

Construction Quality Assurance Report

Harnett County Anderson Creek C&D Landfill - Phases I & II Extension Spring Lake, North Carolina

Prepared for:

**Harnett County Solid Waste Department
Lillington, North Carolina**



Permit No.	Date	Document ID No.
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Prepared by:

NC LIC. NO. C-0828 (ENGINEERING)

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



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Construction Quality Assurance Report

Harnett County Anderson Creek C&D Landfill - Phases I & II Extension Spring Lake, North Carolina

Prepared For:

**Harnett County Solid Waste Department
Lillington, North Carolina**

S+G Project No. HARNETT-AC-13-4

Based on the observations and results of the CQA program documented herein, it is my professional opinion that the construction of the Phases I & II Extension of the Anderson Creek C&D Landfill was completed in accordance with the following:

- i. The Project CQA Manual;
- ii. The conditions of the Permit;
- iii. The requirements of 15A NCAC 13B.0541; and
- iv. Acceptable engineering practices.

Pieter K. Scheer, P.E.
Project Manager



October 2014

NC LIC. NO. C-0828 (ENGINEERING)

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Construction Quality Assurance Report

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1.0 OVERVIEW

This Construction Quality Assurance (CQA) Report has been prepared to document the CQA activities performed during the construction of the Phases I & II Extension of the Anderson Creek Construction and Demolition Debris (C&D) Landfill. The landfill facility is located at 1086 Poplar Drive in Spring Lake, North Carolina and is owned and operated by Harnett County under State Solid Waste Permit No. 43-03. A Permit to Construct for the Phases I & II Extension was issued by the North Carolina Division of Waste Management (NCDWM) on March 14, 2014.

2.0 PROJECT DESCRIPTION

2.1 General

The Phases I & II Extension is an unlined C&D landfill unit designed by Smith Gardner, Inc. (S+G). The extension is approximately 0.4 acres and is located to the northeast of the existing Phases I & II units. Construction activities included of subgrade preparation activities, and construction of a small berm.

It is noted that the berm construction for the extension differs somewhat from the originally approved plan. However, the capacity of the extension remains essentially the same as that previously approved (Refer to revised filling plan for Phases I & II Extension provided under separate cover.).

2.2 Reference Documents

The Phases I & II Extension was constructed in accordance with the following documents.

**Permit Application - Harnett County Anderson Creek Landfill Facility
C&D Landfill and Transfer Station Continued Operations:**

Includes technical specifications, CQA manual, and permit drawings prepared by S+G as revised through March 2014 (Permit to Construct issued by NCDWM on March 14, 2014).

2.3 Project Participants

The following parties were involved in the construction and CQA of the Phases I & II Extension:

2.3.1 Owner

Harnett County Solid Waste Department
200 Alexander Drive
Lillington, NC 27546

Phone: (910) 814-6156

Contacts: Amanda Bader, P.E., County Engineer
Randy Smith, Solid Waste Operations Manager
Andrew Holland, Solid Waste Operations Crew Leader

Note: For this project, the County performed as the Contractor.

2.3.2 Engineer/CQA Engineer

Smith Gardner, Inc. (S+G)
14 N. Boylan Ave.
Raleigh, NC 27603
Phone: (919) 828-0577
Fax: (919) 828-3899

Contacts: Pieter Scheer, P.E., Project Manager

2.3.3 CQA Testing - Earthwork & Construction Monitoring

GeoTechnologies, Inc., P.A.
3200 Wellington Ct., Suite 108
Raleigh, NC 27615
Phone: (919) 954-1514

Contacts: Mike Morton, Construction Services Manager
Mike Norton, Field Technician

2.3.4 Surveyor

Streamline Land Surveying
870 NC55W
Coats, NC 27358
Phone: (910) 897-7715

Contacts: Robert E. Godwin, Jr., PLS

3.0 SUMMARY OF CONSTRUCTION ACTIVITIES

Major elements of the project are discussed below. Photos documenting the construction of the Phases I & II Extension can be found in **Appendix A**. In conjunction with beginning the placement of structural fill, a CQA meeting was held on August 7, 2014. Documentation of this meeting can be found in **Appendix B**.

3.1 Site Preparation

Construction of the Phases I & II Extension began in August 2014 with the surveying/staking of the limits of construction by Streamline Land Surveying and the initiation of earthwork activities by County forces.

3.2 Earthwork

The site, which lies within a portion of the site designated for borrow, was previously cleared and grubbed. Additionally, an existing French drain running northeast of and adjacent to the Phases I & II Extension was removed to the extent practical and the remainder abandoned (References: NC DWM DIN 21375 (Revised Report with Documentation) and DIN 21384 (Acknowledgement of French Drain Removal)).

Once the site was staked, excavation and stockpiling activities were performed. Suitable soils identified for use as structural fill were excavated and placed and compacted or were temporarily stockpiled. A portion of the structural fill came from the County's nearby active borrow area.

During construction of the subgrade for the Phases I & II Extension, Mr. Pieter Scheer, P.E. visited the site and examined the subgrade in accordance with the requirements of 15A NCAC 13B.0540. As anticipated based on the site investigations performed in this area, no evidence of bedrock or groundwater was observed in excavations made to reach subgrade elevations.

An as-built drawing showing completed subgrade elevations is provided in **Appendix D**.

4.0 CQA PROGRAM

4.1 Scope of Services

In satisfying the requirements of the Project CQA Manual for the Phases I & II Extension, the following activities were performed:

- Observation and documentation of construction of prepared subgrade and structural fill.
- Field and laboratory testing of structural fill.
- Verification of the soil types in the upper two (2) feet of the subgrade.
- Review/preparation of record drawing.
- Preparation of the final CQA report.

5.0 EARTHWORK CQA

The criteria for construction of structural fill per the project specifications included the following:

Materials:	SP*, SW*, SM, SM-SC, SC, ML, MH, ML-CL, CL, or CH (ASTM D 2488) with no topsoil or other deleterious material and no stones or rocks in excess of one half the lift thickness as compacted;
Density:	Minimum 95% Maximum Standard Proctor Dry Density (ASTM D 698);
Moisture Content:	As necessary for compaction; and
Lift Thickness:	8-inch max. (compacted).

