

CONSTRUCTION QUALITY ASSURANCE CERTIFICATION REPORT



CLASS 4 LANDFILL PHASE II CONSTRUCTION

**PERMIT NO. 0277-S4
AFIN: 63-00155**

PREPARED FOR:

Saline County Regional Solid Waste Management District
18511 West Sardis Road
Bauxite, Arkansas 72011

PREPARED BY:

Terracon Consultants, Inc.
11400 West Baseline Road
Little Rock, Arkansas 72209

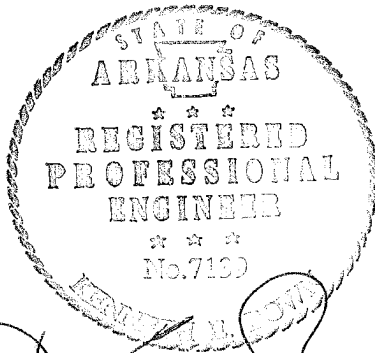
NOVEMBER 2007

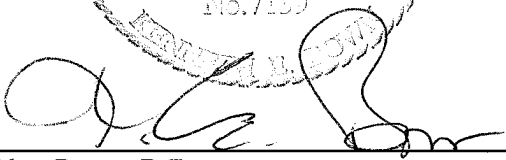
Terracon

PROFESSIONAL ENGINEER'S CERTIFICATION

Terracon Consultants, Inc. has documented the installation, final preparation, and testing of portions of the liner system for Phase II of the Saline County Class 4 Landfill (Landfill).

"I certify to the best of my professional judgment that final preparation activities on Phase II at the Landfill, located near Bauxite, Arkansas were in accordance with the project plans, specifications, and the Landfill Permit. This certification is contingent on the fact that all information supplied to the signatory authority, up to the date of certification is unquestionably accurate and was provided in good faith. Based on my review of the project and my inquiry of the persons directly involved in the project, the information herein is assumed accurate and complete to the best of my knowledge as a Licensed Professional Engineer."





Ken Bown, P.E.
Arkansas Professional Engineer Registration No. 7139

November 30, 2007
Certification Date

TABLE OF CONTENTS

PROFESSIONAL ENGINEER'S CERTIFICATION

1.0 INTRODUCTION.....	1
1.1 GENERAL.....	2
1.2 SITE DESCRIPTION.....	2
1.3 PROJECT DESCRIPTION.....	2
1.4 KEY PERSONNEL.....	5
2.0 SUBGRADE PREPARATION.....	6
2.1 PROJECT SPECIFICATIONS	6
2.2 CONSTRUCTION PROCEDURES.....	6
2.3 SUBGRADE TESTING	6
3.0 CLAY LINER SYSTEM INSTALLATION.....	8
3.1 PROJECT SPECIFICATIONS	8
3.2 CONSTRUCTION PROCEDURES.....	8
3.3 PRE-CONSTRUCTION TESTING OF CLAY LINER MATERIAL.....	8
3.4 CONSTRUCTION TESTING OF COMPACTED CLAY LINER MATERIAL.....	9
4.0 UNDER-DRAIN SYSTEM INSTALLATION	15
4.1 UNDER-DRAIN COLLECTION PIPE	15

LIST OF TABLES

TABLE 1	SOIL MATERIAL PRE-CONSTRUCTION TEST SUMMARY	9
TABLE 2	CLAY LINER MATERIAL CONSTRUCTION TEST SUMMARY	10
TABLE 3	CLAY LINER PERMEABILITY RESULTS SUMMARY.....	11
TABLE 4	UNDER-DRAIN SYSTEM GRAVEL TEST SUMMARY.....	15

LIST OF FIGURES

FIGURE 1	SITE LOCATION MAP.....	1
FIGURE 2	LANDFILL LAYOUT MAP.....	3
FIGURE 3	FIELD DENSITY TEST LOCATIONS – SUBGRADE.....	7
FIGURE 4	FIELD DENSITY TEST LOCATIONS – CLAY LINER (LIFT 1)	12
FIGURE 5	FIELD DENSITY TEST LOCATIONS – CLAY LINER (LIFT 2)	13
FIGURE 6	FIELD DENSITY TEST LOCATIONS – CLAY LINER (LIFT 3)	14

LIST OF APPENDICES

APPENDIX A	AS-BUILT DRAWINGS
APPENDIX B	GENERAL PROJECT CORRESPONDENCE
APPENDIX C	DAILY PROJECT FIELD RECORDS
APPENDIX D	SOIL MATERIAL PRE-CONSTRUCTION TEST RESULTS
APPENDIX E	CLAY LINER MATERIAL CONSTRUCTION TEST RESULTS
APPENDIX F	FIELD MOISTURE/DENSITY TEST RESULTS
APPENDIX G	COMPACTED CLAY LINER PERMEABILITY TEST RESULTS
APPENDIX H	GEOTEXTILE MANUFACTURER'S DATA
APPENDIX I	GEOTEXTILE CONFORMANCE TEST RESULTS
APPENDIX J	GEOSYNTHETICS INVENTORY LISTING
APPENDIX K	UNDER-DRAIN SYSTEM GRAVEL TEST RESULTS
APPENDIX L	CONTRACTOR SUBMITTALS
APPENDIX M	PROJECT PHOTOGRAPHIC LOG

1.0 INTRODUCTION

The Saline County Regional Solid Waste Management District (SCRSWMD) owns and operates a Class 1 and Class 4 Landfill near Bauxite, Arkansas. The Saline County Class 4 Landfill (Landfill) is operated in accordance with Permit No. 0277-S4 as issued by the Arkansas Department of Environmental Quality (ADEQ) on August 2, 1994. **FIGURE 1** illustrates the general geographic location of the facility and **FIGURE 2** presents the general layout of the site.

FIGURE 1 - SITE LOCATION MAP



The Landfill consists of approximately 27 acres with approximately 20 acres designated for solid waste disposal and is being developed in phases. Phase I of the Landfill has been utilized for Class 4 waste disposal as shown in **FIGURE 2**. Construction of the Phase I area was completed in the spring of 1995.

Phase II of the Landfill was completed in November of 2007. The following document summarizes the installation of the bottom liner system and portions of the under-drain system associated with Phase II of the Landfill. Correspondence, details, quality control test results, photographs, and certification associated with the construction are also provided.

1.1 GENERAL

The construction of Phase II was conducted in accordance with the following documents:

- “*Construction Bid and Contract Documents – Class 4 Landfill, Phase II Construction*”, by Terracon, dated August 2007;
- “*Construction Quality Assurance Plan, Saline County Regional Solid Waste Management District Landfill*”, by Terracon, dated April 2007; and
- “*Regulation Number 22, Solid Waste Management Rules*”, by Arkansas Department of Pollution Control and Ecology Commission, dated February 24, 2006.

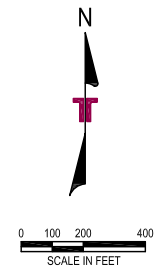
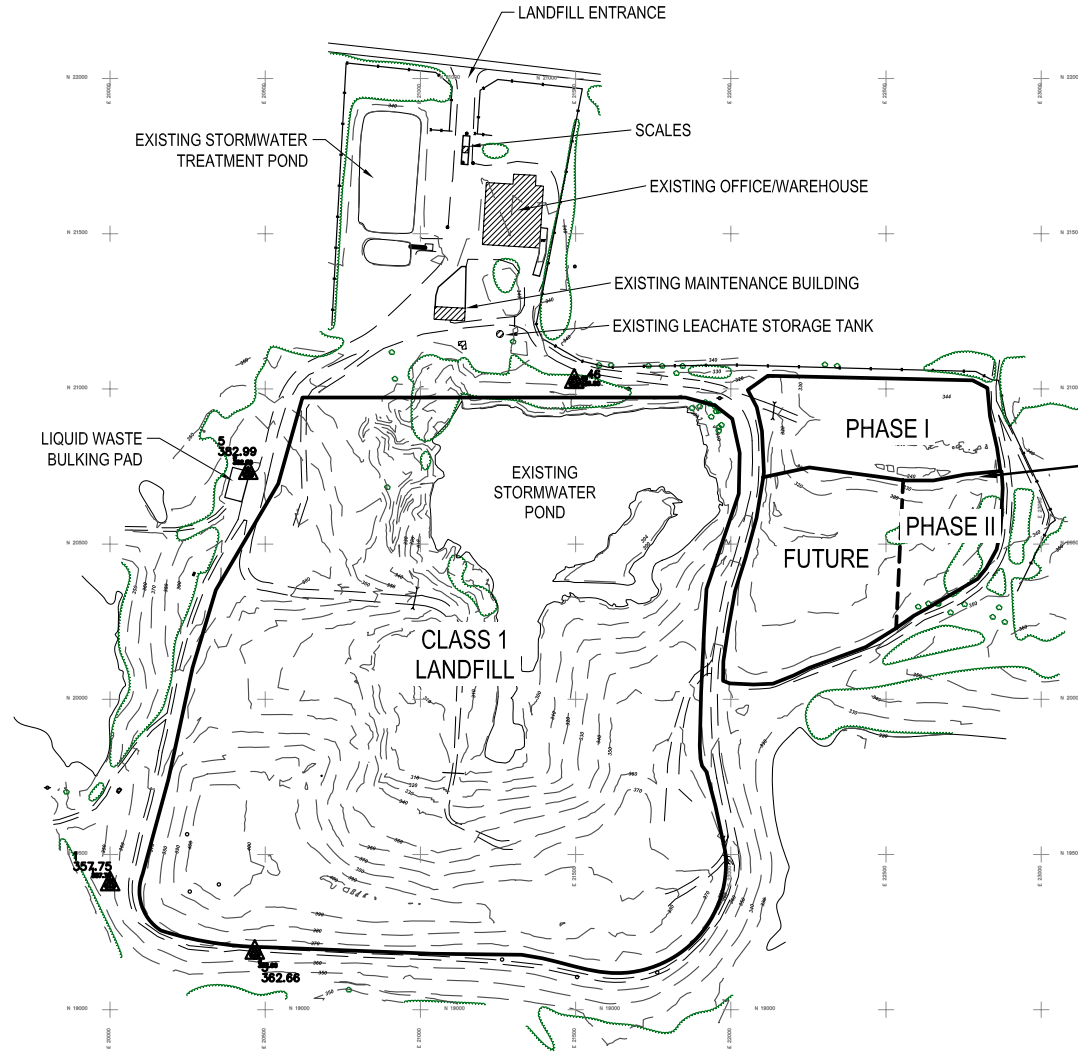
1.2 SITE DESCRIPTION

The Landfill is located at 18511 West Sardis Road, Bauxite, Arkansas. The Landfill has been in operation since July 1996 and has been designed, constructed, and is permitted (Permit 0277-S4) by the ADEQ to accept all types of Class 4 materials as defined in *Arkansas Regulation 22 (Solid Waste Management)*. **FIGURE 2** illustrates the location and orientation of Phase II in relation to the rest of the site.

1.3 PROJECT DESCRIPTION

This project involved the construction of approximately 2 acres of a clay bottom liner system and an under-drain system. The following information summarizes the construction sequence associated with the construction of Phase II.

- Site preparation, excavation to subgrade, and grading of cell area;
- Preparation of subgrade;
- Installation of an under-drain system consisting of two separate collection pipes embedded in gravel and encompassed by geotextile;
- Installation and quality assurance testing of an 18-inch thick compacted clay liner, placed at 90% of the Standard Proctor density with a maximum hydraulic conductivity of 1.0×10^{-5} cm/s; and
- Installation of perimeter ditch and culverts.



CONTROL POINT TABLE			
NUMBER	NORTHING	EASTING	ELEVATION
1	19402.90	20000.33	357.75
3	19182.69	20466.35	362.66
5	20728.35	20445.11	382.99
46	21021.87	21495.64	336.80

LEGEND

- EXISTING INDEX CONTOUR
- EXISTING VEGETATION
- EXISTING CONTROL POINT
- EXISTING LANDFILL OPERATIONS ROAD
- EXISTING FENCE
- EXISTING SITE GRID COORDINATE SYSTEM

NOTES:

This topographic mapping was compiled by AMI Engineering, Inc. from aerial photography taken by Great Lakes Aerial Surveys on January 30th, 2007 at an altitude of 3960-feet above mean terrain.

This mapping was compiled at 1 inch = 100 feet map scale with 2-foot contours, to meet 3.8 feet horizontal accuracy and 1.2-feet vertical accuracy at 95% confidence on well-defined points, as defined by the National Standards for Spatial Data Accuracy (NSSDA).

Mapping in areas obscured by vegetation, shadows, etc. may not meet the above accuracy statement.

REV.	DATE	BY	DESCRIPTION

Terracon
Consulting Engineers and Scientists

11400 WEST BASELINE ROAD LITTLE ROCK, AR. 72209
PH. (501) 455-2199 FAX. (501) 455-4547



LANDFILL LAYOUT MAP

PHASE II CONSTRUCTION QUALITY ASSURANCE

SALINE COUNTY REGIONAL SOLID WASTE MANAGEMENT DISTRICT

CLASS 4 LANDFILL

BAUXITE ARKANSAS

FIGURE 2	
DESIGNED BY:	KEB
DRAWN BY:	JDW
APPROVED BY:	KEB
SCALE:	1" = 400'
DATE:	11/27/07
JOB NO.	055-001-35077118
ACAD NO.	005
SHEET NO.:	2 OF 6

The CQA Report is organized using tables, figures, and appendices to provide documentation of the observations and material testing of the construction of Phase II. General project correspondence is presented in **APPENDIX B**. Daily project field records are presented in **APPENDIX C**.

As required by Reg.22.624 the certification report shall conform to the requirements of Reg.22.428. In accordance with Reg.22.428(i) the CQA Report includes record drawings of Phase II and the appendices and figures identify the following:

Reg.22.428(i)(1) - The limits of liner or final cover barrier construction;

FIGURE 2 and as-built drawings in **APPENDIX A** depicts the limits of the constructed bottom liner system for Phase II.

Reg.22.428(i)(2) - The top and bottom liner or final cover barrier elevations at 50' intervals referenced to the site grid coordinate system;

APPENDIX A provides the top and bottom elevations of the constructed clay liner system at 50' intervals referenced to the site grid coordinate system.

Reg.22.428(i)(3)- If a granular drainage blanket is utilized in the design, top of blanket elevation should be identified at 50' elevations;

Phase II is located in a Class 4 Landfill and as a result a granular drainage blanket was not required.

Reg.22.428(i)(4) The location and elevation of slope breaks, leachate piping, leachate sumps and trenches, berms, and any other features which are material to the disposal area construction;

APPENDIX A (As-built Record Drawing) provides the location and elevation information and other features of Phase II construction.

Reg.22.428(i)(5) A key map showing the location of the construction in relation to the permitted design, along with an identification of areas previously constructed and areas yet to be constructed;

FIGURE 2 and drawings in **APPENDIX A** depict the limits of the constructed bottom liner system for Phase II in relation to the permitted design, along with an identification of areas previously constructed and areas yet to be constructed.

Reg.22.428(i)(6) Compaction and permeability testing locations;

Field logs and Drawings in **APPENDIX F**, **APPENDIX G**, and **FIGURES 3** through **6** provide compaction and permeability test locations for the bottom liner system of Phase II.

Reg.22.428(i)(7) If necessary to document leachate head level compliance (subsections (a)(2) and (g)(6) of this section), the report should also indicate the lowest point of the liner constructed not including leachate trenches and sumps.

A Leachate collection system is not required in Class 4 Landfills. However, **APPENDIX A** provides the lowest point of the liner constructed.

Reg.22.428(i)(8) In addition, the certifying professional shall make a statement that the cell was constructed in accordance with the permit drawings and narrative. The report should also include a list of any deviations from the permitted drawings, if they exist, and reasons for the deviations.

Phase II was constructed as close as possible and in accordance with the permit drawings and narrative and the plans and specifications. The density requirement of 95% standard was reduced to 90% standard following passing permeability tests at a compaction rate of 90% standard.

1.4 KEY PERSONNEL

Grayco Construction Co., Inc. was contracted to perform the earthwork for the project including excavation to subgrade, placement of the clay liner in lifts, installation of the under-drain system and other improvements at the site. The key personnel for each participating firm in the project are listed below.

- **Owner:**
Saline County Regional Solid Waste Management District
 - Executive Director: Dennis Wills
- **CQA Consultant :**
Terracon Consultants, Inc.
 - Senior Engineer: Ken Bown, P.E.
 - Project Manager: Brad Fureigh, E.I.
 - CQA Manager & Monitors: Leslie Haynie, Donny Walls, Clayton Haynes
- **General Contractor:**
Grayco Construction Co., Inc.
 - Project Manager: Shaun Gray
- **Survey Control:**
Harmon Surveying
 - Surveyor: Dodd Harmon, RLS
- **Soil Testing Laboratory:**
Golder Associates, Inc. – Atlanta, Georgia
 - Laboratory Manager: Henry Mock
- **Geosynthetic Laboratory:**
TRI Environmental, Inc. – Austin, Texas
 - Project Manager: Melissa Hunter

2.0 SUBGRADE PREPARATION

This section summarizes the excavation and establishment of the subgrade surface corresponding to the permitted design for Phase II. The bottom grading plan conforms to the approved permit plans and construction drawings.

2.1 PROJECT SPECIFICATIONS

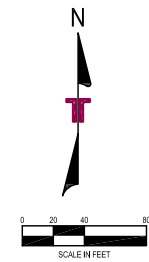
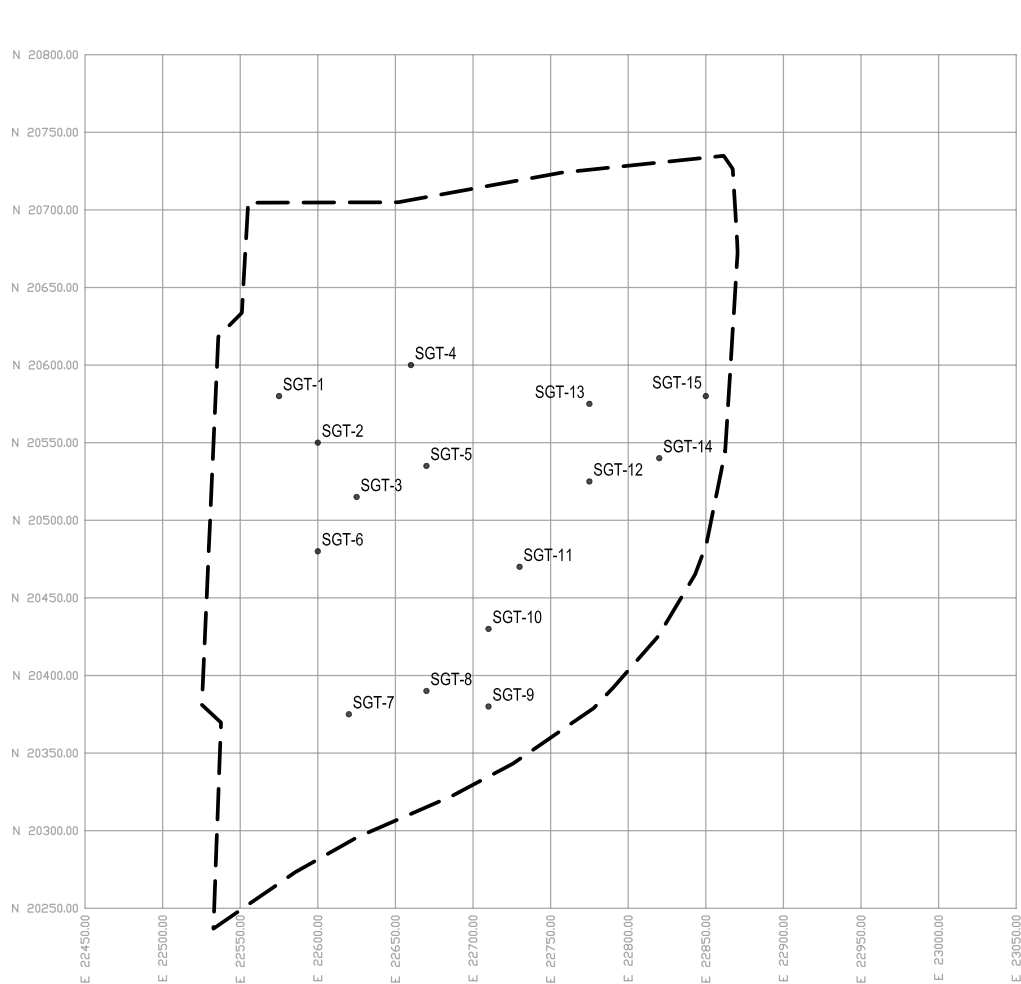
The project specifications called for the subgrade to be established to the lines and grades shown on the project construction plans. Following excavation, the subgrade surface was smooth graded, rolled, and tested to ensure that a suitable foundation was established.

2.2 CONSTRUCTION PROCEDURES

The subgrade preparation and excavation for placement of the compacted clay liner associated with the liner system occurred during October and November of 2007. During this period the construction consisted of excavation of the native clays and silts to the new sub-grade. The elevations associated with the subgrade surface established are provided in **APPENDIX A**.

2.3 SUBGRADE TESTING

The subgrade was compacted to 90% of the Standard Proctor maximum dry density as verified by a Terracon soils technician. **FIGURE 3** illustrates the locations of the field moisture and density tests for the subgrade. **APPENDIX D** provides preconstruction test results for the subgrade material. **APPENDIX F** includes the field logs for the moisture/density testing performed in association with the Phase II subgrade construction.



LEGEND:

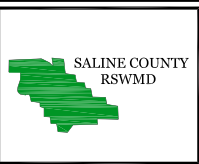
- SGT-1 - DENSITY/MOISTURE TEST LOCATION (SUBGRADE)

REV.	DATE	BY	DESCRIPTION



Terracon
Consulting Engineers and Scientists

11400 WEST BASELINE ROAD LITTLE ROCK, AR 72209
PH. (501) 455-2199 FAX. (501) 455-4547



FIELD DENSITY TEST LOCATIONS - SUBGRADE

PHASE II CONSTRUCTION QUALITY ASSURANCE

SALINE COUNTY REGIONAL SOLID WASTE MANAGEMENT DISTRICT

CLASS 4 LANDFILL

BAUXITE ARKANSAS

FIGURE 3	
DESIGNED BY:	BNF
DRAWN BY:	JDW
APPROV. BY:	KEB
SCALE:	1" = 50'
DATE:	11/16/07
JOB NO.	055-001-35077118
ACAD NO.	001
SHEET NO.:	3 OF 6

3.0 CLAY LINER SYSTEM INSTALLATION

The following section describes the construction of the bottom clay liner system. The compacted clay liner corresponding to Phase II was completed during October and November of 2007.

