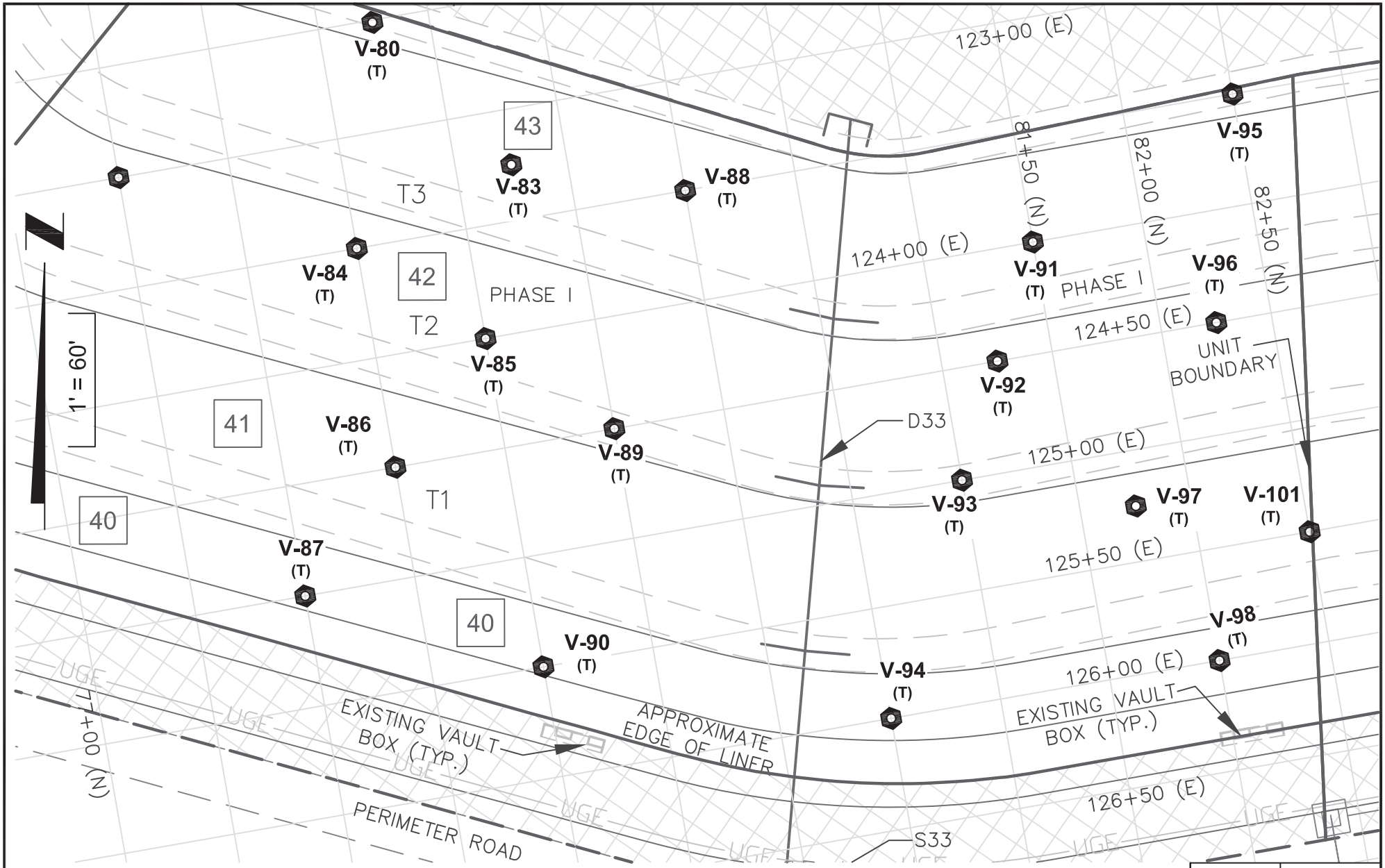
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VEGETATIVE COVER THICKNESS TESTING

PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
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UNIT NO.	*ACRES±
40	0.98
41	1.14
42	1.05
43	1.10

Legend:

T=Thickness
D=Density
P=Perm
R=Retest

A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

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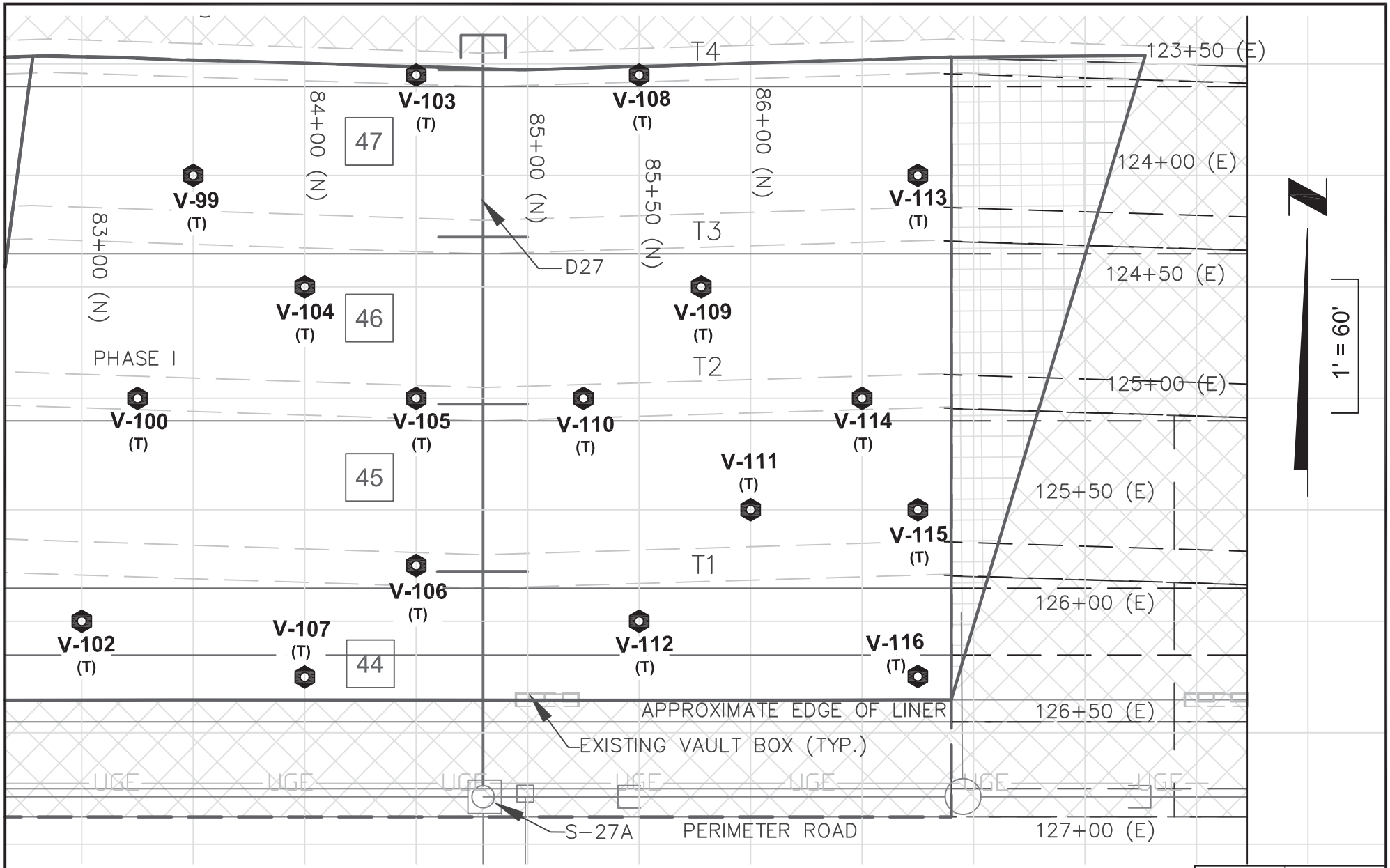
PROJECT NAME:

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Jacksonville, Florida

0006-0006

FIGURE NO.

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Legend:
T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
44	0.62
45	0.79
46	0.80
47	0.88

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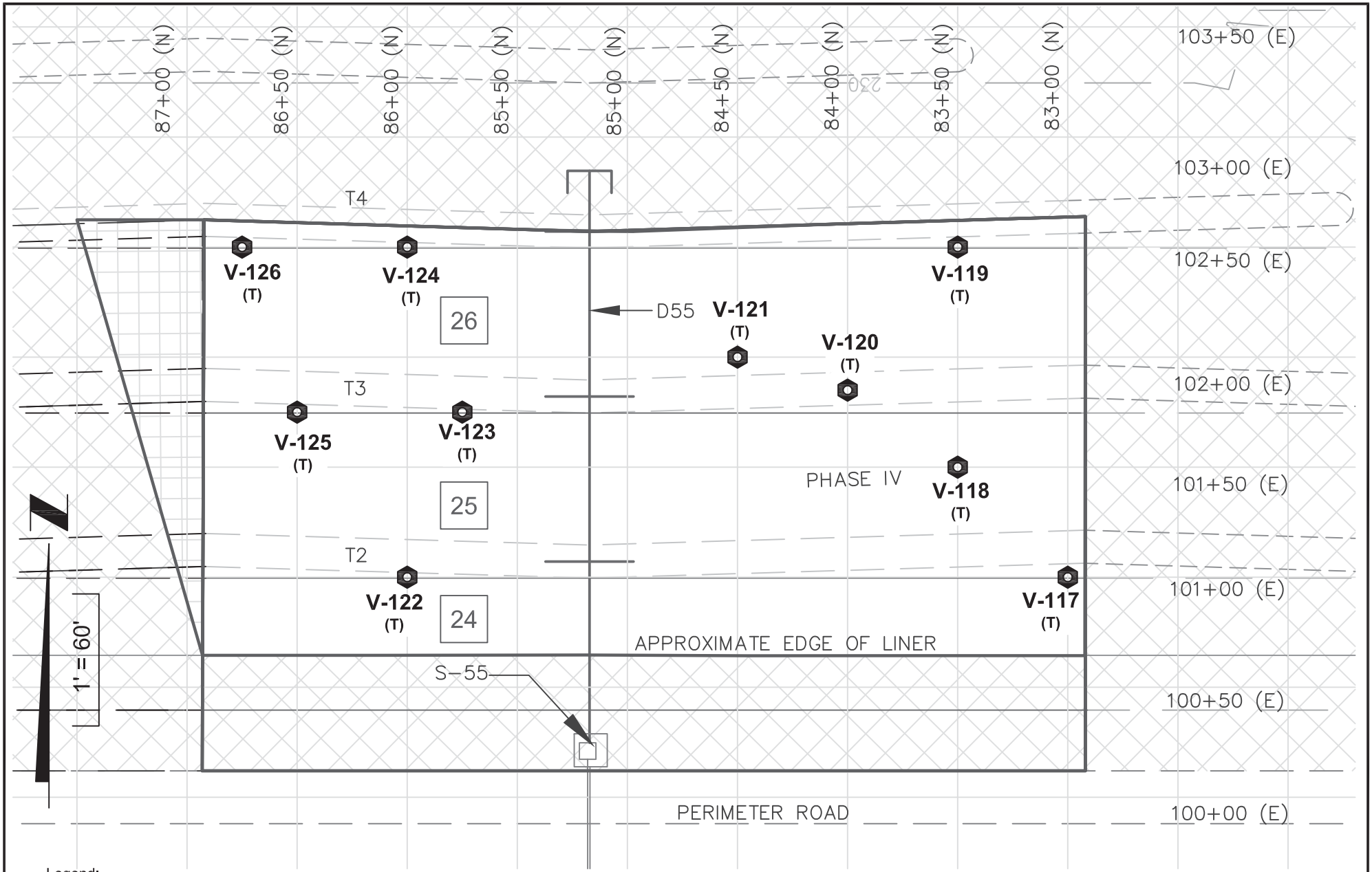
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PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
0006-0006

FIGURE NO.
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Legend:
T=Thickness
D=Density
P=Perm
R=Retest
A=Atterbergs
M=Moisture
F=% Fines

Slope and Swale Outside of Closure: No Testing Performed

*Acres include closure area only. Areas outside anchor berm or above Terrace 4 are not included.

UNIT NO.	*ACRES±
24	0.34
25	0.73
26	0.83

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PROJECT NAME:
TRAIL RIDGE LANDFILL PHASE 3
Jacksonville, Florida
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FIGURE NO.
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Trail Ridge Landfill - Closure Phase 3

APPENDIX



Trail Ridge Landfill - Closure Phase 3

APPENDIX

Complete Package of Field Testing Reports

MAE Meskel & Associates ENGINEERING, PLLC
GEOTECHNICAL CONSTRUCTION TESTING & INSPECTION

October 10, 2012

Ms. Tina Meskel, P.E.
President & Principal Engineer
Meskel & Associates Engineering
8936 Western Way, Suite 12
Jacksonville, FL 32256

Subject: **Report of Compliance, Revision 1**
Materials Testing
Trail Ridge Landfill Phase III
Duval County, Florida
AMEC Project Number 6736-11-5123

Dear Ms. Meskel:

AMEC Environment & Infrastructure, Inc. (AMEC) has completed material testing services for the Trail Ridge Landfill, Phase III. Our services were provided in accordance with the MAE Master Services Agreement signed by Michael J. Holm, P.E. on September 14, 2011. This letter describes the services provided by AMEC.

Soil Quality Assurance Quality Control (QA/QC) Plan

AMEC's scope of involvement with this project consisted of sampling and testing to verify substantial compliance with the material standards. Sampling and testing of materials was performed in general accordance with the QA/QC plan in the project specifications. Material testing was conducted in general accordance with the ASTM standard references shown below.

Test Procedure:	Standard Test Methods For:	Common Name:
ASTM D-698	Laboratory Compaction Characteristics of Soil Using Standard Effort	Standard Proctor
ASTM D-1140	Amount of Material in Soil Finer Than the No. 200	Percent Fines
ASTM D-1557	Laboratory Compaction Characteristics of Soil Using Modified Effort	Modified Proctor
ASTM D-2216	Laboratory Determination of Water (Moisture) Content of Soil by Mass	Moisture Content
ASTM D-2434	Permeability of Granular Soils (Constant Head)	Perm (sand)
ASTM D-3080	Direct Shear Test of Soils Under Consolidated Drained Conditions	Direct Shear
ASTM D-4318	Liquid Limit, Plastic Limit and Plasticity Index of Soils	Atterberg Limits
ASTM D-4767	Consolidated Undrained Triaxial Compression Test for Cohesive Soils	Triaxial Test
USCOE S-Test	Consolidated Drained Triaxial Test for Non-Cohesive Soils	Triaxial Test
ASTM D-5084	Measurement of Hydraulic Conductivity of Saturated Porous Materials	Perm (clay)

ASTM:	Common Name:	Tests Performed
D-698	Standard Proctor	CL-1 to CL-2
D-1140	Percent Fines	C1-1 to C1-180; C2-1 to C2-177
D-1557	Modified Proctor	IC-1 to IC-6
D-2216	Moisture Content	I-1 to I-157
D-2434	Permeability (sand)	Prequalification 1-3; Production 1-3
D-3080	Direct Shear	Clay / Intermediate and Clay/Topsoil (2)
D-4318	Atterberg Limits	C1-1 to C1-180; C2-1 to C2-177
D-4767	Triaxial Test	CL-1, IC-1
USCOE S-Test	Triaxial Test	TS-1 and TS-2
D-5084	Permeability (clay)	C1-1 to C1-180; C2-1 to C2-177

* pH was tested during borrow pit prequalification

Attached are all tests performed for this project that were performed in accordance with the specifications and the QA/QC plan for the Trail Ridge Landfill Incremental Closure Phase 3.

We appreciate the opportunity to be of service as your consultant on this project and look forward to working together in the future. If we may be of further assistance, please contact us.

Sincerely,

AMEC Environment & Infrastructure, Inc.
Florida Board of Professional Engineers Certificate of Authorization No. 5392

10/10/12 COPY

Michael J. Holm, P.E.
Project Manager
Florida License No. 63829

Daniel L. Eisman, P.E.
Project Engineer
Florida License No. 73780

Distribution: Meskel & Associates, Ms. Tina Meskel, P.E.
Project File 6736-11-5123

DELIVERED NOV 0 9 2011

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** October 3, 2011

Sample Number: CL-1

Sample Information: Initial / Final

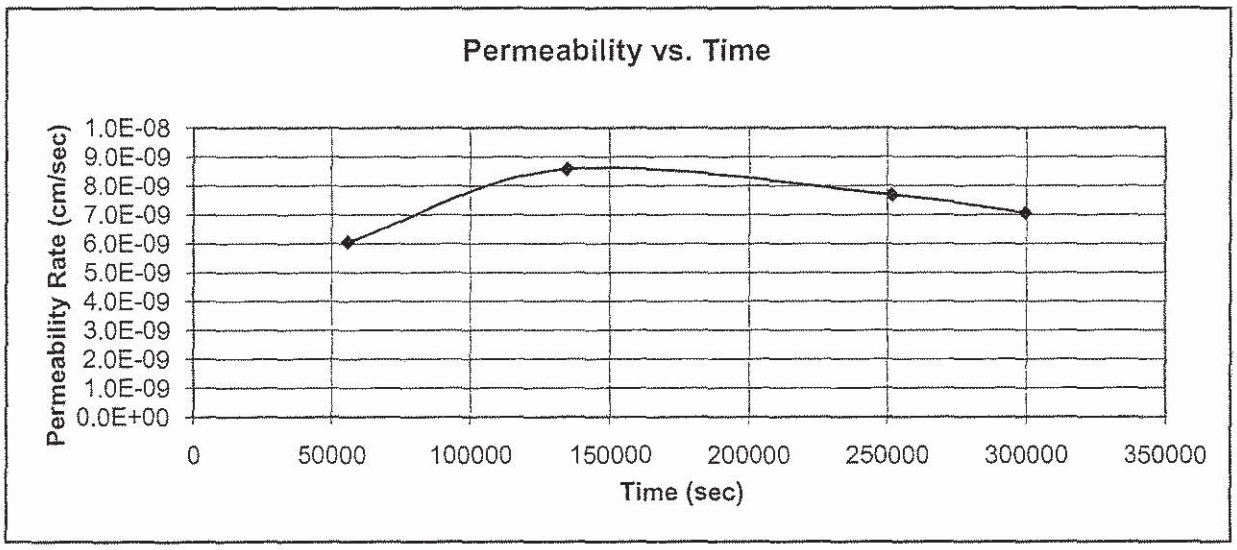
Dia. (in.)	2.86	0.00	**Length (in)**	5.92	0.00	**Weight (gr)**	1109.6	0
Wet Density (pcf)	111.2		**Moisture Content (%)**	32.8		**Dry Density (pcf)**	83.7	
Final WD (pcf)			**Final Moisture (%)**			**Final DD (pcf)**		

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	20.2	**Minimum Hydraulic Gradient**	10.1
Maximum Consolidation Stress (psi)	6.1	**Minimum Consolidation Stress (psi)**	2.1

Permeability Rate

7.3E-09



Reviewed By:

Mike Holm, P.E.

DELIVERED NOV 2 8 2011

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** November 16, 2011

Sample Number: C-1 #5

Sample Information: Initial / Final

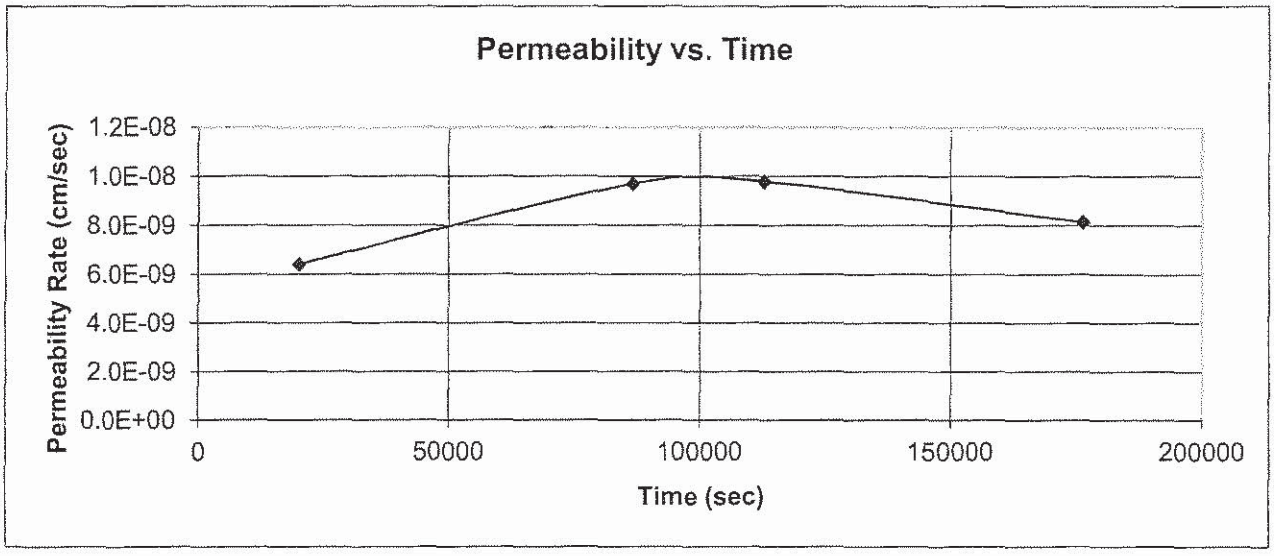
Dia. (in.)	2.85	2.87	**Length (in)**	3.62	3.61	**Weight (gr)**	681.8	691
Wet Density (pcf)	112.9		**Moisture Content (%)**	27.7		**Dry Density (pcf)**	88.4	
Final WD (pcf)	112.8		**Final Moisture (%)**	33.6		**Final DD (pcf)**	84.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	17.8	**Minimum Hydraulic Gradient**	16.6
Maximum Consolidation Stress (psi)	4	**Minimum Consolidation Stress (psi)**	4

Permeability Rate

8.5E-09



Reviewed By:

Mike Holm, P.E.

SCANNED

DELIVERED NOV 2 8 2011

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** November 16, 2011

Sample Number: C-1 #11

Sample Information: Initial / Final

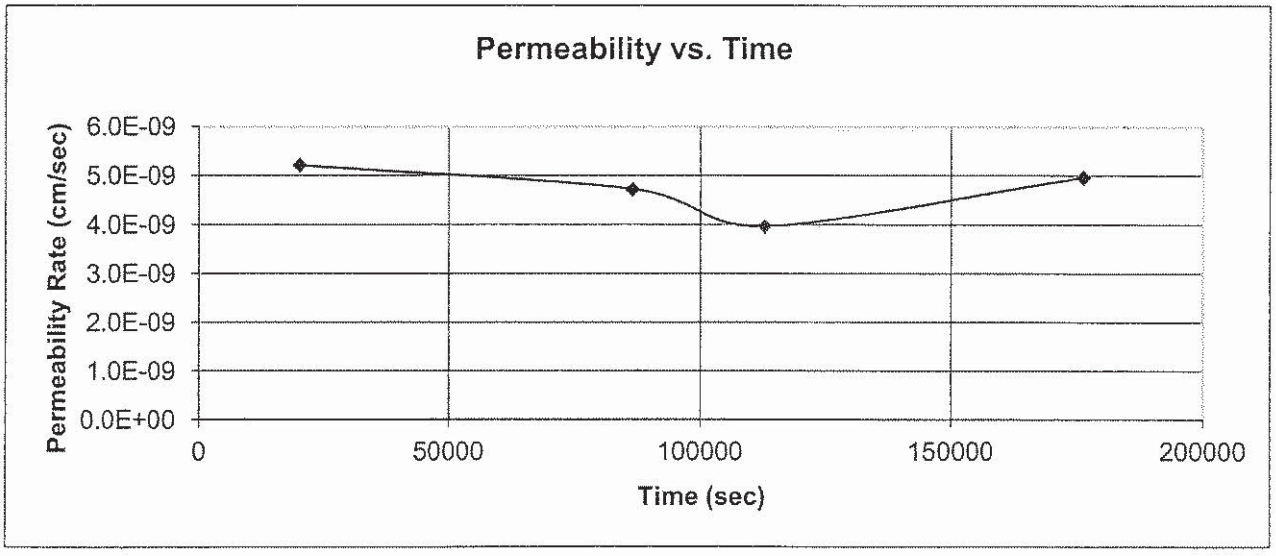
Dia. (in.)	2.86	2.85	**Length (in)**	2.96	2.98	**Weight (gr)**	579.8	586.3
Wet Density (pcf)	116.1		**Moisture Content (%)**	36.8		**Dry Density (pcf)**	84.9	
Final WD (pcf)	117.7		**Final Moisture (%)**	33.4		**Final DD (pcf)**	88.2	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	21.7	**Minimum Hydraulic Gradient**	20.2
Maximum Consolidation Stress (psi)	4	**Minimum Consolidation Stress (psi)**	4

Permeability Rate

4.7E-09



Reviewed By:

Mike Holm, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trailridge **Project Number:** 6736-11-5123

Client MAE **Date Completed:** December 1, 2011

Sample Number: C-1 15

Sample Information:

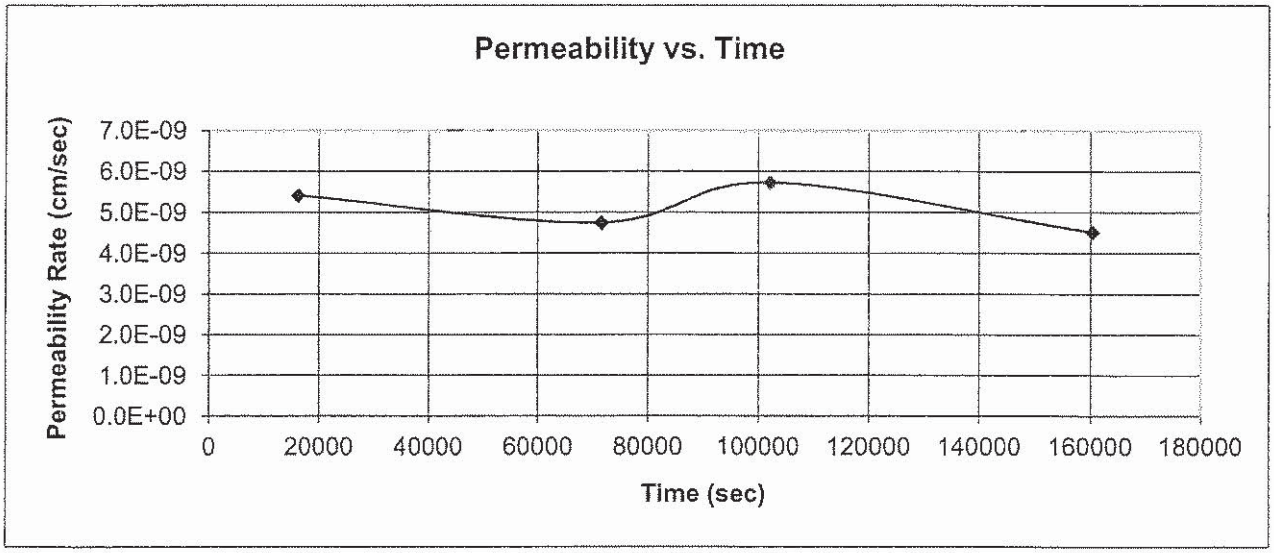
Dia. (in.)	2.85	**Length (in)**	2.33	**Weight (gr)**	447.58
Wet Density (pcf)	114.6	**Moisture Content (%)**	107.9	**Dry Density (pcf)**	55.1

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	Deaired water
Maximum Hydraulic Gradient:	27.7	**Minimum Hydraulic Gradient**	13.8
Maximum Consolidation Stress (psi)	4	**Minimum Consolidation Stress (psi)**	2

Permeability Rate

5.1E-09



Reviewed By:

Mike Holm, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trailridge Landfill **Project Number:** 6736-11-5123

Client MAE **Date Completed:** November 22, 2011

Sample Number: C-1 17

Sample Information:

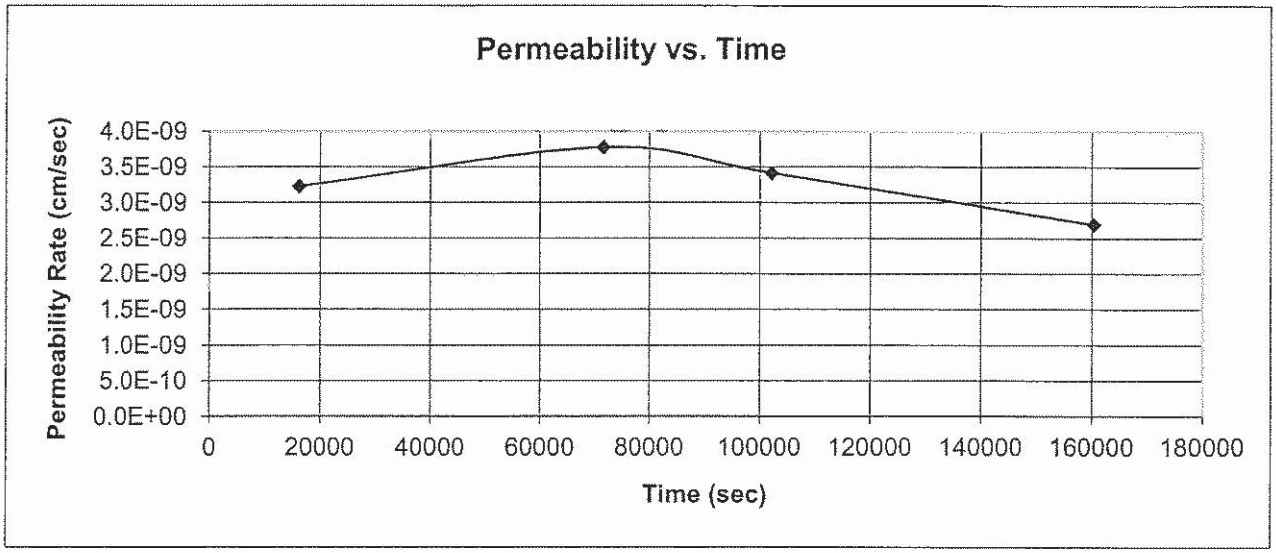
Dia. (in.)	2.82	**Length (in)**	2.53	**Weight (gr)**	494.3
Wet Density (pcf)	118.9	**Moisture Content (%)**	27.9	**Dry Density (pcf)**	93.0

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	Deaired water
Maximum Hydraulic Gradient:	47.3	**Minimum Hydraulic Gradient**	23.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	2

Permeability Rate

3.3E-09



Reviewed By:

Mike Holm, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 20, 2012

Sample Number: C-1-28

Sample Information: Initial / Final

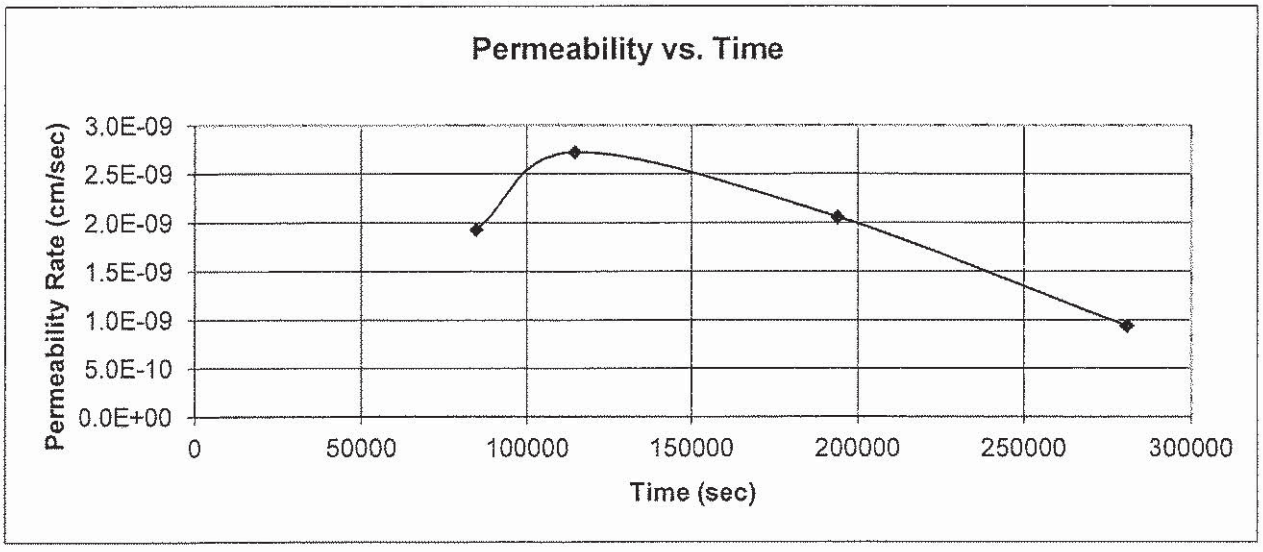
Dia. (in.)	2.84	2.83	Length (in)	3.27	3.34	Weight (gr)	648.7	668.9
Wet Density (pcf)	119.2		Moisture Content (%)	14.7		Dry Density (pcf)	103.9	
Final WD (pcf)	121.1		Final Moisture (%)	31.0		Final DD (pcf)	92.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	28.2	Minimum Hydraulic Gradient	14.1
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

1.9E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 18, 2012

Sample Number: C-1-32

Sample Information: Initial / Final

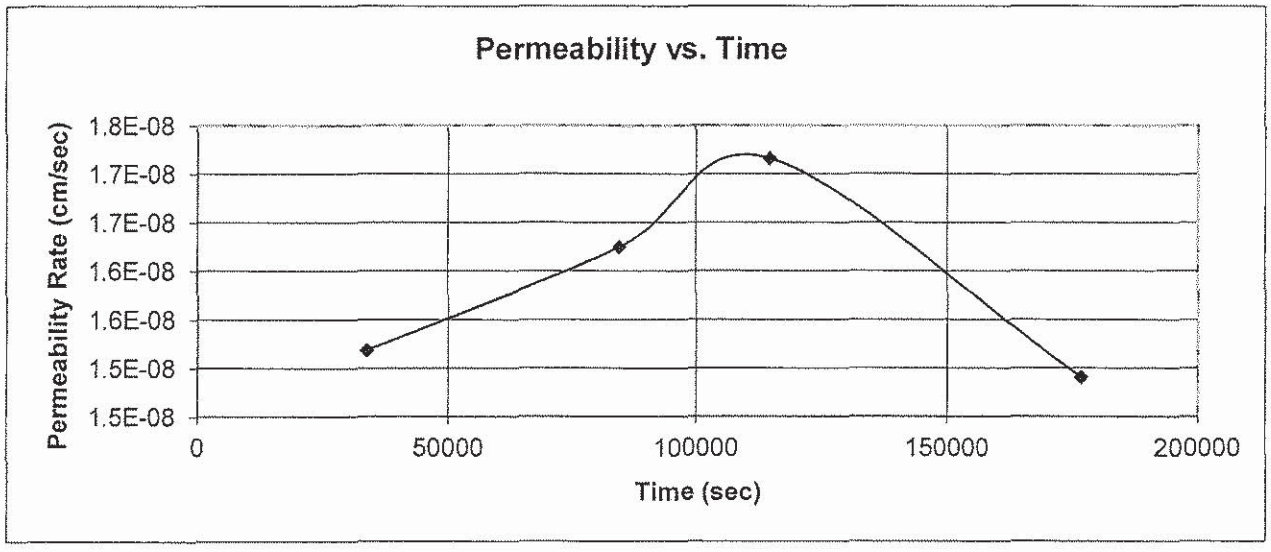
Dia. (in.)	2.83	2.84	**Length (in)**	4.09	4.14	**Weight (gr)**	758	771.39
Wet Density (pcf)	112.3		**Moisture Content (%)**	32.7		**Dry Density (pcf)**	84.6	
Final WD (pcf)	111.9		**Final Moisture (%)**	39.2		**Final DD (pcf)**	80.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	22.5	**Minimum Hydraulic Gradient**	11.2
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.6E-08



Reviewed By:

Daniel Eisman P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 18, 2012

Sample Number: C-1 #36

Sample Information: Initial / Final

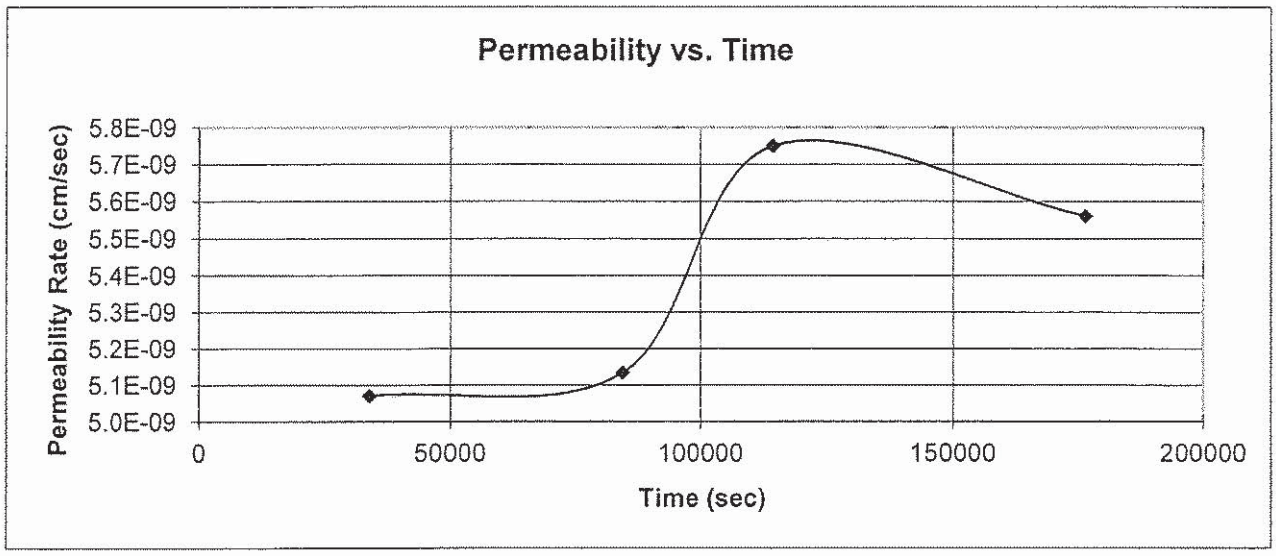
Dia. (in.)	2.83	2.85	Length (in)	3.43	3.42	Weight (gr)	623.6	631.9
Wet Density (pcf)	109.9		Moisture Content (%)	40.6		Dry Density (pcf)	78.1	
Final WD (pcf)	110.7		Final Moisture (%)	44.7		Final DD (pcf)	76.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	26.8	Minimum Hydraulic Gradient	13.4
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

5.4E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 18, 2012

Sample Number: C-1 #45

Sample Information: Initial / Final

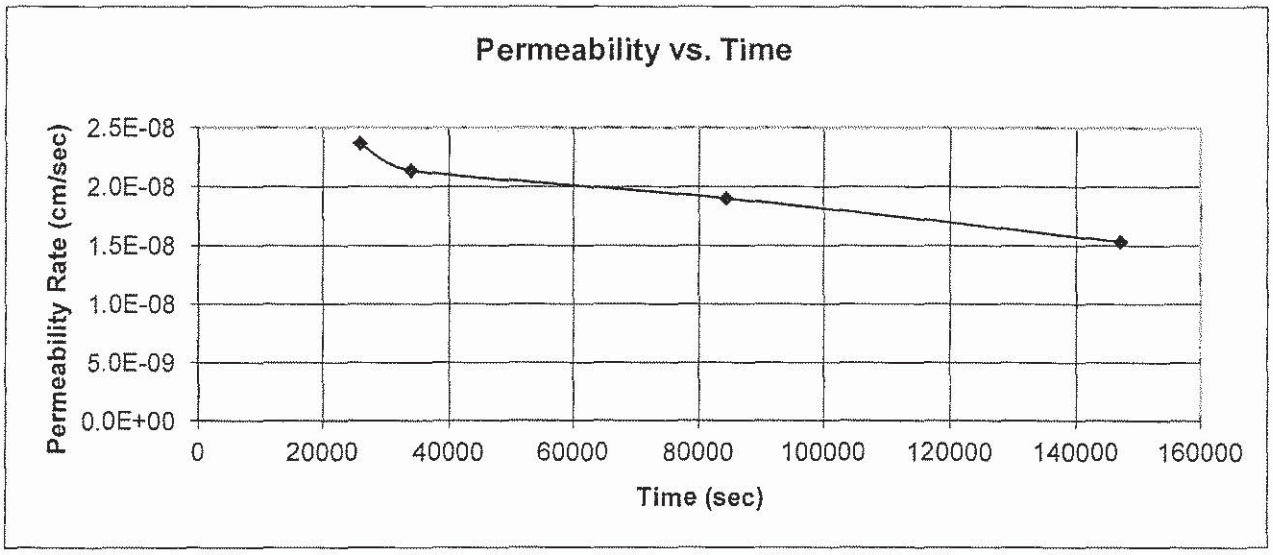
Dia. (in.)	2.83	2.82	**Length (in)**	3.46	3.48	**Weight (gr)**	663.7	678.8
Wet Density (pcf)	116.2		**Moisture Content (%)**	30.3		**Dry Density (pcf)**	89.2	
Final WD (pcf)	119.0		**Final Moisture (%)**	33.8		**Final DD (pcf)**	88.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	26.5	**Minimum Hydraulic Gradient**	13.2
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.0E-08



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 20, 2012

Sample Number: C-1 #49

Sample Information: Initial / Final

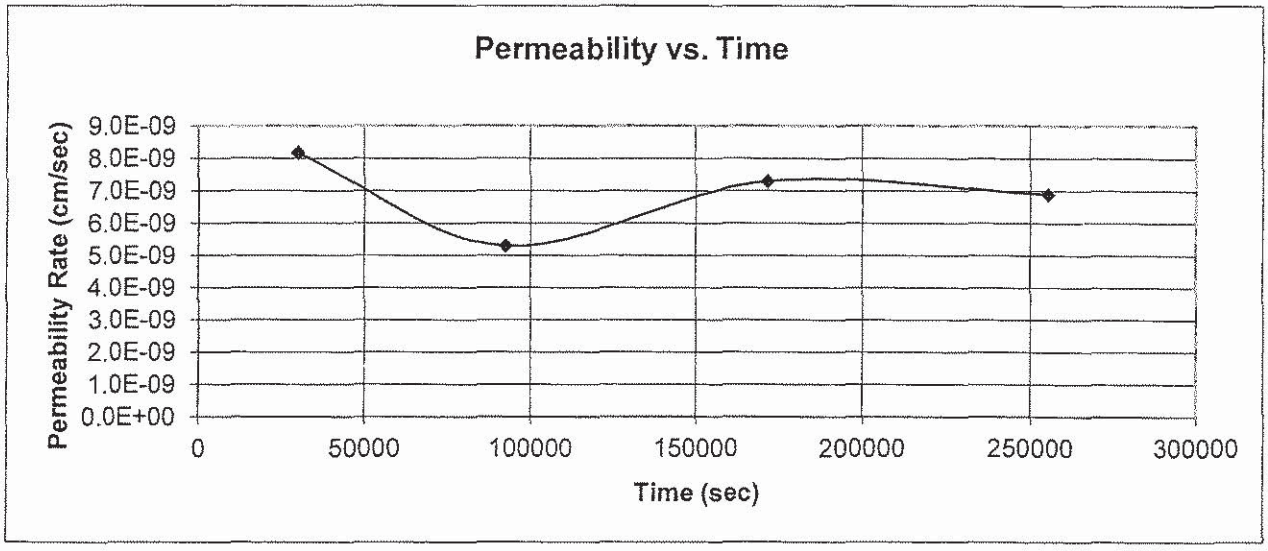
Dia. (in.)	2.85	2.85	**Length (in)**	3.32	3.32	**Weight (gr)**	624.1	629.5
Wet Density (pcf)	112.1		**Moisture Content (%)**	27.8		**Dry Density (pcf)**	87.7	
Final WD (pcf)	113.2		**Final Moisture (%)**	38.1		**Final DD (pcf)**	82.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	27.7	**Minimum Hydraulic Gradient**	13.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

6.9E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 20, 2012

Sample Number: C-1 #51

Sample Information: Initial / Final

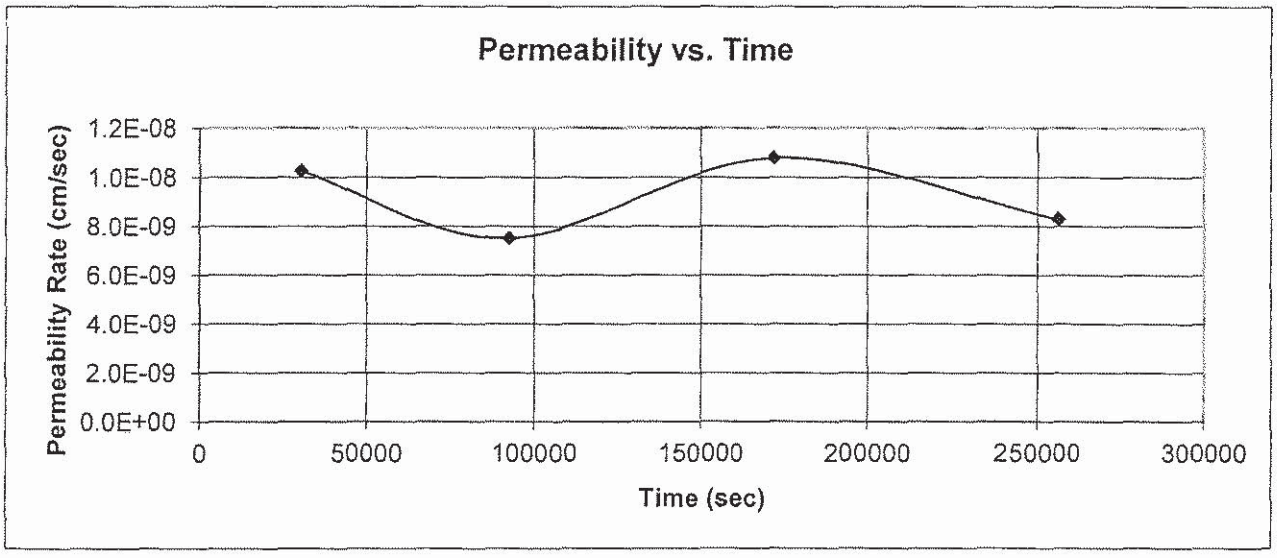
Dia. (in.)	2.85	2.85	**Length (in)**	3.14	3.08	**Weight (gr)**	611.9	620.4
Wet Density (pcf)	116.1		**Moisture Content (%)**	31.9		**Dry Density (pcf)**	88.0	
Final WD (pcf)	120.6		**Final Moisture (%)**	33.1		**Final DD (pcf)**	90.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	29.3	**Minimum Hydraulic Gradient**	14.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

9.2E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 21, 2012

Sample Number: C-1 #53

Sample Information: Initial / Final

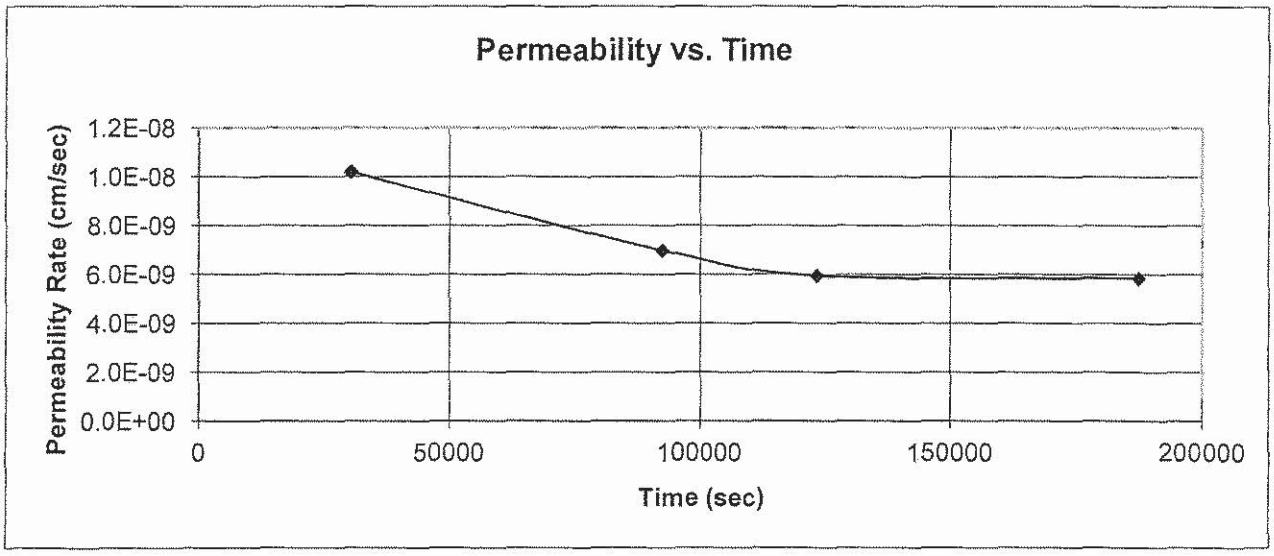
Dia. (in.)	2.85	2.85	**Length (in)**	2.50	2.51	**Weight (gr)**	493.1	504.5
Wet Density (pcf)	117.6		**Moisture Content (%)**	35.9		**Dry Density (pcf)**	86.5	
Final WD (pcf)	120.2		**Final Moisture (%)**	32.4		**Final DD (pcf)**	90.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	36.8	**Minimum Hydraulic Gradient**	18.4
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

7.2E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 21, 2012

Sample Number: C-1 #56

Sample Information: Initial / Final

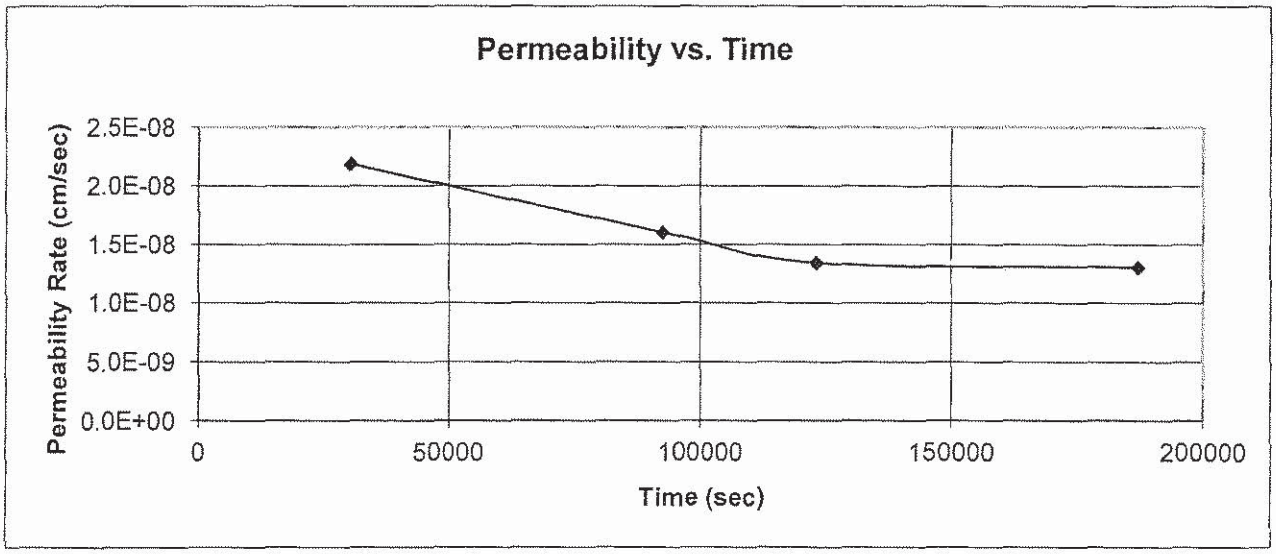
Dia. (in.)	2.83	2.85	**Length (in)**	3.31	3.32	**Weight (gr)**	668.6	687.9
Wet Density (pcf)	122.1		**Moisture Content (%)**	30.4		**Dry Density (pcf)**	93.6	
Final WD (pcf)	123.8		**Final Moisture (%)**	29.5		**Final DD (pcf)**	95.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	27.8	**Minimum Hydraulic Gradient**	13.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.6E-08



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 21, 2012

Sample Number: C-1 #58

Sample Information: Initial / Final

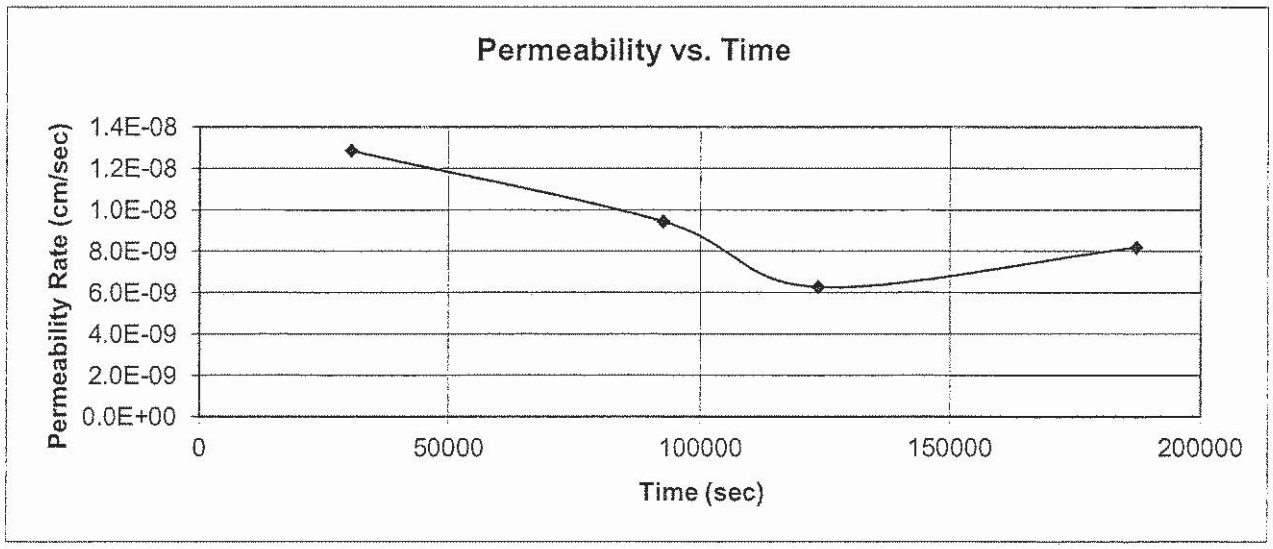
Dia. (in.)	2.85	2.85	Length (in)	2.62	2.64	Weight (gr)	470.6	480.43
Wet Density (pcf)	106.8		Moisture Content (%)	32.5		Dry Density (pcf)	80.6	
Final WD (pcf)	108.4		Final Moisture (%)	47.9		Final DD (pcf)	73.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	35.0	Minimum Hydraulic Gradient	17.5
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

9.2E-09



Reviewed By:

Daniel L. Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 27, 2012

Sample Number: C-1 #64

Sample Information: Initial / Final

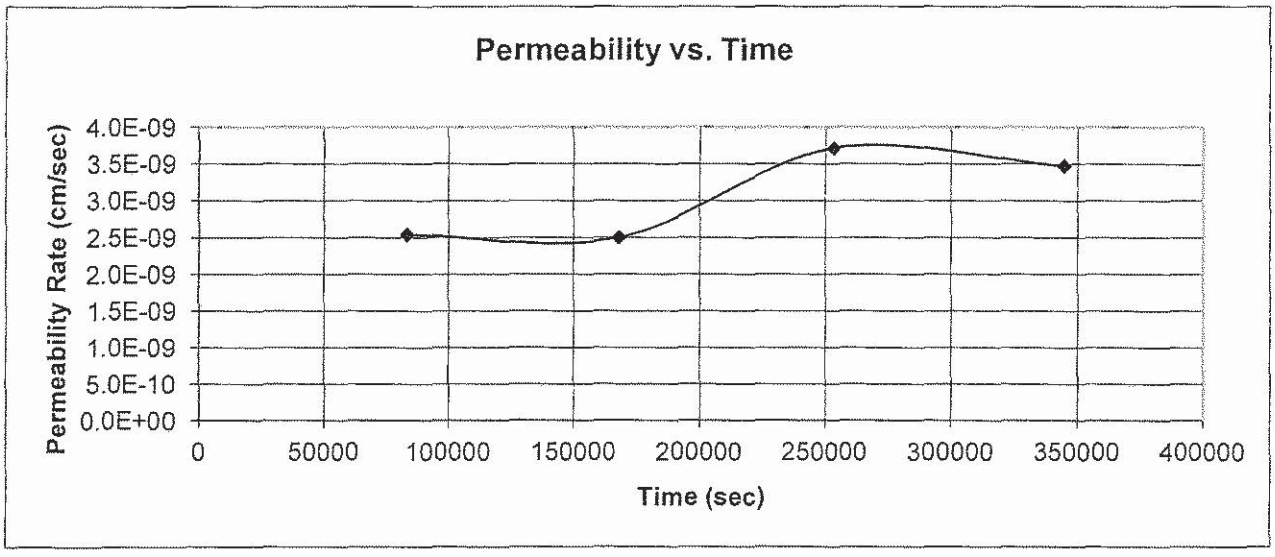
Dia. (in.)	2.81	2.89	Length (in)	2.90	2.93	Weight (gr)	558.3	572.06
Wet Density (pcf)	118.4		Moisture Content (%)	31.9		Dry Density (pcf)	89.8	
Final WD (pcf)	113.6		Final Moisture (%)	36.9		Final DD (pcf)	83.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	22.2	Minimum Hydraulic Gradient	11.1
Maximum Consolidation Stress (psi)	5	Minimum Consolidation Stress (psi)	3

Permeability Rate

3.1E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 27, 2012

Sample Number: C-1 #67

Sample Information: Initial / Final

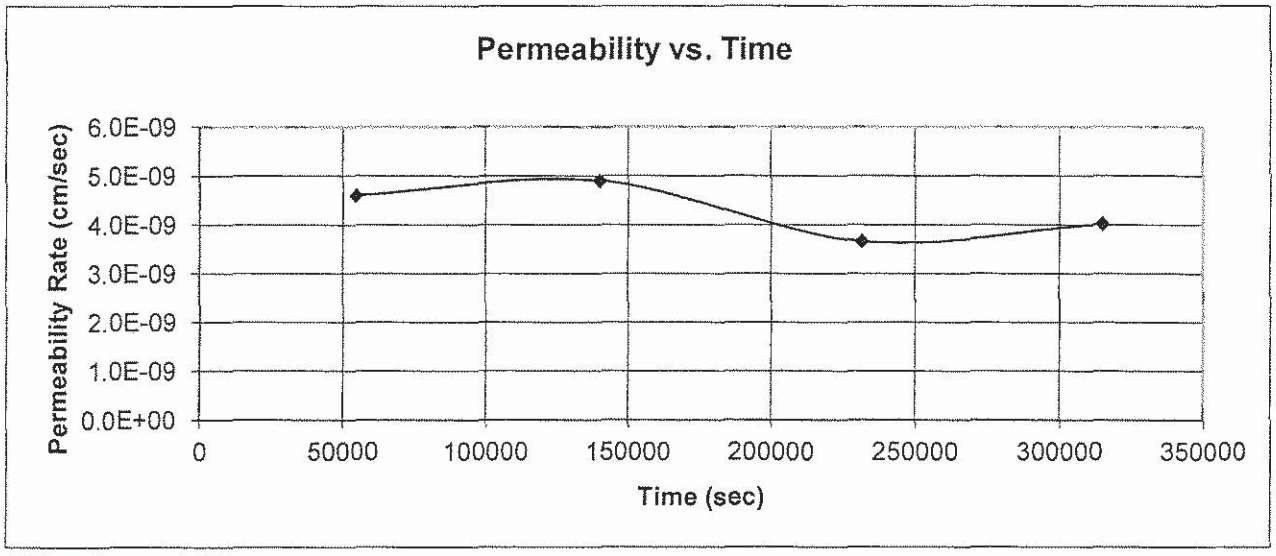
Dia. (in.)	2.83	2.85	**Length (in)**	3.33	3.25	**Weight (gr)**	625.3	636.41
Wet Density (pcf)	113.7		**Moisture Content (%)**	31.6		**Dry Density (pcf)**	86.3	
Final WD (pcf)	117.3		**Final Moisture (%)**	36.7		**Final DD (pcf)**	85.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	27.6	**Minimum Hydraulic Gradient**	13.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.3E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 26, 2012

Sample Number: C-1 #69

Sample Information: Initial / Final

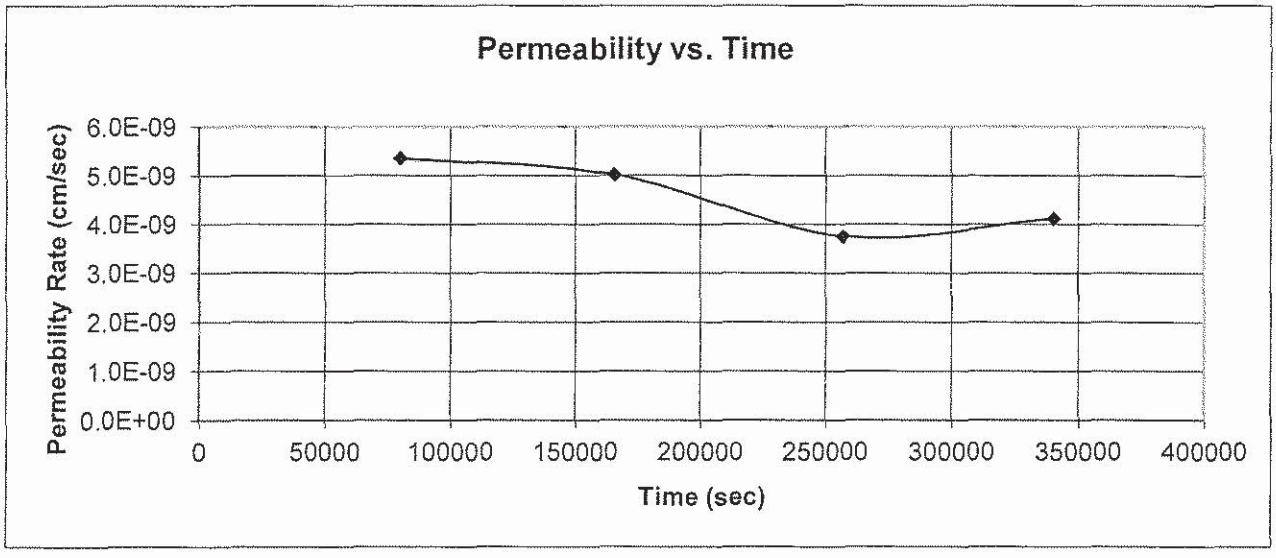
Dia. (in.)	2.84	2.85	**Length (in)**	3.44	3.45	**Weight (gr)**	614.7	619.7
Wet Density (pcf)	107.2		**Moisture Content (%)**	30.7		**Dry Density (pcf)**	82.0	
Final WD (pcf)	107.2		**Final Moisture (%)**	49.7		**Final DD (pcf)**	71.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	26.7	**Minimum Hydraulic Gradient**	13.3
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.6E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 24, 2012

Sample Number: C-1 #71

Sample Information: Initial / Final

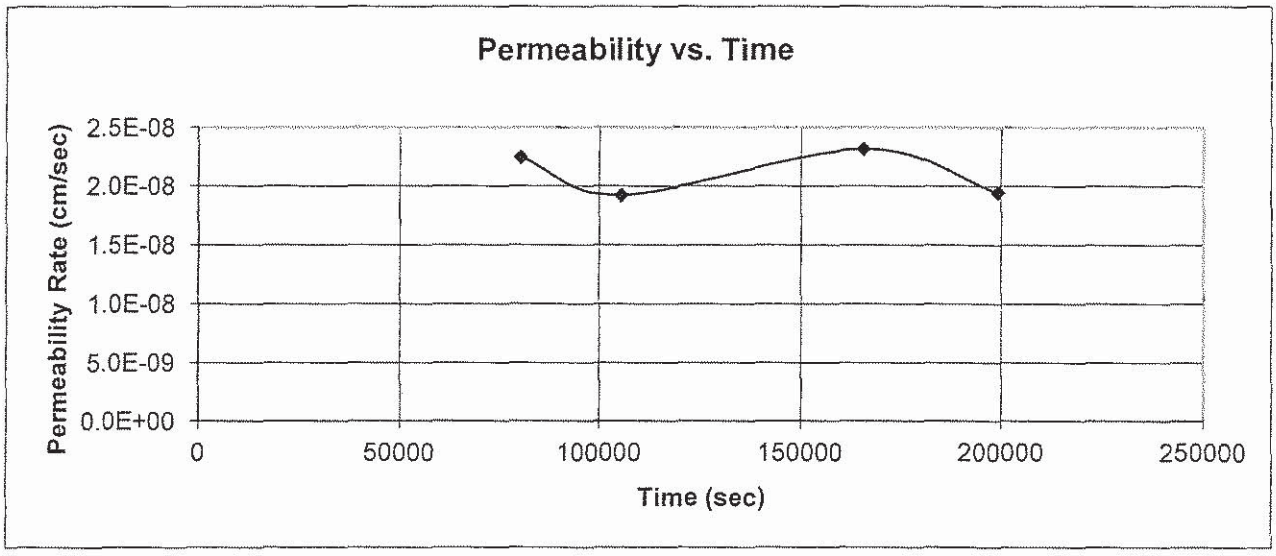
Dia. (in.)	2.84	2.83	**Length (in)**	3.26	3.25	**Weight (gr)**	629.5	643.4
Wet Density (pcf)	116.4		**Moisture Content (%)**	29.2		**Dry Density (pcf)**	90.1	
Final WD (pcf)	120.4		**Final Moisture (%)**	33.7		**Final DD (pcf)**	90.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	28.0	**Minimum Hydraulic Gradient**	13.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.1E-08



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 14, 2012

Sample Number: C-1 #72

Sample Information: Initial / Final

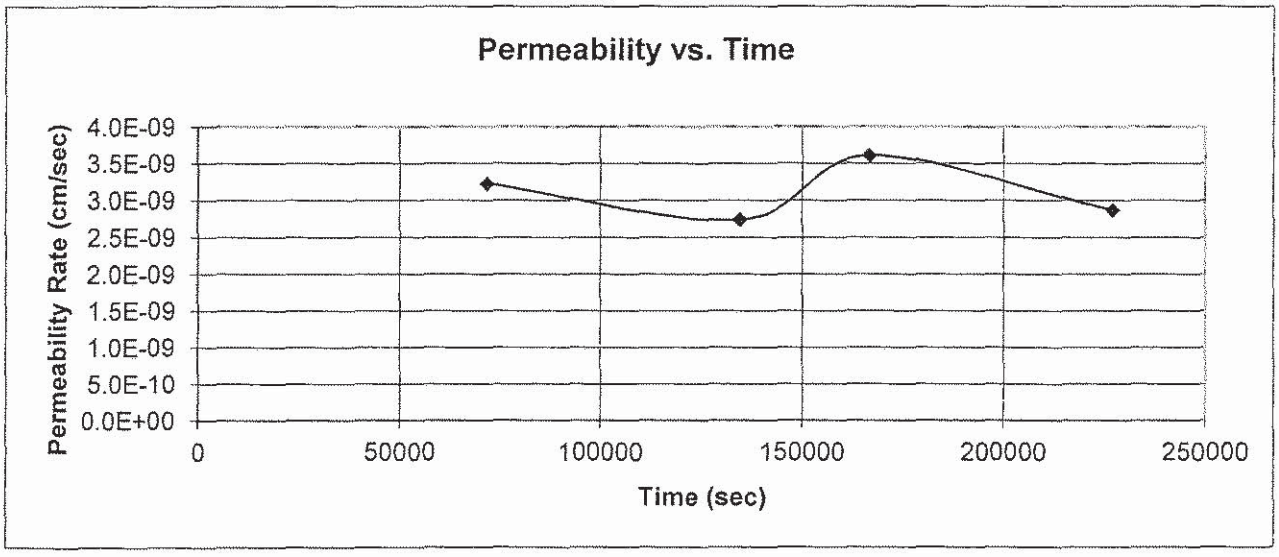
Dia. (in.)	2.85	2.84	**Length (in)**	2.32	2.38	**Weight (gr)**	426.3	431.6
Wet Density (pcf)	109.7		**Moisture Content (%)**	36.5		**Dry Density (pcf)**	80.4	
Final WD (pcf)	109.0		**Final Moisture (%)**	39.8		**Final DD (pcf)**	78.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	39.6	**Minimum Hydraulic Gradient**	19.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.1E-09



Reviewed By:

Daniel Eisman, P.E

2/23/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 14, 2012

Sample Number: C-1 #74

Sample Information: Initial / Final

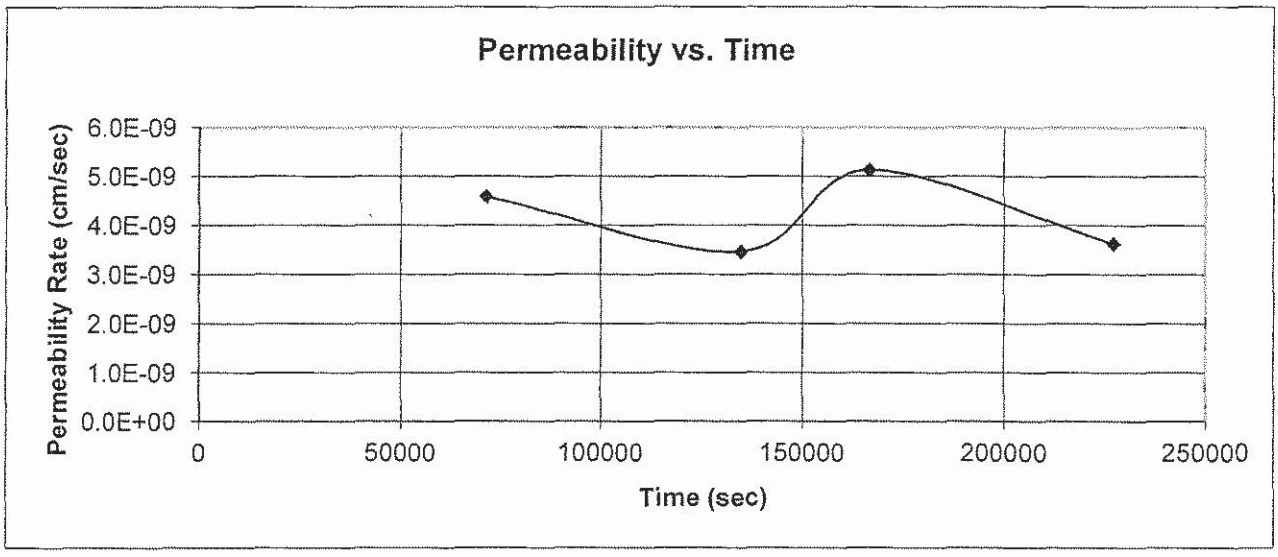
Dia. (in.)	2.85	2.87	**Length (in)**	2.20	2.24	**Weight (gr)**	411.56	434.7
Wet Density (pcf)	112.2		**Moisture Content (%)**	39.4		**Dry Density (pcf)**	80.5	
Final WD (pcf)	114.0		**Final Moisture (%)**	41.6		**Final DD (pcf)**	80.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	41.8	**Minimum Hydraulic Gradient**	20.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.2E-09



Reviewed By:

Daniel Eisman P.E.