*Within the limits of the landfill, SP (poorly-graded sand) and SW (well-graded sand) soils are not allowed in the upper two (2) feet of the subgrade (see **Section 5.1**).

The number and results of material control and record tests performed on the structural fill are summarized in **Table 1**. Other tests performed on an on-going basis during construction included a visual classification of soils (ASTM D 2488) and monitoring of loose lift thickness. Note that the number of tests required was based on an approximate quantity of 2,350 CY of material placed (in-place measure). The results of field and laboratory testing of structural fill can be found in **Appendix C**. An as-built drawing showing completed subgrade elevations is provided in **Appendix D**.

5.1 Soil Types in Upper Two Feet of Landfill Subgrade

For this site, no SP, SW, or coarser soil types (as defined using ASTM D 2488) were found to be present within the limits of the Phases 1 & II Extension based on visual inspection and testing performed as part of construction. Two tests performed on actual materials placed in the upper two feet of the landfill subgrade show that the soils used were classified as SM-SC. This soil type meets the requirements of 15A NCAC 13B.0540 for the upper two feet of the landfill subgrade.

6.0 RECORD DRAWING

The following record (as-built) drawing depicting the construction of the Phases I & II Extension can be found in **Appendix D**:

- Subgrade (prepared by S+G using surveyed elevations by Streamline Land Surveying, Robert Godwin, PLS).

Appendix A

Photographic Log

**Construction Quality Assurance Report
Harnett County Anderson Creek C&D Landfill - Phases I & II Extension
Spring Lake, North Carolina**

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Client Name:
Harnett County, North Carolina

Site Location:
Anderson Creek C&DLF – Phases I & II Extension

Project No.
HARNETT-AC-13-4

Photo No.
1

Direction Photo Taken:
Northwest

Description:
Construction Area from
Access Road



Photo No.
2

Direction Photo Taken:
Southeast

Description:
Construction Area from
Berm



Client Name:
Harnett County, North Carolina

Site Location:
Anderson Creek C&DLF – Phases I & II Extension

Project No.
HARNETT-AC-13-4

Photo No.
3

Direction Photo Taken:

North

Description:

Construction Area from
Phases I & II



Photo No.
4

Direction Photo Taken:

Northeast

Description:

Construction Area from
Phases I & II



Appendix B

CQA Meeting Documentation

**Construction Quality Assurance Report
Harnett County Anderson Creek C&D Landfill - Phases I & II Extension
Spring Lake, North Carolina**

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MEMORANDUM

Date:	October 28, 2014
To:	CQA Report
From:	Pieter K. Scheer, P.E. Smith Gardner, Inc. 
RE:	Harnett County C&DLF - Phases I & II Extension CQA Meeting Documentation

Attendees:

- Randy Smith, Harnett County
- Andrew Holland, Harnett County
- Mike Morton, GeoTechnologies
- Pieter Scheer, Smith Gardner (S+G)

Meeting Summary:

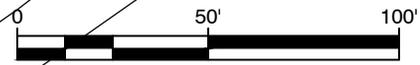
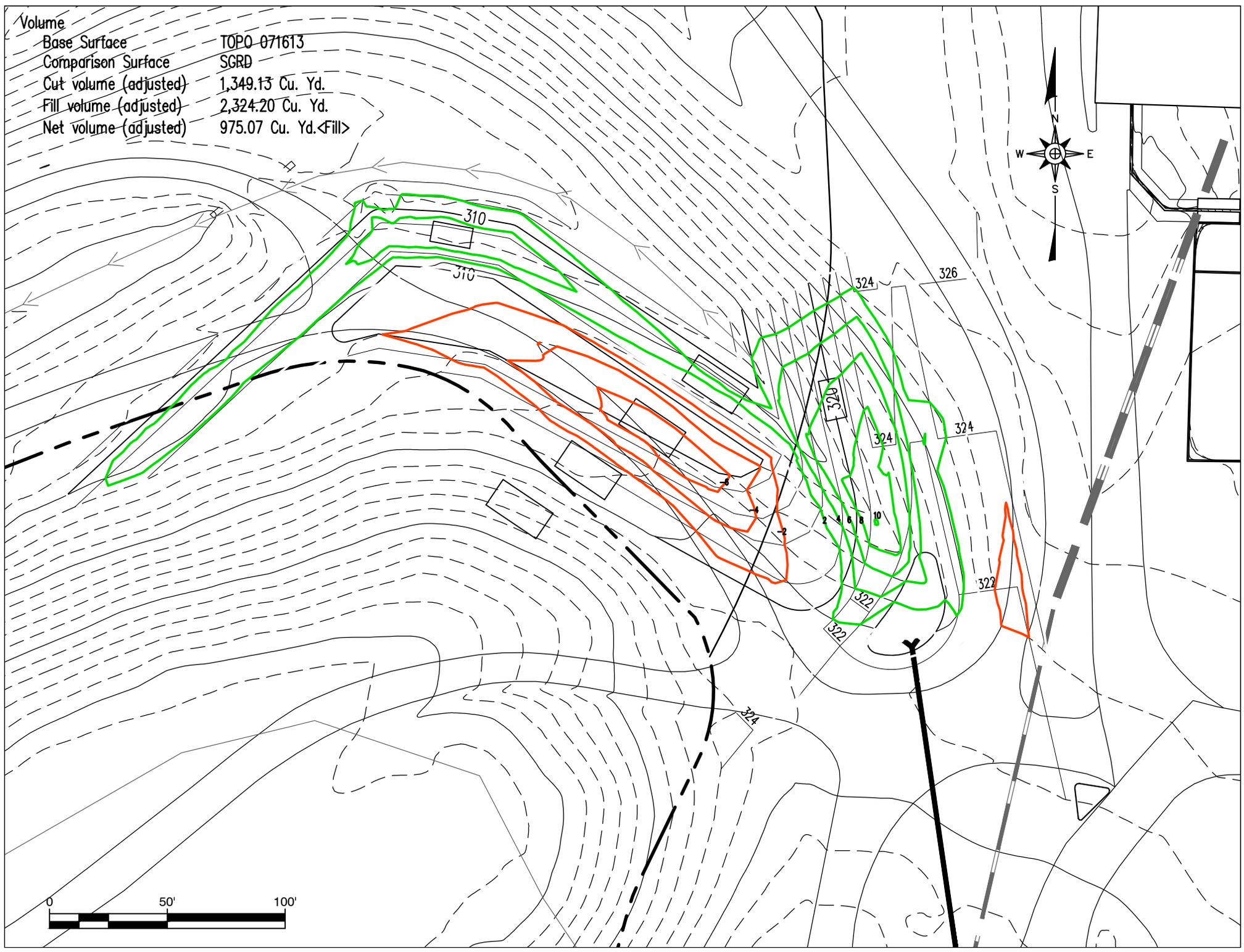
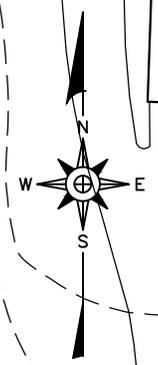
A construction quality assurance (CQA) meeting was held Thursday August 7th at the site to discuss the plans for the placement of structural fill for construction of the Phases I & II Extension of the Harnett County Anderson Creek Construction and Demolition Debris (C&D) Landfill. The meeting began at approximately 2:30 p.m. and lasted approximately 30 minutes.

