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FINAL CONSTRUCTION COMPLETION REPORT EXISTING LANDFILL CLOSURE NAVAL ACTIVITY PUERTO RICO
03/01/2008
SHAW ENVIRONMENAL, INC.

Shaw Environmental & Infrastructure, Inc.

FINAL CONSTRUCTION COMPLETION REPORT
EXISTING LANDFILL CLOSURE
NAVAL ACTIVITY PUERTO RICO
CEIBA, PUERTO RICO

Prepared for:
DEPARTMENT OF THE NAVY
Contract No. N62470-02-D-3260
Task Order No. 0034
Naval Facilities Engineering Command Atlantic

Norfolk, Virginia

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March 2008
Task Order 0034
Project No. 110050

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LIST OF ACRONYMS

CGP	Construction General Permit
CQA	Construction Quality Assurance
CQCP	Construction Quality Control Plan
CY	Cubic Yards
E&S	Erosion and Sedimentation
EPA	US Environmental Protection Agency
EQB	Environmental Quality Board
NAVFAC Atlantic	Naval Facilities Engineering Command Atlantic
LOD	Limits of Disturbance
NAPR	Naval Activity Puerto Rico
NAVFAC	Naval Facilities Engineering Command
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System (NPDES)
PR	Puerto Rico
QC	Quality Control
ROICC	Resident Officer In Charge Of Construction
Shaw	Shaw Environmental, Inc.
US	United States
VR	Variance Request
WP	Work Plan

CONSTRUCTION QUALITY ASSURANCE INSPECTOR CERTIFICATION

The Construction Quality Assurance (CQA) Inspector for this landfill closure was Mr. Daniel Sierra Hernandez, a licensed professional engineer (license #10417) authorized to practice in Puerto Rico (EQB Non-Hazardous Solid Waste Regulation Part IV-D Rule 565H). Mr. Sierra directed the construction inspection, testing and documentation efforts as an independent entity of the construction contractor during low permeability soil layer placement. Mr. Sierra performed all functions as described within the *Landfill Closure Plan* date October 2004 prepared by EnSafe, Inc. included as part of the facility operations register.

Certification of Closure

I, Daniel Sierra Hernandez, hereby certify that the landfill closure activities at NAPR adhered to both the USEPA Subtitle D Regulations (Subpart F: Closure and Post-Closure Care Criteria) and the EQB Non-Hazardous Solid Waste Regulations on closure and post-closure (Part IV-D Closure Criteria). The final system designed and constructed for the solid waste landfill met the following guidelines:

1. Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1 $x10^{-6}$ cm/sec. whichever is less.

2. Minimize infiltration through the closed landfill by the use of an infiltration layer that contains a minimum 18 inches of cover material (<=1 $x10^{-6}$ cm/sec).

3. Minimize erosion of the final cover by the use of an erosion layer that contains a minimum 6 inches of cover material that is capable of sustaining native plant growth.

All closure activities have been completed in accordance with the permitted plans and the approved Closure Plan.

Daniel Sierra Hernandez, P.E.
CQA Inspector, Puerto Rico

MARCH. 10-08
Date

1.0 INTRODUCTION

This Construction Completion Report provides a review of the closure activities that were performed at the existing landfill located within Naval Activity Puerto Rico (NAPR), Ceiba, Puerto Rico. Shaw Environmental, Inc. (Shaw) has prepared this document for Naval Facilities Engineering Command Atlantic (NAVFAC Atlantic) of the United States Navy. The remedial activities were performed under contract N62470-02-D-3260, Task Order No. 34.

Shaw utilized Right Way Environmental Contractors, Inc. (Right Way) of Naranjito, PR as the Prime Puerto Rico Subcontractor. Right Way assisted Shaw with the closure of the site by providing all of the heavy equipment and some of the labor necessary to complete the project.

1.1 PROJECT OBJECTIVES

Project objectives of this task order were as follows:

- Protection of human health and the environment
- Safe removal and placement of surface debris
- Regrading of the site to promote positive laminar drainage
- Clay Cap Installation
- Compliance with all applicable regulations

2.0 DESCRIPTION OF ACTIVITIES

Closure standards for NAPR landfill require that owners and operators install a final cover system that is designed to minimize soil erosion and infiltration of liquids through the cover. All landfill closure activities adhered to both the USEPA Subtitle D Regulations (Subpart F: Closure and Post-Closure Care Criteria) and the EQB Non-Hazardous Waste Regulations on closure and post-closure (Part IV-D Closure Criteria). These authority entities require that all solid waste landfill facilities must install a final system designed and constructed to:

1. Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1 $x10^{-6}$ cm/sec. whichever is less.

2. Minimize infiltration through the closed landfill by the use of an infiltration layer that contains a minimum 18 inches of cover material (<=1 $x10^{-6}$ cm/sec).

3. Minimize erosion of the final cover by the use of an erosion layer that contains a minimum 6 inches of cover material that is capable of sustaining native plant growth.

2.1 PRE-CONSTRUCTION SURVEY

Prior to beginning regrade activities, F&S Survey, a professional surveying company certified/registered in Puerto Rico, began layout of the features indicated on the Design Drawings within the EPA and EQB approved Shaw work plan dated October 2004 (hereinafter referred to as work plan). Shaw established grade control in the work area using existing survey monuments. F&S Survey performed an initial topographic survey of the site prior to regrading activities to provide accurate as-builts for landfill closure. Survey support was also utilized to layout the grading plan and to guide the regrading of waste to the lines and grades shown on the subgrade plan provided in the work plan. An as-built survey of the waste grade layer was completed prior to the start of placement of low permeability soil material to later document the thickness of the low permeability soil layer.

2.2 CLEARING AND GRUBBING

Prior to clearing and grubbing of vegetation or any other ground disturbing activities, all erosion and sedimentation (E&S) controls were installed per the work plan as indicated on the Design Drawings and any condition stated by EQB. Silt fence currently remains in place around the perimeter of the landfill until deemed acceptable to remove by the ROICC.

Clearing and grubbing began after the aforementioned erosion and sediment controls were in place. Shaw submitted an air emission permit application to EQB for fugitive dust generated during clearing and grubbing, ground disturbance and grading of any area, in accordance with

EQB Regulation for the Control of Atmospheric Pollution. Shaw installed the pollution controls necessary to prevent dust from becoming airborne and performed daily dust control via pneumatic water truck. Shaw mobilized equipment and personnel necessary to perform clearing the vegetation within the defined limits of disturbance (LOD). All felled timber and vegetative debris was passed through a commercial chipper, with the chips being incorporated within the regraded waste layer. A rubber tired backhoe was used to transfer and spread the chips. Stumps were also passed through the chipper and incorporated under the cap.

2.3 MONITORING WELL INSPECTION

Nine existing monitoring wells (R7GWO1R, R7GW02R, R7GW04R, R7GWO5R, R7GW06R, R7GW07R2, R7GW09, R7GW10, and R7GW11) were inspected, purged, and re-established by On-Site Environmental, Inc., the groundwater subcontractor. Shaw, On-Site Environmental, Inc., and the Navy coordinated the inspections and it was determined that all monitoring wells were functional as existing groundwater monitoring wells. The monitoring wells near or on the landfill cap are shown on **Figure 1**. Due to clay cap elevation changes near R7GW05R, Shaw installed a new concrete pad around the monitoring well.

2.3 WASTE REGRADING

Existing waste/debris/soil contained within the LOD of the site were regraded utilizing an excavator and bulldozers. The regraded waste conformed to the grades shown on Sheet C-2 in the work plan. Any additional material needed was transported on site to complete final subgrade. Survey support was used to monitor the waste/debris/soil placement. The regraded waste formed a subgrade layer which was then covered with an 18-inch thick layer of clay and a 6-inch thick vegetative layer.

2.4 LOW PERMEABILITY SOIL CAP INSTALLATION

Approximately 245,913.23 tons of low permeability soil (clay) were placed over the regraded waste layer to construct an 18-inch thick clay cap consisting of compacted clay with a maximum permeability of 1×10^{-6} cm/sec. Prior to any placement of clay cap, the subgrade areas were proof-rolled with a 10-ton vibratory smooth drum roller and/or sheepsfoot and no compaction testing was required. To create the initial 18-inches of clay cap, the clay was placed in 8-inch thick loose lifts and compacted to a minimum of 90 percent of the maximum dry density. The low permeability soil consisted of SC, CL, ML, or CL-ML type soil with a minimum plasticity index of 5. The maximum permeability was 1×10^{-6} cm/sec. The 10-ton vibratory smooth drum roller and/or sheepsfoot were utilized to compact the material.

Samples of the material were obtained and tested as detailed in the CQCP within the work plan. Geotechnical samples were collected for soil classification, grain size analysis, water content and plasticity index every 2000 cy of material received on-site. Geotechnical samples were collected for moisture/density every 5000 cy. Incoming clay material analyses are provided as **Appendix B**. During placement of the clay cap, compaction samples were taken at the rate of five per acre while permeability samples were collected at the rate of one per five acres. Geotechnical results for Lifts I, II, and III (Compaction and Permeability) are provided as **Appendix C**. A CPN Nuclear Density Gauge, operated by a licensed sample technician from Jaca and Sierra, was used to document the compaction effort. A copy of the current instrument calibration for the CPN Nuclear Density Gauge and the technician's operator's certification was kept on file at the on site project office.

2.5 VEGETATIVE ESTABLISHMENT LAYER

Approximately 39,635.94 tons of topsoil were received on site to establish a component of the 6-inch thick vegetative establishment layer. The vegetative layer consisted of approximately 2 inches of non-compacted clay (still capable of sustaining native plant growth) and 4 inches of topsoil.

The material placed in this layer only had compaction incidental to the placement. No compaction or permeability testing was performed on this layer. Samples of the soil were collected and analyzed by an agronomy lab for nutrient analysis and amendment recommendations prior to material placement and hydroseeding. Lime and fertilizer were applied as required.

Upon completion of site activities, all disturbed areas were fine graded and re-seeded. The purpose of this activity was to restore the area to natural conditions to encourage the growth of natural flora and to minimize environmental damage during the post-construction period. Seed and mulch were applied to all disturbed areas. The seed mixture consisted of Perennial Rye grass and certified Bermuda grass. Extended term erosion control matting, model no. SC150 by North American Green was installed within the areas shown on **Figure 1**.

2.6 GAS VENT WELLS

Two sentinel wells were placed along the topographic high ridge of the final grade as detailed in **Figure 1**. Each vent consisted of a 6-inch diameter schedule 40 PVC riser connected to a 6-inch perforated lateral via a tee fitting, with gravel covering the perforated piping. As stated in the *Landfill Closure Plan* dated October 2004 prepared by EnSafe, Inc., it is not anticipated that

lateral gas migration will be an issue. These vent wells will serve as monitoring locations and allow for vertical migration of gases. Should monitoring be warranted in the future, additional wells can be readily installed as necessary.

2.7 FINAL SURVEY

A final topographic survey was performed by F&S Surveying upon completion of the low permeability soil cap installation. The data from the survey was subsequently used to prepare an as-built drawing of the completed site (**Figure 1**).

2.8 FINAL INSPECTION

Final acceptance of the completed project was based on a final inspection of the project site that occurred on December 20, 2007 with the ROICC and Shaw Site Superintendent. All punch list items were completed prior to final inspection. The purpose of this inspection was to verify that all the tasks identified on the punch list and all tasks detailed in the contract have been completed to the US Navy's satisfaction. Notice of Termination (NOT) for the coverage under EPA's National Pollutant Discharge Elimination System (NPDES) Stormwater Construction General Permit (CGP) was submitted and the permit was terminated effective midnight February 14, 2008 (**Appendix D**).

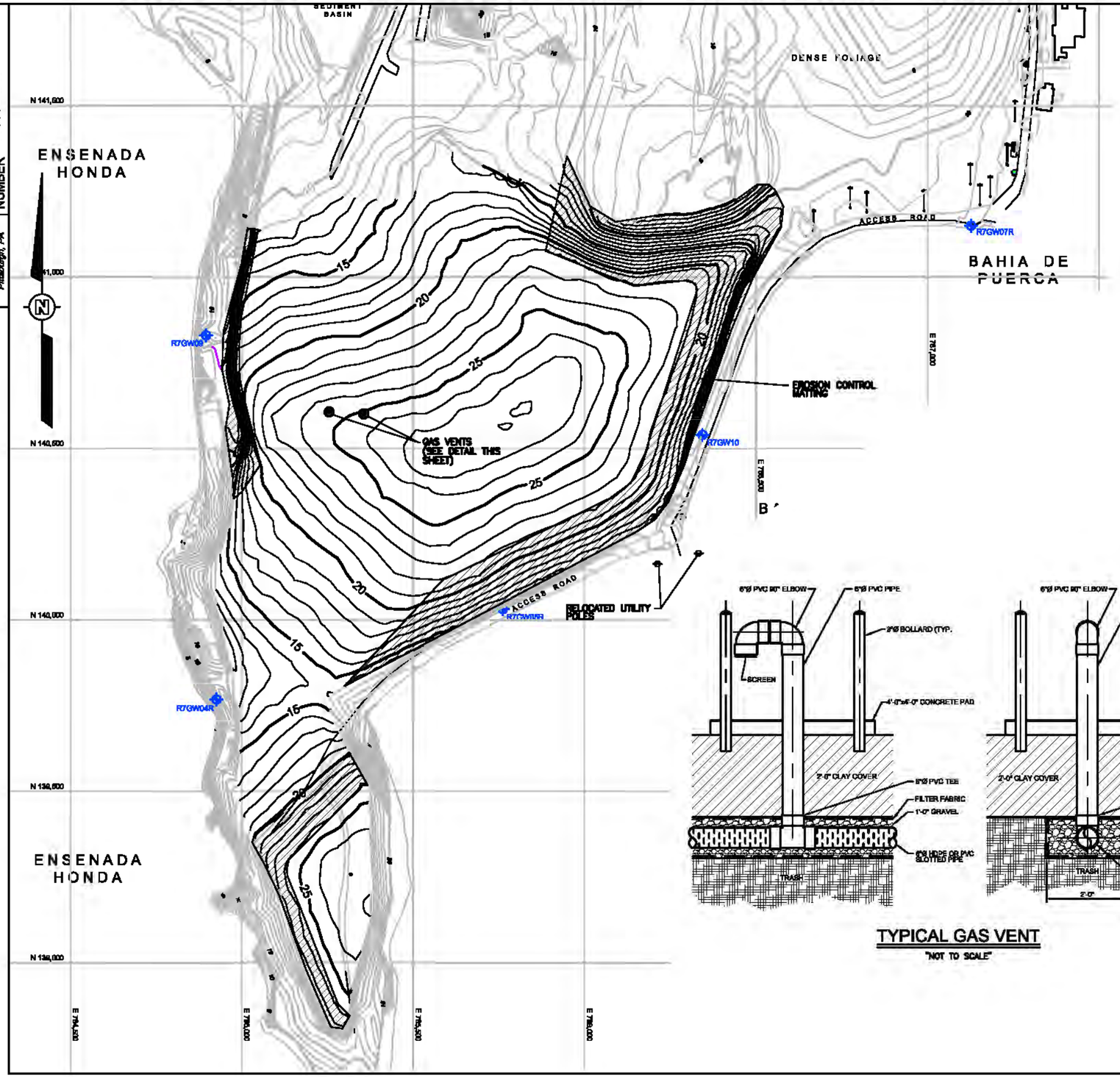
This completion report also serves as the certification from the independent registered professional engineer authorized to practice in Puerto Rico that the closure was performed in accordance with the approved closure plan and EQB Non-Hazardous Solid Waste Regulation Rule 565 (H) as stated in the *Certification of Closure.*

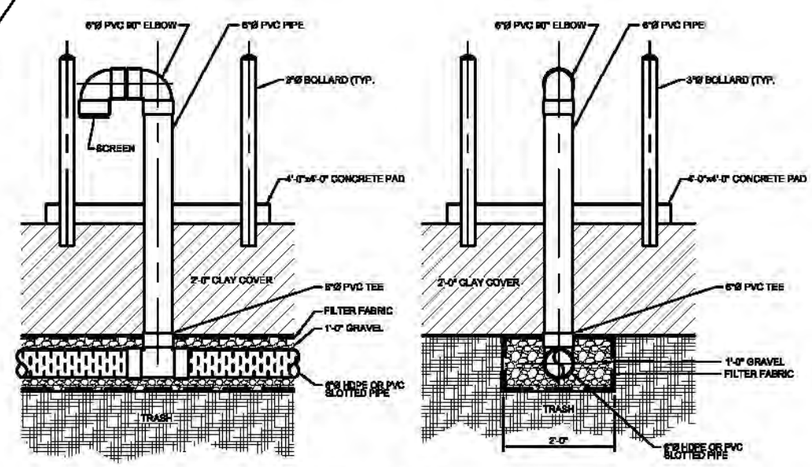
2.9 POST CLOSURE CARE

Right Way Environmental will maintain the vegetative cover of the clay cap for a period of 12 months after completion of final site re-vegetation and demobilization. The site will be inspected monthly and repairs made as required. Cutting of site vegetation will occur quarterly with the first event occurring 3 months after project demobilization. A maintenance report will be submitted to the Navy listing all actions taken, site conditions, and any problems encountered during the monthly inspection once cutting has been completed.

Figures

OFFICE: Pittsburgh, PA
DRAWING NUMBER: 110050-D17





TYPICAL GAS VENT

"NOT TO SCALE"

LEGEND:

- R2GW06 — EXISTING MONITORING WELL
- UTILITY POLE
- EXISTING GROUND CONTOUR (FEET MSL)

REFERENCE:

1. TOPOGRAPHY PREPARED BY F3 SURVEYING, LAND SURVEYORS CONSULTANTS, CUGUAS, PUERTO RICO, DATED: JANUARY 2005; SCALE: 1"=100' WITH 1' CONTOURS.
2. HORIZONTAL CONTROL USED ON THIS PLAN ARE REFERRED TO THE ROOSEVELT ROADS NAVAL STATION COORDINATE SYSTEM. REFERENCE WAS MADE BY GPS OBSERVATION USING AS BASE POINT E.M. WITH THE FOLLOWING SUPPLIED VALUES:

N: 143,078.8338
E: 786,968.6999
ELEV.: 5.380

SCALE
0 150 300 450 FEET

REVISIONS								
0	10/8/04	ACS	PBV	JRF	ISSUED FOR EBS REVIEW			
REV	DATE	BY	CHK'D	APPR'D	DESCRIPTION/ISSUE			

Shaw Environmental, Inc.

DESIGNED BY: A. Smith 8/1/04
DRAWN BY: P. Varner 8/9/04
CHECKED BY: J. Fellows 8/9/04
APPROVED BY:

NAVFAC Naval Facilities Engineering Command Atlantic Division

NAVR: PUERTO RICO
EXISTING LANDFILL CLOSURE, CELBA, PUERTO RICO
FINAL AS-BUILT GRADES

SCALE: AS SHOWN
SIZE: D
DRAWING ORDER NO.: —
CONTR. CONTRACT NO.: N62470-03-D-3280
NAVFAC DRAWING NO.: —
SHEET I.D.: Figure 1

Image: NAVFAC Picture2
Xref: .
O:\Project\LANTDIV\Puerto Rico\110050\VS-BUILT\110050D17.dwg
Plot Date/Time: 01/25/05 08:00am
Plotted by: greg_jones

Appendix A
Photographic Documentation

CTO 34 Photographic Documentation

Original site conditions as seen from the Phase III mound.

Clearing and grubbing was performed at the site. Small debris was chipped on-site and stockpiled for later use as ground cover.

Silt fence was installed around the site perimeter according to drawing C-3 in the Work Plan.

Weigh station used to collect accurate weights of materials imported to the site.

Pedro Green's borrow pit; source of clay material for landfill cap.

Stockpile of clay material brought in from Pedro Greens Pit. Stockpile was located in the Phase III area.

Use of a hydraulic hammer to break large rock formations/concrete debris uncovered during waste re-grade.

Placement of debris referenced in LOC 34-2.

Test Pad after Sheepsfoot and Smooth Drum vibratory roller passes. Test pad was constructed to help determine the most efficient way of installing and compacting the clay cap.

Waste re-grading of the Phase I area.

Waste re-grading of the Phase II area.

Waste re-grading of Phase III area.

Landfill Clay Capping

Excavation of soft spots in the landfill prior to capping. These "soft" spots were caused by high densities of wet trash. Soft spots were primarily found near the monitoring well in the Phase 1 Area. Excavations were backfilled and compacted with clean dirt prior to clay capping.

A nuclear density gauge operated by a certified technician was used to perform compaction testing on the clay cap. Tests were performed at the frequency of 5 per acre.

View from the top of Phase III mound looking over the progress of clay capping in the Phase I area.

View from the top of the Phase III mound looking over the clay capping effort proceeding into the Phase II area.

A view from Phase II looking over the Phase III area clay capping.

After the completion of clay capping the entire area was covered with a 4-inch layer of topsoil.

Erosion Matting was placed around the site consistent with the as-built drawing presented in this Completion Report.

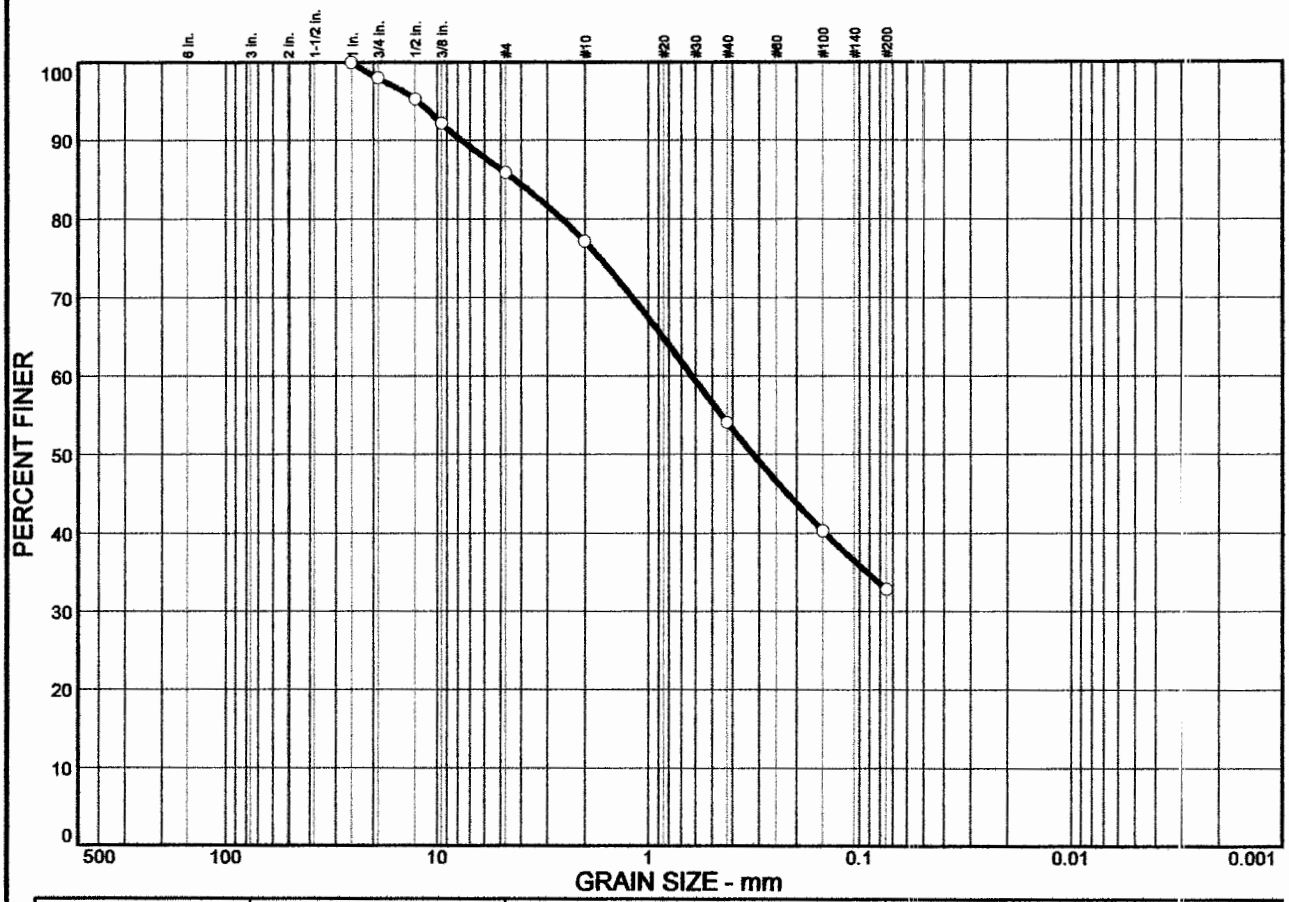
Two gas vents were installed in southern end of the Phase III area of the site. Their locations can be found on the as-built drawing provided in the Closure Report.

Restored condition (prior to initial mowing) of areas of the site completed prior to December 2007, looking north from the southern tip of the landfill.

Area near Phase III completed in November/December 2007.

Appendix B
Incoming Clay Material Analyses
(on CD)

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	14.1	53.1	32.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	98.0		
.50 in.	95.3		
.375 in.	92.2		
#4	85.9		
#10	77.1		
#40	54.1		
#100	40.3		
#200	32.8		

* (no specification provided)

Material Description

Yellowish brown, clayey sand

Atterberg Limits

PL= 23 LL= 39 PI= 16

Coefficients

D_{85}= 4.28 D_{60}= 0.624 D_{50}= 0.320
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-2-6(1)

Remarks

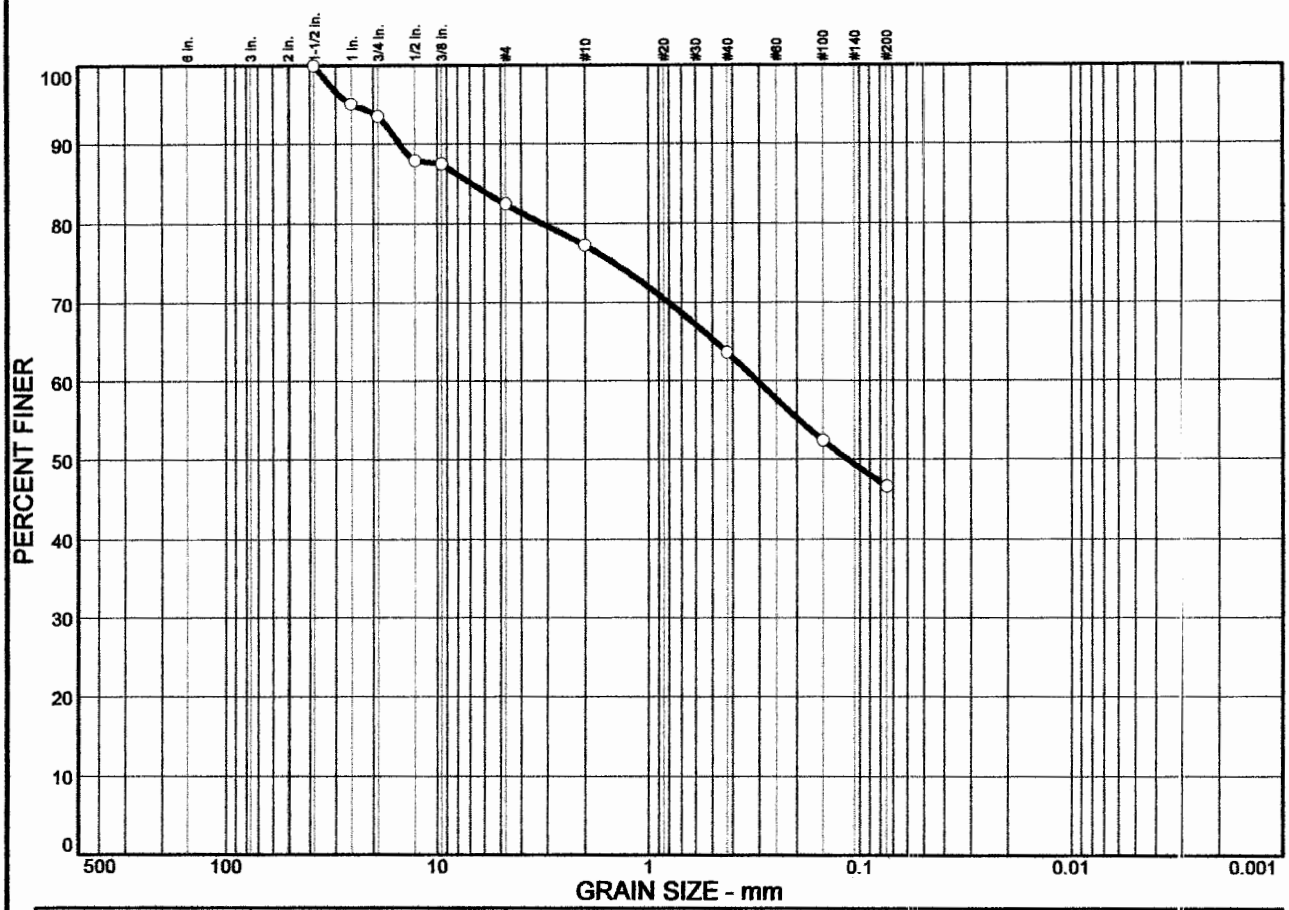
Tested by: S.Martinez
Checked by: Carlos Sierra, MSCE

Sample No.: 2 **Source of Sample:** Project Site **Date:** 2/2/07
Location: 1.22.07 LD #110 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	17.6	35.8	46.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	95.1		
.75 in.	93.5		
.50 in.	87.9		
.375 in.	87.5		
#4	82.4		
#10	77.2		
#40	63.6		
#100	52.4		
#200	46.6		

* (no specification provided)

Material Description

Strong brown, clayey sand with gravel

Atterberg Limits

PL= 28 LL= 54 PI= 26

Coefficients

D_{85}= 6.87 D_{60}= 0.307 D_{50}= 0.115
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-7-6(8)

Remarks

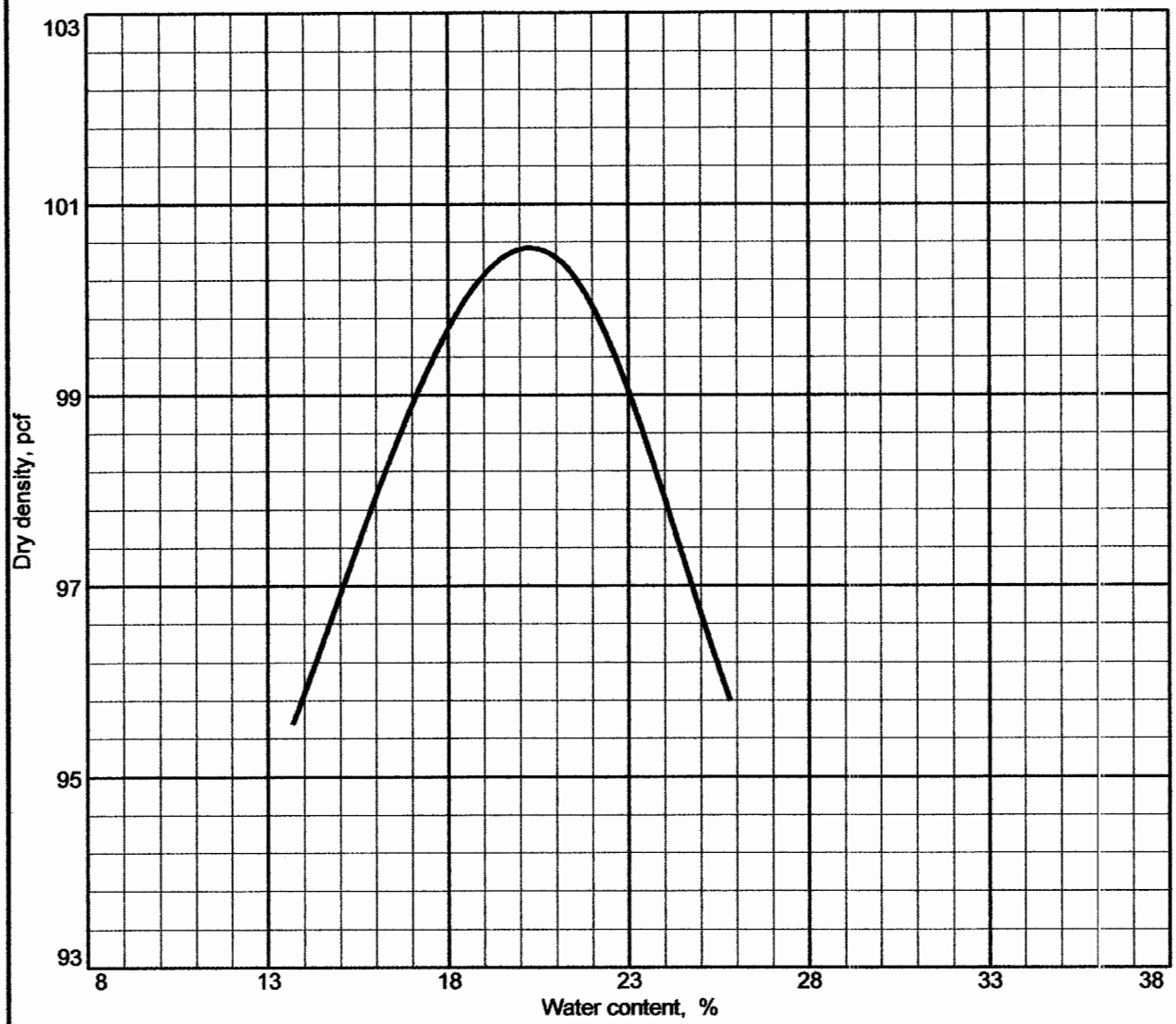
Tested by: S.Martinez
Checked by: Carlos Sierra, MSCE

Sample No.: 4 **Source of Sample:** Project Site **Date:** 2/2/07
Location: 1.23.07 LD #220 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	SC	A-7-6(8)			54	26	17.6	46.6

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 101 pcf Optimum moisture = 20 %	Strong brown, clayey sand with gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Location: 1.23.07 LD #220

Remarks:
Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	19.3	35.2	45.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	90.8		
.50 in.	87.6		
.375 in.	85.1		
#4	80.7		
#10	75.1		
#40	61.9		
#100	51.2		
#200	45.5		

* (no specification provided)

Material Description

Strong brown, clayey sand with gravel

Atterberg Limits

PL= 23 LL= 37 PI= 14

Coefficients

D_{85}= 9.42 D_{60}= 0.354 D_{50}= 0.131
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(3)

Remarks

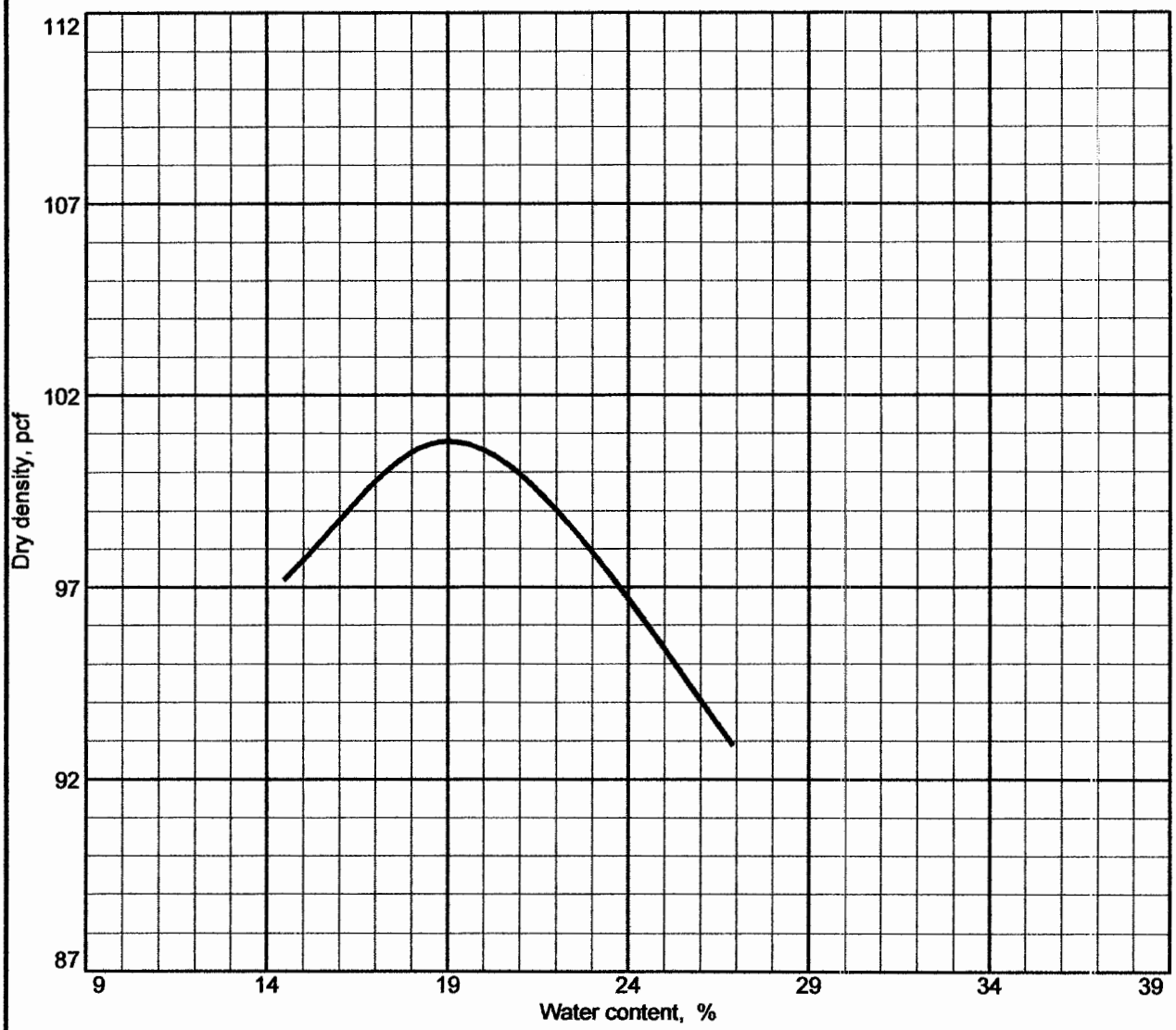
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 7 **Source of Sample:** Project Site **Date:** 2/6/07
Location: 1.23.07 LD #288 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	SC	A-6(3)			37	14	19.3	45.5

TEST RESULTS

Maximum dry density = 101 pcf

Optimum moisture = 19 %

MATERIAL DESCRIPTION

Strong brown, clayey sand with gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

Location: 1.23.07 LD #288

Remarks:

Tested by: S.Martinez

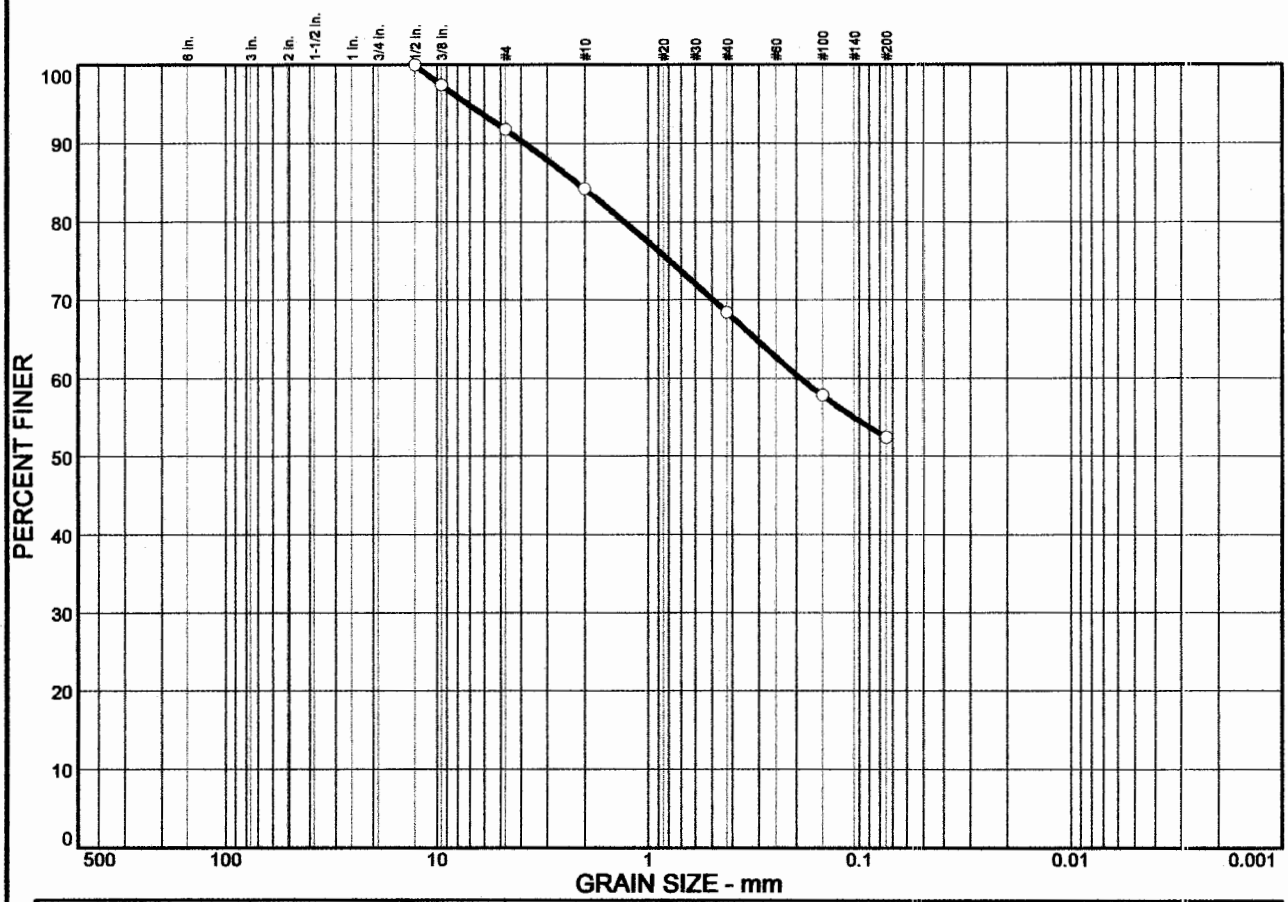
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	8.2	39.4	52.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50 in.	100.0		
.375 in.	97.4		
#4	91.8		
#10	84.2		
#40	68.4		
#100	57.8		
#200	52.4		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay

Atterberg Limits

PL= 22 LL= 45 PI= 23

Coefficients

D_{85}= 2.18 D_{60}= 0.190 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(9)

Remarks

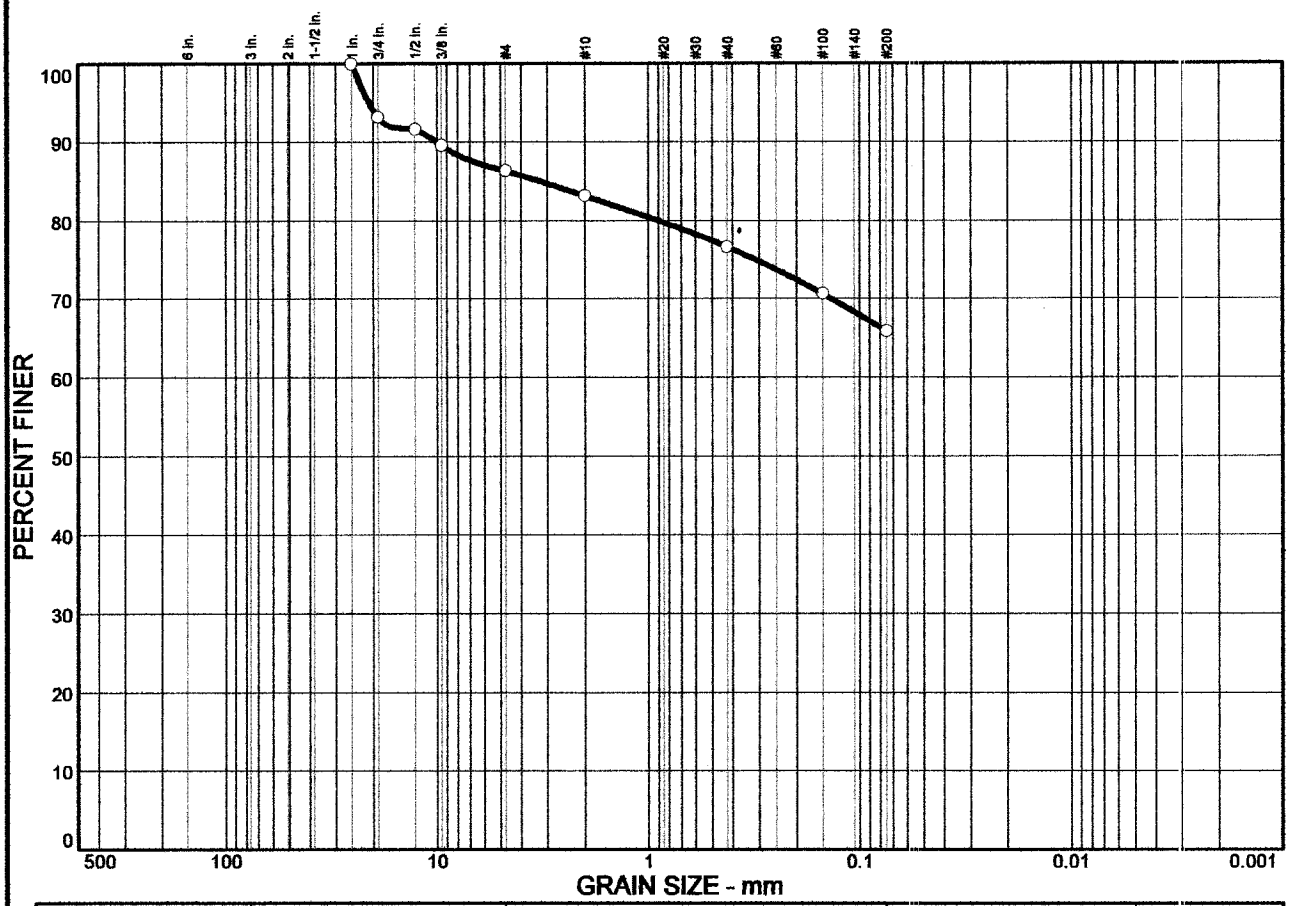
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 14 **Source of Sample:** Project Site **Date:** 2/7/07
Location: 1.23.07 LD #330 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	13.6	20.5	65.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	93.2		
.50 in.	91.6		
.375 in.	89.6		
#4	86.4		
#10	83.2		
#40	76.6		
#100	70.6		
#200	65.9		

* (no specification provided)

Material Description

Strong brown, sandy lean clay

Atterberg Limits

PL= 24 LL= 41 PI= 17

Coefficients

D_{85}= 3.19 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(10)

Remarks

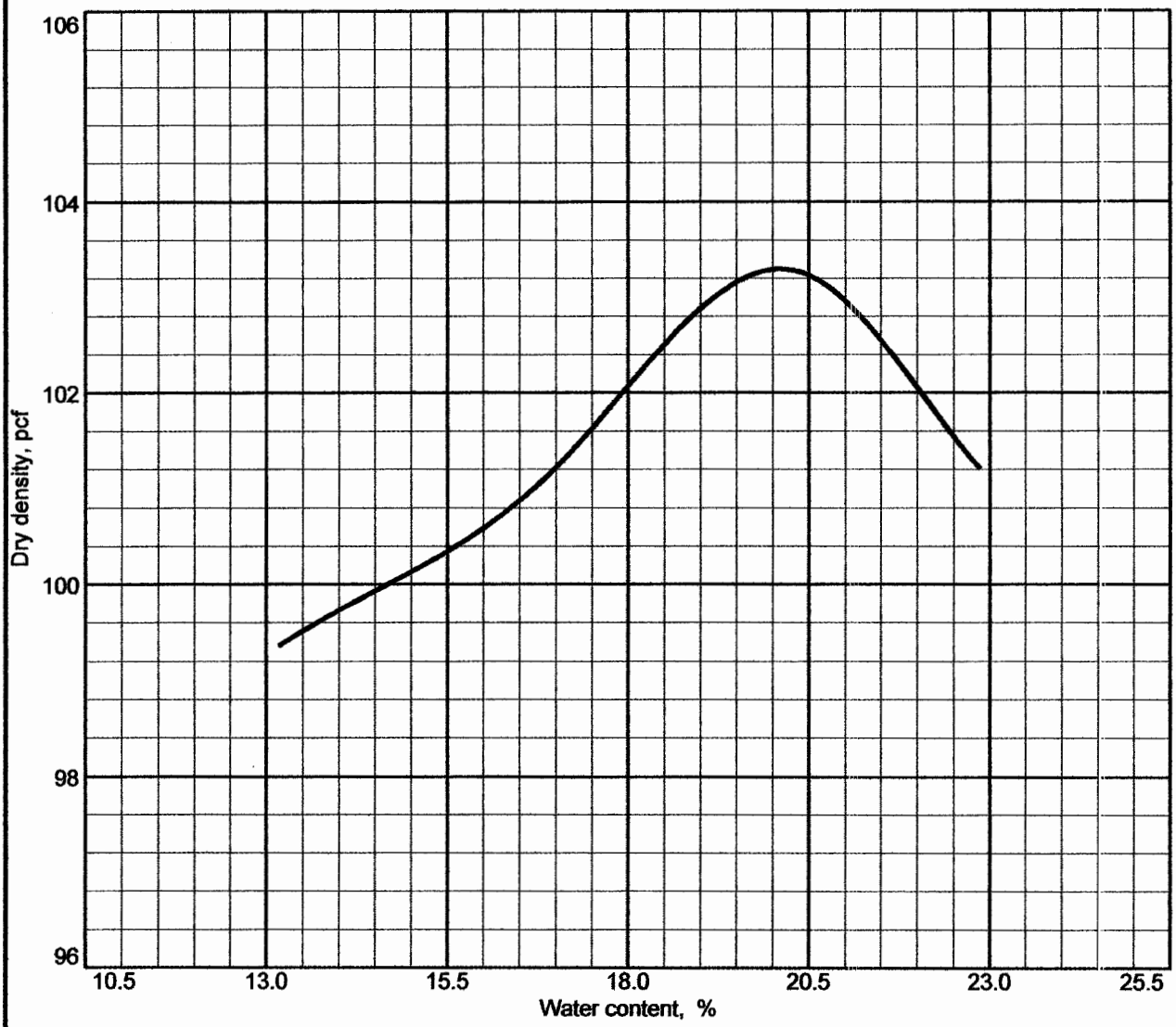
Tested by: S.Martinez
Checked by: Carlos Sierra, MSCE

Sample No.: 3 **Source of Sample:** Project Site **Date:** 2/2/07
Location: 1.23.07 LD #440 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	CL	A-7-6(10)			41	17	10.4	65.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103 pcf Optimum moisture = 20 %	Strong brown, sandy lean clay

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
• **Location:** 1.23.07 LD #440

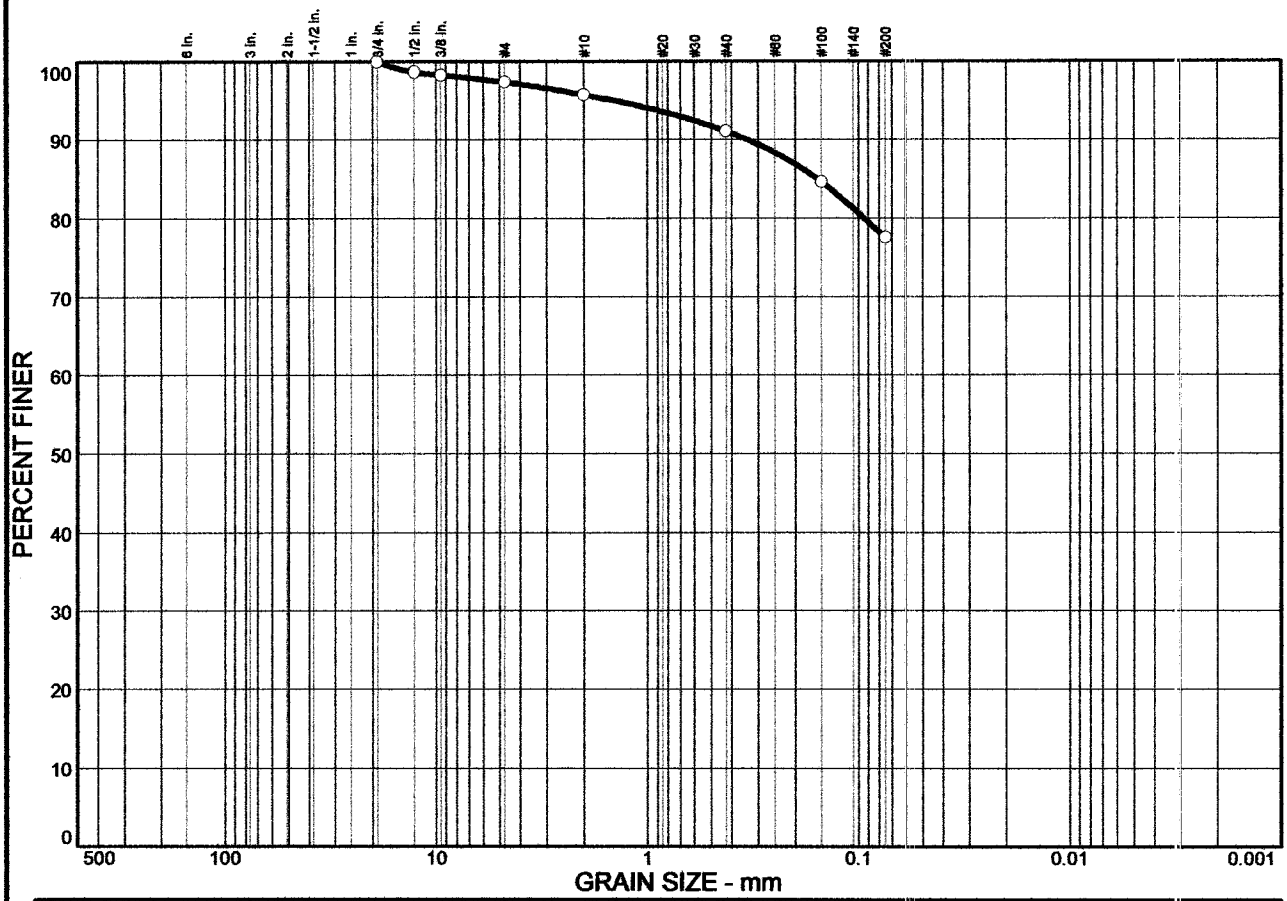
Remarks:
Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.6	19.9	77.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.50 in.	98.7		
.375 in.	98.3		
#4	97.4		
#10	95.8		
#40	91.1		
#100	84.6		
#200	77.5		

* (no specification provided)

Material Description

Brownish yellow, lean clay with sand

Atterberg Limits

PL= 22 LL= 34 PI= 12

Coefficients

D_{85}= 0.157 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(9)

Remarks

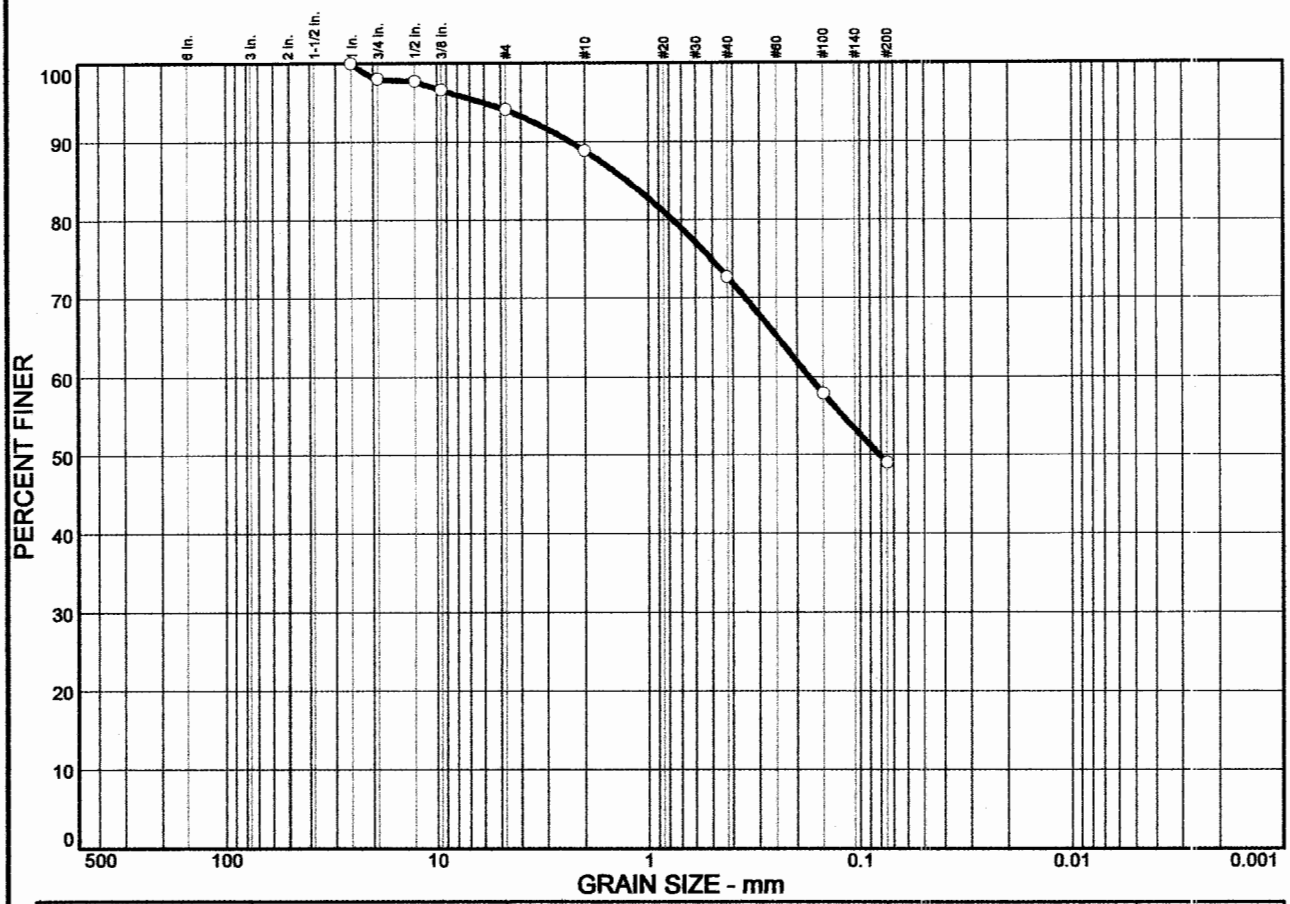
Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 8 **Source of Sample:** Project Site **Date:** 2/6/07
Location: 1.24.07 LD #550 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	5.9	45.1	49.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	98.0		
.50 in.	97.7		
.375 in.	96.6		
#4	94.1		
#10	88.9		
#40	72.7		
#100	57.9		
#200	49.0		

* (no specification provided)

Material Description

Brownish yellow, clayey sand

Atterberg Limits

PL= 21 LL= 31 PI= 10

Coefficients

D_{85}= 1.26 D_{60}= 0.174 D_{50}= 0.0813
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-4(2)

Remarks

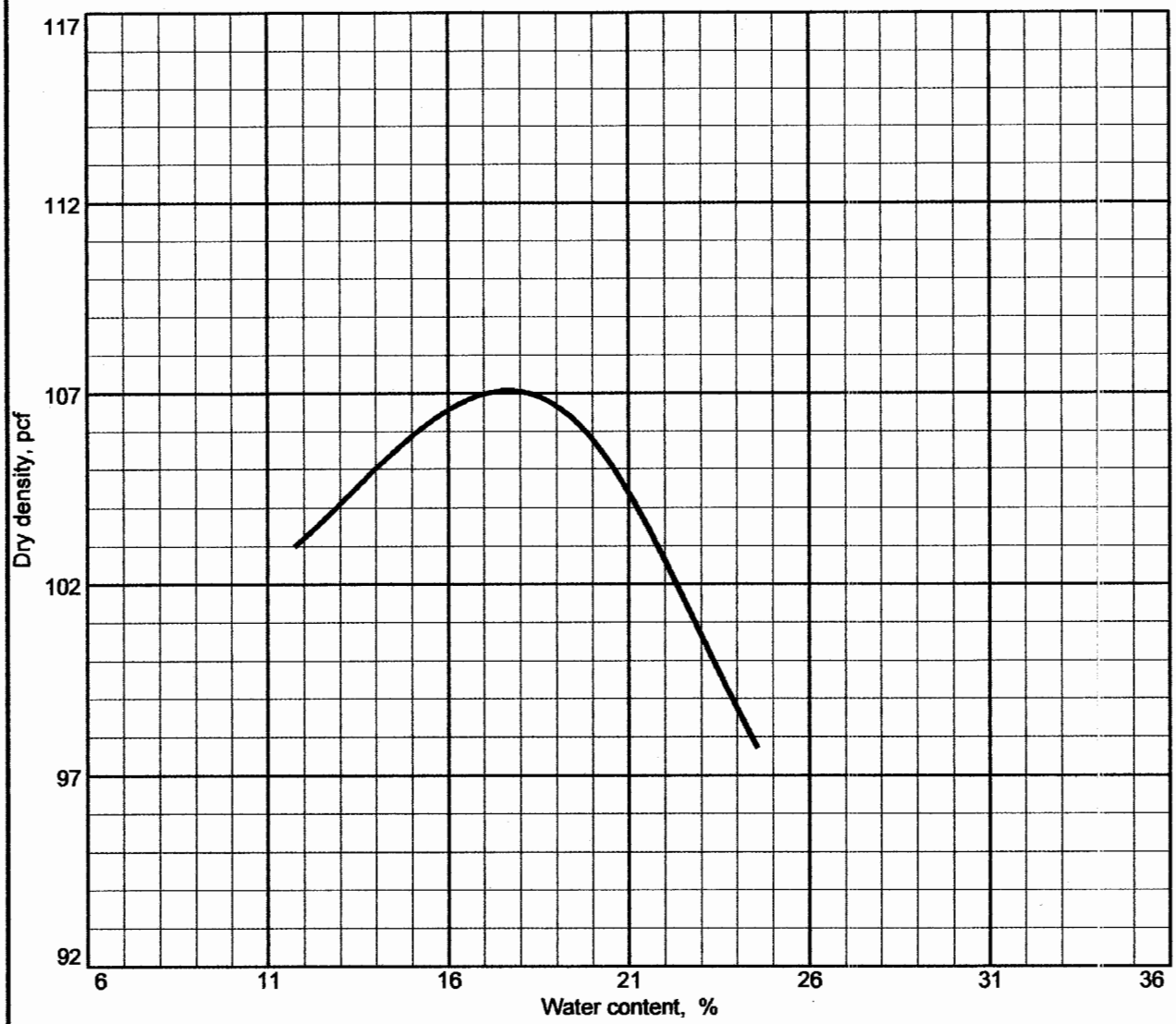
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 9 **Source of Sample:** Project Site **Date:** 2/7/07
Location: 1.24.07 LD #557 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	SC	A-4(2)			31	10	5.9	49.0

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 107 pcf Optimum moisture = 18 %	Brownish yellow, clayey sand

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 1.24.07 LD #557

Remarks:

Tested by: J.Lozada

Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.0	45.6	50.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.9		
.375 in.	98.6		
#4	96.0		
#10	89.5		
#40	71.6		
#100	58.0		
#200	50.4		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay

Atterberg Limits

PL= 19 LL= 35 PI= 16

Coefficients

D_{85}= 1.28 D_{60}= 0.177 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 13 **Source of Sample:** Project Site **Date:** 2/7/07
Location: 1.24.07 LD #660 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	10.1	36.6	53.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	96.7		
.75 in.	96.7		
.50 in.	95.5		
.375 in.	94.2		
#4	89.9		
#10	84.3		
#40	70.4		
#100	59.5		
#200	53.3		

* (no specification provided)

Material Description

Strong brown, sandy lean clay

Atterberg Limits

PL= 20 LL= 35 PI= 15

Coefficients

D_{85}= 2.21 D_{60}= 0.158 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

Tested by:S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 6 **Source of Sample:** Project Site **Date:** 2/6/07
Location: 1.25.07 LD #770 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	17.3	47.9	34.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	95.7		
.75 in.	92.1		
.50 in.	90.3		
.375 in.	88.7		
#4	82.7		
#10	73.2		
#40	53.2		
#100	41.0		
#200	34.8		

* (no specification provided)

Material Description

Brownish yellow, clayey sand with gravel

Atterberg Limits

PL= 21 LL= 31 PI= 10

Coefficients

D_{85}= 6.04 D_{60}= 0.714 D_{50}= 0.330
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-2-4(0)

Remarks

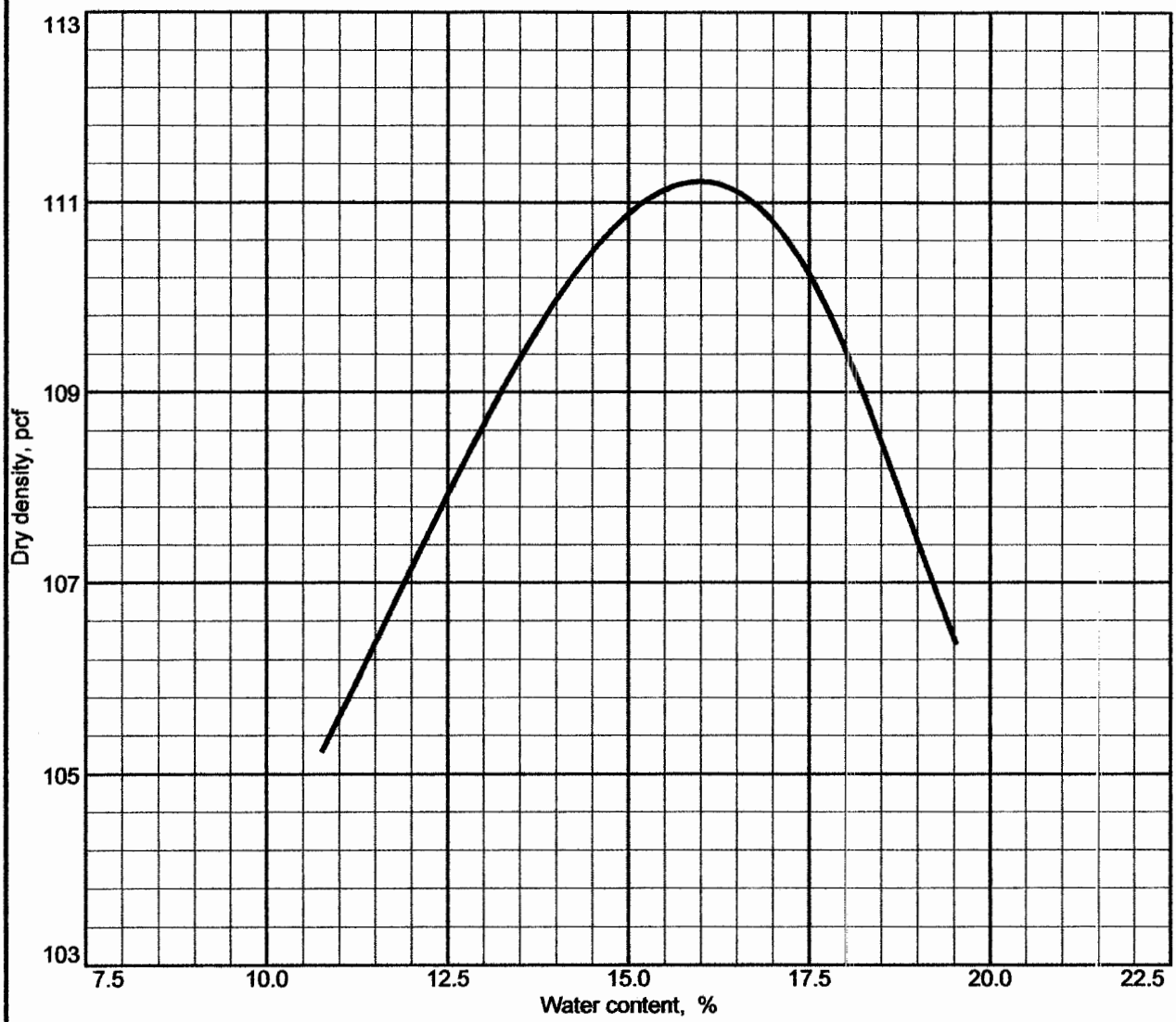
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 5 **Source of Sample:** Project Site **Date:** 2/6/07
Location: 1.25.07 LD #865 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% >	% < No.200
	USCS	AASHTO						
N/A	SC	A-2-4(0)			31	10	17.3	

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 111 pcf Optimum moisture = 16 %	Brownish yellow, clayey sand with gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 1.25.07 LD #865

Remarks:

Tested by: S.Martinez

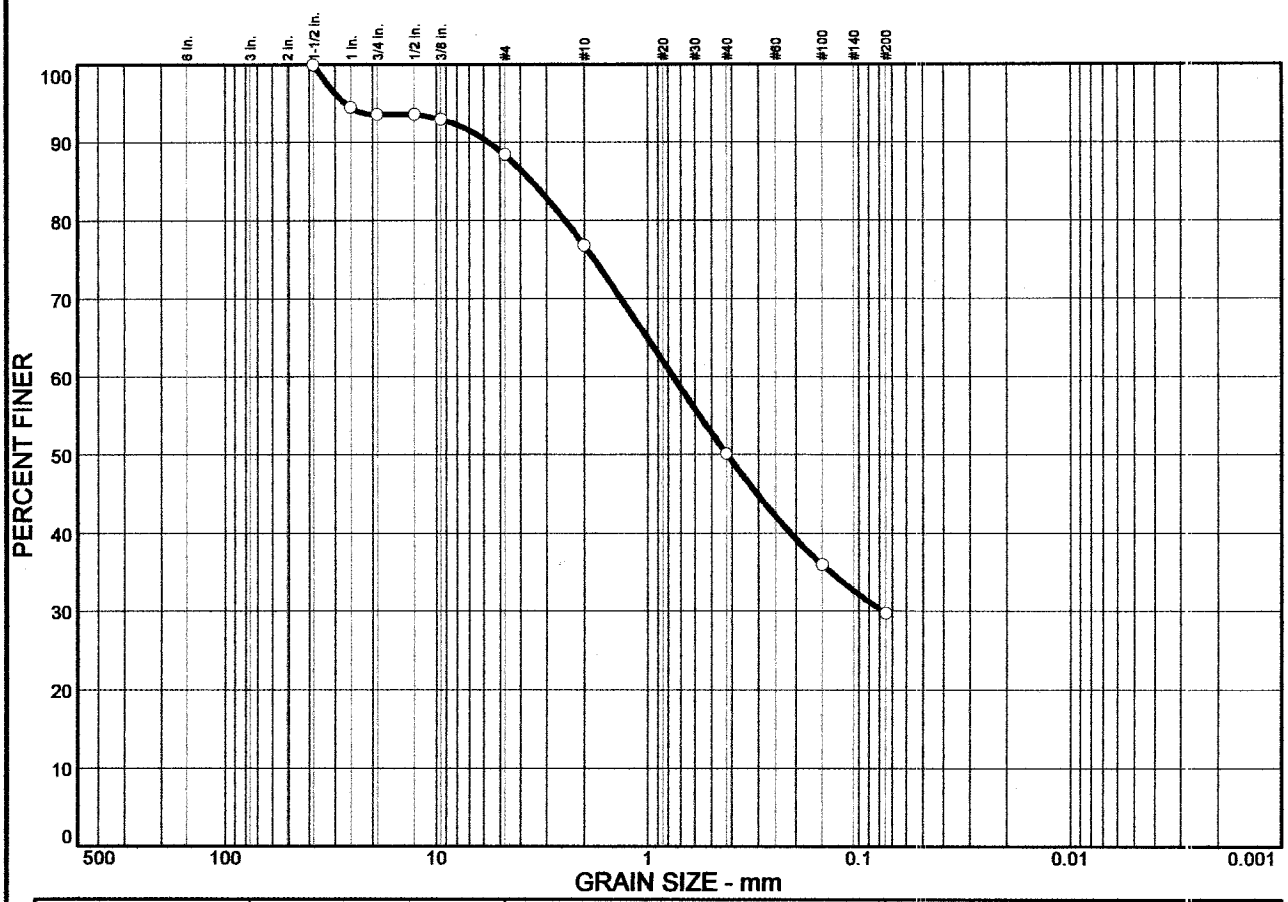
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	11.6	58.7	29.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	94.5		
.75 in.	93.6		
.50 in.	93.6		
.375 in.	93.0		
#4	88.4		
#10	76.7		
#40	50.1		
#100	36.0		
#200	29.7		

* (no specification provided)

Material Description

Brownish yellow, clayey sand

Atterberg Limits

PL= 20 LL= 33 PI= 13

Coefficients

D_{85}= 3.53 D_{60}= 0.761 D_{50}= 0.422
D_{30}= 0.0777 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-2-6(0)

Remarks

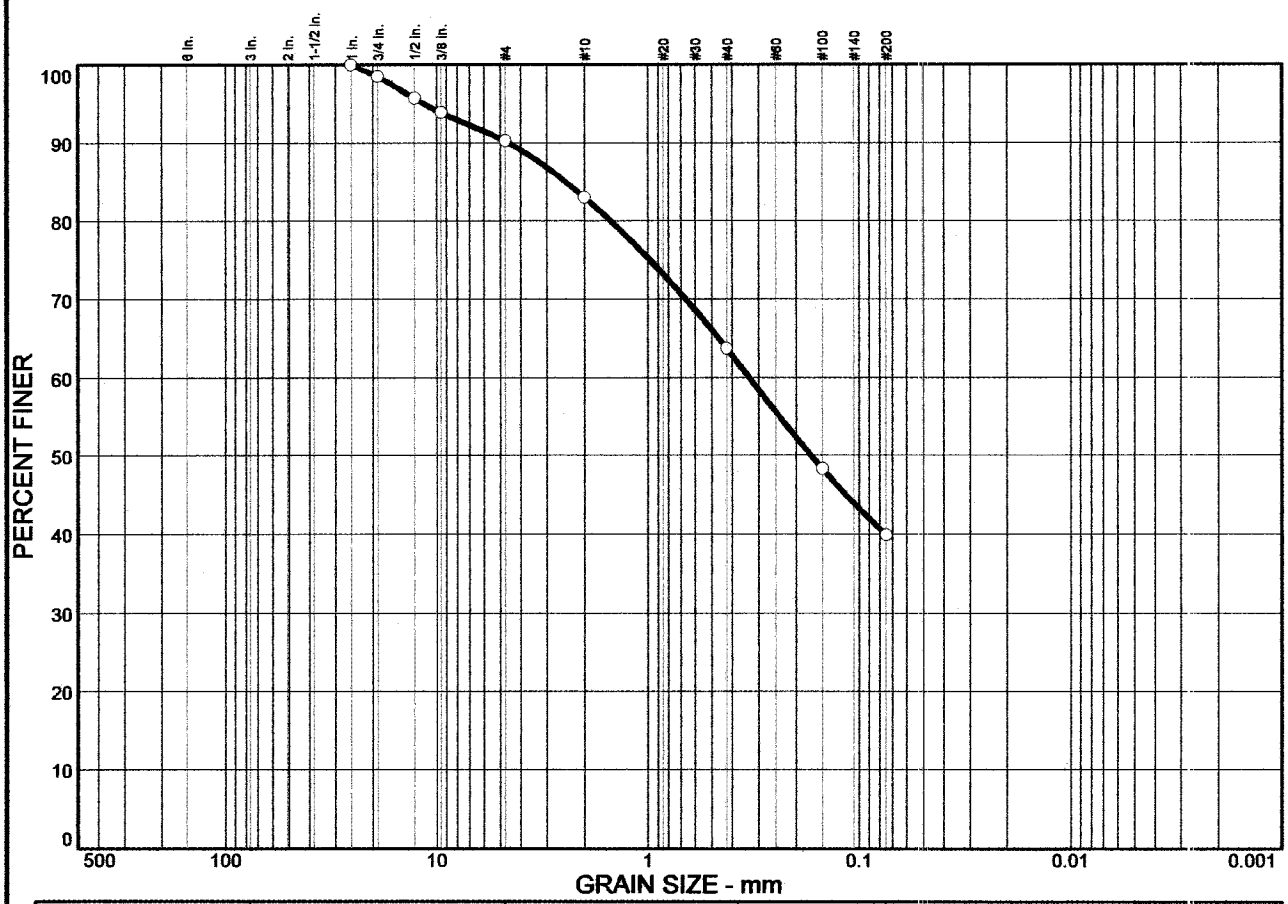
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 10 **Source of Sample:** Project Site **Date:** 2/7/07
Location: 1.26.07 LD #990 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	9.7	50.4	39.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	98.5		
.50 in.	95.7		
.375 in.	93.9		
#4	90.3		
#10	83.0		
#40	63.7		
#100	48.3		
#200	39.9		

* (no specification provided)

Material Description

Brownish yellow, clayey sand

Atterberg Limits

PL= 18 LL= 31 PI= 13

Coefficients

D_{85}= 2.45 D_{60}= 0.332 D_{50}= 0.170
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

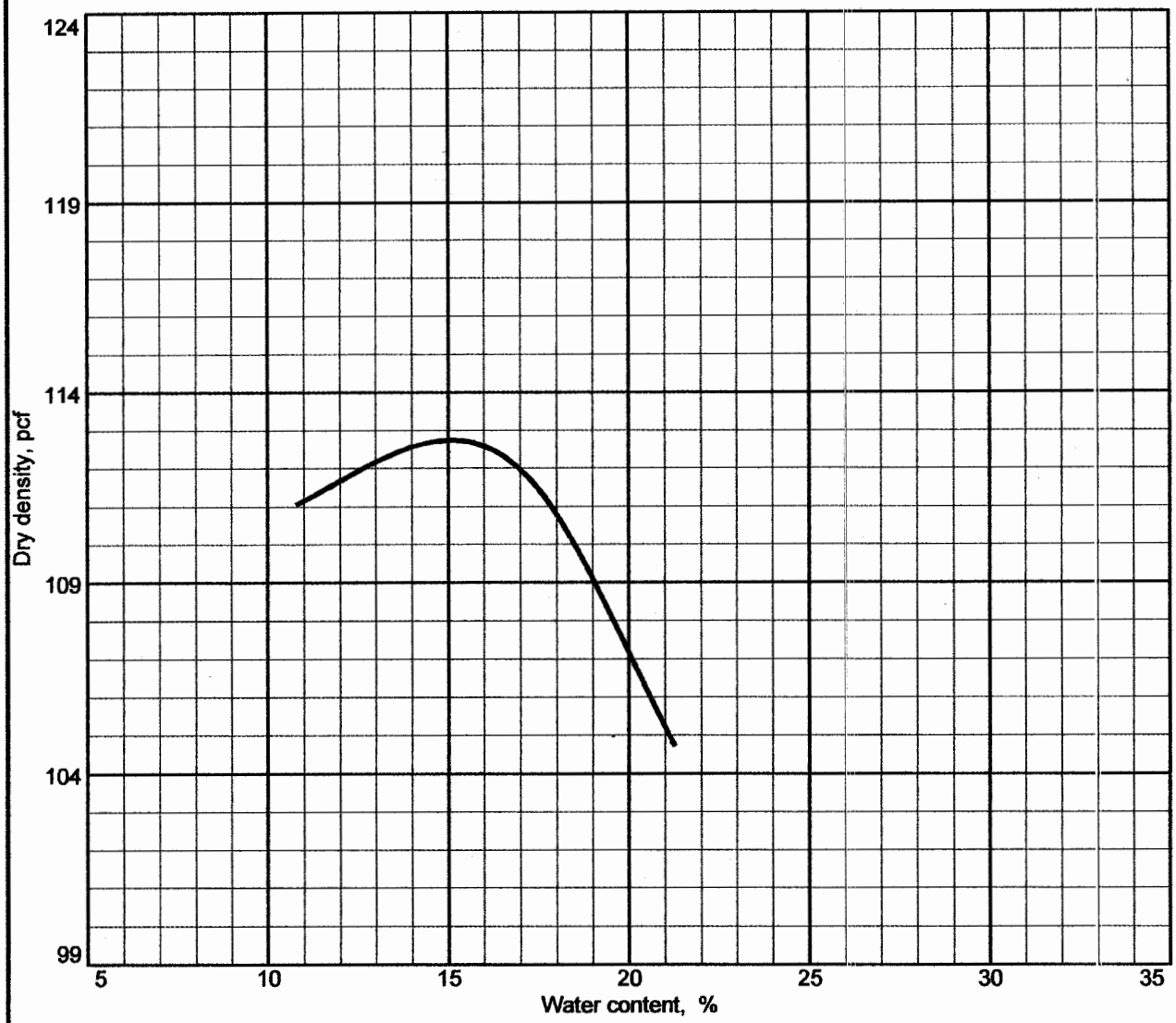
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 11 **Source of Sample:** Project Site **Date:** 2/7/07
Location: 1.29.07 LD #1100 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	SC	A-6(2)			31	13	9.7	39.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 113 pcf Optimum moisture = 15 %	Brownish yellow, clayey sand

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 1.29.07 LD #1100

Remarks:

Tested by: J.Lozada

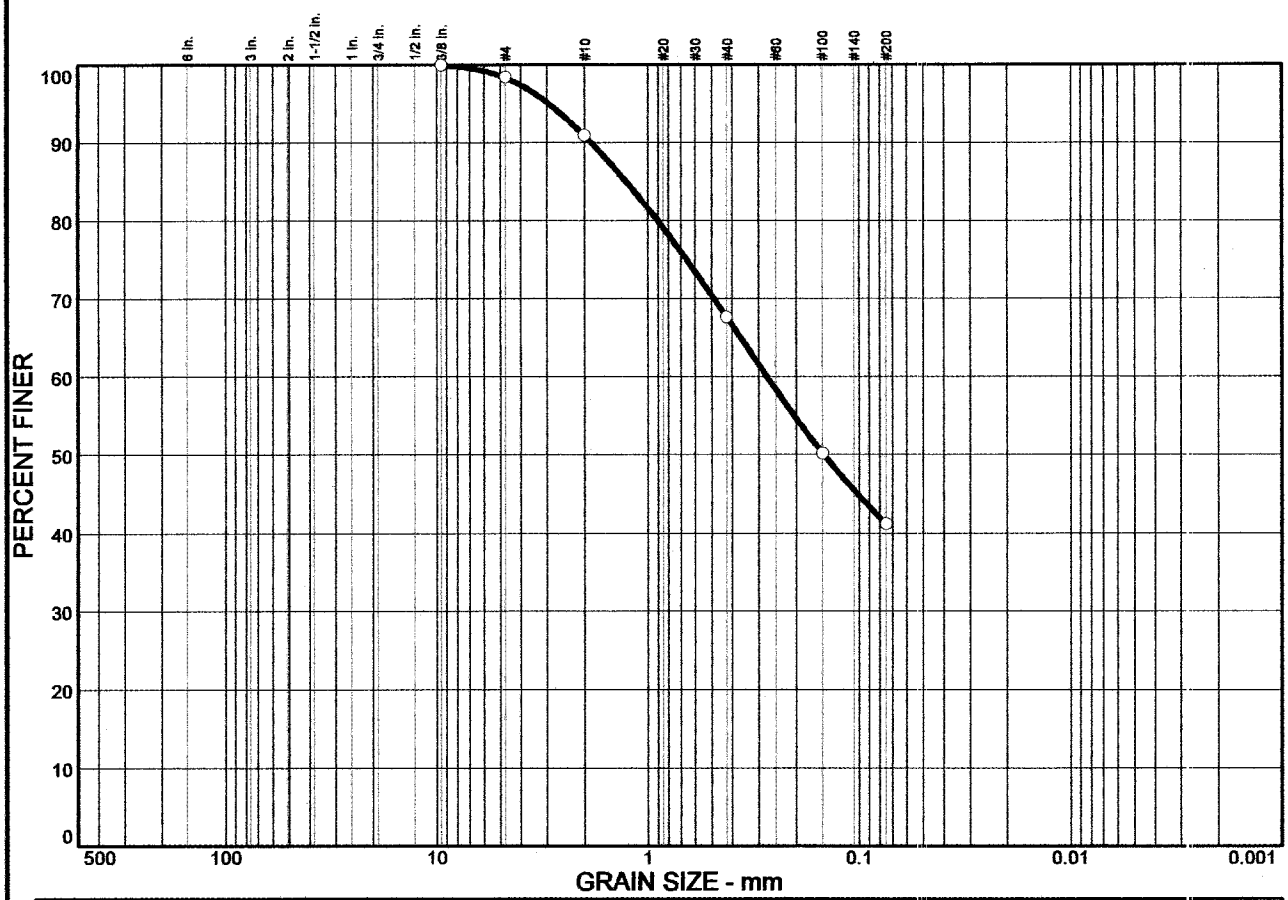
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.6	57.2	41.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	98.4		
#10	90.9		
#40	67.6		
#100	50.2		
#200	41.2		