2/23/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 14, 2012

Sample Number: C-1 #76

Sample Information: Initial / Final

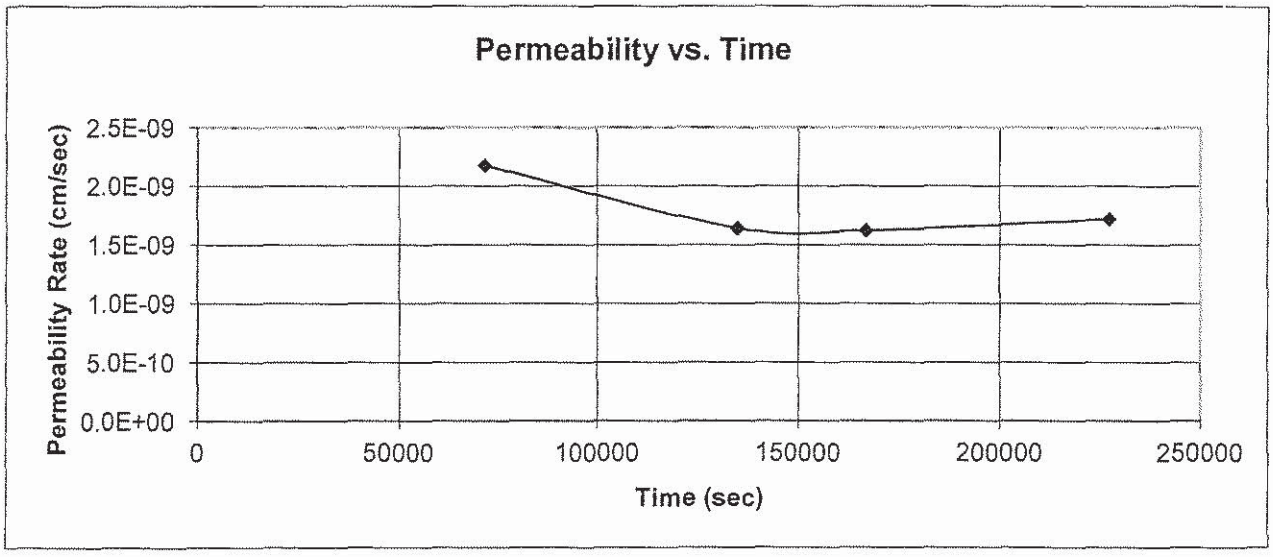
Dia. (in.)	2.84	2.83	**Length (in)**	2.08	2.05	**Weight (gr)**	371.5	375.6
Wet Density (pcf)	107.3		**Moisture Content (%)**	36.0		**Dry Density (pcf)**	78.9	
Final WD (pcf)	111.6		**Final Moisture (%)**	43.4		**Final DD (pcf)**	77.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	44.3	**Minimum Hydraulic Gradient**	22.1
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.8E-09



Reviewed By:

Daniel Eisman, P.E.

2/23/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 13, 2012

Sample Number: C-1 #78

Sample Information: Initial / Final

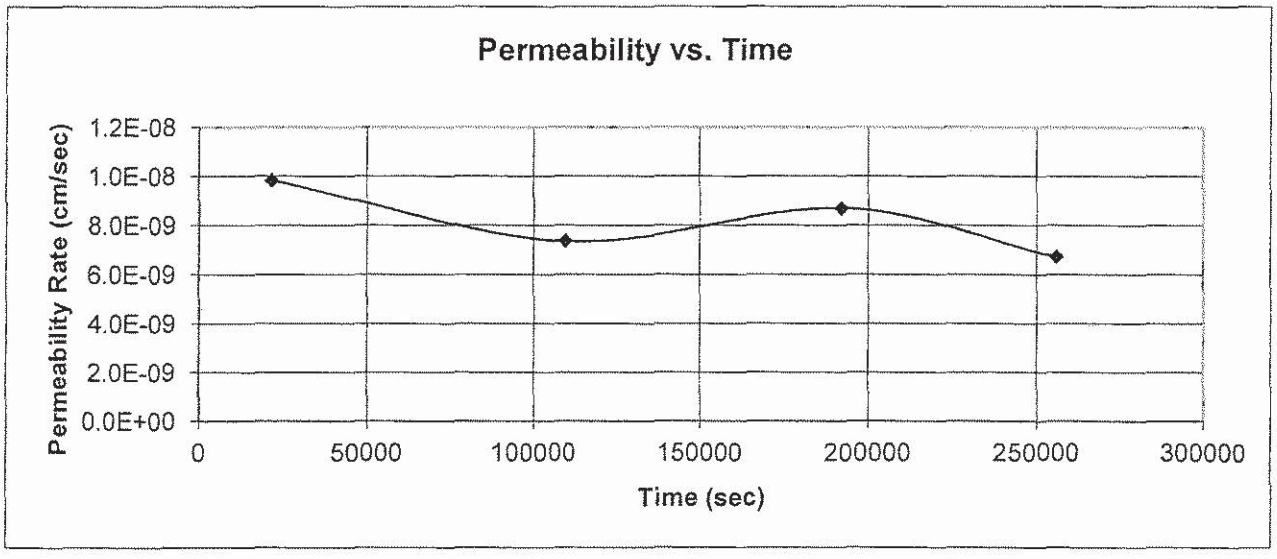
Dia. (in.)	2.84	2.90	Length (in)	2.88	2.88	Weight (gr)	555.9	565.8
Wet Density (pcf)	115.8		Moisture Content (%)	34.4		Dry Density (pcf)	86.2	
Final WD (pcf)	113.4		Final Moisture (%)	31.3		Final DD (pcf)	86.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	32.0	Minimum Hydraulic Gradient	16.0
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

8.2E-09



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3/20/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 10, 2012

Sample Number: C-1 #80

Sample Information: Initial / Final

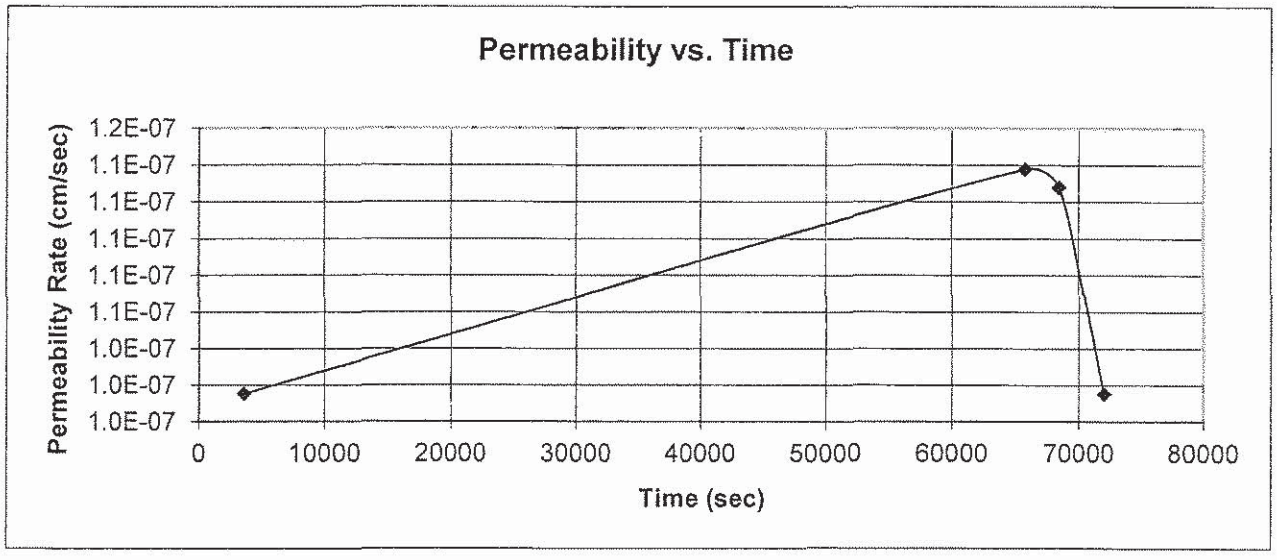
Dia. (in.)	2.82	2.86	**Length (in)**	2.40	2.45	**Weight (gr)**	462.2	475.87
Wet Density (pcf)	117.1		**Moisture Content (%)**	28.7		**Dry Density (pcf)**	91.0	
Final WD (pcf)	115.6		**Final Moisture (%)**	33.1		**Final DD (pcf)**	86.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	38.2	**Minimum Hydraulic Gradient**	19.1
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.1E-07



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 18, 2012

Sample Number: C-1 #80A

Sample Information: Initial / Final

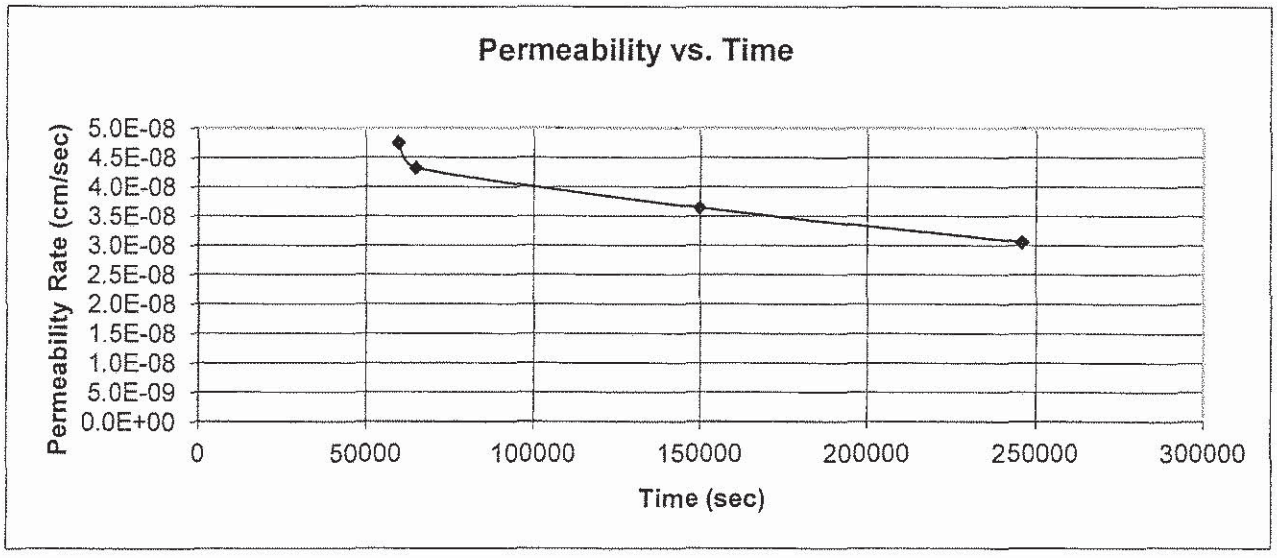
Dia. (in.)	2.85	2.86	Length (in)	2.27	2.30	Weight (gr)	421.8	435.9
Wet Density (pcf)	111.3		Moisture Content (%)	33.2		Dry Density (pcf)	83.6	
Final WD (pcf)	112.1		Final Moisture (%)	36.0		Final DD (pcf)	82.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	40.2	Minimum Hydraulic Gradient	19.9
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

3.9E-08



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 19, 2012

Sample Number: C-1 #80B

Sample Information: Initial / Final

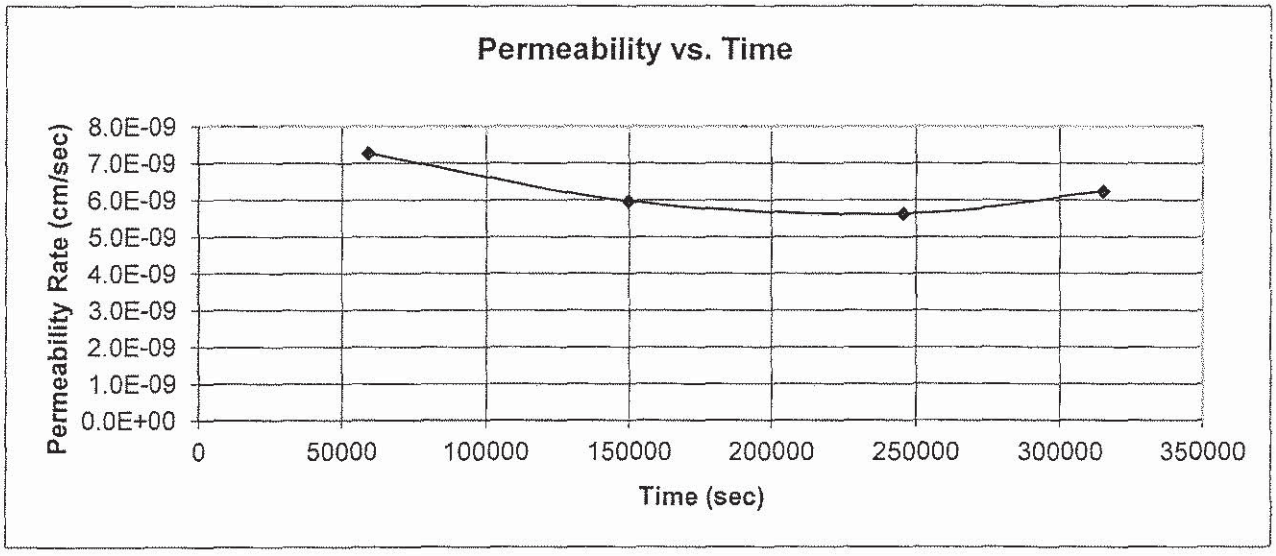
Dia. (in.)	2.83	2.87	Length (in)	2.14	2.14	Weight (gr)	399.41	391
Wet Density (pcf)	113.2		Moisture Content (%)	43.7		Dry Density (pcf)	78.8	
Final WD (pcf)	107.9		Final Moisture (%)	47.3		Final DD (pcf)	73.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	43.0	Minimum Hydraulic Gradient	21.5
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

6.3E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 19, 2012

Sample Number: C-1 #80C

Sample Information: Initial / Final

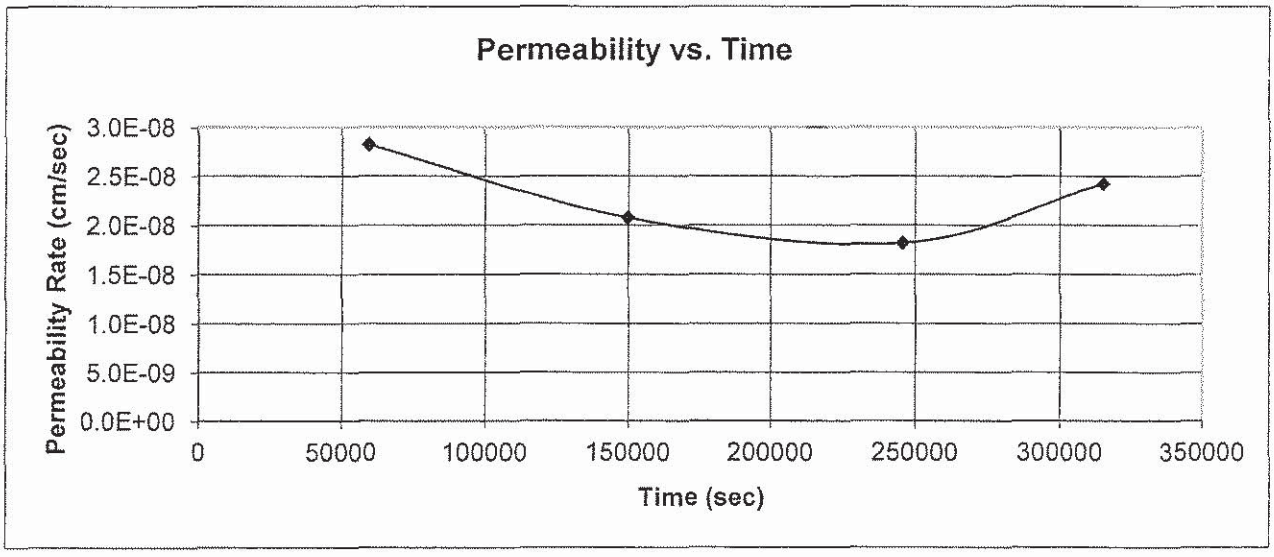
Dia. (in.)	2.79	2.81	Length (in)	2.59	2.60	Weight (gr)	455.1	471.2
Wet Density (pcf)	109.3		Moisture Content (%)	29.1		Dry Density (pcf)	84.7	
Final WD (pcf)	111.2		Final Moisture (%)	38.3		Final DD (pcf)	80.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	35.2	Minimum Hydraulic Gradient	17.4
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

2.3E-08



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 19, 2012

Sample Number: C-1 #80D

Sample Information: Initial / Final

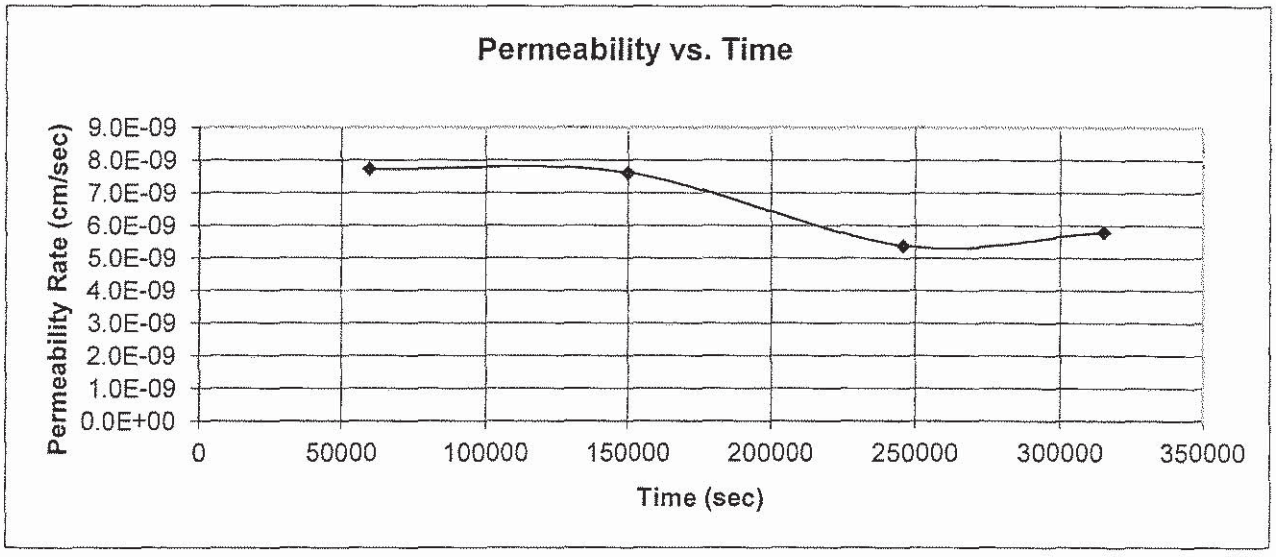
Dia. (in.)	2.84	2.86	**Length (in)**	2.29	2.35	**Weight (gr)**	442.2	454.2
Wet Density (pcf)	116.1		**Moisture Content (%)**	29.2		**Dry Density (pcf)**	89.9	
Final WD (pcf)	114.5		**Final Moisture (%)**	36.2		**Final DD (pcf)**	84.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	40.1	**Minimum Hydraulic Gradient**	20.0
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

6.6E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 12, 2012

Sample Number: C-1 #82

Sample Information: Initial / Final

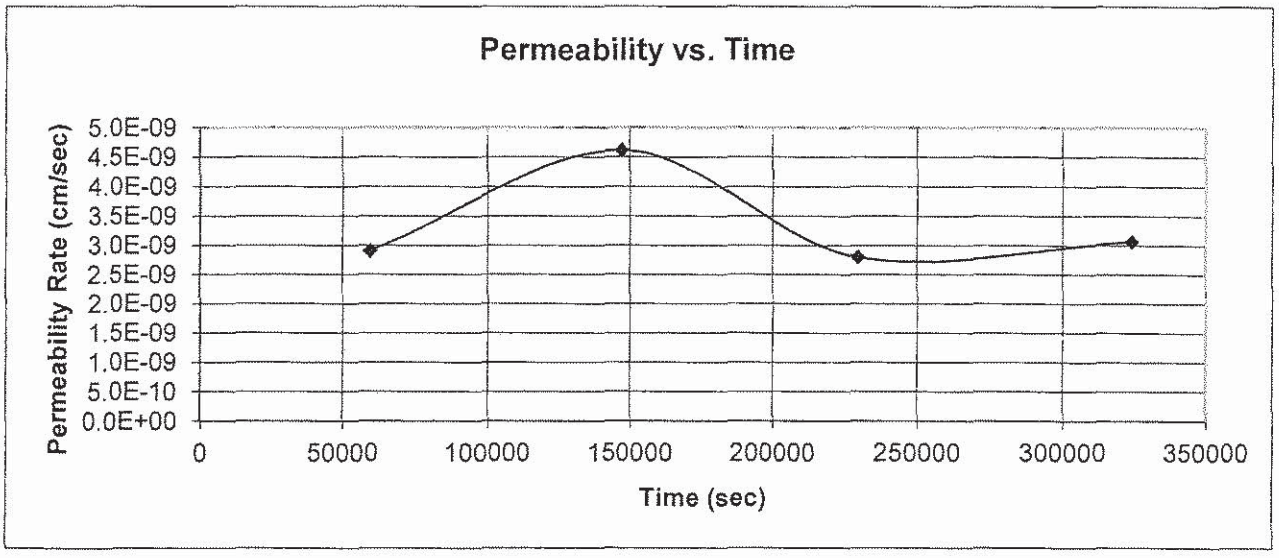
Dia. (in.)	2.87	2.87	**Length (in)**	2.36	2.33	**Weight (gr)**	457.5	469.65
Wet Density (pcf)	113.7		**Moisture Content (%)**	33.0		**Dry Density (pcf)**	85.5	
Final WD (pcf)	118.3		**Final Moisture (%)**	34.7		**Final DD (pcf)**	87.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	38.9	**Minimum Hydraulic Gradient**	19.4
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.3E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 14, 2012

Sample Number: C-1 #84

Sample Information: Initial / Final

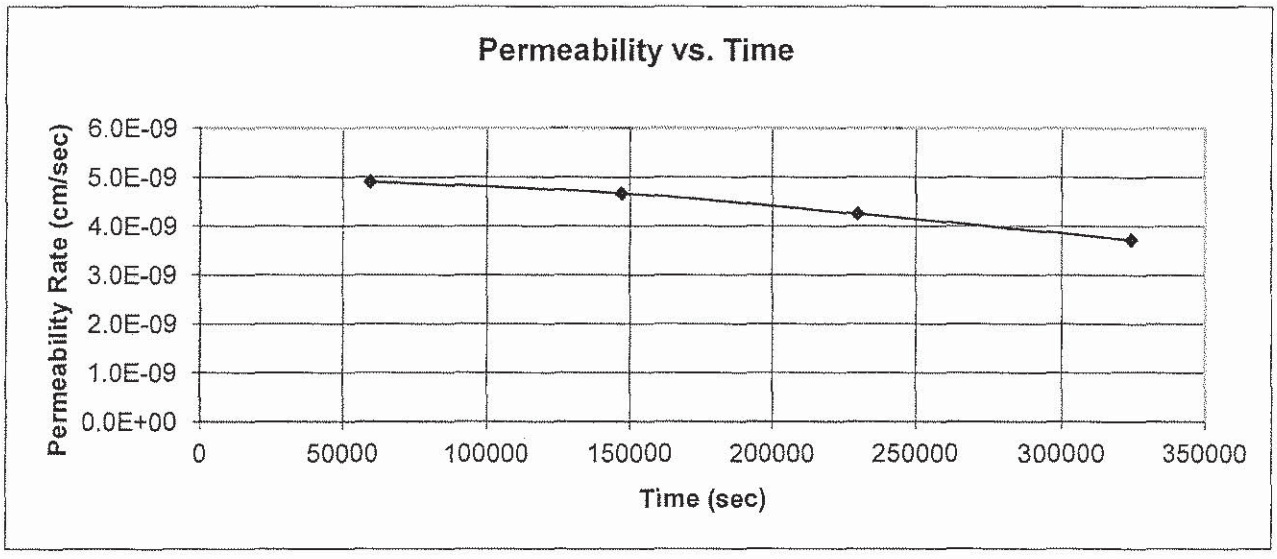
Dia. (in.)	2.85	2.85	**Length (in)**	2.35	2.30	**Weight (gr)**	450.3	458.9
Wet Density (pcf)	114.8		**Moisture Content (%)**	31.2		**Dry Density (pcf)**	87.5	
Final WD (pcf)	119.4		**Final Moisture (%)**	33.8		**Final DD (pcf)**	89.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	39.1	**Minimum Hydraulic Gradient**	19.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.4E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** May 18, 2012

Sample Number: C-1 #86

Sample Information: Initial / Final

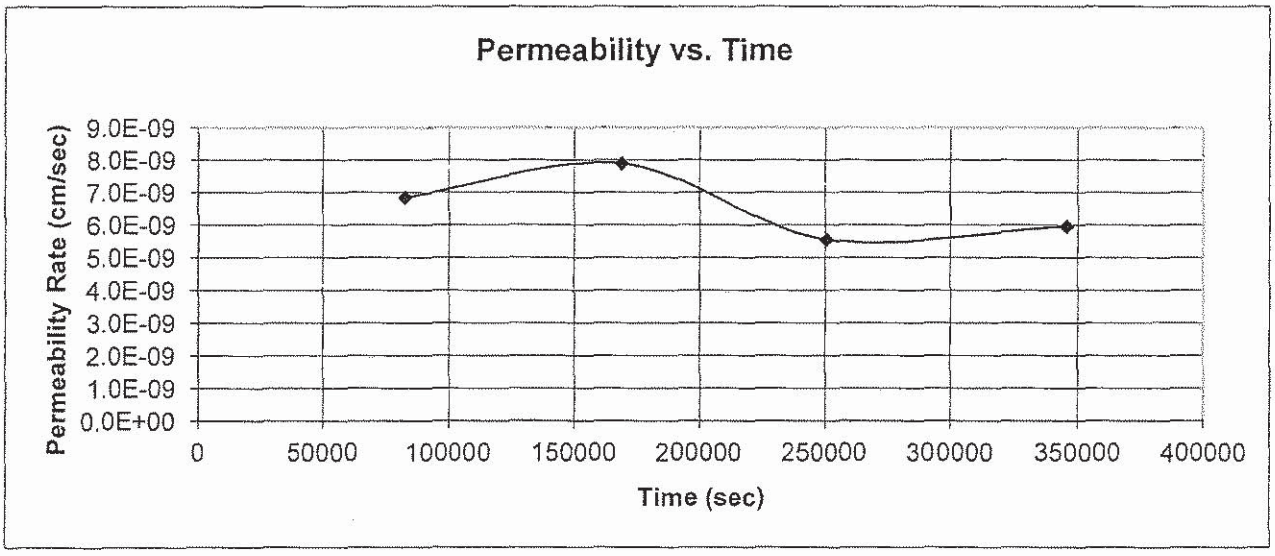
Dia. (in.)	2.79	2.85	**Length (in)**	4.36	4.34	**Weight (gr)**	730.7	747.3
Wet Density (pcf)	104.8		**Moisture Content (%)**	39.5		**Dry Density (pcf)**	75.1	
Final WD (pcf)	102.7		**Final Moisture (%)**	44.1		**Final DD (pcf)**	71.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	21.1	**Minimum Hydraulic Gradient**	10.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

6.6E-09



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Daniel Eisman, P.E.

5/24/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 28, 2012

Sample Number: C-1 #86R

Sample Information: Initial / Final

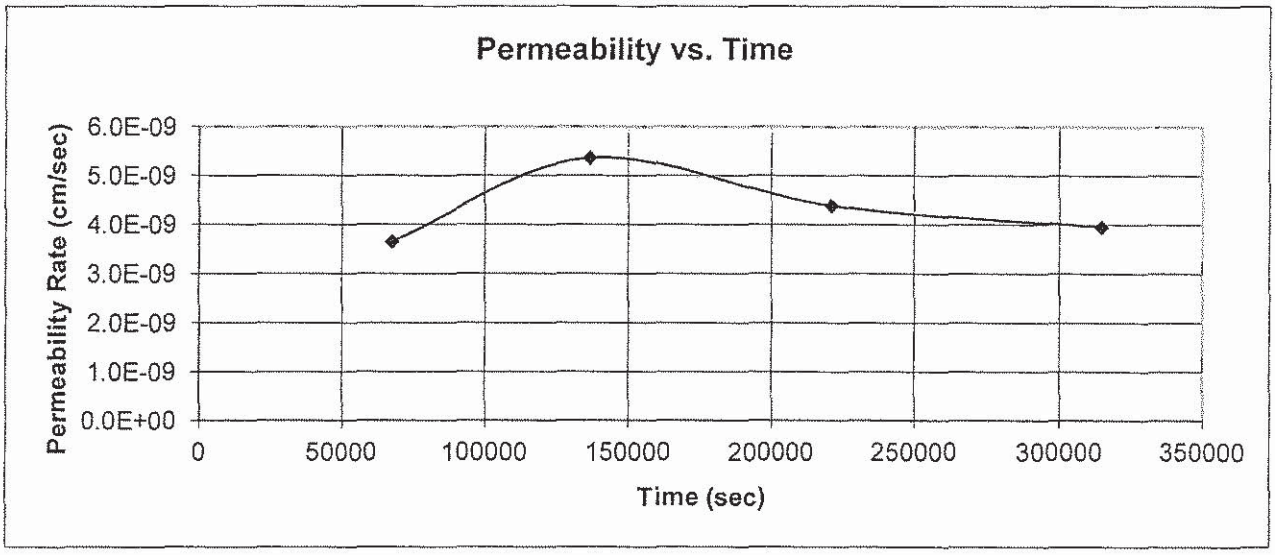
Dia. (in.)	2.83	2.85	**Length (in)**	2.45	2.43	**Weight (gr)**	441.8	452.3
Wet Density (pcf)	108.7		**Moisture Content (%)**	36.2		**Dry Density (pcf)**	79.8	
Final WD (pcf)	110.9		**Final Moisture (%)**	40.5		**Final DD (pcf)**	78.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	37.5	**Minimum Hydraulic Gradient**	18.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.3E-09



Reviewed By:

Daniel Eisman, P.E.

7/3/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 15, 2012

Sample Number: C-1 #86R2

Sample Information: Initial / Final

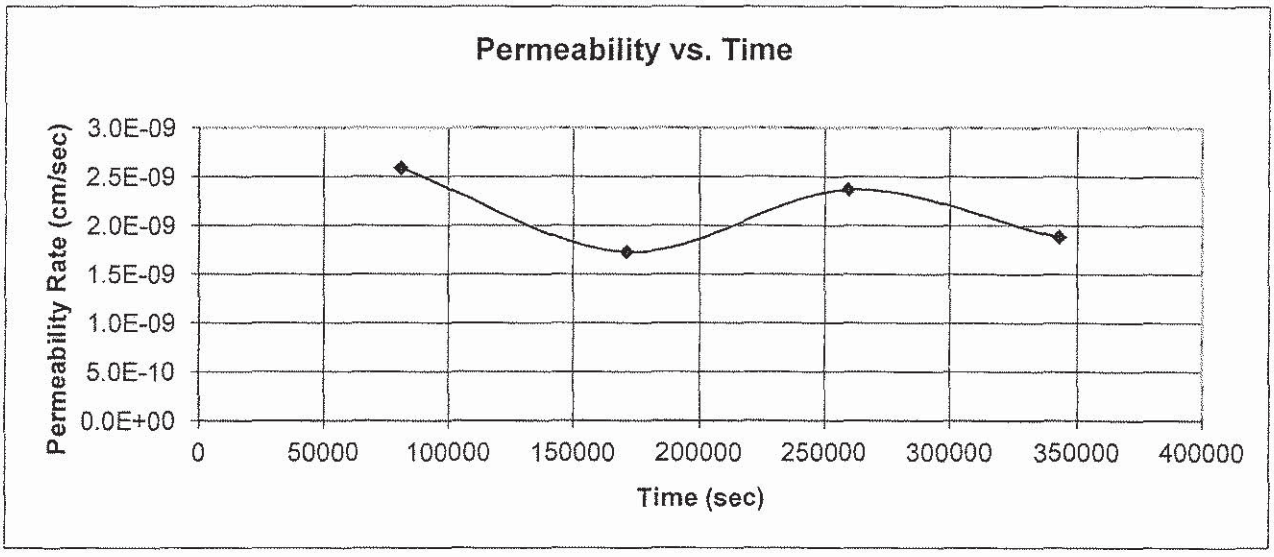
Dia. (in.)	2.85	2.87	Length (in)	2.10	2.08	Weight (gr)	378.5	383.36
Wet Density (pcf)	107.9		Moisture Content (%)	32.7		Dry Density (pcf)	81.3	
Final WD (pcf)	108.6		Final Moisture (%)	43.7		Final DD (pcf)	75.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	43.8	**Minimum Hydraulic Gradient**	21.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.1E-09



Reviewed By:

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7/17/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 17, 2012

Sample Number: C-2 #87R2

Sample Information: Initial / Final

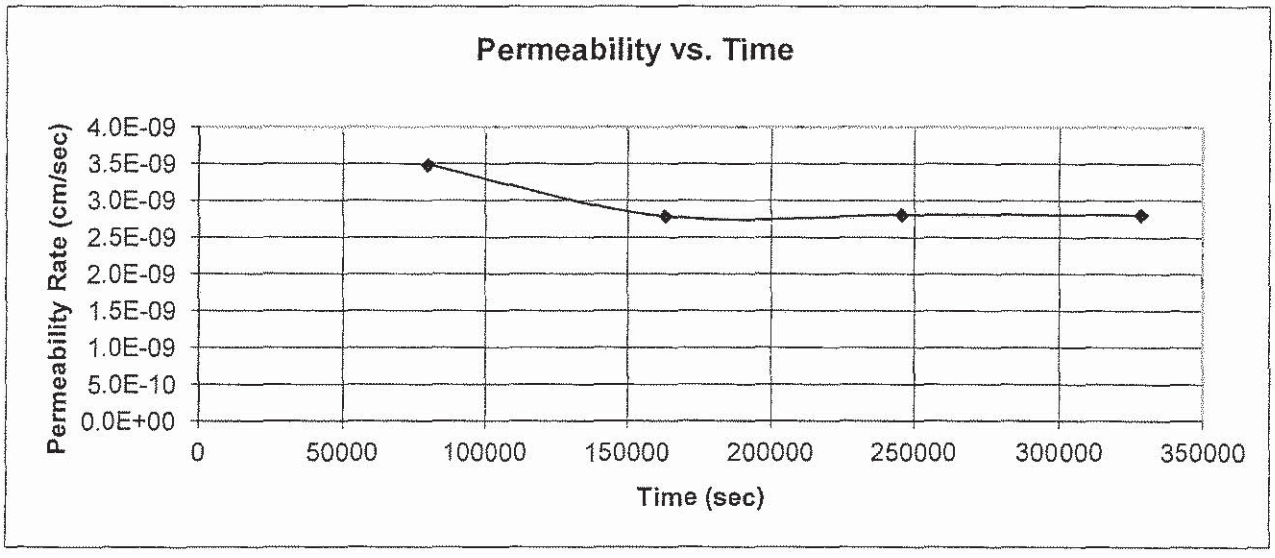
Dia. (in.)	2.84	2.87	**Length (in)**	1.85	2.89	**Weight (gr)**	336.8	345.2
Wet Density (pcf)	109.8		**Moisture Content (%)**	36.2		**Dry Density (pcf)**	80.6	
Final WD (pcf)	70.5		**Final Moisture (%)**	41.4		**Final DD (pcf)**	49.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	49.7	**Minimum Hydraulic Gradient**	24.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.0E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** May 18, 2012

Sample Number: C-1 #88

Sample Information: Initial / Final

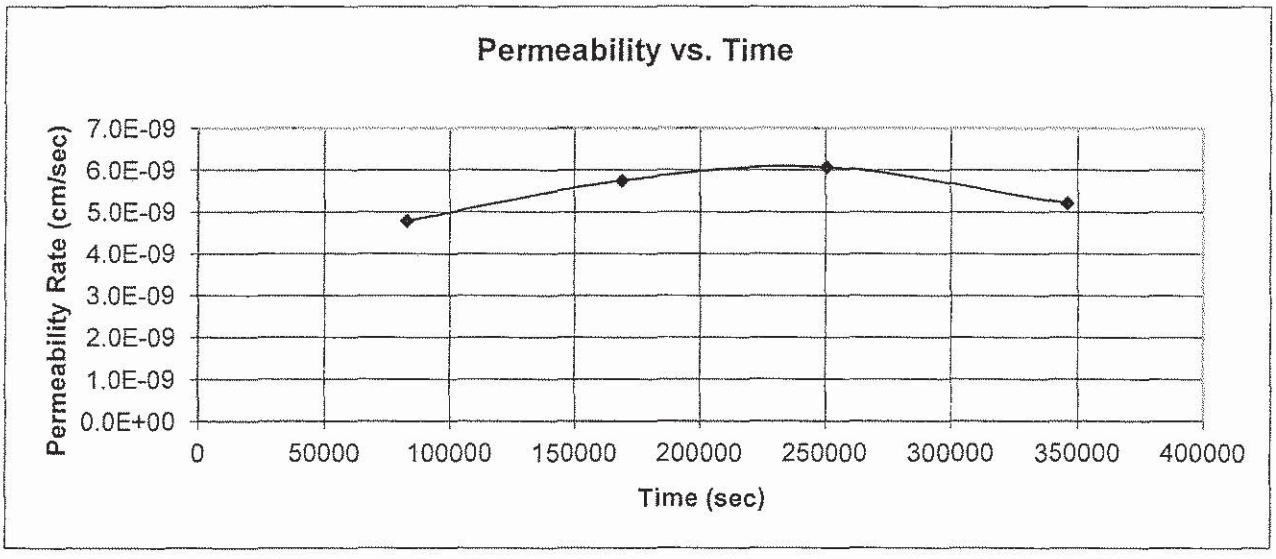
Dia. (in.)	2.88	2.87	Length (in)	4.07	4.02	Weight (gr)	783.5	789.8
Wet Density (pcf)	112.9		Moisture Content (%)	21.5		Dry Density (pcf)	93.0	
Final WD (pcf)	115.3		Final Moisture (%)	34.8		Final DD (pcf)	85.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	22.6	Minimum Hydraulic Gradient	11.3
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

5.5E-09



Reviewed By:

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5/24/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 2, 2012

Sample Number: C-1 #88R

Sample Information: Initial / Final

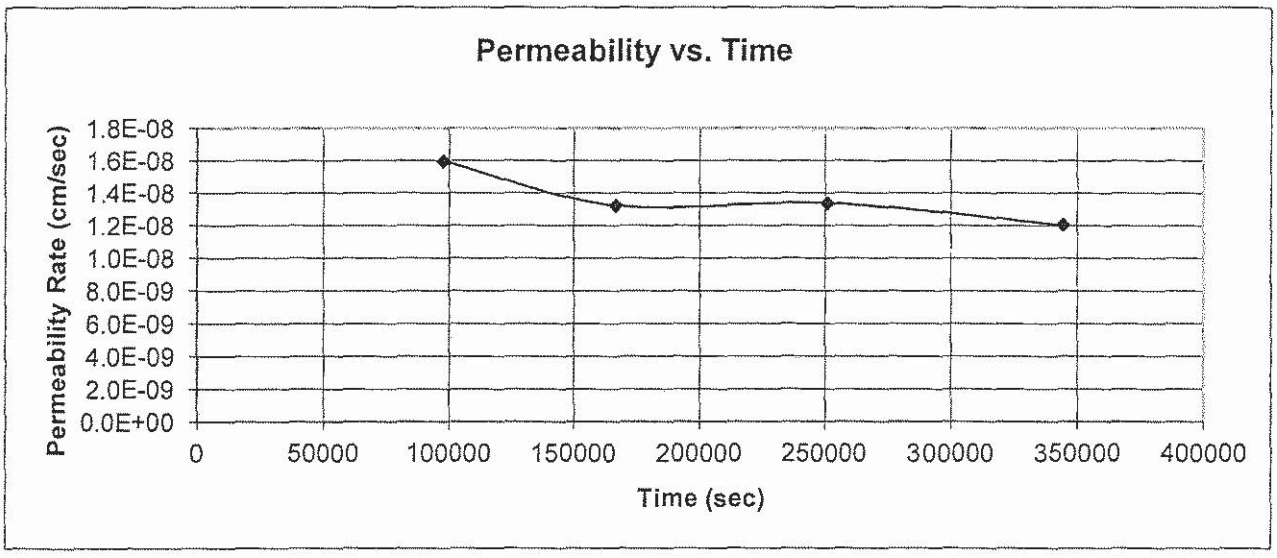
Dia. (in.)	2.86	2.81	**Length (in)**	2.17	2.19	**Weight (gr)**	362.6	383.2
Wet Density (pcf)	99.1		**Moisture Content (%)**	36.0		**Dry Density (pcf)**	72.9	
Final WD (pcf)	107.2		**Final Moisture (%)**	48.1		**Final DD (pcf)**	72.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	41.9	**Minimum Hydraulic Gradient**	20.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.4E-08



Reviewed By:

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7/3/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 16, 2012

Sample Number: C-1 #88R2

Sample Information: Initial / Final

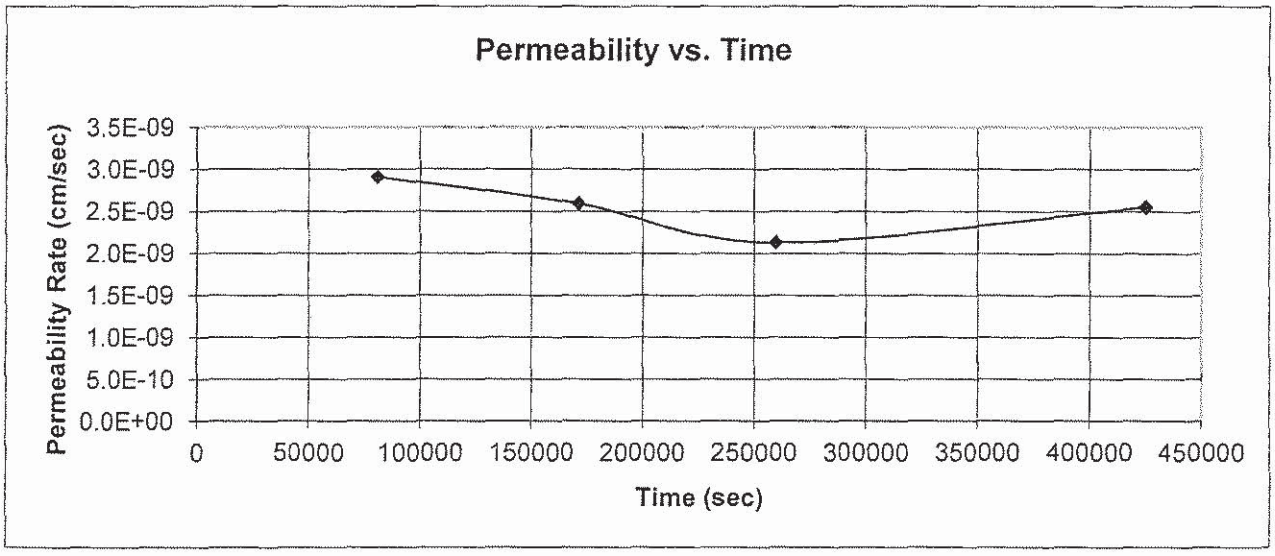
Dia. (in.)	2.84	2.85	**Length (in)**	1.88	1.93	**Weight (gr)**	333.7	340.4
Wet Density (pcf)	106.9		**Moisture Content (%)**	44.2		**Dry Density (pcf)**	74.2	
Final WD (pcf)	105.5		**Final Moisture (%)**	44.8		**Final DD (pcf)**	72.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	49.0	**Minimum Hydraulic Gradient**	24.4
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.5E-09



Reviewed By:

Daniel Eisman, P.E.

7/17/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** May 18, 2012

Sample Number: C-1 #90

Sample Information: Initial / Final

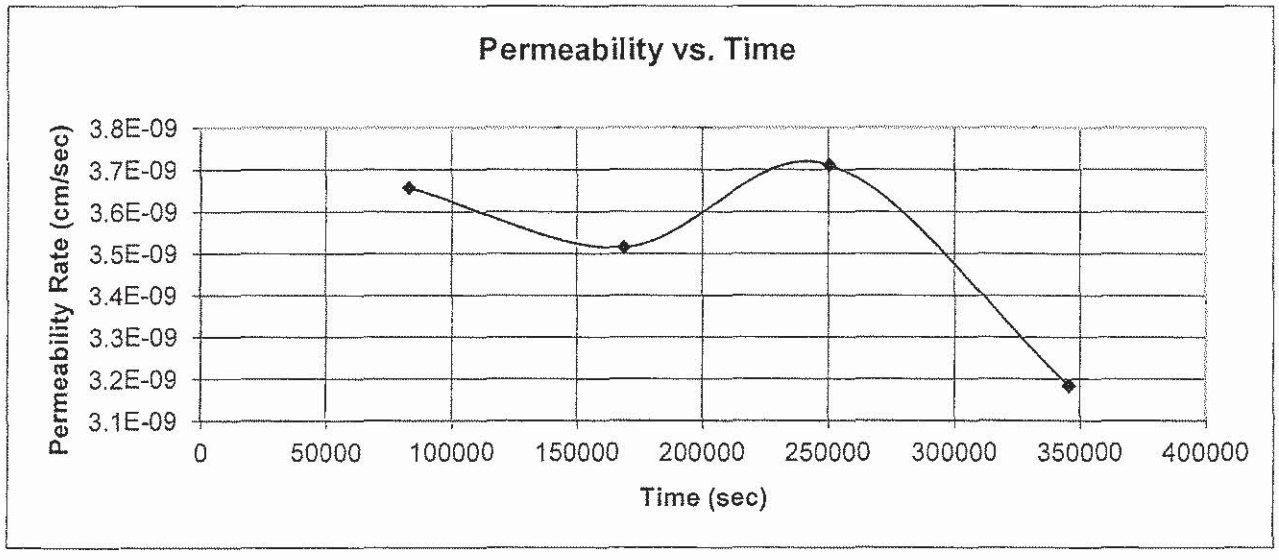
Dia. (in.)	2.85	2.85	Length (in)	4.06	4.03	Weight (gr)	744.5	753
Wet Density (pcf)	109.5		Moisture Content (%)	45.5		Dry Density (pcf)	75.3	
Final WD (pcf)	111.1		Final Moisture (%)	43.6		Final DD (pcf)	77.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	22.7	Minimum Hydraulic Gradient	11.3
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

3.5E-09



Reviewed By:

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5/24/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 2, 2012

Sample Number: C-1 #90R

Sample Information: Initial / Final

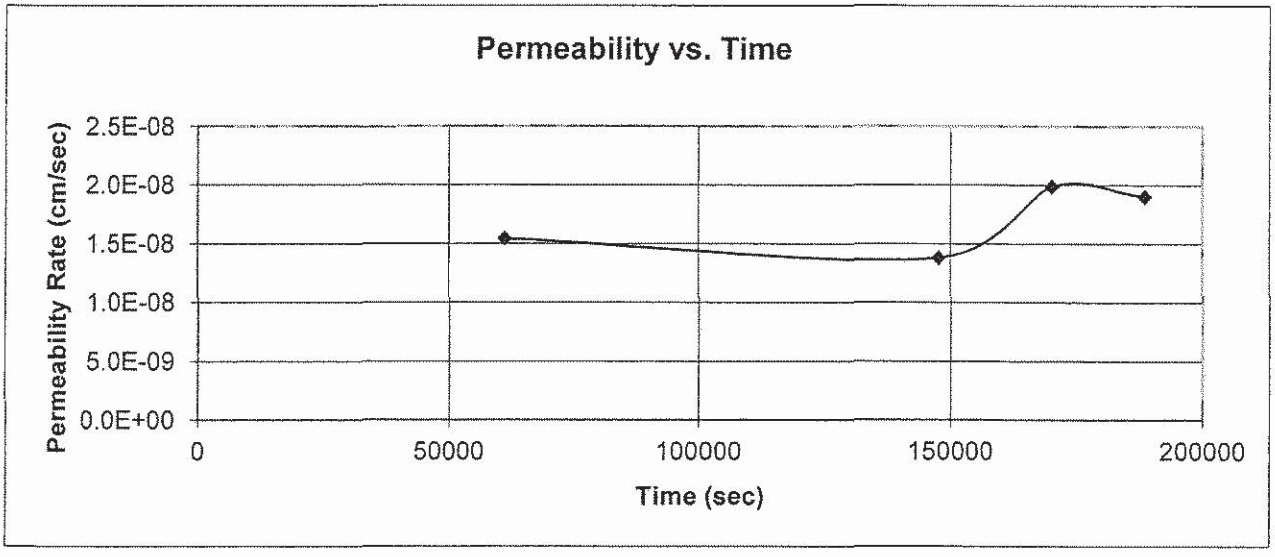
Dia. (in.)	2.83	2.83	**Length (in)**	1.97	1.97	**Weight (gr)**	347.2	358.52
Wet Density (pcf)	107.0		**Moisture Content (%)**	34.1		**Dry Density (pcf)**	79.8	
Final WD (pcf)	110.0		**Final Moisture (%)**	39.5		**Final DD (pcf)**	78.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	46.4	**Minimum Hydraulic Gradient**	23.0
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.7E-08



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7/3/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 16, 2012

Sample Number: C-1 #90R2

Sample Information: Initial / Final

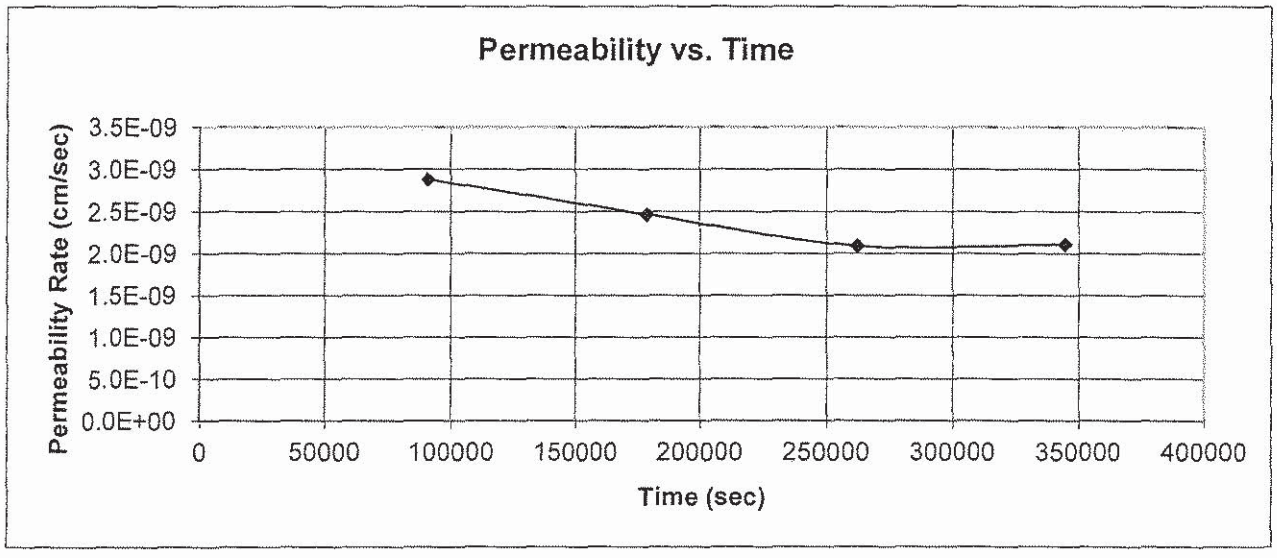
Dia. (in.)	2.86	2.86	Length (in)	1.76	1.71	Weight (gr)	319.5	325
Wet Density (pcf)	107.5		Moisture Content (%)	34.7		Dry Density (pcf)	79.8	
Final WD (pcf)	112.2		Final Moisture (%)	37.3		Final DD (pcf)	81.7	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	52.1	Minimum Hydraulic Gradient	26.0
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

2.4E-09



Reviewed By:

Daniel Eisman, P.E.

7/17/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** May 17, 2012

Sample Number: C-1 #92

Sample Information: Initial / Final

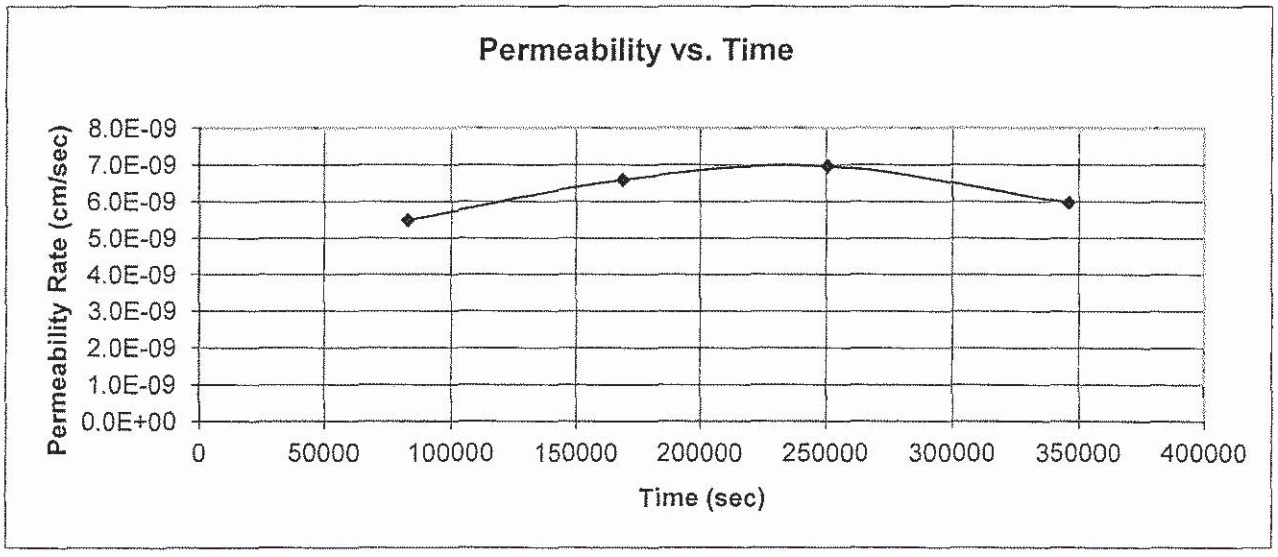
Dia. (in.)	2.85	2.85	Length (in)	4.57	4.55	Weight (gr)	832	840.9
Wet Density (pcf)	109.1		Moisture Content (%)	55.6		Dry Density (pcf)	70.1	
Final WD (pcf)	110.5		Final Moisture (%)	42.7		Final DD (pcf)	77.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	20.1	Minimum Hydraulic Gradient	10.1
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

6.3E-09



Reviewed By:

Daniel Eisman, P.E.

5/24/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 2, 2012

Sample Number: C-1 #92R

Sample Information: Initial / Final

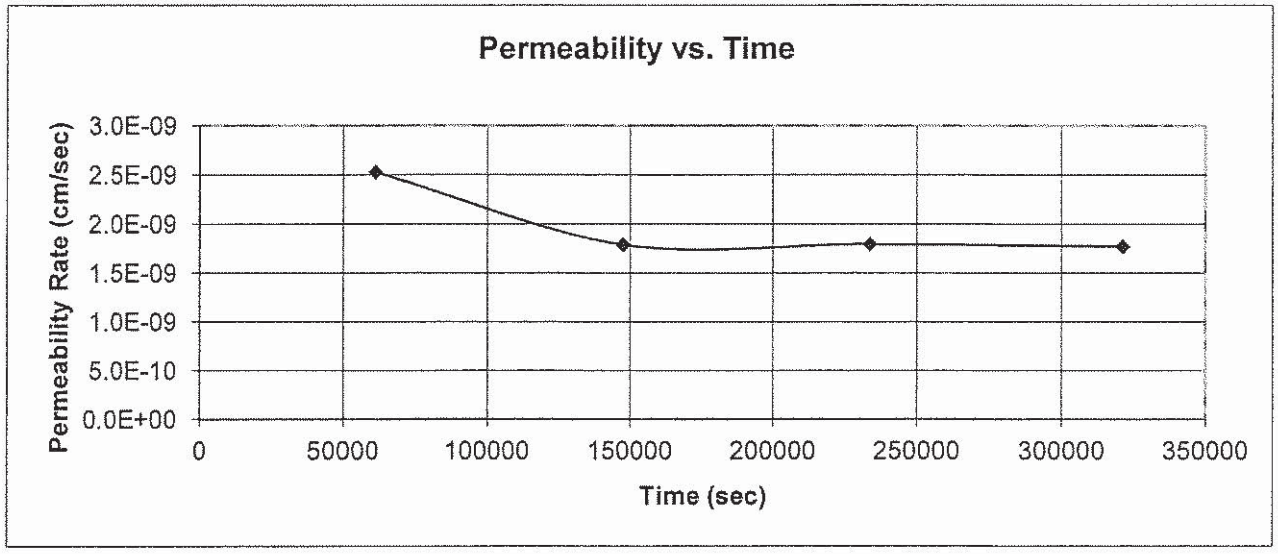
Dia. (in.)	2.84	2.84	Length (in)	2.07	2.08	Weight (gr)	389	392
Wet Density (pcf)	113.0		Moisture Content (%)	46.0		Dry Density (pcf)	77.4	
Final WD (pcf)	113.4		Final Moisture (%)	38.2		Final DD (pcf)	82.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	44.5	Minimum Hydraulic Gradient	22.2
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

2.0E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 16, 2012

Sample Number: C-1 #92R2

Sample Information: Initial / Final

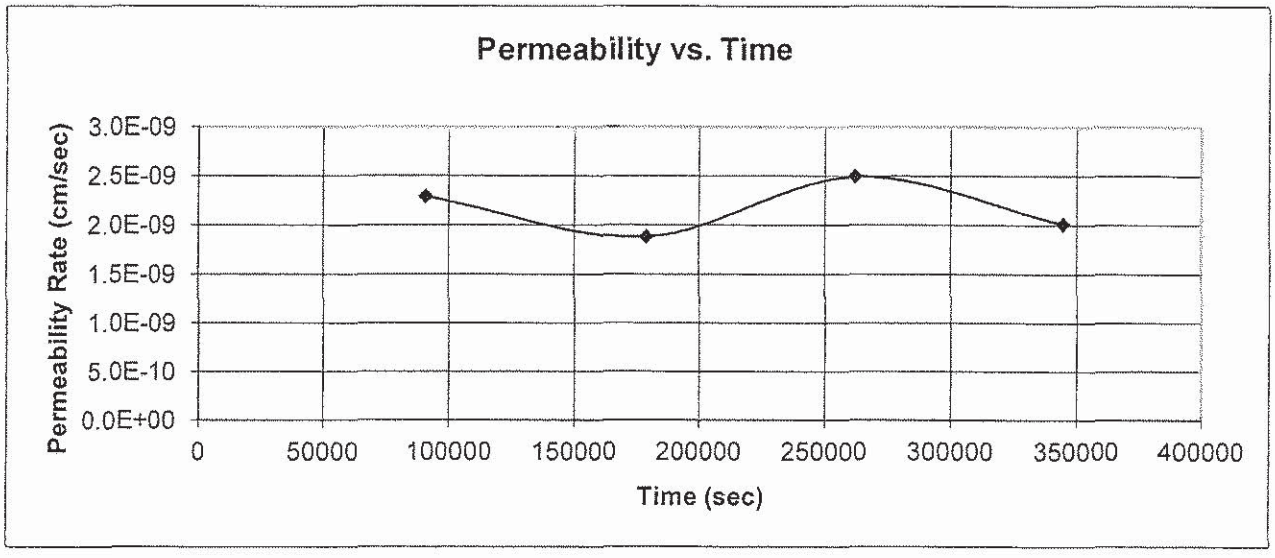
Dia. (in.)	2.83	2.84	**Length (in)**	1.65	1.65	**Weight (gr)**	314.3	322.4
Wet Density (pcf)	115.2		**Moisture Content (%)**	38.2		**Dry Density (pcf)**	83.3	
Final WD (pcf)	117.4		**Final Moisture (%)**	32.1		**Final DD (pcf)**	88.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	55.7	**Minimum Hydraulic Gradient**	27.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.2E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 28, 2012

Sample Number: C-1 #94R

Sample Information: Initial / Final

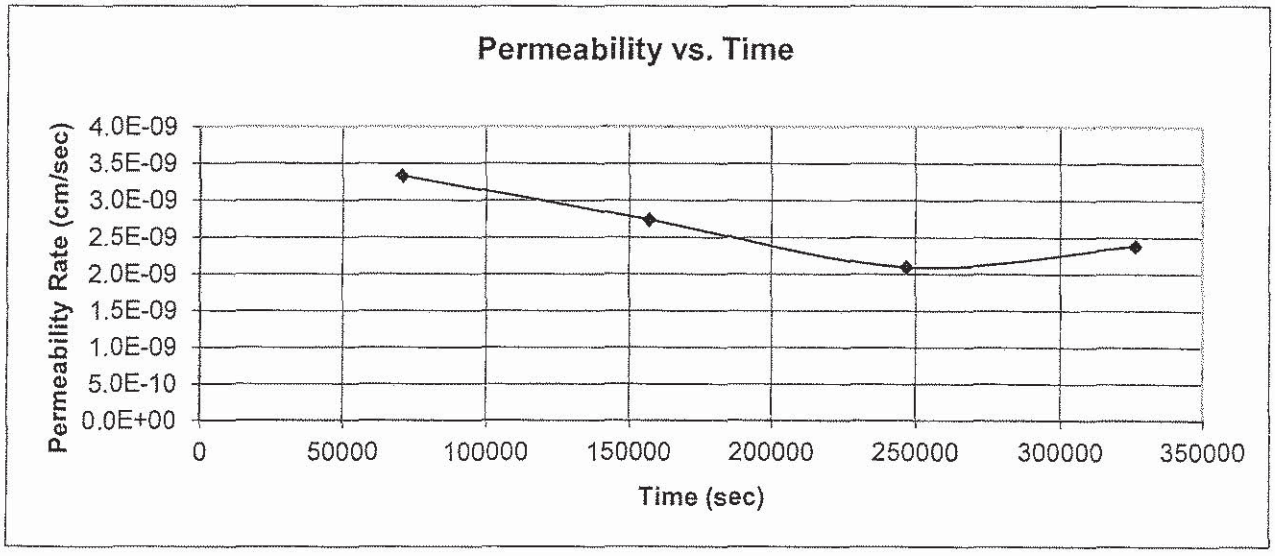
Dia. (in.)	2.86	2.86	**Length (in)**	1.91	1.90	**Weight (gr)**	349.71	352.1
Wet Density (pcf)	108.8		**Moisture Content (%)**	35.2		**Dry Density (pcf)**	80.5	
Final WD (pcf)	110.2		**Final Moisture (%)**	43.1		**Final DD (pcf)**	77.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	48.1	**Minimum Hydraulic Gradient**	24.0
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.6E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 2, 2012

Sample Number: C-1 #96

Sample Information: Initial / Final

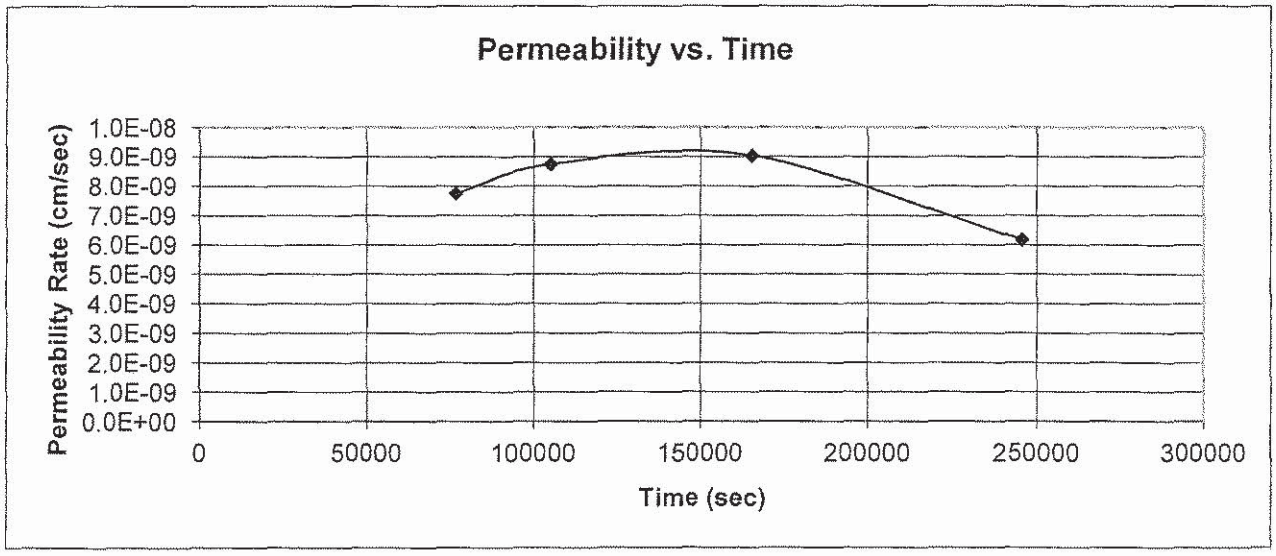
Dia. (in.)	2.87	2.87	**Length (in)**	2.02	2.05	**Weight (gr)**	370.1	379.1
Wet Density (pcf)	108.2		**Moisture Content (%)**	38.0		**Dry Density (pcf)**	78.4	
Final WD (pcf)	108.8		**Final Moisture (%)**	42.3		**Final DD (pcf)**	76.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	45.4	**Minimum Hydraulic Gradient**	22.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

7.9E-09



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6/12/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 29, 2012

Sample Number: C-1 #96R

Sample Information: Initial / Final

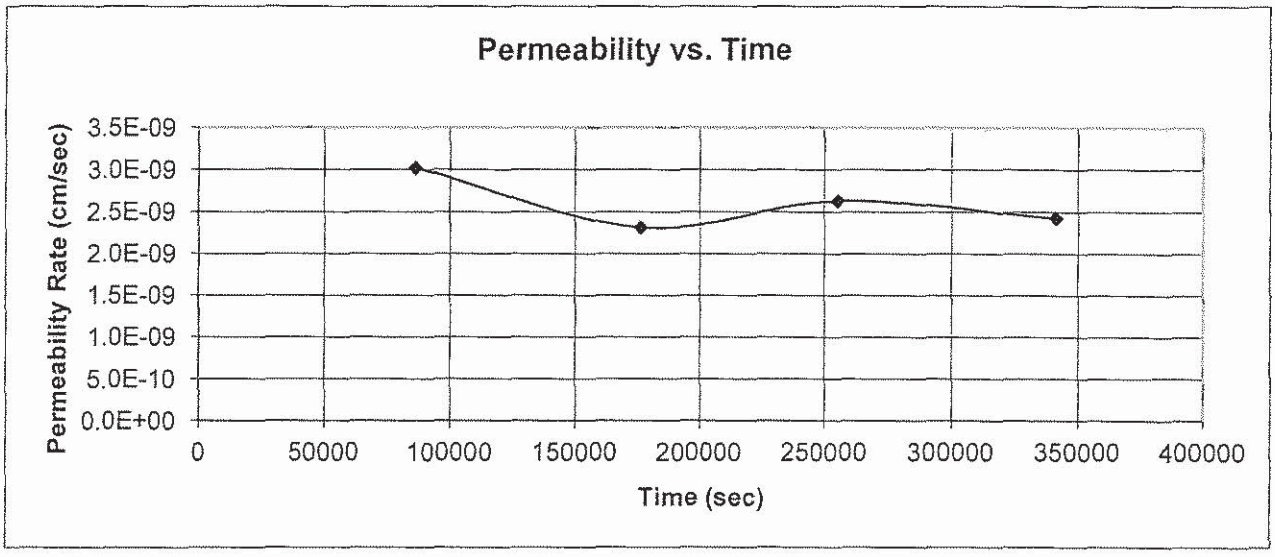
Dia. (in.)	2.85	2.84	**Length (in)**	2.10	2.12	**Weight (gr)**	385.75	391.2
Wet Density (pcf)	109.2		**Moisture Content (%)**	32.7		**Dry Density (pcf)**	82.2	
Final WD (pcf)	111.3		**Final Moisture (%)**	40.9		**Final DD (pcf)**	79.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	43.7	**Minimum Hydraulic Gradient**	21.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.6E-09



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Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 5, 2012

Sample Number: C-1 #98

Sample Information: Initial / Final

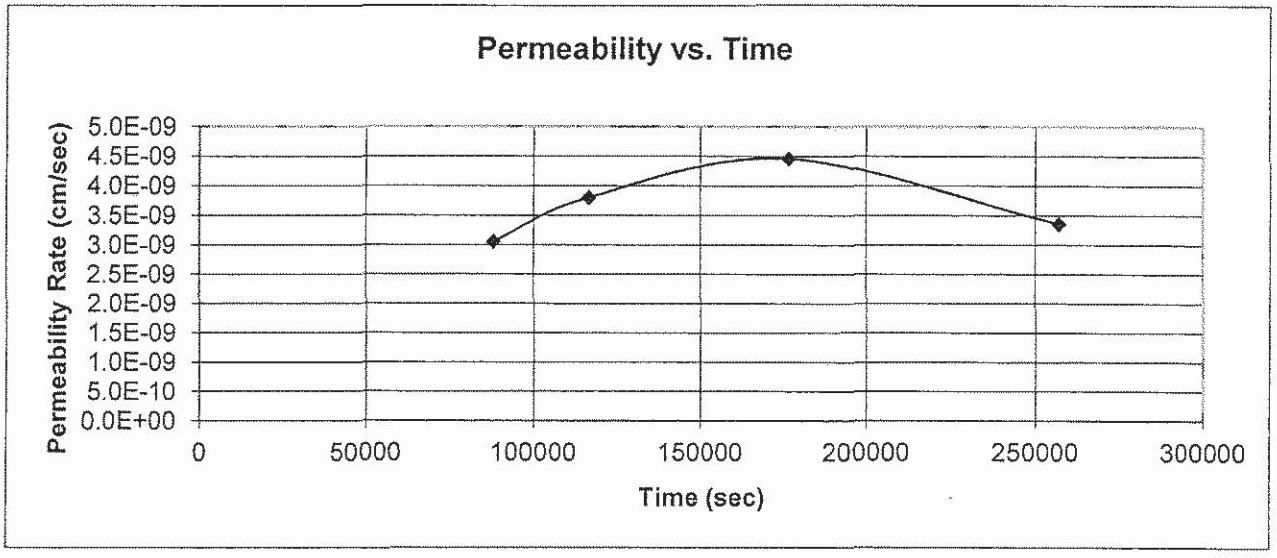
Dia. (in.)	2.88	2.89	**Length (in)**	2.22	2.28	**Weight (gr)**	432.1	439.15
Wet Density (pcf)	113.6		**Moisture Content (%)**	56.0		**Dry Density (pcf)**	72.8	
Final WD (pcf)	111.7		**Final Moisture (%)**	37.3		**Final DD (pcf)**	81.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	41.4	**Minimum Hydraulic Gradient**	20.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.7E-09



Reviewed By:

Daniel Elsman, P.E.

