TRAIL RIDGE LANDFILL
INCREMENTAL CLOSURE
CLOSURE PHASE 4
UNITS 51 – 81

QUALITY ASSURANCE AND QUALITY CONTROL DOCUMENTATION

PREPARED FOR:

CITY OF JACKSONVILLE, FLORIDA

PREPARED BY:

England-Thims & Miller, Inc.
VISION • EXPERIENCE • RESULTS

Engineers – Planners – Surveyors – Landscape Architects
14775 Old St. Augustine Road Jacksonville, Florida 32258
Certificate of Authorization Number: 2584

AND

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

ETM Job Number: E 11-019-P4-2 Date Issued: February 3, 2016

ETM
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www.etminc.com
tel 904-642-8990 • fax 904-646-9485
14775 Old St. Augustine Road • Jacksonville, Florida 32258

February 3, 2016

Mr. Emerson Raulerson, P.E.
Florida Department of Environmental Protection
Northeast District Office
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256-7590

Re: Trail Ridge Landfill
Incremental Side Slope Closure – Phase 4 - Side Slope Units 51 - 81
FDEP Permit No. 0013493-025-SO/01
ETM No. E11-019-P4-2

Dear Mr. Raulerson:

Please find attached the Certification of Completion for Trail Ridge Landfill, Incremental Closure – Phase 4, which includes Side Slopes Units 51-81. The Construction Quality Assurance / Quality Control documentation and As-Builts Drawings are attached.

Subject to your site inspection, the City of Jacksonville, Florida, respectfully requests your written verification that the Department accepts this incremental closure.

If you have any questions regarding this construction, please feel free to give me a call at (904) 265-3163 or email me at Lockwoods@etminc.com.

Sincerely,

ENGLAND, THIMS & MILLER, INC.

SCOTT J. LOCKWOOD LICENSE No. 68426 STATE OF FLORIDA PROFESSIONAL ENGINEER

Scott Jordan Lockwood, P.E.
Project Manager
2-5-2016

Attachment:
Quality Assurance and Quality Control Documentation (One copy / 1 PDF)

cc:			
	Lee Alford, P.E.	COJ	w/attachments
	Greg Mathes	TRLI	w/attachments
	Eric Parker	TRLI	w/attachments (PDF only)
	Allen Rhodes	TRLI	cover letter only
	Juanitta Clem, P.E.	ETM	cover letter only
	Tina Meskel, P.E.	MAE	cover letter only
	Sam Lansdale	MAE	cover letter only

ENGINEER OF RECORD SIGNATURE PAGE

Project Name: **TRAIL RIDGE LANDFILL - INCREMENTAL CLOSURE - CLOSURE PHASE 4 (UNITS 51-81)**
Project Location: Duval County, Located at 5100 Gilridge Drive West of US Highway 301
Project City / State: Jacksonville, Florida 32234-3608
Computer Programs used for this report: Microsoft Word and Excel 2007, Autocad C3D 2015
Etm Job No. E 11-019-P4-2

TABLE OF CONTENTS:

Portion of pages or sections of this report signed and sealed by Engineer
Sections I-IV Only

This report is prepared in general compliance with: FDEP Permit Number 0013493-017-SO dated: September 16, 2009

SCOTT J. LOCKWOOD LICENSE No. 68426 STATE OF FLORIDA PROFESSIONAL ENGINEER

Signature Date: 2-16

Scott Jordan Lockwood, P.E. 68426
Engineer of Record P.E. No.

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England - Thims & Miller, Inc.
14775 Old St. Augustine Rd., Jacksonville, Fl. 32258
Phone (904) 642-8990 CA No: 2584

Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DEP Form # 62-701.900(2)
Form Title Certification of Construction Completion of a Solid Waste Management Facility
Effective Date May 19, 1994

Certification of Construction Completion of a Solid Waste Management Facility

DEP Construction Permit No: 0013493-017-SO County: Duval

Name of Project: Trail Ridge Landfill - Incremental Closure

Name of Owner: City of Jacksonville, Florida

Name of Engineer: ETM - England, Thims & Miller, Inc.

Type of Project: Class I Landfill - Incremental Closure of Phase 4(Units 51-81)

Cost: Estimate $ _____ Actual $ 6,471,621.39

Site Design Quantity: 5,000 (peak) ton/day Site Acreage: 22.60 Acres

Deviations from Plans and Application Approved by DEP (attach additional pages as needed):

Deviations are shown on the attached As-Built Survey prepared by Robert M. Angas Associates, Inc. and as outlined in the Deviations Memorandum (refer to attachment for details).

Please find in Appendix A-1, a deviation letter from Meskel and Associates Engineering, Inc. for Shear Strength testing method between Intermediate and Vegetative Cover Soil.

Address and Telephone No. of Site: 5110 U.S. Highway 301, Baldwin, Florida 32234

Phone Number: (904) 289-9100

Name(s) of Site Supervisor: Greg Mathes (TRLI)

Date Site inspection is requested: As soon as possible

This is to certify that, with the exception of any deviation noted above, the construction of the project has been completed in substantial accordance with the plans authorized by Construction

Permit No.: 0013493-0125-SO/01 Dated: September 16, 2009 (issued date)

Date: 2-5-2016

SCOTT J. LOCKWOOD LICENSE No. 68426 STATE OF FLORIDA PROFESSIONAL ENGINEER

Signature of Professional Engineer

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DEVIATIONS MEMORANDUM

From: **Scott Jordan Lockwood, P.E.**

Re: **Trail Ridge Landfill Incremental Closure – Phase 4**

Date: **February 3, 2016**

Note:

1. Due to settlement over the course of the construction period, there are areas where settlement has occurred between the time the initial cover was graded and finished to the time that the final layer of top soil and sod was placed. Due to this settlement many of the elevations of the final layer deviate from the design elevations. Please refer to As-built Survey (included with these documents) prepared by Robert M. Angas Associates, Inc. (RMA). In order to ensure the proper depth of final cover materials, (initial cover, clay and top soil layers) Meskel and Associates Engineering (MAE) (QA / QC Geotechnical firm) determined the depth of each layer upon placement to verify that the appropriate thickness of materials was provided (refer to tables and letters included in Appendix A, prepared by MAE, for additional information).

2. Due to settlement along Terrace 4, the slopes from Terrace 4 to Terrace 5 for all of the Units on the Southerly and Easterly side of the landfill slopes had to be adjusted to match the grade at the Terrace 4 interface.

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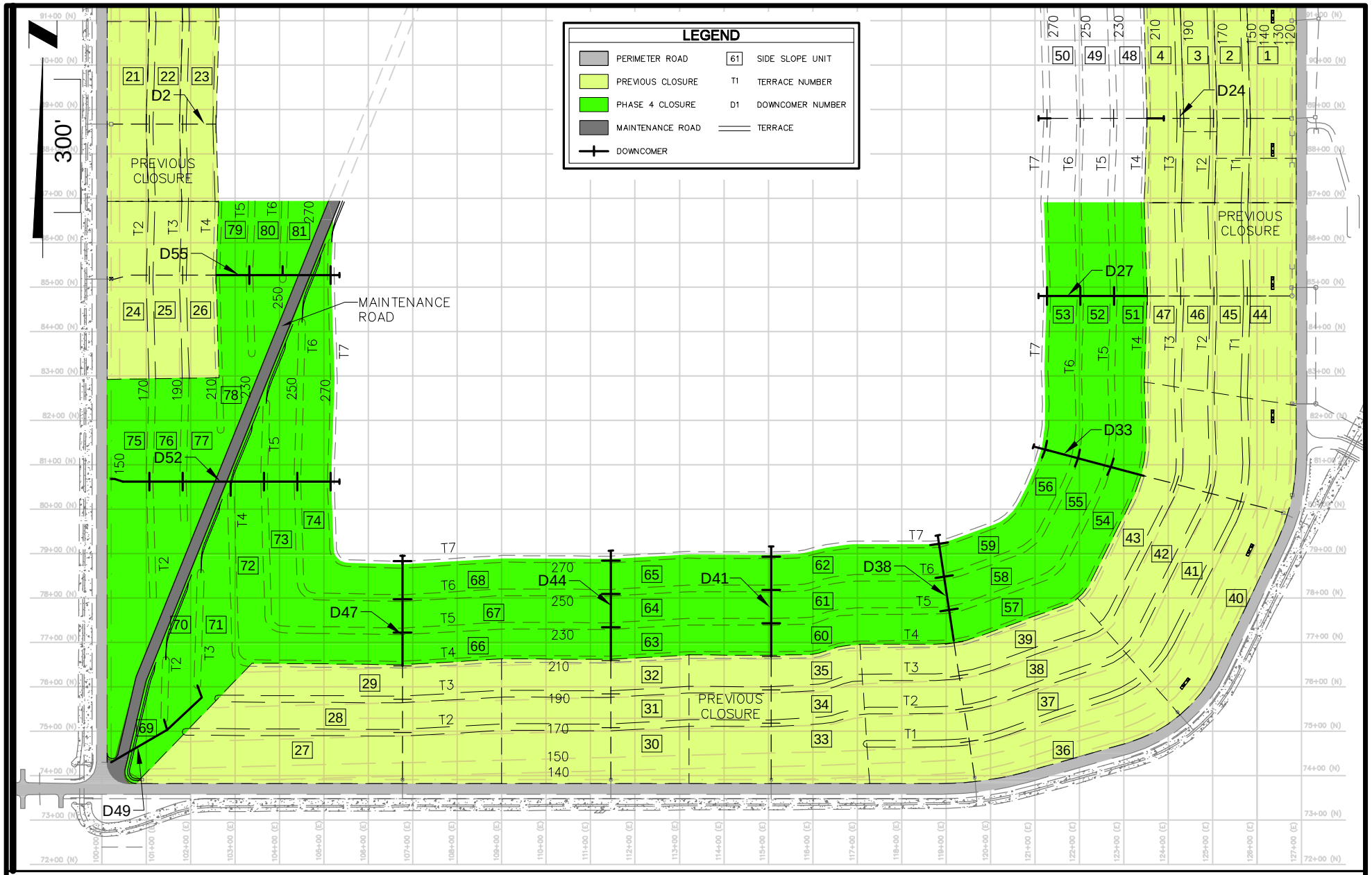

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CLOSURE MAP - UNITS 51-81

TRAIL RIDGE LANDFILL
INCREMENTAL CLOSURE PHASE 4
FOR THE CITY OF JACKSONVILLE, FLORIDA

ETM NO. E 11-019-P4-2
DRAWN BY: S. Lockwood
DATE: February 3, 2016
DRAWING NO. 1

PLOTTED: February 5, 2016 - 8:51 AM, BY: Scott Lockwood
G:\Landfill\Trail\11-019\Close-P4\Design\Plots\Maps\TRLF-FDEP-B11.dwg

APPENDIX 1

QUALITY CONTROL /

QUALITY ASSURANCE PLAN

TRAIL RIDGE LANDFILL
INCREMENTAL SIDE SLOPE CLOSURE
QUALITY ASSURANCE/QUALITY CONTROL PLAN

This plan addresses the quality assurance and quality control (QA/QC) for the incremental closure (close-as-you-go) of Trail Ridge Landfill. This program delineates the quality procedures and standards for the construction. This plan includes the closure of the side slopes only (including the reconstruction of final cover on side slopes). The top area closure has a separate QA/QC Plan.

In the context of this plan, quality assurance and quality control are defined as follows:

Quality Assurance - A planned and systematic pattern of all means and actions designed to provide adequate confidence that items or services meet contractual and regulatory requirements and will perform satisfactorily in service.

Quality Control - Those actions which provide a means to measure and regulate the characteristics of an item or service to contract and regulatory requirements.

The City of Jacksonville, Florida is the owner of Trail Ridge Landfill. Trail Ridge Landfill, Inc. is the permittee and operates the landfill. England, Thims & Miller, Inc. is the design engineer. The name of the Contractor for each incremental closure shall be provided to the Department of Environmental Protection (DEP), prior to construction.

All QA/QC activities (including monitoring, sampling and testing) shall be directed and conducted by third parties, whom are independent of the Contractor.

The QA/QC Plan for this project includes General QA/QC and Soils QA/QC. The General QA/QC includes full-time services to periodically observe the contractor's work to verify substantial compliance with permits, plans, specifications and design concepts. These services will include the following:

General Quality Control Monitor - shall monitor the construction for compliance with the permits, plans, specifications and design including construction to proper lines and grades, maintain daily logs and weekly progress reports of the construction (including observation data sheets, problem identification and correction logs), make note of any construction deviations, coordinate qualifying and testing of materials, monitor any waste excavation, and monitor filling. This individual shall be experienced in civil site construction and solid waste regulations.

General Quality Assurance Engineer - shall supervise the construction monitoring and waste removal to verify compliance with permits, plans, specification and design concepts. This individual shall be experienced in civil site construction and solid waste regulations and shall be a registered Professional Engineer.