3.1 PROJECT SPECIFICATIONS

The project construction plans for the compacted clay liner indicated that the clay liner was constructed in two compacted lifts to form a minimum 18-inch thick re-compacted clay liner. However, moisture-density tests were performed at depths of 6-inch increments using a Troxler moisture-density gauge. Each clay lift was to be placed and compacted to 90% of the Standard Proctor maximum dry density at moisture content above the optimum moisture for the clay material. As required by Reg.22.621(c)(1), the hydraulic conductivity of the clay was not to exceed 1.0×10^{-5} cm/sec.

3.2 CONSTRUCTION PROCEDURES

Placement of the clay liner material was accomplished using off road dump trucks, dozers, a sheeps-foot roller, and a smooth drum roller. The clay liner was moisture conditioned during placement to achieve maximum compaction. Finish grading of the surface was accomplished by utilizing laser-leveling equipment attached to earth moving equipment. Drawings provided in **APPENDIX A** provide the elevations associated with the top of the clay liner for the bottom liner system.

3.3 PRE-CONSTRUCTION TESTING OF CLAY LINER MATERIAL

Field and laboratory testing of the clay liner system was completed as specified in the project specifications, the facility CQA plan, and in accordance with the requirements of Arkansas Regulation No. 22.

Before placement, and during construction, soil samples were obtained from the excavation and clay stockpiles at a minimum frequency of one test per 20,000 cubic yards of soil placed. **APPENDIX D** contains the results of the compacted clay liner pre-construction testing. **TABLE 1** summarizes the results of the pre-construction testing. The results indicate that most of the materials meet or exceed the minimum project standards.

**TABLE 1
CLAY LINER MATERIALS PRE-CONSTRUCTION TEST SUMMARY**

Test Description	Moisture/Density Relationships ASTM D698	Atterberg Limits ASTM D4318	Particle Size Analysis ASTM D1140, D422	Soils Classification (USCS)	Remolded Permeability (cm/sec) D5084
Project Requirements	Minimum 90% Standard Proctor maximum dry density	P.I. greater than 10	More than 30% passing No. 200 sieve More than 80% passing No. 4 sieve Max part. Size = 1"	SC, CL, or CH	1.0×10^{-5} or less Remold to: 90% @ +3 opt. 10psi confining
Sample Number	Test Results				
PC-C1	Max Dry Density: 90.8 pcf Optimum Moisture: 26.1%	L.L. 52 P.L. 29 P.I. 23	98.1% passing No. 200 sieve 100% passing No. 4 sieve	CH	1.0×10^{-6}

3.4 CONSTRUCTION TESTING OF COMPACTED CLAY LINER MATERIAL

During the construction of the compacted clay liner, samples were obtained for laboratory testing to verify the consistency of the materials during construction. The results of the construction laboratory testing are included in **APPENDIX E. TABLE 2** summarizes the results obtained from laboratory testing of the clay liner material. Based upon the results of the construction testing performed, the clay liner material complies with the project specifications.

TABLE 2
COMPACTED CLAY LINER CONSTRUCTION TESTING OF CLAY

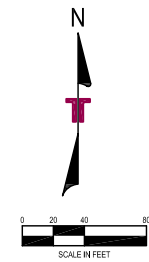
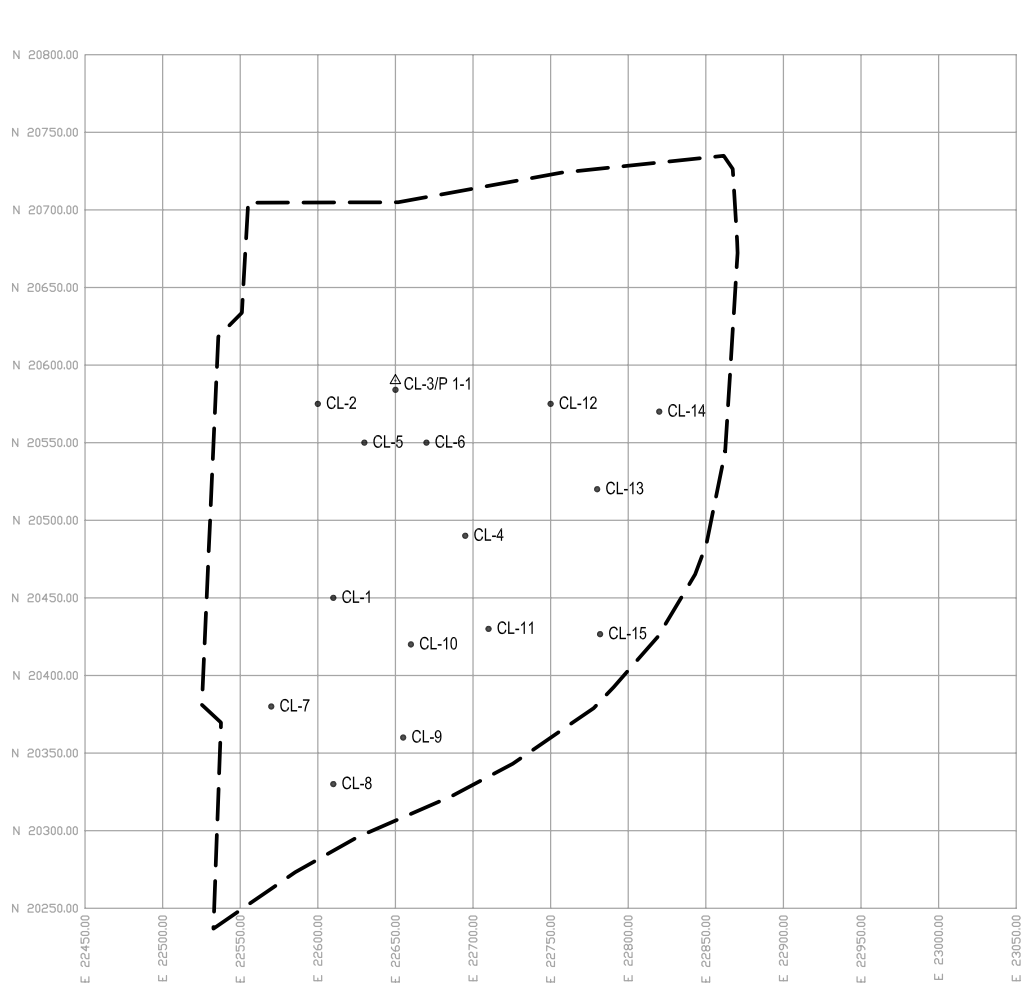
Test Description	Moisture/Density Relationships ASTM D698	Atterberg Limits ASTM D4318	Particle Size Analysis ASTM D1140, D422	Soils Classification (USCS)	Permeability (cm/sec) D5084
Project Requirements	Minimum 90% Standard Proctor maximum dry density	P.I. greater than 10	More than 30% passing No. 200 sieve More than 80% passing No. 4 sieve Max part. Size = 1"	SC, CL, or CH	1.0×10^{-5} or less Remold to: 90% @ +3 opt. 10psi confining
Sample Number	Test Results				
C-C2	Max Dry Density: 95.1 pcf Optimum Moisture: 23.5%	L.L. 37 P.L. 23 P.I. 14	75.2% passing No. 200 Sieve 94.8% passing No. 4 sieve	CL	1.9×10^{-7}
C-C3	Max Dry Density: 96.1 pcf Optimum Moisture: 23.1%	L.L. 39 P.L. 25 P.I. 14	76.9% passing No. 200 Sieve 97.6% passing No. 4 sieve	CL	8.0×10^{-7}

Field moisture and density tests were performed at a minimum rate of one test for every 10,000 square feet per compacted lift. **FIGURE 4** through **FIGURE 6** illustrate the locations of the field moisture and density tests for each compacted lift of clay. **APPENDIX F** includes the field logs for the moisture and density testing performed in association with the Phase II construction. Based upon the results of the moisture and density tests performed by Terracon, the three lifts of compacted clay liner comply with the project specifications.

Shelby tube samples were obtained from each lift at a minimum rate of one test for every 40,000 square feet. **FIGURE 4** through **FIGURE 6** illustrate the locations where the Shelby Tube samples were taken for each compacted lift of clay. The tubes were sealed and delivered to the laboratory for permeability testing using a flexible-wall permeameter (ASTM D-5084). As indicated in **TABLE 3**, permeability results for the completed compacted clay liner meet the project requirements (less than 1.0×10^{-5} cm/s). **APPENDIX G** contains the compacted clay liner permeability test results.

**TABLE 3
 PERMEABILITY RESULTS SUMMARY**

Test No.	Lift No.	Test Results	
		Average Permeability (cm/sec)	Pass/Fail
Perm 1-1	1	2.8×10^{-7}	Pass
Perm 1-2	2	2.1×10^{-6}	Pass
Perm 3-1	3	8.4×10^{-7}	Pass
Perm 3-2	3	5.2×10^{-8}	Pass



LEGEND:

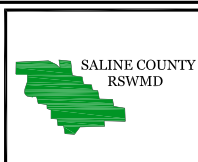
- CL-1 - DENSITY/MOISTURE TEST LOCATION
- △ P 1-1 - PERMEABILITY TEST LOCATION

REV.	DATE	BY	DESCRIPTION



Terracon
Consulting Engineers and Scientists

11400 WEST BASELINE ROAD LITTLE ROCK, AR 72209
PH. (501) 455-2199 FAX. (501) 455-4547



FIELD DENSITY TEST LOCATIONS - CLAY LINER (1ST LIFT)

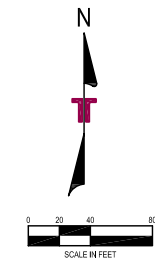
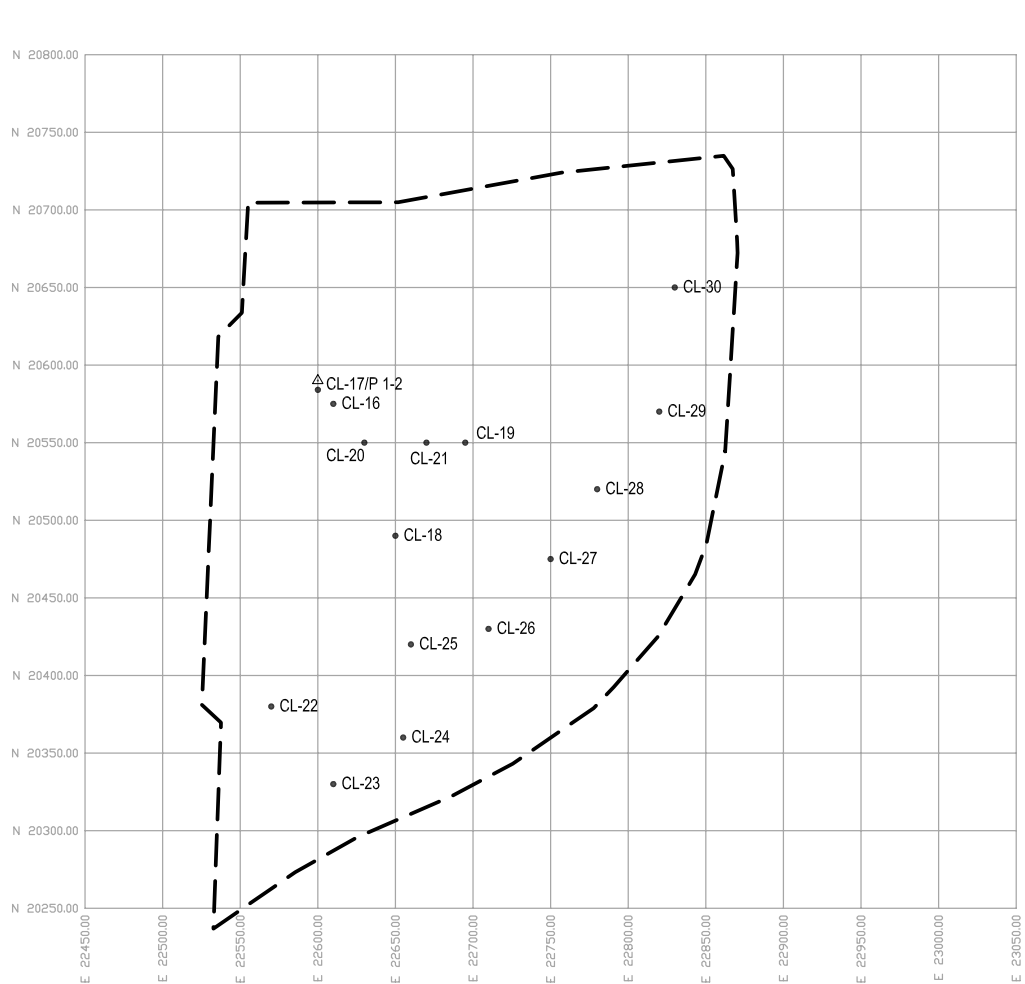
PHASE II CONSTRUCTION QUALITY CONTROL

SALINE COUNTY REGIONAL SOLID WASTE MANAGEMENT DISTRICT

CLASS 4 LANDFILL

BAUXITE ARKANSAS

FIGURE 4	
DESIGNED BY:	BNF
DRAWN BY:	JDW
APPROVED BY:	KEB
SCALE:	1" = 50'
DATE:	11/16/07
JOB NO.	055-001-35077118
ACAD NO.	002
SHEET NO.:	4 OF 6



LEGEND:

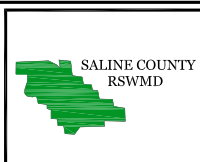
- CL-1 - DENSITY/MOISTURE TEST LOCATION
- △ P 1-1 - PERMEABILITY TEST LOCATION

REV.	DATE	BY	DESCRIPTION



Terracon
Consulting Engineers and Scientists

11400 WEST BASELINE ROAD LITTLE ROCK, AR 72209
PH. (501) 455-2199 FAX. (501) 455-4547



FIELD DENSITY TEST LOCATIONS - CLAY LINER (2ND LIFT)

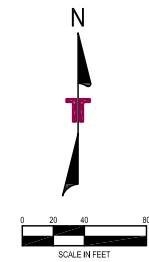
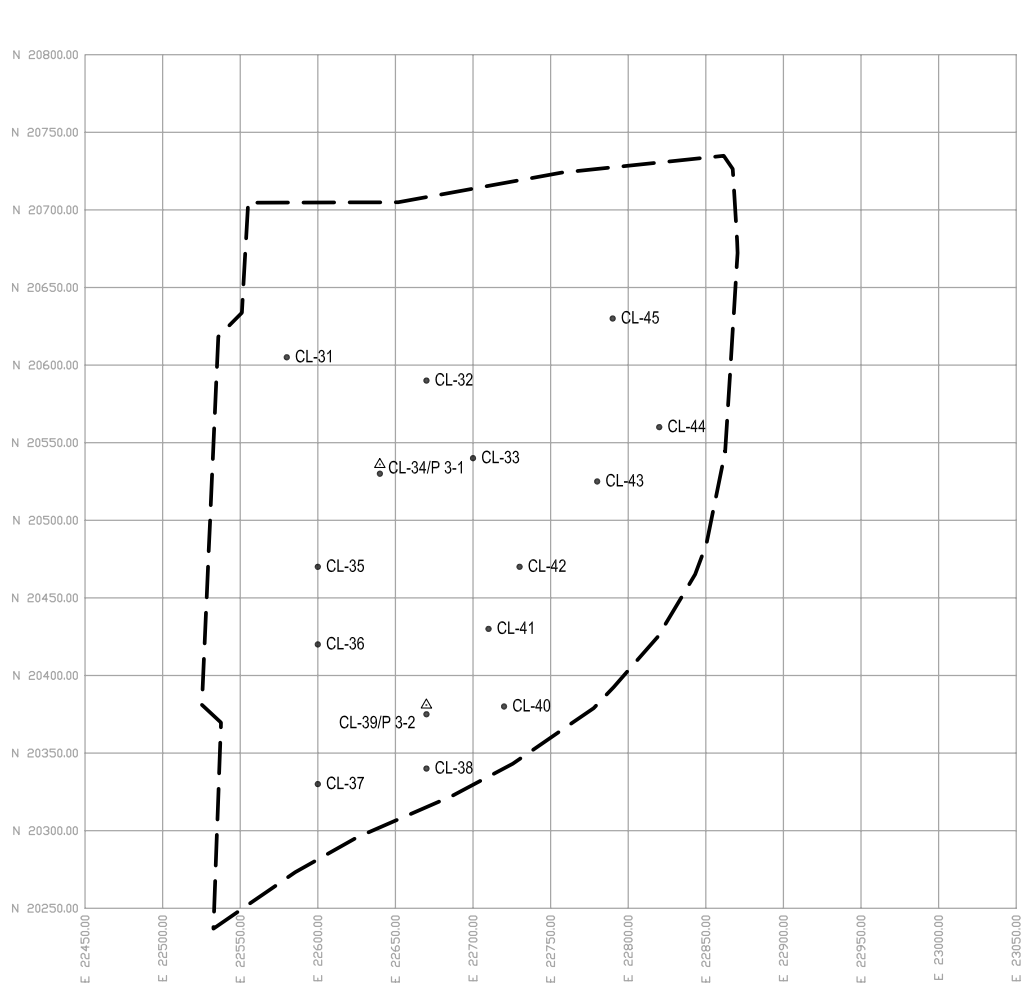
PHASE II CONSTRUCTION QUALITY CONTROL

SALINE COUNTY REGIONAL SOLID WASTE MANAGEMENT DISTRICT

CLASS 4 LANDFILL

BAUXITE ARKANSAS

FIGURE 5	
DESIGNED BY:	BNF
DRAWN BY:	JDW
APPROVED BY:	KEB
SCALE:	1" = 50'
DATE:	11/16/07
JOB NO.	055-001-35077118
ACAD NO.	003
SHEET NO.:	5 OF 6



LEGEND:

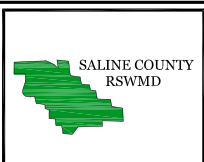
- CL-1 - DENSITY/MOISTURE TEST LOCATION
- △ P 1-1 - PERMEABILITY TEST LOCATION

REV.	DATE	BY	DESCRIPTION



Terracon
Consulting Engineers and Scientists

11400 WEST BASELINE ROAD LITTLE ROCK, AR 72209
PH. (501) 455-2199 FAX. (501) 455-4547



FIELD DENSITY TEST LOCATIONS - CLAY LINER (3RD LIFT)

PHASE II CONSTRUCTION QUALITY CONTROL

SALINE COUNTY REGIONAL SOLID WASTE MANAGEMENT DISTRICT

CLASS 4 LANDFILL

BAUXITE ARKANSAS

FIGURE 6	
DESIGNED BY:	BNF
DRAWN BY:	JDW
APPROVED BY:	KEB
SCALE:	1" = 50'
DATE:	11/16/07
JOB NO.	055-001-35077118
ACAD NO.	004
SHEET NO.:	6 OF 6

4.0 UNDER-DRAIN SYSTEM INSTALLATION

4.1 UNDER-DRAIN COLLECTION PIPE

Two under-drain collection pipes were installed below the Phase II bottom liner system. The collection pipes consist of a six-inch diameter perforated HDPE pipe wrapped in a gravel protective/drainage bed. The gravel consists of washed gravel with a gradation varying from No. 4 to 1 inch in diameter. **TABLE 4** presents the results of laboratory testing of the gravel. The gravel was wrapped with an eight ounce filter fabric to protect the system from clogging. The collection pipe gravity drains at approximately one percent slope from east to west and terminates on the west side of the overbuild berm for the Phase II area. **APPENDIX L** presents the laboratory test results on the gravel used in the drainage system.

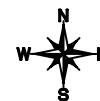
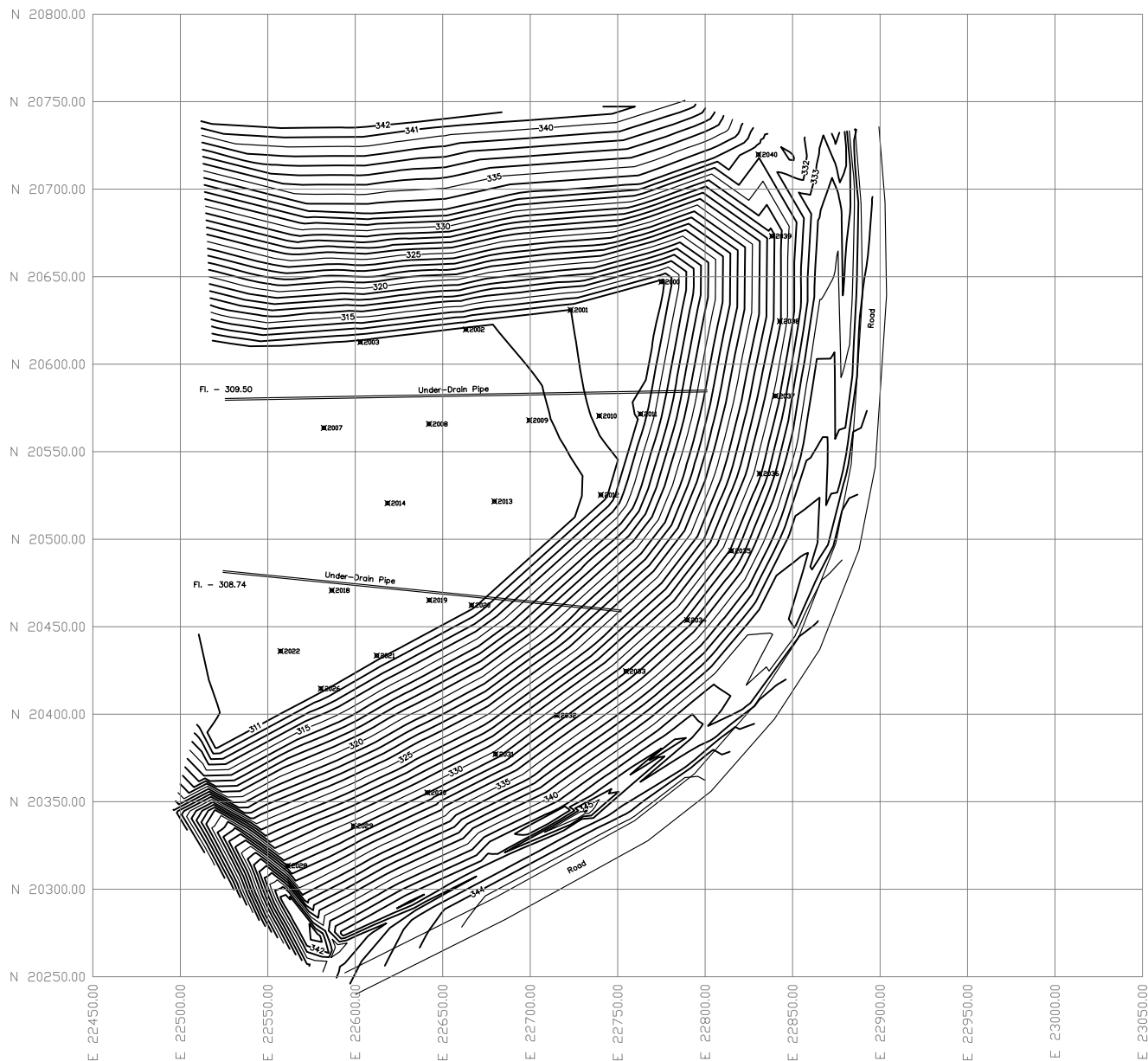
TABLE 4
UNDER-DRAIN SYSTEM GRAVEL
MATERIAL TEST SUMMARY

Test Description	Calcium Carbonate (%)	Particle Size Analysis ASTM D1140, D422	Soils Classification (USCS)	Permeability (cm/sec)
Project Requirements	<15	Less than 5% passing No. 200 sieve	GP	1.0×10^{-3}
Sample Number	Test Results			
PG-1 (Pre-construction)	0.1	0.1% passing No. 200 sieve	GP	2.9
CG-1 (Construction)	--	0.0% passing No. 200 sieve	GP	6.8

APPENDIX A

AS-BUILT DRAWINGS

Topographic Survey
of
Subgrade Surface
Saline County Landfill
Bauxite, Arkansas

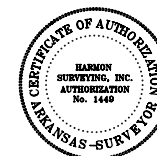


Verification Table			
Pl. No.	Northing	Easting	Sub. El.
2000	20647.86	22775.50	312.87
2001	20631.01	22723.11	311.99
2002	20619.80	22663.26	310.65
2003	20612.82	22602.34	310.68
2004	20563.64	22582.02	310.58
2005	20565.88	22642.18	310.29
2006	20567.91	22609.50	310.63
2007	20570.47	22739.52	312.21
2008	20571.50	22753.82	312.13
2009	20552.32	22700.40	311.13
2010	20521.66	22679.54	310.44
2011	20520.86	22616.40	310.16
2012	20470.79	22586.58	310.14
2013	20465.15	22642.31	310.19
2014	20462.34	22606.50	310.40
2015	20433.50	22612.28	310.40
2016	20436.60	22557.26	310.42
2017	20414.40	22580.30	310.49
2018	20313.44	22561.44	311.86
2019	20236.16	22599.09	310.71
2020	20355.20	22641.23	310.93
2021	20377.10	22680.34	310.41
2022	20390.34	22715.30	311.19
2023	20424.56	22754.76	311.86
2024	20453.79	22789.69	312.34
2025	20463.37	22814.63	311.19
2026	20537.55	22831.77	310.77
2027	20581.82	22840.27	310.31
2028	20624.60	22862.74	310.85
2029	20673.17	22838.22	317.66
2040	20719.91	22830.93	315.14

Certification:
I hereby certify this drawing represents work completed in the field by me or under my supervision, on November 05, 2007, the information shown on this drawing is true and correct to the best of my knowledge.