6/12/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 2, 2012

Sample Number: C-1 #100

Sample Information: Initial / Final

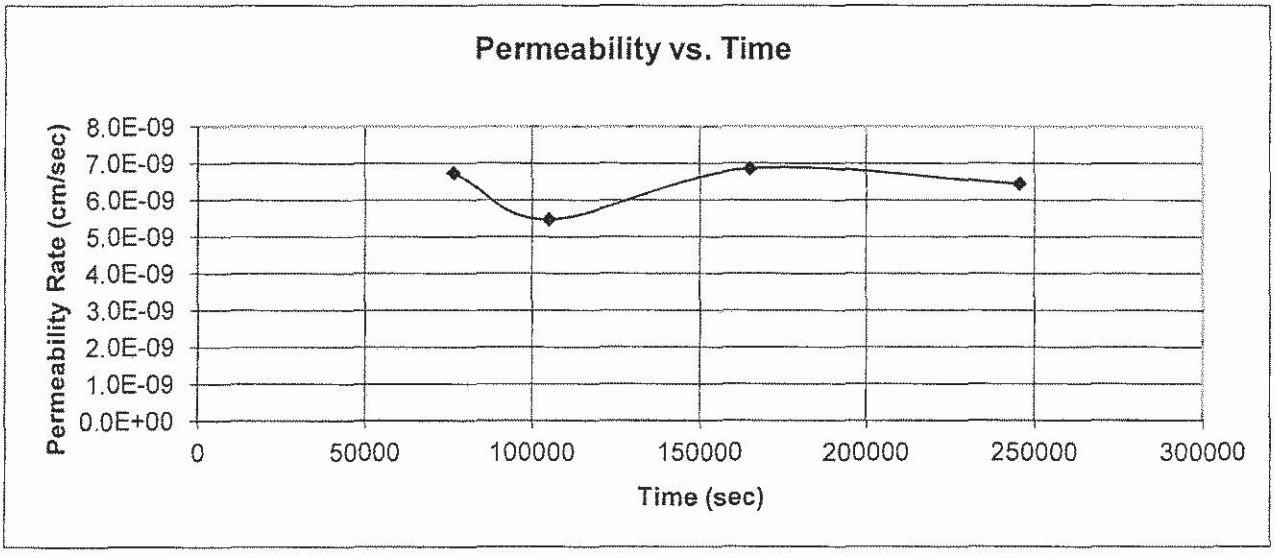
Dia. (in.)	2.85	2.88	**Length (in)**	2.09	2.11	**Weight (gr)**	388.2	394.62
Wet Density (pcf)	110.8		**Moisture Content (%)**	34.6		**Dry Density (pcf)**	82.3	
Final WD (pcf)	109.7		**Final Moisture (%)**	37.8		**Final DD (pcf)**	79.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	43.9	**Minimum Hydraulic Gradient**	21.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

6.4E-09



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6/12/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 2, 2012

Sample Number: C-1 #102

Sample Information: Initial / Final

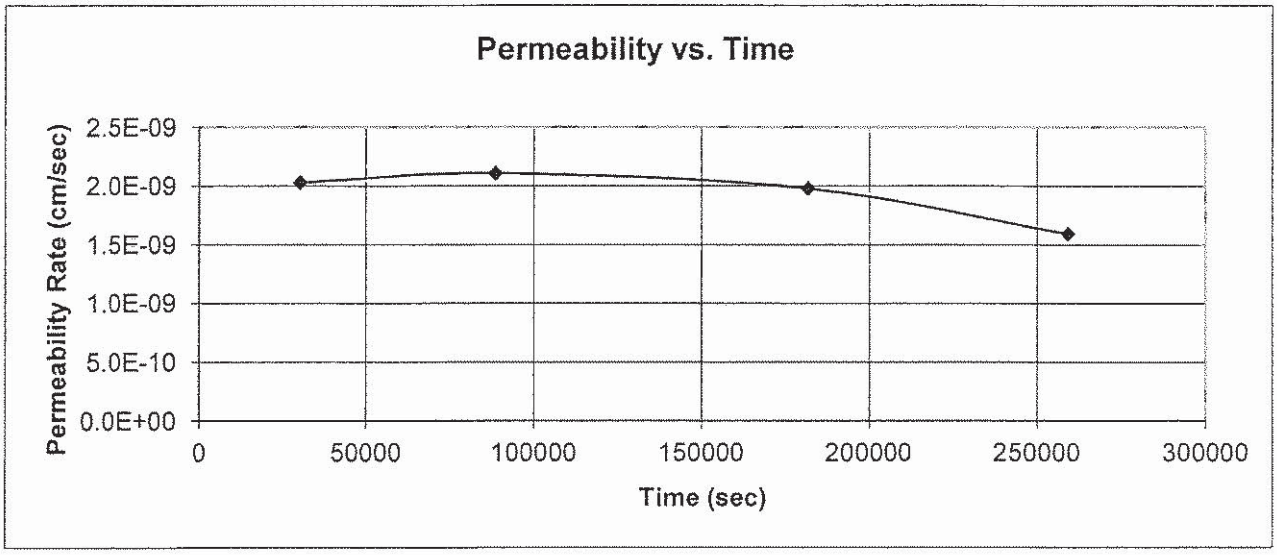
Dia. (in.)	2.84	2.86	**Length (in)**	2.46	2.48	**Weight (gr)**	481.8	491.4
Wet Density (pcf)	118.0		**Moisture Content (%)**	29.0		**Dry Density (pcf)**	91.4	
Final WD (pcf)	117.9		**Final Moisture (%)**	29.4		**Final DD (pcf)**	91.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	37.5	**Minimum Hydraulic Gradient**	18.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.9E-09



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4/10/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 3, 2012

Sample Number: C-1 #104

Sample Information: Initial / Final

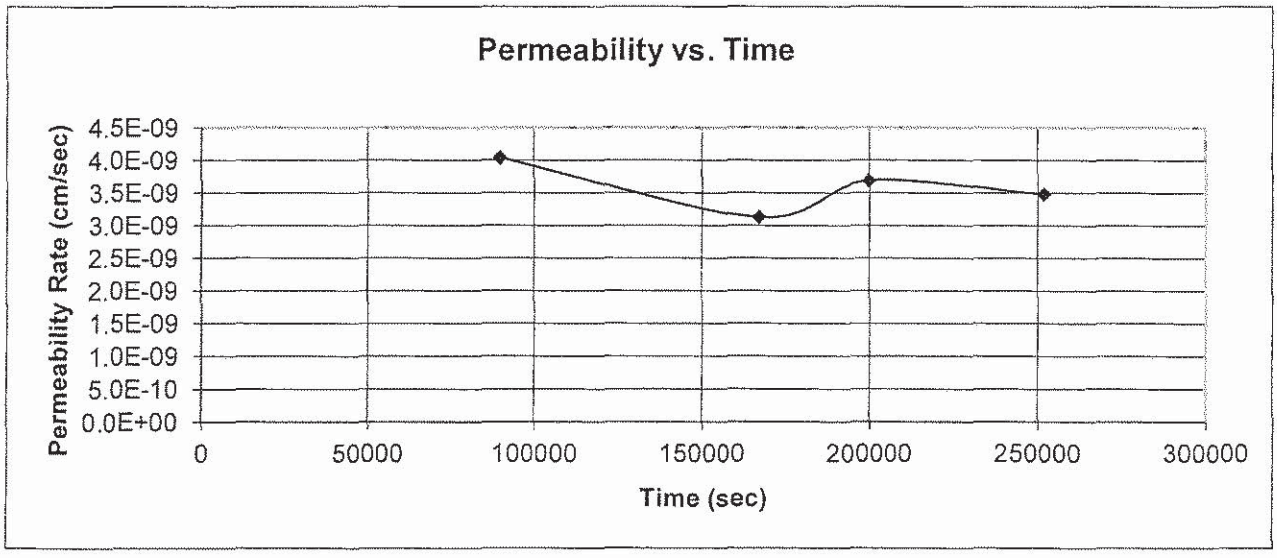
Dia. (in.)	2.84	2.85	Length (in)	2.41	2.42	Weight (gr)	469.2	475.1
Wet Density (pcf)	117.4		Moisture Content (%)	30.6		Dry Density (pcf)	89.9	
Final WD (pcf)	117.4		Final Moisture (%)	31.0		Final DD (pcf)	89.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	38.1	Minimum Hydraulic Gradient	19.0
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

3.6E-09



Reviewed By:

Daniel Eisman, P.E.

4/10/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 6, 2012

Sample Number: C-1 #106

Sample Information: Initial / Final

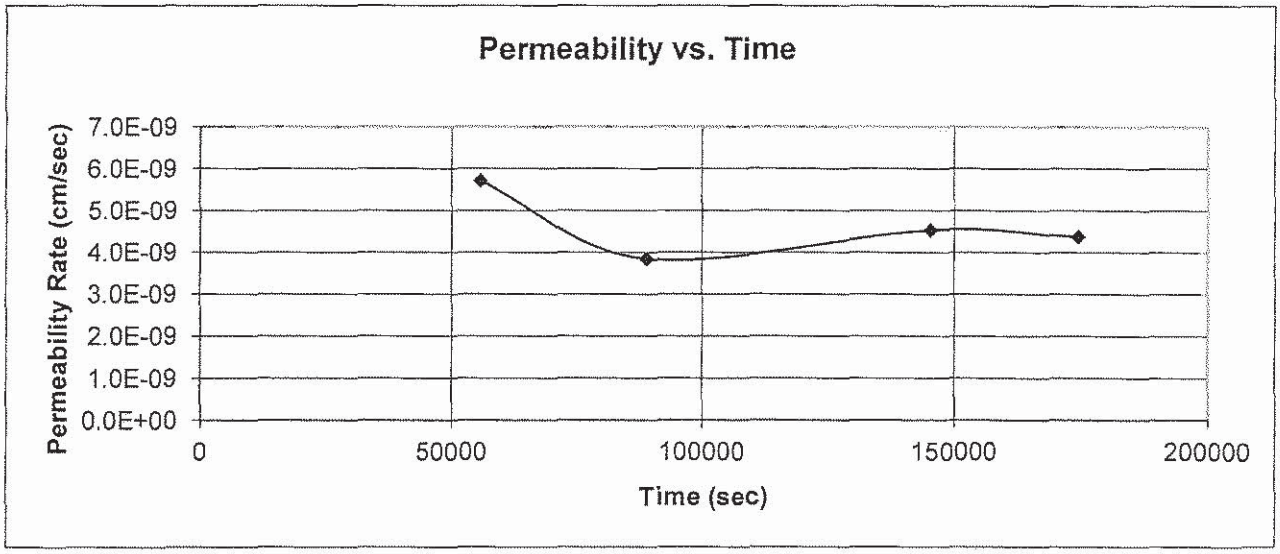
Dia. (in.)	2.84	2.85	Length (in)	2.55	2.55	Weight (gr)	487.5	495.28
Wet Density (pcf)	115.2		Moisture Content (%)	39.4		Dry Density (pcf)	82.6	
Final WD (pcf)	115.9		Final Moisture (%)	35.5		Final DD (pcf)	85.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	36.1	Minimum Hydraulic Gradient	18.0
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

4.6E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 19, 2012

Sample Number: C-1 #110

Sample Information: Initial / Final

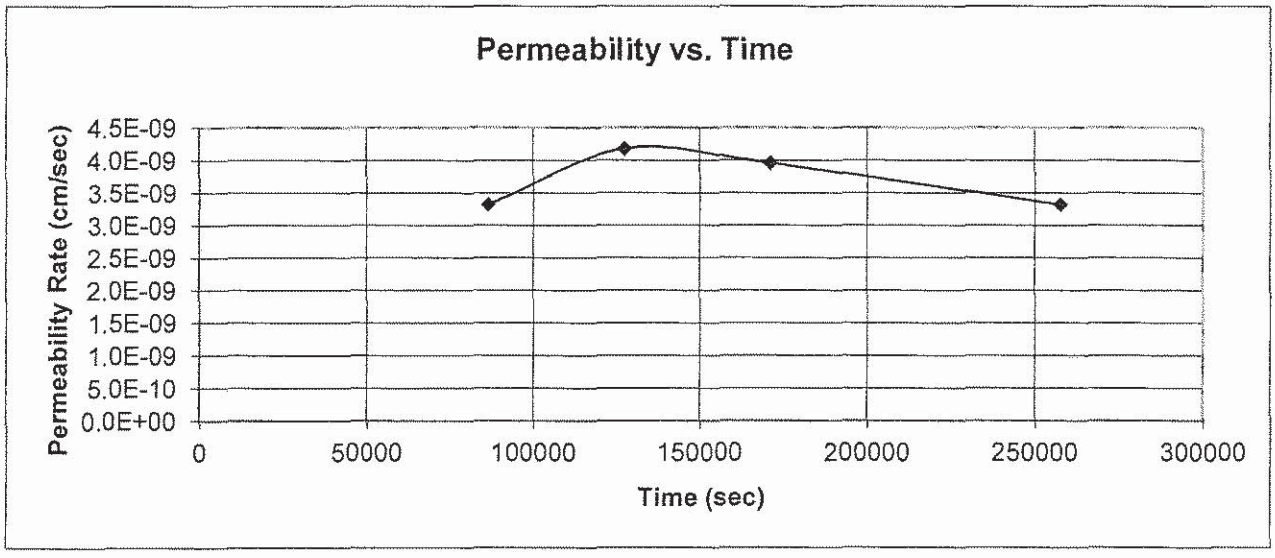
Dia. (in.)	2.86	2.85	**Length (in)**	2.33	2.25	**Weight (gr)**	433.7	442.5
Wet Density (pcf)	110.3		**Moisture Content (%)**	32.7		**Dry Density (pcf)**	83.1	
Final WD (pcf)	117.4		**Final Moisture (%)**	38.2		**Final DD (pcf)**	85.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	39.4	**Minimum Hydraulic Gradient**	19.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.7E-09



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2/23/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 18, 2012

Sample Number: C-1 #111

Sample Information: Initial / Final

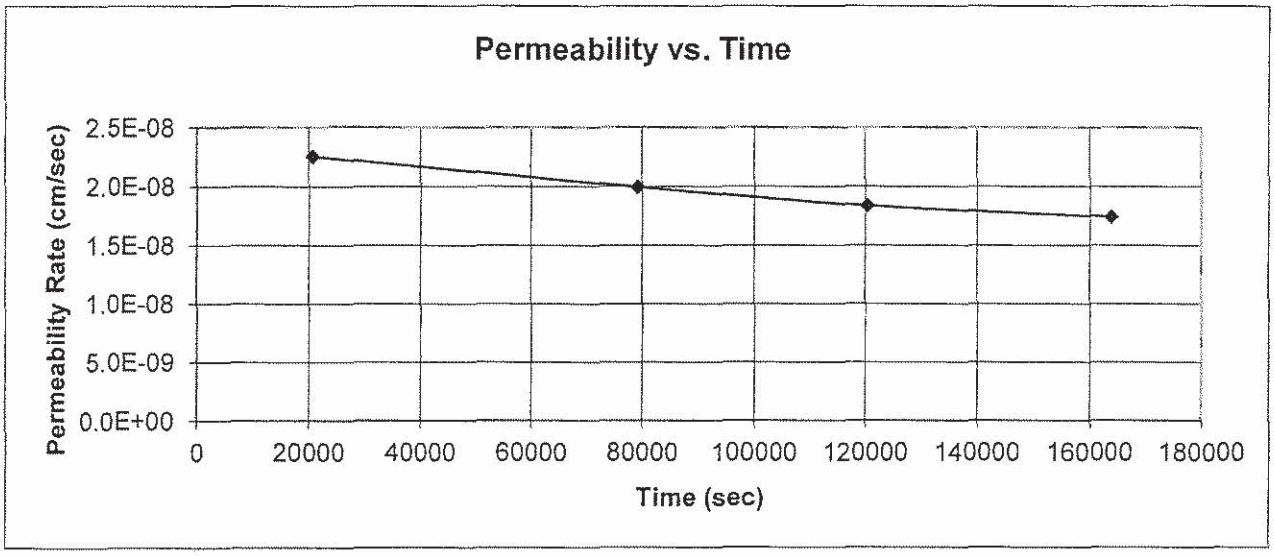
Dia. (in.)	2.85	2.86	**Length (in)**	2.35	2.33	**Weight (gr)**	421.9	430.1
Wet Density (pcf)	106.9		**Moisture Content (%)**	44.5		**Dry Density (pcf)**	74.0	
Final WD (pcf)	109.5		**Final Moisture (%)**	44.3		**Final DD (pcf)**	75.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	39.0	**Minimum Hydraulic Gradient**	19.4
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.0E-08



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2/23/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 20, 2012

Sample Number: C-1 #118

Sample Information: Initial / Final

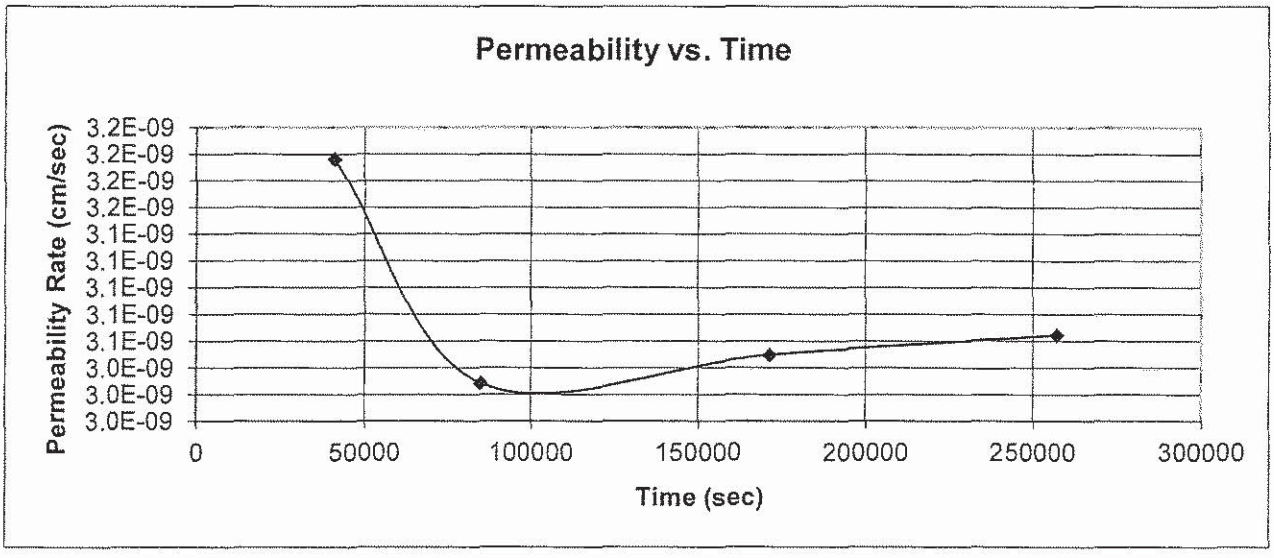
Dia. (in.)	2.86	2.85	**Length (in)**	2.67	2.72	**Weight (gr)**	497.4	505.8
Wet Density (pcf)	110.8		**Moisture Content (%)**	36.0		**Dry Density (pcf)**	81.5	
Final WD (pcf)	111.3		**Final Moisture (%)**	38.4		**Final DD (pcf)**	80.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	34.5	**Minimum Hydraulic Gradient**	17.2
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.1E-09



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2/23/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 16, 2012

Sample Number: C-1 #121

Sample Information: Initial / Final

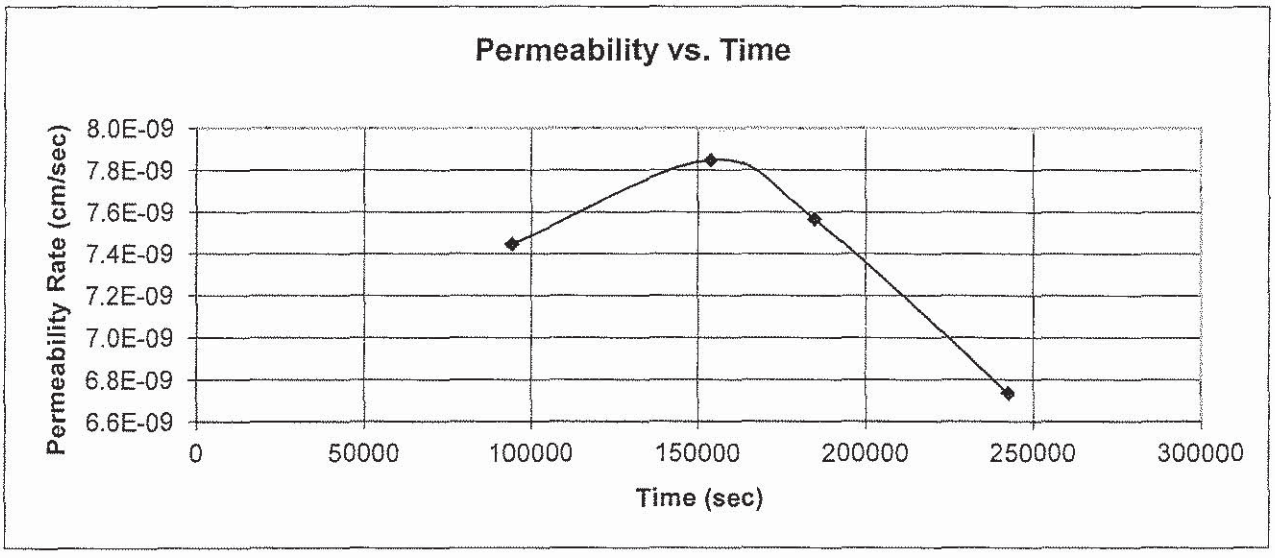
Dia. (in.)	2.85	2.83	**Length (in)**	3.13	3.10	**Weight (gr)**	600.2	615.9
Wet Density (pcf)	115.0		**Moisture Content (%)**	34.6		**Dry Density (pcf)**	85.4	
Final WD (pcf)	120.7		**Final Moisture (%)**	34.3		**Final DD (pcf)**	89.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	29.4	**Minimum Hydraulic Gradient**	14.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

7.4E-09



Reviewed By:

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3/20/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 16, 2012

Sample Number: C-1 #122

Sample Information: Initial / Final

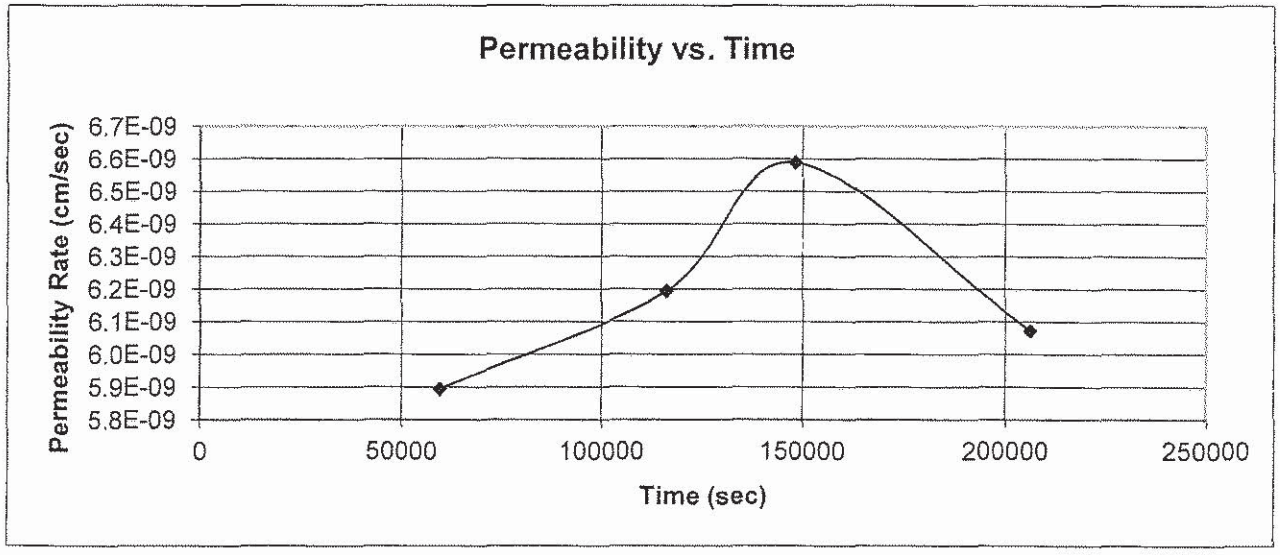
Dia. (in.)	2.87	2.86	**Length (in)**	2.87	2.83	**Weight (gr)**	538.5	546.5
Wet Density (pcf)	110.7		**Moisture Content (%)**	37.2		**Dry Density (pcf)**	80.7	
Final WD (pcf)	114.4		**Final Moisture (%)**	35.9		**Final DD (pcf)**	84.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	32.1	**Minimum Hydraulic Gradient**	16.0
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

6.2E-09



Reviewed By:

Daniel Eisman, P.E.

3/20/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 17, 2012

Sample Number: C-1 #128

Sample Information: Initial / Final

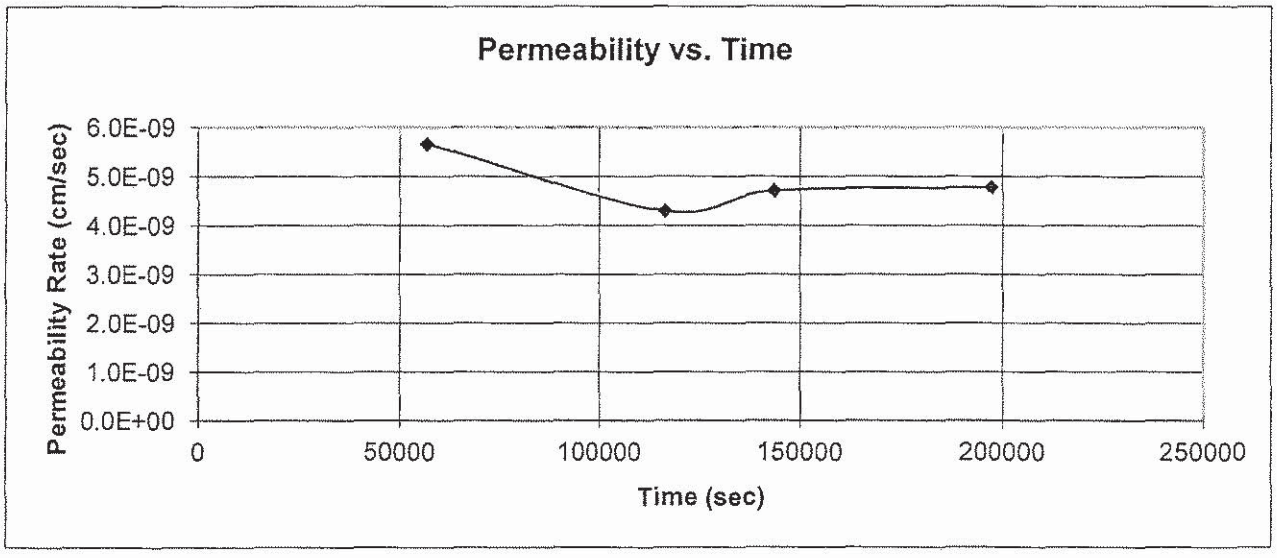
Dia. (in.)	2.84	2.85	**Length (in)**	2.57	2.61	**Weight (gr)**	475	498.5
Wet Density (pcf)	111.0		**Moisture Content (%)**	31.8		**Dry Density (pcf)**	84.2	
Final WD (pcf)	114.2		**Final Moisture (%)**	34.6		**Final DD (pcf)**	84.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	35.8	**Minimum Hydraulic Gradient**	17.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.9E-09



Reviewed By:

Daniel Elsman, P.E.

3/20/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 23, 2012

Sample Number: C-1 #135

Sample Information: Initial / Final

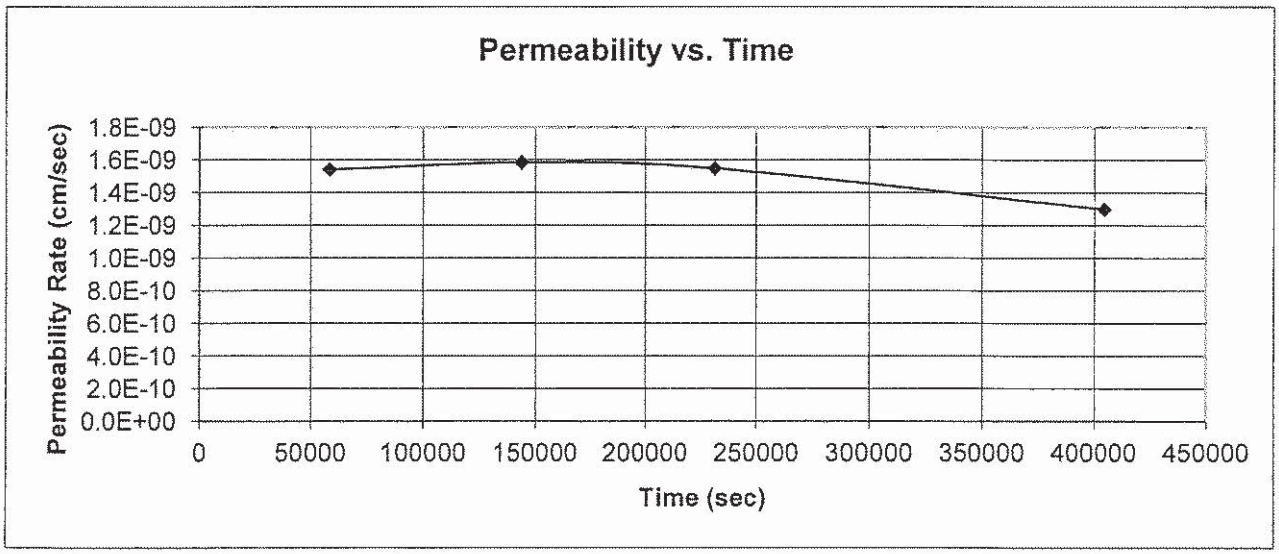
Dia. (in.)	2.84	2.87	Length (in)	1.80	1.81	Weight (gr)	316.1	320.62
Wet Density (pcf)	105.5		Moisture Content (%)	47.2		Dry Density (pcf)	71.6	
Final WD (pcf)	104.8		Final Moisture (%)	51.9		Final DD (pcf)	69.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	51.1	Minimum Hydraulic Gradient	25.5
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

1.5E-09



Reviewed By:

Daniel Eisman, P.E.

4/27/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 23, 2012

Sample Number: C-1 #138

Sample Information: Initial / Final

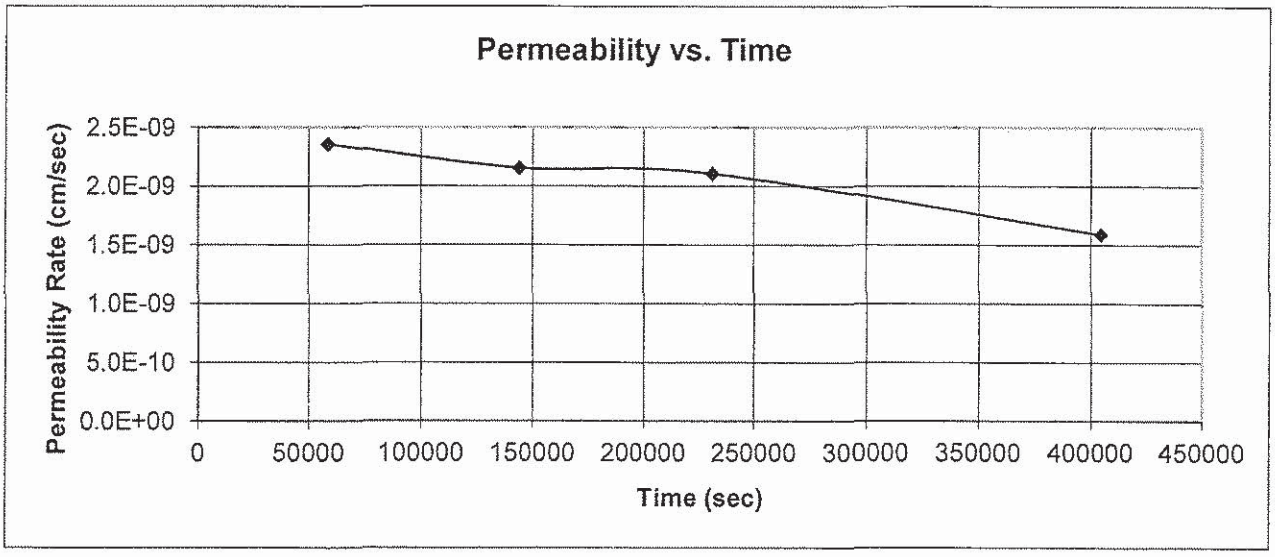
Dia. (in.)	2.86	2.87	**Length (in)**	1.86	1.91	**Weight (gr)**	336.85	343.21
Wet Density (pcf)	107.3		**Moisture Content (%)**	42.9		**Dry Density (pcf)**	75.0	
Final WD (pcf)	105.5		**Final Moisture (%)**	47.7		**Final DD (pcf)**	71.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	49.4	**Minimum Hydraulic Gradient**	24.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.1E-09



Reviewed By:

Daniel Eisman, P.E.

4/27/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 23, 2012

Sample Number: C-1 #139

Sample Information: Initial / Final

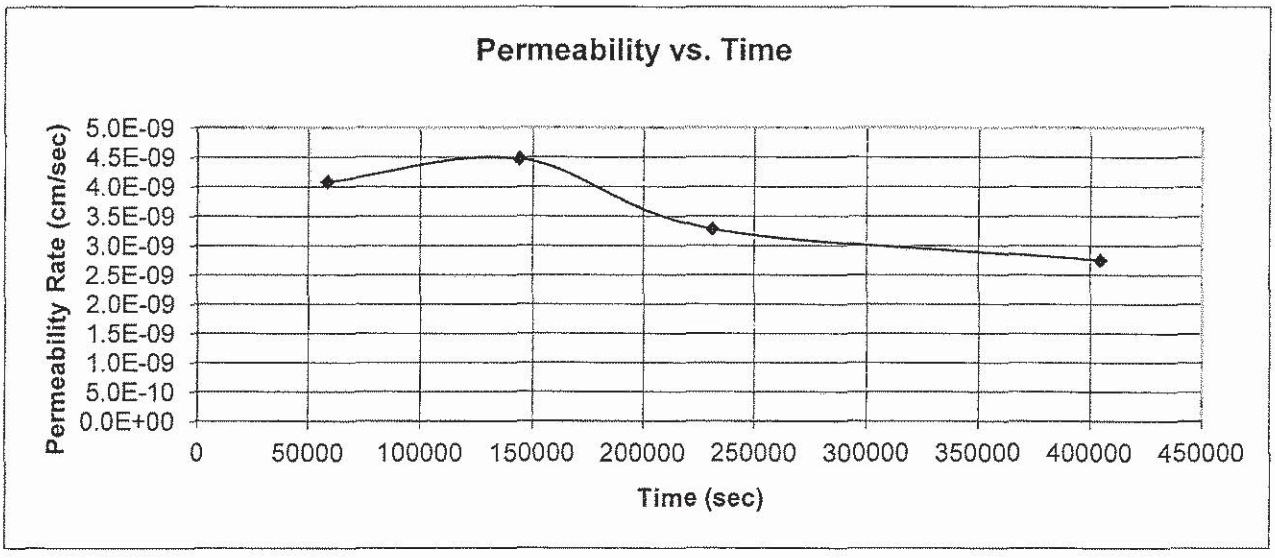
Dia. (in.)	2.87	2.92	**Length (in)**	1.95	1.99	**Weight (gr)**	366.91	378.31
Wet Density (pcf)	110.7		**Moisture Content (%)**	40.9		**Dry Density (pcf)**	78.5	
Final WD (pcf)	108.2		**Final Moisture (%)**	41.8		**Final DD (pcf)**	76.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	47.2	**Minimum Hydraulic Gradient**	23.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.7E-09



Reviewed By:

Daniel Elsman, P.E.

4/27/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 23, 2012

Sample Number: C-1 #141

Sample Information: Initial / Final

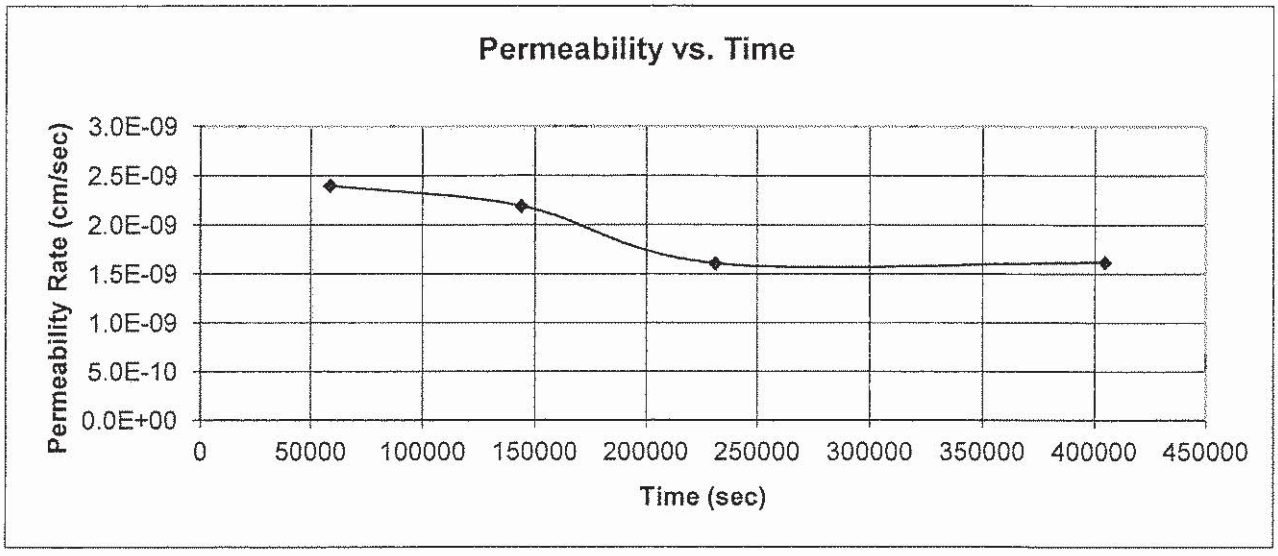
Dia. (in.)	2.89	2.90	**Length (in)**	1.94	1.97	**Weight (gr)**	350.73	356.48
Wet Density (pcf)	104.7		**Moisture Content (%)**	43.7		**Dry Density (pcf)**	72.8	
Final WD (pcf)	104.2		**Final Moisture (%)**	51.2		**Final DD (pcf)**	68.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	47.4	**Minimum Hydraulic Gradient**	23.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.0E-09



Reviewed By:

Daniel Eisman, P.E.

4/27/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 2, 2012

Sample Number: C-1 #148

Sample Information: Initial / Final

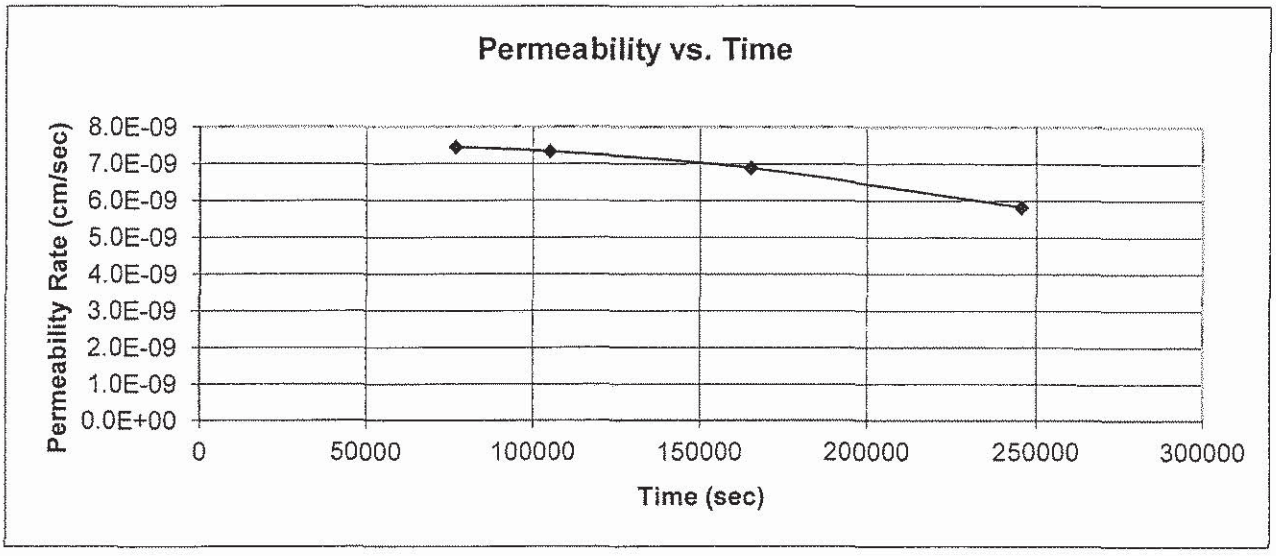
Dia. (in.)	2.84	2.88	**Length (in)**	2.07	2.11	**Weight (gr)**	378.4	400.2
Wet Density (pcf)	110.3		**Moisture Content (%)**	33.9		**Dry Density (pcf)**	82.4	
Final WD (pcf)	111.1		**Final Moisture (%)**	36.3		**Final DD (pcf)**	81.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	44.3	**Minimum Hydraulic Gradient**	22.1
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

6.9E-09



Reviewed By:

Daniel Eisman, P.E.

6/12/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 9, 2012

Sample Number: C-1 #155

Sample Information: Initial / Final

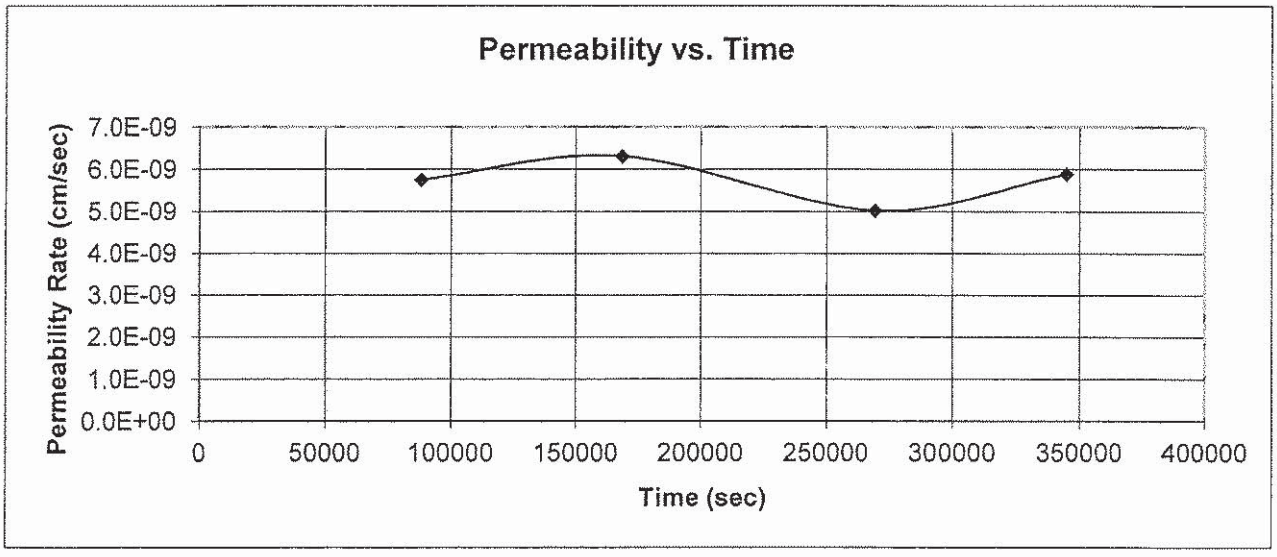
Dia. (in.)	2.85	2.87	**Length (in)**	2.56	2.62	**Weight (gr)**	494.6	508.6
Wet Density (pcf)	115.2		**Moisture Content (%)**	26.6		**Dry Density (pcf)**	91.0	
Final WD (pcf)	114.3		**Final Moisture (%)**	36.0		**Final DD (pcf)**	84.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	35.9	**Minimum Hydraulic Gradient**	17.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

5.7E-09



Reviewed By:

Daniel Eisman, P.E.

6/12/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 9, 2012

Sample Number: C-1 #158

Sample Information: Initial / Final

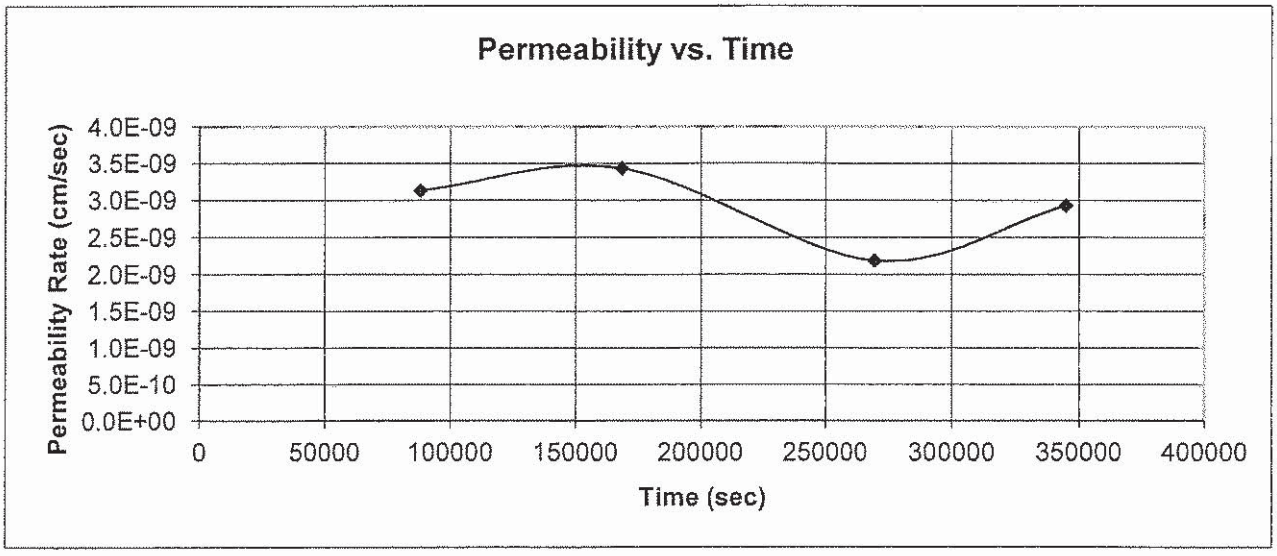
Dia. (in.)	2.84	2.84	Length (in)	2.20	2.19	Weight (gr)	409	414
Wet Density (pcf)	111.9		Moisture Content (%)	35.4		Dry Density (pcf)	82.6	
Final WD (pcf)	113.6		Final Moisture (%)	37.4		Final DD (pcf)	82.7	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	41.7	Minimum Hydraulic Gradient	20.8
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

2.9E-09



Reviewed By:

Daniel Eisman, P.E.

6/12/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** August 20, 2012

Sample Number: C-1 #162

Sample Information: Initial / Final

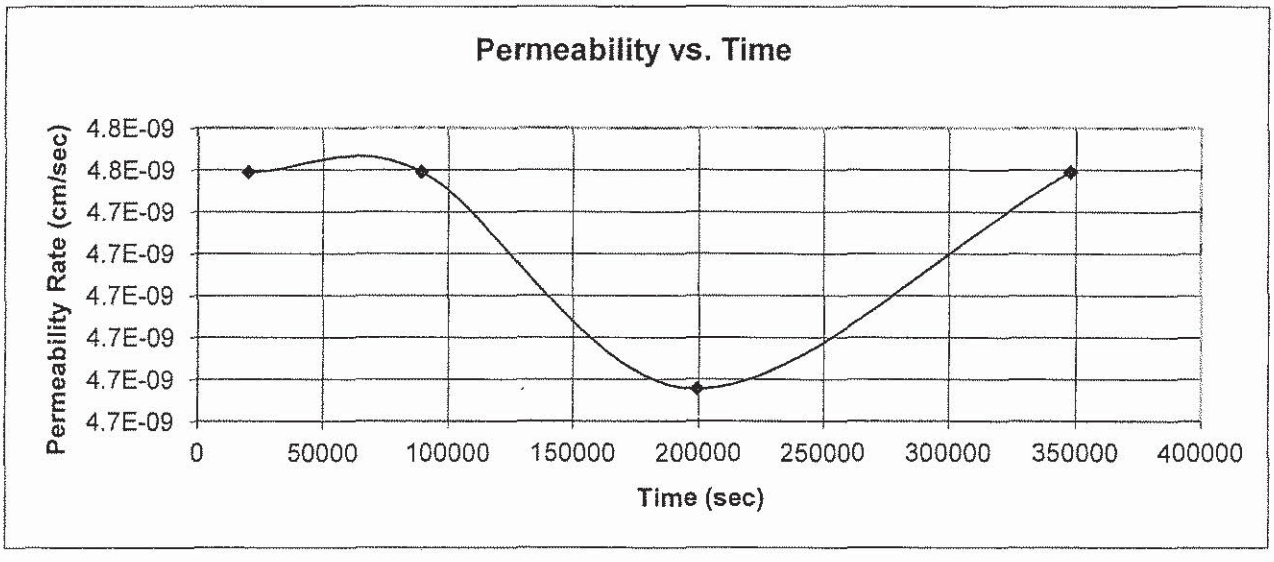
Dia. (in.)	2.82	2.84	**Length (in)**	1.85	1.89	**Weight (gr)**	355.1	376.59
Wet Density (pcf)	116.7		**Moisture Content (%)**	49.5		**Dry Density (pcf)**	78.1	
Final WD (pcf)	119.7		**Final Moisture (%)**	53.2		**Final DD (pcf)**	78.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	49.6	**Minimum Hydraulic Gradient**	24.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.7E-09



Reviewed By:

Daniel Eisman, P.E.

8/28/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 28, 2012

Sample Number: C-1 #170

Sample Information: Initial / Final

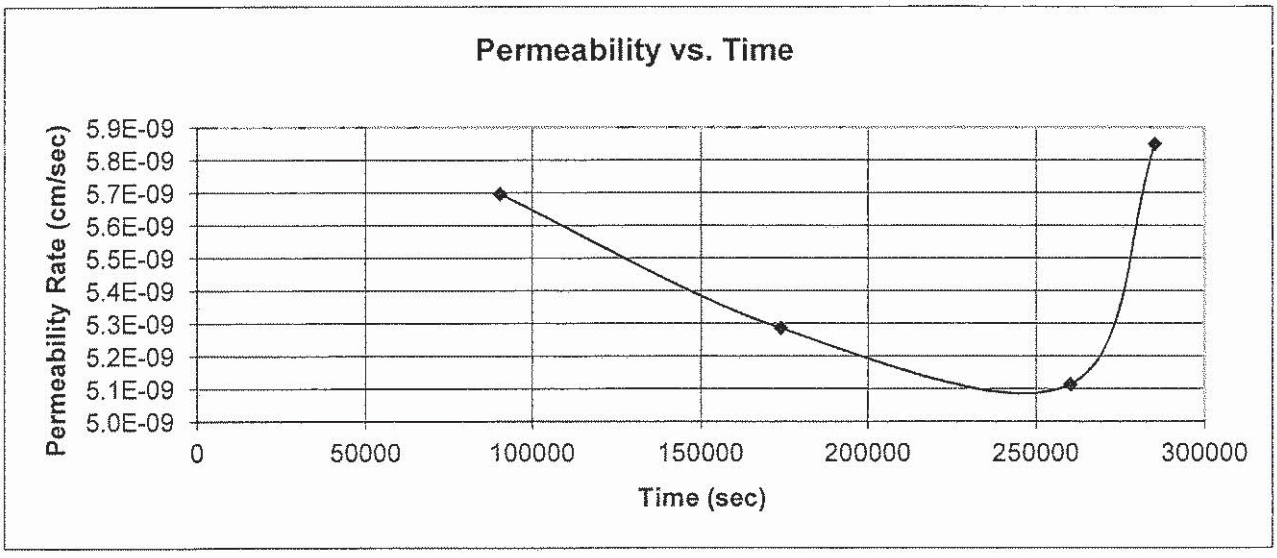
Dia. (in.)	2.85	2.84	Length (in)	2.96	2.97	Weight (gr)	552.5	565.4
Wet Density (pcf)	111.5		Moisture Content (%)	31.2		Dry Density (pcf)	85.0	
Final WD (pcf)	114.2		Final Moisture (%)	37.8		Final DD (pcf)	82.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	31.0	Minimum Hydraulic Gradient	15.5
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

5.5E-09



Reviewed By:

Daniel Eisman

Daniel Eisman, P.E.

4/10/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 23, 2012

Sample Number: C-1 #173

Sample Information: Initial / Final

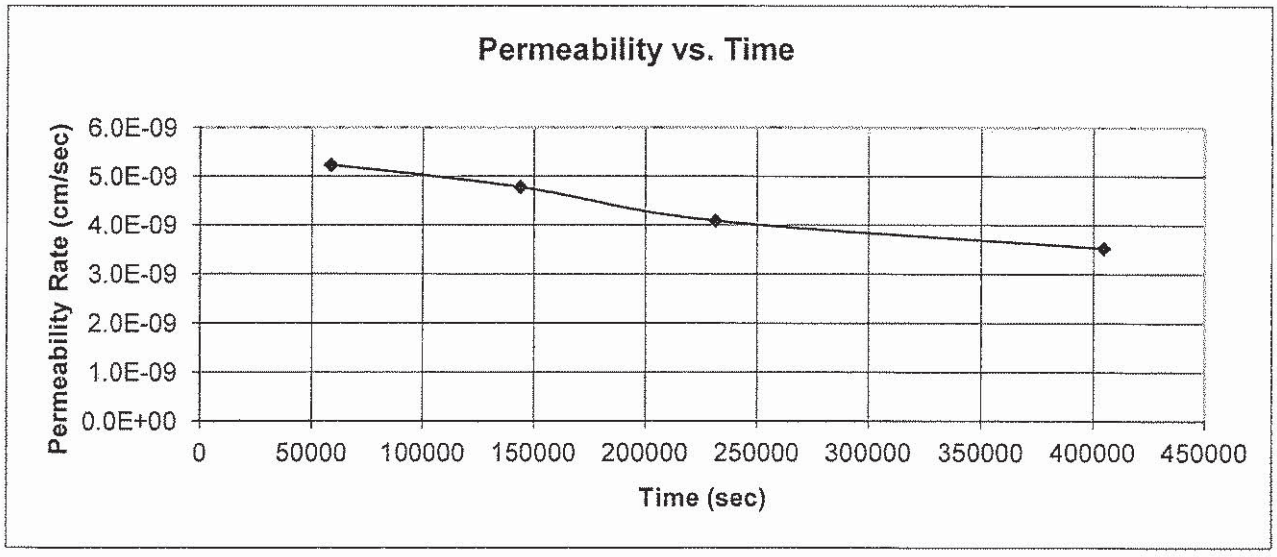
Dia. (in.)	2.85	2.85	**Length (in)**	2.05	2.10	**Weight (gr)**	382.59	393.96
Wet Density (pcf)	111.6		**Moisture Content (%)**	31.5		**Dry Density (pcf)**	84.9	
Final WD (pcf)	111.6		**Final Moisture (%)**	40.3		**Final DD (pcf)**	79.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	44.8	**Minimum Hydraulic Gradient**	22.3
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.4E-09



Reviewed By:

~~Daniel Eisman~~, P.E.

4/27/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** August 18, 2012

Sample Number: C-1 #178

Sample Information: Initial / Final

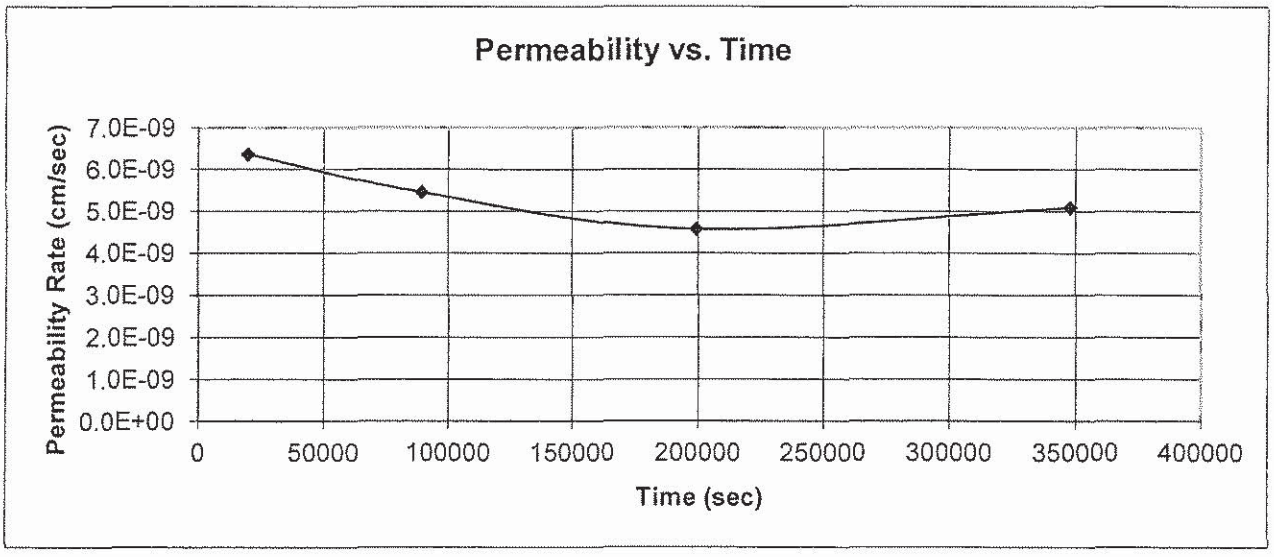
Dia. (in.)	2.87	2.92	Length (in)	1.72	1.80	Weight (gr)	303.32	318.23
Wet Density (pcf)	104.1		Moisture Content (%)	41.9		Dry Density (pcf)	73.4	
Final WD (pcf)	100.9		Final Moisture (%)	48.0		Final DD (pcf)	68.2	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	53.6	Minimum Hydraulic Gradient	26.8
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

5.4E-09



Reviewed By:

Daniel Eisman, P.E.

8/28/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** August 20, 2012

Sample Number: C-1 #179

Sample Information: Initial / Final

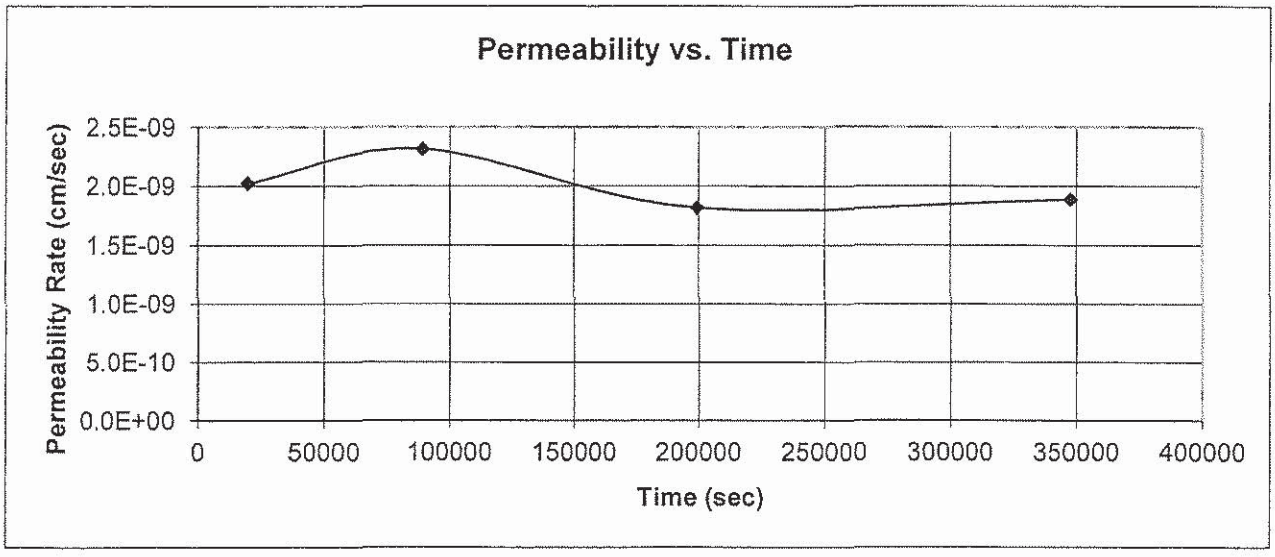
Dia. (in.)	2.85	2.85	**Length (in)**	1.61	1.64	**Weight (gr)**	273.25	275.48
Wet Density (pcf)	101.7		**Moisture Content (%)**	52.1		**Dry Density (pcf)**	66.8	
Final WD (pcf)	99.9		**Final Moisture (%)**	52.8		**Final DD (pcf)**	65.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	57.2	**Minimum Hydraulic Gradient**	28.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.0E-09



Reviewed By:

Daniel Eisman, P.E.

8/28/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** August 20, 2012

Sample Number: C-1 #180

Sample Information: Initial / Final

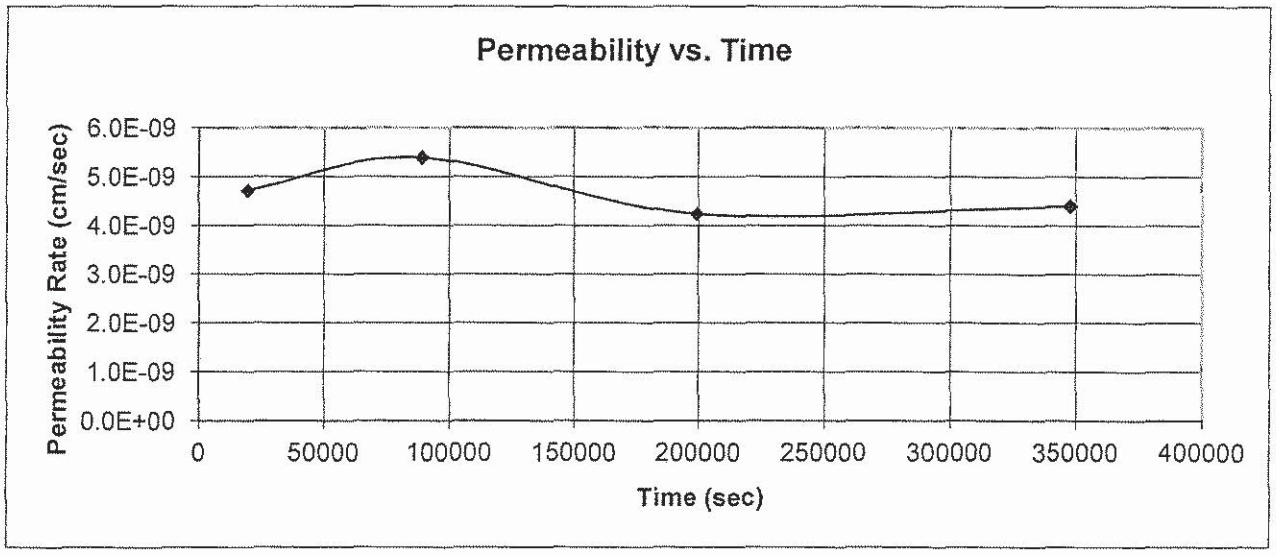
Dia. (in.)	2.85	2.87	**Length (in)**	1.88	1.87	**Weight (gr)**	343.52	350.11
Wet Density (pcf)	109.4		**Moisture Content (%)**	36.9		**Dry Density (pcf)**	79.9	
Final WD (pcf)	110.3		**Final Moisture (%)**	40.9		**Final DD (pcf)**	78.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	49.0	**Minimum Hydraulic Gradient**	24.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.7E-09



Reviewed By:

Daniel Eisman, P.E.

8/28/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trailridge Landfill **Project Number:** 6736-11-5123

Client MAE **Date Completed:** November 22, 2011

Sample Number: C-2 #3

Sample Information:

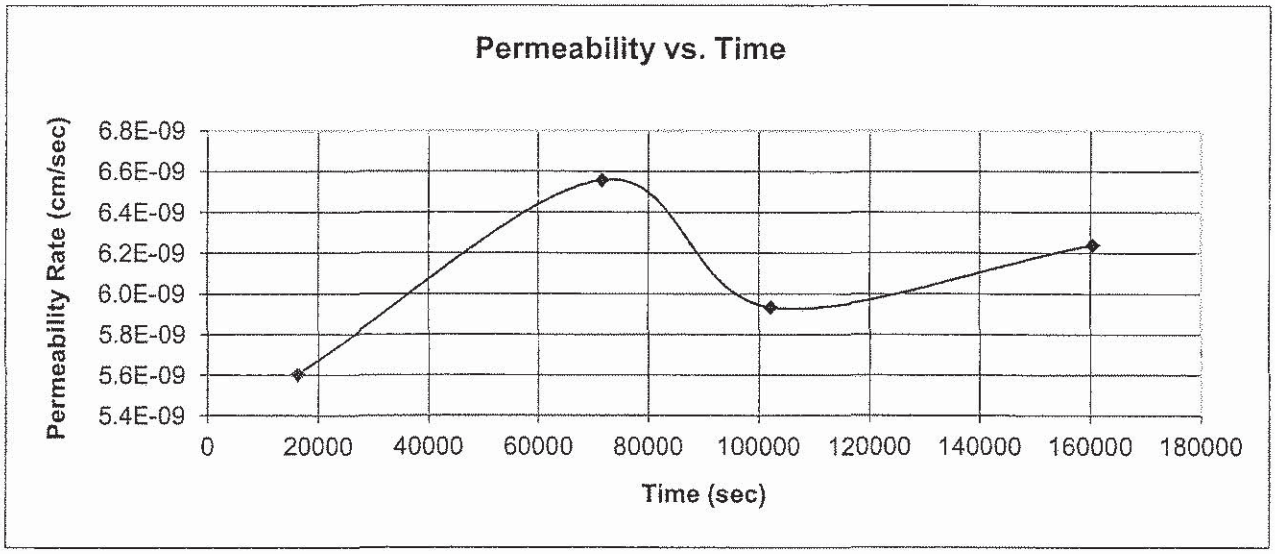
Dia. (in.)	2.85	**Length (in)**	2.40	**Weight (gr)**	441.9
Wet Density (pcf)	110.2	**Moisture Content (%)**	28.7	**Dry Density (pcf)**	85.6

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	Deaired water
Maximum Hydraulic Gradient:	26.8	**Minimum Hydraulic Gradient**	13.4
Maximum Consolidation Stress (psi)	4	**Minimum Consolidation Stress (psi)**	2

Permeability Rate

6.1E-09



Reviewed By:

Mike Holm, P.E.