The General QA/QC Program includes monitoring the following activities:

1. General Earthwork
2. Storm Drainage Installation
3. General Construction Quality Control

The Soils QA/QC for this project includes soil material qualifying, sampling and testing to verify substantial compliance with the material standards. This work will include the following:

Soils Quality Control Monitor - shall pre-qualify soil materials, monitor the installation of soil materials, determine where in-place soil materials shall be tested, and test the in-place soil materials. This individual shall be responsible for assuring that all soil materials have been pre-qualified and have a chain-of-custody from the pre-qualified source to the project site, prior to installation. This individual shall be experienced in quality assurance of soil materials and the preparation of quality assurance documentation including quality assurance forms, reports, certification and manuals. This individual shall be experienced in civil site construction and soil testing standards and procedures and shall be certified by the Quality Assurance Engineer in the duties of the project.

Soils Quality Assurance Engineer - shall supervise the soil material pre-qualifying and testing of in-place soil materials to assure compliance with the test standards and testing frequency requirements, and verify compliance with the plans, specification and design. This individual shall be experienced in quality assurance of soil materials and the preparation of quality assurance documentation including quality assurance forms, reports, certification and manuals. This individual shall hold a B.S., M.S., or Ph.D degree in civil engineering or related fields, be experienced in civil site construction and soil testing procedures, be a registered Professional Engineer, and have worked on at least two other closure projects.

The QA/QC Plan including monitoring construction of the following:

A. Final Cover (Intermediate Cover, Compacted Clay Layer and Vegetative Cover (Top Soil))

Incremental side slope closure of Trail Ridge Landfill includes a final cover consisting of 12" of intermediate cover, 12" of clay, and 24" of vegetative cover. The clay layer of the final cover must be placed in two 6" (minimum) lifts. The Soils Quality Control Monitor shall observe the clay layer construction on a full-time (on-site) basis. The QA/QC for the final cover is as follows:

1. Intermediate Cover

a. Location - The fill material shall come from an off-site source. The Soils Quality Control Monitor shall visually inspect the fill material.

b. Standard - Soil shall be free of brush, weeds, and other litter; and free of roots, stumps, stones and any other extraneous or toxic matter.

The intermediate cover material shall be tested for shear strength in the laboratory (ASTM D-4767). The material shall only be

considered suitable if the material, as documented on laboratory test specimens, can be shown to provide a minimum safety factor of 1.5 against sliding.

The intermediate cover shall be a minimum of 12" thick.

Compacted to 90% of Modified Proctor maximum dry density (ASTM D 1557), unless the soil material contains 30.0% or greater passing the No. 200 sieve, then compacted to 90% of Standard Proctor maximum dry density (ASTM D-698).

c. Frequency - The shear strength shall be tested one time only based upon a representative sample of the material at the required density.

Depth measurements and density tests shall be conducted at the frequency of four per acre.

2. Clay Layer (referred to as Barrier Layer in Chapter 62-701, F.A.C.)

a. Borrow Source - Prior to clay layer installation, an appropriate borrow source shall be located. Suitability of the clay layer construction materials from that source shall be determined in accordance with the following:

(1) If demonstrated field experience is available from at least three prior successful projects of five or more acres each to document that a given borrow source can meet the requirements of the project specifications, then extensive laboratory testing of the borrow source will not be required. However, the source of material shall be geologically similar to and the methods of excavating and stockpiling the material shall be consistent with those used on the prior projects. Furthermore, a minimum of three representative samples from the appropriate thickness of the in-situ stratum or from stockpiles of the borrow material proposed for clay layer construction shall be submitted to the Owner=s independent soil testing laboratory to document through index testing and shear strength testing that the proposed material is consistent with the material used on prior successful projects. At a minimum, index testing shall consist of percent fines, Atterberg limits and moisture content determinations and the shear testing shall consist of triaxial testing of the clay soil and direct shear testing of the interface between the intermediate cover and the clay as well as the interface between the clay and the proposed vegetative cover material.

(2) If demonstrated field experience as defined above is not available or cannot be documented, then the following requirements shall be met.

(a) A field exploration and laboratory testing program shall be conducted by the Owner=s independent soil testing laboratory to document the

horizontal and vertical extent and the homogeneity of the soil strata proposed for use as clay layer material. A sufficient number of index tests from each potential borrow stratum shall be performed to quantify the variability of the borrow materials and to document that the proposed borrow material complies with specifications. At a minimum, the index tests shall consist of percent fines, Atterberg limits and moisture content determinations.

(b) Sufficient laboratory hydraulic conductivity tests shall be conducted on samples representative of the range invariability of the proposed borrow source (ASTM D-5084). For each such sample, test specimens shall be prepared and tested to cover the range of molding conditions (moisture content and dry density) required by project specifications. The hydraulic conductivity tests shall be conducted in triaxial type permeameters. The test specimens shall be consolidated under an isotropic consolidation stress no greater than 10 pounds per square inch and permeated with water under an adequate backpressure to achieve saturation of the test specimens. The inflow to and outflow from the specimens shall be monitored with time and the hydraulic conductivity calculated for each recorded flow increment. The test shall continue until steady state flow is achieved and relatively constant values of hydraulic conductivity are measured (ASTM D-5084). The borrow source will only be considered suitable if the hydraulic conductivity of the material, as documented on laboratory test specimens, can be shown to meet the requirements of the project specifications at the 98 percent confidence level.

(c) Sufficient shear strength testing of the clay material (ASTM D-4767) and direct shear testing of the interface between the intermediate cover and the clay as well as the interface between the clay and the proposed vegetative cover material (ASTM D-3080) shall be conducted on samples representative of the range in variability of the proposed borrow source. For each such sample, test specimens shall be prepared and tested to cover the range of molding conditions (moisture content and dry density) required by project specifications. The borrow source will only be considered suitable if the material, as documented on laboratory test specimens, can be shown to provide a minimum safety factor of 1.5 against sliding for both interfaces as well as the material itself.

(3) The Soils Quality Assurance Engineer shall review the pre-qualification data and shall approve or reject the clay layer material for use.

b. Test Strip - Prior to full-scale clay layer installation, a field test section or test strip shall be constructed at the site above a prepared subbase. The test strip shall be considered acceptable if the measured hydraulic conductivities of undisturbed samples from the test strip meet the requirements of the project specifications at the

98 percent confidence level. If the test section fails to achieve the desired results, additional test sections shall be constructed in accordance with the following requirements:

(1) The test section shall be of sufficient size (40' wide x 60' long, at a minimum) such that full-scale clay layer installation procedures can be duplicated within the test section;

(2) The test section shall be constructed using the same equipment for spreading, kneading and compaction and the same construction procedures (e.g., number of passes, moisture addition and homogenization, if needed) that are anticipated for use during full-scale clay layer installation;

(3) At a minimum, the clay layer test section shall be subject to the following field and laboratory testing requirements by Soils Quality Control Monitor:

(a) A minimum of five random samples of the clay layer construction material delivered to the site during test section installation shall be tested for moisture content (ASTM D-2216), percent fines (ASTM D-1140) and Atterberg limits (ASTM D-4318);

(b) At least five field density and moisture determinations shall be performed on each lift of the compacted clay layer test section;

(c) Upon completion of the test section lift, the thickness of the lift shall be measured at a minimum of five random locations to check for thickness adequacy; and

(d) A minimum of five Shelby tube or drive cylinder (ASTM D-2937) samples shall be obtained from each lift of the test section for laboratory hydraulic conductivity testing. Laboratory hydraulic conductivity testing shall be conducted in triaxial type permeameters (ASTM D-5084). The test specimens shall be consolidated under an isotropic consolidation stress no greater than 10 pounds per square inch and permeated with water under an adequate backpressure to achieve saturation of the test specimens. The inflow to and outflow from the specimens shall be monitored with time and the hydraulic conductivity calculated for each recorded flow increment. The test shall continue until steady state flow is achieved and relatively constant values of hydraulic conductivity are measured (ASTM D-5084).

(e) The test strip shall meet or exceed the standards established below except the field density which shall be established by the QA Engineer, based upon the test strip results. If the test strip fails to meet these standards, the construction methods and/or material will be rejected and the test strip shall be performed again.

c. Final Cover Installation - Full scale final cover installation may begin only after completion of a successful test section. During clay layer construction, quality control testing shall be provided to document that the installed clay layer conforms to project specifications. The testing frequency for quality control testing is specified below; however, during construction of the first five acres, the frequencies shall be doubled. The clay layer shall be installed in two 6" lifts for a total minimum thickness of 12".

(1) Location - The clay layer shall be tested in place. The locations of testing shall be random locations as determined by the Soils Quality Control Monitor. If there are indications of a change in product quality or construction procedures during final cover construction, additional tests shall be performed to determine compliance.

(2) Standard

(a) Clay Layer Subgrade - Compacted to 90% of Modified Proctor maximum dry density (ASTM D-1557)D 1557), unless the soil material contains 30.0% or greater passing the No. 200 sieve, then compacted to 90% of Standard Proctor maximum dry density (ASTM D-698). (See Intermediate Cover above).

(b) Field Density - The field density shall be established by the QA Engineer based upon the test strip results and shall be determined by Standard Proctor Density (ASTM D-698). In no case shall the field density be less than 80% of Standard Proctor Density (ASTM D-698).

(c) Thickness - Each lift (two total) shall be a minimum of 6" thick.

(d) Hydraulic Conductivity - The compacted clay layer shall have an in-place hydraulic conductivity no greater than 6.67×10^{-8} cm/sec (ASTM D-5084).

(3) Field Testing Frequency

(a) Prior to the laying of the clay layer materials, the clay layer subgrade shall be compacted to the specified density. Density tests shall be conducted at a minimum rate of two tests per acre;

(b) A minimum of two moisture content and field density determinations shall be conducted per acre per lift of the compacted clay layer. The degree of compaction shall be checked using the one-point field Proctor test or other appropriate test procedures; and

(c) A minimum of four thickness measures shall be conducted per acre per lift of the compacted clay layer.

(4) Laboratory Testing Frequency

(a) Percent fines (ASTM D-1140) of the clay layer material shall be determined at a minimum frequency of two tests per acre per lift of installed clay layer;

(b) Atterberg limits determinations shall be performed on one sample per acre per lift of installed clay layer; and

(c) Hydraulic conductivity testing of Shelby tube or drive cylinder (ASTM D-2937) samples of the compacted clay layer shall be performed at a minimum frequency of one test per acre per lift. Laboratory hydraulic conductivity tests shall be conducted in triaxial type permeameters (ASTM D-5084). The test specimens shall be consolidated under an isotropic consolidation stress no greater than 10 pounds per square inch and permeated with water under an adequate backpressure to achieve saturation of the test specimens. The inflow to and outflow from the specimens shall be monitored with time and the hydraulic conductivity calculated for each recorded flow increment. The test shall continue until steady state flow is achieved and relatively constant values of hydraulic conductivity are measured.

(5) Deficiency - If the test data from a clay layer section does not meet the requirements of the project specifications, additional random samples shall be tested from that clay layer section. If such additional testing demonstrates that the thickness and hydraulic conductivity meet the requirements of the project specifications at the 95 percent confidence level, that clay layer section will be considered acceptable. If not, that clay layer section shall be reworked or reconstructed so that it does meet these requirements.

3. Clay Layer Tie-In (To Existing Clay Layer, Where Applicable)

a. Location - The edge of any existing final cover adjacent to the proposed final cover area.

b. Standard - The compacted clay layer of any existing final cover and the proposed final cover must be tied together to form one continuous seamless layer. At the interface, the existing and new clay layers shall be compacted to form a seamless connection.

c. Frequency - The Soils Quality Control Monitor shall monitor the tie-in by visual inspection on a continuous basis.

4. Vegetative Cover (Top Soil)

a. Location - The vegetative cover shall be tested in place for thickness. The location of testing shall be determined by the Soils Quality Control Monitor.

b. Standard - Top soil which is reasonably free of brush, weeds, and other litter; and relatively free of roots, stumps, stones and any other extraneous or toxic matter harmful to plant growth. Roots with a diameter greater than ⅜" shall be hand picked and removed.

The vegetative cover shall be at least 24" thick.

Prior to placement, the vegetative cover material shall be tested for shear strength in the laboratory (ASTM D-4767). The material shall only be considered suitable if the material, as documented on laboratory test specimens, can be shown to provide a minimum safety factor of 1.5 against sliding.

c. Frequency - The shear strength shall be tested one time only based upon a representative sample of the material.

Depth measurements shall be taken at the frequency of four per acre. The soil shall be monitored on a continuous basis for extraneous matter.

5. Final Cover Repairs (When Applicable)

If, during construction of the final cover system, damage is sustained on the final cover system (including the intermediate cover, clay layer and vegetative cover), the areas of damage shall be reconstructed and retested in accordance with corresponding section described above. All repair areas shall be tested at the frequencies prescribed above, unless more frequent testing is required at the discretion of the Soils Quality Assurance Engineer.

B. Downcomer Pipes

Downcomer pipes shall be installed in the final cover at the low point of the terraces, to intercept the stormwater between terraces. The downcomer pipes shall include the terrace side drains and terrace underdrain piping.