11-02-07
Justin Dodd Harmon AR P.L.S. #1356
Date

This survey conforms with state regulatory authority tolerance on horizontal and vertical accuracy and was completed using a Trimble 5603, Robotic Total Station based on site monumentation.



		FOR USE AND BENEFIT OF: Terracon
Drawn By: D. Harmon		
Checked By: D. Harmon		
SCALE: 1" = 30' DATE: 11/07/07		

HARMON SURVEYING, INC.
 P.O. Box 691
 Conway, AR 72033
 Phone: (501) 730-1518
 Fax: (501) 730-0637

This topographic map displays the study area with contour lines indicating elevation. The map is oriented with North at the top. The vertical axis (Northing) ranges from 20250.00 to 20800.00, and the horizontal axis (Easting) ranges from 22450.00 to 23050.00. Contour lines are labeled with values such as 315, 320, 325, 330, 335, 340, 341, and 342. Numerous elevation points are marked with their coordinates, including points like 2001, 2002, 2003, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658,

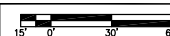
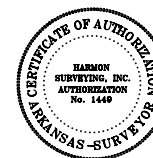


Pl. No.	Verification Table			
	Northing	Easting	Sub. Br.	Loc.
2001	20643.76	22273.11	31.83	318.3
2002	20189.80	20603.26	31.05	310.5
2003	20643.76	22273.11	31.83	318.3
2004	20663.64	22562.02	31.08	312.8
2005	20665.86	22642.16	32.08	312.8
2006	20643.76	22273.11	31.83	318.3
2010	20579.47	22739.52	31.21	318.1
2011	20643.76	22273.11	31.83	318.3
2012	20525.32	22740.40	31.13	314.3
2013	20521.66	22679.54	31.04	312.4
2014	20521.66	22679.54	31.04	312.4
2015	20521.66	22679.54	31.04	312.4
2018	20470.79	22586.56	31.14	312.3
2019	20485.15	22640.27	31.19	313.4
2020	20452.34	22542.34	31.09	313.4
2021	20430.50	22612.28	31.00	313.4
2022	20430.50	22575.70	31.02	312.7
2023	20430.50	22575.70	31.02	312.7
2024	20313.44	22596.44	31.86	318.3
2025	20313.44	22596.44	31.86	318.3
2026	20313.44	22596.44	31.86	318.3
2027	20305.20	22641.23	31.03	312.9
2028	20317.16	22690.24	31.04	312.9
2029	20317.16	22690.24	31.04	312.9
2030	20424.56	22754.70	30.86	313.1
2034	20433.79	22769.89	32.26	314.4
2035	20433.79	22769.89	32.26	314.4
2036	20537.55	22831.17	32.07	312.7
2037	20537.55	22831.17	32.07	312.7
2038	20537.55	22831.17	32.07	312.7
2042	20624.58	22462.74	32.85	321.5
2043	20624.58	22462.74	32.85	321.5
2048	20673.17	22836.22	32.06	312.7
2049	20673.17	22836.22	32.06	312.7

Certification:
I hereby certify this drawing represents work completed in the field by me or under my supervision, on November 12, 2007, the information shown on this drawing is true and correct to the best of my knowledge.

11-13-07
Justin Dodd Harmon AR P.L.S. #1356
Date

This survey conforms with state regulatory authority tolerance on horizontal and vertical accuracy and was completed using a Trimble 5603, Robotic Total Station based on site monumentation.



FOR USE AND BENEFIT OF:	Terracon
-------------------------	----------

Drawn By: D. Harmon
Checked By: D. Harmon
SCALE: 1" = 30'
DATE: 11/13/07

HARMON SURVEYING, INC.
P.O. Box 691
Conway, AR 72033
Phone: (501) 730-1518
Fax: (501) 730-0637



APPENDIX B

GENERAL PROJECT CORRESPONDENCE

September 7, 2007

Mr. Steve Martin, Chief Solid Waste Division
Arkansas Department Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

SUBJECT: **Notification of Construction**
 Saline County Class 4 Landfill
 Permit No. 0277-S4; AFIN 63-00155

Dear Mr. Martin:

Terracon Consultants, Inc. (Terracon) is providing this notification of construction on behalf of the Saline County Regional Solid Waste Management District Landfill (Saline County Landfill), located near Bauxite, Arkansas. The Saline County Landfill is constructing Phase II of the Class 4 Landfill. Terracon and the Saline County Landfill are notifying the Arkansas Department of Environmental Quality (ADEQ) in accordance with Reg.22.428(f) of Regulation 22 of the proposed construction schedule.

Description/Contractor Proposed Schedule

General Contractor for Earthwork (Grayco Construction)	9/17/07 – 11/12/07
Surveying (Harmon Surveying)	9/17/07 – 11/12/07
CQA Services (Terracon Consultants, Inc.)	9/17/07 – 11/12/07

Note: This schedule is tentative and may change due to weather delays.

The earthwork contractor has completed over 500,000 square feet of clay liner during the last three years. Therefore, Terracon requests that the ADEQ waive the test fill requirements of Reg.22.428(c)(11). A construction certification report documenting construction activities will be submitted to the ADEQ upon completion of construction.

If you have any questions or comments, please feel free to contact Ken Bown at kebown@terracon.com or 501-455-2199 at your convenience.

Sincerely,

Terracon


Brad Fureigh, E.I.
Project Engineer


Ken Bown, P.E.
Senior Project Manager

Cc: Dennis Wills, Executive Director, SCRSWMD

N:\Projects\2006\35067125\CQA\Correspondence\ADEQ Notification bnf 9 7 07 doc

September 13, 2007

Mr. Shawn Gray
Grayco Construction
24551 Highway 370
Faulkner, MS 38629

SUBJECT: **Notice to Proceed – Phase II Construction**
 Saline County Class 4 Landfill
 Permit No. 0277-S4; AFIN: 63-00155

Dear Mr. Gray:

By receipt of this letter, you are hereby authorized to proceed with construction of Phase II at the Saline County Regional Solid Waste Management District Class 4 Landfill (Saline County Landfill), located near Bauxite, Arkansas.

This authorization is provided by Terracon Consultants, Inc. (Terracon) on behalf of the Saline County Landfill and is subject to the conditions outlined in the *Construction Bid and Contract Documents – Saline County RSWMD Class 4 Landfill – Phase II Construction, dated August 2007*.

A pre-construction meeting has been scheduled for Monday (September 24, 2007) at 1:30 PM at the Saline County Landfill. Please bring in the signed Contract Agreement (Section IV of the Contract Documents) and Performance Bond.

We look forward to working with you on this project. If you have any questions or comments, please feel free to contact Ken Bown at kebown@terracon.com or 501-455-2199 at your convenience.

Sincerely,

Terracon


Brad Fureigh, E.I.
Project Engineer


Ken Bown, P.E.
Senior Project Manager

Cc: Dennis Wills, Executive Director, SCRSWMD

N:\Projects\2006\35067125\CQA\Correspondence\Grayco notification bnf 9 13 07.doc

APPENDIX C

DAILY PROJECT FIELD RECORDS

DAILY PROJECT FIELD RECORD

DATE: 10/17/18

PROJECT: Saline County Class 4

LOCATION: Bauxite, Arkansas

WEATHER CONDITIONS: Cloudy, Occasional rain

PROJECT NUMBER: 35077118

TERRACON REP: Brad Fureigh, E.I.

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒Grayco Construction	⇒ CAT 330 Excavator
⇒ Shaun Gray, Robert, additional equip. operators	⇒ (3) CAT Off Road 740 dump trucks
⇒	⇒ (2) Cat D6 Dozers
⇒Harmon Surveying	⇒
⇒	⇒
⇒	⇒
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 10/19/07

WEATHER CONDITIONS: Sunny Clear

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Donny Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	⇒ CAT 330 Excavator
⇒ Robert & additional equip. operators	⇒ 2 Cat off road 700 dump truck
⇒	⇒ 2 Cat D6 Dozers
⇒	⇒
⇒	⇒
⇒	⇒
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE:	10/23/07
PROJECT:	Saline County Class 4
LOCATION:	Bauxite, Arkansas

WEATHER CONDITIONS: Rain

PROJECT NUMBER: 35077118

TERRACON REP: Donny Walls

<u>Contractor Personnel on Site:</u>		<u>Contractor Equipment on Site:</u>	
⇒	Grayco Construction	⇒	CAT 330 Excavator
⇒	Robert	⇒	2 Cat off road 700 dump truck
⇒	3 equipment operators	⇒	2 Cat D6 Dozers
⇒		⇒	
⇒		⇒	
⇒		⇒	
⇒		⇒	

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE:	10/26/07
PROJECT:	Saline County Class 4
LOCATION:	Bauxite, Arkansas

WEATHER CONDITIONS: Cloudy 60°

PROJECT NUMBER: 35077118

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>		<u>Contractor Equipment on Site:</u>	
⇒	Grayco Construction	⇒	CAT 330 Excavator
⇒	Robert	⇒	2 Cat off road 700 dump truck
⇒		⇒	2 Cat D6 Dozers
⇒		⇒	
⇒		⇒	
⇒		⇒	
⇒		⇒	

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 10/27/07

WEATHER CONDITIONS: Sunny 60°

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>		<u>Contractor Equipment on Site:</u>	
⇒	Grayco Construction	⇒	CAT 330 & CAT 321 Excavator
⇒	Robert & 4 equipment operators	⇒	2 Cat off road 740 dump truck
⇒		⇒	2 Cat D6 Dozers
⇒		⇒	
⇒		⇒	
⇒		⇒	
⇒		⇒	

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 10/28/07

WEATHER CONDITIONS: Clear & Sunny 60°

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	⇒ CAT 330 & CAT 321 Excavator
⇒ Robert 4 equipment operators	⇒ 2 Cat off road 740 dump truck
⇒	⇒ 2 Cat D6 Dozers
⇒	⇒
⇒	⇒
⇒	⇒
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 10/29/07

WEATHER CONDITIONS: Cool & Sunny

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Stephen Billingsley

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	(3) CAT 740 Dump Trucks
⇒ Robert 4 equipment operators	(2) CAT D6 Dozers
⇒	(2) CAT Excavators
⇒	(1) CAT 815 ⇒
⇒	⇒
⇒	⇒
⇒	⇒

TIME	NOTES
830	Departed Lab
900	Arrived at site
905	Met with Robert. Grayco had already started placing subgrade material on E slope. Obtained construction sample C-C1(*). Grayco excavated cell floor on West end of cell.
1030	Robert set up transit to shoot elevation for East slope
1130	Departed site
1145	Arrived back at lab, (*)dropped off bucket sample C-C1
1200	Crew broke for lunch
100	Arrived back at site
105	Observed crew working slope/shooting elevations
415	Departed site
430	Arrived at lab
	* denotes no densities taken

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 10/30/07

WEATHER CONDITIONS: Sunny, Clear 70's

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	CAT 330 & CAT 321 Excavator
⇒ Robert 4 equipment operators	3 CAT Off Road Dumptrucks
⇒	2 CAT D6 Dozers
⇒	
⇒	
⇒	⇒
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 10/31/07

PROJECT: Saline County Class 4

LOCATION: Bauxite, Arkansas

WEATHER CONDITIONS: Sunny, Clear 70's

PROJECT NUMBER: 35077118

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	CAT 330 & CAT 321 Excavator
⇒ Robert 4 equipment operators	3 CAT Off Road Dump trucks
⇒	2 CAT D6 Dozers
⇒	
⇒	
⇒	⇒
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 11/01/07

WEATHER CONDITIONS: Cloudy 60's

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	CAT 330 & CAT 321 Excavator
⇒ Robert & 4 equipment operators	2 CAT Off Road Dumptrucks
⇒	2 CAT D6 Dozers
⇒	
⇒	
⇒	⇒
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 11/02/07

WEATHER CONDITIONS: Sunny 60's

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	CAT 330 & CAT 321 Excavator
⇒ Robert & 4 equipment operators	3 CAT Off Road Dumptrucks
⇒ Shawn Gray	2 CAT D6 Dozers
⇒	
⇒	
⇒	⇒
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 11/03/07

WEATHER CONDITIONS: Sunny 70's

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	CAT 330 & CAT 321 Excavator
⇒ Shawn, Robert & 4 equipment operators	3 CAT Off Road Dumptrucks
⇒ PFF-Pipe Fabricator	2 CAT D6 Dozers
⇒	
⇒	
⇒	⇒
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 11/04/07

WEATHER CONDITIONS: Clear/Sunny

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Clayton

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	3 Dump trucks
⇒ 3 employees	2 Trackhoes
⇒	2 Dozers
⇒	1 Mini hoe
⇒	1 Roller
⇒	⇒
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 11/05/07

PROJECT: Saline County Class 4

LOCATION: Bauxite, Arkansas

WEATHER CONDITIONS:	Sunny 80's
PROJECT NUMBER:	35077118
TERRACON REP:	Donald Walls

<u>Contractor Personnel on Site:</u>		<u>Contractor Equipment on Site:</u>	
⇒	Grayco Construction		CAT 321, 330, 303 excavators
⇒	Robert and 3 equip. operators-		3 off road dump trucks
⇒			1 CAT CS-563E smooth drum compactor
⇒			2 CAT D6 dozers
⇒			
⇒		⇒	
⇒		⇒	

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 11/06/07

PROJECT: Saline County Class 4

LOCATION: Bauxite, Arkansas

WEATHER CONDITIONS:	Sunny 50's
PROJECT NUMBER:	35077118
TERRACON REP:	Donald Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒Grayco Construction	⇒CAT 321 \$ CAT 330 Excavator
⇒ Robert and 4 equip. operators-	⇒3 CAT off road dump trucks
⇒	⇒CAT sheepsfoot compactor
⇒	⇒CAT smooth drum compactor
⇒	⇒2 CAT D6 dozers
⇒	⇒
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE:	11/07/07
PROJECT:	Saline County Class 4
LOCATION:	Bauxite, Arkansas

WEATHER CONDITIONS: Sunny 60's

PROJECT NUMBER: 35077118

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	2 D6 Dozers
⇒ Robert and 5 equip. operators-	CAT 321 and CAT 330 Excavator
⇒	CAT 815 sheeps foot compactor
⇒	3 CAT Offroad dumptrucks
⇒	CAT Smooth Drum Roller
⇒	
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 11/08/07

WEATHER CONDITIONS: Sunny 60's

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	CAT 321 & CAT 330 Excavator
⇒ Robert and 5 equip. operators-	CAT 815 Sheepsfoot Roller
⇒	3 CAT Offroad Dump trucks
⇒	2 CAT D6 Dozers
⇒	CAT Smooth Drum Roller
⇒	
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.

DAILY PROJECT FIELD RECORD

DATE: 11/09/07

WEATHER CONDITIONS: Sunny 45's

PROJECT: Saline County Class 4

PROJECT NUMBER: 35077118

LOCATION: Bauxite, Arkansas

TERRACON REP: Donald Walls

<u>Contractor Personnel on Site:</u>	<u>Contractor Equipment on Site:</u>
⇒ Grayco Construction	CAT 321 & CAT 330 Excavator
⇒ Robert and 5 equip. operators-	CAT 815 Sheepsfoot Roller
⇒	3 CAT Offroad Dump trucks
⇒	2 CAT D6 Dozers
⇒	CAT Smooth Drum Roller
⇒	
⇒	⇒

[illegible]

Note: Copies of all completed "Project Field Record Forms" are to be submitted to the Project Manager at the end of each day and should be maintained with the Project Records.³⁰

APPENDIX D
SOIL MATERIAL PRE-CONSTRUCTION
TEST RESULTS

**TERRACON/SALINE COUNTY CLASS 4 LANDFILL/AL
SUMMARY OF SOIL DATA**

Sample Identification	Sample Type	Sample Depth	Soil Classification	Natural Moisture %	Atterberg Limits				Grain Size Distribution			Compaction		Gs	Unit Weight		Permeability (cm/sec)	Additional Tests Conducted (See Notes)
									% Finer No. 4 Sieve	% Finer No. 200 Sieve	% Finer .005 mm	Maximum Dry Density (lb/cuft)	Optimum Moisture %		Moisture %	Dry (lb/cuft)		
					L.L.	P.L.	P.I.	L.I.										
PC-C1	Bulk	-	CH	21.6	52	29	23	-0.31	100.0	98.1	45.0	90.8	26.1	-	28.8	86.6	1.0E-06	-
PC-C2	Bulk	-	CL	33.4	45	26	19	0.37	100.0	89.6	38.0	92.3	25.9	-	28.8	87.8	3.5E-07	-

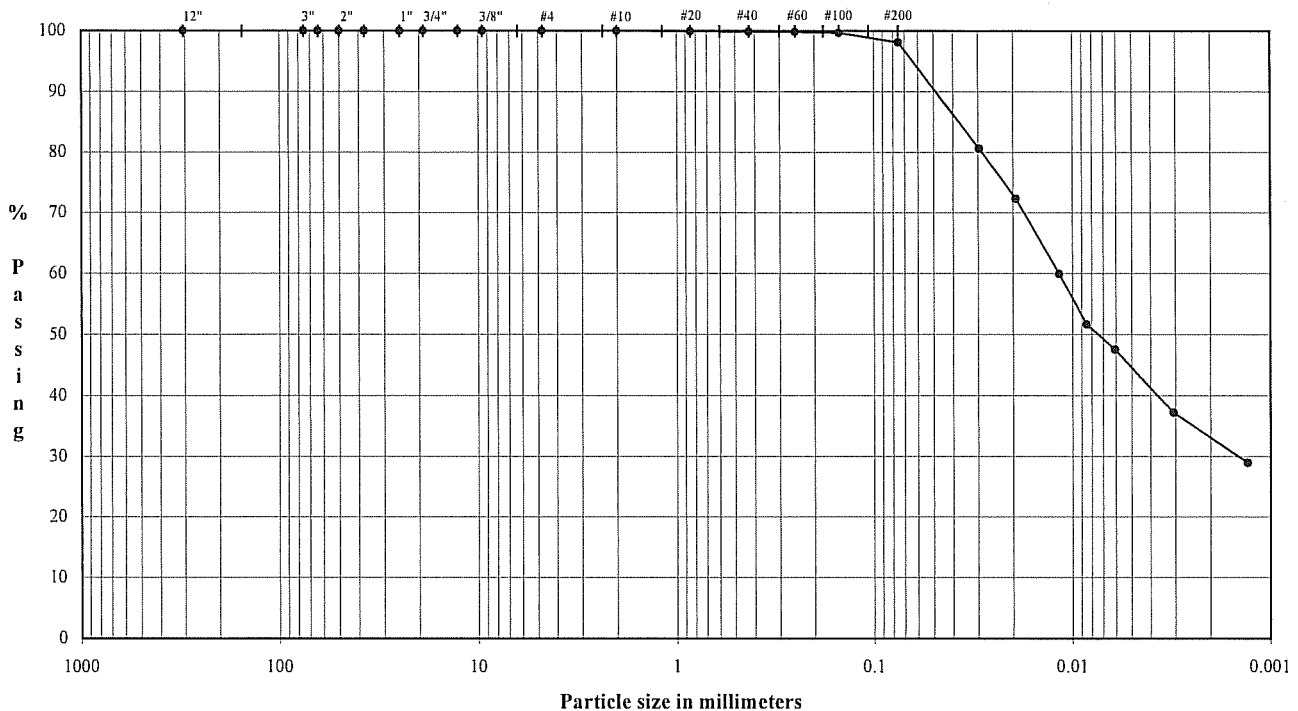
ABBREVIATIONS: LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Me)

NOTES: T = TRIAXIAL TEST
U = UNCONFINED COMPRESSION TEST
C = CONSOLIDATION TEST
DS = DIRECT SHEAR TEST
O = ORGANIC CONTENT
P = pH

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: TERRACON/SALINE COUNTY CLASS 4 LANDFILL/AL
 SAMPLE ID: PC-C1 - Depth: -
 TYPE: Bulk



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

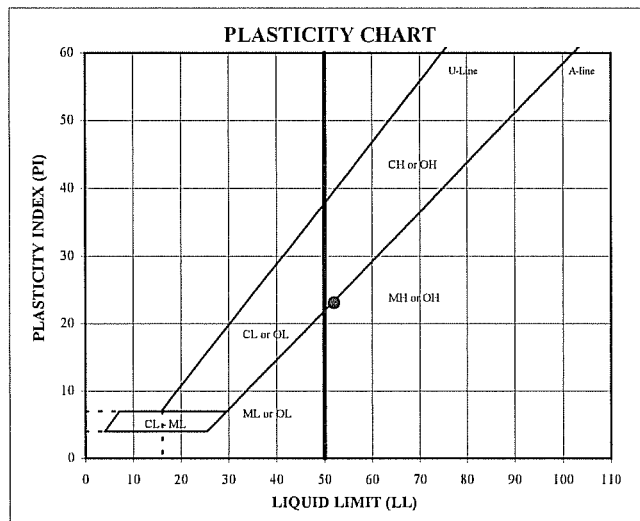
Particle Size (mm)	% Passing	Classification	Percentage
12.0"	304.8	100.0	
3.0"	75.0	100.0	
2.5"	63.5	100.0	
2.0"	50.0	100.0	
1.5"	37.5	100.0	
1.0"	25.0	100.0	
0.75"	19.0	100.0	
0.50"	12.7	100.0	
0.375"	9.5	100.0	
#4	4.8	100.0	
#10	2.00	100.0	
#20	0.85	100.0	
#40	0.43	99.9	
#60	0.25	99.9	
#100	0.15	99.7	
#200	0.075	98.1	

Hydrometer Analysis

(mm)	% Finer		
0.030	80.6		
0.019	72.3		
0.012	59.9		
0.0085	51.7		
0.0061	47.5		
0.0031	37.2		
0.0013	28.9		

DESCRIPTION: Dark Grayish Brown, SILTY CLAY, trace medium to fine sand.