REPORT OF SOIL PERMEABILITY TESTING

Project: Trailridge Landfill **Project Number:** 6736-11-5123

Client MAE **Date Completed:** November 28, 2011

Sample Number: C-2 #11

Sample Information:

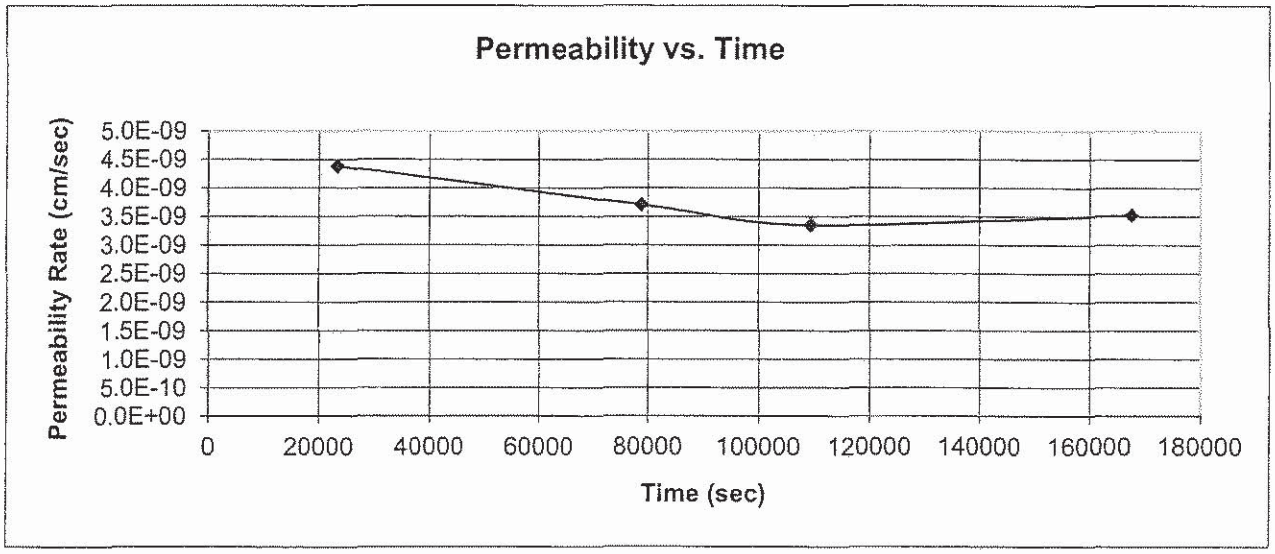
Dia. (in.)	2.84	**Length (in)**	2.70	**Weight (gr)**	516.7
Wet Density (pcf)	115.0	**Moisture Content (%)**	26.7	**Dry Density (pcf)**	90.8

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	Deaired water
Maximum Hydraulic Gradient:	23.8	**Minimum Hydraulic Gradient**	11.9
Maximum Consolidation Stress (psi)	4	**Minimum Consolidation Stress (psi)**	2

Permeability Rate

3.7E-09



Reviewed By:

Mike Holm, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 25, 2012

Sample Number: C-2 #22

Sample Information: Initial / Final

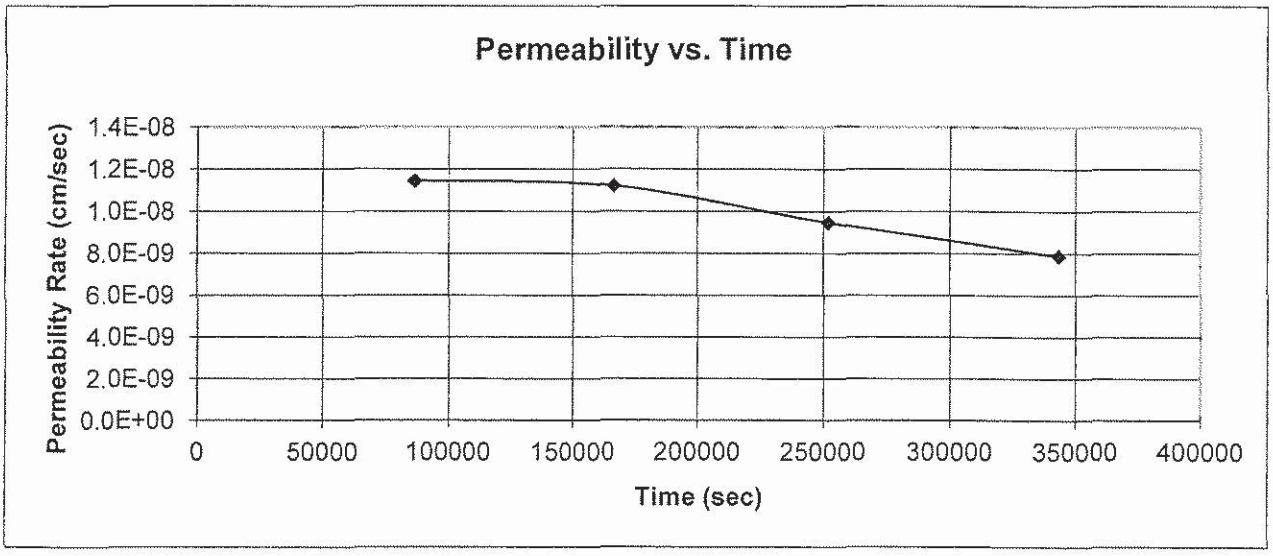
Dia. (in.)	2.84	2.85	Length (in)	2.51	2.42	Weight (gr)	447.9	473.12
Wet Density (pcf)	107.9		Moisture Content (%)	34.7		Dry Density (pcf)	80.1	
Final WD (pcf)	116.7		Final Moisture (%)	40.3		Final DD (pcf)	83.2	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	25.5	Minimum Hydraulic Gradient	12.7
Maximum Consolidation Stress (psi)	5	Minimum Consolidation Stress (psi)	3

Permeability Rate

1.0E-08



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 25, 2012

Sample Number: C-2 #25

Sample Information: Initial / Final

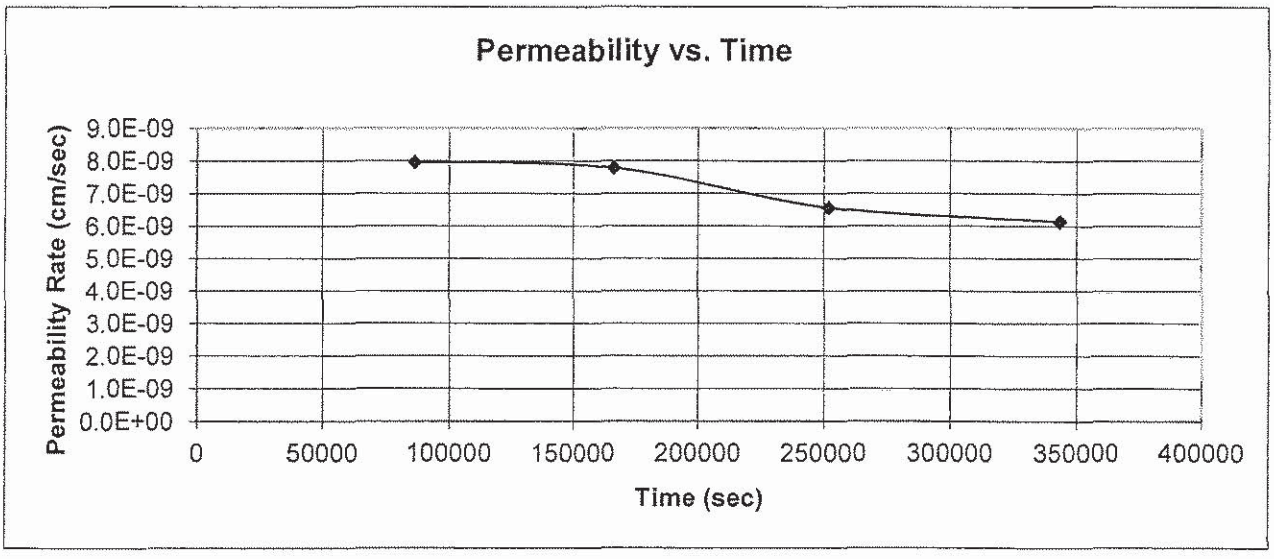
Dia. (in.)	2.83	2.85	**Length (in)**	2.49	2.58	**Weight (gr)**	467.9	480.6
Wet Density (pcf)	113.6		**Moisture Content (%)**	28.0		**Dry Density (pcf)**	88.8	
Final WD (pcf)	111.3		**Final Moisture (%)**	37.2		**Final DD (pcf)**	81.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	36.9	**Minimum Hydraulic Gradient**	18.4
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

7.1E-09



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Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 25, 2012

Sample Number: C-2 #27

Sample Information: Initial / Final

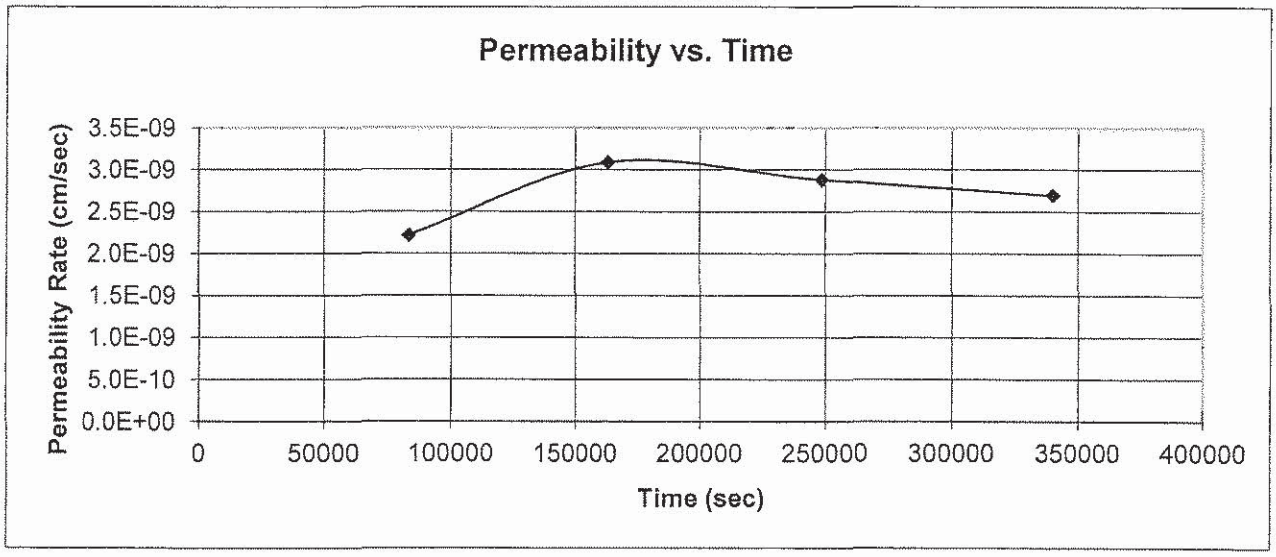
Dia. (in.)	2.82	2.85	**Length (in)**	2.43	2.48	**Weight (gr)**	450.9	460.77
Wet Density (pcf)	112.9		**Moisture Content (%)**	30.1		**Dry Density (pcf)**	86.8	
Final WD (pcf)	111.1		**Final Moisture (%)**	37.8		**Final DD (pcf)**	80.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	37.8	**Minimum Hydraulic Gradient**	18.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.7E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 3, 2012

Sample Number: C-2 #28

Sample Information: Initial / Final

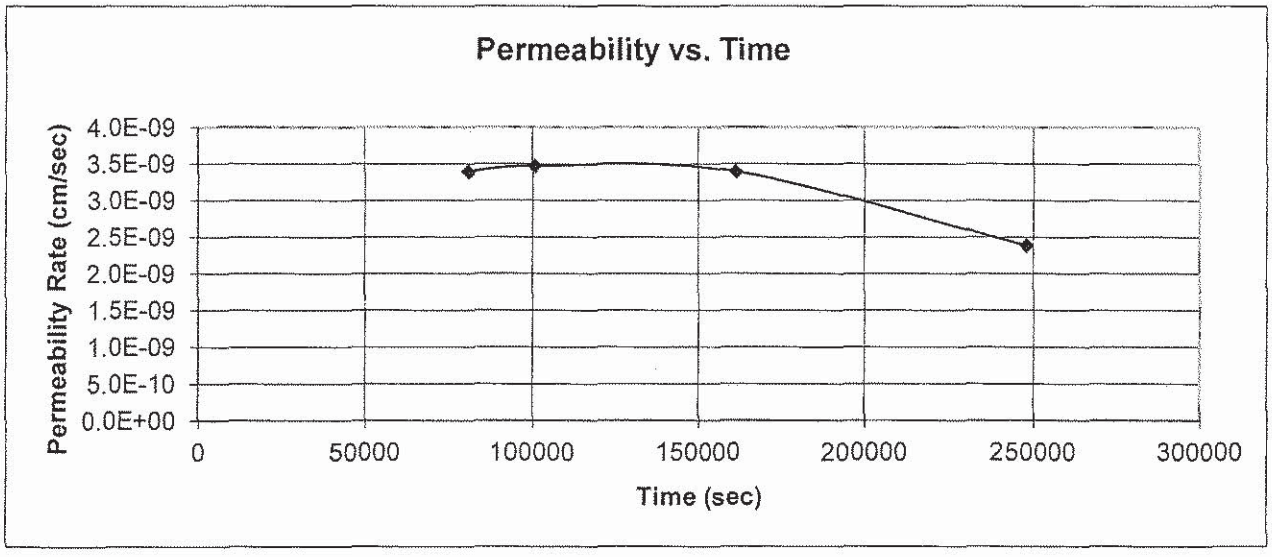
Dia. (in.)	2.85	2.82	**Length (in)**	2.76	2.74	**Weight (gr)**	514	522.5
Wet Density (pcf)	111.7		**Moisture Content (%)**	32.6		**Dry Density (pcf)**	84.2	
Final WD (pcf)	116.2		**Final Moisture (%)**	36.0		**Final DD (pcf)**	85.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	33.3	**Minimum Hydraulic Gradient**	16.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.2E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** January 26, 2012

Sample Number: C-2 #30

Sample Information: Initial / Final

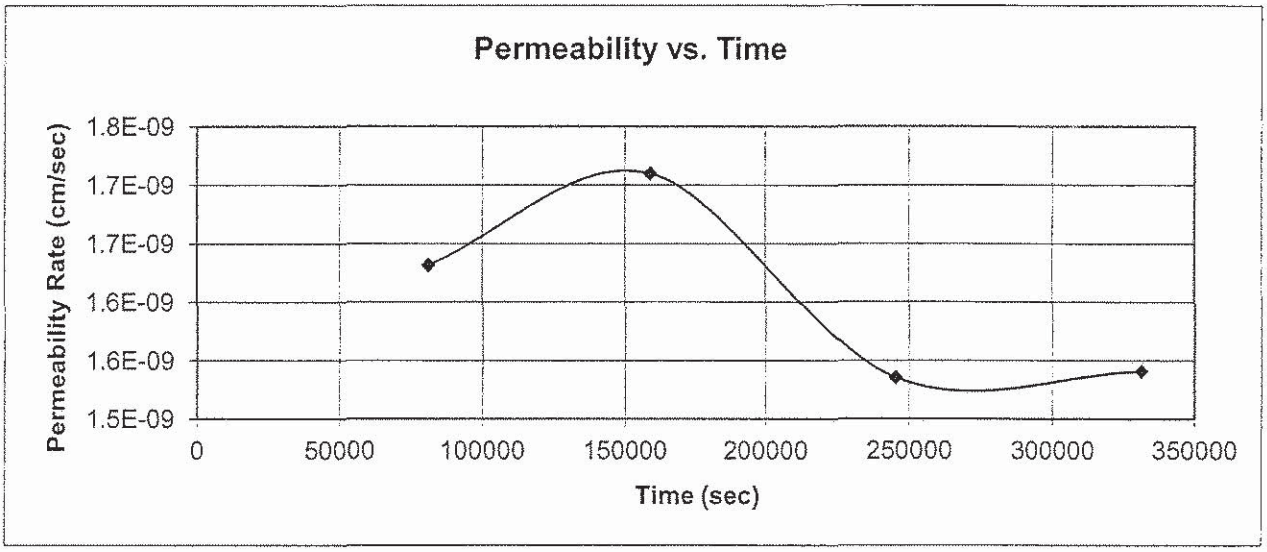
Dia. (in.)	2.84	2.87	**Length (in)**	2.66	2.71	**Weight (gr)**	471.2	520.5
Wet Density (pcf)	106.5		**Moisture Content (%)**	31.6		**Dry Density (pcf)**	80.9	
Final WD (pcf)	113.3		**Final Moisture (%)**	33.1		**Final DD (pcf)**	85.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	34.7	**Minimum Hydraulic Gradient**	17.3
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.6E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 1, 2012

Sample Number: C-2 #32

Sample Information: Initial / Final

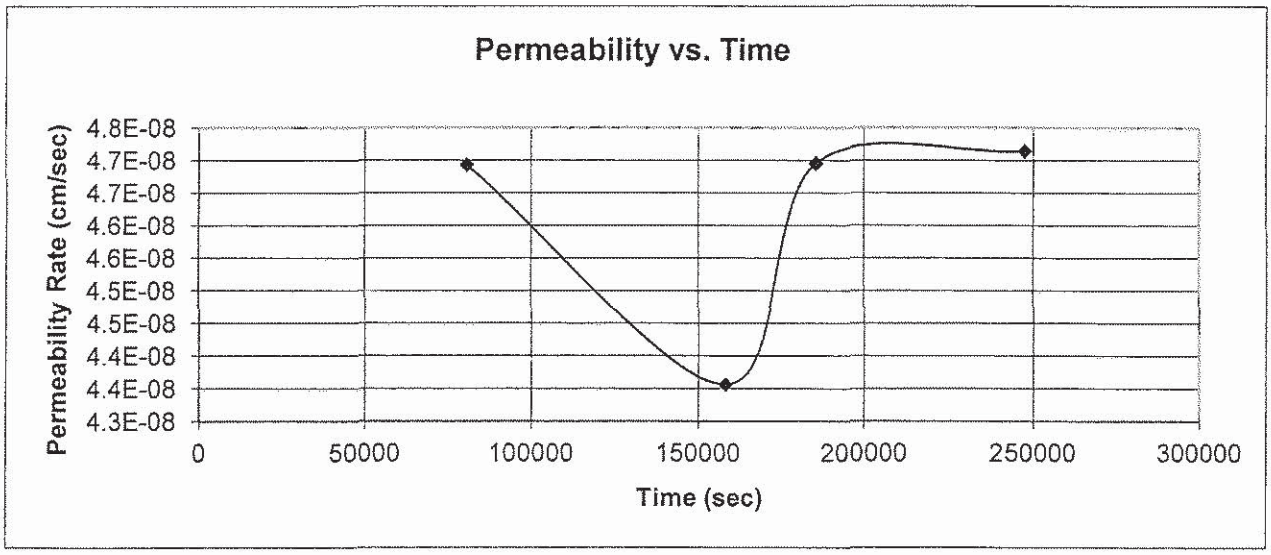
Dia. (in.)	2.85	2.89	**Length (in)**	2.34	2.39	**Weight (gr)**	391.92	411.28
Wet Density (pcf)	100.0		**Moisture Content (%)**	32.6		**Dry Density (pcf)**	75.5	
Final WD (pcf)	100.4		**Final Moisture (%)**	46.6		**Final DD (pcf)**	68.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	38.3	**Minimum Hydraulic Gradient**	18.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.6E-08



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 10, 2012

Sample Number: C-2 #36

Sample Information: Initial / Final

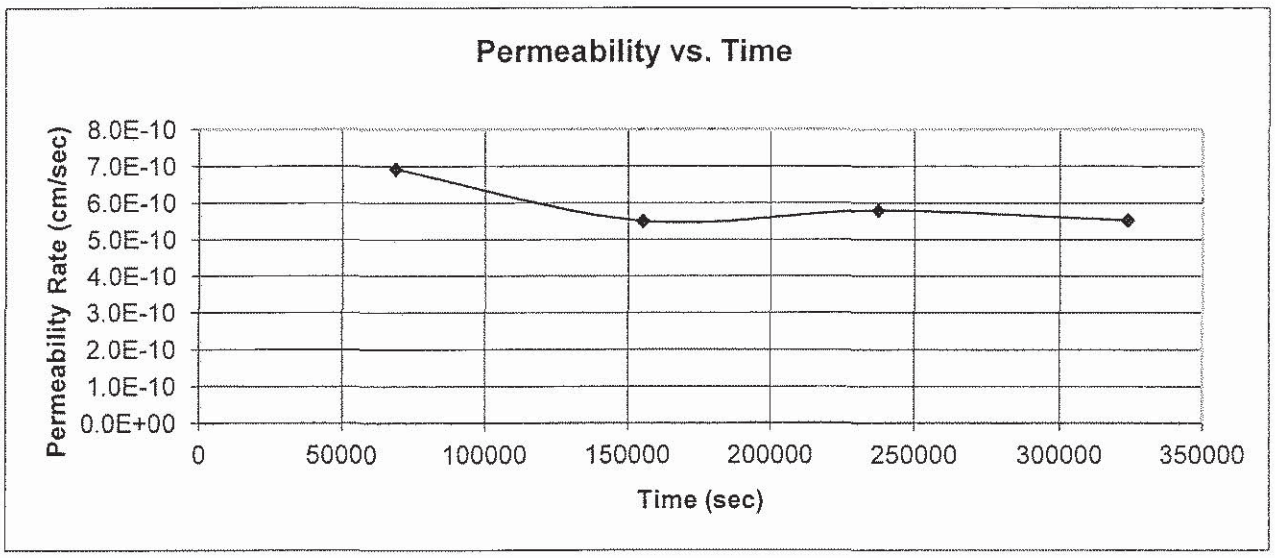
Dia. (in.)	2.84	2.84	**Length (in)**	1.91	1.93	**Weight (gr)**	374.91	384.1
Wet Density (pcf)	118.2		**Moisture Content (%)**	29.2		**Dry Density (pcf)**	91.5	
Final WD (pcf)	120.3		**Final Moisture (%)**	32.3		**Final DD (pcf)**	90.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	48.3	**Minimum Hydraulic Gradient**	24.2
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

5.9E-10



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 5, 2012

Sample Number: C-2 #39

Sample Information: Initial / Final

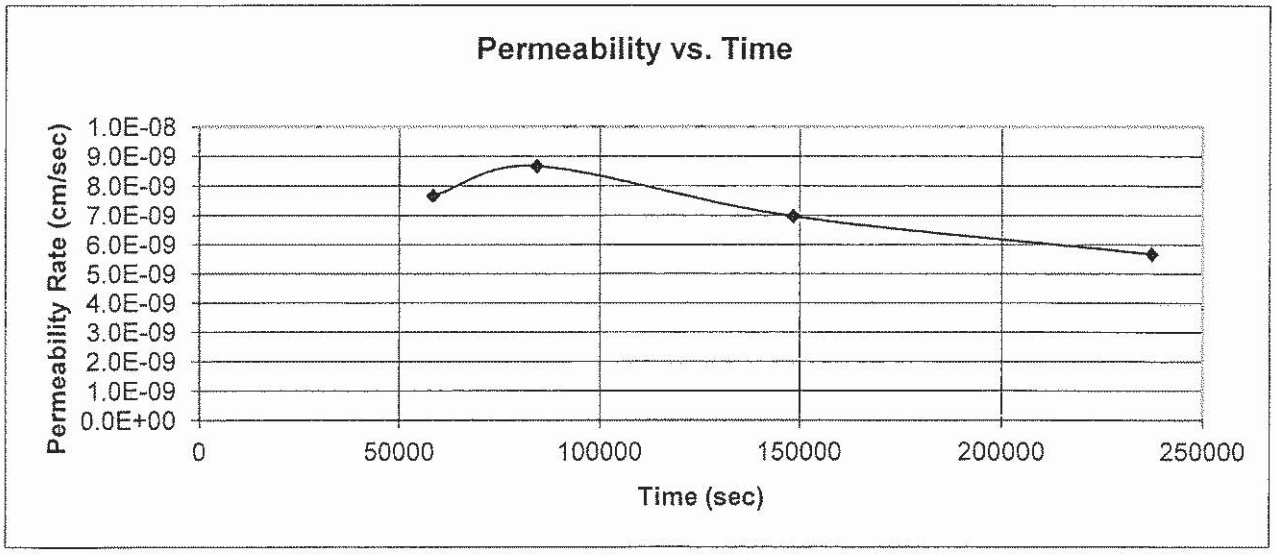
Dia. (in.)	2.83	2.87	**Length (in)**	2.22	2.21	**Weight (gr)**	403.91	422
Wet Density (pcf)	109.9		**Moisture Content (%)**	40.1		**Dry Density (pcf)**	78.5	
Final WD (pcf)	113.0		**Final Moisture (%)**	39.0		**Final DD (pcf)**	81.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	41.3	**Minimum Hydraulic Gradient**	20.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

7.3E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 5, 2012

Sample Number: C-2 #44

Sample Information: Initial / Final

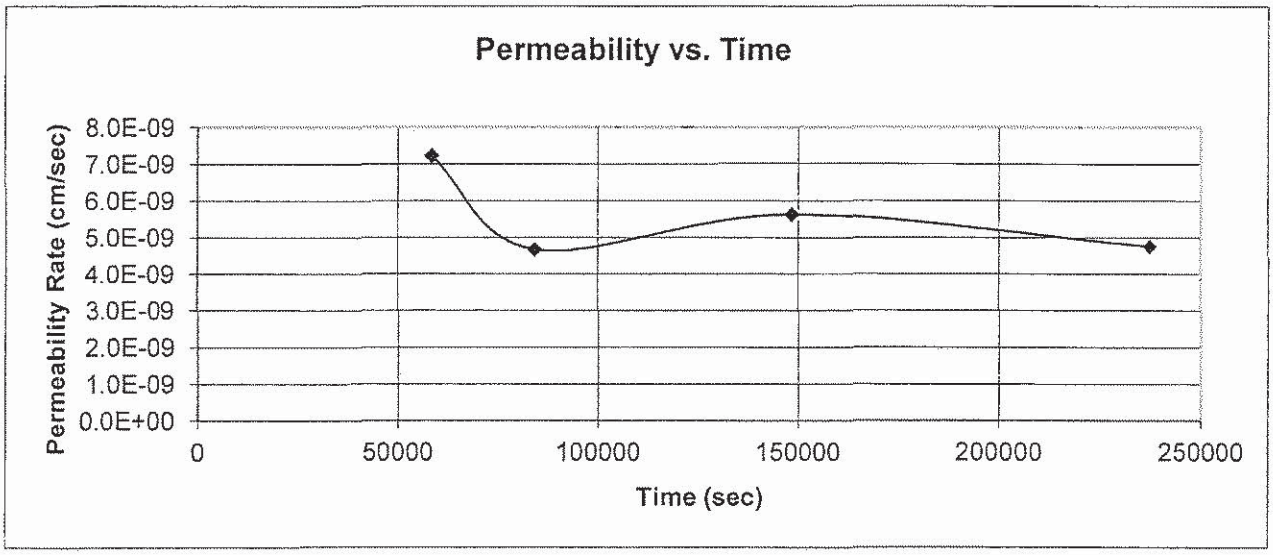
Dia. (in.)	2.86	2.87	**Length (in)**	2.44	2.54	**Weight (gr)**	467.49	476.61
Wet Density (pcf)	114.2		**Moisture Content (%)**	32.3		**Dry Density (pcf)**	86.3	
Final WD (pcf)	110.6		**Final Moisture (%)**	37.0		**Final DD (pcf)**	80.7	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	37.7	**Minimum Hydraulic Gradient**	18.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

5.6E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 6, 2012

Sample Number: C-2 #46

Sample Information: Initial / Final

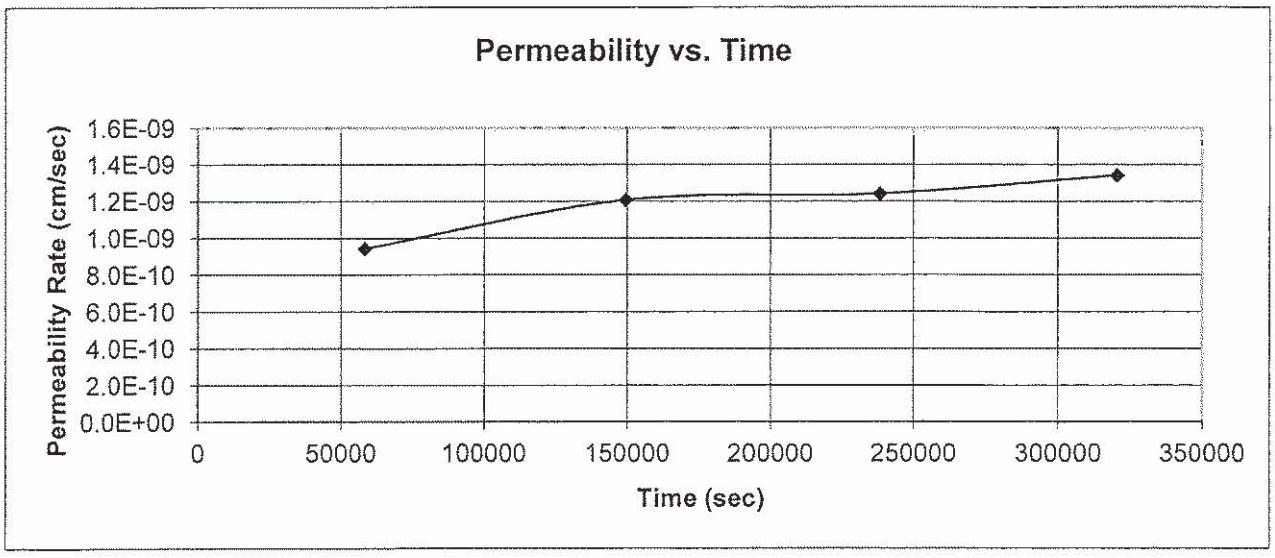
Dia. (in.)	2.84	2.89	Length (in)	2.20	1.93	Weight (gr)	388.91	402
Wet Density (pcf)	106.7		Moisture Content (%)	28.3		Dry Density (pcf)	83.1	
Final WD (pcf)	121.0		Final Moisture (%)	30.3		Final DD (pcf)	92.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	41.9	Minimum Hydraulic Gradient	21.0
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

1.2E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 5, 2012

Sample Number: C-2 #51

Sample Information: Initial / Final

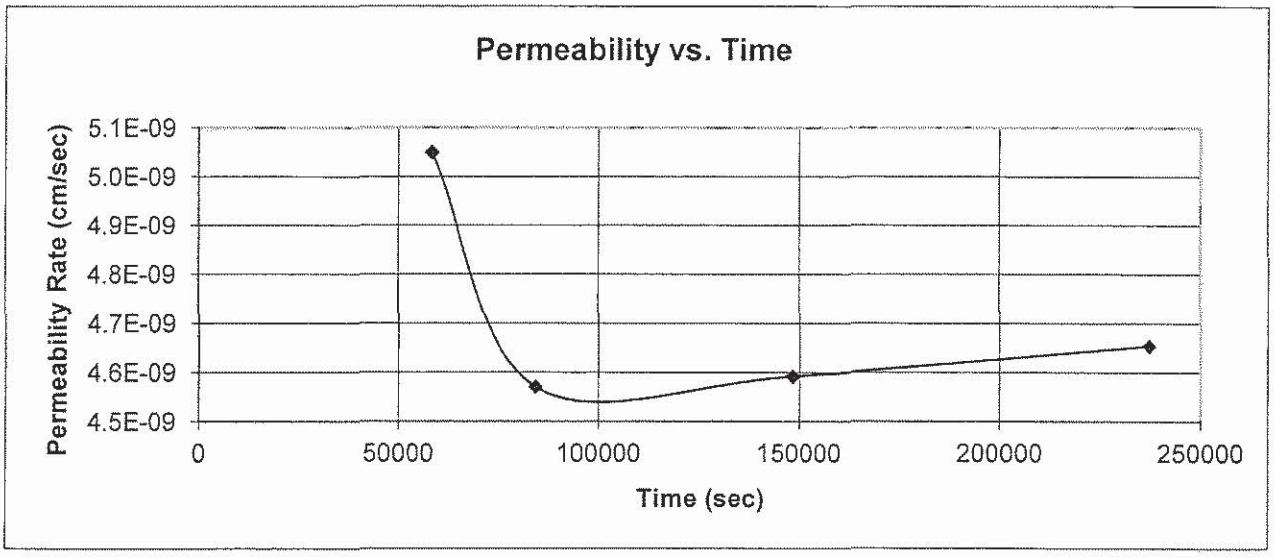
Dia. (in.)	2.86	2.87	**Length (in)**	2.39	2.44	**Weight (gr)**	462.6	471.8
Wet Density (pcf)	114.3		**Moisture Content (%)**	32.8		**Dry Density (pcf)**	86.0	
Final WD (pcf)	113.9		**Final Moisture (%)**	35.0		**Final DD (pcf)**	84.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	38.4	**Minimum Hydraulic Gradient**	19.2
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.7E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 8, 2012

Sample Number: C-2 #54

Sample Information: Initial / Final

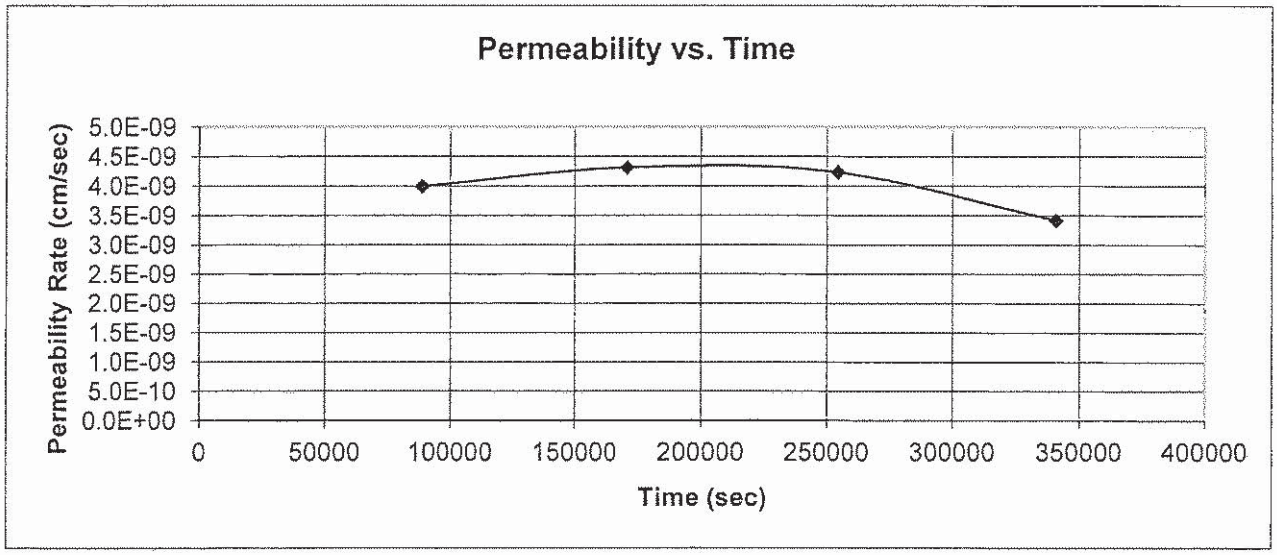
Dia. (in.)	2.84	2.87	Length (in)	2.36	2.43	Weight (gr)	458.75	468.2
Wet Density (pcf)	117.2		Moisture Content (%)	44.5		Dry Density (pcf)	81.1	
Final WD (pcf)	113.5		Final Moisture (%)	34.6		Final DD (pcf)	84.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	39.0	Minimum Hydraulic Gradient	19.4
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

4.0E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 8, 2012

Sample Number: C-2 #58

Sample Information: Initial / Final

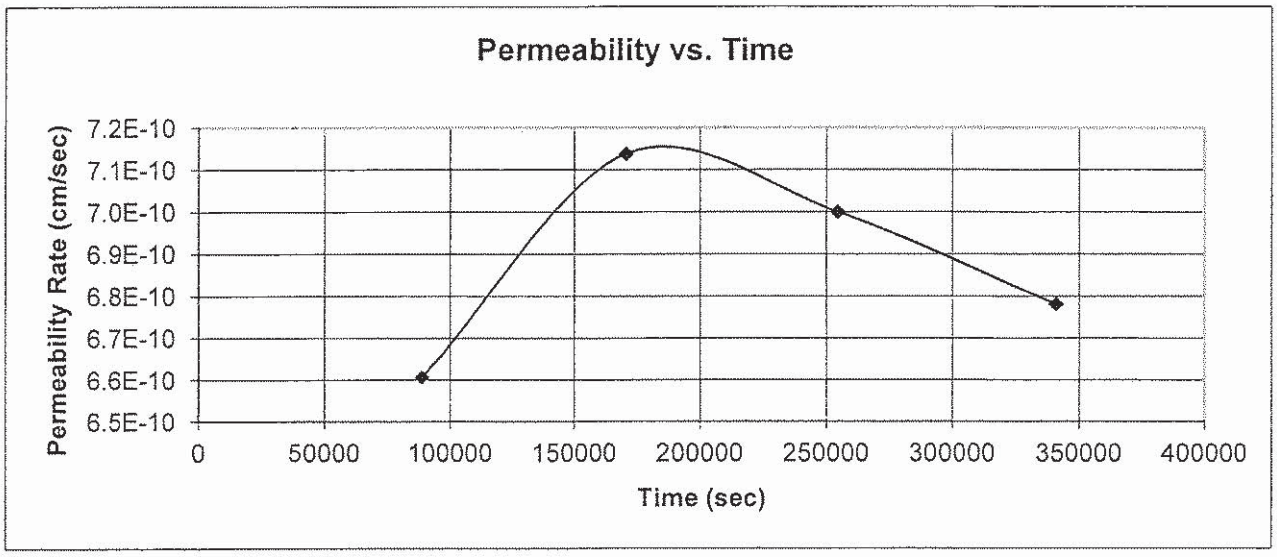
Dia. (in.)	2.84	2.87	Length (in)	2.34	2.40	Weight (gr)	445.46	466.9
Wet Density (pcf)	114.3		Moisture Content (%)	23.5		Dry Density (pcf)	92.5	
Final WD (pcf)	114.6		Final Moisture (%)	32.6		Final DD (pcf)	86.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	39.3	Minimum Hydraulic Gradient	19.6
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

6.9E-10



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 10, 2012

Sample Number: C-2 #60

Sample Information: Initial / Final

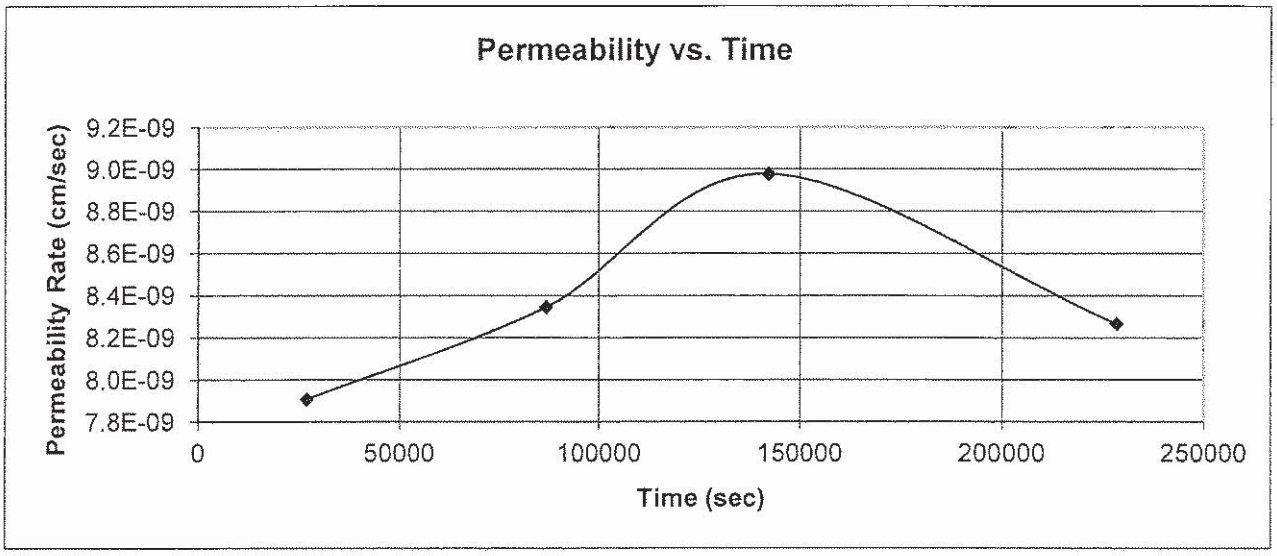
Dia. (in.)	2.83	2.86	Length (in)	2.83	2.88	Weight (gr)	544.9	563.1
Wet Density (pcf)	116.1		Moisture Content (%)	29.6		Dry Density (pcf)	89.6	
Final WD (pcf)	116.3		Final Moisture (%)	34.4		Final DD (pcf)	86.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	32.5	Minimum Hydraulic Gradient	16.2
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

8.4E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 9, 2012

Sample Number: C-2 #63

Sample Information: Initial / Final

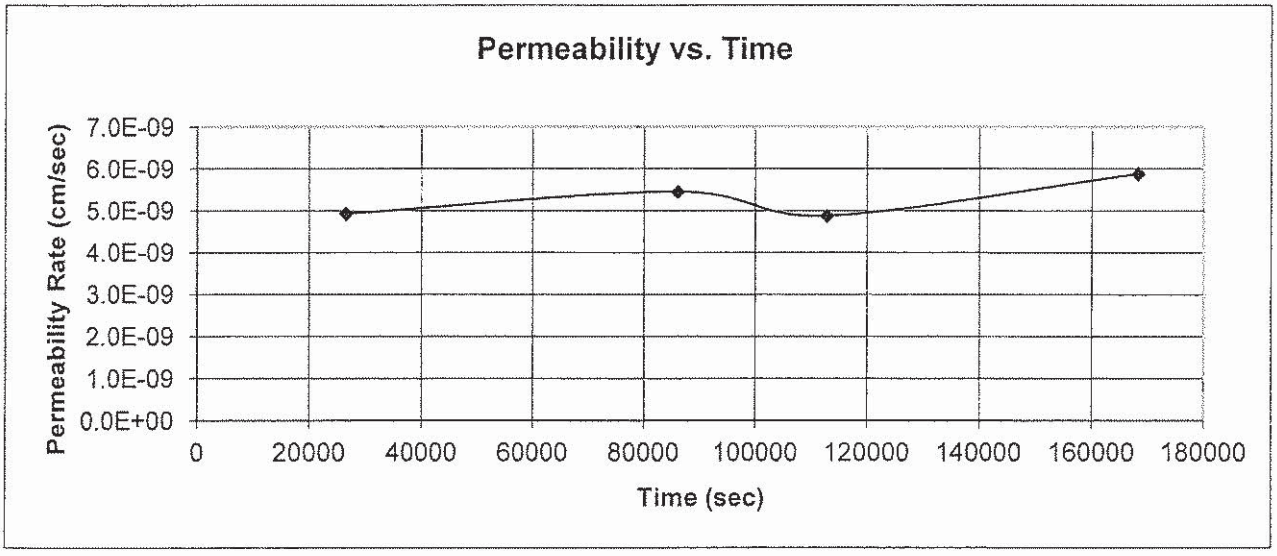
Dia. (in.)	2.83	2.85	Length (in)	2.59	2.63	Weight (gr)	508.1	522.15
Wet Density (pcf)	118.8		Moisture Content (%)	29.8		Dry Density (pcf)	91.6	
Final WD (pcf)	118.4		Final Moisture (%)	30.4		Final DD (pcf)	90.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	35.6	Minimum Hydraulic Gradient	17.8
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

5.3E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 9, 2012

Sample Number: C-2 #65

Sample Information: Initial / Final

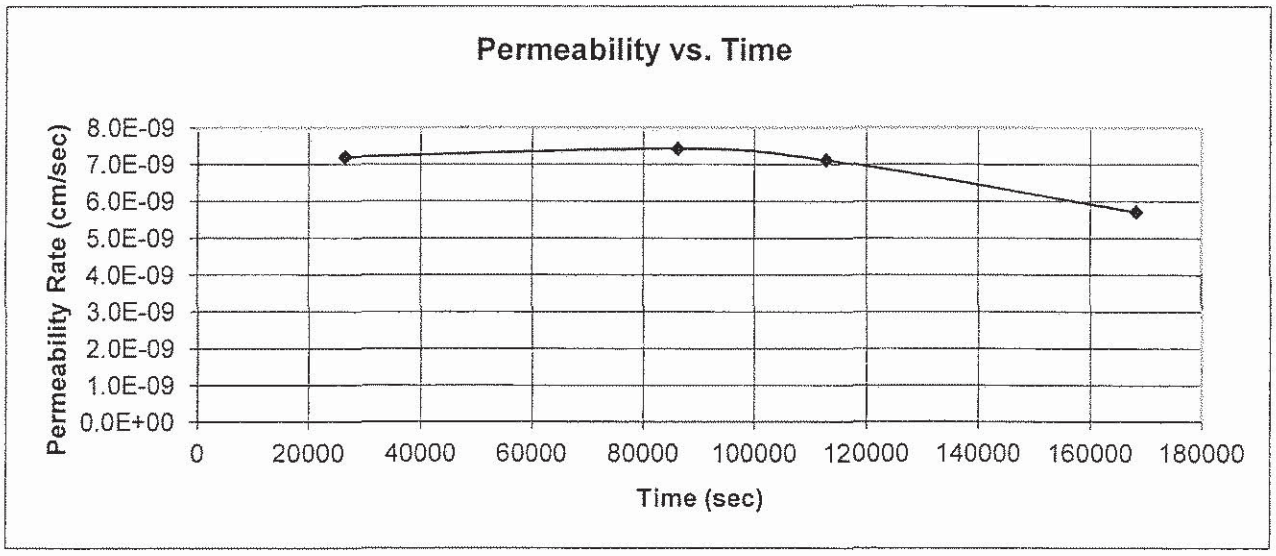
Dia. (in.)	2.83	2.85	Length (in)	2.51	2.52	Weight (gr)	474.2	485.3
Wet Density (pcf)	114.7		Moisture Content (%)	25.0		Dry Density (pcf)	91.8	
Final WD (pcf)	115.2		Final Moisture (%)	35.4		Final DD (pcf)	85.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	36.7	Minimum Hydraulic Gradient	18.3
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

6.9E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 14, 2012

Sample Number: C-2 #69

Sample Information: Initial / Final

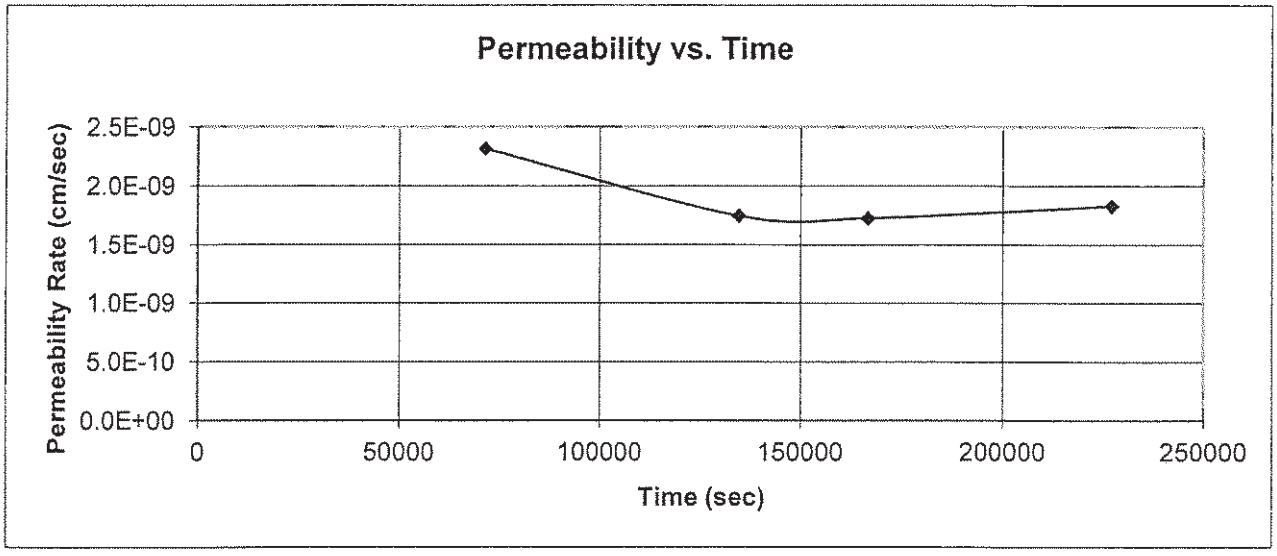
Dia. (in.)	2.86	2.87	**Length (in)**	2.24	2.27	**Weight (gr)**	385.7	393.1
Wet Density (pcf)	102.0		**Moisture Content (%)**	44.7		**Dry Density (pcf)**	70.5	
Final WD (pcf)	102.2		**Final Moisture (%)**	55.1		**Final DD (pcf)**	65.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	41.1	**Minimum Hydraulic Gradient**	20.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.9E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 14, 2012

Sample Number: C-2 #71

Sample Information: Initial / Final

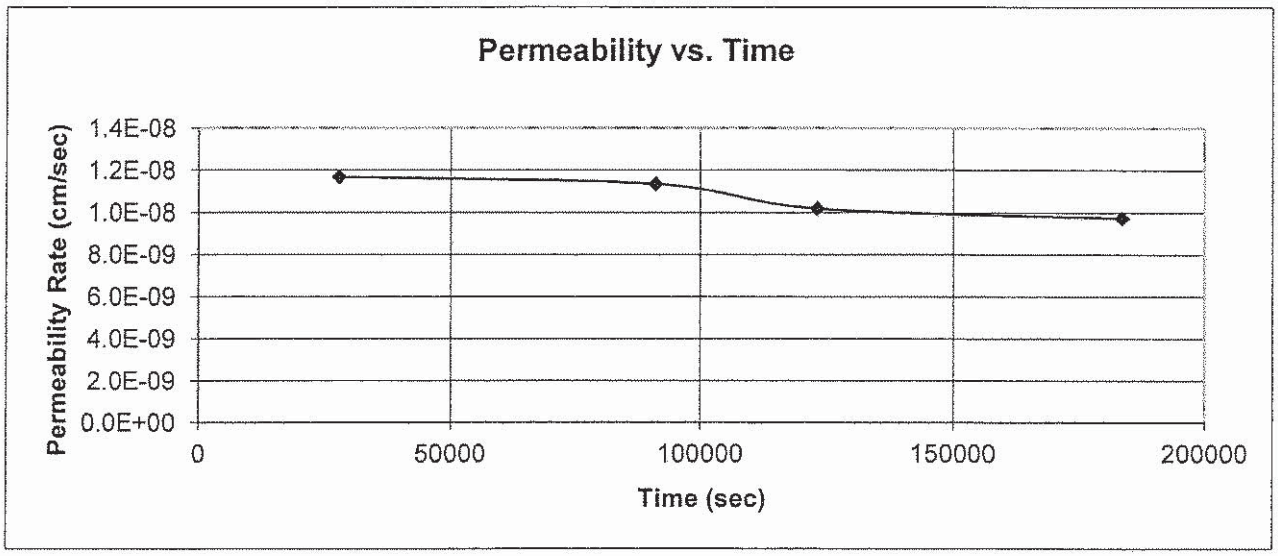
Dia. (in.)	2.85	2.84	**Length (in)**	2.63	2.63	**Weight (gr)**	494.9	515.5
Wet Density (pcf)	112.1		**Moisture Content (%)**	32.4		**Dry Density (pcf)**	84.7	
Final WD (pcf)	118.0		**Final Moisture (%)**	34.6		**Final DD (pcf)**	87.7	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	34.9	**Minimum Hydraulic Gradient**	17.4
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.1E-08



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** February 14, 2012

Sample Number: C-2 #73

Sample Information: Initial / Final

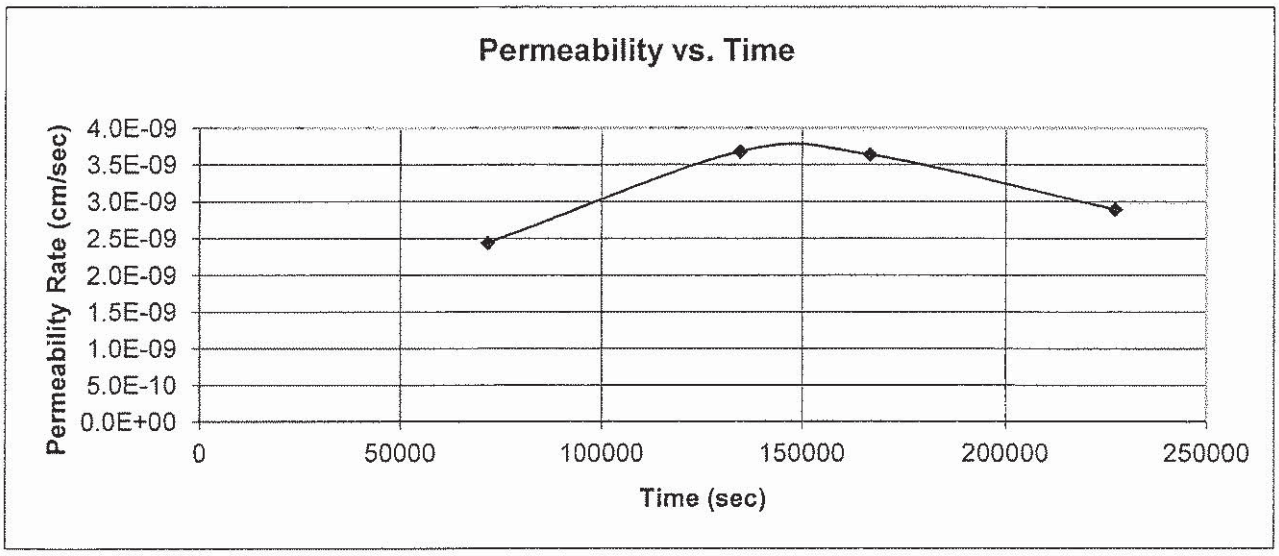
Dia. (in.)	2.87	2.85	**Length (in)**	2.37	2.27	**Weight (gr)**	460.9	466.85
Wet Density (pcf)	114.5		**Moisture Content (%)**	27.7		**Dry Density (pcf)**	89.6	
Final WD (pcf)	122.4		**Final Moisture (%)**	32.3		**Final DD (pcf)**	92.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	38.8	**Minimum Hydraulic Gradient**	19.4
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.2E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 12, 2012

Sample Number: C-2 #77

Sample Information: Initial / Final

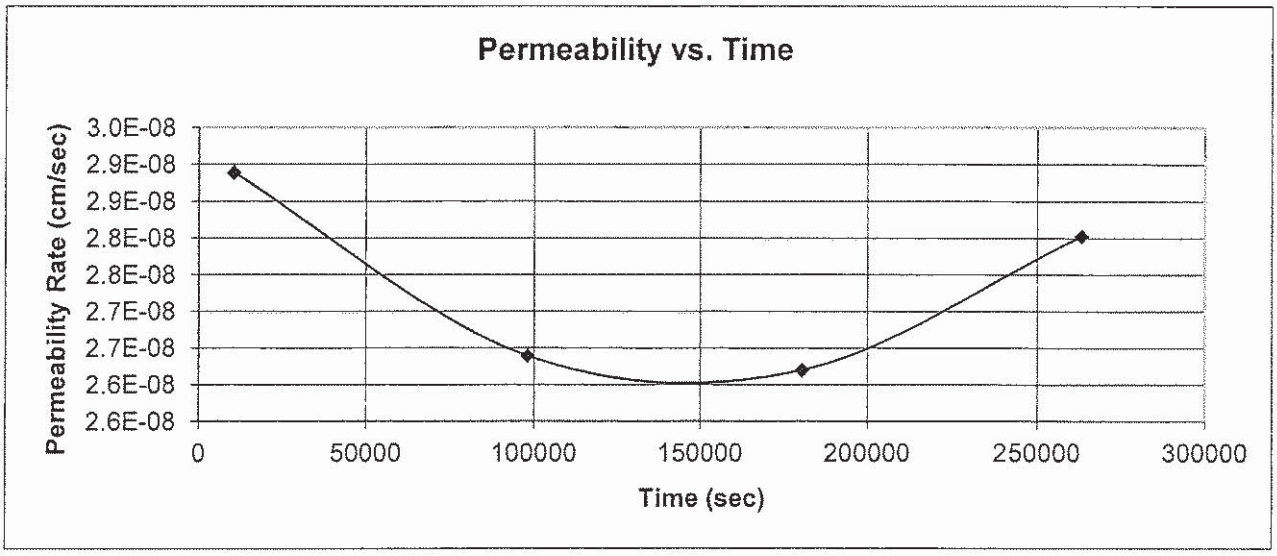
Dia. (in.)	2.91	2.90	**Length (in)**	2.11	2.13	**Weight (gr)**	400.9	410.6
Wet Density (pcf)	109.1		**Moisture Content (%)**	30.6		**Dry Density (pcf)**	83.5	
Final WD (pcf)	111.1		**Final Moisture (%)**	36.4		**Final DD (pcf)**	81.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	43.6	**Minimum Hydraulic Gradient**	21.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.7E-08



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3/20/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 14, 2012

Sample Number: C-2 #75

Sample Information: Initial / Final

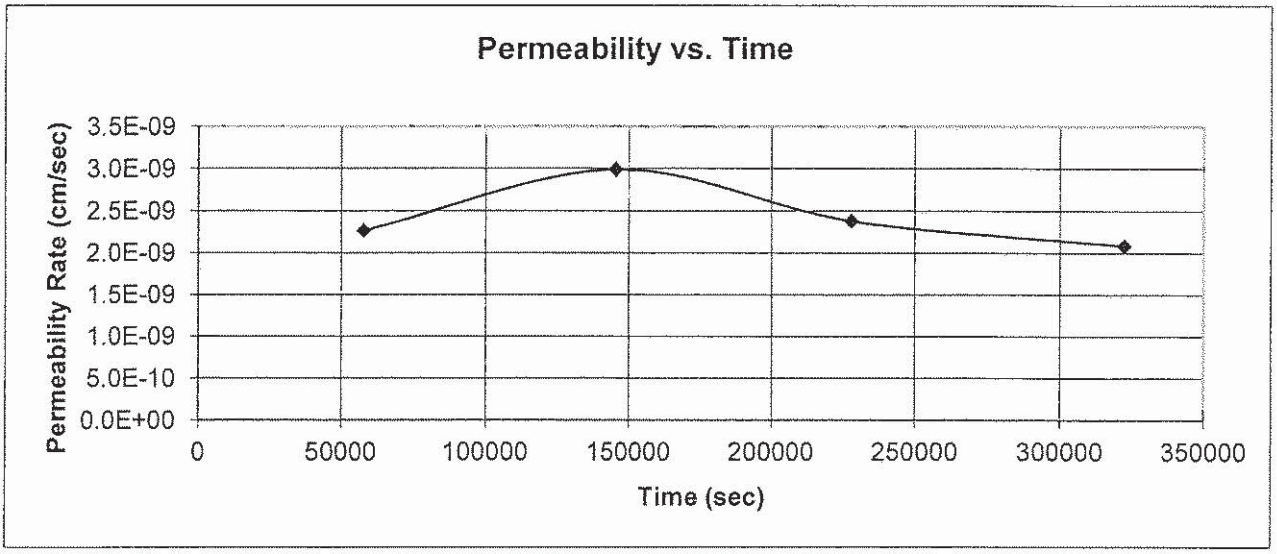
Dia. (in.)	2.88	2.88	**Length (in)**	2.69	2.71	**Weight (gr)**	531.9	538.1
Wet Density (pcf)	116.0		**Moisture Content (%)**	31.4		**Dry Density (pcf)**	88.3	
Final WD (pcf)	116.3		**Final Moisture (%)**	33.0		**Final DD (pcf)**	87.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	34.3	**Minimum Hydraulic Gradient**	17.1
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.4E-09



Reviewed By:

Daniel Eisman, P.E.

3/20/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 14, 2012

Sample Number: C-2 #79

Sample Information: Initial / Final

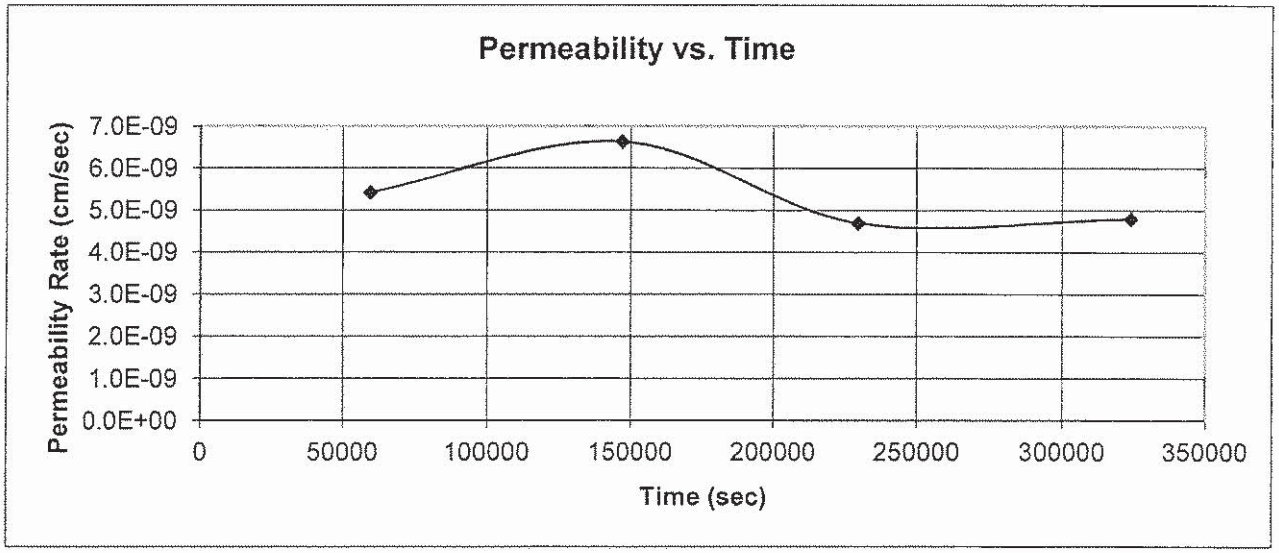
Dia. (in.)	2.87	2.81	**Length (in)**	2.63	2.71	**Weight (gr)**	488.7	500.4
Wet Density (pcf)	109.8		**Moisture Content (%)**	29.5		**Dry Density (pcf)**	84.8	
Final WD (pcf)	113.4		**Final Moisture (%)**	41.8		**Final DD (pcf)**	80.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	35.0	**Minimum Hydraulic Gradient**	17.4
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

5.4E-09



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3/20/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 14, 2012

Sample Number: C-2 #81

Sample Information: Initial / Final

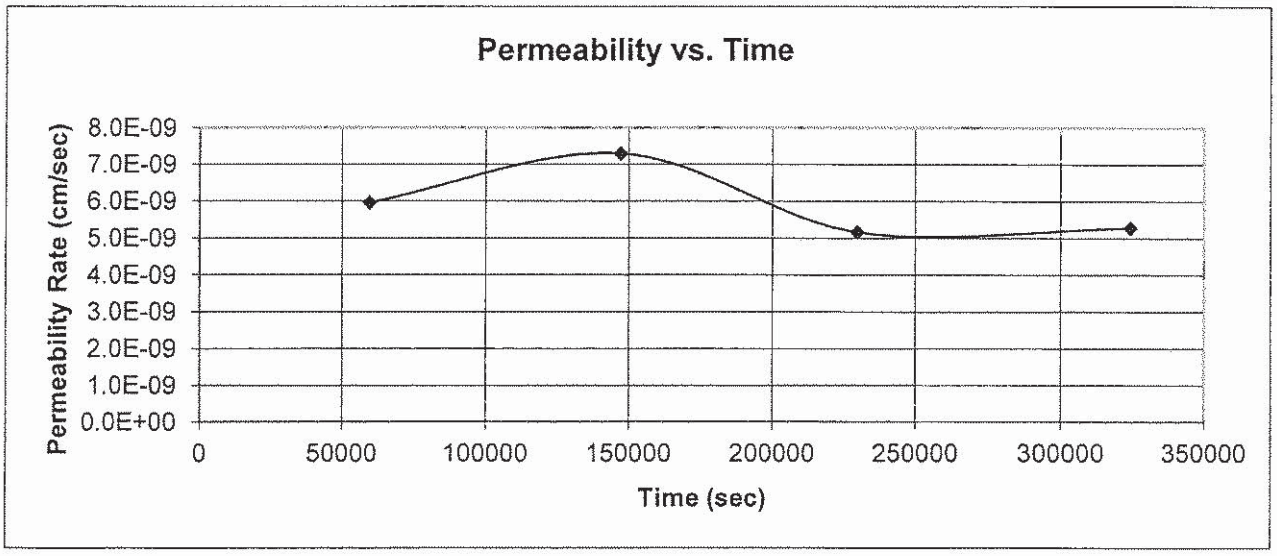
Dia. (in.)	2.79	2.67	**Length (in)**	2.75	2.71	**Weight (gr)**	472.5	475.9
Wet Density (pcf)	106.9		**Moisture Content (%)**	35.3		**Dry Density (pcf)**	79.0	
Final WD (pcf)	119.5		**Final Moisture (%)**	41.2		**Final DD (pcf)**	84.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	33.5	**Minimum Hydraulic Gradient**	16.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

5.9E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** May 19, 2012

Sample Number: C-2 #83

Sample Information: Initial / Final

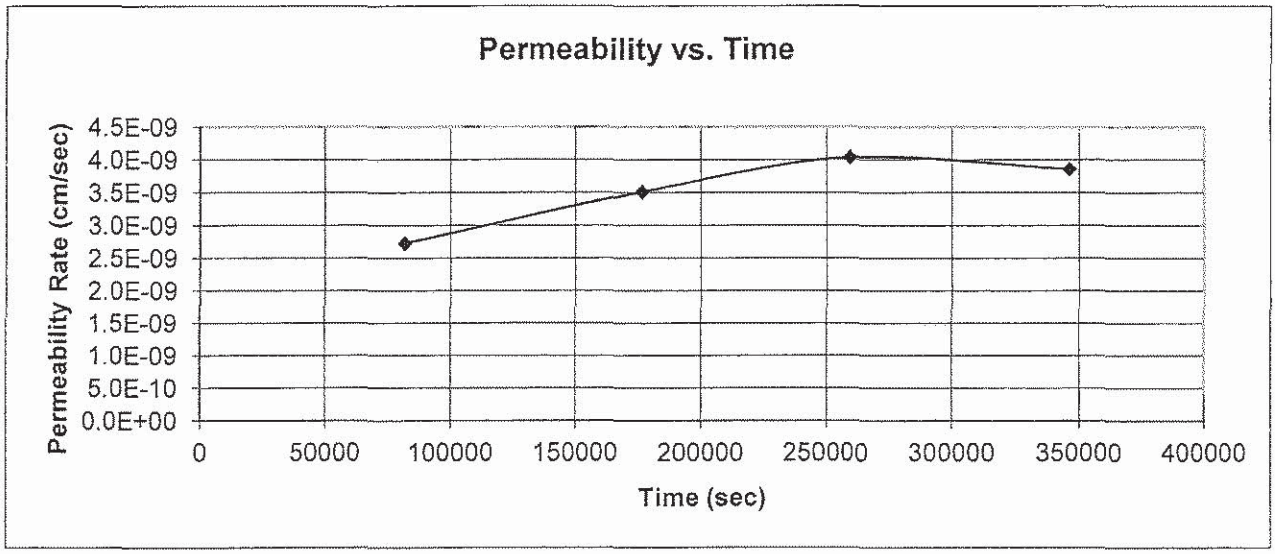
Dia. (in.)	2.85	2.85	**Length (in)**	4.48	4.44	**Weight (gr)**	816.8	821.7
Wet Density (pcf)	109.2		**Moisture Content (%)**	27.3		**Dry Density (pcf)**	85.8	
Final WD (pcf)	110.5		**Final Moisture (%)**	42.4		**Final DD (pcf)**	77.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	20.6	**Minimum Hydraulic Gradient**	10.3
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.5E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 2, 2012

Sample Number: C-2 #83R

Sample Information: Initial / Final

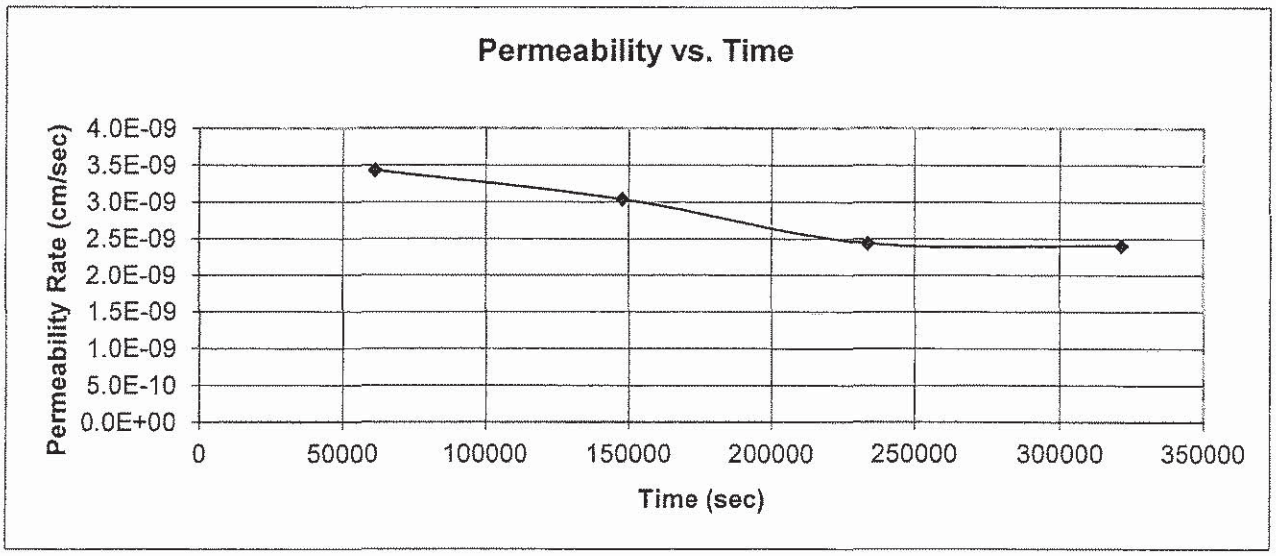
Dia. (in.)	2.84	2.81	**Length (in)**	2.09	2.10	**Weight (gr)**	380.7	387.2
Wet Density (pcf)	109.6		**Moisture Content (%)**	33.4		**Dry Density (pcf)**	82.1	
Final WD (pcf)	113.3		**Final Moisture (%)**	36.8		**Final DD (pcf)**	82.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	43.9	**Minimum Hydraulic Gradient**	21.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.8E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 13, 2012

Sample Number: C-2 #83R2

Sample Information: Initial / Final

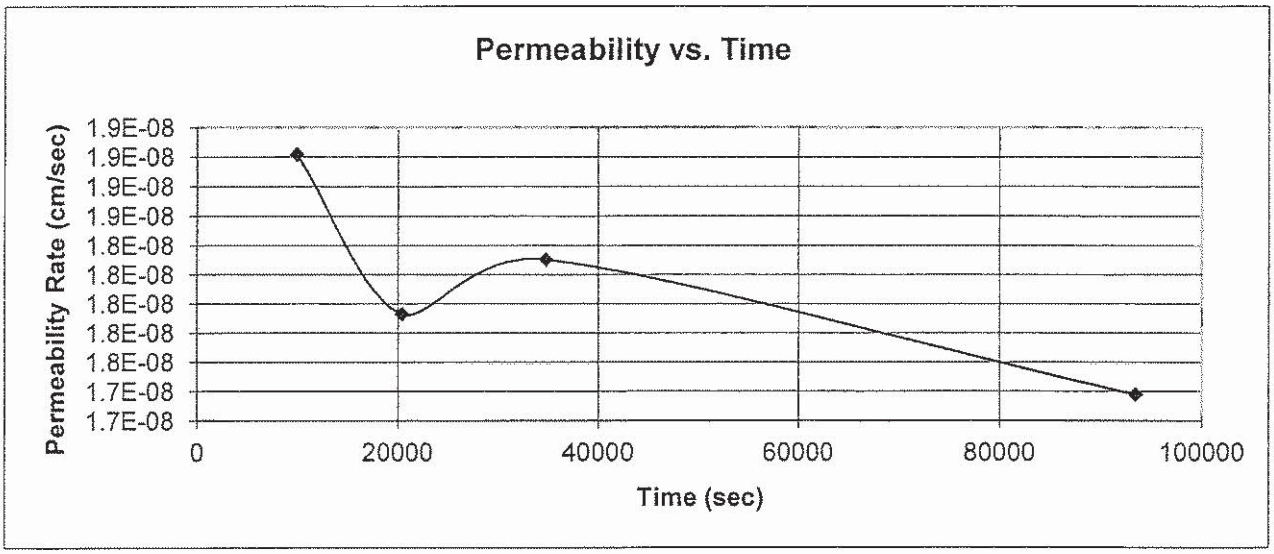
Dia. (in.)	2.84	2.87	**Length (in)**	1.50	1.63	**Weight (gr)**	287.7	307.15
Wet Density (pcf)	115.2		**Moisture Content (%)**	26.2		**Dry Density (pcf)**	91.3	
Final WD (pcf)	110.8		**Final Moisture (%)**	35.1		**Final DD (pcf)**	82.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	61.2	**Minimum Hydraulic Gradient**	30.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.8E-08



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** May 18, 2012

Sample Number: C-2 #85

Sample Information: Initial / Final

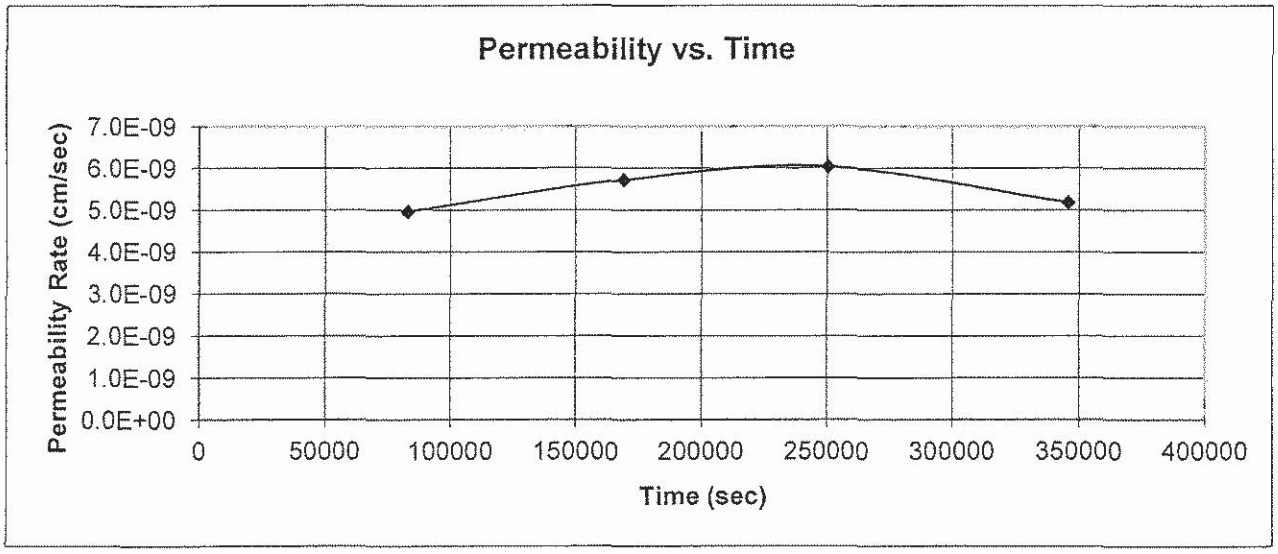
Dia. (in.)	2.84	2.85	Length (in)	3.28	4.04	Weight (gr)	763.3	774
Wet Density (pcf)	140.3		Moisture Content (%)	41.1		Dry Density (pcf)	99.5	
Final WD (pcf)	114.6		Final Moisture (%)	36.9		Final DD (pcf)	83.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	28.0	Minimum Hydraulic Gradient	14.0
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

5.5E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 2, 2012

Sample Number: C-2 #85R

Sample Information: Initial / Final

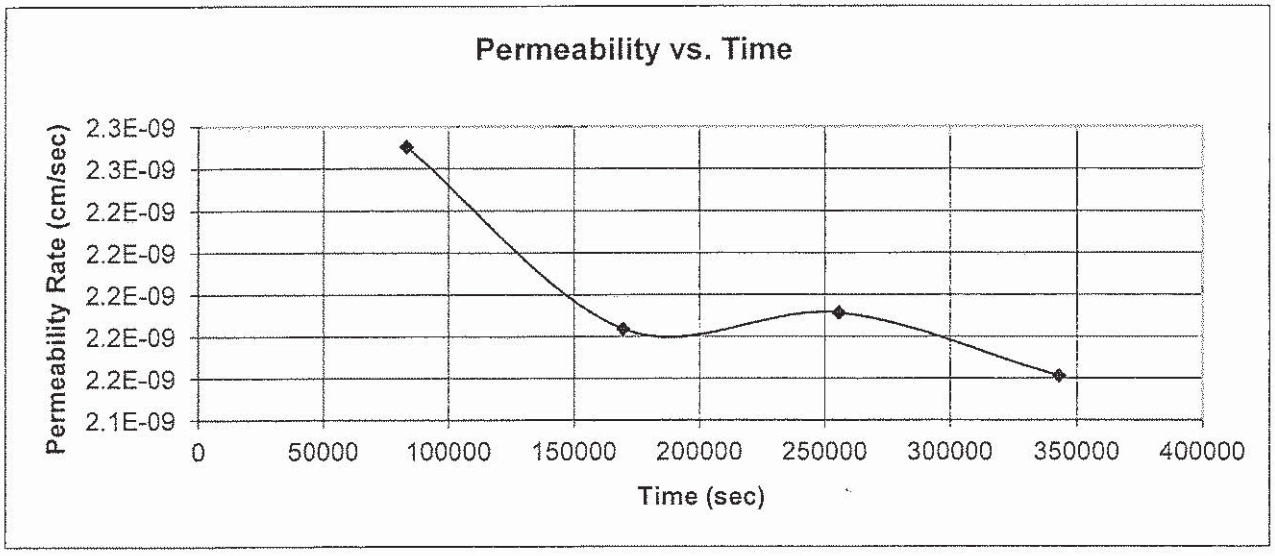
Dia. (in.)	2.85	2.85	Length (in)	1.90	1.89	Weight (gr)	337.7	343.4
Wet Density (pcf)	106.5		Moisture Content (%)	42.2		Dry Density (pcf)	74.9	
Final WD (pcf)	108.5		Final Moisture (%)	46.3		Final DD (pcf)	74.2	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	48.5	Minimum Hydraulic Gradient	24.2
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