The downcomer pipes shall be constructed as shown on the Construction Drawings. The clay around the pipes shall be compacted into a uniform homogeneous material. Prior to placement of vegetative cover over the downcomer pipes, the pipe shall be inspected by the General Quality Control Monitor.

1. Location - The compacted clay layer shall be tested in place. The locations of testing shall be determined by the Soils Quality Control Monitor. If there are indications of a change in product quality or construction procedures during construction, additional tests shall be performed to determine compliance.

2. Standard –

   a. Clay Layer Subgrade - Compacted to 90% of Modified Proctor maximum dry density (ASTM D 1557)D 1557), unless the soil material contains 30.0% or greater passing the No. 200 sieve, then compacted to 90% of Standard Proctor maximum dry density (ASTM D-698) (12" thick minimum).

   b. Field Density - The field density of the clay layer shall be as established in Section A.2.c.(2)(b) above and shall be determined by Standard Proctor Density (ASTM D 698).

   c. Thickness - Twelve inches minimum below pipe.

   d. Hydraulic Conductivity - The compacted clay layer shall have an in-place hydraulic conductivity no greater than 6.67×10^{-8} cm/sec (ASTM D 5084).

3. Field Testing Frequency -

   a. Prior to the laying of the compacted clay materials, the subbase shall be compacted to the specified density. Density tests and thickness shall be conducted at a minimum rate of one per 75 linear feet of pipe. (Minimum of one test between terraces).

   b. A minimum of one moisture content and field density determination of the compacted clay layer shall be conducted per 75 linear feet of pipe.

   c. A minimum of two thickness measures of the compacted clay layer shall be conducted per 75 linear feet of pipe.

4. Laboratory Testing Frequency -

   a. Hydraulic conductivity testing of Shelby tube or drive cylinder (ASTM D 2937) samples of the compacted clay layer shall be performed at a minimum frequency of one test per 75 linear feet of pipe (at least once between terraces). Laboratory hydraulic conductivity tests shall be conducted in triaxial type permeameters (ASTM D 5084). The test specimens shall be consolidated under an isotropic consolidation stress no greater than 10 pounds per square inch and permeated with water under an adequate backpressure to achieve saturation of the test specimens. The inflow to and outflow from the specimens shall be monitored with time and the hydraulic conductivity calculated for each recorded flow increment. The test shall continue

until steady state flow is achieved and relatively constant values of hydraulic conductivity are measured.

5. Deficiency - If the test data from a compacted clay layer section does not meet the requirements of the project specifications, that section shall be reworked or reconstructed so that it does meet these requirements.

C. Underdrain Filter Sand

The underdrains in the terraces shall be surrounded by filter sand as shown on the Contract Drawings. The QA/QC for the filter sand is as follows:

1. Filter Sand

a. Location - The material shall be pre-qualified prior to installation.

If the testing is done at the borrow source, a chain of custody shall be provided.

b. Standard - Clean, uniformly graded sand with a uniformity coefficient of 1.5 or greater and an effective grain size of 0.2 mm to 0.5 mm. Grain size distribution shall be conducted as part of pre-qualification.

The sand shall have a hydraulic conductivity no less than 1.0×10^{-3} cm/sec at a density of 100 percent Modified Proctor. The hydraulic conductivity testing shall be by Constant Head method (ASTM D2434).

c. Frequency - The hydraulic conductivity of the sand shall be tested once per 500 cubic yards of sand material.

D. Gas Management System (Gas Wells and Headers)

Gas wells (temporary and permanent) shall be installed in accordance with the Construction Drawings. The QA/QC for gas well materials shall be as follows:

1. Gravel for Gas Wells

a. Location - The gravel shall be pre-qualified by certification by the supplier.

b. Standard - The gravel shall be clean gravel with no fines. The gravel shall be FDOT No. 3 Course Aggregate (ASTM D 448).

The gravel shall be non-calcareous (ASTM D 4373).

c. Frequency - The gravel shall be certified by the supplier. The gravel shall be tested once per 100 C.Y.

2. Bentonite for Gas Wells

a. Location - The material shall be pre-qualified with documentation from the supplier.

b. Standard - The material shall have a hydraulic conductivity no greater than 1.0 x 10^{-8} cm/sec (ASTM D 5084).

c. Frequency - The material shall be certified by the supplier, one time only.

3. Permanent Header Pipe

The permanent header pipe shall be placed in the areas of final cover and shall be placed on the barrier soil layer, as shown on the Construction Drawings. The header pipe shall not be placed until the barrier soil has been tested and approved. The placement of the header pipe over the barrier soil layer and covering of the header pipe shall be conducted in the presence of either the Soils Quality Control Monitor or the General Quality Control Monitor.

4. Temporary Header Pipe

The temporary header pipe shall be placed in areas that have not received final cover, shall be placed on a prepared subgrade and shall be backfilled with clean fill. The header pipe shall be installed in accordance with the Construction Drawings. The pipe subgrade as well as the backfill around the pipes shall be compacted. Prior to placement of cover over the pipe, the pipe shall be inspected by the General Quality Control Monitor. The QA/QC for the installation of the temporary header pipe is as follows:

a. Location - The compacted subgrade and backfill shall be tested in place. The locations of testing shall be determined by the Soils Quality Control Monitor.

b. Standard - The subgrade and backfill shall be compacted to 85% of Standard Proctor maximum dry density (ASTM D-698) and shall be placed in 12-inch maximum lifts.

The minimum cover (clean fill) over the header pipe shall be 12 inches.

c. Frequency – The density of the subgrade and backfill shall be tested once per 500 linear feet per lift. The thickness of the cover over the pipe shall be checked once per 500 linear feet.

APPENDIX 2

TRAIL RIDGE LANDFILL

INCREMENTAL CLOSURE PHASE 4

UNITS 51 – 81

CONSTRUCTION PHOTOGRAPHS

Aerial Photograph - Trail Ridge Landfill) (Phase 4 - Initial cover exposed) (March 2013)

Aerial Photograph - Trail Ridge Landfill (Phase 4 - Initial cover exposed) (March 2013)

Balancing Initial Cover Maintenance Road (Facing South) (April 2013)

Maintenance Road swale – Initial Cover grading (Facing South) (April 2013)

Installing Seep Drain – Units 71 and 72 (Facing easterly) (April 2013)

Density Testing Clay – Units 79 (Facing North) (June 2013)

Installing Underdrain – Terrace 6 – Units 79-81 (facing North) (July 2013)

Underdrain wrapped with filter fabric (facing north) (July 2013)

Aerial Photograph - Trail Ridge Landfill (Clay and Top soil on parts of Phase 4) (August 2014)

Aerial Photograph - Trail Ridge Landfill (Initial cover exposed on parts of Phase 4) (August 2014)

Aerial Photograph - Trail Ridge Landfill (Top soil and Initial cover exposed on parts of Phase 4) (August 2014)

Completed Rip Rap – Downcomer D-52 at Terrace 2 (Facing Southwesterly) (August 2014)

Grading Top Soil – Unit 76 (Facing Northwesterly) (September 2014)

Grading terrace swales – Unit 77 at Terrace 3 (Facing Northerly) (September 2014)

Finished subgrade at fabra-form replacement S-110 (Facing Southeasterly) (October 2014)

Finishing concrete S-110 (Facing East) (October 2014)

Grading initial cover at clay test strip (Facing East) (October 2014)

Compacting Clay along Maintenance Road (Facing South) (October 2014)

Installing geotextile prior to crushcrete placement for Maintenance Road (Facing South) (October 2014)

Placing crushcrete over geotextile for Maintenance Road (Facing North) (October 2014)

Graded top soil prior to sod placement - Units 66-68 (Facing West) (October 2014)

Installing rolled sod with overlapping joints Unit 66 (Facing North) (October 2014)

Grading Initial Cover (Units 57 – 59) (Facing East) (November 2014)

Installation of Inlet S-111 (November 2014)

Compacting First Lift Crushcrete for Maintenance Road (Facing Northwesterly) (November 2014)

Placing Second Lift of Crushcrete for Maintenance Road (Facing North) (November 2014)

Excavating Initial Cover Trench for D-41 (Facing North) (December 2014)

Grading Perimeter Road Swale (Unit 75) (Facing North) (December 2014)

Grading Clay (Unit 60) (Facing East) (December 2014)

Excavating Initial Cover for Downcomer D-38 (Facing North) (January 2015)

Graded Initial Cover (Unit 55) (Facing Northeasterly) (January 2015)

Placing Clay (Unit 55) (Facing Northwesterly) (January 2015)

Leveling Underdrain Sand at Terrace 6 adjacent to D-41 (Facing East) (January 2015)

Placing Top Soil (Unit 62) (Facing West) (January 2015)

Top Soil within Units 63-65 (Facing Easterly) (February 2015)

Installation of D-33 in Clay Trench (Facing Northwesterly) (February 2015)

Placement of Downcomer D-33 (Facing Northwesterly) (February 2015)

Installation of Rip Rap for Temporary Downcomer D-52 at Terrace 10 (Facing West) (March 2015)

Grading Clay Swale for Underdrain Installation within Units 54 thru 56 (Facing Northeasterly) (March 2015)

Grading Clay for Terrace Underdrain within Units 51 thru 53 (Facing Easterly) (March 2015)

Placing Rolled Sod within Units 60 thru 62 (Facing East) (March 2015)

Graded Top Soil within Units 57 thru 59 (Facing Southwesterly) (March 2015)

Installing Underdrain within Unit 52 (Facing Northerly) (April 2015)

Rip-Rap Installation at Downcomer D-27 (Facing Easterly) (April 2015)

Grading Initial Cover within Units 51 -53 (Facing Southerly) (April 2015)

Graded Terrace Swale within Units 51-53 (Facing Southeasterly) (April 2015)

Cutting Grass within Units 69-81 (Facing Southerly) (May 2015)

Grading Maintenance Road prior to prime coat installation (facing southwesterly) (June 2015)

Prime coat installation for the maintenance road (facing southwesterly) (June 2015)

Cleaning Fabra form Ditch – Southside of Landfill (facing westerly) (June 2015)

Aerial Photograph - Trail Ridge Landfill (Phase 4 mostly sodded) (August 2015)

Aerial Photograph - Trail Ridge Landfill (Phase 4 mostly sodded) (August 2015)

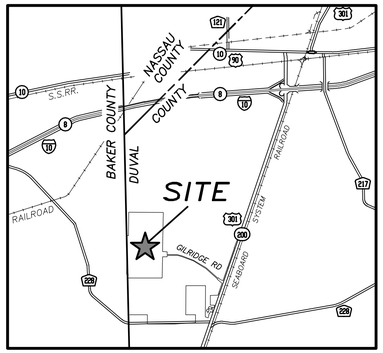
Aerial Photograph - Trail Ridge Landfill (Phase 4 mostly sodded) (September 2015)

Aerial Photograph - Trail Ridge Landfill (Phase 4 sodded) (October 2015)

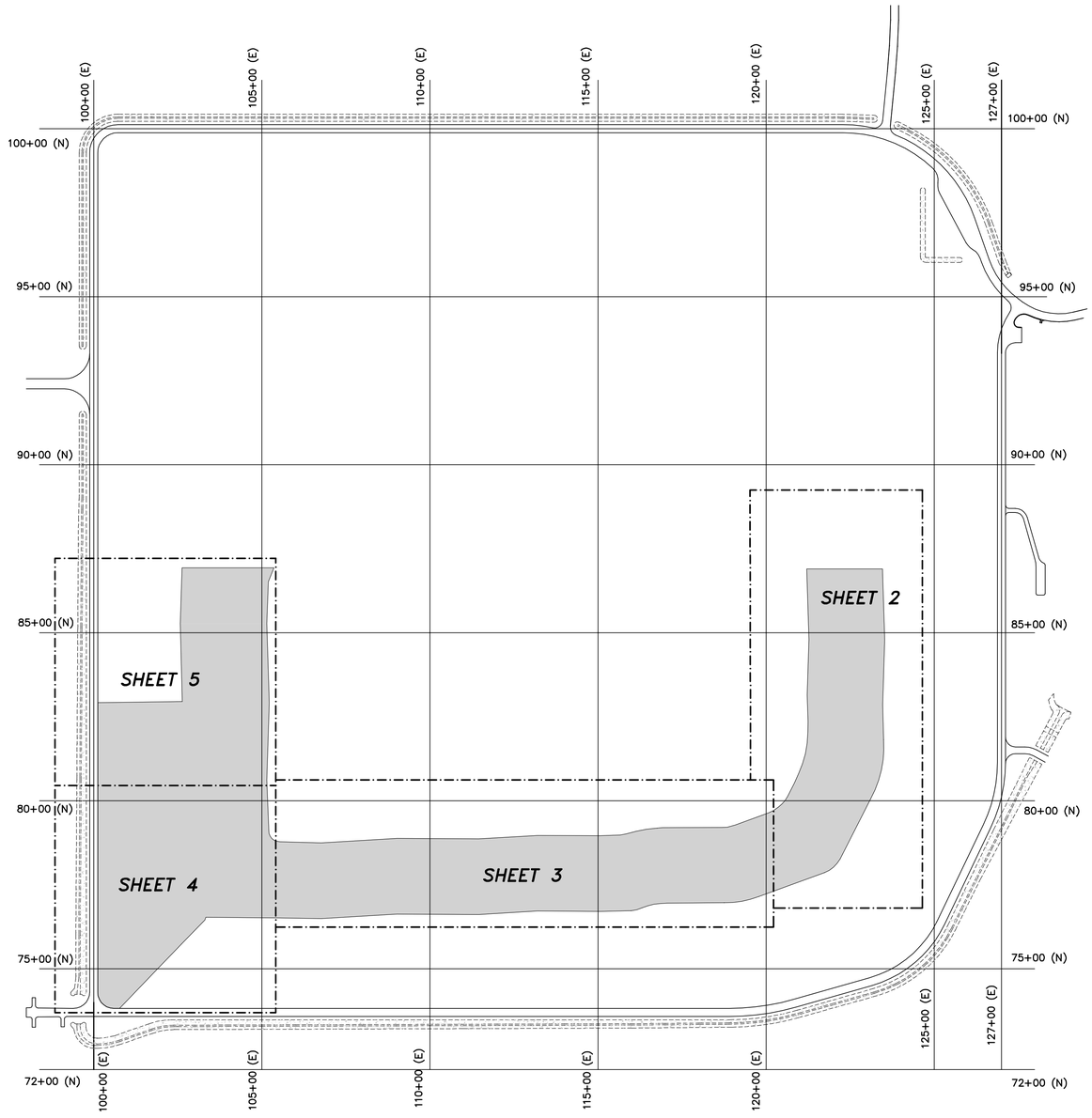
Aerial Photograph - Trail Ridge Landfill (Phase 4 sodded) (October 2015)