* (no specification provided)

Material Description

Brownish yellow, clayey sand

Atterberg Limits

PL= 22 LL= 34 PI= 12

Coefficients

D_{85}= 1.27 D_{60}= 0.275 D_{50}= 0.148
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

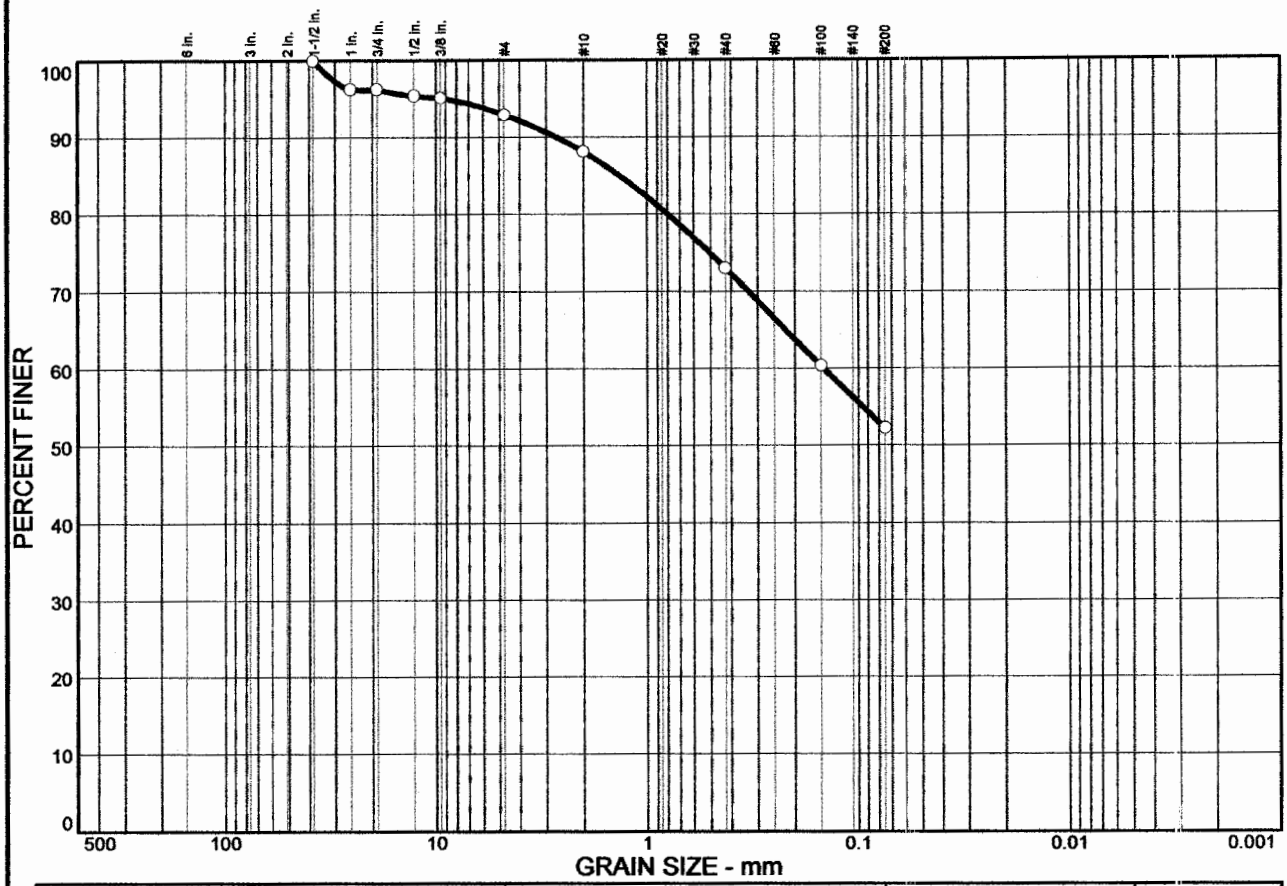
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 12 **Source of Sample:** Project Site **Date:** 2/7/07
Location: 1.29.07 LD #1153 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	7.0	40.8	52.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	96.3		
.75 in.	96.3		
.5 in.	95.5		
.375 in.	95.2		
#4	93.0		
#10	88.1		
#40	73.0		
#100	60.3		
#200	52.2		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay

Atterberg Limits

PL= 21 LL= 35 PI= 14

Coefficients

D_{85}= 1.35 D_{60}= 0.146 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(4)

Remarks

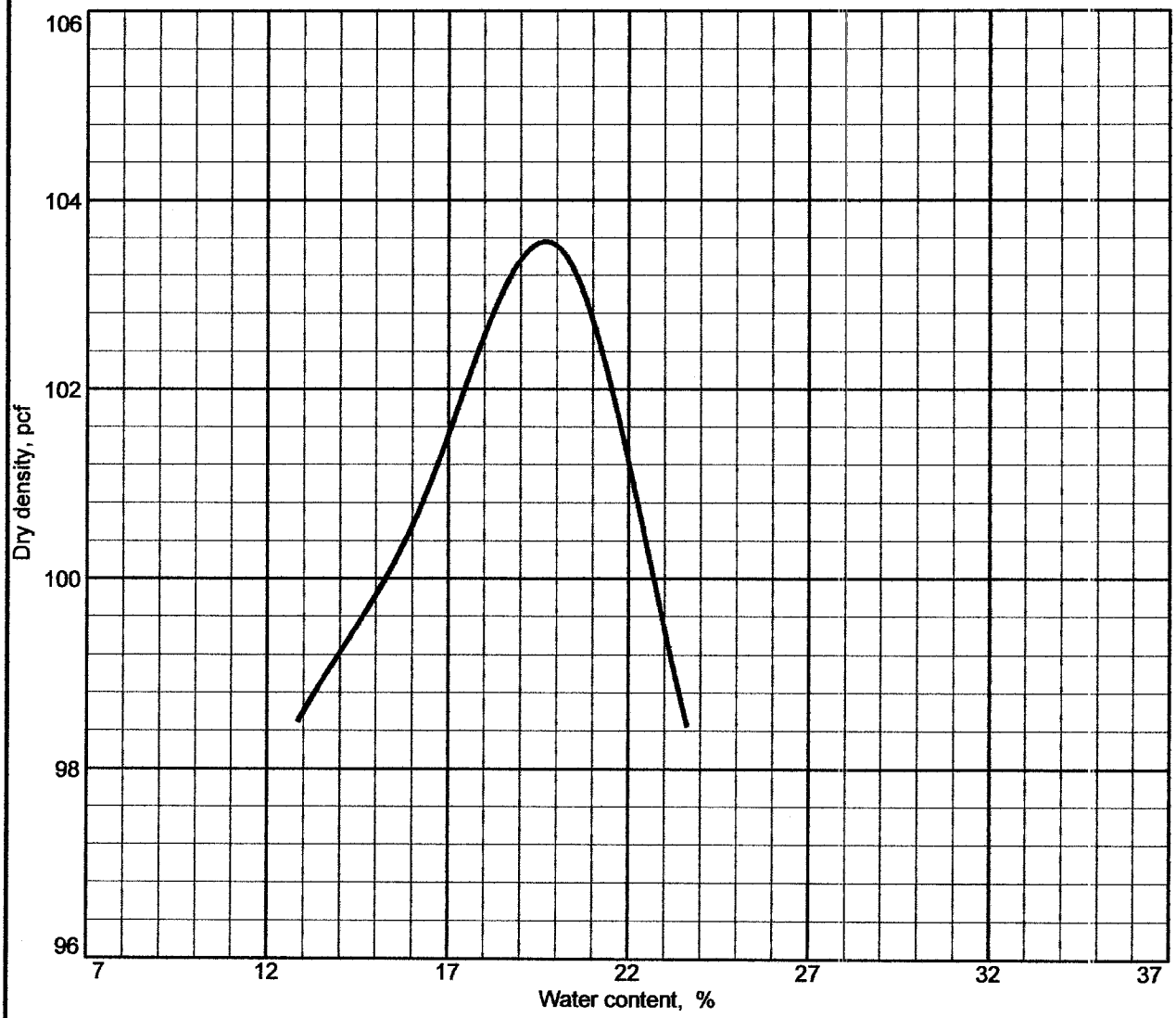
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 19 **Source of Sample:** Project Site **Date:** 2/14/07
Location: 1.25.07 LD #880 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	CL	A-6(4)			35	14	7.0	52.2

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104 pcf Optimum moisture = 20 %	Brownish yellow, sandy lean clay

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
• **Location:** 1.25.07 LD #880

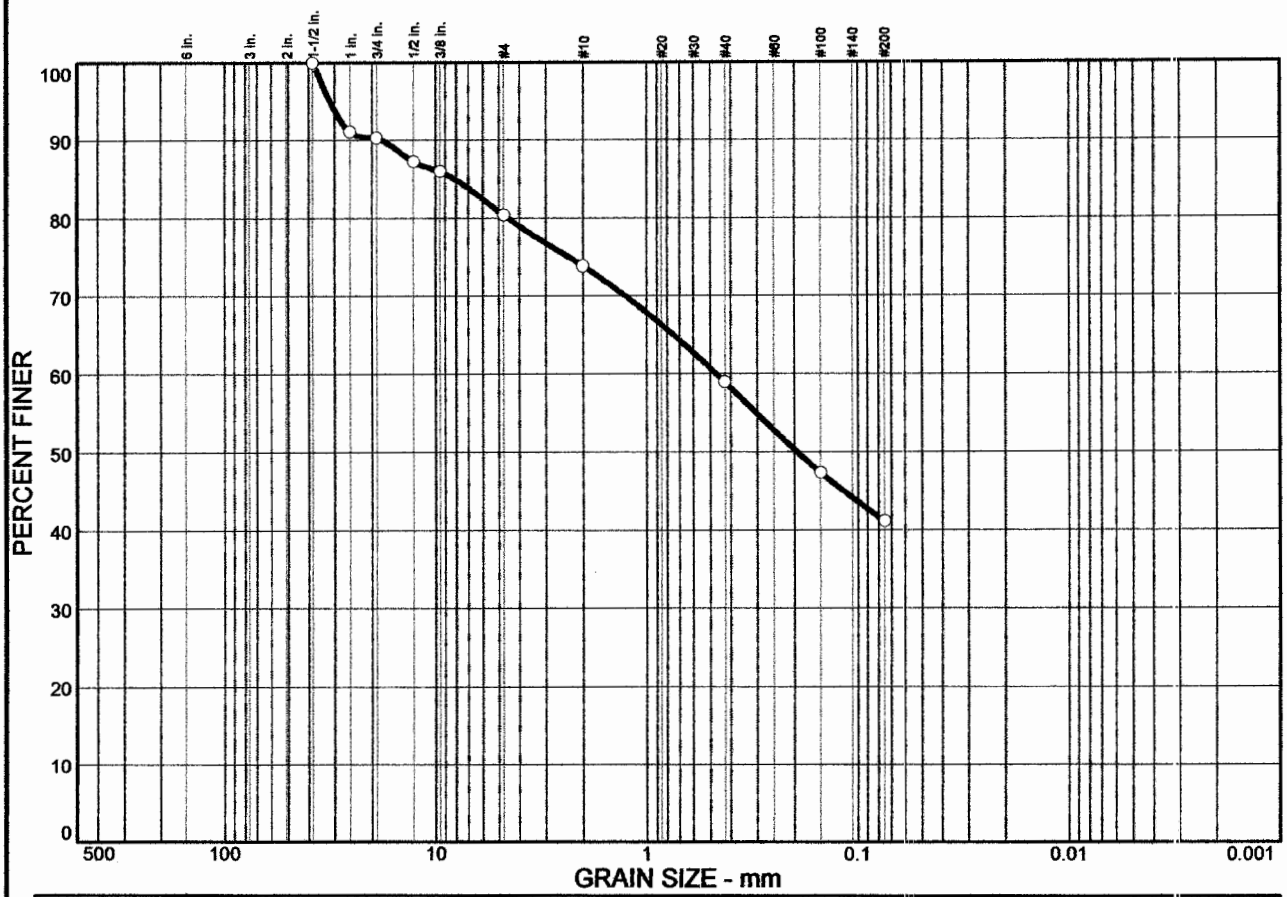
Remarks:
Tested by: D.Cotto
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	19.6	39.3	41.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	91.1		
.75 in.	90.3		
.5 in.	87.3		
.375 in.	86.0		
#4	80.4		
#10	73.8		
#40	58.9		
#100	47.3		
#200	41.1		

* (no specification provided)

Material Description

Brownish yellow, silt some gravel trace clay

Atterberg Limits

PL= 19 LL= 33 PI= 14

Coefficients

D_{85}= 8.06 D_{60}= 0.469 D_{50}= 0.194
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

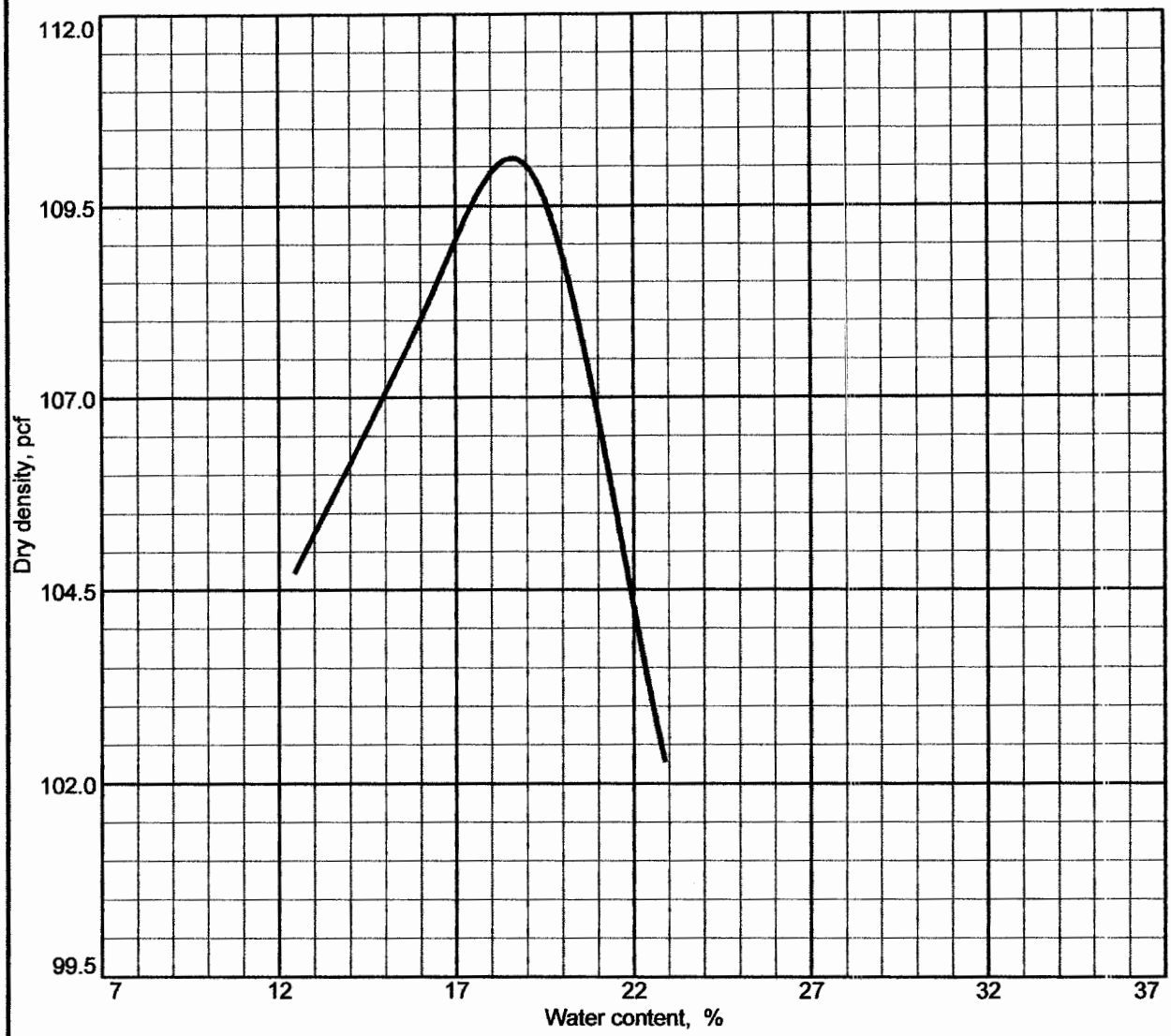
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 16 **Source of Sample:** Project Site **Date:** 2/14/07
Location: 1.29.07 LD #1210 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	SC	A-6(2)			33	14	19.6	41.1

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 110 pcf Optimum moisture = 19 %	Brownish yellow, silt some gravel trace clay

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Location: 1.29.07 LD #1210

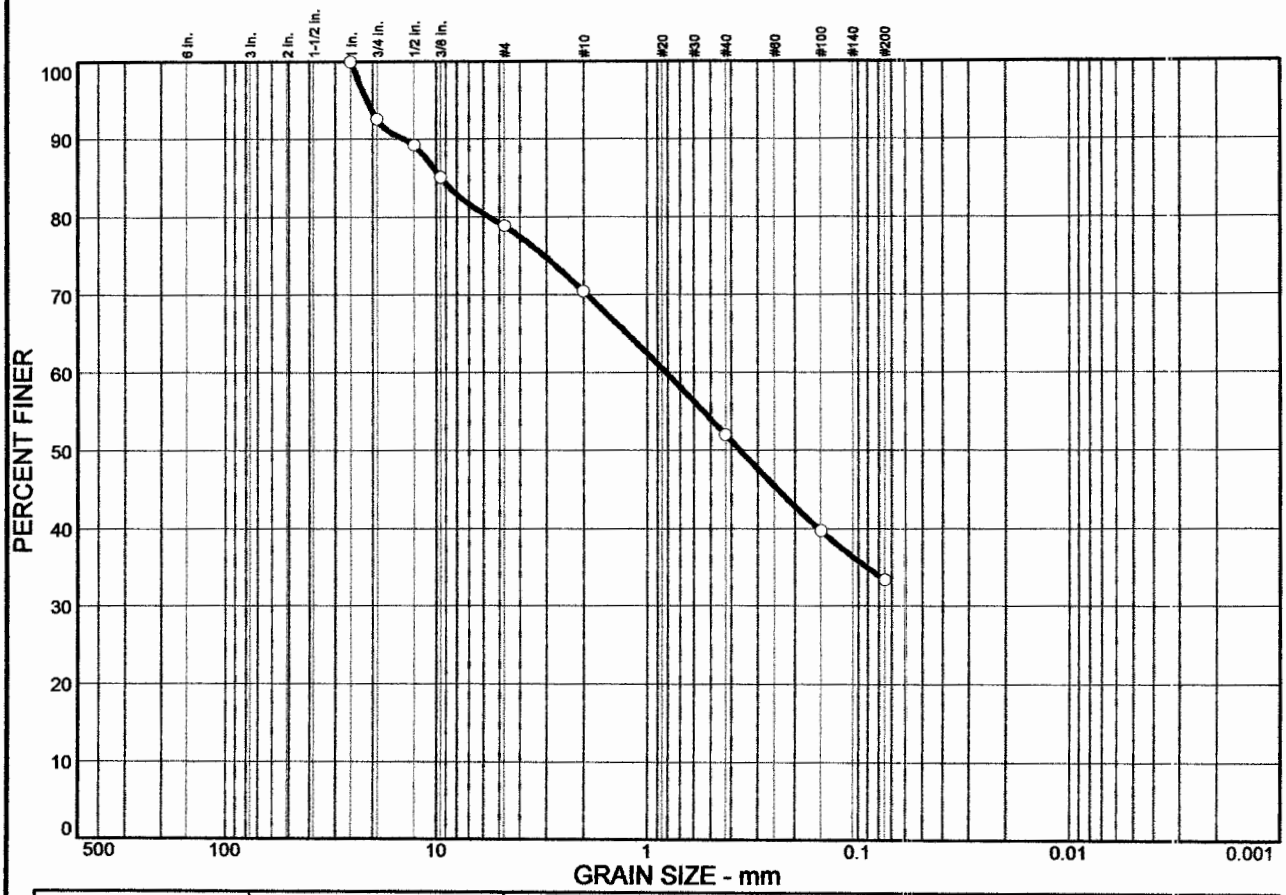
Remarks:
Tested by: D.Cotto
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	21.2	45.4	33.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	92.6		
.5 in.	89.2		
.375 in.	85.1		
#4	78.8		
#10	70.4		
#40	52.0		
#100	39.7		
#200	33.4		

* (no specification provided)

Material Description

Brownish yellow, gravelly sand with silt trace clay

Atterberg Limits

PL= 20 LL= 30 PI= 10

Coefficients

D_{85}= 9.46 D_{60}= 0.815 D_{50}= 0.362
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-2-4(0)

Remarks

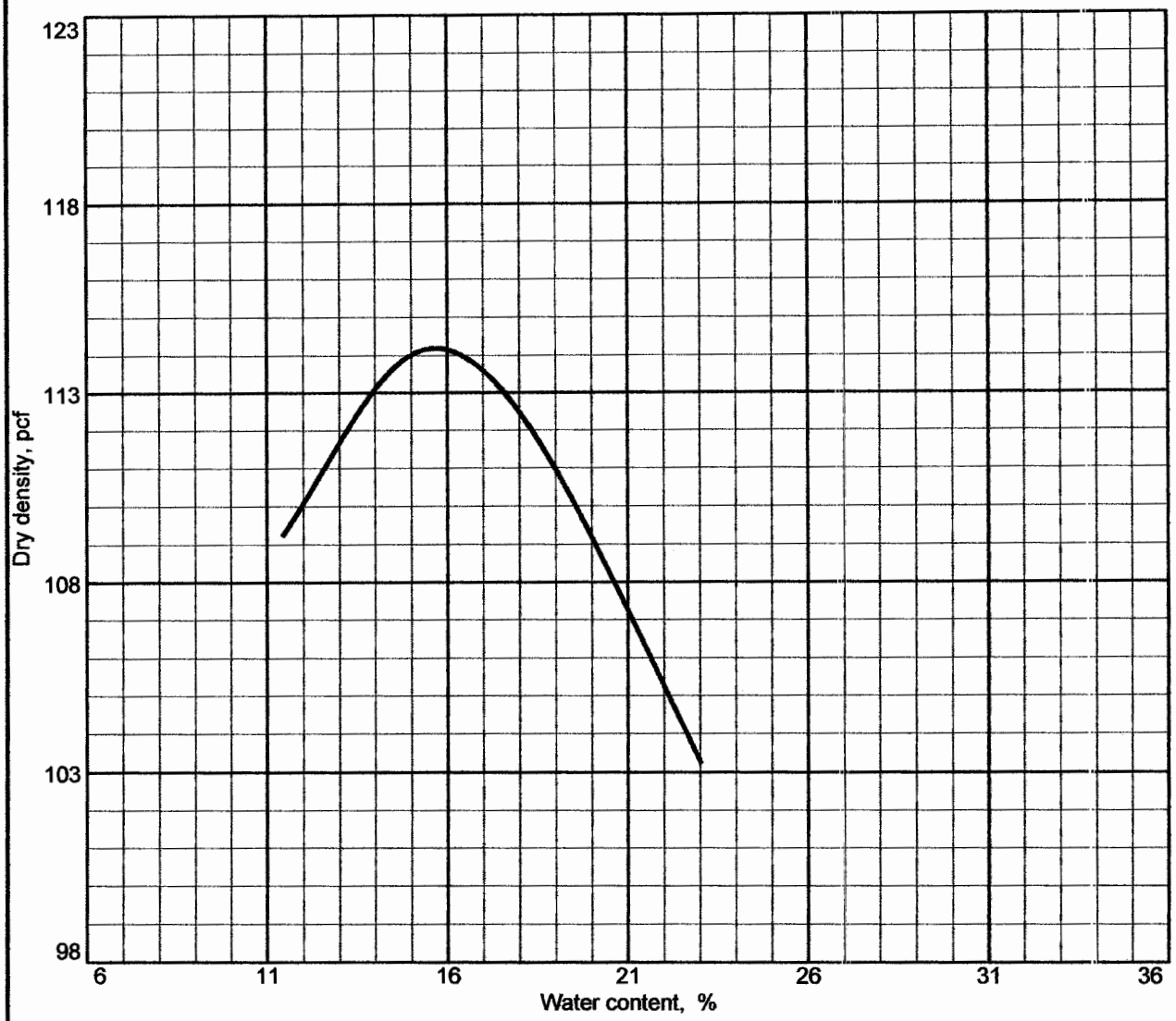
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 17 **Source of Sample:** Project Site **Date:** 2/14/07
Location: 1.29.07 LD #1320 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	SC	A-2-4(0)			30	10	21.2	33.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 114 pcf Optimum moisture = 16 %	Brownish yellow, gravelly sand with silt trace clay

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 1.29.07 LD #1320

Remarks:

Tested by: S.Martinez

Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	17.7	44.1	38.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	95.9		
.5 in.	92.8		
.375 in.	89.2		
#4	82.3		
#10	71.6		
#40	52.6		
#100	43.1		
#200	38.2		

* (no specification provided)

Material Description

Brownish yellow, sand with clay some gravel trace silt

Atterberg Limits

PL= 17 LL= 30 PI= 13

Coefficients

D_{85}= 6.35 D_{60}= 0.812 D_{50}= 0.330
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(1)

Remarks

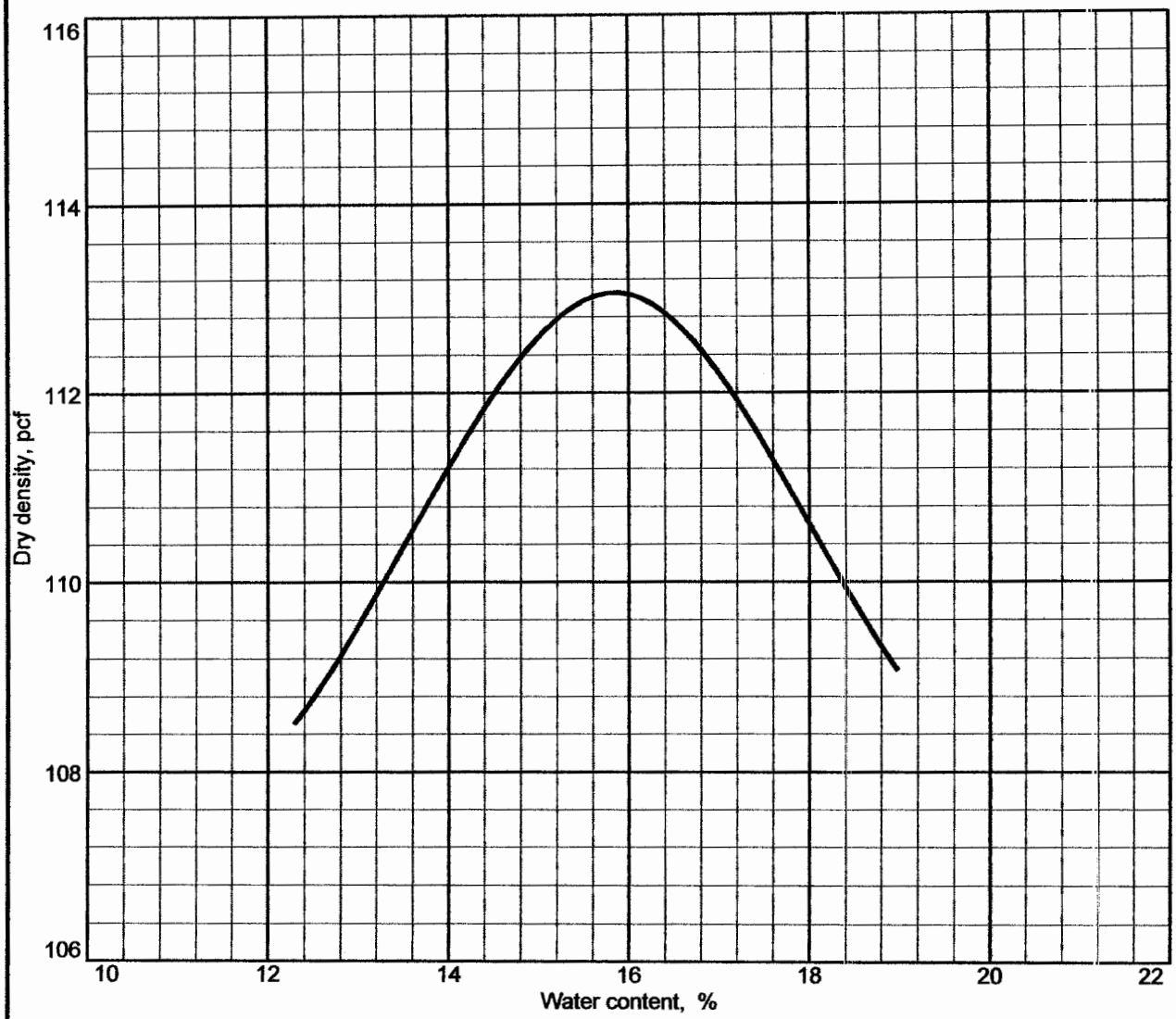
Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 15 **Source of Sample:** Project Site **Date:** 2/14/07
Location: 1.30.07 LD #1430 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	SC	A-6(1)			30	13	17.7	38.2

TEST RESULTS

Maximum dry density = 113 pcf

Optimum moisture = 16 %

MATERIAL DESCRIPTION

Brownish yellow, sand with clay some gravel trace silt

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 1.30.07 LD #1430

Remarks:

Tested by: S.Martinez

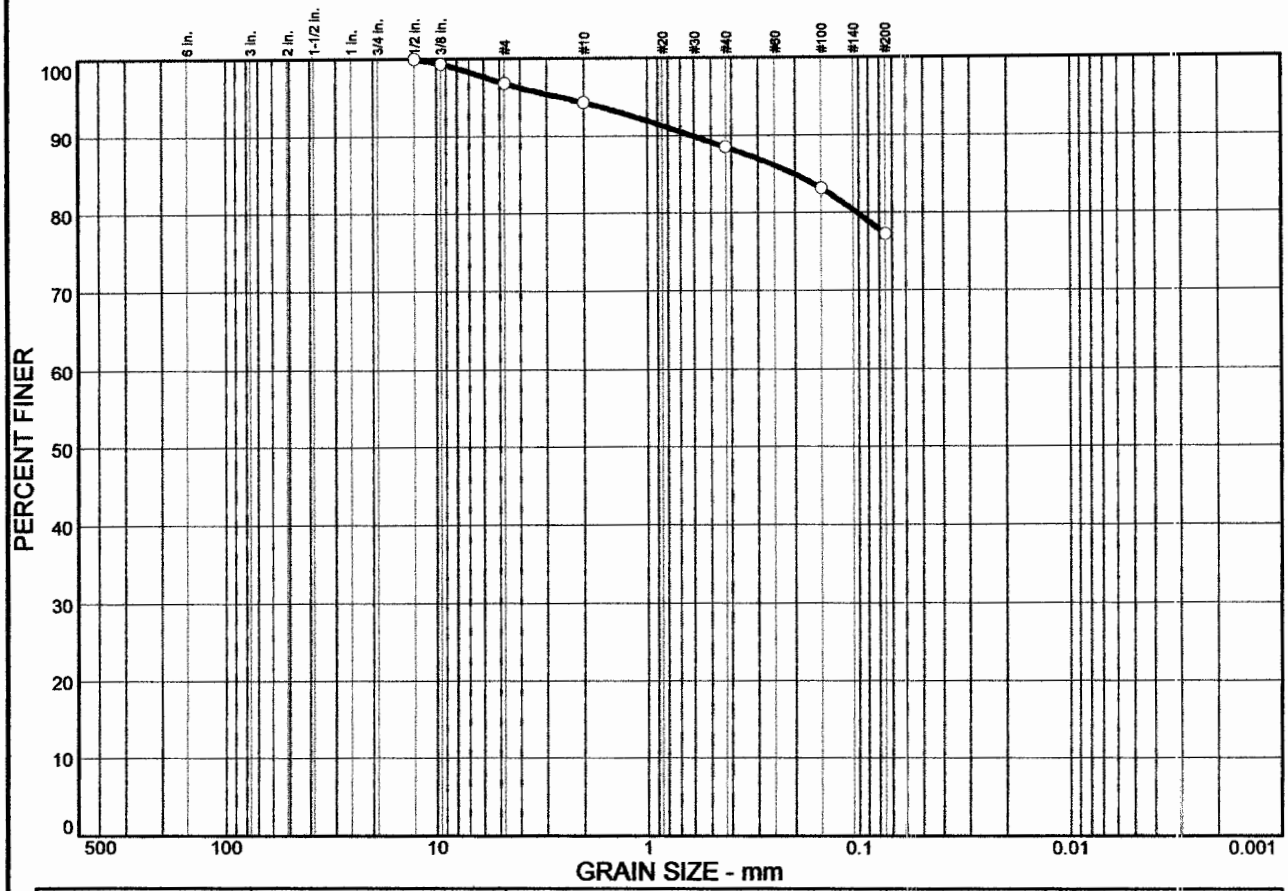
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.1	19.7	77.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
.375 in.	99.4		
#4	96.9		
#10	94.4		
#40	88.5		
#100	83.1		
#200	77.2		

* (no specification provided)

Material Description

Brownish yellow, silty clay some sand trace gravel

Atterberg Limits

PL= 21 LL= 34 PI= 13

Coefficients

D_{85}= 0.202 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(9)

Remarks

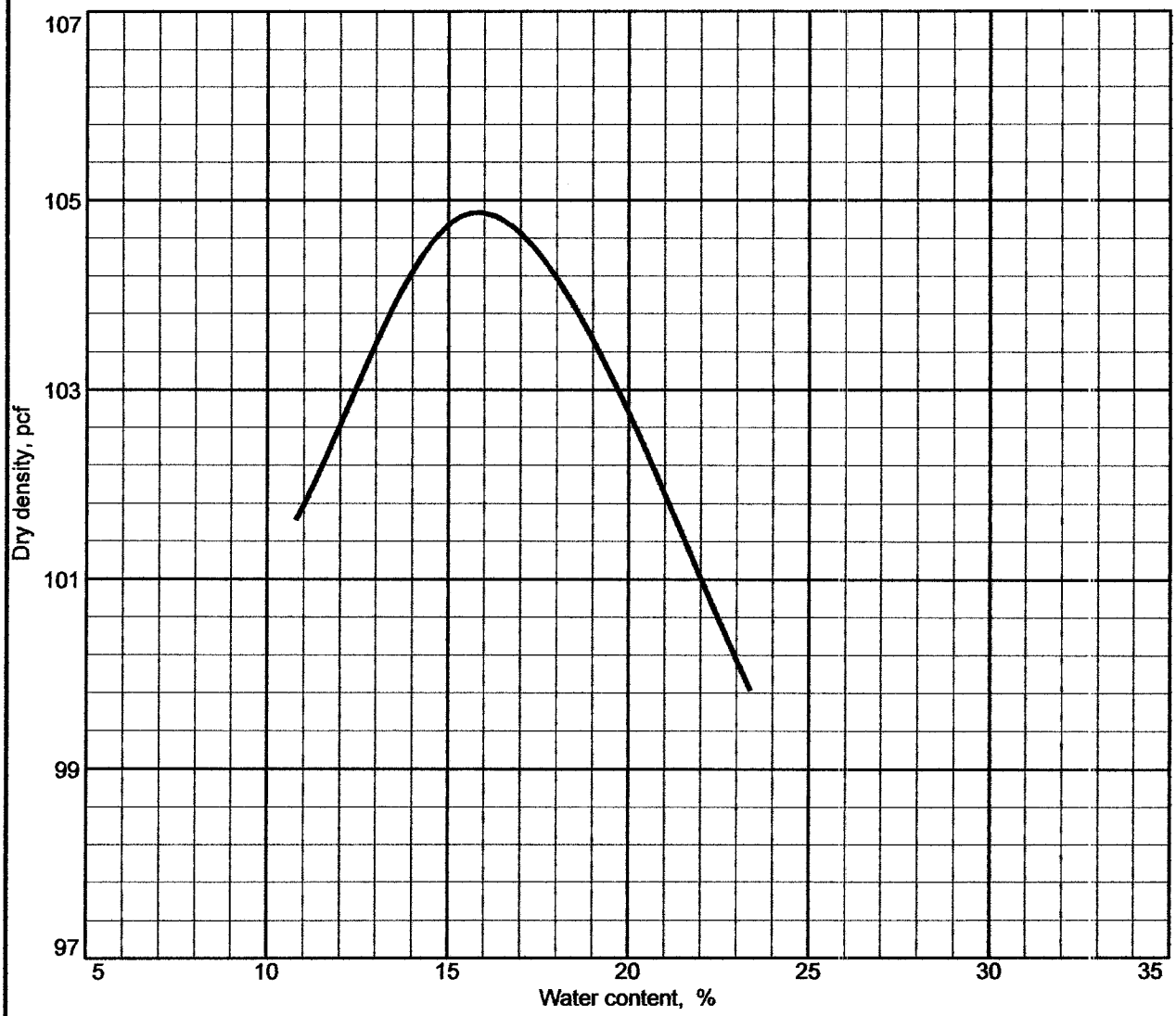
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 18 **Source of Sample:** Project Site **Date:** 2/14/07
Location: 1.30.07 LD #1441 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	CL	A-6(9)			34	13	3.1	77.2

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 105 pcf Optimum moisture = 16 %	Brownish yellow, silty clay some sand trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 1.30.07 LD #1441

Remarks:

Tested by: S.Martinez

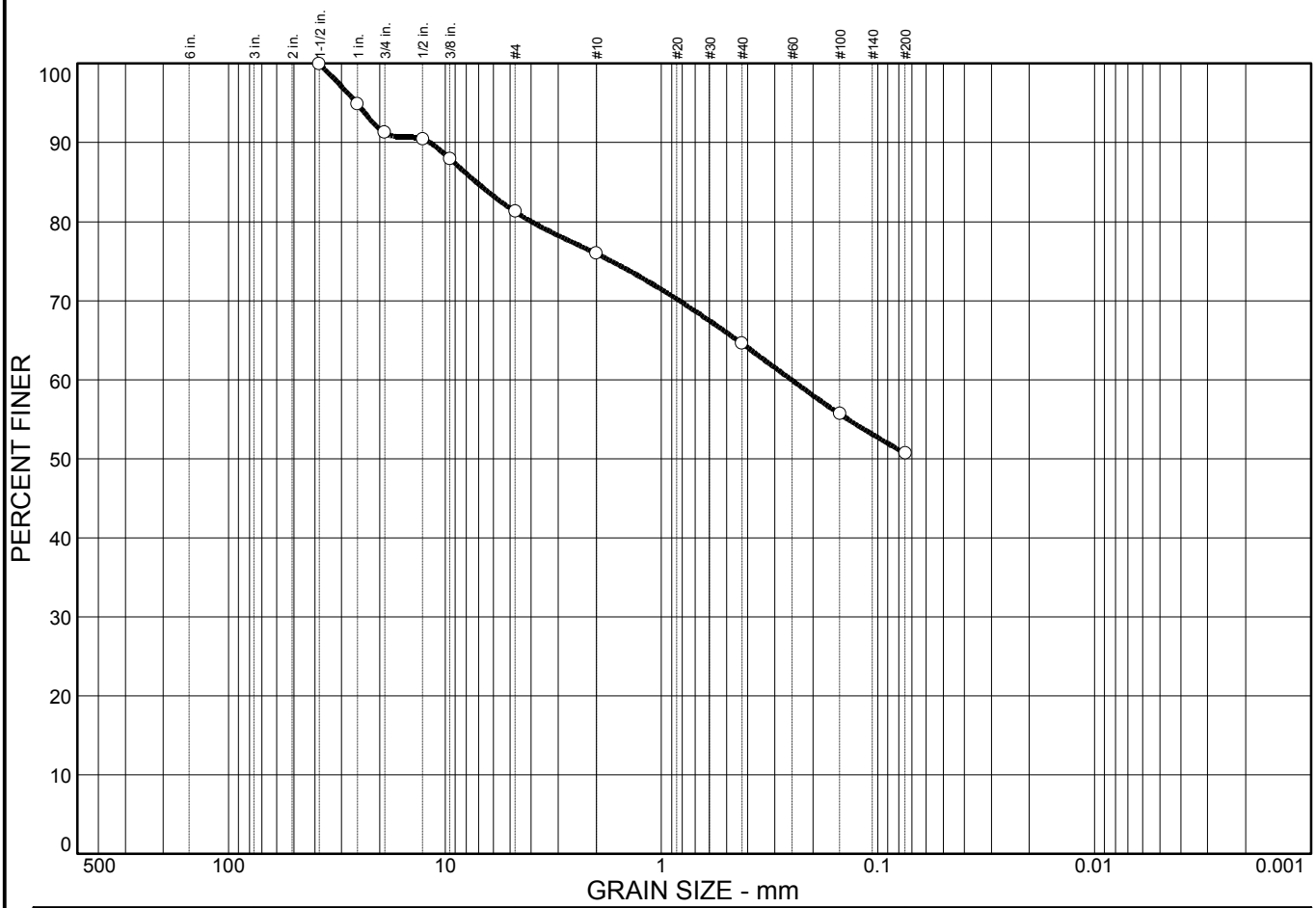
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	18.7	30.6	50.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	94.9		
.75 in.	91.3		
.5 in.	90.5		
.375 in.	88.0		
#4	81.3		
#10	76.0		
#40	64.6		
#100	55.7		
#200	50.7		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay some gravel trace silt

Atterberg Limits

PL= 21 LL= 32 PI= 11

Coefficients

D_{85}= 7.15 D_{60}= 0.251 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(3)

Remarks

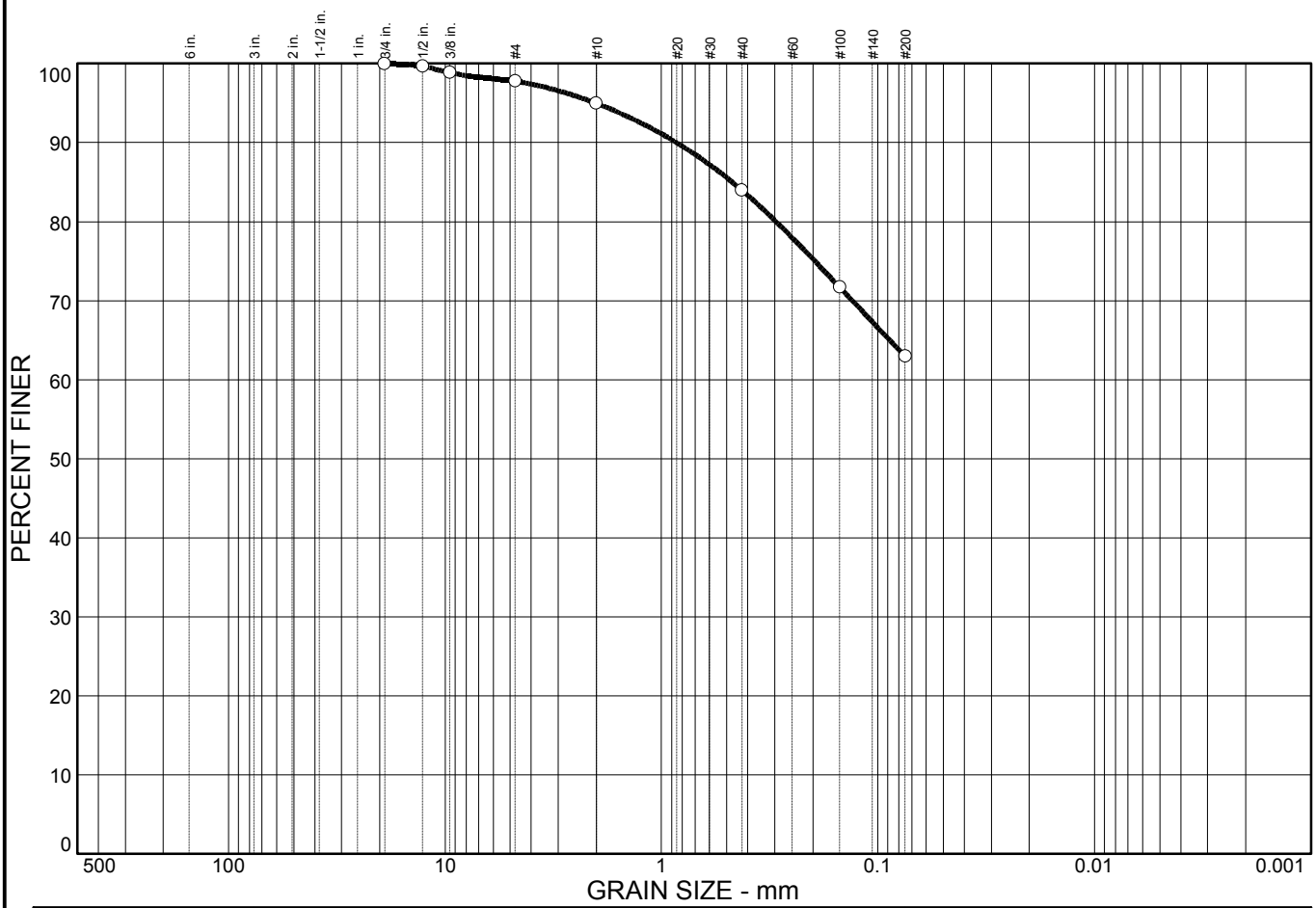
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 25 **Source of Sample:** Project Site **Date:** 2/16/07
Location: 2.05.07 LD #1540 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.2	34.8	63.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.7		
.375 in.	98.9		
#4	97.8		
#10	95.0		
#40	84.0		
#100	71.7		
#200	63.0		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace gravel and silt

Atterberg Limits

PL= 22 LL= 36 PI= 14

Coefficients

D_{85}= 0.470 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(7)

Remarks

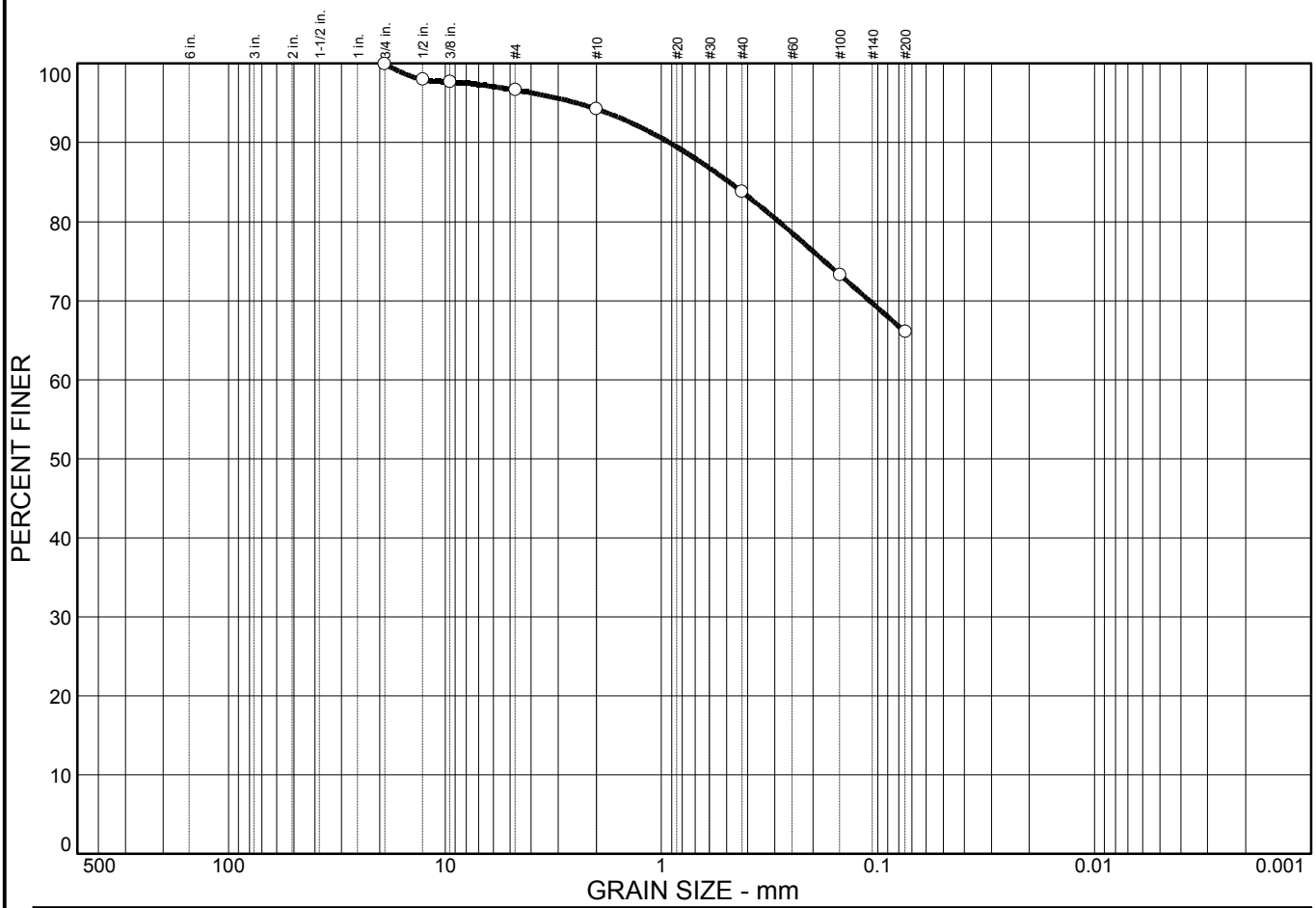
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 28 **Source of Sample:** Project Site **Date:** 2/16/07
Location: 2.05.07 LD #1650 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.3	30.6	66.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.0		
.375 in.	97.7		
#4	96.7		
#10	94.3		
#40	83.8		
#100	73.3		
#200	66.1		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace gravel and silt

Atterberg Limits

PL= 23 LL= 38 PI= 15

Coefficients

D_{85}= 0.486 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(8)

Remarks

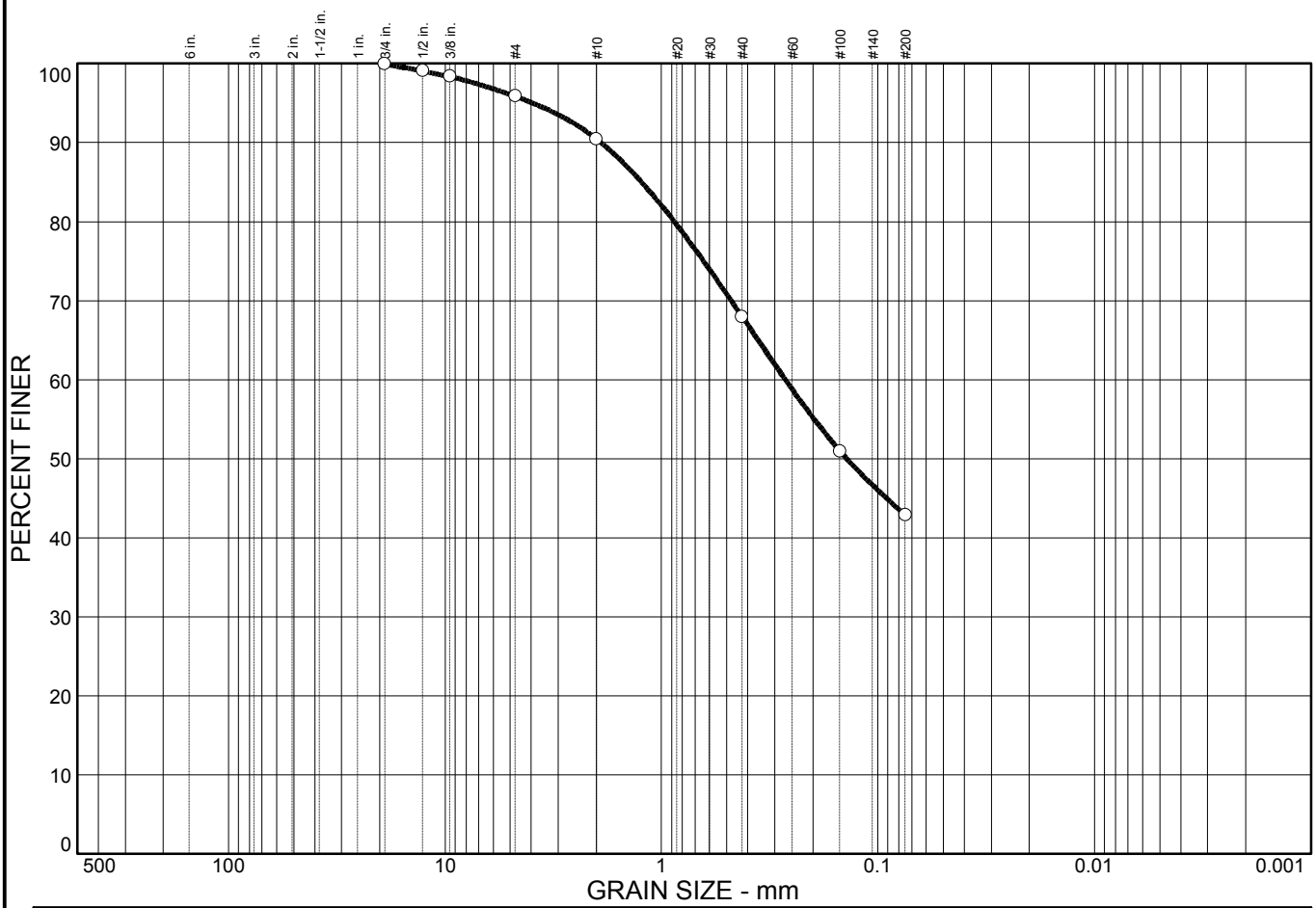
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 27 **Source of Sample:** Project Site **Date:** 2/16/07
Location: 2.05.07 LD #1760 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.1	53.0	42.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.1		
.375 in.	98.4		
#4	95.9		
#10	90.5		
#40	68.0		
#100	51.0		
#200	42.9		

* (no specification provided)

Material Description

Brownish yellow, clayey sand trace gravel and silt

Atterberg Limits

PL= 20 LL= 32 PI= 12

Coefficients

D_{85}= 1.24 D_{60}= 0.268 D_{50}= 0.139
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

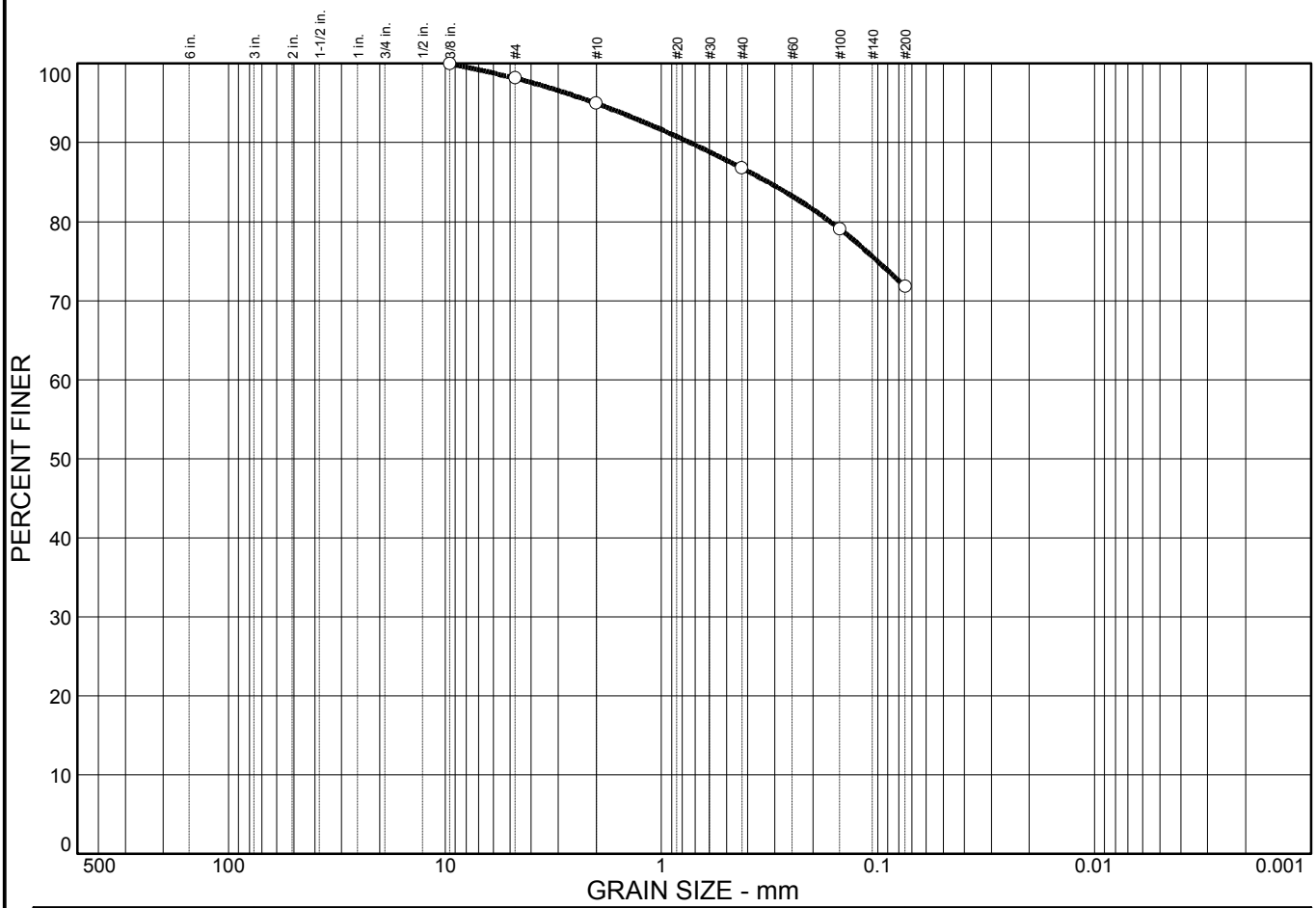
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 22 **Source of Sample:** Project Site **Date:** 2/16/07
Location: 2.07.07 LD #1870 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.8	26.4	71.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	98.2		
#10	95.0		
#40	86.8		
#100	79.1		
#200	71.8		

* (no specification provided)

Material Description

Brownish yellow, sandy silt some clay trace gravel

Atterberg Limits

PL= 25 LL= 34 PI= 9

Coefficients

D_{85}= 0.320 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO= A-4(6)

Remarks

Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 26 **Source of Sample:** Project Site **Date:** 2/16/07
Location: 2.07.07 LD #1980 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	6.6	49.4	44.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	95.9		
.5 in.	95.9		
.375 in.	95.7		
#4	93.4		
#10	87.4		
#40	67.9		
#100	52.4		
#200	44.0		

* (no specification provided)

Material Description

Brownish yellow, clayey sand

Atterberg Limits

PL= 18 LL= 30 PI= 12

Coefficients

D_{85}= 1.57 D_{60}= 0.254 D_{50}= 0.125
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

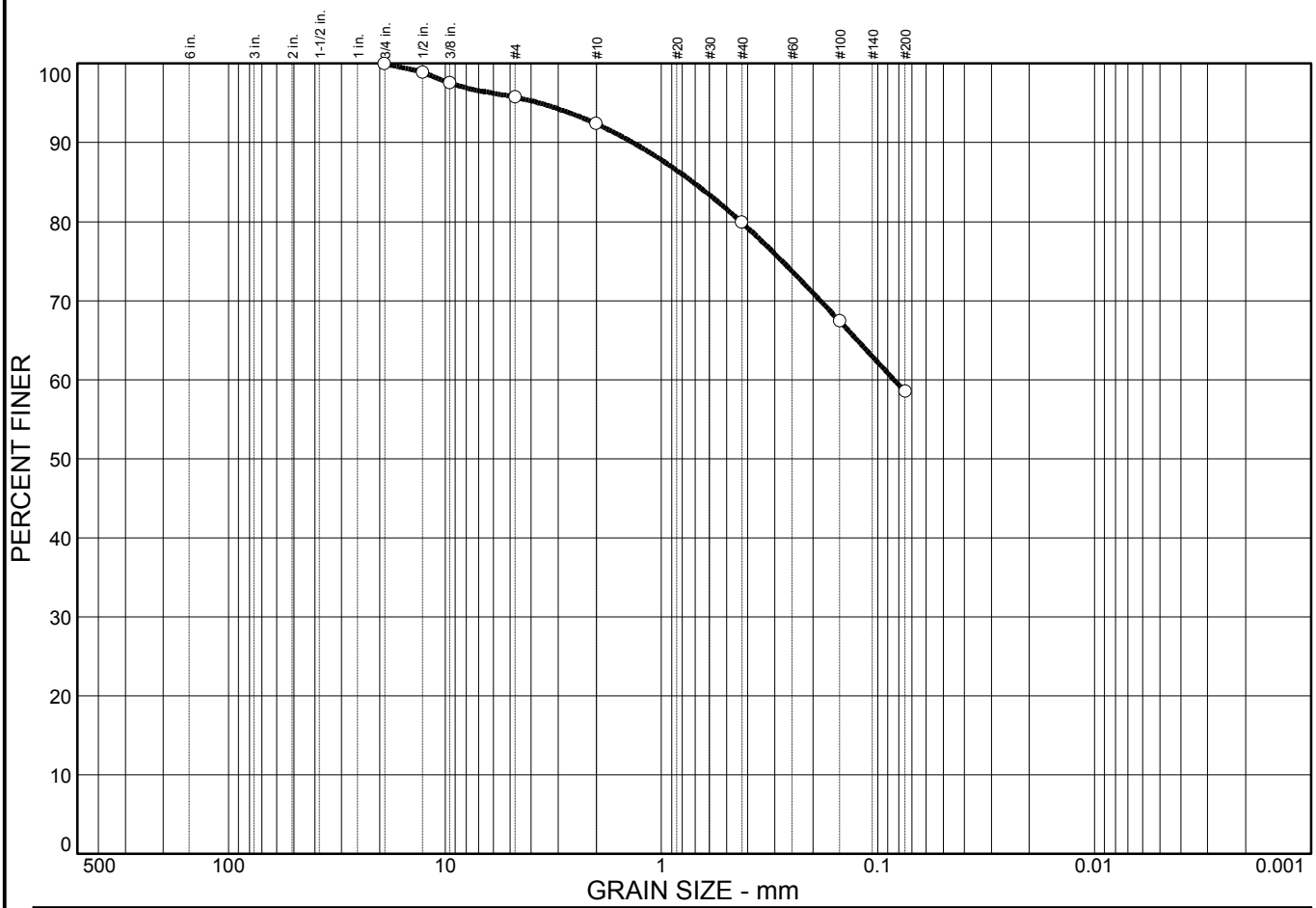
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 20 **Source of Sample:** Project Site **Date:** 2/15/07
Location: 2.08.07 LD #2090 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.2	37.3	58.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.9		
.375 in.	97.6		
#4	95.8		
#10	92.4		
#40	79.9		
#100	67.4		
#200	58.5		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace gravel and silt

Atterberg Limits

PL= 22 LL= 37 PI= 15

Coefficients

D_{85}= 0.714 D_{60}= 0.0843 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

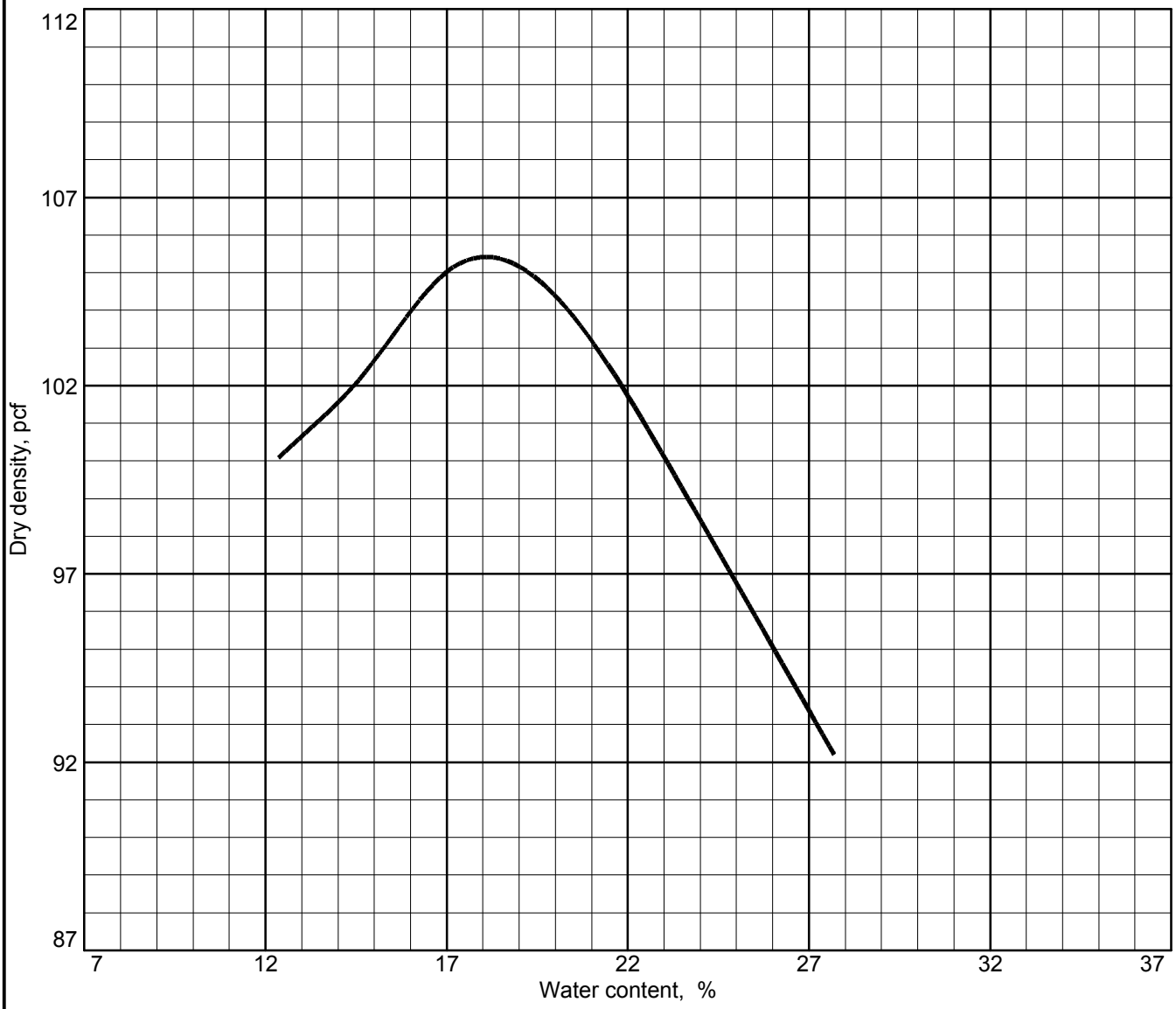
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 23 **Source of Sample:** Project Site **Date:** 2/16/07
Location: 2.08.07 LD #2200 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 105 pcf Optimum moisture = 18 %	Brownish yellow, sandy clay trace gravel and silt

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

● **Location:** 2.09.07 LD #2305

Remarks:

Tested by: S.Perez

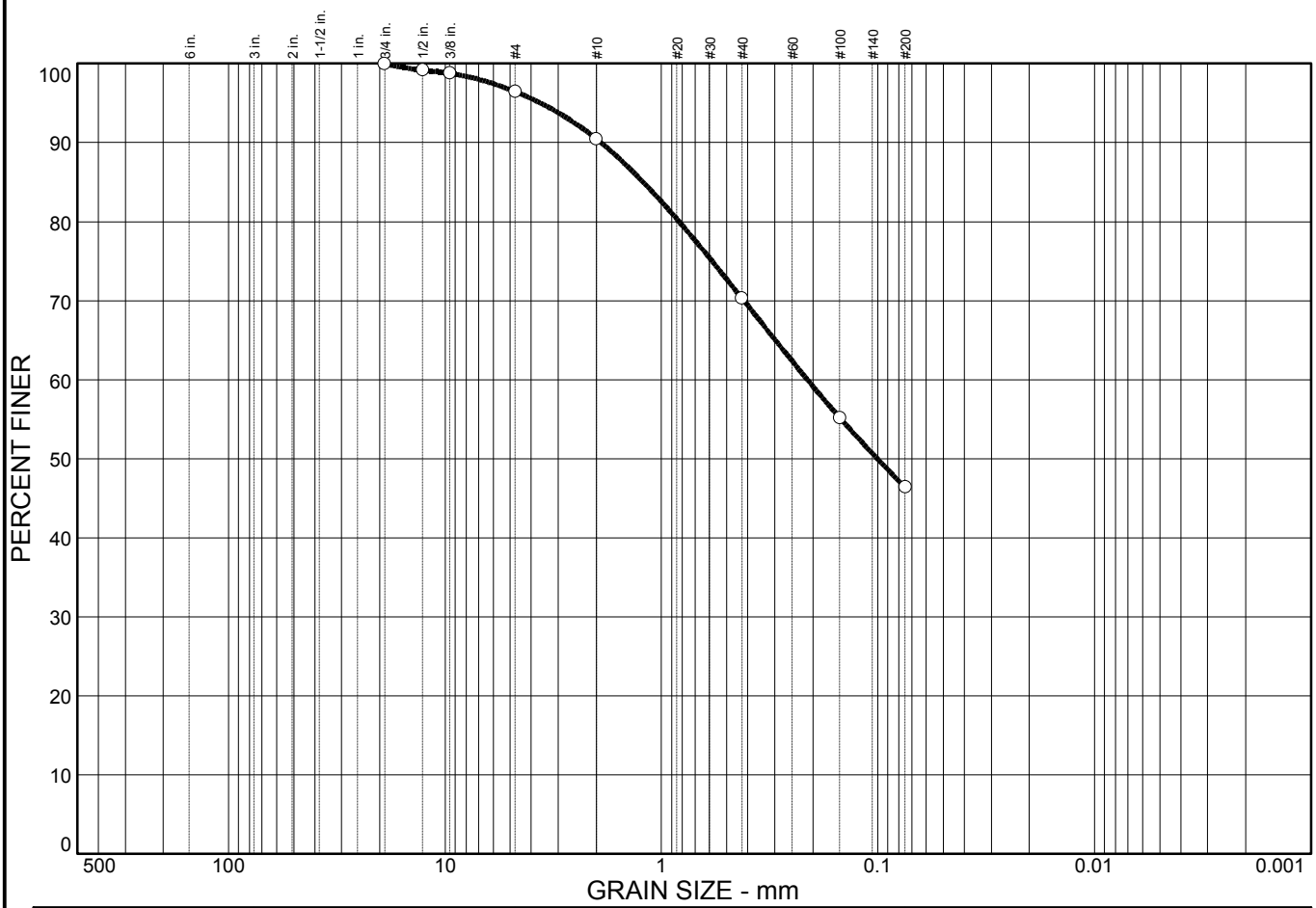
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.5	50.1	46.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.2		
.375 in.	98.8		
#4	96.5		
#10	90.5		
#40	70.3		
#100	55.2		
#200	46.4		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel and silt

Atterberg Limits

PL= 19 LL= 32 PI= 13

Coefficients

D_{85}= 1.21 D_{60}= 0.212 D_{50}= 0.100
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(3)

Remarks

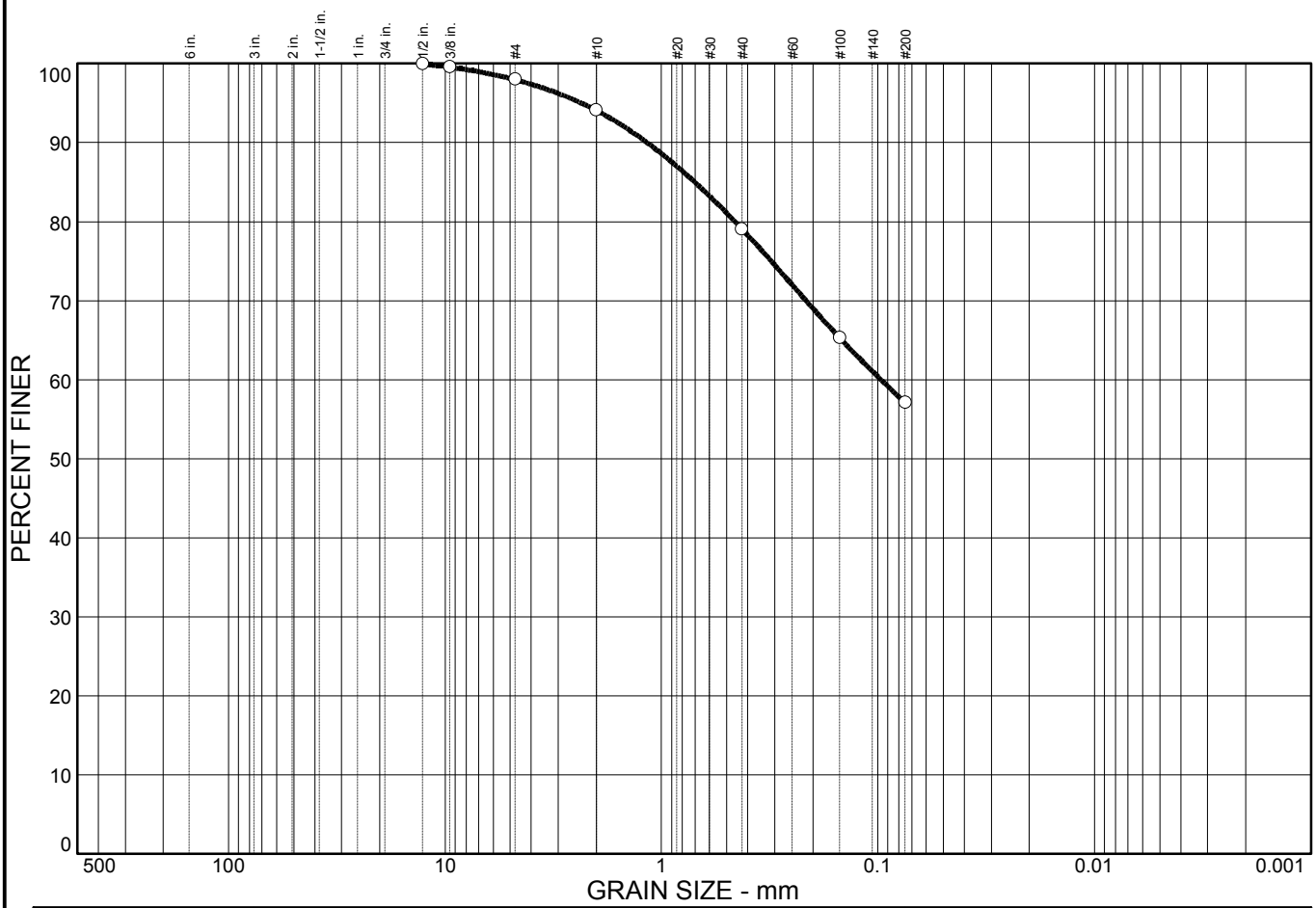
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 21 **Source of Sample:** Project Site **Date:** 2/15/07
Location: 2.09.07 LD #2310 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.0	40.9	57.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.6		
#4	98.0		
#10	94.1		
#40	79.1		
#100	65.3		
#200	57.1		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace gravel and silt

Atterberg Limits

PL= 22 LL= 36 PI= 14

Coefficients

D_{85}= 0.701 D_{60}= 0.0965 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

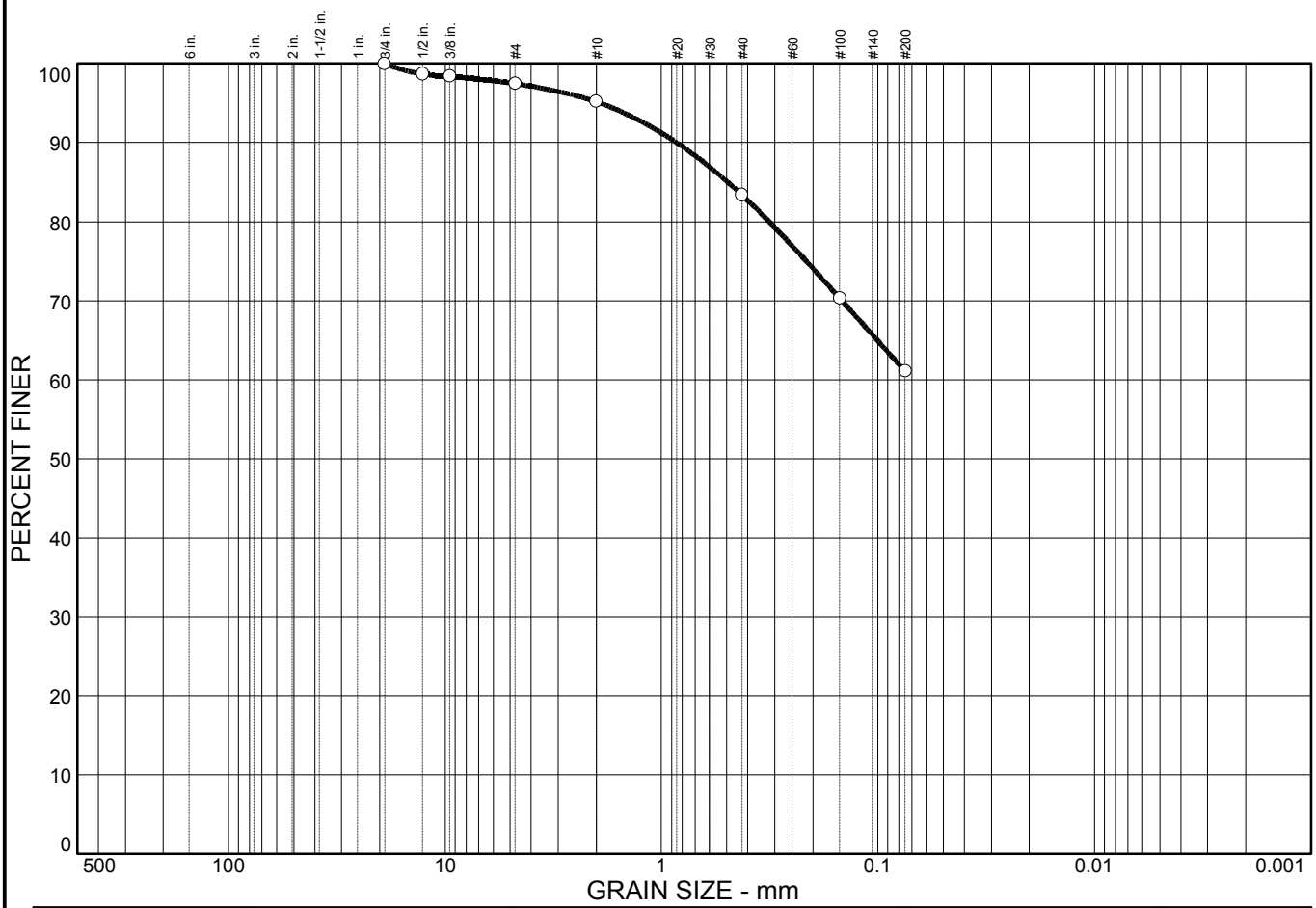
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 24 **Source of Sample:** Project Site **Date:** 2/16/07
Location: 2.09.07 LD #2420 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.5	36.4	61.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.7		
.375 in.	98.4		
#4	97.5		
#10	95.2		
#40	83.4		
#100	70.3		
#200	61.1		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace silt and gravel

Atterberg Limits

PL= 23 LL= 35 PI= 12

Coefficients

D_{85}= 0.493 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

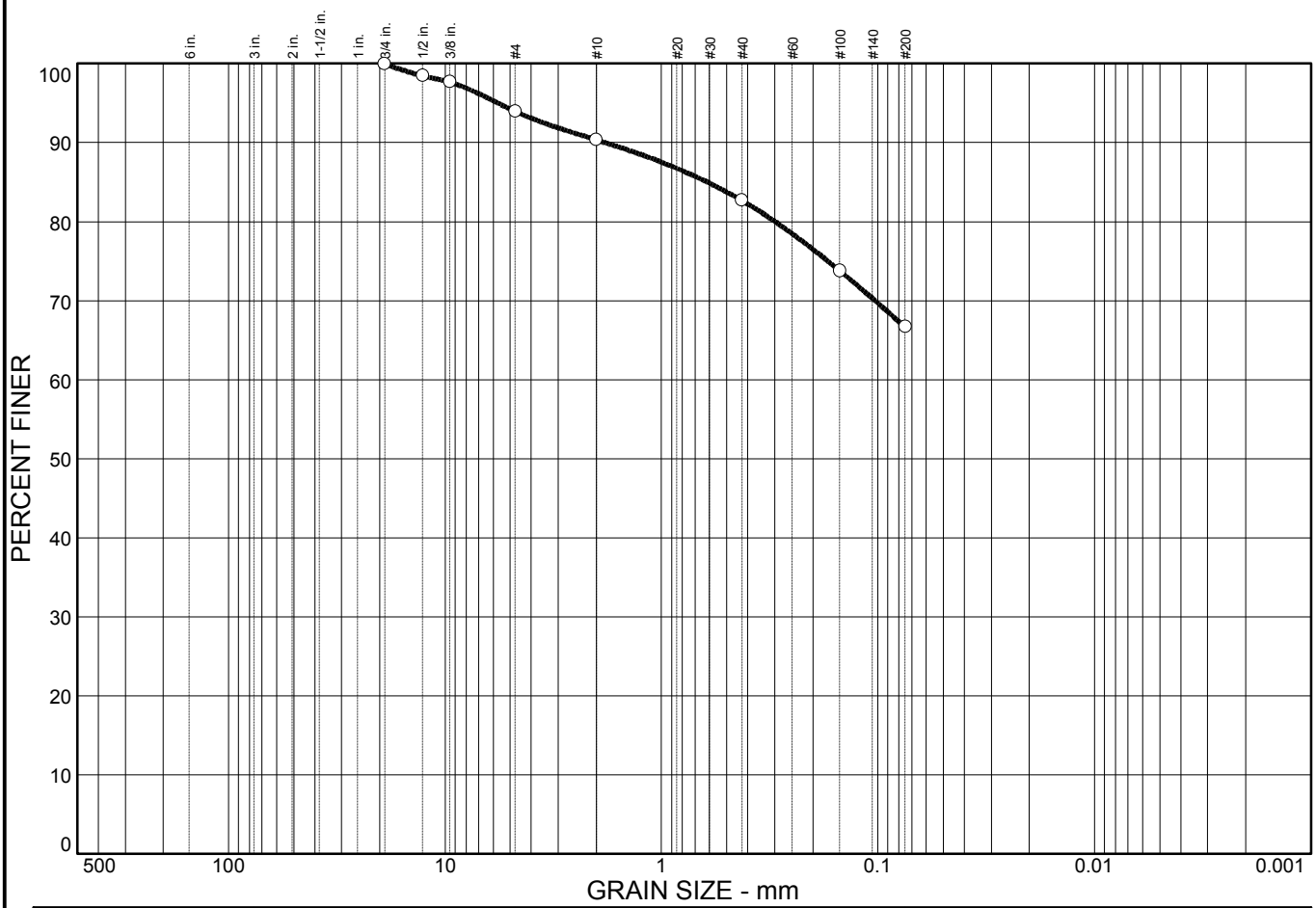
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 30 **Source of Sample:** Project Site **Date:** 2/19/07
Location: 2.09.07 LD #2530 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	6.0	27.3	66.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.5		
0.375 in.	97.7		
#4	94.0		
#10	90.4		
#40	82.7		
#100	73.8		
#200	66.7		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace gravel and silt