2.2E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 16, 2012

Sample Number: C-2 #85R2

Sample Information: Initial / Final

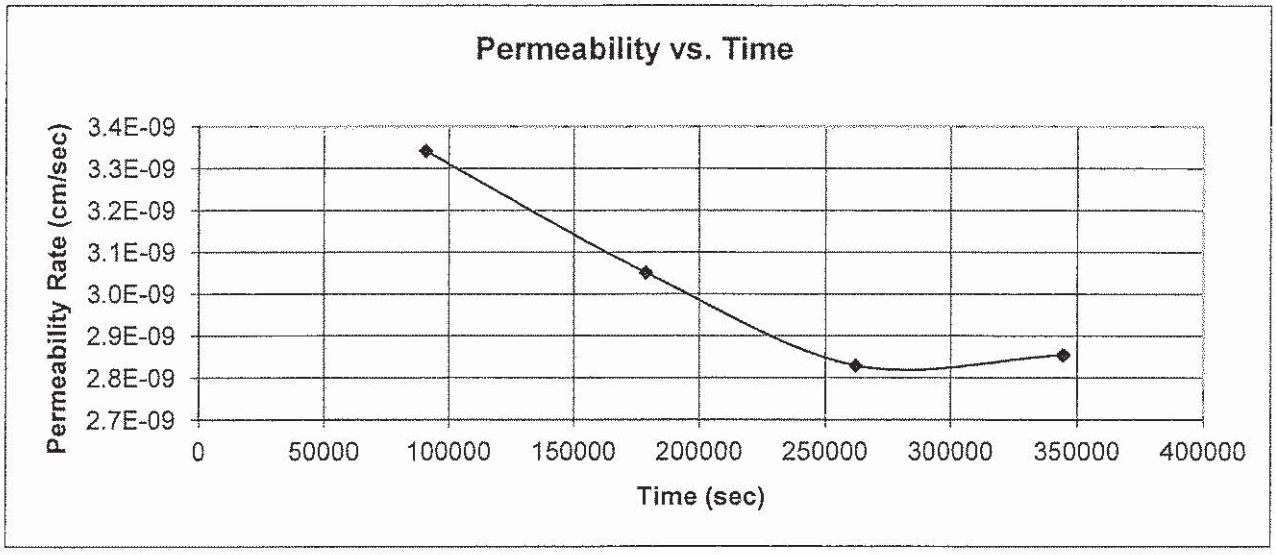
Dia. (in.)	2.83	2.87	**Length (in)**	1.34	1.34	**Weight (gr)**	237.3	246.1
Wet Density (pcf)	107.5		**Moisture Content (%)**	26.9		**Dry Density (pcf)**	84.7	
Final WD (pcf)	107.7		**Final Moisture (%)**	41.4		**Final DD (pcf)**	76.2	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	68.7	**Minimum Hydraulic Gradient**	34.2
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.0E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** May 17, 2012

Sample Number: C-2 #87

Sample Information: Initial / Final

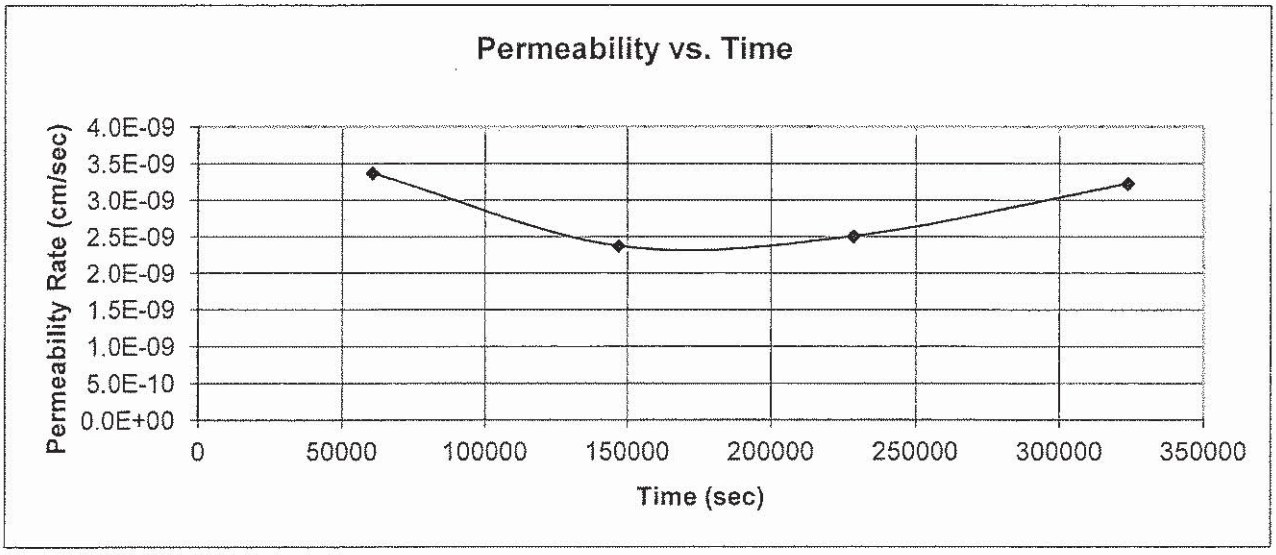
Dia. (in.)	2.84	2.84	Length (in)	4.08	4.13	Weight (gr)	730.8	740.5
Wet Density (pcf)	107.9		Moisture Content (%)	39.5		Dry Density (pcf)	77.3	
Final WD (pcf)	107.9		Final Moisture (%)	50.4		Final DD (pcf)	71.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	22.6	Minimum Hydraulic Gradient	11.3
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

2.9E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 2, 2012

Sample Number: C-2 #87R

Sample Information: Initial / Final

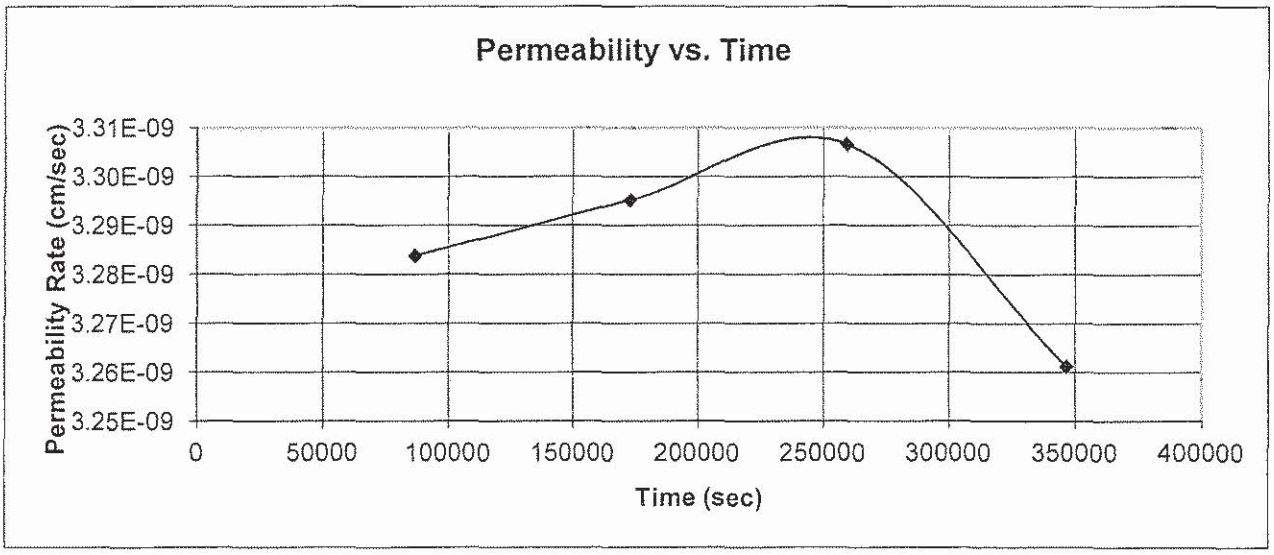
Dia. (in.)	2.89	2.88	Length (in)	1.96	1.98	Weight (gr)	363.5	368.9
Wet Density (pcf)	108.2		Moisture Content (%)	35.2		Dry Density (pcf)	80.0	
Final WD (pcf)	109.0		Final Moisture (%)	42.1		Final DD (pcf)	76.7	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	46.9	Minimum Hydraulic Gradient	23.4
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

3.3E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** May 17, 2012

Sample Number: C-2 #89

Sample Information: Initial / Final

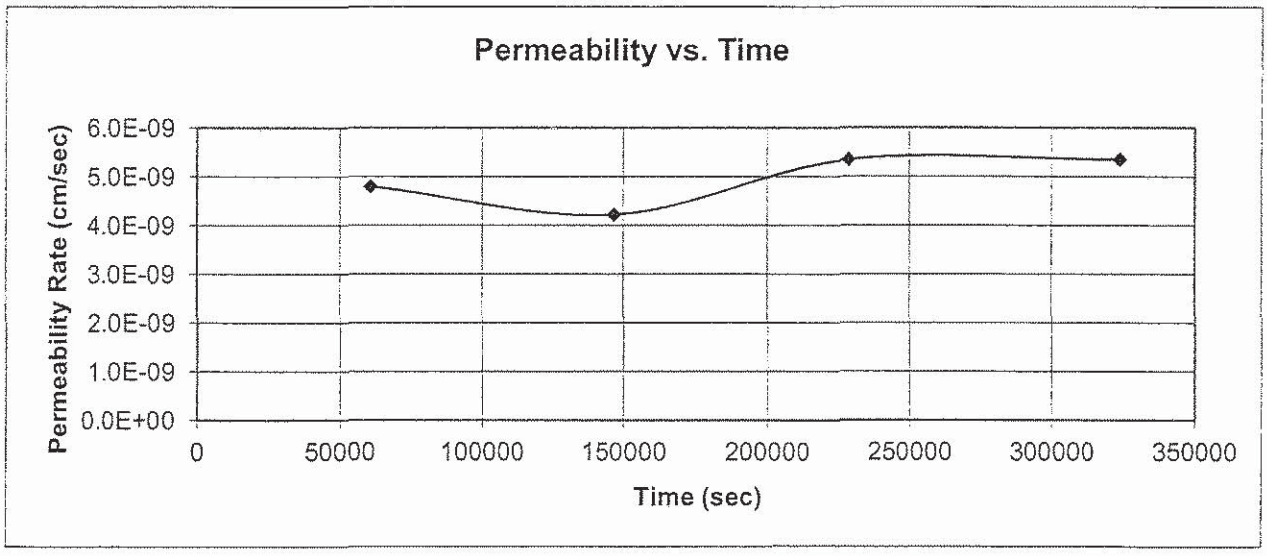
Dia. (in.)	2.86	2.85	**Length (in)**	2.95	2.98	**Weight (gr)**	533.1	538.73
Wet Density (pcf)	107.2		**Moisture Content (%)**	49.7		**Dry Density (pcf)**	71.6	
Final WD (pcf)	107.7		**Final Moisture (%)**	47.5		**Final DD (pcf)**	73.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	31.2	**Minimum Hydraulic Gradient**	15.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.9E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 2, 2012

Sample Number: C-2 #89R

Sample Information: Initial / Final

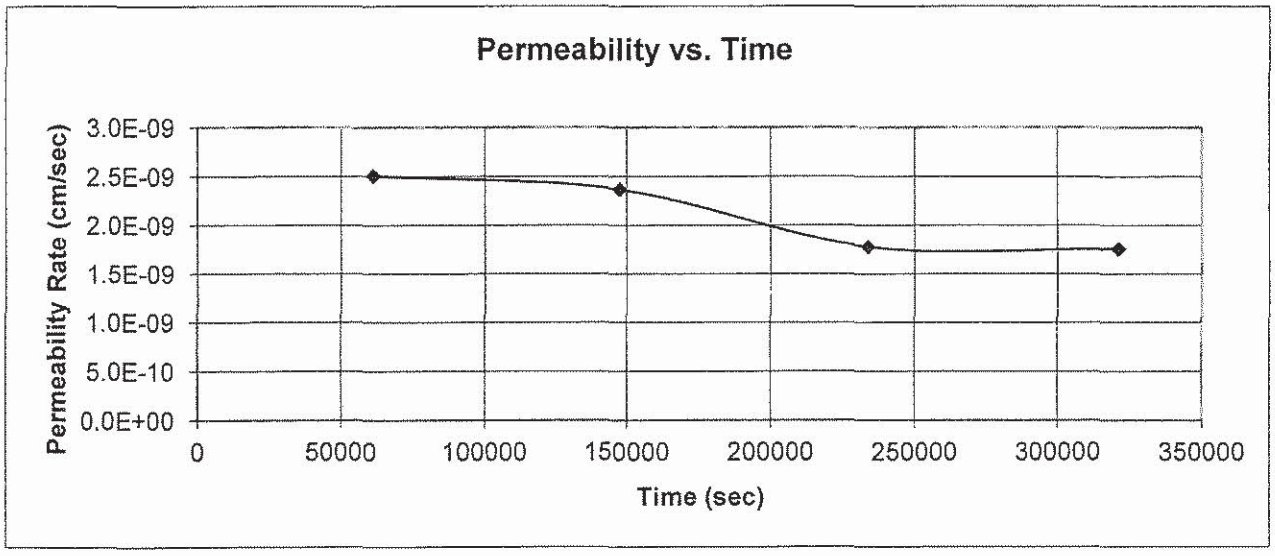
Dia. (in.)	2.89	2.89	**Length (in)**	2.12	2.08	**Weight (gr)**	399.9	403.5
Wet Density (pcf)	109.8		**Moisture Content (%)**	37.0		**Dry Density (pcf)**	80.1	
Final WD (pcf)	112.8		**Final Moisture (%)**	43.1		**Final DD (pcf)**	78.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	43.5	**Minimum Hydraulic Gradient**	21.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.1E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 17, 2012

Sample Number: C-2 #89R2

Sample Information: Initial / Final

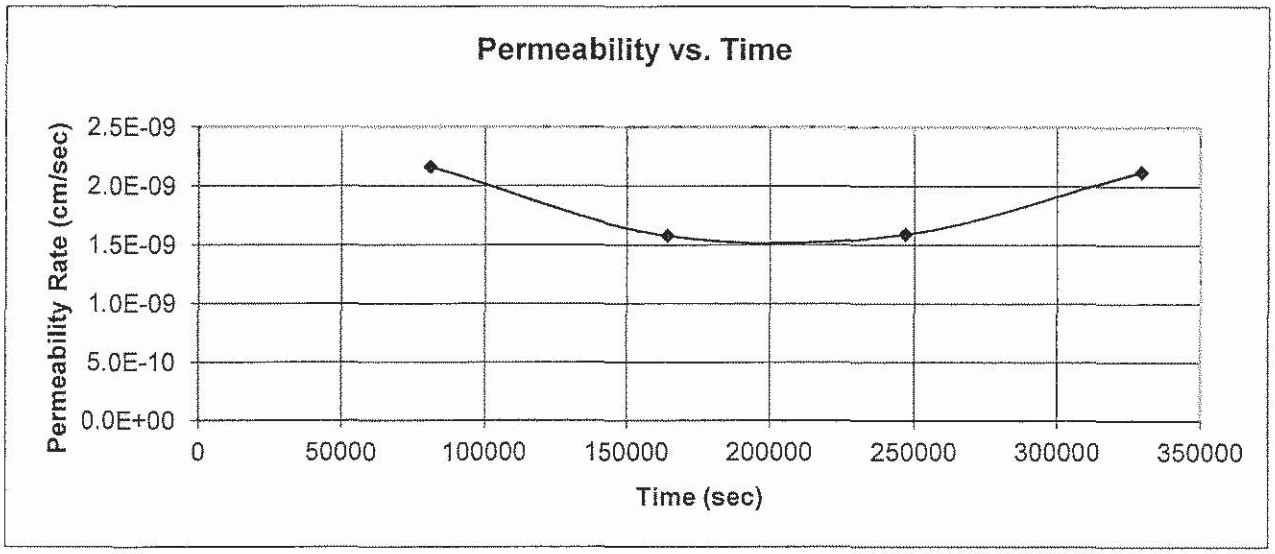
Dia. (in.)	2.85	2.88	Length (in)	1.76	1.79	Weight (gr)	331	335.5
Wet Density (pcf)	112.4		Moisture Content (%)	35.4		Dry Density (pcf)	83.0	
Final WD (pcf)	109.4		Final Moisture (%)	38.2		Final DD (pcf)	79.2	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	52.2	**Minimum Hydraulic Gradient**	26.1
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.9E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 29, 2012

Sample Number: C-2 #91R

Sample Information: Initial / Final

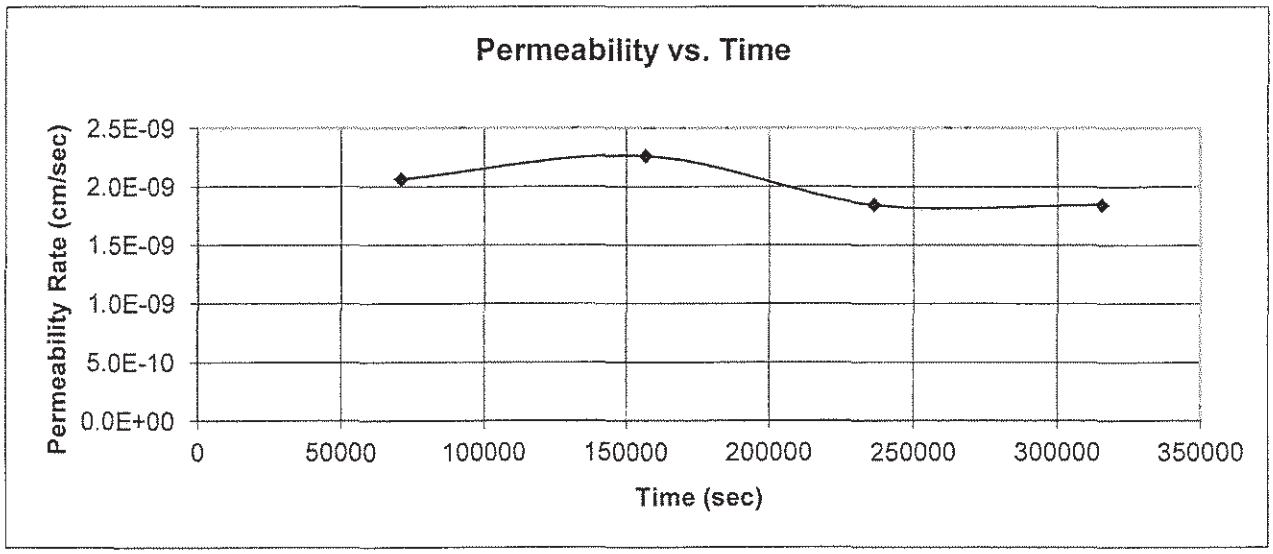
Dia. (in.)	2.84	2.83	**Length (in)**	1.95	1.92	**Weight (gr)**	351.37	352.5
Wet Density (pcf)	107.9		**Moisture Content (%)**	37.9		**Dry Density (pcf)**	78.2	
Final WD (pcf)	111.5		**Final Moisture (%)**	42.7		**Final DD (pcf)**	78.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	47.1	**Minimum Hydraulic Gradient**	23.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.0E-09



Reviewed By:

For

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 9, 2012

Sample Number: C-2 #93

Sample Information: Initial / Final

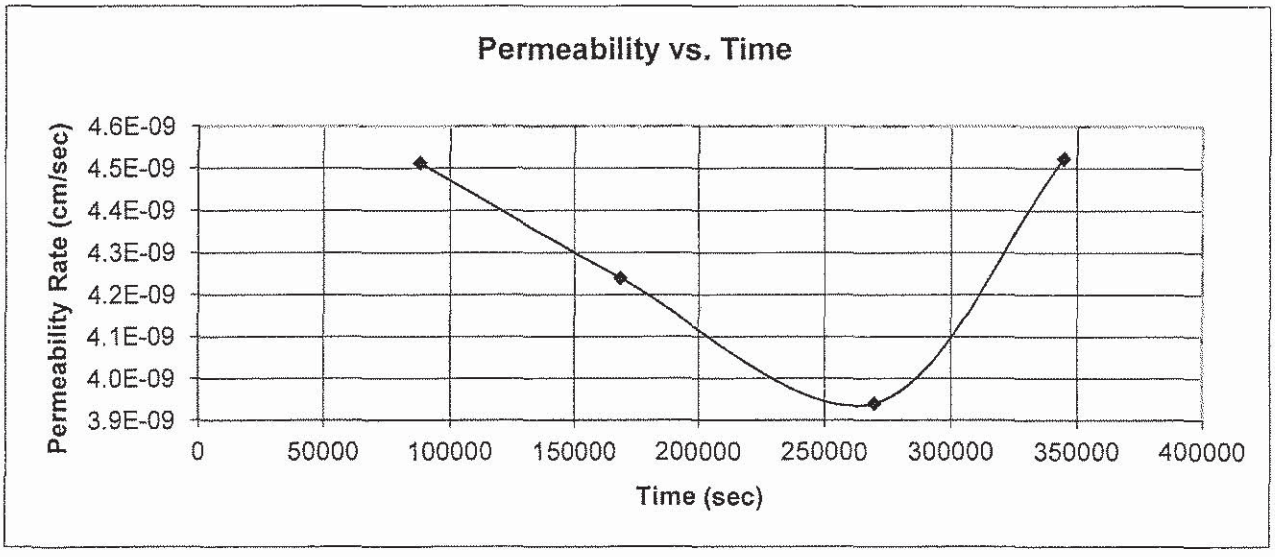
Dia. (in.)	2.85	2.87	**Length (in)**	2.29	2.33	**Weight (gr)**	414.5	438.5
Wet Density (pcf)	107.6		**Moisture Content (%)**	32.5		**Dry Density (pcf)**	81.2	
Final WD (pcf)	111.0		**Final Moisture (%)**	39.4		**Final DD (pcf)**	79.7	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	40.1	**Minimum Hydraulic Gradient**	20.0
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.3E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** July 29, 2012

Sample Number: C-2 #93R

Sample Information: Initial / Final

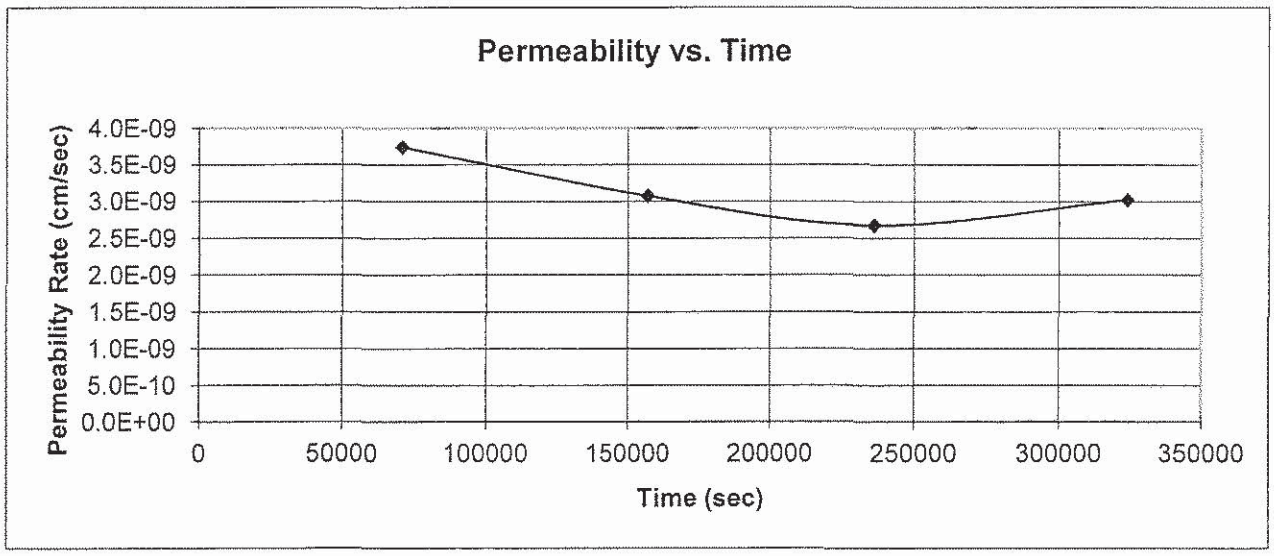
Dia. (in.)	2.85	2.85	**Length (in)**	2.13	2.14	**Weight (gr)**	394.38	400.4
Wet Density (pcf)	110.7		**Moisture Content (%)**		40.5	**Dry Density (pcf)**		78.8
Final WD (pcf)	112.1		**Final Moisture (%)**		39.8	**Final DD (pcf)**		80.2

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	43.1	**Minimum Hydraulic Gradient**	21.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.1E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 9, 2012

Sample Number: C-2 #95

Sample Information: Initial / Final

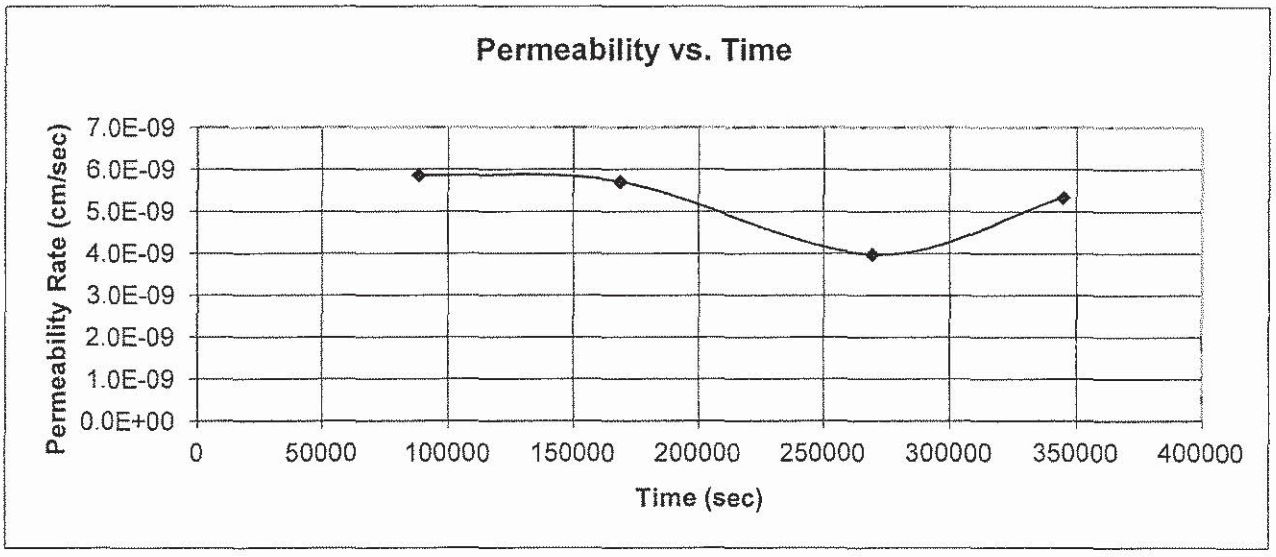
Dia. (in.)	2.85	2.85	Length (in)	2.30	2.31	Weight (gr)	423.1	432.3
Wet Density (pcf)	110.1		Moisture Content (%)	38.0		Dry Density (pcf)	79.8	
Final WD (pcf)	112.3		Final Moisture (%)	39.4		Final DD (pcf)	80.6	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	39.8	**Minimum Hydraulic Gradient**	19.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

5.2E-09



Reviewed By:

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6/12/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 8, 2012

Sample Number: C-2 #97

Sample Information: Initial / Final

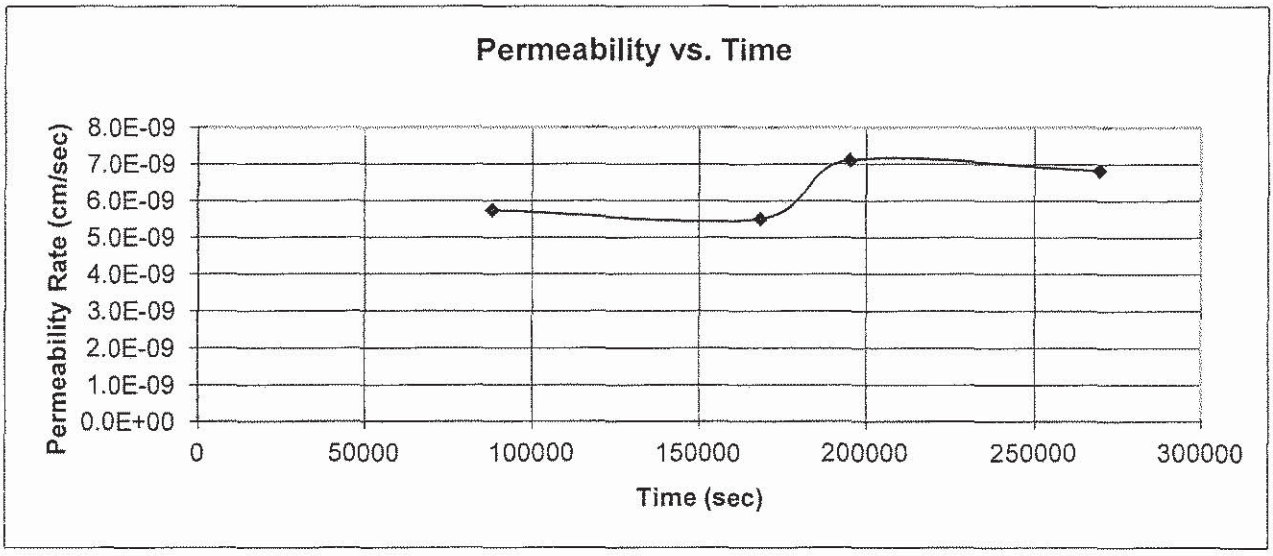
Dia. (in.)	2.84	2.84	**Length (in)**	2.54	2.54	**Weight (gr)**	468.6	475.17
Wet Density (pcf)	110.6		**Moisture Content (%)**	44.9		**Dry Density (pcf)**	76.4	
Final WD (pcf)	112.4		**Final Moisture (%)**	39.7		**Final DD (pcf)**	80.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	36.2	**Minimum Hydraulic Gradient**	18.0
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

6.3E-09



Reviewed By:

Daniel Eisman, P.E.

6/12/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 2, 2012

Sample Number: C-2 #99

Sample Information: Initial / Final

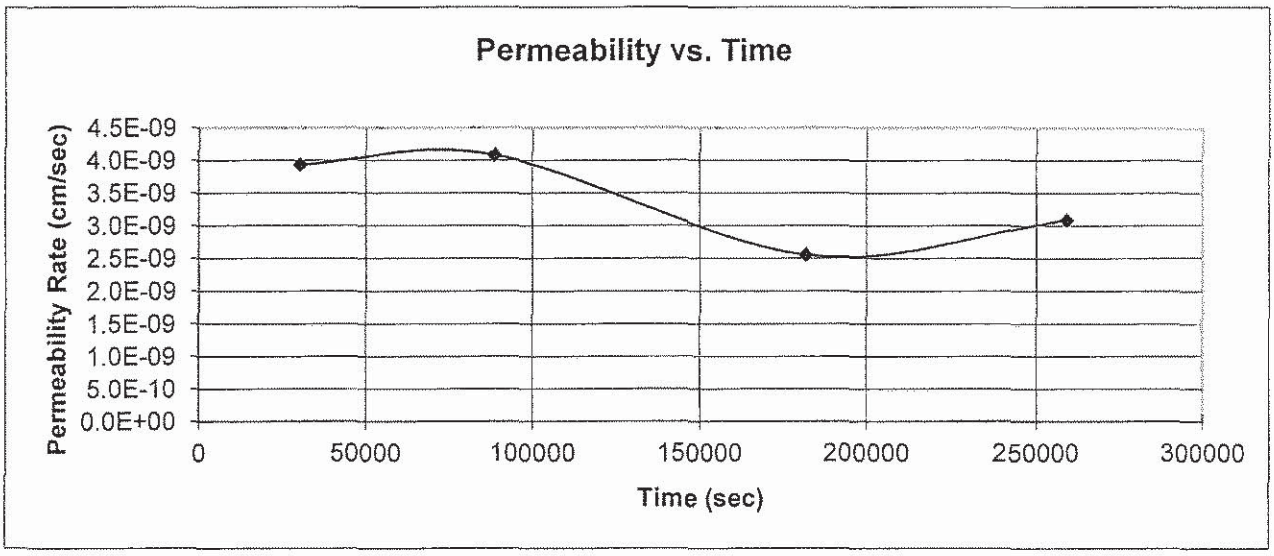
Dia. (in.)	2.84	2.87	Length (in)	2.38	2.39	Weight (gr)	460	469.9
Wet Density (pcf)	116.5		Moisture Content (%)	25.5		Dry Density (pcf)	92.8	
Final WD (pcf)	115.9		Final Moisture (%)	32.6		Final DD (pcf)	87.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	38.7	Minimum Hydraulic Gradient	19.3
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

3.4E-09



Reviewed By:

Daniel Eisman, P.E.

4/10/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 2, 2012

Sample Number: C-2 #101

Sample Information: Initial / Final

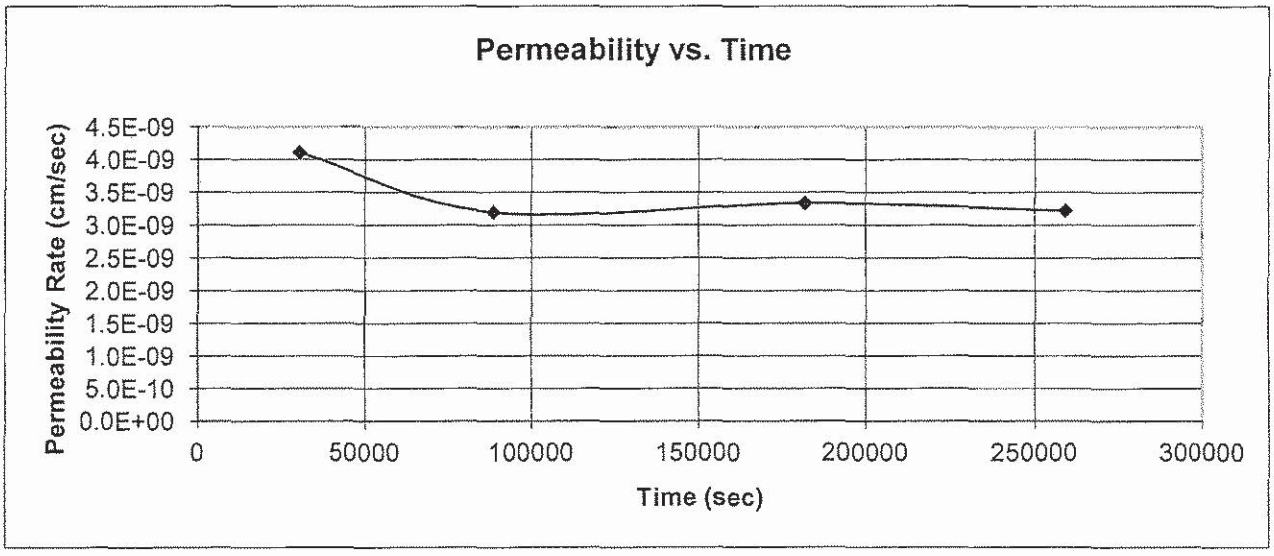
Dia. (in.)	2.81	2.83	**Length (in)**	2.44	2.46	**Weight (gr)**	468.3	478.6
Wet Density (pcf)	118.0		**Moisture Content (%)**	30.7		**Dry Density (pcf)**	90.3	
Final WD (pcf)	118.3		**Final Moisture (%)**	28.9		**Final DD (pcf)**	91.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	37.8	**Minimum Hydraulic Gradient**	18.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.5E-09



Reviewed By:

Daniel Eisman, P.E.

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 2, 2012

Sample Number: C-2 #103

Sample Information: Initial / Final

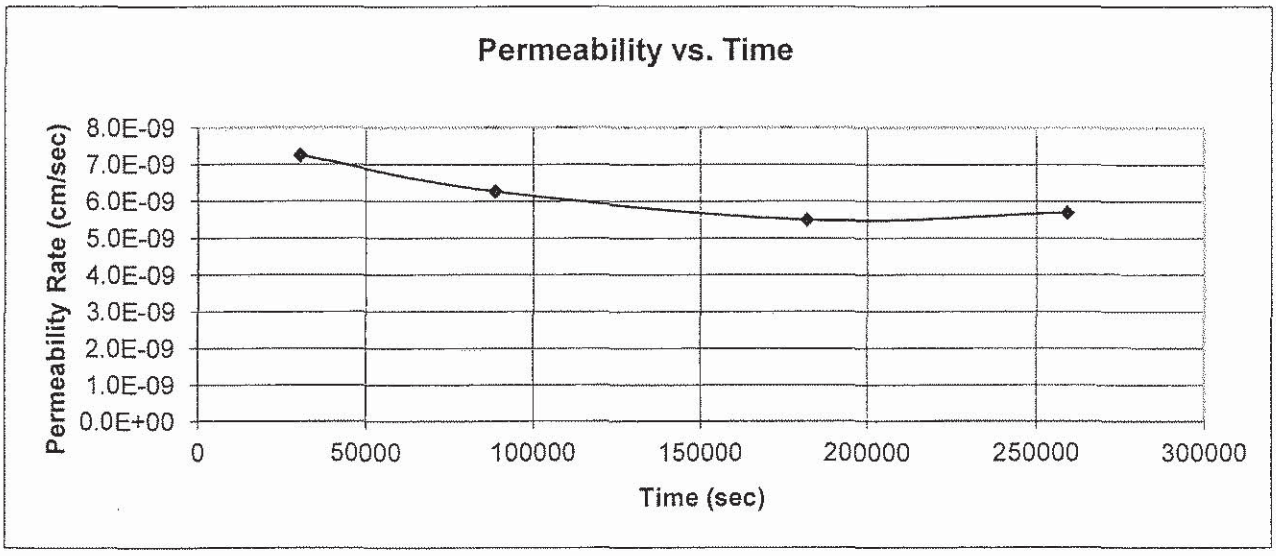
Dia. (in.)	2.84	2.83	**Length (in)**	2.92	2.96	**Weight (gr)**	516.4	101.85
Wet Density (pcf)	106.6		**Moisture Content (%)**	32.9		**Dry Density (pcf)**	80.2	
Final WD (pcf)	20.8		**Final Moisture (%)**	32.9		**Final DD (pcf)**	15.7	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	31.5	**Minimum Hydraulic Gradient**	15.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

6.2E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 8, 2012

Sample Number: C-2 #105

Sample Information: Initial / Final

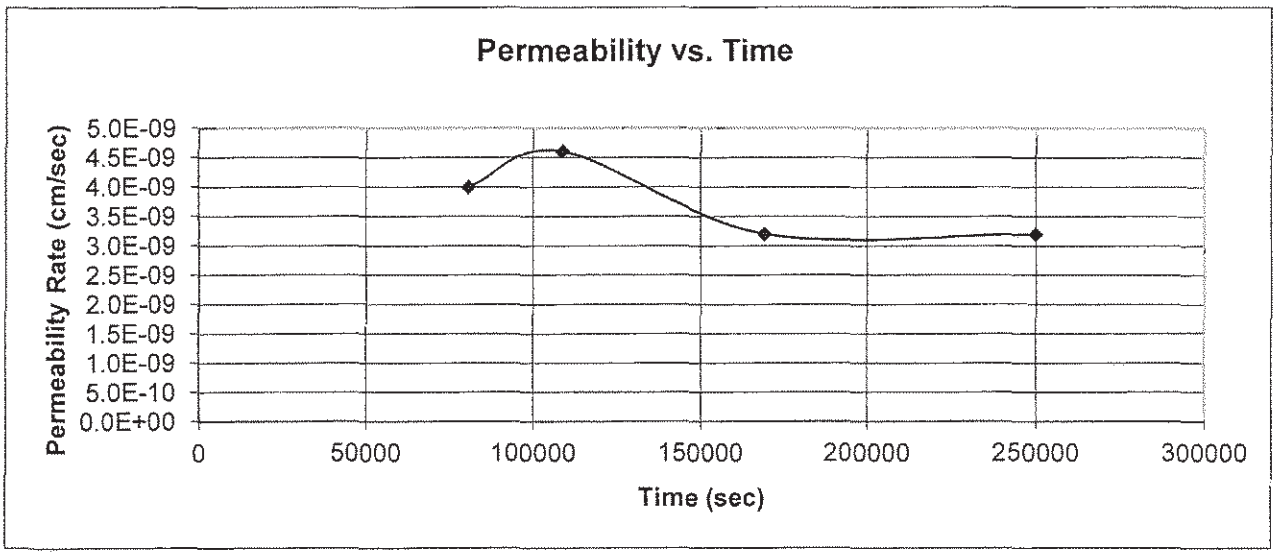
Dia. (in.)	2.84	2.87	Length (in)	2.58	2.58	Weight (gr)	490.3	502.16
Wet Density (pcf)	114.2		Moisture Content (%)	32.3		Dry Density (pcf)	86.3	
Final WD (pcf)	114.6		Final Moisture (%)	35.6		Final DD (pcf)	84.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	35.6	**Minimum Hydraulic Gradient**	17.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.8E-09



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3/20/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 7, 2012

Sample Number: C-2 #110

Sample Information: Initial / Final

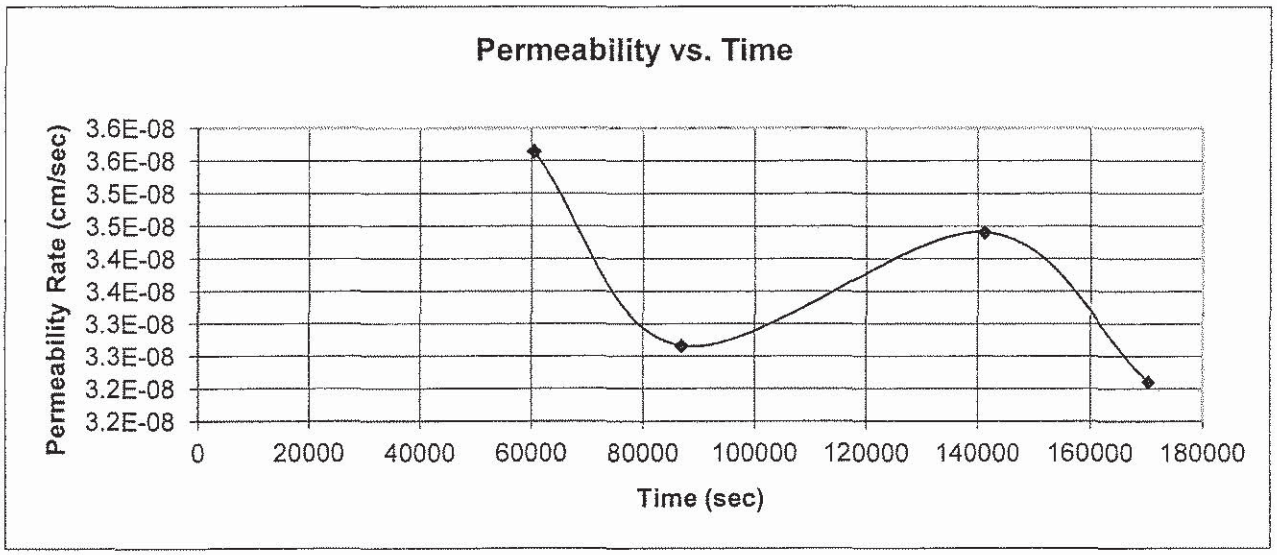
Dia. (in.)	2.86	2.88	**Length (in)**	2.90	2.87	**Weight (gr)**	527.7	537.24
Wet Density (pcf)	108.0		**Moisture Content (%)**	50.7		**Dry Density (pcf)**	71.7	
Final WD (pcf)	109.5		**Final Moisture (%)**	42.2		**Final DD (pcf)**	77.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	31.3	**Minimum Hydraulic Gradient**	15.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

3.4E-08



Reviewed By:

Daniel Eisman, P.E.

3/20/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 2, 2012

Sample Number: C-2 #111

Sample Information: Initial / Final

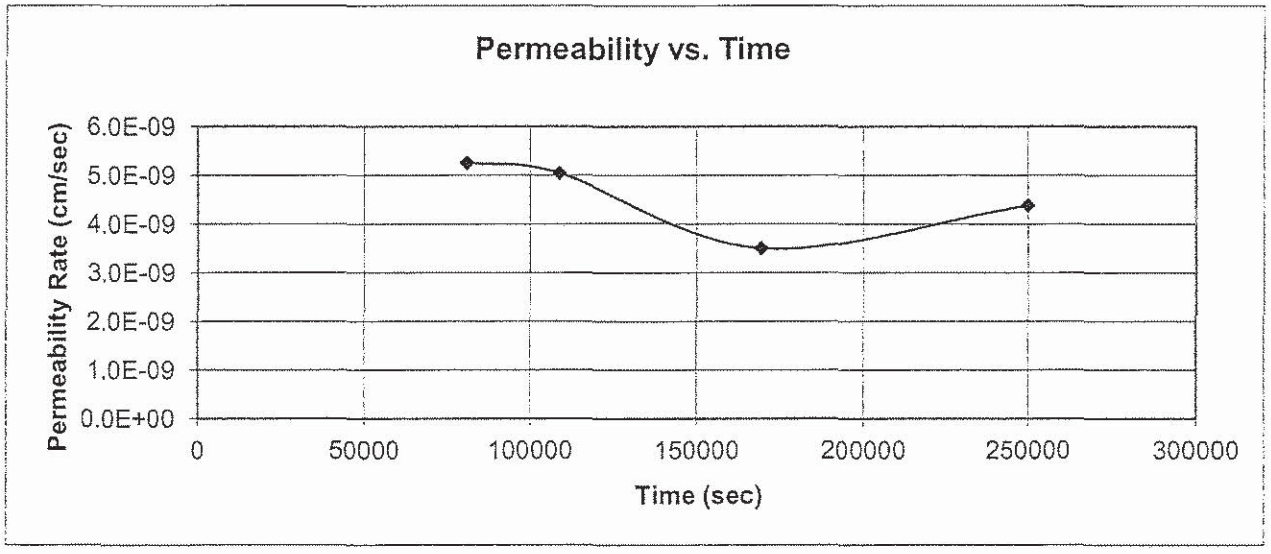
Dia. (in.)	2.86	2.83	Length (in)	2.87	2.85	Weight (gr)	537.8	547.9
Wet Density (pcf)	111.2		Moisture Content (%)	34.5		Dry Density (pcf)	82.6	
Final WD (pcf)	117.1		Final Moisture (%)	32.5		Final DD (pcf)	88.4	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	32.0	Minimum Hydraulic Gradient	16.0
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

4.5E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** March 6, 2012

Sample Number: C-2 #115

Sample Information: Initial / Final

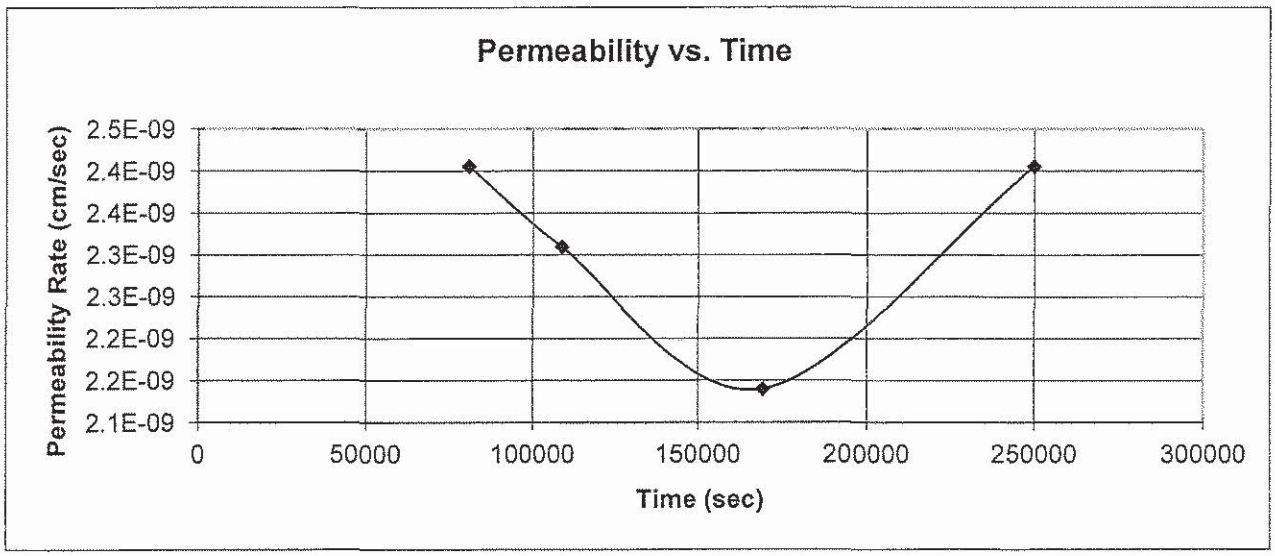
Dia. (in.)	2.84	2.84	**Length (in)**	2.58	2.58	**Weight (gr)**	489.8	495.6
Wet Density (pcf)	114.5		**Moisture Content (%)**	33.2		**Dry Density (pcf)**	85.9	
Final WD (pcf)	115.5		**Final Moisture (%)**	35.7		**Final DD (pcf)**	85.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	35.7	**Minimum Hydraulic Gradient**	17.8
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.3E-09



Reviewed By:

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 6, 2012

Sample Number: C-2 #121

Sample Information: Initial / Final

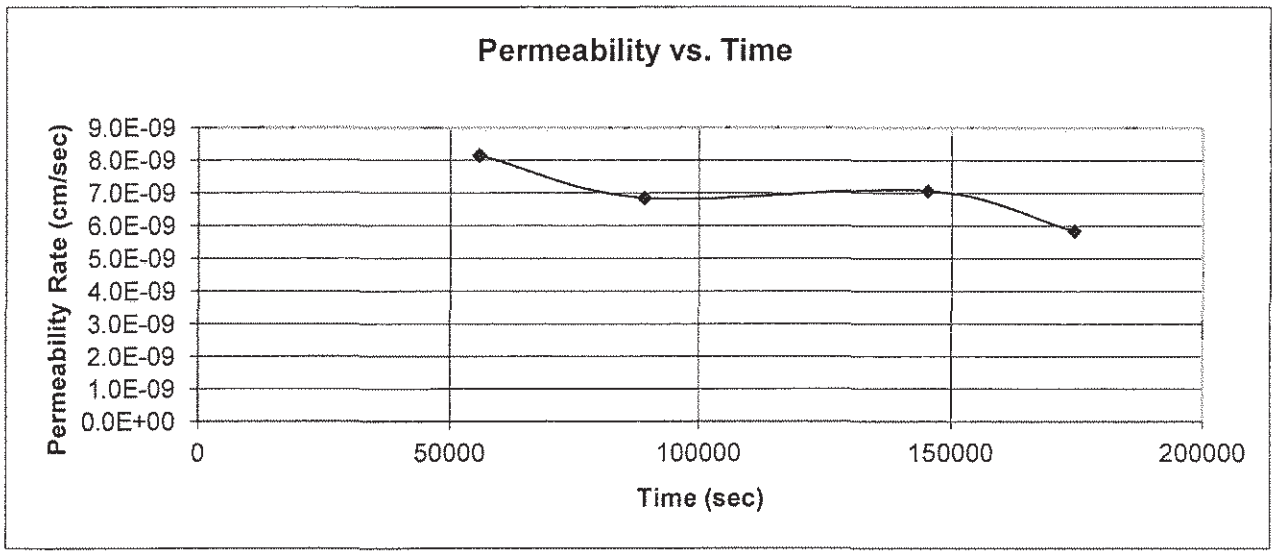
Dia. (in.)	2.83	2.85	**Length (in)**	2.26	2.32	**Weight (gr)**	448	457.75
Wet Density (pcf)	120.0		**Moisture Content (%)**	38.7		**Dry Density (pcf)**	86.5	
Final WD (pcf)	117.5		**Final Moisture (%)**	34.0		**Final DD (pcf)**	87.7	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	40.6	**Minimum Hydraulic Gradient**	20.3
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

7.0E-09



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4/10/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 6, 2012

Sample Number: C-2 #126

Sample Information: Initial / Final

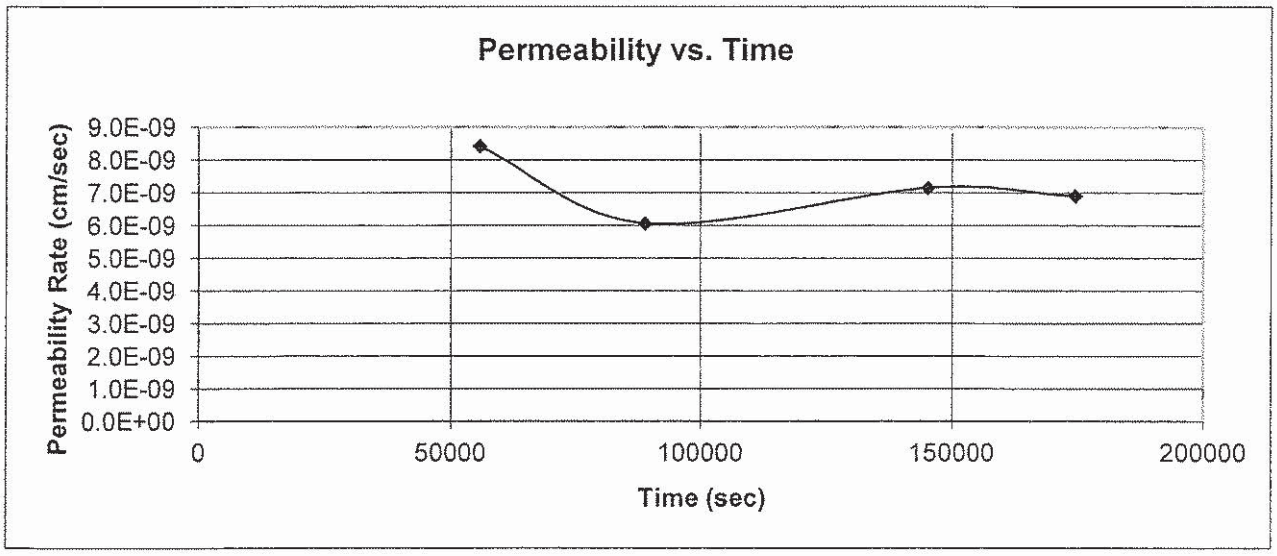
Dia. (in.)	2.85	2.87	**Length (in)**	2.71	2.76	**Weight (gr)**	529.7	539.5
Wet Density (pcf)	116.4		**Moisture Content (%)**	37.0		**Dry Density (pcf)**	85.0	
Final WD (pcf)	115.4		**Final Moisture (%)**	34.7		**Final DD (pcf)**	85.7	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	33.9	**Minimum Hydraulic Gradient**	16.9
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

7.1E-09



Reviewed By:

Daniel Eisman, P.E.

4/16/12

REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 2, 2012

Sample Number: C-2 #129

Sample Information: Initial / Final

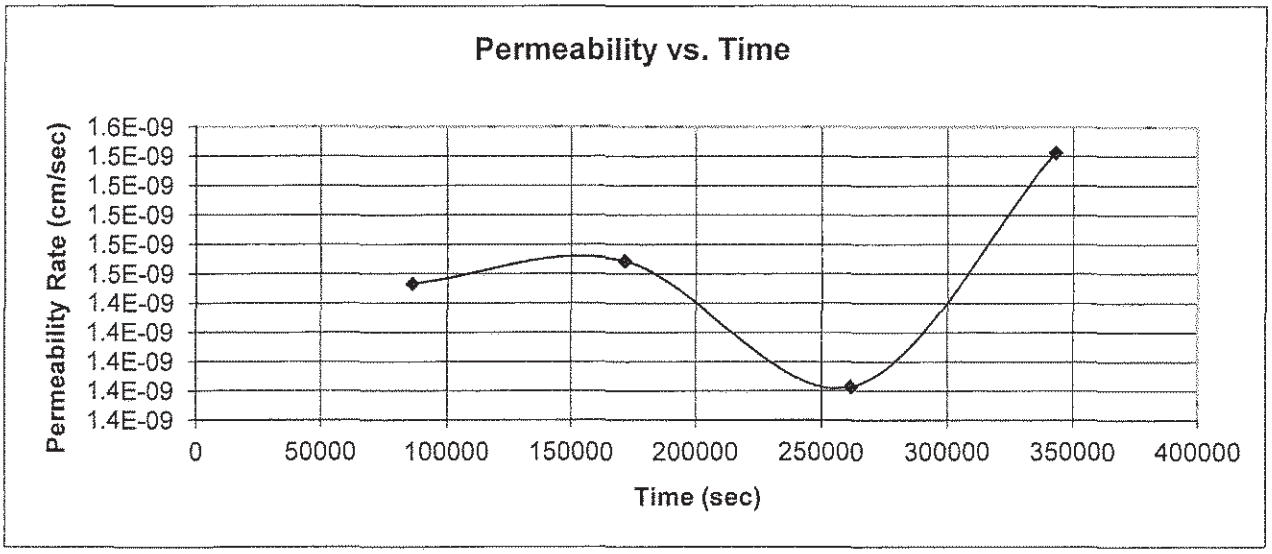
Dia. (in.)	2.87	2.88	Length (in)	2.55	2.60	Weight (gr)	483.26	492
Wet Density (pcf)	111.6		Moisture Content (%)	37.0		Dry Density (pcf)	81.5	
Final WD (pcf)	110.9		Final Moisture (%)	39.5		Final DD (pcf)	79.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	36.1	Minimum Hydraulic Gradient	18.0
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

1.5E-09



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6/4/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 2, 2012

Sample Number: C-2 #134

Sample Information: Initial / Final

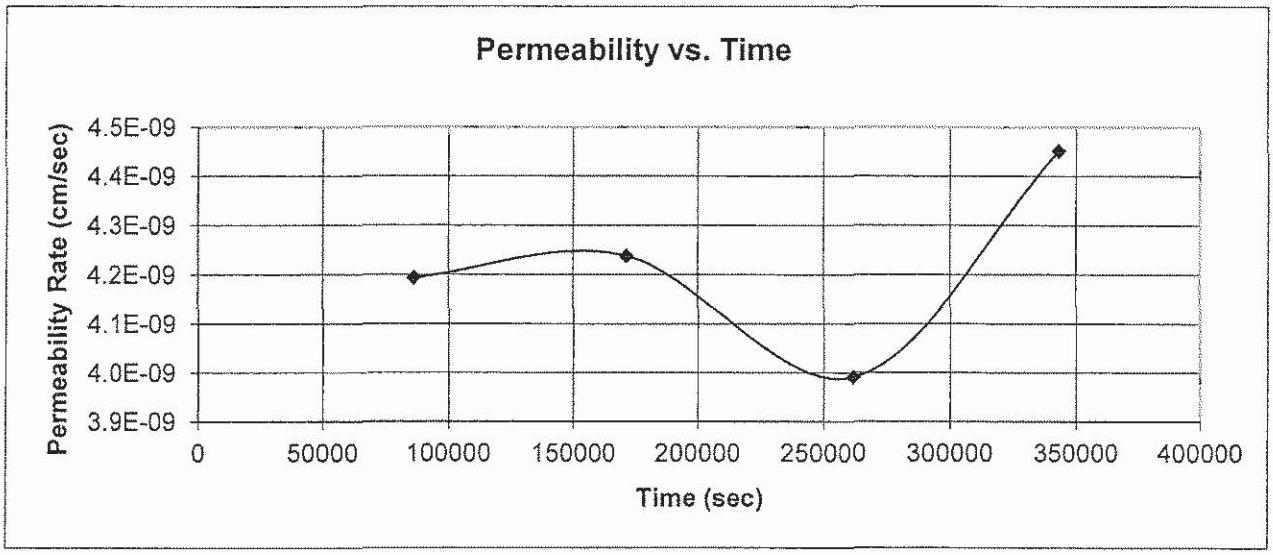
Dia. (in.)	2.82	2.86	**Length (in)**	2.85	2.92	**Weight (gr)**	506	539.9
Wet Density (pcf)	108.5		**Moisture Content (%)**	29.7		**Dry Density (pcf)**	83.7	
Final WD (pcf)	110.1		**Final Moisture (%)**	39.0		**Final DD (pcf)**	79.2	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	32.3	**Minimum Hydraulic Gradient**	16.1
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.2E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 2, 2012

Sample Number: C-2 #136

Sample Information: Initial / Final

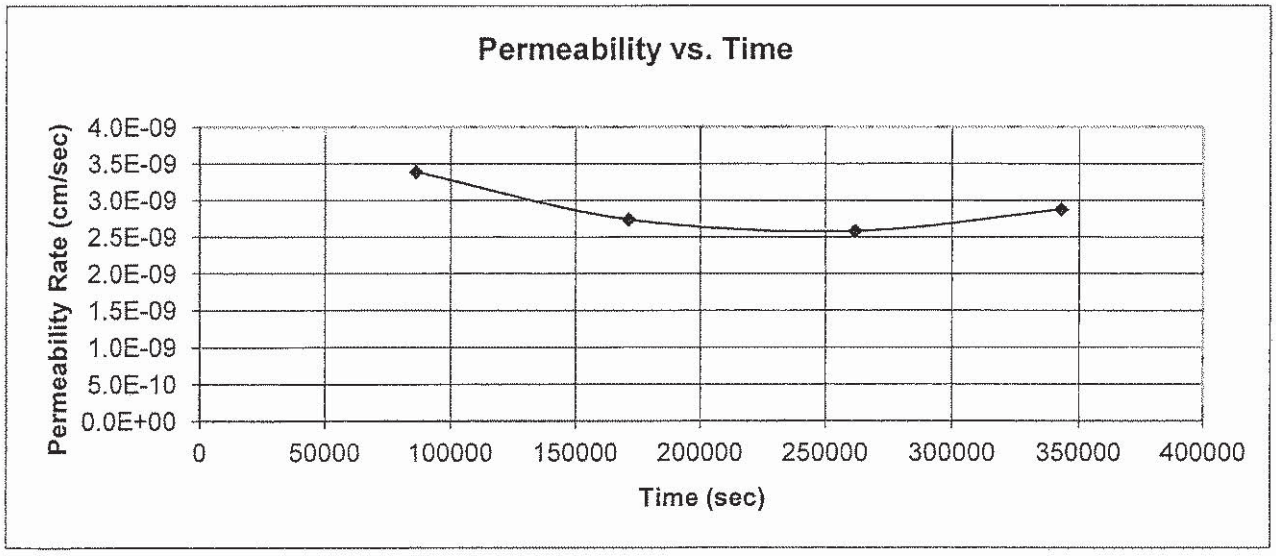
Dia. (in.)	2.85	2.87	**Length (in)**	2.35	2.31	**Weight (gr)**	432.3	442.5
Wet Density (pcf)	110.2		**Moisture Content (%)**	34.1		**Dry Density (pcf)**	82.1	
Final WD (pcf)	112.5		**Final Moisture (%)**	38.4		**Final DD (pcf)**	81.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	39.2	**Minimum Hydraulic Gradient**	19.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.9E-09



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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 2, 2012

Sample Number: C-2 #139

Sample Information: Initial / Final

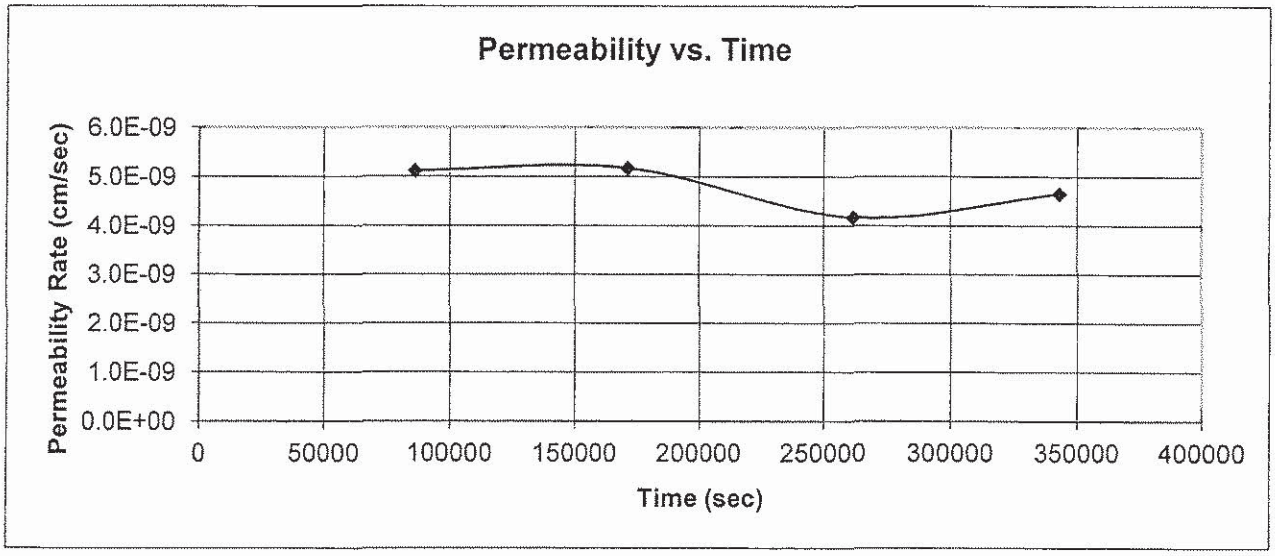
Dia. (in.)	2.85	2.86	Length (in)	2.53	2.57	Weight (gr)	459.2	477.1
Wet Density (pcf)	108.7		Moisture Content (%)	33.4		Dry Density (pcf)	81.5	
Final WD (pcf)	110.5		Final Moisture (%)	41.5		Final DD (pcf)	78.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	36.3	**Minimum Hydraulic Gradient**	18.1
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.8E-09



Reviewed By:

Daniel Eisman, P.E.

6/4/12

REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 26, 2012

Sample Number: C-2 #141

Sample Information: Initial / Final

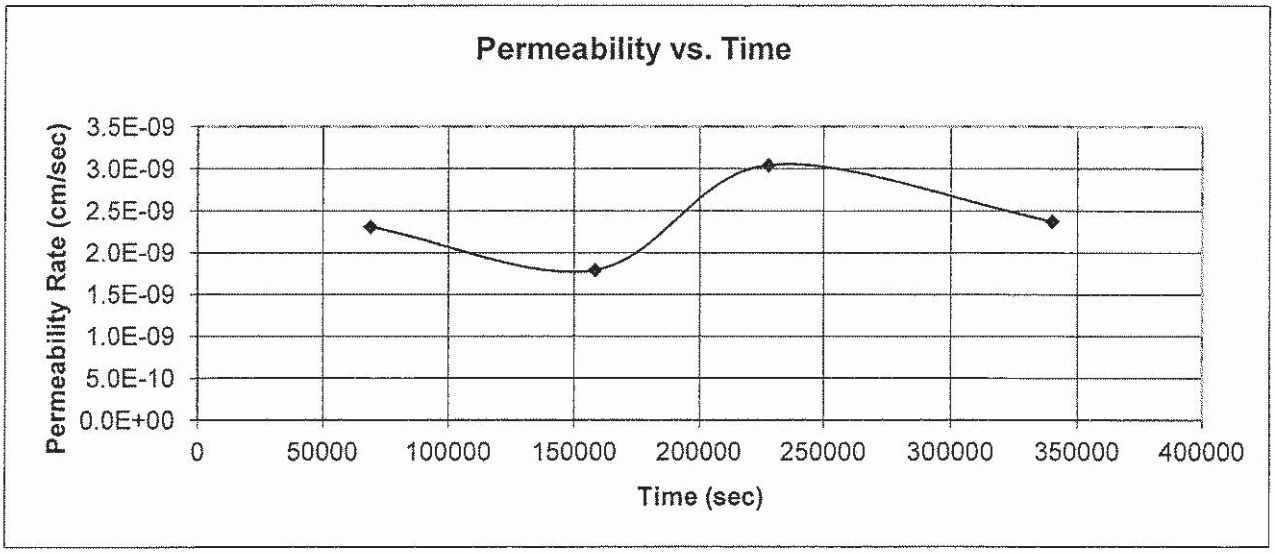
Dia. (in.)	2.86	2.88	Length (in)	2.15	2.16	Weight (gr)	408.9	420.58
Wet Density (pcf)	112.8		Moisture Content (%)	36.3		Dry Density (pcf)	82.8	
Final WD (pcf)	114.0		Final Moisture (%)	36.6		Final DD (pcf)	83.5	

Test Parameters

Test Method Used:	ASTM D-5084, method A	Permeant Fluid:	De-aired water
Maximum Hydraulic Gradient:	42.7	Minimum Hydraulic Gradient	21.3
Maximum Consolidation Stress (psi)	6	Minimum Consolidation Stress (psi)	3

Permeability Rate

2.4E-09



Reviewed By:

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6/29/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 26, 2012

Sample Number: C-2 #142

Sample Information: Initial / Final

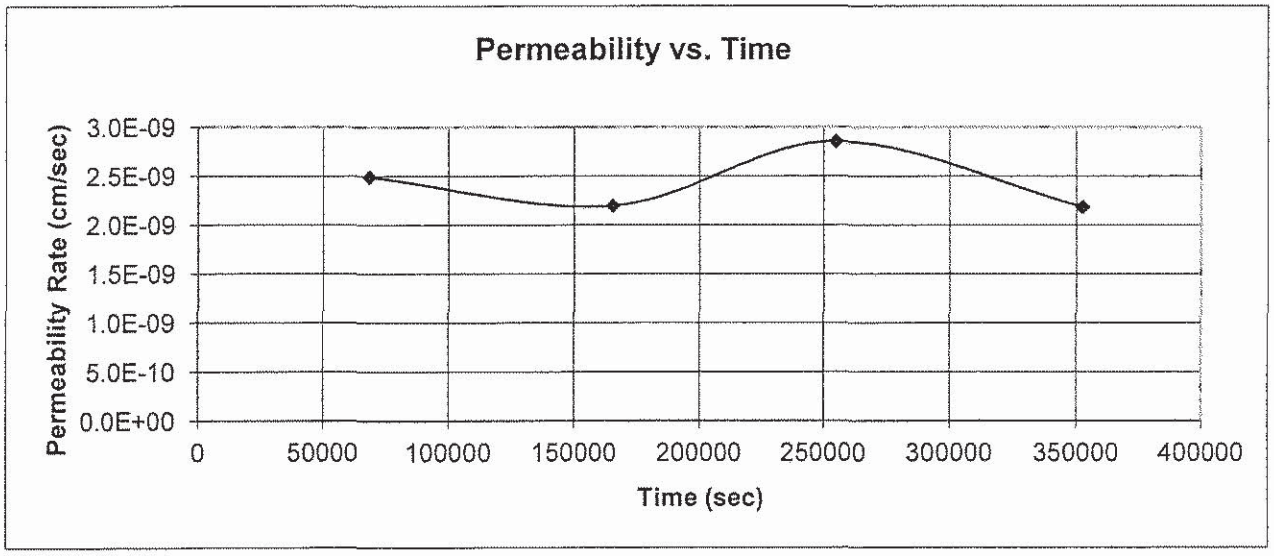
Dia. (in.)	2.91	2.92	**Length (in)**	1.78	1.90	**Weight (gr)**	356	366.87
Wet Density (pcf)	114.7		**Moisture Content (%)**	33.6		**Dry Density (pcf)**	85.8	
Final WD (pcf)	109.5		**Final Moisture (%)**	37.2		**Final DD (pcf)**	79.8	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	51.5	**Minimum Hydraulic Gradient**	25.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.4E-09



Reviewed By:

Daniel Eisman, P.E.