The site has currently been staked and the County has performed initial earthwork activities. Anticipated earthwork quantities are shown in the **attached** isopach drawing.

The County will contact S+G/GeoTechnologies to perform moisture/density testing of structural fill placed to construct the planned berm. Earthwork testing and subgrade verification will follow the **attached** specification and CQA requirements. An as-built survey will be performed by Streamline Land Surveying (Robert Godwin, PLS). S+G will prepare the certification report which will include the as-built survey and information from tests performed by GeoTechnologies.

- Attachments: Isopach Drawing showing Anticipated Earthwork
 Earthwork Specification & CQA Requirements

Volume	
Base Surface	TOPO 071613
Comparison Surface	SGRD
Cut volume (adjusted)	1,349.13 Cu. Yd.
Fill volume (adjusted)	2,324.20 Cu. Yd.
Net volume (adjusted)	975.07 Cu. Yd.<Fill>



CQA MEETING AGENDA

1. Review of Specification Requirements

Earthwork (Perimeter Berm and Subgrade):

- Compaction Requirements: $\geq 95\%$ Std. Proctor; moisture content as required to obtain density
- Surveying: Verify elevation and slope of completed subgrade
- Upper 2 Feet of Subgrade Must be SM, SC, ML, MH, CL, or CH

2. Review of CQA Requirements

A. Control Tests on Subgrade Material

- Visual Classification
- Moisture-Density Relationship: 1 per 5,000 CY (per Each Soil)

B. Approval of Subgrade (visual (by P.G. or P.E. (S+G) and review of survey information)

C. CQA Testing:

- In-Place Moisture/Density Testing: 20,000 SF/Lift & 1 per 500/LF/Lift of Berms
- Verification of Subgrade Soil Type (Atterberg Limits & Grain Size Analysis on Upper 2 Feet): 1 per 10,000 SF (Test 2 Locations Minimum)

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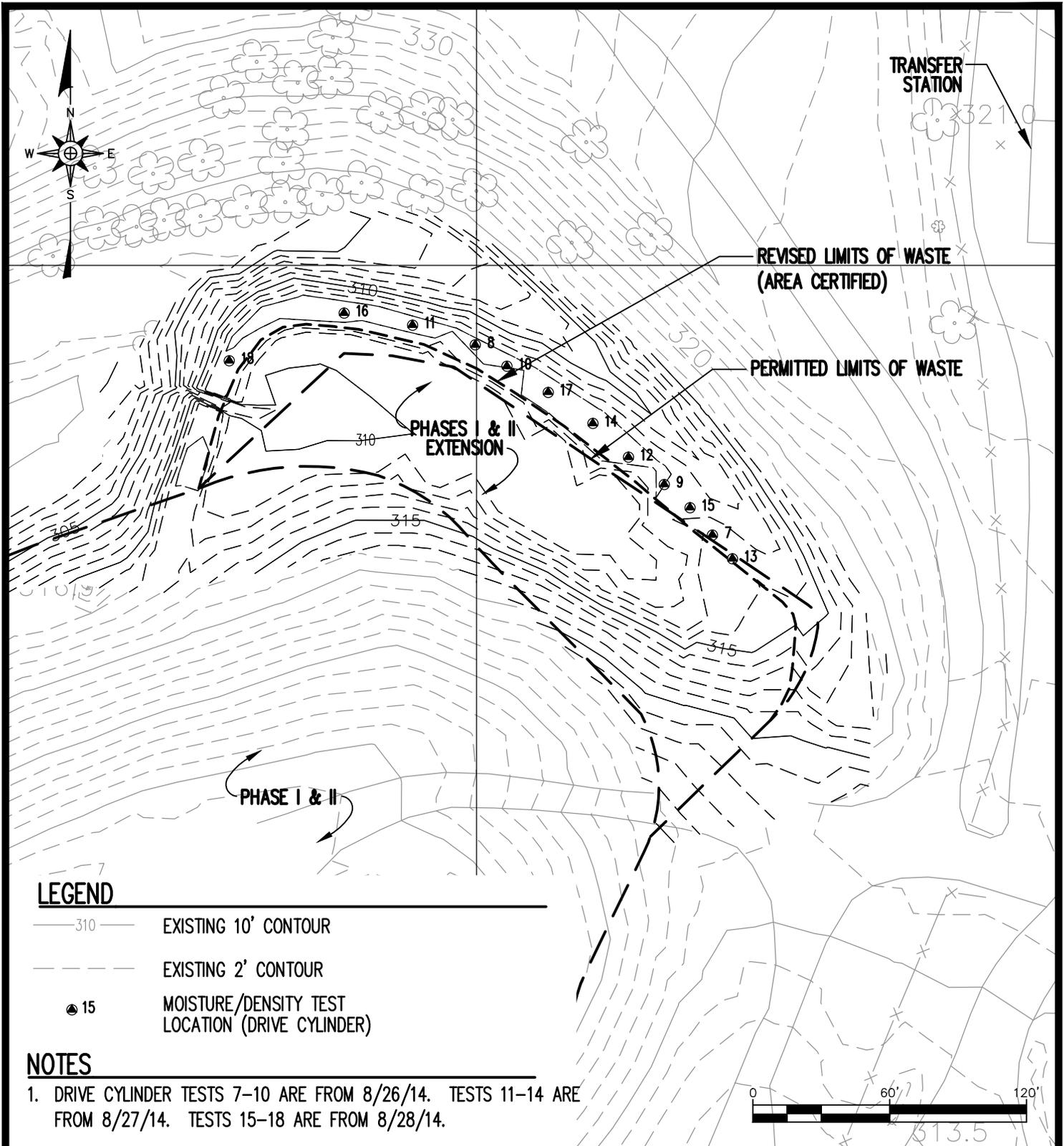
Appendix C

