GEO-TEST

GEOTECHNICAL ENGINEERING SERVICES
JOB NO. 1-50405
TIERRA CONTENTA PHASE 3
SPINE INFRASTRUCTURE
SANTA FE, NEW MEXICO

PREPARED FOR

DESIGN ENGINUITY

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June 29, 2015
Job No.1-50405

Design Enginuity, LLC
P.O. Box 2758
Santa Fe, New Mexico 87506

ATTN: **Ms. Oralynn Guerrerortiz**

RE: **Geotechnical Engineering Services**
Tierra Contenta, Phase 3
Spine Infrastructure
Santa Fe, New Mexico

Dear Ms. Guerrerortiz:

Submitted herein is the Geotechnical Engineering Services Report for the above referenced project. The report contains the results of our field investigation, laboratory testing, and recommendations for the pavement section, as well as criteria for general site grading.

It has been a pleasure to serve you on this project. If you should have any questions, please contact this office.

Respectfully submitted:

GEO-TEST, INC.

Timothy Matson, Geologist

Reviewed by:

Robert D Booth, P

ROBERT D. BOOTH NEW MEXICO 5711 LICENSED PROFESSIONAL ENGINEER

cc: Addressee (3)

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TABLE OF CONTENTS

INTRODUCTION 1

PROPOSED CONSTRUCTION 1

FIELD EXPLORATION 1

LABORATORY TESTING 2

SUBSURFACE SOIL CONDITIONS 2

CONCLUSIONS AND RECOMMENDATIONS 2

PAVEMENT DESIGN 3

PAVING MATERIALS 3

SITE-GRADING 4

MOISTURE PROTECTION 5

CONSTRUCTION EXCAVATIONS 5

REVIEW AND INSPECTION 5

CLOSURE 6

BORING LOCATION MAP 7

BORING LOGS 8

SUMMARY OF LABORATORY RESULTS 25

GRAIN SIZE DISTRIBUTION 27

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INTRODUCTION

This report presents the results of a geotechnical investigation performed by this firm for the proposed roadway construction and infrastructure for Tierra Contenta, Phase 3 in Santa Fe, New Mexico.

The objective of this investigation is to:

1) Evaluate the nature and engineering properties of the subsurface soils underlying the proposed roadway and sewer line alignment.

2) To provide recommendations for the necessary earthwork during construction of the proposed roadways and infrastructure including temporary slopes during trenching and pavement section design.

The investigation includes subsurface exploration, selected soil sampling, laboratory testing of the samples, performing an engineering analysis and preparation of this report.

PROPOSED CONSTRUCTION

It is understood that the project consists of the construction of approximately 5,810 linear feet of new roadway and will run from the east terminus of Herrera Drive west to Jaguar Drive. The sewer line will be about 2,400 feet long. Traffic data has not been provided, however, the roadways will serve a residential subdivision.

Should structural loads or other project details vary significantly from those outlined above, this firm should be notified for review and possible revision of recommendations contained herein.

FIELD EXPLORATION

Seventeen (17) exploratory borings were drilled along the proposed roadways to depths ranging from approximately 4½ to 11 feet below existing site grades. The approximate locations of the borings are as shown on the Boring Location Map, Figure 1. The soils encountered in the borings were continuously examined, visually classified and logged during the drilling operation. The boring logs are presented in a following section of this report. Drilling was accomplished using a truck mounted drill rig equipped with 5.5-inch diameter continuous flight hollow stem auger. Subsurface materials were sampled at five-foot intervals or less in the borings utilizing an open

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tube split barrel sampler driven by a standard penetration test hammer. Grab samples of the auger cuttings were taken at various intervals.

LABORATORY TESTING

Selected samples were tested in the laboratory to determine certain engineering properties of the soils. Moisture contents were determined to evaluate the various soil deposits with depth. The results of these tests are shown on the boring logs.

Sieve analysis and Atterberg limits tests were performed to aid in soil classification and R-value correlation. The results of these tests are presented in the Summary of Laboratory Results presented in a following section of this report.

SUBSURFACE SOIL CONDITIONS

The soils encountered at the boring locations consisted primarily of interbedded sandy clays with various amounts of gravel, clayey sands with gravel, silty sands with gravel and clayey/silty gravels with sand to full depth explored. These soils range from firm and dense to hard and very dense and are generally low to medium in plasticity.

No free groundwater was encountered and soil moisture contents were relatively low throughout the extent of the borings.

CONCLUSIONS AND RECOMMENDATIONS

According to the Unified Soil Classification System (USCS), the upper 5 feet of the existing subgrade soils consist primarily of Sandy Clays with various amounts of gravel (CL), Clayey Sands with various amounts of gravel (SC), Clayey Gravel with Sand (GC), Silty Gravel with Sand (GM) and classify as A-6, A-2-6, A-2-4 and A-7, according to the American Association of State Highway and Transportation Officials (AASHTO) soil classification system

Correlated R-values were determined in accordance with NMDOT procedures for the samples taken from the upper 4.5 feet which indicate that the soils possess R-values ranging from 55 to 6 with an average R-value of about 14. Based on the above, and the fact that most of the estimated R-values were between 11 and 9, a design R-value of 10 was selected for pavement design.

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PAVEMENT DESIGN

Pavement design and analysis was performed in general conformance the procedures outlined in the latest edition of the "Guide for Design of Pavement Structures" by the American Association of State Highway and Transportation and the "Structural Design Guide for Flexible Pavements", Bulletin 102, by the New Mexico Department of Transportation. A Serviceability Index of 2.0, a Regional Factor of 1.6 (Santa Fe County), and a 10 year Pavement Design Life was used in the analysis. Using the above parameters, along with an estimated Equivalent Daily 18 Kip Axle load application of 5, and a Soil Support Value of 3.0 (estimated R Value of 10), a Weighed Structural Number of 2.40 was determined.

Based on the above, the following pavement section is recommended for consideration.

Description	Depth
Hot-Mix Asphalt (HMA) Pavement	3.0"
Aggregate Base Course	10.0"
Compacted Subgrade	12.0"

The pavement section applies to moderate automobile traffic with only occasional heavy vehicles, including delivery trucks, busses, and trash collection trucks. If heavier traffic is anticipated, the Hot-Mix Asphalt section should be thickened by 1 inch.

PAVING MATERIALS

All paving materials, quality and construction, should conform to Section 423 of the current New Mexico Department of Transportation Standard Specifications for Road and Bridge Construction. The HMA should be SPIII or SPIV, compacted to a minimum of 92 to 96 percent of the theoretical maximum density. The Performance Graded (PG) asphalt binder used should be based on the NMDOT's Pavement Type Selection and Design Guideline.

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SITE-GRADING

The following general guidelines should be included in the project construction specifications to provide a basis for quality control during site grading. It is recommended that all structural fill and backfill be placed and compacted under engineering observation and in accordance with the following:

1) After site stripping, clearing, and grubbing, and making any required excavations, the exposed native soils in cut areas as well as areas to receive fill should be densified prior placement of structural fill or base course.

2) Densification of the exposed native soils should consist of scarifying to a depth of 12 inches, moisture conditioning to near optimum moisture content and compacting the area to a minimum of 95 percent of maximum dry density as determined in accordance with AASHTO T-180, or in accordance with project specifications, local requirements or governing jurisdiction.

3) The results of this investigation indicate that the native soils will be suitable for structural fill. All structural fill or backfill material should be free of vegetation and debris and contain no rocks larger than 3 inches. When the roadway is close to final subgrade elevations, samples of the subgrade soils should be taken to verify design R-values.

4) Fill or backfill, as well as the base course, shall be placed in 8-inch loose lifts and compacted with approved compaction equipment. Lifts should be reduced to 4-inch loose lifts if hand held compaction equipment is used. All compaction of fill, backfill or base course shall be accomplished to a minimum of 95 percent of the maximum dry density as determined in accordance with AASHTO T-180 and the moisture content of the fill or backfill, during compaction, should be within 2 percent of the optimum moisture content, or in accordance with project specifications, local requirements or governing jurisdiction

5) Tests for degree of compaction should be determined by the ASTM D-1556 method or ASTM D-6938. Observation and field tests should be conducted during fill and backfill placement by the geotechnical engineer to assist the contractor in evaluating the required degree of compaction. If less than 95 percent is indicated, additional

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compaction effort should be made with adjustment of the moisture content as necessary until 95 percent compaction is obtained.

MOISTURE PROTECTION

All paved areas should be graded to drain and not allow any ponding on the surface of the paved areas. Positive drainage should also be provided away from the perimeter of all paved areas for a distance of at least 10 feet. Where possible, off site drainage should be routed around and not be allowed to enter the roadway.

CONSTRUCTION EXCAVATIONS

The results of this investigation indicate that the surficial soils encountered in the borings can be readily excavated using normal earth moving and excavation equipment. In addition, most of the excavated soils will be suitable for use as backfill above pipe embedment materials.

Excavated slopes for utility construction should be designed and constructed in accordance with 29 CFR 1926, Subpart P, and any applicable state or local regulations. Temporary cut slopes should not exceed 1.5 horizontal to 1 vertical. Shoring, bracing or benching should be performed by the contractor for in accordance with the strictest governing safety standards.