6/29/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 26, 2012

Sample Number: C-2 #152

Sample Information: Initial / Final

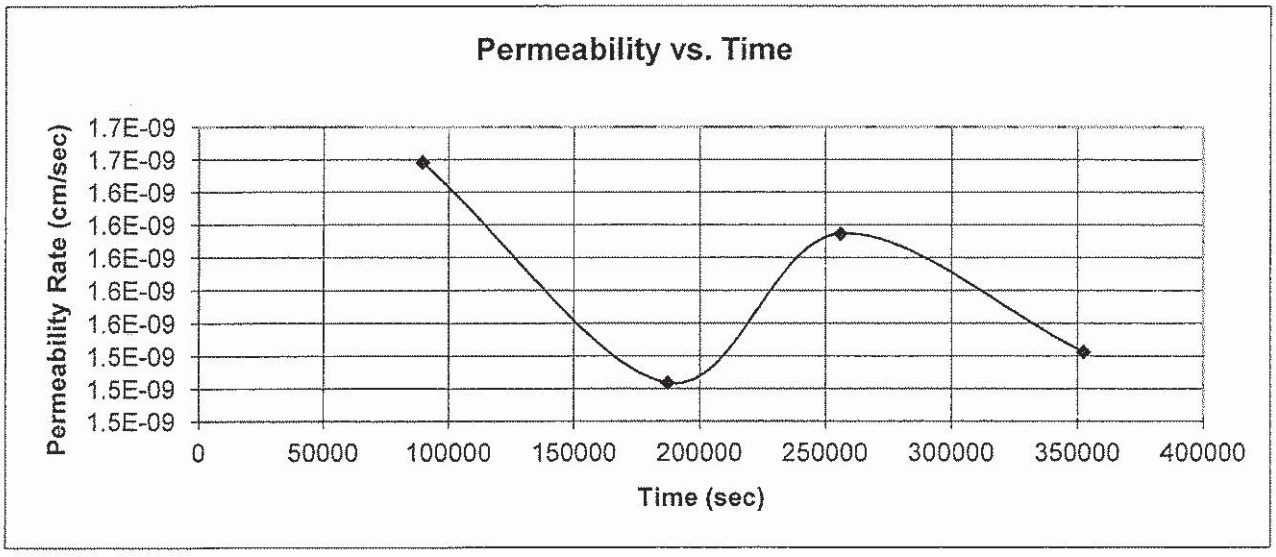
Dia. (in.)	2.86	2.88	**Length (in)**	1.51	1.55	**Weight (gr)**	281.9	287.98
Wet Density (pcf)	111.0		**Moisture Content (%)**	39.9		**Dry Density (pcf)**	79.3	
Final WD (pcf)	109.3		**Final Moisture (%)**	40.2		**Final DD (pcf)**	78.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	61.1	**Minimum Hydraulic Gradient**	30.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

1.6E-09



Reviewed By:

Daniel Eisman, P.E.

6/29/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** June 26, 2012

Sample Number: C-2 #156

Sample Information: Initial / Final

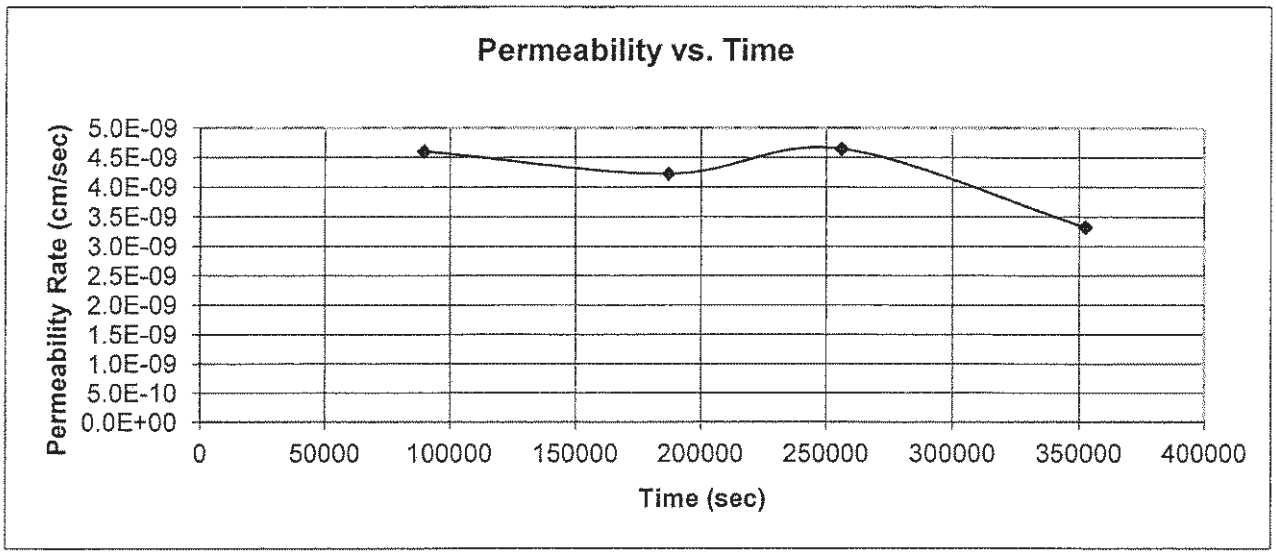
Dia. (in.)	2.84	2.88	**Length (in)**	1.83	2.90	**Weight (gr)**	316.2	331.02
Wet Density (pcf)	104.1		**Moisture Content (%)**	40.1		**Dry Density (pcf)**	74.3	
Final WD (pcf)	66.5		**Final Moisture (%)**	51.5		**Final DD (pcf)**	43.9	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	50.2	**Minimum Hydraulic Gradient**	25.0
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.2E-09



Reviewed By:

Daniel Eisman, P.E.

6/29/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** August 20, 2012

Sample Number: C-2 #160

Sample Information: Initial / Final

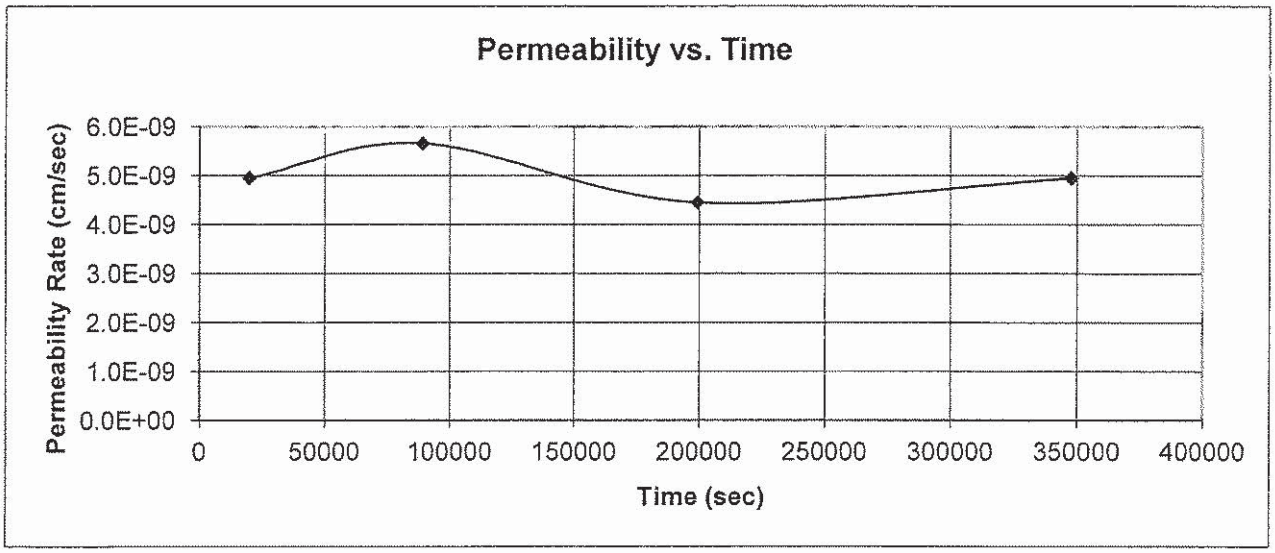
Dia. (in.)	2.85	2.87	**Length (in)**	1.97	1.97	**Weight (gr)**	338.07	345.31
Wet Density (pcf)	102.7		**Moisture Content (%)**	55.8		**Dry Density (pcf)**	65.9	
Final WD (pcf)	103.5		**Final Moisture (%)**	49.8		**Final DD (pcf)**	69.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	46.7	**Minimum Hydraulic Gradient**	23.3
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

5.0E-09



Reviewed By:

Daniel Eisman, P.E.

8/28/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 6, 2012

Sample Number: C-2 #166

Sample Information: Initial / Final

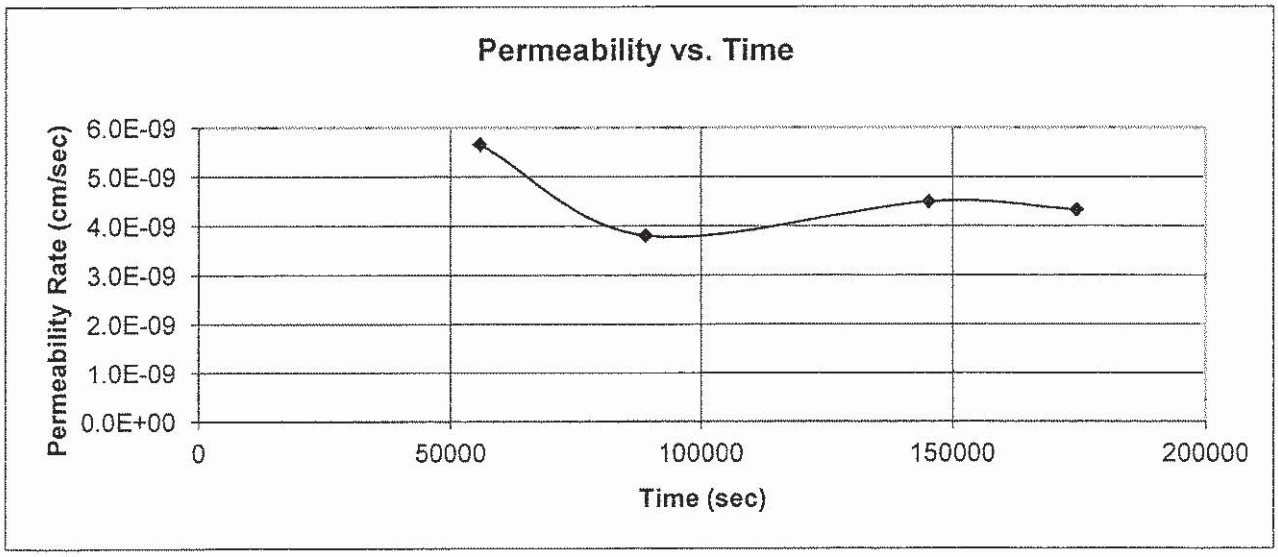
Dia. (in.)	2.85	2.87	**Length (in)**	2.55	2.59	**Weight (gr)**	496.6	507.47
Wet Density (pcf)	116.0		**Moisture Content (%)**	30.9		**Dry Density (pcf)**	88.6	
Final WD (pcf)	115.1		**Final Moisture (%)**	35.1		**Final DD (pcf)**	85.2	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	36.0	**Minimum Hydraulic Gradient**	18.0
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

4.6E-09



Reviewed By:

Daniel Eisman, P.E.

4/10/12

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** April 23, 2012

Sample Number: C-2 #174

Sample Information: Initial / Final

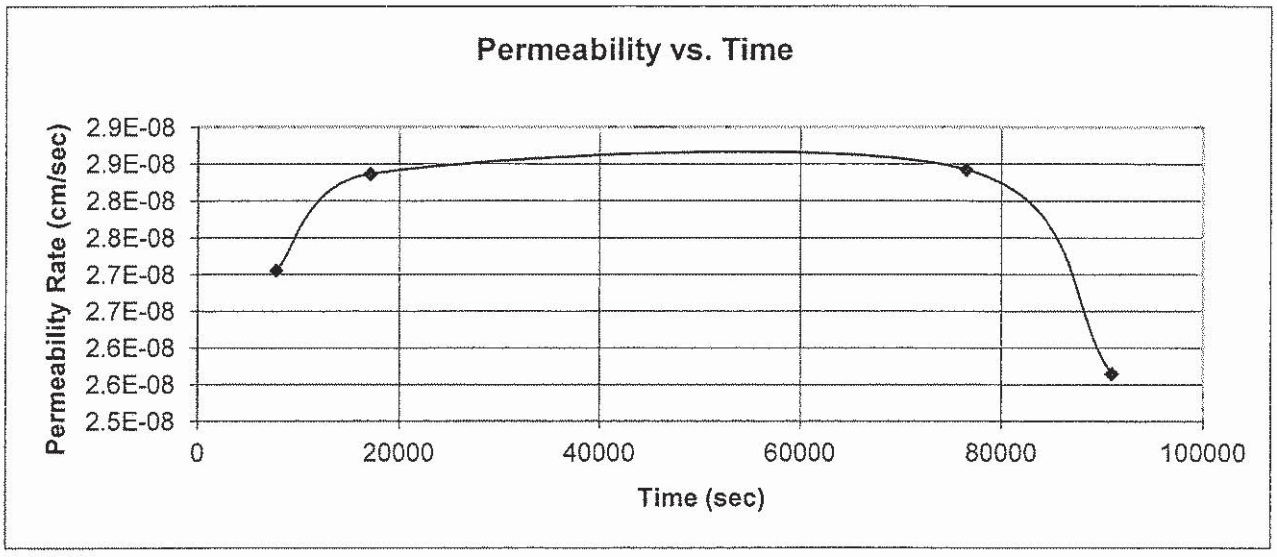
Dia. (in.)	2.85	2.86	**Length (in)**	2.13	2.14	**Weight (gr)**	410.64	421.01
Wet Density (pcf)	114.8		**Moisture Content (%)**	28.8		**Dry Density (pcf)**	89.1	
Final WD (pcf)	116.6		**Final Moisture (%)**	33.8		**Final DD (pcf)**	87.1	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	43.2	**Minimum Hydraulic Gradient**	21.6
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.7E-08



Reviewed By:

Daniel Eisman, P.E.

4/27/12

SCANNED

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** August 20, 2012

Sample Number: C-2 #176

Sample Information: Initial / Final

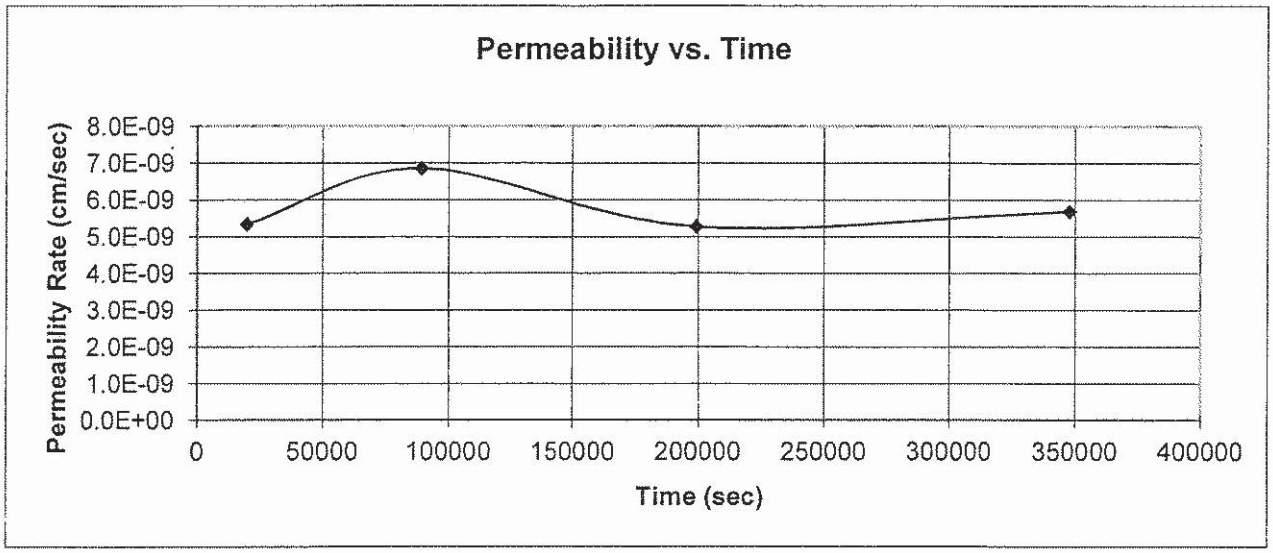
Dia. (in.)	2.85	2.87	**Length (in)**	2.12	2.16	**Weight (gr)**	368.64	383.7
Wet Density (pcf)	103.9		**Moisture Content (%)**	45.2		**Dry Density (pcf)**	71.5	
Final WD (pcf)	104.6		**Final Moisture (%)**	49.5		**Final DD (pcf)**	70.0	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	43.3	**Minimum Hydraulic Gradient**	21.7
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

5.8E-09



Reviewed By:

Daniel Eisman, P.E.

8/28/12

SCANNED

DELIVERED AUG 3 1 2012

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REPORT OF SOIL PERMEABILITY TESTING

Project: Trail Ridge **Project Number:** 6736-11-5123

Client Meskel & Assc (ETM) **Date Completed:** August 20, 2012

Sample Number: C-2 #177

Sample Information: Initial / Final

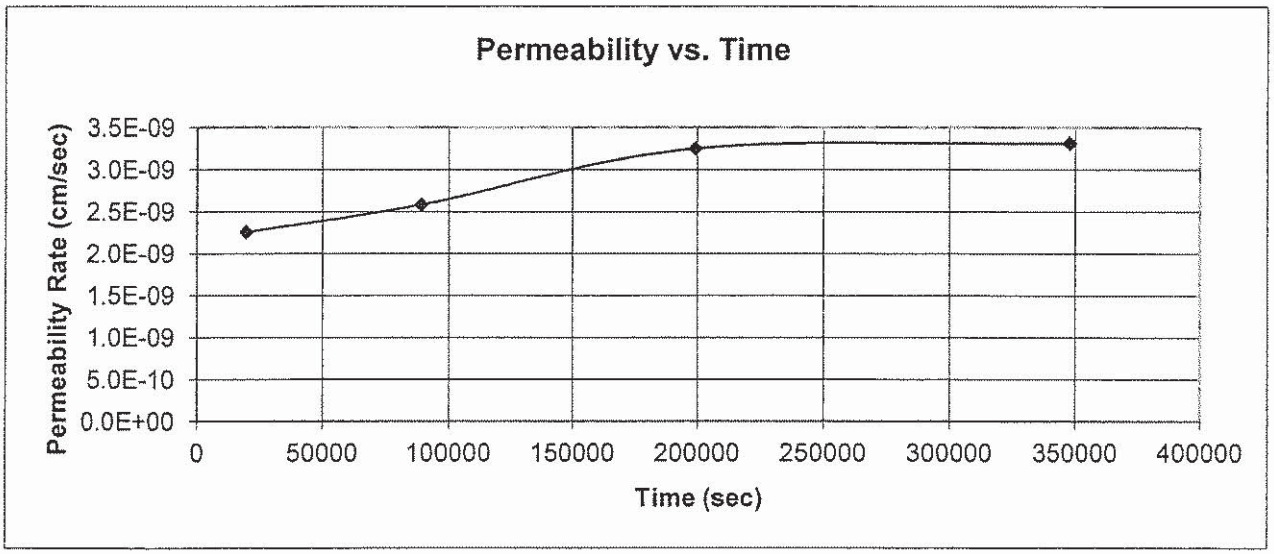
Dia. (in.)	2.85	2.86	**Length (in)**	1.80	1.85	**Weight (gr)**	320.93	327.79
Wet Density (pcf)	106.0		**Moisture Content (%)**	36.7		**Dry Density (pcf)**	77.6	
Final WD (pcf)	104.9		**Final Moisture (%)**	43.2		**Final DD (pcf)**	73.3	

Test Parameters

Test Method Used:	ASTM D-5084, method A	**Permeant Fluid:**	De-aired water
Maximum Hydraulic Gradient:	51.0	**Minimum Hydraulic Gradient**	25.5
Maximum Consolidation Stress (psi)	6	**Minimum Consolidation Stress (psi)**	3

Permeability Rate

2.9E-09



Reviewed By:

Daniel Eisman, P.E.

8/28/12

SC

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ASTM D-2216 ASTM D-1140

Date: 11/11/2011 **Project:** Trailridge Landfill **Job No.:** 6736-11-5123 **Client:** Meskel & Associates

Sample Location				Scale U5000D		Performed By: FB		Checked By:	
Boring No.	**Sample No.**	**Depth (Ft)**	**Tare No.**	**Tare Weight (g)**	**Wet Weight (g)**	**Dry Weight (g)**	**After Wash (g)**	**Percent Water**	**Percent Fines**
C-1	4			50.63	179.69	151.24	103.77	**28.3**	**47.2**
C-1	9			50.2	175	148.19	98.6	**27.4**	**50.6**
C-1	1	moisture only		54.37	123.99	107.75		**30.4**	
C-1	3			53.28	144.55	121.74		**33.3**	
C-1	6			50.23	190.29	158.34		**29.6**	
C-1	8			51.83	145.83	123.73		**30.7**	
Perm Samples									
C-1	5			50.52	143.65	123.45	88.53	**27.7**	**47.9**
C-1	11			51.15	157.67	129.04	84.78	**36.8**	**56.8**

MKH

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DELIVERED APR 0 5 2012

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REPORT OF SOIL PROPERTIES TESTING

Job No.: 6736-11-5123 **Client:** MAE

Project: Trail Ridge Landfill **Date:** 12/23/2011

Performed By: FB Checked By:

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C2-13	NP	NP	NP	36.8	55.4
C2-16-A	65	19	46	29.9	52.1
C2-12	NP	NP	NP	25.4	45.7
C2-21-A	64	19	45	22.9	49.3
C2-18	NP	NP	NP	26.4	NP
C2-15	NP	NP	NP	28.3	NP
C2-21-B	NP	NP	NP	27.0	NP
C2-16-B	NP	NP	NP	30.1	NP

NP - Not Performed

Reviewed By:

Dan Eisman, E.I.

3/16/12

DELIVERED JAN 2 5 2012

amec

REPORT OF SOIL PROPERTIES TESTING

Job No.: 6736-11-5123 **Client:** MAE

Project: Trail Ridge Landfill **Date:** 12/7/2011

Performed By: FB Checked By:

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C1-13	NP	NP	NP	34.5	NP
C1-14	NP	NP	NP	29.7	NP
C1-15	65	19	46	29.0	49.6
C1-16	71	23	48	28.8	49.3
C1-17	79	23	56	27.9	50.0
C1-20	NP	NP	NP	27.0	NP
C1-21	83	22	60	21.2	49.0
C1-22	NP	NP	NP	30.3	NP

NP - Not Performed

Reviewed By:

Mike Holm, P.E.

SCANNED

DELIVERED DEC 1 3 2011

amec

REPORT OF SOIL PROPERTIES TESTING

Job No.: 6736-11-5123 **Client:** MAE

Project: Trail Ridge Landfill **Date:** 12/7/2011

Performed By: FB Checked By: MSH

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
CL-13	NP	NP	NP	34.5	NP
CL-14	NP	NP	NP	29.7	NP
CL-15	65	19	46	29.0	49.6
CL-16	71	23	48	28.8	49.3
CL-17	79	23	56	27.9	50.0
CL-20	NP	NP	NP	27.0	NP
CL-21	83	22	60	21.2	49.0
CL-22	NP	NP	NP	30.3	NP

NP - Not Performed

Reviewed By:

Michael Holm

Mike Holm, P.E.

SCANNED

DELIVERED APR 0 5 2012

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REPORT OF SOIL PROPERTIES TESTING

Client: MAE **Date:** 2/1/2012

Project: Trail Ridge Landfill **Job No.:** 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C1-24	NP	NP	NP	34.4	52.6
C1-28	74	23	51	14.7	46.4
C1-30	NP	NP	NP	22.6	45.1
C1-32	70	21	50	32.7	55.1
C1-36	75	23	52	40.6	60.9
C1-40	NP	NP	NP	28.1	45.4
C1-45	75	20	54	30.3	56.0
C1-47	NP	NP	NP	27.6	47.6
C1-49	78	23	55	27.8	49.1
C1-51	76	26	50	31.9	55.4
C1-53	82	26	56	35.9	51.3
C1-56-B	NP	NP	NP	32.7	51.3
C1-56-A	83	27	56	30.4	44.5
C1-58	81	25	57	32.7	50.4
C1-59	NP	NP	NP	34.9	48.7
C1-62	NP	NP	NP	32.2	53.7
C1-63	NP	NP	NP	31.4	46.8
C1-64	76	25	50	42.9	54.1
C1-67	75	25	50	31.6	47.5
C1-69	81	25	56	30.7	47.7
C1-71	69	24	45	29.6	48.4

NP= Not Performed

Reviewed By:

Daniel Eisman, P.E.

3/16/12

DELIVERED FEB 0 3 2012

REPORT OF SOIL PROPERTIES TESTING

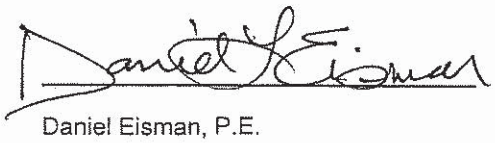
Client: MAE **Date:** 2/1/2012

Project: Trail Ridge Landfill **Job No.:** 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C1-24	NP	NP	NP	34.4	52.6
C1-28	74	23	51	14.7	46.4
C1-30	NP	NP	NP	22.6	45.1
C1-32	70	21	50	32.7	55.1
C1-36	75	23	52	40.6	60.9
C1-40	NP	NP	NP	28.1	45.4
C1-45	75	20	54	30.3	56.0
C1-47	NP	NP	NP	27.6	47.6
C1-49	78	23	55	27.8	49.1
C1-51	76	26	50	31.9	55.4
C1-53	82	26	56	35.9	51.3
C1-56	NP	NP	NP	32.7	51.3
C1-56	83	27	56	30.4	44.5
C1-58	81	25	57	32.7	50.4
C1-59	NP	NP	NP	34.9	48.7
C1-62	NP	NP	NP	32.2	53.7
C1-63	NP	NP	NP	31.4	46.8
C1-64	76	25	50	42.9	54.1
C1-67	75	25	50	31.6	47.5
C1-69	81	25	56	30.7	47.7
C1-71	69	24	45	29.6	48.4

NP= Not Performed

Reviewed By:



Daniel Eisman, P.E.

amec

Client: MAE Date: 2/9/2012

Project: Trail Ridge Landfill Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-2 22	82	23	58	34.7	45.9
C-2 25	77	25	53	28.0	48.9
C-2 27	83	26	57	30.1	45.9
C-2 28	75	24	51	32.6	50.3
C-2 30	76	26	50	31.6	52.1
C-2 32	78	26	52	32.6	49.8
C2-35	NT	NT	NT	37.2	54.3
C2-36	85	22	63	29.2	47.2
C2-39	87	30	57	40.1	63.7
C2-41	NT	NT	NT	25.2	53.0
C2-44	89	28	61	32.3	48.0
C2-46	85	26	59	28.3	49.3
C2-47	NT	NT	NT	28.8	54.5
C2-49	NT	NT	NT	31.9	51.5
C2-51	79	23	56	32.8	53.4
C2-53	NT	NT	NT	32.3	52.1
C2-54	89	24	64	44.5	59.0
C2-56	NT	NT	NT	28.8	49.7
C2-58	86	26	60	23.5	51.3
C2-59	NT	NT	NT	24.9	48.4
C2-60	85	23	61	29.6	51.2
C2-62	NT	NT	NT	33.8	51.2
C2-63	90	27	63	29.8	51.2
C2-64	NT	NT	NT	34.3	49.3
C2-65	84	25	59	25.0	50.1
C2-67	NT	NT	NT	35.7	51.8

NT= Not Tested ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

DELIVERED FEB 2 9 2012

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Client: MAE Date: Revised 2-14-12

Project: Trail Ridge Landfill Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-1 72	86	27	59	36.5	51.2
C-1 74	78	25	54	39.4	53.7
C-1 76	86	24	62	36.0	47.4
C-2 69	77	25	52	44.7	64.1
C-2 71	75	22	53	32.4	48.0
C-2 73	74	22	52	27.7	42.6

NT= Not Tested ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

2/23/12

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DELIVERED FEB 2 9 2012

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Client: MAE **Date:** 2/15/2012

Project: Trail Ridge Landfill **Job No.:** 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-1 110	89	32	57	32.7	50.0
C-1 111	87	33	54	44.5	50.7
C-1 112	NT	NT	NT	30.1	44.2
C-1 114	NT	NT	NT	29.3	43.3
C-1 118	79	27	52	36.0	51.8
	NT= Not Tested			ASTM D-2216	ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

2/23/12

DELIVERED APR 0 5 2012

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Client: MAE Date: 3/1/2012

Project: Trail Ridge Landfill Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-2 105	71	23	48	32.3	50.3
C-2 110	101	33	68	50.7	73.0
C-2 111	98	27	70	34.5	53.0
C-2 115	96	25	70	33.2	52.3
	NT= Not Tested			ASTM D-2216	ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

3/20/12

DELIVERED APR 0 5 2012

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Client: MAE Date: Revised 3/19/2012

Project: Trail Ridge Landfill Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
Received 3-7-12					
C-1 78	72	19	53	34.4	76.3
C-1 80	73	21	53	28.7	47.0
C-1 82	74	20	54	33.0	60.6
C-1 84	80	21	59	31.2	52.0
C-1 121	81	21	60	34.6	52.4
C-1 122	80	20	60	37.2	49.4
C-1 128	72	20	52	31.8	49.3
C-2 75	71	19	51	31.4	49.2
C-2 77	69	20	49	30.6	47.7
C-2 79	74	20	54	29.5	51.4
C-2 81	79	21	57	35.3	51.7
Received 3-13-12					
C1 80A	73	24	49	33.2	50.6
C1 80B	79	26	53	43.7	63.7
C1 80C	77	25	52	29.1	55.1
C1 80D	76	25	51	29.2	51.6
	NT= Not Tested			ASTM D-2216	ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

3/20/12

DELIVERED APR 19 2012

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Client: MAE

Date: Received beginning 3/23/2012
Revised 4/6/2012

Project: Trail Ridge Landfill

Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
Received 3-23-12					
C-1 170	79	21	58	31.2	52.0
Received 3-27-12					
C-1 102	72	20	52	29.0	48.4
C-1 104	74	23	50	30.6	50.7
C-1 106	81	25	56	39.4	52.5
C-2 99	80	16	64	25.5	45.8
C-2 101	74	23	51	30.7	48.9
C-2 103	80	18	62	32.9	50.5
C-2 121	81	23	58	38.7	56.5
C-2 126	77	21	55	37.0	58.8
Received 4-2-12					
C-2 166	75	18	56	30.86	49.1

NT= Not Tested

ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

4/10/12

DELIVERED MAY 0 3 2012

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Client: MAE

Project: Trail Ridge Landfill

Date: Received 4/17/2012
Revised 4/24/2012

Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-1 135	80	31	49	47.2	58.9
C-1 138	76	27	49	42.9	57.7
C-1 139	69	23	47	40.9	55.7
C-1 141	84	25	59	43.7	60.2
C-1 173	80	28	52	31.5	50.2
C-2 174	86	23	63	28.8	51.8

NT= Not Tested

ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

4/27/12

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DELIVERED JUN 0 6 2012

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Client: MAE
Project: Trail Ridge Landfill

Date: Received 5/11/2012
Revised 5/17/2012
Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-1 81	72	20	52	33.7	50.6
C-1 88	67	22	45	33.0	49.5
C-1 90	82	31	51	44.0	55.0
C-1 92	76	25	51	28.3	56.5
C-2 83	86	26	60	27.9	52.5
C-2 85	87	27	60	35.4	54.2
C-2 87	85	28	57	48.5	63.2
C-2 89	85	31	55	48.1	59.0

NT= Not Tested

ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

5/22/12

SCANNED

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Client: MAE

Project: Trail Ridge Landfill

Date: Received 5/25/2012
Revised 5/31/2012

Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-2 129	87	21	66	37.0	55.5
C-2 134	89	23	66	29.7	61.0
C-2 136	92	21	71	33.3	57.0
C-2 139	90	22	68	33.4	59.8

NT= Not Tested

ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

6/4/12

DELIVERED JUN 1 9 2012

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Client: MAE
Project: Trail Ridge Landfill

Date: Received 5/27/2012
Revised 6/12/2012
Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-1 96	93	24	69	38.0	55.5
C-1 98	93	26	67	56.0	78.7
C-1 100	86	20	66	34.6	49.7
C-1 148	91	21	70	33.9	53.6
C-1 155	85	25	60	26.6	52.7
C-1 158	88	23	65	35.4	51.6
C-2 93	81	25	56	32.5	50.2
C-2 95	83	21	62	38.0	54.6
C-2 97	80	23	57	44.9	57.7
				ASTM D-2216	ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

6/12/12

SCANNED

DELIVERED JUL 2 2012

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Client: MAE

Project: Trail Ridge Landfill

Date: Received 6/19/2012
Revised 6/28/2012

Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-2 141	84	22	62	36.3	51.3
C-2 142	83	24	59	33.6	55.6
C-2 152	86	23	63	39.9	54.4
C-2 156	90	28	62	40.1	58.2

ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

6/29/12

SCANNED

DELIVERED JUL 1 0 2012

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Client: MAE
Project: Trail Ridge Landfill

Date: Received 6/22/2012
Revised 7/2/2012
Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-1 86R	89	27	62	36.2	50.3
C-1 88R	86	24	62	36.0	51.1
C-1 90R	85	27	58	34.1	47.6
C-1 92R	85	24	61	46.0	55.3
C-2 83R	94	27	66	33.4	50.0
C-2 85R	90	24	66	42.2	56.6
C-2 87R	93	28	65	35.2	50.5
C-2 89R	91	30	62	37.0	49.4

ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

7/3/12

SCANNED

DELIVERED JUL 2 3 2012

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Client: MAE

Project: Trail Ridge Landfill

Date: Received 7/10/2012
Revised 7/16/2012

Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-1 86R 2	92	23	69	32.7	69.4
C-1 88R 2	87	24	63	44.2	53.3
C-1 90R 2	87	23	65	34.7	50.2
C-1 92R 2	85	24	61	38.2	55.1
C-2 83R 2	82	20	63	26.2	51.6
C-2 85R 2	84	24	60	26.9	53.9
C-2 87R 2	88	26	62	36.2	50.7
C-2 89R 2	82	22	59	35.4	50.7

ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

SCANNED

DELIVERED AUG 13 2012

amec

Client: MAE

Project: Trail Ridge Landfill

Date: Received 7/23/2012
Revised 7/26/2012

Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C-1 94R	91	22	70	35.2	54.0
C-1 96R	91	23	68	32.7	50.5
C-2 91R	92	20	72	37.9	52.5
C-2 93R	93	22	71	40.5	55.5

ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

SCANNED

DELIVERED AUG 3 1 2012

amec

Client: MAE

Project: Trail Ridge Landfill

Date: Received 8/14/2012
Revised 8/17/2012

Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
C1 162	93	31	63	49.5	65.4
C1 178	92	27	65	41.9	65.3
C1 179	99	29	70	52.1	68.2
C1 180	94	32	61	36.9	50.5
C2 160	99	27	72	55.8	69.9
C2 176	96	31	65	45.2	65.1
C2 177	96	30	66	36.7	53.5

ASTM D-2216 ASTM D-1140

Reviewed By:

Daniel Eisman, P.E.

8/28/12

SCANNED

DELIVERED OCT 1 9 2011

amec

REPORT OF ORGANIC CONTENT

Project: Trail Ridge

Project Number: 6736-11-5123

Client: Meskel & Associates

Date: 9/27/11

Location: Spencer Pit, TP-6 Sample

Sample Number	pH	Can Weight	Dry Weight	After Burn Weight	Percent Organic
TS-2	6.2	104.93	150.27	149.92	0.8%

Scale: BP3100

Performed By

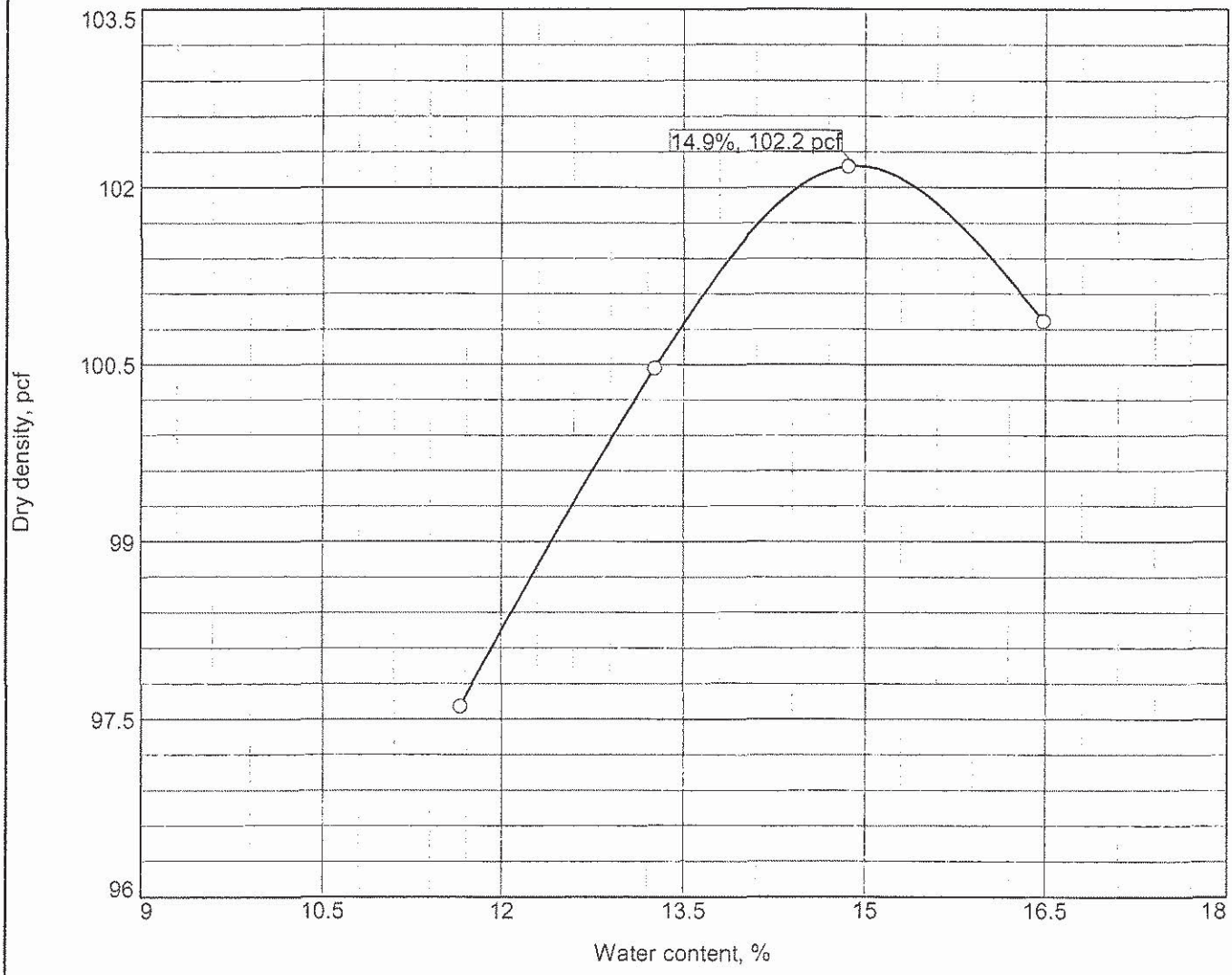
CMJr.

Reviewed By

Mike Holm, P.E.

SCANNED

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
	SP	A-3			NP	NP	0.1	2.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 102.2 pcf Optimum moisture = 14.9 %	Dark Gray Fine SAND

Project No. 6736115123 **Client:** Meskel & Associates
Project: Trailridge Landfill Closure

○ **Source of Sample:** Vegatative Cover (Top Soil) **Sample Number:** TS-2

AMEC E&I

Jacksonville, Florida

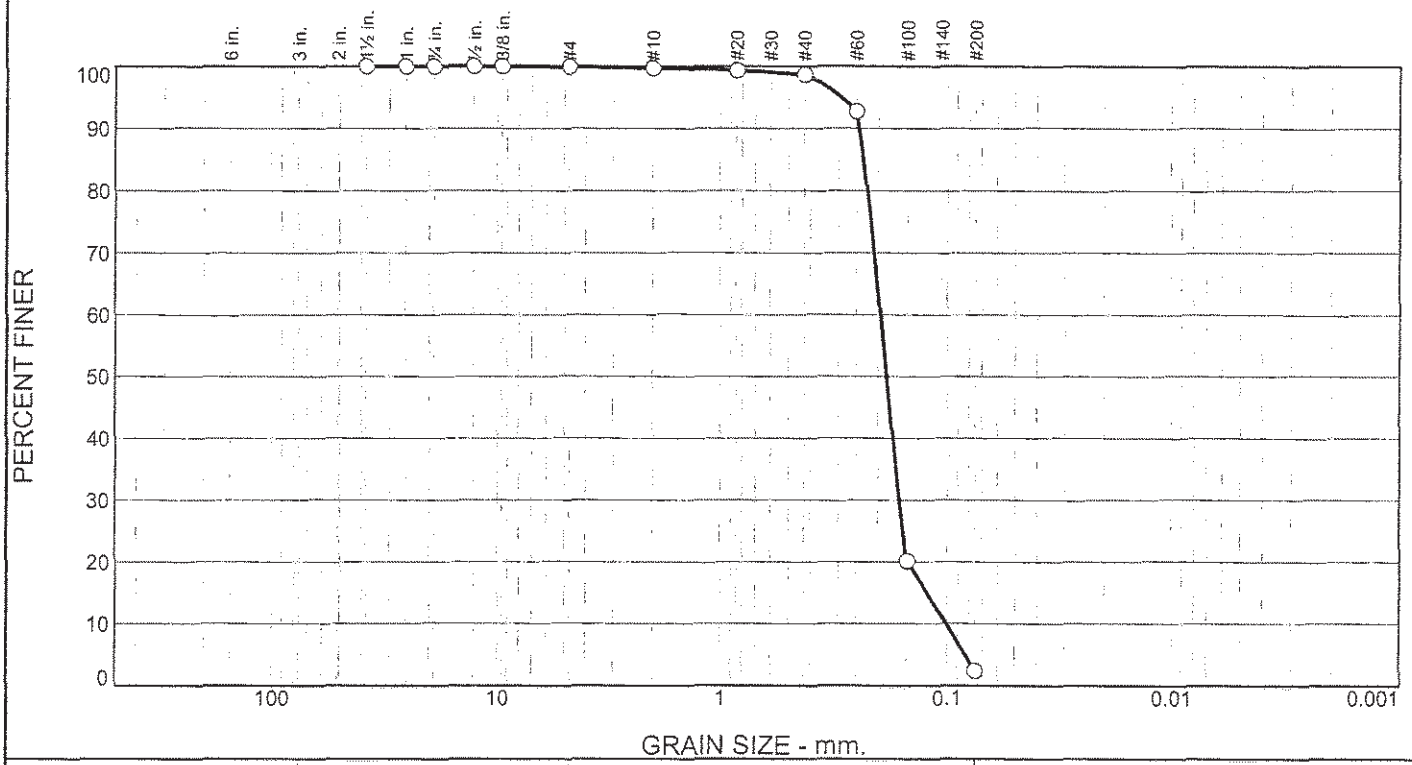
Remarks:

Figure

Tested By: CM

Michael J. Holm

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	1.1	96.2	2.4	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.9		
#10	99.7		
#20	99.3		
#40	98.6		
#60	92.7		
#100	20.1		
#200	2.4		

* (no specification provided)

Material Description

Dark Gray Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SP AASHTO (M 145)= A-3

Coefficients

D_{90}= 0.2431 D_{85}= 0.2326 D_{60}= 0.1960
D_{50}= 0.1842 D_{30}= 0.1618 D_{15}= 0.1227
D_{10}= 0.1009 C_u= 1.94 C_c= 1.32

Remarks

Date Received: 10/11/11 **Date Tested:** 10/13/11

Tested By: CM

Checked By: _____

Title: _____

Source of Sample: Vegatative Cover (Top Soil) **Date Sampled:** 10/11/11

Sample Number: TS-2

AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates

Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**

DELIVERED NOV 1 5 2011

REPORT OF SOIL TESTING

As requested, AMEC E&I has completed organic and pH testing of four proposed topsoil samples delivered to our Jacksonville office on September 27, 2011. The samples were tested in generel accordance with ASTM D-2974 (loss on ignition) and D-4972 (pH). The results are outlined below.

Project: Trailridge Phase III Closure

Project Number: 6736-11-5123

Client: Meskel & Associates

Date: 9/28/2011

Location: Proposed Top Soil from Borrow Source

Sample Number	pH	Can Weight	Dry Weight	After Burn Weight	Percent Organic
TS-3A	3.6	115.41	175.48	172.96	4.2%
TS-3B	4.1	110.43	148.66	145.56	8.1%

Performed By

M. Coleman

Reviewed By

Mike Holm, P.E.

SCANNED

DELIVERED NOV 15 2011

REPORT OF SOIL TESTING

As requested, AMEC E&I has completed organic and pH testing of four proposed topsoil samples delivered to our Jacksonville office on September 27, 2011. The samples were tested in generel accordance with ASTM D-2974 (loss on ignition) and D-4972 (pH). The results are outlined below.

Project: Trailridge Phase III Closure

Project Number: 6736-11-5123

Client: Meskel & Associates

Date: 9/28/2011

Location: Proposed Top Soil from Borrow Source

Sample Number	pH	Can Weight	Dry Weight	After Burn Weight	Percent Organic
TS-4	3.7	116.34	168.23	166.90	2.6%
TS-5	3.6	117.27	182.42	181.48	1.4%

Performed By

M. Coleman

Reviewed By

Mike Holm, P.E.

SCANNED

DELIVERED NOV 15 2011

REPORT OF SOIL TESTING

As requested, AMEC E&I has completed organic and pH testing of one proposed topsoil sample delivered to our Jacksonville office on October 3, 2011. The sample was tested in generel accordance with ASTM D-2974 (loss on ignition) and D-4972 (pH). The results are outlined below.

Project: Trailridge Phase III Closure

Project Number: 6736-11-5123

Client: Meskel & Associates

Date: 10/5/2011

Location: Proposed Top Soil from Borrow Source

Sample Number	pH	Can Weight	Dry Weight	After Burn Weight	Percent Organic
TS-6	5.3	107.64	134.74	133.93	3.0%

Performed By

M. Coleman

Reviewed By

Mike Holm, P.E.

SCANNED

DELIVERED

amec

Atterbergs, Percent Fines, & Moisture Content

Client: MAE
Project: Trail Ridge Landfill

Date: Received 5/22/2012
Tested 5/23/2012
Job No.: 6736-11-5123

Test Number	Liquid Limit	Plastic Limit	Plasticity Index	Lab Moisture Content (%)	Percent Passing No. 200 Sieve
QC Sample	NT	NT	NT	32.5	59.3
	NT= Not Tested			ASTM D-2216	ASTM D-1140

Reviewed By:

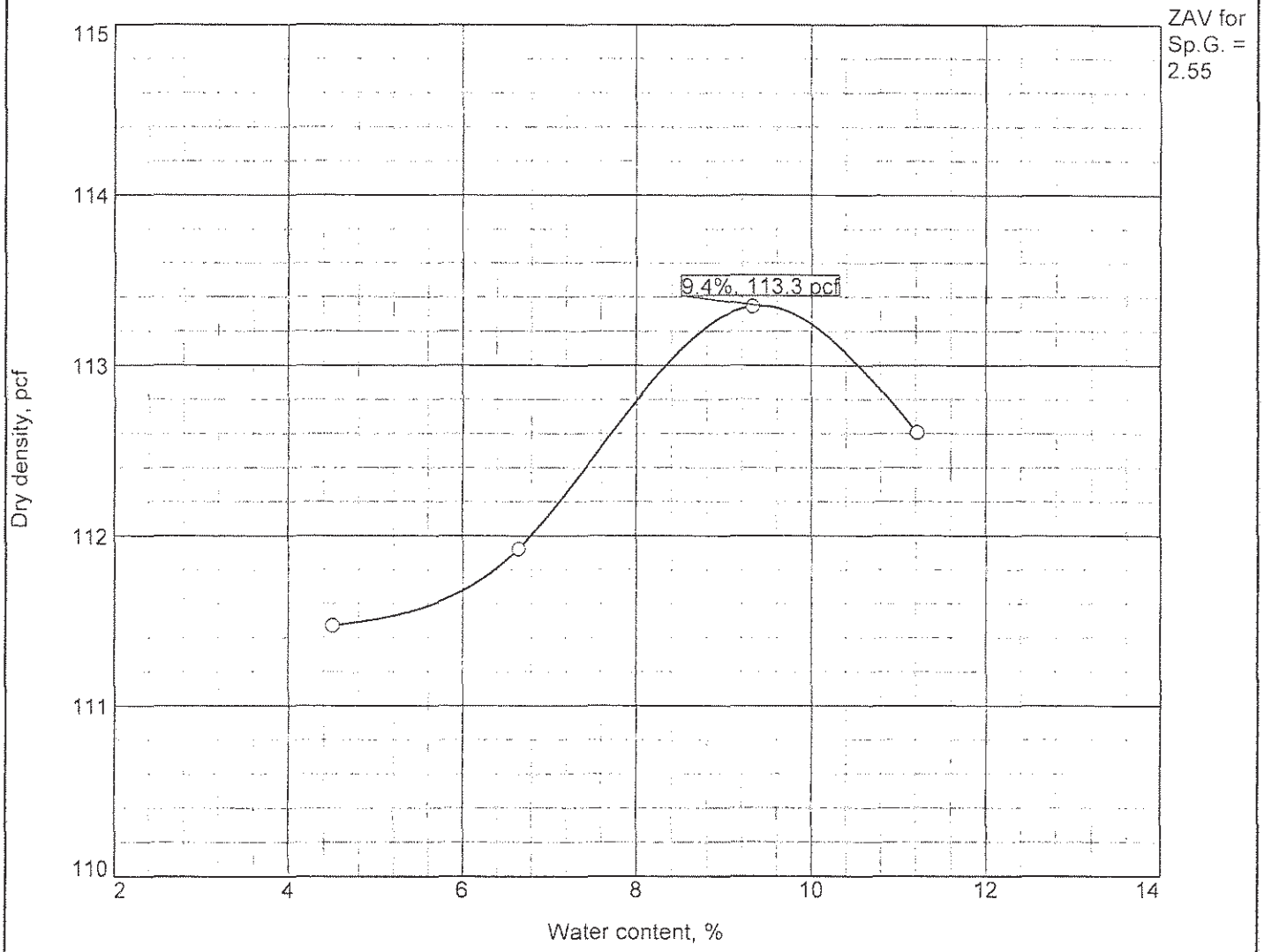
Daniel Eisman, P.E.

5/30/12

SCANNED

DELIVERED NOV 0 9 2011

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method C Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 113.3 pcf Optimum moisture = 9.4 %	Very DarkBrown Slightlty Silty Medium to Fine SAND

Project No. 6736115123 **Client:** Meskel & Associates
Project: Trailridge Landfill Closure

○ **Source of Sample:** Intermediate Cover **Sample Number:** IC-5

AMEC E&I

Jacksonville, Florida

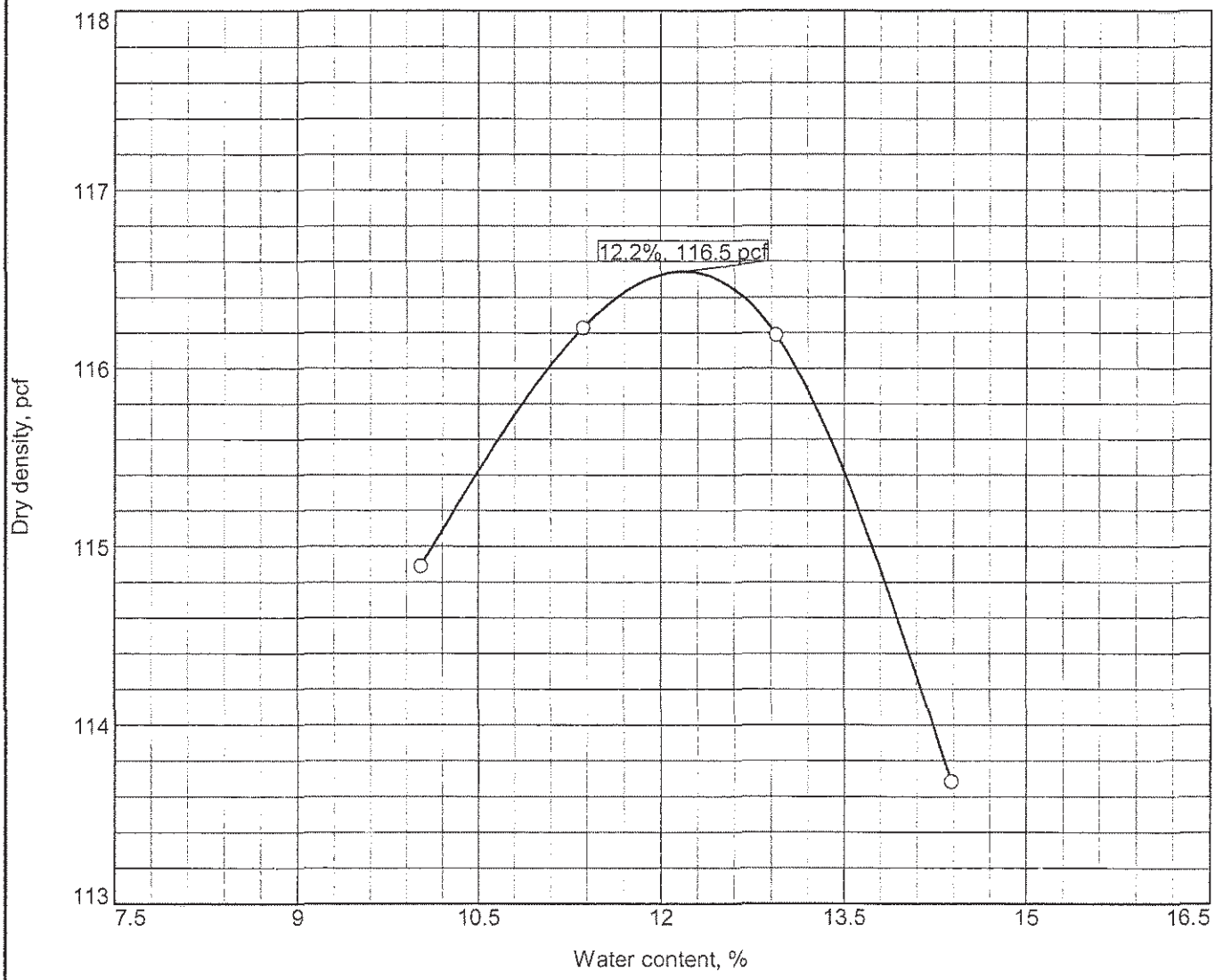
Remarks:
Date Tested: 10-28-11

Figure MSH 11/2/11

Tested By: MC

SCANNED

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
	SM	A-2-4(0)			NP	NP	0.0	15.3

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 116.5 pcf Optimum moisture = 12.2 %	Very Dark Brown Slightlty Silty Medium to Fine SAND

Project No. 6736115123 **Client:** Meskel & Associates
Project: Trailridge Landfill Closure

○ **Source of Sample:** Intermediate Cover **Sample Number:** IC-6

AMEC E&I

Jacksonville, Florida

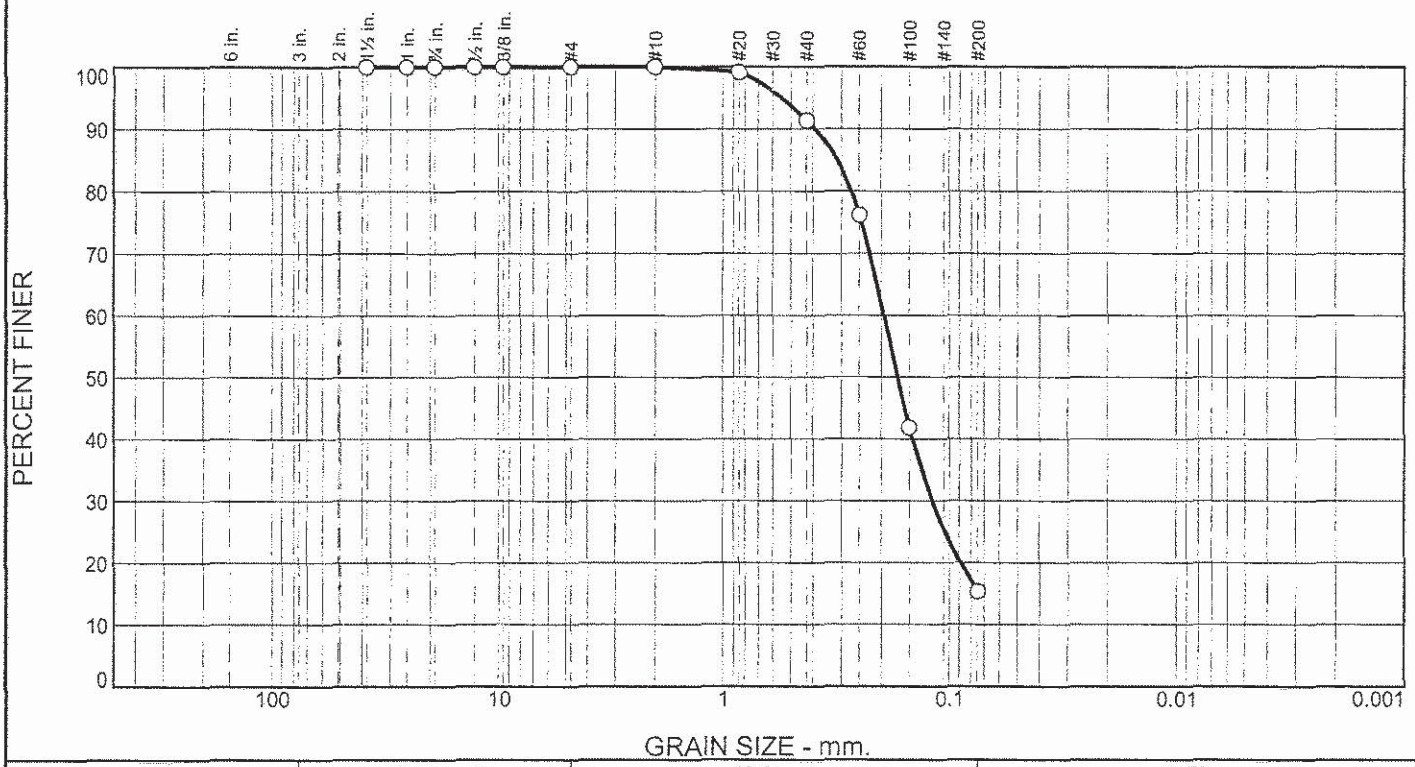
Remarks:

Figure

Tested By: CM

Michael J. Holm

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	8.6	76.1	15.3	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5"	100.0		
1.0"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	99.1		
#40	91.4		
#60	76.2		
#100	41.9		
#200	15.3		

* (no specification provided)

Material Description

Very Dark Brown Slightlty Silty Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 0.3897 D_{85}= 0.3111 D_{60}= 0.1948
D_{50}= 0.1695 D_{30}= 0.1189 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 12/16/11 **Date Tested:** 12/21/11

Tested By: CM

Checked By:

Title:

Source of Sample: Intermediate Cover **Date Sampled:** 12-16-11

Sample Number: IC-6

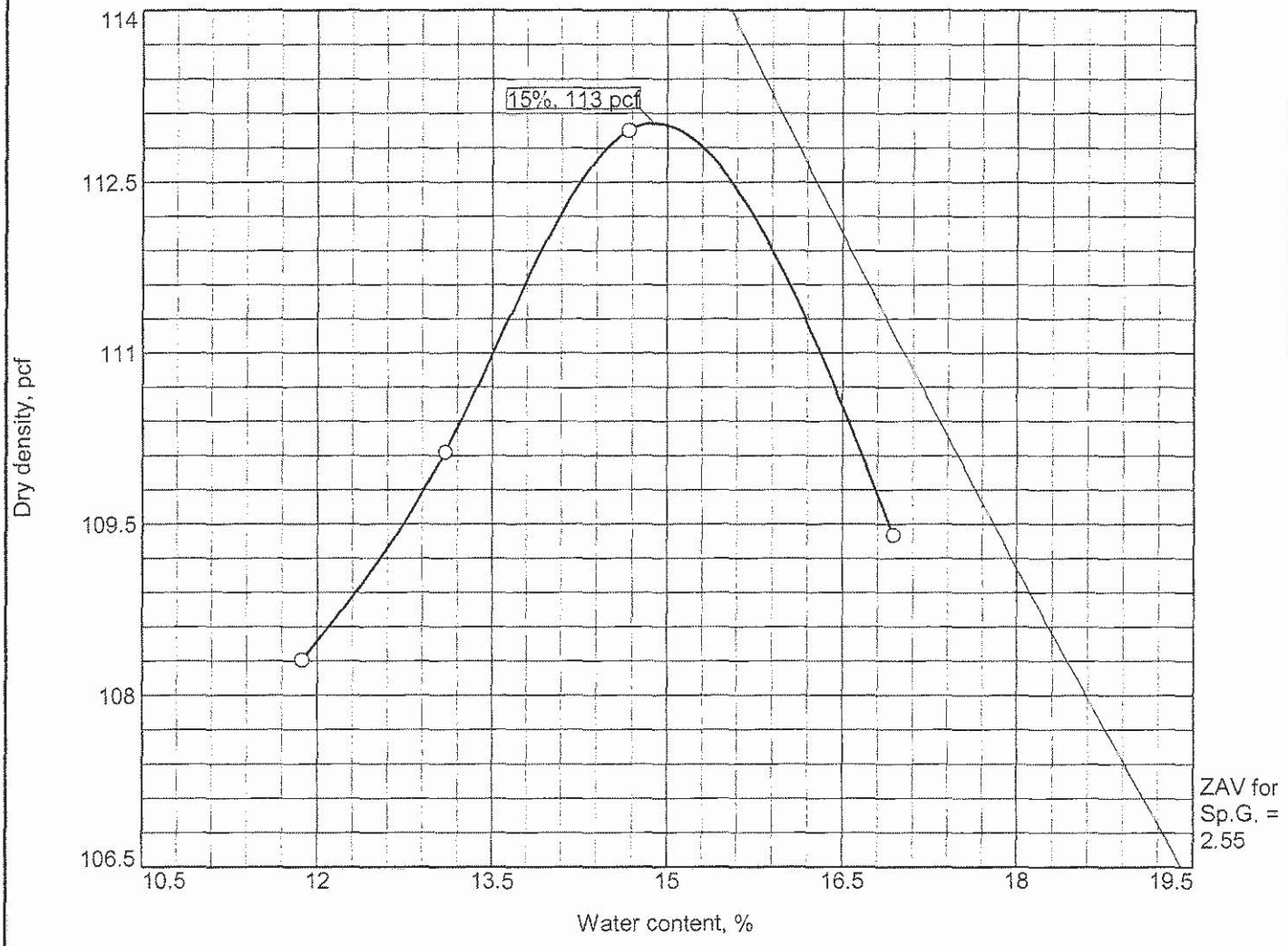
AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates

Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**



Test specification: AASHTO T 99-01 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
	SM	A-4					0.0	43.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 113 pcf Optimum moisture = 15 %	Reddish Brown Silty Slightly Clayey Medium to Fine SAND

Project No. 6736115123 **Client:** Meskel & Associates

Project: Trailridge Landfill Closure

Date: 4-9-12

○ **Source of Sample:** Intermediate Cover **Sample Number:** IC-7

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Jacksonville, Florida

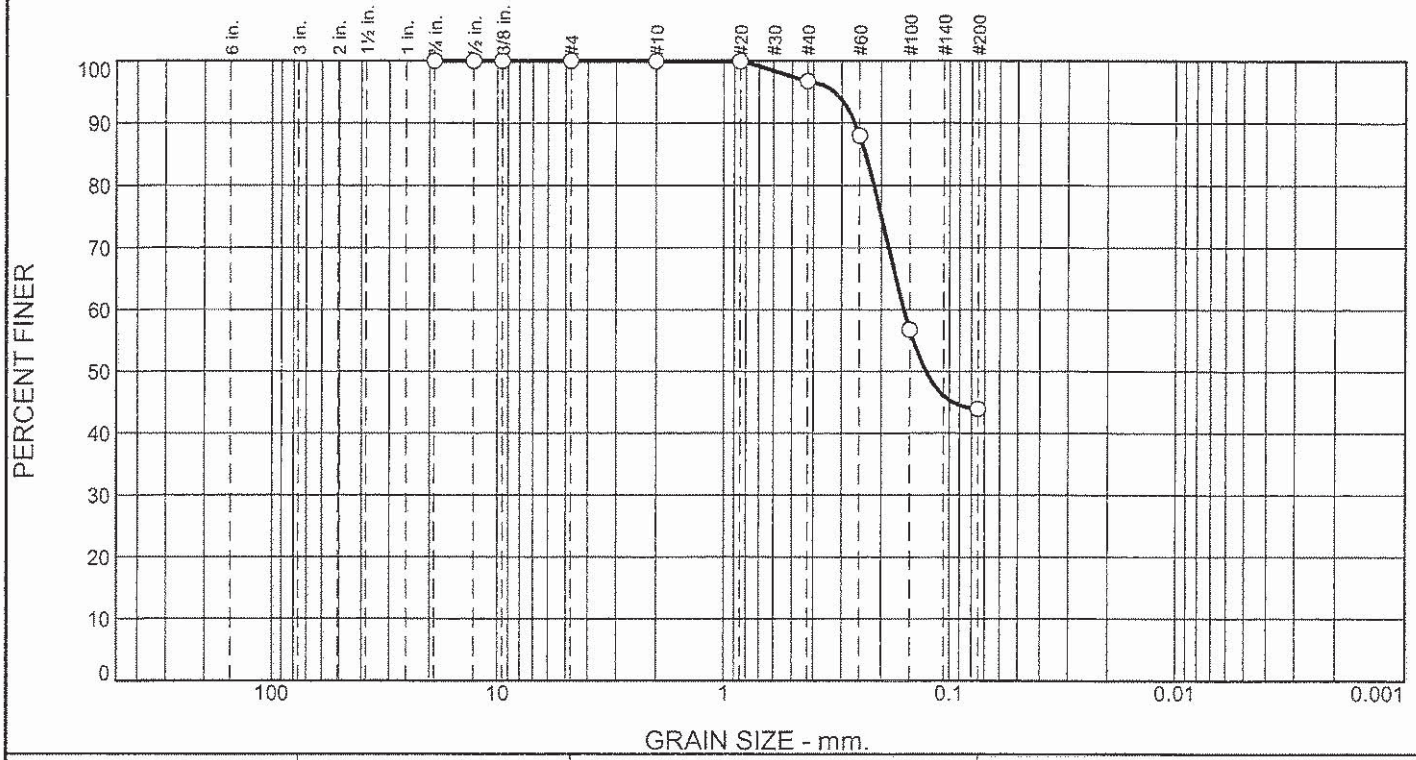
Remarks:

4/10/12

Figure

Tested By: MC

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.3	52.8	43.9	

Test Results (D-422 & D-1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/4	100.0		
1/2	100.0		
3/8	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	96.7		
#60	88.0		
#100	56.7		
#200	43.9		

* (no specification provided)

Material Description

Reddish Brown Silty Slightly Clayey Medium to Fine SAND

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-4

Coefficients

D_{90}= 0.2625 D_{85}= 0.2353 D_{60}= 0.1591
D_{50}= 0.1269 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 4-6-12 **Date Tested:** 4-9-12

Tested By: MC

Checked By: 4/10/12

Title: Proj. Engineer

Source of Sample: Intermediate Cover
Sample Number: IC-7

Date Sampled: 4-6-12

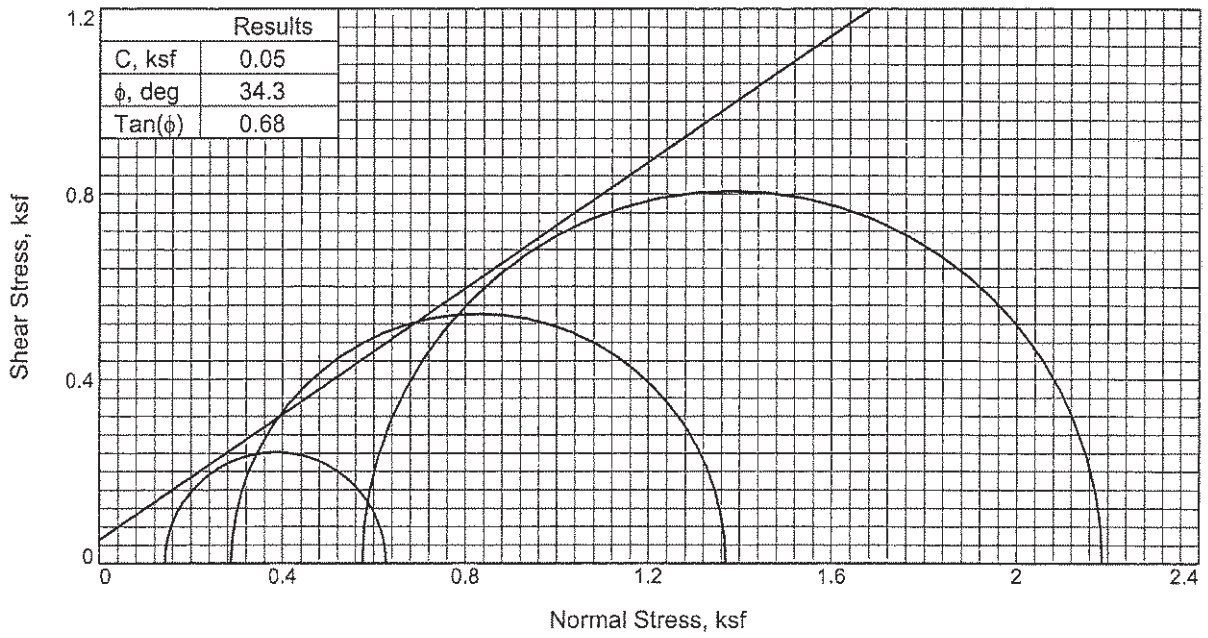
AMEC E&I

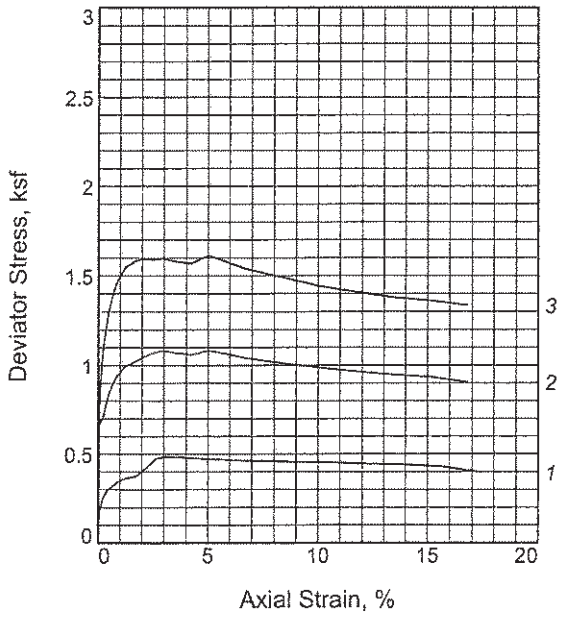
Jacksonville, Florida

Client: Meskel & Associates
Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**