Earthwork CQA Data

**Construction Quality Assurance Report
Harnett County Anderson Creek C&D Landfill - Phases I & II Extension
Spring Lake, North Carolina**

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G:\CAD\Harnett County\Harnett-AC-13-4\sheet\HARNETT-A0053.dwg - 10/30/2014 10:42 AM



LEGEND

- 310 — EXISTING 10' CONTOUR
- - - - - EXISTING 2' CONTOUR
- 15 MOISTURE/DENSITY TEST LOCATION (DRIVE CYLINDER)

NOTES

1. DRIVE CYLINDER TESTS 7-10 ARE FROM 8/26/14. TESTS 11-14 ARE FROM 8/27/14. TESTS 15-18 ARE FROM 8/28/14.

PREPARED FOR:

**ANDERSON CREEK C&DLF
PHASES I & II EXTENSION
STRUCTURAL FILL TEST LOCATIONS**

PREPARED BY:

NC LIC. NO. C-0828 [ENGINEERING]

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

DRAWN: C.T.J.	APPROVED: P.K.S.	SCALE: AS SHOWN	DATE: Oct 2014	PROJECT NO.: HARNETT-AC 13-4	FIGURE NO.: 1	FILE NAME: HARNETT-A0053
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Field Report

PROJECT INFORMATION

Project Name: <u>Anderson Creek Landfill</u>		Project Number: <u>1-14-0619 CA</u>	
Location: <u>Anderson Creek</u>		Technician: <u>M. Norton</u>	
Date: <u>8-26-14</u>	Weather: _____	Temp: _____	
Present at Site: _____		Arrive at Site: <u>7:30</u>	<u>am/pm</u>
_____		Depart Site: <u>12:30</u>	<u>am/pm</u>
_____		# of Trips: <u>1</u>	

DENSITY TESTS

Note: For location of failing density tests, see "Remarks".

Type of Test		#1	#2	#3	#4	#5	#6	#7	#8	#9
Sandcone	Compaction	96.4	95.9	99.3	97.5					
Drive Tube <u>X</u>	Wc +/- Opt.	-3.9	-4.7	-1.4	-2.0					
Nuclear	Pass/Fail	P	P	P	P					
CABC	Elevation	-8'	-8'	-6'	-6'					
	Stone Depth, in.									

CONCRETE/GROUT/MORTAR

Description	No. Sets	#1	#2	#3	#4	#5	#6	#7	#8
6" x 12"	Slump, in.								
4" x 8"	Air, %								
Grout	Unit Weight								
Mortar	Conc. Temp.								

PROOFROLL

Proofroll	Subgrade	Stable?	
	CABC Stone	Stable?	

If not stable, see "Remarks".
 For location, see "Remarks".

FOOTING INSPECTIONS

Location	#1	#2	#3	#4	#5	#6	#7	#8
#1) Req. Bearing								
#2) Blows @ SG								
#3) Blows -1'								
#4) Blows -2'								
#5) Blows -3'								
#6) Blows -4'								
#7) Blows -5'								
#8) Blows -6'								

REMARKS

Conducted soil density testing on BERM of C&D Landfill. Moisture contents were low but due to the sandy material being used, if density is achieved, moisture is not an issue. All tests meet the minimum density requirement of 95% of maximum dry density.

Signature Michael Norton

PROJECT NO: 1-14-0619CA

DRIVE TUBE

PROJECT NAME: Anderson Creek Landfill

FIELD DENSITY WORKSHEET

TEST NO.	1	2	3	4
DATE	8-26			
A. Wet Weight of Sample & Mold	5.51	5.46	5.74	5.64
B. Weight of Mold	1.26	1.26	1.26	1.26
C. Wet Weight of Sample (A-B)	4.25	4.20	4.48	4.38
D. Mold Volume Factor	29.54	29.54	29.54	29.54
E. Wet Weight Soil / Cu. Ft. (CxD)	125.55	124.07	132.34	129.39
F. Wet Weight of Moisture Sample	214.6	209.1	210.9	208.3
G. Dry Weight of Moisture Sample	198.8	195.2	191.1	189.7
H. Weight of Water (F-G)	15.8	13.9	19.8	18.6
I. Percent Moisture ((H/G) x 100)	7.9	7.1	10.4	9.8
J. Dry Density per Cu. Ft.	116.4	115.8	119.9	117.8

ONE POINT PROCTOR DETERMINATION

K. Weight of Soil & Mold	13.09			
L. Weight of Mold	9.06			
M. Mold Volume Factor	29.95			
N. Wet Weight (Cu. Ft.) ((K-L) x M)	120.70			
O. Dry Weight (Cu. Ft.)	111.9			
P. Wet Weight of Moisture Sample				
Q. Dry Weight of Moisture Sample				
R. Weight of Water (P-Q)				
S. Moisture Content ((R/Q)x100)	7.9			
MAXIMUM DRY DENSITY	120.8	120.8	120.8	120.8
OPTIMUM MOISTURE CONTENT	11.8	11.8	11.8	11.8
% COMPACTION	96.4	95.9	99.3	97.5
TEST LOCATION	SE SECTION OF BERM	NE SECTION OF BERM	SE SECTION OF BERM	NE SECTION OF BERM
TEST ELEVATION	-3'	-3'	-6'	-6'
SPECIFIED COMPACTION	95	95	95	95
PASSED (P) / FAILED (F)	P	P	P	P

TECHNICIAN: Michael L. Nicks



Field Report

PROJECT INFORMATION

Project Name: <u>Anderson Creek Landfill</u>		Project Number: <u>1-14-0619 CA</u>	
Location: <u>Anderson Creek</u>		Technician: <u>M. Norton</u>	
Date: <u>8-27-14</u>	Weather: _____	Temp: _____	
Present at Site: _____		Arrive at Site: <u>7:00</u>	<u>am/pm</u>
_____		Depart Site: <u>12:00</u>	<u>am/pm</u>
_____		# of Trips: <u>1</u>	

DENSITY TESTS

Note: For location of failing density tests, see "Remarks".