Aerial Photograph - Trail Ridge Landfill (Phase 4 sodded) (October 2015)

Aerial Photograph - Trail Ridge Landfill (Phase 4 sodded) (October 2015)



VICINITY MAP
(NOT TO SCALE)



GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

GENERAL NOTES:

1) *THE PURPOSE OF THIS SURVEY IS TO DENOTE THE AS-BUILT DATA FOR TRAIL RIDGE LANDFILL INCREMENTAL CLOSURE (CLOSURE PHASE 4) OF THE SIDE SLOPES.*

2) *THE HORIZONTAL GRID DEPICTED HEREON IS REFERENCED TO A LOCAL DATUM.*

3) *SOURCE BENCHMARK IS A CONCRETE MONUMENT WITH A U.S. COASTAL AND GEODETIC SURVEY DISK STAMPED "AJ-59", LOCATED ALONG U.S. HIGHWAY NO. 301 APPROXIMATELY 800 FEET NORTHERLY OF ITS INTERSECTION WITH STATE ROAD NO. 228. PID NO. BD1401, ELEVATION 88.41 FEET (NATIONAL GEODETIC VERTICAL DATUM 1929).*

4) *THIS COMPILATION OF AS-BUILT DATA WAS COLLECTED BY THIS FIRM FROM APRIL 2013 THROUGH DECEMBER 2015.*

5) *THE AS-BUILT DATA DENOTED HEREON WITH AN ASTERISK (*) REFLECTS THE ELEVATION OF FINAL COVER AS OF THE DATE OF SURVEY. HOWEVER, DUE TO THE TIME LAPSE BETWEEN INSTALLATION OF INITIAL COVER AND THE COMPLETION OF THE FINAL COVER LAYER SETTLEMENT HAS OCCURRED CAUSING THESE AS-BUILT ELEVATIONS TO BE LOWER THAN THE DESIGN ELEVATIONS.*

AS-BUILT

LEGEND:

S-35	STRUCTURE NUMBER
T1	TERRACE NUMBER
D33	DOWNCOMER PIPE NUMBER
	DOWNCOMER PIPE
1	SLOPE PROFILE NUMBER
39	SIDE SLOPE UNIT
	LIMITS OF SIDE SLOPE CLOSURE
	CLOSED SIDE SLOPE UNIT

NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

DAMON J. KELLY
PROFESSIONAL SURVEYOR AND MAPPER
STATE of FLORIDA LS No. 6284

DATE: DECEMBER 29, 2015

AS-BUILT SURVEY OF

TRAIL RIDGE LANDFILL INCREMENTAL CLOSURE PHASE 4
A PORTION OF SECTION 19, TOWNSHIP 3 SOUTH, RANGE 23 EAST, DUVAL COUNTY, FLORIDA, ALSO BEING A PORTION OF THOSE LANDS DESCRIBED AND RECORDED IN OFFICIAL RECORDS BOOK 7245, PAGE 1751, OF THE CURRENT PUBLIC RECORDS OF SAID COUNTY.

ROBERT M. ANGAS ASSOCIATES, INC.
SURVEYING & PLANNING CIVIL ENGINEERING
14775 Old St. Augustine Road, Jacksonville, FL. 32258
Tel: (904) 642-8550 Fax: (904) 642-4165
Certificate of Authorization No.: LB 3624

SHEET
1
OF
5

EASTERN SLOPE (Profile 3–High Point)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	86+90 N	123+53.75 E	208.94	208.99	4–26–12	212.10	210.34*	7–21–15
TERRACE No. 4 BOTTOM	86+90 N	123+46.25 E	206.44	206.49	4–26–12	209.60	207.88*	7–21–15
TERRACE No. 5 TOP	86+90 N	122+78.75 E	228.94	228.84	5–4–15	232.10	230.59*	7–21–15
TERRACE No. 5 BOTTOM	86+90 N	122+71.25 E	226.44	226.43	5–4–15	229.60	228.29*	7–21–15
TERRACE No. 6 TOP	86+90 N	122+03.75 E	248.94	248.84	5–4–15	252.10	250.84*	7–21–15
TERRACE No. 6 BOTTOM	86+90 N	121+96.25 E	246.44	246.34	5–4–15	249.60	248.63*	7–21–15
TERRACE No. 7 TOP	86+90 N	121+28.45 E	269.04	269.04	5–4–15	272.20	270.22*	7–21–15
TERRACE No. 7 BOTTOM	86+90 N	121+20.95 E	266.54	266.49	5–4–15	269.70	267.66*	7–21–15

EASTERN SLOPE (Profile 4–Low Point at Downcomer D–27)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	84+80 N	123+60.05 E	–	–	–	210.00	208.58*	8–10–15
TERRACE No. 4 BOTTOM	84+80 N	123+52.55 E	–	–	–	207.50	205.59*	8–10–15
TERRACE No. 5 TOP	84+80 N	122+85.05 E	226.84	226.86	3–2–15	230.00	229.10*	8–10–15
TERRACE No. 5 BOTTOM	84+80 N	122+77.55 E	224.34	224.34	3–2–15	227.50	226.48*	8–10–15
TERRACE No. 6 TOP	84+80 N	122+10.05 E	246.84	246.79	3–2–15	250.00	249.08*	8–10–15
TERRACE No. 6 BOTTOM	84+80 N	122+02.55 E	244.34	244.31	3–2–15	247.50	246.53*	8–10–15
TERRACE No. 7 TOP	84+80 N	121+35.05 E	266.84	266.78	3–2–15	270.00	268.08*	8–18–15
TERRACE No. 7 BOTTOM	84+80 N	121+27.55 E	264.34	264.44	3–2–15	267.50	266.38*	8–10–15

EASTERN SLOPE (Profile 5–High Point between Downcomers D–33 and D–27)

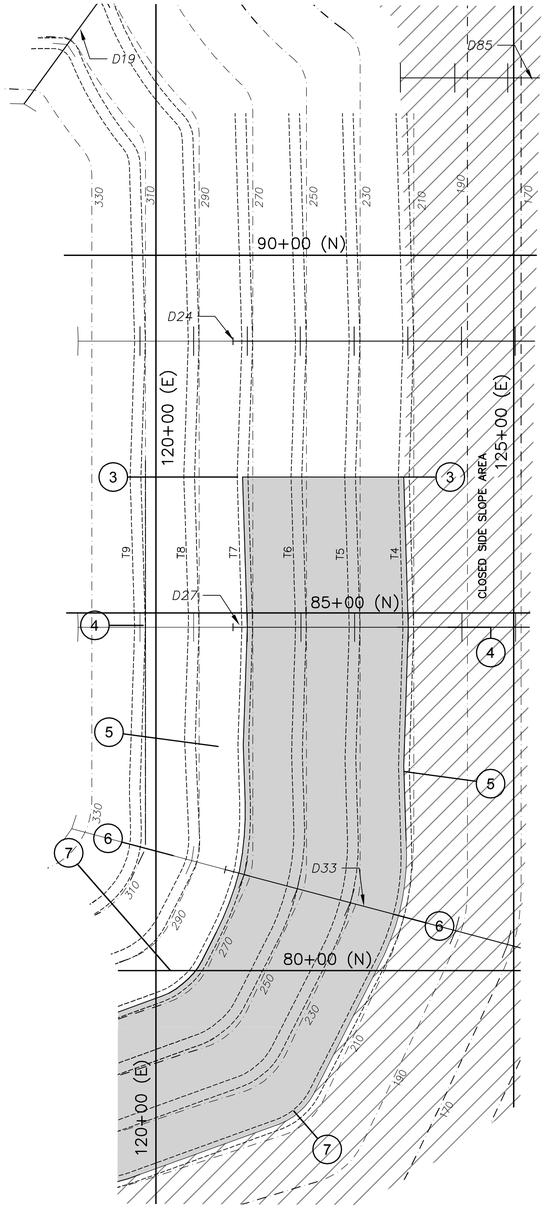
DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	82+85.15 N	123+53.87 E	–	–	–	212.10	210.30*	8–10–15
TERRACE No. 4 BOTTOM	82+86.11 N	123+46.33 E	–	–	–	209.60	208.30*	8–10–15
TERRACE No. 5 TOP	82+94.71 N	122+79.19 E	228.84	228.86	2–12–15	232.00	231.17*	8–10–15
TERRACE No. 5 BOTTOM	82+95.67 N	122+71.65 E	226.34	226.40	2–12–15	229.50	228.41*	8–10–15
TERRACE No. 6 TOP	83+04.27 N	122+04.45 E	248.74	248.75	2–12–15	251.90	250.87*	8–10–15
TERRACE No. 6 BOTTOM	83+05.23 N	121+96.91 E	246.24	246.30	2–12–15	249.40	248.51*	8–10–15
TERRACE No. 7 TOP	83+13.85 N	121+29.47 E	268.74	268.83	2–12–15	271.90	270.30*	8–10–15
TERRACE No. 7 BOTTOM	83+14.8 N	121+22.00 E	266.24	266.35	2–12–15	269.40	267.51*	8–10–15

EASTERN SLOPE (Profile 6–Low Point at Downcomer D–33)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	80+82.05 N	123+48.2 E	–	–	–	210.00	210.30*	1–28–14
TERRACE No. 4 BOTTOM	80+83.9 N	123+40.92 E	–	–	–	207.50	206.33*	8–10–15
TERRACE No. 5 TOP	81+00.62 N	122+73.45 E	226.84	226.87	2–9–15	230.00	229.39*	8–10–15
TERRACE No. 5 BOTTOM	81+02.45 N	122+66.15 E	224.34	224.33	2–9–15	227.50	227.49	8–10–15
TERRACE No. 6 TOP	81+19.15 N	121+98.75 E	246.84	246.83	2–9–15	250.00	249.40*	8–10–15
TERRACE No. 6 BOTTOM	81+20.95 N	121+91.45 E	244.34	244.36	2–9–15	247.50	247.40	8–10–15
TERRACE No. 7 TOP	81+37.7 N	121+24.05 E	266.84	266.76	2–9–15	270.00	269.35*	8–10–15
TERRACE No. 7 BOTTOM	81+39.5 N	121+16.75 E	264.34	264.39	2–9–15	267.50	266.92*	8–10–15

EASTERN SLOPE (Profile 7–High Point between Downcomers D–33 and D–38)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	77+93.41 N	122+01.34 E	–	–	–	213.30	210.80*	8–10–15
TERRACE No. 4 BOTTOM	77+99.05 N	121+96.40 E	–	–	–	210.80	208.61*	8–10–15
TERRACE No. 5 TOP	78+54.06 N	121+48.23 E	229.64	229.56	1–6–15	232.80	231.71*	8–10–15
TERRACE No. 5 BOTTOM	78+59.70 N	121+43.29 E	227.14	227.09	1–6–15	230.30	229.51*	8–10–15
TERRACE No. 6 TOP	79+15.37 N	120+94.53 E	249.24	249.34	1–6–15	252.40	250.73*	8–10–15
TERRACE No. 6 BOTTOM	79+21.01 N	120+89.58 E	246.74	246.64	1–6–15	249.90	248.70*	8–10–15
TERRACE No. 7 TOP	79+75.56 N	120+41.82 E	268.74	268.73	1–6–15	271.90	270.11*	8–10–15
TERRACE No. 7 BOTTOM	79+81.2 N	120+36.88 E	266.24	266.26	1–6–15	269.40	267.81*	8–10–15



GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

LEGEND:

- S–35 STRUCTURE NUMBER
- T1 TERRACE NUMBER
- D33 DOWNCOMER PIPE NUMBER
- DOWNCOMER PIPE
- (1) SLOPE PROFILE NUMBER
- 39 SIDE SLOPE UNIT
- LIMITS OF SIDE SLOPE CLOSURE
- CLOSED SIDE SLOPE UNIT

SEE SHEET 1 FOR GENERAL NOTES.