Bedding and pipe embedment materials to be used around underground utilities should be well graded sand or gravel conforming to the pipe manufacturer's recommendations and should be placed and compacted in accordance with project specifications, local requirements or governing jurisdiction. General fill to be used above pipe embedment materials should be placed and compacted in accordance with the plans and specifications. On-site soils may be used as general fill above pipe embedment materials provided they meet the requirements. Water jetting of trench backfill should not be allowed.

REVIEW AND INSPECTION

This report has been prepared to aid in the evaluation of this site and to assist in the design of this project. It is recommended that the geotechnical engineer be provided the opportunity to review the final design drawings and specifications in order to evaluate whether the recommendations in this report are applicable to the final design. Review of the final design drawings and specifications should be noted in writing by the geotechnical engineer.

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Variations from soil conditions presented herein may be encountered during construction of this project. In order to permit correlation between the conditions encountered during construction and to confirm recommendations presented herein, it is recommended that the geotechnical engineer be retained to perform sufficient review during construction of this project. Observation and testing should be performed during construction to confirm that suitable fill soils are placed upon competent materials and properly compacted and foundation elements penetrate the recommended soils.

CLOSURE

Our conclusions, recommendations and opinions presented herein are:

1) Based upon our evaluation and interpretation of the findings of the field and laboratory program.

2) Based upon an interpolation of soil conditions between and beyond the explorations.

3) Subject to confirmation of the conditions encountered during construction.

4) Based upon the assumption that sufficient observation will be provided during construction.

5) Prepared in accordance with generally accepted professional geotechnical engineering principles and practice.

This report has been prepared for the sole use of, Design Enginuity specifically to aid in the design of the Tierra Contenta, Phase 3, infrastructure in Santa Fe, New Mexico, and not for the use by any third parties.

We make no other warranty, either express or implied. Any person using this report for bidding or construction purposes should perform such independent investigation as he deems necessary to satisfy himself as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project. If conditions encountered during construction appear to be different than indicated by this report, this office should be notified. All soil samples will be discarded 60 days after the date of this report unless we receive a specific request to retain the samples for a longer period of time.

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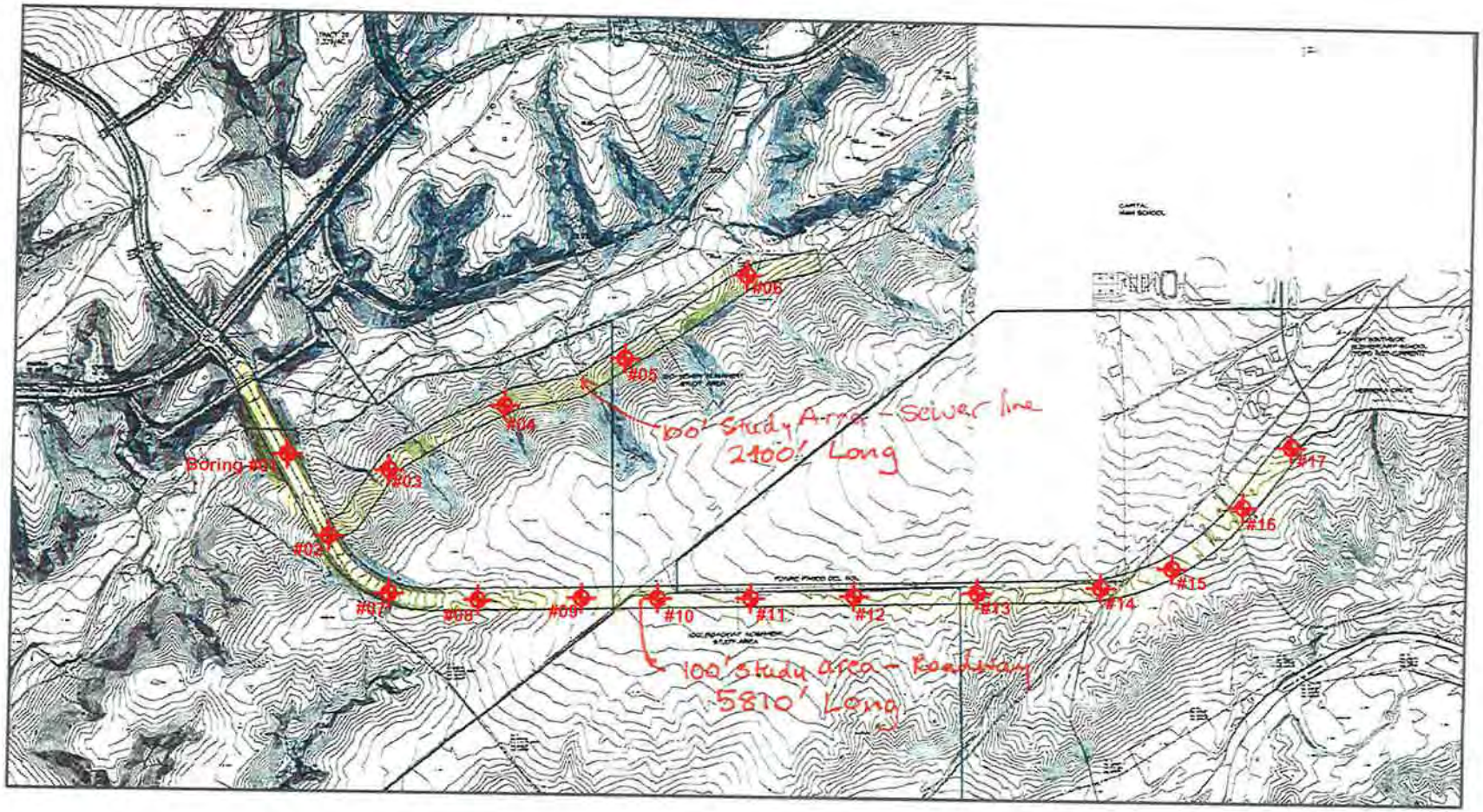
BORING LOCATION MAP



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Tierra Contenta, Phase III
Spine Infrastructuer
Santa Fe, New Mexico
Job No. 1-50405

Figure 1

GEO-TEST
GEOTECHNICAL ENGINEERING
AND MATERIAL TESTING
SANTA FE – ALBUQUERQUE – LAS CRUCES

GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/03/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 01

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION
			SS	14-19-25 44	6		SC	CLAYEY SAND WITH GRAVEL, fine to medium grained, some sand, low plastitiy, very dense, slightly moist, brown
5			SS	16-19-26 45	5		GC	CLAYEY GRAVEL WITH SAND, fine to coarse grained, occasional cobbles, low plasticity, very dense, slightly moist, brown
10			SS	18-23-30 53	4			STOPPED AUGER AT 9.5' STOPPED SAMPLER AT 11' EMBANKMENT FILL
15								

N blows/ft: 20 40 60 80

44 45 53

LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/03/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 02

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	SAMPLE TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft (20 40 60 80)
					7				
			AC						
5					5		SC-SM	SILTY, CLAYEY SAND WITH GRAVEL, fine to medium grained, some coarse sand, low plasticity, moist to slightly moist, brown	
			AC						
10								STOPPED AUGER AT 9.5'	
15									

LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
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GEO-TEST

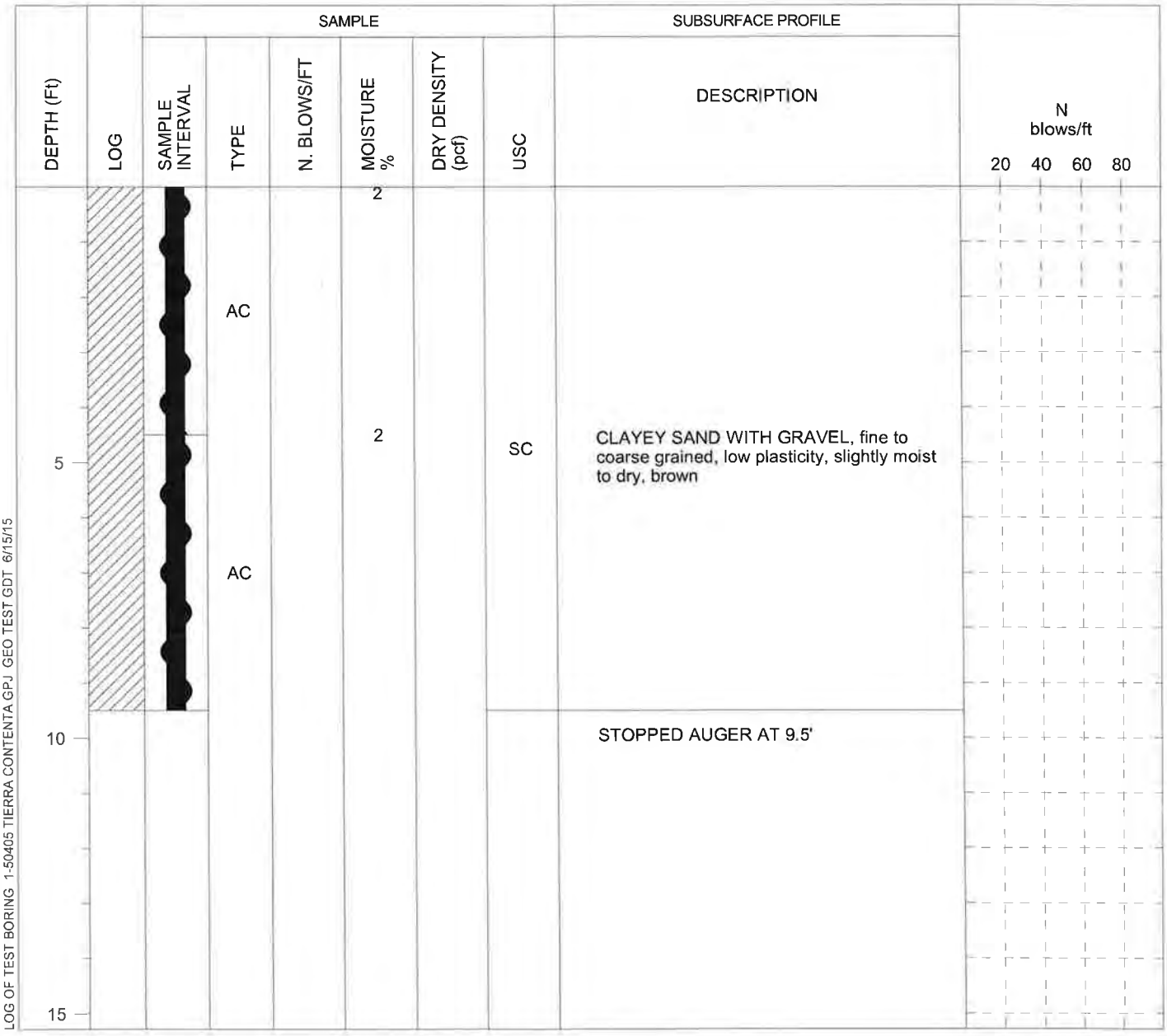
Project: Tierra Contenta, Phase III
Date: 06/03/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 03