USCS: CH



ATTERBERG LIMITS Method -B (Dry preparation)

M _r	LL	PL	PI	LI
21.6	52	29	23	-0.31

 LL (oven-dried)
 < 0.75 = ORGANIC (OL/OH)

TECH MJW/TJ
 DATE 07/16/07
 CHECK [Signature]
 REVIEW [Signature]

MOISTURE / DRY DENSITY CURVE

ASTM D 698 Method A

Mechanical

Standard

Wet Method

PROJECT NAME:

TERRACON/SALINE COUNTY CLASS 4 LANDFILL/AL

PROJECT NUMBER:

073-90216

SAMPLE ID:

PC-C1

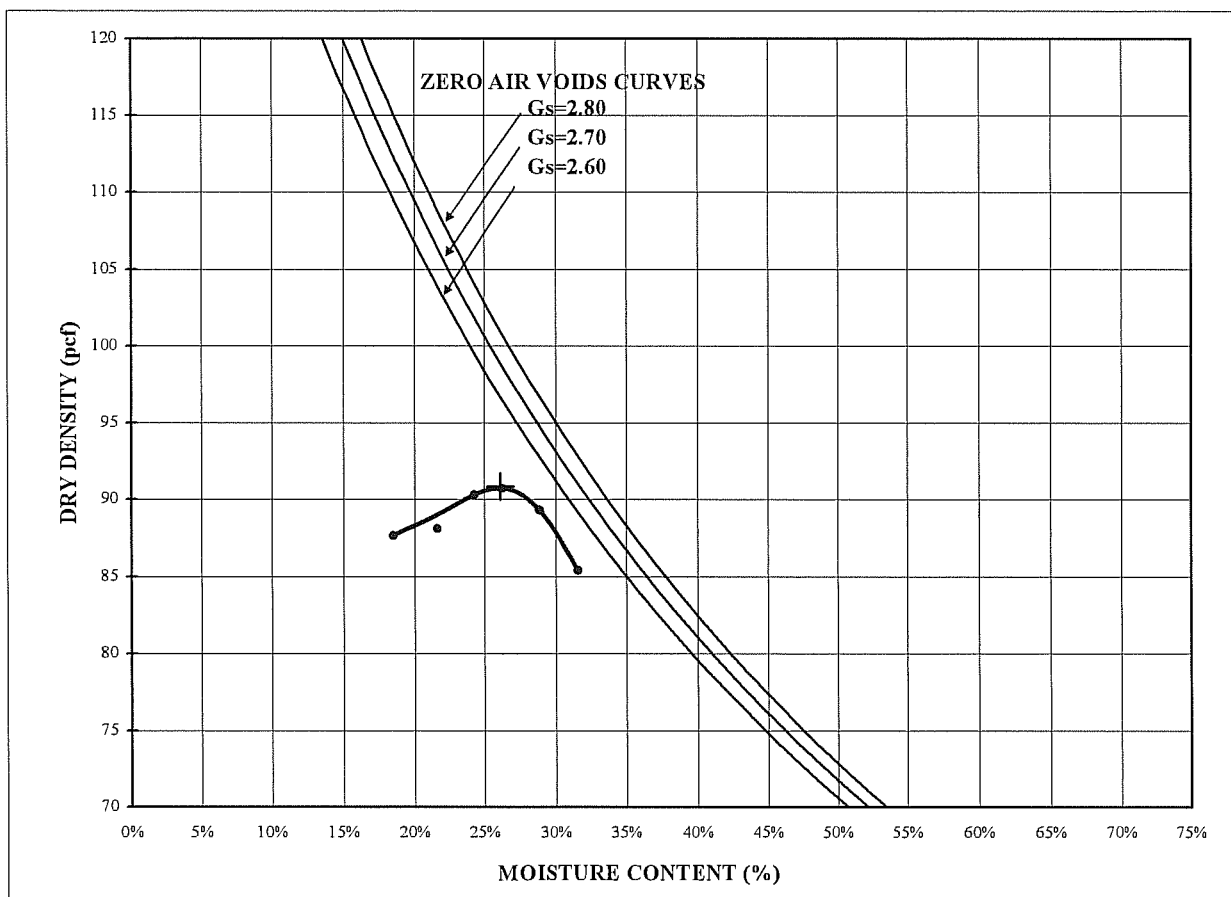
-

DEPTH:

-

SAMPLE TYPE:

Bulk



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	87.6	18.5%
2	88.1	21.6%
3	90.3	24.3%
4	90.7	26.2%
5	89.3	28.9%
6	85.4	31.6%

Maximum Dry Density (pcf)	90.8
Optimum Moisture (%)	26.1
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	

As-Received Moisture Content **21.6%**

% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	

DESCRIPTION: Dark Grayish Brown, SILTY CLAY, trace medium to fine sand.

USCS

CH

CHECK
REVIEW

[Signature]

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE
PROJECT NUMBER
SAMPLE ID
SAMPLE TYPE

TERRACON/SALINE COUNTY CLASS 4 LANDFILL/AL	
073-90216	
PC-C1	-
Bulk	

Board #
Flow Pump
Flow Pump Speed
Technician

2
1
6
AK

COMMENTS

The sample was remolded to 95.4% of the Maximum Dry Density and OPTM + 2.7% (using ASTM D 698).

Sample Data, Initial

Height, inches	2.996	B-Value, f	1.00
Diameter, inches	2.790	Cell Pres.	90.0
Area, cm ²	39.44	Bot. Pres.	80.0
Volume, cm ³	300.15	Top Pres.	80.0
Mass, g	536.10	Tot. B.P.	80.0
Moisture Content, %	28.76	Head, max.	92.85
Dry Density, pcf	86.56	Head, min.	92.85
Spec. Gravity(assumed)	2.700	Max. Grad.	12.03
Volume Solids, cm ³	154.21	Min. Grad.	12.03
Volume Voids, cm ³	145.95		
Void Ratio	0.95		
Saturation, %	82.0%		

Sample Data, Final

Height, inches	3.039
Diameter, inches	2.784
Area, cm ²	39.27
Volume, cm ³	303.15
Mass, g	556.70
Moisture Content, %	33.71
Dry Density, pcf	85.70
Volume Solids, cm ³	154.21
Volume Voids, cm ³	148.95
Void Ratio	0.97
Saturation, %	94.2%

WATER CONTENTS

	Sample Initial	Sample Final
Wt Soil & Tare, i g	536.10	565.03
Wt Soil & Tare, f g	416.36	424.70
Wt Tare g	0.00	8.38
Wt Moisture Lost g	119.74	140.33
Wt Dry Soil g	416.36	416.32
Water Content %	28.76%	33.71%

DESCRIPTION

Dark Grayish Brown, SILTY CLAY, trace medium to fine sand.

Flow Pump Rate 5.04E-04 cm³/sec

USCS CH

TIME FUNCTIONS, SECONDS								dP	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)				
07/21/07	39284	9	10	20.9	0	0	0	0	1.32	92.85	12.03	1.0E-06
07/21/07	39284	9	15	20.9	5	5	300	300	1.32	92.85	12.03	1.0E-06
07/21/07	39284	9	20	20.9	5	10	300	600	1.32	92.85	12.03	1.0E-06
07/21/07	39284	9	25	20.9	5	15	300	900	1.32	92.85	12.03	1.0E-06 *
07/21/07	39284	9	30	20.9	5	20	300	1200	1.32	92.85	12.03	1.0E-06 *
07/21/07	39284	9	35	20.9	5	25	300	1500	1.32	92.85	12.03	1.0E-06 *
07/21/07	39284	9	40	20.9	5	30	300	1800	1.32	92.85	12.03	1.0E-06 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

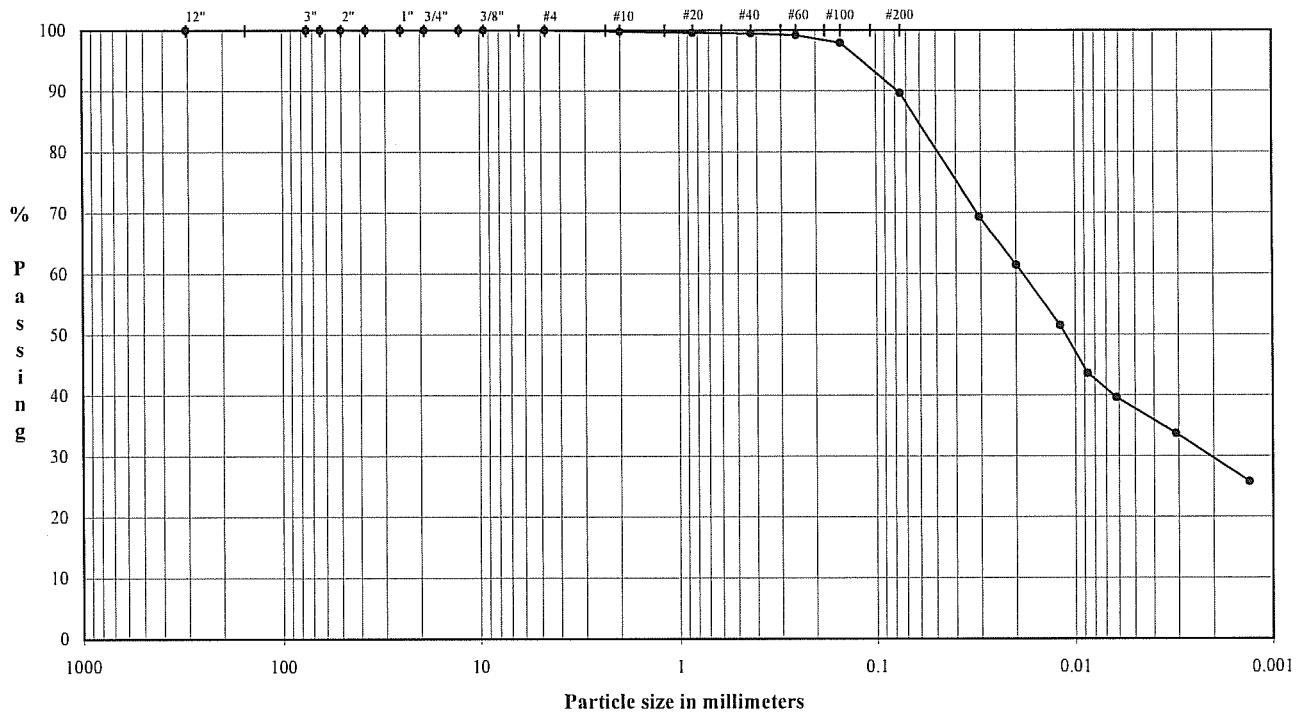
PERMEABILITY REPORTED AS ** 1.0E-06 cm/sec **

DATE 7/21/2007
CHECK
REVIEW

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: TERRACON/SALINE COUNTY CLASS 4 LANDFILL/AL
 SAMPLE ID: PC-C2 - Depth: -
 TYPE: Bulk



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

Particle Size (mm)	% Passing	Classification	Percentage
12.0"	304.8	100.0	
3.0"	75.0	100.0	
2.5"	63.5	100.0	
2.0"	50.0	100.0	
1.5"	37.5	100.0	
1.0"	25.0	100.0	
0.75"	19.0	100.0	
0.50"	12.7	100.0	
0.375"	9.5	100.0	
#4	4.8	100.0	
#10	2.00	99.8	0.22
#20	0.85	99.6	
#40	0.43	99.5	0.30
#60	0.25	99.2	
#100	0.15	97.9	
#200	0.075	89.6	9.87

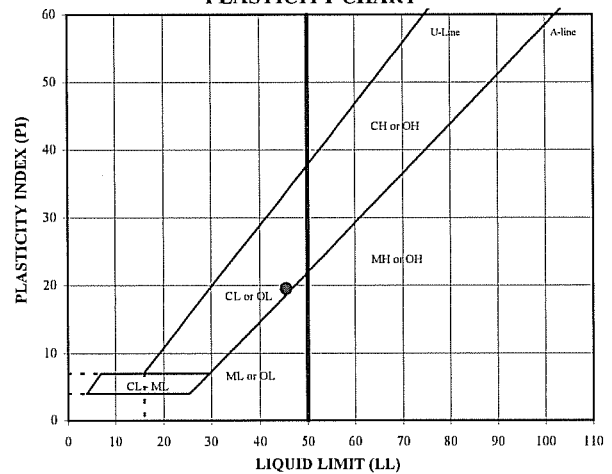
Hydrometer Analysis

(mm)	% Finer		
0.031	69.4		
0.020	61.4		
0.012	51.5		
0.0087	43.6		
0.0062	39.6		
0.0031	33.7		
0.0013	25.8		

DESCRIPTION: Black, SILTY CLAY, little fine sand.

USCS: CL

PLASTICITY CHART


 ATTERBERG LIMITS
 Method -B (Dry preparation)

M _c	LL	PL	PI	LI
33.4	45	26	19	0.37

 LL (oven-dried)
 < 0.75 = ORGANIC (OL/OH)

TECH MJW/TJ
 DATE 07/16/07
 CHECK [Signature]
 REVIEW [Signature]

MOISTURE / DRY DENSITY CURVE

ASTM D 698 Method A

Mechanical

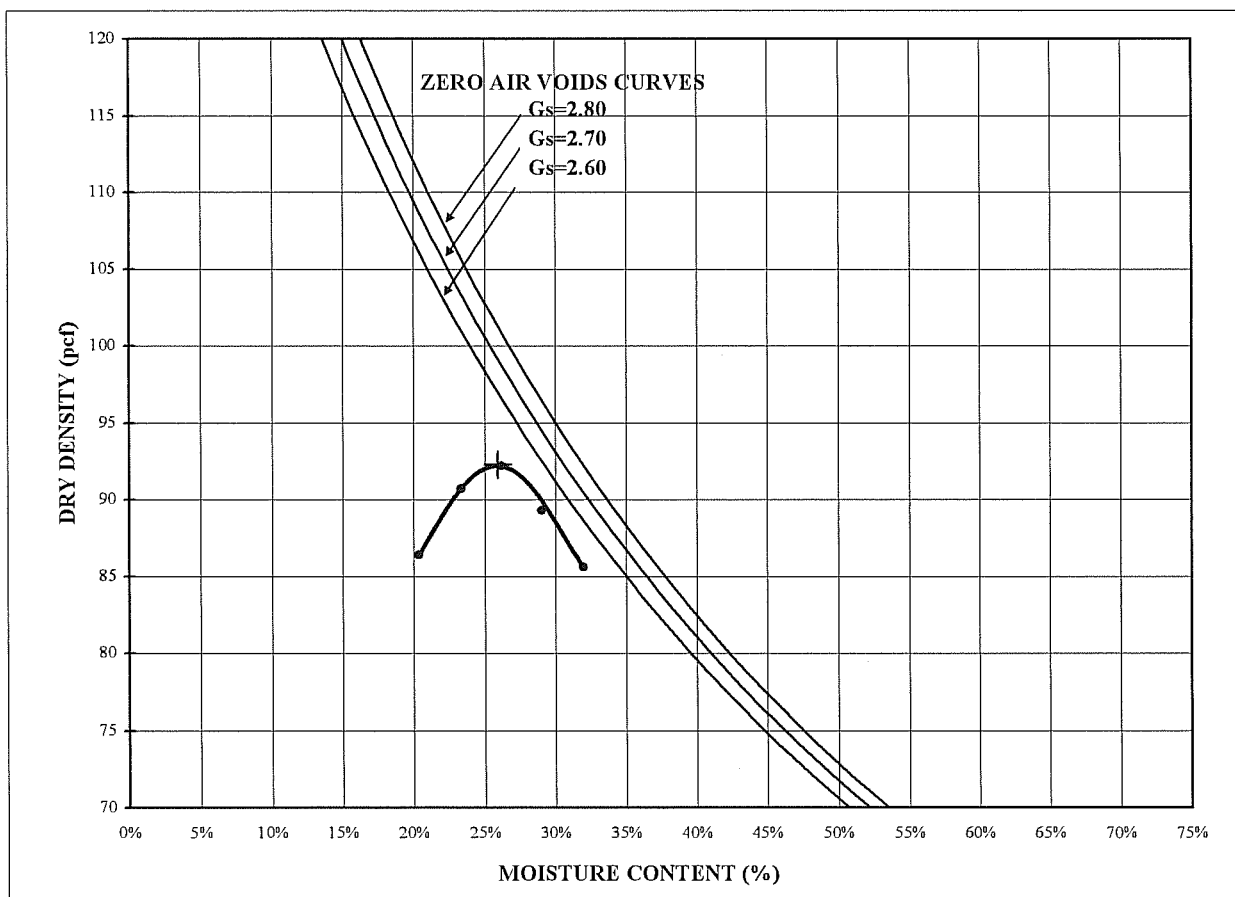
Standard

Wet Method

PROJECT NAME: TERRACON/SALINE COUNTY CLASS 4 LANDFILL/AL

PROJECT NUMBER: 073-90216

SAMPLE ID: PC-C2 - DEPTH: - SAMPLE TYPE: Bulk



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	86.4	20.3%
2	90.7	23.3%
3	92.2	26.2%
4	89.3	29.0%
5	85.6	32.0%

Maximum Dry Density (pcf)	92.3
Optimum Moisture (%)	25.9
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	

As-Received Moisture Content 33.4%

% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	

DESCRIPTION Black, SILTY CLAY, little fine sand.

USCS CL

CHECK
REVIEW

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE TERRACON/SALINE COUNTY CLASS 4 LANDFILL/LAL
PROJECT NUMBER 073-90216
SAMPLE ID PC-C2
SAMPLE TYPE Bulk

Board # 9
Flow Pump 2
Flow Pump Speed 7
Technician AK

COMMENTS The sample was remolded to 97.1% of the Maximum Dry Density and OPTM + 3.1% (using ASTM D 698).

Sample Data, Initial

Height, inches	2.996	B-Value, f	1.00
Diameter, inches	2.790	Cell Pres.	90.0
Area, cm ²	39.44	Bot. Pres.	80.0
Volume, cm ³	300.15	Top Pres.	80.0
Mass, g	543.82	Tot. B.P.	80.0
Moisture Content, %	28.81	Head, max.	132.24
Dry Density, pcf	87.77	Head, min.	132.24
Spec. Gravity(assumed)	2.700	Max. Grad.	17.19
Volume Solids, cm ³	156.37	Min. Grad.	17.19
Volume Voids, cm ³	143.78		
Void Ratio	0.92		
Saturation, %	84.6%		

Sample Data, Final

Height, inches	3.029
Diameter, inches	2.789
Area, cm ²	39.41
Volume, cm ³	303.24
Mass, g	559.46
Moisture Content, %	32.51
Dry Density, pcf	86.88
Volume Solids, cm ³	156.37
Volume Voids, cm ³	146.87
Void Ratio	0.94
Saturation, %	93.5%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	543.82	567.70
Wt Soil & Tare, f	g	422.20	430.44
Wt Tare	g	0.00	8.26
Wt Moisture Lost	g	121.62	137.26
Wt Dry Soil	g	422.20	422.18
Water Content	%	28.81%	32.51%

DESCRIPTION

Black, SILTY CLAY, little fine sand.