AS-BUILT SURVEY OF
TRAIL RIDGE LANDFILL INCREMENTAL CLOSURE PHASE 4
A PORTION OF SECTION 19, TOWNSHIP 3 SOUTH, RANGE 23 EAST, DUVAL COUNTY, FLORIDA, ALSO BEING A PORTION OF THOSE LANDS DESCRIBED AND RECORDED IN OFFICIAL RECORDS BOOK 7245, PAGE 1751, OF THE CURRENT PUBLIC RECORDS OF SAID COUNTY.

DATE DECEMBER 29, 2015

RMA GROUP
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Certificate of Authorization No.: LB 3364

SHEET 2 OF 5

CAD FILE: I:\Survey\RMApro\Trail Ridge\Topo\TR Phase 4 Closure.dwg FIELD BOOK: X1484 DRAWN BY: DMS CHECKED BY: DJK

COUNTY: DUVAL ORDER NO.: 13–025.00 FILE NO.: 1220–40.00B

SOUTHERN SLOPE (Profile 8–Low Point at Downcomer D–38)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	76+91.48 N	119+19.39 E	–	–	–	210.00	208.41*	8–10–15
TERRACE No. 4 BOTTOM	76+98.89 N	119+18.27 E	–	–	–	207.50	205.31*	8–10–15
TERRACE No. 5 TOP	77+65.63 N	119+08.14 E	226.84	226.88	1–6–15	230.00	229.76*	8–10–15
TERRACE No. 5 BOTTOM	77+73.04 N	119+07.01 E	224.34	224.43	1–6–15	227.50	227.42	8–10–15
TERRACE No. 6 TOP	78+39.78 N	118+96.88 E	246.84	246.94	1–6–15	250.00	248.93*	8–10–15
TERRACE No. 6 BOTTOM	78+47.19 N	118+95.75 E	244.34	244.43	1–6–15	247.50	246.43*	8–10–15
TERRACE No. 7 TOP	79+13.93 N	118+85.62 E	266.84	266.87	1–6–15	270.00	268.39*	8–10–15
TERRACE No. 7 BOTTOM	79+21.34 N	118+84.50 E	264.34	264.34	1–6–15	267.50	266.58*	8–10–15

SOUTHERN SLOPE (Profile 9–High Point between Downcomers D–38 and D–41)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	76+88.00 N	117+06.85 E	–	–	–	212.20	209.75*	8–10–15
TERRACE No. 4 BOTTOM	76+95.5 N	117+06.32 E	–	–	–	209.70	207.91*	8–10–15
TERRACE No. 5 TOP	77+62.57 N	117+01.63 E	228.94	228.89	12–12–14	232.10	231.75*	8–10–15
TERRACE No. 5 BOTTOM	77+70.05 N	117+01.11 E	226.44	226.52	12–12–14	229.60	229.64	8–10–15
TERRACE No. 6 TOP	78+37.43 N	116+96.40 E	248.94	248.84	12–12–14	252.10	251.00*	8–10–15
TERRACE No. 6 BOTTOM	78+44.93 N	116+95.88 E	246.44	246.50	12–12–14	249.60	248.91*	8–10–15
TERRACE No. 7 TOP	79+12.29 N	116+91.17 E	268.84	268.89	12–12–14	272.00	270.67*	8–10–15
TERRACE No. 7 BOTTOM	79+19.78 N	116+90.65 E	266.34	266.43	12–12–14	269.50	268.98*	8–10–15

SOUTHERN SLOPE (Profile 10–Low Point at Downcomer D–41)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	76+63.25 N	115+06.75 E	–	–	–	210.00	209.11*	8–10–15
TERRACE No. 4 BOTTOM	76+70.75 N	115+06.75 E	–	–	–	207.50	205.16*	8–10–15
TERRACE No. 5 TOP	77+38.25 N	115+06.75 E	226.84	226.94	12–9–14	230.00	229.47*	8–10–15
TERRACE No. 5 BOTTOM	77+45.75 N	115+06.75 E	224.34	224.32	12–9–14	227.50	227.26*	8–10–15
TERRACE No. 6 TOP	78+13.25 N	115+06.75 E	246.84	246.90	12–9–14	250.00	249.10*	8–10–15
TERRACE No. 6 BOTTOM	78+20.75 N	115+06.75 E	244.34	244.44	12–9–14	247.50	246.99*	8–10–15
TERRACE No. 7 TOP	78+88.25 N	115+06.75 E	266.84	266.85	12–9–14	270.00	269.91	6–16–15
TERRACE No. 7 BOTTOM	78+95.75 N	115+06.75 E	264.34	264.34	12–9–14	267.50	266.74*	8–10–15

SOUTHERN SLOPE (Profile 11–High Point between Downcomers D–44 and D–41)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	76+64.06 N	113+20 E	208.74	209.49*	11–21–13	211.90	209.90*	12–29–15
TERRACE No. 4 BOTTOM	76+71.56 N	113+20 E	206.24	207.99*	6–16–15	209.40	207.72*	12–29–15
TERRACE No. 5 TOP	77+39.06 N	113+20 E	228.74	228.78	10–30–13	231.90	230.88*	8–10–15
TERRACE No. 5 BOTTOM	77+46.56 N	113+20 E	226.24	226.27	10–30–13	229.40	228.47*	8–10–15
TERRACE No. 6 TOP	78+14.06 N	113+20 E	248.74	248.71	11–21–13	251.90	250.90*	8–10–15
TERRACE No. 6 BOTTOM	78+21.56 N	113+20 E	246.24	246.29	11–21–13	249.40	248.90*	8–10–15
TERRACE No. 7 TOP	78+89.36 N	113+20 E	268.84	268.87	11–21–13	272.00	269.64*	8–10–15
TERRACE No. 7 BOTTOM	78+96.86 N	113+20 E	266.34	266.39	11–21–13	269.50	267.61*	8–10–15

SOUTHERN SLOPE (Profile 12–Low Point at Downcomer D–44)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	76+53.86 N	111+45.25 E	206.84	207.18*	11–21–13	210.00	–	–
TERRACE No. 4 TOP E.	76+53 N	111+65 E	20 FOOT OFFSETS (DUE TO DOWNCOMER)			210.25	208.05*	8–10–15
TERRACE No. 4 TOP W.	76+53 N	111+25 E				210.25	207.44*	8–10–15
TERRACE No. 4 BOTTOM	76+61.36 N	111+45.25 E	204.34	204.71*	11–21–13	207.50	–	–
TERRACE No. 4 BOTTOM E.	76+61 N	111+65 E	20 FOOT OFFSETS (DUE TO DOWNCOMER)			207.75	206.17*	8–10–15
TERRACE No. 4 BOTTOM W.	76+61 N	111+25 E				207.75	205.17*	8–10–15
TERRACE No. 5 TOP	77+28.86 N	111+45.25 E	226.84	227.06*	11–21–13	230.00	–	–
TERRACE No. 5 TOP E.	77+29 N	111+65 E	20 FOOT OFFSETS (DUE TO DOWNCOMER)			230.25	229.70*	8–10–15
TERRACE No. 5 TOP W.	77+29 N	111+25 E				230.25	228.18*	8–10–15
TERRACE No. 5 BOTTOM	77+36.36 N	111+45.25 E	224.34	224.60*	11–21–13	227.50	–	–
TERRACE No. 5 BOTTOM E.	77+36 N	111+65 E	20 FOOT OFFSETS (DUE TO DOWNCOMER)			227.75	227.58*	8–10–15
TERRACE No. 5 BOTTOM W.	77+36 N	111+25 E				227.75	226.58*	8–10–15
TERRACE No. 6 TOP	78+03.86 N	111+45.25 E	246.84	247.02*	11–21–13	250.00	–	–
TERRACE No. 6 TOP E.	78+04 N	111+65 E	20 FOOT OFFSETS (DUE TO DOWNCOMER)			250.25	249.86*	8–10–15
TERRACE No. 6 TOP W.	78+04 N	111+25 E				250.25	247.54*	8–10–15
TERRACE No. 6 BOTTOM	78+11.36 N	111+45.25 E	244.34	244.58*	11–21–13	247.50	–	–
TERRACE No. 6 BOTTOM E.	78+61 N	111+65 E	20 FOOT OFFSETS (DUE TO DOWNCOMER)			247.75	247.38*	8–10–15
TERRACE No. 6 BOTTOM W.	78+61 N	111+25 E				247.75	245.41*	8–10–15
TERRACE No. 7 TOP	78+78.86 N	111+45.25 E	266.84	267.10*	11–21–13	270.00	–	–
TERRACE No. 7 TOP E.	78+79 N	111+65 E	20 FOOT OFFSETS (DUE TO DOWNCOMER)			270.25	268.27*	8–10–15
TERRACE No. 7 TOP W.	78+79 N	111+25 E				270.25	268.27*	6–16–15
TERRACE No. 7 BOTTOM	78+86.36 N	111+45.25 E	264.34	264.59*	11–21–13	267.50	–	–
TERRACE No. 7 BOTTOM E.	78+79 N	111+65 E	20 FOOT OFFSETS (DUE TO DOWNCOMER)			267.75	267.23*	8–10–15
TERRACE No. 7 BOTTOM W.	78+79 N	111+25 E				267.75	266.14*	8–10–15

SOUTHERN SLOPE (Profile 13–High Point Between Downcomers D–44 and D–47)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	76+55.21 N	109+02 E	209.34	209.16*	10–30–13	212.50	209.37*	8–10–15
TERRACE No. 4 BOTTOM	76+62.71 N	109+02 E	206.84	207.28*	10–30–13	210.00	207.49*	8–10–15
TERRACE No. 5 TOP	77+30.21 N	109+02 E	229.34	229.26	10–30–13	232.50	230.64*	8–10–15
TERRACE No. 5 BOTTOM	77+37.71 N	109+02 E	226.84	226.87	10–30–13	230.00	228.43*	8–10–15
TERRACE No. 6 TOP	78+05.21 N	109+02 E	249.34	249.34	10–30–13	252.50	249.85*	8–10–15
TERRACE No. 6 BOTTOM	78+12.71 N	109+02 E	246.84	246.91	10–30–13	250.00	247.66*	8–10–15
TERRACE No. 7 TOP	78+80.51 N	109+02 E	269.44	269.50	10–30–13	272.60	269.01*	6–16–15
TERRACE No. 7 BOTTOM	78+88.01 N	109+02 E	266.94	266.95	10–30–13	270.10	267.85*	8–10–15

SOUTHERN SLOPE (Profile 14–Low Point at Downcomer D–47)