Atterberg Limits

PL= 23 LL= 43 PI= 20

Coefficients

D_{85}= 0.609 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(12)

Remarks

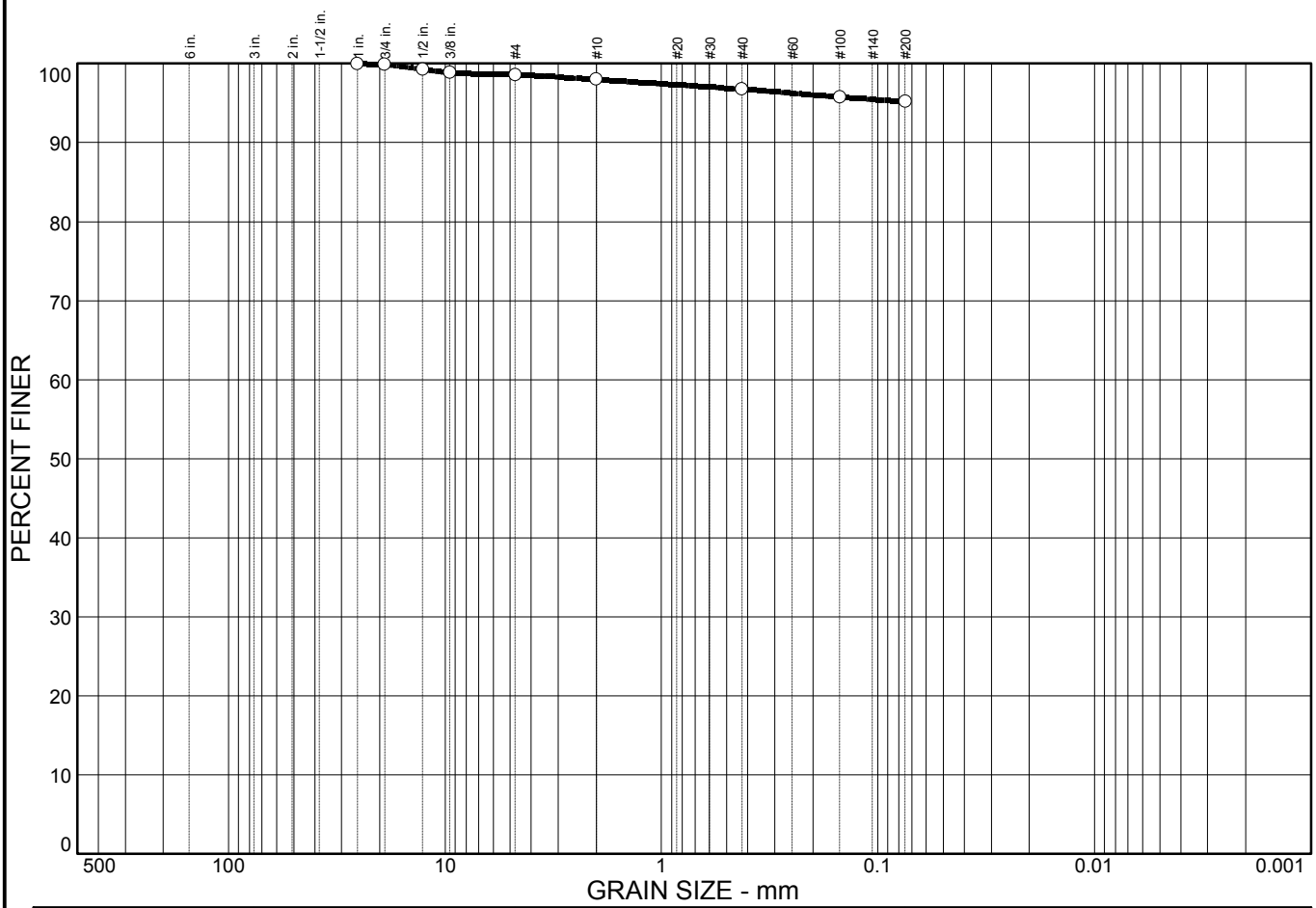
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 31 **Source of Sample:** Project Site **Date:** 2/19/07
Location: 2.12.07 LD #2640 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.4	3.4	95.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	99.9		
.5 in.	99.3		
.375 in.	98.9		
#4	98.6		
#10	98.0		
#40	96.8		
#100	95.8		
#200	95.2		

* (no specification provided)

Material Description

Brownish yellow, silty clay trace sand and gravel

Atterberg Limits

PL= 21 LL= 33 PI= 12

Coefficients

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

Classification

USCS= CL AASHTO= A-6(12)

Remarks

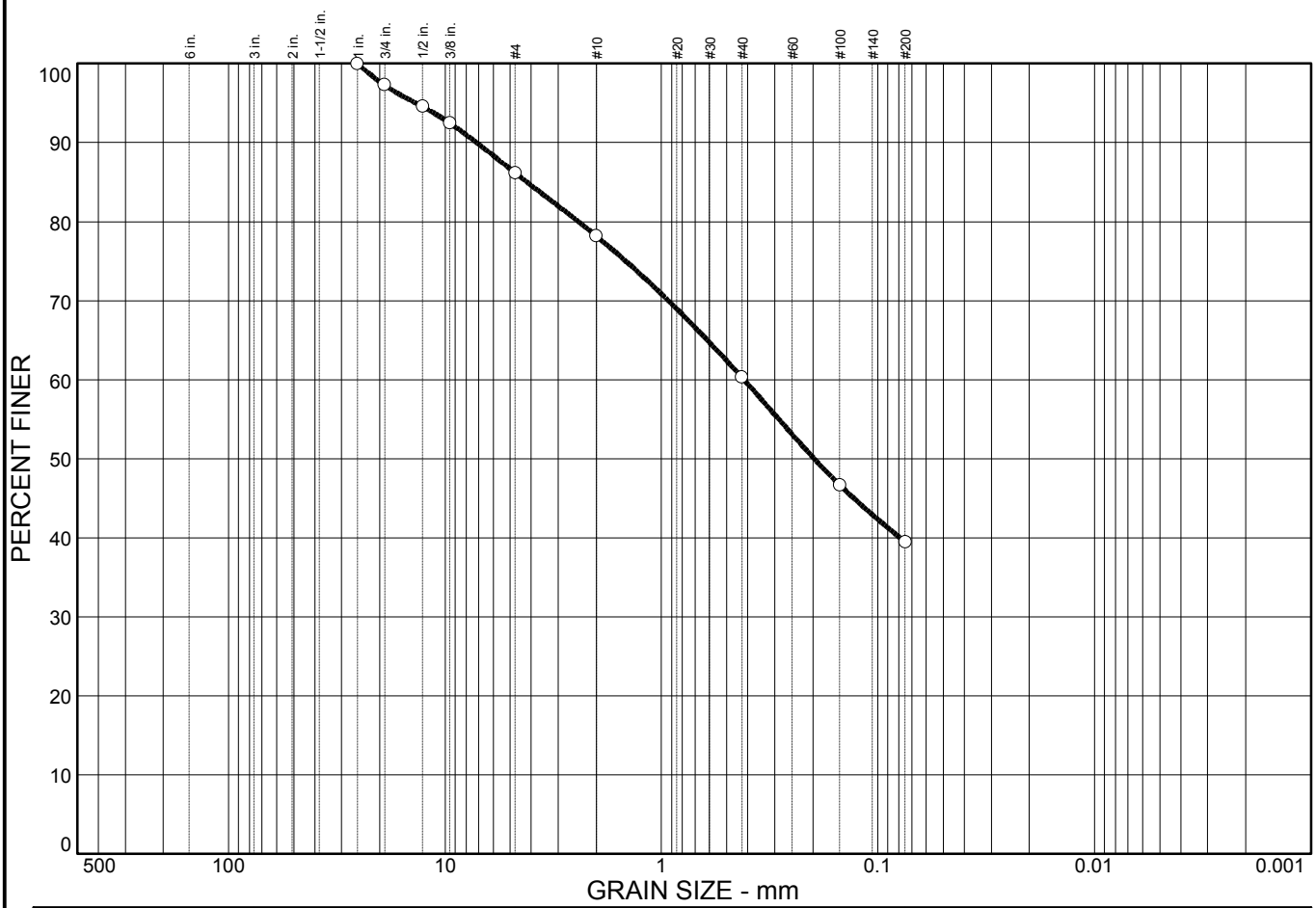
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 32 **Source of Sample:** Project Site **Date:** 2/19/07
Location: 2.13.07 LD #2750 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	13.8	46.7	39.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	97.3		
.5 in.	94.6		
.375 in.	92.5		
#4	86.2		
#10	78.2		
#40	60.3		
#100	46.7		
#200	39.5		

* (no specification provided)

Material Description

Brownish yellow, sand with clay some gravel

Atterberg Limits

PL= 19 LL= 30 PI= 11

Coefficients

D_{85}= 4.17 D_{60}= 0.416 D_{50}= 0.197
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(1)

Remarks

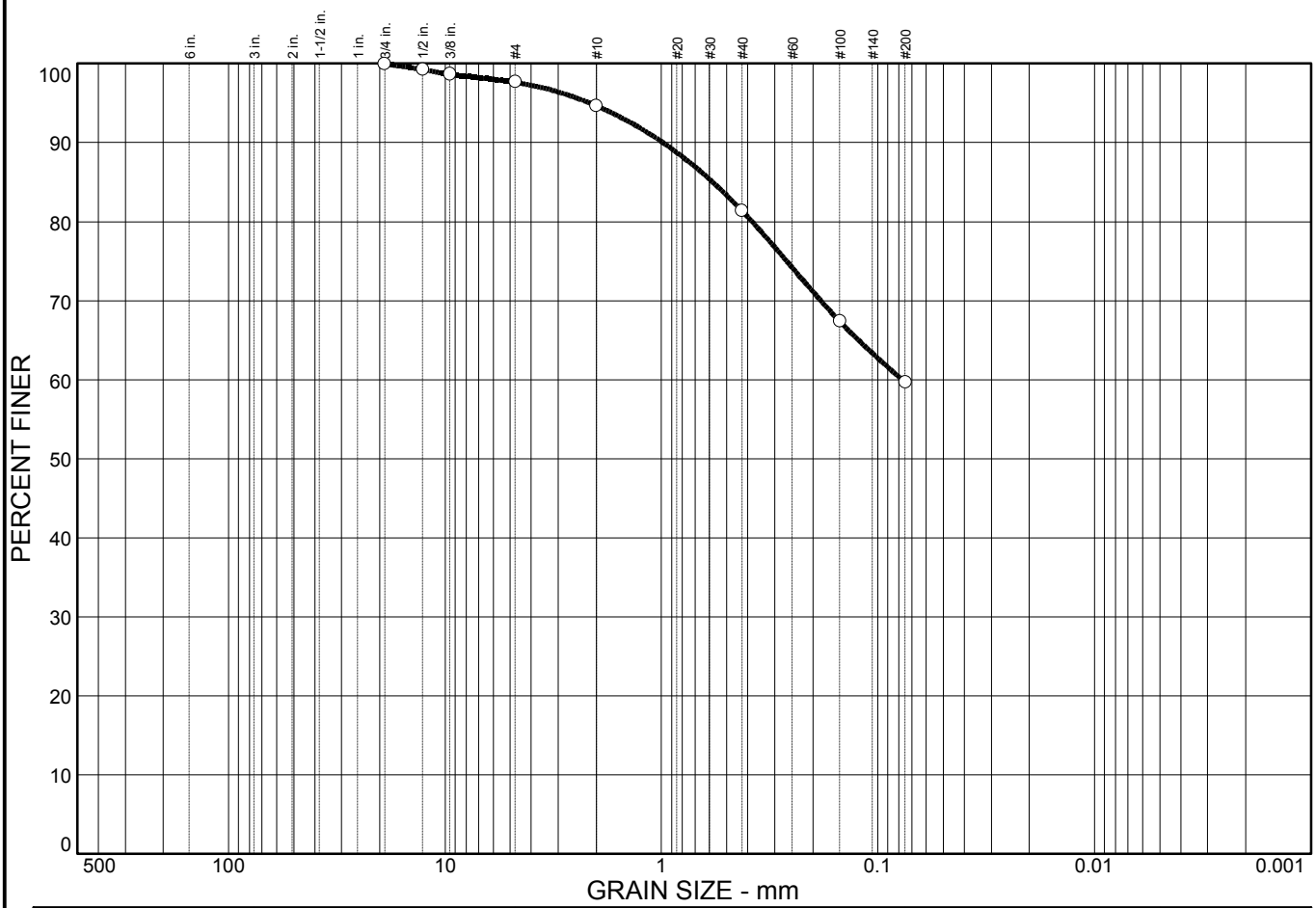
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 34 **Source of Sample:** Project Site **Date:** 2/19/07
Location: 2.13.07 LD #2860 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.3	38.0	59.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.3		
.375 in.	98.7		
#4	97.7		
#10	94.7		
#40	81.4		
#100	67.4		
#200	59.7		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace silt and gravel

Atterberg Limits

PL= 21 LL= 35 PI= 14

Coefficients

D_{85}= 0.579 D_{60}= 0.0772 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

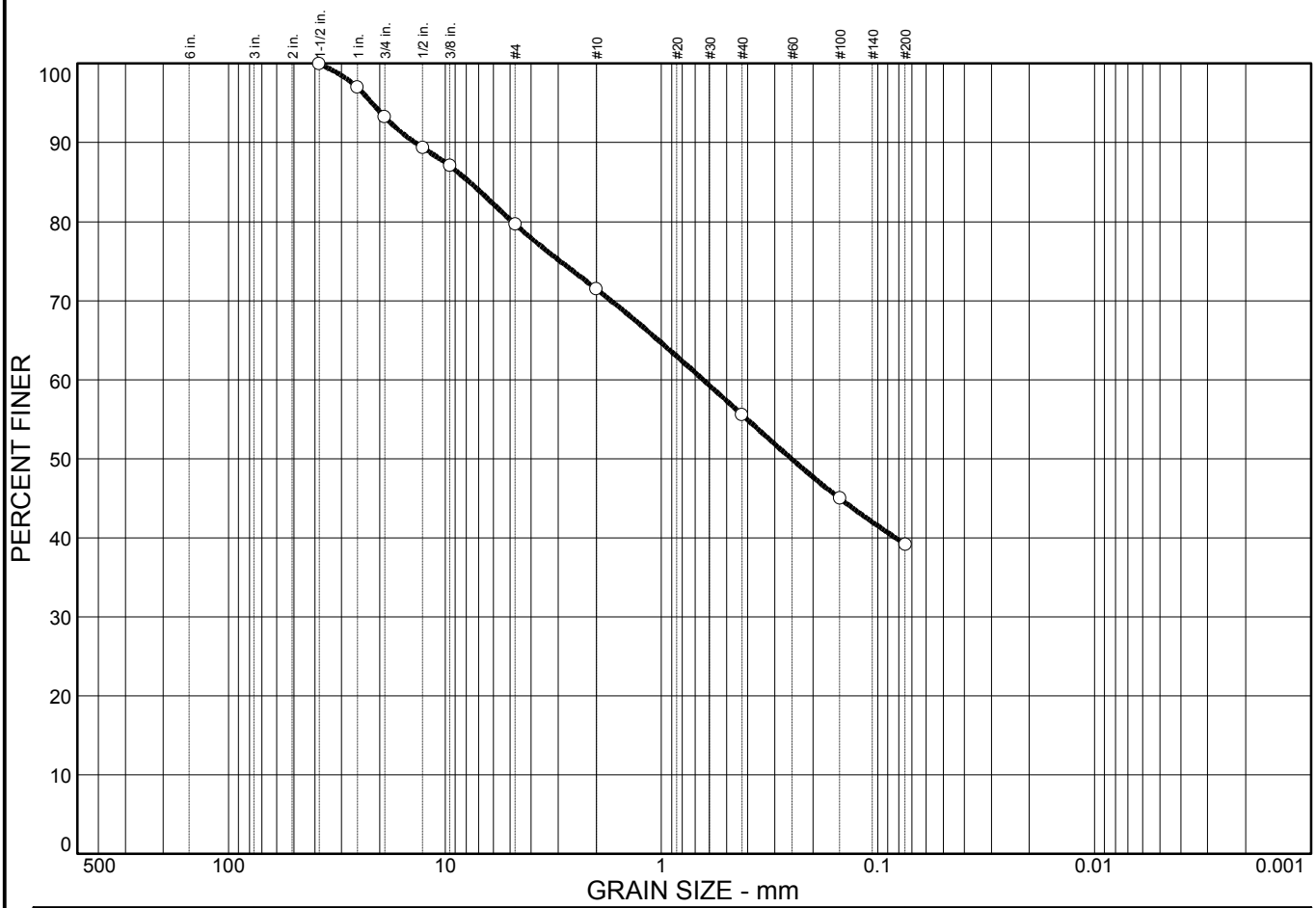
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 36 **Source of Sample:** Project Site **Date:** 2/19/07
Location: 2.14.07 LD #2970 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	20.3	40.5	39.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	97.0		
.75 in.	93.3		
.50 in.	89.4		
.375 in.	87.1		
#4	79.7		
#10	71.5		
#40	55.6		
#100	45.0		
#200	39.2		

* (no specification provided)

Material Description

Brownish yellow, gravelly sand with clay

Atterberg Limits

PL= 19 LL= 31 PI= 12

Coefficients

D_{85}= 7.68 D_{60}= 0.641 D_{50}= 0.250
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(1)

Remarks

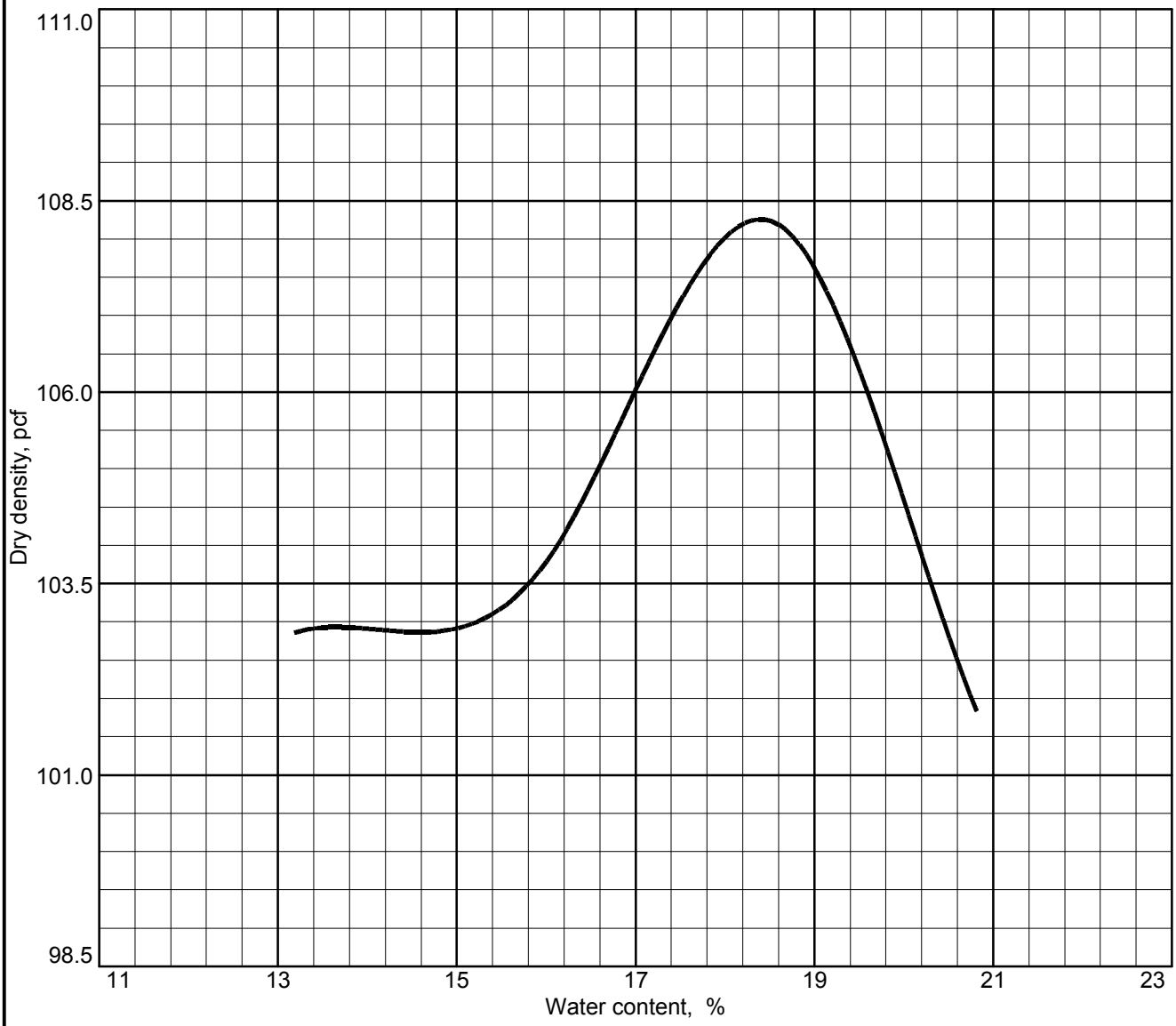
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 33 **Source of Sample:** Project Site **Date:** 2/19/07
Location: 2.14.07 LD #3080 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 108 pcf Optimum moisture = 18 %	Brownish yellow, sandy clay trace gravel and silt

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

● **Location:** 2.14.07 LD #3169

Remarks:

Tested by: D.Cotto

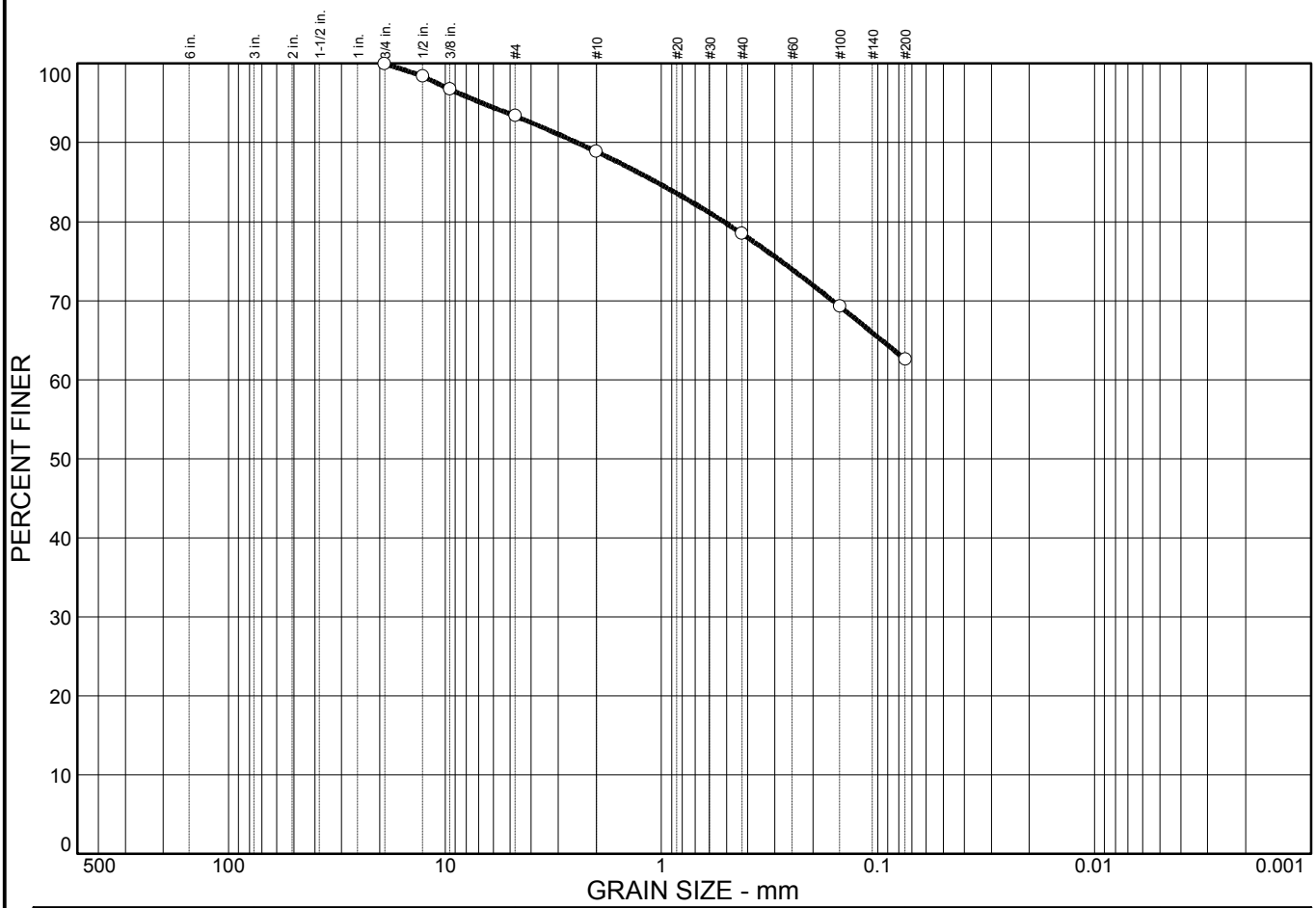
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	6.6	30.8	62.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.4		
.375 in.	96.8		
#4	93.4		
#10	88.9		
#40	78.5		
#100	69.3		
#200	62.6		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace silt and gravel

Atterberg Limits

PL= 22 LL= 35 PI= 13

Coefficients

D_{85}= 1.05 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

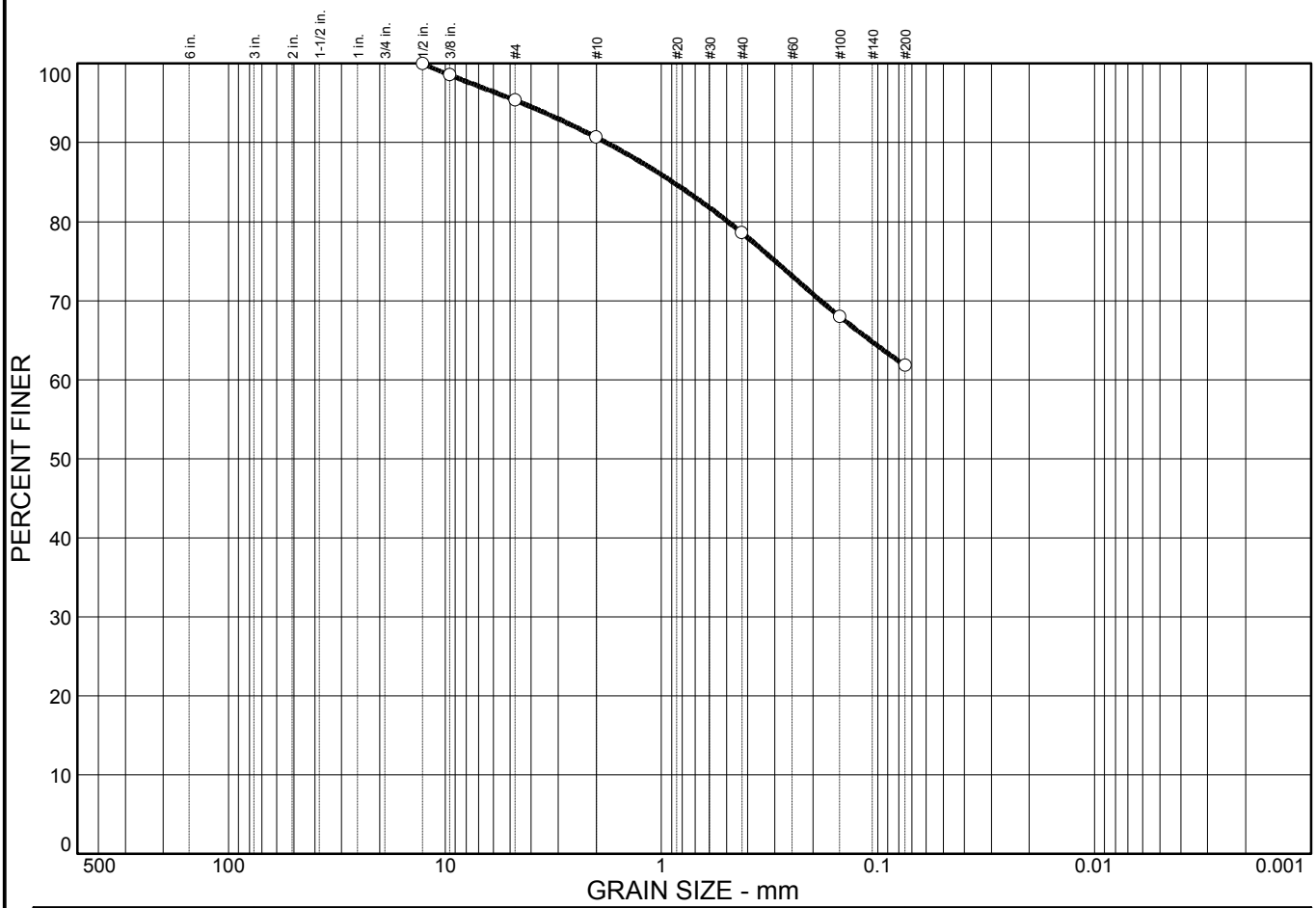
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 38 **Source of Sample:** Project Site **Date:** 2/19/07
Location: 2.14.07 LD #3190 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.6	33.6	61.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.6		
#4	95.4		
#10	90.7		
#40	78.6		
#100	68.0		
#200	61.8		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace gravel and silt

Atterberg Limits

PL= 23 LL= 37 PI= 14

Coefficients

D_{85}= 0.883 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(7)

Remarks

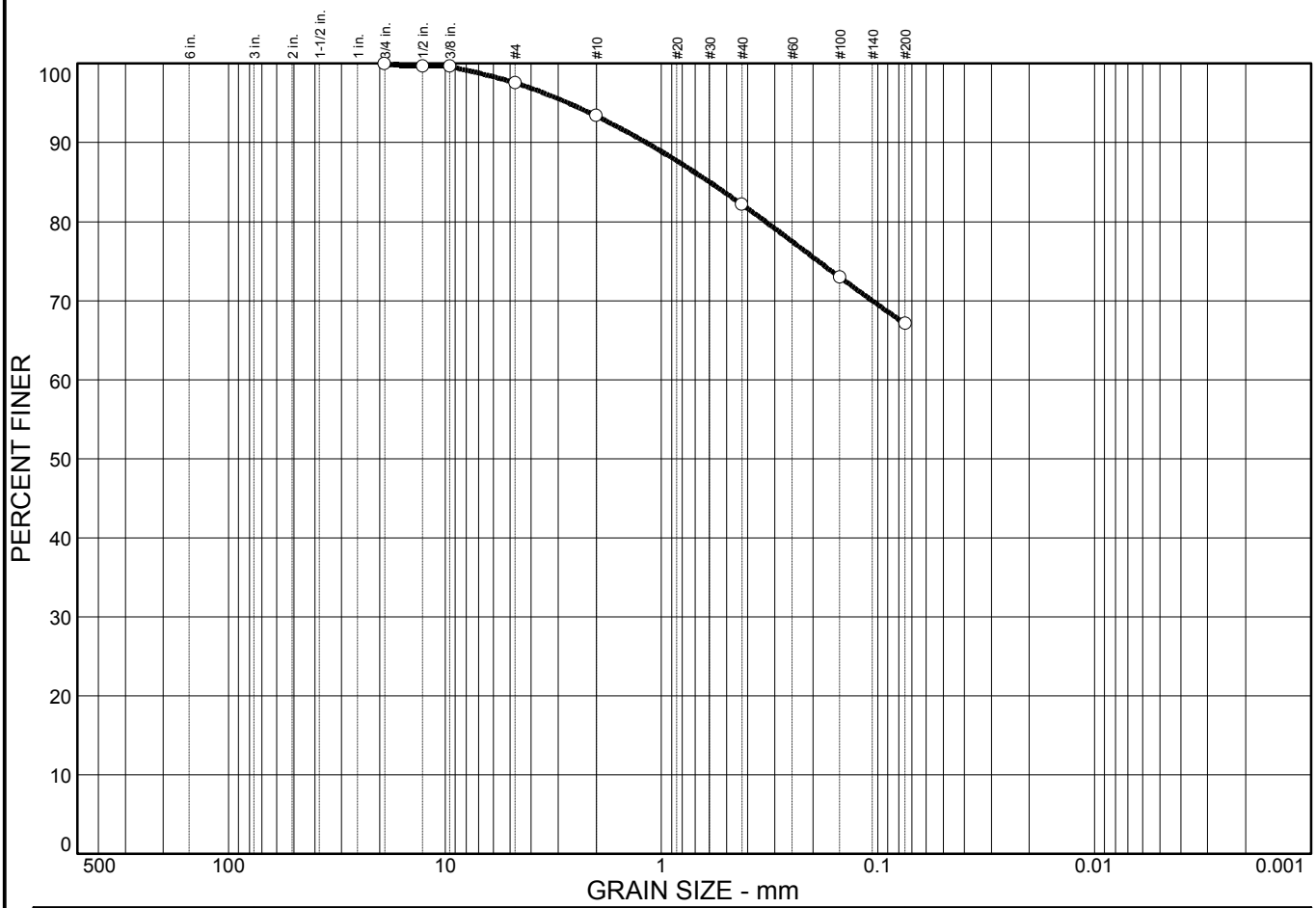
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 35 **Source of Sample:** Project Site **Date:** 2/19/07
Location: 2.15.07 LD #3300 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.4	30.5	67.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.7		
.375 in.	99.7		
#4	97.6		
#10	93.4		
#40	82.2		
#100	73.0		
#200	67.1		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace silt and gravel

Atterberg Limits

PL= 20 LL= 42 PI= 22

Coefficients

D_{85}= 0.597 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(13)

Remarks

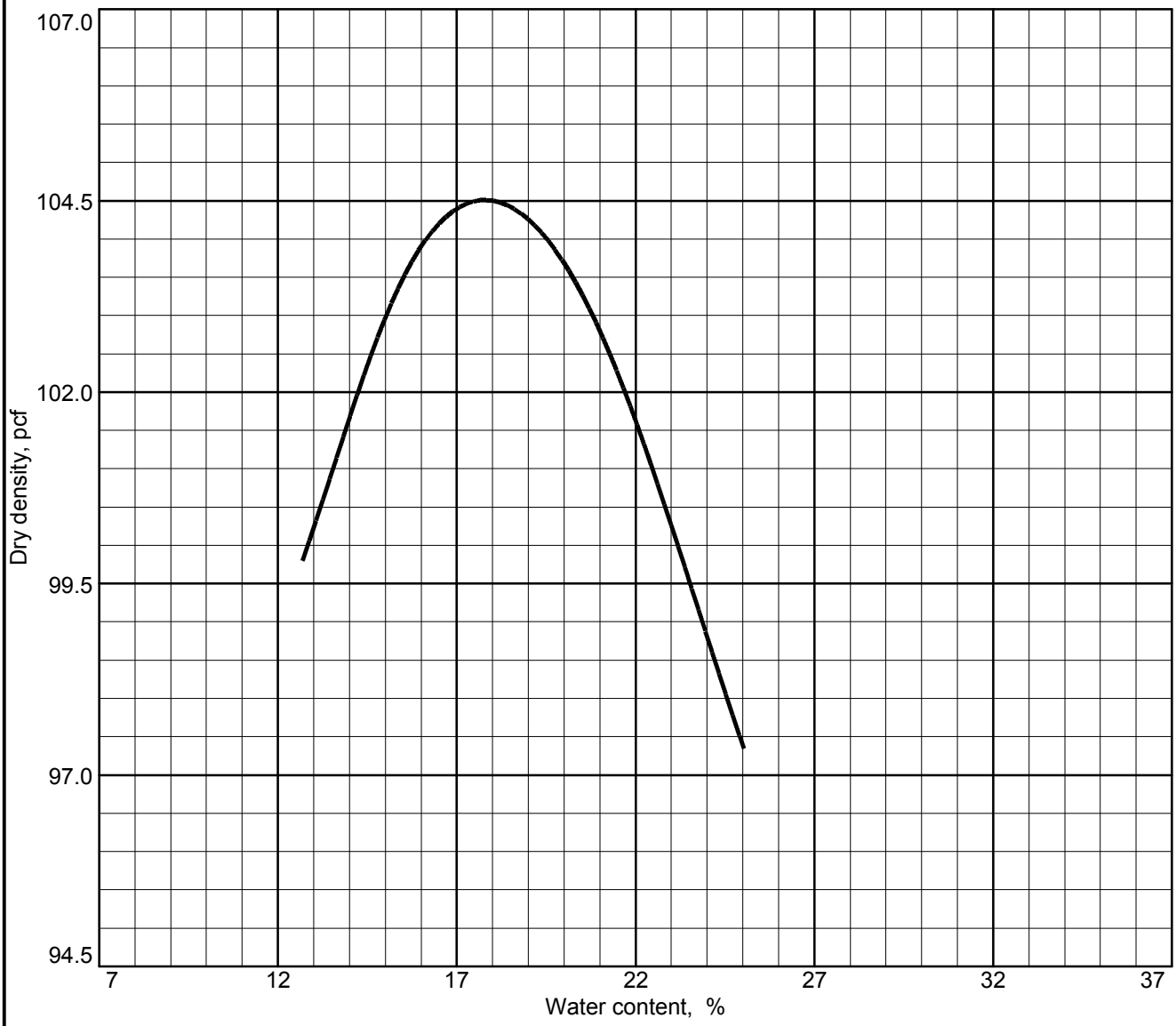
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 37 **Source of Sample:** Project Site **Date:** 2/19/07
Location: 2.15.07 LD #3410 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 105 pcf Optimum moisture = 18 %	Brownish yellow, sandy clay trace gravel and silt

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

● **Location:** 2.14.07 LD #3457

Remarks:

Tested by: D.Cotto

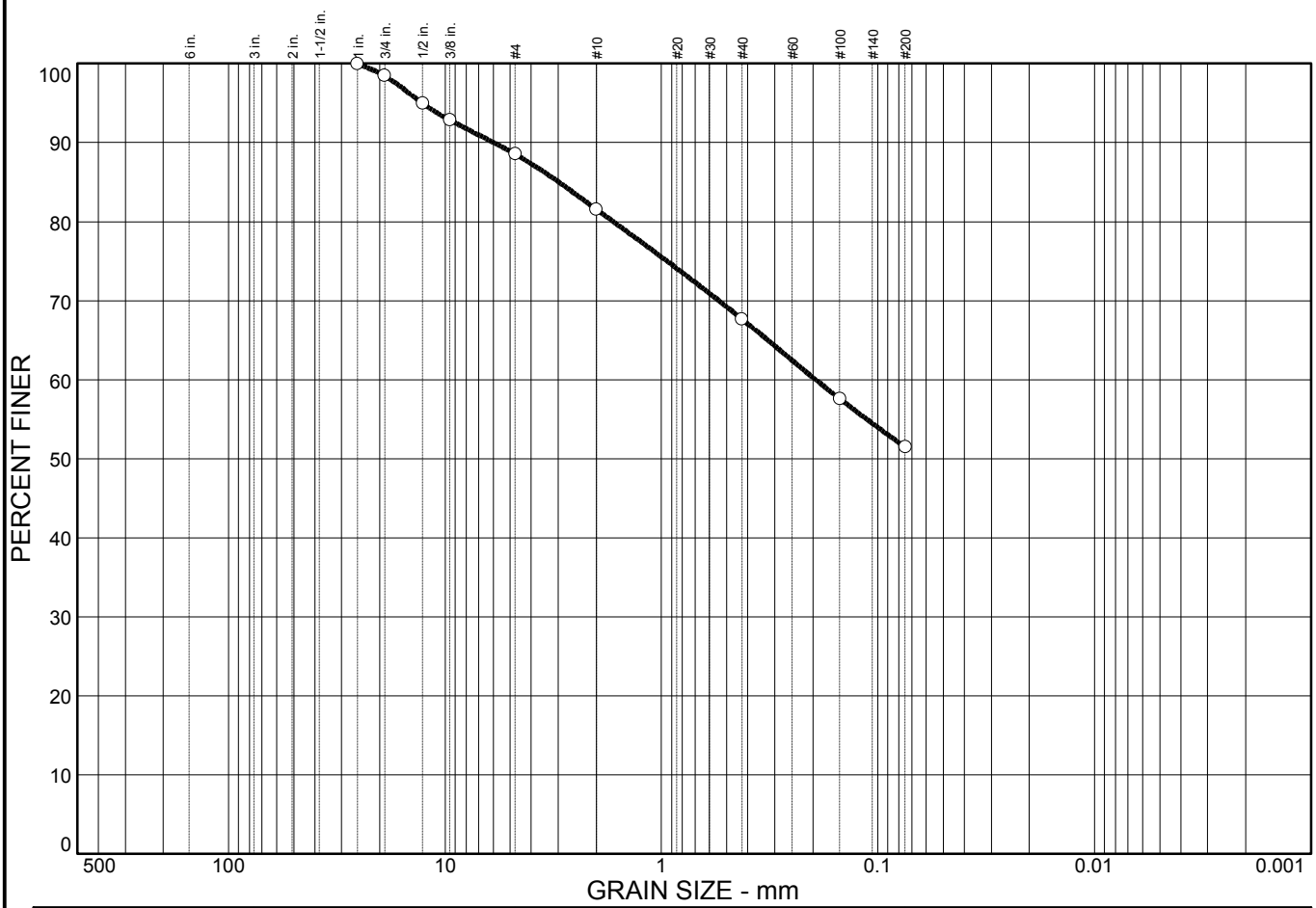
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	11.4	37.1	51.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	98.5		
.5 in.	95.0		
.375 in.	92.9		
#4	88.6		
#10	81.6		
#40	67.7		
#100	57.6		
#200	51.5		

* (no specification provided)

Material Description

Brownish yellow, clay with sand some gravel and silt

Atterberg Limits

PL= 22 LL= 37 PI= 15

Coefficients

D_{85}= 2.97 D_{60}= 0.193 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

Tested by: S.Perez

Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 29 **Source of Sample:** Project Site **Date:** 2/19/07
Location: 2.15.07 LD #3520 **Elev./Depth:** N/A

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Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

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February 19, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : DETERMINATION WATER CONTENT OF SOILS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by:	Client	
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 2216

Tests Results

A. Water Content Test Results (ASTM D 2216)

Test No.	Water Content (%)	Sample ID
1	18.2	2.07.07 LD 1870
2	22.0	2.08.07 LD 2200
3	21.3	2.09.07 LD 2420
4	18.3	2.05.07 LD 1540
5	19.5	2.07.07 LD 1980
6	22.8	2.05.07 LD 1760
7	21.4	2.05.07 LD 1650
8	36.2	2.08.07 LD 2090
9	18.6	2.09.07 LD 2310

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.

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February 19, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by:	Client	
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM C 803)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	4.80×10^{-8}	1.25.07 LD 880
2	4.70×10^{-7}	1.29.07 LD 1210
3	8.20×10^{-8}	1.29.07 LD 1320
4	1.90×10^{-7}	1.30.07 LD 1430

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.

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February 20, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by:	Client	
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM C 803)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	4.60×10^{-7}	1.23.07 LD 288

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.

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February 21, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Client
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM C 803)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	2.90×10^{-7}	1.31.07 LD 577

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.

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February 23, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by:	Client	
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM C 803)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	2.20×10^{-7}	1.22.07 LD 110

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.

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March 01, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by:	Client	
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM C 803)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	5.80×10^{-7}	1.25.07 LD 770

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.

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Marzo 05, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by:	Client	
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM C 803)

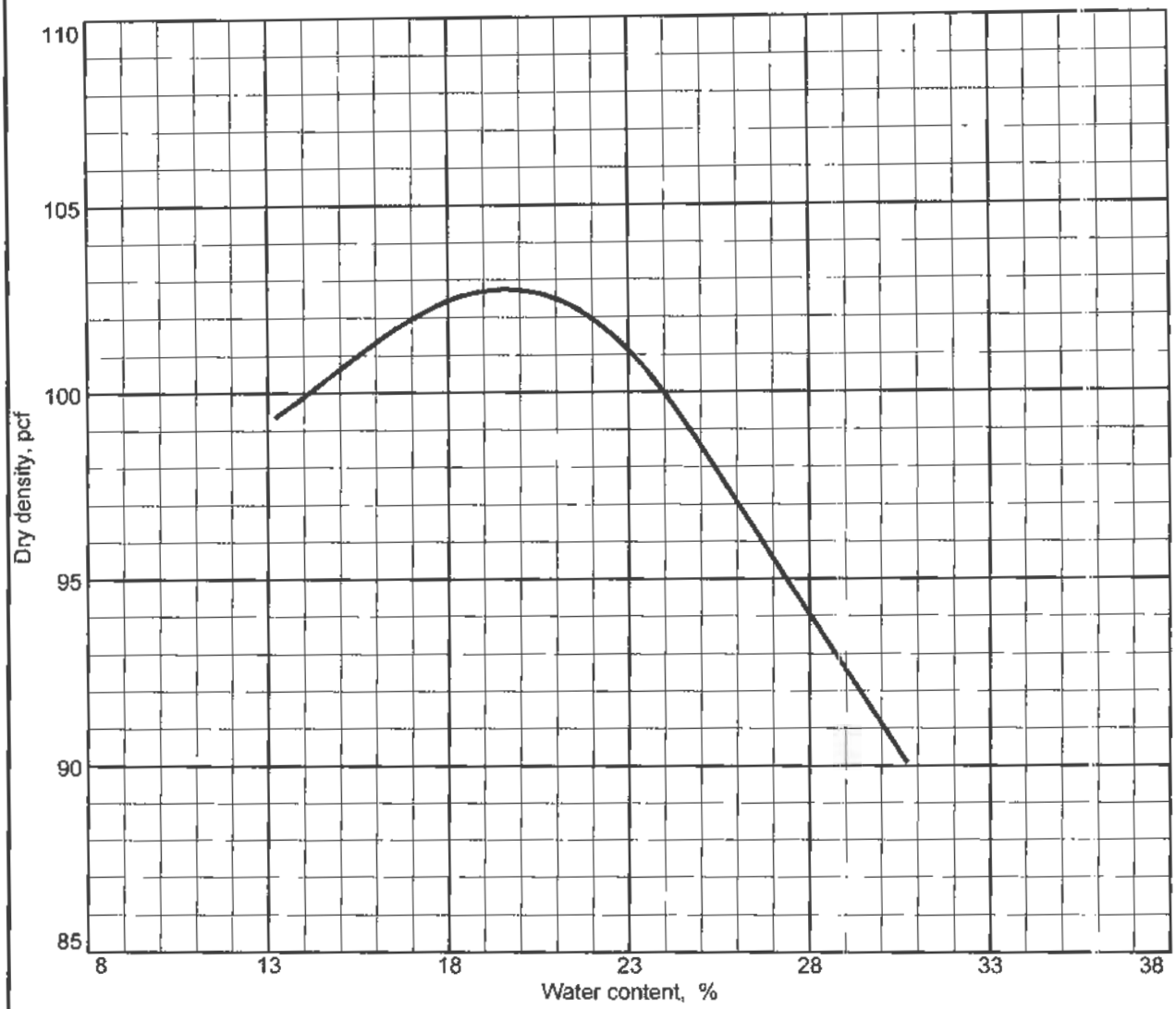
Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	8.30×10^{-7}	1.29.07 LD 1100

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.

COMPACTION TEST REPORT

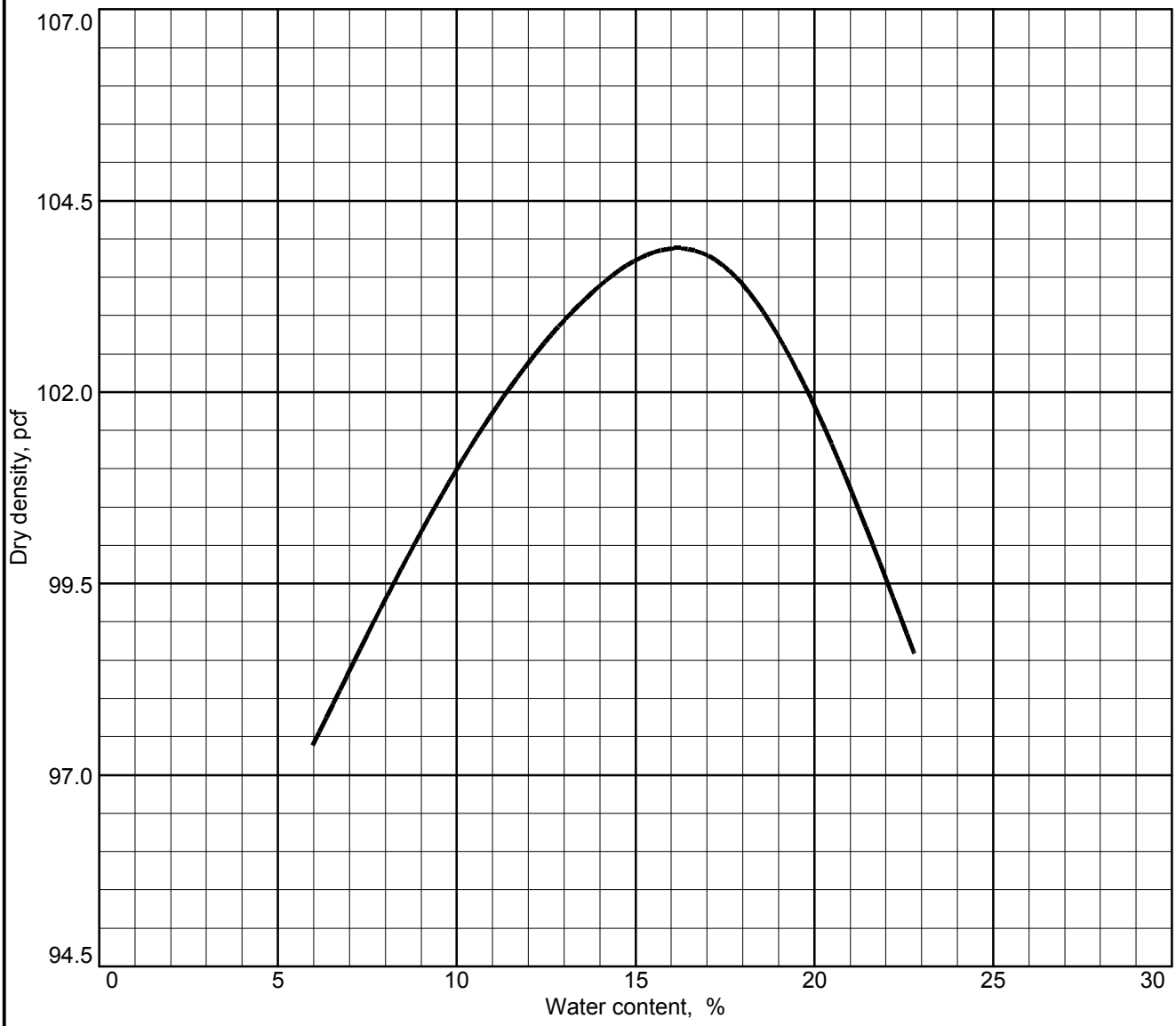


Test specification: ASTM D 698-91 Procedure A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103 pcf Optimum moisture = 20 %	Brownish yellow, sandy silt trace clay
Project No. Client: Shaw Enviromental & Infrastructure Inc. Project: Puerto Rico Landfill Closure • Location: 2.05.07 LD #1729	Remarks: Tested by: D.Cotto Checked by: Ediwn Gutierrez, E.I.T.
COMPACTION TEST REPORT JACA & SIERRA TESTING LABORATORIES	Figure

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104 pcf Optimum moisture = 16 %	Yellowish brown, silty clay trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

● **Location:** 2.08.07 LD #2017

Remarks:

Tested by: S.Perez

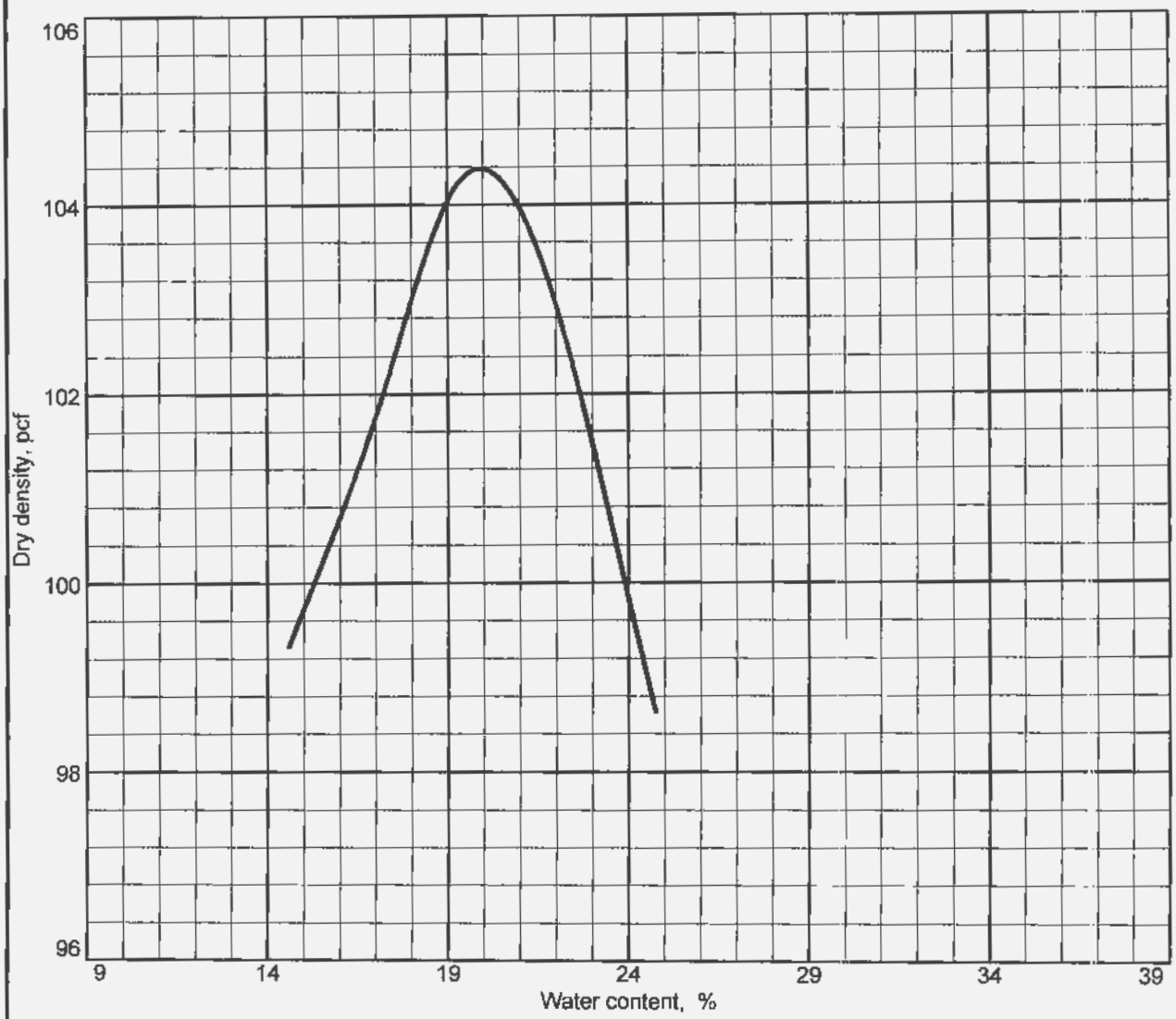
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104 pcf Optimum moisture = 20 %	Brownish yellow, sandy silt trace clay

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
• **Location:** 2.12.07 LD #2593

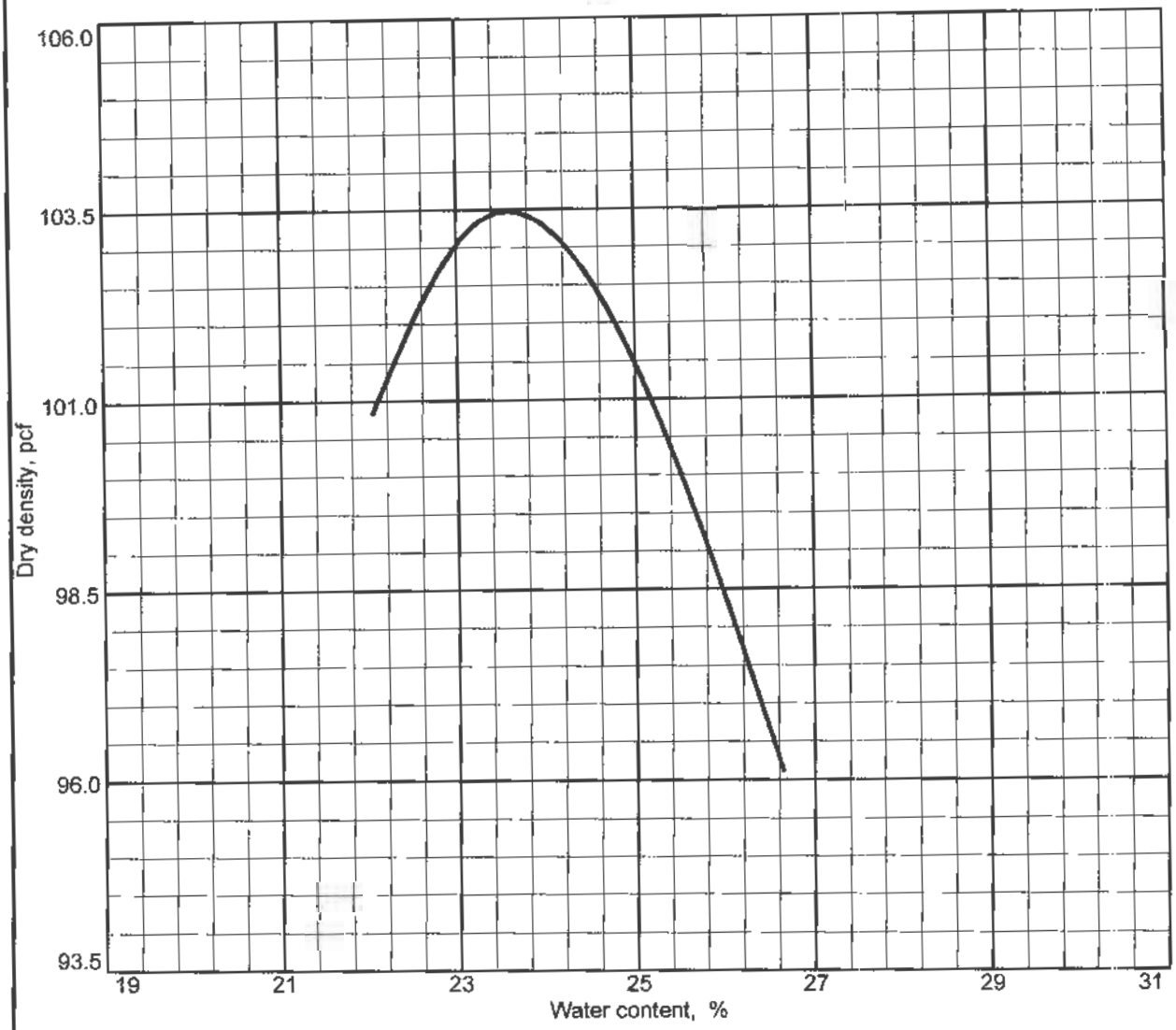
Remarks:
Tested by: M.Pereira
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103 pcf Optimum moisture = 23 %	Brownish yellow, sandy silt trace clay

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Location: 2.13.07 LD #2881

Remarks:
Tested by: D.Cotto
Checked by: Edwin Gutierrez, E.I.T.

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

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February 27, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : DETERMINATION WATER CONTENT OF SOILS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by:	Client	
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 2216

Tests Results

A. Water Content Test Results (ASTM D 2216)

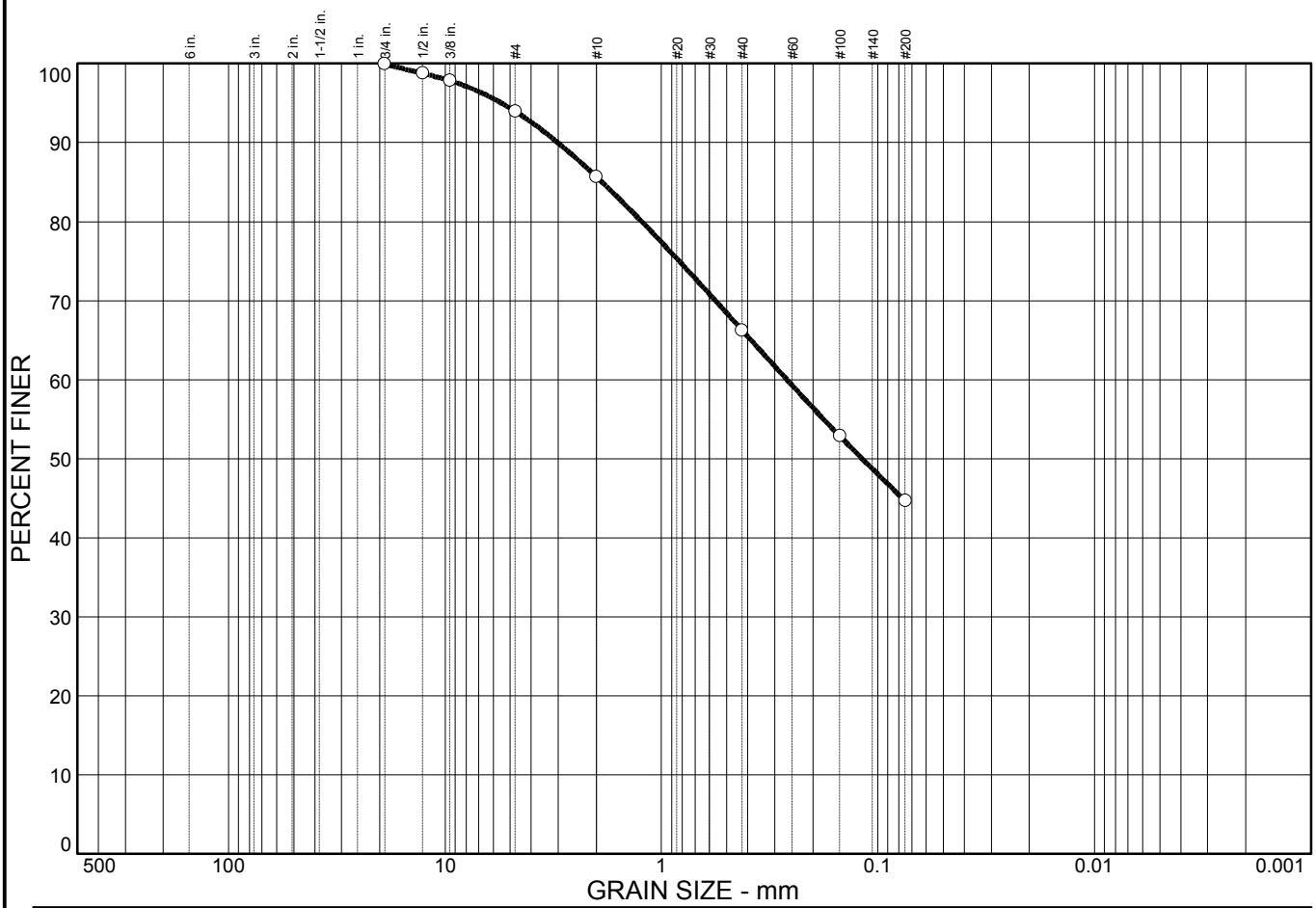
Test No.	Water Content (%)	Sample ID
1	16.98	2.22.07 LD 3740
2	16.86	2.20.07 LD 3630
3	16.58	2.22.07 LD 3745

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	6.0	49.3	44.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.8		
.375 in.	97.9		
#4	94.0		
#10	85.7		
#40	66.3		
#100	52.9		
#200	44.7		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel

Atterberg Limits

PL= 19 LL= 36 PI= 17

Coefficients

D_{85}= 1.88 D_{60}= 0.263 D_{50}= 0.118
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(4)

Remarks

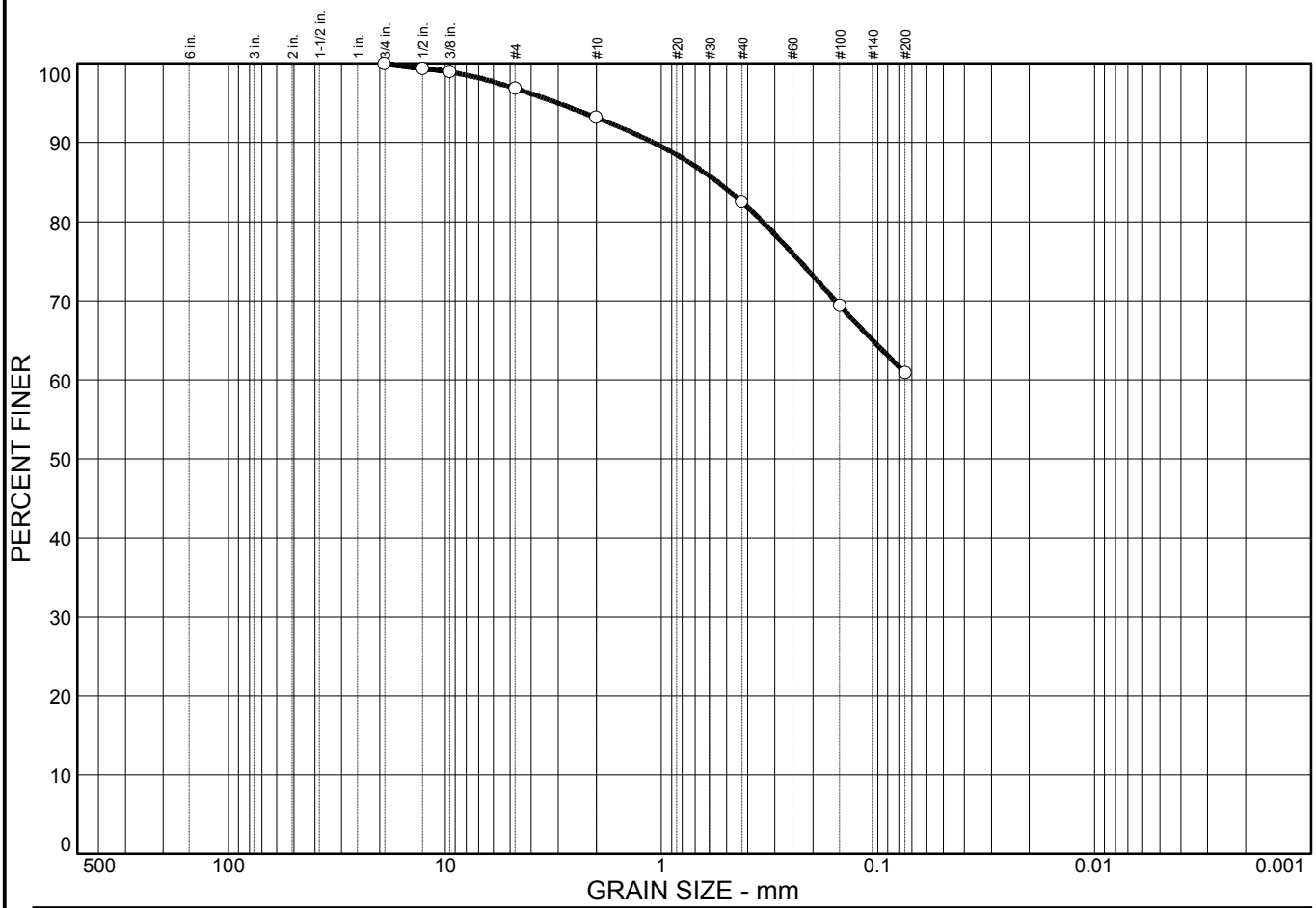
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 47 **Source of Sample:** Project Site **Date:** 3/01/07
Location: 2.20.07 LD #3630 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.1	36.0	60.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.4		
.375 in.	99.0		
#4	96.9		
#10	93.2		
#40	82.5		
#100	69.4		
#200	60.9		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace silt and gravel

Atterberg Limits

PL= 18 LL= 31 PI= 13

Coefficients

D_{85}= 0.548 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

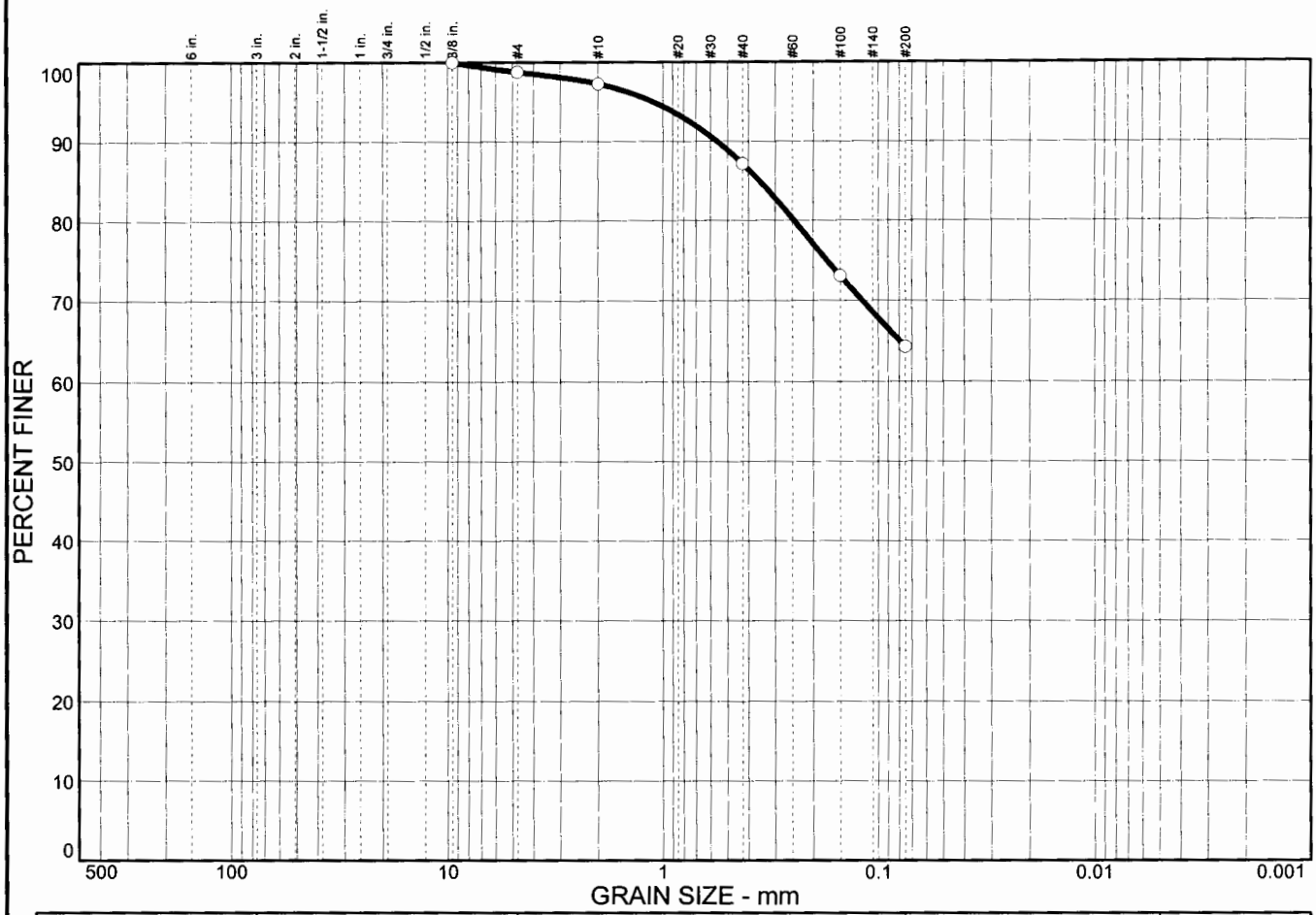
Tested by: S.Perez-L.Castro
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 48 **Source of Sample:** Project Site **Date:** 3/06/07
Location: 2.22.07 LD #3740 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.2	34.5	64.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	98.8		
#10	97.3		
#40	87.1		
#100	73.1		
#200	64.3		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace gravel

Atterberg Limits

PL= 20 LL= 33 PI= 13

Coefficients

D_{85}= 0.357 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

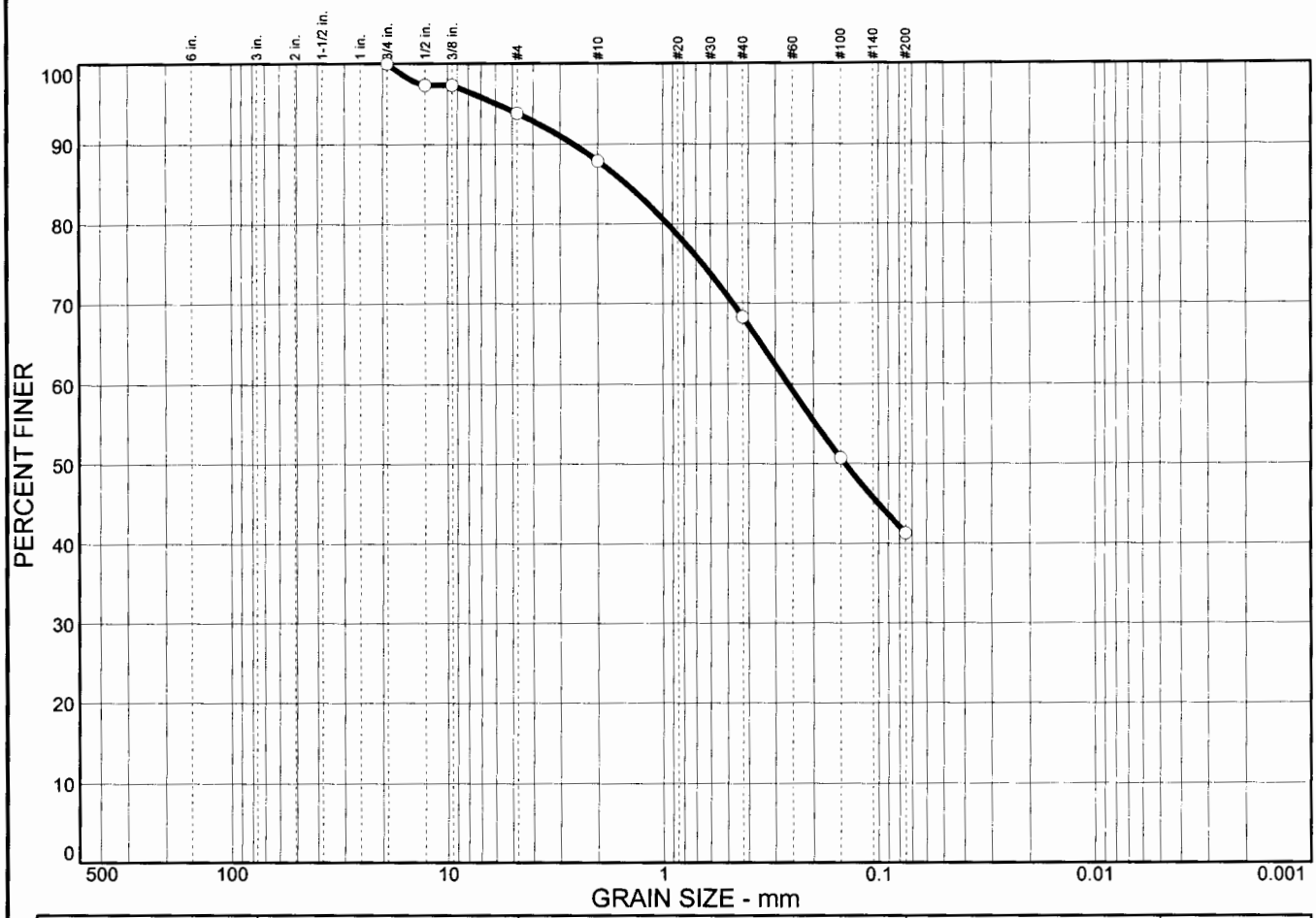
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 58 **Source of Sample:** Project Site **Date:** 3/14/07
Location: 2.26.07 LD #3850 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	6.2	52.5	41.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.3		
.375 in.	97.3		
#4	93.8		
#10	87.9		
#40	68.3		
#100	50.7		
#200	41.3		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel

Atterberg Limits

PL= 20 LL= 33 PI= 13

Coefficients

D_{85}= 1.47 D_{60}= 0.262 D_{50}= 0.143
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.