Type of Test		#1	#2	#3	#4	#5	#6	#7	#8	#9
Sandcone	Compaction	97.6	96.1	99.5	98.3					
Drive Tube <u>X</u>	Wc +/- Opt.	-1.0	-0.2	-2.8	-2.9					
Nuclear	Pass/Fail	P	P	P	P					
CABC	Elevation	-5'	-5'	-4'	-4'					
	Stone Depth, in.									

CONCRETE/GROUT/MORTAR

Description	No. Sets	#1	#2	#3	#4	#5	#6	#7	#8
6" x 12"	Slump, in.								
4" x 8"	Air, %								
Grout	Unit Weight								
Mortar	Conc. Temp.								

PROOFROLL

Proofroll	Subgrade	Stable?	If not stable, see "Remarks".
	CABC Stone	Stable?	For location, see "Remarks".

FOOTING INSPECTIONS

Location	#1	#2	#3	#4	#5	#6	#7	#8
#1) Req. Bearing								
#2) Blows @ SG								
#3) Blows -1'								
#4) Blows -2'								
#5) Blows -3'								
#6) Blows -4'								
#7) Blows -5'								
#8) Blows -6'								

REMARKS

Conducted soil density testing on berm of C&D landfill as fill was placed. All tests meet minimum density requirement of 95% of maximum dry density.

Signature Michael Norton



PROJECT NO: 1.14.0619 CA
 PROJECT NAME: ANDERSON CREEK Landfill

DRIVE TUBE
 FIELD DENSITY WORKSHEET

TEST NO.	1	2	3	4
DATE	8-27			
A. Wet Weight of Sample & Mold	5.72	5.68	5.73	5.67
B. Weight of Mold	1.26	1.26	1.26	1.26
C. Wet Weight of Sample (A-B)	4.46	4.42	4.47	4.41
D. Mold Volume Factor	29.54	29.54	29.54	29.54
E. Wet Weight Soil / Cu. Ft. (CxD)	131.75	130.57	132.04	130.27
F. Wet Weight of Moisture Sample	204.7	206.7	207.9	206.8
G. Dry Weight of Moisture Sample	185.6	186.1	191.6	190.7
H. Weight of Water (F-G)	19.1	20.6	16.3	16.1
I. Percent Moisture ((H/G) x 100)	10.3	11.1	8.5	8.4
J. Dry Density per Cu. Ft.	119.4	117.5	121.7	120.2

ONE POINT PROCTOR DETERMINATION

K. Weight of Soil & Mold	13.49			
L. Weight of Mold	9.06			
M. Mold Volume Factor	29.95			
N. Wet Weight (Cu. Ft.) ((K-L) x M)	132.68			
O. Dry Weight (Cu. Ft.)	120.3			
P. Wet Weight of Moisture Sample				
Q. Dry Weight of Moisture Sample				
R. Weight of Water (P-Q)				
S. Moisture Content ((R/Q)x100)	10.3			
MAXIMUM DRY DENSITY	122.3	122.3	122.3	122.3
OPTIMUM MOISTURE CONTENT	11.3	11.3	11.3	11.3
% COMPACTION	97.6	96.1	99.5	98.3
TEST LOCATION	NE SECTION OF BERM	SE SECTION OF BERM	SE SECTION OF BERM	NE SECTION OF BERM
TEST ELEVATION	-5'	-5'	-4'	-4'
SPECIFIED COMPACTION	95	95	95	95
PASSED (P) / FAILED (F)	P	P	P	P

TECHNICIAN: Michael J. [Signature]



Field Report

PROJECT INFORMATION

Project Name: <u>Anderson Creek Landfill</u>	Project Number: <u>1-14-0619 CA</u>
Location: <u>Anderson Creek</u>	Technician: <u>M. Norton</u>
Date: <u>8-28-14</u> Weather: _____	Temp: _____
Present at Site: _____	Arrive at Site: <u>8:00</u> <u>am/pm</u>
	Depart Site: <u>11:30</u> <u>am/pm</u>
	# of Trips: <u>1</u>

DENSITY TESTS

Note: For location of failing density tests, see "Remarks".

Type of Test		#1	#2	#3	#4	#5	#6	#7	#8	#9
Sandcone	Compaction	96.2	95.5	97.9	98.3					
Drive Tube <u>X</u>	Wc +/- Opt.	-3.5	-2.3	-1.5	-1.4					
Nuclear	Pass/Fail	P	P	P	P					
CABC	Elevation	56	-2	-1'	56					
	Stone Depth, in.									

CONCRETE/GROUT/MORTAR

Description	No. Sets	#1	#2	#3	#4	#5	#6	#7	#8
6" x 12"	Slump, in.								
4" x 8"	Air, %								
Grout	Unit Weight								
Mortar	Conc. Temp.								

PROOFROLL

Proofroll	Subgrade		Stable?		If not stable, see "Remarks".
	CABC Stone		Stable?		For location, see "Remarks".

FOOTING INSPECTIONS

Location		#1	#2	#3	#4	#5	#6	#7	#8
#1)	Req. Bearing								
#2)	Blows @ SG								
#3)	Blows -1'								
#4)	Blows -2'								
#5)	Blows -3'								
#6)	Blows -4'								
#7)	Blows -5'								
#8)	Blows -6'								

REMARKS

Conducted soil density tests on BERM of C&D landfill.
 Adjusted ELEVATIONS on South END of BERM due to BEING GIVEN
 WRONG ELEVATION ON THE FIRST day.
 All TESTS MEET THE MINIMUM DENSITY REQUIREMENT of 95%
 of MAXIMUM dry density.