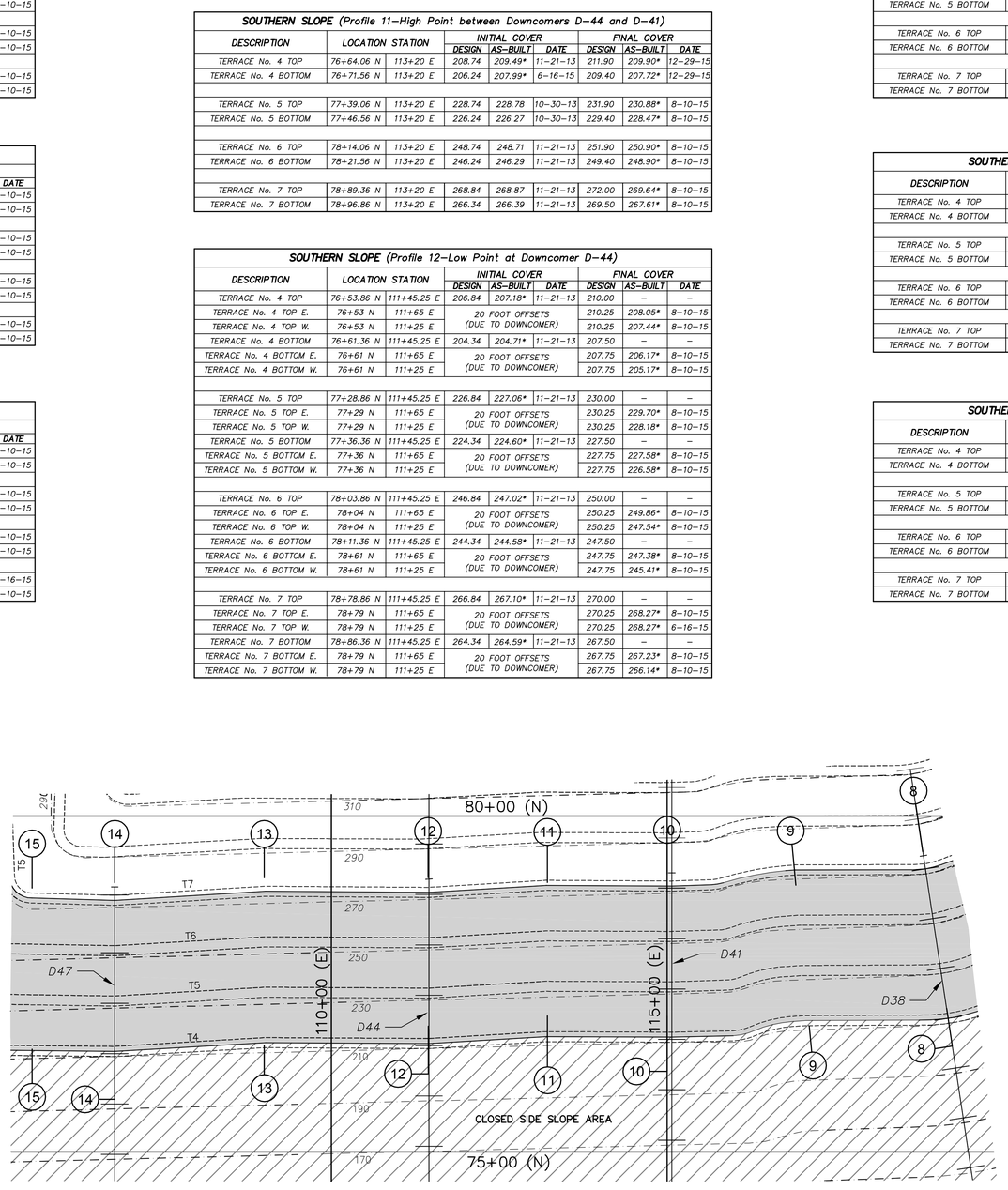
DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	76+42.04 N	106+77.11 E	–	–	–	210.00	207.95*	6–16–15
TERRACE No. 4 BOTTOM	76+49.54 N	106+77.11 E	–	–	–	207.50	204.61*	8–10–15
TERRACE No. 5 TOP	77+17.04 N	106+77.11 E	226.84	226.85	10–30–13	230.00	228.22*	8–10–15
TERRACE No. 5 BOTTOM	77+24.54 N	106+77.11 E	224.34	224.38	10–30–13	227.50	225.57*	8–10–15
TERRACE No. 6 TOP	77+92.04 N	106+77.11 E	246.84	246.86	10–30–13	250.00	247.15*	8–10–15
TERRACE No. 6 BOTTOM	77+99.54 N	106+77.11 E	244.34	244.39	10–30–13	247.50	245.11*	8–10–15
TERRACE No. 7 TOP	78+67.04 N	106+77.11 E	266.84	266.89	10–30–13	270.00	269.25*	1–27–14
TERRACE No. 7 BOTTOM	78+74.54 N	106+77.11 E	264.34	264.38	10–30–13	267.50	264.36*	8–10–15

SOUTHERN SLOPE (Profile 15–High Point at Terrace 7 Corner)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	76+43.42 N	105+54 E	208.34	208.40	10–30–13	211.50	208.60*	10–30–13
TERRACE No. 4 BOTTOM	76+50.92 N	105+54 E	205.84	205.81	10–30–13	209.00	207.44*	1–27–14
TERRACE No. 5 TOP	77+19.02 N	105+54 E	228.54	228.52	10–30–13	231.70	229.45*	8–10–15
TERRACE No. 5 BOTTOM	77+26.52 N	105+54 E	226.04	226.12	10–30–13	229.20	229.21	1–27–14
TERRACE No. 6 TOP	77+94.32 N	105+54 E	248.64	248.60	10–30–13	251.80	248.68*	6–16–15
TERRACE No. 6 BOTTOM	78+01.82 N	105+54 E	246.14	246.17	10–30–13	249.30	248.33*	1–27–14
TERRACE No. 7 TOP	78+70.52 N	105+54 E	269.04	269.10	9–23–13	272.20	271.08*	1–27–14
TERRACE No. 7 BOTTOM	78+78.02 N	105+54 E	266.54	266.64	9–23–13	269.70	265.86*	6–16–15

LEGEND:

S–35	STRUCTURE NUMBER
T1	TERRACE NUMBER
D33	DOWNCOMER PIPE NUMBER
⊢⊣	DOWNCOMER PIPE
(7)	SLOPE PROFILE NUMBER
39	SIDE SLOPE UNIT
	LIMITS OF SIDE SLOPE CLOSURE
	CLOSED SIDE SLOPE UNIT



GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SEE SHEET 1 FOR GENERAL NOTES.

AS-BUILT SURVEY OF

TRAIL RIDGE LANDFILL INCREMENTAL CLOSURE PHASE 4
A PORTION OF SECTION 19, TOWNSHIP 3 SOUTH,
RANGE 23 EAST, DUVAL COUNTY, FLORIDA, ALSO BEING
A PORTION OF THOSE LANDS DESCRIBED AND RECORDED
IN OFFICIAL RECORDS BOOK 7245, PAGE 1751,
OF THE CURRENT PUBLIC RECORDS OF SAID COUNTY.

DATE DECEMBER 29, 2015

RMA
ROBERT M. ANGAS ASSOCIATES, INC.
SURVEYING & PLANNING CIVIL ENGINEERING
14775 Old St. Augustine Road, Jacksonville, FL. 32258
Tel.: (904) 642–8550 Fax: (904) 642–4165
Certificate of Authorization No.: LB 3624

SHEET 3 OF 5

CAD FILE: I:\Survey\RMAproj\Trail Ridge\Topo\TR Phase 4 Closure.dwg FIELD BOOK: X1484 DRAWN BY: DMS CHECKED BY: DJK

COUNTY: DUVAL ORDER NO.: 13–025.00 FILE NO.: 1220–40.00B

SOUTHERN SLOPE (Profile 16–High Point at Terrace 6 Corner)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 4 TOP	76+44.08 N	104+80 E	–	–	–	212.35	209.14*	1–27–14
TERRACE No. 4 BOTTOM	76+51.58 N	104+80 E	–	–	–	209.85	207.21*	8–10–15
TERRACE No. 5 TOP	77+20.13 N	104+80 E	229.54	229.59	10–30–13	232.70	230.55*	8–10–15
TERRACE No. 5 BOTTOM	77+27.63 N	104+80 E	227.04	227.13	10–30–13	230.20	230.11	1–27–14
TERRACE No. 6 TOP	77+95.73 N	104+80 E	249.74	249.72	5–1–13	252.90	252.06*	1–27–14
TERRACE No. 6 BOTTOM	78+03.23 N	104+80 E	247.24	247.24	5–1–13	250.40	249.55*	1–27–14

SOUTHERN SLOPE (Profile 17–High Point at Terrace 5 Corner)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 4 TOP	76+44.80 N	104+07 E	–	–	–	213.20	210.30*	1–27–14
TERRACE No. 4 BOTTOM	76+52.30 N	104+07 E	–	–	–	210.70	208.62*	8–10–15
TERRACE No. 5 TOP	77+21.30 N	104+07 E	230.54	230.48	9–23–13	233.70	231.41*	8–10–15
TERRACE No. 5 BOTTOM	77+28.80 N	104+07 E	228.04	228.09	9–23–13	231.20	228.96*	8–10–15

SOUTHERN SLOPE (Profile 18–High Point at Terrace 4 Corner)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 4 TOP	76+45.52 N	103+33.50 E	210.94	211.00	9–23–13	214.10	210.48*	8–10–15
TERRACE No. 4 BOTTOM	76+53.02 N	103+33.50 E	208.44	208.34	10–30–13	211.60	208.68*	8–10–15

SOUTHERN SLOPE (Profile 19–High Point at Terrace 3)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 3 TOP	75+68.75 N	102+61.25 E	190.94	190.21*	10–9–13	194.10	191.28*	12–29–15
TERRACE No. 3 BOTTOM	75+76.25 N	102+61.25 E	188.44	188.88*	10–9–13	191.60	188.87*	12–29–15

SOUTHERN SLOPE (Profile 20–High Point at Terrace 2)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 2 TOP	74+94.25 N	101+88.44 E	171.74	171.39*	10–9–13	174.90	173.14*	12–29–15
TERRACE No. 2 BOTTOM	75+01.75 N	101+88.44 E	169.24	169.45*	10–9–13	172.40	170.98*	12–29–15

WESTERN SLOPE (Profile 21–Low Point at Terrace 2 Corner)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
MAINTENANCE ROAD	75+26 N	100+54.25 E	–	–	–	160.30	160.95*	8–10–15
MAINTENANCE ROAD	75+26 N	100+78.90 E	–	–	–	160.50	161.12*	8–10–15
GRADE BREAK	75+26 N	100+84.90 E	–	–	–	158.50	158.90*	8–10–15
GRADE BREAK	75+26 N	100+88.90 E	–	–	–	158.50	159.35*	8–10–15
TERRACE No. 2 TOP	75+26 N	101+32.60 E	166.84	166.81	10–16–13	170.00	168.22*	8–10–15
TERRACE No. 2 BOTTOM	75+26 N	101+40.10 E	164.34	164.40	10–16–13	167.50	167.49	11–21–13

WESTERN SLOPE (Profile 22–Low Point at Terrace 3 Corner)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
MAINTENANCE ROAD	76+03 N	100+72.35 E	–	–	–	165.55	167.75*	8–10–15
MAINTENANCE ROAD	76+03 N	100+97.00 E	–	–	–	165.50	165.38*	8–10–15
GRADE BREAK	76+03 N	101+03.00 E	160.34	160.39	9–23–13	163.50	163.43	1–6–15
GRADE BREAK	76+03 N	101+07.00 E	160.34	160.43	9–23–13	163.50	163.27*	8–10–15
TERRACE No. 2 TOP	76+03 N	101+34.70 E	167.64	167.67	9–23–13	170.80	169.75*	8–10–15
TERRACE No. 2 BOTTOM	76+03 N	101+42.20 E	165.14	165.21	9–23–13	168.30	168.29	1–6–15
TERRACE No. 3 TOP	76+03 N	102+07.30 E	186.64	186.59	9–23–13	190.00	189.97	1–6–15
TERRACE No. 3 BOTTOM	76+03 N	102+14.80 E	184.34	184.40	9–23–13	187.50	186.06*	8–10–15

WESTERN SLOPE (Profile 23–High Point at Terrace 2 Corner)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
MAINTENANCE ROAD	76+60.5 N	100+92.25 E	166.59	166.54	8–14–13	169.75	169.75	1–6–15
MAINTENANCE ROAD	76+60.5 N	101+18.15 E	166.54	166.62	8–14–13	169.70	169.74	1–6–15
TERRACE No. 2 TOP	76+60.5 N	101+36.35 E	168.24	168.14	8–14–13	171.40	171.14*	1–6–15
TERRACE No. 2 BOTTOM	76+60.5 N	101+43.85 E	165.74	165.76	8–14–13	168.90	168.93	1–6–15

WESTERN SLOPE (Profile 24–At Terrace 4 Corner)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
MAINTENANCE ROAD	76+80 N	101+00.35 E	168.59	168.60	8–14–13	171.50	171.44	1–6–15
MAINTENANCE ROAD	76+80 N	101+26.25 E	168.59	168.65	8–14–13	171.75	171.76	1–6–15
GRADE BREAK	76+80 N	101+44.25 E	167.44	167.53	8–14–13	170.60	170.06*	8–10–15
TERRACE No. 3 TOP	76+80 N	102+09.90 E	187.64	187.65	8–14–13	190.80	189.26*	8–10–15
TERRACE No. 3 BOTTOM	76+80 N	102+17.40 E	185.14	185.22	8–14–13	188.30	187.22*	8–10–15
TERRACE No. 4 TOP	76+80 N	102+93.30 E	210.44	210.38	8–14–13	213.60	211.40*	8–10–15
TERRACE No. 4 BOTTOM	76+80 N	103+00.80 E	207.94	207.90	8–14–13	211.10	209.49*	8–10–15

WESTERN SLOPE (Profile 25–At Terrace 5 Corner)