Flow Pump Rate 2.38E-04 cm³/sec

USCS CL

TIME FUNCTIONS, SECONDS								dP	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)				
07/21/07	39284	12	45	20.1	0	0	0	0	1.88	132.24	17.19	3.5E-07
07/21/07	39284	12	50	20.1	5	5	300	300	1.88	132.24	17.19	3.5E-07
07/21/07	39284	12	55	20.1	5	10	300	600	1.88	132.24	17.19	3.5E-07
07/21/07	39284	13	0	20.1	5	15	300	900	1.88	132.24	17.19	3.5E-07 *
07/21/07	39284	13	5	20.1	5	20	300	1200	1.88	132.24	17.19	3.5E-07 *
07/21/07	39284	13	10	20.1	5	25	300	1500	1.88	132.24	17.19	3.5E-07 *
07/21/07	39284	13	15	20.1	5	30	300	1800	1.88	132.24	17.19	3.5E-07 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 3.5E-07 cm/sec **

DATE 7/21/2007
CHECK
REVIEW

APPENDIX E
CLAY LINER MATERIAL CONSTRUCTION
TEST RESULTS

**TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AR
SUMMARY OF SOIL DATA**

Sample Identification	Sample Type	Sample Depth	Soil Classification	Natural Moisture %	Atterberg Limits				Grain Size Distribution			Compaction		Gs	Unit Weight		Permeability (cm/sec)	Carbonate Content %	Additional Tests Conducted (See Notes)
									% Finer No. 4 Sieve	% Finer No. 200 Sieve	% Finer .005 mm	Maximum Dry Density (lb/cuft)	Optimum Moisture %		Moisture %	Dry (lb/cuft)			
					L.L.	P.L.	P.I.	L.I.											
C-C1	Bulk	-	ML	26.8	41	26	15	0.05	97.5	73.8	-	93.6	23.7	-	-	-	-	-	-
C-C2	Bulk	-	CL	22.6	37	23	14	-0.06	94.8	75.2	28.0	95.1	23.5	-	26.6	90.3	1.9E-07	-	-
C-C3	Bulk	-	CL	24.0	39	25	14	-0.09	97.6	76.9	40.0	96.1	23.1	-	24.9	92.5	8.0E-07	-	-
PG-1	Bulk	-	GP	-	-	-	-	-	1.4	0.1	-	-	-	-	-	92.3	2.9	0.1	-
PS-1	Bulk	-	SP-SM	14.6	-	-	-	-	99.5	6.1	-	-	-	-	-	104.6	3.9E-02	0.6	-
CG-1	Bulk	-	GP	-	-	-	-	-	0.2	0.0	-	-	-	-	-	49.7	6.8	-	-
1-1	UD	Lift 1	(ML)	27.9	-	-	-	-	-	-	-	-	-	-	27.9	91.3	2.8E-07	-	-
1-2	UD	Lift 2	(ML)	23.0	-	-	-	-	-	-	-	-	-	-	23.0	97.3	2.1E-06	-	-
3-1	UD	Lift 3	(ML)	26.9	-	-	-	-	-	-	-	-	-	-	26.9	92.9	8.4E-07	-	-
3-2	UD	Lift 3	(ML)	21.8	-	-	-	-	-	-	-	-	-	-	21.8	100.3	5.2E-08	-	-

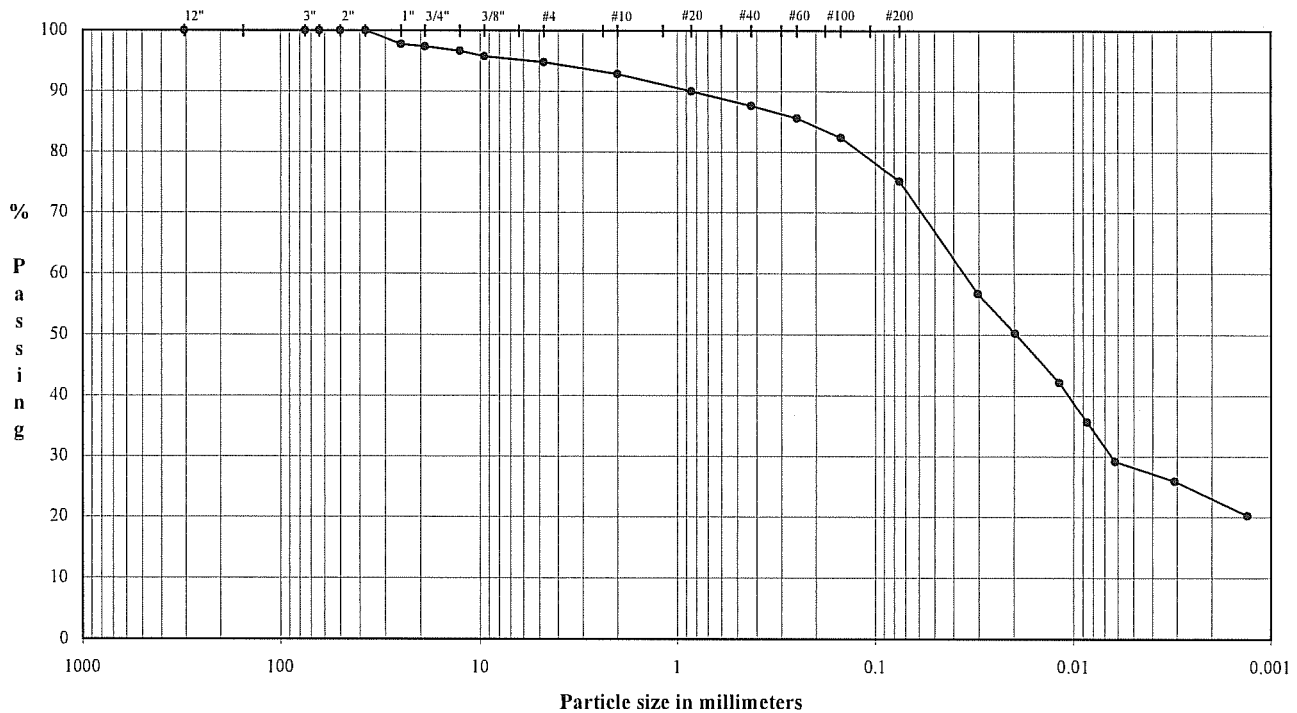
ABBREVIATIONS: LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Mc)

NOTES: T = TRIAXIAL TEST
U = UNCONFINED COMPRESSION TEST
C = CONSOLIDATION TEST
DS = DIRECT SHEAR TEST
O = ORGANIC CONTENT
P = pH

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: TERRACON/SALINE COUNTY CLASS 4 LFPHASE II/AR
 SAMPLE ID: C-C2 - Depth: -
 TYPE: Bulk



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

Particle Size (mm)	% Passing	Classification	Percentage
12.0"	304.8	100.0	
3.0"	75.0	100.0	
2.5"	63.5	100.0	
2.0"	50.0	100.0	
1.5"	37.5	100.0	
1.0"	25.0	97.8	
0.75"	19.0	97.4	
0.50"	12.7	96.7	
0.375"	9.5	95.7	
#4	4.8	94.8	
#10	2.00	92.9	
#20	0.85	90.1	
#40	0.43	87.6	
#60	0.25	85.6	
#100	0.15	82.4	
#200	0.075	75.2	

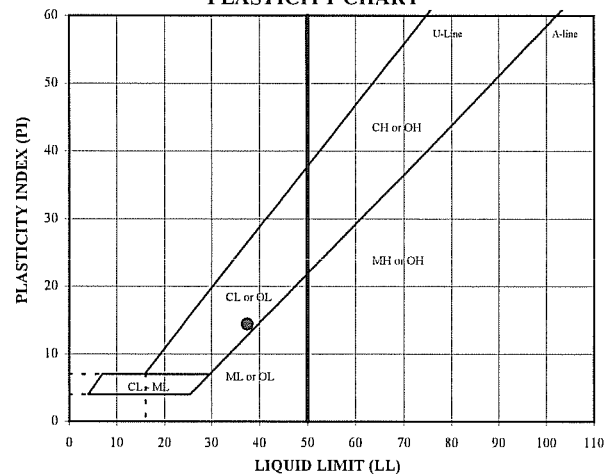
Hydrometer Analysis

(mm)	% Finer		
0.030	56.8		
0.020	50.3		
0.012	42.2		
0.0086	35.7		
0.0062	29.2		
0.0031	26.0		
0.0013	20.3		

DESCRIPTION: Very Dark Brown, SILTY CLAY, some coarse to fine sand, little coarse to fine gravel.

USCS: CL

PLASTICITY CHART



ATTERBERG LIMITS
Method -B (Dry preparation)

M _L	LL	PL	PI	LI
22.6	37	23	14	-0.06

LL (oven-dried)
< 0.75 = ORGANIC
(OL/OH)

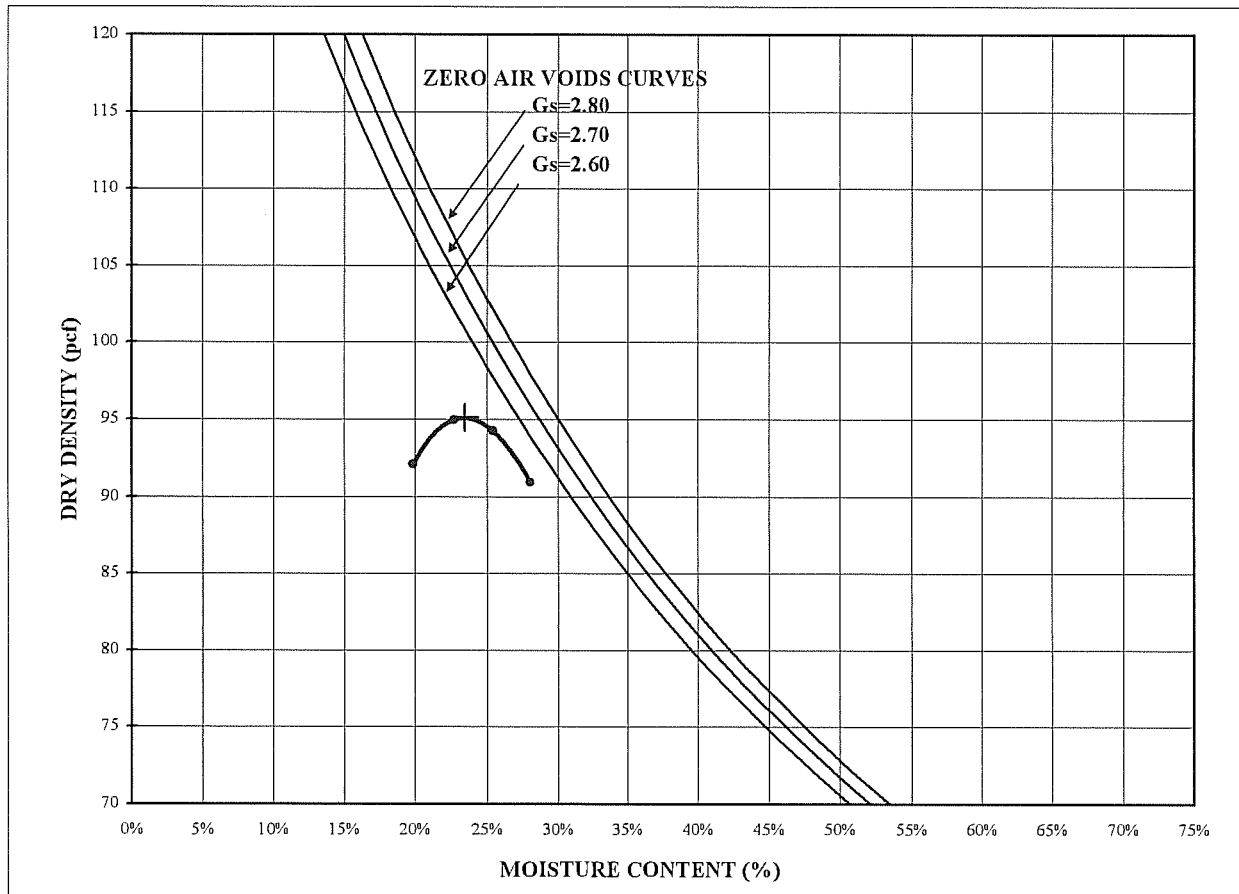
TECH TJ/BW
 DATE 11/11/07
 CHECK *Am*
 REVIEW *Wry*

MOISTURE / DRY DENSITY CURVE

ASTM D 698 Method A

Mechanical	Standard	Wet Method
------------	----------	------------

PROJECT NAME: TERRACON/SALINE COUNTY CLASS 4 LFPHASE II/AR
 PROJECT NUMBER: 073-90216-001
 SAMPLE ID: C-C2 - DEPTH: - SAMPLE TYPE: Bulk



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	92.1	19.9%
2	95.0	22.7%
3	94.3	25.4%
4	90.9	28.0%

Maximum Dry Density (pcf) **95.1**
 Optimum Moisture (%) **23.5**
 Corrected Maximum Dry Density (pcf)
 Corrected Optimum Moisture (%)

As-Received Moisture Content **22.6%**

% Retained on # 4 sieve **5.2%**
 % Retained on 3/8" sieve
 % Retained on 3/4" sieve

DESCRIPTION Very Dark Brown, SILTY CLAY, some coarse to fine sand, trace coarse to fine gravel.

USCS **CL**

CHECK
 REVIEW *[Signature]*

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE TERRACON/SALINE COUNTY CLASS 4 LFP HASE II/AR
PROJECT NUMBER 073-90216-001
SAMPLE ID C-C2 - -
SAMPLE TYPE Bulk

Board # 2
Flow Pump 2
Flow Pump Speed 8
Technician SDM

COMMENTS The sample was remolded to 94.9% of the Maximum Dry Density and OPTM + 3.2% (using ASTM D 698).

Sample Data, Initial

Height, inches	3.001	B-Value, f	0.98
Diameter, inches	2.790	Cell Pres.	90.0
Area, cm ²	39.44	Bot. Pres.	80.0
Volume, cm ³	300.65	Top Pres.	80.0
Mass, g	550.67	Tot. B.P.	80.0
Moisture Content, %	26.55	Head, max.	114.65
Dry Density, pcf	90.32	Head, min.	114.65
Spec. Gravity (assumed)	2.700	Max. Grad.	15.02
Volume Solids, cm ³	161.17	Min. Grad.	15.02
Volume Voids, cm ³	139.49		
Void Ratio	0.87		
Saturation, %	82.8%		

Sample Data, Final

Height, inches	3.006
Diameter, inches	2.789
Area, cm ²	39.41
Volume, cm ³	300.94
Mass, g	566.43
Moisture Content, %	30.17
Dry Density, pcf	90.23
Volume Solids, cm ³	161.17
Volume Voids, cm ³	139.77
Void Ratio	0.87
Saturation, %	93.9%

WATER CONTENTS	Sample	Sample
	Initial	Final
Wt Soil & Tare, i	550.67	574.32
Wt Soil & Tare, f	435.15	443.14
Wt Tare	0.00	8.31
Wt Moisture Lost	115.52	131.18
Wt Dry Soil	435.15	434.83
Water Content	26.55%	30.17%

DESCRIPTION

Very Dark Brown, SILTY CLAY, some coarse to fine sand, little coarse to fine gravel.

Flow Pump Rate 1.12E-04 cm³/sec USCS CL

TIME FUNCTIONS, SECONDS								dP	Reading	Head	Gradient	Permeability
DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc				
				(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)
11/15/07	39401	9	45	20.9	0	0	0	0	1.63	114.65	15.02	1.9E-07
11/15/07	39401	9	50	20.9	5	5	300	300	1.63	114.65	15.02	1.9E-07
11/15/07	39401	9	55	20.9	5	10	300	600	1.63	114.65	15.02	1.9E-07
11/15/07	39401	10	0	20.9	5	15	300	900	1.63	114.65	15.02	1.9E-07 *
11/15/07	39401	10	5	20.9	5	20	300	1200	1.63	114.65	15.02	1.9E-07 *
11/15/07	39401	10	10	20.9	5	25	300	1500	1.63	114.65	15.02	1.9E-07 *
11/15/07	39401	10	15	20.9	5	30	300	1800	1.63	114.65	15.02	1.9E-07 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 1.9E-07 cm/sec **

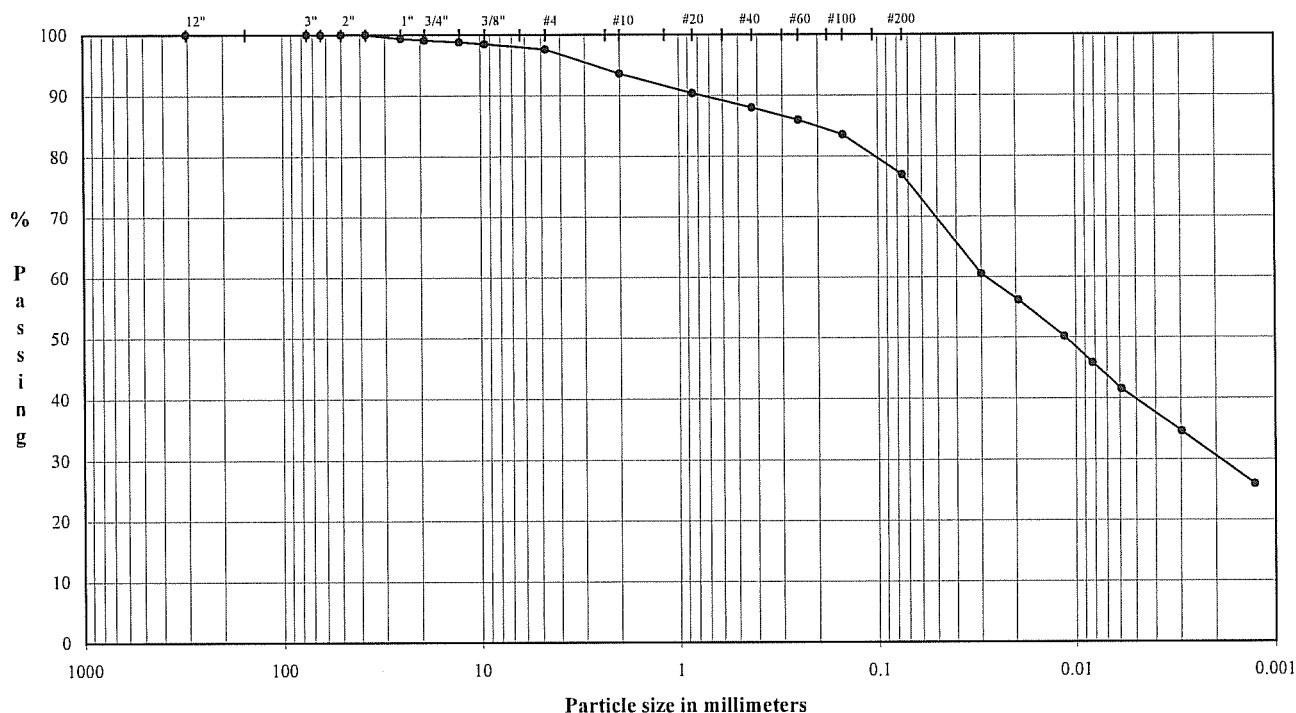
DATE 11/15/07
CHECK *CT*
REVIEW *AK*

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: TERRACON/SALINE COUNTY CLASS 4 LFPHASE II/AR
 SAMPLE ID: C-C3
 TYPE: Bulk

Depth: -



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves and Numbers

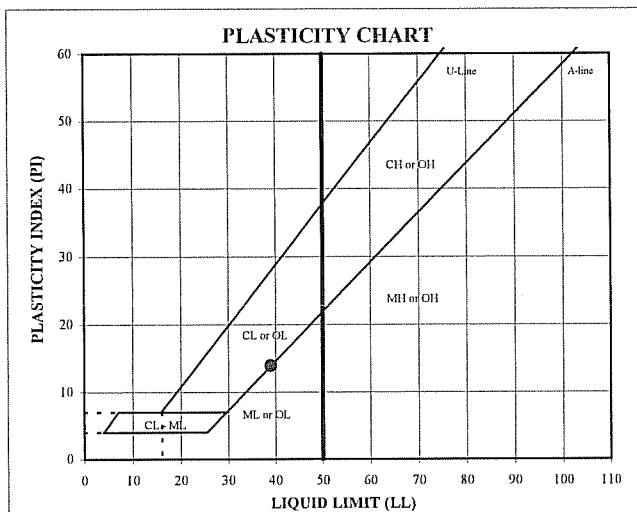
Particle Size (mm)	% Passing	Classification	Percentage
12.0"	304.8	100.0	
3.0"	75.0	100.0	
2.5"	63.5	100.0	
2.0"	50.0	100.0	
1.5"	37.5	100.0	
1.0"	25.0	99.4	
0.75"	19.0	99.1	
0.50"	12.7	98.8	
0.375"	9.5	98.5	
#4	4.8	97.6	
#10	2.00	93.6	
#20	0.85	90.4	
#40	0.43	88.0	
#60	0.25	86.0	
#100	0.15	83.5	
#200	0.075	76.9	

Hydrometer Analysis

(mm)	% Finer		
0.030	60.5		
0.019	56.2		
0.011	50.1		
0.0082	45.8		
0.0059	41.5		
0.0030	34.6		
0.0013	25.9		

DESCRIPTION: Black and Gray, SILTY CLAY, some coarse to fine sand, trace coarse to fine gravel.

USCS: CL



ATTERBERG LIMITS
Method -B (Dry preparation)

M _c	LL	PL	PI	LI
24.0	39	25	14	-0.09

LL (oven-dried)
 < 0.75 = ORGANIC
 (OL/OH)

TECH: BW/TJ/SDM
 DATE: 11/13/07
 CHECK: *AW*
 REVIEW: *CA*

MOISTURE / DRY DENSITY CURVE

ASTM D 698 Method A

Mechanical

Standard

Wet Method

PROJECT NAME:

TERRACON/SALINE COUNTY CLASS 4 LFPHASE II/AR

PROJECT NUMBER:

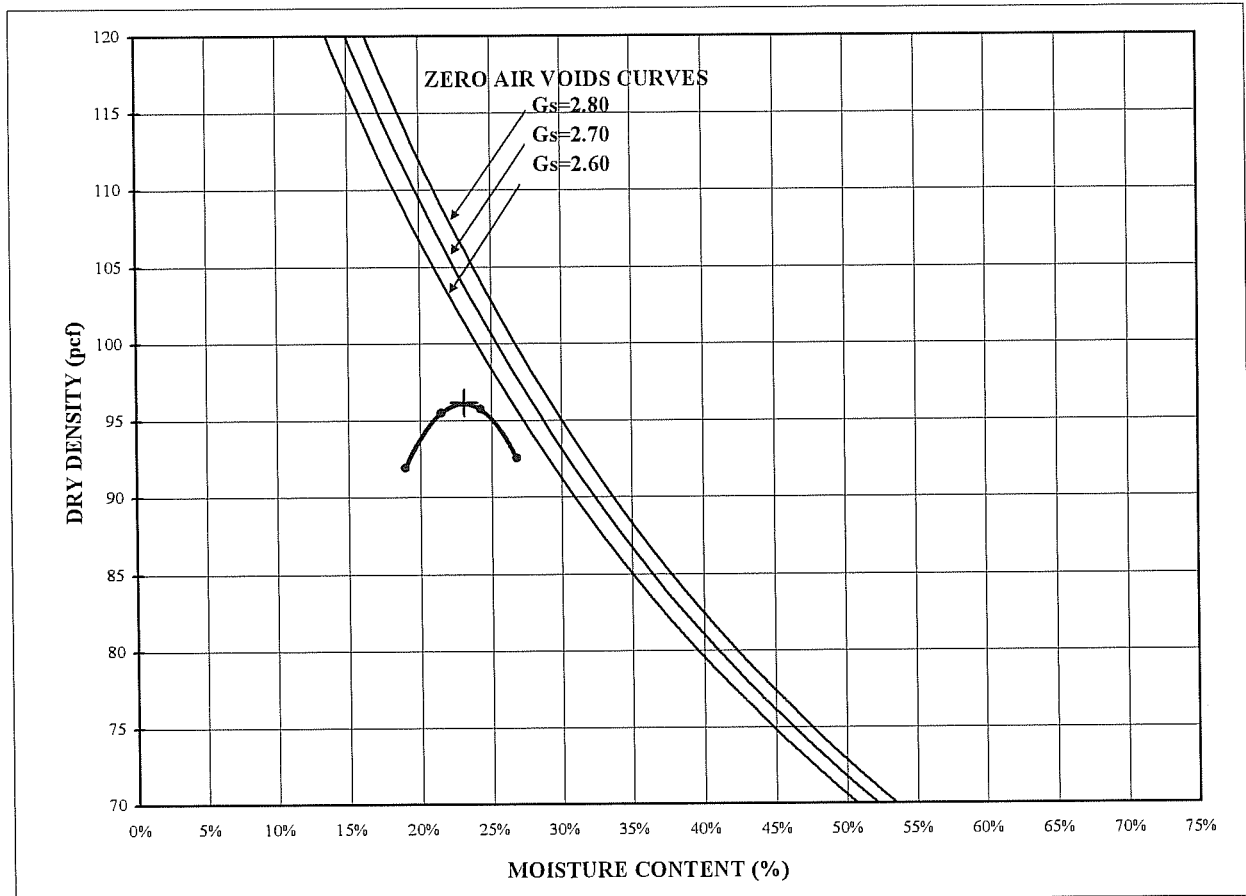
073-90216-001

SAMPLE ID:

C-C3

DEPTH: -

SAMPLE TYPE: Bulk



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	91.9	19.0%
2	95.5	21.5%
3	95.7	24.2%
4	92.5	26.8%

Maximum Dry Density (pcf) **96.1**Optimum Moisture (%) **23.1**

Corrected Maximum Dry Density (pcf)

Corrected Optimum Moisture (%)

As-Received Moisture Content **24.0%**% Retained on # 4 sieve **2.4%**

% Retained on 3/8" sieve

% Retained on 3/4" sieve

DESCRIPTION Black and Gray, SILTY CLAY, some coarse to fine sand, trace coarse to fine gravel.