Signature Michael Norton



PROJECT NO: 1-14-0619 CA
 PROJECT NAME: ANDERSON CREEK LANDFILL

DRIVE TUBE
 FIELD DENSITY WORKSHEET

TEST NO.	1	2	3	4
DATE	8-28			
A. Wet Weight of Sample & Mold	5.53	5.68	5.69	5.71
B. Weight of Mold	1.26	1.26	1.26	1.26
C. Wet Weight of Sample (A-B)	4.27	4.42	4.43	4.45
D. Mold Volume Factor	29.54	29.54	29.54	29.54
E. Wet Weight Soil / Cu. Ft.(CXD)	126.14	130.57	130.86	131.45
F. Wet Weight of Moisture Sample	205.3	204.4	209.4	208.1
G. Dry Weight of Moisture Sample	189.8	186.9	190.0	188.7
H. Weight of Water (F-G)	15.5	17.5	19.4	19.4
I. Percent Moisture ((H/G) x 100)	8.2	9.4	10.2	10.3
J. Dry Density per Cu. Ft.	116.6	119.4	118.7	119.2

ONE POINT PROCTOR DETERMINATION

K. Weight of Soil & Mold	13.17			
L. Weight of Mold	9.06			
M. Mold Volume Factor	29.95			
N. Wet Weight (Cu. Ft.) ((K-L) x M)	123.09			
O. Dry Weight (Cu. Ft.)	113.8			
P. Wet Weight of Moisture Sample				
Q. Dry Weight of Moisture Sample				
R. Weight of Water (P-Q)				
S. Moisture Content ((R/Q)x100)	8.2			
MAXIMUM DRY DENSITY	121.2	121.2	121.2	121.2
OPTIMUM MOISTURE CONTENT	11.7	11.7	11.7	11.7
% COMPACTION	96.2	98.5	97.9	98.3
TEST LOCATION	SE SECTION OF BERM	NE SECTION OF BERM	NE SECTION OF BERM	NORTH END OF BERM
TEST ELEVATION	56 56	56 - 2	56 - 1	56
SPECIFIED COMPACTION	95	95	95	95
PASSED (P) / FAILED (F)	P	P	P	P

TECHNICIAN: Michael Newton



GeoTechnologies, Inc.

Geotechnical and Construction Materials Testing Services

October 13, 2014

Attached for your review are reports and/or other information for the Anderson Creek Landfill project which is located in Anderson Creek, NC. If you should have any questions regarding this information, please feel free to contact the project manager.

GEOTECHNOLOGIES, INC., P.A.

Project No. 1140619CA

Enclosures

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Field Report

PROJECT INFORMATION

Project Name: Anderson Creek Landfill		Project Number: 1-14-0619-CA	
Location: Anderson Creek, NC		Technician: Jeffrey Whitley	
Date: 9/30/2014	Weather: Sunny	Temp: _____ °	
Present at Site: _____		Arrive at Site: 10:00	X am pm
_____		Depart Site: 10:30	X am pm
_____		# of Trips: 1	

DENSITY TESTS

Note: For location of failing density tests, see "Remarks".

Type of Test		#1	#2	#3	#4	#5	#6	#7	#8	#9
Sandcone	Compaction (%)									
	Wc +/- Opt. (%)									
Drive Tube										
Nuclear	Pass/Fail									
CABC	Elevation (ft)									
Moisture	Stone Depth (inches)									

CONCRETE/GROUT/MORTAR

Description	No. Sets		#1	#2	#3	#4	#5	#6	#7	#8
6" x 12"		Slump (inches)								
4" x 8"		Air (%)								
Grout		Unit Weight (pcf)								
Mortar		Conc. Temp. (degrees)								

PROOFROLL

Proofroll	Subgrade		Stable?		If not stable, see "Remarks".
	CABC Stone		Stable?		For location, see "Remarks".