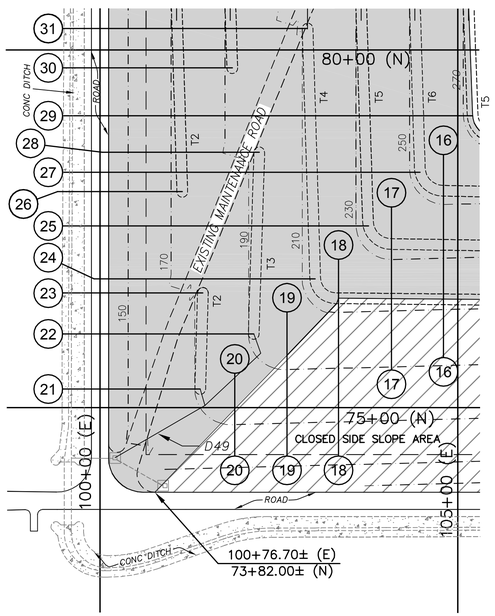
DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
MAINTENANCE ROAD	77+54 N	101+30.30 E	176.34	176.34	8–14–13	179.50	177.89*	8–10–15
MAINTENANCE ROAD	77+54 N	101+56.20 E	176.59	176.62	8–14–13	179.75	178.36*	8–10–15
GRADE BREAK	77+54 N	101+62.20 E	174.59	174.68	8–14–13	177.75	176.55*	8–10–15
GRADE BREAK	77+54 N	101+66.20 E	174.59	174.67	8–14–13	177.75	176.97*	8–10–15
TERRACE No. 3 TOP	77+54 N	102+12.25 E	188.39	188.43	8–14–13	191.55	189.99*	8–10–15
TERRACE No. 3 BOTTOM	77+54 N	102+19.75 E	185.89	185.85	8–14–13	189.05	188.22*	8–10–15
TERRACE No. 4 TOP	77+54 N	102+91.15 E	209.69	209.62	8–14–13	212.85	210.76*	8–10–15
TERRACE No. 4 BOTTOM	77+54 N	102+98.65 E	207.19	207.25	8–14–13	210.35	210.25	1–27–14
TERRACE No. 5 TOP	77+54 N	103+67.35 E	230.09	230.11	8–14–13	233.25	230.30*	8–10–15
TERRACE No. 5 BOTTOM	77+54 N	103+74.85 E	227.59	227.56	9–23–13	230.75	228.41*	8–10–15

WESTERN SLOPE (Profile 26–High Point at Terrace 2)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 2 TOP	78+02 N	101+07.85 E	169.54	169.54	8–14–13	172.70	172.59	12–29–15
TERRACE No. 2 BOTTOM	78+02 N	101+15.35 E	167.04	167.11	8–14–13	170.20	170.95*	12–29–15

WESTERN SLOPE (Profile 27–At Terrace 6 Corner)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 2 TOP	78+29 N	101+06.95 E	169.24	169.16	8–14–13	172.40	172.23*	12–29–14
TERRACE No. 2 BOTTOM	78+29 N	101+14.45 E	166.74	166.79	7–19–13	169.90	170.31*	12–29–15
MAINTENANCE ROAD	78+29 N	101+60.65 E	184.49	184.54	7–19–13	187.65	186.20*	8–10–15
MAINTENANCE ROAD	78+29 N	101+86.55 E	184.69	184.75	8–14–13	187.85	186.53*	8–10–15
GRADE BREAK	78+29 N	101+92.55 E	182.69	182.66	8–14–13	185.85	185.12*	8–10–15
GRADE BREAK	78+29 N	101+94.10 E	182.69	182.61	8–14–13	185.85	185.31*	8–10–15
TERRACE No. 3 TOP	78+29 N	102+14.35 E	189.14	189.21	8–14–13	192.30	190.68*	8–10–15
TERRACE No. 3 BOTTOM	78+29 N	102+21.85 E	186.64	186.72	8–14–13	189.80	188.89*	8–10–15
TERRACE No. 4 TOP	78+29 N	102+88.60 E	208.89	208.82	8–14–13	212.05	210.17*	8–10–15
TERRACE No. 4 BOTTOM	78+29 N	102+96.10 E	206.39	206.47	7–19–13	209.55	207.92*	8–10–15
TERRACE No. 5 TOP	78+29 N	103+64.80 E	229.29	229.30	7–19–13	232.45	231.38*	1–27–14
TERRACE No. 5 BOTTOM	78+29 N	103+72.30 E	226.79	226.76	7–19–13	229.95	227.35*	8–10–15
TERRACE No. 6 TOP	78+29 N	104+39.80 E	249.29	249.20	7–19–13	252.45	249.32*	8–10–15
TERRACE No. 6 BOTTOM	78+29 N	104+47.30 E	246.79	246.78	7–19–13	249.95	247.24*	8–10–15



LEGEND:

- S–35 STRUCTURE NUMBER
- T1 TERRACE NUMBER
- D33 DOWNCOMER PIPE NUMBER
- DOWNCOMER PIPE
- (1) SLOPE PROFILE NUMBER
- 39 SIDE SLOPE UNIT
- LIMITS OF SIDE SLOPE CLOSURE
- CLOSED SIDE SLOPE UNIT

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

WESTERN SLOPE (Profile 28–High Point at Terrace 3)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 2 TOP	78+57 N	101+06.05 E	168.94	168.99	7–19–13	172.10	172.32	10–29–14
TERRACE No. 2 BOTTOM	78+57 N	101+13.55 E	166.44	166.52	7–19–13	169.60	169.92	10–29–14
MAINTENANCE ROAD	78+57 N	101+71.95 E	187.44	187.49	7–19–13	190.60	189.16*	8–10–15
MAINTENANCE ROAD	78+57 N	101+97.85 E	187.69	187.75	7–19–13	190.85	189.64*	8–10–15
TERRACE No. 3 TOP	78+57 N	102+15.15 E	189.44	189.52	7–19–13	192.60	190.73*	12–29–15
TERRACE No. 3 BOTTOM	78+57 N	102+22.65 E	186.94	187.02	7–19–13	190.10	188.85*	12–29–15

WESTERN SLOPE (Profile 29–At Terrace 7 Corner)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 2 TOP	79+08 N	101+04.55 E	168.44	168.41	7–19–13	171.60	171.61	10–21–14
TERRACE No. 2 BOTTOM	79+08 N	101+12.05 E	165.94	165.95	7–19–13	169.10	169.20	10–29–14
GRADE BREAK	79+08 N	101+74.75 E	186.84	186.92	7–19–13	190.00	189.31*	4–24–15
MAINTENANCE ROAD	79+08 N	101+92.60 E	192.94	192.96	7–19–13	196.10	193.95*	8–10–15
MAINTENANCE ROAD	79+08 N	102+18.50 E	193.24	193.30	7–19–13	196.40	194.55*	8–10–15
GRADE BREAK	79+08 N	102+25.95 E	191.44	191.37	7–19–13	194.60	192.31*	8–10–15
GRADE BREAK	79+08 N	102+28.65 E	191.44	191.50	7–19–13	194.60	192.47*	8–10–15
TERRACE No. 4 TOP	79+08 N	102+86.20 E	208.09	208.02	7–19–13	211.25	209.10*	8–10–15
TERRACE No. 4 BOTTOM	79+08 N	102+93.70 E	205.59	205.67	7–19–13	208.75	206.86*	8–10–15
TERRACE No. 5 TOP	79+08 N	103+62.25 E	228.44	228.49	7–19–13	231.60	228.13*	2–24–15
TERRACE No. 5 BOTTOM	79+08 N	103+69.75 E	225.94	225.93	7–19–13	229.10	226.48*	8–10–15
TERRACE No. 6 TOP	79+08 N	104+37.25 E	248.44	248.35	5–1–13	251.60	248.16*	4–24–15
TERRACE No. 6 BOTTOM	79+08 N	104+44.75 E	245.94	245.97	5–1–13	249.10	245.96*	4–24–15
TERRACE No. 7 TOP	79+08 N	105+12.40 E	268.49	268.42	5–1–13	271.65	267.20*	12–29–15
TERRACE No. 7 BOTTOM	79+08 N	105+19.90 E	265.99	265.98	5–1–13	269.15	264.94*	12–29–15

WESTERN SLOPE (Profile 30–High Point at Terrace 3)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 2 TOP	79+75 N	101+02.45 E	167.74	167.69	7–11–13	170.90	170.51*	10–29–14
TERRACE No. 2 BOTTOM	79+75 N	101+09.95 E	165.24	165.30	7–11–13	168.40	168.33	10–29–14
TERRACE No. 3 TOP	79+75 N	101+77.75 E	187.84	187.80	7–11–13	191.00	190.15*	8–10–15
TERRACE No. 3 BOTTOM	79+75 N	101+85.25 E	185.34	185.40	7–11–13	188.50	188.60	4–24–15

WESTERN SLOPE (Profile 31–Low Point at Terrace 4)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS-BUILT	DATE	DESIGN	AS-BUILT	DATE
TERRACE No. 2 TOP	80+30 N	101+00.80 E	167.19	167.14	7–11–13	170.35	169.81*	10–29–14
TERRACE No. 2 BOTTOM	80+30 N	101+08.30 E	164.69	164.78	7–11–13	167.85	167.75	4–24–15
TERRACE No. 3 TOP	80+30 N	101+75.80 E	187.19	187.20	7–11–13	190.35	189.17*	8–10–15
TERRACE No. 3 BOTTOM	80+30 N	101+83.30 E	184.69	184.69	7–11–13	187.85	187.75	4–24–15
MAINTENANCE ROAD	80+30 N	102+41.95 E	206.09	206.10	7–11–13	209.25	206.77*	8–10–15
MAINTENANCE ROAD	80+30 N	102+67.85 E	206.39	206.41	7–19–13	209.55	207.22*	8–10–15
TERRACE No. 4 TOP	80+30 N	102+82.65 E	206.84	206.92	7–19–13	210.00	208.87*	10–29–14
TERRACE No. 4 BOTTOM	80+30 N	102+90.15 E	204.34	204.43	7–19–13	207.50	207.42	8–20–13

AS-BUILT SURVEY OF

TRAIL RIDGE LANDFILL INCREMENTAL CLOSURE PHASE 4

A PORTION OF SECTION 19, TOWNSHIP 3 SOUTH, RANGE 23 EAST, DUVAL COUNTY, FLORIDA, ALSO BEING A PORTION OF THOSE LANDS DESCRIBED AND RECORDED IN OFFICIAL RECORDS BOOK 7245, PAGE 1751, OF THE CURRENT PUBLIC RECORDS OF SAID COUNTY.

DATE: DECEMBER 29, 2015

RMA GROUP
ROBERT M. ANGAS ASSOCIATES, INC.
SURVEYING ■ PLANNING ■ CIVIL ENGINEERING
14775 Old St. Augustine Road, Jacksonville, FL. 32258
Tel.: (904) 642–8550 Fax: (904) 642–4165
Certificate of Authorization No.: LB 3624

SHEET 4 OF 5

SEE SHEET 1 FOR GENERAL NOTES.

WESTERN SLOPE (Profile 32–Low Point at Downcomer D–52)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 2 TOP	80+61.50 N	100+99.75 E	166.84	166.92	7–11–13	170.00	169.86*	8–10–15
TERRACE No. 2 BOTTOM	80+61.50 N	101+07.25 E	164.34	164.40	7–11–13	167.50	167.83*	8–10–15
TERRACE No. 3 TOP	80+61.50 N	101+74.75 E	186.84	186.88	7–11–13	190.00	188.87*	8–10–15
TERRACE No. 3 BOTTOM	80+61.50 N	101+82.25 E	184.34	184.39	7–11–13	187.50	187.28*	8–10–15
GRADE BREAK	80+61.50 N	102+49.65 E	206.84	206.88	9–23–13	210.00	209.23*	8–10–15
MAINTENANCE ROAD	80+61.50 N	102+54.65 E	209.49	209.56	6–5–13	212.65	209.87*	8–10–15
MAINTENANCE ROAD	80+61.50 N	102+80.55 E	209.79	209.86	7–11–13	212.95	210.20*	8–10–15
GRADE BREAK	80+61.50 N	102+90.30 E	207.69	207.74	7–11–13	210.85	208.56*	12–29–15
GRADE BREAK	80+61.50 N	102+92.15 E	207.69	207.75	6–5–13	210.85	208.17*	12–29–15
TERRACE No. 5 TOP	80+61.50 N	103+57.60 E	226.84	226.85	6–5–13	230.00	227.73*	4–24–15
TERRACE No. 5 BOTTOM	80+61.50 N	103+65.10 E	224.34	224.33	7–11–13	227.50	224.37*	8–10–15
TERRACE No. 6 TOP	80+61.50 N	104+32.60 E	246.84	246.89	7–11–13	250.00	245.80*	12–29–15
TERRACE No. 6 BOTTOM	80+61.50 N	104+40.10 E	244.34	244.41	7–11–13	247.50	242.72*	12–29–15
TERRACE No. 7 TOP	80+61.50 N	105+07.60 E	266.84	266.83	7–11–13	270.00	267.92*	4–24–15
TERRACE No. 7 BOTTOM	80+61.50 N	105+15.10 E	264.34	264.43	7–11–13	267.50	267.44	1–24–14

WESTERN SLOPE (Profile 33–High Point at Terrace 4)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 2 TOP	81+78 N	101+03.50 E	168.09	168.10	6–25–13	171.25	170.88*	10–31–14
TERRACE No. 2 BOTTOM	81+78 N	101+11.00 E	165.59	165.66	6–25–13	168.75	168.72	4–24–15
TERRACE No. 3 TOP	81+78 N	101+78.50 E	188.09	188.12	6–5–13	191.25	190.25*	12–29–15
TERRACE No. 3 BOTTOM	81+78 N	101+86.00 E	185.59	185.66	6–5–13	188.75	187.95	12–29–15
TERRACE No. 4 TOP	81+78 N	102+60.25 E	210.34	210.31	6–5–13	213.50	211.82*	10–31–14
TERRACE No. 4 BOTTOM	81+78 N	102+67.75 E	207.84	207.84	6–5–13	211.00	210.01*	10–31–14