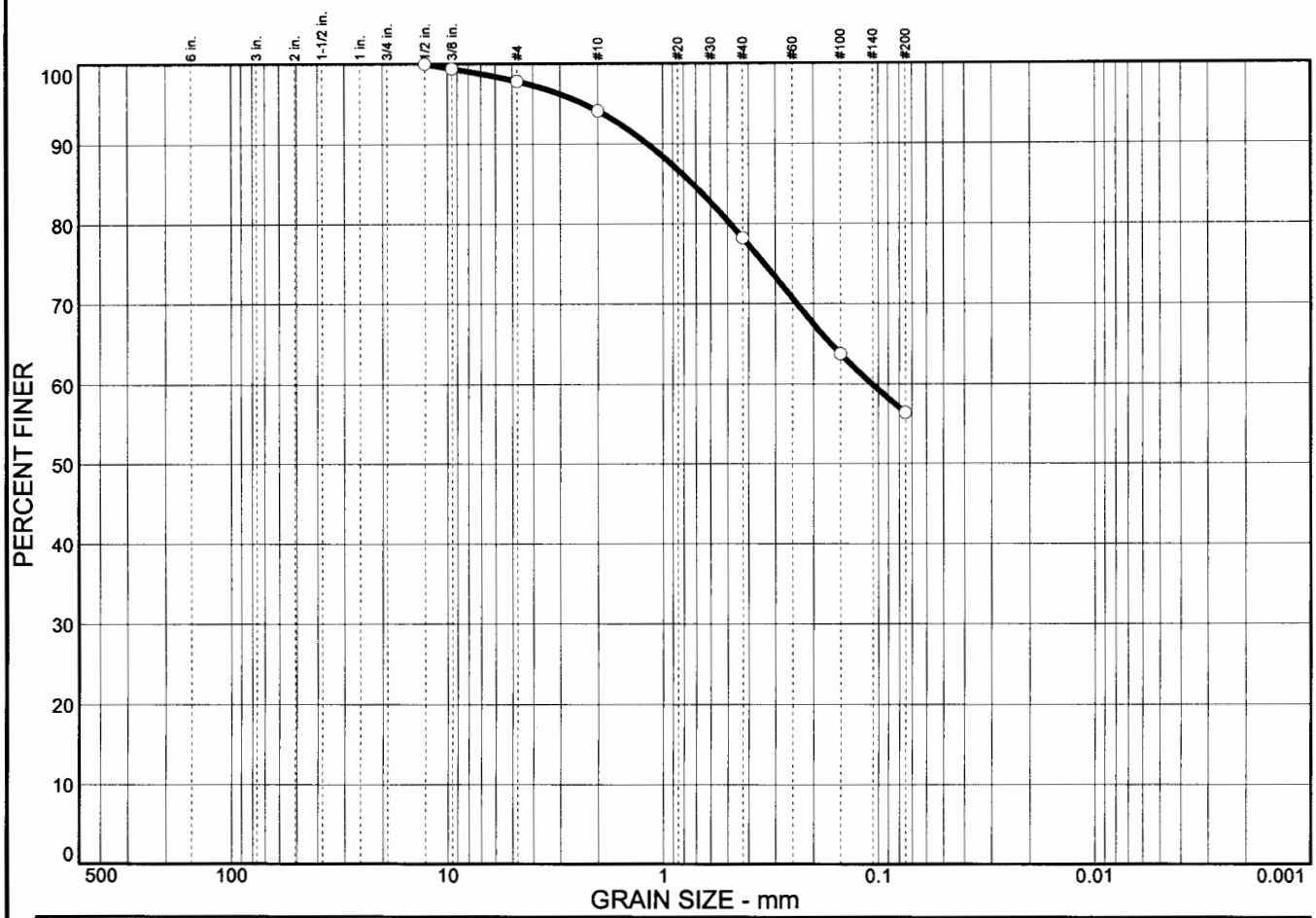
Edwin Gutierrez

Sample No.: 49 **Source of Sample:** Project Site **Date:** 3/12/07
Location: 2.26.07 LD #3960 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.2	41.4	56.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.4		
#4	97.8		
#10	94.1		
#40	78.2		
#100	63.8		
#200	56.4		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace silt and gravel

Atterberg Limits

PL= 20 LL= 34 PI= 14

Coefficients

D_{85}= 0.728 D_{60}= 0.107 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

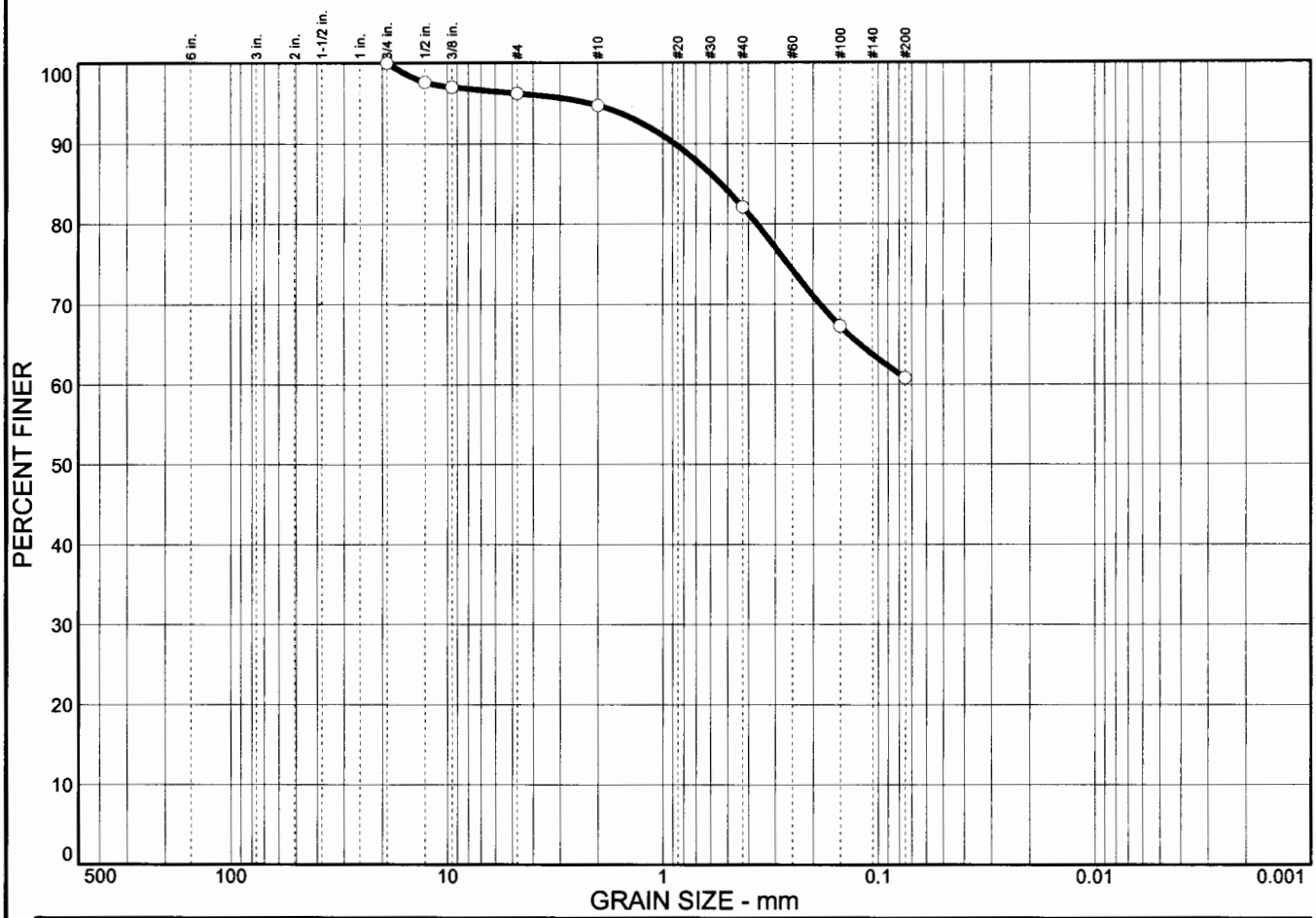
Edwin Gutierrez

Sample No.: 62 **Source of Sample:** Project Site **Date:** 3/15/07
Location: 2.26.07 LD #4070 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.8	35.4	60.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.6		
.375 in.	97.0		
#4	96.2		
#10	94.7		
#40	82.1		
#100	67.3		
#200	60.8		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace silt and gravel

Atterberg Limits

PL= 20 LL= 35 PI= 15

Coefficients

D_{85}= 0.535 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(7)

Remarks

Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

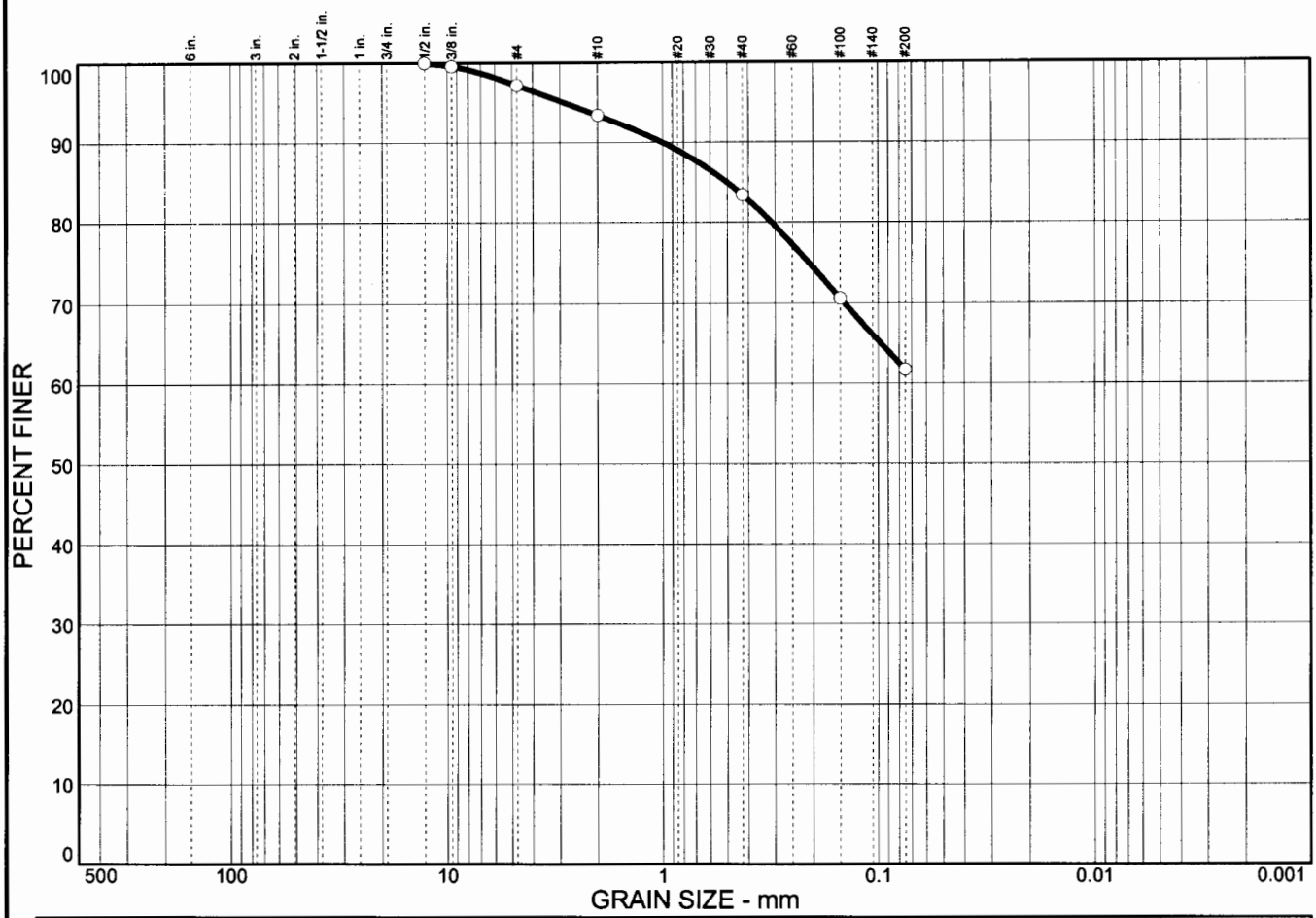
Edwin Gutierrez

Sample No.: 60 **Source of Sample:** Project Site **Date:** 3/15/07
Location: 2.27.07 LD #4180 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.8	35.5	61.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.6		
#4	97.2		
#10	93.4		
#40	83.4		
#100	70.6		
#200	61.7		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace silt and gravel

Atterberg Limits

PL= 21 LL= 35 PI= 14

Coefficients

D_{85}= 0.503 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(7)

Remarks

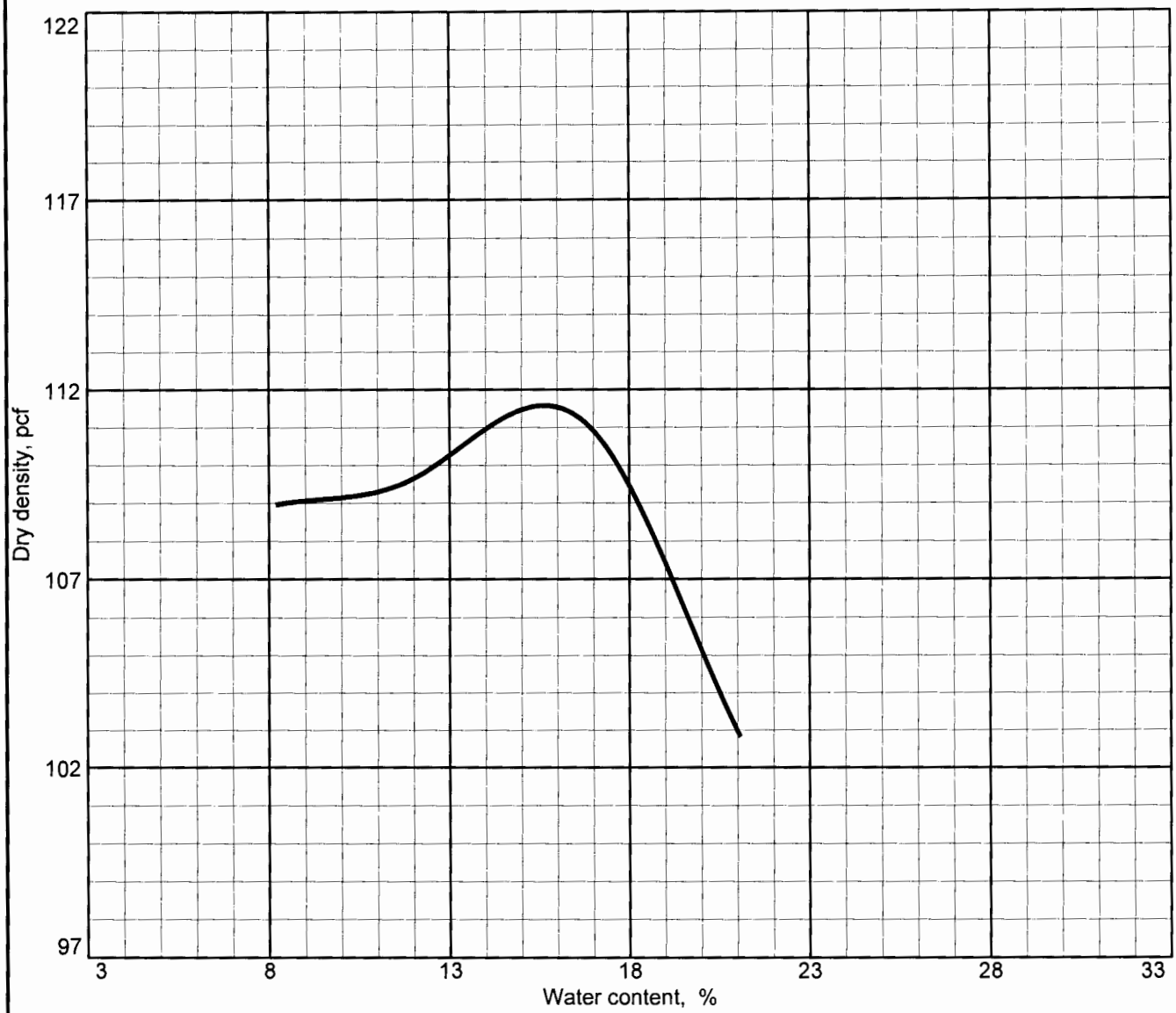
Tested by: S.PErez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 61 **Source of Sample:** Project Site **Date:** 3/15/07
Location: 2.27.07 LD #4290 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 112 pcf Optimum moisture = 16 %	Brownish yellow, clayey sand trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 2.27.07 LD #4321

Remarks:

Tested by: R.Ortiz

Checked by: Edwin Gutierrez, E.I.T.

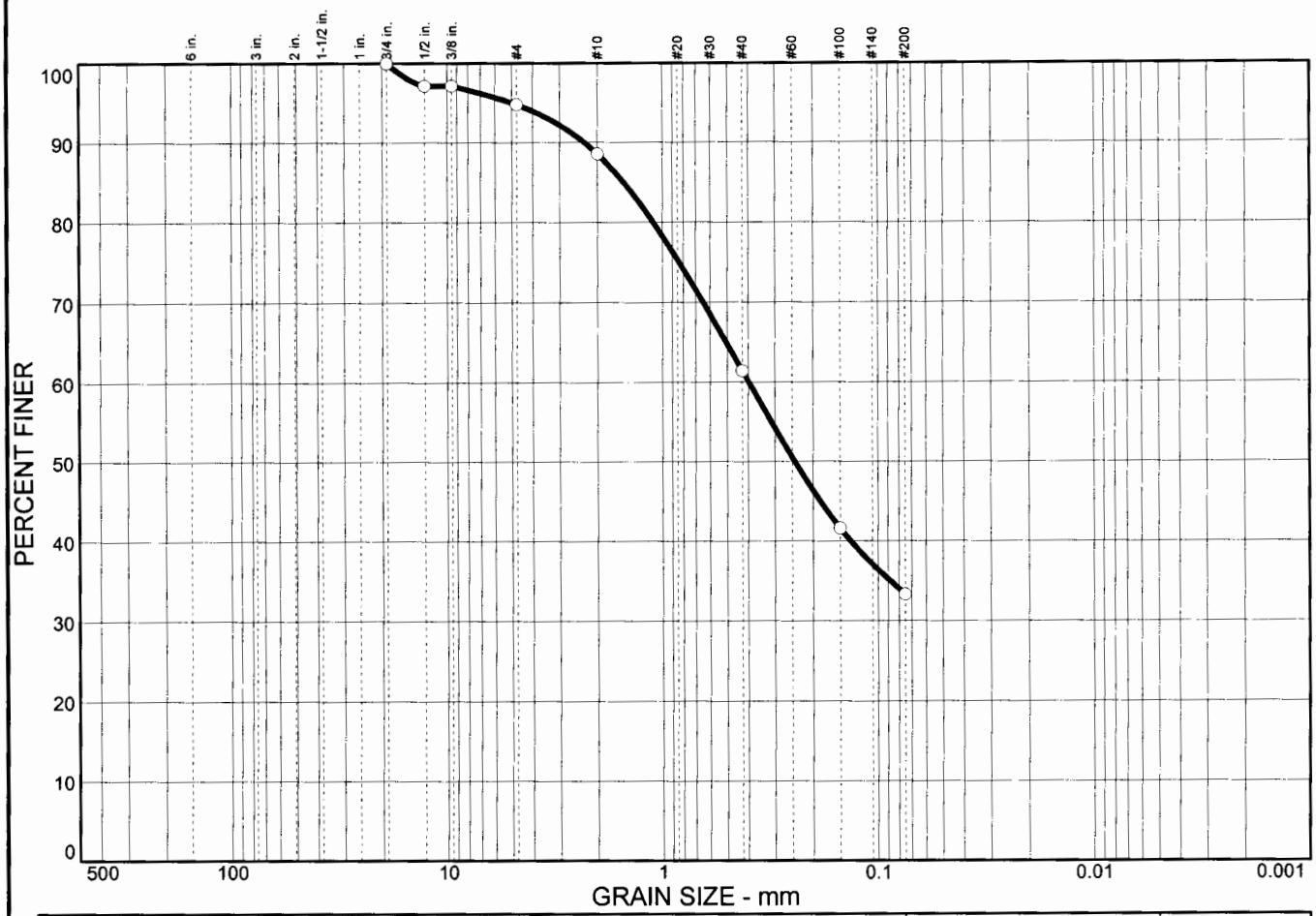
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	5.2	61.5	33.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.2		
.375 in.	97.2		
#4	94.8		
#10	88.5		
#40	61.4		
#100	41.6		
#200	33.3		

* (no specification provided)

Material Description

Brownish yellow, clayey sand trace gravel

Atterberg Limits

PL= 17 LL= 32 PI= 15

Coefficients

D_{85}= 1.52 D_{60}= 0.397 D_{50}= 0.243
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-2-6(1)

Remarks

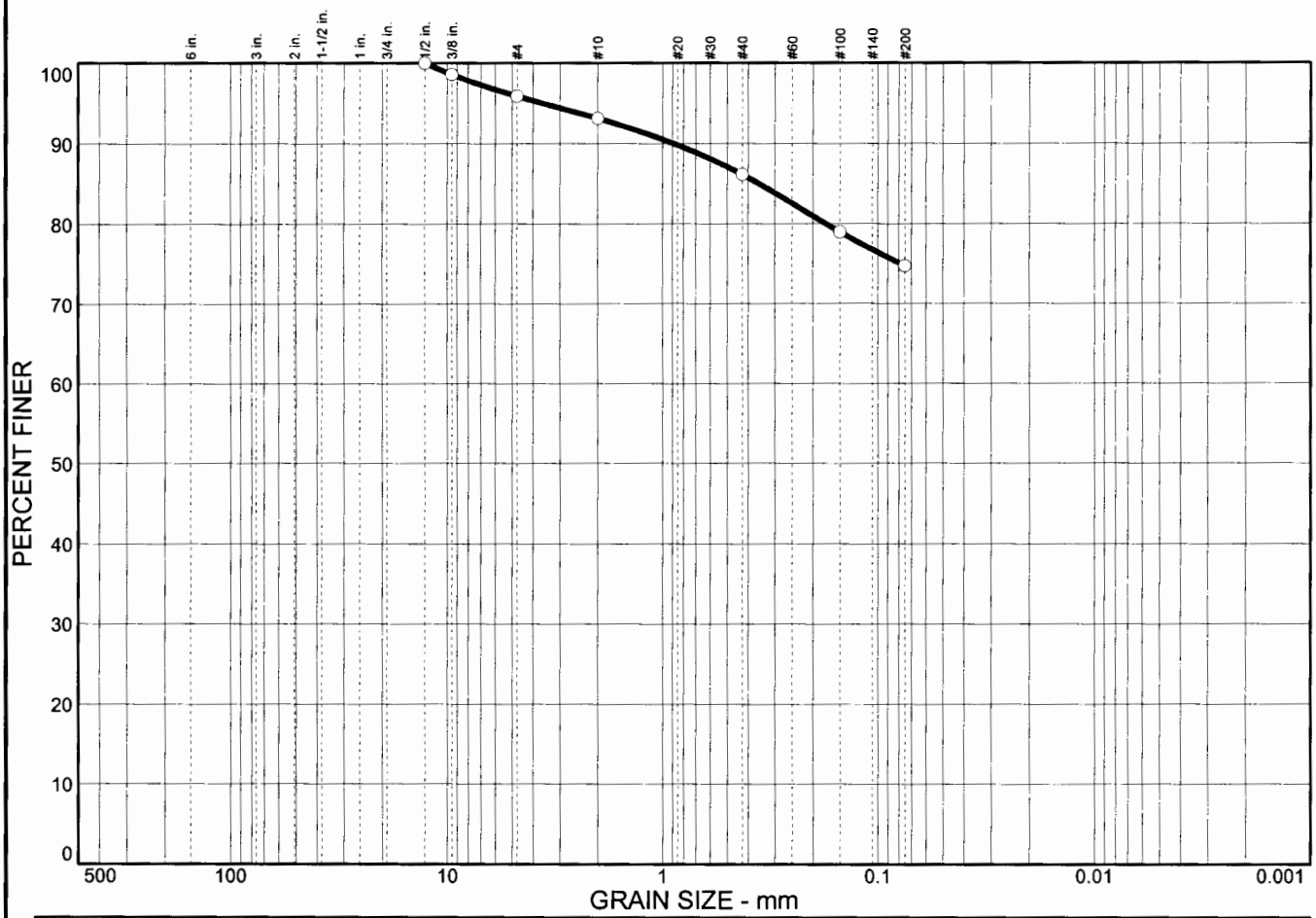
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 53 **Source of Sample:** Project Site **Date:** 3/12/07
Location: 2.28.07 LD #4400 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.1	21.1	74.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.6		
#4	95.9		
#10	93.1		
#40	86.1		
#100	79.0		
#200	74.8		

* (no specification provided)

Material Description

Brownish yellow, sandy clay trace gravel and silt

Atterberg Limits

PL= 23 LL= 38 PI= 15

Coefficients

D_{85}= 0.358 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(11)

Remarks

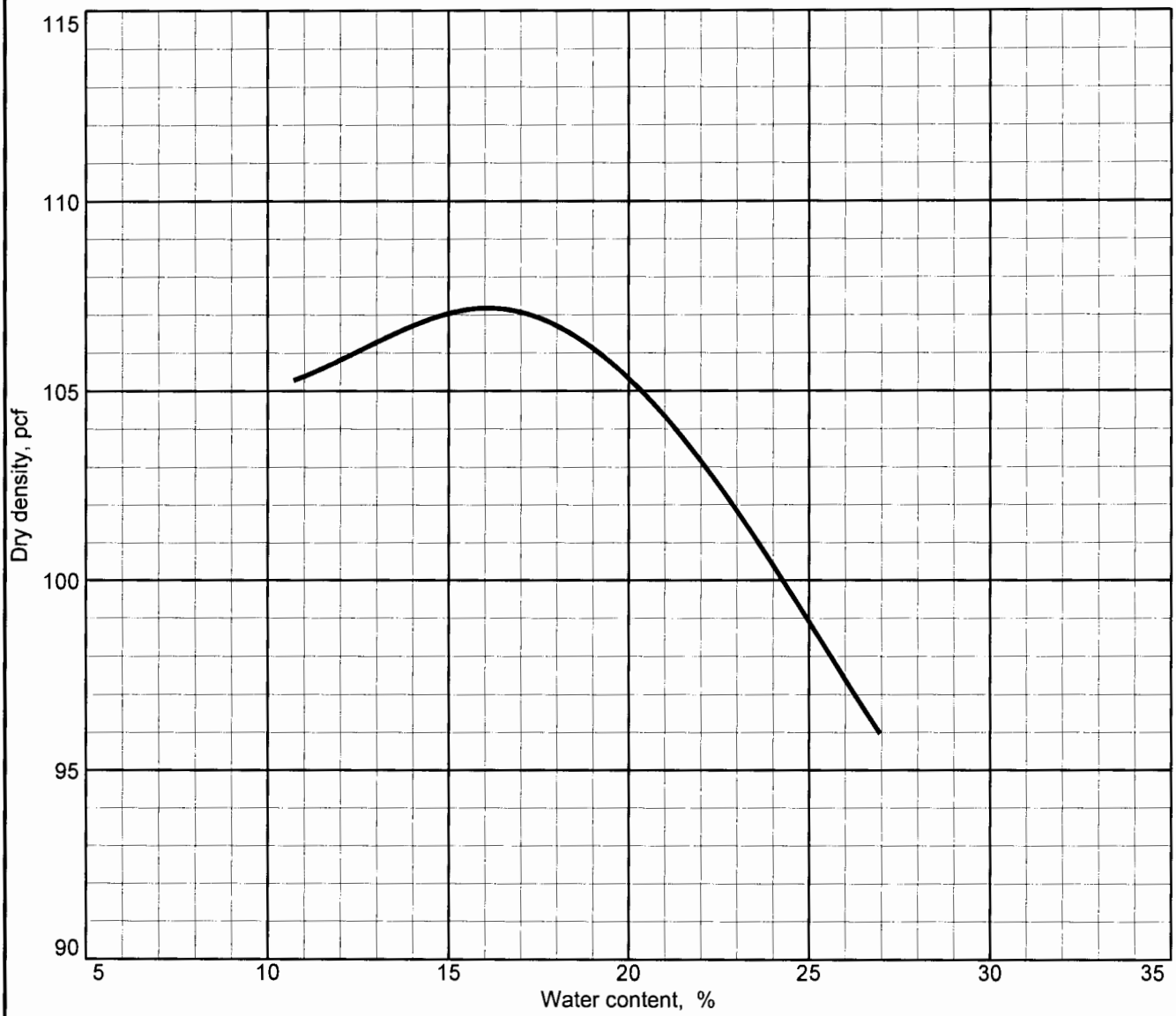
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 52 **Source of Sample:** Project Site **Date:** 3/12/07
Location: 2.28.07 LD #4510 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 107 pcf Optimum moisture = 16 %	Brownish yellow, clayey sand trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 2.28.07 LD #4609

Remarks:

Tested by: R.Ortiz

Checked by: Edwin Gutierrez E.I.T.

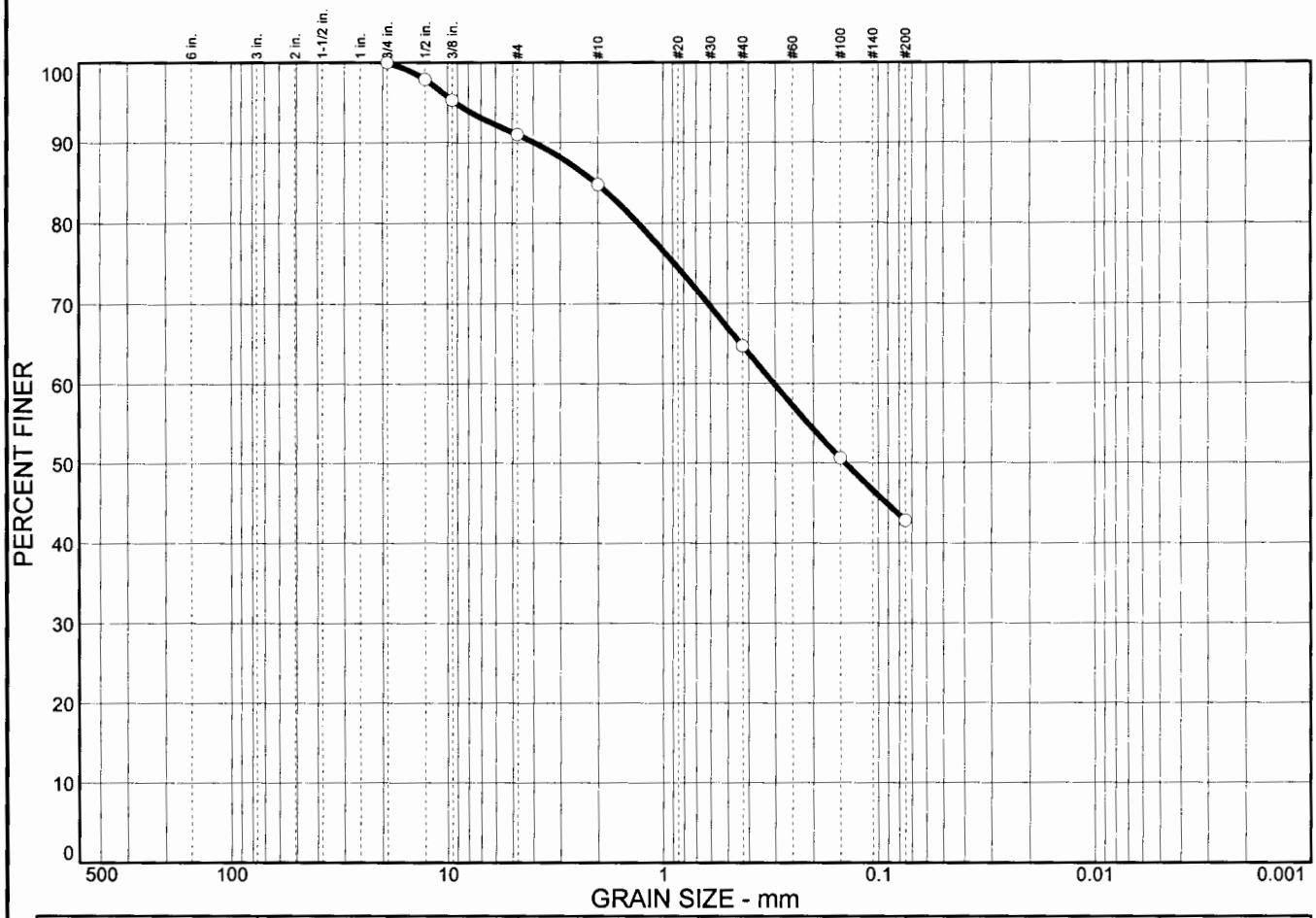
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	9.0	48.2	42.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.9		
.375 in.	95.3		
#4	91.0		
#10	84.7		
#40	64.7		
#100	50.6		
#200	42.8		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel

Atterberg Limits

PL= 19 LL= 34 PI= 15

Coefficients

D_{85}= 2.06 D_{60}= 0.305 D_{50}= 0.143
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(3)

Remarks

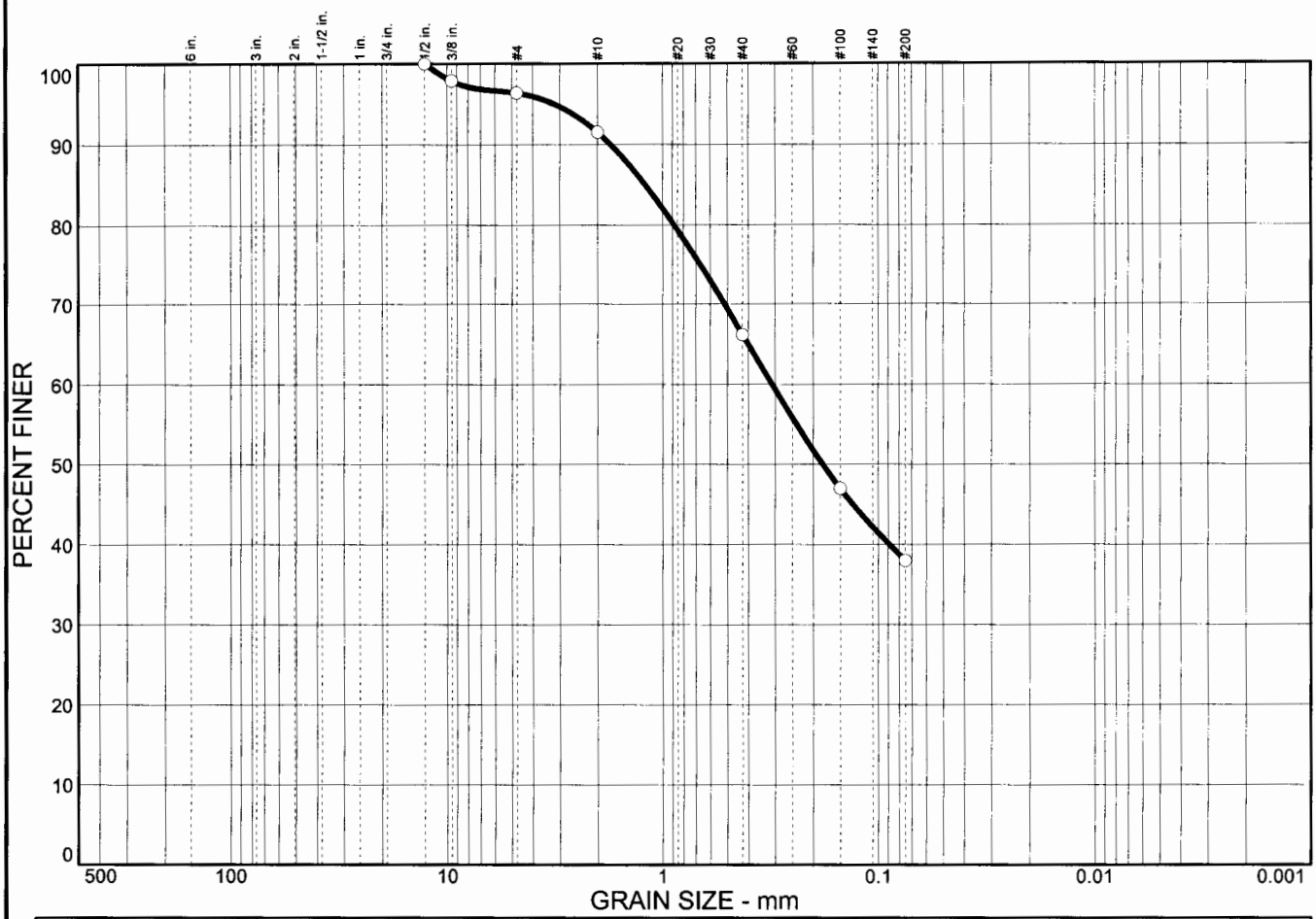
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 54 **Source of Sample:** Project Site **Date:** 3/12/07
Location: 2.28.07 LD #4620 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.6	58.4	38.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	97.9		
#4	96.4		
#10	91.5		
#40	66.2		
#100	47.0		
#200	38.0		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel

Atterberg Limits

PL= 19 LL= 31 PI= 12

Coefficients

D_{85}= 1.20 D_{60}= 0.311 D_{50}= 0.181
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(1)

Remarks

Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.

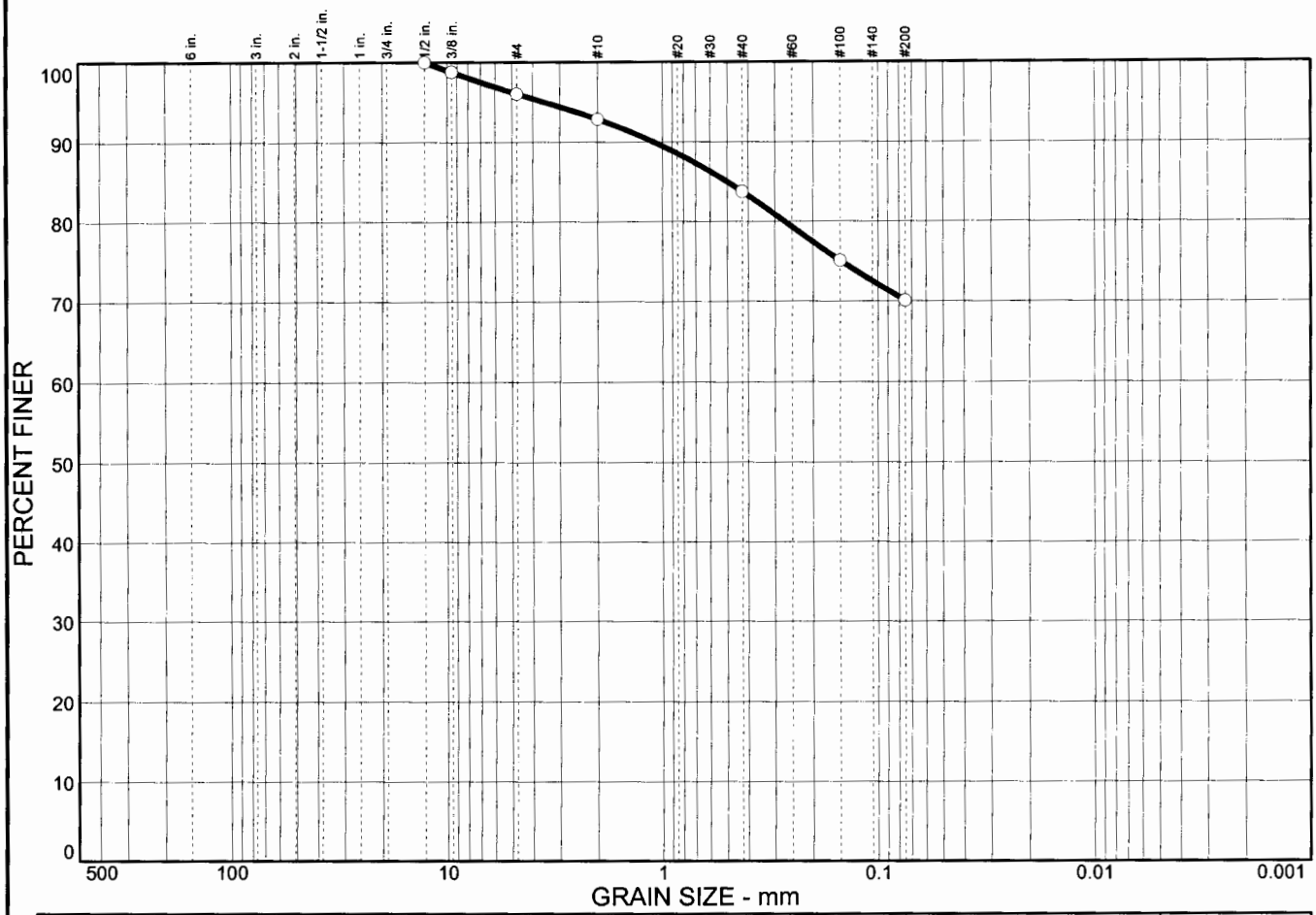
Edwin Gutierrez

Sample No.: 51 **Source of Sample:** Project Site **Date:** 3/12/07
Location: 3.01.07 LD #4730 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.9	26.0	70.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.8		
#4	96.1		
#10	92.9		
#40	83.7		
#100	75.1		
#200	70.1		

* (no specification provided)

Material Description

Brownish yellow, sandy clay trace silt and gravel

Atterberg Limits

PL= 18 LL= 36 PI= 18

Coefficients

D_{85}= 0.504 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(11)

Remarks

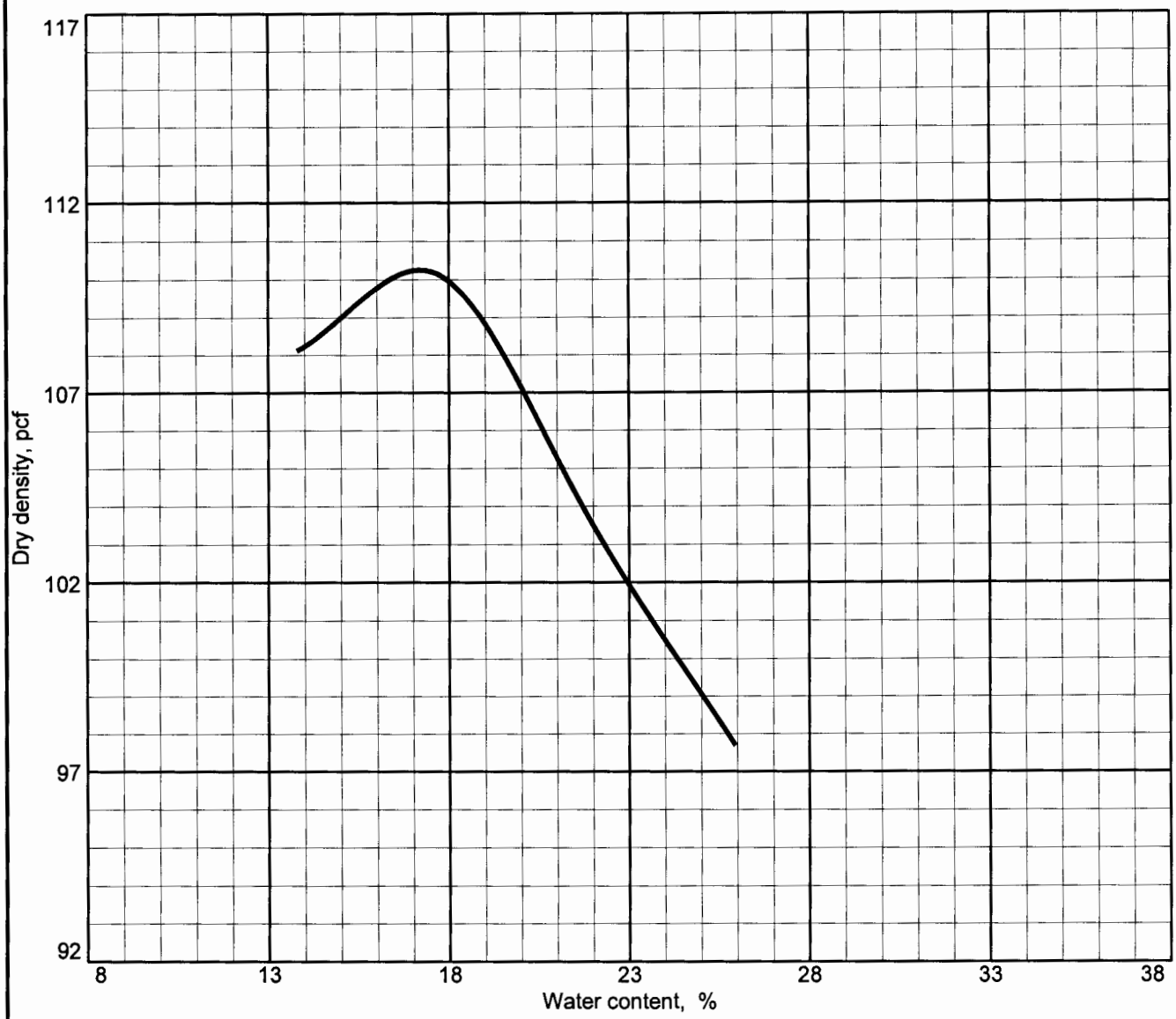
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 50 **Source of Sample:** Project Site **Date:** 3/12/07
Location: 3.01.07 LD #4840 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 110 pcf Optimum moisture = 17 %	Brownish yellow, sand with clay trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 3.12.07 LD #4897

Remarks:

Tested by: S.Perez

Checked by: Edwin Gutierrez/E.I.T.

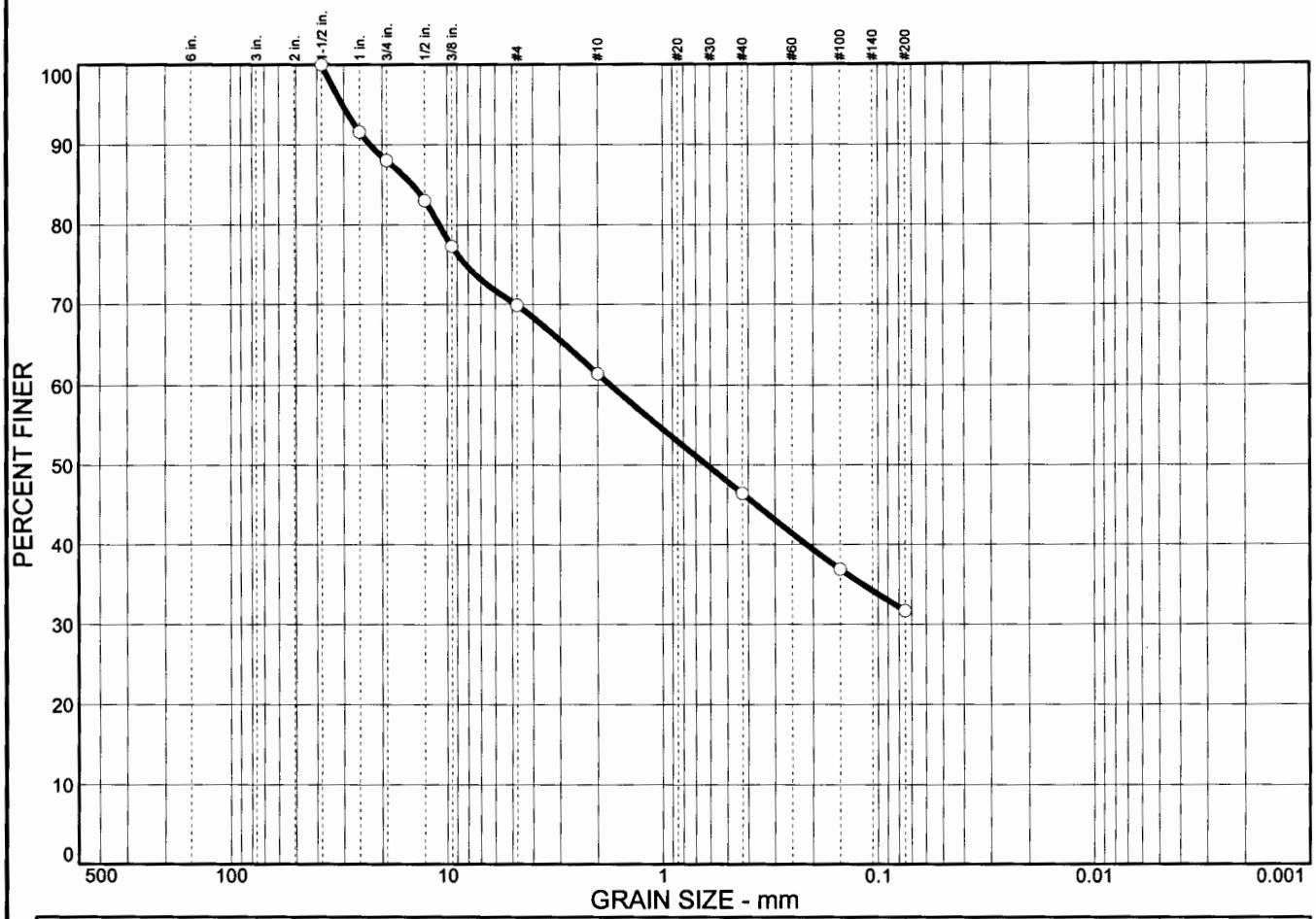
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	30.1	38.2	31.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	91.6		
.75 in.	88.0		
.5 in.	83.0		
.375 in.	77.3		
#4	69.9		
#10	61.4		
#40	46.4		
#100	36.9		
#200	31.7		

* (no specification provided)

Material Description

Brownish yellow, gravelly sand with clay

Atterberg Limits

PL= 19 LL= 32 PI= 13

Coefficients

D_{85}= 14.5 D_{60}= 1.75 D_{50}= 0.622
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-2-6(1)

Remarks

Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 69 **Source of Sample:** Project Site **Date:** 3/19/07
Location: 3.12.07 LD #4950 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA TESTING LABORATORIES
SOIL CONSULTING ENGINEERS

Soil and Material Testing Laboratories
Earthwork Supervision
Large Diameter Drilling
Monitoring Wells
Water Wells

P.O. Box 363116 San Juan, Puerto Rico
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(787) 761-2668
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March 20, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : DETERMINATION WATER CONTENT OF SOILS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Client
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 2216

Tests Results

A. Water Content Test Results (ASTM D 2216)

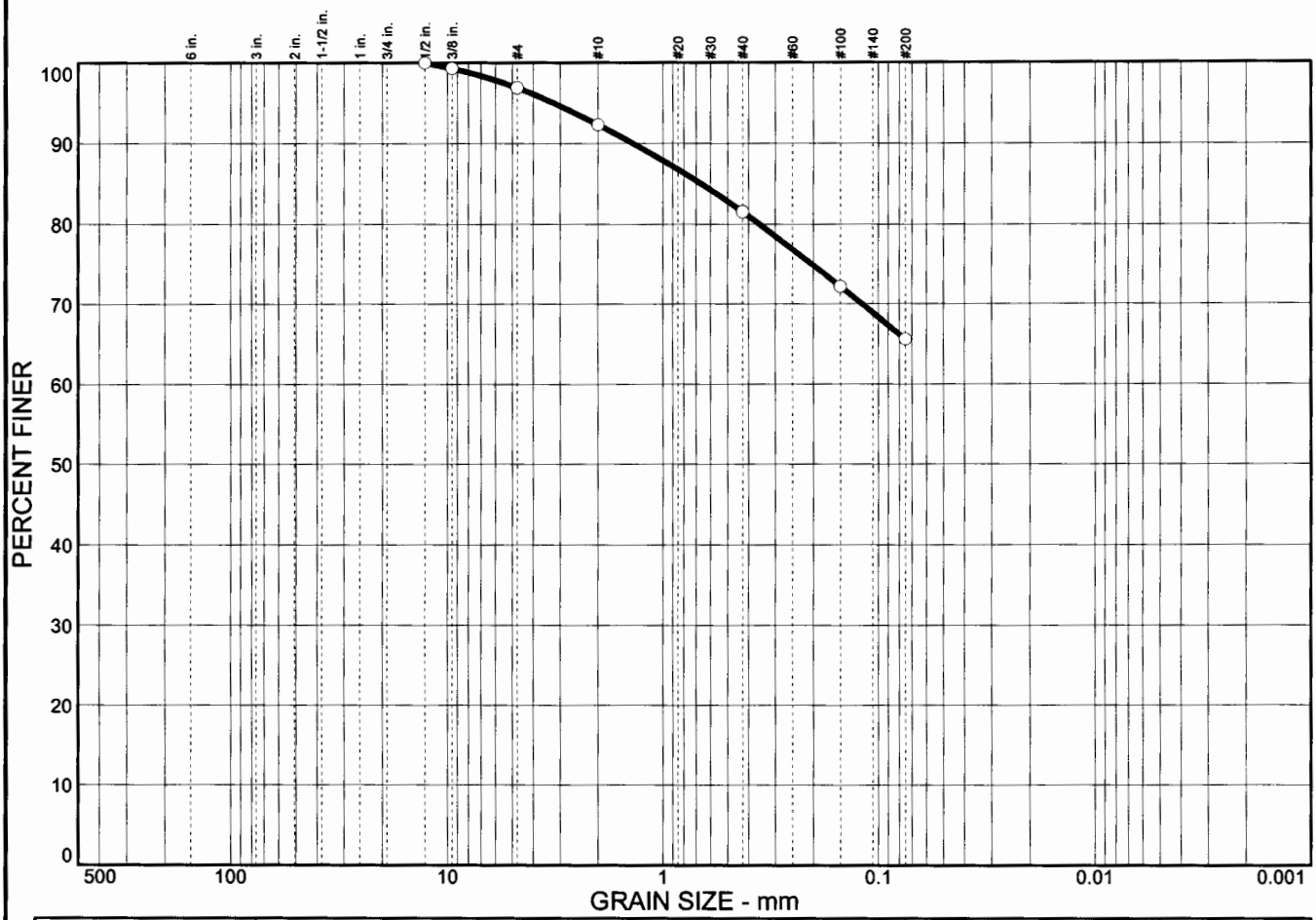
Test No.	Water Content (%)	Sample ID
1	16.02	3.16.07 LD 5280
2	15.46	3.12.07 LD 5473
3	18.26	3.15.07 Conf. P2
4	11.82	3.14.07 LD 5610
5	14.69	3.14.07 LD 5390
6	14.64	3.15.07 Conf. P2
7	16.71	3.15.07 LD 5720
8	17.70	3.15.07 LD 5830
9	14.75	3.13.07 LD 5170
10	16.91	3.12.07 LD 5060
11	19.86	3.14.07 LD 5500

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

Edwin Gutierrez Torres, E.I.T.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.1	31.3	65.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.3		
#4	96.9		
#10	92.3		
#40	81.5		
#100	72.2		
#200	65.6		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace gravel

Atterberg Limits

PL= 22 LL= 35 PI= 13

Coefficients

D_{85}= 0.666 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(7)

Remarks

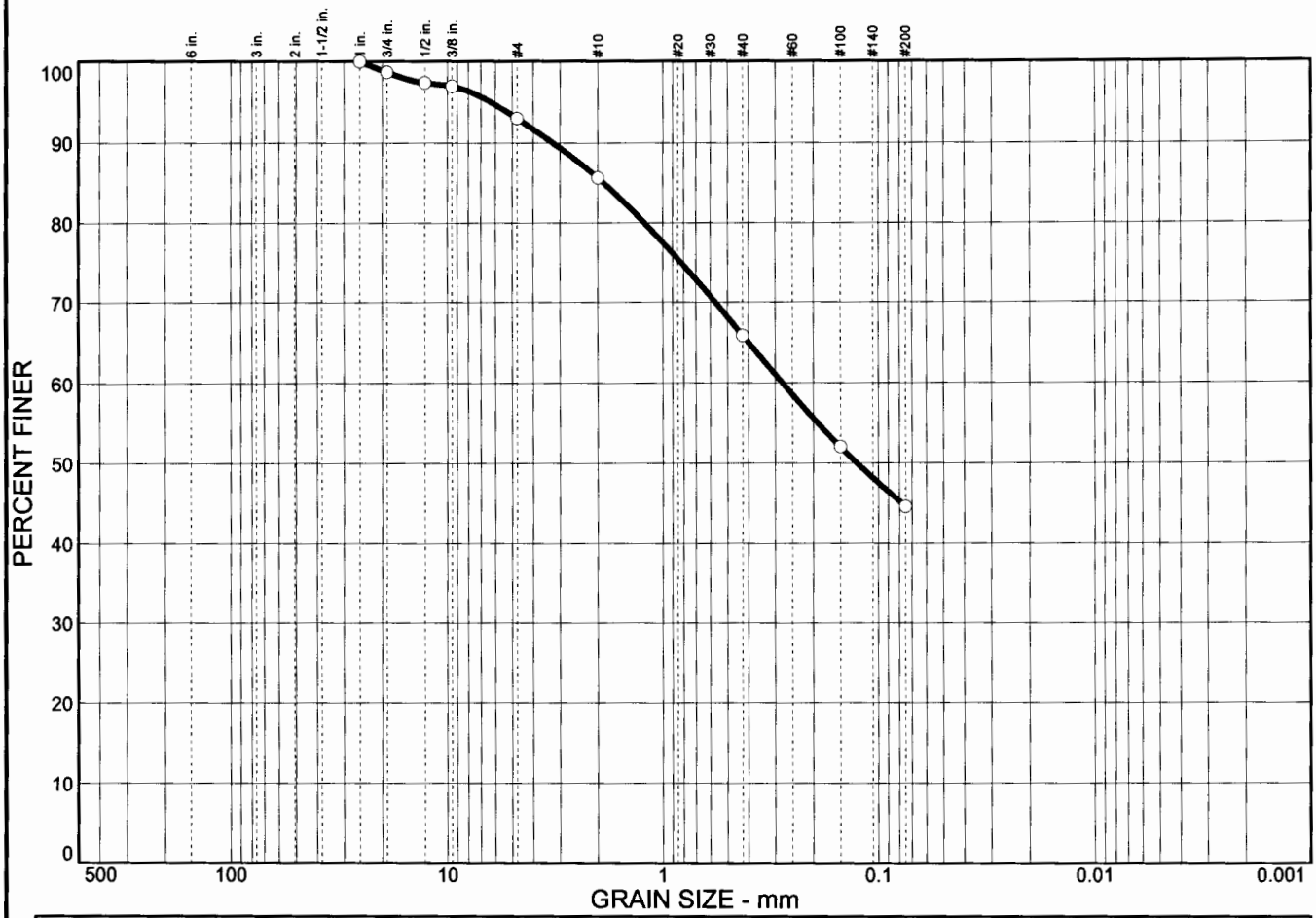
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 65 **Source of Sample:** Project Site **Date:** 3/19/07
Location: 3.12.07 LD #5060 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	7.0	48.4	44.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	98.7		
.5 in.	97.4		
.375 in.	97.0		
#4	93.0		
#10	85.6		
#40	65.9		
#100	52.0		
#200	44.6		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel

Atterberg Limits

PL= 20 LL= 34 PI= 14

Coefficients

D_{85}= 1.89 D_{60}= 0.279 D_{50}= 0.126
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(3)

Remarks

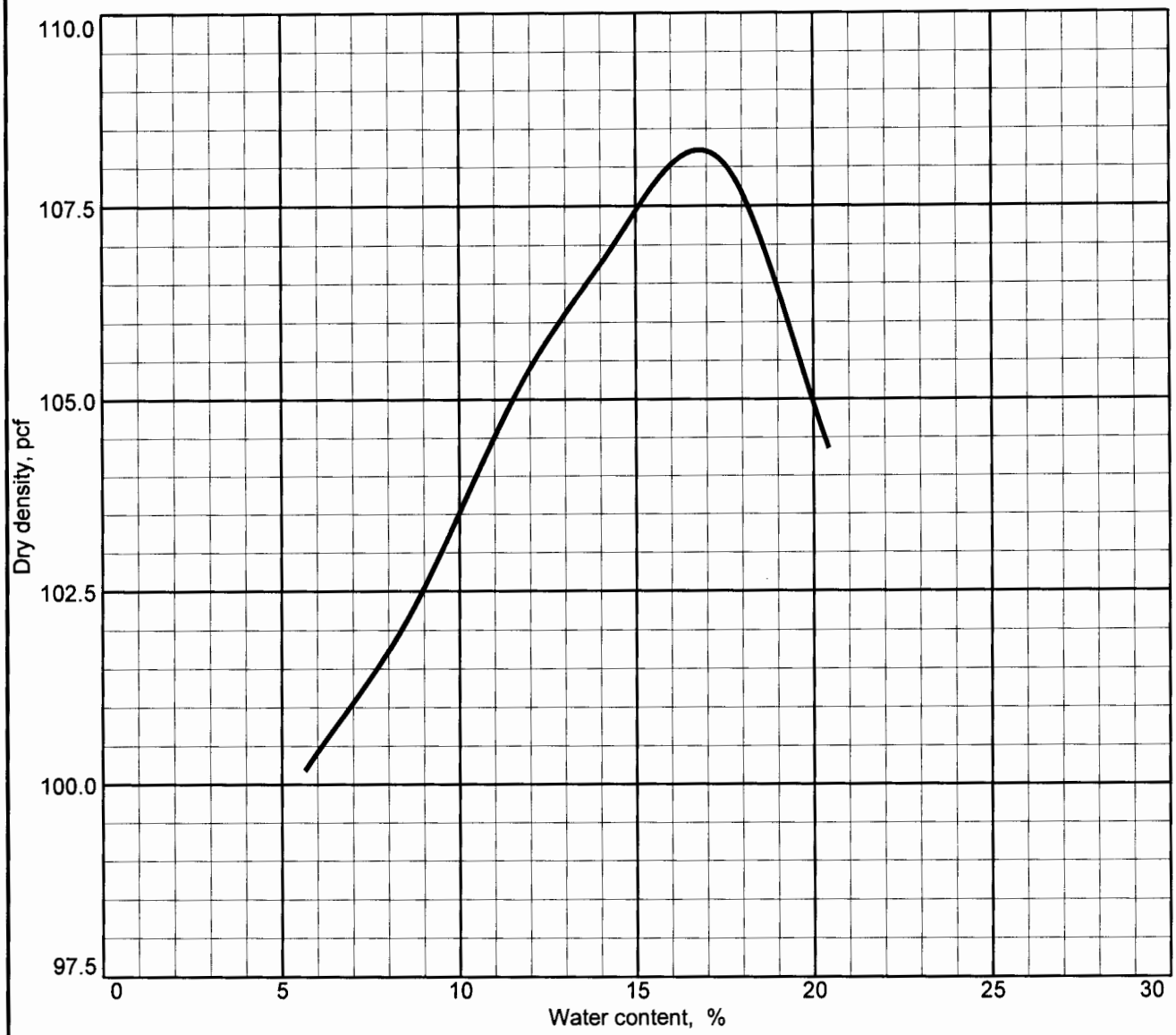
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 68 **Source of Sample:** Project Site **Date:** 3/19/07
Location: 3.13.07 LD #5170 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 108 pcf Optimum moisture = 17 %	Brownish yellow, sand with clay trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 3.13.07 LD #5185

Remarks:

Tested by: M.Pereira

Checked by: Edwin Gutierrez, E.I.T.

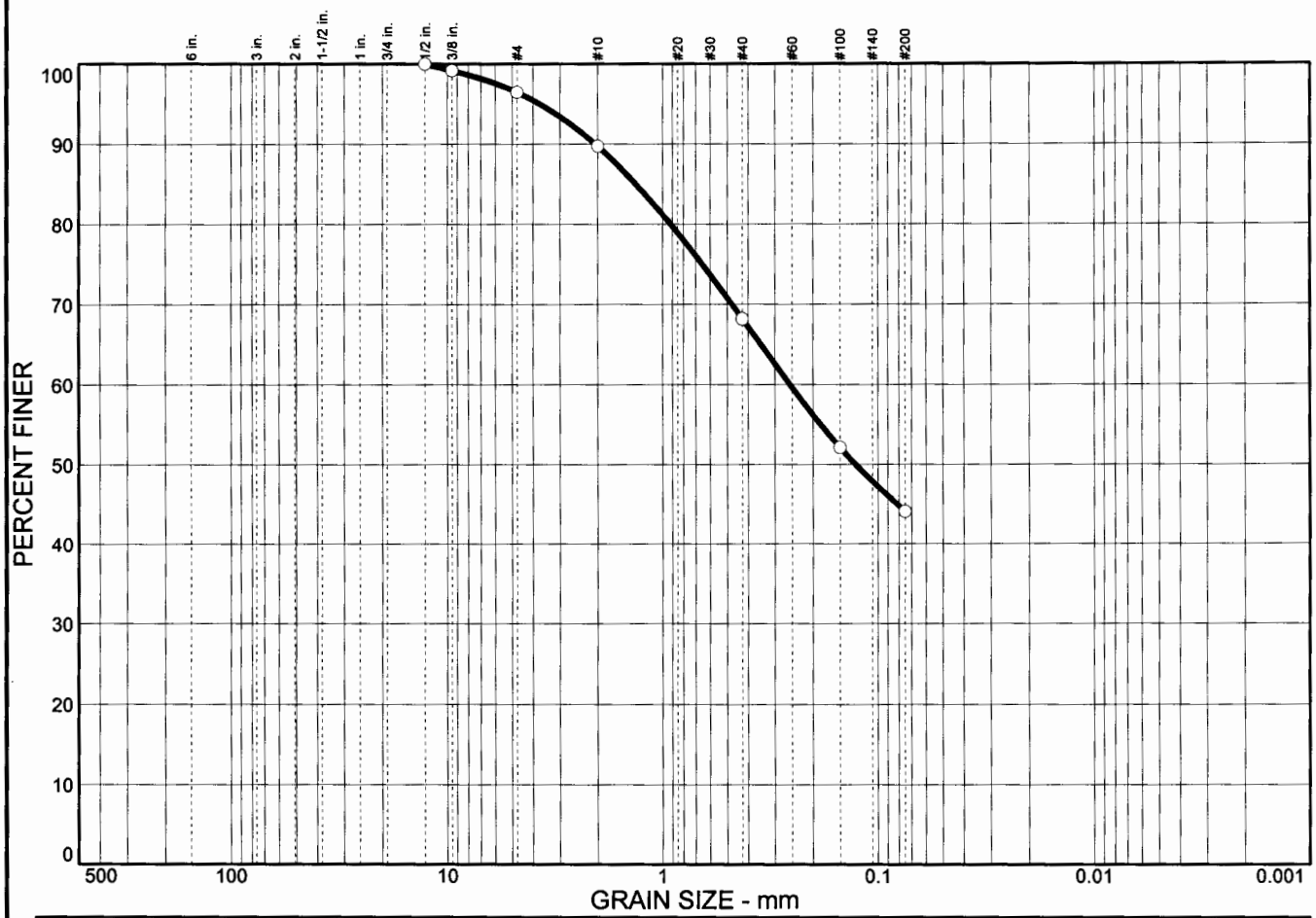
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.5	52.4	44.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.2		
#4	96.5		
#10	89.7		
#40	68.2		
#100	52.1		
#200	44.1		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel

Atterberg Limits

PL= 20 LL= 34 PI= 14

Coefficients

D_{85}= 1.33 D_{60}= 0.256 D_{50}= 0.127
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(3)

Remarks

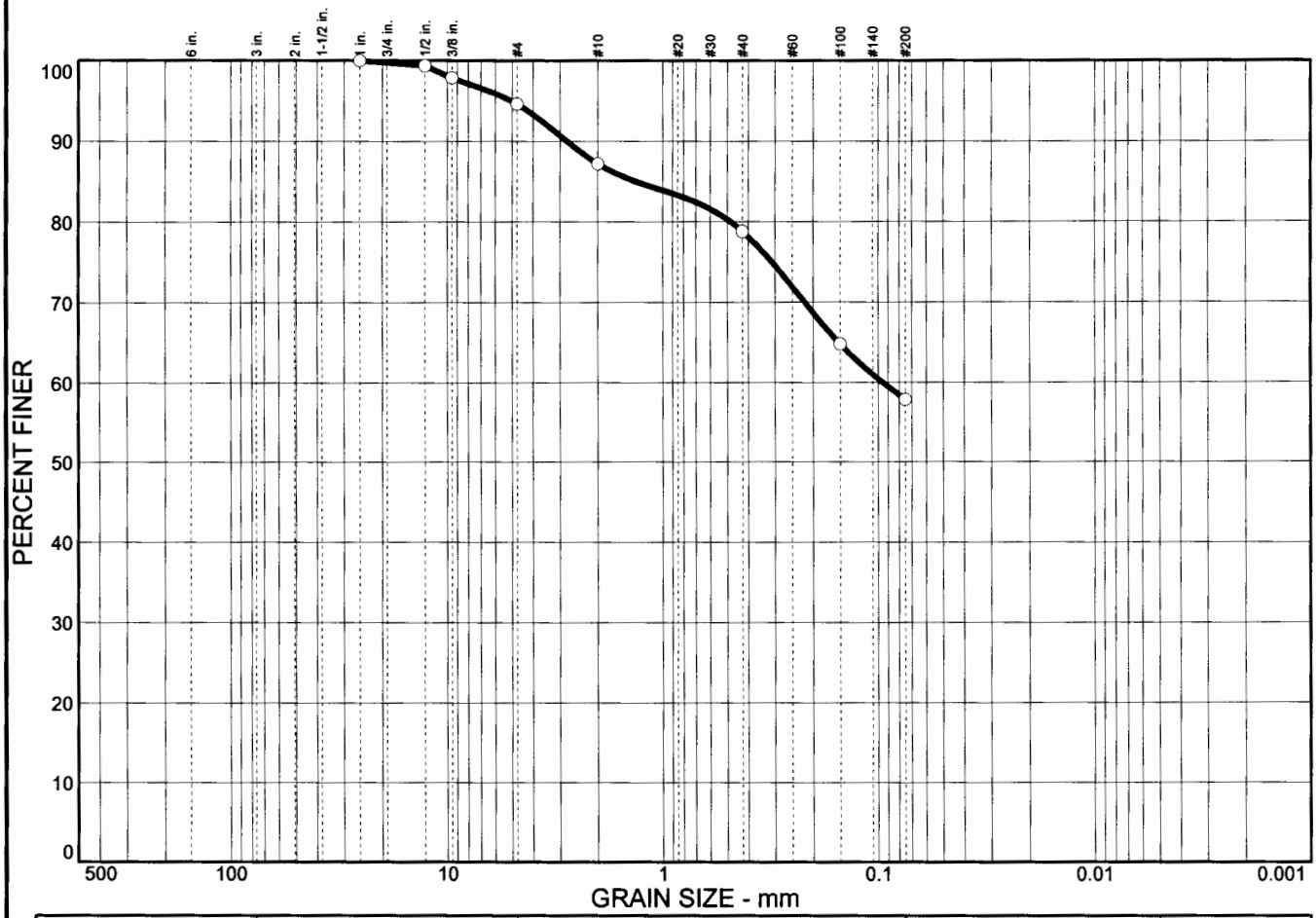
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 67 **Source of Sample:** Project Site **Date:** 3/19/07
Location: 3.13.07 LD #5280 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	5.4	36.8	57.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.5 in.	99.4		
.375 in.	97.9		
#4	94.6		
#10	87.2		
#40	78.8		
#100	64.8		
#200	57.8		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace gravel and silt

Atterberg Limits

PL= 21 LL= 34 PI= 13

Coefficients

D_{85}= 1.34 D_{60}= 0.0956 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

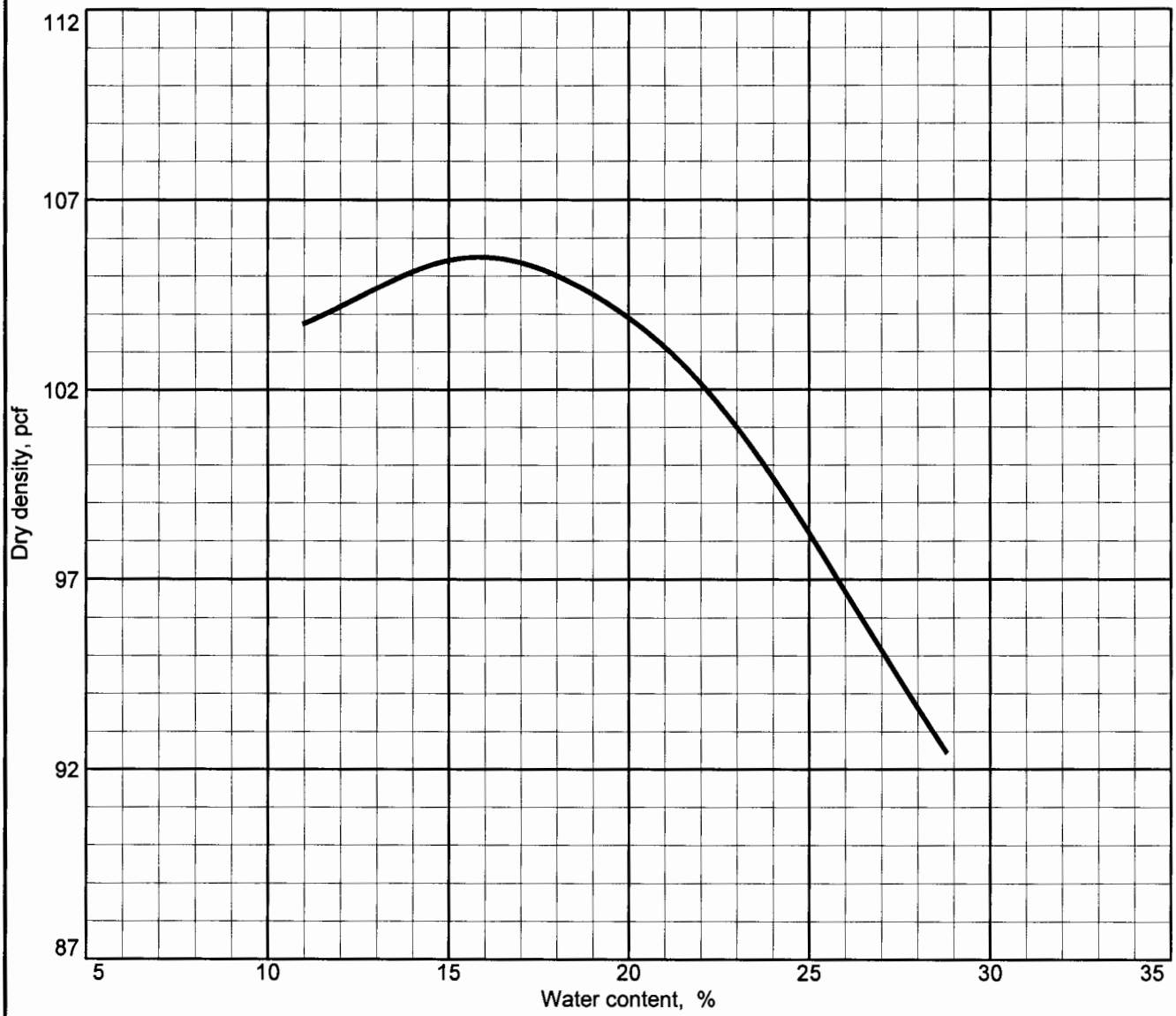
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 70 **Source of Sample:** Project Site **Date:** 3/19/07
Location: 3.14.07 LD #5390 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 105 pcf Optimum moisture = 16 %	Brownish yellow, clay with sand trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 3.14.07 LD #5473

Remarks:

Tested by: S.Perez

Checked by: Edwin Gutierrez, E.I.T.

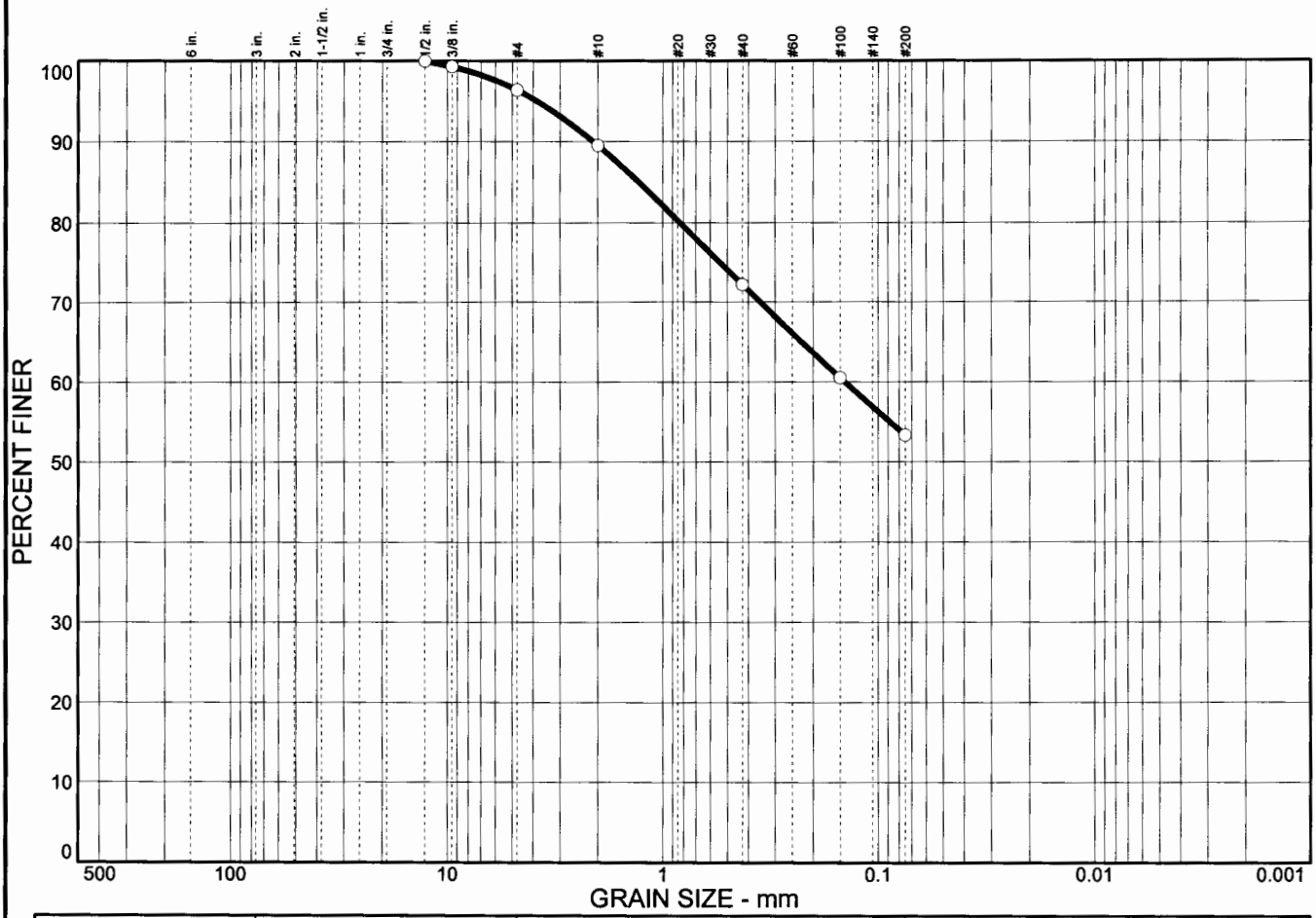
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.6	43.1	53.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.3		
#4	96.4		
#10	89.5		
#40	72.2		
#100	60.5		
#200	53.3		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace gravel and silt

Atterberg Limits

PL= 24 LL= 37 PI= 13

Coefficients

D_{85}= 1.29 D_{60}= 0.143 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(4)

Remarks

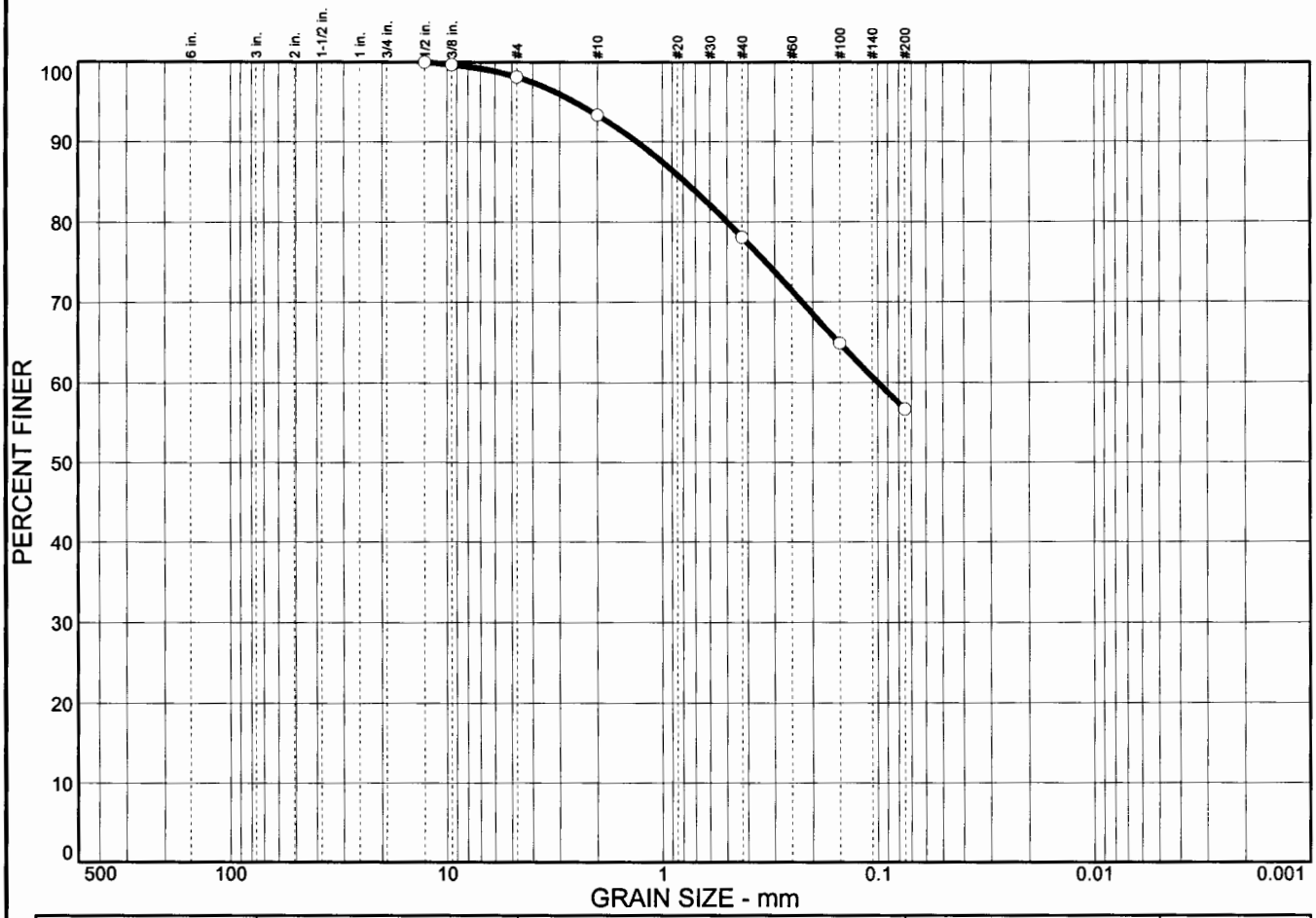
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 73 **Source of Sample:** Project Site **Date:** 3/19/07
Location: 3.14.07 LD #5500 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.8	41.6	56.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.7		
#4	98.2		
#10	93.4		
#40	78.1		
#100	64.9		
#200	56.6		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace gravel

Atterberg Limits

PL= 20 LL= 34 PI= 14

Coefficients

D_{85}= 0.782 D_{60}= 0.100 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

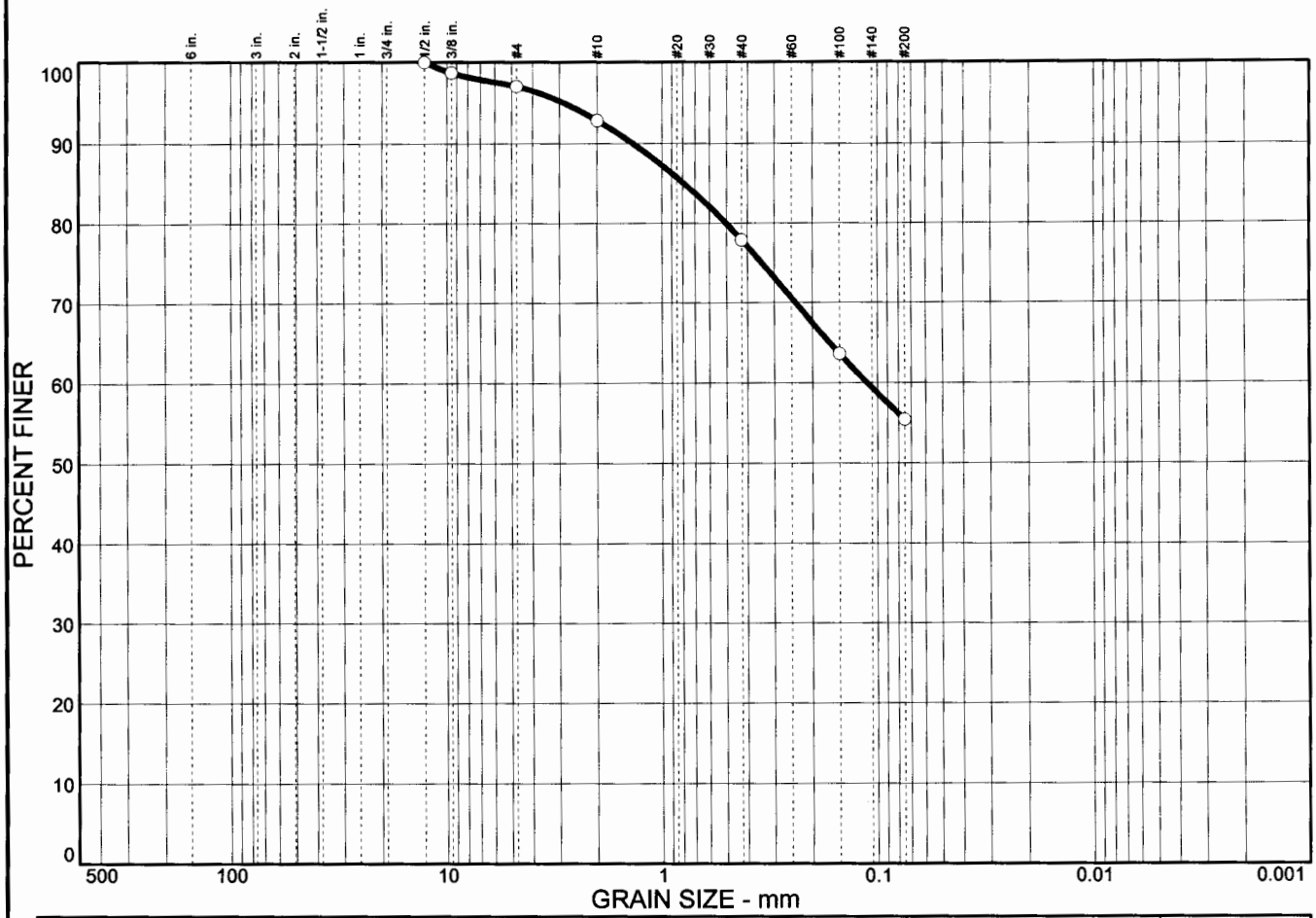
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 66 **Source of Sample:** Project Site **Date:** 3/19/07
Location: 3.14.07 LD #5610 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.0	41.6	55.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.7		
#4	97.0		
#10	92.8		
#40	77.9		
#100	63.6		
#200	55.4		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace gravel

Atterberg Limits

PL= 19 LL= 32 PI= 13

Coefficients

D_{85}= 0.787 D_{60}= 0.112 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(4)

Remarks

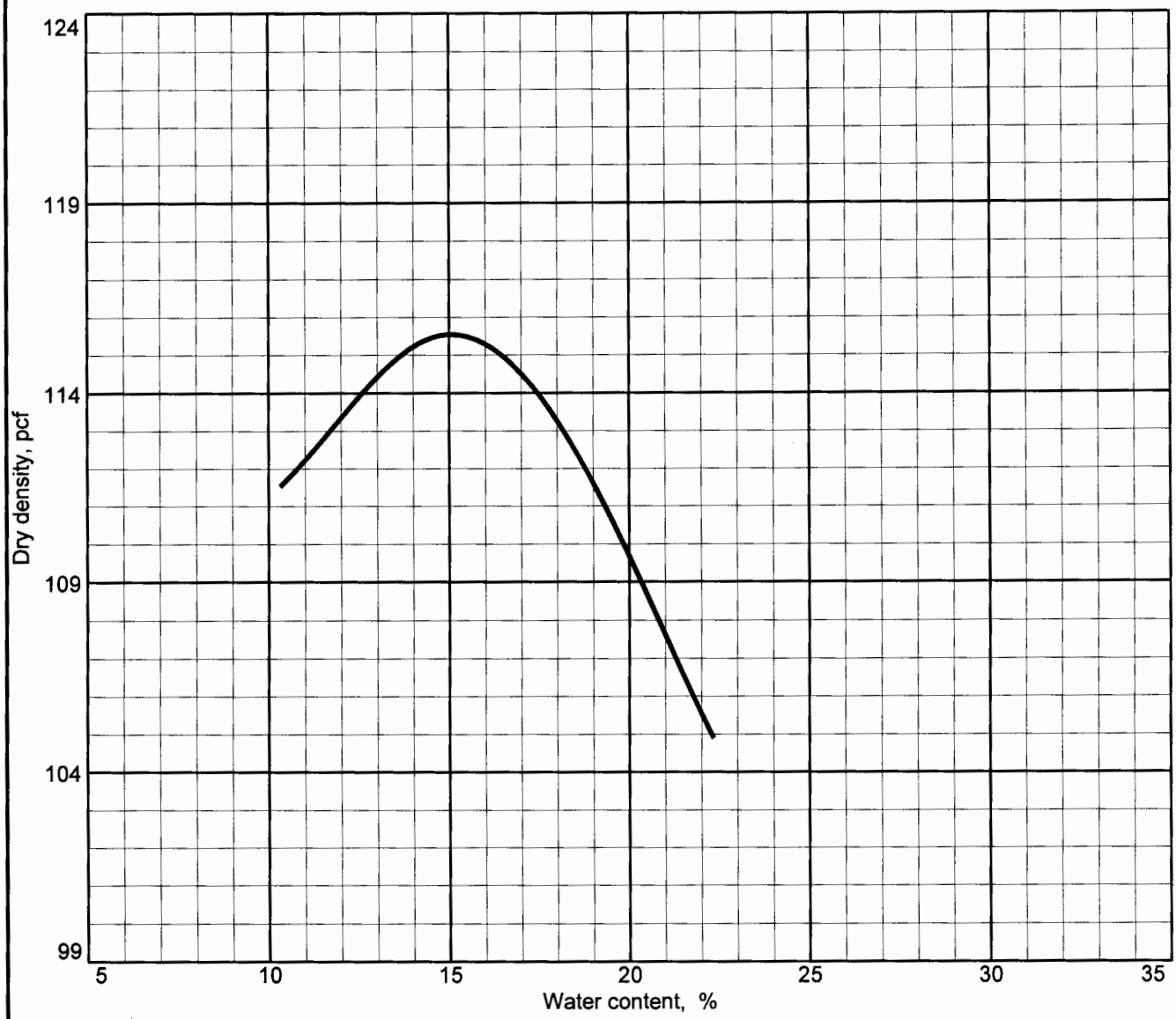
Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 63 **Source of Sample:** Project Site **Date:** 3/19/07
Location: 3.15.07 LD #5720 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 116 pcf Optimum moisture = 15 %	Brownish yellow, sand with clay trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** 3.15.07 LD #5761

Remarks:

Tested by: W.Alicea

Checked by: Edwin Gutierrez, E.I.T.