USCS

CL

CHECK *Ag*
REVIEW *CA*

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE
PROJECT NUMBER
SAMPLE ID
SAMPLE TYPE

TERRACON/SALINE COUNTY CLASS 4 LFPHASE II/AR		
073-90216-001		
C-C3	-	-
Bulk		

Board #	5
Flow Pump	2
Flow Pump Speed	6
Technician	CA

COMMENTS The sample was remolded to 95.1% of the Maximum Dry Density and OPTM + 3.4% (using ASTM D 698).

Sample Data, Initial

Height, inches	2.986	B-Value, f	0.99
Diameter, inches	2.790	Cell Pres.	90.0
Area, cm ²	39.44	Bot. Pres.	80.0
Volume, cm ³	299.15	Top Pres.	80.0
Mass, g	553.64	Tot. B.P.	80.0
Moisture Content, %	24.89	Head, max.	106.21
Dry Density, pcf	92.47	Head, min.	106.21
Spec. Gravity(assumed)	2.700	Max. Grad.	14.00
Volume Solids, cm ³	164.19	Min. Grad.	14.00
Volume Voids, cm ³	134.96		
Void Ratio	0.82		
Saturation, %	81.7%		

Sample Data, Final

Height, inches	2.986
Diameter, inches	2.794
Area, cm ²	39.56
Volume, cm ³	300.01
Mass, g	568.71
Moisture Content, %	28.29
Dry Density, pcf	92.21
Volume Solids, cm ³	164.19
Volume Voids, cm ³	135.82
Void Ratio	0.83
Saturation, %	92.3%

WATER CONTENTS

	Sample Initial	Sample Final
Wt Soil & Tare, i	553.64	576.78
Wt Soil & Tare, f	443.31	451.46
Wt Tare	0.00	8.43
Wt Moisture Lost	110.33	125.32
Wt Dry Soil	443.31	443.03
Water Content	24.89%	28.29%

DESCRIPTION

Black and Gray, SILTY CLAY, some coarse to fine sand, trace coarse to fine gravel.

Flow Pump Rate 4.70E-04 cm³/sec

USCS CL

TIME FUNCTIONS, SECONDS								dP	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)				
11/19/07	39405	11	5	22.4	0	0	0	0	1.51	106.21	14.00	8.0E-07
11/19/07	39405	11	10	22.4	5	5	300	300	1.51	106.21	14.00	8.0E-07
11/19/07	39405	11	15	22.4	5	10	300	600	1.51	106.21	14.00	8.0E-07
11/19/07	39405	11	20	22.4	5	15	300	900	1.51	106.21	14.00	8.0E-07 *
11/19/07	39405	11	25	22.4	5	20	300	1200	1.51	106.21	14.00	8.0E-07 *
11/19/07	39405	11	30	22.4	5	25	300	1500	1.51	106.21	14.00	8.0E-07 *
11/19/07	39405	11	35	22.4	5	30	300	1800	1.51	106.21	14.00	8.0E-07 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 8.0E-07 cm/sec **

DATE 11/19/07
CHECK *CH*
REVIEW *AL*

APPENDIX F

FIELD MOISTURE/DENSITY TEST RESULTS

Terracon

Project No: 35077118
Date of Report: 11/4/2007

Depart Lab:	<u>8:30 AM</u>	Depart Site:	<u>4:00 PM</u>
Arrive Site:	8:50 AM	Arrive Lab:	4:20 PM

MATERIAL INFORMATION			
Mat'l. No.	Material Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
PC-C1	Dark Grayish Brown Silty Clay	90.8	26.1

[illegible]

Summary of Field Density Test Results ASTM D 2922

Project No: 35077118
Date of Report: 11/5/2007

Terracon
11400 West Baseline Road
Little Rock, AR 72209
(501) 455-2199

Client Name: Saline County RSWMD
Contractor: Grayco Construction Co., Inc.
Project Name: Class 4 - Phase II
Location: Bauxite, Arkansas
Reviewed by: Brad Fureigh, E.I.
Technician: Donny Walls
Test Location: Cell Floor

Depart Lab: 6:15 AM Depart Site: 5:00 PM
Arrive Site: 6:30 AM Arrive Lab: 5:30 PM

MATERIAL INFORMATION			
Mat'l. No.	Material Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
PC-C1	Dark Grayish Brown Silty Clay	90.8	26.1

Test No.	Lift or Elev.	Test Location		Shelby Tube Sample	Mat'l. No.	Wet Density, pcf	Dry Density, pcf	Lab Max. Dry Density, pcf	Percent Compaction %	Percent Compaction Required	Moisture Content %	Optimum Moisture %	PASS or FAIL
		Northing	Easting										
SG-5	Subgrade	20535	22670	N/A	PC-C1	110.6	85.9	90.8	94.6	90.0	28.8	26.1	PASS
SG-6	Subgrade	20480	22600	N/A	PC-C1	112.7	86.9	90.8	95.7	90.0	29.7	26.1	PASS
SG-7	Subgrade	20375	22620	N/A	PC-C1	109.9	82.3	90.8	90.7	90.0	33.5	26.1	PASS
SG-8	Subgrade	20390	22670	N/A	PC-C1	108.7	83.5	90.8	91.9	90.0	30.2	26.1	PASS
SG-9	Subgrade	20380	22710	N/A	PC-C1	107.0	83.0	90.8	91.4	90.0	28.9	26.1	PASS
SG-10	Subgrade	20430	22710	N/A	PC-C1	110.8	84.5	90.8	93.1	90.0	31.1	26.1	PASS
SG-11	Subgrade	20470	22730	N/A	PC-C1	108.4	82.8	90.8	91.2	90.0	30.9	26.1	PASS
SG-12	Subgrade	20525	22775	N/A	PC-C1	108.5	82.1	90.8	90.4	90.0	32.2	26.1	PASS
SG-13	Subgrade	20575	22775	N/A	PC-C1	111.1	84.0	90.8	92.6	90.0	32.2	26.1	PASS
SG-14	Subgrade	20540	22820	N/A	PC-C1	109.2	82.5	90.8	90.8	90.0	32.4	26.1	PASS

Summary of Field Density Test Results ASTM D 2922

Project No: 35077118
Date of Report: 11/5/2007

Terracon
11400 West Baseline Road
Little Rock, AR 72209
(501) 455-2199

Client Name:	Saline County RSWMD
Contractor:	Grayco Construction Co., Inc.
Project Name:	Class 4 - Phase II
Location:	Bauxite, Arkansas
Reviewed by:	Brad Fureigh, E.I.
Technician:	Donny Walls
Test Location:	Cell Floor

Depart Lab:	<u>6:15 AM</u>	Depart Site:	<u>5:00 PM</u>
Arrive Site:	6:30 AM	Arrive Lab:	5:30 PM

MATERIAL INFORMATION

Mat'l. No.	Material Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
PC-C1	Dark Grayish Brown Silty Clay	90.8	26.1

[illegible]

Summary of Field Density Test Results ASTM D 2922

Project No: 35077118
Date of Report: 11/7/2007

Terracon
11400 West Baseline Road
Little Rock, AR 72209
(501) 455-2199

Client Name: Saline County RSWMD
Contractor: Grayco Construction Co., Inc.
Project Name: Class 4 - Phase II
Location: Bauxite, Arkansas
Reviewed by: Brad Fureigh, E.I.
Technician: Donny Walls
Test Location: Cell Floor & Side Slopes

Depart Lab: 6:15 AM Depart Site: 4:00 PM
Arrive Site: 6:40 AM Arrive Lab: 4:15 PM

MATERIAL INFORMATION			
Mat'l. No.	Material Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
PC-C1	Dark Grayish Brown Silty Clay	90.8	26.1

Test No.	Lift or Elev.	Test Location		Shelby Tube Sample	Mat'l. No.	Wet Density, pcf	Dry Density, pcf	Lab Max. Dry Density, pcf	Percent Compaction %	Percent Compaction Required	Moisture Content %	Optimum Moisture %	PASS or FAIL
		Northing	Easting										
CL-1	1st Lift Clay Liner	20450	22610	N/A	PC-C1	113.8	88.1	90.8	97.0	90.0	29.2	26.1	PASS
CL-2	1st Lift Clay Liner	20575	22600	N/A	PC-C1	116.0	89.2	90.8	98.2	90.0	30.1	26.1	PASS
CL-3	1st Lift Clay Liner	20590	22650	1 - 1	PC-C1	112.7	87.4	90.8	96.3	90.0	28.9	26.1	PASS
CL-4	1st Lift Clay Liner	20490	22695	N/A	PC-C1	115.5	88.9	90.8	97.9	90.0	29.9	26.1	PASS
CL-5	1st Lift Clay Liner	20550	22630	N/A	PC-C1	110.9	86.0	90.8	94.7	90.0	29.0	26.1	PASS
CL-6	1st Lift Clay Liner	20550	22670	N/A	PC-C1	115.3	89.0	90.8	98.0	90.0	29.6	26.1	PASS
CL-7	1st Lift Clay Liner	20380	22570	N/A	PC-C1	112.7	86.6	90.8	95.4	90.0	30.1	26.1	PASS
CL-8	1st Lift Clay Liner	20330	22610	N/A	PC-C1	113.9	86.0	90.8	94.7	90.0	32.4	26.1	PASS
CL-9	1st Lift Clay Liner	20360	22655	N/A	PC-C1	116.1	88.2	90.8	97.2	90.0	31.6	26.1	PASS
CL-10	1st Lift Clay Liner	20420	22660	N/A	PC-C1	118.4	88.8	90.8	97.8	90.0	33.3	26.1	PASS

Summary of Field Density Test Results ASTM D 2922

Project No: 35077118
Date of Report: 11/7/2007

Terracon
11400 West Baseline Road
Little Rock, AR 72209
(501) 455-2199

Client Name: Saline County RSWMD
Contractor: Grayco Construction Co., Inc.
Project Name: Class 4 - Phase II
Location: Bauxite, Arkansas
Reviewed by: Brad Fureigh, E.I.
Technician: Donny Walls
Test Location: Cell Floor & Side Slopes

Depart Lab: 6:15 AM Depart Site: 4:00 PM
Arrive Site: 6:40 AM Arrive Lab: 4:15 PM

MATERIAL INFORMATION			
Mat'l. No.	Material Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
PC-C1	Dark Grayish Brown Silty Clay	90.8	26.1

Test No.	Lift or Elev.	Test Location		Shelby Tube Sample	Mat'l. No.	Wet Density, pcf	Dry Density, pcf	Lab Max. Dry Density, pcf	Percent Compaction %	Percent Compaction Required	Moisture Content %	Optimum Moisture %	PASS or FAIL
		Northing	Easting										
CL-11	1st Lift Clay Liner	20430	22710	N/A	PC-C1	112.9	87.4	90.8	96.2	90.0	29.2	26.1	PASS
CL-12	1st Lift Clay Liner	20575	22750	N/A	PC-C1	108.3	84.1	90.8	92.6	90.0	28.8	26.1	PASS
CL-13	1st Lift Clay Liner	20520	22780	N/A	PC-C1	110.4	85.0	90.8	93.6	90.0	29.9	26.1	PASS
CL-14	1st Lift Clay Liner	20570	22820	N/A	PC-C1	112.1	85.3	90.8	94.0	90.0	31.4	26.1	PASS
CL-15	1st Lift Clay Liner	20450	22830	N/A	PC-C1	114.4	86.7	90.8	95.4	90.0	32.0	26.1	PASS
CL-16	2nd Lift Clay Liner	20575	22610	N/A	PC-C1	111.3	86.2	90.8	94.9	90.0	29.1	26.1	PASS
CL-17	2nd Lift Clay Liner	20590	22600	1 - 2	PC-C1	116.8	87.7	90.8	96.6	90.0	33.2	26.1	PASS
CL-18	2nd Lift Clay Liner	20490	22650	N/A	PC-C1	117.1	85.8	90.8	94.5	90.0	36.5	26.1	PASS
CL-19	2nd Lift Clay Liner	20550	22695	N/A	PC-C1	111.3	85.7	90.8	94.4	90.0	29.9	26.1	PASS
CL-20	2nd Lift Clay Liner	20550	22630	N/A	PC-C1	113.1	87.7	90.8	96.6	90.0	29.0	26.1	PASS

Summary of Field Density Test Results ASTM D 2922

Project No: 35077118
Date of Report: 11/7/2007

Terracon
11400 West Baseline Road
Little Rock, AR 72209
(501) 455-2199

Client Name: Saline County RSWMD
Contractor: Grayco Construction Co., Inc.
Project Name: Class 4 - Phase II
Location: Bauxite, Arkansas
Reviewed by: Brad Fureigh, E.I.
Technician: Donny Walls
Test Location: Cell Floor & Side Slopes

Depart Lab: 6:15 AM Depart Site: 4:00 PM
Arrive Site: 6:40 AM Arrive Lab: 4:15 PM

MATERIAL INFORMATION			
Mat'l. No.	Material Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
PC-C1	Dark Grayish Brown Silty Clay	90.8	26.1

Test No.	Lift or Elev.	Test Location		Shelby Tube Sample	Mat'l. No.	Wet Density, pcf	Dry Density, pcf	Lab Max. Dry Density, pcf	Percent Compaction %	Percent Compaction Required	Moisture Content %	Optimum Moisture %	PASS or FAIL
		Northing	Easting										
CL-21	2nd Lift Clay Liner	20550	22670	N/A	PC-C1	108.1	83.9	90.8	92.4	90.0	28.9	26.1	PASS
CL-22	2nd Lift Clay Liner	20380	22570	N/A	PC-C1	109.4	84.4	90.8	93.0	90.0	29.6	26.1	PASS
CL-23	2nd Lift Clay Liner	20330	22610	N/A	PC-C1	109.6	84.3	90.8	92.8	90.0	30.0	26.1	PASS
CL-24	2nd Lift Clay Liner	20360	22655	N/A	PC-C1	112.0	85.3	90.8	93.9	90.0	31.3	26.1	PASS
CL-25	2nd Lift Clay Liner	20420	22660	N/A	PC-C1	114.1	85.5	90.8	94.2	90.0	33.4	26.1	PASS
CL-26	2nd Lift Clay Liner	20430	22710	N/A	PC-C1	117.0	89.9	90.8	99.0	90.0	30.2	26.1	PASS
CL-27	2nd Lift Clay Liner	20475	22750	N/A	PC-C1	115.1	88.6	90.8	97.6	90.0	29.9	26.1	PASS
CL-28	2nd Lift Clay Liner	20520	22780	N/A	PC-C1	116.1	88.9	90.8	97.9	90.0	30.6	26.1	PASS
CL-29	2nd Lift Clay Liner	20570	22820	N/A	PC-C1	113.8	87.1	90.8	95.9	90.0	30.7	26.1	PASS
CL-30	2nd Lift Clay Liner	20650	22830	N/A	PC-C1	114.1	86.5	90.8	95.3	90.0	31.9	26.1	PASS

Summary of Field Density Test Results ASTM D 2922

Project No: 35077118
Date of Report: 11/8/2007

Terracon
11400 West Baseline Road
Little Rock, AR 72209
(501) 455-2199

Client Name: Saline County RSWMD
Contractor: Grayco Construction Co., Inc.
Project Name: Class 4 - Phase II
Location: Bauxite, Arkansas
Reviewed by: Brad Fureigh, E.I.
Technician: Donny Walls
Test Location: Cell Floor & Side Slopes

Depart Lab: 6:30 AM Depart Site: 3:30 PM
Arrive Site: 6:45 AM Arrive Lab: 4:00 PM

MATERIAL INFORMATION			
Mat'l. No.	Material Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
PC-C1	Dark Grayish Brown Silty Clay	90.8	26.1

Test No.	Lift or Elev.	Test Location		Shelby Tube Sample	Mat'l. No.	Wet Density, pcf	Dry Density, pcf	Lab Max. Dry Density, pcf	Percent Compaction %	Percent Compaction Required	Moisture Content %	Optimum Moisture %	PASS or FAIL
		Northing	Easting										
CL-31	3rd Lift Clay Liner	20605	22580	N/A	PC-C1	111.0	86.0	90.8	94.8	90.0	29.0	26.1	PASS
CL-32	3rd Lift Clay Liner	20590	22670	N/A	PC-C1	111.2	85.7	90.8	94.4	90.0	29.7	26.1	PASS
CL-33	3rd Lift Clay Liner	20540	22700	N/A	PC-C1	111.4	86.4	90.8	95.2	90.0	28.9	26.1	PASS
CL-34	3rd Lift Clay Liner	20530	22640	3 - 1	PC-C1	112.5	86.8	90.8	95.6	90.0	29.6	26.1	PASS
CL-35	3rd Lift Clay Liner	20470	22600	N/A	PC-C1	109.8	84.4	90.8	92.9	90.0	30.1	26.1	PASS
CL-36	3rd Lift Clay Liner	20420	22600	N/A	PC-C1	112.6	86.4	90.8	95.2	90.0	30.3	26.1	PASS
CL-37	3rd Lift Clay Liner	20330	22600	N/A	PC-C1	113.7	87.7	90.8	96.5	90.0	29.7	26.1	PASS
CL-38	3rd Lift Clay Liner	20340	22670	N/A	PC-C1	112.6	87.1	90.8	95.9	90.0	29.3	26.1	PASS
CL-39	3rd Lift Clay Liner	20375	22670	3 - 2	PC-C1	114.8	88.3	90.8	97.3	90.0	30.0	26.1	PASS
CL-40	3rd Lift Clay Liner	20380	22720	N/A	PC-C1	115.6	88.1	90.8	97.0	90.0	31.2	26.1	PASS

Summary of Field Density Test Results ASTM D 2922

Project No: 35077118
Date of Report: 11/8/2007

Terracon
11400 West Baseline Road
Little Rock, AR 72209
(501) 455-2199

Client Name:	Saline County RSWMD
Contractor:	Grayco Construction Co., Inc.
Project Name:	Class 4 - Phase II
Location:	Bauxite, Arkansas
Reviewed by:	Brad Fureigh, E.I.
Technician:	Donny Walls
Test Location:	Cell Floor & Side Slopes

Depart Lab:	<u>6:30 AM</u>	Depart Site:	<u>3:30 PM</u>
Arrive Site:	6:45 AM	Arrive Lab:	4:00 PM

MATERIAL INFORMATION

Mat'l. No.	Material Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
PC-C1	Dark Grayish Brown Silty Clay	90.8	26.1

[illegible]

APPENDIX G
COMPACTED CLAY LINER PERMEABILITY
TEST RESULTS

**TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AR
SUMMARY OF SOIL DATA**

Sample Identification	Sample Type	Sample Depth	Soil Classification	Natural Moisture %	Atterberg Limits				Grain Size Distribution			Compaction		Gs	Unit Weight		Permeability (cm/sec)	Carbonate Content %	Additional Tests Conducted (See Notes)
									% Finer No. 4 Sieve	% Finer No. 200 Sieve	% Finer .005 mm	Maximum Dry Density (lb/cuft)	Optimum Moisture %		Moisture %	Dry (lb/cuft)			
					L.L.	P.L.	P.I.	L.I.											
C-C1	Bulk	-	ML	26.8	41	26	15	0.05	97.5	73.8	-	93.6	23.7	-	-	-	-	-	-
C-C2	Bulk	-	CL	22.6	37	23	14	-0.06	94.8	75.2	28.0	95.1	23.5	-	-	-	-	-	-
PG-1	Bulk	-	GP	-	-	-	-	-	1.4	0.1	-	-	-	-			0.1	-	-
PS-1	Bulk	-	SP-SM	14.6	-	-	-	-	99.5	6.1	-	-	-	-	-	104.6	3.9E-02	0.6	-
1-1	UD	Lift 1	(ML)	27.9	-	-	-	-	-	-	-	-	-	-	27.9	91.3	2.8E-07	-	-
1-2	UD	Lift 2	(ML)	23.0	-	-	-	-	-	-	-	-	-	-	23.0	97.3	2.1E-06	-	-
3-1	UD	Lift 3	(ML)	26.9	-	-	-	-	-	-	-	-	-	-	26.9	92.9	8.4E-07	-	-
3-2	UD	Lift 3	(ML)	21.8	-	-	-	-	-	-	-	-	-	-	21.8	100.3	5.2E-08	-	-

ABBREVIATIONS: LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Mc)

NOTES: T = TRIAXIAL TEST
U = UNCONFINED COMPRESSION TEST
C = CONSOLIDATION TEST
DS = DIRECT SHEAR TEST
O = ORGANIC CONTENT
P = pH

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE
 PROJECT NUMBER
 SAMPLE ID
 SAMPLE TYPE

TERRACON/SALINE COUNTY CLASS 4 LF-PHASE I/AR	
073-90216-001	
1-1	Lift 1
UD	

Board #
 Flow Pump
 Flow Pump Speed
 Technician

3
2
7
PWM

COMMENTS

Sample Data, Initial

Height, inches	2.935	B-Value, f	0.99
Diameter, inches	2.856	Cell Pres.	90.0
Area, cm ²	41.33	Bot. Pres.	80.0
Volume, cm ³	308.12	Top Pres.	80.0
Mass, g	576.37	Tot. B.P.	80.0
Moisture Content, %	27.92	Head, max.	154.04
Dry Density, pcf	91.25	Head, min.	154.04
Spec. Gravity(assumed)	2.700	Max. Grad.	20.62
Volume Solids, cm ³	166.87	Min. Grad.	20.62
Volume Voids, cm ³	141.24		
Void Ratio	0.85		
Saturation, %	89.1%		

Sample Data, Final

Height, inches	2.941
Diameter, inches	2.847
Area, cm ²	41.07
Volume, cm ³	306.80
Mass, g	583.74
Moisture Content, %	29.56
Dry Density, pcf	91.64
Volume Solids, cm ³	166.87
Volume Voids, cm ³	139.93
Void Ratio	0.84
Saturation, %	95.2%

WATER CONTENTS

Wt Soil & Tare, i g
 Wt Soil & Tare, f g
 Wt Tare g
 Wt Moisture Lost g
 Wt Dry Soil g
 Water Content %

Sample

Initial

576.37
450.56
0.00
125.81
450.56
27.92%

Sample

Final

592.07
458.90
8.37
133.17
450.53
29.56%

DESCRIPTION

Dark Gray, CLAYEY SILT, some fine sand.