DELIVERED OCT 1 9 2011





Sample No.		1	2	3
Initial	Water Content, %	13.9	13.7	14.0
	Dry Density, pcf	107.5	106.7	106.8
	Saturation, %	68.6	66.2	68.0
	Void Ratio	0.5348	0.5461	0.5448
	Diameter, in.	2.87	2.87	2.92
	Height, in.	5.80	6.01	5.97
At Test	Water Content, %	18.5	18.8	20.0
	Dry Density, pcf	110.8	110.2	107.9
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4898	0.4970	0.5294
	Diameter, in.	2.84	2.84	2.91
	Height, in.	5.74	5.95	5.95
Strain rate, in./min.		0.03	0.03	0.03
Back Pressure, psi		50.00	50.00	50.00
Cell Pressure, psi		51.00	52.00	54.00
Fail. Stress, ksf		0.48	1.08	1.61
Ult. Stress, ksf				
σ_1 Failure, ksf		0.63	1.37	2.19
σ_3 Failure, ksf		0.14	0.29	0.58

Type of Test: Consolidated Drained

Sample Type: Remolded

Description: Dark Gray Slightly Silty Medium to Fine SAND

LL= NP **PI=** NP

Specific Gravity= 2.643

Remarks:

Client: Meskel & Associates

Project: Trailridge Landfill Closure

Source of Sample: Intermediate Cover

Sample Number: IC-1

Proj. No.: 6736115123 **Date Sampled:** 9-22-11

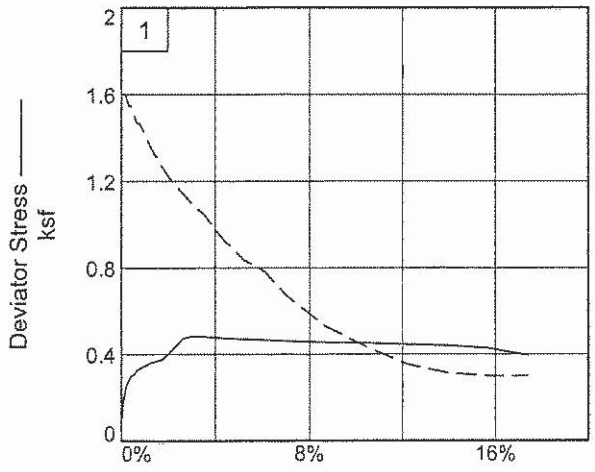
TRIAXIAL SHEAR TEST REPORT
AMEC E&I
Jacksonville, Florida

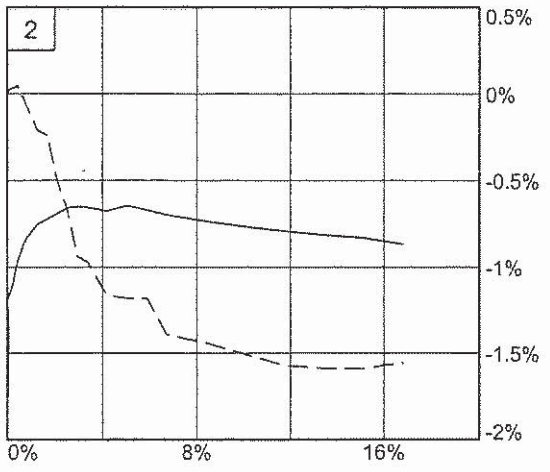
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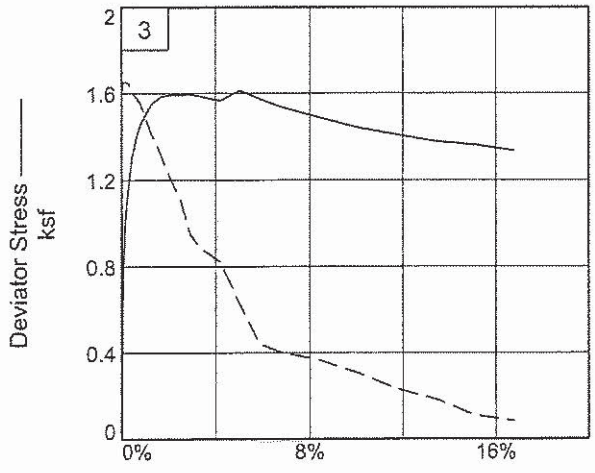
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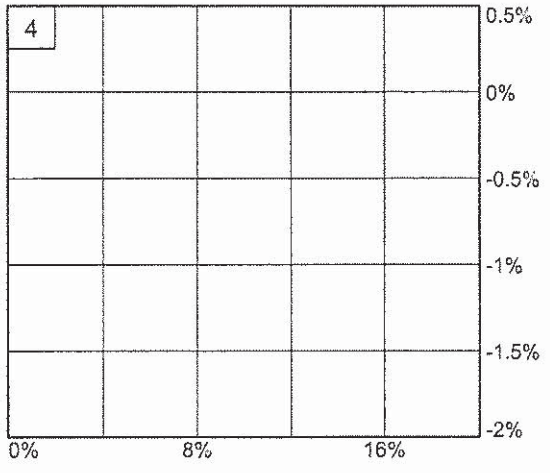
Michael J. Holm

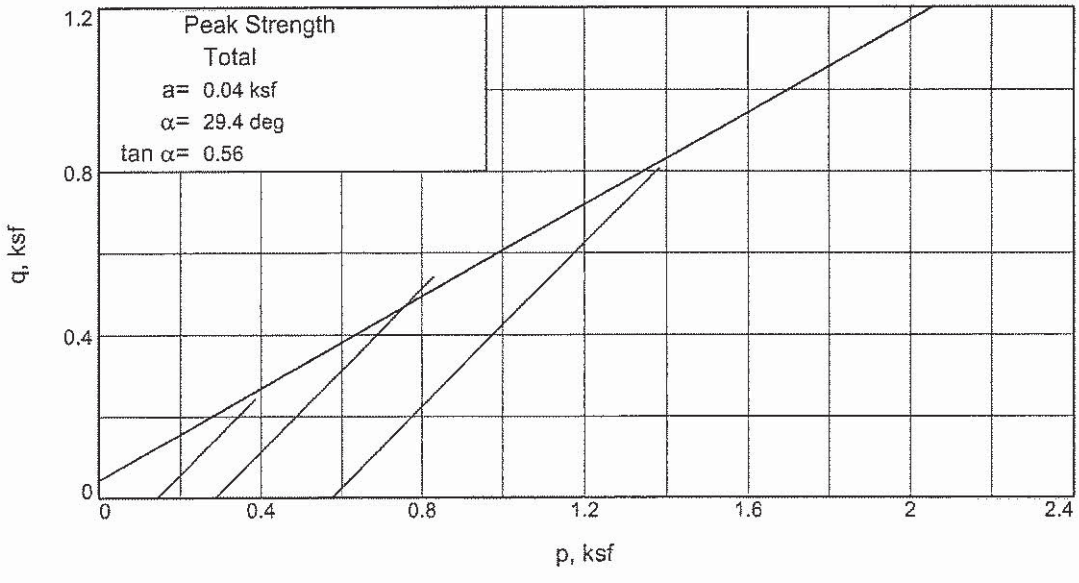
SCANNED











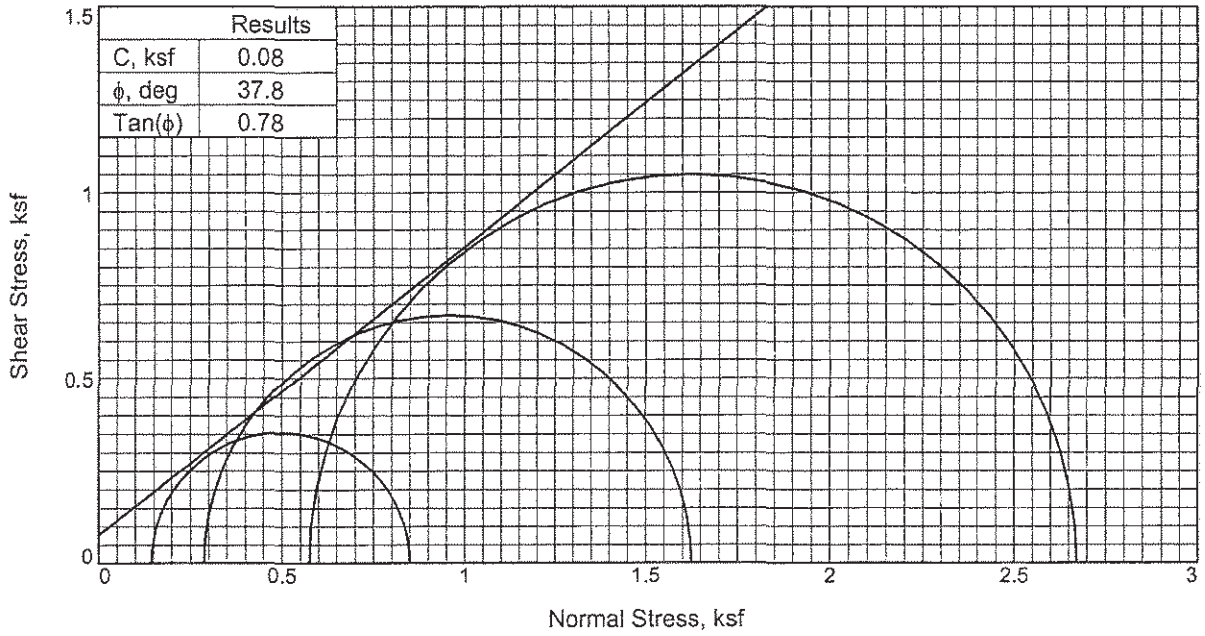
Client: Meskel & Associates
Project: Trailridge Landfill Closure
Source of Sample: Intermediate Cover
Project No.: 6736115123

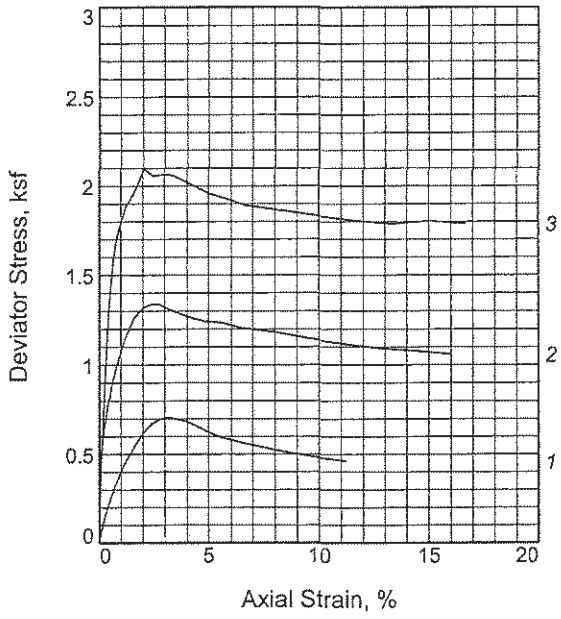
Sample Number: IC-1
Figure _____

AMEC E&I

Tested By: FB

DELIVERED OCT 1 9 2011





Sample No.		1	2	3
Initial	Water Content, %	12.2	12.3	12.5
	Dry Density, pcf	96.4	97.1	95.8
	Saturation, %	58.0	59.9	58.5
	Void Ratio	0.4796	0.4684	0.4894
	Diameter, in.	2.83	2.84	2.84
	Height, in.	6.30	6.34	6.13
At Test	Water Content, %	19.0	18.4	16.9
	Dry Density, pcf	99.5	100.4	102.9
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4341	0.4201	0.3869
	Diameter, in.	2.80	2.81	2.77
	Height, in.	6.23	6.27	5.99
Strain rate, in./min.		0.03	0.03	0.03
Back Pressure, psi		50.00	50.00	50.00
Cell Pressure, psi		51.00	52.00	54.00
Fail. Stress, ksf		0.71	1.34	2.10
Ult. Stress, ksf				
σ_1 Failure, ksf		0.85	1.63	2.67
σ_3 Failure, ksf		0.14	0.29	0.58

Type of Test: Consolidated Drained

Sample Type:

Description: Brown and Gray Slightly Silty Fine SAND

Specific Gravity= 2.285

Remarks:

Client: Meskel & Associates

Project: Trailridge Landfill Closure

Source of Sample: Vegatative Cover (Top Soil)

Sample Number: TS-1

Proj. No.: 6736115123 **Date Sampled:**

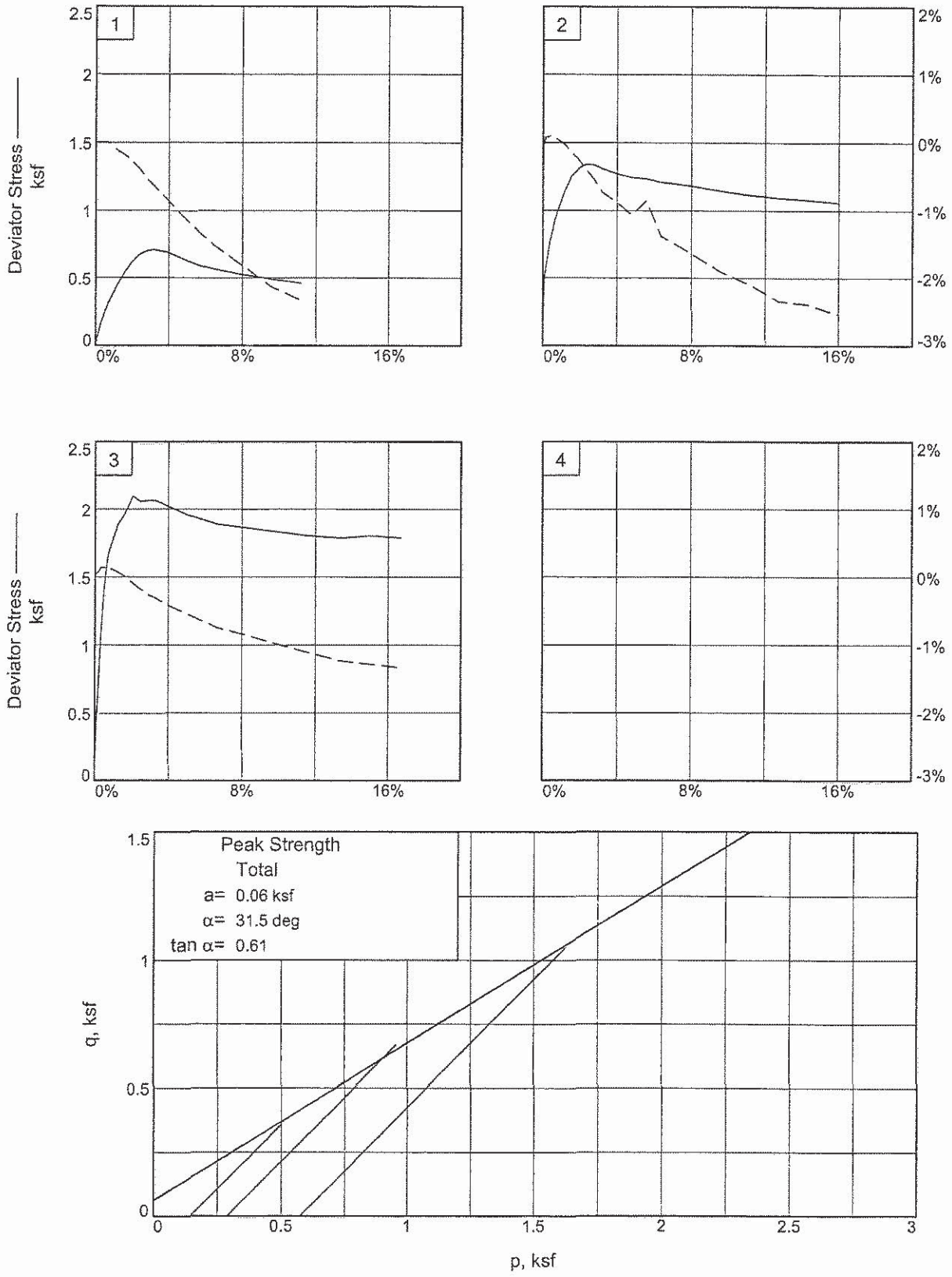
TRIAXIAL SHEAR TEST REPORT
AMEC E&I
Jacksonville, Florida

Figure _____

Tested By: MC

Michael J. Holm 4/2/11

SCANNED



Client: Meskel & Associates

Project: Trailridge Landfill Closure

Source of Sample: Vegatative Cover (Top Soil) **Sample Number:** TS-1

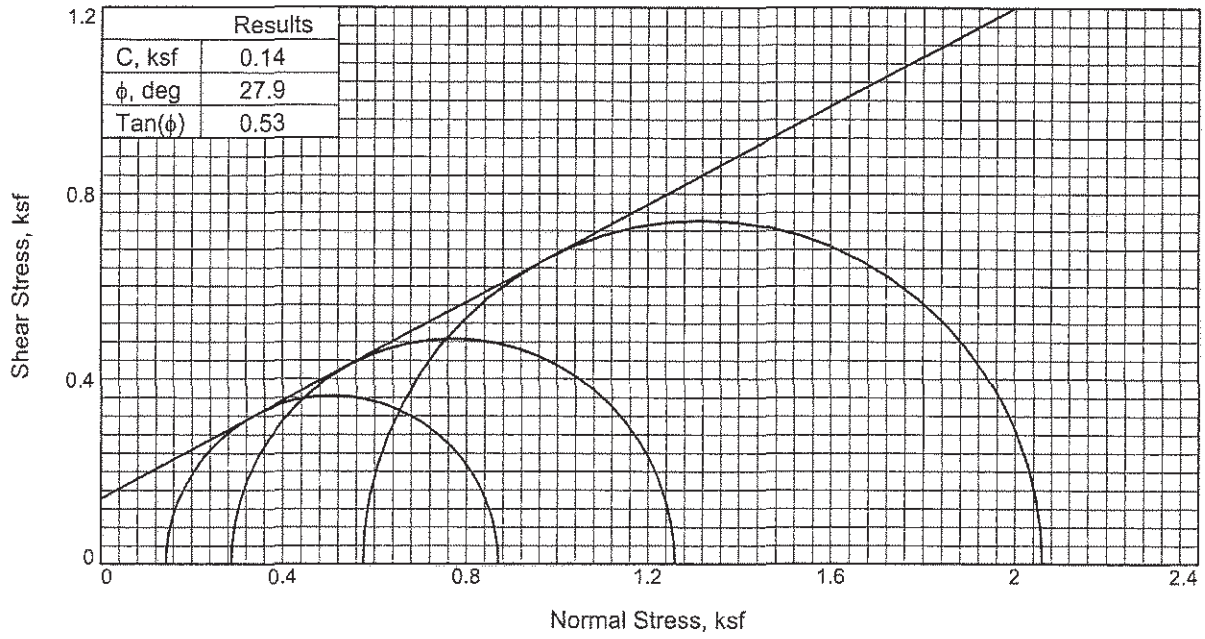
Project No.: 6736115123 **Figure** _____

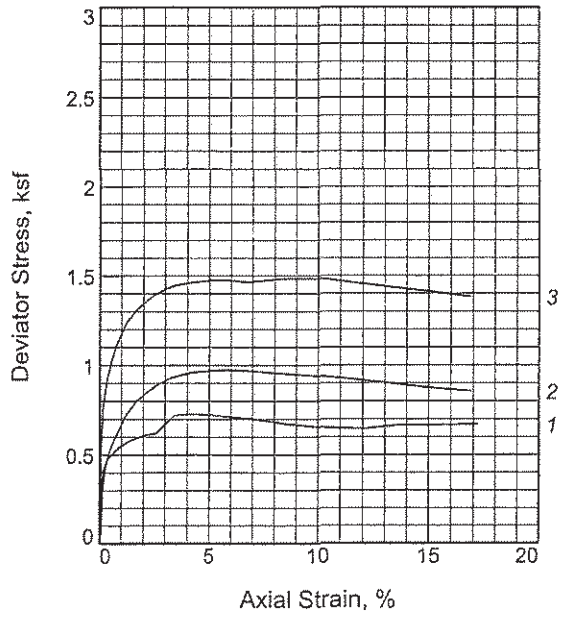
AMEC E&I

Tested By: MC

SCANNED

DELIVERED NOV 0 9 2011





Sample No.		1	2	3
Initial	Water Content, %	12.2	12.1	11.0
	Dry Density, pcf	93.3	92.4	93.8
	Saturation, %	41.6	40.4	38.3
	Void Ratio	0.7763	0.7930	0.7668
	Diameter, in.	2.84	2.84	2.84
	Height, in.	5.86	5.99	5.98
At Test	Water Content, %	27.7	27.4	27.1
	Dry Density, pcf	95.5	96.0	96.5
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7347	0.7271	0.7184
	Diameter, in.	2.82	2.80	2.81
	Height, in.	5.81	5.92	5.93
Strain rate, in./min.		0.03	0.03	0.03
Back Pressure, psi		50.00	50.00	50.00
Cell Pressure, psi		51.00	52.00	54.00
Fail. Stress, ksf		0.73	0.97	1.48
Ult. Stress, ksf				
σ_1 Failure, ksf		0.87	1.26	2.06
σ_3 Failure, ksf		0.14	0.29	0.58

Type of Test:
Consolidated Drained
Sample Type: Bulk
Description: Dark Gray Fine SAND

LL= NP **PI=** NP
Specific Gravity= 2.655
Remarks:

Client: Meskel & Associates

Project: Trailridge Landfill Closure

Source of Sample: Vegatative Cover (Top Soil)
Sample Number: TS-2
Proj. No.: 6736115123 **Date Sampled:** 10/11/11

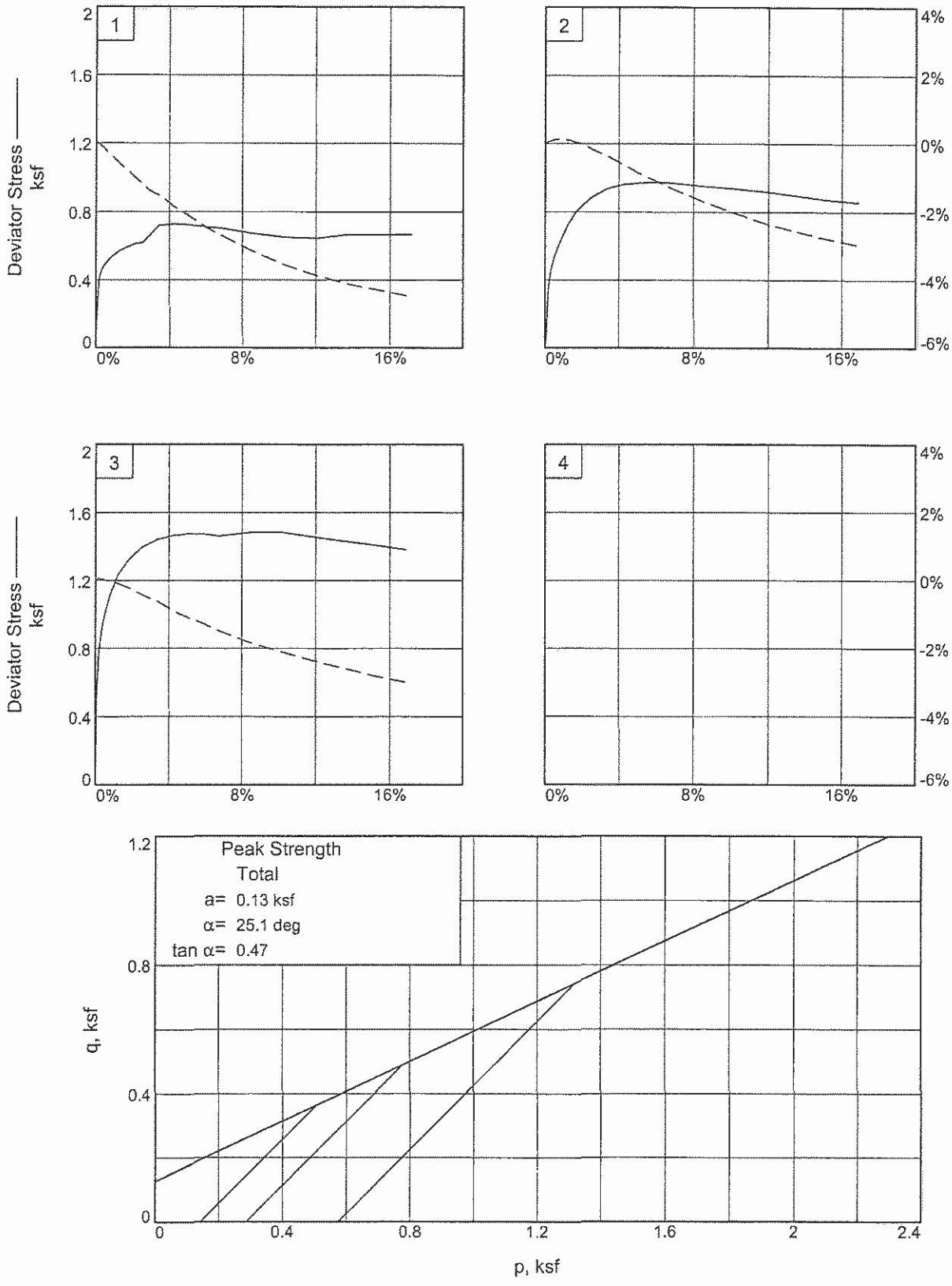
TRIAXIAL SHEAR TEST REPORT
AMEC E&I
Jacksonville, Florida

Figure _____

Michael J. Holm

Tested By: FB

SCANNED



Client: Meskel & Associates

Project: Trailridge Landfill Closure

Source of Sample: Vegatative Cover (Top Soil) **Sample Number:** TS-2

Project No.: 6736115123 **Figure** _____

AMEC E&I

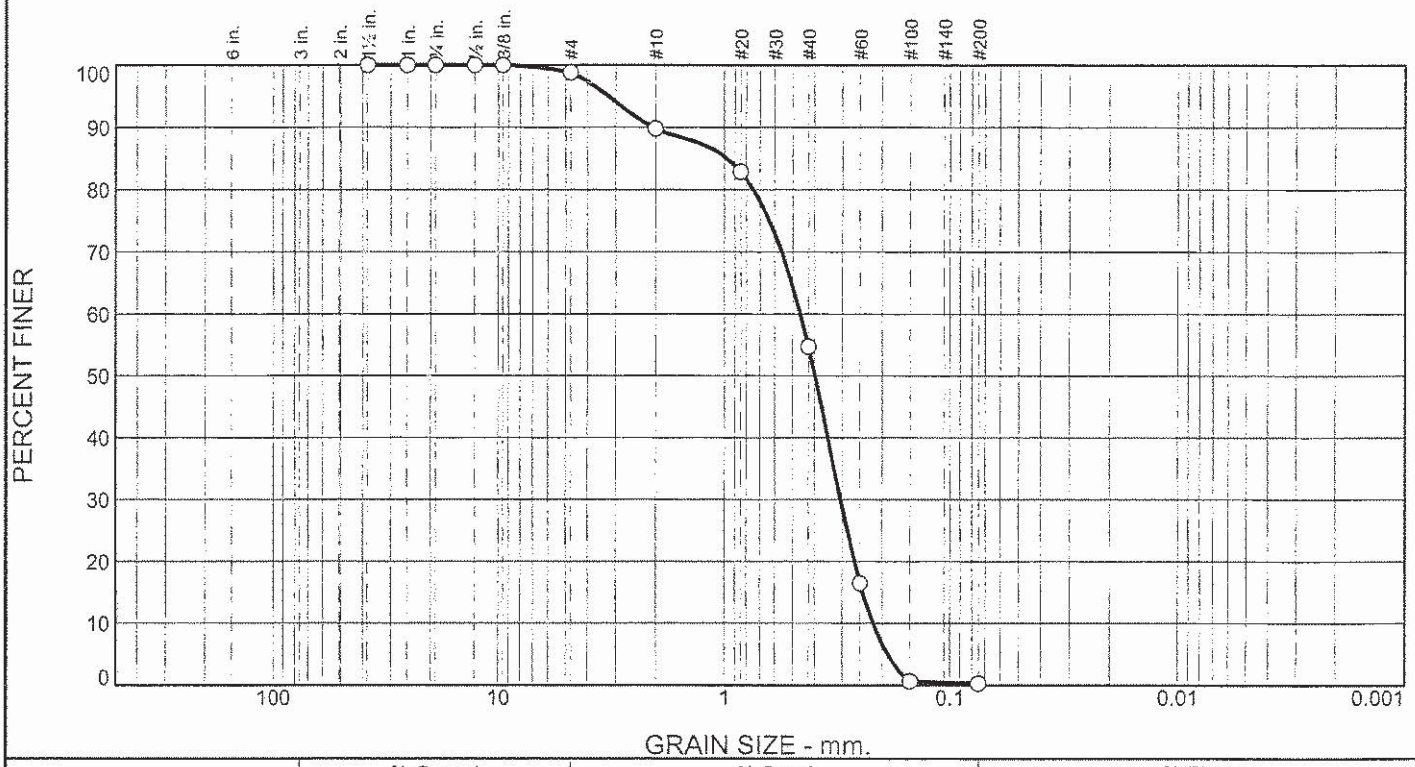
Michael J. Holm

Tested By: FB

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DELIVERED JAN 1 1 2012

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.2	9.0	35.1	54.4	0.3	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5"	100.0		
1.0"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	98.8		
#10	89.8		
#20	82.9		
#40	54.7		
#60	16.5		
#100	0.7		
#200	0.3		

* (no specification provided)

Material Description

Light Gray Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SP AASHTO (M 145)= A-3

Coefficients

D_{90}= 2.0447 D_{85}= 0.9714 D_{60}= 0.4618
D_{50}= 0.3974 D_{30}= 0.3055 D_{15}= 0.2434
D_{10}= 0.2190 C_u= 2.11 C_c= 0.92

Remarks

Date Received: 1/4/11 **Date Tested:** 1/5/11

Tested By: CRM

Checked By: David Eisel

Title: PROJECT ENGINEER

Location: Project Field Sample
Sample Number: Production #2

Date Sampled: 1/4/11

AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates
Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**

amec

REPORT OF SOIL PERMEABILITY TESTING

Project: Trailridge **Project Number:** 6736-11-5123

Client Meskel **Date Completed:** January 5, 2011

Sample Number: Underdrain Production #2

The sample was remolded to 100% of fill material proctor maximum density 107.8 at optimum moisture of 12.4%. The compacted sample was tested for permeability and the results are outlined below.

Sample Information:

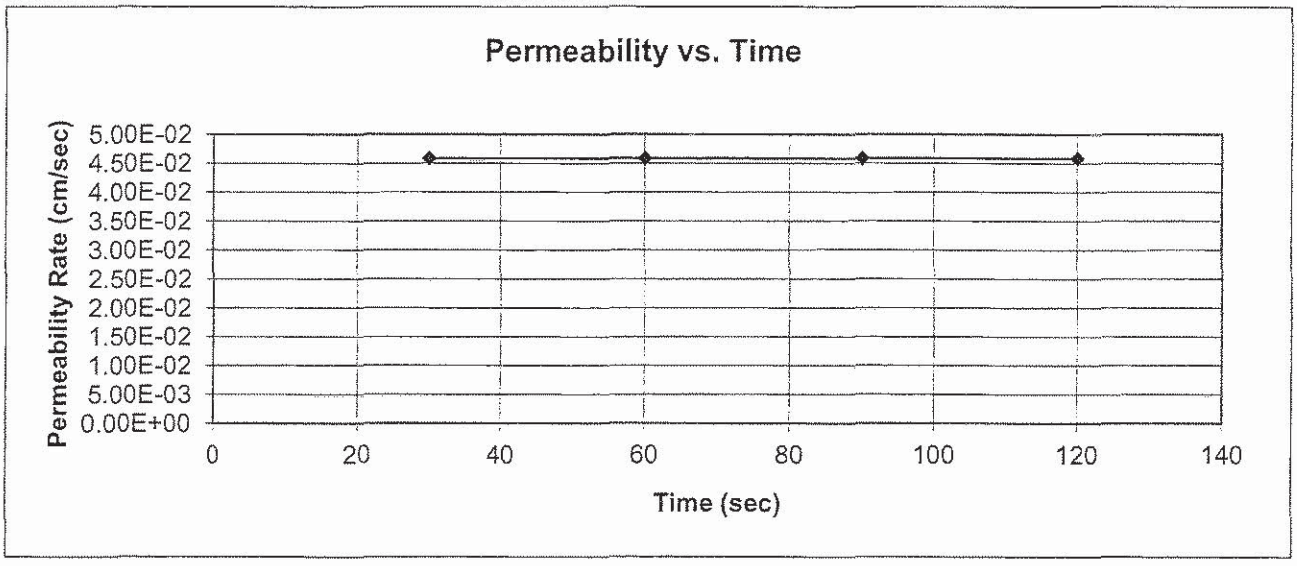
Dia. (in.)	3.99	**Length (in)**	4.58	**Weight (gr)**	1834
Wet Density (pcf)	122.1	**Moisture Content (%)**	12.2	**Dry Density (pcf)**	108.9

Test Parameters

Test Method Used:	ASTM D-2434	**Permeant Fluid:**	Tap water

Permeability Rate

4.6E-02

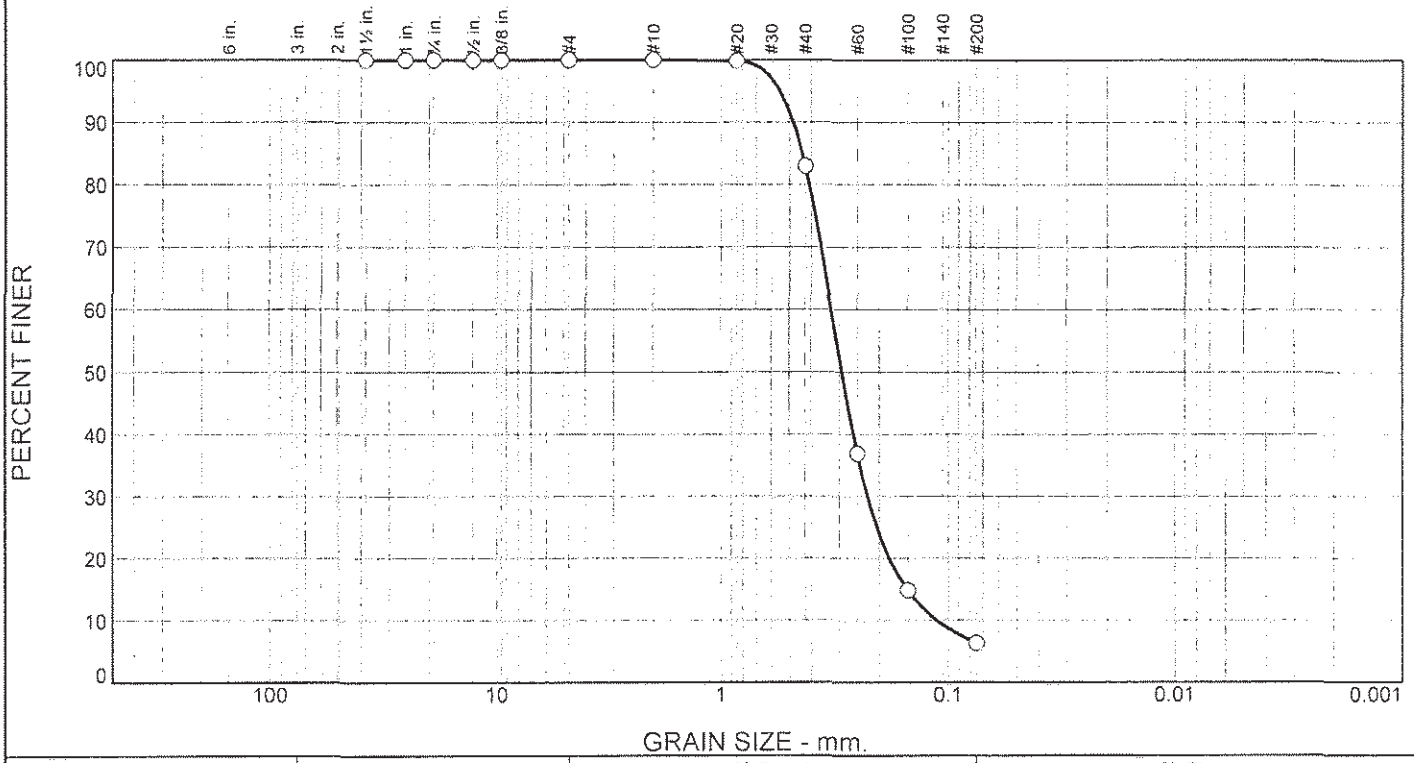


Reviewed By:

Daniel L. Eisman, P.E.

DELIVERED OCT 1 9 2011

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	17.0	76.6	6.4	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	83.0		
#60	36.9		
#100	14.9		
#200	6.4		

* (no specification provided)

Material Description

Brown Fine SAND

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.4801 D_{85}= 0.4382 D_{60}= 0.3247
D_{50}= 0.2919 D_{30}= 0.2254 D_{15}= 0.1509
D_{10}= 0.1122 C_u= 2.89 C_c= 1.39

Remarks

Date Received: 10/14/11 **Date Tested:** 10/14/11

Tested By: CM

Checked By:

Title:

Location: Maxville- MacClenny Rd. Pit **Date Sampled:** 10/13/14

Sample Number: 1

AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates

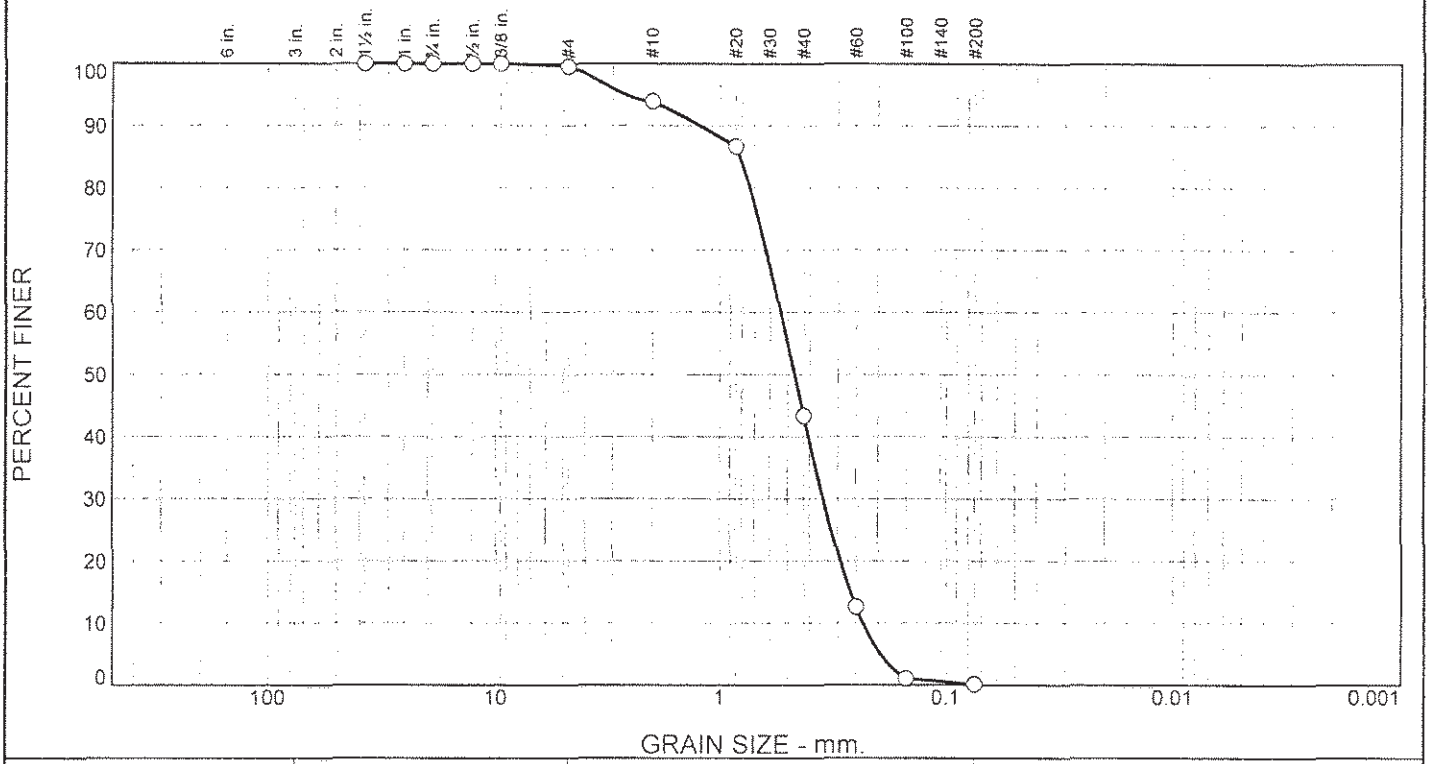
Project: Trailridge Landfill Closure

Project No: 6736115123 **Figure**

SCANNED

DELIVERED NOV 1 5 2011

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	5.6	50.5	43.2	0.2	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.5		
#10	93.9		
#20	86.7		
#40	43.4		
#60	12.6		
#100	1.1		
#200	0.2		

* (no specification provided)

Material Description

Light Gray Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SP AASHTO (M 145)= A-1-b

Coefficients

D_{90}= 1.2288 D_{85}= 0.8150 D_{60}= 0.5365
D_{50}= 0.4665 D_{30}= 0.3480 D_{15}= 0.2643
D_{10}= 0.2330 C_u= 2.30 C_c= 0.97

Remarks

Date Received: 11/9/11 Date Tested: 11/10/11

Tested By: CM

Checked By: Mich Holm

Title: P.E. 11/10/11

Michael J. Holm

Location: Siboney Aggregates, Stokes Rd. Date Sampled: 11/9/11

Sample Number: 3

AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates

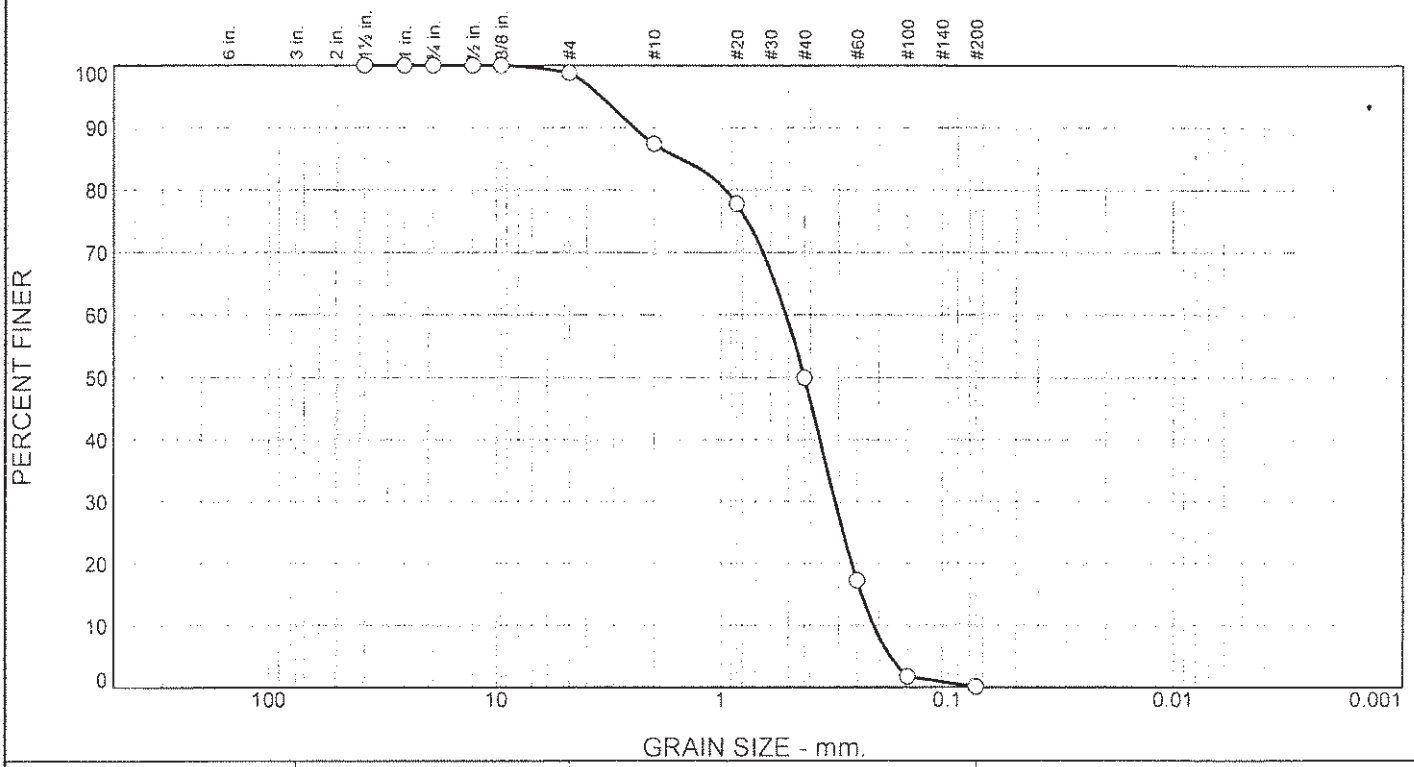
Project: Trailridge Landfill Closure

Project No: 6736115123 Figure

SCANNED

DELIVERED DEC 0 7 2011

Grain Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.2	11.4	37.4	49.9	0.1	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	98.8		
#10	87.4		
#20	77.8		
#40	50.0		
#60	17.3		
#100	1.7		
#200	0.1		

* (no specification provided)

Material Description

Light Gray Fine SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= SP AASHTO (M 145)= A-1-b

Coefficients

D_{90}= 2.4498 D_{85}= 1.5072 D_{60}= 0.5115
D_{50}= 0.4251 D_{30}= 0.3110 D_{15}= 0.2385
D_{10}= 0.2111 C_u= 2.42 C_c= 0.90

Remarks

Date Received: 12/2/11 Date Tested: 12/5/11

Tested By: CM

Checked By: Michael Holm

Title: 12/6/11

Michael J. Holm

Location: Siboney Aggregates, Stokes Rd. Date Sampled: 12/2/11

Sample Number: 4

AMEC E&I

Jacksonville, Florida

Client: Meskel & Associates

Project: Trailridge Landfill Closure

Project No: 6736115123 Figure

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	**F**	S
Project No: 6736-11-5123	**Sunny**		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s		50s	**60s**	**70s**	
AMEC Representative: Clarence Ignacio	80s	90s		100s	110s	+	
Date: 11/11/11 Active Site Time: 7.5 Hours	Concrete Air Meter SN:						
Standby Time: (Explain in Activities Section)	Nuclear Density Gauge SN:						
Concrete: Cylinders, Beams, Cubes, or Prisms Set Nos.:	Speedy Moisture Tester SN:						
Density Tests: **Nuclear**, Shelby Tube, Sand Cone Test Nos.: 36-50	Field Scales g. No.:						
Other Equipment:	Field Scales lb SN:						

ACTIVITIES:

On November 11, 2011, a representative from AMEC E&I, Inc. (AMEC) arrived on site as requested to perform density tests on the completed compacted areas located between 104+00 E to 106+50 E for the intermediate cover and on the western line of Phase III for the 1st lift of clay liner from 104+00 E. Performed density tests, which is documented on the Field Density Worksheet. Obtained permeability test samples 17 @ C1-5, 103+50 E @ 76 to N; 18 @ C1-11, 103+0 E @ 75 to N. Thickness was also recorded. Obtained additional samples for fines/soil classification.

	Density	Oven Moisture	Permeabilities	Fines/Soil/Class./Att.	Thickness (in.)
C1-1 @ 101+75 E, 74+75 N	--	--	--	--	8
C1-2 @ 102+00 E, 75+00 N	--	--	--	--	8
C1-3 @ 102+50 E, 75+50 N	--	--	--	--	8
C1-4 @ 103+00 E, 76+00 N	--	--	--	--	8
C1-5 @ 103+50 E, 76+00 N	--	--	17	--	8
C1-6 @ 104+00 E, 75+50 N	--	--	--	--	8
C1-7 @ 103+50 E, 75+00 N	--	--	--	--	8
C1-8 @ 103+50 E, 75+00 N	--	--	--	--	8
C1-9 @ 104+00 E, 74+75 N	--	--	--	--	8
C1-10 @ 103+00 E, 74+75 N	--	--	--	--	8
C1-11 @ 103+00 E, 74+00 N	--	--	18	--	8

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED DEC 2 2 2011

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	**M**	T	W	T	F	S
Project No: 6736-11-5123	**Sunny**		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	**70s**		
AMEC Representative: Clarence Ignacio	80s	90s	100s	110s	+		
Date: 11/21/11 Active Site Time: 7.5 Hours	Concrete Air Meter SN:						
Standby Time: (Explain in Activities Section)	Nuclear Density Gauge SN:						
Concrete: Cylinders, Beams, Cubes, or Prisms Set Nos.:	Speedy Moisture Tester SN:						
Density Tests: **Nuclear**, Shelby Tube, Sand Cone Test Nos.: 51-56	Field Scales g. No.:						
Other Equipment:	Field Scales lb SN:						

ACTIVITIES:

On November 21, 2011, a representative from AMEC E&I, Inc. (AMEC) arrived on site as requested to perform density tests on the first lift of 6" clay liner located between Sta. 104+50 E to Sta. 106+25 E. Additional testing and sampling was also performed in the areas stated. (thickness, oven moisture sample, permeabilities, and fines/soil/classification/Atterberg).

	Density	Oven Moisture	Permeabilities	Fines/Soil/Class./Att.	Thickness (in.)
C1-12 @ 104+50E, 75+0 N	--	--	--	--	8
C1-13 @ 104+50 E, 76+25 N	51	5	--	--	8
C1-14 @ 105+50 E, 76+0 N	52	6	--	--	6
C1-15 @ 105+75 E, 76+25 N	53	7	19	3	8
C1-16 @ 106+25 E, 76+75 N	--	--	--	4	7
C1-17 @ 105+50 E, 75+0 N	54	8	20	5	7
C1-18 @ 106+0 E, 75+50 N	--	--	--	--	7
C1-19 @ 106+25 E, 75+25 N	--	--	--	--	7
C1-20 @ 105+0 E, 75+50 N	55	9	--	--	7
C1-21 @ 105+0 E, 74+75 N	--	--	--	6	6
C1-22 @ 106+25 E, 74+75 N	56	10	--	--	7
C1-23 @ 105+50 E, 74+50 N	--	--	--	--	6

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED DEC 2 2 2011

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	F	S
Project No: 6736-11-5123	**Sunny**		**Cloudy**		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	**70s**		
AMEC Representative: Clarence Ignacio	80s	90s	100s	110s	+		
Date: 11/22/11 Active Site Time: 6.5 Hours	Concrete Air Meter SN:						
Standby Time: (Explain in Activities Section)	Nuclear Density Gauge SN:						
Concrete: Cylinders, Beams, Cubes, or Prisms Set Nos.:	Speedy Moisture Tester SN:						
Density Tests: **Nuclear**, Shelby Tube, Sand Cone Test Nos.: 57-62	Field Scales g. No.:						
Other Equipment:	Field Scales lb SN:						

ACTIVITIES:

On November 22, 2011, a representative from AMEC E&I, Inc. (AMEC) arrived on site as requested to perform density tests and obtain samples and verify the thickness of the second 6" lift placed and compacted in areas between the west phase line to Sta. 104+00 E.

	Density	Oven Moisture	Permeabilities	Fines/Soil/Class./Att.	Thickness (in.)
C2-1 @ 102+0 E, 74+75 N	57	11	--	--	14
C2-2 @ 102+50 E, 75+00 N	--	--	--	7	14
C2-5 @ 103+00 E, 75+00 N	58	12	--	--	15
C2-10 @ 103+50 E, 74+75 N	--	--	--	--	13
C2-9 @ 104+00 E, 75+75 N	59	13	--	--	14
C2-8 @ 104+00 E, 76+40 N	--	--	--	--	14
C2-4 @ 103+00 E, 76+00 N	60	14	--	--	14
C2-7 @ 103+50 E, 75+75 N	--	--	--	8	--
C2-6 @ 103+00 E, 74+50 N	--	--	--	--	13
C2-3 @ 102+50 E, 75+50 N	61	15	21	9	14
C2-11 @ 104+00 E, 74+75 N	62	16	22	10	--

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED DEC 2 2 2011

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	**F**	S
Project No: 6736-11-5123	Sunny		**Cloudy**		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	**70s**		
AMEC Representative: Robbie Drawdy	80s	90s	100s	110s	+		
Date: 12/16/11 Active Site Time:	Concrete Air Meter SN:						
Standby Time: (Explain in Activities Section)	Nuclear Density Gauge SN:						
Concrete: Cylinders, Beams, Cubes, or Prisms Set Nos.:	Speedy Moisture Tester SN:						
Density Tests: **Nuclear**, Shelby Tube, Sand Cone Test Nos.: 63-66	Field Scales g. No.:						
Other Equipment:	Field Scales lb SN:						

ACTIVITIES:

On December 16, 2011, a representative from AMEC E&I, Inc. (AMEC) arrived on site as requested.

	Density	Oven Moisture	Percent Fines	Atterberg/Perm	Thickness (in.)
C2-18 @ 105+50 E, 74+50 N	63	12	--	--	22
C2-13 @ 105+00 E, 75+00 N	--	--	11	--	14
C2-12 @ 104+50 E, 75+50 N	--	--	12	--	13
C2-14 @ 105+00 E, 75+50 N	--	--	--	--	13
C2-15 @ 105+00 E, 76+40 N	64	18	--	--	15
C2-19	--	--	--	--	12
C2-21 @ 106+25 E, 76+00 N	65	19	13	23	--
C2-20 @ 106+00 E, 75+75 N	--	--	--	--	14
C2-16 @ 105+50 E, 75+50 N	66	20	14	24	13

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	**F**	S
Project No: 6736-11-5123	**Sunny**			**Cloudy**		Rainy	
Client: MAE Engineering	<32	32-**40s**		**50s**	60s		**70s**
AMEC Representative: John Teague	80s	90s		100s	110s		+
Date: 1/13/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to perform clay density tests and pick up perm and index testing samples for the laboratory from Sta. 107+00E to 111+00E.

After waiting on the contractor to finish compacting intermediate cover (initial) density tests and thicknesses were performed on the area from 113+00E to 114+50E.

Density tests were performed on Downcomer D-47 and failing tests were retested after recompaction.

Please refer to the density report for more information and thicknesses at density test locations.

Please refer to table below for thicknesses not at density locations.

Location	Thickness (inches)
1st Lift Clay Layer	
C1-25 @ Sta. 107+50E & 76+50N	7
C1-26 @ Sta. 107+50E & 76+00N	7
C1-27 @ Sta. 108+00E & 76+00N	6
C1-29 @ Sta. 109+00E & 75+00N	6
C1-31 @ Sta. 110+00E & 76+50N	7
C1-33 @ Sta. 111+00E & 76+50N	8
C1-34 @ Sta. 111+00E & 76+00N	7
C1-35 @ Sta. 110+50E & 75+50N	7
C1-37 @ Sta. 110+00E & 75+50N	6
C1-38 @ Sta. 109+50E & 75+15N	6
C1-39 @ Sta. 109+00E & 75+25N	7
C1-41 @ Sta. 107+50E & 75+50N	7
C1-42 @ Sta. 108+50E & 75+50N	7
C1-43 @ Sta. 107+50E & 74+75N	7
C1-44 @ Sta. 108+25E & 74+75N	7
C1-46 @ Sta. 109+50E & 74+50N	8
C1-48 @ Sta. 111+00E & 74+75N	6
Intermediate (Initial)	
I-56 @ 114+00E & 75+50N	12+
I-60 @ 106+75E & 74+50N	12+
I-62 @ 106+75E & 75+50N	12+
I-63 @ 106+75E & 76+00N	12+

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED FEB 0 3 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	**M**	T	W	T	F	S
Project No: 6736-11-5123	**Sunny**		**Cloudy**		Rainy		
Client: MAE Engineering	<32	32-40s	50s	**60s**	**70s**		
AMEC Representative: John Teague	80s	90s	100s	110s	+		
Date: 1/16/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to perform density tests on the first lift clay for Downcomer D-47 and between Downcomer D-41 and D-44. Clay index samples and perms were taken at the above areas for laboratory testing. See the density report for additional information.

Location	Thickness (inches)
C1-49 @ Sta. 106+77E & 74+50N	10
C1-50 @ Sta. 106+77E & 74+85N	13
C1-51 @ Sta. 106+77E & 75+25N	12
C1-52 @ Sta. 106+77E & 75+50N	11
C1-53 @ Sta. 106+77E & 76+00N	6
C1-54 @ Sta. 106+77E & 76+45N	10
C1-55 @ Sta. 112+00E & 74+50N	8
C1-56 @ Sta. 112+00E & 75+00N	7
C1-57 @ Sta. 112+00E & 75+50N	6
C1-58 @ Sta. 112+00E & 76+50N	6.5
C1-59 @ Sta. 113+50E & 76+50N	7
C1-60 @ Sta. 114+50E & 76+00N	7
C1-61 @ Sta. 114+00E & 75+50N	7
C1-62 @ Sta. 112+50E & 75+50N	6
C1-63 @ Sta. 113+00E & 75+00N	6
C1-64 @ Sta. 114+00E & 74+75N	7.5
C1-65 @ Sta. 112+00E & 76+00N	7

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

SCANNED

Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	**T**	W	T	F	S
Project No: 6736-11-5123	Sunny		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	**70s**		
AMEC Representative: Clarence Ignacio	80s	90s	100s	110s	+		
Date: 1/17/12 Active Site Time:	Concrete Air Meter SN:						
Standby Time: (Explain in Activities Section)	Nuclear Density Gauge SN:						
Concrete: Cylinders, Beams, Cubes, or Prisms Set Nos.:	Speedy Moisture Tester SN:						
Density Tests: Nuclear, Shelby Tube, Sand Cone Test Nos.:	Field Scales g. No.:						
Other Equipment:	Field Scales lb SN:						

ACTIVITIES:

On January 20, 2012, a representative from AMEC Environment & Infrastructure, Inc. (AMEC) arrived on site as requested to perform density tests and obtain clay index samples for the second lift of clay liner for Downcomer D-47.

	Density	Oven Moisture	Percent Fines	Atterberg/Perm	Thickness (in.)
C2-22 @ 106+75E & 74+50N	104	--	--	--	13
C2-23 @ 106+75E & 74+90N	--	--	--	--	13
C2-24 @ 106+75E & 75+25N	--	--	--	--	13
C2-25 @ 106+75E & 75+50N	105	--	--	--	14
C2-26 @ 106+75E & 76+00N	--	--	--	--	13
C2-27 @ 106+75E & 76+60N	106	--	--	--	13

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael S. Holm

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DELIVERED FEB 0 3 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	**F**	S
Project No: 6736-11-5123	Sunny		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	**70s**		
AMEC Representative: Clarence Ignacio	80s	90s	100s	110s	+		
Date: 1/20/12 Active Site Time:	Concrete Air Meter SN:						
Standby Time: (Explain in Activities Section)	Nuclear Density Gauge SN:						
Concrete: Cylinders, Beams, Cubes, or Prisms Set Nos.:	Speedy Moisture Tester SN:						
Density Tests: Nuclear, Shelby Tube, Sand Cone Test Nos.:	Field Scales g. No.:						
Other Equipment:	Field Scales lb SN:						

ACTIVITIES:

On site as requested to perform density tests on the Intermediate layer beneath Downcomer 44 (I65, I66, I67, I68) and a retest on I47R. Thickness for Intermediate layer was 12"+ D44 – Phase III

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

SCANNED

DELIVERED FEB 0 3 2012

amec

Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	F	S
Project No: 6736-11-5123	Sunny		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	**70s**		
AMEC Representative: Clarence Ignacio	80s	90s	100s	110s	+		
Date: 1/20/12 Active Site Time:	Concrete Air Meter SN:						
Standby Time: (Explain in Activities Section)	Nuclear Density Gauge SN:						
Concrete: Cylinders, Beams, Cubes, or Prisms Set Nos.:	Speedy Moisture Tester SN:						
Density Tests: Nuclear, Shelby Tube, Sand Cone Test Nos.:	Field Scales g. No.:						
Other Equipment:	Field Scales lb SN:						

ACTIVITIES:

On site as requested to perform density tests and observe the thickness and obtain clay index sample for the first lift of clay liner beneath Downcomer 44.

	Density	Oven Moisture	Percent Fines	Atterberg/Perm	Thickness (in.)
C1-66 @ 111+50E & 74+50N	--	--	--	--	10
C1-67 @ 111+50E & 74+90N	112	--	--	--	10
C1-68 @ 111+50E & 75+40N	--	--	--	--	8
C1-69 @ 111+50E & 75+70N	113	--	--	--	10
C1-70 @ 111+50E & 76+10N	--	--	--	--	8
C1-71 @ 111+50E & 76+40N	114	--	--	--	10

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED FEB 0 3 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	**T**	W	T	F	S
Project No: 6736-11-5123	**Sunny**			**Cloudy**		Rainy	
Client: MAE Engineering	<32	32-40s		50s	**60s**		**70s**
AMEC Representative: John Teague	80s	90s		100s	110s		+
Date: 1/24/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today at 9:00 a.m. to perform 2nd lift clay densities, thickness, and pull perms and index tests on Downcomer that was cancelled yesterday when the technician arrived. Contractor just started pushing in 2nd lift clay layer when AMEC representative arrived.

Clay Thicknesses for 2nd Lift Clay on Downcomer D-44

Location	Thickness (inches)
C2-28 @ Sta. 111+50E & 74+50N	14
C2-29 @ Sta. 111+50E & 74+90N	12
C2-30 @ Sta. 111+50E & 75+25N	14
C2-31 @ Sta. 111+50E & 75+60N	15
C2-32 @ Sta. 111+50E & 76+00N	14
C2-33 @ Sta. 111+50E & 76+50N	13

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	F	S
Project No: 6736-11-5123	Sunny		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s		50s	60s		70s
AMEC Representative: John Teague	80s	90s		100s	110s		+
Date: 1/31/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to perform density tests and sample clay in Phases II and III. Density tests were also performed in Phase II initial cover. Please see table below for clay and initial cover thicknesses.

Location	Thickness (inches)
Clay Thicknesses	
C2-34, Sta. 107+25E & 76+25N	13
C2-35, Sta. 107+50E & 75+25N	15
C2-36, Sta. 108+00E & 76+50N	13
C2-37, Sta. 108+50E & 76+00N	14
C2-38, Sta. 109+00E & 76+25N	12
C2-39, Sta. 109+50E & 76+50N	12
C2-40, Sta. 110+00E & 76+00N	13
C2-41, Sta. 110+50E & 76+00N	12
C2-42, Sta. 111+00E & 76+50N	13
C2-43, Sta. 112+00E & 76+50N	13
C2-44, Sta. 112+25E & 76+25N	13
C2-45, Sta. 113+00E & 76+25N	14
C2-46, Sta. 114+00E & 76+00N	12
C2-47, Sta. 114+50E & 76+50N	12
C2-48, Sta. 113+50E & 75+50N	12
C2-49, Sta. 112+50E & 75+50N	13
C2-50, Sta. 112+00E & 75+50N	13
C2-51, Sta. 111+00E & 75+50N	14
C2-52, Sta. 110+50E & 75+00N	14
C2-53, Sta. 110+00E & 75+50N	13
C2-54, Sta. 109+50E & 75+50N	13
C2-55, Sta. 109+00E & 75+00N	12
C2-56, Sta. 108+50E & 75+00N	12
C2-57, Sta. 108+00E & 75+50N	13
C2-58, Sta. 107+50E & 75+00N	15
C2-59, Sta. 108+00E & 74+50N	13
C2-60, Sta. 108+50E & 74+50N	12
C2-61, Sta. 109+00E & 74+50N	12
C2-62, Sta. 110+00E & 74+50N	13
C2-63, Sta. 111+00E & 74+50N	12
C2-64, Sta. 112+25E & 74+75N	14
C2-65, Sta. 112+75E & 74+50N	15
C2-66, Sta. 113+50E & 74+50N	13
C2-67, Sta. 114+00E & 75+00N	12

Location	Thickness (inches)
Initial Cover	
I-69, Sta. 115+50E & 75+75N	13
I-70, Sta. 117+50E & 76+75N	13
I-71, Sta. 118+75E & 76+75N	14
I-72, Sta. 117+75E & 75+75N	14
I-73, Sta. 118+75E & 75+75N	13
I-74, Sta. 117+00E & 75+40N	12
I-75, Sta. 116+50E & 75+75N	13
I-76, Sta. 116+00E & 74+75N	13
I-77, Sta. 117+50E & 74+75N	12
I-78, Sta. 118+00E & 75+25N	12
I-79, Sta. 119+00E & 75+25N	13
I-80, Sta. 118+50E & 74+40N	14

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

SCANNED

DELIVERED FEB 2 1 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	F	S
Project No: 6736-11-5123	**Sunny**		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	70s		
AMEC Representative: John Teague	80s	90s	100s	110s	+		
Date: 2/2/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to retest failing initial cover tests from Tuesday (1/31/12) and test additional areas of initial cover.

Contractor just began wetting areas of failing previous tests and had not attempted any compaction on these areas when AMEC arrived, so MAE had AMEC begin testing new areas first.

Please refer to the table below for initial cover thicknesses in new areas density tested today.

After waiting on ERC to re-compact areas, failing density tests 142 (I-74) 145 (I-77), 146 (I-78), and 147 (I-80 were retested as density tests 157 through 160.

Location	Thickness (inches)
I-81, Sta. 120+25E & 77+00N	12
I-82, Sta. 121+00E & 77+50N	13
I-83, Sta. 122+25E & 77+50N	12
I-84, Sta. 122+50E & 77+00N	12
I-85, Sta. 121+50E & 76+50N	6 (corrected to 12)
I-86, Sta. 120+75E & 75+85N	6 (corrected to 12)
I-87, Sta. 120+00E & 76+25N	13
I-88, Sta. 121+50E & 75+25N	13
I-89, Sta. 122+00E & 76+00N	14
I-90, Sta. 123+00E & 76+50N	12
I-91, Sta. 123+50E & 76+00N	13

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED FEB 2 1 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	**W**	T	F	S
Project No: 6736-11-5123	**Sunny**			**Cloudy**		Rainy	
Client: MAE Engineering	<32	32-40s		**50s**	**60s**	70s	
AMEC Representative: John Teague	80s	90s		100s	110s	+	
Date: 2/8/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to perform density tests on initial cover for Downcomer D-46.

Location	Thickness (inches)
I-92, Sta. 115+00E & 74+75N	12
I-93, Sta. 115+00E & 75+50N	13
I-94, Sta. 115+00E & 75+75N	14
I-95, Sta. 115+00E & 76+25N	12

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED FEB 2 1 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	F	S
Project No: 6736-11-5123	Sunny		**Cloudy**		Rainy		
Client: MAE Engineering	<32	32-40s	**50s**	**60s**	70s		
AMEC Representative: John Teague	80s	90s	100s	110s	+		
Date: 2/9/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to perform density tests, thickness tests, and pick up perm and index samples for lab testing on first and second lift clay layers for Downcomer D-41.

Location	Thickness (inches)
1st Lift	
C1-72, Sta. 115+07E & 74+75N	11½
C1-73, Sta. 115+07E & 75+10N	9
C1-74, Sta. 115+07E & 75+50N	10
C1-75, Sta. 115+07E & 75+80N	13
C1-76, Sta. 115+07E & 76+25N	12
C1-77, Sta. 115+07E & 76+55N	10
2nd Lift	
C2-68, Sta. 115+07E & 74+70N	19
C2-69, Sta. 115+07E & 75+00N	17
C2-70, Sta. 115+07E & 75+45N	16
C2-71, Sta. 115+07E & 75+75N	20
C2-72, Sta. 115+07E & 76+20N	13
C2-73, Sta. 115+07E & 76+50N	16

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael D. Holm

DELIVERED FEB 2 1 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	**T**	W	T	F	S
Project No: 6736-11-5123	Sunny		**Cloudy**		Rainy		
Client: MAE Engineering	<32	32-40s	**50s**	60s	70s		
AMEC Representative: John Teague	80s	90s	100s	110s	+		
Date: 2/14/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to perform density tests, thickness measurements and sample clay first lift between 115+00 E to 119+50E on Phase II for permeability and index testing by the laboratory.

Location	Thickness (inches)
Clay Thickness	
C1-108, Sta. 115+50E & 76+50N	8
C1-109, Sta. 116+00E & 75+50N	7
C1-110, Sta. 115+75E & 74+60N	8
C1-111, Sta. 116+50E & 76+00N	7
C1-112, Sta. 117+00E & 75+00N	10
C1-113, Sta. 117+00E & 76+50N	8
C1-114, Sta. 118+00E & 76+00N	7
C1-115, Sta. 118+00E & 74+75N	6
C1-116, Sta. 118+75E & 76+75N	8
C1-117, Sta. 118+50E & 76+50N	8
C1-118, Sta. 118+50E & 74+60N	8
C1-119, Sta. 119+00E & 75+00N	6

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED MAR 15 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	**W**	T	F	S
Project No: 6736-11-5123	Sunny			**Cloudy**		Rainy	
Client: MAE Engineering	<32	32-40s		50s	60s	**70s**	
AMEC Representative: Tim Curry	80s	90s		100s	110s	+	
Date: 3/7/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today and performed density tests, thickness tests, and picked perms and index samples for lab testing on 1st and 2nd lift clay layers for Downcomer D-38.

Location	Thickness (inches)
Clay Thicknesses (1st Lift)	
C1-78 @ 119+60E & 74+45N	7
C1-79 @ 119+55E & 74+60N	7
C1-80 @ 119+50E & 75+00N	10
C1-81 @ 119+45E & 75+25N	11
C1-82 @ 119+40E & 75+70N	8
C1-83 @ 119+30E & 76+00N	9
C1-84 @ 119+20E & 76+35N	7
C1-85 @ 119+15E & 76+65N	8
C1-120 @ 120+00E & 76+50N	7
C1-121 @ 120+50E & 77+00N	9
C1-122 @ 121+00E & 76+00N	8
C1-123 @ 121+50E & 75+50N	7
C1-124 @ 121+50E & 77+75N	8.5

Location	Thickness (inches)
Clay Thicknesses (2nd Lift)	
C2-74 @ 119+60E & 74+45N	14
C2-75 @ 119+55E & 74+60N	14
C2-76 @ 119+50E & 75+00N	18
C2-77 @ 119+40E & 74+25N	17
C2-78 @ 119+40E & 74+70N	18
C2-79 @ 119+30E & 76+00N	20
C2-80 @ 119+25E & 76+65N	22
C2-81 @ 119+20E & 76+70N	20
C1-125 @ 121+50E & 77+00N	9
C1-126 @ 122+00E & 77+50N	7
C1-127 @ 122+50E & 77+00N	8
C1-128 @ 121+25E & 76+00N	7
C1-129 @ 123+00E & 76+25N	7
C1-130 @ 123+00E & 75+50N	6

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED APR 0 5 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	F	S
Project No: 6736-11-5123	**Sunny**		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s	50s	**60s**	70s		
AMEC Representative: Sampson Reamy	80s	90s	100s	110s	+		
Date: 3/13/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to perform density and permeability retests, as well as sampling on the first lift of clay on Terrace II D38, Phase II, Unit 37 for permeability and index testing by our AMEC lab.

Location	Thickness (inches)
Clay Thickness	
C1-80C, Sta. 119+40E & 75+10N	9
C1-80A, Sta. 119+50E & 74+85N	10
C1-80B, Sta. 119+50E & 74+90N	10
C1-80D, Sta. 119+50E & 75+15N	10

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED APR 0 5 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	F	S
Project No: 6736-11-5123	**Sunny**		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	70s		
AMEC Representative: Tim Curry	**80s**	90s	100s	110s	+		
Date: 3/15/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. was on site to perform field density tests and intermediate cover thickness checks.