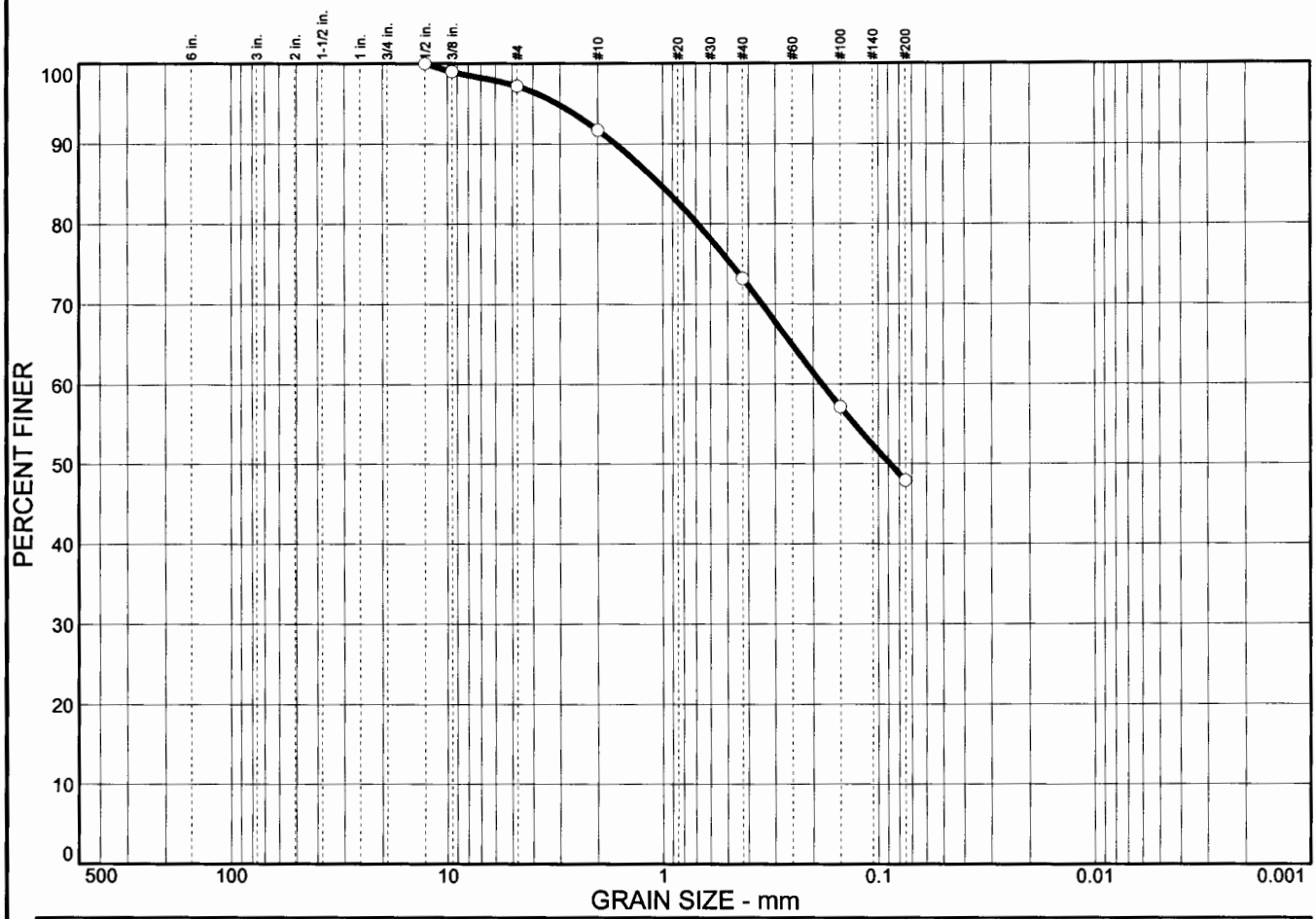
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.8	49.3	47.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.0		
#4	97.2		
#10	91.7		
#40	73.2		
#100	57.1		
#200	47.9		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel and silt

Atterberg Limits

PL= 20 LL= 31 PI= 11

Coefficients

D_{85}= 1.03 D_{60}= 0.182 D_{50}= 0.0884
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

Tested by: S.Perez-D.Cotto
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 72 **Source of Sample:** Project Site **Date:** 3/19/07
Location: 3.15.07 LD #5830 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

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March 23, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : DETERMINATION WATER CONTENT OF SOILS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Client
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 2216

Tests Results

A. Water Content Test Results (ASTM D 2216)

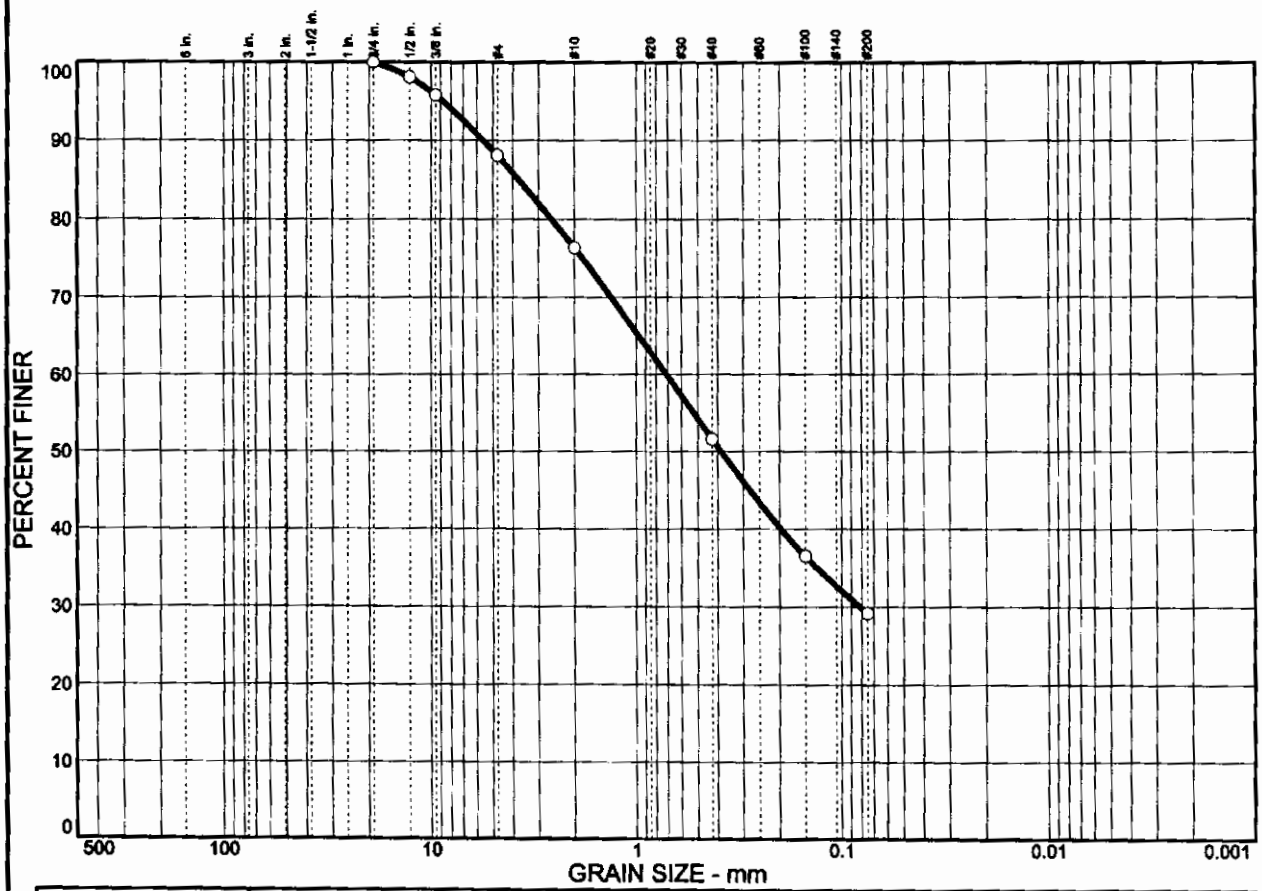
Test No.	Water Content (%)	Sample ID
1	15.34	3.22.07 LD 6820
2	16.55	3.20.07 LD 6490
3	18.47	3.19.07 LD 6160
4	18.69	3.20.07 LD 6380
5	13.67	3.16.07 LD 5940
6	18.38	3.16.07 LD 6050
7	14.42	3.19.07 LD 6270
8	18.52	3.21.07 LD 6600
9	13.68	3.22.07 LD 6930
10	13.08	3.22.07 LD 6710

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

Edwin Gutierrez Torres, E.I.T.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	12.0	58.8	29.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.1		
.375 in.	95.8		
#4	88.0		
#10	76.3		
#40	51.6		
#100	36.5		
#200	29.2		

* (no specification provided)

Material Description

Brownish yellow, clayey sand, some gravel

Atterberg Limits

PL= 21 LL= 30 PI= 9

Coefficients

D_{85}= 3.75 D_{60}= 0.712 D_{50}= 0.385
D_{30}= 0.0814 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-2-4(0)

Remarks

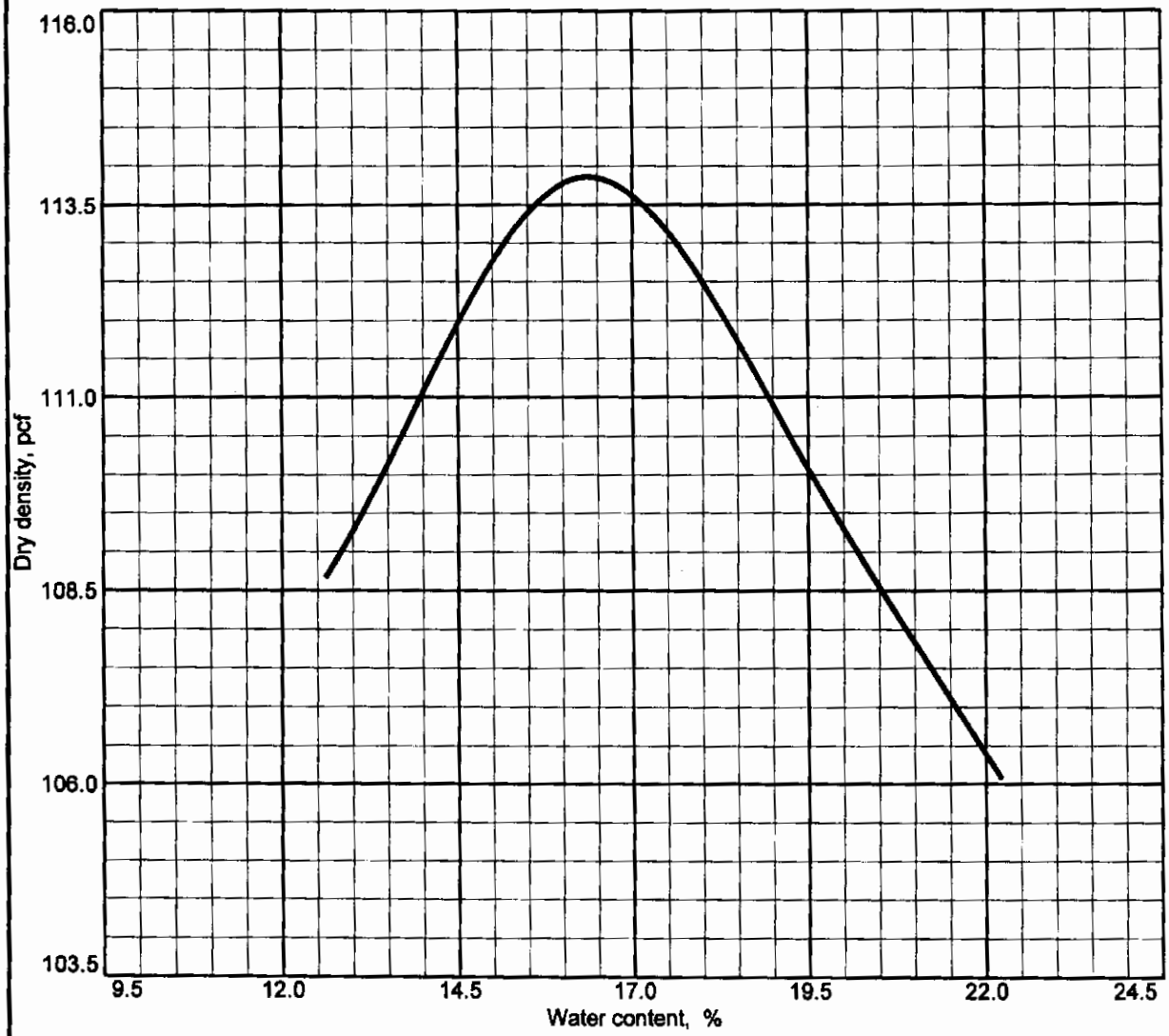
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 87 **Source of Sample:** Project Site **Date:** 3/26/07
Location: 3.16.07 LD #5940 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 114 pcf Optimum moisture = 16 %	Brownish yellow, clayey sand trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
• **Location:** 3.16.07 LD #6049

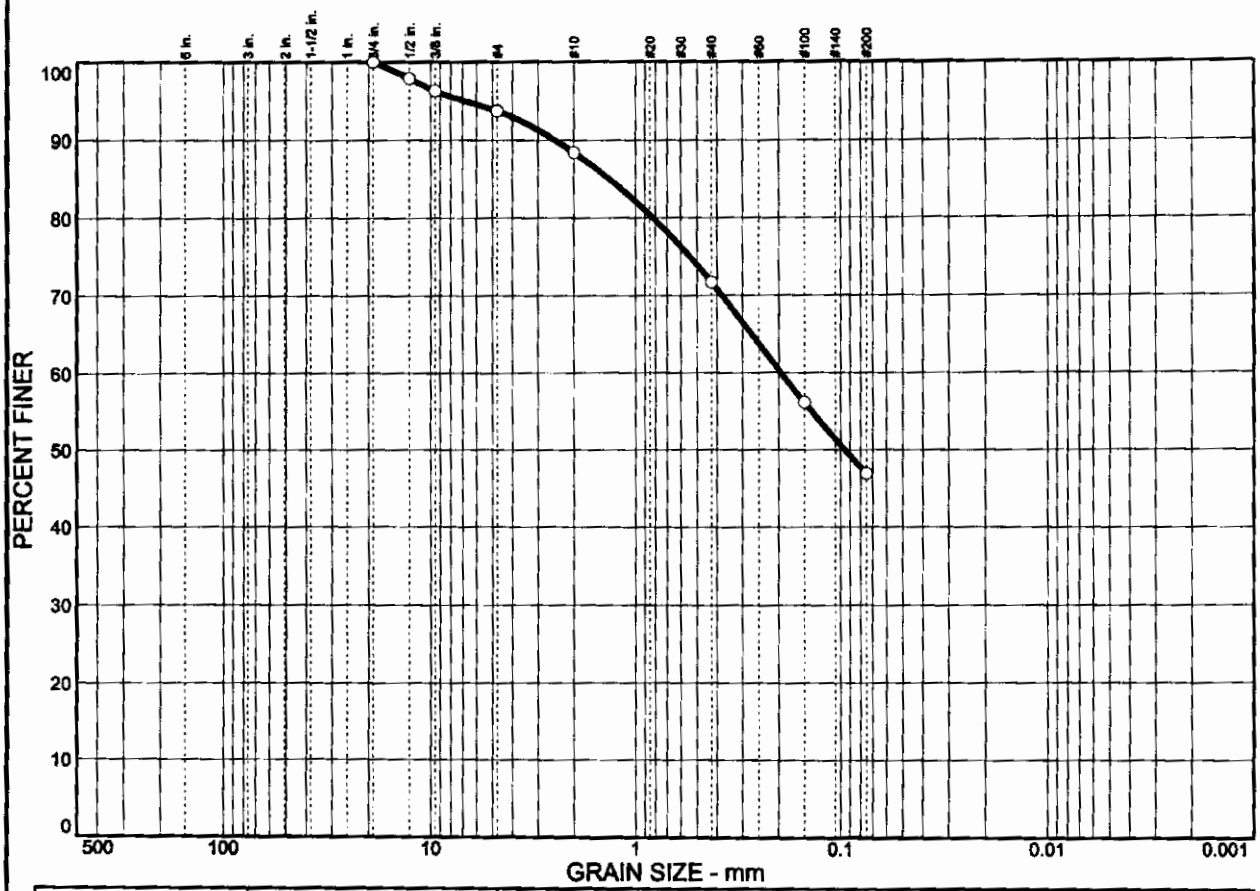
Remarks:
Tested by: R.Figaro
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	6.3	46.8	46.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.9		
.375 in.	96.3		
#4	93.7		
#10	88.4		
#40	71.7		
#100	56.1		
#200	46.9		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace gravel

Atterberg Limits

PL= 23 LL= 33 PI= 10

Coefficients

D_{85}= 1.34 D_{60}= 0.195 D_{50}= 0.0955
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-4(2)

Remarks

Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

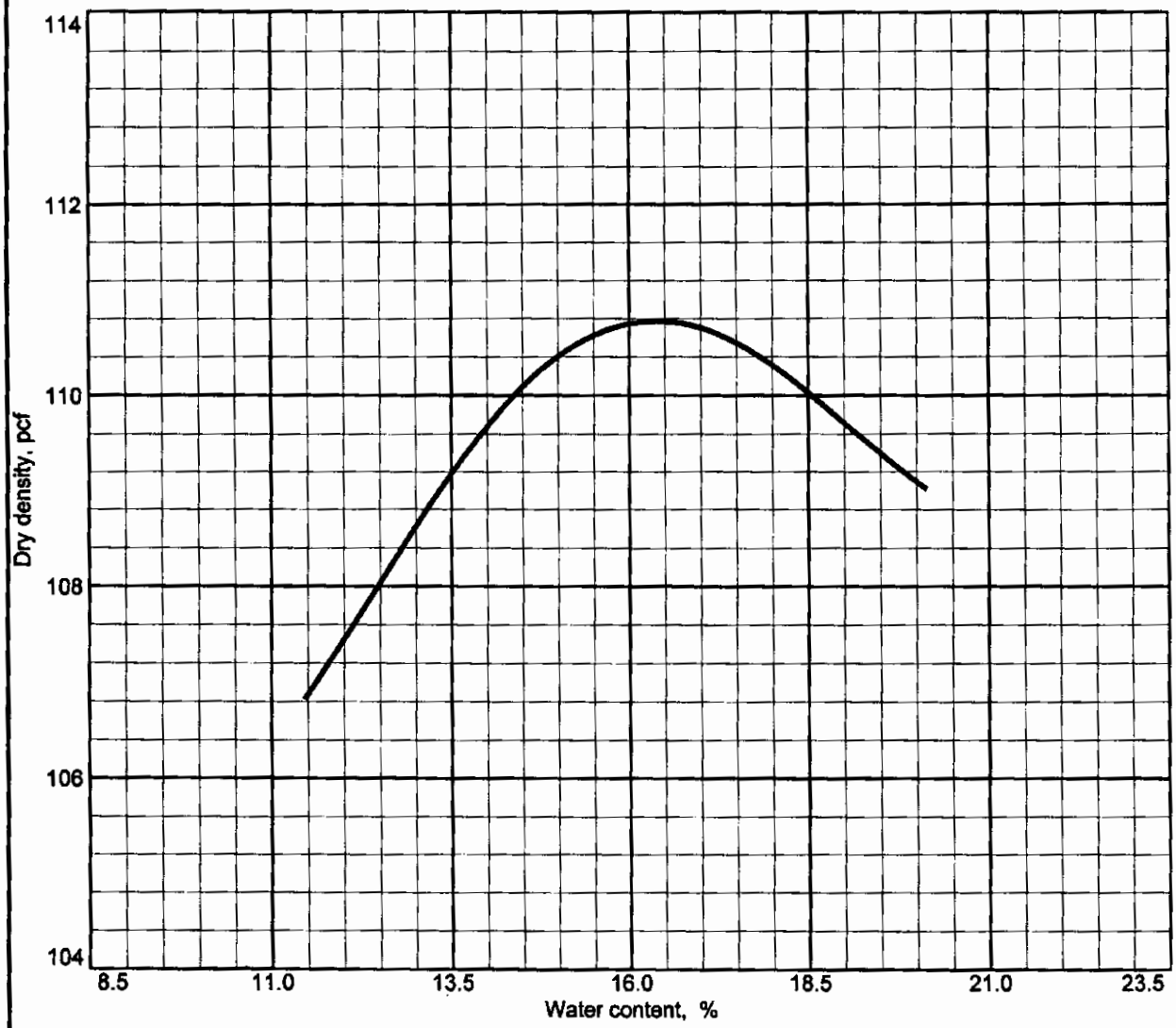
Edwin Gutierrez

Sample No.: 86 **Source of Sample:** Project Site **Date:** 3/26/07
Location: 3.16.07 LD #6050 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 111 pcf Optimum moisture = 16 %	Brownish yellow, clayey sand some gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Location: 3.20.07 LD #6337

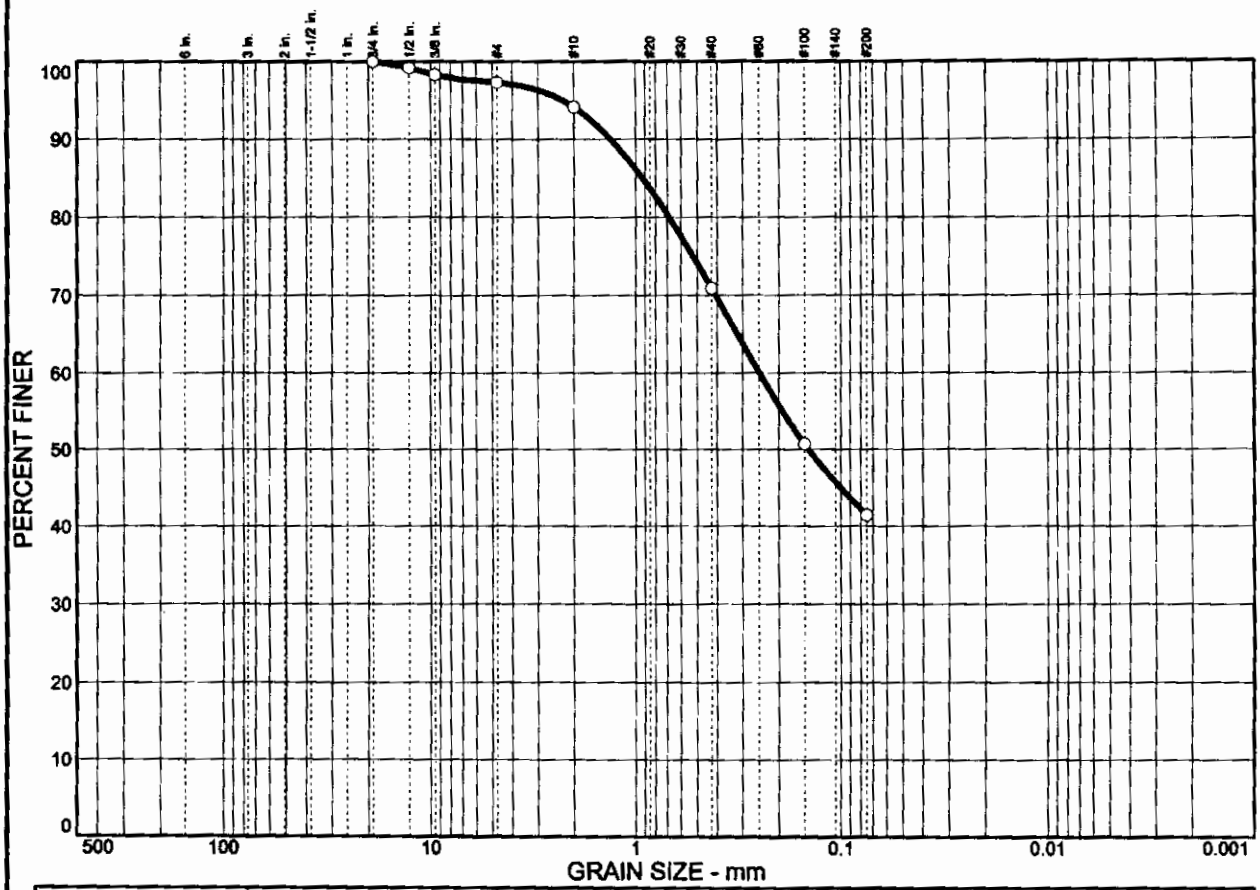
Remarks:
Tested by: R.Torres
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.7	55.9	41.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.2		
0.375 in.	98.3		
#4	97.3		
#10	94.1		
#40	70.9		
#100	50.7		
#200	41.4		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel

Atterberg Limits

PL= 20 LL= 33 PI= 13

Coefficients

D_{85}= 0.927 D_{60}= 0.249 D_{50}= 0.144
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

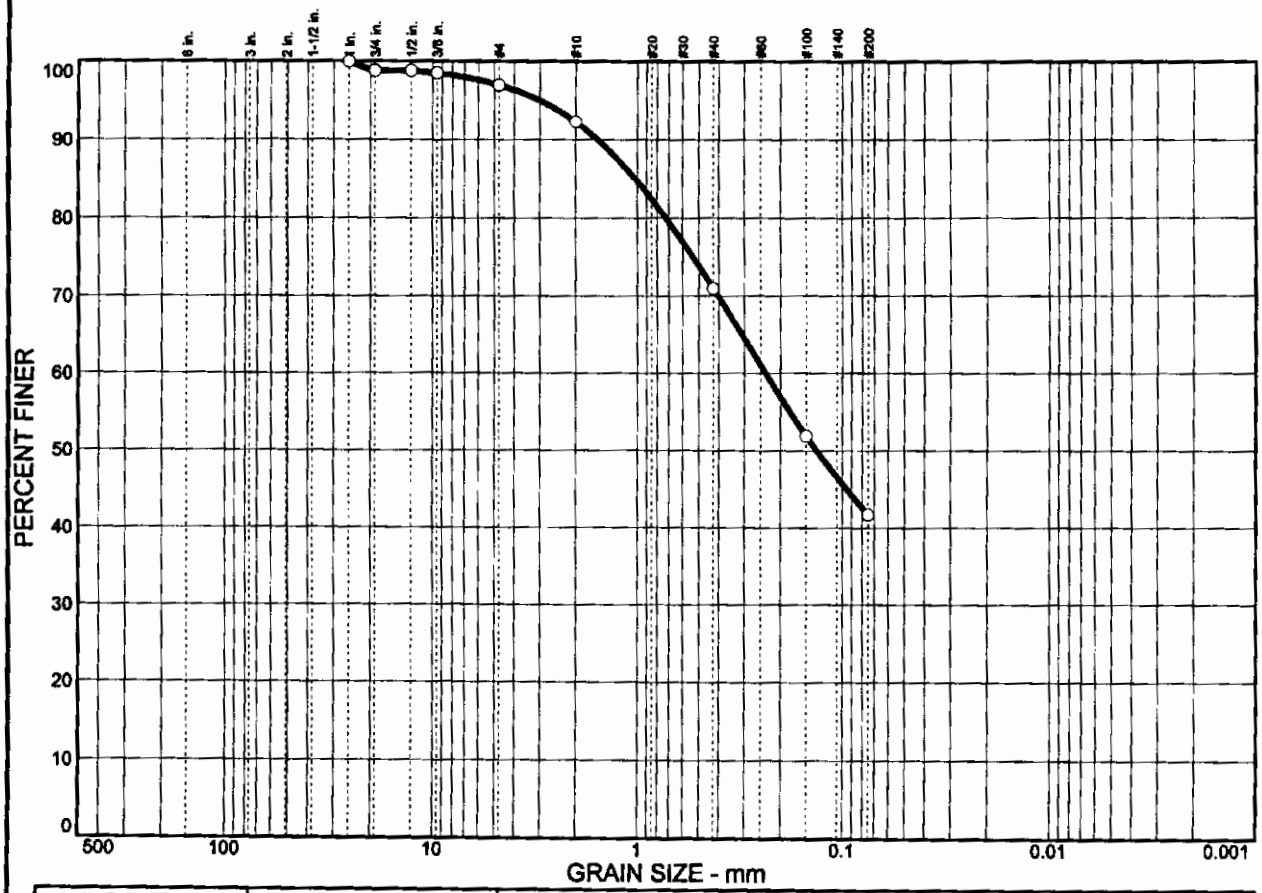
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 91 **Source of Sample:** Project Site **Date:** 3/26/07
Location: 3.20.07 LD #6380 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.0	55.3	41.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	98.8		
.5 in.	98.8		
.375 in.	98.5		
#4	97.0		
#10	92.3		
#40	71.0		
#100	51.9		
#200	41.7		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel

Atterberg Limits

PL= 22 LL= 32 PI= 10

Coefficients

D_{85}= 1.03 D_{60}= 0.236 D_{50}= 0.133
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

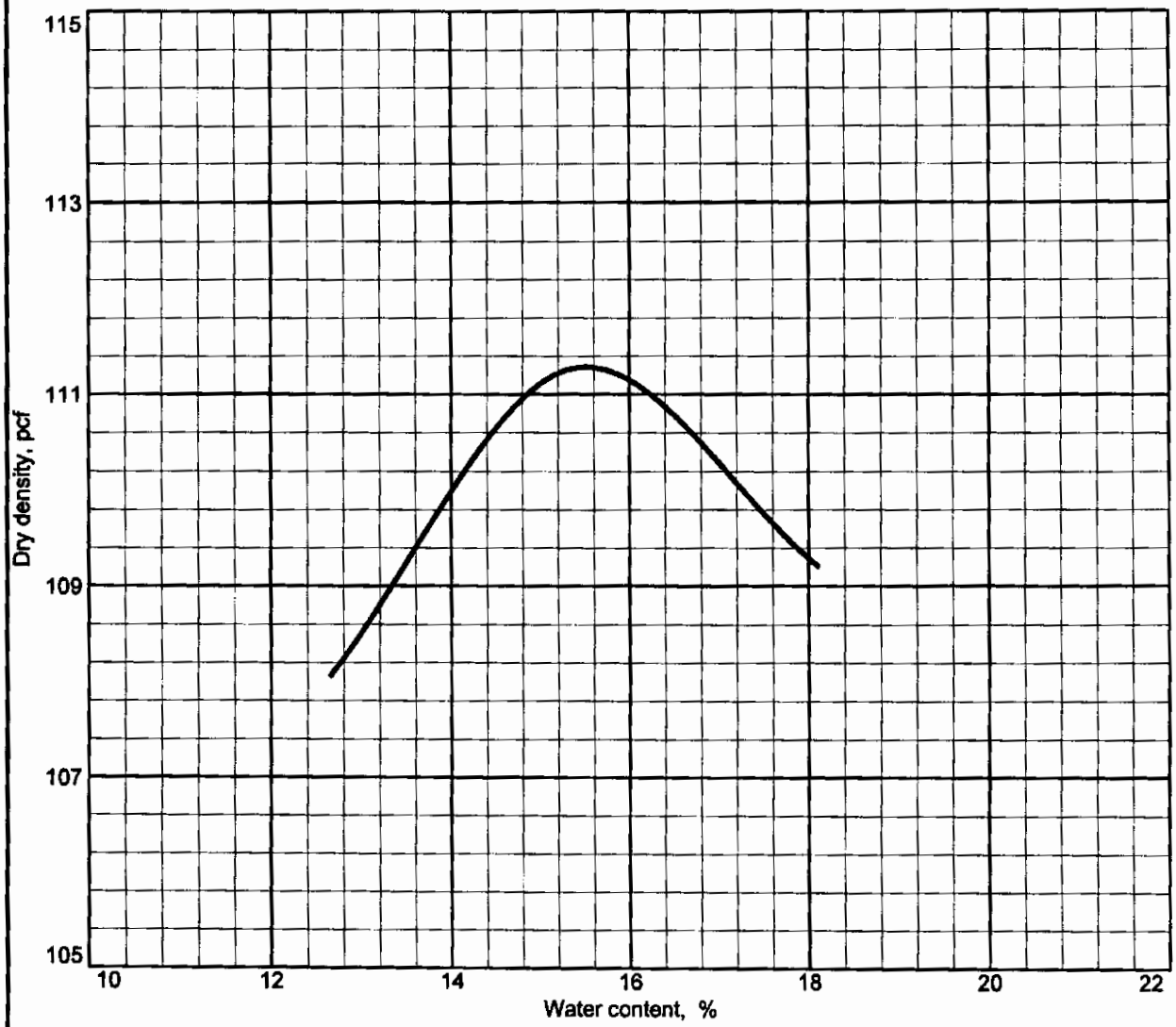
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 90 **Source of Sample:** Project Site **Date:** 3/26/07
Location: 3.21.07 LD #6600 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 111 pcf Optimum moisture = 16 %	Brownish yellow, clayey sand some gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Location: 3.21.07 LD #6625

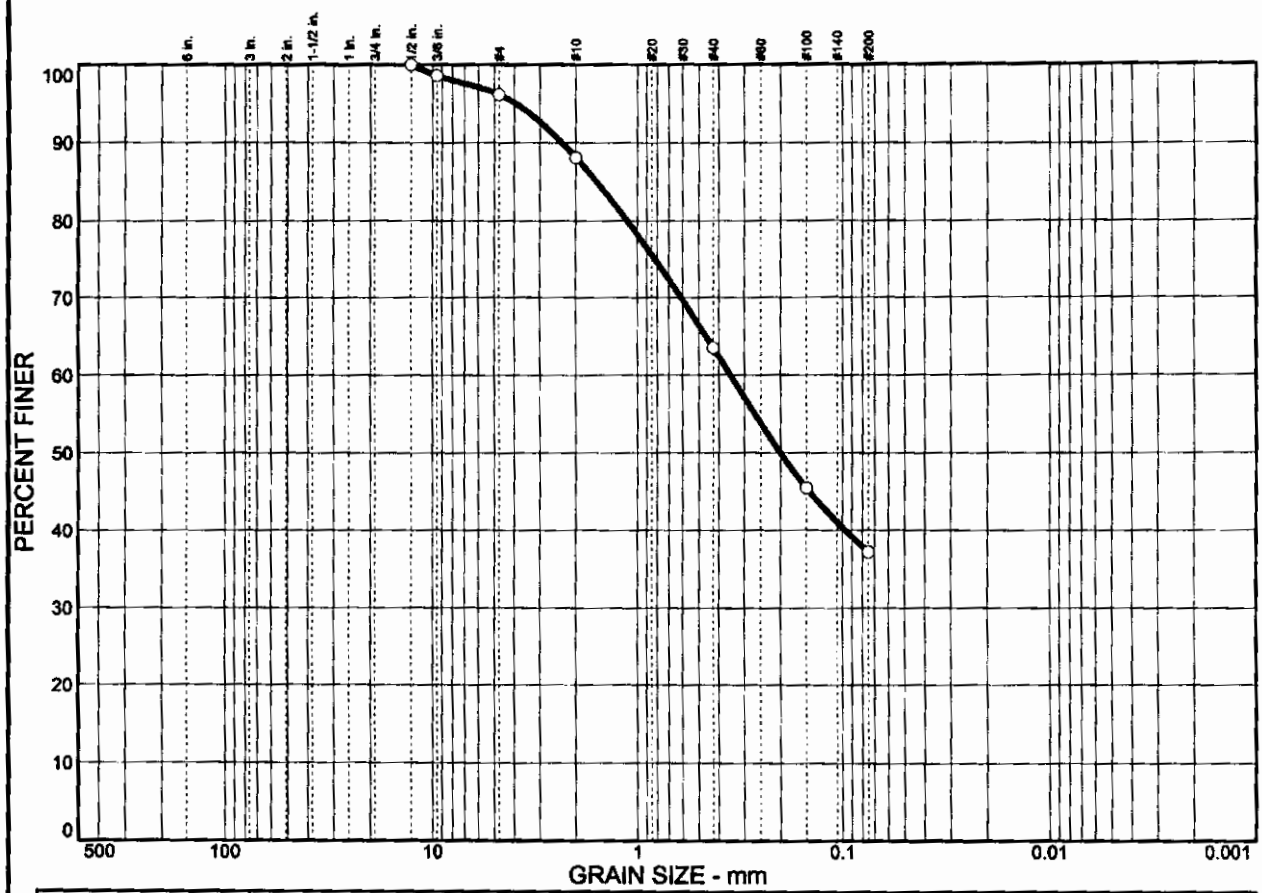
Remarks:
Tested by: R.Torres
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.9	58.9	37.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.6		
#4	96.1		
#10	88.1		
#40	63.5		
#100	45.5		
#200	37.2		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace gravel

Atterberg Limits

PL= 22 LL= 30 PI= 8

Coefficients

D_{85}= 1.58 D_{60}= 0.351 D_{50}= 0.201
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-4(0)

Remarks

Tested by: S.Perez
Ckecked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

Sample No.: 88 **Source of Sample:** Project Site **Date:** 3/26/07
Location: 3.22.07 LD #6820 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT

Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 113 pcf Optimum moisture = 18 %	Brownish yellow, clayey sand trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Location: 3.22.07 LD #6913

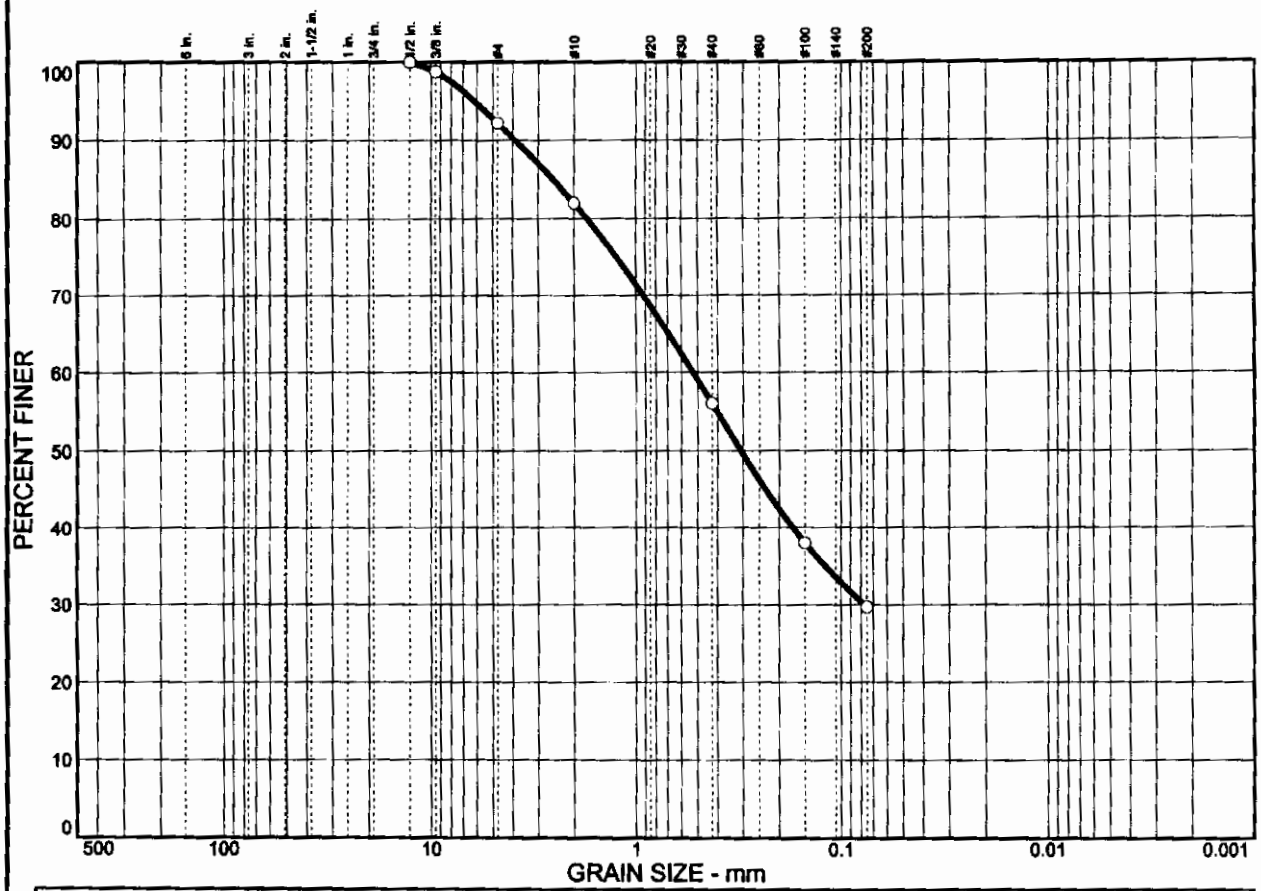
Remarks:
Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	7.8	62.5	29.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.8		
#4	92.2		
#10	82.0		
#40	56.0		
#100	38.0		
#200	29.7		

* (no specification provided)

Material Description

Brownish yellow, clayey sand trace gravel

Atterberg Limits

PL= 23 LL= 40 PI= 17

Coefficients

D_{85}= 2.53 D_{60}= 0.527 D_{50}= 0.308
D_{30}= 0.0771 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-2-6(1)

Remarks

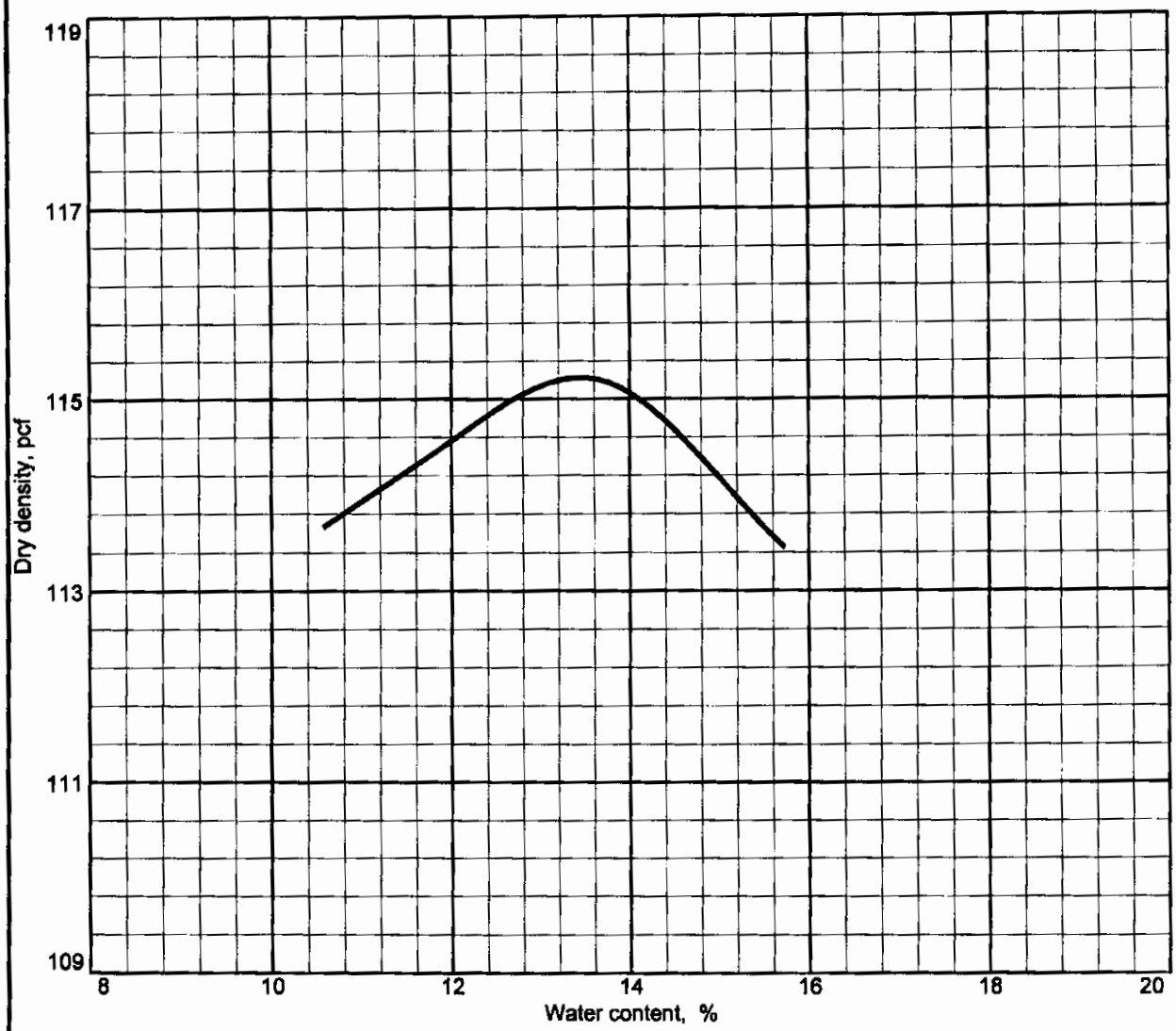
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 89 **Source of Sample:** Project Site **Date:** 3/26/07
Location: 3.22.07 LD #6930 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 115 pcf Optimum moisture = 13 %	Brownish yellow, clayey sand some gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Location: 3.23.07 LD #3745

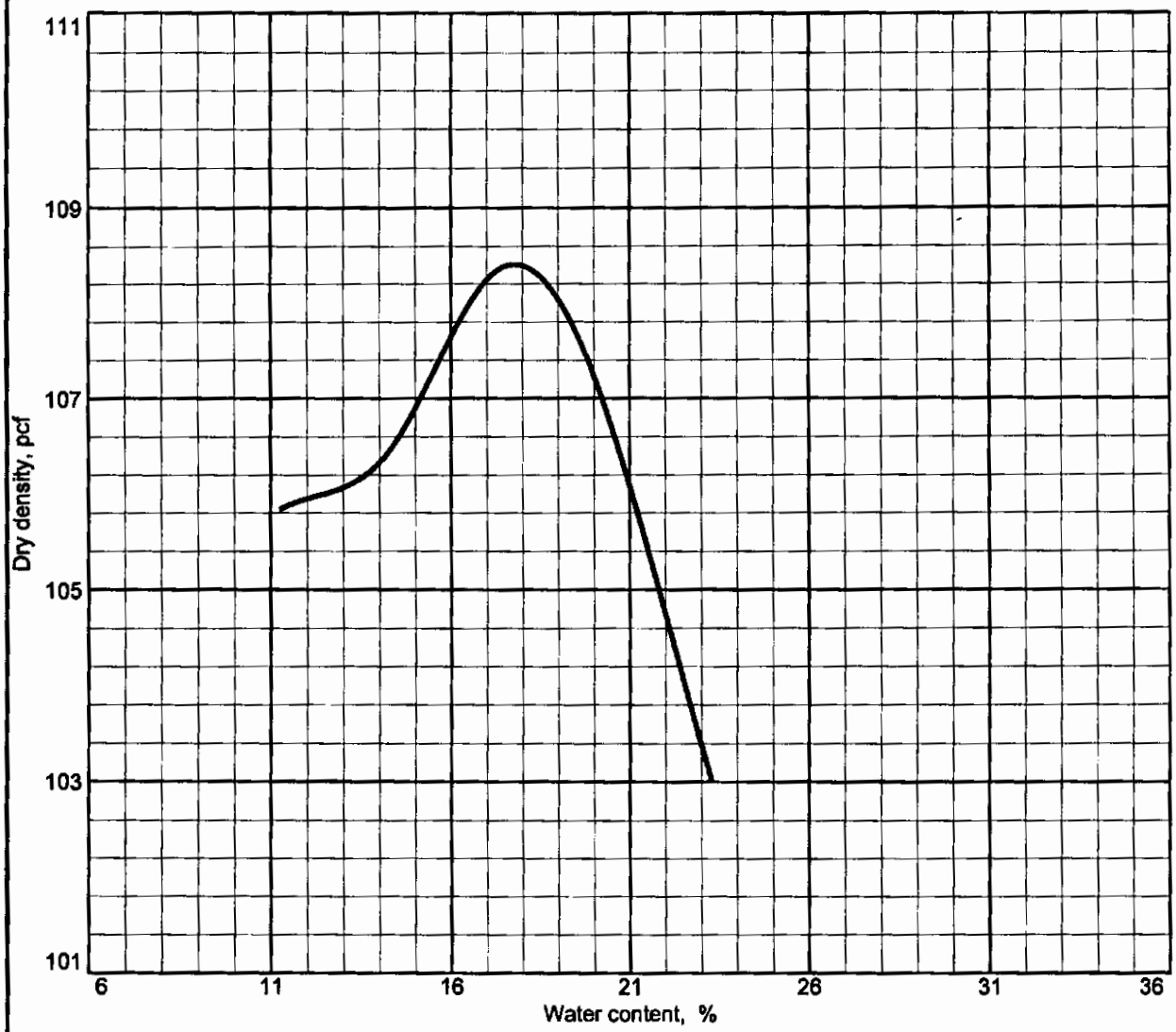
Remarks:
Tested by: R.Torres
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 108 pcf Optimum moisture = 18 %	Brownish yellow, clayey sand trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Location: 3.23.07 LD #4033

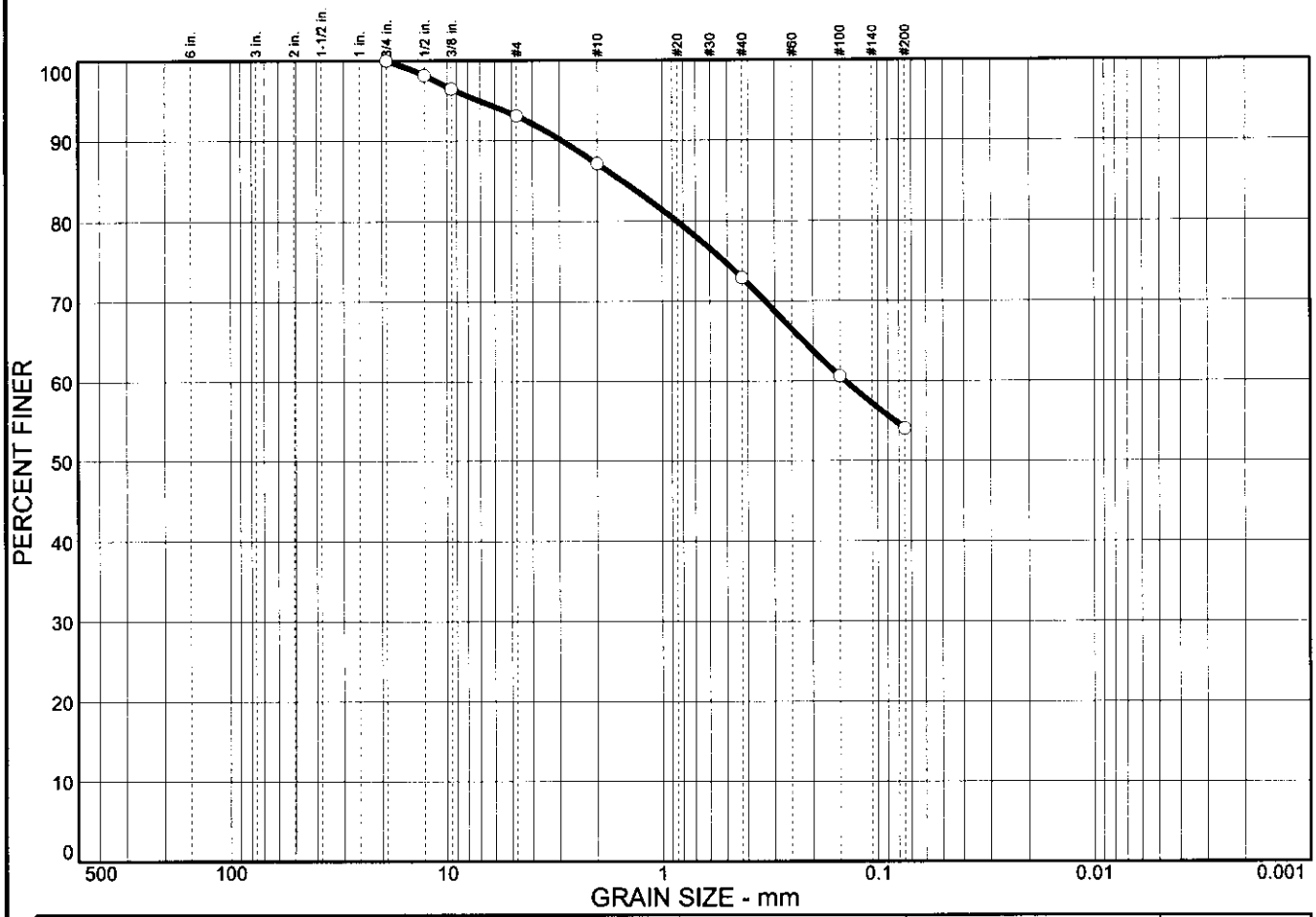
Remarks:
Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	6.9	39.1	54.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.2		
.375 in.	96.5		
#4	93.1		
#10	87.1		
#40	72.9		
#100	60.6		
#200	54.0		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace gravel and silt

Atterberg Limits

PL= 19 LL= 30 PI= 11

Coefficients

D_{85}= 1.54 D_{60}= 0.142 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(3)

Remarks

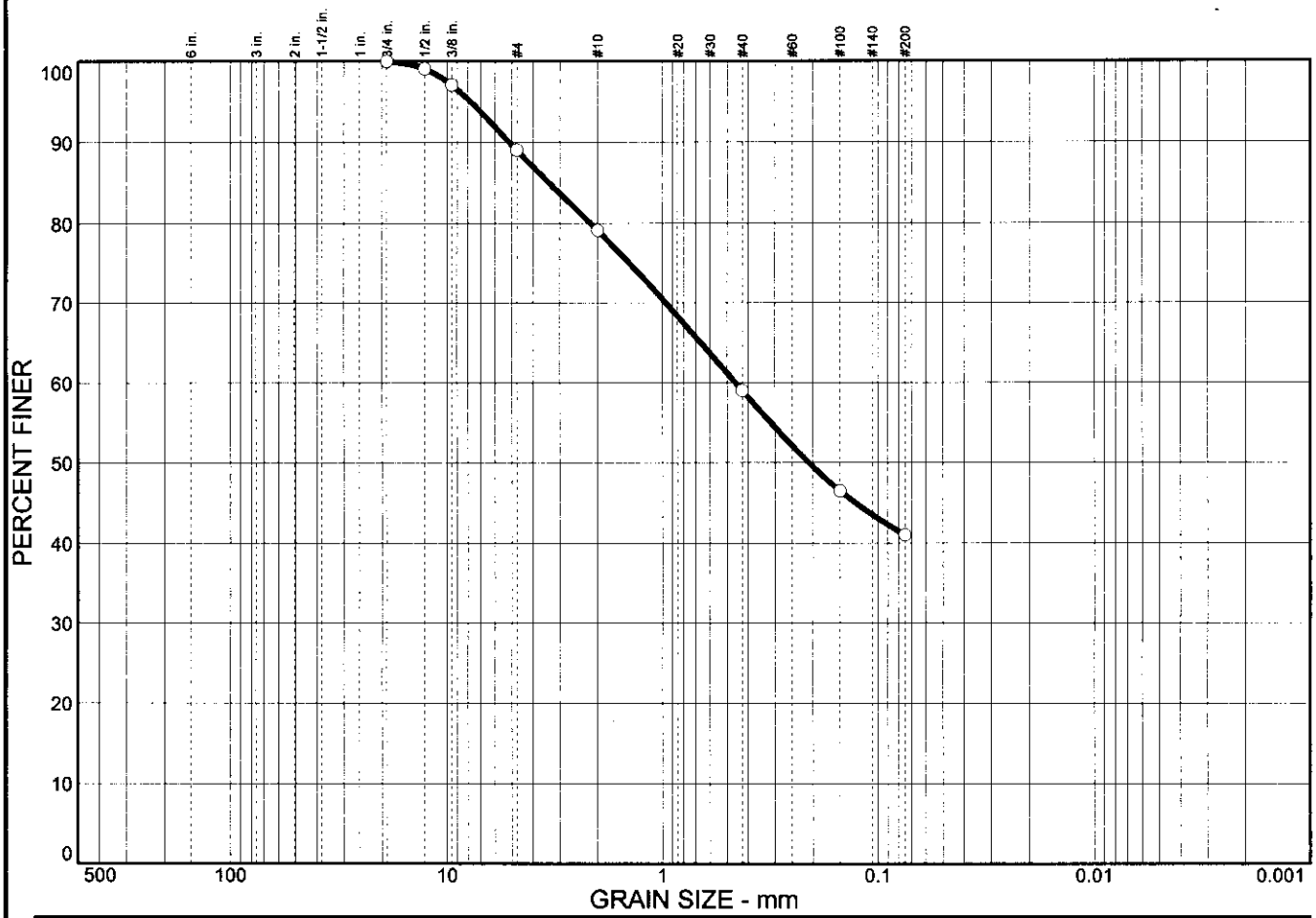
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: 96 **Source of Sample:** Project Site **Date:** 4/4/07
Location: 4.02.07 QC #6160 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	11.0	48.0	41.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.1		
.375 in.	97.1		
#4	89.0		
#10	79.1		
#40	59.0		
#100	46.5		
#200	41.0		

* (no specification provided)

Material Description

Brownish yellow, sand with clay some gravel trace silt

Atterberg Limits

PL= 17 LL= 29 PI= 12

Coefficients

D_{85}= 3.37 D_{60}= 0.458 D_{50}= 0.209
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(1)

Remarks

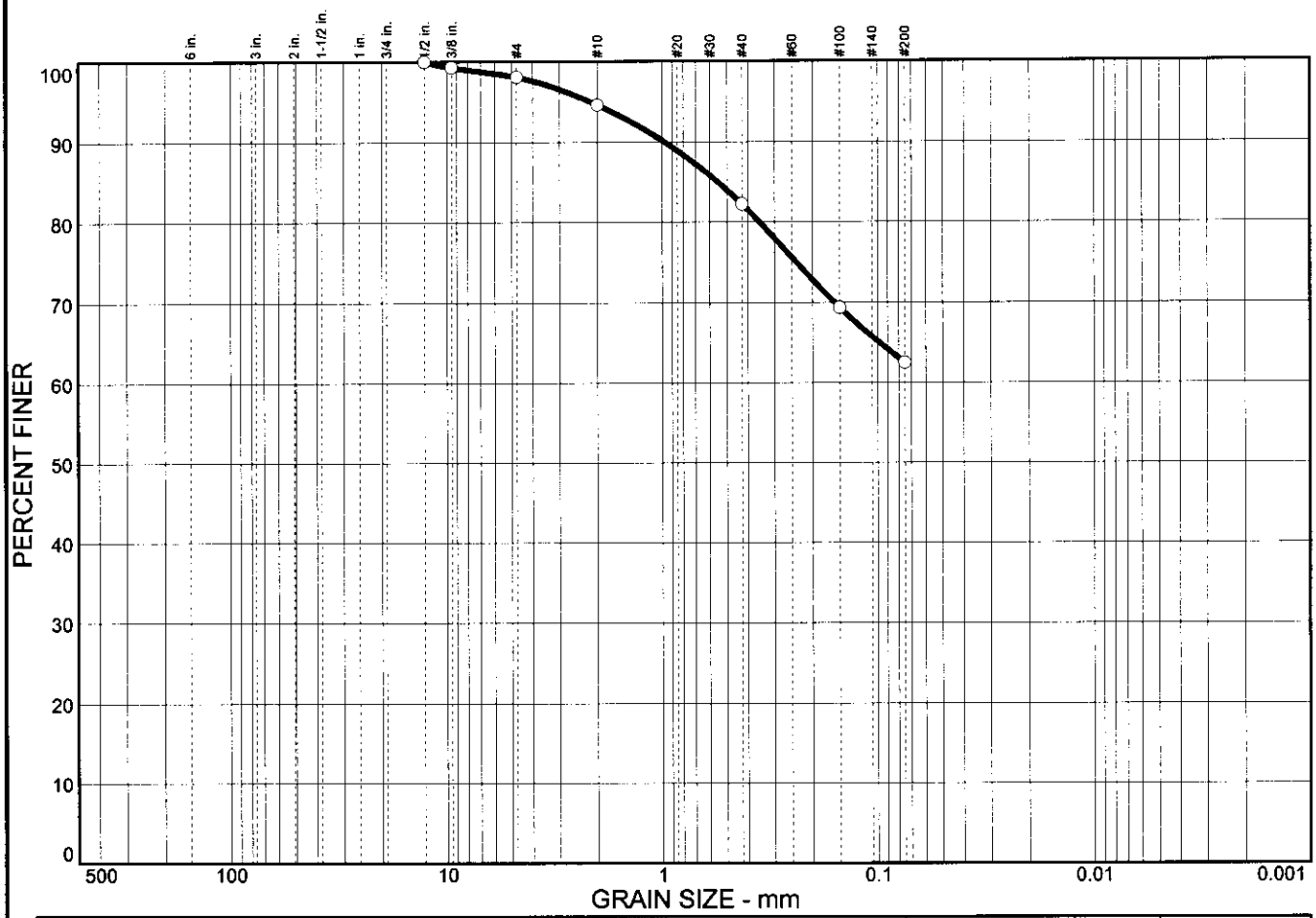
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: 94 **Source of Sample:** Project Site **Date:** 4/4/07
Location: 4.02.07 QC #6270 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.9	35.6	62.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.3		
#4	98.1		
#10	94.6		
#40	82.2		
#100	69.4		
#200	62.5		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace silt and gravel

Atterberg Limits

PL= 20 LL= 31 PI= 11

Coefficients

D_{85}= 0.552 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

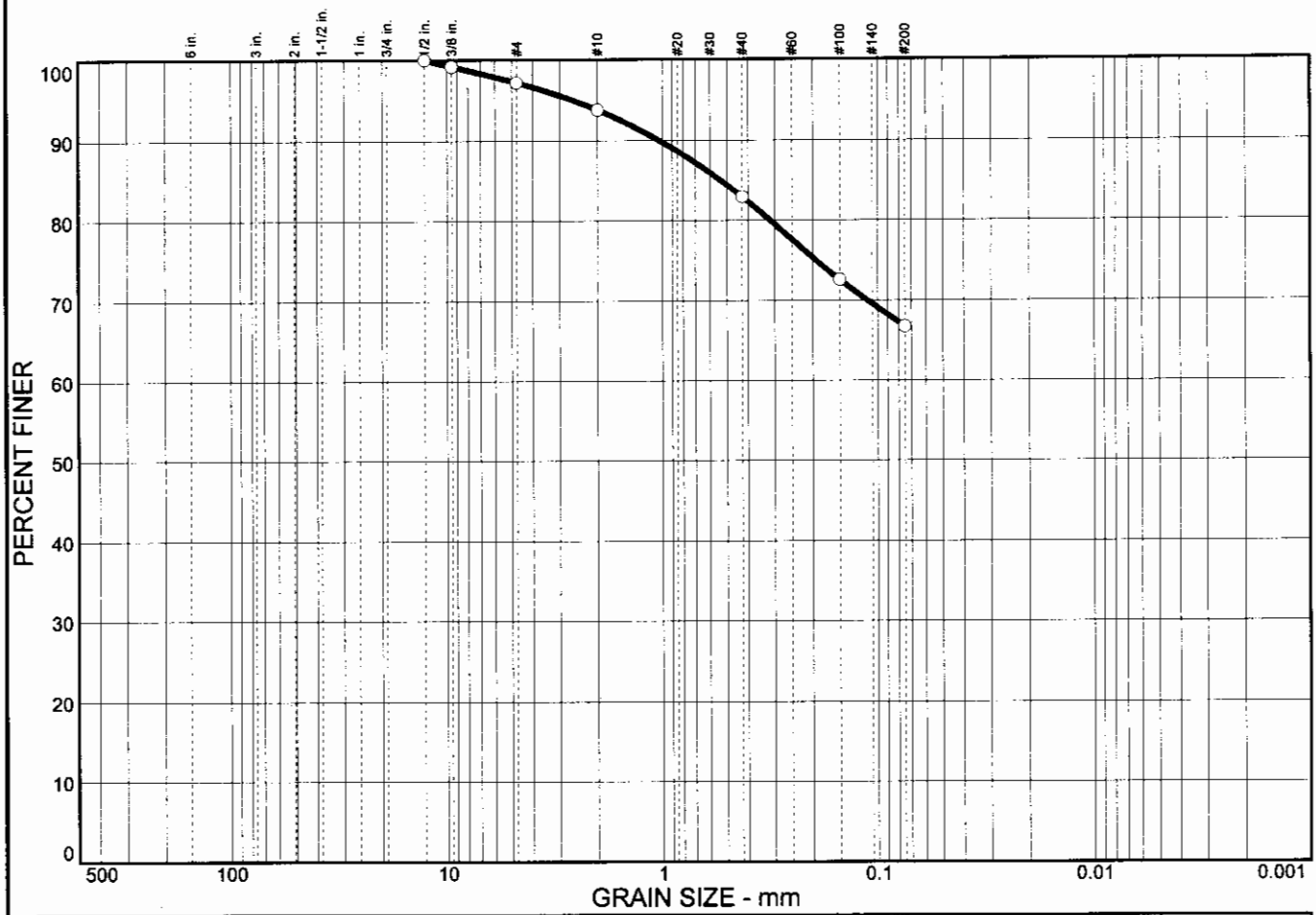
Edwin Gutierrez

Sample No.: 97 **Source of Sample:** Project Site **Date:** 4/4/07
Location: 4.02.07 QC #6490 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.8	30.4	66.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.2		
#4	97.2		
#10	93.8		
#40	82.9		
#100	72.6		
#200	66.8		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace silt and gravel

Atterberg Limits

PL= 20 LL= 31 PI= 11

Coefficients

D_{85}= 0.537 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

Sample No.: 95 **Source of Sample:** Project Site **Date:** 4/4/07
Location: 4.02/07 QC #6710 **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

July 18, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION AND STANDARD PROCTOR TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-110)
Date of Receipt of Test Samples	:	July 13, 2007
Dates Tests were Performed	:	July 16 to 18, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487 and ASTM D 698

Tests Results

Sample Description	:	Brownish yellow, sandy silt some clay, trace gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	ML
AASHTO Classification	:	A-6

B. Standard Proctor Compaction Test Results (ASTM D 698)

Maximum Dry Density	:	106.0 pcf
Optimum Moisture Content	:	16.0 %

Respectfully submitted,

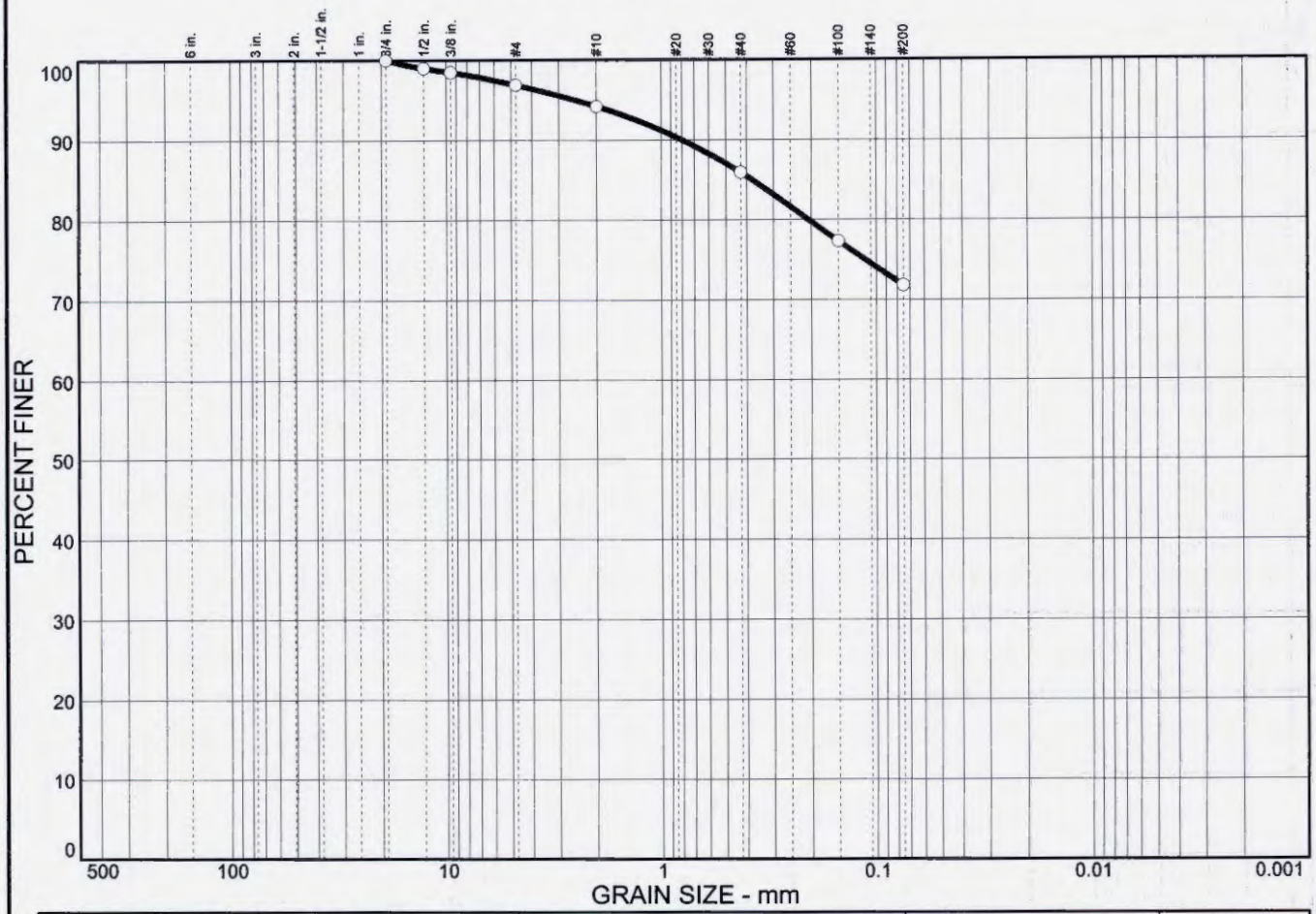
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez
EDWIN GUTIERREZ, E.I.T.

PO Box 363116, San Juan, PR 00936-3116
Road 850 Km 0.2 Las Cuevas Ward, Trujillo Alto, PR 00976
☎ 787-761-2570 787-748-6970 www.jacasierra.com

sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.1	25.1	71.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.0		
.375 in.	98.5		
#4	96.9		
#10	94.2		
#40	85.9		
#100	77.3		
#200	71.8		

* (no specification provided)

Material Description

Brownish yellow, sandy silt some clay, trace gravel

Atterberg Limits

PL= 26 LL= 38 PI= 12

Coefficients

D_{85}= 0.378 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO= A-6(8)

Remarks

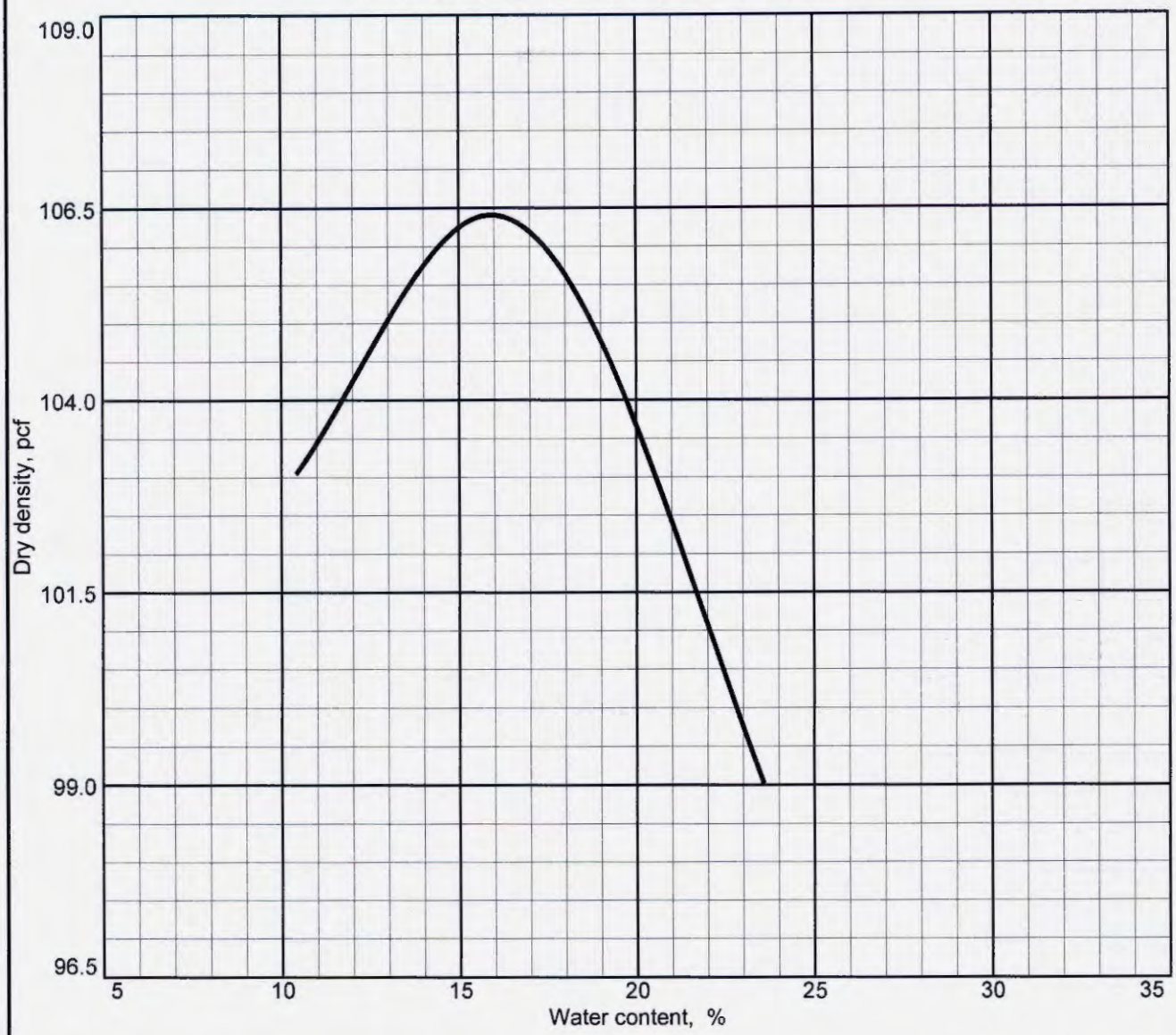
Tested by: S.Perez-S.Martinez
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: P3-110 **Source of Sample:** Project Site **Date:** 7/17/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	ML	A-6(8)			38	12	3.1	71.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106 pcf Optimum moisture = 16 %	Brownish yellow, sandy silt some clay, trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** Ceiba, PR

Remarks:

Tested by: E.Ortiz-T.Rivera

Checked by: Edwin Gutierrez, P.I.T.

Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

July 17, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION AND STANDARD PROCTOR TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-220)
Date of Receipt of Test Samples	:	July 12, 2007
Dates Tests were Performed	:	July 13 to 17, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487 and ASTM D 698

Tests Results

Sample Description	:	Brownish yellow, sandy lean clay, trace gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-7-6

B. Standard Proctor Compaction Test Results (ASTM D 698)

Maximum Dry Density	:	106.0 pcf
Optimum Moisture Content	:	18.0 %

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

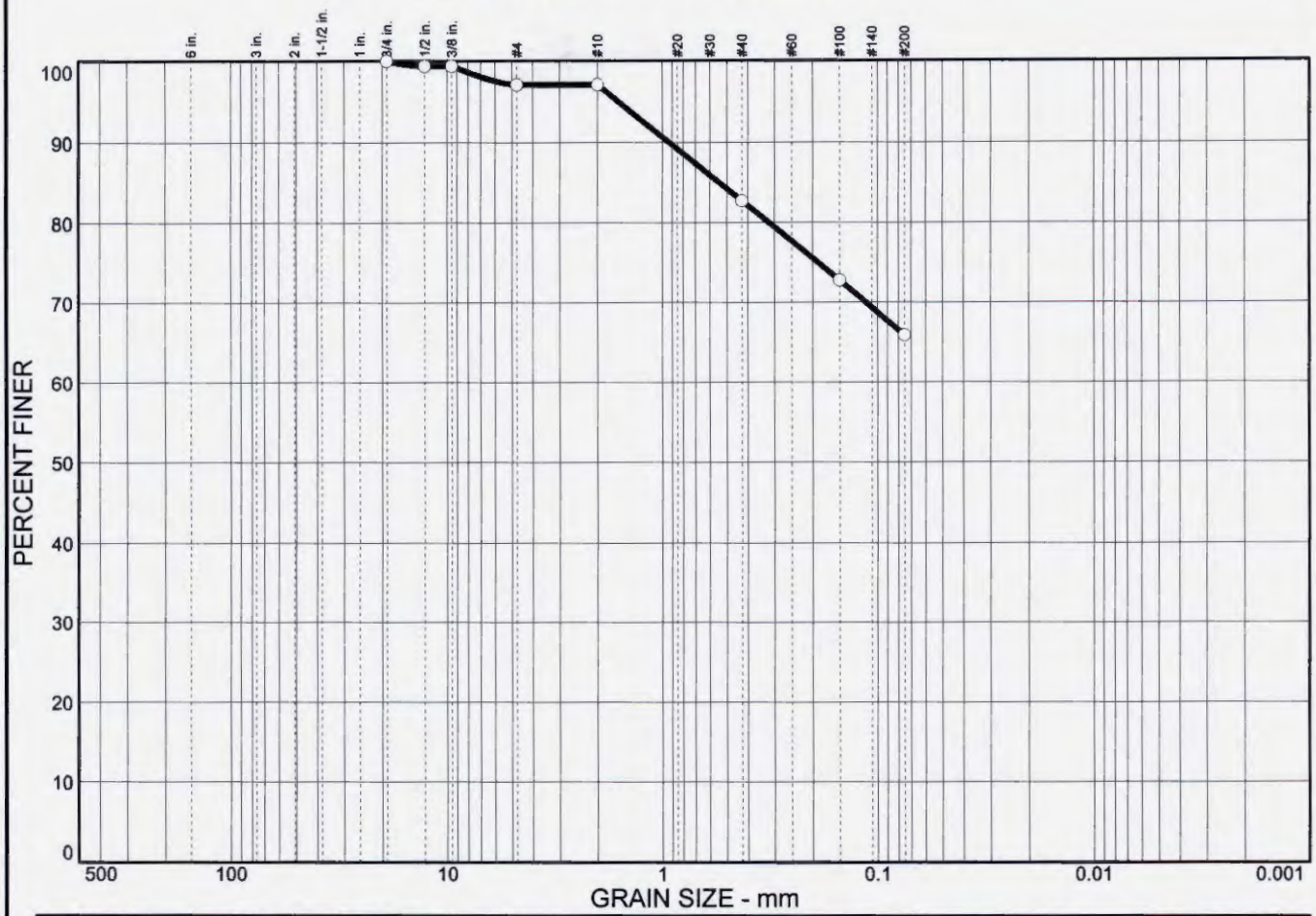
Edwin Gutierrez

EDWIN GUTIERREZ, E.I.T.

PO Box 363116, San Juan, PR 00936-3116
Road 850 Km 0.2 Las Cuevas Ward, Trujillo Alto, PR 00976
☎ 787-761-2570 787-748-6970 www.jacasierra.com

sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.9	31.2	65.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.4		
.375 in.	99.4		
#4	97.1		
#10	97.1		
#40	82.7		
#100	72.8		
#200	65.9		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay, trace gravel

Atterberg Limits

PL= 24 LL= 42 PI= 18

Coefficients

D_{85}= 0.544 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(11)

Remarks

Tested by: S.Perez-S.Martinez
Checked: Edwin Gutierrez, E.I.T.

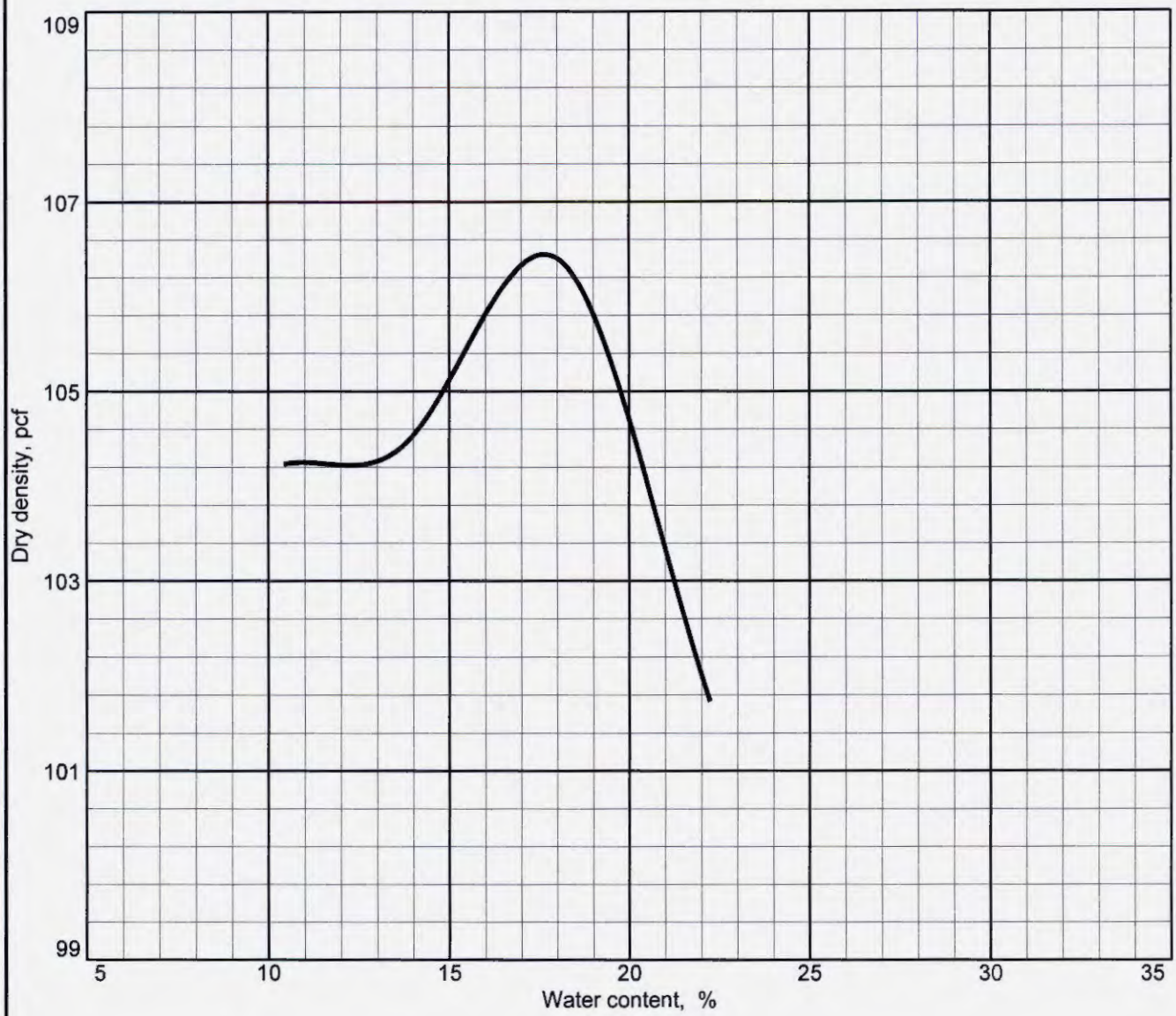
Edwin Gutierrez

Sample No.: P3-220 **Source of Sample:** Project Site **Date:** 7/17/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	CL	A-7-6(11)			42	18	2.9	65.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106 pcf Optimum moisture = 18 %	Brownish yellow, sandy lean clay, trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** Ceiba, PR

Remarks:

Tested by: P.Mojica

Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

July 18, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION AND STANDARD PROCTOR TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-330)
Date of Receipt of Test Samples	:	July 13, 2007
Dates Tests were Performed	:	July 16 to 18, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487 and ASTM D 698

Tests Results

Sample Description	:	Brownish yellow, sandy lean clay, trace gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-6

B. Standard Proctor Compaction Test Results (ASTM D 698)

Maximum Dry Density	:	103.0 pcf
Optimum Moisture Content	:	19.0 %

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

EDWIN GUTIERREZ, E.I.T.