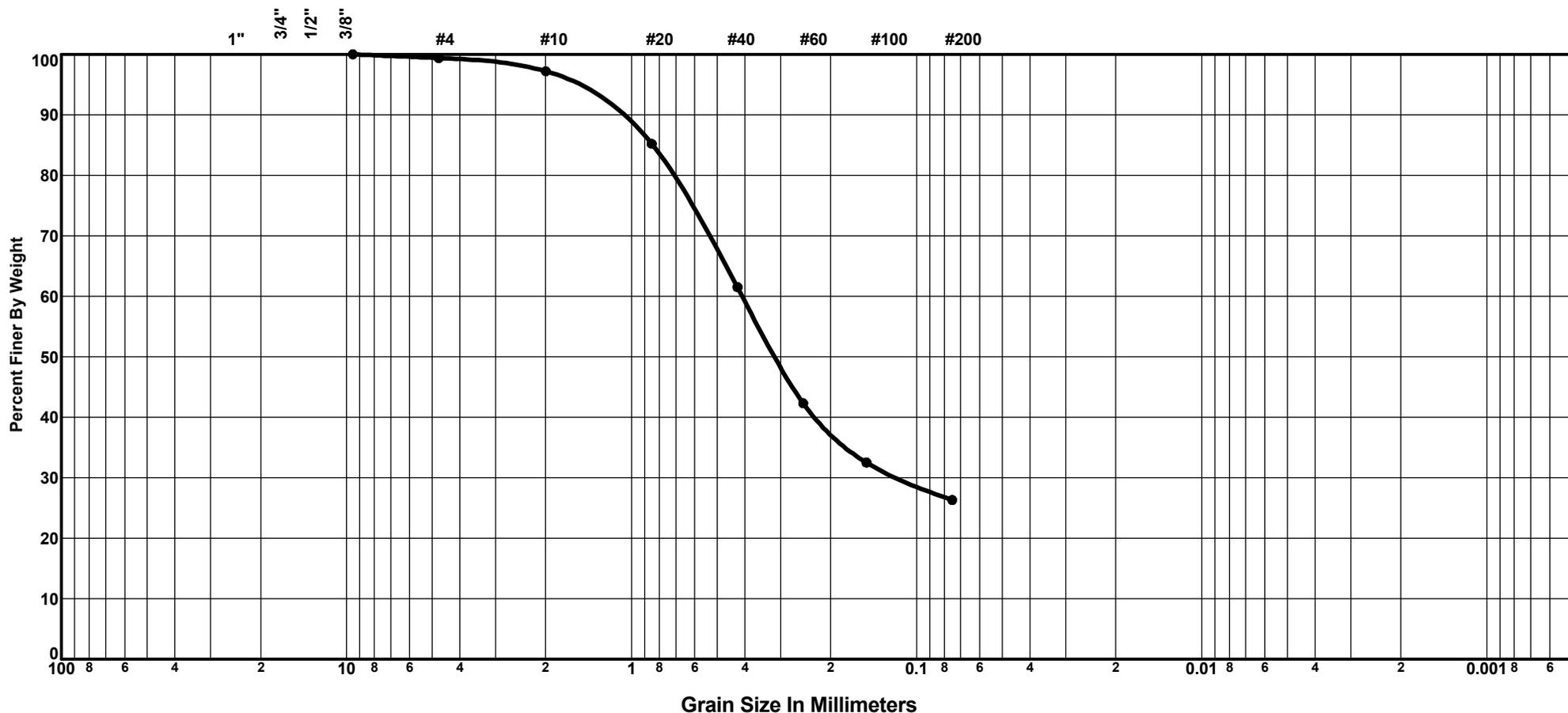
FOOTING INSPECTIONS

Location		#1	#2	#3	#4	#5	#6	#7	#8
#1)	Req. Bearing								
#2)	Blows @ SG								
#3)	Blows -1'								
#4)	Blows -2'								
#5)	Blows- 3'								
#6)	Blows -4'								
#7)	Blows -5'								
#8)	Blows -6'								

REMARKS

Technician picked up two samples and brought back to our laboratory.

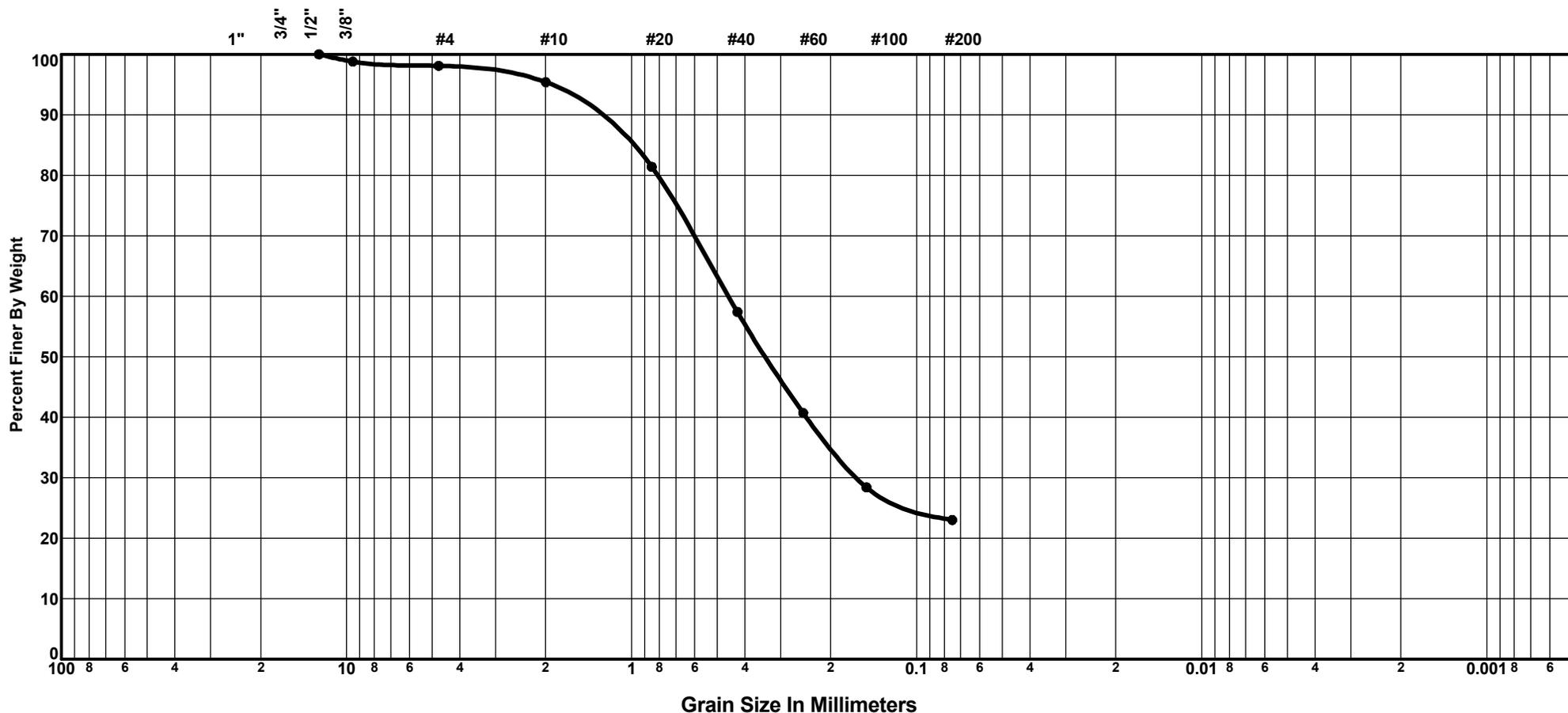
U.S. Standard Sieve Sizes



GRAVEL		SAND			FINES	
COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

Boring No.	Elev./Depth	Nat. W.C.	L.L.	P.L.	P.I.	Soil Description or Classification	 GRAIN SIZE DISTRIBUTION 3200 Wellington Court, Suite 108 Raleigh, NC 27615
S-3			28.0	20.0	8.0	Brown Silty Clayey Fine to Medium Sand (SM-SC)	
Project: Anderson Creek Landfill Anderson Creek, NC						Job No.: 1-14-0619-CA Date Recieved: 10/1/2014 Date: 10/9/14 Dates Tested: 10/1-10/6/2014	

U.S. Standard Sieve Sizes



GRAVEL		SAND			FINES	
COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

Boring No.	Elev./Depth	Nat. W.C.	L.L.	P.L.	P.I.	Soil Description or Classification	 GRAIN SIZE DISTRIBUTION 3200 Wellington Court, Suite 108 Raleigh, NC 27615
S-4			26.0	19.0	7.0	Brown Silty Clayey Fine to Medium Sand (SM-SC)	
Project: Anderson Creek Landfill Anderson Creek, NC						Job No.: 1-14-0619-CA Date: 10/9/14 Date Recieved: 10/1/2014 Dates Tested: 10/1-10/6/2014	