Thickness checks were from I-147 to I-157. All locations met the required minimum of 12 inches. Also took four density tests. See the Report of Field Density Tests for results and locations.

Location	Thickness (inches)
I-147	20
I-148	18
I-149	16
I-150	18
I-151	16
I-152	17
I-153	20
I-154	18
I-155	18
I-156	18
I-157	18

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED APR 0 5 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	F	S
Project No: 6736-11-5123	**Sunny**		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	70s		
AMEC Representative: Sampson Reamy	**80s**	90s	100s	110s	+		
Date: 3/27/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to perform density tests, thickness measurements and sample clay Phase IV at D55 1st and 2nd lift and Phase II 2nd lift clay.

Location	Thickness (inches)
Phase IV	
C1-106 Sta. 85+27N @ D55 & 101+00E	12
C2-103 Sta. 85+27N @ D55 & 100+75E	24
C2-101 Sta. 85+27N @ D55 & 101+25E	23
C1-104 Sta. 85+27N @ D55 & 101+50E	11
C2-99 Sta. 85+27N @ D55 & 102+00E	24
C1-102 Sta. 85+27N @ D55 & 102+50E	10
C1-103 Sta. 102+00E	10
C1-105 Sta. 101+25E	10
C1-107 Sta. 100+75E	14
C2-102 Sta. 101+00E	24
C2-100 Sta. 101+50E	24
C2-98 Sta. 102+50E	22
Phase II	
C2-121 Sta. 121+50E & 76+50N	12
C2-126 Sta. 122+50E & 76+00N	12

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Michael J. Holm

DELIVERED MAY 03 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	**M**	T	W	T	F	S
Project No: 6736-11-5123	**Sunny**		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	70s		
AMEC Representative: Tim Curry	**80s**	90s	100s	110s	+		
Date: 4/2/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today for one permeability, one density test, one sample for lab tests, and depth checks on Phase IV, 2nd lift of clay.

Location	Thickness (inches)
C2-166 @ 101+00E & 83+50N	13
C2-167 @ 101+50E & 84+00N	13
C2-168 @ 102+00E & 84+50N	13
C2-169 @ 102+25E & 83+50N	14
C2-170 @ 101+50E & 84+75N	14
C2-171 @ 102+25E & 84+50N	14

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Daniel Eisman

4/25/12

SCANNED

Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	F	S
Project No: 6736-11-5123	**Sunny**		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s		50s	60s		70s
AMEC Representative: Sampson Reamy	**80s**	90s		100s	110s		+
Date: 4/17/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to perform two density tests on Phase IV 1st and 2nd lift and four density tests on Phase I, 1st lift. Tests achieved minimum 80% compaction. Soil samples obtained for permeability, Atterberg, percent fines and percent moisture. Depths were also checked at locations.

Location	Thickness (inches)
C1-173 @ 101+00E & 86+00N (Phase IV)	8
C1-138 @ 125+00E & 78+00N (Phase I)	10
C1-135 @ 122+50E & 78+50N (Phase I)	10
C1-139 @ 123+50E & 80+00N (Phase I)	8
C1-141 @ 125+50E & 79+00N (Phase I)	9
C2-174 @ 102+00E & 86+00N (Phase IV)	15

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Daniel Eisman

4/25/12

DELIVERED MAY 2 2 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	M	T	W	T	**F**	S
Project No: 6736-11-5123	**Sunny**		Cloudy		Rainy		
Client: MAE Engineering	<32	32-40s	50s	60s	70s		
AMEC Representative: Sampson Reamy	**80s**	90s	100s	110s	+		
Date: 5/11/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today and performed eight density tests on first and second lift clay at D33 Phase I. Eight samples were obtained for permeability, fines, atterburg, and moisture.

Location	Thickness (inches)
Clay Thicknesses (1st Lift)	
C1-86 @ 80+50N & 126+10E	12
C1-87 @ 80+50N & 125+90E	10
C1-88 @ 80+50N & 125+50E	12
C1-89 @ 80+50N & 125+10E	12
C1-90 @ 80+50N & 124+90E	13
C1-91 @ 80+50N & 124+50E	13
C1-92 @ 80+50N & 124+10E	14
C1-93 @ 80+50N & 123+75E	15

Location	Thickness (inches)
Clay Thicknesses (2nd Lift)	
C2-82 @ 80+50N & 126+10E	18
C2-83 @ 80+50N & 125+90E	16
C2-84 @ 80+50N & 125+50E	18
C2-85 @ 80+50N & 125+25E	18
C2-86 @ 80+50N & 124+90E	19
C2-87 @ 80+50N & 124+50E	18
C2-88 @ 80+50N & 124+10E	20
C2-89 @ 80+50N & 123+75E	19

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Daniel Eisman

5/16/12

SCANNED

DELIVERED AUG 1 3 2012

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Record of Daily Activities

Project: Trailridge Landfill Phase III	S	**M**	T	W	T	F	S
Project No: 6736-11-5123	Sunny		Cloudy		**Rainy**		
Client: MAE Engineering	<32	32-40s	50s	60s	70s		
AMEC Representative: Sampson Reamy	**80s**	90s	100s	110s	+		
Date: 7/30/12 Active Site Time:	Concrete Air Meter SN:						

ACTIVITIES:

At the request of MAE Engineering, a representative of AMEC Environment & Infrastructure, Inc. visited the site today to perform four density tests on Phase I initial cover. All tests achieved required compaction of 90%. See corresponding "Report of Field Density Tests" for results.

Location	Thickness (inches)
I-141 @ 85+50N & 126+25E	12+
I-145 @ 86+75N & 125+25E	12+
I-139 @ 85+50N & 124+50E	12+
I-139 @ 85+25N & 123+75E	12+

Client's Representative:

This report is subject to revision after review.

Reviewed by:

Daniel Eisman

8/6/12

SCANNED

REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

amec

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 10/7/2011
JOB NUMBER: 6736-11-5123
REPORT ID: D001

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
10/5/2011	1	7.5	107.7	1	117.8	10.0	91.4	90.0	D6938	*See comments
Location:	Approx. 10' E & 6' S of N corner of test strip, initial cover									
Comments:	*Finished initial cover									
10/5/2011	2	9.2	110.0	1	117.8	10.0	93.4	90.0	D6938	*See comments
Location:	Approx. 12' W & 10' N of SE corner of test strip, initial cover									
Comments:	*Finished initial cover									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

DISTRIBUTION

Tina Meskel, Meskel & Associates (1)

RESPECTFULLY SUBMITTED

Michael J. Holm

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DELIVERED OCT 1 9 2011

REPORT OF FIELD DENSITY TESTS

amec

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 10/17/2011
JOB NUMBER: 6736-11-5123
REPORT ID: D002

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
10/11/2011	3	11.2	112.0	1	117.8	10.0	**95.1**	90.0	D6938	*See comments
Location:	Approx. 21' S & 11' W of NE corner of 2nd test strip area									
Comments:	*Finished initial cover									
10/11/2011	4	12.9	110.6	1	117.8	10.0	**93.9**	90.0	D6938	*See comments
Location:	Approx. 19' N & 19' E of SW corner of 2nd test strip area									
Comments:	*Finished initial cover									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 1/10/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D003

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
10/12/2011	5	35.8	80.0	2	89.0	29.9	89.9	0.0	D6938	*See comments
Location:	P-1, clay test strip, bottom clay layer N2142154.050; E326717.445									
Comments:	*Top of 1st layer clay lift		Clay Thickness: 11-1/2"							
10/12/2011	6	32.6	81.2	2	89.0	29.9	91.2	0.0	D6938	*See comments
Location:	P-2, clay test strip, bottom clay layer, N2142176.882; E326718.869									
Comments:	*Top of 1st layer clay lift		Clay Thickness: 13"							
10/12/2011	7	34.6	82.9	2	89.0	29.9	93.1	0.0	D6938	*See comments
Location:	P-3, clay test strip, bottom clay layer, N2142148.858; E326735.932									
Comments:	*Top of 1st layer clay lift		Clay Thickness: 7"							
10/12/2011	8	36.8	80.8	2	89.0	29.9	90.8	0.0	D6938	*See comments
Location:	P-4, clay test strip, bottom clay layer, N 2142168.611; E326737.379									
Comments:	*Top of 1st layer clay lift		Clay Thickness: 12"							
10/12/2011	9	32.8	82.3	2	89.0	29.9	92.5	0.0	D6938	*See comments
Location:	P-5, clay test strip, bottom clay layer, N2142152.105; E326759.150									
Comments:	*Top of 1st layer clay lift		Clay Thickness: 6"							
10/12/2011	10	34.0	80.5	2	89.0	29.9	90.4	0.0	D6938	*See comments
Location:	P-6, clay test strip, bottom clay layer, N2142177.703; E326749.569									
Comments:	*Top of 1st layer clay lift		Clay Thickness: 11"							
10/12/2011	11	34.3	81.4	2	89.0	29.9	91.5	0.0	D6938	*See comments
Location:	P-7, clay test strip, bottom clay layer, N2142152.102; E326760.920									
Comments:	*Top of 1st layer clay lift		Clay Thickness: 6-1/2"							
10/12/2011	12	37.1	80.3	2	89.0	29.9	90.2	0.0	D6938	*See comments
Location:	P-8, Clay test strip, bottom clay layer, N2142177.568; E326773.304									
Comments:	*Top of 1st layer clay lift		Clay Thickness: 9-1/4"							
10/13/2011	13	30.5	85.2	2	89.0	29.9	95.7	0.0	D6938	*See comments
Location:	P-9, clay test strip, top clay layer, N2142178.608; E326719.378									
Comments:	*Top of 2nd layer clay lift		Clay Thickness: 16"							
10/13/2011	14	36.9	79.2	2	89.0	29.9	89.0	0.0	D6938	*See comments
Location:	P-10, clay test strip, top clay layer, N2142159.583; E326717.482									
Comments:	*Top of 2nd layer clay lift		Clay Thickness: 18"							
10/13/2011	15	32.8	83.9	2	89.0	29.9	94.3	0.0	D6938	*See comments
Location:	P-11, clay test strip, top clay layer, N2142159.583; E326717.482									
Comments:	*Top of 2nd layer clay lift		Clay Thickness: 17-1/8"							
10/13/2011	16	34.0	84.9	2	89.0	29.9	95.4	0.0	D6938	*See comments
Location:	P-12, clay test strip, top clay layer, N2142174.522; E326730.666									
Comments:	*Top of 2nd layer clay lift		Clay Thickness: 17-1/2"							

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 1/10/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D003

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
10/13/2011	17	32.5	85.0	2	89.0	29.9	**95.5**	0.0	D6938	*See comments
Location:	P-13, clay test strip, top clay layer, N2142173.295; E326751.350									
Comments:	*Top of 2nd layer clay lift Clay Thickness: 15-1/4"									
10/13/2011	18	32.3	84.1	2	89.0	29.9	**94.5**	0.0	D6938	*See comments
Location:	P-14, clay test strip, top clay layer, N2142156.831; E326744.920									
Comments:	*Top of 2nd layer clay lift Clay Thickness: 14"									
10/13/2011	19	33.1	82.7	2	89.0	29.9	**92.9**	0.0	D6938	*See comments
Location:	P-15, clay test strip, top clay layer, N214259.571; E326760.419									
Comments:	*Top of 2nd layer clay lift Clay Thickness: 16-1/4"									
10/13/2011	20	34.3	83.0	2	89.0	29.9	**93.3**	0.0	D6938	*See comments
Location:	P-16, clay test strip, top clay layer, N2142175.291; E326760.702									
Comments:	*Top of 2nd layer clay lift Clay Thickness: 16-1/4"									
10/28/2011	21	7.2	108.3	3	112.5	10.2	**96.3**	90.0	D6938	Finished grade
Location:	I-1, Unit 27, 7450N; 1020E									
Comments:	Thickness: 12"+									
10/28/2011	22	8.6	111.7	3	112.5	10.2	**99.3**	90.0	D6938	Finished grade
Location:	I-2, Unit 27, 74+75N; 101+75E									
Comments:	Thickness: 12"+									
10/28/2011	23	7.5	108.0	3	112.5	10.2	**96.0**	90.0	D6938	Finished grade
Location:	I-3, Unit 27, 74+75N; 102+50E									
Comments:	Thickness: 12"+									
10/28/2011	24	11.8	98.3	3	112.5	10.2	**87.4<<**	90.0	D6938	Finished grade
Location:	I-4, Unit 27, 74+50N; 103+00E									
Comments:	Thickness: 12"+									
10/28/2011	25	15.8	107.3	3	112.5	10.2	**95.4**	90.0	D6938	Finished grade
Location:	RETEST of #24 - I-4, Unit 27, 74+50N; 103+00E									
Comments:	Thickness: 12"+									
10/28/2011	26	6.3	109.8	3	112.5	10.2	**97.6**	90.0	D6938	Finished grade
Location:	I-5, Unit 27, 74+75N; 103+50E									
Comments:	Thickness: 12"+									
10/28/2011	27	5.9	106.0	3	112.5	10.2	**94.2**	90.0	D6938	Finished grade
Location:	I-6, Unit 27, 74+90N; 104+00E									
Comments:	Thickness: 12"+									
10/28/2011	28	6.5	111.7	4	113.3	9.4	**98.6**	90.0	D6938	Finished grade
Location:	I-7, Unit 28, 75+20N; 103+75E									
Comments:	Thickness: 12"+									

REPORT OF FIELD DENSITY TESTS

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CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 1/10/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D003

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
10/28/2011	29	3.3	110.4	4	113.3	9.4	**97.4**	90.0	D6938	Finished grade
Location:	I-8, Unit 28, 75+50N; 103+50E									
Comments:	Thickness: 12"+									
10/28/2011	30	10.9	111.6	4	113.3	9.4	**98.5**	90.0	D6938	Finished grade
Location:	I-9, Unit 28, 75+00N; 103+00E									
Comments:	Thickness: 12"+									
10/28/2011	31	5.9	103.6	4	113.3	9.4	**91.4**	90.0	D6938	Finished grade
Location:	I-10, Unit 28, 75+25N; 102+50E									
Comments:	Thickness: 12"+									
10/28/2011	32	10.5	105.4	4	113.3	9.4	**93.0**	90.0	D6938	Finished grade
Location:	I-11, Unit 29, 76+43N; 103+50E									
Comments:	Thickness: 12"+									
10/28/2011	33	4.9	109.3	4	113.3	9.4	**96.5**	90.0	D6938	Finished grade
Location:	I-12, Unit 29, 76+25N; 104+00E									
Comments:	Thickness: 12"+									
10/28/2011	34	7.5	110.3	4	113.3	9.4	**97.4**	90.0	D6938	Finished grade
Location:	I-13, Unit 29, 76+00N; 104+50E									
Comments:	Thickness: 12"+									
10/28/2011	35	10.7	103.5	4	113.3	9.4	**91.4**	90.0	D6938	Finished grade
Location:	I-14, Unit 29, 75+75N; 105+00									
Comments:	Thickness: 12"+									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

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CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 11/15/2011
JOB NUMBER: 6736-11-5123
REPORT ID: D004

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
11/11/2011	36	28.8	86.9	2	89.0	29.9	**97.6**	80.0	D6938	*See commetns
Location:	CL-1, 101+75 E @ 74+75 N, 8" thick									
Comments:	*1st lift of clay liner									
11/11/2011	37	27.3	87.6	2	89.0	29.9	**98.4**	80.0	D6938	*See comments
Location:	CL-3, 102+50 E @ 75+50 N, 8" thick									
Comments:	*1st lift of clay liner									
11/11/2011	38	25.3	88.9	2	89.0	29.9	**99.9**	80.0	D6938	*See comments
Location:	CL-6, 104+0 E @ 175+50 N, 8" thick									
Comments:	*1st lift of clay liner									
11/11/2011	39	28.9	84.4	2	89.0	29.9	**94.8**	80.0	D6938	*See comments
Location:	CL-8, 103+50 E @ 75+00 N, 8" thick									
Comments:	*1st lift of clay liner									
11/11/2011	40	10.4	111.7	5	117.7	9.8	**94.9**	90.0	D6938	*See comments
Location:	I-15, 104+50 E @ 74+50 N, +12" thick									
Comments:	*Intermediate cover									
11/11/2011	41	10.0	111.3	6	117.8	10.0	**94.5**	90.0	D6938	*See comments
Location:	I-16, 105+00 E @ 74+75 N, +12" thick									
Comments:	*Intermediate cover									
11/11/2011	42	13.6	108.8	6	117.8	10.0	**92.4**	90.0	D6938	*See comments
Location:	I-17, 105+50 E @ 74+50 N, +12" thick									
Comments:	Intermediate cover									
11/11/2011	43	7.8	109.3	6	117.8	10.0	**92.8**	90.0	D6938	*See comments
Location:	I-18, 106+00 E @ 74+40 N, +12" thick									
Comments:	*Intermediate cover									
11/11/2011	44	13.0	109.3	6	117.8	10.0	**92.8**	90.0	D6938	*See comments
Location:	I-19, 106+50 E @ 74+90 N, +12" thick									
Comments:	*Intermediate cover									
11/11/2011	45	9.8	109.2	6	117.8	10.0	**92.7**	90.0	D6938	*See comments
Location:	I-20, 106+25 E @ 75+25 N, +12" thick									
Comments:	*Intermediate cover									
11/11/2011	46	10.9	106.0	5	117.7	9.8	**90.1**	90.0	D6938	*See comments
Location:	I-21, 105+75 E @ 75+00 N, +12" thick									
Comments:	*Intermediate cover									
11/11/2011	47	12.1	109.0	5	117.7	9.8	**92.6**	90.0	D6938	*See comments
Location:	I-22, 105+50 E @ 75+50 N, +12" thick									
Comments:	*Intermediate cover									

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

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CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 11/15/2011
JOB NUMBER: 6736-11-5123
REPORT ID: D004

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
11/11/2011	48	12.2	105.9	5	117.7	9.8	**90.0**	90.0	D6938	*See comments
Location:	I-23, 106+0 E @ 76+0 N, +12" thick									
Comments:	*Intermediate cover									
11/11/2011	49	12.1	106.4	5	117.7	9.8	**90.4**	90.0	D6938	*See comments
Location:	I-24, 106+25 E @ 76+50 N, +12" thick									
Comments:	*Intermediate cover									
11/11/2011	50	7.6	109.0	5	117.7	9.8	**92.6**	90.0	D6938	*See comments
Location:	I-25, 104+50 E @ 75+25 N, +12" thick									
Comments:	*Intermediate cover									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 1/10/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D005

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
11/21/2011	51	25.1	89.5	2	89.0	29.9	100.6	80.0	D6938	*See comments
Location:	C1-13 @ 104+50 E, & 76+25 N									
Comments:	*1st lift 6" clay liner									
11/21/2011	52	29.7	79.2	2	89.0	29.9	89.0	80.0	D6938	*See comments
Location:	C1-14 @ 105+50 E, & 76+0 N									
Comments:	*1st lift 6" clay liner									
11/21/2011	53	23.7	89.8	2	89.0	29.9	100.9	80.0	D6938	*See comments
Location:	C1-15 @ 105+75 E, & 76+25 N									
Comments:	*1st lift 6" clay liner									
11/21/2011	54	25.8	89.2	2	89.0	29.9	100.2	80.0	D6938	*See comments
Location:	C1-17 @ 105+50 E, & 75+0 N									
Comments:	*1st lift 6" clay liner									
11/21/2011	55	24.2	90.8	2	89.0	29.9	102.0	80.0	D6938	*See comments
Location:	C1-20 @ 105+0 E, & 75+50 N									
Comments:	*1st lift 6" clay liner									
11/21/2011	56	22.3	91.7	2	89.0	29.9	103.0	80.0	D6938	*See comments
Location:	C1-22 @ 106+25 E, & 74+75 N									
Comments:	1st 6" lift clay liner									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
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REPORT OF FIELD DENSITY TESTS

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3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 11/30/2011
JOB NUMBER: 6736-11-5123
REPORT ID: D006

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
11/22/2011	57	27.1	87.6	2	89.0	29.9	**98.4**	80.0	D6938	*See comments
Location:	W phase line to 104+00E, C2-1 @ 102+00 E @ 74+75 N									
Comments:	*2nd 6" lift clay liner									
11/22/2011	58	29.0	89.4	2	89.0	29.9	**100.4**	80.0	D6938	*See comments
Location:	W phase line to 104+00E, C2-5 @ 103+00 E @ 75+00 N									
Comments:	*2nd 6" lift clay liner									
11/22/2011	59	28.9	86.4	2	89.0	29.9	**97.1**	80.0	D6938	*See comments
Location:	W phase line to 104+00E, C2-9 @ 104+00 E @ 75+75 N									
Comments:	*2nd 6" lift clay liner									
11/22/2011	60	26.0	91.7	2	89.0	29.9	**103.0**	80.0	D6938	*See comments
Location:	W phase line to 104+00E, C2-4 @ 103+00 E @ 76+00 N									
Comments:	*2nd 6" lift clay liner									
11/22/2011	61	25.5	91.0	2	89.0	29.9	**102.2**	80.0	D6938	*See comments
Location:	W phase line to 104+00E, C2-3 @ 102+50 E @ 75+50 N									
Comments:	*2nd 6" lift clay liner									
11/22/2011	62	21.9	86.9	2	89.0	29.9	**97.6**	80.0	D6938	*See comments
Location:	W phase line to 104+00E, C2-11 @ 104+00 E @ 74+75 N									
Comments:	*2nd 6 lift clay liner									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 12/20/2011
JOB NUMBER: 6736-11-5123
REPORT ID: D007

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
12/16/2011	63	23.8	84.9	2	89.0	29.9	**95.4**	80.0	D6938	2nd lift, 6" clay
Location:	C2-18, 105+50 E, 74+50 N									
Comments:	Thickness: 13"									
12/16/2011	64	25.2	90.0	2	89.0	29.9	**101.1**	80.0	D6938	2nd lift, 6" clay
Location:	C2-15, 105+00 E, 76+40 N									
Comments:	Thickness: 15"									
12/16/2011	65	25.3	82.7	2	89.0	29.9	**92.9**	80.0	D6938	2nd lift, 6" clay
Location:	C2-21, 106+25 E, 76+00 N									
Comments:	Thickness: 14"									
12/16/2011	66	23.2	89.8	2	89.0	29.9	**100.9**	80.0	D6938	2nd lift, 6" clay
Location:	C2-16, 105+50 E, 75+50 N									
Comments:	Thickness: 13"									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 1/3/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D008

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
12/29/2011	67	6.5	112.4	5	117.7	9.8	**95.5**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-27, 107+50 E, 46+00 N									
Comments:										
12/29/2011	68	6.4	108.7	5	117.7	9.8	**92.4**	90.0	D6938	1st12" lift
Location:	Intermediate cover, I-29, 108+75 E, 76+40 N									
Comments:										
12/29/2011	69	8.6	111.1	5	117.7	9.8	**94.4**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-35, 113+00 E, 76+00 N									
Comments:										
12/29/2011	70	10.4	118.1	5	117.7	9.8	**100.3**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-33, 111+00 E, 76+00 N									
Comments:										
12/29/2011	71	6.3	107.0	5	117.7	9.8	**90.9**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-37, 112+15 E, 75+50 N									
Comments:										
12/29/2011	72	5.3	113.1	5	117.7	9.8	**96.1**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-40, 110+50 E, 75+50 N									
Comments:										
12/29/2011	73	9.0	111.5	5	117.7	9.8	**94.7**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-44, 108+50 E, 75+50 N									
Comments:										
12/29/2011	74	8.4	106.3	5	117.7	9.8	**90.3**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-46, 107+50 E, 72+25 N									
Comments:										
12/29/2011	75	5.6	105.7	5	117.7	9.8	**89.8<<**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-47, 107+00 E, 75+50 N									
Comments:										
12/29/2011	76	6.8	111.8	5	117.7	9.8	**95.0**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-48, 107+00 E, 74+75 N									
Comments:										
12/29/2011	77	10.6	107.5	5	117.7	9.8	**91.3**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-49, 108+25 E, 74+75 N									
Comments:										
12/29/2011	78	8.8	113.6	5	117.7	9.8	**96.5**	90.0	D6938	1st 12" lift
Location:	Intermediate cover, I-50, 111+00 E, 44+75 N									
Comments:										
12/29/2011	79	11.4	110.2	5	117.7	9.8	**93.6**	90.0	D6938	1st 12" lift

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 1/3/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D008

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
Location: Intermediate cover, I-38, 112+00 E, 75+00 N										
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 1/24/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D009

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
1/13/2012	80	15.6	91.8	2	89.0	29.9	**103.1**	80.0	D6938	*See comments
Location:	C1-24, Sta. 107+00E & 75+75N									
Comments:	*Finished 1st lift clay		Thicknes: 8"							
1/13/2012	81	22.4	93.4	2	89.0	29.9	**104.9**	80.0	D6938	*See comments
Location:	C1-28, Sta. 108+50E & 76+25N									
Comments:	*Finished 1st lift clay		Thickness: 6"							
1/13/2012	82	21.9	89.4	2	89.0	29.9	**100.4**	80.0	D6938	*See comments
Location:	C1-30, Sta. 109+75E & 76+00N									
Comments:	*Finished 1st lift clay		Thickness: 7"							
1/13/2012	83	23.6	88.7	2	89.0	29.9	**99.7**	80.0	D6938	*See comments
Location:	C1-32, Sta. 110+50E & 76+00N									
Comments:	*Finished 1st lift clay		Thickness: 7"							
1/13/2012	84	22.6	93.5	2	89.0	29.9	**105.1**	80.0	D6938	*See comments
Location:	C1-36, Sta. 111+00E & 75+15N									
Comments:	*Finished 1st lift clay		Thickness: 7"							
1/13/2012	85	30.1	85.2	2	89.0	29.9	**95.7**	80.0	D6938	*See comments
Location:	C1-40, Sta. 108+00E & 75+00N									
Comments:	*Finished 1st lift clay		Thickness: 6"							
1/13/2012	86	23.3	89.7	2	89.0	29.9	**100.8**	80.0	D6938	*See comments
Location:	C1-45, Sta. 108+50E & 74+50N									
Comments:	*Finished 1st lift clay		Thickness: 8"							
1/13/2012	87	22.8	94.5	2	89.0	29.9	**106.2**	80.0	D6938	*See comments
Location:	C1-47, Sta. 110+50E & 74+50N									
Comments:	*Finished 1st lift clay		Thickness: 8"							
1/13/2012	88	8.4	111.8	5	117.7	9.8	**95.0**	90.0	D6938	*See comments
Location:	I-57, Sta. 114+50E & 75+25N									
Comments:	*Finished initial cover		Thickness: 12"+							
1/13/2012	89	12.4	105.4	4	113.3	9.4	**93.0**	90.0	D6938	*See comments
Location:	I-58, Sta. 114+00E & 74+50N									
Comments:	*Finished initial cover		Thickness: 12"+							
1/13/2012	90	6.0	96.4	5	117.7	9.8	**81.9<<**	90.0	D6938	*See comments
Location:	D-47, I-59, Sta. 106+75E & 74+80N									
Comments:	*Finished inital cover @ downcomer		Thickness: 12"+							
1/13/2012	91	12.8	96.2	5	117.7	9.8	**81.7<<**	90.0	D6938	*See comments
Location:	D-47, I-61, Sta. 106+75E & 75+25N									
Comments:	*Finished inital cover @ downcomer		Thickness: 12"+							
1/13/2012	92	12.3	109.4	5	117.7	9.8	**92.9**	90.0	D6938	*See comments

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

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CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 1/24/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D009

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
Location:	D-47, I-64, Sta. 106+75E & 76+60N									
Comments:	*Finished inital cover @ downcomer			Thickness: 12"+						
1/13/2012	93	8.2	105.5	5	117.7	9.8	**89.6<<**	90.0	D6938	*See comments
Location:	RETEST of #91 - D-47, I-61, Sta. 106+75E & 75+25N									
Comments:	*Finished inital cover @ downcomer			Thickness: 12"+			Round to 90 % → OK MJH			
1/13/2012	94	9.6	110.9	5	117.7	9.8	**94.2** ✓	90.0	D6938	*See comments
Location:	RETEST of #90 - D-47, I-59, Sta. 106+75E & 74+80N									
Comments:	*Finished inital cover @ downcomer			Thickness: 12"+						
1/16/2012	95	26.7	88.4	2	89.0	29.9	**99.3**	80.0	D6938	*See comments
Location:	D-47, C1-49, Sta. 106+77E & 74+50N; perm/atterberg/% fines/moisture									
Comments:	*Finished 1st lift clay			Thickness: 10"						
1/16/2012	96	27.3	90.1	2	89.0	29.9	**101.2**	80.0	D6938	*See comments
Location:	D-47, C1-51, Sta. 106+77E & 75+25N; perm/atterberg/% fines/moisture									
Comments:	Finished 1st lift clay			Thickness: 12"						
1/16/2012	97	25.7	91.1	2	89.0	29.9	**102.4**	80.0	D6938	*See comments
Location:	D-47, C1-53, Sta. 106+77E & 76+00N; perm/atterberg/% fines/moisture									
Comments:	*Finished 1st lift clay			Thickness: 6"						
1/16/2012	98	20.9	91.7	2	89.0	29.9	**103.0**	80.0	D6938	*See comments
Location:	D-47, C1-56, Sta. 112+00E & 75+00N; perm/atterberg/% fines/moisture									
Comments:	*Finished 1st lift clay			Thickness: 7"						
1/16/2012	99	24.3	85.3	2	89.0	29.9	**95.8**	80.0	D6938	*See comments
Location:	D-47, C1-58, Sta. 112+00E & 76+50N; perm/atterberg/% fines/moisture									
Comments:	*Finished 1st lift clay			Thickness: 6.5"						
1/16/2012	100	24.5	87.4	2	89.0	29.9	**98.2**	80.0	D6938	*See comments
Location:	C1-59, Sta. 113+50E & 76+50N; % fines/moisture									
Comments:	*Finished 1st lift clay			Thickness: 7"						
1/16/2012	101	13.7	106.8	7	120.6	11.9	**88.6**	80.0	D6938	*See comments
Location:	C1-62, Sta. 112+50E & 75+50N; % fines/moisture									
Comments:	*Finished 1st lift clay			Thickness: 6"						
1/16/2012	102	21.1	93.0	2	89.0	29.9	**104.5**	80.0	D6938	*See comments
Location:	C1-63, Sta. 113+00E & 75+00N; % fines/moisture									
Comments:	*Finished first lift clay			Thickness: 7"						
1/16/2012	103	29.2	82.9	2	89.0	29.9	**93.1**	80.0	D6938	*See comments
Location:	C1-64, Sta. 114+00E & 74+75N; perm/atterberg/% fines/moisture									
Comments:	*Finished 1st lift clay			Thickness: 7.5"						

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 1/24/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D009

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 2/24/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D010

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
1/17/2012	104	35.9	81.8	2	89.0	29.9	**91.9**	80.0	D6938	2nd clay liner lift
Location:	C2-22, 106+75E @ 74+50N (D47)									
Comments:										
1/17/2012	105	43.5	77.0	2	89.0	29.9	**86.5**	80.0	D6938	2nd clay liner lift
Location:	C2-25, 106+75E @ 75+50N (D47)									
Comments:										
1/17/2012	106	36.6	81.1	2	89.0	29.9	**91.1**	80.0	D6938	2nd clay liner lift
Location:	C2-27, 106+75E @ 76+60N (D47)									
Comments:										
1/19/2012	107	8.7	108.3	5	117.7	9.8	**92.0**	90.0	D6938	Intermed. cover
Location:	Downcomer 44, 111+50E @ 75+50N, Phase III, I65									
Comments:	Thickness: 12"+									
1/19/2012	108	8.5	107.2	5	117.7	9.8	**91.1**	90.0	D6938	Intermed. cover
Location:	Downcomer 44, 111+50E @ 75+20N, Phase III, I66									
Comments:	Thickness: 12"+									
1/19/2012	109	6.9	108.8	5	117.7	9.8	**92.4**	90.0	D6938	Intermed. cover
Location:	Downcomer 44, 111+50E @ 75+80N, Phase III, I67									
Comments:	Thickness: 12"+									
1/19/2012	110	9.0	107.9	5	117.7	9.8	**91.7**	90.0	D6938	Intermed. cover
Location:	Downcomer 44, 111+50E @ 76+40N, Phase III, I68									
Comments:	*Thickness: 12"+									
1/19/2012	111	13.1	107.6	5	117.7	9.8	**91.4**	90.0	D6938	Intermed. cover
Location:	RETEST #75 - 107+00E @ 75+50N, I47R									
Comments:	Thickness: 12"+									
1/20/2012	112	35.4	83.0	2	89.0	29.9	**93.3**	80.0	D6938	1st lift of clay line
Location:	Downcomer 44, 111+50E @ 74+90N, C1-67									
Comments:										
1/20/2012	113	35.2	84.1	2	89.0	29.9	**94.5**	80.0	D6938	1st lift of clay line
Location:	Downcomer 44, 111+50E @ 75+70N, C1-69									
Comments:										
1/20/2012	114	34.4	83.4	2	89.0	29.9	**93.7**	80.0	D6938	1st lift of clay line
Location:	Downcomer 44, 111+50E @ 76+40N, C1-71									
Comments:										

REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 2/24/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D010

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

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3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 2/1/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D011

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
1/24/2012	115	35.3	80.7	2	89.0	29.9	**90.7**	80.0	D6938	*See comments
Location:	C2-28, Downcomer D-44 @ sta. 111+50E & 74+50N									
Comments:	*Finished 2nd lift, clay layer									
1/24/2012	116	31.8	85.3	2	89.0	29.9	**95.8**	80.0	D6938	*See comments
Location:	C2-30, Downcomer D-44 @ sta. 111+50E & 75+25N									
Comments:	*Finished 2nd lift, clay layer									
1/24/2012	117	33.2	73.2	2	89.0	29.9	**82.2**	80.0	D6938	*See comments
Location:	C2-32, Downcomer D-44 @ sta. 111+50E & 76+00N									
Comments:	*Finished 2nd lift, clay layer									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 2/13/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D012

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
1/31/2012	118	26.0	88.4	2	89.0	29.9	99.3	80.0	D6938	*See comments
Location:	C2-35, Sta. 107+50E & 75+75N (CA)									
Comments:	*2nd lift clay finished									
1/31/2012	119	21.9	87.5	2	89.0	29.9	98.3	80.0	D6938	*See comments
Location:	C2-36,Sta. 108+00E & 76+50N (P/AH/CA)									
Comments:	*2nd lift clay finished									
1/31/2012	120	21.9	89.1	2	89.0	29.9	100.1	80.0	D6938	*See comments
Location:	C2-39, Sta. 109+50E & 76+50N (P/ATT/CA)									
Comments:	*2nd lift clay finished									
1/31/2012	121	22.4	91.6	2	89.0	29.9	102.9	80.0	D6938	*See comments
Location:	C2-41, Sta. 110+50E & 76+00N (CA)									
Comments:	*2nd lift clay finished									
1/31/2012	122	22.3	92.7	2	89.0	29.9	104.2	80.0	D6938	*See comments
Location:	C2-44, Sta. 112+25E & 76+25N (P/ATT/CA)									
Comments:	*2nd lift clay finished									
1/31/2012	123	22.5	92.8	2	89.0	29.9	104.3	80.0	D6938	*See comments
Location:	C2-46, Sta. 114+00E & 76+00N (P/AH/CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	124	22.5	83.6	2	89.0	29.9	93.9	80.0	D6938	*See comments
Location:	C2-47, Sta. 114+50E & 76+50N (CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	125	22.5	91.9	2	89.0	29.9	103.3	80.0	D6938	*See comments
Location:	C2-49, Sta. 112+50E & 75+50N (CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	126	25.7	88.0	2	89.0	29.9	98.9	80.0	D6938	*See comments
Location:	C2-51, Sta. 111+00E & 75+50N (P/AH/CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	127	21.0	93.3	2	89.0	29.9	104.8	80.0	D6938	*See comments
Location:	C2-53, Sta. 110+00E & 75+50N (CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	128	19.7	94.0	2	89.0	29.9	105.6	80.0	D6938	*See comments
Location:	C2-54, Sta. 109+50E & 75+50N (P/AH/CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	129	19.0	93.8	2	89.0	29.9	105.4	80.0	D6938	*See comments
Location:	C2-56, Sta. 108+50E & 75+00 (N/CA)									
Comments:	*Finished 2nd lift clay									

REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 2/13/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D012

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
1/31/2012	130	23.4	86.8	2	89.0	29.9	**97.5**	80.0	D6938	*See comments
Location:	C2-58, Sta. 107+50E & 75+00N (P/AH/CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	131	20.4	92.6	2	89.0	29.9	**104.0**	80.0	D6938	*See comments
Location:	C2-59, Sta. 108+00E & 74+50N (CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	132	20.9	93.8	2	89.0	29.9	**105.4**	80.0	D6938	*See comments
Location:	C2-60, Sta. 108+50E & 74+50N (P/AH/CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	133	22.1	88.0	2	89.0	29.9	**98.9**	80.0	D6938	*See comments
Location:	C2-62, Sta. 110+00E & 74+50N (CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	134	17.3	97.2	8	92.5	19.9	**105.1**	80.0	D6938	*See comments
Location:	C2-63, Sta. 111+00E & 74+50N (P/AH/CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	135	19.9	91.6	2	89.0	29.9	**102.9**	80.0	D6938	*See comments
Location:	C2-64, Sta. 112+00E & 74+75N (CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	136	22.0	89.4	2	89.0	29.9	**100.4**	80.0	D6938	*See comments
Location:	C2-65, Sta. 112+75E & 74+50N (P/AH/CA)									
Comments:	*Finished 2nd lift clay									
1/31/2012	137	23.4	88.9	2	89.0	29.9	**99.9**	80.0	D6938	*See comments
Location:	C2-67, Sta. 114+00E & 75+00N									
Comments:	*Finished 2nd lift clay									
1/31/2012	138	10.3	103.9	4	113.3	9.4	**91.7**	90.0	D6938	*See comments
Location:	IC-69, Sta. 115+50E & 75+75N									
Comments:	*Finished initial cover									
1/31/2012	139	8.0	107.3	5	117.7	9.8	**91.2**	90.0	D6938	*See comments
Location:	IC-70, Sta. 117+50E & 76+75N									
Comments:	*Finished initial cover									
1/31/2012	140	10.7	108.5	5	117.7	9.8	**92.2**	90.0	D6938	*See comments
Location:	IC-71, Sta. 118+75E & 76+75N									
Comments:	*Finished initial cover									
1/31/2012	141	10.4	106.2	5	117.7	9.8	**90.2**	90.0	D6938	*See comments
Location:	IC-73, Sta. 118+75E & 75+75N									
Comments:	*Finished initial cover									

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 2/13/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D012

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
1/31/2012	142	11.2	101.8	5	117.7	9.8	**86.5<<**	90.0	D6938	*See comments
Location:	IC-74, Sta. 117+00E & 75+40N									
Comments:	*Finished initial cover									
1/31/2012	143	8.4	107.9	5	117.7	9.8	**91.7**	90.0	D6938	*See comments
Location:	IC-75, Sta. 116+50E & 75+75N									
Comments:	*Finished initial cover									
1/31/2012	144	7.8	106.3	5	117.7	9.8	**90.3**	90.0	D6938	*See comments
Location:	IC-76, Sta. 116+00, 74+75N									
Comments:	*Finished initial cover									
1/31/2012	145	5.4	104.0	5	117.7	9.8	**88.4<<**	90.0	D6938	*See comments
Location:	IC-77, Sta. 117+50E & 74+75N									
Comments:	*Finished initial cover									
1/31/2012	146	11.3	100.3	5	117.7	9.8	**85.2<<**	90.0	D6938	*See comments
Location:	IC-78, Sta. 118+00E & 75+25N									
Comments:	*Finished initial cover									
1/31/2012	147	7.6	102.5	5	117.7	9.8	**87.1<<**	90.0	D6938	*See comments
Location:	IC-80, Sta. 118+50E & 74+40N									
Comments:	*Finished initial cover									
2/2/2012	148	6.7	103.8	4	113.3	9.4	**91.6**	90.0	D6938	*See comments
Location:	I-81, Sta. 120+25E & 77+00N									
Comments:	*Finished initial cover									
2/2/2012	149	4.6	106.4	5	117.7	9.8	**90.4**	90.0	D6938	*See comments
Location:	I-82, Sta. 121+00E & 77+50N									
Comments:	*Finished initial cover									
2/2/2012	150	4.1	108.4	5	117.7	9.8	**92.1**	90.0	D6938	*See comments
Location:	I-83, Sta. 122+25E & 77+50N									
Comments:	*Finished initial cover									
2/2/2012	151	5.8	108.0	5	117.7	9.8	**91.8**	90.0	D6938	*See comments
Location:	I-84, Sta. 122+50E & 77+00N									
Comments:	*Finished initial cover									
2/2/2012	152	5.5	112.6	5	117.7	9.8	**95.7**	90.0	D6938	*See comments
Location:	I-87, Sta. 120+00E & 76+25N									
Comments:	*Finished initial cover									
2/2/2012	153	7.9	107.0	5	117.7	9.8	**90.9**	90.0	D6938	*See comments
Location:	I-88, Sta. 121+50E & 75+25N									
Comments:	*Finished initial cover									

REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 2/13/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D012

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
2/2/2012	154	9.6	111.3	5	117.7	9.8	**94.6**	90.0	D6938	*See comments
Location:	I-89, Sta. 122+00E * 76+00N									
Comments:	*Finished initial cover									
2/2/2012	155	7.3	111.3	5	117.7	9.8	**94.6**	90.0	D6938	*See comments
Location:	I-90, Sta. 123+00E & 76+50N									
Comments:	*Finished initial cover									
2/2/2012	156	5.5	106.5	5	117.7	9.8	**90.5**	90.0	D6938	*See comments
Location:	I-91, Sta. 123+50E & 76+00N									
Comments:	*Finished initial cover									
2/2/2012	157	9.2	106.2	5	117.7	9.8	**90.2**	90.0	D6938	*See comments
Location:	RETEST of #142 - IC-74, Sta. 117+00E & 75+40N									
Comments:	*Finished initial cover									
2/2/2012	158	8.6	106.9	5	117.7	9.8	**90.8**	90.0	D6938	*See comments
Location:	RETEST of #145 - IC-77, Sta. 117+50E & 74+75N									
Comments:	*Finished initial cover									
2/2/2012	159	11.9	110.9	5	117.7	9.8	**94.2**	90.0	D6938	*See comments
Location:	RETEST of #146 - IC-78, Sta. 118+00E & 75+25N									
Comments:	*Finished initial cover									
2/2/2012	160	10.6	106.4	5	117.7	9.8	**90.4**	90.0	D6938	*See comments
Location:	RETEST of #1147 - IC-80, Sta. 118+50E & 74+40N									
Comments:	*Finished initial cover									
2/8/2012	161	10.1	110.0	5	117.7	9.8	**93.5**	90.0	D6938	*See comments
Location:	I-92 Downcomer D-4 @ Sta. 115+07E & 74+75N									
Comments:	*Finished initial cover									
2/8/2012	162	8.2	102.7	3	112.5	10.2	**91.3**	90.0	D6938	*See comments
Location:	I-93 Downcomer D-4 @ Sta. 115+07E & 74+50N									
Comments:	*Finished initial cover									
2/8/2012	163	8.5	104.2	3	112.5	10.2	**92.6**	90.0	D6938	*See comments
Location:	I-94 Downcomer D-4 @ Sta. 115+07E & 75+75N									
Comments:	*Finished initial cover									
2/8/2012	164	8.3	104.9	3	112.5	10.2	**93.2**	90.0	D6938	*See comments
Location:	I-95 Downcomer D-4 @ Sta. 115+07E & 76+25N									
Comments:	*Finished initial cover									
2/9/2012	165	38.2	77.8	2	89.0	29.9	**87.4**	80.0	D6938	*See comments
Location:	C1-72 Downcomer D-41 @ Sta. 115+07E & 74+75N									
Comments:	*Finished 1st lift, clay									

REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 2/13/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D012

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
2/9/2012	166	32.6	82.3	2	89.0	29.9	**92.5**	80.0	D6938	*See comments
Location:	C1-74 Downcomer D-41 @ Sta. 115+07E & 75+50N									
Comments:	*Finished 1st lift, clay									
2/9/2012	167	40.2	72.2	2	89.0	29.9	**81.1**	80.0	D6938	*See comments
Location:	C1-76 Downcomer D-41 @ Sta. 115+07E & 76+25N									
Comments:	*Finished 1st lift, clay									
2/9/2012	168	38.9	76.1	2	89.0	29.9	**85.5**	80.0	D6938	*See comments
Location:	C2-69 Downcomer D-41 @ Sta. 115+07E & 75+00N									
Comments:	*Finished 2nd lift, clay									
2/9/2012	169	37.2	77.5	2	89.0	29.9	**87.1**	80.0	D6938	*See comments
Location:	C2-71 Downcomer D-41 @ Sta. 115+07E & 75+75N									
Comments:	*Finished 2nd lift, clay									
2/9/2012	170	33.3	82.6	2	89.0	29.9	**92.8**	80.0	D6938	*See comments
Location:	C2-73 Downcomer D-41 @ Sta. 115+07E & 76+50N									
Comments:	*Finished 2nd lift, clay									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 2/17/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D013

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
2/14/2012	171	21.3	89.8	2	89.0	29.9	**100.9**	80.0	D6938	*See comments
Location:	C1-110, Sta. 15+75E & 74+60N (P/AH/CA)									
Comments:	*Finished 1st lift, clay									
2/14/2012	172	24.2	87.1	2	89.0	29.9	**97.9**	80.0	D6938	*See comments
Location:	C1-111, Sta. 116+50E & 76+00N (P/AH/CA)									
Comments:	*Finished 1st lift clay									
2/14/2012	173	25.5	85.6	2	89.0	29.9	**96.2**	80.0	D6938	*See comments
Location:	C1-112, Sta. 117+00E & 75+00N, (CA)									
Comments:	*Finished 1st lift clay									
2/14/2012	174	21.8	90.9	2	89.0	29.9	**102.1**	80.0	D6938	*See comments
Location:	C1-114, Sta. 118+00E & 76+00N (CA)									
Comments:	*Finished 1st lift, clay									
2/14/2012	175	23.4	86.9	2	89.0	29.9	**97.6**	80.0	D6938	*See comments
Location:	C1-118, Sta. 118+50E & 74+60N (P/AH/CA)									
Comments:	*Finished 1st lift, clay									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 3/2/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D014

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
3/1/2012	176	31.3	72.5	2	89.0	29.9	**81.5**	80.0	D6938	*See comments
Location:	C2-115, 118+50E & 74+50N (P/AH/CA)									
Comments:	*Finished 2nd lift, clay									
3/1/2012	177	28.5	81.7	2	89.0	29.9	**91.8**	80.0	D6938	*See comments
Location:	C2-110, 116+50E & 75+00N (P/AH/CA)									
Comments:	*Finished 2nd lift, clay									
3/1/2012	178	24.9	82.2	2	89.0	29.9	**92.4**	80.0	D6938	*See comments
Location:	C2-105, 116+00E & 75+75N (P/AH/CA)									
Comments:	*Finished 2nd lift, clay									
3/1/2012	179	26.3	84.9	2	89.0	29.9	**95.4**	80.0	D6938	*See comments
Location:	C2-111, 118+00E & 76+50N (P/AH/CA)									
Comments:	*Finished 2nd lift, clay									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 3/8/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D015

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
3/6/2012	180	10.6	102.2	3	112.5	10.2	**90.8**	90.0	D6938	1st lift
Location:	I-96 Intermediate cover, 119+25E & 74+60N									
Comments:	Thickness: 13+"									
3/6/2012	181	7.0	110.2	3	112.5	10.2	**98.0**	90.0	D6938	1st lift
Location:	I-97 Intermediate cover, 119+25E & 75+25N									
Comments:	Thickness: 13+"									
3/6/2012	182	6.1	112.6	3	112.5	10.2	**100.1**	90.0	D6938	1st lift
Location:	I-98 Intermediate cover, 119+25E & 76+00N									
Comments:	Thickness: 13+"									
3/6/2012	183	8.8	107.7	3	112.5	10.2	**95.7**	90.0	D6938	1st lift
Location:	I-99 Intermediate cover, 119+25E & 76+75N									
Comments:	Thickness: 13"									
3/7/2012	184	30.1	83.1	2	89.0	29.9	**93.4**	90.0	D6938	1st lift
Location:	C1-78, 119+00E & 74+40N									
Comments:										
3/7/2012	185	31.9	86.2	2	89.0	29.9	**96.9**	90.0	D6938	2nd lift
Location:	C2-75, 119+00E & 74+40N									
Comments:										
3/7/2012	186	30.5	82.2	2	89.0	29.9	**92.4**	90.0	D6938	1st lift
Location:	C1-80, 119+50E & 75+00N									
Comments:										
3/7/2012	187	31.7	82.3	2	89.0	29.9	**92.5**	90.0	D6938	2nd lift
Location:	C2-77, 119+40E & 75+25N									
Comments:										
3/7/2012	188	29.4	82.0	2	89.0	29.9	**92.1**	90.0	D6938	1st lift
Location:	C1-82, 119+40E & 75+70N									
Comments:										
3/7/2012	189	32.0	81.3	2	89.0	29.9	**91.3**	90.0	D6938	2nd lift
Location:	C2-79, 119+30E & 76+00N									
Comments:										
3/7/2012	190	32.5	81.6	2	89.0	29.9	**91.7**	90.0	D6938	1st lift
Location:	C1-84, 119+20E & 76+35N									
Comments:										
3/7/2012	191	33.1	82.4	2	89.0	29.9	**92.6**	90.0	D6938	2nd lift
Location:	C2-81, 119+20E & 76+70N									
Comments:										

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 3/8/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D015

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
3/7/2012	192	29.3	86.3	2	89.0	29.9	97.0	90.0	D6938	1st lift
Location:	C1-121, 120+50E & 77+00N									
Comments:										
3/7/2012	193	30.2	82.2	2	89.0	29.9	92.4	90.0	D6938	1st lift
Location:	C1-122, 121+00E & 76+00N									
Comments:										
3/7/2012	194	29.1	85.7	2	89.0	29.9	96.3	90.0	D6938	1st lift
Location:	C1-128 122+25E & 76+00N									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 3/15/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D016

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
3/13/2012	195	34.4	78.5	2	89.0	29.9	**88.2**	80.0	D6938	1st lift, clay
Location:	C1-80C									
Comments:	*Moisture persentages are oven-dried									
3/13/2012	196	30.1	84.1	2	89.0	29.9	**94.5**	80.0	D6938	1st lift, clay
Location:	C1-80A									
Comments:	*Moisture persentages are oven-dried									
3/13/2012	197	27.9	79.5	2	89.0	29.9	**89.3**	80.0	D6938	1st lift, clay
Location:	C1-80B									
Comments:	*Moisture persentages are oven-dried									
3/13/2012	198	53.1	67.1	2	89.0	29.9	**75.4<<**	80.0	D6938	1st lift, clay
Location:	C1-80D									
Comments:	*Moisture persentages are oven-dried									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 3/21/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D017

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
3/15/2012	199	8.5	108.4	4	113.3	9.4	**95.7**	90.0	D6938	*See comments
Location:	I-153, 101+50E & 86+00N									
Comments:	*1st lift intermediate cover									
3/15/2012	200	10.9	102.9	4	113.3	9.4	**90.8**	90.0	D6938	*See comments
Location:	I-157, 102+50E & 86+75N									
Comments:	*1st lift intermediate cover									
3/15/2012	201	8.2	107.7	4	113.3	9.4	**95.1**	90.0	D6938	*See comments
Location:	I-151, 102+75E & 84+00N									
Comments:	*1st lift intermediate cover									
3/15/2012	202	8.3	111.8	6	117.8	10.0	**94.9**	90.0	D6938	*See comments
Location:	I-148, 101+50E & 83+50N									
Comments:	*1st lift intermediate cover									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 3/28/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D018

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
3/23/2012	203	6.1	109.8	3	112.5	10.2	**97.6**	90.0	D6938	*See comments
Location:	I-111, 85+72N @ D55, 101+00E									
Comments:	*Intermediate cover									
3/23/2012	204	5.2	103.8	3	112.5	10.2	**92.3**	90.0	D6938	*See comments
Location:	I-110, 85+72N @ D55, 101+00E									
Comments:	*Intermediate cover									
3/23/2012	205	6.5	107.5	3	112.5	10.2	**95.6**	90.0	D6938	*See comments
Location:	I-109, 85+72N @ D55, 102+00E									
Comments:	*Intermeidate cover									
3/23/2012	206	7.7	111.1	3	112.5	10.2	**98.8**	90.0	D6938	*See comments
Location:	I-108, 85+72N @ D55, 102+50E									
Comments:	*Intermediate cover									
3/23/2012	207	28.3	85.2	2	89.0	29.9	**95.7**	90.0	D6938	1st lift clay
Location:	C1-170, 83+50N & 102+50E; M, F, P, A									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 3/29/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D019

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
3/27/2012	208	33.9	81.7	2	89.0	29.9	**91.8**	80.0	D6938	1st lift clay
Location:	C1-106, 85+27N @ D55 & 101+00E									
Comments:										
3/27/2012	209	38.8	73.2	2	89.0	29.9	**82.2**	80.0	D6938	2nd lift clay
Location:	C2-103, 85+27N @ D55 & 100+75E									
Comments:										
3/27/2012	210	32.2	84.6	2	89.0	29.9	**95.1**	80.0	D6938	2nd lift clay
Location:	C2-101, 85+27N @ D55 & 101+25E									
Comments:										
3/27/2012	211	33.1	80.6	2	89.0	29.9	**90.6**	80.0	D6938	1st lift clay
Location:	C1-104, 85+27N @ D55 & 101+50E									
Comments:										
3/27/2012	212	27.5	90.4	2	89.0	29.9	**101.6**	80.0	D6938	2nd lift clay
Location:	C2-99, 85+27N @ D55 & 102+00E									
Comments:										
3/27/2012	213	27.3	90.2	2	89.0	29.9	**101.3**	80.0	D6938	1st lift clay
Location:	C1-102, 85+27N @ D55 & 102+50E									
Comments:										
3/27/2012	214	24.9	85.3	2	89.0	29.9	**95.8**	80.0	D6938	2nd lift clay
Location:	C2-121, 121+50E & 76+50N									
Comments:										
3/27/2012	215	30.3	71.7	2	89.0	29.9	**80.6**	80.0	D6938	2nd lift clay
Location:	C2-126, 122+50E & 76+00N									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 4/24/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D021

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
4/2/2012	216	34.3	81.4	10	89.9	29.9	90.5	90.0	D6938	2nd lift
Location:	C2-166, Sta. 101+00E & 83+50N									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 4/12/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D020

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
4/10/2012	217	8.7	112.9	9	113.0	15.0	**99.9**	90.0	D6938	*See comments
Location:	I-113, 77+50N & 123+50E									
Comments:	*Intermeidate cover									
4/10/2012	218	10.0	105.2	9	113.0	15.0	**93.1**	90.0	D6938	*See comments
Location:	I-116, 79+50N & 123+00E									
Comments:	*Intermediate cover									
4/10/2012	219	9.1	102.1	9	113.0	15.0	**90.4**	90.0	D6938	*See comments
Location:	I-120, 80+00N & 124+50E									
Comments:	*Intermediate cover									
4/10/2012	220	7.7	111.1	9	113.0	15.0	**98.4**	90.0	D6938	*See comments
Location:	I-122, 78+50N & 125+00E									
Comments:	*Intermediate cover									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 4/24/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D022

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
4/17/2012	221	19.8	90.2	2	89.0	29.9	**101.3**	80.0	D6938	Clay 1st lift
Location:	C1-173, Sta. 101+00E @ 86+00N									
Comments:										
4/17/2012	222	26.9	78.0	2	89.0	29.9	**87.6**	80.0	D6938	Clay 1st lift
Location:	C1-138, Sta. 125+00E @ 78+00N									
Comments:										
4/17/2012	223	28.6	77.2	2	89.0	29.9	**86.7**	80.0	D6938	Clay 1st lift
Location:	C1-135, Sta. 122+50E @ 78+50N									
Comments:										
4/17/2012	224	31.2	78.9	2	89.0	29.9	**88.7**	80.0	D6938	Clay 1st lift
Location:	C1-139, Sta. 123+50E @ 80+00N									
Comments:										
4/17/2012	225	25.7	78.1	2	89.0	29.9	**87.8**	80.0	D6938	Clay 1st lift
Location:	C1-141, Sta. 125+50E @ 79+00N									
Comments:										
4/17/2012	226	25.6	90.8	2	89.0	29.9	**102.0**	80.0	D6938	2nd lift clay
Location:	C2-174, Sta. 102+00E @ 86+00N									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 5/8/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D023

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
4/26/2012	227	9.7	110.2	9	113.0	15.0	**97.5**	90.0	D6938	I-C
Location:	I-126, Phase I between D-33 & D-27, 125+75E & 80+75N									
Comments:										
4/26/2012	228	14.6	108.8	9	113.0	15.0	**96.3**	90.0	D6938	I-C
Location:	I-125, Phase I between D-33 & D-27, 124+50E & 81+25N									
Comments:										
4/26/2012	229	7.4	112.6	9	113.0	15.0	**99.6**	90.0	D6938	I-C
Location:	I-124, Phase I between D-33 & D-27, 124+00E & 81+50N									
Comments:										
4/26/2012	230	15.8	106.4	9	113.0	15.0	**94.2**	90.0	D6938	I-C
Location:	I-135, Phase I between D-33 & D-27, 124+75E & 84+00N									
Comments:										
4/26/2012	231	8.1	109.8	9	113.0	15.0	**97.2**	90.0	D6938	I-C
Location:	I-130, Phase I between D-33 & D-27, 125+75E & 82+25N									
Comments:										
4/26/2012	232	9.3	108.5	9	113.0	15.0	**96.0**	90.0	D6938	I-C
Location:	I-137, Phase I between D-33 & D-27, 126+00E & 84+00N									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 8/30/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D024

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
5/2/2012	233	8.0	105.5	9	113.0	15.0	**93.4**	90.0	D6938	1st lift
Location:	I-100, Phase I, 80+20N & 126+20E									
Comments:										
5/2/2012	234	6.3	112.4	9	113.0	15.0	**99.5**	90.0	D6938	1st lift
Location:	I-101, Phase I, 80+40N & 125+25E									
Comments:										
5/2/2012	235	7.3	112.3	9	113.0	15.0	**99.4**	90.0	D6938	1st lift
Location:	I-102, Phase I, 80+60N & 124+55E									
Comments:										
5/2/2012	236	8.3	106.3	9	113.0	15.0	**94.1**	90.0	D6938	1st lift
Location:	I-103, Phase I, 80+75N & 123+75E									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 5/15/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D025

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
5/11/2012	237	28.7	81.3	11	89.0	29.0	**91.3**	80.0	D6938	2nd lift clay
Location:	C2-83									
Comments:										
5/11/2012	238	35.0	75.8	11	89.0	29.0	**85.2**	80.0	D6938	1st lift clay
Location:	C1-86									
Comments:										
5/11/2012	239	28.2	83.4	11	89.0	29.0	**93.7**	80.0	D6938	2nd lift
Location:	C2-85									
Comments:										
5/11/2012	240	38.5	74.1	11	89.0	29.0	**83.3**	80.0	D6938	1st lift
Location:	C1-88									
Comments:										
5/11/2012	241	39.1	72.6	11	89.0	29.0	**81.6**	80.0	D6938	2nd lift
Location:	C2-87									
Comments:										
5/11/2012	242	43.8	72.2	11	89.0	29.0	**81.1**	80.0	D6938	1st lift clay
Location:	C1-90									
Comments:										
5/11/2012	243	32.0	80.2	11	89.0	29.0	**90.1**	80.0	D6938	2nd lift clay
Location:	C2-89									
Comments:										
5/11/2012	244	48.1	72.5	11	89.0	29.0	**81.5**	80.0	D6938	1st lift
Location:	C1-92									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 6/7/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D026

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
5/25/2012	245	29.4	84.7	2	89.0	29.9	**95.2**	90.0	D6938	*See comments
Location:	C2-134, Sta. 124+00E & 78+00N									
Comments:	*Top of finished clay									
5/25/2012	246	24.7	89.5	2	89.0	29.9	**100.6**	90.0	D6938	*See comments
Location:	C2-129, Sta. 123+00E & 78+50N									
Comments:	*Top of finished clay									
5/25/2012	247	27.2	84.7	2	89.0	29.9	**95.2**	90.0	D6938	*See comments
Location:	C2-136, Sta. 123+50E & 80+00N									
Comments:	*Top of finished clay									
5/25/2012	248	30.3	80.3	2	89.0	29.9	**90.2**	90.0	D6938	*See comments
Location:	C2-139, Sta. 125+50E & 79+00N									
Comments:	*Top of finished clay									
5/25/2012	249	10.7	105.2	9	113.0	15.0	**93.1**	90.0	D6938	*See comments
Location:	I-104, sta. 126+00E & 84+75N									
Comments:	*Intermediate cover Thickness: 12+									
5/25/2012	250	13.3	107.8	9	113.0	15.0	**95.4**	90.0	D6938	*See comments
Location:	I-105, Sta. 125+25E & 84+75N									
Comments:	*Intermediate cover Thickness: 12+									
5/25/2012	251	14.5	102.7	9	113.0	15.0	**90.9**	90.0	D6938	*See comments
Location:	I-106, sta. 124+50E & 84+75N									
Comments:	*Intermediate cover Thickness: 12+									
5/25/2012	252	12.7	103.0	9	113.0	15.0	**91.2**	90.0	D6938	*See comments
Location:	I-107, Sta. 123+75E & 84+75N									
Comments:	*Intermediate cover Thickness: 12+									
5/27/2012	253	34.0	84.2	2	89.0	29.9	**94.6**	90.0	D6938	1st lfit
Location:	C1-94, sta. 84+80N & 126+25E									
Comments:	Thickness: 15"									
5/27/2012	254	39.2	80.3	2	89.0	29.9	**90.2**	90.0	D6938	2nd lift
Location:	C2-91, Sta. 84+80N & 126+00E									
Comments:	Thickness: 20"									
5/27/2012	255	37.7	80.3	2	89.0	29.9	**90.2**	90.0	D6938	1st lift
Location:	C1-96, Sta. 84+80N & 125+75E									
Comments:	Thickness: 12"									
5/27/2012	256	34.7	80.9	2	89.0	29.9	**90.9**	90.0	D6938	1st lift
Location:	C2-93, Sta. 84+80N & 125+25E									
Comments:	Thickness: 17"									

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 6/7/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D026

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
5/27/2012	257	38.2	80.7	2	89.0	29.9	90.7	90.0	D6938	2ndl lift
Location:	C2-95, Sta. 84+80N & 124+50E									
Comments:	Thickness: 20"									
5/27/2012	258	37.9	81.7	2	89.0	29.9	91.8	90.0	D6938	1st lift
Location:	C1-98, Sta. 84+80N & 124+90E									
Comments:	Thickness: 12"									
5/27/2012	259	34.2	81.1	2	89.0	29.9	91.1	90.0	D6938	2nd lift
Location:	C2-97, Sta. 84+80N & 123+75E									
Comments:	Thickness: 18"									
5/27/2012	260	38.7	80.1	2	89.0	29.9	90.0	90.0	D6938	1st lift
Location:	C1-100, Sta. 84+80N & 124+25E									
Comments:	Thickness: 15"									
5/27/2012	261	35.6	81.3	2	89.0	29.9	91.3	90.0	D6938	1st lift
Location:	C1-158, Sta. 84+00N & 126+25E									
Comments:	Thickness: 9"									
5/27/2012	262	29.9	88.9	2	89.0	29.9	99.9	90.0	D6938	1st lift
Location:	C1-155, Sta. 84+00N & 124+50E									
Comments:	Thickness: 8"									
5/27/2012	263	33.4	85.3	2	89.0	29.9	95.8	90.0	D6938	1st lift
Location:	C1-148, Sta. 81+75N & 125+25E									
Comments:	Thickness: 8"									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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6/8/12

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REPORT OF FIELD DENSITY TESTS

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Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 6/21/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D027

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
6/19/2012	264	20.1	85.5	2	89.0	29.9	**96.1**	80.0	D6938	2nd clay lift
Location:	C2-156, sta. 126+00E & 84+50N, 15" depth									
Comments:										
6/19/2012	265	26.0	85.8	2	89.0	29.9	**96.4**	80.0	D6938	2nd lift clay
Location:	C2-152, 124+00E & 84+50N, 15" depth									
Comments:										
6/19/2012	266	18.4	92.1	2	89.0	29.9	**103.5**	80.0	D6938	2nd lift clay
Location:	C2-141, 124+50E & 81+50N, 14" depth									
Comments:										
6/19/2012	267	20.4	90.1	2	89.0	29.9	**101.2**	80.0	D6938	2nd lift clay
Location:	C2-142, 125+50E & 1+00N, 14" depth									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 6/25/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D028

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
6/22/2012	268	34.3	79.0	2	89.0	29.9	88.8	80.0	D6938	Clay, 2nd lift
Location:	C2-83R, 80+50N & 125+75E									
Comments:	Thickness: 16"									
6/22/2012	269	42.0	73.4	2	89.0	29.9	82.5	80.0	D6938	Clay, 1st lift
Location:	C1-86R, 80+50N & 126+20E									
Comments:	Thickness: 8"									
6/22/2012	270	38.5	76.1	2	89.0	29.9	85.5	80.0	D6938	Clay, 2nd lift
Location:	C2-85R, 80+50N & 125+20E									
Comments:	Thickness: 17"									
6/22/2012	271	36.1	74.7	2	89.0	29.9	83.9	80.0	D6938	Clay, 1st lift
Location:	C1-88R, 80+50N & 125+50E									
Comments:	Thickness: 10"									
6/22/2012	272	38.7	74.6	2	89.0	29.9	83.8	80.0	D6938	Clay, 2nd lift
Location:	C2-87R, 80+50N & 124+50E									
Comments:	Thickness: 16"									
6/22/2012	273	38.7	74.6	2	89.0	29.9	83.8	80.0	D6938	Clay, 1st lift
Location:	C1-90R, 80+50N & 124+80E									
Comments:	Thickness: 9"									
6/22/2012	274	35.7	78.7	2	89.0	29.9	88.4	80.0	D6938	Clay, 2nd lift
Location:	C2-89R, 80+50N & 123+75E									
Comments:	Thickness: 16"									
6/22/2012	275	44.8	73.0	2	89.0	29.9	82.0	80.0	D6938	Clay, 1st lift
Location:	C1-92R, 80+50N & 124+20E									
Comments:	Thickness: 9"									

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 7/12/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D029

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
7/10/2012	276	33.1	76.8	2	89.0	29.9	**86.3**	80.0	D6938	Clay 2nd lift
Location:	C2-87R2, 80+50N & 124+50E, 16"									
Comments:										
7/10/2012	277	20.5	86.3	2	89.0	29.9	**97.0**	80.0	D6938	Clay 2nd lift
Location:	C2-89R2, 80+50N & 13+75E, 16"									
Comments:										
7/10/2012	278	38.8	75.2	2	89.0	29.9	**84.5**	80.0	D6938	Clay 1st lift
Location:	C1-92R2, 80+50N & 124+20E, 9"									
Comments:										
7/10/2012	279	36.8	72.2	2	89.0	29.9	**81.1**	80.0	D6938	Clay 1st lift
Location:	C1-86R2, 80+50N & 126+20E, 8"									
Comments:										
7/10/2012	280	24.3	83.1	2	89.0	29.9	**93.4**	80.0	D6938	Clay 2nd lift
Location:	C2-83R2, 80+50N & 125+75E, 16"									
Comments:										
7/10/2012	281	33.5	76.8	2	89.0	29.9	**86.3**	80.0	D6938	Clay 1st lift
Location:	C1-88R2, 80+50N & 125+50E, 10"									
Comments:										
7/10/2012	282	29.1	72.8	2	89.0	29.9	**81.8**	80.0	D6938	Clay 2nd lift
Location:	C2-85R2, 80+50N & 125+20E, 17"									
Comments:										
7/10/2012	283	33.8	77.0	2	89.0	29.9	**86.5**	80.0	D6938	Clay 1st lift
Location:	C1-90R2, 80+50N & 124+80E, 9"									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 7/25/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D030

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
7/23/2012	284	38.6	74.9	10	89.9	29.9	**83.3**	80.0	D6938	Clay 1st lift
Location:	C1-94R, 84+75N & 126+25E, 15"									
Comments:										
7/23/2012	285	43.2	72.3	10	89.9	29.9	**80.4**	80.0	D6938	Clay 2nd lift
Location:	C2-91R, 84+75N & 126+00E, 20"									
Comments:										
7/23/2012	286	41.1	75.6	10	89.9	29.9	**84.1**	80.0	D6938	Clay 2nd lift
Location:	C2-93R, 84+75N & 125+25E, 17"									
Comments:										
7/23/2012	287	41.4	73.4	10	89.9	29.9	**81.6**	80.0	D6938	Clay 1st lift
Location:	C1-96R, 84+75N & 125+60E, 12"									
Comments:										

REMARKS

Performed in General Accordance With Referenced ASTM Methods
<< Denotes Percent Compaction or Moisture is Less Than Specified.

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Daniel Eisman 7/25/12

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 9/10/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D032

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
7/29/2012	288	4.1	105.1	9	113.0	15.0	**93.0**	90.0	D6938	Initial cover
Location:	I-141, 85+50N & 126+25E									
Comments:										
7/29/2012	289	11.5	106.0	9	113.0	15.0	**93.8**	90.0	D6938	Initial cover
Location:	I-145, 86+75N & 125+35E									
Comments:										
7/29/2012	290	3.9	110.0	9	113.0	15.0	**97.3**	90.0	D6938	Initial cover
Location:	I-139, 85+50N & 124+50E									
Comments:										
7/29/2012	291	8.8	103.5	9	113.0	15.0	**91.6**	90.0	D6938	Initial cover
Location:	I-138, 85+25N & 123+75E									
Comments:										

REMARKS

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REPORT OF FIELD DENSITY TESTS

3901 Carmichael Ave.
Jacksonville, FL 32207

CLIENT: Meskel & Associates
PROJECT: Trailridge Phase III

DATE: 8/21/2012
JOB NUMBER: 6736-11-5123
REPORT ID: D033

Test Date	Test Number	Moisture Content (%)	Dry Density (PCF)	Proctor Number	Max. Dry Density (pcf)	Optimum Moisture (%)	Compaction (%)	Specified Compaction (%)	ASTM Test Method	Elevation or Depth
8/14/2012	292	42.3	76.2	2	89.0	29.9	**85.6**	80.0	D6938	Clay, 1st lift
Location:	C1-180, 124+00E @ 82+50N									
Comments:	Thickness: 7"									
8/14/2012	293	32.8	72.0	2	89.0	29.9	**80.9**	80.0	D6938	Clay, 2nd lift
Location:	C2-176, 123+75E @ 87+25N									
Comments:	Thickness: 14"									
8/14/2012	294	42.8	76.1	2	89.0	29.9	**85.5**	80.0	D6938	Clay, 1st lift
Location:	C1-178, 123+60E @ 87+25N									
Comments:	Thickness: 7"									
8/14/2012	295	19.4	79.3	2	89.0	29.9	**89.1**	80.0	D6938	Clay, 2nd lift
Location:	C2-177, 124+75E @ 87+00N									
Comments:	Thickness: 16"									
8/14/2012	296	36.7	75.4	2	89.0	29.9	**84.7**	80.0	D6938	Clay, 1st lift
Location:	C1-179, 124+50E @ 87+00N									
Comments:	Thickness: 8"									
8/14/2012	297	32.1	72.3	2	89.0	29.9	**81.2**	80.0	D6938	Clay, 2nd lift
Location:	C2-160, 125+50E @ 86+00N									
Comments:	Thickness: 12"									
8/14/2012	298	37.7	73.3	2	89.0	29.9	**82.4**	80.0	D6938	Clay, 1st lift
Location:	C1-162, 125+80E @ 86+00N									
Comments:	Thickness: 6"									

REMARKS

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