WESTERN SLOPE (Profile 34–High Point at Terrace 5)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 2 TOP	82+38 N	101+05.30 E	168.69	168.72	6–25–13	171.85	171.64*	7–21–15
TERRACE No. 2 BOTTOM	82+38 N	101+12.80 E	166.19	166.24	6–25–13	169.35	169.14*	7–21–15
TERRACE No. 3 TOP	82+38 N	101+80.30 E	188.69	188.63	6–5–13	191.85	190.77*	7–21–15
TERRACE No. 3 BOTTOM	82+38 N	101+87.80 E	186.19	186.23	6–5–13	189.35	189.09*	7–21–15
TERRACE No. 4 TOP	82+38 N	102+58.45 E	209.74	209.67	6–5–13	212.90	210.45*	7–21–15
TERRACE No. 4 BOTTOM	82+38 N	102+65.95 E	207.24	207.23	6–5–13	210.40	208.59*	7–21–15
MAINTENANCE ROAD	82+38 N	103+26.10 E	228.54	228.51	6–5–13	231.70	227.69*	7–21–15
MAINTENANCE ROAD	82+38 N	103+52.00 E	228.79	228.82	6–5–13	231.95	228.28*	7–21–15
TERRACE No. 5 TOP	82+38 N	103+62.65 E	228.69	228.78	6–5–13	231.85	229.26*	7–21–15
TERRACE No. 5 BOTTOM	82+38 N	103+70.15 E	226.19	226.17	6–5–13	229.35	227.24*	7–21–15

WESTERN SLOPE (Profile 35–High Point Between Downcomer D–52 and D–55)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 2 TOP	82+92 N	101+06.80 E	169.24	169.23	6–25–13	172.40	171.36*	7–21–15
TERRACE No. 2 BOTTOM	82+92 N	101+14.30 E	166.74	166.73	6–25–13	169.90	170.44*	7–21–15
TERRACE No. 3 TOP	82+92 N	101+81.80 E	189.24	189.16	6–25–13	192.40	190.14*	7–21–15
TERRACE No. 3 BOTTOM	82+92 N	101+89.30 E	186.64	186.74	6–25–13	189.80	188.73*	7–21–15
TERRACE No. 4 TOP	82+92 N	102+56.50 E	209.14	209.14	6–25–13	212.30	209.63*	7–21–15
TERRACE No. 4 BOTTOM	82+92 N	102+64.00 E	206.64	206.60	4–17–13	209.80	208.15*	7–21–15
GRADE BREAK	82+92 N	103+24.60 E	226.84	226.86	4–17–13	230.00	226.41*	7–21–15
MAINTENANCE ROAD	82+92 N	103+48.00 E	234.49	234.54	4–17–13	237.65	233.41*	7–21–15
MAINTENANCE ROAD	82+92 N	103+73.90 E	234.64	234.85	4–17–13	237.80	233.91*	7–21–15
GRADE BREAK	82+92 N	103+79.90 E	232.64	232.73	4–17–13	235.80	234.54*	12–29–15
GRADE BREAK	82+92 N	103+83.90 E	232.64	232.63	4–17–13	235.80	235.49*	12–29–15
TERRACE No. 6 TOP	82+92 N	104+39.35 E	249.34	249.33	4–17–13	252.50	248.89*	7–21–15
TERRACE No. 6 BOTTOM	82+92 N	104+46.85 E	246.84	246.83	9–23–13	250.00	247.02*	7–21–15
TERRACE No. 7 TOP	82+92 N	105+14.85 E	269.34	269.40	4–17–13	272.50	267.74*	7–21–15
TERRACE No. 7 BOTTOM	82+92 N	105+22.35 E	266.84	266.92	4–17–13	270.00	265.62*	7–21–15

WESTERN SLOPE (Profile 36–High Point at Terrace 5)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	83+50 N	102+55.15 E	208.64	208.89*	7–21–15	211.80	209.01*	8–18–15
TERRACE No. 4 BOTTOM	83+50 N	102+62.65 E	206.14	206.17	4–17–13	209.30	207.10*	8–18–15
TERRACE No. 5 TOP	83+50 N	103+29.85 E	228.54	228.57	4–17–13	231.70	229.14*	7–21–15
TERRACE No. 5 BOTTOM	83+50 N	103+37.35 E	226.04	226.05	4–17–13	229.20	227.36*	7–21–15

WESTERN SLOPE (Profile 37–High Point at Terrace 6)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	84+21 N	102+52.90 E	207.89	208.17*	7–21–15	211.05	208.06*	8–18–15
TERRACE No. 4 BOTTOM	84+21 N	102+60.40 E	205.39	205.49	4–17–13	208.55	206.34*	8–18–15
TERRACE No. 5 TOP	84+21 N	103+28.05 E	227.94	227.94	4–17–13	231.10	228.07*	8–18–15
TERRACE No. 5 BOTTOM	84+21 N	103+35.55 E	225.44	225.54	4–17–13	228.60	226.36*	8–18–15
MAINTENANCE ROAD	84+21 N	104+00.10 E	248.29	248.29	4–17–13	251.45	246.87*	8–18–15
MAINTENANCE ROAD	84+21 N	104+26.00 E	248.54	248.60	4–17–13	251.70	247.53*	8–18–15
TERRACE No. 6 TOP	84+21 N	104+43.15 E	250.74	250.73	4–17–13	253.90	250.73*	8–18–15
TERRACE No. 6 BOTTOM	84+21 N	104+50.65 E	248.24	248.33	4–17–13	251.40	248.67*	8–18–15

WESTERN SLOPE (Profile 38–Low Point at Downcomer D–55)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 5 TOP	85+27 N	103+24.75 E	226.84	226.87	4–17–13	230.00	227.39*	8–18–15
TERRACE No. 5 BOTTOM	85+27 N	103+32.25 E	224.34	224.36	4–17–13	227.50	224.93*	8–18–15
TERRACE No. 6 TOP	85+27 N	103+99.75 E	246.84	246.87	4–17–13	250.00	246.53*	8–18–15
TERRACE No. 6 BOTTOM	85+27 N	104+07.25 E	244.34	244.33	4–17–13	247.50	244.34*	7–21–15
MAINTENANCE ROAD	85+27 N	104+43.00 E	–	–	–	262.85	257.89*	8–18–15
MAINTENANCE ROAD	85+27 N	104+68.90 E	–	–	–	263.15	258.92*	8–18–15
GRADE BREAK	85+27 N	104+74.90 E	257.99	258.11	4–17–13	261.15	257.16*	7–21–15
GRADE BREAK	85+27 N	104+78.90 E	257.99	258.11	4–17–13	261.15	257.18*	7–21–15
TERRACE No. 7 TOP	85+27 N	105+07.60 E	266.84	266.76	4–17–13	270.00	267.32*	8–18–15
TERRACE No. 7 BOTTOM	85+27 N	105+15.10 E	264.34	264.26	4–17–13	267.50	264.09*	8–18–15

WESTERN SLOPE (Profile 39–High Point at Terrace 7)

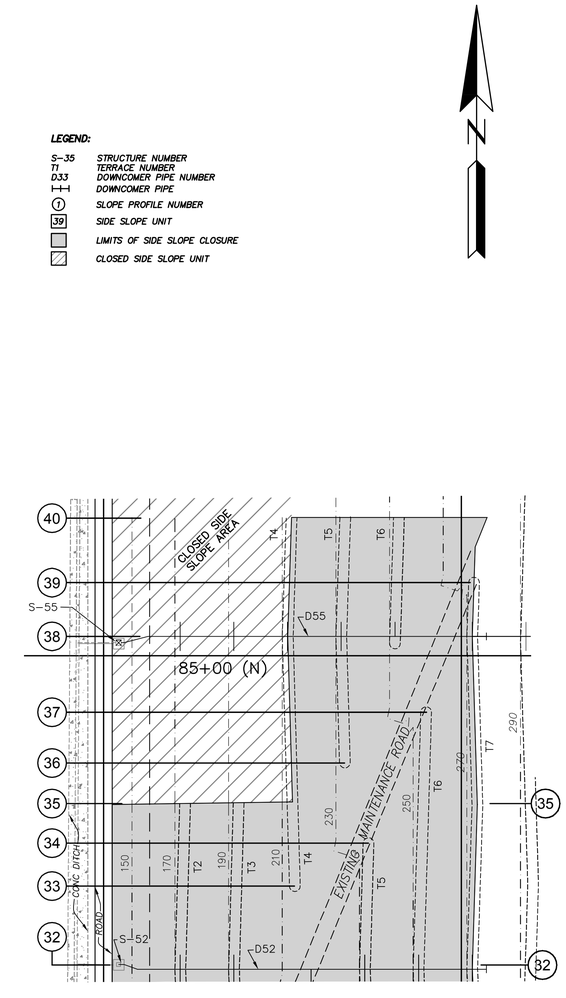
DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	86+02 N	102+52.30 E	207.69	207.68	4–17–13	210.85	207.41*	8–18–15
TERRACE No. 4 BOTTOM	86+02 N	102+59.80 E	205.19	205.23	4–17–13	208.35	205.44*	8–18–15
TERRACE No. 5 TOP	86+02 N	103+27.30 E	227.69	227.68	4–17–13	230.85	227.83*	8–18–15
TERRACE No. 5 BOTTOM	86+02 N	103+34.80 E	225.19	225.27	4–17–13	228.35	225.68*	8–18–15
TERRACE No. 6 TOP	86+02 N	104+02.30 E	247.69	247.73	4–17–13	250.85	246.73*	12–29–15
TERRACE No. 6 BOTTOM	86+02 N	104+09.80 E	245.19	245.24	4–17–13	248.35	244.69*	12–29–15
MAINTENANCE ROAD	86+02 N	104+73.35 E	267.79	267.81	4–17–13	270.95	266.44*	8–18–15
MAINTENANCE ROAD	86+02 N	104+99.25 E	268.09	268.12	4–17–13	271.25	266.97*	8–18–15
TERRACE No. 7 TOP	86+02 N	105+10.15 E	267.74	267.81	4–17–13	270.90	267.12*	7–21–15
TERRACE No. 7 BOTTOM	86+02 N	105+17.65 E	265.24	265.28	4–17–13	268.40	265.72*	8–18–15

WESTERN SLOPE (Profile 40–High Point)

DESCRIPTION	LOCATION STATION		INITIAL COVER			FINAL COVER		
			DESIGN	AS–BUILT	DATE	DESIGN	AS–BUILT	DATE
TERRACE No. 4 TOP	86+92 N	102+55.15 E	208.64	208.66	4–17–13	211.80	209.34*	8–18–15
TERRACE No. 4 BOTTOM	86+92 N	102+62.65 E	206.14	206.12	4–17–13	209.30	207.02*	8–18–15
TERRACE No. 5 TOP	86+92 N	103+30.15 E	228.64	228.58	4–17–13	231.80	228.97*	8–18–15
TERRACE No. 5 BOTTOM	86+92 N	103+37.65 E	226.14	226.24	4–17–13	229.30	227.00*	8–18–15
TERRACE No. 6 TOP	86+92 N	104+05.15 E	248.64	248.67	4–17–13	251.80	248.04*	7–21–15
TERRACE No. 6 BOTTOM	86+92 N	104+12.65 E	246.14	246.19	4–17–13	249.30	246.15*	8–18–15
GRADE BREAK	86+92 N	104+74.75 E	266.84	266.85	4–17–13	270.00	266.46*	8–18–15
MAINTENANCE ROAD	86+92 N	105+09.75 E	277.49	277.51	4–17–13	280.65	274.39*	8–18–15
MAINTENANCE ROAD	86+92 N	105+35.65 E	277.79	277.81	4–17–13	280.95	273.21*	8–18–15
GRADE BREAK	86+92 N	105+41.65 E	275.79	275.88	4–17–13	278.95	272.28*	8–18–15

LEGEND:

S–35	STRUCTURE NUMBER
T1	TERRACE NUMBER
D33	DOWNCOMER PIPE NUMBER
	DOWNCOMER PIPE
(7)	SLOPE PROFILE NUMBER
39	SIDE SLOPE UNIT
	LIMITS OF SIDE SLOPE CLOSURE
	CLOSED SIDE SLOPE UNIT



GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

AS-BUILT SURVEY OF

TRAIL RIDGE LANDFILL INCREMENTAL CLOSURE PHASE 4
A PORTION OF SECTION 19, TOWNSHIP 3 SOUTH,
RANGE 23 EAST, DUVAL COUNTY, FLORIDA, ALSO BEING
A PORTION OF THOSE LANDS DESCRIBED AND RECORDED
IN OFFICIAL RECORDS BOOK 7245, PAGE 1751,
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SHEET 5 OF 5

SEE SHEET 1 FOR GENERAL NOTES.

CAD FILE: I:\Survey\RMAproj\Trail Ridge\Topo\TR Phase 4 Closure.dwg FIELD BOOK: X1484 DRAWN BY: DMS CHECKED BY: DJK

COUNTY: DUVAL ORDER NO.: 13-025.00 FILE NO.: 1220-40.00B