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Road 850 Km 0.2 Las Cuevas Ward, Trujillo Alto, PR 00976
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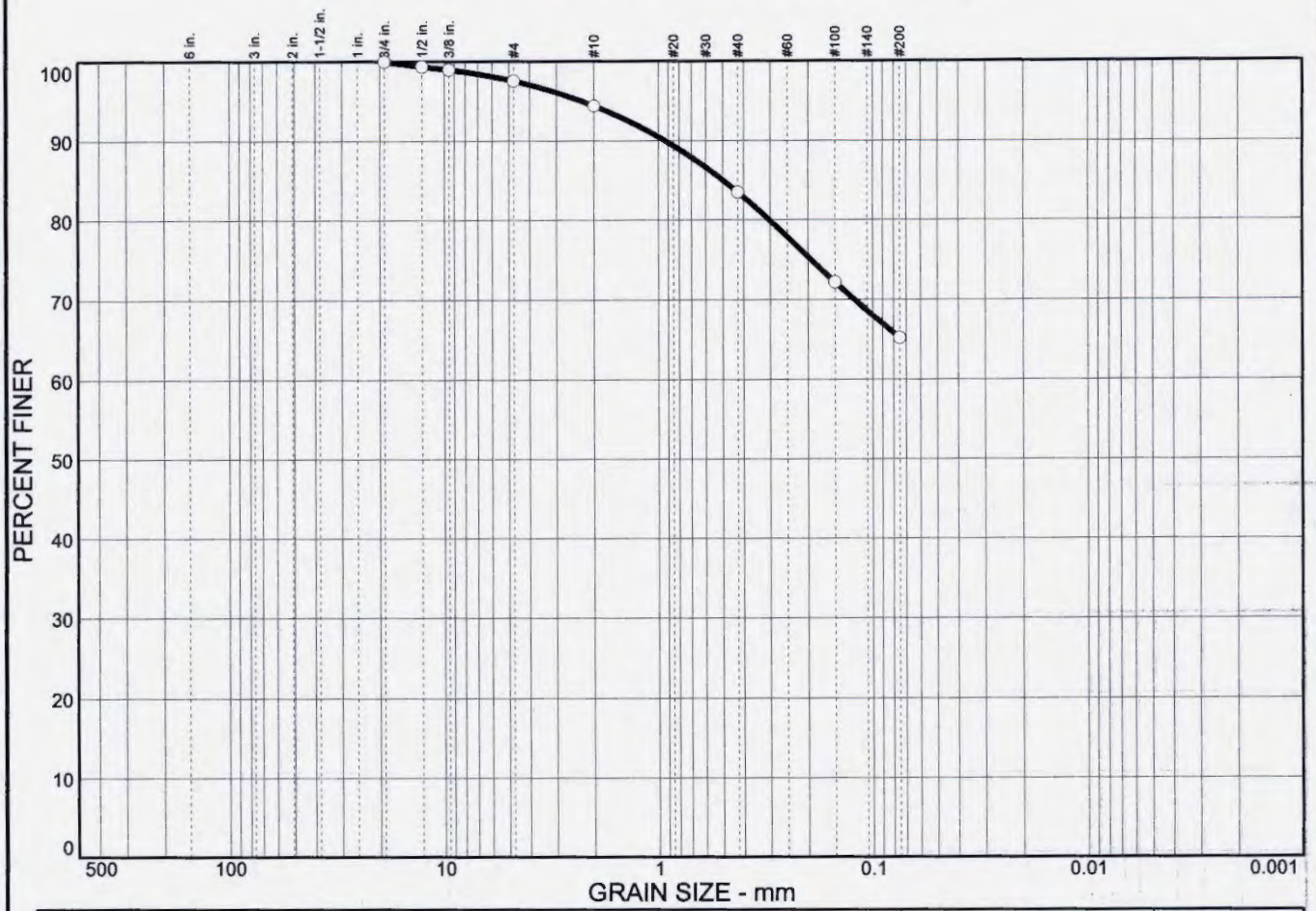
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.4	32.4	65.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.4		
.375 in.	99.0		
#4	97.6		
#10	94.4		
#40	83.5		
#100	72.2		
#200	65.2		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay, trace gravel

Atterberg Limits

PL= 24 LL= 36 PI= 12

Coefficients

D_{85}= 0.498 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

Tested by: S.Perez-S.Martinez
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: P3-330 **Source of Sample:** Project Site **Date:** 7/17/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT

Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	CL	A-6(6)			36	12	2.4	65.2

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103 pcf Optimum moisture = 19 %	Brownish yellow, sandy lean clay, trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** Ceiba, PR

Remarks:

Tested by: A.Garcia

Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 3, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : STANDARD TEST METHOD FOR HYDROMETER ANALYSIS

Project	:	Puerto Rico Landfill Closure-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-550)
Date of Receipt of Test Samples	:	July 26, 2007
Dates Tests were Performed	:	August 2 to 3, 2007
Standard Test Methods Used	:	ASTM D422

Tests Results

Sample Description	:	Brownish yellow, silty clay with sand.

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

EDWIN GUTIERREZ, E.I.T.

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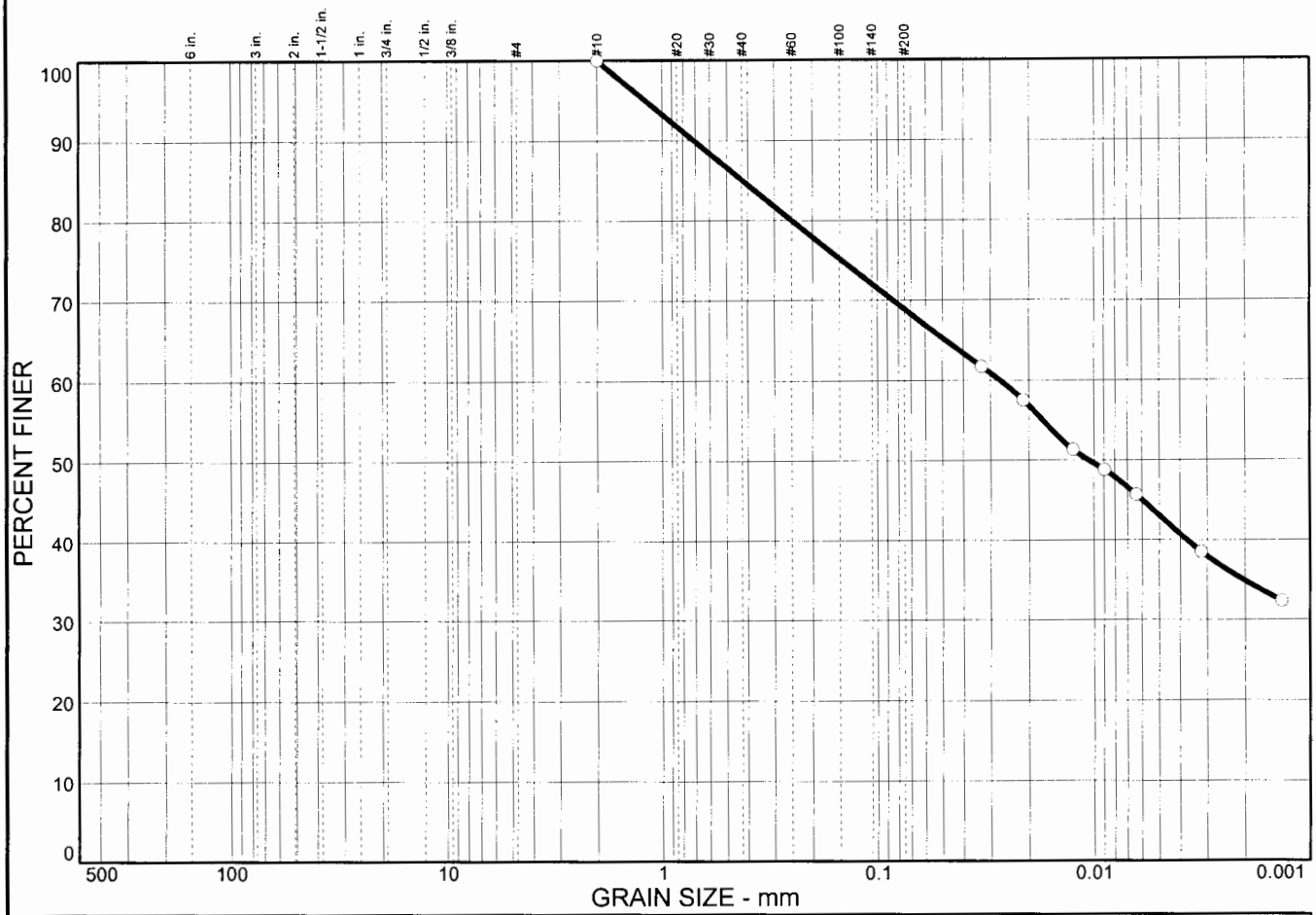
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	31.1	25.8	43.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		

* (no specification provided)

Material Description

Brownish yellow, silty clay with sand

Atterberg Limits

PL= 47 LL= 26 PI= 21

Coefficients

D_{85}= 0.423 D_{60}= 0.0272 D_{50}= 0.0106
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

Sample No.: P3-550 **Source of Sample:** Project Site **Date:** 8/03/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 3, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : STANDARD TEST METHOD FOR HYDROMETER ANALYSIS

Project	:	Puerto Rico Landfill Closure-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-660)
Date of Receipt of Test Samples	:	July 30, 2007
Dates Tests were Performed	:	August 2 to 3, 2007
Standard Test Methods Used	:	ASTM D422

Tests Results

Sample Description	:	Brownish yellow, silty clay with sand.

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

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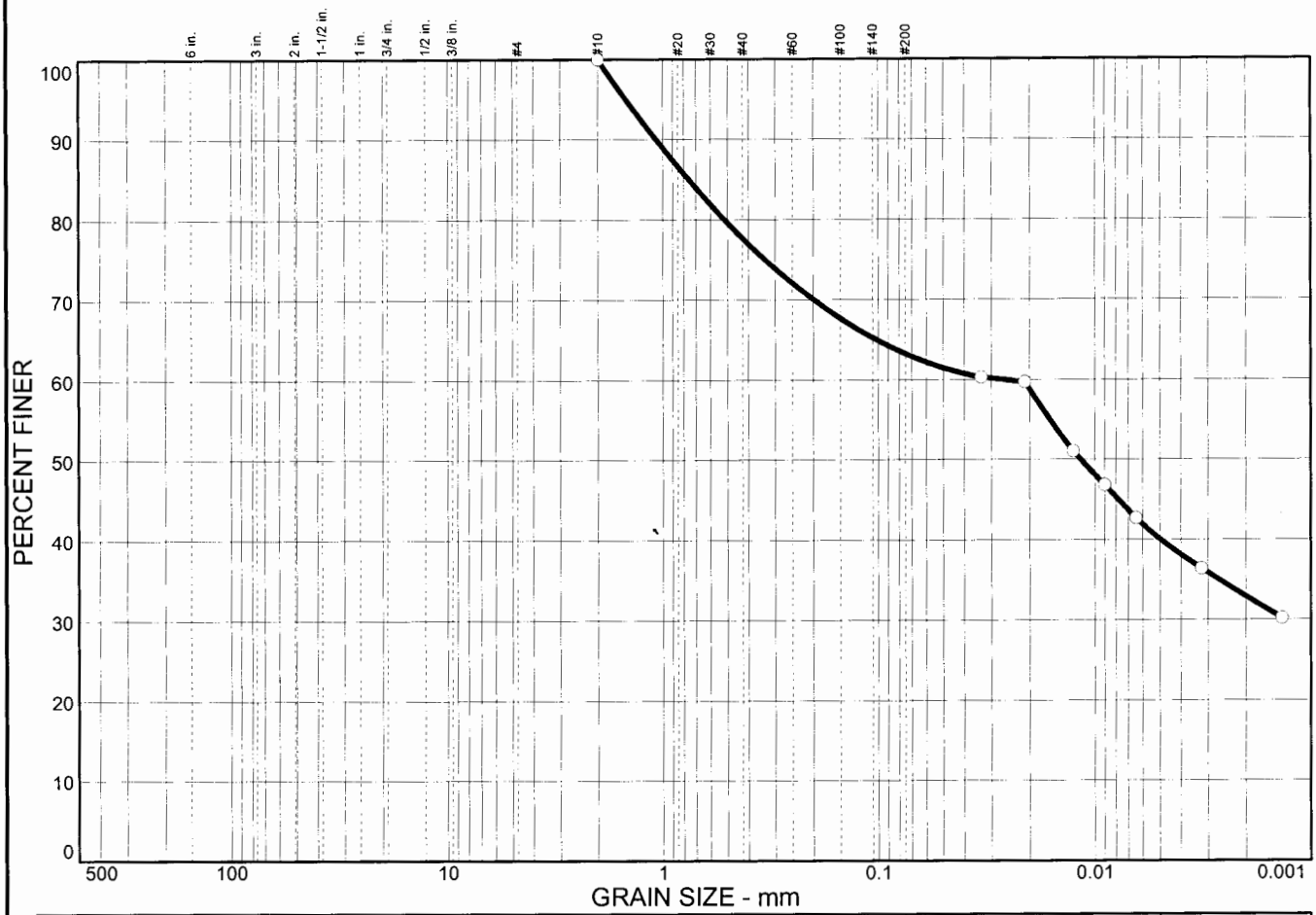
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	36.8	23.2	40.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		

* (no specification provided)

Material Description

Brownish yellow, silty clay with sand

Atterberg Limits

PL= 22 LL= 38 PI= 16

Coefficients

D_{85}= 0.758 D_{60}= 0.0265 D_{50}= 0.0117
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

Sample No.: P3-660 **Source of Sample:** Project Site **Date:** 8/06/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 7, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION AND STANDARD PROCTOR TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-660)
Date of Receipt of Test Samples	:	July 30, 2007
Dates Tests were Performed	:	August 1 to 6, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487 and ASTM D 698

Tests Results

Sample Description	:	Brownish yellow, sandy silt, some clay trace gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	ML
AASHTO Classification	:	A-4

B. Standard Proctor Compaction Test Results (ASTM D 698)

Maximum Dry Density	:	107.0 pcf
Optimum Moisture Content	:	16.0 %

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

EDWIN GUTIERREZ, E.I.T.

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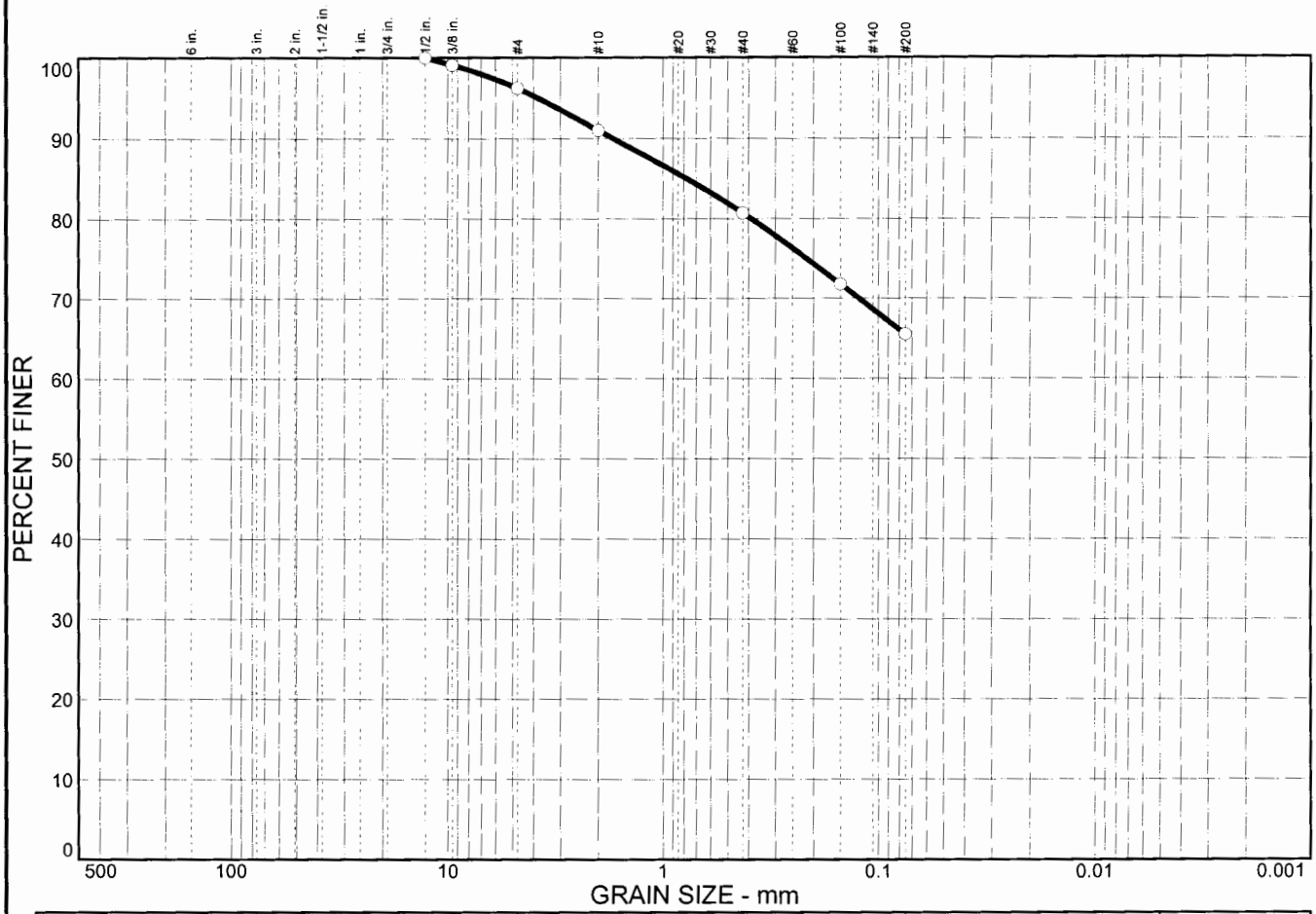
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.8	30.7	65.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.1		
#4	96.2		
#10	91.0		
#40	80.7		
#100	71.8		
#200	65.5		

* (no specification provided)

Material Description

Brownish yellow, sandy silt, some clay trace gravel

Atterberg Limits

PL= 22 LL= 38 PI= 16

Coefficients

D_{85}= 0.778 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

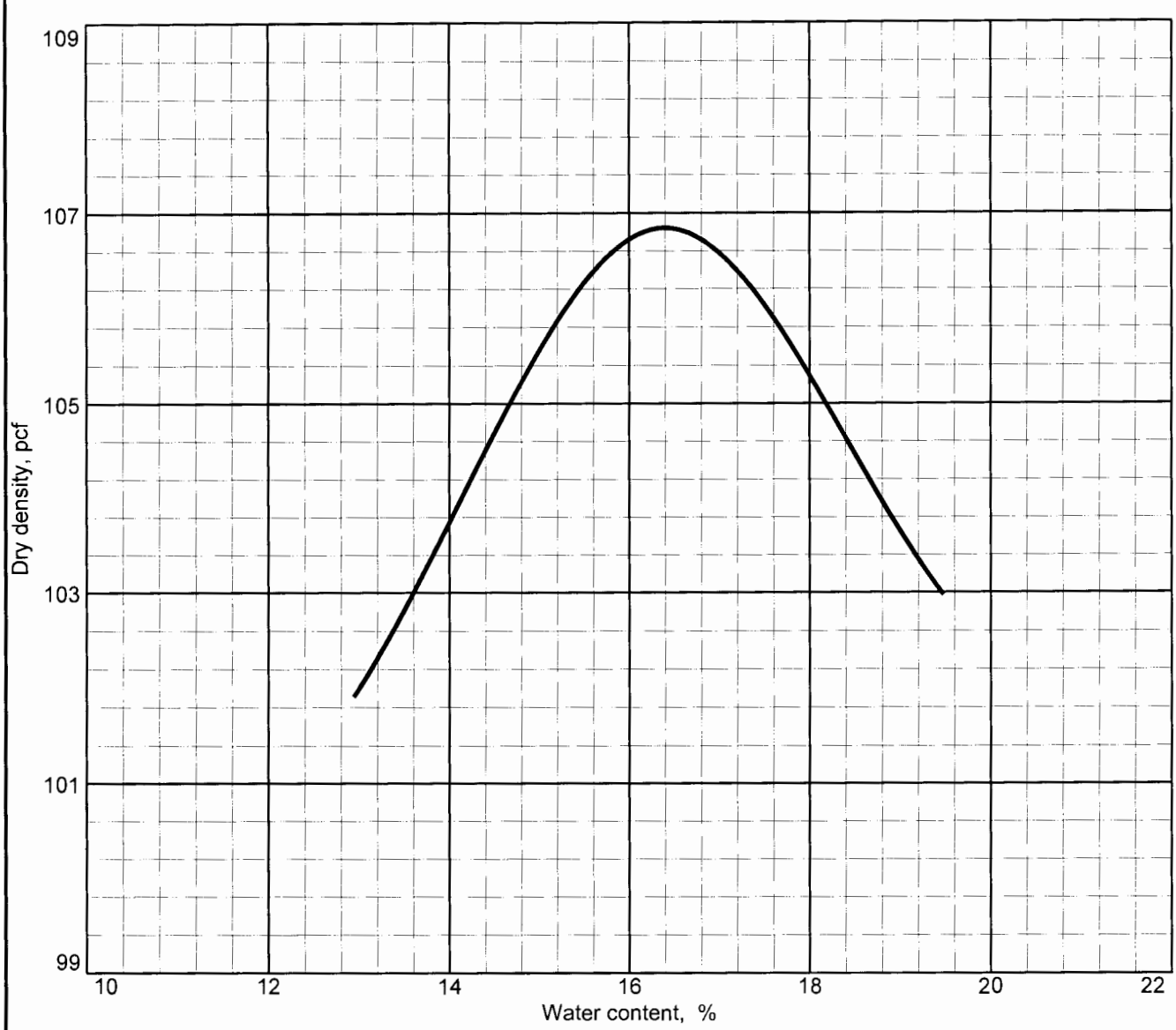
Tested by: S.Perez-G.Guzman
Checked by: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: P3-660 **Source of Sample:** Project Site **Date:** 8/06/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	ML	A-4(0)			38	16	3.8	65.5

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 107 pcf Optimum moisture = 16 %	Brownish yellow, sandy silt, some clay trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** Ceiba, PR

Remarks:

Tested by: G.Guzman

Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 3, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : STANDARD TEST METHOD FOR HYDROMETER ANALYSIS

Project	:	Puerto Rico Landfill Closure-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-770)
Date of Receipt of Test Samples	:	July 26, 2007
Dates Tests were Performed	:	August 2 to 3, 2007
Standard Test Methods Used	:	ASTM D422

Tests Results

Sample Description	:	Brownish yellow, silty sand with clay.

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

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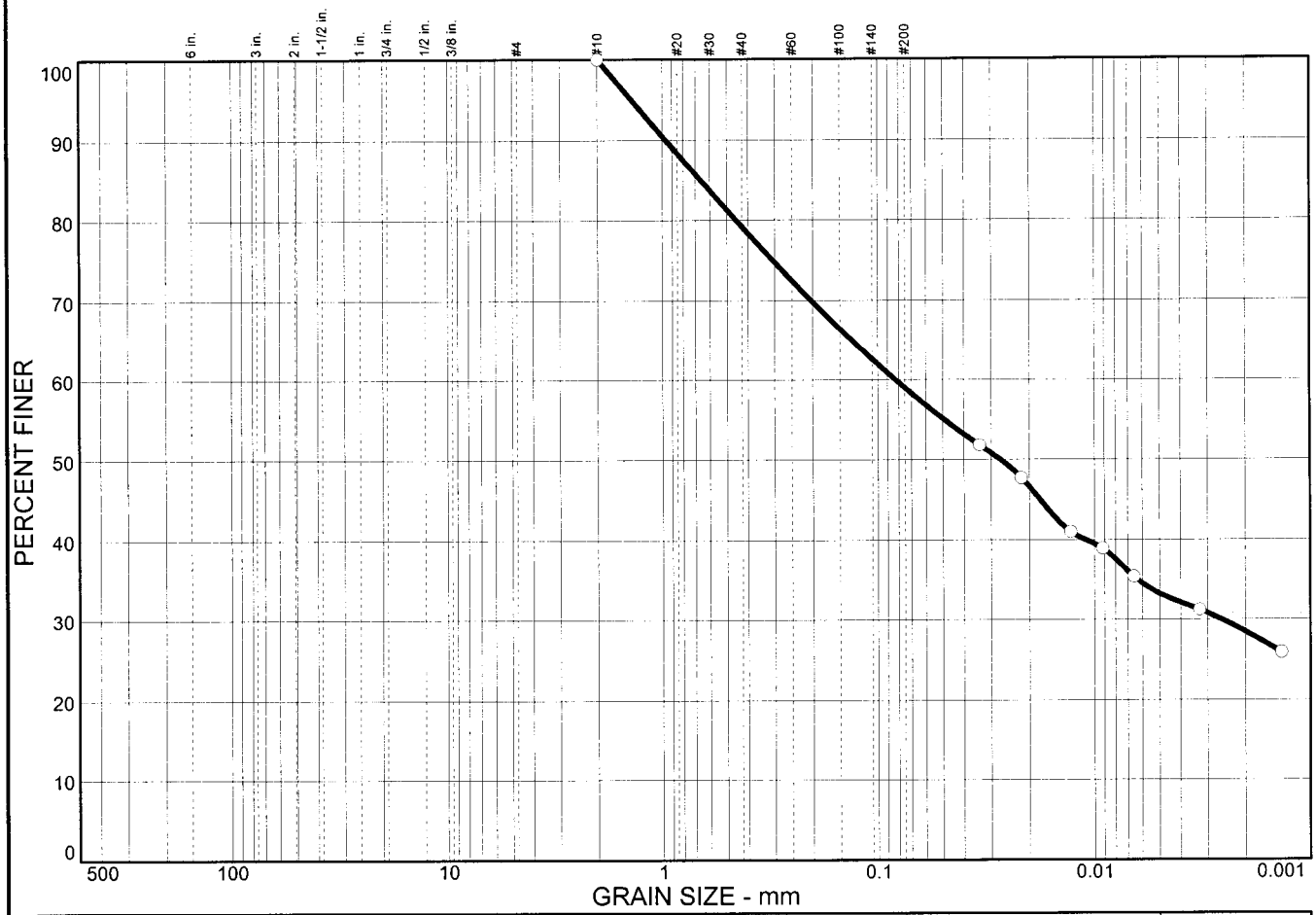
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	41.0	25.7	33.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		

* (no specification provided)

Material Description

Brownish yellow, silty sand with clay

Atterberg Limits

PL= 34 LL= 22 PI= 12

Coefficients

D_{85}= 0.663 D_{60}= 0.0829 D_{50}= 0.0272
D_{30}= 0.0026 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

Sample No.: P3-770 **Source of Sample:** Project Site **Date:** 8/03/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 21, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION AND STANDARD PROCTOR TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-1100)
Date of Receipt of Test Samples	:	August 14, 2007
Dates Tests were Performed	:	August 15 to 20, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487 and ASTM D 698

Tests Results

Sample Description	:	Brownish yellow, sandy silt, trace clay and gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	ML
AASHTO Classification	:	A-6

B. Standard Proctor Compaction Test Results (ASTM D 698)

Maximum Dry Density	:	109.0 pcf
Optimum Moisture Content	:	19.0 %

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

EDWIN GUTIERREZ, E.I.T.

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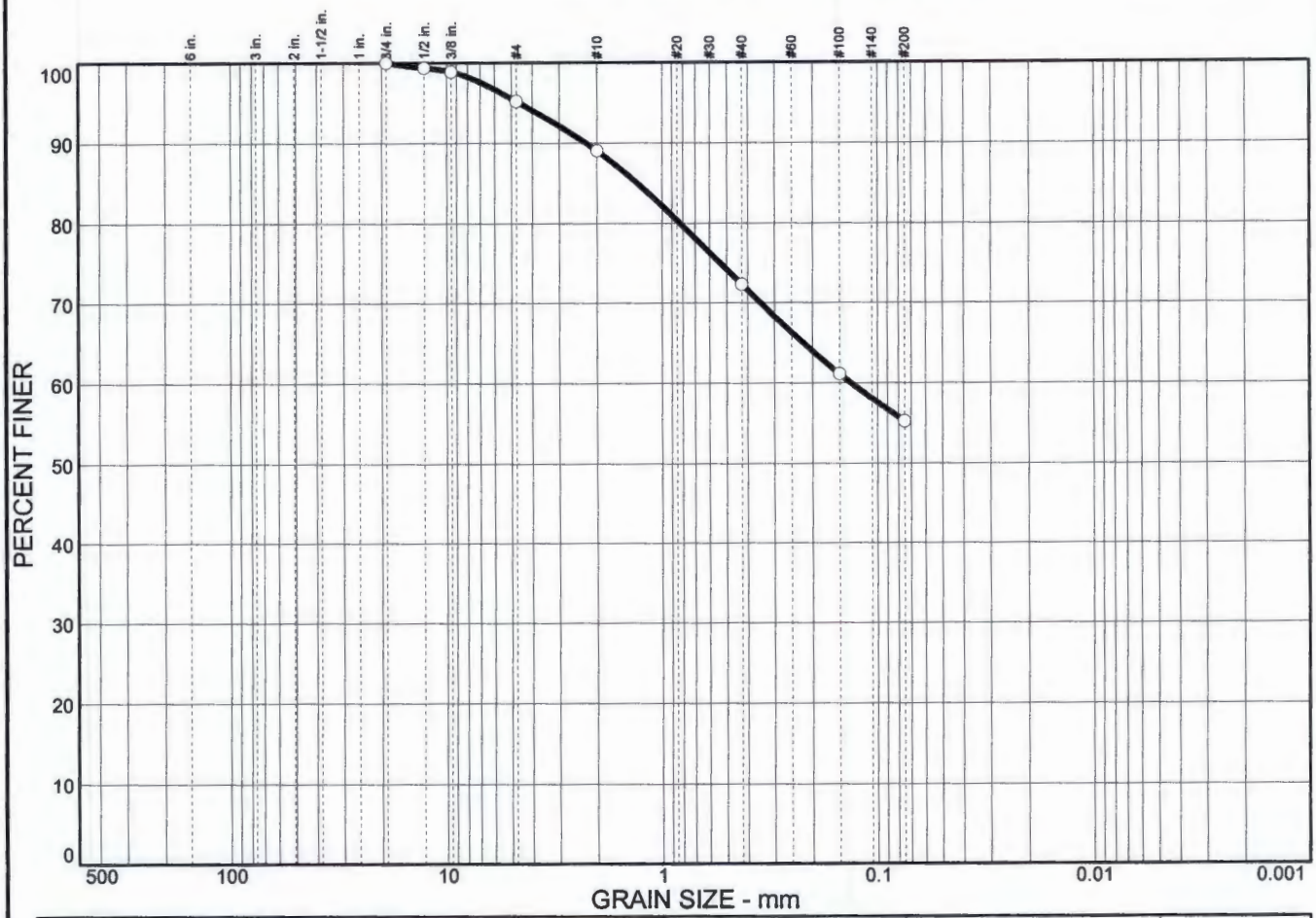
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.8	40.0	55.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.4		
.375 in.	98.9		
#4	95.2		
#10	89.0		
#40	72.3		
#100	61.1		
#200	55.2		

* (no specification provided)

Material Description

Brownish yellow. sandy silt, trace clay and gravel

Atterberg Limits

PL= 27 LL= 38 PI= 11

Coefficients

D_{85}= 1.31 D_{60}= 0.133 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO= A-6(4)

Remarks

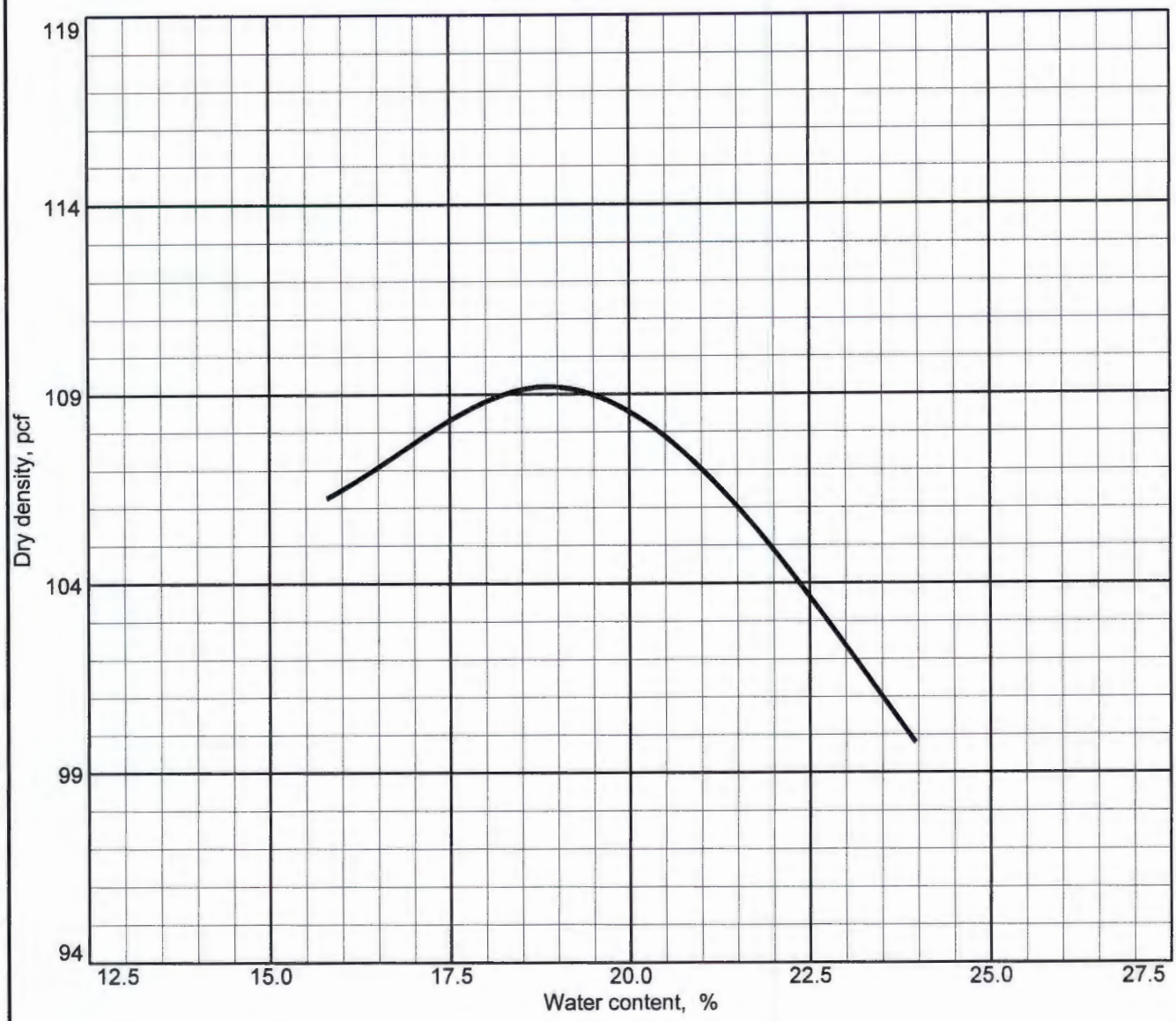
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: P3-1100 **Source of Sample:** Project Site **Date:** 8/17/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	ML	A-6(4)			38	11	4.8	55.2

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 109 pcf Optimum moisture = 19 %	Brownish yellow. sandy silt, trace clay and gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** Ceiba, PR

Remarks:

Tested by: E.Malave

Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 20, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-1210)
Date of Receipt of Test Samples	:	August 17, 2007
Dates Tests were Performed	:	August 18 to 20, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487

Tests Results

Sample Description : Brownish yellow, sandy lean clay, trace gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-6

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

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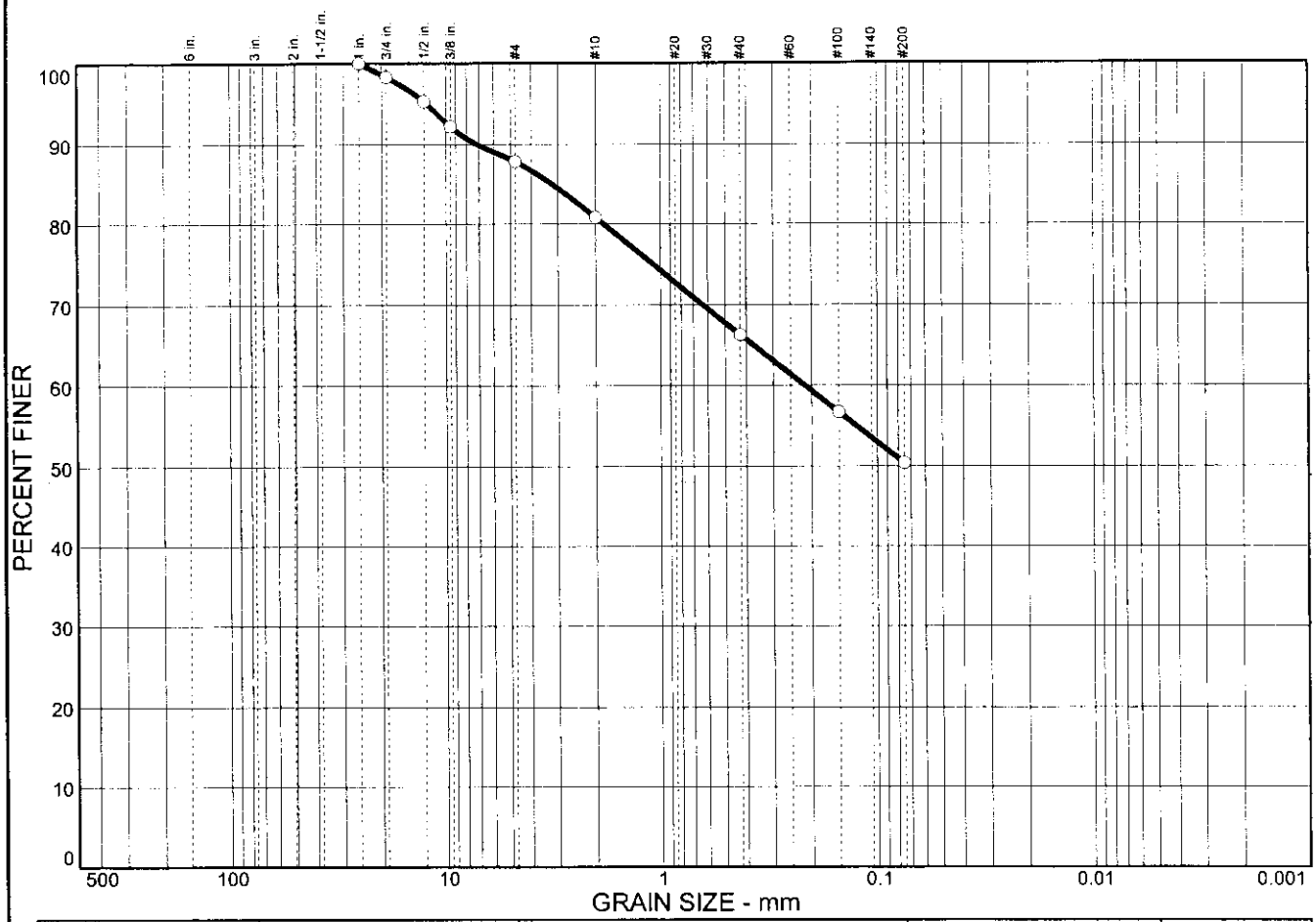
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	12.2	37.4	50.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	98.3		
.5 in.	95.3		
.375 in.	92.2		
#4	87.8		
#10	80.8		
#40	66.3		
#100	56.7		
#200	50.4		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay, trace gravel

Atterberg Limits

PL= 23 LL= 39 PI= 16

Coefficients

D_{85}= 3.21 D_{60}= 0.215 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: P3-1210 **Source of Sample:** Project Site **Date:** 8/20/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 21, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-1430)
Date of Receipt of Test Samples	:	August 17, 2007
Dates Tests were Performed	:	August 18 to 21, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487

Tests Results

Sample Description	:	Brownish yellow, clay with sand trace silt and gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-6

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

EDWIN GUTIERREZ, E.I.T.

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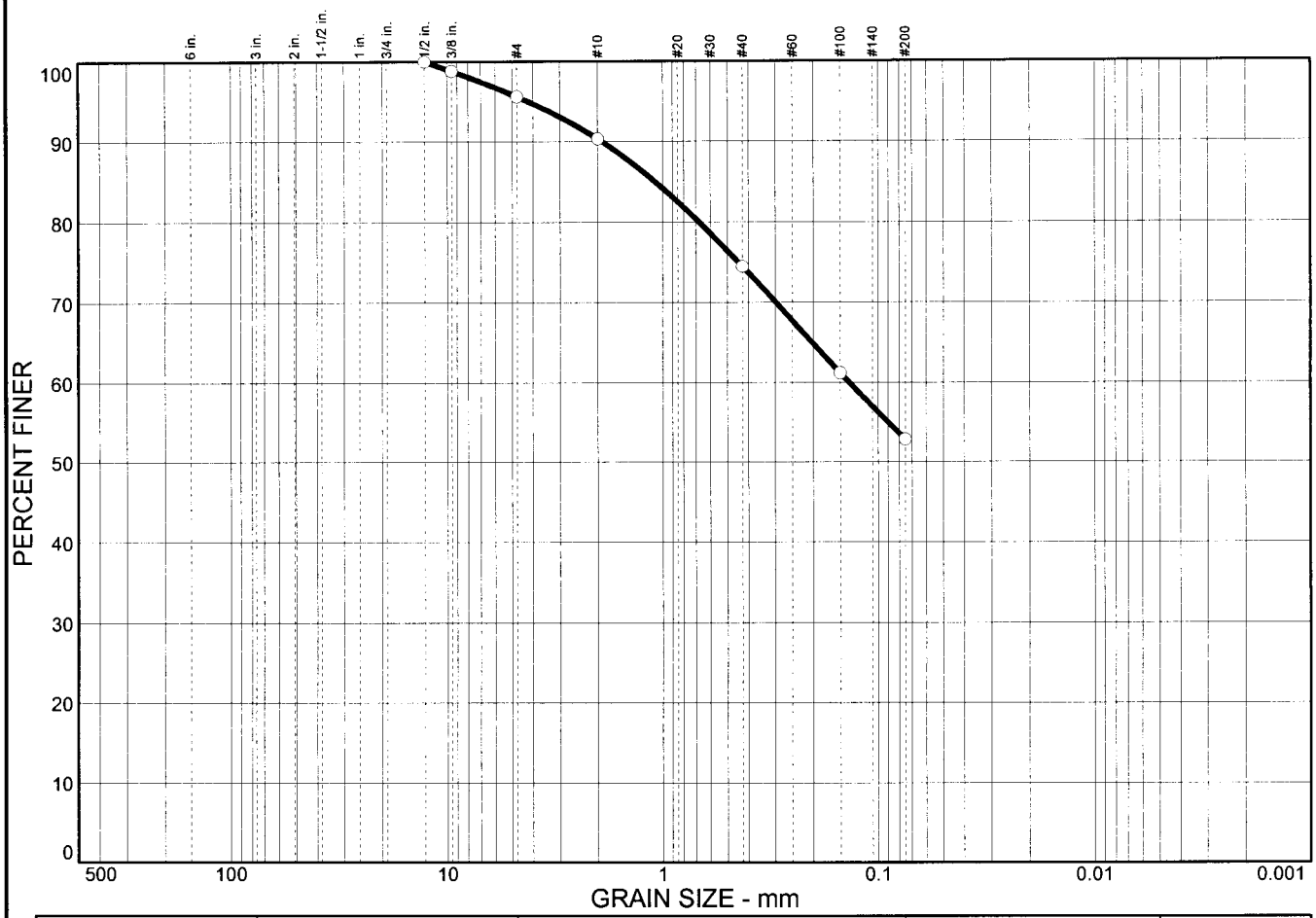
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.4	42.8	52.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
.375 in.	98.8		
#4	95.6		
#10	90.3		
#40	74.5		
#100	61.2		
#200	52.8		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace silt and gravel

Atterberg Limits

PL= 21 LL= 33 PI= 12

Coefficients

D_{85}= 1.09 D_{60}= 0.136 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(4)

Remarks

Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: P3-1430 **Source of Sample:** Project Site **Date:** 8/21/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 21, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION AND STANDARD PROCTOR TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-1540)
Date of Receipt of Test Samples	:	August 17, 2007
Dates Tests were Performed	:	August 18 to 20, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487 and ASTM D 698

Tests Results

Sample Description	:	Brownish yellow, gravelly sand with clay.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	SC
AASHTO Classification	:	A-6

B. Standard Proctor Compaction Test Results (ASTM D 698)

Maximum Dry Density	:	118.0 pcf
Optimum Moisture Content	:	14.0 %

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

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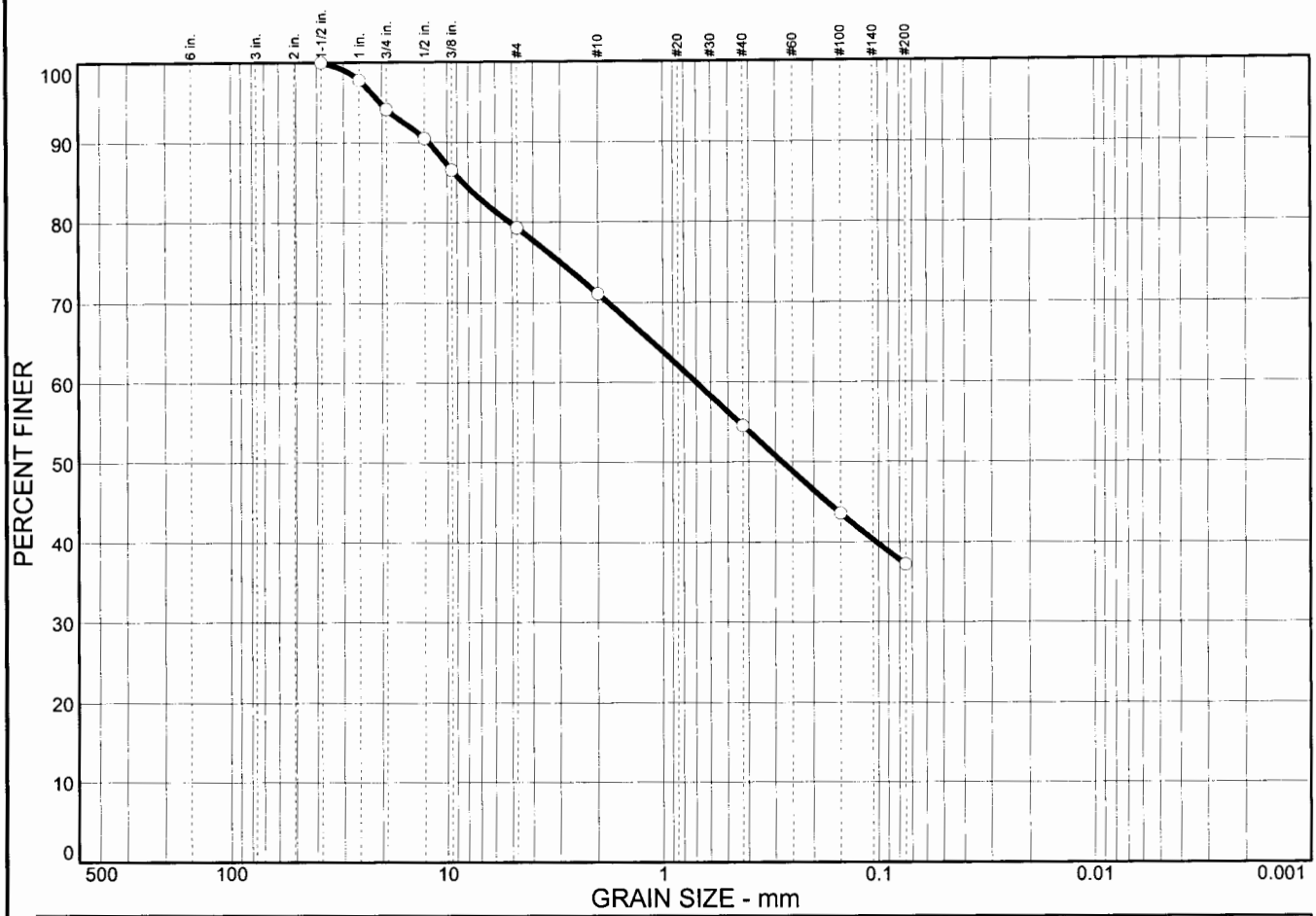
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	20.7	42.1	37.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	97.8		
.75 in.	94.2		
.5 in.	90.5		
.375 in.	86.5		
#4	79.3		
#10	71.1		
#40	54.5		
#100	43.6		
#200	37.2		

* (no specification provided)

Material Description

Brownish yellow, gravelly sand with clay

Atterberg Limits

PL= 21 LL= 34 PI= 13

Coefficients

D_{85}= 8.49 D_{60}= 0.702 D_{50}= 0.280
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(1)

Remarks

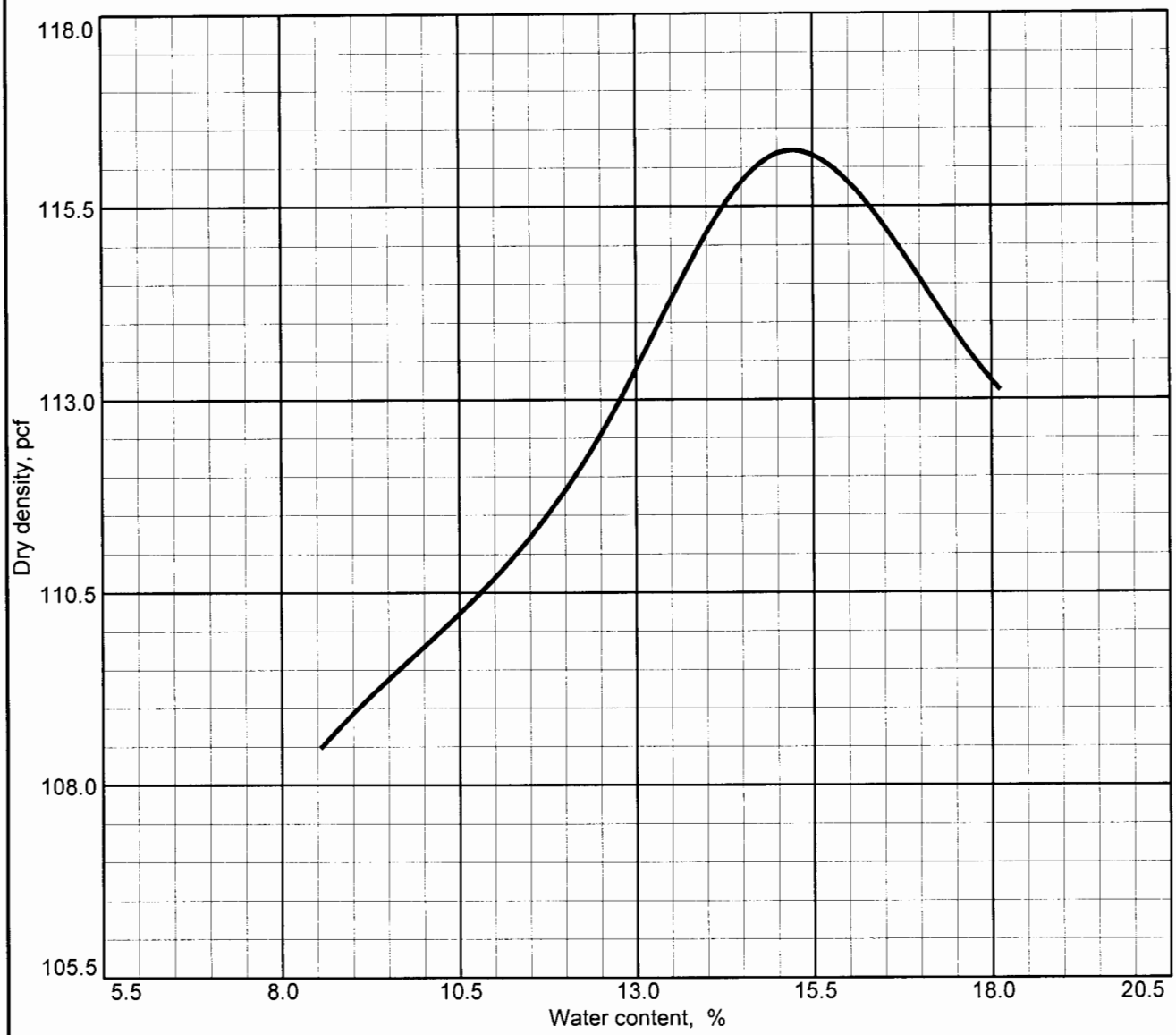
Tested by: S.Perez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: P3-1540 **Source of Sample:** Project Site **Date:** 8/21/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	SC	A-6(1)			34	13		37.2

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 116 pcf Optimum moisture = 15 %	Brownish yellow, gravelly sand with clay

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** Ceiba, PR

Remarks:

Tested by: R.Torres

Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

September 14, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : STANDARD TEST METHOD FOR HYDROMETER ANALYSIS

Project	:	Puerto Rico Landfill Closure-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (QC-1320)
Date of Receipt of Test Samples	:	August 29, 2007
Dates Tests were Performed	:	September 11 to 12, 2007
Standard Test Methods Used	:	ASTM D422

Tests Results

Sample Description	:	Brownish yellow, sand with silty clay.

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

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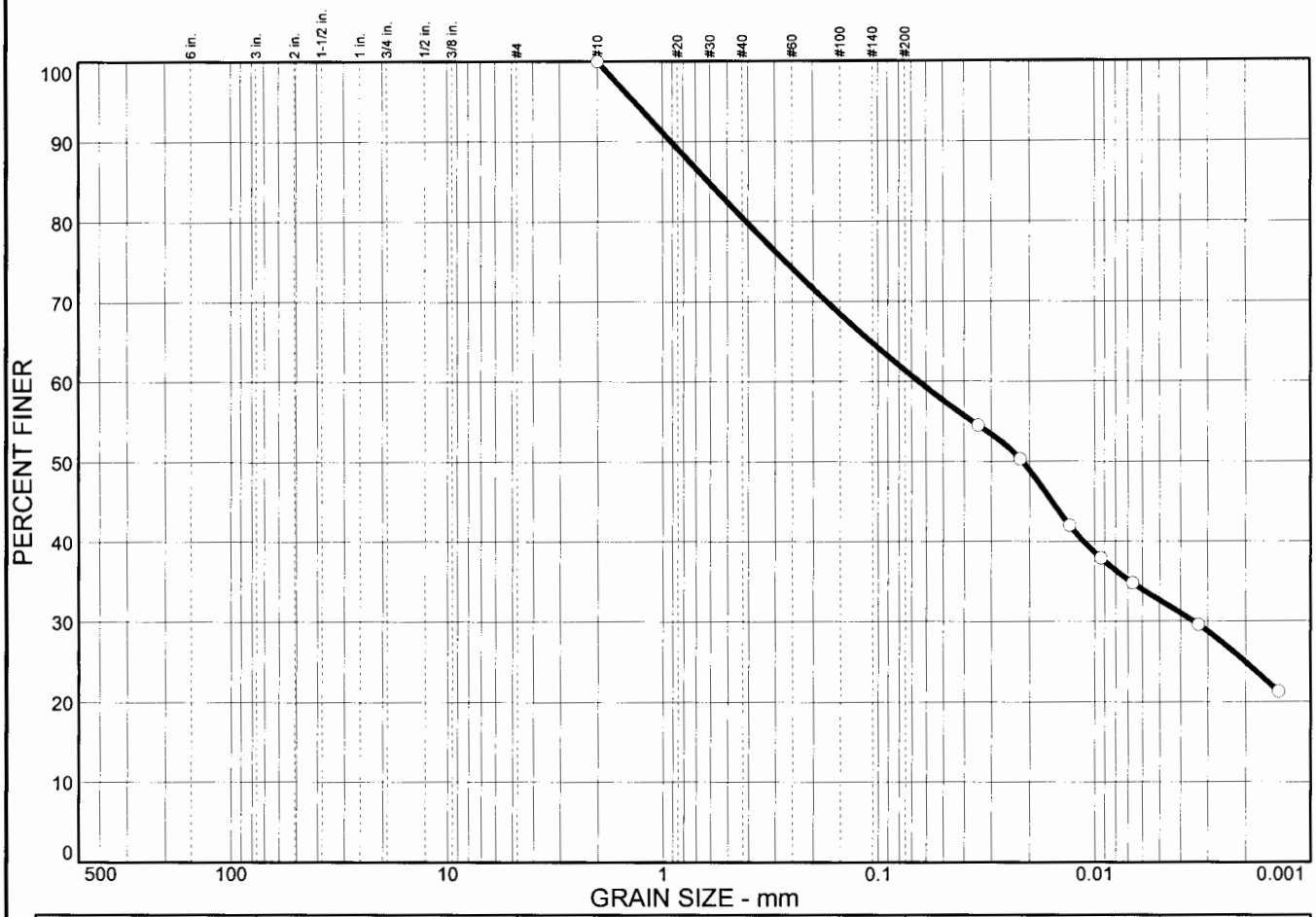
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	38.6	28.7	32.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		

* (no specification provided)

Material Description

Brownish yellow, sand with silty clay

Atterberg Limits

PL= 21 LL= 34 PI= 13

Coefficients

D_{85}= 0.614 D_{60}= 0.0650 D_{50}= 0.0215
D_{30}= 0.0035 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: QC-1320 **Source of Sample:** Project Site **Date:** 9/12/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 27, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-1650)
Date of Receipt of Test Samples	:	August 21, 2007
Dates Tests were Performed	:	August 22 to 24, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487

Tests Results

Sample Description	:	Brownish yellow, clay with sand trace silt and gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-6

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

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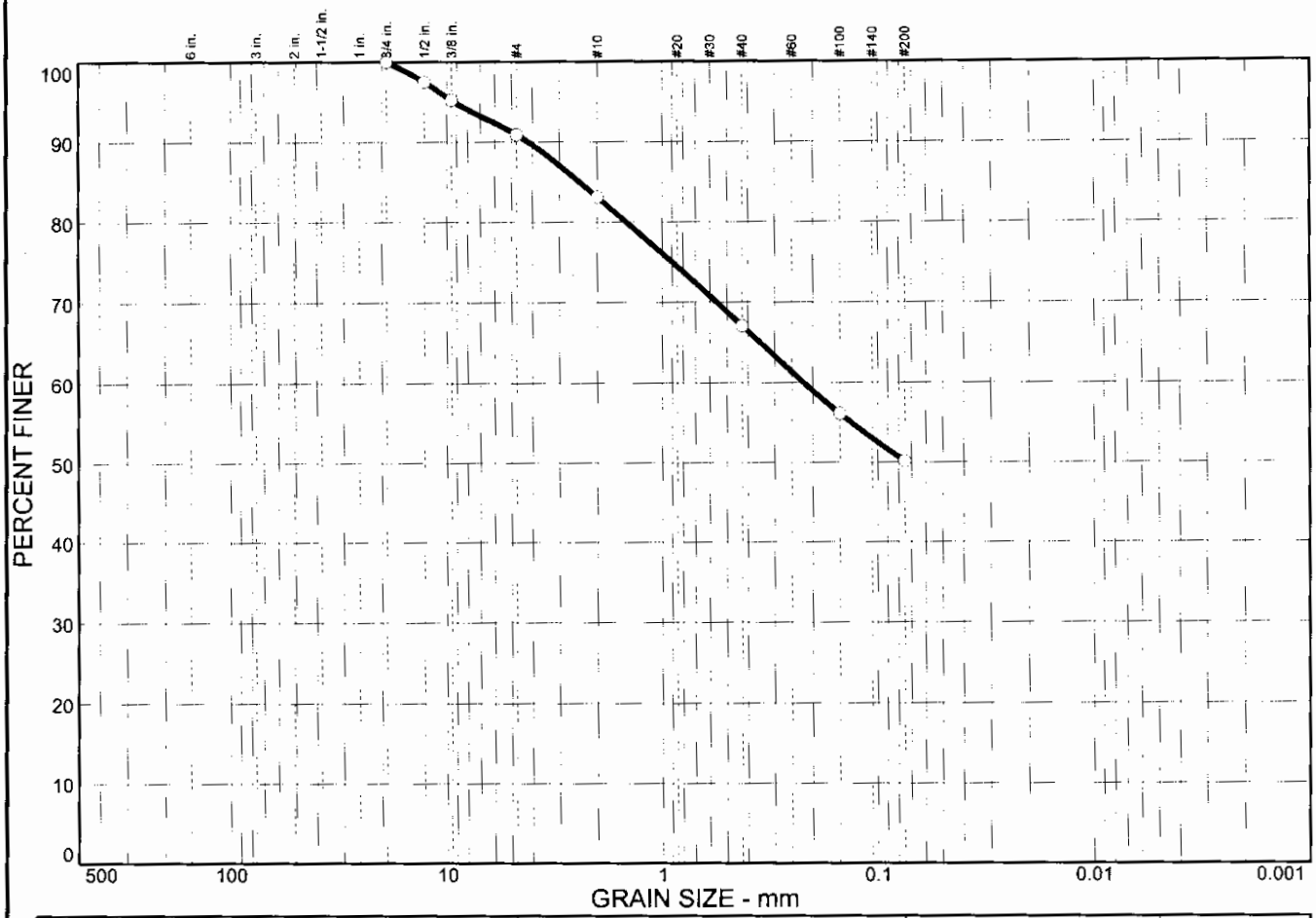
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	9.1	40.8	50.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.5		
.375 in.	95.2		
#4	90.9		
#10	83.1		
#40	67.1		
#100	56.1		
#200	50.1		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace silt and gravel

Atterberg Limits

PL= 23 LL= 38 PI= 15

Coefficients

D_{85}= 2.42 D_{60}= 0.221 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: P3-1650 **Source of Sample:** Project Site **Date:** 8/24/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 27, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION AND STANDARD PROCTOR TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-1760)
Date of Receipt of Test Samples	:	August 21, 2007
Dates Tests were Performed	:	August 22 to 24, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487 and ASTM D 698

Tests Results

Sample Description	:	Brownish yellow, sand with clay trace silt and gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	SC
AASHTO Classification	:	A-6

B. Standard Proctor Compaction Test Results (ASTM D 698)

Maximum Dry Density	:	116.0 pcf
Optimum Moisture Content	:	13.0 %

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

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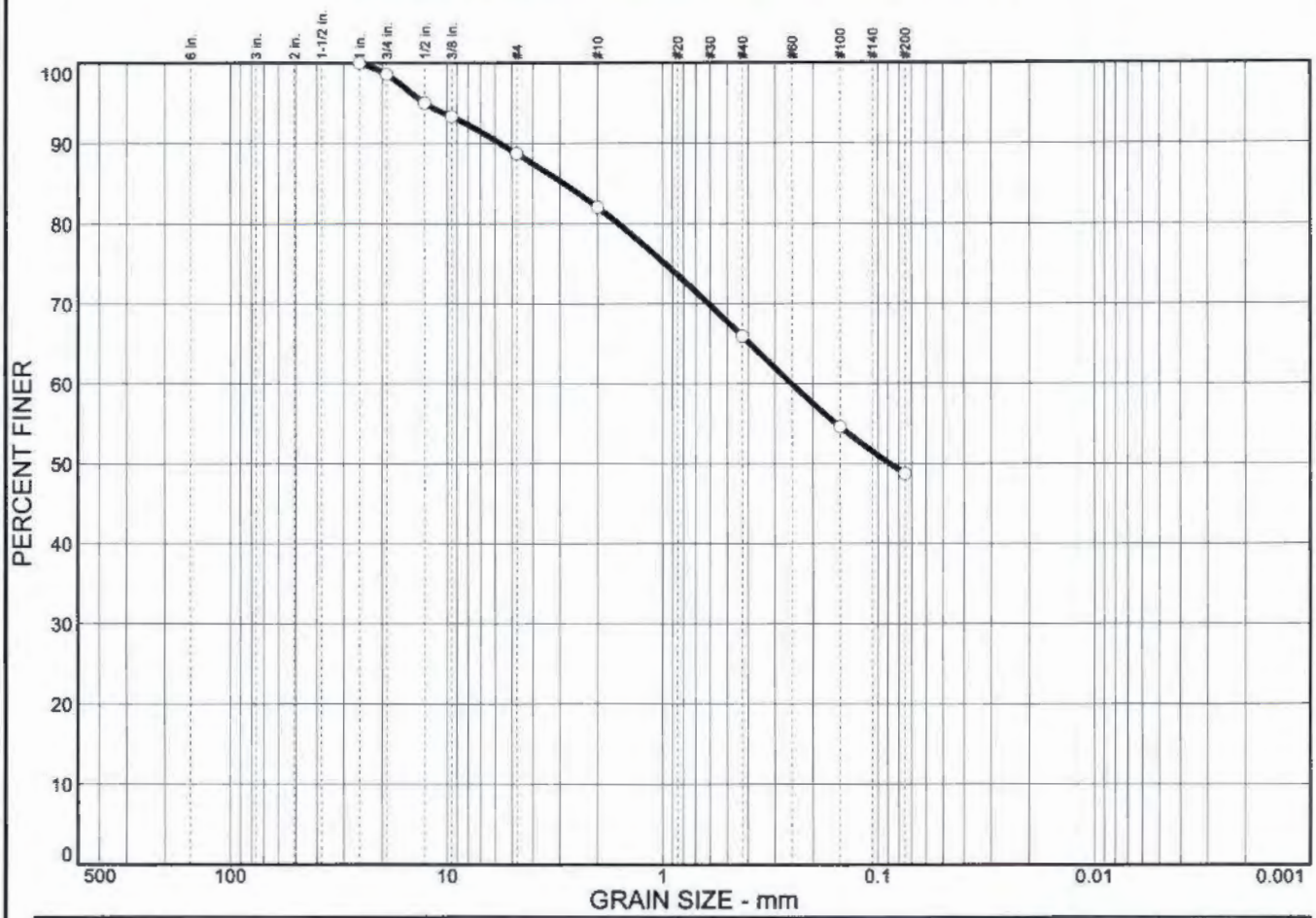
Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	11.3	40.0	48.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	98.6		
.5 in.	95.0		
.375 in.	93.3		
#4	88.7		
#10	82.0		
#40	65.9		
#100	54.6		
#200	48.7		

* (no specification provided)

Material Description

Brownish yellow, sand with clay trace silt and gravel

Atterberg Limits

PL= 21 LL= 34 PI= 13

Coefficients

D_{85}= 2.89 D_{60}= 0.253 D_{50}= 0.0881
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(3)

Remarks

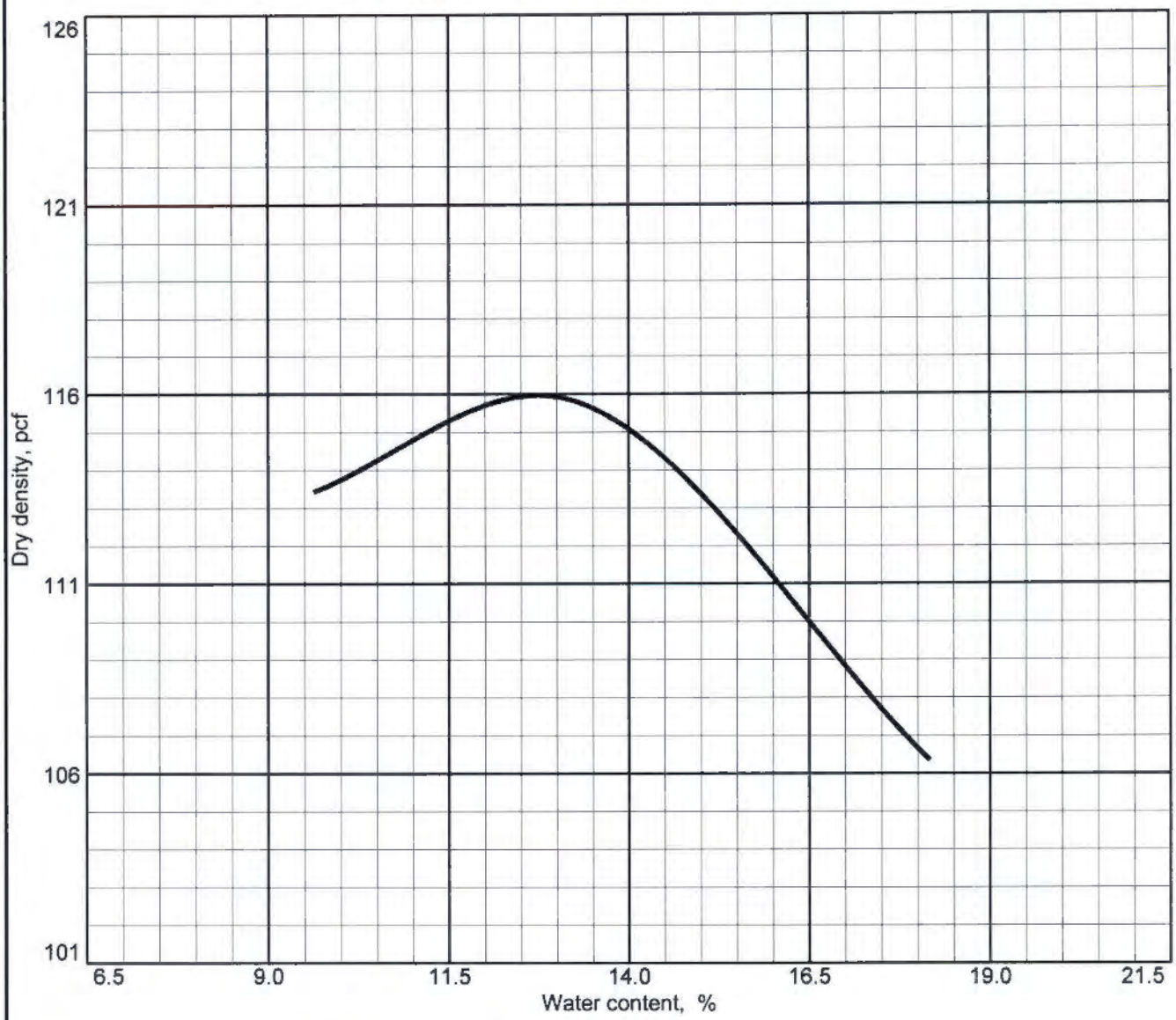
Tested by: S,Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: P3-1760 **Source of Sample:** Project Site **Date:** 8/24/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	SC	A-6(3)			34	13	11.3	48.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 116 pcf Optimum moisture = 13 %	Brownish yellow, sand with clay trace silt and gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** Ceiba, PR

Remarks:

Tested by: M.Pereira-E.Malave

Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 27, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-1870)
Date of Receipt of Test Samples	:	August 22, 2007
Dates Tests were Performed	:	August 23 to 27, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487

Tests Results

Sample Description	:	Brownish yellow, sand with clay, some gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	SC
AASHTO Classification	:	A-6

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

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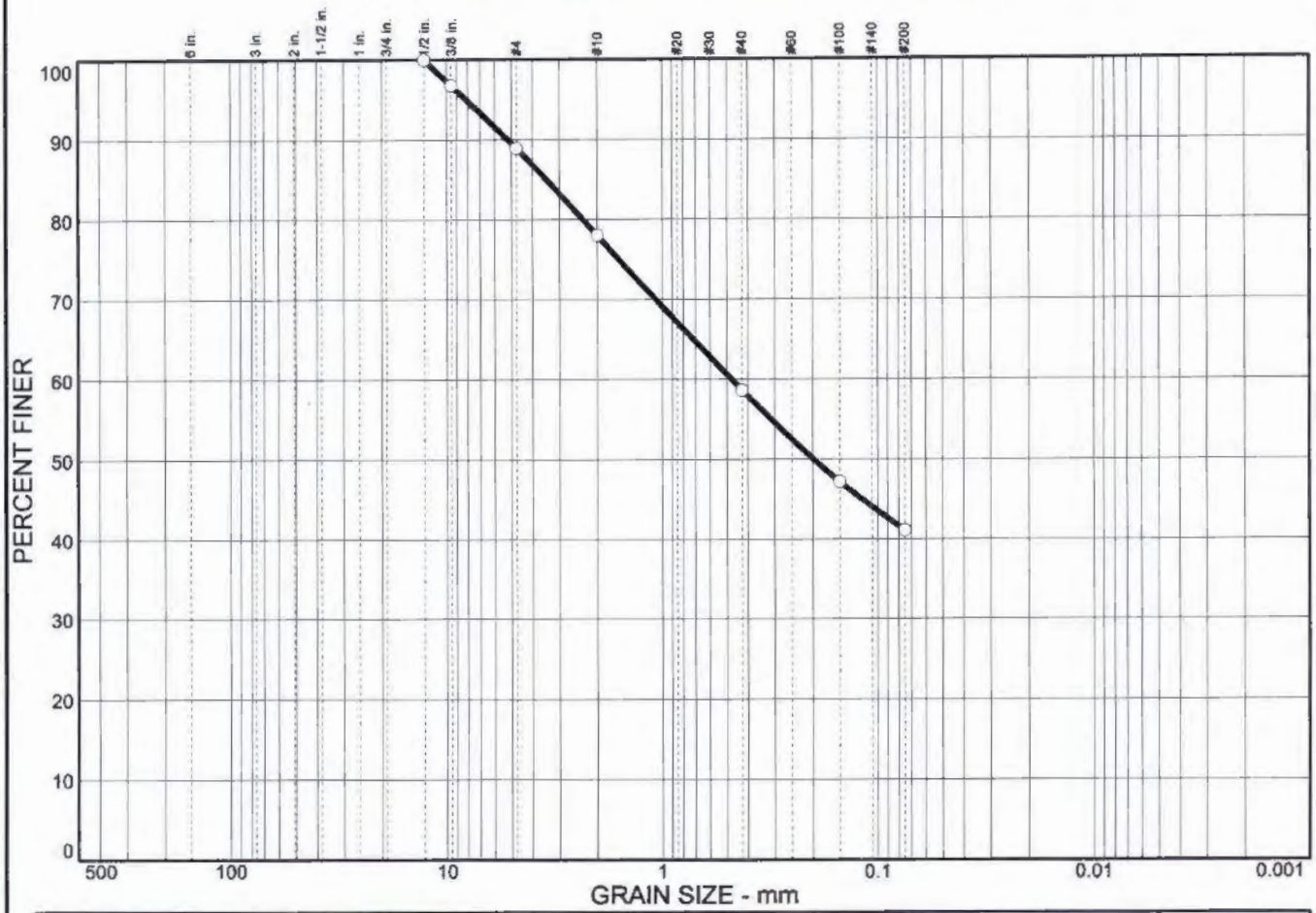
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	11.1	47.8	41.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	96.8		
#4	88.9		
#10	78.0		
#40	58.6		
#100	47.2		
#200	41.1		

* (no specification provided)

Material Description

Brownish yellow, sand with clay, some gravel

Atterberg Limits

PL= 20 LL= 33 PI= 13

Coefficients

D_{85}= 3.46 D_{60}= 0.478 D_{50}= 0.198
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

Tested by:S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: P3-1870 **Source of Sample:** Project Site **Date:** 8/27/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

September 4, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION AND STANDARD PROCTOR TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-1980)
Date of Receipt of Test Samples	:	August 29, 2007
Dates Tests were Performed	:	August 30 to September 4, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487 and ASTM D 698

Tests Results

Sample Description : Brownish yellow, clay with sand trace gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-6

B. Standard Proctor Compaction Test Results (ASTM D 698)

Maximum Dry Density	:	119.0 pcf
Optimum Moisture Content	:	15.0 %

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

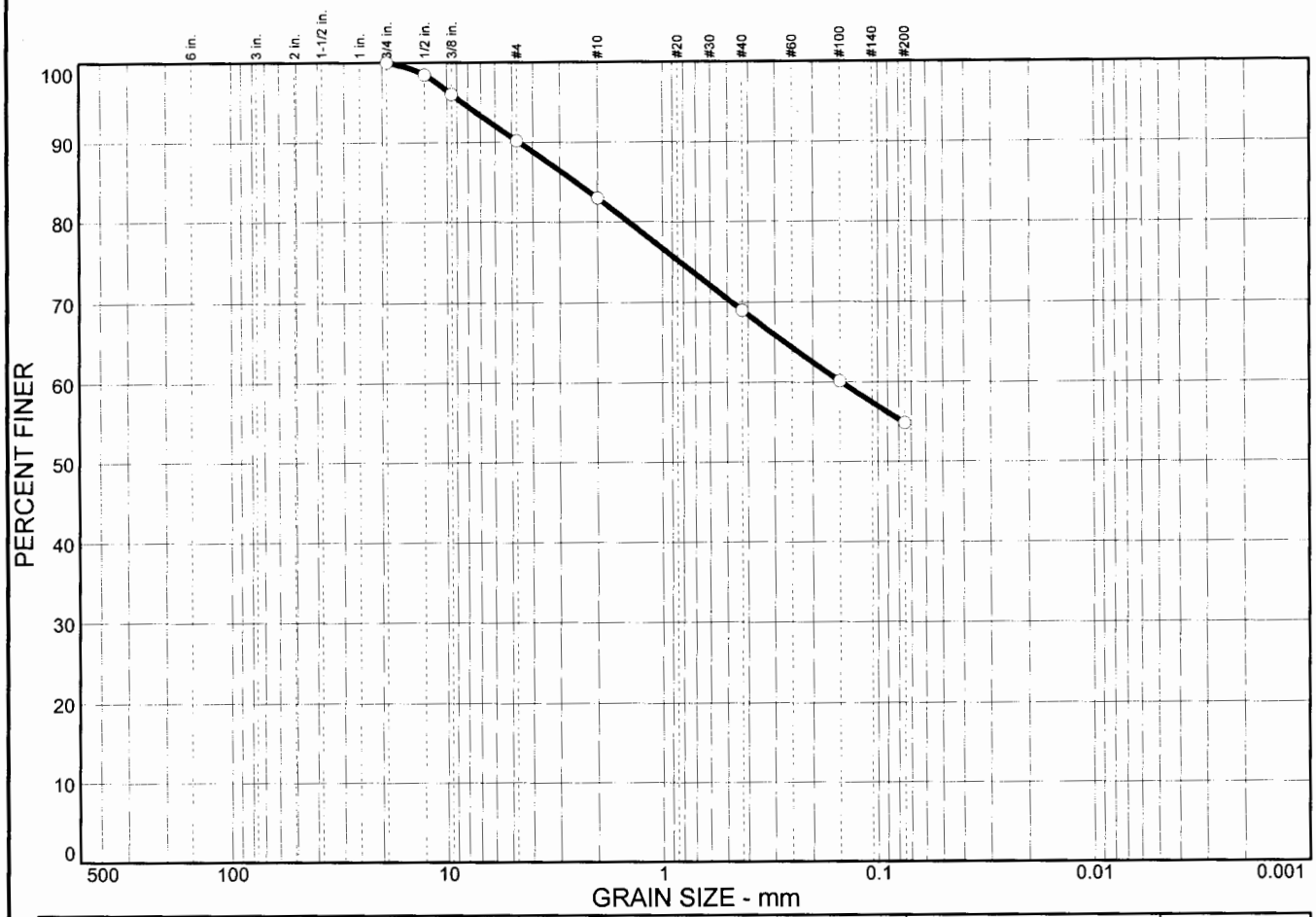
Edwin Gutierrez

EDWIN GUTIERREZ, E.I.T.

PO Box 363116, San Juan, PR 00936-3116
Road 850 Km 0.2 Las Cuevas Ward, Trujillo Alto, PR 00976
☎ 787-761-2570 787-748-6970 www.jacasierra.com

sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	9.8	35.4	54.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.5		
.375 in.	96.1		
#4	90.2		
#10	82.9		
#40	69.0		
#100	60.1		
#200	54.8		

* (no specification provided)

Material Description

Brownish yellow, clay with sand trace gravel

Atterberg Limits

PL= 23 LL= 35 PI= 12

Coefficients

D_{85}= 2.55 D_{60}= 0.148 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(4)

Remarks

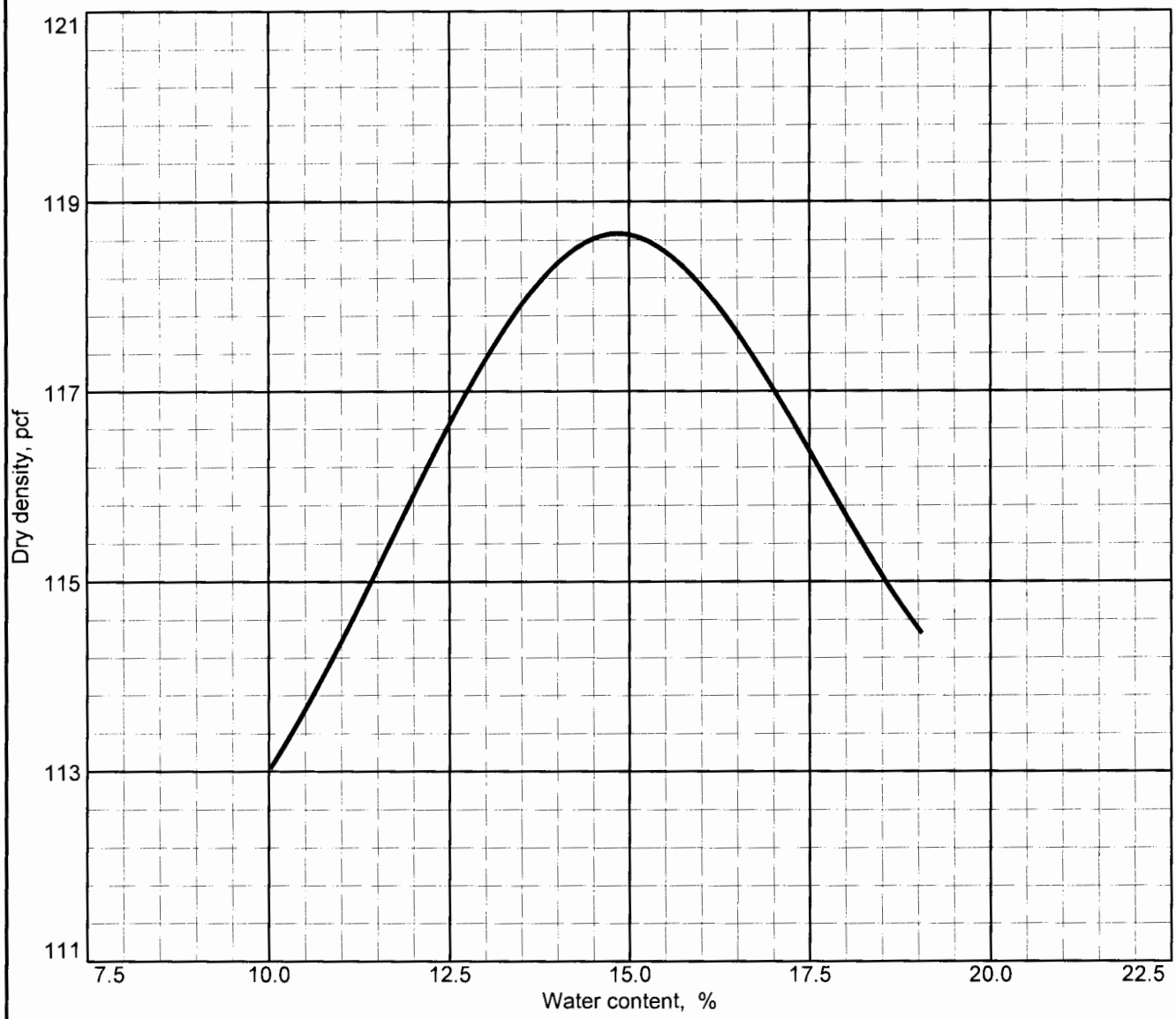
Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: P3-1980 **Source of Sample:** Project Site **Date:** 8/31/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	CL	A-6(4)			35	12	9.8	54.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 119 pcf Optimum moisture = 15 %	

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** Ceiba, PR

Remarks:

Tested by: J.Lozada-M.Pereira

Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

September 1, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-2090)
Date of Receipt of Test Samples	:	August 29, 2007
Dates Tests were Performed	:	August 30 to 31, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487

Tests Results

Sample Description	:	Brownish yellow, sandy lean clay, trace gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-6

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

EDWIN GUTIERREZ, E.I.T.