During Drilling: None After 24 Hours:



LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
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GEO-TEST

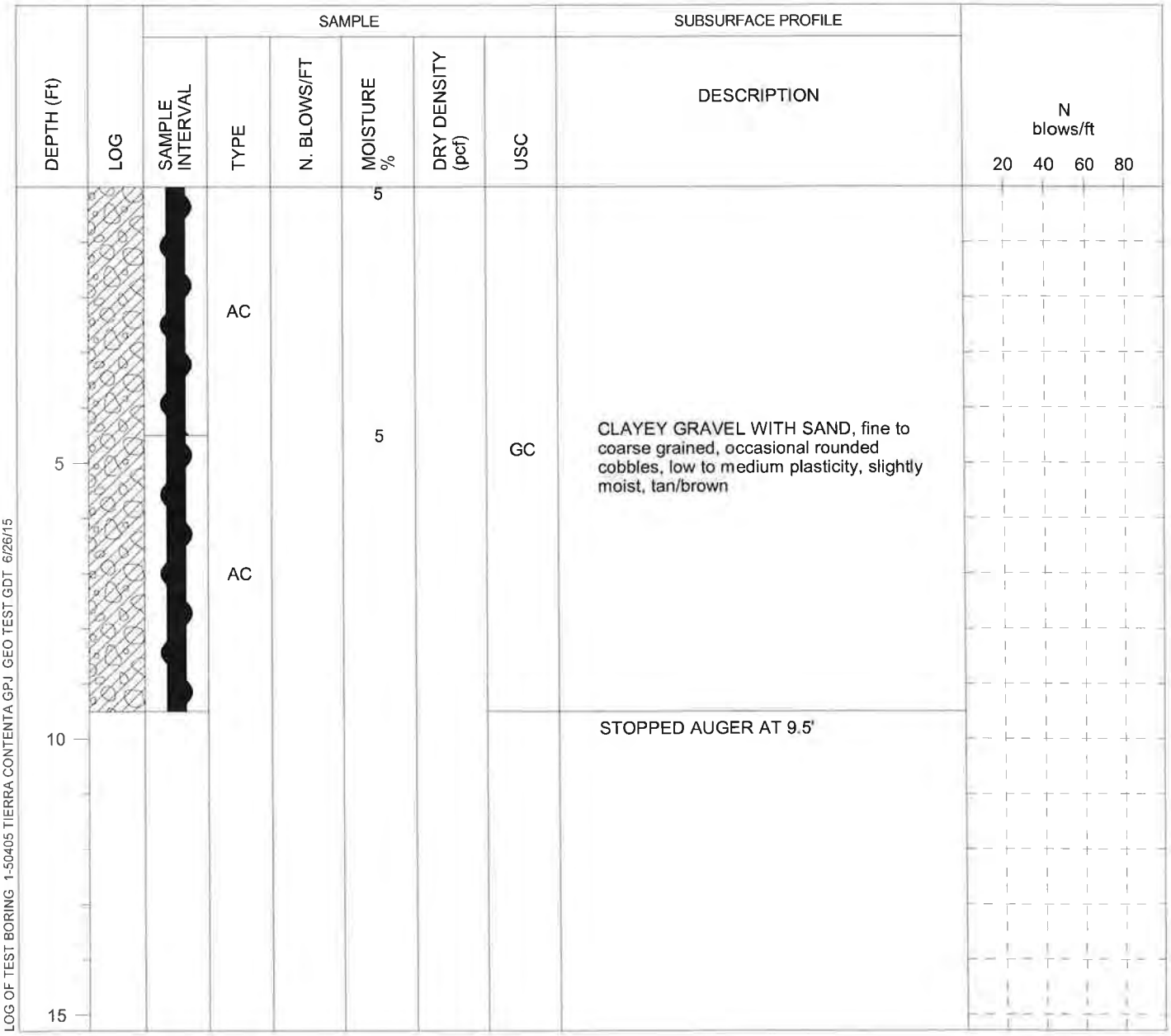
Project: Tierra Contenta, Phase III
Date: 06/03/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 04

During Drilling: None After 24 Hours:



LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/26/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
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Project: Tierra Contenta, Phase III
Date: 06/03/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 05

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	SAMPLE TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION
			AC		7		CL	SANDY CLAY, fine grained, some gravel, medium plasticity, slightly moist, tan/brown
5			AC		5		CL	SANDY CLAY WITH GRAVEL, fine to medium grained, medium plasticity, slightly moist, tan/brown
10								STOPPED AUGER AT 9.5'
15								

N blows/ft: 20 40 60 80

LOG OF TEST BORING 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

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GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/03/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 06

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
					3				
			AC						
					3		SC	CLAYEY SAND WITH GRAVEL, fine to medium grained, low plasticity, slightly moist to dry, tan/brown	
5			AC						
10								STOPPED AUGER AT 9.5'	
15									

LOG OF TEST BORING 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
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GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/03/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 07

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
					3				
			AC				GM	SILTY GRAVEL WITH SAND, fine to coarse grained, non-plastic, dense, slightly moist, brown	
5								STOPPED AUGER AT 4.5'	
10									
15									

LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
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Project: Tierra Contenta, Phase III
Date: 06/03/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 08

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
			AC		7		CL	SANDY CLAY, fine grained, some gravel, medium plasticity, slightly moist, tan/brown	
5			AC		5		CL	SANDY CLAY WITH GRAVEL, fine to medium grained, low to medium plasticity, slightly moist to dry, tan/brown	
10								STOPPED AUGER AT 9.5'	
15									

LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
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GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/04/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 09

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION
			SS	10-12-15 27	6			
5			SS	13-15-18 33	7		CL	CLAY WITH SAND, medium plasticity, firm to hard, slightly moist, tan/brown
10			SS	9-14-16 30	7			
15								STOPPED AUGER AT 9.5' STOPPED SAMPLER AT 11'

N blows/ft
20 40 60 80
27
33
30

LOG OF TEST BORING 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
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Project: Tierra Contenta, Phase III
Date: 06/04/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 10

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
					7				
5			AC				CL	SANDY CLAY, some gravel , slightly cemented, low plasticity, slightly moist, tan	
10								STOPPED AUGER AT 9.5'	
15									

LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/04/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 11

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	SAMPLE TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft (20 40 60 80)
					10				
5			AC				CL	CLAY WITH SAND, some gravel, medium plasticity, slightly moist to moist, tan	
10								STOPPED AUGER AT 9.5'	
15									

LOG OF TEST BORING 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
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GEO-TEST