Flow Pump Rate 2.38E-04 cm³/sec

USCS (ML)

TIME FUNCTIONS, SECONDS								dP	Reading	Head	Gradient	Permeability
DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc				
				(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)
11/08/07	39394	8	0	20.4	0	0	0	0	2.19	154.04	20.62	2.8E-07
11/08/07	39394	8	5	20.4	5	5	300	300	2.19	154.04	20.62	2.8E-07
11/08/07	39394	8	10	20.4	5	10	300	600	2.19	154.04	20.62	2.8E-07
11/08/07	39394	8	15	20.4	5	15	300	900	2.19	154.04	20.62	2.8E-07 *
11/08/07	39394	8	20	20.4	5	20	300	1200	2.19	154.04	20.62	2.8E-07 *
11/08/07	39394	8	25	20.4	5	25	300	1500	2.19	154.04	20.62	2.8E-07 *
11/08/07	39394	8	30	20.4	5	30	300	1800	2.19	154.04	20.62	2.8E-07 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 2.8E-07 cm/sec **

DATE 11/8/07
 CHECK *AW*
 REVIEW *BA*

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE
 TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AR

PROJECT NUMBER
 073-90216-001

SAMPLE ID
 1-2 Lift 2

SAMPLE TYPE
 UD

Board # 4

Flow Pump 2

Flow Pump Speed 6

Technician PWM

COMMENTS

Sample Data, Initial

Height, inches	2.943	B-Value, f	0.98
Diameter, inches	2.859	Cell Pres.	90.0
Area, cm ²	41.42	Bot. Pres.	80.0
Volume, cm ³	309.61	Top Pres.	80.0
Mass, g	593.78	Tot. B.P.	80.0
Moisture Content, %	23.01	Head, max.	40.09
Dry Density, pcf	97.29	Head, min.	40.09
Spec. Gravity(assumed)	2.700	Max. Grad.	5.36
Volume Solids, cm ³	178.78	Min. Grad.	5.36
Volume Voids, cm ³	130.82		
Void Ratio	0.73		
Saturation, %	84.9%		

Sample Data, Final

Height, inches	2.944
Diameter, inches	2.852
Area, cm ²	41.22
Volume, cm ³	308.20
Mass, g	610.52
Moisture Content, %	26.48
Dry Density, pcf	97.73
Volume Solids, cm ³	178.78
Volume Voids, cm ³	129.41
Void Ratio	0.72
Saturation, %	98.8%

		Sample Initial	Sample Final
WATER CONTENTS			
Wt Soil & Tare, i	g	593.78	618.81
Wt Soil & Tare, f	g	482.71	491.01
Wt Tare	g	0.00	8.33
Wt Moisture Lost	g	111.07	127.80
Wt Dry Soil	g	482.71	482.68
Water Content	%	23.01%	26.48%

DESCRIPTION

Dark Gray, CLAYEY SILT, some fine sand.

Flow Pump Rate 4.70E-04 cm³/sec

USCS (ML)

TIME FUNCTIONS, SECONDS								dP	Reading	Head	Gradient	Permeability
DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc				
				(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)
11/08/07	39394	8	35	20.6	0	0	0	0	0.57	40.09	5.36	2.1E-06
11/08/07	39394	8	40	20.6	5	5	300	300	0.57	40.09	5.36	2.1E-06
11/08/07	39394	8	45	20.6	5	10	300	600	0.57	40.09	5.36	2.1E-06
11/08/07	39394	8	50	20.6	5	15	300	900	0.57	40.09	5.36	2.1E-06 *
11/08/07	39394	8	55	20.6	5	20	300	1200	0.57	40.09	5.36	2.1E-06 *
11/08/07	39394	9	0	20.6	5	25	300	1500	0.57	40.09	5.36	2.1E-06 *
11/08/07	39394	9	5	20.6	5	30	300	1800	0.57	40.09	5.36	2.1E-06 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 2.1E-06 cm/sec **

DATE 11/8/07

CHECK *AK*

REVIEW *P. W. M.*

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE
 PROJECT NUMBER
 SAMPLE ID
 SAMPLE TYPE

TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AR	
073-90216-001	
3-1	Lift 3
UD	

Board #	4
Flow Pump	2
Flow Pump Speed	6
Technician	CA

COMMENTS

Sample Data, Initial

Height, inches	2.932	B-Value, f	0.98
Diameter, inches	2.791	Cell Pres.	90.0
Area, cm ²	39.47	Bot. Pres.	80.0
Volume, cm ³	293.95	Top Pres.	80.0
Mass, g	555.05	Tot. B.P.	80.0
Moisture Content, %	26.89	Head, max.	101.99
Dry Density, pcf	92.85	Head, min.	101.99
Spec. Gravity(assumed)	2.700	Max. Grad.	13.90
Volume Solids, cm ³	162.00	Min. Grad.	13.90
Volume Voids, cm ³	131.95		
Void Ratio	0.81		
Saturation, %	89.2%		

Sample Data, Final

Height, inches	2.888
Diameter, inches	2.789
Area, cm ²	39.41
Volume, cm ³	289.12
Mass, g	564.94
Moisture Content, %	29.16
Dry Density, pcf	94.40
Volume Solids, cm ³	162.00
Volume Voids, cm ³	127.12
Void Ratio	0.78
Saturation, %	100.3%

WATER CONTENTS

	Sample Initial	Sample Final
Wt Soil & Tare, i g	555.05	572.84
Wt Soil & Tare, f g	437.41	445.41
Wt Tare g	0.00	8.34
Wt Moisture Lost g	117.64	127.43
Wt Dry Soil g	437.41	437.07
Water Content %	26.89%	29.16%

DESCRIPTION

Dark Gray, CLAYEY SILT, some fine sand.

Flow Pump Rate 4.70E-04 cm³/sec

USCS (ML)

TIME FUNCTIONS, SECONDS								dP	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)				
11/11/07	39397	10	35	21.2	0	0	0	0	1.45	101.99	13.90	8.4E-07
11/11/07	39397	10	40	21.2	5	5	300	300	1.45	101.99	13.90	8.4E-07
11/11/07	39397	10	45	21.2	5	10	300	600	1.45	101.99	13.90	8.4E-07
11/11/07	39397	10	50	21.2	5	15	300	900	1.45	101.99	13.90	8.4E-07 *
11/11/07	39397	10	55	21.2	5	20	300	1200	1.45	101.99	13.90	8.4E-07 *
11/11/07	39397	11	0	21.2	5	25	300	1500	1.45	101.99	13.90	8.4E-07 *
11/11/07	39397	11	5	21.2	5	30	300	1800	1.45	101.99	13.90	8.4E-07 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 8.4E-07 cm/sec **

DATE 11/11/07
 CHECK *ML*
 REVIEW *10.11*

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AR	Board #	5	COMMENTS	
PROJECT NUMBER	073-90216-001	Flow Pump	2		
SAMPLE ID	3-2 Lift 3	Flow Pump Speed	9		
SAMPLE TYPE	UD	Technician	CA		

Sample Data, Initial

Height, inches	2.965	B-Value, f	0.98
Diameter, inches	2.827	Cell Pres.	90.0
Area, cm ²	40.50	Bot. Pres.	80.0
Volume, cm ³	304.98	Top Pres.	80.0
Mass, g	597.02	Tot. B.P.	80.0
Moisture Content, %	21.79	Head, max.	148.42
Dry Density, pcf	100.30	Head, min.	148.42
Spec. Gravity(assumed)	2.700	Max. Grad.	19.89
Volume Solids, cm ³	181.56	Min. Grad.	19.89
Volume Voids, cm ³	123.42		
Void Ratio	0.68		
Saturation, %	86.5%		

Sample Data, Final

Height, inches	2.938
Diameter, inches	2.816
Area, cm ²	40.18
Volume, cm ³	299.85
Mass, g	602.00
Moisture Content, %	22.80
Dry Density, pcf	102.01
Volume Solids, cm ³	181.56
Volume Voids, cm ³	118.29
Void Ratio	0.65
Saturation, %	94.5%

WATER CONTENTS	Sample Initial	Sample Final
Wt Soil & Tare, i g	597.02	609.67
Wt Soil & Tare, f g	490.21	498.00
Wt Tare g	0.00	8.31
Wt Moisture Lost g	106.81	111.67
Wt Dry Soil g	490.21	489.69
Water Content %	21.79%	22.80%

DESCRIPTION

Dark Gray, CLAYEY SILT, some fine sand.

Flow Pump Rate 4.26E-05 cm³/sec USCS (ML)

TIME FUNCTIONS, SECONDS								dP	Reading	Head	Gradient	Permeability
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)				
11/11/07	39397	11	20	21.4	0	0	0	0	2.11	148.42	19.89	5.2E-08
11/11/07	39397	11	25	21.4	5	5	300	300	2.11	148.42	19.89	5.2E-08
11/11/07	39397	11	30	21.4	5	10	300	600	2.11	148.42	19.89	5.2E-08
11/11/07	39397	11	35	21.4	5	15	300	900	2.11	148.42	19.89	5.2E-08 *
11/11/07	39397	11	40	21.4	5	20	300	1200	2.11	148.42	19.89	5.2E-08 *
11/11/07	39397	11	45	21.4	5	25	300	1500	2.11	148.42	19.89	5.2E-08 *
11/11/07	39397	11	50	21.4	5	30	300	1800	2.11	148.42	19.89	5.2E-08 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 5.2E-08 cm/sec **

DATE	11/11/07
CHECK	<i>M</i>
REVIEW	<i>P</i>

APPENDIX H

GEOTEXTILE MANUFACTURER'S DATA

PRODUCT DATA SHEET

GEOTEX 1001

GEOTEX 1001 is a polypropylene, staple fiber, needlepunched nonwoven geotextile produced by Propex, and will meet the following Minimum Average Roll Values (MARV) when tested in accordance with the methods listed below. The fibers are needed to form a stable network that retains dimensional stability relative to each other. The geotextile is resistant to ultraviolet degradation and to biological and chemical environments normally found in soils.

GEOTEX 1001 conforms to the property values listed below.¹ Propex performs internal Manufacturing Quality Control (MQC) tests that have been accredited by the Geosynthetic Accreditation Institute - Laboratory Accreditation Program (GAI-LAP).

		MARV ²	
PROPERTY	TEST METHOD	ENGLISH	METRIC
Mechanical			
Tensile Strength (Grab)	ASTM D-4632	250 lbs	1112 N
Elongation	ASTM D-4632	50%	50%
Puncture	ASTM D-4833	150 lbs	668 N
CBR Puncture	ASTM D-6241	625 lbs	2780 N
Mullen Burst	ASTM D-3786	460 psi	3171 kPa
Trapezoidal Tear	ASTM D-4533	100 lbs	445 N
Endurance			
UV Resistance	ASTM D-4355	70%	70%
Hydraulic			
Apparent Opening Size (AOS) ³	ASTM D-4751	100 US Std. Sieve	0.150 mm
Permittivity	ASTM D-4491	1.2 sec ⁻¹	1.2 sec ⁻¹
Water Flow Rate	ASTM D-4491	85 gpm/ft ²	3463 l/min/m ²
Roll Sizes		15 ft x 300 ft	4.57 m x 91.5 m

NOTES:

1. The property values listed above are effective 08/2006 and are subject to change without notice.
2. Values shown are in weaker principal direction. Minimum average roll values (MARV) are calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any samples taken from quality assurance testing will exceed the value reported.
3. Maximum average roll value.

PROPEX
GEOSYNTHETICS

THE ADVANTAGE CREATORSSM

Propex Inc
6025 Lee Highway, Suite 425
PO Box 22788
Chattanooga, TN 37422

PH: 423 899 0444
PH: 800 621 1273
FAX: 423 899 7619
www.geotextile.com

GeotexSM, LandlokSM, PyramatSM, X3SM, SuperGeoSM, PetromatSM and PetrotacSM are registered trademarks of Propex Inc. THIS PUBLICATION SHOULD NOT BE CONSTRUED AS ENGINEERING ADVICE. WHILE INFORMATION CONTAINED IN THIS PUBLICATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE, PROPEX DOES NOT WARRANT ITS ACCURACY OR COMPLETENESS. THE ULTIMATE CUSTOMER AND USER OF THE PRODUCTS SHOULD ASSUME SOLE RESPONSIBILITY FOR THE FINAL DETERMINATION OF THE SUITABILITY OF THE INFORMATION AND THE PRODUCTS FOR THE CONTEMPLATED AND ACTUAL USE. THE ONLY WARRANTY MADE BY PROPEX FOR ITS PRODUCTS IS SET FORTH IN OUR PRODUCT DATA SHEETS FOR THE PRODUCT, OR SUCH OTHER WRITTEN WARRANTY AS MAY BE AGREED BY PROPEX AND INDIVIDUAL CUSTOMERS. PROPEX SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM PROVISION OF SAMPLES, A COURSE OF DEALING OR USAGE OF TRADE.



Contech Construction Product

8/28/2008

BOL: 0 PO:
 Yearly Compliance Letter

This certificate indicates that C100NW manufactured as Propex product 1001 is a nonwoven polypropylene geotextile and will meet the following Minimum Average Roll Values (MARV) when tested in accordance with the ASTM test methods listed below, unless otherwise stated.

PROPERTY	TEST METHOD	UNITS	ENGLISH	METRIC
Tensile Strength	ASTM D4632	lbs (N)	250	1112
Elongation	ASTM D4632	%	50	50
Puncture	ASTM D4833	lbs (N)	150	668
Mullen Burst	ASTM D3786	psi (kPa)	480	3171
Trapezoidal Tear	ASTM D4533	lbs (N)	100	445
UV Resistance (min)	ASTM D4355	%	70	70
AOB (max)	ASTM D4751	US Std. Sieve (mm)	100	0.180
Permittivity	ASTM D4491	1/sec	1.20	1.20
Water Flow Rate	ASTM D4491	gpm/ft ² (l/min/m ²)	85.0	3483

Lenore Choate

Lenore Choate
 Quality Assurance Engineer
 Corporate Quality

This publication should not be construed as engineering advice. While information contained in this publication is accurate to the best of our knowledge, Propex does not warrant its accuracy or completeness. The ultimate customer and user of the products should assume sole responsibility for the final determination of the suitability of the information and the products for the contemplated and actual use. The only warranty made by Propex for its products is set forth in our product data sheet for the product, or such other written warranty as may be agreed by Propex and individual customers. Propex specifically disclaims all other warranties, express or implied, including without limitation, warranties of merchantability or fitness for a particular purpose, or arising from provision of samples, a course of dealing or usage of trade.

APPENDIX I

GEOTEXTILE CONFORMANCE TEST RESULTS



November 9, 2007

Mail To:

Brad Fureigh
Terracon
11400 West Baseline Rd
Little Rock, AR 72209

email: bnfureigh@terracon.com

Bill To:

<= Same

Dear Mr. Fureigh

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	Saline County Class 4 - Phase II
TRI Job Reference Number:	E2299-68-07
Material(s) Tested:	1 Nonwoven Geotextile(s)
Test(s) Requested:	Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Puncture Strength (ASTM D 4833) Trapezoidal Tear (ASTM D 4533) Apparent Opening Size (ASTM D 4751) Permittivity (ASTM D 4491)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager



GEOTEXTILE TEST RESULTS

TRI Client: Terracon
Project: Saline County Class 4 - Phase II

Material: Nonwoven Geotextile
Sample Identification: NL
TRI Log #: E2299-68-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	4.68	4.07	4.77	3.94	4.26	3.78	4.11	4.84	3.93	4.02	4.24	0.38	
Mass/Unit Area (oz/sq.yd)	10.89	9.47	11.10	9.16	9.91	8.79	9.56	11.26	9.14	9.35	9.86	0.89	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	239	281	413	262	232	294	266	397	249	262	290	64	205 min
TD - Tensile Strength (lbs)	365	271	312	256	267	297	333	281	306	294	298	33	205 min
MD - Elong. @ Max. Load (%)	64	71	62	72	66	78	77	67	69	71	70	5	50 min
TD - Elong. @ Max. Load (%)	72	77	85	65	68	63	82	91	70	75	75	9	50 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	170	179	174	137	148	190	174	172	141	208	169	21	110 min
	180	195	180	143	148								
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	83	82	78	126	85	83	97	101	69	114	92	18	80 min
TD - Tear Strength (lbs)	104	113	121	120	129	121	112	116	142	107	118	11	80 min
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.075	0.106	0.090	0.106	0.150						0.105	0.028	
Sieve No.	200	140	170	140	100						140		80 min
MD Machine Direction	TD Transverse Direction				NA Not Available								

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



GEOTEXTILE TEST RESULTS

TRI Client: Terracon
Project: Saline County Class 4 - Phase II

Material: Nonwoven Geotextile
Sample Identification: NL
TRI Log #: E2299-68-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)													
Water Temp. (C):	21												
Correction Factor:	0.976												
Trial =>	1					2							
Thickness (mils)	105	105	105	105	105	97	97	97	97	97			
Time (s)	18	18	18	18	18	20	20	20	20	20			
Flow (L)	2.40	2.36	2.36	2.40	2.36	2.64	2.64	2.60	2.60	2.64			
Permittivity (s-1)	1.29	1.27	1.27	1.29	1.27	1.28	1.28	1.26	1.26	1.28			
Flow rate (GPM/ft2)	97	95	95	97	95	96	96	94	94	96			
Permeability (cm/s)	0.345	0.340	0.340	0.345	0.340	0.316	0.316	0.311	0.311	0.316			
Trial =>	3					4							
Thickness (mils)	111	111	111	111	111	106	106	106	106	106			
Time (s)	18	18	18	18	18	18	18	18	18	18			
Flow (L)	2.56	2.52	2.56	2.56	2.56	2.32	2.32	2.32	2.32	2.32			
Permittivity (s-1)	1.38	1.36	1.38	1.38	1.38	1.25	1.25	1.25	1.25	1.25	1.30	0.05	
Flow rate (GPM/ft2)	103	102	103	103	103	94	94	94	94	94	97	4	
Permeability (cm/s)	0.389	0.383	0.389	0.389	0.389	0.337	0.337	0.337	0.337	0.337	0.345	0.028	

APPENDIX J
GEOSYNTHETICS INVENTORY LISTING

Geosynthetics Inventory



Terracon Project No: 35077118

11400 West Baseline Road

Little Rock, AR 72209

Phone 501.455.2199

Fax 501.455.4547

Client Name: Saline County RSWMD
 Contractor: Grayco Construction Co., Inc.
 Project Name: Class 4 - Phase II
 Address: Saline County Class 4 LF
 Location: Bauxite, Arkansas

Manufacturer: PROPEX
 Transportation: Truck
 Date of Arrival: 11/2/07
 Material Type: 8oz Geo
 Condition of Material: Good

ROLL COUNT	ROLL NUMBER	RESIN OR LOT NO.	MATERIAL DIMENSIONS				QC/QA CERT.	CONF. SAMPLE	REMARKS
			LENGTH (FEET)	WIDTH (FEET)	SQUARE FEET	THICK (MILLS)			
1	2008421719	2144528	300	15	4,500		DW	YES	
2	2008675321	2144528	300	15	4,500		DW		
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

TOTAL THIS PAGE: 9,000 ft²
 TOTAL ACCUMULATED: 9,000 ft²

Material Type Legend:

40S = 40 Mil Smooth HDPE Geomembrane
 40T = 40 Mil Textured HDPE Geomembrane
 60S = 60 Mil Smooth HDPE Geomembrane
 60T = 60 Mil Textured HDPE Geomembrane

DSGC - Double Sided Geocomposite
 SSGC - Single Sided Geocomposite
 8oz Geo - 8 ounce Geotextile
 12oz Geo - 12 ounce Geotextile

APPENDIX K

UNDER-DRAIN SYSTEM GRAVEL TEST RESULTS

**TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AR
SUMMARY OF SOIL DATA**

Sample Identification	Sample Type	Sample Depth	Soil Classification	Natural Moisture %	Atterberg Limits				Grain Size Distribution			Compaction		Gs	Unit Weight		Permeability (cm/sec)	Carbonate Content %	Additional Tests Conducted (See Notes)
									% Finer No. 4 Sieve	% Finer No. 200 Sieve	% Finer .005 mm	Maximum Dry Density (lb/cuft)	Optimum Moisture %		Moisture %	Dry (lb/cuft)			
					L.L.	P.L.	P.I.	L.I.	Sieve	Sieve	mm	(lb/cuft)	%		%	(lb/cuft)			
C-C1	Bulk	-	ML	26.8	41	26	15	0.05	97.5	73.8	-	93.6	23.7	-	-	-	-	-	-
C-C2	Bulk	-	CL	22.6	37	23	14	-0.06	94.8	75.2	28.0	95.1	23.5	-	26.6	90.3	1.9E-07	-	-
C-C3	Bulk	-	CL	24.0	39	25	14	-0.09	97.6	76.9	40.0	96.1	23.1	-	24.9	92.5	8.0E-07	-	-
PG-1	Bulk	-	GP	-	-	-	-	-	1.4	0.1	-	-	-	-	-	92.3	2.9	0.1	-
PS-1	Bulk	-	SP-SM	14.6	-	-	-	-	99.5	6.1	-	-	-	-	-	104.6	3.9E-02	0.6	-
CG-1	Bulk	-	GP	-	-	-	-	-	0.2	0.0	-	-	-	-	-	49.7	6.8	-	-
1-1	UD	Lift 1	(ML)	27.9	-	-	-	-	-	-	-	-	-	-	27.9	91.3	2.8E-07	-	-
1-2	UD	Lift 2	(ML)	23.0	-	-	-	-	-	-	-	-	-	-	23.0	97.3	2.1E-06	-	-
3-1	UD	Lift 3	(ML)	26.9	-	-	-	-	-	-	-	-	-	-	26.9	92.9	8.4E-07	-	-
3-2	UD	Lift 3	(ML)	21.8	-	-	-	-	-	-	-	-	-	-	21.8	100.3	5.2E-08	-	-

ABBREVIATIONS: LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Mc)