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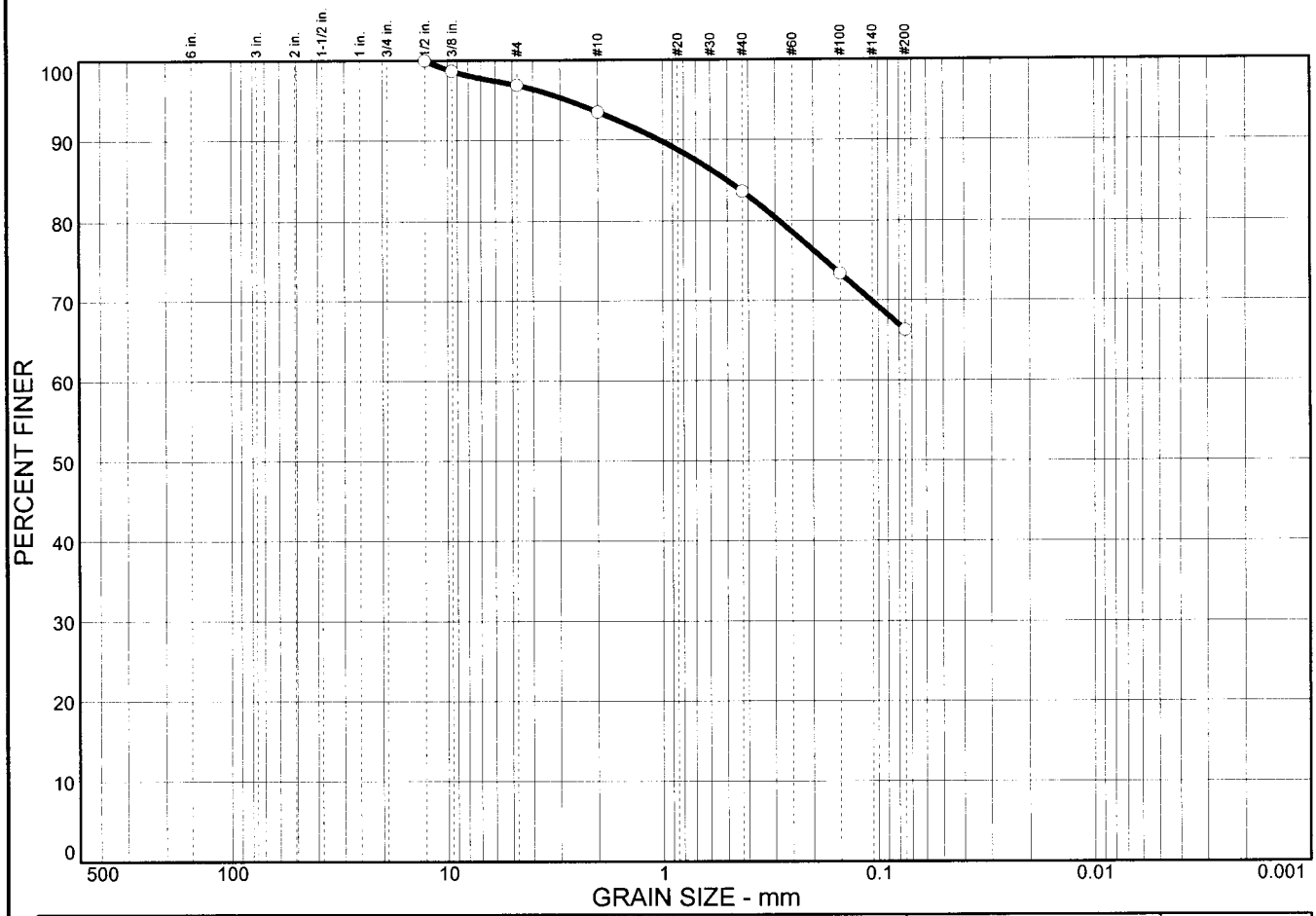
Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.1	30.6	66.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.7		
#4	96.9		
#10	93.5		
#40	83.6		
#100	73.4		
#200	66.3		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay, trace gravel

Atterberg Limits

PL= 21 LL= 35 PI= 14

Coefficients

D_{85}= 0.503 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(7)

Remarks

Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

Sample No.: P3-2090 **Source of Sample:** Project Site **Date:** 8/31/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

September 4, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION AND STANDARD PROCTOR TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (P3-2200)
Date of Receipt of Test Samples	:	August 29, 2007
Dates Tests were Performed	:	August 30 to September 4, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487 and ASTM D 698

Tests Results

Sample Description	:	Brownish yellow, sandy lean clay trace gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-6

B. Standard Proctor Compaction Test Results (ASTM D 698)

Maximum Dry Density	:	110.0 pcf
Optimum Moisture Content	:	16.0 %

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

EDWIN GUTIERREZ, E.I.T.

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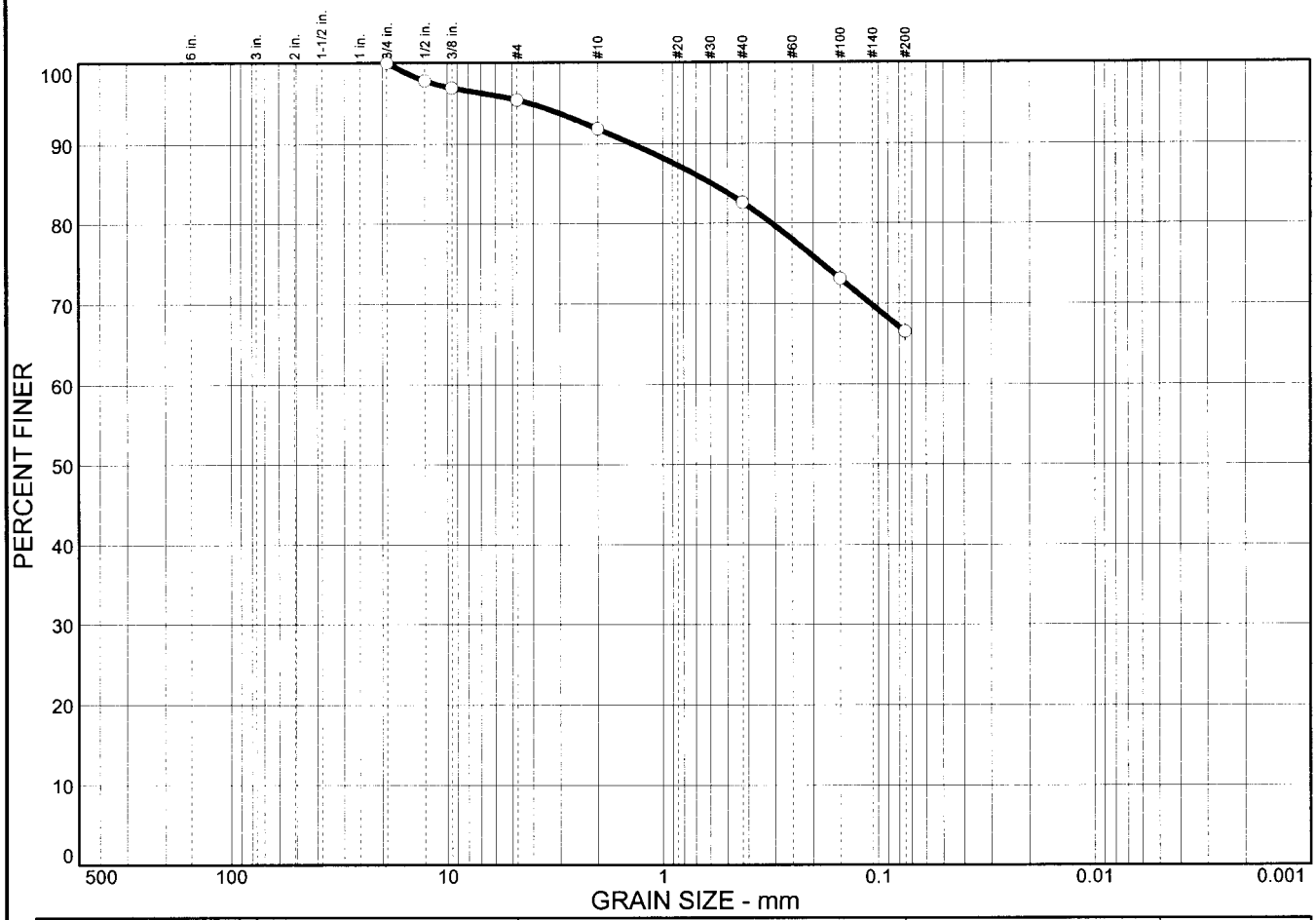
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.6	28.9	66.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.8		
.375 in.	96.9		
#4	95.4		
#10	91.8		
#40	82.6		
#100	73.1		
#200	66.5		

* (no specification provided)

Material Description

Brownish yellow, sandy lean clay trace gravel

Atterberg Limits

PL= 21 LL= 39 PI= 18

Coefficients

D_{85}= 0.589 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(10)

Remarks

Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

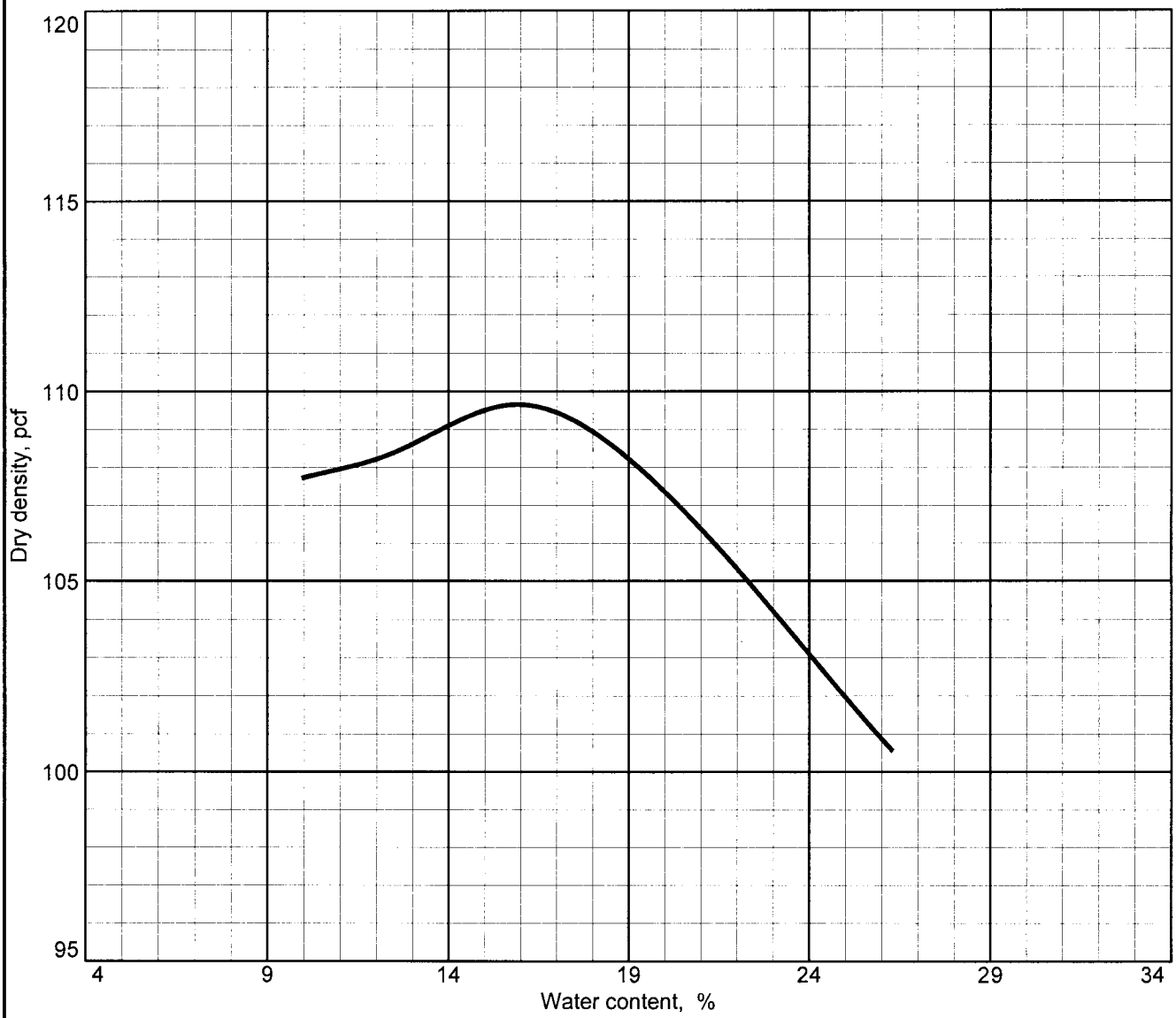
Edwin Gutierrez

Sample No.: P3-2200 **Source of Sample:** Project Site **Date:** 8/31/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	CL	A-6(10)			39	18	4.6	66.5

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 110 pcf Optimum moisture = 16 %	Brownish yellow, sandy lean clay trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** Ceiba, PR

Remarks:

Tested by: J.Lozada-M.Pereira

Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

December 7, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (M7-0005)
Date of Receipt of Test Samples	:	December 5, 2007
Dates Tests were Performed	:	December 6 to 7, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487

Tests Results

Sample Description	:	Yellowish brown, sandy lean clay.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-7-6

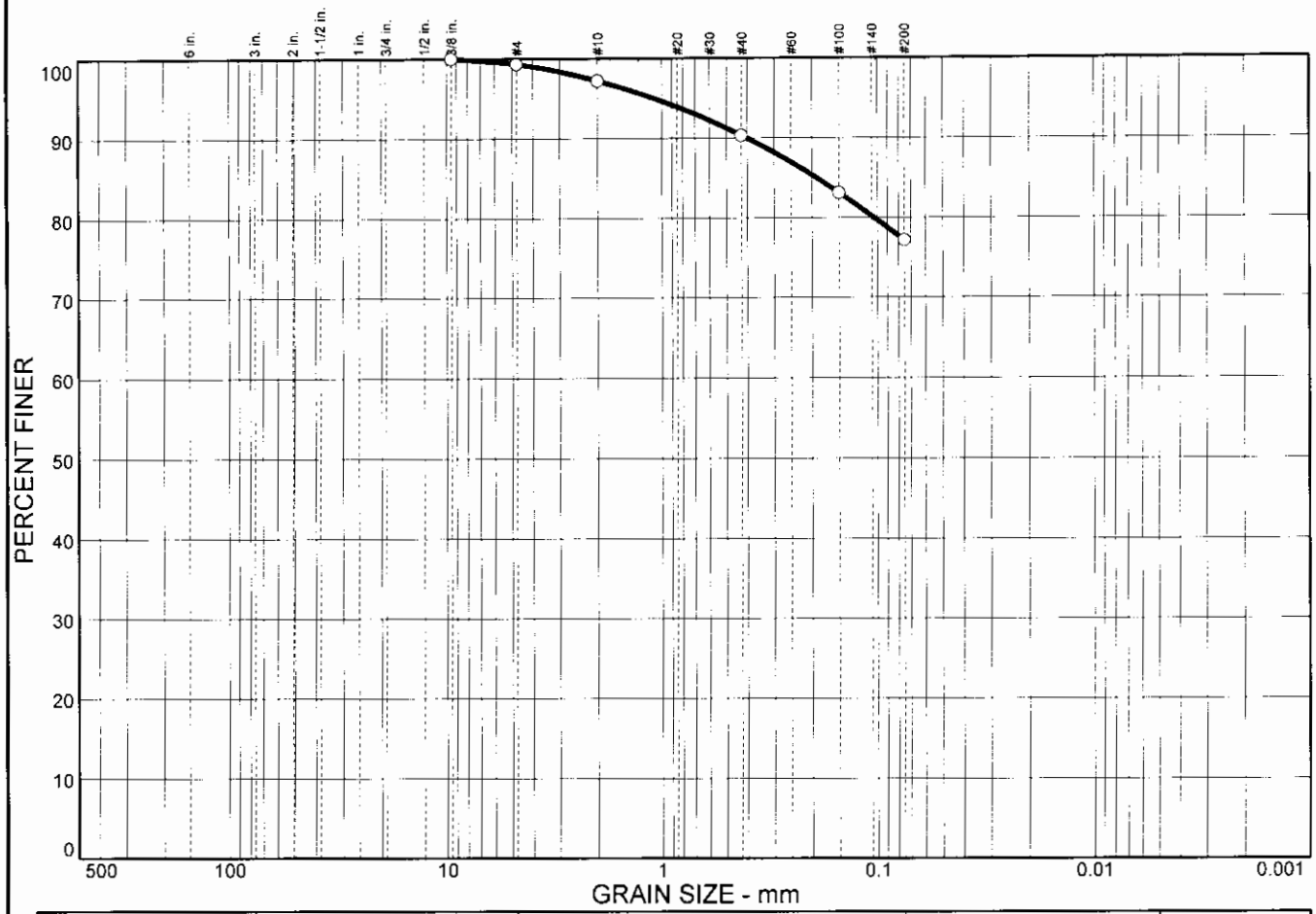
Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez
EDWIN GUTIERREZ, E.I.T.

PO Box 363116, San Juan, PR 00936-3116
Road 850 Km 0.2 Las Cuevas Ward, Trujillo Alto, PR 00976
☎ 787-761-2570 787-748-6970 www.jacasierra.com

sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.7	22.2	77.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.3		
#10	97.2		
#40	90.3		
#100	83.1		
#200	77.1		

* (no specification provided)

Material Description

Yellowish brown, sandy lean clay

Atterberg Limits

PL= 22 LL= 42 PI= 20

Coefficients

D_{85}= 0.191 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(15)

Remarks

Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: M7-0005 **Source of Sample:** Project Site **Date:** 12/07/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

December 12, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116B
VIRGINIA BEACH, VA 23455

SUBJECT : STANDARD TEST METHOD FOR HYDROMETER ANALYSIS

Project	:	Puerto Rico Landfill Closure-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceibe, PR (M7-0005)
Date of Receipt of Test Samples	:	December 5, 2007
Dates Tests were Performed	:	December 10 to 11, 2007
Standard Test Methods Used	:	ASTM D422

Tests Results

Sample Description	:	Yellowish brown, sandy clay with silt.

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez
EDWIN GUTIERREZ, E.I.T.

PO Box 363116, San Juan, PR 00936-3116
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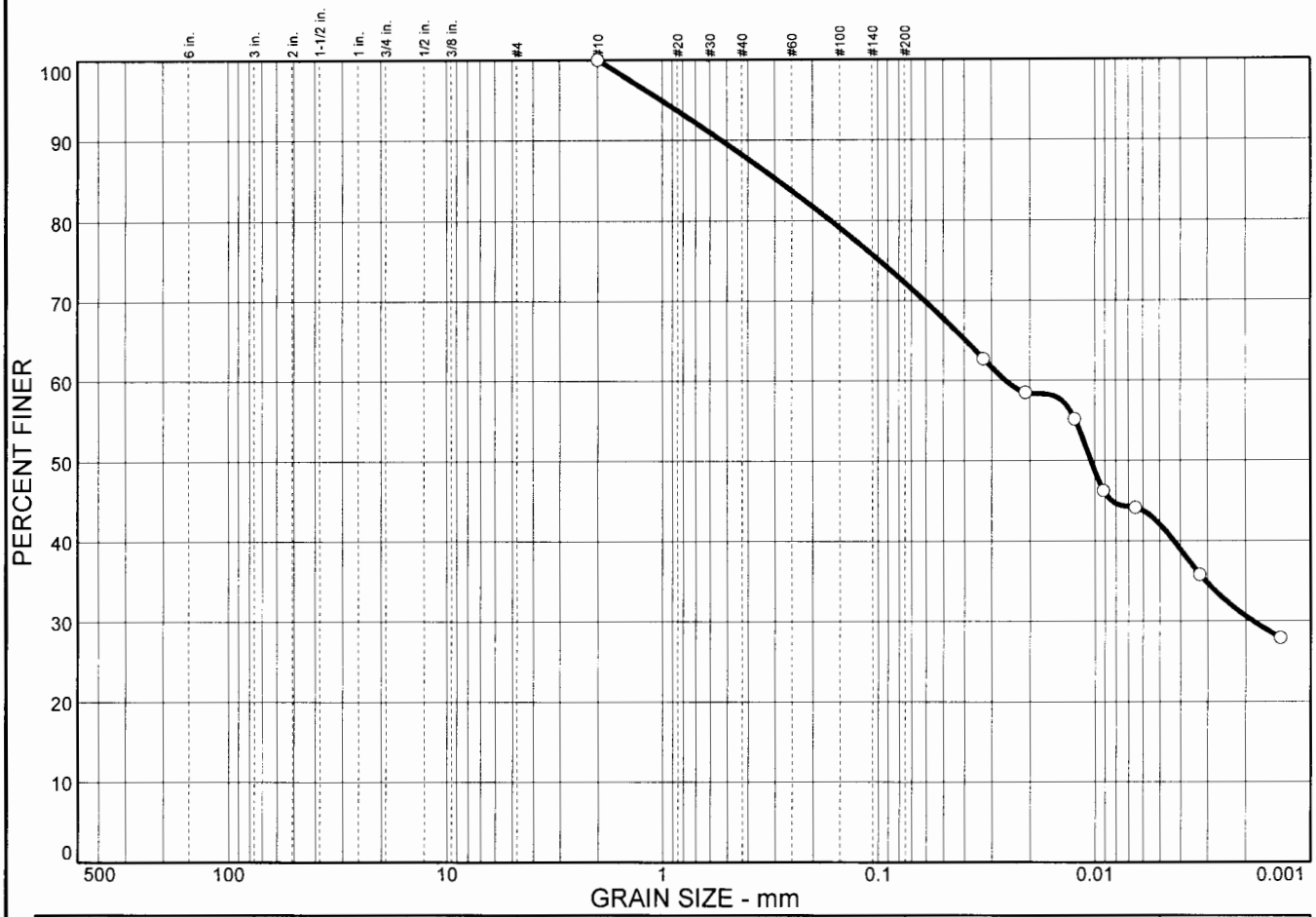
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	27.8	30.2	42.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		

* (no specification provided)

Material Description

Yellowish brown, sandy clay with silt

Atterberg Limits

PL= 22 LL= 42 PI= 20

Coefficients

D_{85}= 0.291 D_{60}= 0.0259 D_{50}= 0.0104
D_{30}= 0.0018 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(13)

Remarks

Tested by: R.Torres-S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: M7-0005 **Source of Sample:** Project Site **Date:** 12/11/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

December 7, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (M7-0115)
Date of Receipt of Test Samples	:	December 5, 2007
Dates Tests were Performed	:	December 6 to 7, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487

Tests Results

Sample Description	:	Yellowish brown, lean clay some sand trace gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-7-6

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

EDWIN GUTIERREZ, E.I.T.

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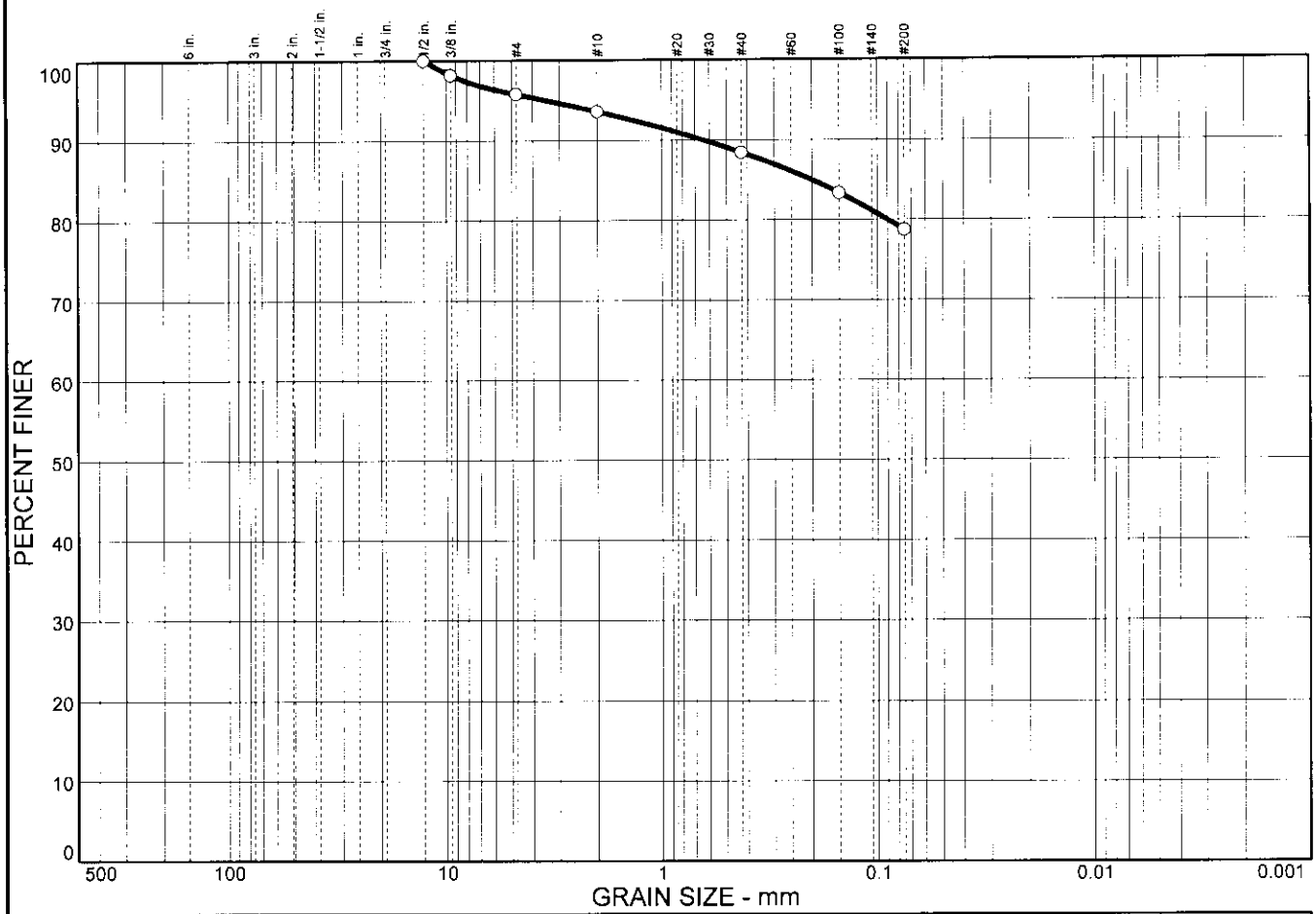
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.2	17.1	78.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.2		
#4	95.8		
#10	93.6		
#40	88.4		
#100	83.3		
#200	78.7		

* (no specification provided)

Material Description

Yellowish brown, lean clay some sand trace gravel

Atterberg Limits

PL= 22 LL= 42 PI= 20

Coefficients

D_{85}= 0.203 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(16)

Remarks

Tested by: S.Martinez
Checke dby: Edwin Gutierrez, E.I.T.
Edwin Gutierrez

Sample No.: M7-0115 **Source of Sample:** Project Site **Date:** 12/07/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

December 12, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116B
VIRGINIA BEACH, VA 23455

SUBJECT : STANDARD TEST METHOD FOR HYDROMETER ANALYSIS

Project	:	Puerto Rico Landfill Closure-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceibe, PR (M7-0115)
Date of Receipt of Test Samples	:	December 5, 2007
Dates Tests were Performed	:	December 10 to 11, 2007
Standard Test Methods Used	:	ASTM D422

Tests Results

Sample Description	:	Yellowish brown, sandy silty clay.

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

EDWIN GUTIERREZ, E.I.T.

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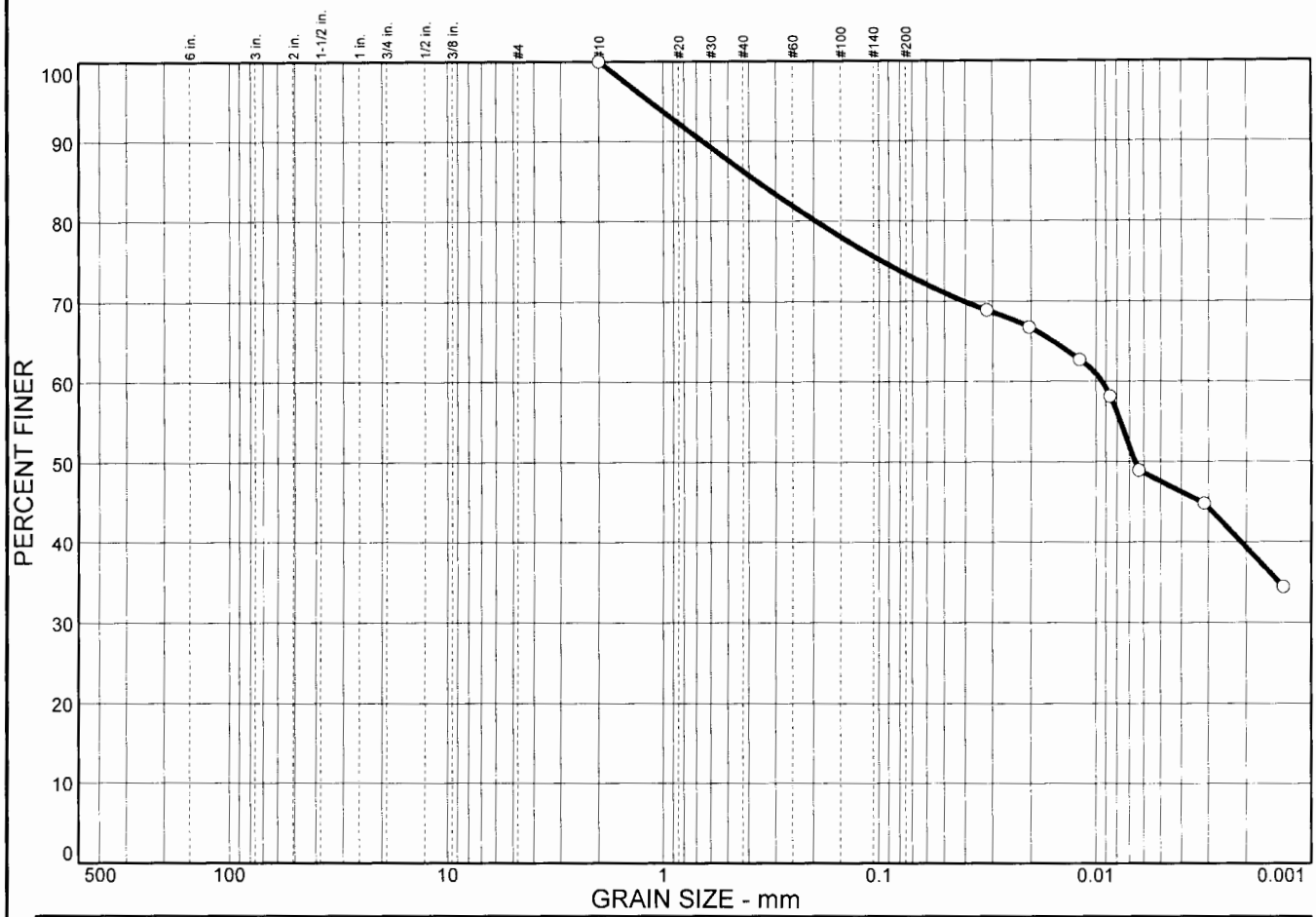
Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	26.6	25.8	47.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		

* (no specification provided)

Material Description

Yellowish brown, sandy silty clay

Atterberg Limits

PL= 22 LL= 42 PI= 20

Coefficients

D_{85}= 0.368 D_{60}= 0.0094 D_{50}= 0.0066
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(14)

Remarks

Tested by: R.Torres-S,Martinez
Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

Sample No.: M7-0115 **Source of Sample:** Project Site **Date:** 12/11/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

December 7, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (M7-0225)
Date of Receipt of Test Samples	:	December 5, 2007
Dates Tests were Performed	:	December 6 to 7, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487

Tests Results

Sample Description	:	Yellowish brown, sandy lean clay, trace gravel.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-6

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez
EDWIN GUTIERREZ, E.I.T.

PO Box 363116, San Juan, PR 00936-3116
Road 850 Km 0.2 Las Cuevas Ward, Trujillo Alto, PR 00976
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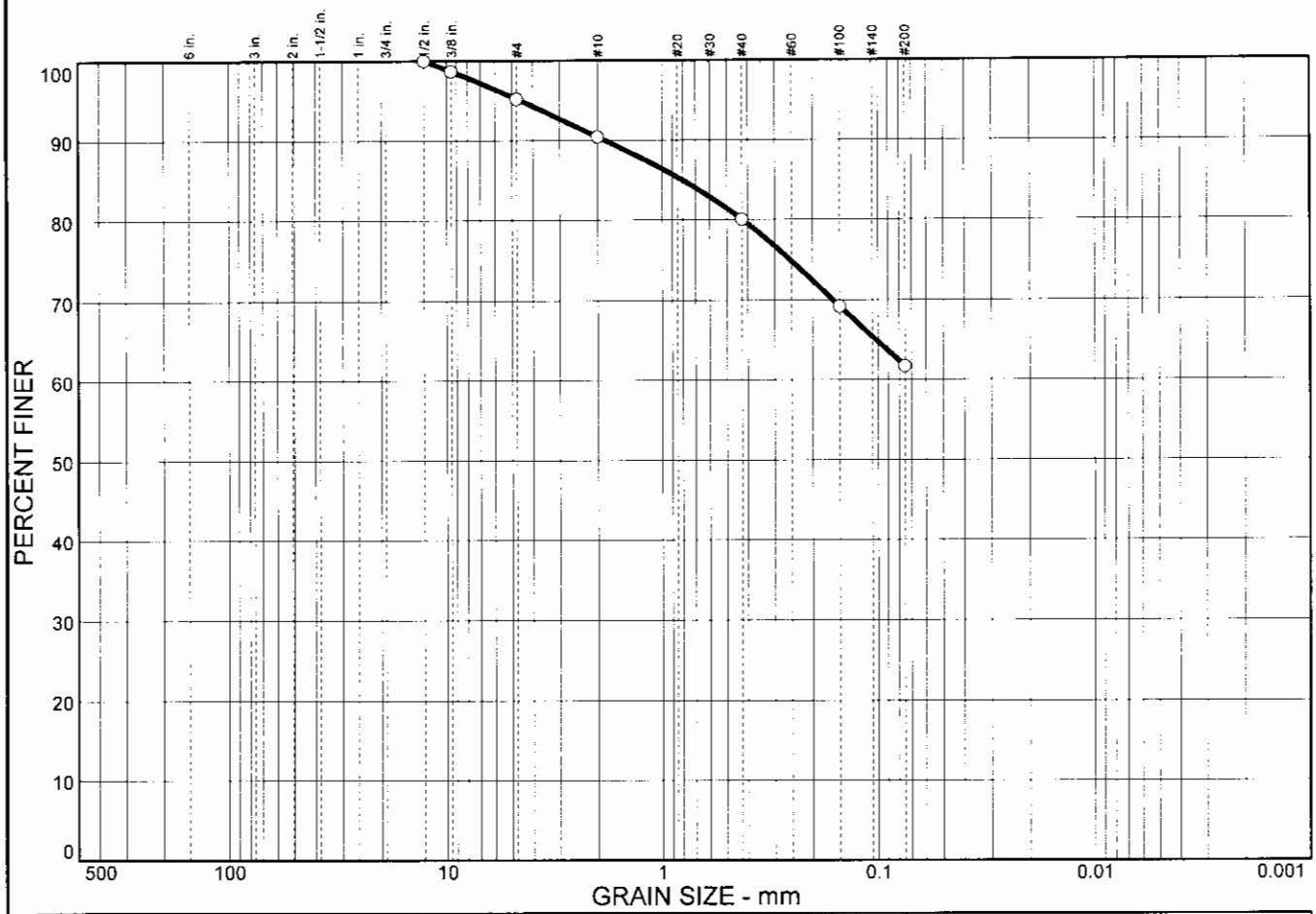
Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.8	33.5	61.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.7		
#4	95.2		
#10	90.4		
#40	80.0		
#100	69.2		
#200	61.7		

* (no specification provided)

Material Description

Yellowish brown, sandy lean clay, trace gravel

Atterberg Limits

PL= 19 LL= 35 PI= 16

Coefficients

D_{85}= 0.811 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(8)

Remarks

Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: M7-0225 **Source of Sample:** Project Site **Date:** 12/07/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

December 12, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116B
VIRGINIA BEACH, VA 23455

SUBJECT : STANDARD TEST METHOD FOR HYDROMETER ANALYSIS

Project	:	Puerto Rico Landfill Closure-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceibe, PR (M7-0225)
Date of Receipt of Test Samples	:	December 5, 2007
Dates Tests were Performed	:	December 10 to 11, 2007
Standard Test Methods Used	:	ASTM D422

Tests Results

Sample Description	:	Yellowish brown, sandy clay with silt.

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES
Edwin Gutierrez
EDWIN GUTIERREZ, E.I.T.

PO Box 363116, San Juan, PR 00936-3116
Road 850 Km 0.2 Las Cuevas Ward, Trujillo Alto, PR 00976
☎ 787-761-2570 787-748-6970 www.jacasierra.com

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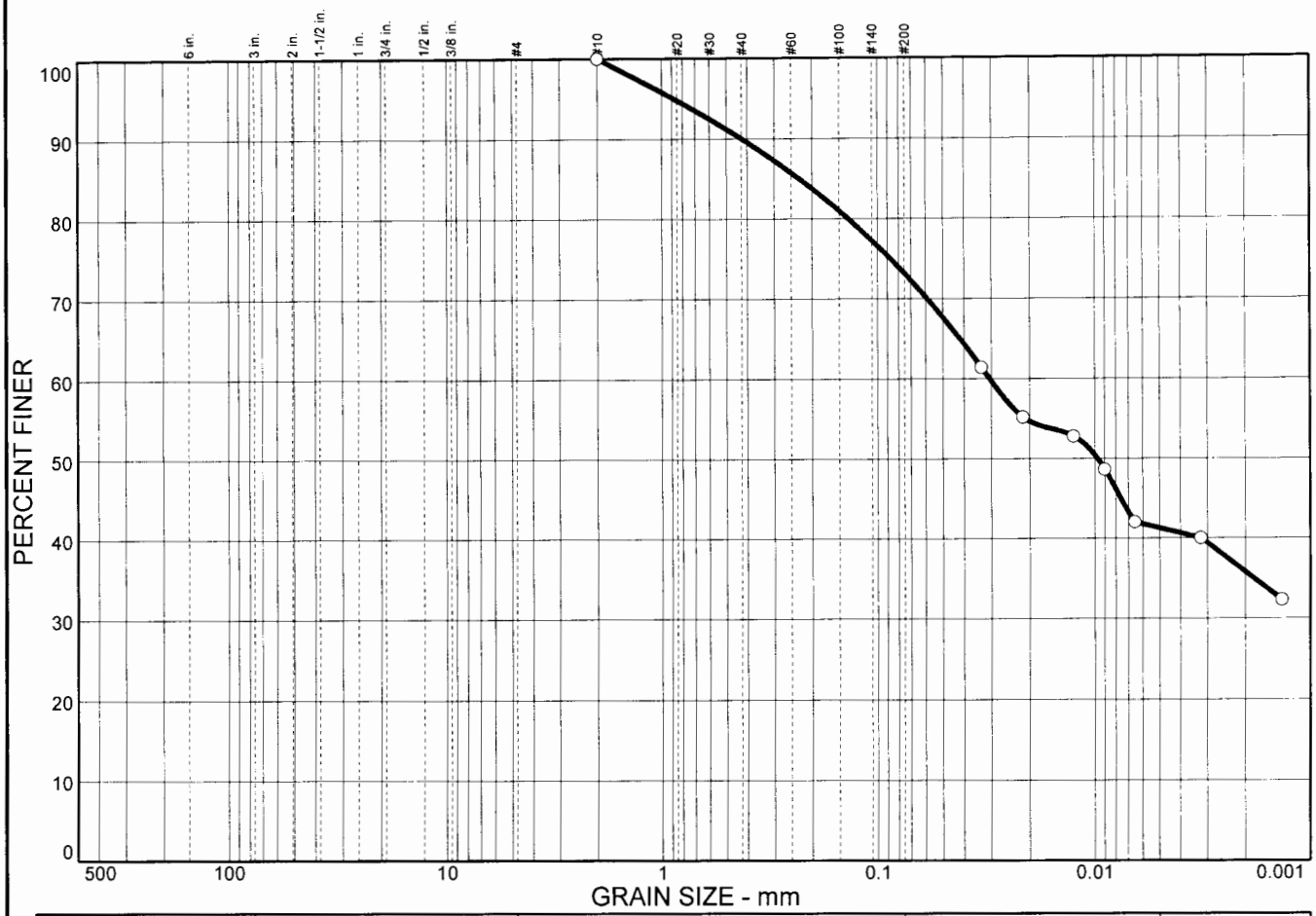
Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	26.9	31.8	41.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		

* (no specification provided)

Material Description

Yellowish brown, sandy clay with silt

Atterberg Limits

PL= 19 LL= 35 PI= 16

Coefficients

D_{85}= 0.230 D_{60}= 0.0306 D_{50}= 0.0097
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(10)

Remarks

Tested by: R.Torres-S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

Sample No.: M7-0225 **Source of Sample:** Project Site **Date:** 12/11/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

December 12, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : STANDARD PROCTOR TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (M7-0225)
Date of Receipt of Test Samples	:	December 5, 2007
Dates Tests were Performed	:	December 7 to 10, 2007
Standard Test Methods Used	:	ASTM D 698

Tests Results

Sample Description	:	Yellowish brown, sandy lean clay, trace gravel.

A. Standard Proctor Compaction Test Results (ASTM D 698)

Maximum Dry Density	:	111.0 pcf
Optimum Moisture Content	:	12.0 %

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

EDWIN GUTIERREZ, E.I.T

PO Box 363116, San Juan, PR 00936-3116
Road 850 Km 0.2 Las Cuevas Ward, Trujillo Alto, PR 00976
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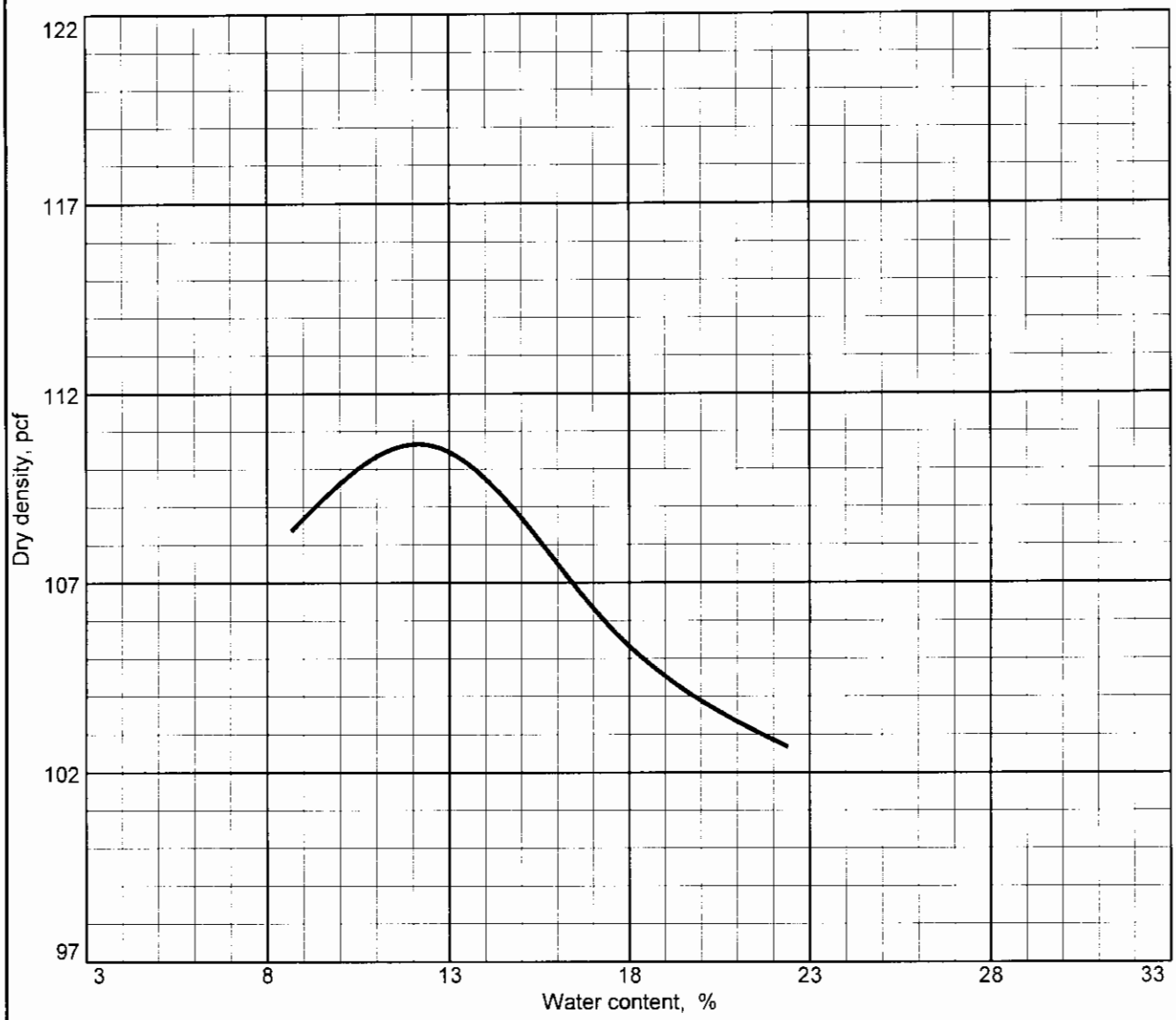
COMPACTION TEST REPORT



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
N/A	CL	A-6(8)			35	16	4.8	61.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 111 pcf Optimum moisture = 12 %	Yellowish brown, sandy lean clay, trace gravel

Project No. **Client:** Shaw Enviromental & Infrastructure Inc.

Project: Puerto Rico Landfill Closure

- **Location:** Ceiba, PR

Remarks:

Tested by: S.Torres

Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

COMPACTION TEST REPORT

JACA & SIERRA TESTING LABORATORIES

Figure

JACA & SIERRA TESTING LABORATORIES
SOIL CONSULTING ENGINEERS

Soil and Material Testing Laboratories
Earthwork Supervision
Large Diameter Drilling
Monitoring Wells
Water Wells

P.O. Box 363116 San Juan, Puerto Rico
00936-3116
Tels. (787) 761-2570
(787) 761-2668
Fax: (787) 748-6970

December 7, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
Attn: Mr. Steven J. Jackson, P.A.
2790 Mosside Blvd.
Monroeville, PA 15146

SUBJECT : DETERMINATION WATER CONTENT OF SOILS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 2216

Tests Results

A. Water Content Test Results (ASTM D 2216)

Test No.	Water Content (%)	Test Location
1	21.5	M7-0005
2	22.9	M7-0115
3	15.6	M7-0225

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

December 14, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
ATTN. MR. STEVEN J. JACKSON, PA
2790 MOSSIDE BOULEVARD
MONROEVILLE, PA 15146

SUBJECT : CLASSIFICATION TEST RESULTS

Project	:	PR Landfill Closure-Roosevelt Roads-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceiba, PR (M7-0335)
Date of Receipt of Test Samples	:	December 6, 2007
Dates Tests were Performed	:	December 7 to 11, 2007
Standard Test Methods Used	:	AASHTO M 145, ASTM D 3282 ASTM D 2487

Tests Results

Sample Description	:	Brownish yellow, lean clay with sand trace gravel and silt.

A. Classification Test Results (ASTM D 2487, ASTM D 3282 and AASHTO M 145)

USCS Classification	:	CL
AASHTO Classification	:	A-6

Respectfully submitted,

JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez

EDWIN GUTIERREZ, E.I.T.

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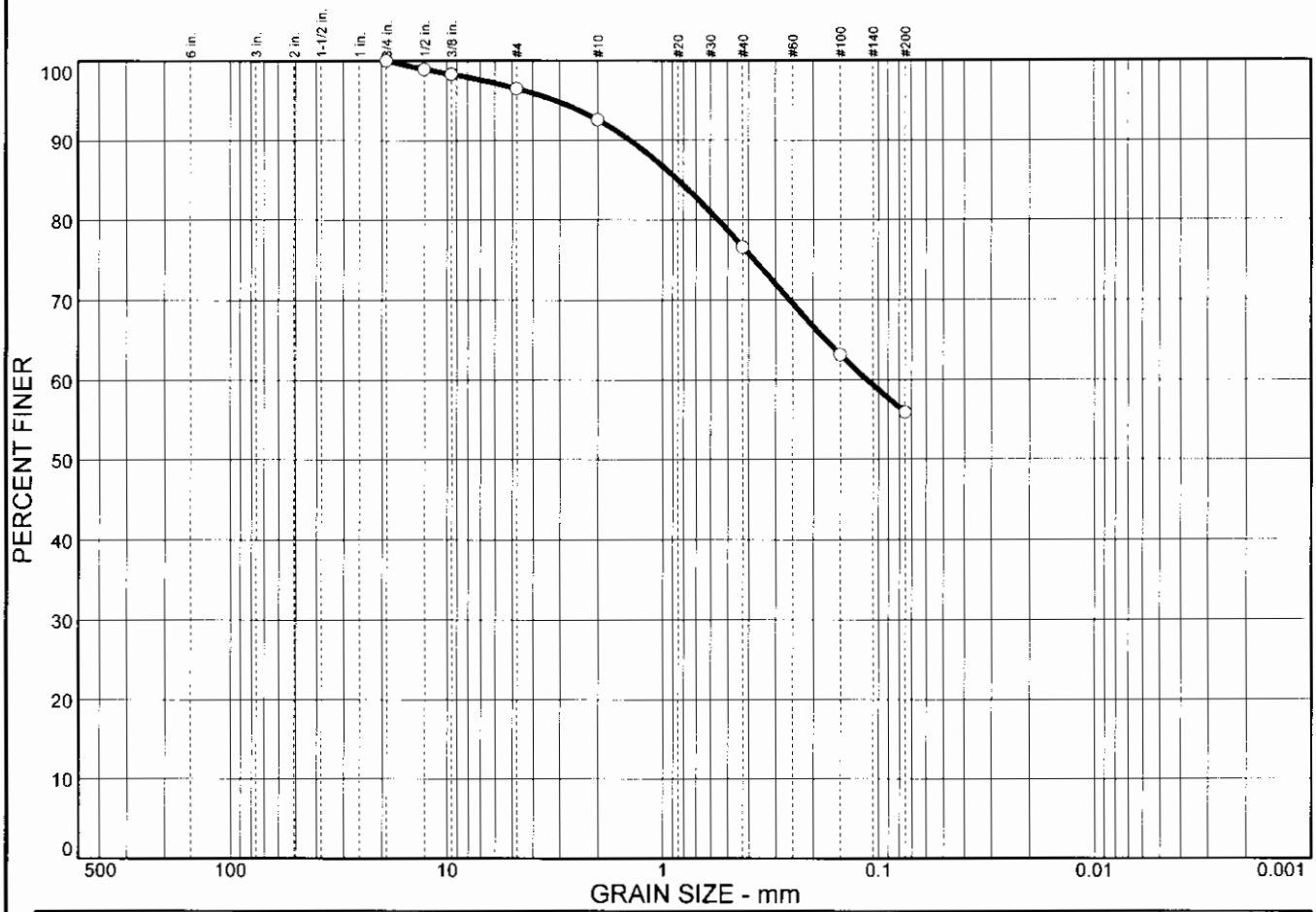
Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.5	40.6	55.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.9		
.375 in.	98.3		
#4	96.5		
#10	92.6		
#40	76.6		
#100	63.1		
#200	55.9		

* (no specification provided)

Material Description

Brownish yellow, lean clay with sand trace gravel and silt

Atterberg Limits

PL= 14 LL= 30 PI= 16

Coefficients

D_{85}= 0.851 D_{60}= 0.113 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

Tested by: S.Martinez-D.Marques
Checked by: Edwin Gutierrez, E.I.T.

Edwin Gutierrez

Sample No.: M7-0335 **Source of Sample:** Project Site **Date:** 12/13/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

December 14, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116B
VIRGINIA BEACH, VA 23455

SUBJECT : STANDARD TEST METHOD FOR HYDROMETER ANALYSIS

Project	:	Puerto Rico Landfill Closure-Ceiba, PR
Samples Secured and Transported by	:	Jaca & Sierra Testing Labs.
Source of Samples	:	Project Site-Ceibe, PR (M7-0335)
Date of Receipt of Test Samples	:	December 6, 2007
Dates Tests were Performed	:	December 11 to 12, 2007
Standard Test Methods Used	:	ASTM D422

Tests Results

Sample Description	:	Brownish yellow, silty clay with sand.

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES
Edwin Gutierrez
EDWIN GUTIERREZ, E.I.T.

PO Box 363116, San Juan, PR 00936-3116
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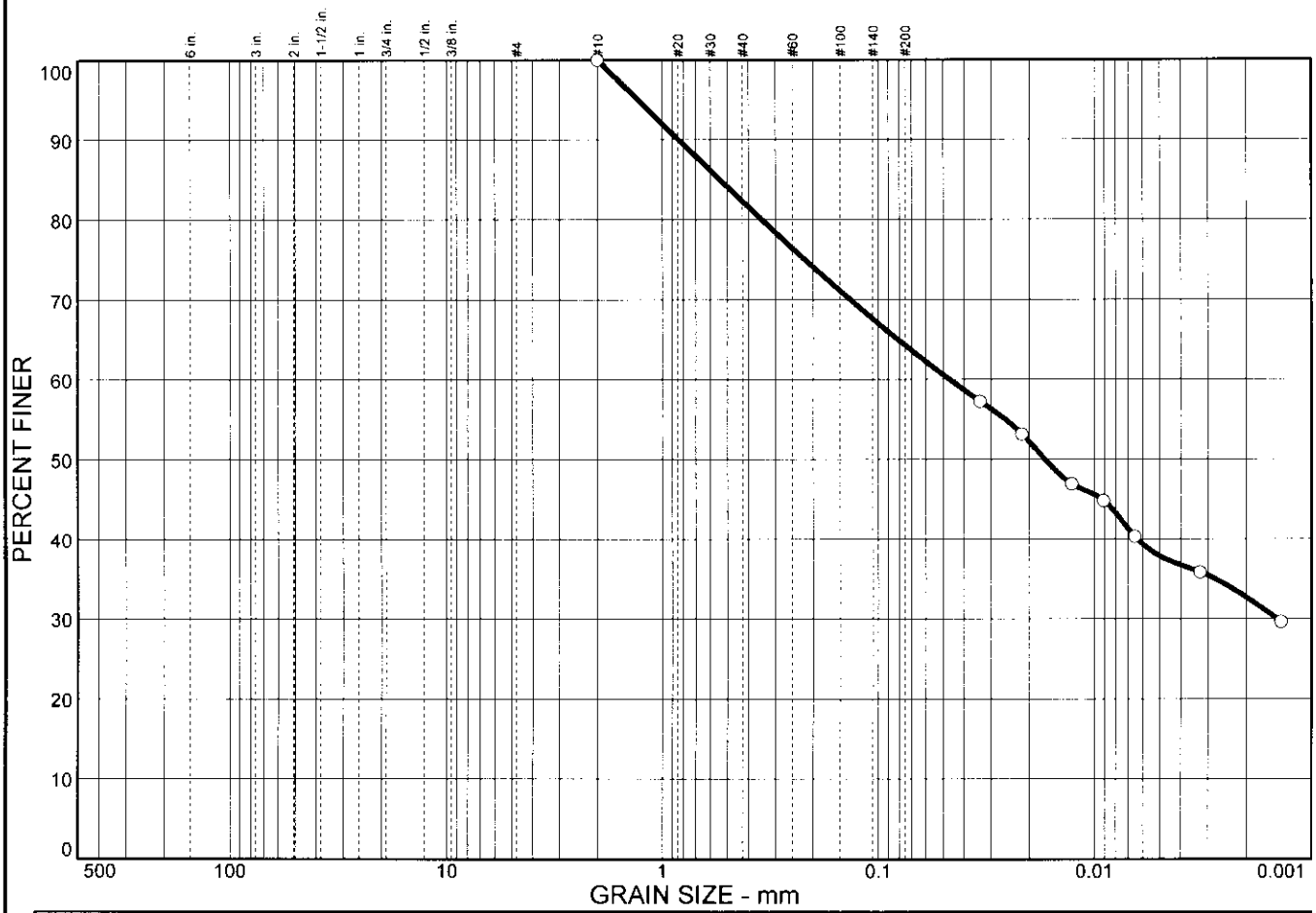
sm

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	35.8	26.4	37.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		

* (no specification provided)

Material Description

Brownish yellow, silty clay with sand

Atterberg Limits

PL= 30 LL= 14 PI= 16

Coefficients

D_{85}= 0.544 D_{60}= 0.0470 D_{50}= 0.0170
D_{30}= 0.0014 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Tested by: S.Martinez
Checked by: Edwin Gutierrez, E.I.T.

Sample No.: M7-0335 **Source of Sample:** Project Site **Date:** 12/13/07
Location: Ceiba, PR **Elev./Depth:** N/A

JACA & SIERRA TESTING LABORATORIES

Client: Shaw Enviromental & Infrastructure Inc.
Project: Puerto Rico Landfill Closure
Project No: **Figure**

JACA & SIERRA TESTING LABORATORIES
SOIL CONSULTING ENGINEERS

Soil and Material Testing Laboratories
Earthwork Supervision
Large Diameter Drilling
Monitoring Wells
Water Wells

P.O. Box 363116 San Juan, Puerto Rico
00936-3116
Tels. (787) 761-2570
(787) 761-2668
Fax: (787) 748-6970

December 19, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
Attn: Mr. Steven J. Jackson, P.A.
2790 Mosside Blvd.
Monroeville, PA 15146

SUBJECT : DETERMINATION WATER CONTENT OF SOILS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 2216

Tests Results

A. Water Content Test Results (ASTM D 2216)

Test No.	Water Content (%)	Test Location
1	21.6	M7-0335

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

Appendix C
Geotechnical Results for Lifts I, II, and III (Compaction and Permeability Results)

CLAY CAP SAMPLING LOG: Phase I

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permeability
Sample					***Results***					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
3/27/2007	Grid 1 LF 1	1	Comp	6"	124.0	23.2	22.9	100.9	**93.4**	NA
3/27/2007	Grid 2 LF 1	2	Comp	6"	121.2	22.5	22.7	98.7	**91.4**	NA
3/27/2007	Grid 2 LF 1	3	Comp	6"	123.9	22.2	21.0	101.6	**94.1**	NA
3/27/2007	Grid 2 LF 1	Grid 2 LF 1	Perm	6"	NA	NA	NA	NA	**NA**	**3.9×10^{-7}**
4/2/2007	Grid 4 LF 1	1	Comp	6"	116.6	17.6	17.7	99.1	**91.7**	NA
4/2/2007	Grid 4 LF 1	2	Comp	6"	126.3	18.9	17.6	107.4	**99.4**	NA
4/2/2007	Grid 4 LF 1	3	Comp	6"	122.7	19.1	18.4	103.6	**95.9**	NA
4/2/2007	Grid 4 LF 1	4	Comp	6"	122.7	22.5	22.4	100.2	**92.8**	NA
4/2/2007	Grid 4 LF 1	5	Comp	6"	128.7	21.2	19.7	107.5	**99.5**	NA
4/3/2007	Grid 3 LF 1	1	Comp	6"	125.6	19.5	18.3	106.2	**98.3**	NA
4/3/2007	Grid 3 LF 1	2	Comp	6"	123.9	19.5	18.7	104.4	**96.6**	NA
4/3/2007	Grid 3 LF 1	3	Comp	6"	125.1	19.9	18.9	105.1	**97.3**	NA
4/3/2007	Grid 3 LF 1	4	Comp	6"	123.5	21.6	21.2	101.9	**94.3**	NA
4/3/2007	Grid 3 LF 1	5	Comp	6"	125.2	21.4	20.2	103.8	**96.1**	NA
4/4/2007	Grid 5 LF 1	1	Comp	6"	129.2	19.3	17.6	109.8	**101.7**	NA
4/4/2007	Grid 5 LF 1	2	Comp	6"	122.7	20.1	19.5	102.7	**95.0**	NA
4/4/2007	Grid 5 LF 1	3	Comp	6"	120.8	21.2	21.2	99.6	**92.2**	NA
4/4/2007	Grid 5 LF 1	4	Comp	6"	127.0	23.1	22.2	103.9	**96.2**	NA
4/5/2007	Grid 6 LF 1	1	Comp	6"	119.6	19.3	19.2	100.3	**92.8**	NA
4/5/2007	Grid 6 LF 1	2	Comp	6"	124.6	21.0	20.2	103.6	**95.9**	NA
4/5/2007	Grid 6 LF 1	3	Comp	6"	125.5	21.7	20.9	103.8	**96.1**	NA
4/5/2007	Grid 6 LF 1	4	Comp	6"	127.5	21.4	20.1	106.1	**98.2**	NA
4/5/2007	Grid 6 LF 1	5	Comp	6"	125.9	21.0	20.0	104.9	**97.1**	NA
4/5/2007	Grid 6 LF 1	7	Comp	6"	124.8	20.3	19.4	104.4	**96.7**	NA
4/5/2007	Grid 8 LF 1	6	Comp	6"	125.8	22.0	21.2	103.7	**96.0**	NA
4/5/2007	Grid 8 LF 1	8	Comp	6"	120.0	20.1	20.1	99.9	**92.4**	NA
4/5/2007	Grid 8 LF 1	9	Comp	6"	118.7	19.5	19.6	99.3	**91.9**	NA
4/5/2007	Grid 8 LF 1	10	Comp	6"	122.6	20.7	20.3	101.9	**94.3**	NA
4/5/2007	Grid 8 LF 1	11	Comp	6"	126.3	22.3	21.4	104.0	**96.3**	NA
4/9/2007	Grid 7 LF 1	1	Comp	6"	127.4	20.2	18.8	107.3	**99.3**	NA
4/9/2007	Grid 7 LF 1	2	Comp	6"	121.5	20.8	20.6	100.7	**93.2**	NA
4/9/2007	Grid 7 LF 1	3	Comp	6"	117.4	18.8	19.0	98.7	**91.3**	NA
4/9/2007	Grid 10 LF 1	Grid 10 LF 1	Perm	6"	NA	NA	NA	NA	**NA**	**7.21×10^{-8}**
4/10/2007	Grid 9 LF 1	1	Comp	6"	122.2	18.4	17.7	103.8	**96.1**	NA
4/10/2007	Grid 9 LF 1	2	Comp	6"	118.0	17.3	17.1	100.7	**93.2**	NA
4/10/2007	Grid 9 LF 1	3	Comp	6"	124.8	20.2	19.3	104.6	**96.9**	NA
4/11/2007	Grid 15 LF 1	1	Comp	6"	126.9	23.4	22.6	103.4	**95.7**	NA
4/11/2007	Grid 15 LF 1	2	Comp	6"	127.3	26.4	20.1	105.9	**98.1**	NA
4/11/2007	Grid 15 LF 1	3	Comp	6"	124.0	19.0	18.1	105.0	**97.2**	NA
4/11/2007	Grid 15 LF 1	4	Comp	6"	120.6	19.6	19.4	101.0	**93.5**	NA

CLAY CAP SAMPLING LOG: Phase I

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permeability
Sample					***Results***					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
4/11/2007	Grid 15 LF 1	5	Comp	6"	128.3	21.5	20.0	106.8	**98.8**	NA
4/11/2007	Grid 13 LF 1	6	Comp	6"	129.4	22.6	21.1	106.8	**98.8**	NA
4/11/2007	Grid 13 LF 1	7	Comp	6"	123.4	19.7	18.9	103.7	**96.0**	NA
4/11/2007	Grid 13 LF 1	8	Comp	6"	119.6	22.3	22.9	97.3	**90.0**	NA
4/11/2007	Grid 13 LF 1	9	Comp	6"	120.0	20.6	20.6	99.4	**92.1**	NA
4/11/2007	Grid 13 LF 1	10	Comp	6"	125.0	20.6	19.7	104.4	**96.6**	NA
4/16/2007	Grid 11 LF 1	1	Comp	6"	119.5	19.1	19.2	100.4	**92.9**	NA
4/16/2007	Grid 11 LF 1	2	Comp	6"	119.2	19.5	19.5	99.8	**92.4**	NA
4/16/2007	Grid 11 LF 1	3	Comp	6"	122.8	20.0	19.4	102.8	**95.2**	NA
4/16/2007	Grid 11 LF 1	4	Comp	6"	121.4	18.2	17.6	103.2	**95.5**	NA
4/16/2007	Grid 11 LF 1	5	Comp	6"	121.8	21.2	21.0	100.6	**93.1**	NA
4/16/2007	Grid 12 LF 1	6	Comp	6"	122.8	19.0	18.3	103.8	**96.1**	NA
4/16/2007	Grid 12 LF 1	7	Comp	6"	122.7	19.4	18.7	103.3	**95.7**	NA
4/16/2007	Grid 12 LF 1	8	Comp	6"	126.2	19.7	18.5	106.5	**98.6**	NA
4/16/2007	Grid 12 LF 1	9	Comp	6"	122.0	17.8	17.1	104.2	**96.4**	NA
4/16/2007	Grid 12 LF 1	10	Comp	6"	123.7	20.0	19.2	103.7	**96.0**	NA
4/16/2007	Grid 12 LF 1	11	Comp	6"	120.4	18.2	17.7	102.3	**94.7**	NA
4/16/2007	Grid 14 LF 1	12	Comp	6"	120.8	19.0	18.6	101.8	**94.3**	NA
4/16/2007	Grid 14 LF 1	13	Comp	6"	120.3	18.6	18.2	101.7	**94.2**	NA
4/16/2007	Grid 14 LF 1	14	Comp	6"	122.6	18.2	17.4	104.3	**96.6**	NA
4/16/2007	Grid 14 LF 1	15	Comp	6"	120.0	18.2	17.8	101.8	**94.2**	NA
4/16/2007	Grid 14 LF 1	16	Comp	6"	117.3	18.0	18.1	99.3	**91.9**	NA
4/16/2007	Grid 16 LF 1	17	Comp	6"	117.1	18.8	19.0	98.3	**91.0**	NA
4/16/2007	Grid 16 LF 1	18	Comp	6"	123.3	19.2	18.4	104.2	**96.4**	NA
4/16/2007	Grid 16 LF 1	19	Comp	6"	129.7	18.7	16.8	111.0	**102.7**	NA
4/16/2007	Grid 10 LF 1	20	Comp	6"	126.1	24.6	24.2	101.6	**94.0**	NA
4/16/2007	Grid 10 LF 1	21	Comp	6"	125.4	21.9	21.1	103.5	**95.8**	NA
4/16/2007	Grid 10 LF 1	22	Comp	6"	125.7	18.5	17.2	107.2	**99.2**	NA
4/16/2007	Grid 10 LF 1	23	Comp	6"	119.3	18.0	17.8	101.3	**93.7**	NA
4/17/2007	Grid 17 LF 1	1	Comp	6"	123.4	21.6	21.2	101.8	**94.2**	NA
4/17/2007	Grid 17 LF 1	2	Comp	6"	122.8	23.8	24.0	99.0	**91.6**	NA
4/17/2007	Grid 17 LF 1	3	Comp	6"	118.8	20.7	21.1	98.1	**90.8**	NA
4/17/2007	Grid 17 LF 1	4	Comp	6"	118.4	19.7	20.0	98.7	**91.4**	NA
4/17/2007	Grid 17 LF 1	5	Comp	6"	121.2	20.5	20.4	100.7	**93.2**	NA
4/17/2007	Grid 18 LF 1	6	Comp	6"	119.1	20.0	20.1	99.2	**91.8**	NA
4/17/2007	Grid 18 LF 1	7	Comp	6"	124.1	20.7	20.0	103.4	**95.7**	NA
4/17/2007	Grid 18 LF 1	8	Comp	6"	123.2	20.8	20.3	102.4	**94.8**	NA
4/17/2007	Grid 18 LF 1	9	Comp	6"	123.3	21.2	20.7	102.1	**94.5**	NA
4/17/2007	Grid 18 LF 1	10	Comp	6"	121.3	20.0	19.7	101.3	**93.8**	NA
4/17/2007	Grid 18 LF 1	Grid 18 LF 1	Perm	6"	NA	NA	NA	NA	**NA**	**9.9 x 10^{-6}**

CLAY CAP SAMPLING LOG: Phase I

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permeability
Sample					*Results*					
Date	Location	#	Type	Depth	Wet Density	Moisture	Moisture Content %	Dry Unit Weight	% Compaction	Permeability
5/17/2007	Grid 1 LF 2	2	Comp	6"	119.5	12.9	12	106.6	**98.7**	NA
5/17/2007	Grid 2 LF 2	1	Comp	6"	124.7	14.7	13.2	110	**101.9**	NA
5/17/2007	Grid 2 LF 2	3	Comp	6"	118.4	15.6	15.1	102.8	**95.2**	NA
5/18/2007	Grid 3 LF 2	4	Comp	6"	121.8	14.6	13.6	107.1	**99.2**	NA
5/18/2007	Grid 3 LF 2	3	Comp	6"	122.6	15.6	14.5	107	**99**	NA
5/17/2007	Grid 3 LF 2	6	Comp	6"	121.7	15.6	14.6	106.2	**98.3**	NA
5/17/2007	Grid 3 LF 2	5	Comp	6"	122.1	13	11.9	109.1	**101**	NA
5/17/2007	Grid 4 LF 2	4	Comp	6"	123.4	14.3	13	109.1	**101**	NA
5/17/2007	Grid 4 LF 2	7	Comp	6"	122	14.8	13.8	107.2	**99.2**	NA
5/18/2007	Grid 4 LF 2	3	Comp	6"	119.3	13.4	12.6	105.9	**98**	NA
5/18/2007	Grid 4 LF 2	1	Comp	6"	123.8	14.8	13.5	109	**100.9**	NA
5/17/2007	Grid 4 LF 2	8	Comp	6"	122.7	12.9	11.7	109.8	**101.6**	NA
5/23/2007	Grid 4 LF 2	Grid 4 LF 2	Perm	6"	NA	NA	NA	NA	**NA**	**4.45×10^{-7}**
5/18/2007	Grid 5 LF 2	9	Comp	6"	122.2	15.9	14.9	106.3	**98.4**	NA
5/18/2007	Grid 5 LF 2	12	Comp	6"	123	18.4	17.6	104.6	**96.8**	NA
5/18/2007	Grid 5 LF 2	11	Comp	6"	121.7	16.9	16.1	104.8	**97**	NA
5/18/2007	Grid 5 LF 2	10	Comp	6"	119.6	17.5	17.1	102.1	**94.5**	NA
5/18/2007	Grid 6 LF 2	13	Comp	6"	120.2	16.5	15.9	103.6	**95.9**	NA
5/18/2007	Grid 6 LF 2	14	Comp	6"	124.4	18.6	17.6	105.8	**97.9**	NA
5/18/2007	Grid 6 LF 2	7	Comp	6"	122.6	18.3	17.5	104.3	**96.5**	NA
5/18/2007	Grid 6 LF 2	8	Comp	6"	123	18.3	17.4	104.7	**96.9**	NA
5/18/2007	Grid 6 LF 2	6	Comp	6"	120	17.9	17.5	102.1	**94.6**	NA
5/18/2007	Grid 6 LF 2	5	Comp	6"	120	16.2	15.5	103.9	**96.2**	NA
5/18/2007	Grid 7 LF 2	21	Comp	6"	119.7	15.8	15.1	103.9	**96.2**	NA
5/18/2007	Grid 7 LF 2	20	Comp	6"	120.8	14.9	14.1	105.9	**98**	NA
5/18/2007	Grid 7 LF 2	19	Comp	6"	114.2	14.8	14.8	99.5	**92.1**	NA
5/18/2007	Grid 8 LF 2	16	Comp	6"	120.5	16.1	15.4	104.4	**96.7**	NA
5/18/2007	Grid 8 LF 2	15	Comp	6"	119.4	17.9	17.6	101.4	**93.9**	NA
5/18/2007	Grid 8 LF 2	17	Comp	6"	122.4	17.6	16.8	104.8	**97**	NA
5/18/2007	Grid 8 LF 2	22	Comp	6"	122.1	18.9	18.2	103.3	**95.6**	NA
5/18/2007	Grid 8 LF 2	18	Comp	6"	123.9	19.1	18.2	104.8	**97**	NA
5/18/2007	Grid 9 LF 2	29	Comp	6"	129	16.7	14.8	112.3	**104**	NA
5/18/2007	Grid 9 LF 2	28	Comp	6"	124.7	15.8	14.5	108.9	**100.8**	NA
5/18/2007	Grid 9 LF 2	27	Comp	6"	119.8	13	12.1	106.7	**98.7**	NA
5/18/2007	Grid 10 LF 2	26	Comp	6"	116.4	14.5	14.1	101.9	**94.3**	NA
5/18/2007	Grid 10 LF 2	23	Comp	6"	122.5	15.5	14.4	107	**99.1**	NA
5/18/2007	Grid 10 LF 2	24	Comp	6"	117.7	15	14.6	102.6	**95**	NA
5/18/2007	Grid 10 LF 2	25	Comp	6"	117.8	13.6	13	104.2	**96.5**	NA
5/17/2007	Grid 10 LF 2	Grid 10 LF 2	Perm	6"	NA	NA	NA	NA	**NA**	**2.13×10^{-7}**
5/18/2007	Grid 11 LF 2	33	Comp	6"	121.3	23	23.4	98.3	**91**	NA

CLAY CAP SAMPLING LOG: Phase I

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permeability
Sample					*Results*					
Date	Location	#	Type	Depth	Wet Density	Moisture	Moisture Content %	Dry Unit Weight	% Compaction	Permeability
5/18/2007	Grid 11 LF 2	32	Comp	6"	116.3	18.6	19	97.7	**90.4**	NA
5/18/2007	Grid 11 LF 2	31	Comp	6"	117.4	19.4	19.7	98	**90.7**	NA
5/18/2007	Grid 11 LF 2	30	Comp	6"	122	21.6	21.4	100.4	**93**	NA
5/18/2007	Grid 11 LF 2	34	Comp	6"	122.6	22.8	22.5	99.8	**92.4**	NA
5/17/2007	Grid 11 LF 2	Grid 11 LF 2	Perm	6"	NA	NA	NA	NA	**NA**	**4.59×10^{-7}**
5/22/2007	Grid 12 LF 2	2	Comp	6"	121.6	18.4	17.85	103.2	**95.55**	NA
5/22/2007	Grid 12 LF 2	1	Comp	6"	123.5	20.8	20.2	102.7	**95**	NA
5/22/2007	Grid 12 LF 2	5	Comp	6"	118.6	21.2	21.78	97.4	**90.18**	NA
5/22/2007	Grid 12 LF 2	4	Comp	6"	118	17.4	17.25	100.6	**93.18**	NA
5/22/2007	Grid 12 LF 2	3	Comp	6"	118.2	19.9	20.28	98.2	**90.99**	NA
5/22/2007	Grid 12 LF 2	6	Comp	6"	119.9	20.9	21.08	99.1	**91.75**	NA
5/18/2007	Grid 13 LF 2	37	Comp	6"	126.6	20.7	19.5	105.9	**98.1**	NA
5/18/2007	Grid 13 LF 2	38	Comp	6"	121.9	15.5	14.6	106.4	**98.5**	NA
5/18/2007	Grid 13 LF 2	36	Comp	6"	123	19.7	19.1	103.3	**95.6**	NA
5/18/2007	Grid 13 LF 2	35	Comp	6"	124.3	22.8	22.5	101.5	**93.9**	NA
5/18/2007	Grid 13 LF 2	39	Comp	6"	123.5	19.3	18.5	104.2	**96.4**	NA
5/22/2007	Grid 14 LF 2	8	Comp	6"	121.3	20.2	20.01	101.1	**93.64**	NA
5/22/2007	Grid 14 LF 2	7	Comp	6"	121.2	18.8	18.32	102.4	**94.86**	NA
5/22/2007	Grid 14 LF 2	9	Comp	6"	118.2	17.3	17.16	100.9	**93.44**	NA
5/22/2007	Grid 14 LF 2	11	Comp	6"	126.3	22.3	21.4	104	**96.3**	NA
5/22/2007	Grid 14 LF 2	12	Comp	6"	122.2	18.5	17.7	103.7	**96**	NA
5/18/2007	Grid 15 LF 2	40	Comp	6"	120.1	21.2	21.4	98.9	**91.5**	NA
5/18/2007	Grid 15 LF 2	43	Comp	6"	120.4	21	21.1	99.4	**92**	NA
5/18/2007	Grid 15 LF 2	41	Comp	6"	120.2	21	21.1	99.2	**91.8**	NA
5/18/2007	Grid 15 LF 2	42	Comp	6"	120.9	17.3	16.6	103.6	**95.9**	NA
5/18/2007	Grid 15 LF 2	44	Comp	6"	118.9	17	16.6	101.9	**94.3**	NA
5/22/2007	Grid 16 LF 2	13	Comp	6"	120.4	17.6	17.1	102.8	**95.1**	NA
5/22/2007	Grid 16 LF 2	15	Comp	6"	124.5	18.6	17.5	105.9	**98**	NA
5/22/2007	Grid 16 LF 2	14	Comp	6"	124.2	18.7	17.6	105.5	**97.7**	NA
5/22/2007	Grid 16 LF 2	10	Comp	6"	123	18.7	17.92	104.3	**96.5**	NA
5/22/2007	Grid 17 LF 2	21	Comp	6"	123.3	16.6	15.5	106.7	**98.8**	NA
5/22/2007	Grid 17 LF 2	22	Comp	6"	119.8	18.5	18.3	101.2	**93.7**	NA
5/22/2007	Grid 17 LF 2	24	Comp	6"	123.4	21.3	20.8	102.1	**94.5**	NA
5/22/2007	Grid 17 LF 2	23	Comp	6"	117.5	17.5	17.5	100	**92.5**	NA
5/22/2007	Grid 17 LF 2	25	Comp	6"	123.8	20.9	20.3	102.9	**95.2**	NA
5/22/2007	Grid 18 LF 2	16	Comp	6"	125.5	23.1	22.6	102.4	**94.8**	NA
5/22/2007	Grid 18 LF 2	18	Comp	6"	121.8	20.4	20.1	101.3	**93.8**	NA
5/22/2007	Grid 18 LF 2	17	Comp	6"	128	22.5	21.3	105.5	**97.7**	NA
5/22/2007	Grid 18 LF 2	19	Comp	6"	123.9	20.3	19.5	103.6	**95.9**	NA
5/22/2007	Grid 18 LF 2	20	Comp	6"	127.3	21.3	20.1	105.9	**98.11**	NA

CLAY CAP SAMPLING LOG: Phase I

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permeability
Sample					*Results*					
Date	Location	#	Type	Depth	Wet Density	Moisture	Moisture Content %	Dry Unit Weight	% Compaction	Permeability
6/21/2007	Grid 1 LF 3	2	Comp	6"	123.6	18.2	17.2	105.4	**97.6**	NA
6/21/2007	Grid 2 LF 3	1	Comp	6"	123.4	18.0	17.0	105.4	**97.6**	NA
6/21/2007	Grid 2 LF 3	3	Comp	6"	122.2	17.3	16.5	104.9	**97.1**	NA
6/21/2007	Grid 3 LF 3	5	Comp	6"	123.1	17.3	16.3	105.8	**97.9**	NA
6/21/2007	Grid 3 LF 3	12	Comp	6"	118.6	15.5	15.0	103.1	**95.5**	NA
6/21/2007	Grid 3 LF 3	11	Comp	6"	126.1	18.2	16.9	107.8	**99.8**	NA
6/21/2007	Grid 3 LF 3	10	Comp	6"	123.6	18.0	17.0	105.6	**97.8**	NA
6/21/2007	Grid 3 LF 3	9	Comp	6"	121.1	18.8	18.3	102.3	**94.7**	NA
6/21/2007	Grid 4 LF 3	4	Comp	6"	116.4	14.5	14.2	101.8	**94.3**	NA
6/21/2007	Grid 4 LF 3	6	Comp	6"	121.3	17.4	16.7	103.8	**96.1**	NA
6/21/2007	Grid 4 LF 3	7	Comp	6"	120.6	18.6	18.1	102.1	**94.5**	NA
6/21/2007	Grid 4 LF 3	8	Comp	6"	120.4	20.6	20.6	99.7	**92.3**	NA
6/19/2007	Grid 4 LF 3	Grid 4 LF 3	Perm	6"	NA	NA	NA	NA	**NA**	**4.79×10^{-8}**
6/20/2007	Grid 5 LF 3	27	Comp	6"	123.6	18.6	17.6	105.0	**97.2**	NA
6/20/2007	Grid 5 LF 3	28	Comp	6"	116.3	18.9	19.3	97.5	**90.2**	NA
6/20/2007	Grid 5 LF 3	29	Comp	6"	121.5	19.9	19.6	101.5	**94.0**	NA
6/20/2007	Grid 5 LF 3	26	Comp	6"	122.2	19.3	18.7	102.9	**95.3**	NA
6/20/2007	Grid 6 LF 3	12	Comp	6"	126.3	20.3	19.2	106.0	**98.1**	NA
6/20/2007	Grid 6 LF 3	14	Comp	6"	122.8	22.0	21.7	100.8	**93.3**	NA
6/20/2007	Grid 6 LF 3	13	Comp	6"	126.7	20.3	19.0	106.4	**98.5**	NA
6/20/2007	Grid 7 LF 3	15	Comp	6"	121.7	19.3	18.8	102.4	**94.8**	NA
6/20/2007	Grid 7 LF 3	16	Comp	6"	125.5	18.9	17.7	106.6	**98.7**	NA
6/20/2007	Grid 7 LF 3	18	Comp	6"	127.1	16.8	15.1	110.3	**102.1**	NA
6/20/2007	Grid 7 LF 3	17	Comp	6"	126.0	18.1	16.8	107.9	**99.9**	NA
6/20/2007	Grid 8 LF 3	9	Comp	6"	124.5	18.9	17.9	105.3	**97.5**	NA
6/20/2007	Grid 8 LF 3	8	Comp	6"	117.5	18.4	18.6	99.1	**91.7**	NA
6/20/2007	Grid 8 LF 3	19	Comp	6"	122.7	21.7	21.4	101.0	**93.5**	NA
6/20/2007	Grid 8 LF 3	11	Comp	6"	126.3	19.7	18.5	106.6	**98.6**	NA
6/20/2007	Grid 8 LF 3	10	Comp	6"	118.0	18.6	18.6	99.5	**92.1**	NA
6/20/2007	Grid 9 LF 3	2	Comp	6"	127.6	19.1	17.5	108.6	**100.5**	NA
6/20/2007	Grid 9 LF 3	20	Comp	6"	123.1	18.5	17.6	104.6	**96.8**	NA
6/20/2007	Grid 9 LF 3	3	Comp	6"	124.4	20.8	20.1	103.6	**95.9**	NA
6/20/2007	Grid 10 LF 3	1	Comp	6"	119.4	18.2	18.0	101.2	**93.7**	NA
6/20/2007	Grid 10 LF 3	4	Comp	6"	125.5	21.5	20.6	104.0	**96.2**	NA
6/20/2007	Grid 10 LF 3	7	Comp	6"	125.3	19.8	18.7	105.5	**97.7**	NA
6/20/2007	Grid 10 LF 3	5	Comp	6"	124.0	18.6	17.7	105.3	**97.5**	NA
6/20/2007	Grid 10 LF 3	6	Comp	6"	120.5	17.6	17.1	102.9	**95.2**	NA
6/23/2007	Grid 10 LF 3	Grid 10 LF 3	Perm	6"	NA	NA	NA	NA	**NA**	**8.40×10^{-7}**
6/19/2007	Grid 11 LF 3	10	Comp	6"	121.5	17.6	16.9	103.9	**96.2**	NA
6/19/2007	Grid 11 LF 3	7	Comp	6"	117.4	16.9	16.8	100.5	**93.1**	NA