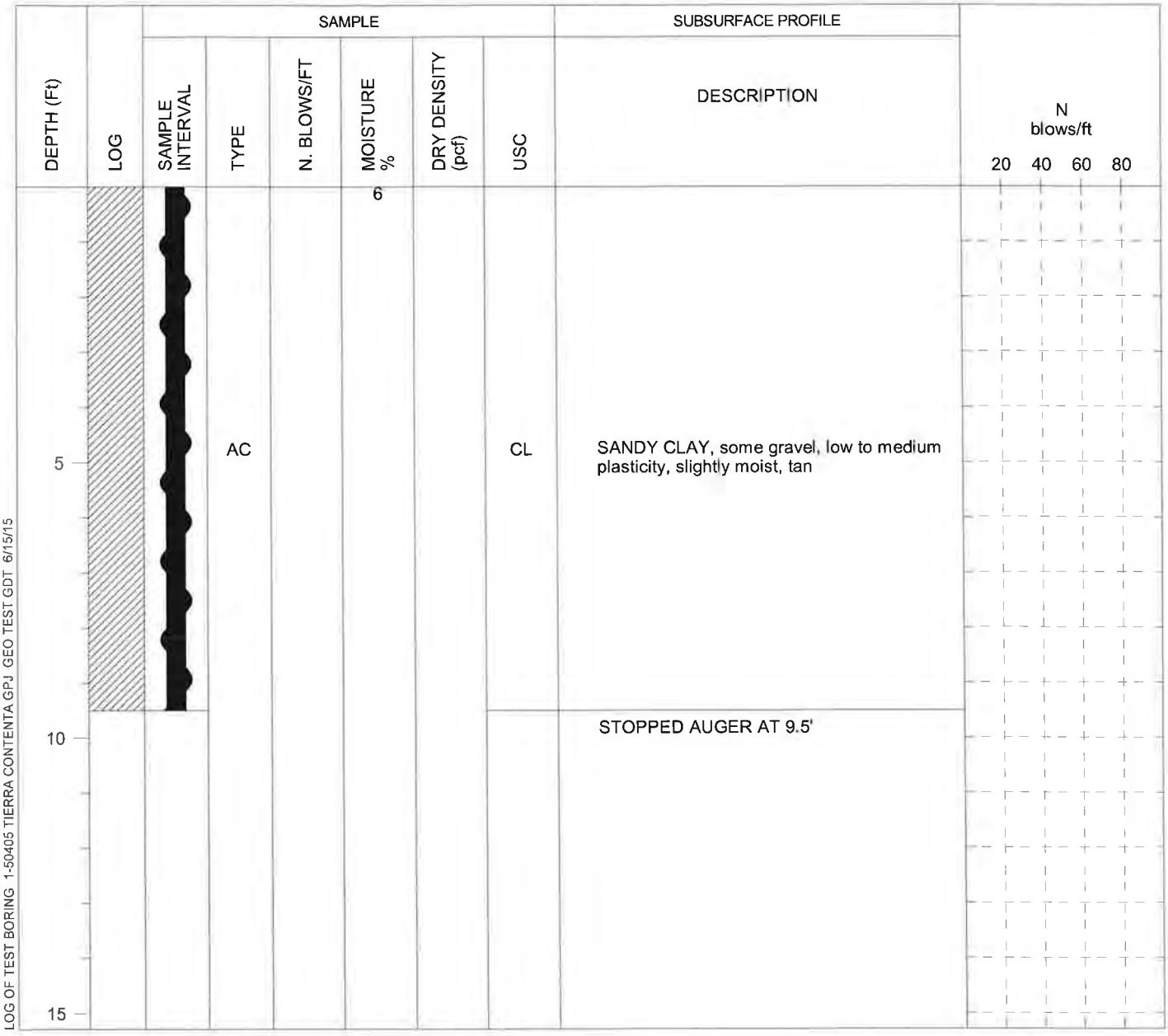
Project: Tierra Contenta, Phase III
Date: 06/04/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 12

During Drilling: None After 24 Hours:



LOG OF TEST BORING 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/04/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

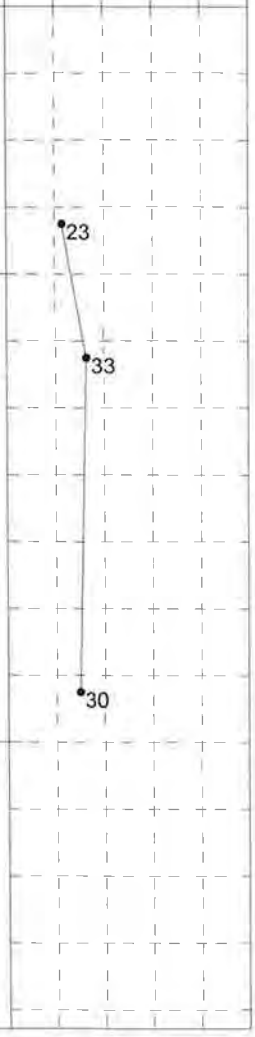
LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 13

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION
			SS	6-9-14 23	5		SC	CLAYEY SAND, fine grained, some gravel, low plasticity, dense, slightly moist, tan
5			SS	10-16-17 33	5		CL	SANDY CLAY, some gravel, low plasticity, hard, slightly moist, tan
10			SS	9-14-16 30	4			STOPPED AUGER AT 9.5' STOPPED SAMPLER AT 11'
15								



LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

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GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/04/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 14

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
					5				
			AC				CL	SANDY CLAY, low plasticity, weakly cemented, slightly moist, tan	
5								STOPPED AUGER AT 4.5'	
10									
15									

LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

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GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/04/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 15

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
					8				
			AC				CL	SANDY CLAY, low plasticity, weakly cemented, slightly moist, tan	
5								STOPPED AUGER AT 4.5'	
10									
15									

LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

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GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/04/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 16

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	SAMPLE TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
					9				
5			AC				CL	SANDY CLAY, low to medium plasticity, weakly cemented, slightly moist to moist, tan	
10								STOPPED AUGER AT 9.5'	
15									

LOG OF TEST BORING 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

GEO-TEST

Project: Tierra Contenta, Phase III
Date: 06/04/2015 Project No: 1-50405
Elevation: Type: 5.5" OD HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 17

During Drilling: None After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION
			SS	18-28-30 58	9		CL	SANDY CLAY, medium plasticity, moderately cemented, hard, slightly moist to moisot, tan
5			SS	30-36-50/4" 50/4"	8			
			SS	50/5"	5		GC	CLAYEY GRAVEL WITH SAND, fine to medium grained, low plasticity, hard, slightly moist, tan
10								STOPPED AUGER AT 9.5' STOPPED SAMPLER AT 9'11"
15								

N blows/ft: 20 40 60 80 — 58

LOG OF TEST BORING 1-50405 TIERRA CONTENTA GPJ GEO TEST GDT 6/15/15

LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve
AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurments were made.

SUMMARY OF LABORATORY RESULTS

						SIEVE ANALYSIS PERCENT PASSING											
TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(%) MOIST	LL	PI	NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
01	2.5	SC	5.8	26	11	28	29	40	58	70	83	88	100				
01	4.5	GC	5.1	25	10	24	25	35	51	59	68	71	79	100			
01	9.5		4.2														
02	0-4.5	SC-SM	6.9	25	7	25	26	38	58	71	84	88	95	100			
02	4.5-9.5		5.1														
03	0-4.5	SC	2.4	29	11	22	22	31	50	63	78	86	98	100			
03	4.5-9.5		2.1														
04	0-4.5	GC	5.1	41	16	15	16	22	32	43	60	72	94	100			
04	4.5-9.5		4.6														
05	0-4.5	CL	7.4	35	17	58	61	68	81	88	95	97	100				
05	4.5-9.5	CL	5.3	34	20	51	51	57	69	78	90	97	100				
06	0-4.5		2.8														
06	4.5-9.5	SC	3.4	29	8	22	22	32	52	68	82	85	100				
07	0-4.5	GM	3.2	NP	NP	14	16	24	40	52	66	77	94	94	100		
08	0-4.5	CL	6.9	34	18	54	56	66	80	88	96	99	100				
08	4.5-9.5		5.0														
09	2.5	CL	6.3	31	16	82	84	91	96	97	99	100					
09	4.5	CL	7.1	36	17	72	76	85	94	98	99	100					
09	9.5		7.2														

GEO-TEST

LL = LIQUID LIMIT
PI = PLASTICITY INDEX
NP = NON PLASTIC or NO VALUE

Project: Tierra Contenta, Phase III
Location: Santa Fe, New Mexico
Number: 1-50405

SUMMARY OF LABORATORY RESULTS 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15

SUMMARY OF LABORATORY RESULTS

TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(%) MOIST	LL	PI	SIEVE ANALYSIS PERCENT PASSING											
						NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
10	0-9.5	CL	6.6	26	11	60	66	77	89	95	98	100					
11	0-9.5	CL	9.6	37	21	71	75	84	93	97	100						
12	0-9.5	CL	5.8	29	14	70	72	79	89	94	96	97	100				
13	2.5	SC	4.6	26	10	48	52	64	85	94	100						
13	4.5	CL	5.0	28	14	56	58	68	88	96	100						
13	9.5		3.7														
14	0-4.5	CL	5.3	27	12	68	73	81	95	99	100						
15	0-4.5	CL	7.7	27	13	63	68	77	93	99	100						
16	0-4.5	CL	9.2	31	15	66	69	79	94	99	100						
17	2.5	CL	9.3	43	25	68	70	81	96	100							
17	4.5	CL	8.1	43	26	57	65	73	92	97	100						
17	9.5		4.9														