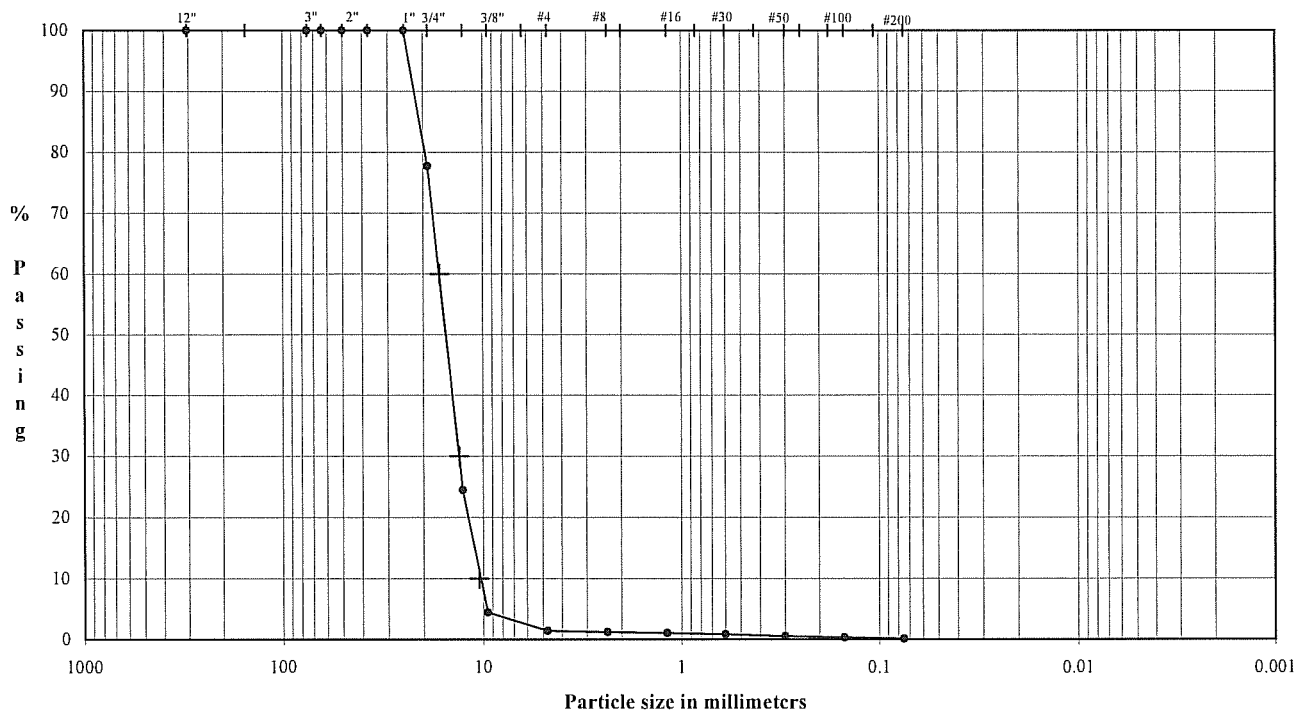
NOTES: T = TRIAXIAL TEST
U = UNCONFINED COMPRESSION TEST
C = CONSOLIDATION TEST
DS = DIRECT SHEAR TEST
O = ORGANIC CONTENT
P = pH

PARTICLE SIZE DISTRIBUTION

ASTM C 136

PROJECT NAME: TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AR
 SAMPLE ID: PG-1
 TYPE: Bulk

Depth: -



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

	Particle Size		% Passing	Particle Size	
	(mm)			Classification	Percentage
U.S. Standard Sieves Sizes and Numbers	12.0"	304.8	100.0	Cobbles	0.00
	3.0"	75.0	100.0		
	2.5"	63.5	100.0		
	2.0"	50.0	100.0		
	1.5"	37.5	100.0		
	1.0"	25.0	100.0	Coarse Gravel	22.25
	0.75"	19.0	77.8		
	0.50"	12.7	24.5		
	0.375"	9.5	4.5	Fine Gravel	76.35
	#4	4.8	1.4		
	#8	2.36	1.2	Coarse Sand	0.21
	#16	1.18	1.1	Medium Sand	0.50
	#30	0.60	0.8		
	#50	0.30	0.5		
	#100	0.15	0.3	Fine Sand	0.56
	#200	0.075	0.1		
				Fines	0.12

$C_u = D_{60}/D_{10} =$	16.5/10.5	2	< 4
$C_c = D_{30}^2/(D_{10} \cdot D_{60}) =$	13.2^2/(10.5 \cdot 16.5)	1.0	> 1

DESCRIPTION: Brown and Gray, COARSE TO FINE GRAVEL, trace coarse to fine sand, trace fines.

USCS: GP

TECH TJ
 DATE 11/06/07
 CHECK *[Signature]*
 REVIEW *[Signature]*

CARBONATE CONTENT ASTM D 3042 - MODIFIED

PROJECT TITLE

TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AR

PROJECT NUMBER

073-90216-001

SAMPLE ID

PG-1

	1	2	3
Residue +Tare weight (g)	583.60	586.16	583.55
Tare Weight (g)	84.13	84.74	84.07
Residue weight (g)	499.47	501.42	499.48

After Acid Application and Wash

Residue + Tare weight (g)	583.12	585.72	583.12
Residue weight (g)	498.99	500.98	499.05
Carbonate Content (%)	0.1	0.1	0.1

Average Carbonate Content (%)

0.1

REMARKS

SAMPLE DESCRIPTION

Brown and Gray, COARSE TO FINE GRAVEL, trace coarse to fine sand, trace fines.

USCS

GP

MODIFIED: Only the Plus No.200 Size material used in the test.

TECH JD/TJ

DATE 11/7/2007

CHECK

REVIEW

CONSTANT HEAD PERMEABILITY TEST

ASTM D 2434 - MODIFIED

PROJECT TITLE
PROJECT NUMBER
REMARKS

TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AH
073-90216-001
-

SAMPLE ID
SAMPLE TYPE
SAMPLE DEPTH

PG-1
Bulk
-

		TIME IN	VOLUME	TEMP.	Flow Rate	
		SECONDS	(ml)	°C	(ml/sec)	
Gradient -1	1.	14.31	8600	21.0	600.98	*
	2.	14.31	8600	21.0	600.98	*
Gradient -2	1.	20.88	8600	21.0	411.88	*
	2.	21.01	8600	21.0	409.33	*
Gradient -3	1.	27.22	8600	21.0	315.94	*
	2.	27.40	8600	21.0	313.87	*

INITIAL UNIT WEIGHT DETERMINATION

APPARATUS & WET SAMPLE (lbs): 34.7
APPARATUS & WET SAMPLE (g): 15730.6
APPARATUS WEIGHT (g): 0.0
WET SAMPLE WEIGHT (g): 15730.6

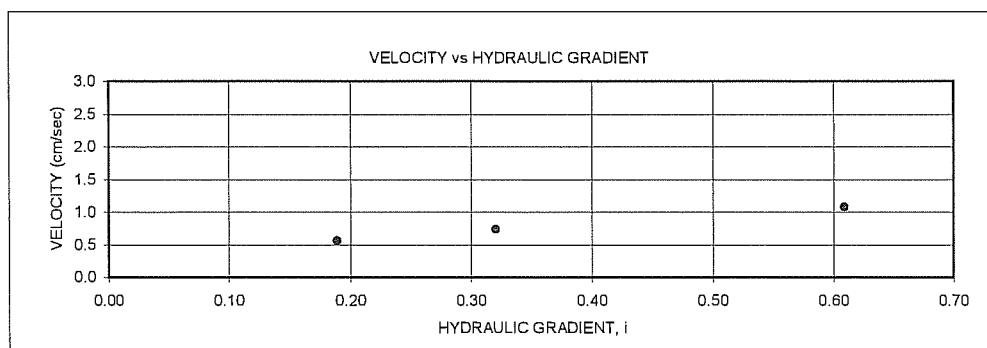
	INITIAL	FINAL
SAMPLE LENGTH (in):	7.5	7.5
SAMPLE DIAMETER (in):	10.5	10.5
SAMPLE AREA (in ²):	86.59	86.59
SAMPLE AREA (cm ²):	558.64	558.64
SAMPLE VOLUME (in ³):	649.43	649.43
SAMPLE VOLUME (ft ³):	0.376	0.376
WET DENSITY IN (pcf):	92.3	92.3
DRY DENSITY IN (pcf):	92.3	92.3

INITIAL MOISTURE CONTENT

WET SAMPLE & TARE (g):
DRY SAMPLE & TARE (g):
WEIGHT OF TARE (g):
WEIGHT OF WATER (g):
DRY SAMPLE WEIGHT (g):
MOISTURE CONTENT (%):

AVERAGE FLOW RATE (ml/sec):	600.98	410.60	314.91
AVERAGE TEMP (°C):	21.0	21.0	21.0
TEMPERATURE CORRECTION	0.976	0.976	0.976
HEAD OF WATER (mm):	116.0	61.0	36.0
HEAD OF WATER (in):	4.6	2.4	1.4
HYDRAULIC GRADIENT (i):	0.61	0.32	0.19
Velocity (cm/sec)	1.08	0.73	0.56

Permeability @ 20°C (cm/sec) = 1.7 2.2 2.9

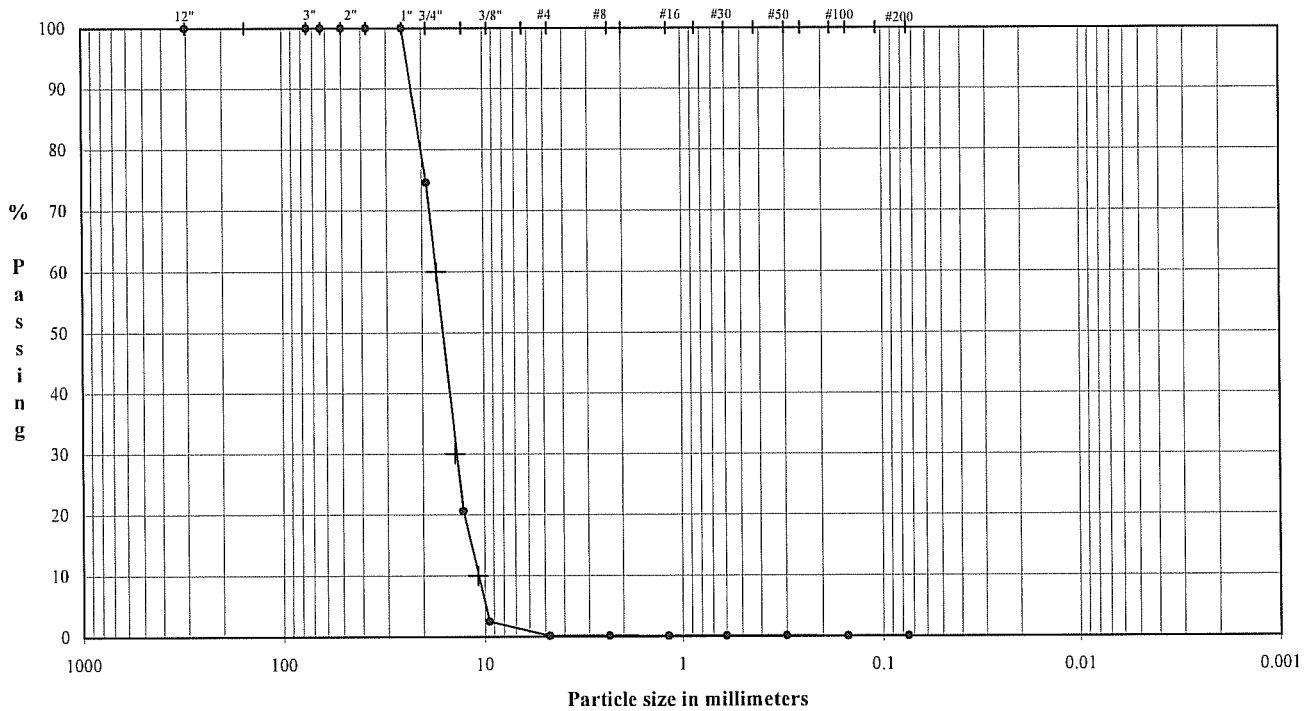


TECH DW
DATE 11/15/2007
CHECK CA
REVIEW AK

PARTICLE SIZE DISTRIBUTION

ASTM C 136

PROJECT NAME: **TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AR**
 SAMPLE ID: **CG-1** - Depth: -
 TYPE: **Bulk**



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers	Particle Size		% Passing	Particle Size	
	(mm)		Classification	Percentage	
	12.0"	304.8	100.0	Cobbles	0.00
	3.0"	75.0	100.0		
	2.5"	63.5	100.0		
	2.0"	50.0	100.0		
	1.5"	37.5	100.0		
	1.0"	25.0	100.0	Coarse Gravel	25.40
	0.75"	19.0	74.6		
	0.50"	12.7	20.6		
	0.375"	9.5	2.5	Fine Gravel	74.42
	#4	4.8	0.2		
	#8	2.36	0.1	Coarse Sand	0.05
	#16	1.18	0.1	Medium Sand	0.04
	#30	0.60	0.1		
	#50	0.30	0.1	Fine Sand	0.05
	#100	0.15	0.1		
	#200	0.075	0.0		
				Fines	0.04

$C_u = D_{60}/D_{10} =$	17/10.8	2	< 4
$C_c = D_{30}^2/(D_{10} \cdot D_{60}) =$	13.9^2/(10.8 * 17)	1.1	> 1

DESCRIPTION: Brown and Gray, COARSE TO FINE GRAVEL, trace coarse to fine sand, trace fines.

USCS: GP

TECH	JD
DATE	11/15/07
CHECK	CK
REVIEW	HL

CONSTANT HEAD PERMEABILITY TEST

ASTM D 2434

PROJECT TITLE
PROJECT NUMBER
REMARKS

TERRACON/SALINE COUNTY CLASS 4 LF-PHASE II/AR
CG-1
-

SAMPLE ID
SAMPLE TYPE
SAMPLE DEPTH

CG-1
Bulk
-

	TIME IN SECONDS	VOLUME (ml)	TEMP. °C	(ml/sec)	
1.	12.91	5650	21.0	437.65	
2.	12.95	5650	21.0	436.29	*
3.	12.99	5650	21.0	434.95	*
4.	12.96	5650	21.0	435.96	*

INITIAL UNIT WEIGHT DETERMINATION

APPARATUS & WET SAMPLE (g):	6517.0
APPARATUS WEIGHT (g):	2192.0
WET SAMPLE WEIGHT (g):	4325.0
SAMPLE LENGTH (in):	10.0
SAMPLE DIAMETER (in):	6.5
SAMPLE AREA (in ²):	33.18
SAMPLE AREA (cm ²):	214.08
SAMPLE VOLUME (in ³):	331.83
SAMPLE VOLUME (ft ³):	0.192
WET DENSITY (pcf):	49.7
DRY DENSITY (pcf):	49.7

INITIAL MOISTURE CONTENT

WET SAMPLE & TARE (g):	
DRY SAMPLE & TARE (g):	
WEIGHT OF TARE (g):	
WEIGHT OF WATER (g):	
DRY SAMPLE WEIGHT (g):	
MOISTURE CONTENT (%):	

FINAL DIMENSIONS

SAMPLE LENGTH (in):	10.0
SAMPLE DIAMETER (in):	6.5
AVERAGE Q VALUE (ml/sec):	435.73
AVERAGE TEMP (°C):	21.0
TEMPERATURE CORRECTION:	0.976
HEAD OF WATER (in):	2.9
HYDRAULIC GRADIENT (i):	0.29

K VALUE CORRECTED FOR 20 DEGREES C = 6.8E+00 cm/sec

TECH	TJ
DATE	11/13/2007
CHECK	CA
REVIEW	AK

APPENDIX L
CONTRACTOR SUBMITTALS



Davis Broadwater
Regional Sales Representative
South Central Region

103 Chestnut Drive
Clinton, MS 39056
Phone: 601-924-4269
Fax: 601-924-4270
Cell: 601-988-8451
e-mail: dbroadwater@contech-cpi.com

LETTER OF QUALITY ASSURANCE

Date: November 26, 2007

To Whom It May Concern:

CONTECH CONSTRUCTION PRODUCTS INC. hereby proposes to furnish High Density Polyethylene Pipe (HDPE) for the referenced project listed below in accordance with the attached specification sheet.

PROJECT: Saline County Landfill
Saline County, Arkansas

PURCHASER: Grayco
24551 Hwy 370
Falkner, MS 38629

MATERIAL: HDPE Pipe
30" Diameter

CONTECH CONSTRUCTION PRODUCTS INC.

A handwritten signature in black ink, appearing to read "Davis M. Broadwater", is written over the printed name and title.

Davis M. Broadwater
Regional Sales Representative

HANCOR SURE-LOK® ST PIPE SPECIFICATIONS

Scope

This specification describes 4- through 60-inch (100 to 1500 mm) Hancor Sure-Lok ST pipe for use in gravity flow drainage applications.

Pipe Requirements

Sure-Lok pipe shall have a smooth interior and annular exterior corrugations.

- 4- through 10-inch (100 to 250mm) shall meet AASHTO M252, Type S.
- 12- through 60-inch (300 to 1500 mm) shall meet AASHTO M294, Type S or ASTM F2306.
- Manning's "n" value for use in design shall be 0.012.

Joint Performance

Pipe shall be joined using a bell & spigot joint meeting AASHTO M252, AASHTO M294 or ASTM F2306. The joint shall be soil-tight and gaskets, when applicable, shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly.

Fittings

Fittings shall conform to AASHTO M252, AASHTO M294, or ASTM F2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the soil-tight joint performance requirements of AASHTO M252, AASHTO M294 or ASTM F2306.

Material Properties

Virgin material for pipe and fitting production shall be high density polyethylene conforming with the minimum requirements of cell classification 424420C for 4- through 10-inch (100 to 250mm) diameters, or 435400C for 12- through 60-inch (300 to 1500mm) diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%. The 12- through 60-inch (300 to 1500mm) virgin pipe material shall comply with the notched constant ligament-stress (NCLS) test as specified in Section 9.5 and 5.1 of AASHTO M294 and ASTM F2306, respectively.

Installation

Installation shall be in accordance with ASTM D2321 and Hancor's published installation guidelines with the exception that minimum cover in trafficked areas for 4- through 48-inch (100 to 1200 mm) diameters shall be one foot (0.3 m) and for 54- and 60-inch (1350 and 1500 mm) diameters shall be 2 ft (0.6 m) in single run applications. Contact your local Hancor representative or visit our website at www.hancor.com for a copy of the latest installation guidelines.

Pipe Dimensions

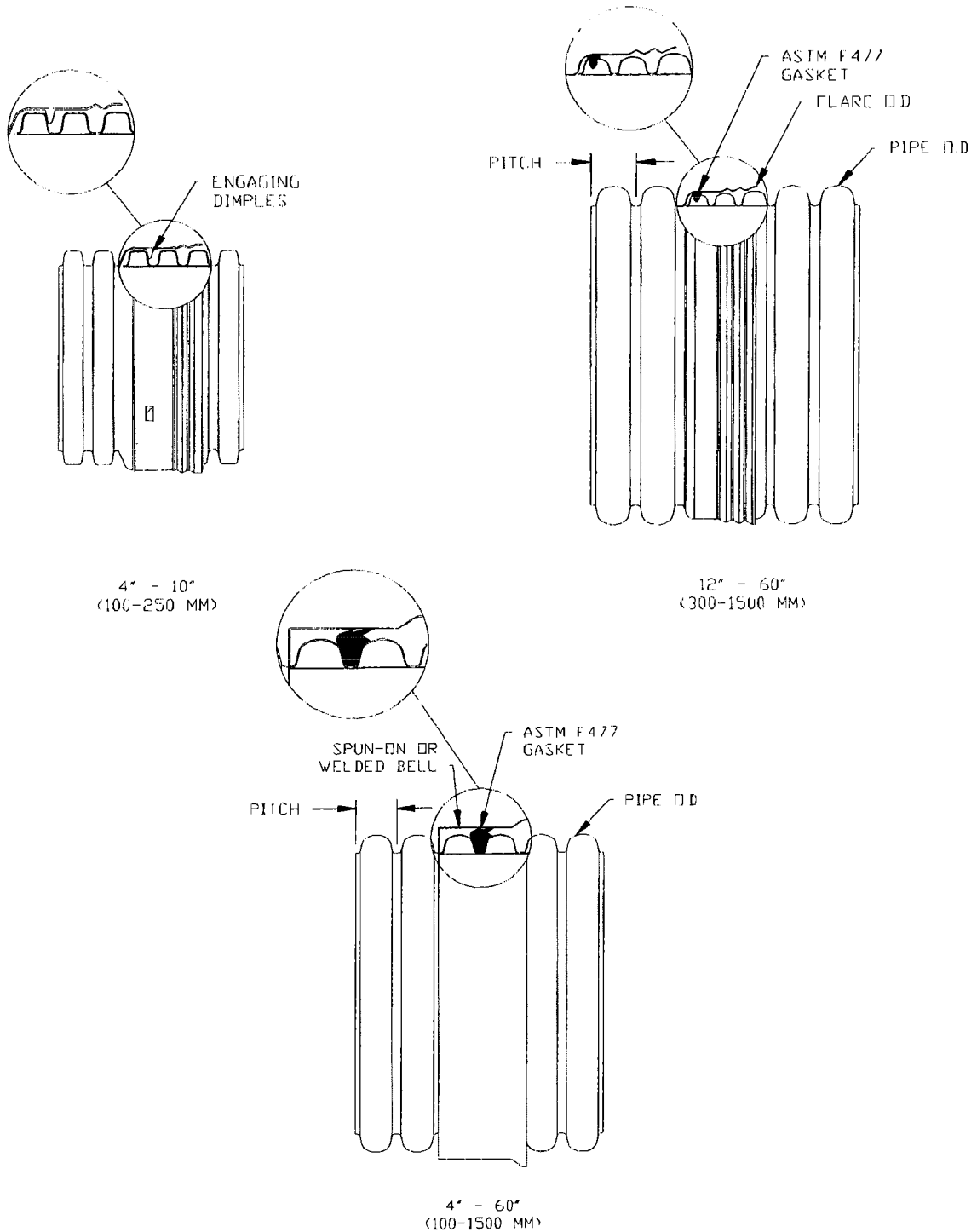
Nominal Diameter, in (mm)														
Pipe I.D. (mm)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	54* (1350)	60 (1500)
Pipe O.D.** (mm)	4.8 (122)	6.9 (175)	9.1 (231)	11.4 (290)	14.5 (368)	18 (457)	21 (533)	28 (711)	36 (914)	42 (1067)	48 (1219)	54 (1372)	61 (1549)	67 (1702)
Perforations	All diameters available with or without perforations													

*Check with sales representative for availability by region.

**Pipe O.D. values are provided for reference purposes only, values stated for 12- through 60-inch are ± 1 inch. Contact a sales representative for exact values.

SURE-LOK® ST PIPE JOINING SYSTEM

(Joint configuration & availability subject to change without notice. Product detail may differ slightly from actual product appearance.)



APPENDIX M
PROJECT PHOTOGRAPHIC LOG



Looking southeast at excavation of Phase II



Looking northeast at continued excavation of Phase II



Excavation and installation of subgrade layer



Excavation of under-drain system trench



Installation of geotextile and gravel in under-drain system



Installation of compacted clay liner



Looking north, construction of west perimeter cell berm



Looking west at top of clay liner