CLAY CAP SAMPLING LOG: Phase I

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permeability
Sample					***Results***					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
6/19/2007	Grid 11 LF 3	8	Comp	6"	123.0	17.6	16.7	105.3	**97.5**	NA
6/19/2007	Grid 11 LF 3	9	Comp	6"	117.0	17.3	17.3	99.7	**92.3**	NA
6/19/2007	Grid 12 LF 3	1	Comp	6"	119.7	17.6	17.2	102.1	**94.5**	NA
6/19/2007	Grid 12 LF 3	2	Comp	6"	119.7	18.5	18.2	101.2	**93.7**	NA
6/19/2007	Grid 12 LF 3	6	Comp	6"	117.4	18.0	18.1	99.4	**92.0**	NA
6/19/2007	Grid 12 LF 3	5	Comp	6"	116.5	18.3	18.7	98.1	**90.8**	NA
6/19/2007	Grid 12 LF 3	3	Comp	6"	119.5	18.2	17.9	101.3	**93.7**	NA
6/19/2007	Grid 12 LF 3	4	Comp	6"	123.3	17.7	16.7	105.6	**97.7**	NA
6/8/2007	Grid 13 LF 3	20	Comp	6"	119.8	16.2	15.6	103.6	**95.9**	NA
6/8/2007	Grid 13 LF 3	22	Comp	6"	128.5	15.2	13.3	113.4	**105.0**	NA
6/8/2007	Grid 13 LF 3	23	Comp	6"	126.5	18.2	16.7	108.3	**100.3**	NA
6/8/2007	Grid 13 LF 3	24	Comp	6"	115.0	18.7	19.4	96.3	**90.0**	NA
6/8/2007	Grid 13 LF 3	25	Comp	6"	122.8	19.7	19.1	103.1	**95.4**	NA
6/8/2007	Grid 14 LF 3	16	Comp	6"	125.6	21.7	20.9	103.9	**96.2**	NA
6/8/2007	Grid 14 LF 3	18	Comp	6"	128.3	21.3	19.8	107.0	**99.0**	NA
6/8/2007	Grid 14 LF 3	17	Comp	6"	124.6	23.1	22.7	101.5	**93.9**	NA
6/8/2007	Grid 14 LF 3	21	Comp	6"	118.2	19.8	20.1	98.4	**91.1**	NA
6/8/2007	Grid 14 LF 3	19	Comp	6"	126.9	21.2	20.0	105.7	**97.9**	NA
6/8/2007	Grid 14 LF 3	Grid 14 LF 3	Perm	6"	NA	NA	NA	NA	**NA**	**7.68×10^{-7}**
6/8/2007	Grid 15 LF 3	6	Comp	6"	122.9	16.5	15.4	106.4	**98.5**	NA
6/8/2007	Grid 15 LF 3	7	Comp	6"	126.2	21.4	20.4	104.8	**97.0**	NA
6/8/2007	Grid 15 LF 3	9	Comp	6"	124.7	18.3	17.2	106.4	**98.5**	NA
6/8/2007	Grid 15 LF 3	8	Comp	6"	120.0	18.5	18.2	101.5	**93.9**	NA
6/8/2007	Grid 15 LF 3	10	Comp	6"	123.4	20.2	19.5	103.2	**95.6**	NA
6/8/2007	Grid 16 LF 3	11	Comp	6"	124.1	18.9	18.0	105.2	**97.4**	NA
6/8/2007	Grid 16 LF 3	12	Comp	6"	125.5	22.9	22.3	102.6	**94.9**	NA
6/8/2007	Grid 16 LF 3	13	Comp	6"	127.2	21.9	20.8	105.3	**97.4**	NA
6/8/2007	Grid 16 LF 3	14	Comp	6"	125.3	21.3	20.4	104.0	**96.3**	NA
6/8/2007	Grid 16 LF 3	15	Comp	6"	125.8	20.6	19.6	105.1	**97.3**	NA
6/8/2007	Grid 17 LF 3	1	Comp	6"	126.3	17.7	16.2	108.6	**100.5**	NA
6/8/2007	Grid 17 LF 3	2	Comp	6"	120.7	17.9	17.4	102.8	**95.1**	NA
6/8/2007	Grid 17 LF 3	3	Comp	6"	125.2	18.6	17.4	106.7	**98.7**	NA
6/8/2007	Grid 17 LF 3	4	Comp	6"	119.8	19.7	19.0	100.6	**93.1**	NA
6/8/2007	Grid 17 LF 3	5	Comp	6"	124.3	19.8	18.8	104.6	**96.8**	NA
6/20/2007	Grid 18 LF 3	21	Comp	6"	125.4	19.3	18.1	106.1	**98.2**	NA
6/20/2007	Grid 18 LF 3	22	Comp	6"	121.3	20.1	19.9	101.1	**93.6**	NA
6/20/2007	Grid 18 LF 3	25	Comp	6"	117.4	17.2	17.1	100.2	**92.8**	NA
6/20/2007	Grid 18 LF 3	24	Comp	6"	115.5	17.3	17.6	98.0	**90.7**	NA
6/20/2007	Grid 18 LF 3	23	Comp	6"	121.7	18.6	18.0	103.1	**95.4**	NA

CLAY CAP SAMPLING LOG:Phase II

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permability
		Sample			*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
5/25/2007	Grid 1 Lift 1	5	Comp	6"	119.4	15.8	15.2	103.6	**95.9**	NA
5/25/2007	Grid 1 Lift 1	6	Comp	6"	125.5	20.6	19.6	104.9	**97.1**	NA
5/25/2007	Grid 1 Lift 1	7	Comp	6"	124.5	17.5	16.3	106.9	**99.0**	NA
5/25/2007	Grid 1 Lift 1	8	Comp	6"	123.7	17.2	16.0	106.6	**98.7**	NA
5/25/2007	Grid 1 Lift 1	9	Comp	6"	120.1	15.8	15.0	104.3	**96.5**	NA
5/25/2007	Grid 2 Lift 1	10	Comp	6"	118.1	18.7	18.8	99.4	**92.0**	NA
5/25/2007	Grid 2 Lift 1	11	Comp	6"	122.3	15.1	14.1	107.2	**99.2**	NA
5/25/2007	Grid 2 Lift 1	30	Comp	6"	118.6	18.4	18.3	100.2	**92.8**	NA
5/25/2007	Grid 2 Lift 1	13	Comp	6"	125.2	15.4	14.0	109.8	**101.6**	NA
5/25/2007	Grid 2 Lift 1	12	Comp	6"	117.4	13.6	13.1	103.8	**96.1**	NA
5/25/2007	Grid 2 Lift 1	Grid 2 Lift 1	Perm	6"	NA	NA	NA	NA	NA	**1.28×10^{-8}**
5/25/2007	Grid 3 Lift 1	15	Comp	6"	115.7	16.2	16.3	99.4	**92.0**	NA
5/25/2007	Grid 3 Lift 1	2	Comp	6"	118.3	17.1	16.9	101.2	**93.7**	NA
5/25/2007	Grid 3 Lift 1	14	Comp	6"	123.9	19.3	18.4	104.6	**96.8**	NA
5/25/2007	Grid 3 Lift 1	3	Comp	6"	114.2	14.6	14.6	99.6	**92.2**	NA
5/25/2007	Grid 3 Lift 1	4	Comp	6"	121.0	15.1	14.2	105.9	**98.0**	NA
5/25/2007	Grid 4 Lift 1	18	Comp	6"	121.6	18.3	17.7	103.2	**95.6**	NA
5/25/2007	Grid 4 Lift 1	17	Comp	6"	120.1	15.9	15.2	104.2	**96.4**	NA
5/25/2007	Grid 4 Lift 1	19	Comp	6"	126.7	19.4	18.1	107.2	**99.3**	NA
5/25/2007	Grid 4 Lift 1	20	Comp	6"	118.1	16.8	16.6	101.3	**93.8**	NA
5/25/2007	Grid 4 Lift 1	16	Comp	6"	118.6	14.7	14.2	103.8	**96.1**	NA
6/25/2007	Grid 5 Lift 1	16	Comp	6"	129.0	19.3	17.5	109.7	**101.5**	NA
5/25/2007	Grid 6 Lift 1	21	Comp	6"	115.5	14.3	14.1	101.2	**93.7**	NA
5/25/2007	Grid 6 Lift 1	28	Comp	6"	119.4	15.6	15.0	103.8	**96.1**	NA
5/25/2007	Grid 6 Lift 1	22	Comp	6"	115.1	12.1	11.8	103.0	**95.3**	NA
5/25/2007	Grid 6 Lift 1	27	Comp	6"	117.6	14.2	13.7	103.4	**95.7**	NA
5/25/2007	Grid 6 Lift 1	29	Comp	6"	116.8	12.8	12.2	104.1	**96.3**	NA
5/25/2007	Grid 7 Lift 1	1	Comp	6"	120.9	16.1	15.4	104.8	**97.0**	NA
5/25/2007	Grid 7 Lift 1	23	Comp	6"	119.8	14.0	13.2	105.8	**97.9**	NA
5/25/2007	Grid 7 Lift 1	24	Comp	6"	114.5	14.3	14.3	100.2	**92.7**	NA
5/25/2007	Grid 7 Lift 1	26	Comp	6"	125.8	19.7	18.6	106.1	**98.2**	NA
5/25/2007	Grid 7 Lift 1	31	Comp	6"	119.9	16.2	15.6	103.7	**96.0**	NA
5/25/2007	Grid 7 Lift 1	Grid 7 Lift 1	Perm	6"	NA	NA	NA	NA	NA	**9.05×10^{-8}**
5/29/2007	Grid 8 Lift 1	11	Comp	6"	122.8	16.4	15.3	106.5	**98.6**	NA
5/29/2007	Grid 8 Lift 1	10	Comp	6"	123.4	17.0	16.0	106.3	**98.4**	NA
5/29/2007	Grid 8 Lift 1	12	Comp	6"	119.4	18.5	18.3	100.9	**93.4**	NA
5/29/2007	Grid 8 Lift 1	13	Comp	6"	121.9	19.2	18.7	102.6	**95.0**	NA
5/29/2007	Grid 8 Lift 1	14	Comp	6"	125.8	18.6	17.3	107.2	**99.2**	NA
5/29/2007	Grid 9 Lift 1	7	Comp	6"	125.1	16.4	15.1	108.6	**100.6**	NA
5/29/2007	Grid 9 Lift 1	5	Comp	6"	115.6	16.2	16.2	99.4	**92.0**	NA
5/29/2007	Grid 9 Lift 1	8	Comp	6"	119.2	18.1	17.8	101.2	**93.6**	NA

CLAY CAP SAMPLING LOG:Phase II

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permability
		Sample			*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
5/29/2007	Grid 9 Lift 1	9	Comp	6"	116.7	16.0	15.8	100.7	**93.2**	NA
5/29/2007	Grid 9 Lift 1	17	Comp	6"	119.3	18.0	17.7	101.4	**93.8**	NA
5/29/2007	Grid 10 Lift 1	1	Comp	6"	124.5	20.2	19.3	104.3	**96.5**	NA
5/29/2007	Grid 10 Lift 1	4	Comp	6"	116.6	17.0	17.0	99.6	**92.2**	NA
5/29/2007	Grid 10 Lift 1	6	Comp	6"	114.4	15.3	15.4	99.1	**91.7**	NA
5/29/2007	Grid 10 Lift 1	2	Comp	6"	115.3	17.0	17.2	98.3	**91.0**	NA
5/29/2007	Grid 10 Lift 1	3	Comp	6"	125.8	18.6	17.3	107.2	**99.2**	NA
5/29/2007	Grid 11 Lift 1	16	Comp	6"	125.2	18.9	17.8	106.3	**98.4**	NA
5/29/2007	Grid 11 Lift 1	20	Comp	6"	122.3	18.8	18.1	103.5	**95.8**	NA
5/29/2007	Grid 11 Lift 1	18	Comp	6"	121.3	17.4	16.7	103.9	**96.2**	NA
5/29/2007	Grid 11 Lift 1	15	Comp	6"	123.7	19.8	19.1	103.8	**96.1**	NA
5/29/2007	Grid 11 Lift 1	19	Comp	6"	123.3	17.2	16.2	106.1	**98.2**	NA
5/29/2007	Grid 12 Lift 1	23	Comp	6"	123.1	20.3	19.6	102.9	**95.2**	NA
5/29/2007	Grid 12 Lift 1	27	Comp	6"	121.4	19.6	19.3	101.7	**94.0**	NA
5/29/2007	Grid 12 Lift 1	24	Comp	6"	118.8	18.6	18.5	100.2	**92.7**	NA
5/29/2007	Grid 12 Lift 1	25	Comp	6"	120.9	19.3	19.0	101.6	**94.0**	NA
5/29/2007	Grid 12 Lift 1	26	Comp	6"	121.4	19.7	19.3	101.7	**94.2**	NA
5/29/2007	Grid 13 Lift 1	22	Comp	6"	124.3	19.9	19.1	104.3	**96.6**	NA
5/29/2007	Grid 13 Lift 1	21	Comp	6"	126.0	17.6	16.1	108.5	**100.4**	NA
5/29/2007	Grid 13 Lift 1	29	Comp	6"	120.3	17.2	16.6	103.1	**95.5**	NA
5/29/2007	Grid 13 Lift 1	35	Comp	6"	124.0	15.7	14.5	108.3	**100.3**	NA
5/29/2007	Grid 13 Lift 1	28	Comp	6"	124.8	20.2	19.3	104.6	**96.8**	NA
6/4/2007	Grid 13 Lift 1	Grid 13 Lift 1	Perm	6"	NA	NA	NA	NA	NA	**2.06×10^{-7}**
5/29/2007	Grid 14 Lift 1	30	Comp	6"	121.8	17.6	16.9	104.2	**96.5**	NA
5/29/2007	Grid 14 Lift 1	31	Comp	6"	121.8	16.8	16.0	105.0	**97.2**	NA
5/29/2007	Grid 14 Lift 1	33	Comp	6"	118.9	15.1	14.5	103.8	**96.1**	NA
5/29/2007	Grid 14 Lift 1	34	Comp	6"	121.7	18.4	17.8	103.3	**95.6**	NA
5/29/2007	Grid 14 Lift 1	32	Comp	6"	125.2	20.9	20.0	104.3	**96.5**	NA
6/14/2007	Grid 15 Lift 1	19	Comp	6"	124.4	20.6	19.8	103.7	**96.0**	NA
6/14/2007	Grid 15 Lift 1	18	Comp	6"	120.3	21.2	21.4	99.1	**91.7**	NA
6/14/2007	Grid 15 Lift 1	17	Comp	6"	123.7	23.5	23.5	100.2	**92.7**	NA
6/14/2007	Grid 15 Lift 1	10	Comp	6"	112.4	13.3	13.3	99.1	**91.7**	NA
6/14/2007	Grid 15 Lift 1	11	Comp	6"	128.4	22.9	21.7	105.4	**97.6**	NA
6/14/2007	Grid 16 Lift 1	1	Comp	6"	123.7	19.4	18.6	104.3	**96.5**	NA
6/14/2007	Grid 16 Lift 1	9	Comp	6"	124.6	14.9	13.6	109.7	**101.5**	NA
6/14/2007	Grid 16 Lift 1	8	Comp	6"	129.3	22.0	20.4	107.3	**99.3**	NA
6/14/2007	Grid 16 Lift 1	7	Comp	6"	119.9	22.0	22.4	98.0	**90.7**	NA
6/14/2007	Grid 16 Lift 1	20	Comp	6"	124.8	20.2	19.2	104.6	**96.8**	NA
7/2/2007	Grid 16 Lift 1	Grid 16 Lift 1	Perm	6"	NA	NA	NA	NA	NA	**1.58×10^{-7}**
6/14/2007	Grid 17 Lift 1	3	Comp	6"	121.3	17.8	17.1	103.5	**95.8**	NA
6/14/2007	Grid 17 Lift 1	2	Comp	6"	131.4	21.9	20.0	109.4	**101.3**	NA

CLAY CAP SAMPLING LOG:Phase II

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permability
		Sample			*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
6/14/2007	Grid 17 Lift 1	4	Comp	6"	119.5	20.4	20.6	99.1	**91.7**	NA
6/14/2007	Grid 17 Lift 1	5	Comp	6"	119.0	21.1	21.5	97.9	**90.6**	NA
6/14/2007	Grid 17 Lift 1	6	Comp	6"	119.5	19.4	19.4	100.1	**92.6**	NA
6/14/2007	Grid 18 Lift 1	12	Comp	6"	128.0	22.8	21.6	105.2	**97.3**	NA
6/14/2007	Grid 18 Lift 1	13	Comp	6"	121.3	24.7	25.5	97.0	**90.0**	NA
6/14/2007	Grid 18 Lift 1	21	Comp	6"	129.0	24.6	23.5	104.5	**96.7**	NA
6/14/2007	Grid 18 Lift 1	15	Comp	6"	123.3	23.9	24.0	99.4	**92.0**	NA
6/14/2007	Grid 18 Lift 1	16	Comp	6"	125.6	23.3	22.7	102.3	**94.7**	NA
6/15/2007	Grid 1 Lift 2	1	Comp	6"	119.3	21.0	21.3	98.4	**91.0**	NA
6/15/2007	Grid 1 Lift 2	6	Comp	6"	126.0	23.2	22.5	102.8	**95.2**	NA
6/15/2007	Grid 1 Lift 2	7	Comp	6"	127.1	22.5	21.5	104.6	**96.8**	NA
6/15/2007	Grid 1 Lift 2	8	Comp	6"	128.8	21.3	19.8	107.5	**99.5**	NA
6/15/2007	Grid 1 Lift 2	9	Comp	6"	123.5	23.0	22.8	100.6	**93.1**	NA
6/15/2007	Grid 2 Lift 2	11	Comp	6"	125.0	22.2	21.5	102.8	**95.2**	NA
6/15/2007	Grid 2 Lift 2	5	Comp	6"	118.1	21.1	21.7	97.0	**90.0**	NA
6/15/2007	Grid 2 Lift 2	12	Comp	6"	122.0	20.9	20.6	101.2	**93.6**	NA
6/15/2007	Grid 2 Lift 2	10	Comp	6"	128.0	25.7	25.1	102.3	**94.7**	NA
6/15/2007	Grid 2 Lift 2	31	Comp	6"	127.5	23.5	22.6	104.0	**96.2**	NA
6/15/2007	Grid 3 Lift 2	23	Comp	6"	122.4	21.6	21.4	100.8	**93.3**	NA
6/15/2007	Grid 3 Lift 2	13	Comp	6"	125.3	21.6	20.8	103.7	**96.0**	NA
6/15/2007	Grid 3 Lift 2	4	Comp	6"	126.4	20.5	19.3	105.9	**98.1**	NA
6/15/2007	Grid 3 Lift 2	2	Comp	6"	130.6	23.4	21.7	107.2	**99.3**	NA
6/15/2007	Grid 3 Lift 2	3	Comp	6"	118.1	21.1	21.7	97.0	**90.0**	NA
6/23/2007	Grid 3 Lift 2	Grid 3 Lift 2	Perm	6"	NA	NA	NA	NA	NA	**4.32 x 10^{-7}**
6/15/2007	Grid 4 Lift 2	14	Comp	6"	125.3	21.6	20.8	103.7	**96.0**	NA
6/15/2007	Grid 4 Lift 2	15	Comp	6"	120.9	21.2	21.3	99.7	**92.3**	NA
6/15/2007	Grid 4 Lift 2	19	Comp	6"	127.0	22.6	21.6	104.5	**96.7**	NA
6/15/2007	Grid 4 Lift 2	16	Comp	6"	119.3	18.7	18.6	100.5	**93.1**	NA
6/15/2007	Grid 4 Lift 2	17	Comp	6"	120.9	22.2	22.5	98.7	**91.4**	NA
6/25/2007	Grid 5 Lift 2	13	Comp	6"	126.7	19.0	17.6	107.7	**99.7**	NA
6/25/2007	Grid 5 Lift 2	14	Comp	6"	119.8	18.0	17.6	101.9	**94.3**	NA
6/25/2007	Grid 5 Lift 2	15	Comp	6"	127.8	19.4	17.8	108.4	**100.4**	NA
6/26/2007	Grid 8 Lift 3	7	Comp	6"	127.4	21.9	20.7	105.5	**97.6**	NA
6/15/2007	Grid 6 Lift 2	20	Comp	6"	125.4	22.4	21.7	102.9	**95.3**	NA
6/15/2007	Grid 6 Lift 2	30	Comp	6"	125.9	21.5	20.5	104.4	**96.6**	NA
6/15/2007	Grid 6 Lift 2	29	Comp	6"	124.9	22.4	21.8	102.5	**94.9**	NA
6/15/2007	Grid 6 Lift 2	22	Comp	6"	126.0	23.1	22.4	103.1	**95.4**	NA
6/15/2007	Grid 6 Lift 2	21	Comp	6"	122.0	23.3	23.5	98.8	**91.4**	NA
6/14/2007	Grid 6 Lift 2	Grid 6 Lift 2	Perm	6"	NA	NA	NA	NA	NA	**7.84 x 10^{-7}**
6/15/2007	Grid 7 Lift 2	25	Comp	6"	130.2	22.2	20.5	108.0	**100.0**	NA
6/15/2007	Grid 7 Lift 2	24	Comp	6"	128.7	22.3	20.9	106.4	**98.5**	NA

CLAY CAP SAMPLING LOG:Phase II

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permability
		Sample			*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
6/15/2007	Grid 7 Lift 2	28	Comp	6"	124.8	21.0	20.2	103.8	**96.1**	NA
6/15/2007	Grid 7 Lift 2	27	Comp	6"	125.9	24.8	24.5	101.1	**93.6**	NA
6/15/2007	Grid 7 Lift 2	26	Comp	6"	122.9	22.3	22.1	100.6	**93.2**	NA
6/18/2007	Grid 8 Lift 2	13	Comp	6"	122.8	21.4	21.1	101.4	**93.8**	NA
6/18/2007	Grid 8 Lift 2	14	Comp	6"	124.2	20.3	19.4	104.0	**96.3**	NA
6/18/2007	Grid 8 Lift 2	20	Comp	6"	125.3	19.8	18.7	105.5	**97.6**	NA
6/18/2007	Grid 8 Lift 2	11	Comp	6"	128.7	20.8	19.3	107.9	**99.9**	NA
6/18/2007	Grid 8 Lift 2	12	Comp	6"	120.4	19.5	19.3	100.9	**93.4**	NA
6/18/2007	Grid 9 Lift 2	10	Comp	6"	127.9	20.8	19.3	107.1	**99.2**	NA
6/18/2007	Grid 9 Lift 2	1	Comp	6"	125.9	20.4	19.2	105.6	**97.7**	NA
6/18/2007	Grid 9 Lift 2	2	Comp	6"	128.5	21.4	19.9	107.1	**99.2**	NA
6/18/2007	Grid 9 Lift 2	9	Comp	6"	123.3	19.4	18.7	103.9	**96.2**	NA
6/18/2007	Grid 9 Lift 2	8	Comp	6"	119.7	18.1	17.7	101.7	**94.1**	NA
6/18/2007	Grid 10 Lift 2	6	Comp	6"	126.3	20.1	18.8	106.2	**98.3**	NA
6/18/2007	Grid 10 Lift 2	7	Comp	6"	130.9	18.3	16.2	112.6	**104.2**	NA
6/18/2007	Grid 10 Lift 2	4	Comp	6"	125.9	18.7	17.4	107.2	**99.2**	NA
6/18/2007	Grid 10 Lift 2	3	Comp	6"	128.6	20.5	19.0	108.1	**100.1**	NA
6/18/2007	Grid 10 Lift 2	5	Comp	6"	125.3	18.9	17.7	106.4	**98.5**	NA
6/18/2007	Grid 11 Lift 2	19	Comp	6"	125.1	22.5	21.9	102.5	**94.9**	NA
6/18/2007	Grid 11 Lift 2	18	Comp	6"	125.9	21.7	20.8	104.2	**96.5**	NA
6/18/2007	Grid 11 Lift 2	17	Comp	6"	125.1	20.9	20.0	104.2	**96.4**	NA
6/18/2007	Grid 11 Lift 2	16	Comp	6"	126.4	20.8	19.6	105.7	**97.8**	NA
6/18/2007	Grid 11 Lift 2	15	Comp	6"	126.3	20.6	19.4	105.7	**97.9**	NA
6/23/2007	Grid 11 Lift 2	Grid 11 Lift 1	Perm	6"	NA	NA	NA	NA	NA	**4.91 x 10^{-7}**
6/19/2007	Grid 12 Lift 2	15	Comp	6"	120.0	21.5	21.7	98.6	**91.2**	NA
6/19/2007	Grid 12 Lift 2	26	Comp	6"	126.1	19.9	18.7	106.2	**98.3**	NA
6/19/2007	Grid 12 Lift 2	11	Comp	6"	117.5	18.5	18.6	99.1	**91.7**	NA
6/19/2007	Grid 12 Lift 2	14	Comp	6"	119.6	17.5	17.2	102.0	**94.4**	NA
6/19/2007	Grid 12 Lift 2	13	Comp	6"	122.9	17.5	16.6	105.4	**97.5**	NA
6/19/2007	Grid 13 Lift 2	16	Comp	6"	122.5	18.8	18.1	103.7	**96.0**	NA
6/19/2007	Grid 13 Lift 2	25	Comp	6"	126.6	17.1	15.6	109.5	**101.3**	NA
6/19/2007	Grid 13 Lift 2	21	Comp	6"	127.5	19.4	17.9	107.9	**99.8**	NA
6/19/2007	Grid 13 Lift 2	19	Comp	6"	124.2	19.2	18.2	105.1	**97.3**	NA
6/19/2007	Grid 13 Lift 2	20	Comp	6"	128.5	19.1	17.4	109.4	**101.2**	NA
6/19/2007	Grid 14 Lift 2	18	Comp	6"	115.0	17.6	18.0	97.4	**90.2**	NA
6/19/2007	Grid 14 Lift 2	23	Comp	6"	125.1	18.5	17.3	106.6	**98.6**	NA
6/19/2007	Grid 14 Lift 2	22	Comp	6"	122.0	20.4	20.0	101.6	**94.1**	NA
6/19/2007	Grid 14 Lift 2	27	Comp	6"	121.6	22.6	22.8	98.9	**91.6**	NA
6/19/2007	Grid 14 Lift 2	17	Comp	6"	120.9	22.1	22.3	98.8	**91.5**	NA
6/21/2007	Grid 15 Lift 2	29	Comp	6"	121.1	16.7	16.0	104.3	**96.6**	NA
6/21/2007	Grid 15 Lift 2	28	Comp	6"	119.7	19.3	19.2	100.3	**92.9**	NA

CLAY CAP SAMPLING LOG:Phase II

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permability
		Sample			*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
6/21/2007	Grid 15 Lift 2	24	Comp	6"	128.6	18.6	16.8	110.1	**101.9**	NA
6/21/2007	Grid 15 Lift 2	23	Comp	6"	125.5	21.2	20.3	104.3	**96.5**	NA
6/21/2007	Grid 15 Lift 2	22	Comp	6"	125.7	21.5	20.6	104.2	**96.4**	NA
6/21/2007	Grid 16 Lift 2	17	Comp	6"	126.8	20.9	19.7	105.9	**98.0**	NA
6/21/2007	Grid 16 Lift 2	15	Comp	6"	130.2	21.9	20.1	108.3	**100.3**	NA
6/21/2007	Grid 16 Lift 2	16	Comp	6"	129.6	21.6	19.9	108.0	**100.0**	NA
6/21/2007	Grid 16 Lift 2	14	Comp	6"	119.5	19.4	19.3	100.1	**92.7**	NA
6/21/2007	Grid 16 Lift 2	13	Comp	6"	126.7	22.1	21.0	104.7	**96.9**	NA
6/21/2007	Grid 17 Lift 2	21	Comp	6"	121.7	20.1	19.8	101.6	**94.0**	NA
6/21/2007	Grid 17 Lift 2	18	Comp	6"	122.4	20.1	19.6	102.4	**94.7**	NA
6/21/2007	Grid 17 Lift 2	19	Comp	6"	121.9	20.3	19.9	101.6	**94.1**	NA
6/21/2007	Grid 17 Lift 2	20	Comp	6"	126.3	21.0	19.9	105.3	**97.4**	NA
6/21/2007	Grid 18 Lift 2	27	Comp	6"	126.7	21.0	19.8	105.7	**97.8**	NA
6/21/2007	Grid 18 Lift 2	26	Comp	6"	123.6	21.2	20.6	102.5	**94.8**	NA
6/21/2007	Grid 18 Lift 2	25	Comp	6"	122.4	20.1	19.6	102.3	**94.7**	NA
6/25/2007	Grid 1 Lift 3	21	Comp	6"	117.9	17.9	17.9	100.0	**92.0**	NA
6/25/2007	Grid 1 Lift 3	22	Comp	6"	122.5	18.4	17.7	104.1	**96.3**	NA
6/25/2007	Grid 1 Lift 3	23	Comp	6"	120.3	18.7	18.4	101.5	**94.0**	NA
6/25/2007	Grid 1 Lift 3	24	Comp	6"	115.8	15.2	15.1	100.6	**93.1**	NA
6/25/2007	Grid 1 Lift 3	25	Comp	6"	123.5	17.0	15.9	106.5	**98.6**	NA
6/25/2007	Grid 2 Lift 3	2	Comp	6"	120.5	18.5	18.6	101.5	**94.0**	NA
6/25/2007	Grid 2 Lift 3	1	Comp	6"	125.4	19.7	18.6	105.7	**97.8**	NA
6/25/2007	Grid 2 Lift 3	5	Comp	6"	129.7	18.7	16.8	110.9	**102.7**	NA
6/25/2007	Grid 2 Lift 3	3	Comp	6"	131.5	18.3	16.1	113.2	**104.8**	NA
6/25/2007	Grid 2 Lift 3	4	Comp	6"	127.4	18.2	16.7	109.2	**101.1**	NA
6/27/2007	Grid 2 Lift 2	Grid 2 Lift 2	Perm	6"	NA	NA	NA	NA	NA	**7.96 x 10^{-7}**
7/12/2007	Grid 3 Lift 3	5	Comp	6"	119.6	13.1	12.2	106.5	**98.6**	NA
7/12/2007	Grid 3 Lift 3	3	Comp	6"	121.4	14.9	13.9	106.5	**98.6**	NA
7/12/2007	Grid 3 Lift 3	2	Comp	6"	119.1	14.8	14.1	104.3	**96.6**	NA
7/12/2007	Grid 3 Lift 3	1	Comp	6"	117.5	14.1	13.6	103.4	**95.7**	NA
7/12/2007	Grid 3 Lift 3	4	Comp	6"	117.1	14.1	13.7	103.0	**95.3**	NA
6/26/2007	Grid 4 Lift 3	1	Comp	6"	128.7	21.7	20.3	107.0	**99.0**	NA
6/25/2007	Grid 4 Lift 3	7	Comp	6"	130.3	18.7	18.4	101.6	**94.0**	NA
6/25/2007	Grid 4 Lift 3	6	Comp	6"	128.5	17.7	15.9	110.8	**102.6**	NA
6/25/2007	Grid 4 Lift 3	9	Comp	6"	124.8	16.9	15.6	108.0	**99.9**	NA
6/25/2007	Grid 4 Lift 3	10	Comp	6"	126.2	17.6	16.2	108.5	**100.5**	NA
6/25/2007	Grid 5 Lift 3	11	Comp	6"	128.8	19.4	17.6	109.5	**101.3**	NA
6/25/2007	Grid 5 Lift 3	12	Comp	6"	122.1	19.0	18.4	103.1	**95.5**	NA
6/25/2007	Grid 6 Lift 3	17	Comp	6"	129.6	18.8	16.9	110.8	**102.6**	NA
6/25/2007	Grid 6 Lift 3	20	Comp	6"	121.4	18.8	18.3	102.6	**95.0**	NA
6/25/2007	Grid 6 Lift 3	19	Comp	6"	126.8	18.7	17.2	108.1	**100.1**	NA

CLAY CAP SAMPLING LOG:Phase II

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permability
		Sample			*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
6/25/2007	Grid 6 Lift 3	18	Comp	6"	131.8	20.6	18.5	111.2	**102.9**	NA
6/25/2007	Grid 6 Lift 3	8	Comp	6"	125.2	17.8	16.5	107.4	**99.4**	NA
6/27/2007	Grid 7 Lift 3	6	Comp	6"	118.8	19.5	19.6	99.2	**91.9**	NA
6/27/2007	Grid 7 Lift 3	8	Comp	6"	123.2	20.3	19.7	102.8	**95.2**	NA
6/27/2007	Grid 7 Lift 3	10	Comp	6"	126.0	21.0	19.9	105.0	**97.2**	NA
6/27/2007	Grid 7 Lift 3	11	Comp	6"	124.8	19.6	18.6	105.2	**97.4**	NA
6/27/2007	Grid 7 Lift 3	9	Comp	6"	128.0	20.8	19.3	107.2	**99.2**	NA
6/27/2007	Grid 7 Lift 3	Grid 7 Lift 3	Perm	6"	NA	NA	NA	NA	NA	**4.66 x 10^{-7}**
6/26/2007	Grid 8 Lift 3	5	Comp	6"	127.1	23.2	22.3	103.9	**96.2**	NA
6/26/2007	Grid 8 Lift 3	6	Comp	6"	128.0	24.2	23.2	103.9	**96.2**	NA
6/27/2007	Grid 8 Lift 3	5	Comp	6"	126.8	21.4	20.3	105.4	**97.5**	NA
6/27/2007	Grid 8 Lift 3	4	Comp	6"	121.3	20.7	20.5	100.6	**93.1**	NA
6/27/2007	Grid 8 Lift 3	3	Comp	6"	120.6	21.2	21.3	99.4	**92.0**	NA
6/26/2007	Grid 9 Lift 3	8	Comp	6"	127.2	21.5	20.4	105.6	**97.8**	NA
6/26/2007	Grid 9 Lift 3	9	Comp	6"	124.5	22.6	22.1	101.9	**94.3**	NA
6/26/2007	Grid 9 Lift 3	10	Comp	6"	126.5	22.0	21.0	104.4	**96.7**	NA
6/26/2007	Grid 9 Lift 3	12	Comp	6"	127.4	21.8	20.6	105.6	**97.7**	NA
6/26/2007	Grid 9 Lift 3	11	Comp	6"	125.4	21.6	20.7	103.9	**96.1**	NA
6/27/2007	Grid 10 Lift 3	14	Comp	6"	127.9	22.0	20.7	105.9	**98.0**	NA
6/27/2007	Grid 10 Lift 3	15	Comp	6"	121.5	19.6	19.2	101.9	**94.3**	NA
6/27/2007	Grid 10 Lift 3	7	Comp	6"	123.8	20.8	20.2	102.9	**95.3**	NA
6/27/2007	Grid 10 Lift 3	13	Comp	6"	121.0	20.3	20.1	100.7	**93.2**	NA
6/27/2007	Grid 10 Lift 3	12	Comp	6"	127.4	20.3	18.9	107.1	**99.2**	NA
7/2/2007	Grid 10 Lift 3	Grid 10 Lift 3	Perm	6"	NA	NA	NA	NA	NA	**1.30 x 10^{-8}**
6/26/2007	Grid 11 Lift 3	2	Comp	6"	124.5	23.7	23.5	100.7	**93.3**	NA
6/26/2007	Grid 11 Lift 3	3	Comp	6"	125.3	24.1	23.8	101.2	**93.7**	NA
6/27/2007	Grid 11 Lift 3	1	Comp	6"	123.6	23.0	22.8	100.6	**93.1**	NA
6/26/2007	Grid 11 Lift 3	4	Comp	6"	123.6	24.7	24.9	98.9	**91.6**	NA
6/27/2007	Grid 11 Lift 3	2	Comp	6"	120.4	20.7	20.8	99.7	**92.3**	NA
6/28/2007	Grid 12 Lift 3	1	Comp	6"	130.0	20.2	18.4	109.7	**101.6**	NA
6/28/2007	Grid 12 Lift 3	2	Comp	6"	127.7	21.3	20.0	106.3	**98.4**	NA
6/28/2007	Grid 12 Lift 3	3	Comp	6"	120.7	19.9	19.7	100.8	**93.3**	NA
6/28/2007	Grid 12 Lift 3	4	Comp	6"	120.3	19.8	19.7	100.5	**93.0**	NA
6/28/2007	Grid 12 Lift 3	5	Comp	6"	128.4	21.5	20.1	106.9	**98.9**	NA
7/2/2007	Grid 12 Lift 3	Grid 12 Lift 3	Perm	6"	NA	NA	NA	NA	NA	**1.30 x 10^{-8}**
6/28/2007	Grid 13 Lift 3	7	Comp	6"	123.2	20.2	19.5	103.0	**95.4**	NA
6/28/2007	Grid 13 Lift 3	10	Comp	6"	126.8	19.7	18.4	107.1	**99.1**	NA
6/28/2007	Grid 13 Lift 3	11	Comp	6"	125.3	20.8	19.8	104.5	**96.7**	NA
6/28/2007	Grid 13 Lift 3	8	Comp	6"	128.6	20.7	19.1	107.9	**99.9**	NA
6/28/2007	Grid 13 Lift 3	9	Comp	6"	123.9	20.4	19.7	103.5	**95.8**	NA
6/27/2007	Grid 14 Lift 3	16	Comp	6"	123.5	22.4	22.1	101.2	**93.6**	NA

CLAY CAP SAMPLING LOG:Phase II

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

			Compaction							Permability
		Sample			*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
6/27/2007	Grid 14 Lift 3	18	Comp	6"	128.5	20.7	19.1	107.8	**99.8**	NA
6/27/2007	Grid 14 Lift 3	19	Comp	6"	121.7	20.2	19.9	101.5	**93.9**	NA
6/27/2007	Grid 14 Lift 3	20	Comp	6"	122.0	19.1	18.5	103.0	**95.3**	NA
6/27/2007	Grid 14 Lift 3	17	Comp	6"	124.6	19.1	18.1	105.5	**97.7**	NA
7/12/2007	Grid 15 Lift 3	6	Comp	6"	116.5	14.1	13.7	102.4	**94.8**	NA
7/12/2007	Grid 15 Lift 3	14	Comp	6"	120.2	14.4	13.6	105.7	**97.9**	NA
7/12/2007	Grid 15 Lift 3	7	Comp	6"	115.6	16.8	17.0	98.7	**91.4**	NA
7/12/2007	Grid 15 Lift 3	8	Comp	6"	129.9	20.2	18.4	109.7	**101.5**	NA
7/12/2007	Grid 15 Lift 3	13	Comp	6"	121.1	15.8	14.9	105.3	**97.5**	NA
7/12/2007	Grid 15 Lift 3	9	Comp	6"	117.7	13.1	12.5	104.6	**96.9**	NA
6/28/2007	Grid 16 Lift 3	6	Comp	6"	126.8	22.0	20.9	104.8	**97.1**	NA
6/28/2007	Grid 16 Lift 3	12	Comp	6"	125.0	21.3	20.5	103.7	**96.0**	NA
6/28/2007	Grid 16 Lift 3	18	Comp	6"	124.4	21.6	21.0	102.8	**95.1**	NA
6/28/2007	Grid 16 Lift 3	19	Comp	6"	120.4	21.3	21.5	99.1	**91.7**	NA
6/28/2007	Grid 16 Lift 3	20	Comp	6"	122.9	21.0	20.6	101.8	**94.3**	NA
6/28/2007	Grid 17 Lift 3	17	Comp	6"	123.7	20.3	19.6	103.4	**95.7**	NA
6/28/2007	Grid 17 Lift 3	16	Comp	6"	123.1	21.0	20.5	102.1	**94.5**	NA
6/28/2007	Grid 17 Lift 3	15	Comp	6"	127.1	22.9	21.9	104.2	**96.5**	NA
6/28/2007	Grid 17 Lift 3	14	Comp	6"	123.8	22.7	22.4	101.1	**93.6**	NA
6/28/2007	Grid 17 Lift 3	13	Comp	6"	123.2	21.6	21.2	101.6	**94.1**	NA
7/12/2007	Grid 18 Lift 3	10	Comp	6"	119.7	16.8	16.3	102.8	**95.2**	NA
7/12/2007	Grid 18 Lift 3	11	Comp	6"	124.2	16.3	15.0	108.0	**99.9**	NA
7/12/2007	Grid 18 Lift 3	12	Comp	6"	125.7	16.9	15.5	108.8	**100.7**	NA

CLAY CAP SAMPLING LOG: Phase III

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

Compaction **Permability**

Sample					*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
7/24/2007	Grid 1 Lift 1	9	Comp	6"	129.5	21.9	20.3	107.6	**99.6**	NA
7/24/2007	Grid 1 Lift 1	8	Comp	6"	122.2	17.6	16.8	104.5	**96.8**	NA
7/24/2007	Grid 1 Lift 1	7	Comp	6"	130.5	19.6	17.7	110.9	**102.6**	NA
7/24/2007	Grid 1 Lift 1	6	Comp	6"	131.1	20.8	18.8	110.4	**102.2**	NA
7/24/2007	Grid 1 Lift 1	5	Comp	6"	126.3	18.1	16.7	108.3	**100.2**	NA
7/13/2007	Grid 1 Lift 1	Grid 1 Lift 1	Perm	6"	NA	NA	NA	NA	NA	**2.08 x 10^{-7}**
7/30/2007	Grid 2 Lift 1	3	Comp	6"	119.4	21.8	22.4	97.5	**90.3**	NA
7/30/2007	Grid 2 Lift 1	4	Comp	6"	116.7	14.7	14.3	102.0	**94.4**	NA
7/30/2007	Grid 2 Lift 1	5	Comp	6"	128.9	21.9	20.5	106.9	**99.0**	NA
7/30/2007	Grid 2 Lift 1	10	Comp	6"	123.7	21.0	20.4	102.1	**95.1**	NA
7/30/2007	Grid 2 Lift 1	11	Comp	6"	118.4	18.5	18.5	99.9	**92.5**	NA
8/3/2007	Grid 2 Lift 1	Grid 2 Lift 1	Perm	6"	NA	NA	NA	NA	NA	**2.79 x 10^{-7}**
7/24/2007	Grid 3 Lift 1	1	Comp	6"	125.6	16.9	15.5	108.8	**100.7**	NA
7/24/2007	Grid 3 Lift 1	2	Comp	6"	127.5	19.3	17.8	108.2	**100.1**	NA
7/24/2007	Grid 3 Lift 1	4	Comp	6"	123.6	16.2	15.1	107.3	**99.4**	NA
7/24/2007	Grid 3 Lift 1	3	Comp	6"	118.5	13.7	13.0	104.8	**97.0**	NA
7/24/2007	Grid 4 Lift 1	11	Comp	6"	124.7	17.8	16.6	106.9	**98.9**	NA
7/24/2007	Grid 4 Lift 1	10	Comp	6"	129.8	20.1	18.2	109.8	**101.6**	NA
7/24/2007	Grid 4 Lift 1	14	Comp	6"	134.5	22.5	20.1	112.0	**103.7**	NA
7/24/2007	Grid 4 Lift 1	12	Comp	6"	130.9	22.3	20.5	108.6	**100.5**	NA
7/24/2007	Grid 4 Lift 1	15	Comp	6"	125.4	20.0	18.9	105.4	**97.6**	NA
7/24/2007	Grid 4 Lift 1	13	Comp	6"	128.2	20.6	19.1	107.6	**99.6**	NA
7/24/2007	Grid 5 Lift 1	17	Comp	6"	126.1	20.8	19.7	105.3	**97.5**	NA
7/24/2007	Grid 5 Lift 1	16	Comp	6"	122.2	19.0	18.4	103.2	**95.5**	NA
7/24/2007	Grid 5 Lift 1	20	Comp	6"	122.9	16.6	15.6	106.3	**98.4**	NA
7/24/2007	Grid 5 Lift 1	18	Comp	6"	120.4	16.3	15.6	104.1	**96.3**	NA
7/24/2007	Grid 5 Lift 1	19	Comp	6"	125.6	22.8	22.2	102.7	**95.1**	NA
7/30/2007	Grid 6 Lift 1	1	Comp	6"	122.5	22.4	22.3	100.2	**92.7**	NA
7/30/2007	Grid 6 Lift 1	2	Comp	6"	130.1	20.6	18.8	109.5	**101.3**	NA
7/30/2007	Grid 6 Lift 1	6	Comp	6"	124.1	21.6	21.0	102.5	**94.9**	NA
7/30/2007	Grid 6 Lift 1	7	Comp	6"	121.0	20.3	20.1	100.7	**93.2**	NA
7/30/2007	Grid 6 Lift 1	8	Comp	6"	125.9	21.0	20.0	104.9	**97.1**	NA
7/30/2007	Grid 6 Lift 1	9	Comp	6"	125.9	23.0	22.3	102.9	**95.2**	NA
7/30/2007	Grid 6 Lift 1	Grid 6 Lift 1	Perm	6"	NA	NA	NA	NA	NA	**1.12 x 10^{-7}**
7/30/2007	Grid 7 Lift 1	17	Comp	6"	127.2	22.5	21.4	104.7	**96.9**	NA
7/30/2007	Grid 7 Lift 1	18	Comp	6"	128.0	22.2	20.9	105.8	**97.9**	NA
7/30/2007	Grid 7 Lift 1	19	Comp	6"	126.6	22.7	21.8	103.9	**96.1**	NA
7/30/2007	Grid 7 Lift 1	20	Comp	6"	119.6	20.4	20.5	99.2	**91.8**	NA
7/30/2007	Grid 7 Lift 1	21	Comp	6"	125.4	22.4	21.6	103.0	**95.4**	NA
7/30/2007	Grid 8 Lift 1	12	Comp	6"	120.1	20.2	20.2	99.8	**92.4**	NA
7/30/2007	Grid 8 Lift 1	13	Comp	6"	119.9	20.2	20.3	99.7	**92.3**	NA
7/30/2007	Grid 8 Lift 1	14	Comp	6"	120.6	22.1	22.3	98.5	**91.2**	NA
7/30/2007	Grid 8 Lift 1	15	Comp	6"	126.4	22.1	21.1	104.3	**96.6**	NA

CLAY CAP SAMPLING LOG: Phase III

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

Compaction **Permability**

Sample					*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
7/30/2007	Grid 8 Lift 1	16	Comp	6"	123.8	20.9	20.2	102.9	**95.3**	NA
8/3/2007	Grid 9 Lift 1	7	Comp	6"	125.4	25.4	25.3	100.0	**92.6**	NA
8/3/2007	Grid 9 Lift 1	8	Comp	6"	124.8	26.2	26.5	98.6	**91.3**	NA
8/3/2007	Grid 9 Lift 1	9	Comp	6"	127.1	25.4	24.9	101.7	**94.1**	NA
8/3/2007	Grid 9 Lift 1	10	Comp	6"	127.0	24.9	24.3	102.2	**94.6**	NA
8/3/2007	Grid 9 Lift 1	11	Comp	6"	126.6	22.5	21.5	104.1	**96.4**	NA
8/3/2007	Grid 10 Lift 1	1	Comp	6"	123.7	25.5	26.0	98.2	**90.9**	NA
8/3/2007	Grid 10 Lift 1	2	Comp	6"	129.3	21.5	19.9	107.8	**99.8**	NA
8/3/2007	Grid 10 Lift 1	3	Comp	6"	127.1	25.1	24.6	101.9	**94.4**	NA
8/3/2007	Grid 10 Lift 1	4	Comp	6"	120.7	23.1	23.6	97.7	**90.4**	NA
8/3/2007	Grid 10 Lift 1	5	Comp	6"	124.4	25.0	25.2	99.4	**92.0**	NA
8/3/2007	Grid 10 Lift 1	6	Comp	6"	127.3	26.4	26.1	100.9	**93.4**	NA
8/3/2007	Grid 10 Lift 1	Grid 10 Lift 1	Perm	6"	NA	NA	NA	NA	NA	**2.58 x 10^{-8}**
8/17/2007	Grid 11 Lift 1	6	Comp	6"	119.1	19.9	20.1	99.2	**91.8**	NA
8/17/2007	Grid 11 Lift 1	7	Comp	6"	118.4	21.6	22.3	97.8	**90.0**	NA
8/17/2007	Grid 11 Lift 1	8	Comp	6"	119.9	18.6	18.4	101.3	**93.8**	NA
8/17/2007	Grid 11 Lift 1	9	Comp	6"	127.5	23.5	22.5	104.0	**96.3**	NA
8/17/2007	Grid 11 Lift 1	10	Comp	6"	122.8	22.9	22.9	99.8	**92.4**	NA
8/17/2007	Grid 11 Lift 1	11	Comp	6"	122.8	21.4	21.0	101.4	**93.9**	NA
8/16/2007	Grid 12 Lift 1	23	Comp	6"	118.8	20.6	21.0	98.1	**90.8**	NA
8/16/2007	Grid 12 Lift 1	24	Comp	6"	126.1	23.2	22.5	102.9	**95.2**	NA
8/16/2007	Grid 12 Lift 1	25	Comp	6"	125.2	24.1	23.8	101.0	**93.6**	NA
8/16/2007	Grid 12 Lift 1	26	Comp	6"	124.2	21.7	21.1	102.5	**94.9**	NA
8/16/2007	Grid 12 Lift 1	27	Comp	6"	124.1	23.1	22.8	101.0	**93.5**	NA
8/16/2007	Grid 12 Lift 1	28	Comp	6"	121.4	24.5	25.2	97.0	**90.0**	NA
8/16/2007	Grid 12 Lift 1	29	Comp	6"	127.7	21.6	20.3	106.1	**98.2**	NA
8/16/2007	Grid 1 Lift 2	11	Comp	6"	115.4	18.2	18.7	97.2	**90.0**	NA
8/16/2007	Grid 1 Lift 2	12	Comp	6"	117.0	18.3	18.5	98.7	**91.4**	NA
8/16/2007	Grid 1 Lift 2	13	Comp	6"	121.7	21.0	20.8	100.7	**93.2**	NA
8/16/2007	Grid 1 Lift 2	17	Comp	6"	115.2	17.5	17.9	97.7	**90.4**	NA
8/16/2007	Grid 2 Lift 2	1	Comp	6"	120.0	21.9	22.3	98.1	**90.8**	NA
8/16/2007	Grid 2 Lift 2	2	Comp	6"	127.8	23.3	22.2	104.6	**96.8**	NA
8/16/2007	Grid 2 Lift 2	3	Comp	6"	122.6	22.6	22.6	100.0	**92.6**	NA
8/16/2007	Grid 2 Lift 2	4	Comp	6"	129.0	22.5	21.0	106.6	**98.6**	NA
8/16/2007	Grid 2 Lift 2	5	Comp	6"	128.3	24.9	24.0	103.5	**95.8**	NA
8/16/2007	Grid 2 Lift 2	6	Comp	6"	117.7	18.4	18.5	99.2	**91.9**	NA
8/16/2007	Grid 3 Lift 2	7	Comp	6"	124.5	22.0	21.4	102.5	**94.9**	NA
8/16/2007	Grid 3 Lift 2	8	Comp	6"	127.9	24.8	24.1	103.1	**95.4**	NA
8/16/2007	Grid 3 Lift 2	9	Comp	6"	119.2	20.2	20.3	99.0	**91.7**	NA
8/16/2007	Grid 3 Lift 2	10	Comp	6"	115.6	17.0	17.2	98.6	**91.3**	NA
8/16/2007	Grid 3 Lift 2	15	Comp	6"	124.5	23.4	23.2	101.0	**93.5**	NA
7/30/2007	Grid 3 Lift 2	Grid 3 Lift 2	Perm	6"	NA	NA	NA	NA	NA	**2.54 x 10^{-7}**
8/22/2007	Grid 4 Lift 2	4	Comp	6"	128.8	22.7	21.3	106.1	**98.2**	NA

CLAY CAP SAMPLING LOG: Phase III

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10 $^{-6}$)

Compaction **Permability**

Sample					*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
8/22/2007	Grid 4 Lift 2	5	Comp	6"	118.5	20.4	20.7	98.2	**90.9**	NA
8/22/2007	Grid 4 Lift 2	7	Comp	6"	128.1	21.4	20.0	106.7	**98.8**	NA
8/22/2007	Grid 4 Lift 2	8	Comp	6"	121.7	22.4	22.5	99.3	**92.0**	NA
8/22/2007	Grid 4 Lift 2	12	Comp	6"	119.6	22.4	23.3	97.0	**90.0**	NA
8/22/2007	Grid 5 Lift 2	2	Comp	6"	119.3	20.7	20.9	98.6	**91.3**	NA
8/22/2007	Grid 5 Lift 2	3	Comp	6"	127.4	23.1	22.1	104.3	**96.6**	NA
8/22/2007	Grid 5 Lift 2	9	Comp	6"	128.7	27.3	26.9	101.4	**94.0**	NA
8/22/2007	Grid 5 Lift 2	10	Comp	6"	130.2	23.5	21.9	106.8	**98.8**	NA
8/22/2007	Grid 5 Lift 2	11	Comp	6"	121.6	22.9	23.2	98.7	**91.3**	NA
8/13/2007	Grid 6 Lift 2	1	Comp	6"	129.2	26.5	25.8	102.7	**95.1**	NA
8/13/2007	Grid 6 Lift 2	2	Comp	6"	129.0	24.6	23.5	104.4	**96.6**	NA
8/13/2007	Grid 6 Lift 2	3	Comp	6"	130.8	24.8	23.3	106.0	**98.1**	NA
8/13/2007	Grid 6 Lift 2	4	Comp	6"	121.7	19.6	19.2	102.1	**94.5**	NA
8/13/2007	Grid 6 Lift 2	5	Comp	6"	120.4	20.6	20.6	99.8	**92.4**	NA
8/13/2007	Grid 6 Lift 2	6	Comp	6"	125.8	23.3	22.6	102.5	**94.9**	NA
8/9/2007	Grid 6 Lift 2	Grid 6 Lift 2	Perm	6"	NA	NA	NA	NA	NA	**1.95 x 10^{-7}**
8/13/2007	Grid 7 Lift 2	7	Comp	6"	123.8	26.1	26.6	97.7	**90.5**	NA
8/13/2007	Grid 7 Lift 2	8	Comp	6"	131.9	24.8	23.1	107.1	**99.2**	NA
8/13/2007	Grid 7 Lift 2	9	Comp	6"	124.7	23.7	23.5	100.9	**93.4**	NA
8/13/2007	Grid 7 Lift 2	10	Comp	6"	130.4	26.7	25.7	103.7	**96.0**	NA
8/13/2007	Grid 7 Lift 2	11	Comp	6"	129.2	24.9	23.8	104.3	**96.6**	NA
8/13/2007	Grid 7 Lift 2	12	Comp	6"	126.4	23.2	22.4	103.3	**95.6**	NA
8/16/2007	Grid 8 Lift 2	14	Comp	6"	128.1	28.8	29.0	99.3	**91.9**	NA
8/16/2007	Grid 8 Lift 2	18	Comp	6"	126.9	24.7	24.1	102.2	**94.6**	NA
8/16/2007	Grid 8 Lift 2	19	Comp	6"	126.3	23.6	23.0	102.6	**95.0**	NA
8/16/2007	Grid 8 Lift 2	20	Comp	6"	129.6	25.2	24.1	104.4	**96.6**	NA
8/16/2007	Grid 8 Lift 2	21	Comp	6"	128.4	21.6	20.2	106.8	**98.9**	NA
8/16/2007	Grid 8 Lift 2	22	Comp	6"	129.3	24.7	23.5	104.7	**96.9**	NA
8/17/2007	Grid 9 Lift 2	13	Comp	6"	122.4	22.6	22.6	99.8	**92.4**	NA
8/17/2007	Grid 9 Lift 2	14	Comp	6"	123.4	20.8	20.2	102.6	**95.0**	NA
8/17/2007	Grid 9 Lift 2	15	Comp	6"	124.2	19.9	19.0	104.3	**96.5**	NA
8/17/2007	Grid 9 Lift 2	16	Comp	6"	125.8	17.9	16.5	108.0	**100.0**	NA
8/17/2007	Grid 9 Lift 2	17	Comp	6"	125.6	21.0	20.0	104.6	**96.9**	NA
8/17/2007	Grid 9 Lift 2	18	Comp	6"	126.3	24.2	23.6	102.1	**94.5**	NA
8/13/2007	Grid 9 Lift 2	Grid 9 Lift 2	Perm	6"	NA	NA	NA	NA	NA	**4.32 x 10^{-7}**
8/17/2007	Grid 10 Lift 2	1	Comp	6"	124.1	20.5	19.8	103.6	**95.9**	NA
8/17/2007	Grid 10 Lift 2	2	Comp	6"	129.2	20.1	18.4	109.1	**101.0**	NA
8/17/2007	Grid 10 Lift 2	3	Comp	6"	122.7	21.8	21.6	100.9	**93.4**	NA
8/17/2007	Grid 10 Lift 2	4	Comp	6"	128.2	19.5	17.9	108.7	**100.6**	NA
8/17/2007	Grid 10 Lift 2	5	Comp	6"	124.1	18.2	17.1	105.9	**98.0**	NA
8/17/2007	Grid 10 Lift 2	12	Comp	6"	127.3	17.1	15.5	110.2	**102.0**	NA
8/20/2007	Grid 11 Lift 2	1	Comp	6"	123.7	21.8	21.3	102.0	**94.4**	NA
8/20/2007	Grid 11 Lift 2	2	Comp	6"	129.9	20.8	19.0	109.2	**101.1**	NA

CLAY CAP SAMPLING LOG: Phase III

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

Compaction **Permability**

Sample					*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
8/20/2007	Grid 11 Lift 2	3	Comp	6"	123.5	18.6	17.7	104.9	**97.1**	NA
8/20/2007	Grid 11 Lift 2	4	Comp	6"	119.9	16.9	16.4	102.9	**95.3**	NA
8/20/2007	Grid 11 Lift 2	5	Comp	6"	130.1	19.0	17.1	111.1	**102.8**	NA
8/20/2007	Grid 12 Lift 2	6	Comp	6"	126.5	19.6	18.3	106.9	**99.0**	NA
8/20/2007	Grid 12 Lift 2	7	Comp	6"	128.3	10.3	17.3	109.4	**101.3**	NA
8/20/2007	Grid 12 Lift 2	8	Comp	6"	127.8	22.6	21.4	105.2	**97.4**	NA
8/20/2007	Grid 12 Lift 2	9	Comp	6"	126.6	19.8	18.5	106.8	**98.9**	NA
8/20/2007	Grid 12 Lift 2	10	Comp	6"	129.2	18.1	16.2	111.1	**102.9**	NA
8/27/2007	Grid 1 Lift 3	12	Comp	6"	129.6	20.9	19.2	108.7	**100.6**	NA
8/27/2007	Grid 1 Lift 3	13	Comp	6"	127.4	22.9	21.9	104.5	**96.7**	NA
8/27/2007	Grid 1 Lift 3	14	Comp	6"	126.5	19.7	18.4	106.8	**98.9**	NA
8/27/2007	Grid 1 Lift 3	15	Comp	6"	131.6	22.0	20.0	109.7	**101.5**	NA
8/27/2007	Grid 1 Lift 3	16	Comp	6"	126.8	18.7	17.2	108.1	**100.1**	NA
8/27/2007	Grid 1 Lift 3	17	Comp	6"	131.0	20.8	18.9	110.2	**102.0**	NA
8/24/2007	Grid 2 Lift 3	1	Comp	6"	127.8	19.0	17.4	108.9	**100.8**	NA
8/24/2007	Grid 2 Lift 3	2	Comp	6"	131.9	21.5	19.4	110.4	**102.1**	NA
8/24/2007	Grid 2 Lift 3	3	Comp	6"	130.4	26.8	25.8	103.6	**95.9**	NA
8/24/2007	Grid 2 Lift 3	10	Comp	6"	132.0	20.9	18.8	111.0	**102.8**	NA
8/24/2007	Grid 2 Lift 3	11	Comp	6"	125.2	19.7	18.6	105.5	**97.7**	NA
8/24/2007	Grid 2 Lift 3	12	Comp	6"	119.2	22.1	24.0	96.1	**90.0**	NA
8/27/2007	Grid 3 Lift 3	6	Comp	6"	131.6	21.7	19.7	109.9	**101.7**	NA
8/27/2007	Grid 3 Lift 3	7	Comp	6"	125.3	22.1	21.3	103.2	**95.5**	NA
8/27/2007	Grid 3 Lift 3	8	Comp	6"	132.2	24.0	22.1	108.2	**100.1**	NA
8/27/2007	Grid 3 Lift 3	9	Comp	6"	127.2	18.4	16.8	108.8	**100.8**	NA
8/27/2007	Grid 3 Lift 3	10	Comp	6"	131.3	20.5	18.4	110.8	**102.5**	NA
8/27/2007	Grid 3 Lift 3	11	Comp	6"	125.5	21.8	20.9	103.8	**96.0**	NA
8/27/2007	Grid 3 Lift 3	Grid 3 Lift 3	Perm	6"	NA	NA	NA	NA	NA	**3.60×10^{-8}**
8/27/2007	Grid 4 Lift 3	18	Comp	6"	125.5	22.1	21.3	103.4	**95.7**	NA
8/27/2007	Grid 4 Lift 3	19	Comp	6"	124.4	26.4	26.9	97.9	**90.7**	NA
8/27/2007	Grid 4 Lift 3	20	Comp	6"	124.6	21.8	21.2	102.7	**95.1**	NA
8/27/2007	Grid 4 Lift 3	21	Comp	6"	128.9	24.2	23.1	104.6	**96.8**	NA
8/29/2007	Grid 4 Lift 3	14	Comp	6"	127.5	25.0	24.3	102.6	**94.9**	NA
8/29/2007	Grid 5 Lift 3	15	Comp	6"	123.6	26.4	27.1	97.3	**90.0**	NA
8/29/2007	Grid 5 Lift 3	16	Comp	6"	130.2	21.8	20.1	108.3	**100.3**	NA
8/29/2007	Grid 5 Lift 3	17	Comp	6"	121.8	20.6	20.3	101.2	**93.7**	NA
8/29/2007	Grid 5 Lift 3	18	Comp	6"	135.6	23.9	21.3	111.7	**103.4**	NA
8/29/2007	Grid 5 Lift 3	19	Comp	6"	131.8	23.6	21.8	108.2	**100.1**	NA
9/12/2007	3-3-G5-P1	3-3-G5-P1	Perm	6"	NA	NA	NA	NA	NA	**4.55×10^{-7}**
8/17/2007	Grid 6 Lift 3	19	Comp	6"	130.0	23.9	22.5	106.1	**98.2**	NA
8/17/2007	Grid 6 Lift 3	20	Comp	6"	123.2	19.5	18.8	103.7	**96.0**	NA
8/17/2007	Grid 6 Lift 3	21	Comp	6"	127.3	22.0	20.8	105.4	**97.5**	NA
8/17/2007	Grid 6 Lift 3	22	Comp	6"	127.1	21.2	20.0	105.9	**98.0**	NA
8/17/2007	Grid 6 Lift 3	23	Comp	6"	127.8	22.9	21.8	104.9	**97.1**	NA

CLAY CAP SAMPLING LOG: Phase III

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10 $^{-6}$)

Compaction **Permability**

Sample					*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
8/17/2007	Grid 6 Lift 3	24	Comp	6"	125.6	23.6	23.1	102.0	**94.4**	NA
8/22/2007	Grid 7 Lift 3	13	Comp	6"	122.8	22.8	22.7	100.0	**92.6**	NA
8/22/2007	Grid 7 Lift 3	14	Comp	6"	122.3	24.8	25.4	97.5	**90.2**	NA
8/22/2007	Grid 7 Lift 3	15	Comp	6"	123.4	24.8	25.4	97.5	**90.2**	NA
8/22/2007	Grid 7 Lift 3	16	Comp	6"	130.1	22.7	21.1	107.4	**99.0**	NA
8/22/2007	Grid 7 Lift 3	17	Comp	6"	133.8	21.8	19.4	112.0	**103.7**	NA
8/22/2007	Grid 7 Lift 3	18	Comp	6"	129.6	21.8	20.2	107.8	**99.8**	NA
8/24/2007	Grid 8 Lift 3	4	Comp	6"	124.2	24.3	24.3	99.9	**92.5**	NA
8/24/2007	Grid 8 Lift 3	5	Comp	6"	128.7	24.4	23.3	104.4	**96.6**	NA
8/24/2007	Grid 8 Lift 3	6	Comp	6"	129.0	21.1	19.5	107.9	**99.8**	NA
8/24/2007	Grid 8 Lift 3	7	Comp	6"	130.7	24.4	22.9	106.3	**98.4**	NA
8/24/2007	Grid 8 Lift 3	8	Comp	6"	124.5	23.8	23.5	100.8	**93.3**	NA
8/24/2007	Grid 8 Lift 3	9	Comp	6"	127.8	24.3	23.4	103.5	**95.8**	NA
8/29/2007	Grid 9 Lift 3	11	Comp	6"	129.2	23.3	22.0	105.9	**98.0**	NA
8/29/2007	Grid 9 Lift 3	12	Comp	6"	125.2	28.3	29.2	97.0	**90.0**	NA
8/29/2007	Grid 9 Lift 3	13	Comp	6"	131.0	24.7	23.3	106.2	**98.3**	NA
8/29/2007	Grid 9 Lift 3	20	Comp	6"	126.3	24.0	23.4	102.3	**94.7**	NA
8/30/2007	Grid 9 Lift 3	1	Comp	6"	125.6	21.1	20.2	104.4	**96.6**	NA
8/29/2007	Grid 10 Lift 3	6	Comp	6"	129.2	21.2	19.6	108.0	**100.0**	NA
8/29/2007	Grid 10 Lift 3	7	Comp	6"	123.3	26.6	27.4	96.8	**90.0**	NA
8/29/2007	Grid 10 Lift 3	8	Comp	6"	127.2	22.9	21.9	104.3	**96.6**	NA
8/29/2007	Grid 10 Lift 3	9	Comp	6"	136.0	24.0	21.4	112.0	**103.7**	NA
8/29/2007	Grid 10 Lift 3	10	Comp	6"	133.0	24.6	22.6	108.4	**100.4**	NA
8/30/2007	Grid 11 Lift 3	7	Comp	6"	130.2	21.2	19.5	109.0	**100.9**	NA
8/30/2007	Grid 11 Lift 3	8	Comp	6"	121.0	18.6	18.1	102.4	**94.8**	NA
8/30/2007	Grid 11 Lift 3	9	Comp	6"	123.4	22.8	22.6	100.6	**93.1**	NA
8/30/2007	Grid 11 Lift 3	10	Comp	6"	120.6	19.6	19.3	101.1	**93.5**	NA
8/30/2007	Grid 12 Lift 3	2	Comp	6"	126.1	21.2	20.2	104.4	**96.6**	NA
8/30/2007	Grid 12 Lift 3	3	Comp	6"	119.7	23.5	24.3	96.2	**90.0**	NA
8/30/2007	Grid 12 Lift 3	4	Comp	6"	118.3	17.0	16.8	101.2	**93.7**	NA
8/30/2007	Grid 12 Lift 3	5	Comp	6"	117.5	20.5	21.1	97.0	**90.0**	NA
8/30/2007	Grid 12 Lift 3	6	Comp	6"	122.9	24.1	24.4	98.8	**91.4**	NA
9/12/2007	3-3-G12-P1	3-3-G12-P1	Perm	6"	NA	NA	NA	NA	NA	**1.66 x 10^{-7}**
8/27/2007	Lift 1	1	Comp	6"	132.2	22.1	20.1	110.1	**101.9**	NA
8/27/2007	Lift 1	2	Comp	6"	125.3	22.8	22.2	102.5	**94.9**	NA
8/27/2007	Lift 1	3	Comp	6"	128.0	20.3	18.8	107.8	**99.8**	NA
8/27/2007	Lift 1	4	Comp	6"	125.4	21.5	20.6	104.0	**96.2**	NA
8/27/2007	Lift 1	5	Comp	6"	128.8	21.9	20.4	107.0	**99.8**	NA
8/29/2007	Lift 2	1	Comp	6"	125.6	20.0	18.9	105.6	**97.7**	NA
8/29/2007	Lift 2	2	Comp	6"	120.8	24.5	25.4	97.0	**90.0**	NA
8/29/2007	Lift 2	3	Comp	6"	125.2	22.7	22.1	102.5	**94.9**	NA
8/29/2007	Lift 2	4	Comp	6"	122.4	24.0	24.4	98.3	**91.0**	NA
8/29/2007	Lift 2	5	Comp	6"	129.2	21.2	19.6	108.0	**100.0**	NA

CLAY CAP SAMPLING LOG: Phase III

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10 $^{-6}$)

Compaction **Permability**

Sample					*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
8/30/2007	Lift 3	11	Comp	6"	121.1	21.2	21.2	99.9	**92.4**	NA
8/30/2007	Lift 3	12	Comp	6"	120.8	22.5	22.9	98.3	**91.0**	NA
8/30/2007	Lift 3	13	Comp	6"	119.1	19.7	19.7	99.4	**92.0**	NA
8/30/2007	Lift 3	14	Comp	6"	122.1	22.9	23.0	99.2	**91.9**	NA
8/30/2007	Lift 3	15	Comp	6"	120.7	24.0	24.7	96.8	**90.0**	NA

CLAY CAP SAMPLING LOG: MOD 6

5 Compaction Samples Per Acre (>90%) & 1 Permeability Sample Per Five Acres (Max 1.0 x 10^{-6})

Compaction **Permability**

Sample					*Results*					
Date	**Location**	**#**	**Type**	**Depth**	**Wet Density**	**Moisture**	**Moisture Content %**	**Dry Unit Weight**	**% Compaction**	**Permeability**
12/5/2007	G5-L1	1	Comp	4"	126.6	24.7	24.2	101.9	**94.4**	NA
12/5/2007	G5-L1	2	Comp	4"	117.9	27.4	30.2	90.5	**83.8**	NA
12/5/2007	G5-L1	3	Comp	4"	135.4	26.3	24.1	109.1	**100.0**	NA
12/5/2007	G5-L1	4	Comp	4"	134.2	25.1	23.0	109.0	**100.0**	NA
12/5/2007	G5-L1	5	Comp	4"	134.3	26.3	24.3	108.0	**100.0**	NA
12/5/2007	G5-L1	6 (Retest #2)	Comp	4"	131.2	26.8	25.6	104.4	**96.7**	NA
12/5/2007	G4-L1	7	Comp	4"	124.5	24.1	24.0	100.4	**93.0**	NA
12/5/2007	G4-L1	8	Comp	4"	129.9	22.8	21.3	107.1	**99.2**	NA
12/5/2007	G4-L1	9	Comp	4"	132.5	24.0	22.1	108.6	**100.0**	NA
12/5/2007	G4-L1	10	Comp	4"	128.9	25.2	24.2	103.7	**96.0**	NA
12/5/2007	G4-L1	11	Comp	4"	132.1	24.6	27.8	107.5	**99.5**	NA
12/5/2007	G4-L1	Mod 6 Lift I	Perm	NA	NA	NA	NA	NA	NA	**7.75×10^{-7}**
12/6/2007	G5-L2	1	Comp	4"	125.8	27.4	27.8	98.4	**91.1**	NA
12/6/2007	G5-L2	2	Comp	4"	124.8	27.5	28.2	97.3	**90.1**	NA
12/6/2007	G5-L2	3	Comp	4"	132.1	22.6	20.6	109.5	**100.0**	NA
12/6/2007	G5-L2	4	Comp	4"	121.4	22.5	22.6	99.0	**91.7**	NA
12/6/2007	G5-L2	5	Comp	4"	127.3	24.4	23.2	104.9	**97.1**	NA
12/6/2007	G4-L2	6	Comp	4"	129.0	27.4	27.0	101.6	**94.1**	NA
12/6/2007	G4-L2	7	Comp	4"	127.5	23.4	22.4	104.1	**96.4**	NA
12/6/2007	G4-L2	8	Comp	4"	122.1	23.7	24.0	98.4	**91.1**	NA
12/6/2007	G4-L2	9	Comp	4"	123.0	18.2	17.3	104.8	**97.0**	NA
12/6/2007	G4-L2	10	Comp	4"	128.6	23.0	21.7	105.7	**97.9**	NA
12/6/2007	G5-L2	Mod 6 Lift II	Perm	NA	NA	NA	NA	NA	NA	**7.60×10^{-7}**
12/10/2007	G5-L3	1	Comp	4"	128.3	24.7	23.7	103.7	**96.0**	NA
12/10/2007	G5-L3	2	Comp	4"	124.8	23.6	23.3	101.2	**93.7**	NA
12/10/2007	G5-L3	3	Comp	4"	122.3	21.8	21.7	100.5	**93.1**	NA
12/10/2007	G5-L3	4	Comp	4"	122.1	24.2	24.7	97.9	**90.6**	NA
12/10/2007	G5-L3	5	Comp	4"	119.8	21.6	22.0	98.2	**90.9**	NA
12/10/2007	G4-L3	6	Comp	4"	126.5	25.6	25.4	100.9	**93.4**	NA
12/10/2007	G4-L3	7	Comp	4"	125.8	22.4	21.6	103.4	**95.7**	NA
12/10/2007	G4-L3	8	Comp	4"	125.7	22.3	21.6	103.4	**95.7**	NA
12/10/2007	G4-L3	9 (Retest #8)	Comp	4"	124.7	22.7	22.2	102.0	**94.4**	NA
12/10/2007	G4-L3	10	Comp	4"	127.7	23.1	22.1	104.6	**96.9**	NA
12/10/2007	G4-L3	11	Comp	4"	127.7	22.6	21.4	105.1	**97.3**	NA
12/10/2007	G3-L3	12	Comp	4"	124.4	24.4	24.4	100.0	**92.6**	NA
12/10/2007	G3-L3	13	Comp	4"	121.8	24.4	25.0	97.4	**90.2**	NA
12/10/2007	G3-L3	14	Comp	4"	115.5	24.6	27.0	90.9	**84.2**	NA
12/10/2007	G3-L3	15	Comp	4"	124.5	22.7	22.3	101.8	**94.3**	NA
12/10/2007	G3-L3	16	Comp	4"	120.7	22.1	22.3	98.7	**91.4**	NA
12/10/2007	G3-L3	17 (Retest #14)	Comp	4"	121.9	23.1	23.3	98.8	**91.5**	NA
12/10/2007	G3-L3	Mod 6 Lift III	Perm	NA	NA	NA	NA	NA	NA	**2.50×10^{-6}**

JACA & SIERRA TESTING LABORATORIES

SOIL CONSULTING ENGINEERS

Soil and Material Testing Laboratories
Earthwork Supervision
Large Diameter Drilling
Monitoring Wells
Water Wells

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Fax: (787) 748-6970

March 29, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra Personnel (Shelby Tube)
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM C 803)

Test No.	Hydraulic Conductivity (cm/sec)	Sample ID
1	3.9×10^{-7}	3.27.07 Grid 2 LF1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Carlos R. Sierra MS, PE

JACA & SIERRA TESTING LABORATORIES
SOIL CONSULTING ENGINEERS

Soil and Material Testing Laboratories
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April 11, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Client
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM C 803)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	7.21×10^{-8}	4.10.07 Grid 10 LF 1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.

JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

May 22, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	1.08×10^{-6}	5-17-07 G-4 P-1
2	2.13×10^{-7}	5-17-07 G-10 P-1
3	4.59×10^{-7}	5-17-07 G-11 P-1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboartory Enginner

PO Box 363116, San Juan, PR 00936-3116
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Geotechnical Engineers

May 25, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	1.28×10^{-8}	2-1-G2-P1
2	9.05×10^{-8}	2-1-G7-P1
3	4.45×10^{-7}	G4-P1-B

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
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Geotechnical Engineers

June 18, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	7.68×10^{-7}	1-3-G14-P1
2	1.82×10^{-6}	2-1-G16-P1
3	1.01×10^{-6}	2-2-G3-P1
4	7.84×10^{-7}	2-2-G6-P1

← PHASE 1
LIFT 3

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

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Edwin Gutierrez Torres, E.I.T.

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JACA & SIERRA
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June 25, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	2.10×10^{-6}	2-2-G16-P2
2	4.79×10^{-8}	1-3-G4-P1

← PHASE 1
LIFT 3

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
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June 28, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	8.40×10^{-7}	1-3-G10-P1
2	4.32×10^{-7}	2-2-G3-P2
3	4.91×10^{-7}	2-2-G11-P1

← PHASE 1
LIFT 3

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
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May 25, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
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VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	1.28×10^{-8}	2-1-G2-P1
2	9.05×10^{-8}	2-1-G7-P1
3	4.45×10^{-7}	G4-P1-B

PHASE 2
LIFT 1

Respectfully submitted,
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June 4, 2007

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VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	2.06×10^{-7}	2-1-G13-P1

← PHASE 2
LIFT 1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

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July 05, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	4.66×10^{-7}	2-3-G7-P1
2	7.96×10^{-7}	2-3-G2-P1
3	1.30×10^{-8}	2-3-G10-P1
4	1.30×10^{-8}	2-3-G12-P1
5	1.58×10^{-7}	2-1-G16-P3 ← PHASE 2 LIFT 1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES
Edwin Gutierrez
Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

June 18, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	7.68×10^{-7}	1-3-G14-P1
2	1.82×10^{-6}	2-1-G16-P1
3	1.01×10^{-6}	* 2-2-G3-P1
4	7.84×10^{-7}	2-2-G6-P1

PHASE 2
LIFT 2

* RETESTED ON 6/28

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez
Edwin Gutierrez Torres, E.I.T.

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JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

June 28, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	8.40×10^{-7}	1-3-G10-P1
2	4.32×10^{-7}	2-2-G3-P2
3	4.91×10^{-7}	2-2-G11-P1

PHASE 2
LIFT 2

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

July 05, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	4.66×10^{-7}	2-3-G7-P1
2	7.96×10^{-7}	2-3-G2-P1
3	1.30×10^{-8}	2-3-G10-P1
4	1.30×10^{-8}	2-3-G12-P1
5	1.58×10^{-7}	2-1-G16-P3

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

July 17, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	1.06×10^{-6}	3-1-G2-P1 Re-tested as 3-1-G2-P2
2	2.08×10^{-7}	3-1-G1-P1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 03, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	1.12×10^{-7}	3-1-G6-P1
2	2.54×10^{-7}	3-2-G3-P1 Result for a Lift II Sample

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 06, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	2.79×10^{-7}	3-1-G2-P2 Re-test Result
2	2.58×10^{-8}	3-1-G10-P1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
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Geotechnical Engineers

August 03, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
5700 THURSTON AVE. SUITE 116 B
VIRGINIA BEACH, VA 23455

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	1.12×10^{-7}	3-1-G6-P1
2	2.54×10^{-7}	3-2-G3-P1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 15, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
Attn: Mr. Steven J. Jackson, P.A.
2790 Mosside Blvd.
Monroeville, PA 15146

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	1.95×10^{-7}	3-2-G6-P1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 15, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
Attn: Mr. Steven J. Jackson, P.A.
2790 Mosside Blvd.
Monroeville, PA 15146

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	4.32×10^{-7}	3-2-G9-P1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

August 30, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
Attn: Mr. Steven J. Jackson, P.A.
2790 Mosside Blvd.
Monroeville, PA 15146

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	3.60×10^{-8}	3-3-G3-P2

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA
Testing Laboratories, Inc.
Geotechnical Engineers

September 17, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
Attn: Mr. Steven J. Jackson, P.A.
2790 Mosside Blvd.
Monroeville, PA 15146

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. **Hydraulic Conductivity Test Results (ASTM D 5084)**

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	4.55×10^{-7}	3-3-G5-P1
2	1.66×10^{-7}	3-3-G12-P1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

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JACA & SIERRA TESTING LABORATORIES
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Soil and Material Testing Laboratories
Earthwork Supervision
Large Diameter Drilling
Monitoring Wells
Water Wells

P.O. Box 363116 San Juan, Puerto Rico
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December 7, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
Attn: Mr. Steven J. Jackson, P.A.
2790 Mosside Blvd.
Monroeville, PA 15146

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	7.75×10^{-7}	Mod 7-G4-L1

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

JACA & SIERRA TESTING LABORATORIES
SOIL CONSULTING ENGINEERS

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(787) 761-2668
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December 10, 2007

SHAW ENVIRONMENTAL & INFRASTRUCTURE, INC.
Attn: Mr. Steven J. Jackson, P.A.
2790 Mosside Blvd.
Monroeville, PA 15146

SUBJECT : MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS

Project	:	Landfill Closure Roosevelt Roads Ceiba, Puerto Rico
Sample Secured and Transported by	:	Jaca & Sierra
Location of Sample	:	Project Site
Standard Test Methods Used	:	ASTM D 5084

Tests Results

A. Hydraulic Conductivity Test Results (ASTM D 5084)

Test No.	Hydraulic Conductivity (cm/seg)	Sample ID
1	7.60×10^{-7}	Area 1 Lift II
2	2.50×10^{-8}	Area 1 Lift III

Respectfully submitted,
JACA & SIERRA TESTING LABORATORIES

Edwin Gutierrez Torres, E.I.T.
Laboratory Engineer

Appendix D
NPDES Notice of Termination Acceptance Letter

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
STORMWATER NOTICE OF INTENT PROCESSING CENTER

02/25/2008

OPERATOR:

SHAW ENVIRONMENTAL INC.
ATTN: P. TAYLOR SWORD
500 E. MAIN ST. SUITE 1630
NORFOLK, VA 23510

FACILITY:

NAPR LANDFILL CLOSURE
NAPR, NAVAL STATION ROOSEVELT ROADS
CEIBA, PR 00735

TRACKING NUMBER: PRR10BC51

Dear Operator:

Thank you for submitting your Notice of Termination (NOT) form terminating coverage under EPA's NPDES Stormwater Construction General Permit (CGP). The coverage for the facility listed above, which began on 11/07/2006, has been terminated effective midnight 02/14/2008. By submission of this NOT form, you are certifying that you have reviewed the terms and conditions of EPA's Construction General Permit and have determined that the facility no longer requires coverage.

If you have questions concerning the stormwater program, please call:

Region 2

Sergio Bosques (787) 977-5838

Next time, please use the EPA's electronic Notice of Intent (eNOI) system (http://www.epa.gov/npdes/enoi). It is easy to use and faster than submitting a paper form. You can terminate (NOT) this NOI by using the eNOI system.

If you have questions about your form, please call the EPA NOI Processing Center at 1-866-352-7755 (toll free) or send an inquiry via the online form at http:///www.epa.gov/npdes/noicontact.

EPA NOI Processing Center
Operated by Avanti Corporation
1200 Pennsylvania Ave., NW
Mail Code: 4203M
Washington, DC 20460
1-866-352-7755