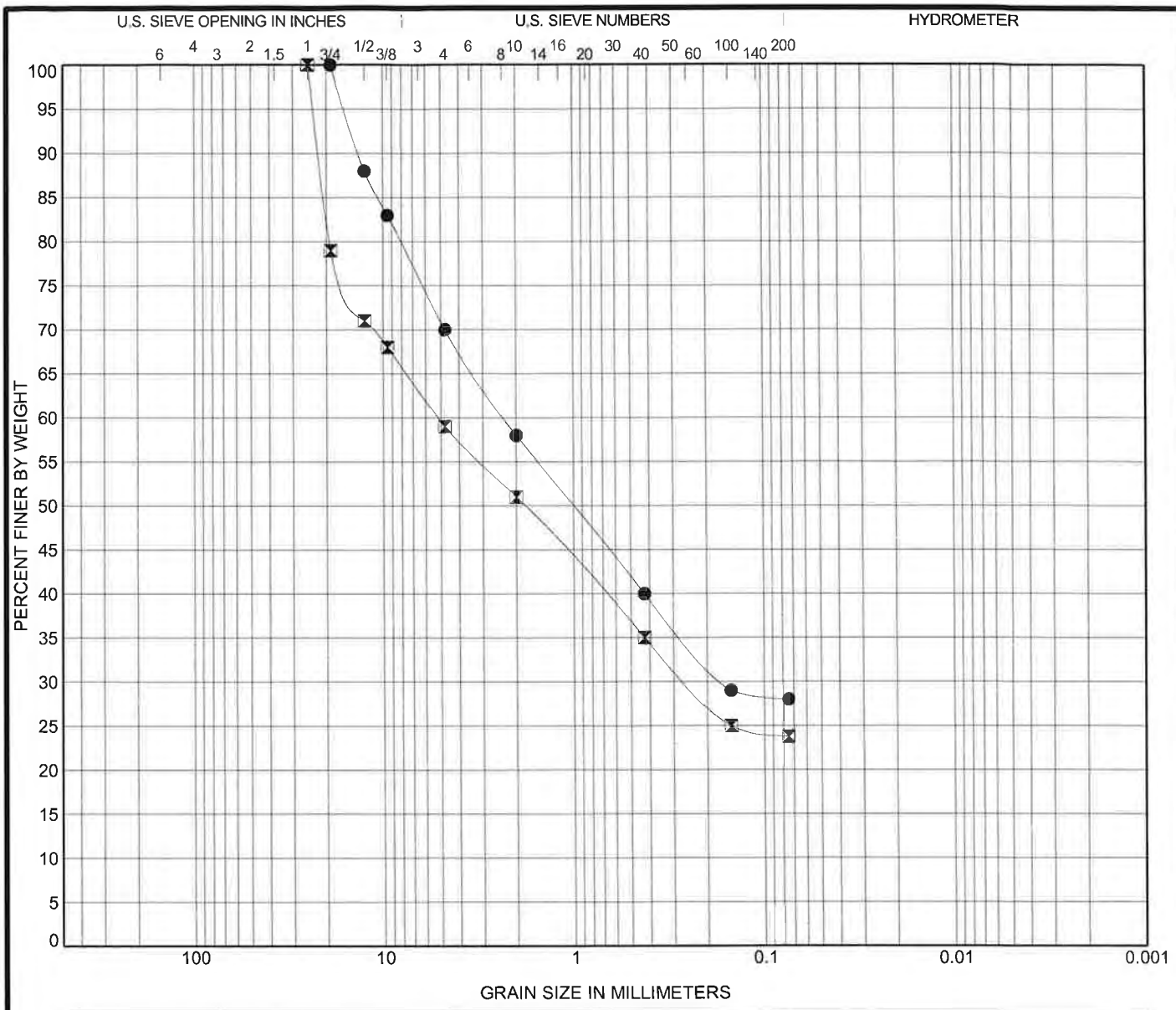
GEO-TEST

LL = LIQUID LIMIT
PI = PLASTICITY INDEX
NP = NON PLASTIC or NO VALUE

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	01	2.5	**CLAYEY SAND with GRAVEL(SC)**	26	15	11		
⊠	01	4.5	**CLAYEY GRAVEL with SAND(GC)**	25	15	10		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	01	2.5	19	2.31	0.165		30.0	42.0	28.0	
⊠	01	4.5	25	5.13	0.252		41.0	35.2	23.8	

GEO-TEST

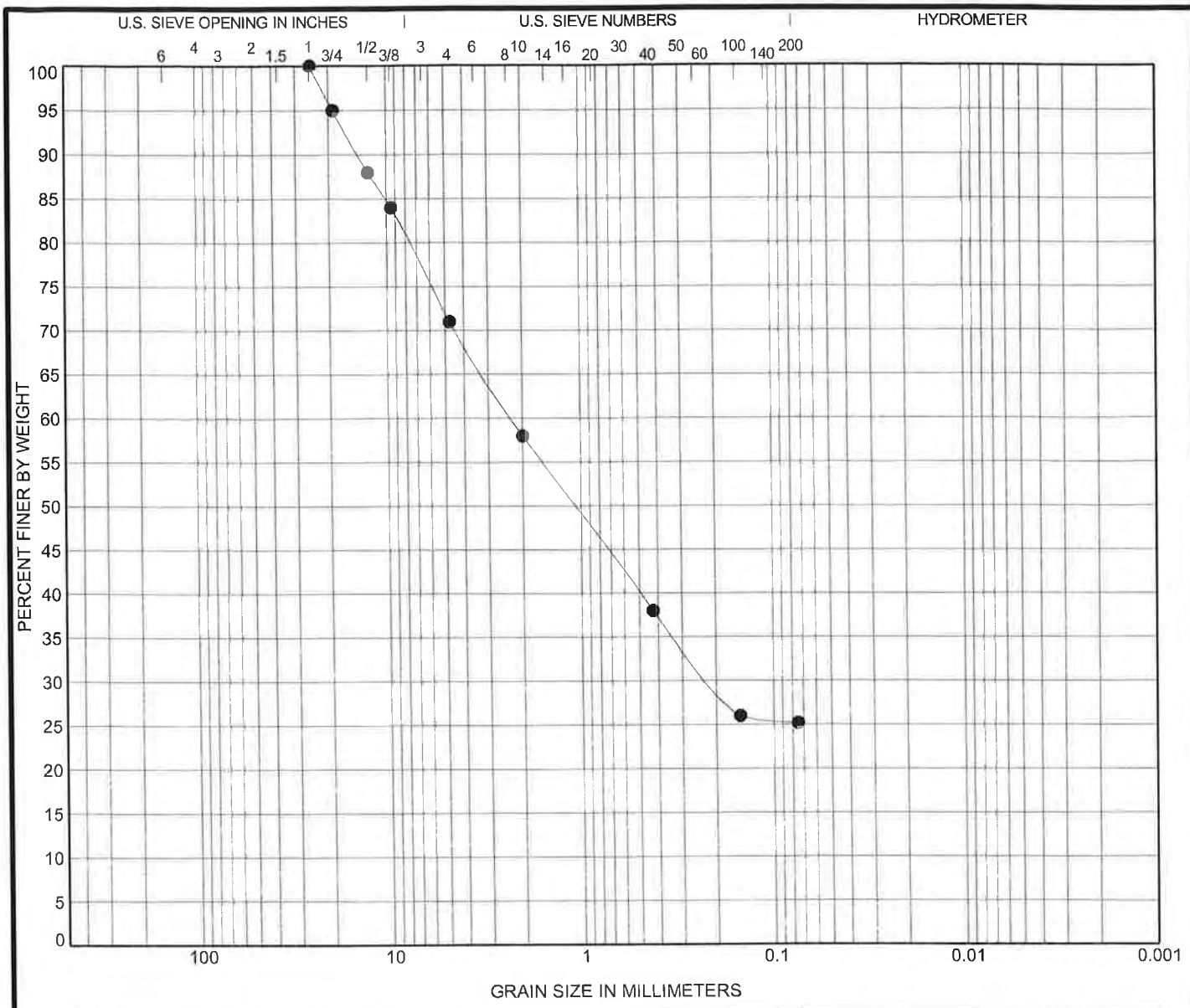
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	02	0-4.5	**SILTY, CLAYEY SAND with GRAVEL(SC-SM)**	**25**	**18**	**7**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	02	0-4.5	**25**	**2.285**	**0.212**		**29.0**	**45.8**	**25.2**	