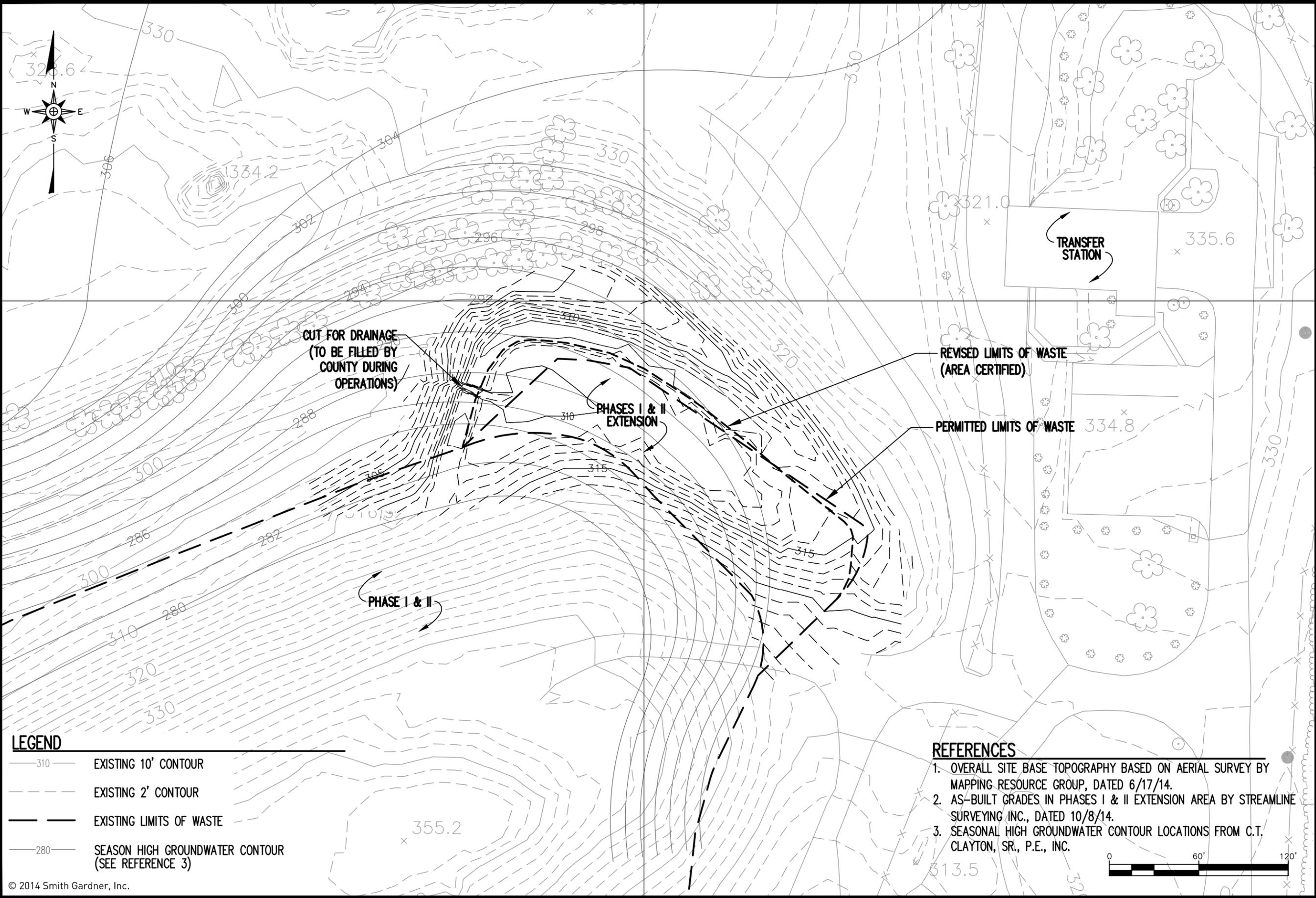
Appendix D

Record Drawing

**Construction Quality Assurance Report
Harnett County Anderson Creek C&D Landfill - Phases I & II Extension
Spring Lake, North Carolina**

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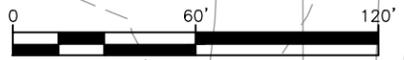
G:\CAD\Harnett County\Harnett-AC-13-4\sheets\HARNETT-B0058.dwg - 10/30/2014 10:41 AM



LEGEND

	EXISTING 10' CONTOUR
	EXISTING 2' CONTOUR
	EXISTING LIMITS OF WASTE
	SEASON HIGH GROUNDWATER CONTOUR (SEE REFERENCE 3)

- REFERENCES**
- OVERALL SITE BASE TOPOGRAPHY BASED ON AERIAL SURVEY BY MAPPING RESOURCE GROUP, DATED 6/17/14.
 - AS-BUILT GRADES IN PHASES I & II EXTENSION AREA BY STREAMLINE SURVEYING, INC., DATED 10/8/14.
 - SEASONAL HIGH GROUNDWATER CONTOUR LOCATIONS FROM C.T. CLAYTON, SR., P.E., INC.



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PREPARED BY: _____ NC LIC. NO. C-0828 (ENGINEERING)

FIGURE NO. AB-1

SCALE: AS SHOWN

APPROVED: P.K.S.

DRAWN: K.C.B.

PROJECT NO. HARNETT-AC-13-4

DATE: Oct 2014

FILENAME: HARNETT-B0058

PREPARED FOR:

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

**ANDERSON CREEK C&DLF
PHASES I AND II EXTENSION
AS-BUILT**

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From: [Pieter Scheer](#)
To: [Chao, Ming-tai](#)
Cc: [Amanda Bader](#); [Randy W. Smith](#); [Andrew Holland](#); [Scheer, Pieter](#)
Subject: Harnett County - Anderson Creek C&DLF - Phases I & II Extension - COA Report
Date: Friday, October 31, 2014 2:56:08 PM
Attachments: [HC ACLF C&D Ph I & II Extension COA Report 10-14.pdf](#)

Ming:

Attached for your review is the COA report for the small extension area at Anderson Creek. Due to the noted difference in the alignment of the as-built berm, we will be submitting a revised filling plan under separate cover.

Please let me know if you have any questions or comments or need anything further.

Thanks.

Pieter

Pieter K. Scheer, P.E.

Vice President, Senior Engineer

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