GEO-TEST

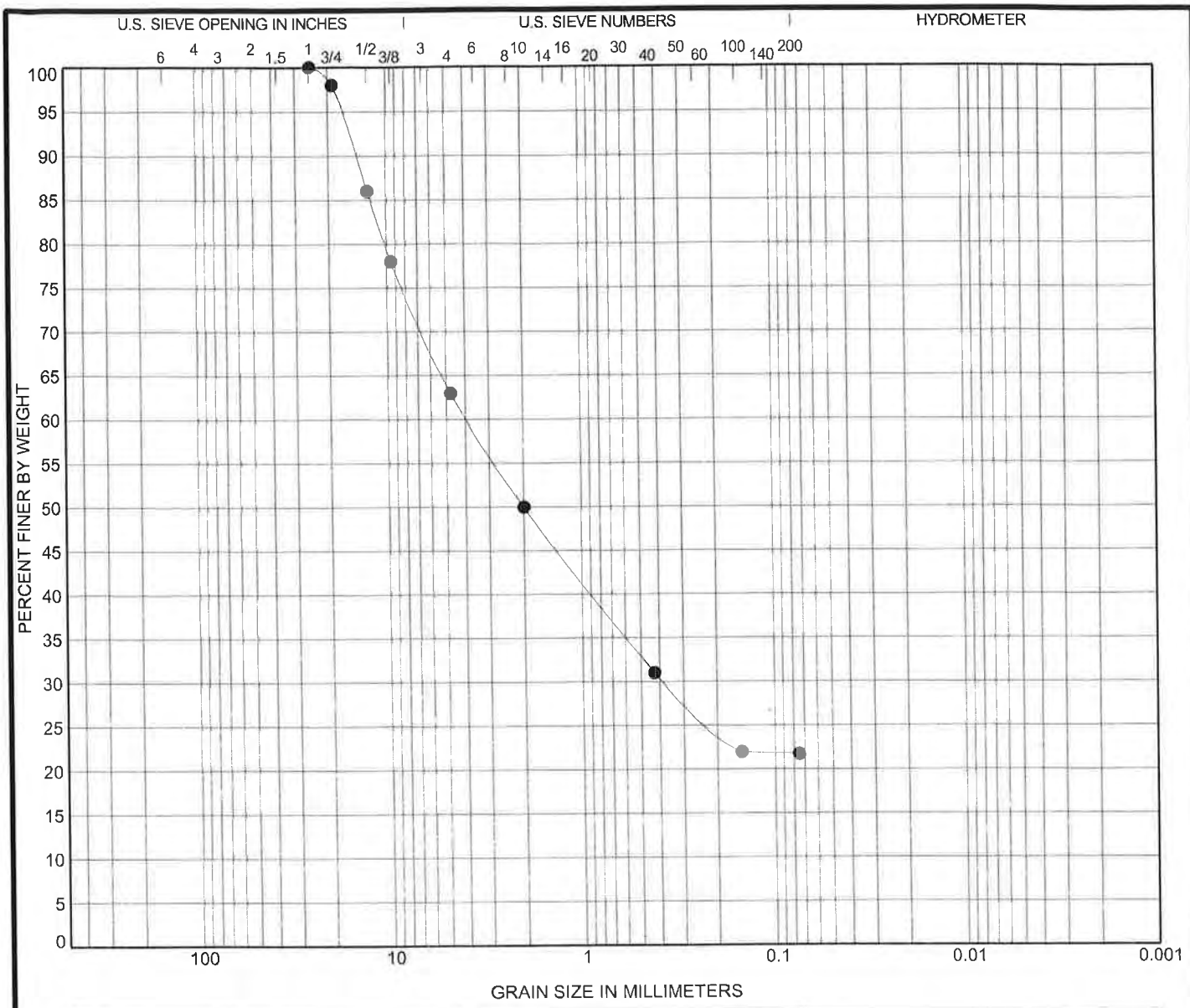
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	03	0-4.5	CLAYEY SAND with GRAVEL(SC)	29	18	11		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	03	0-4.5	25	3.89	0.379		37.0	41.2	21.8	

GEO-TEST

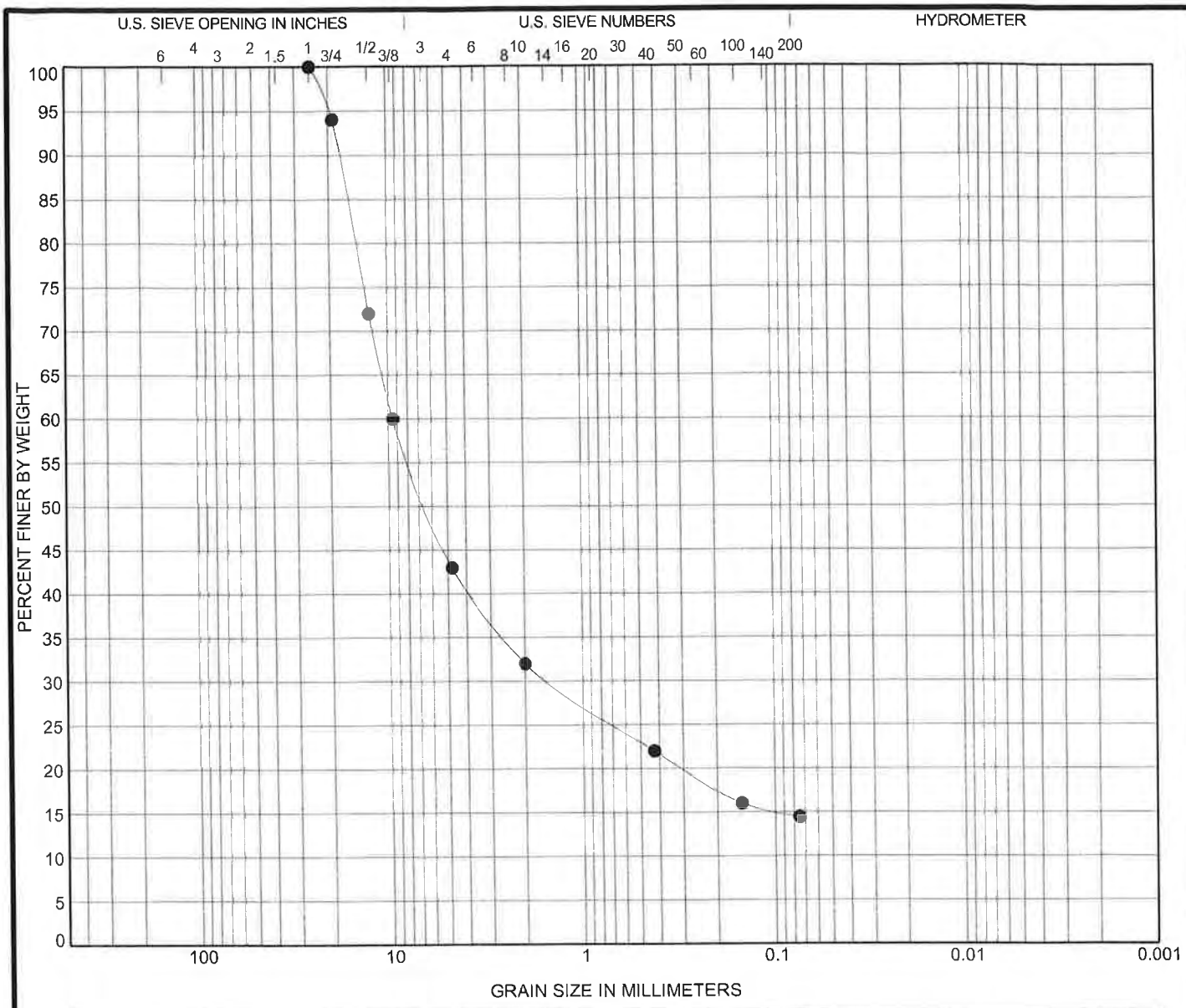
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	04	0-4.5	**CLAYEY GRAVEL with SAND(GC)**	**41**	**25**	**16**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	04	0-4.5	**25**	**9.5**	**1.467**		**57.0**	**28.5**	**14.5**	

GEO-TEST

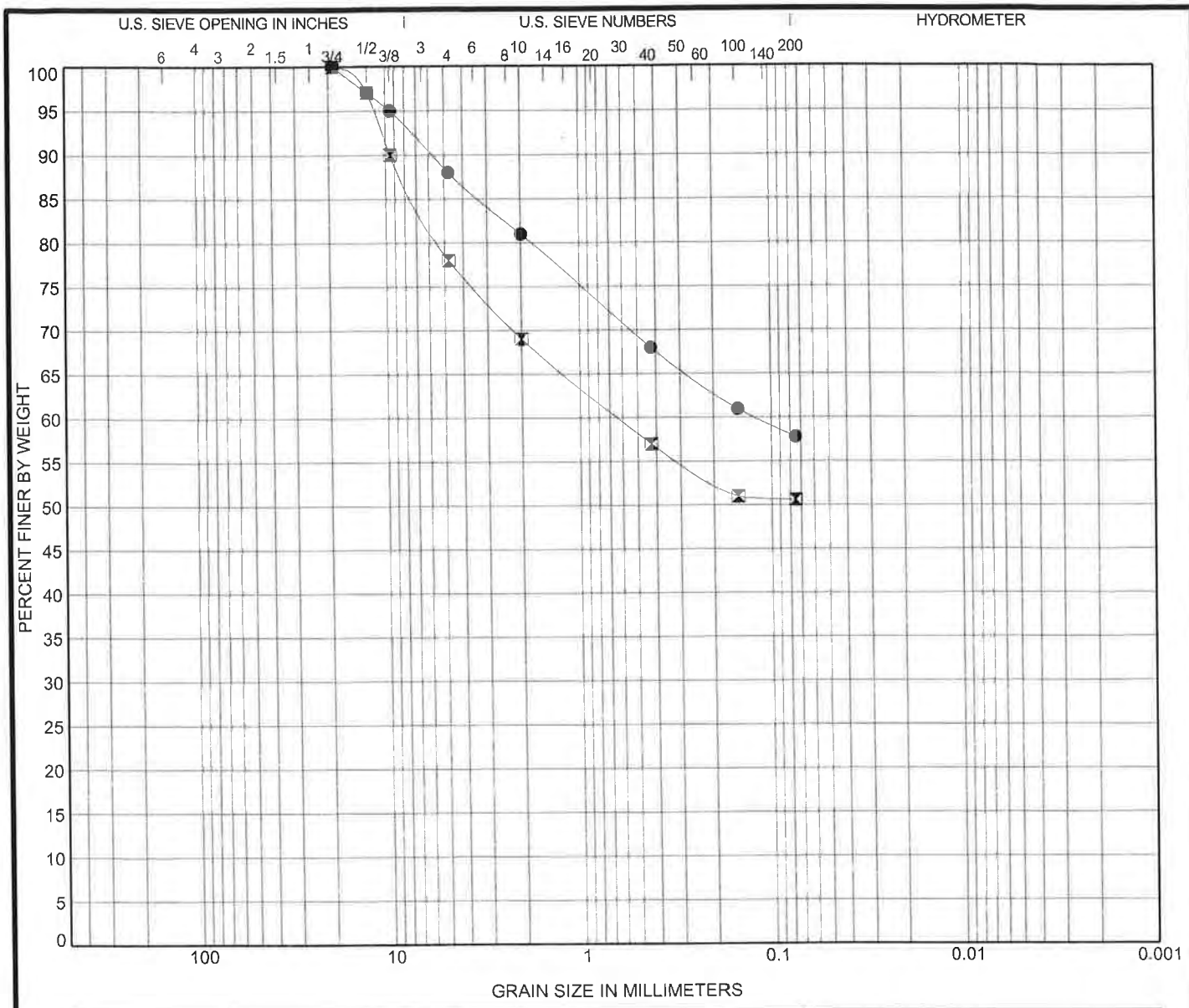
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	05	0-4.5	SANDY LEAN CLAY(CL)	35	18	17		
⧓	05	4.5-9.5	SANDY LEAN CLAY with GRAVEL(CL)	34	14	20		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	05	0-4.5	19	0.121			12.0	30.2	57.8	
⧓	05	4.5-9.5	19	0.626			22.0	27.4	50.6	

GEO-TEST

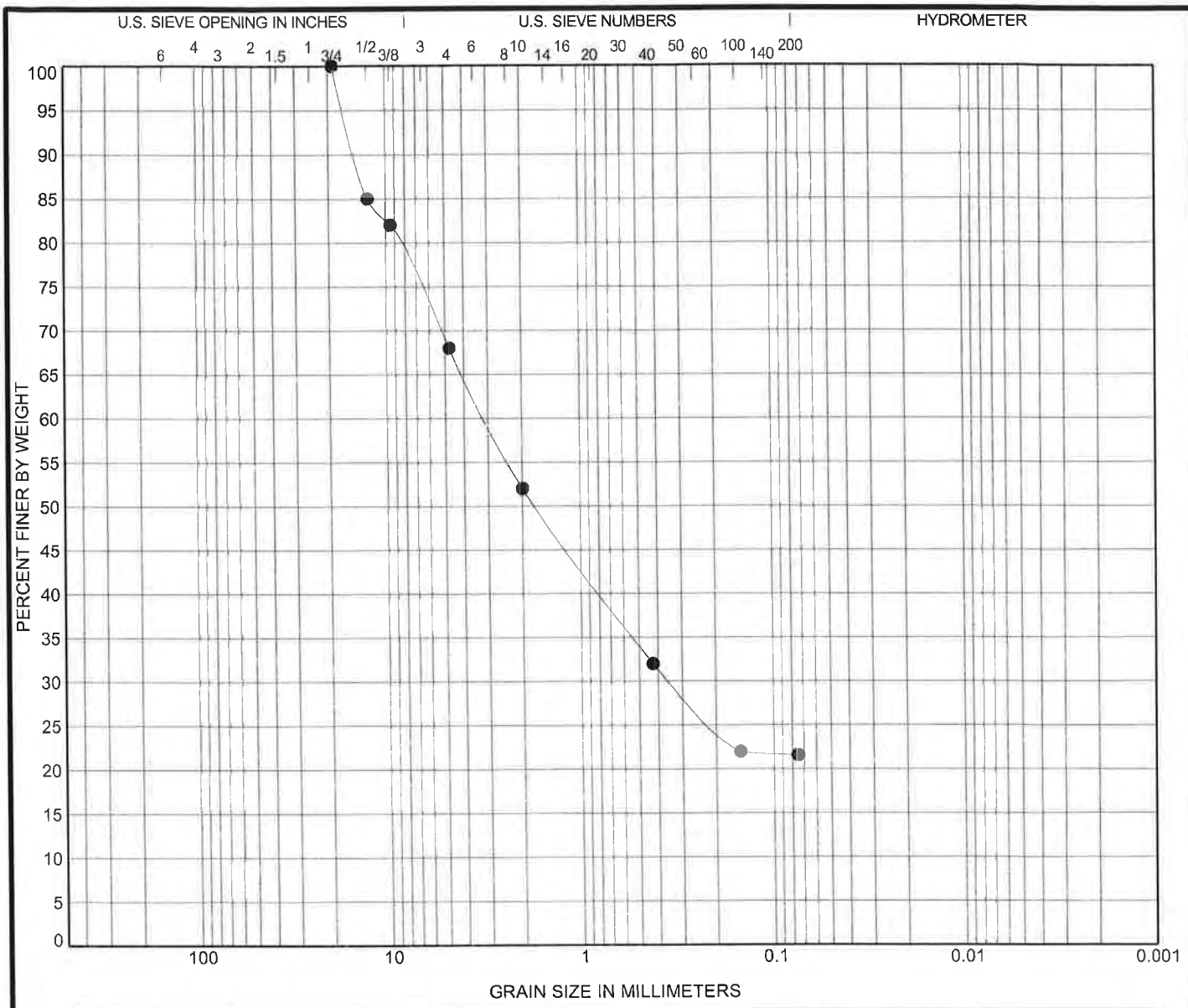
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 8/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	06	4.5-9.5	**CLAYEY SAND with GRAVEL(SC)**	**29**	**21**	**8**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	06	4.5-9.5	**19**	**3.082**	**0.345**		**32.0**	**46.4**	**21.6**	

GEO-TEST

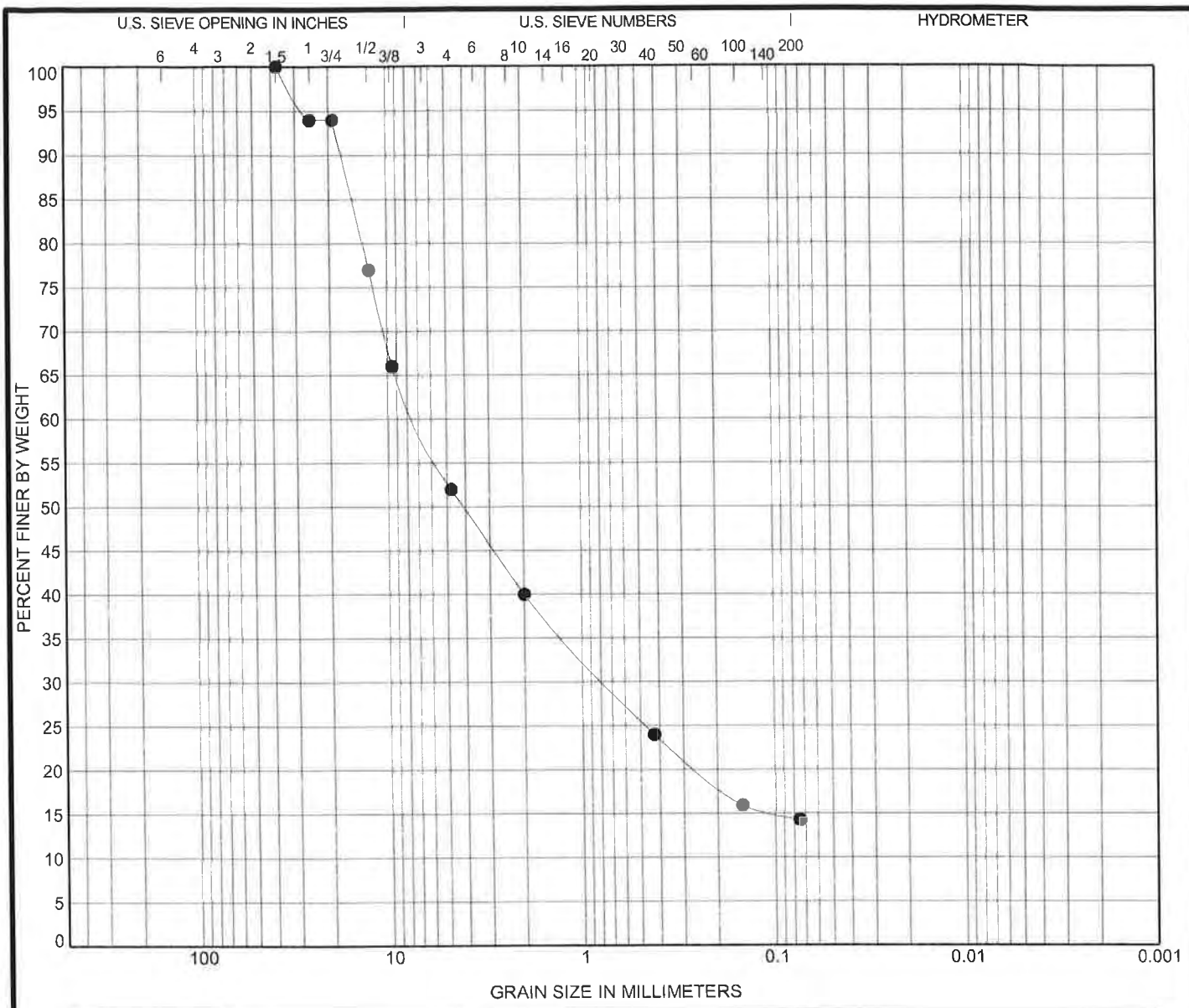
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	07	0-4.5	**SILTY GRAVEL with SAND(GM)**	**NP**	**NP**	**NP**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	07	0-4.5	**37.5**	**7.058**	**0.76**		**48.0**	**37.7**	**14.3**	

GEO-TEST

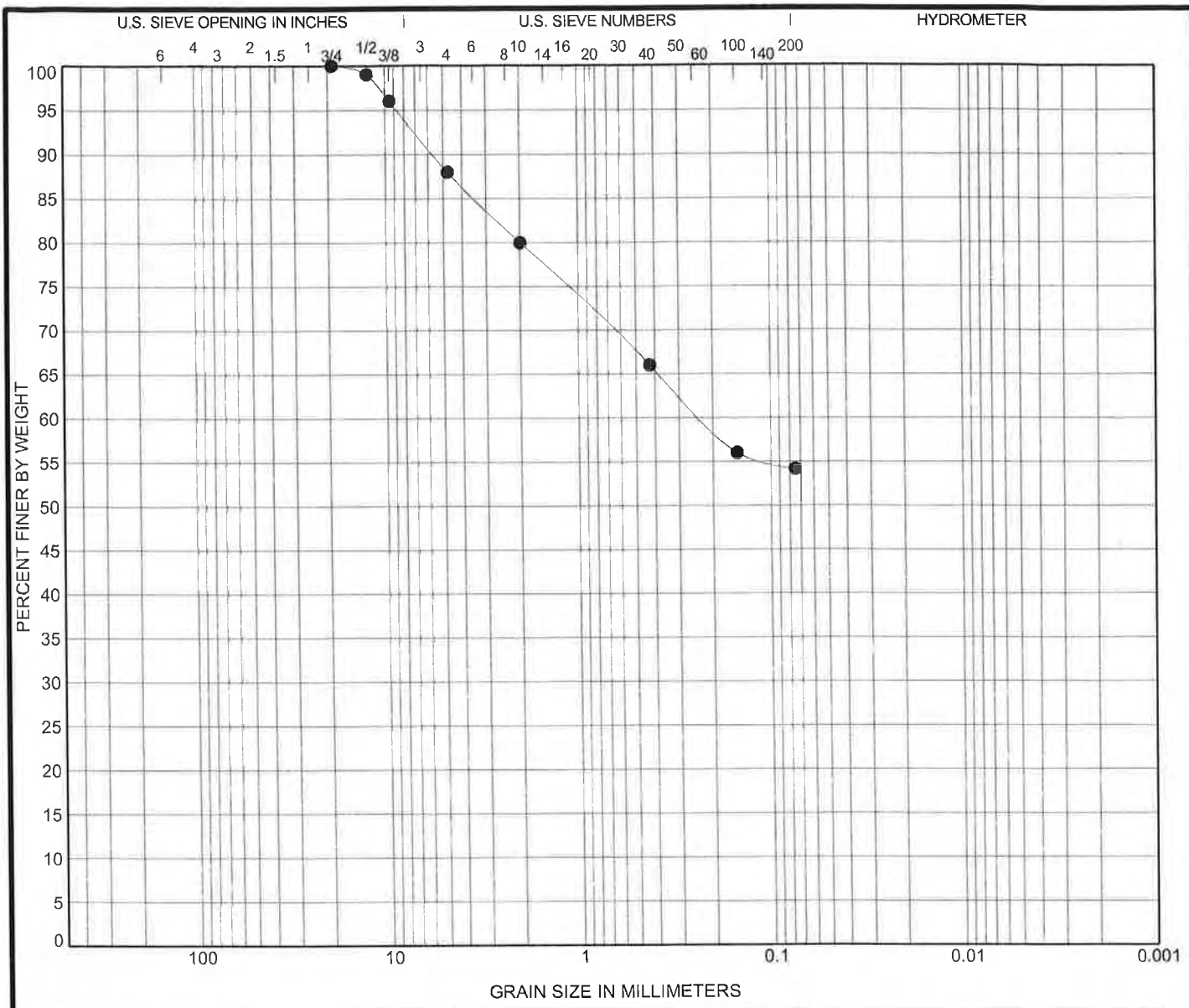
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	08	0-4.5	**SANDY LEAN CLAY(CL)**	**34**	**16**	**18**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	08	0-4.5	**19**	**0.228**			**12.0**	**33.8**	**54.2**	

GEO-TEST

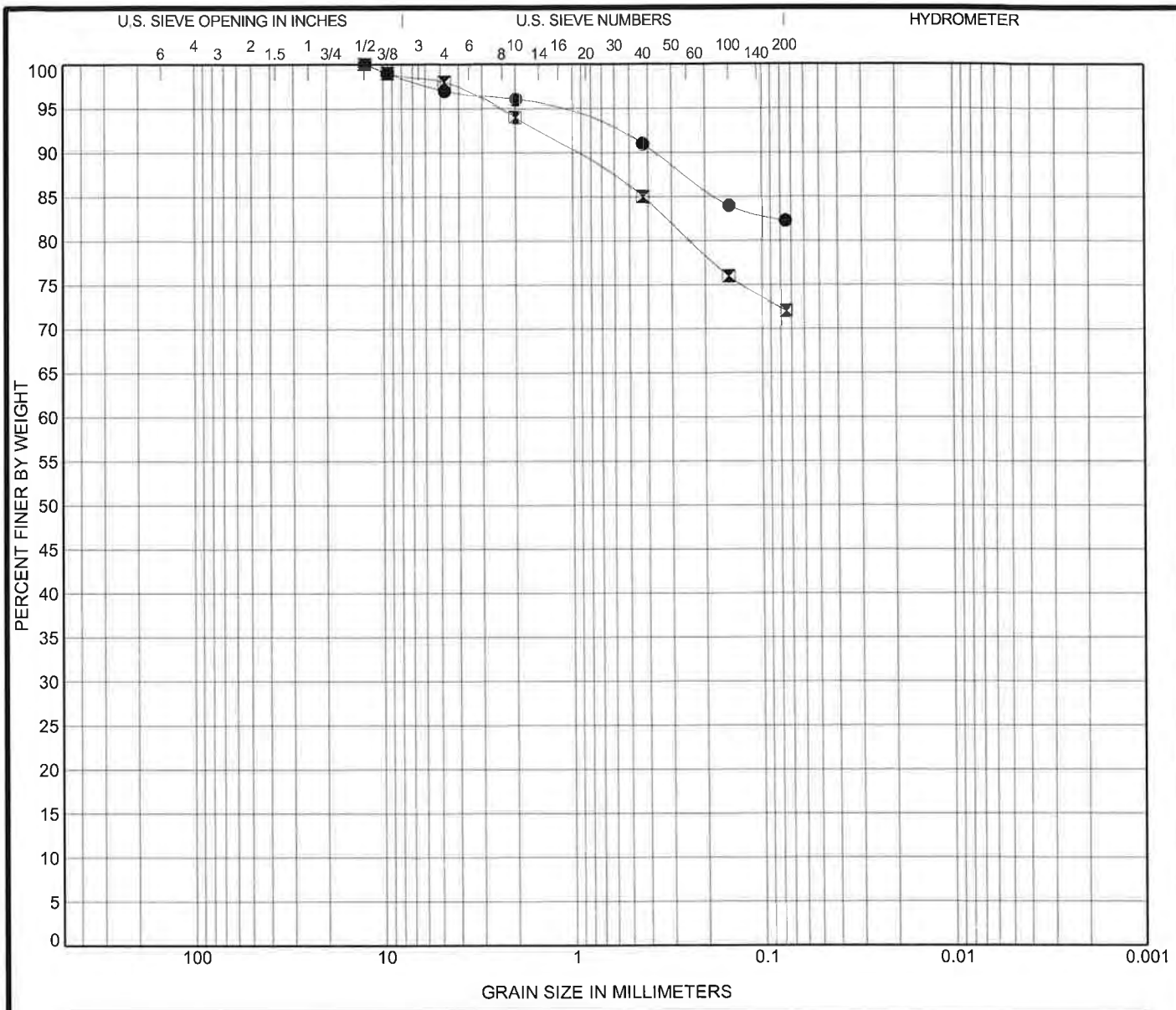
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● 09	2.5	**LEAN CLAY with SAND(CL)**	**31**	**15**	**16**		
⊠ 09	4.5	**LEAN CLAY with SAND(CL)**	**36**	**19**	**17**		

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 09	2.5	**12.5**				**3.0**	**14.7**	**82.3**	
⊠ 09	4.5	**12.5**				**2.0**	**25.9**	**72.1**	

GEO-TEST

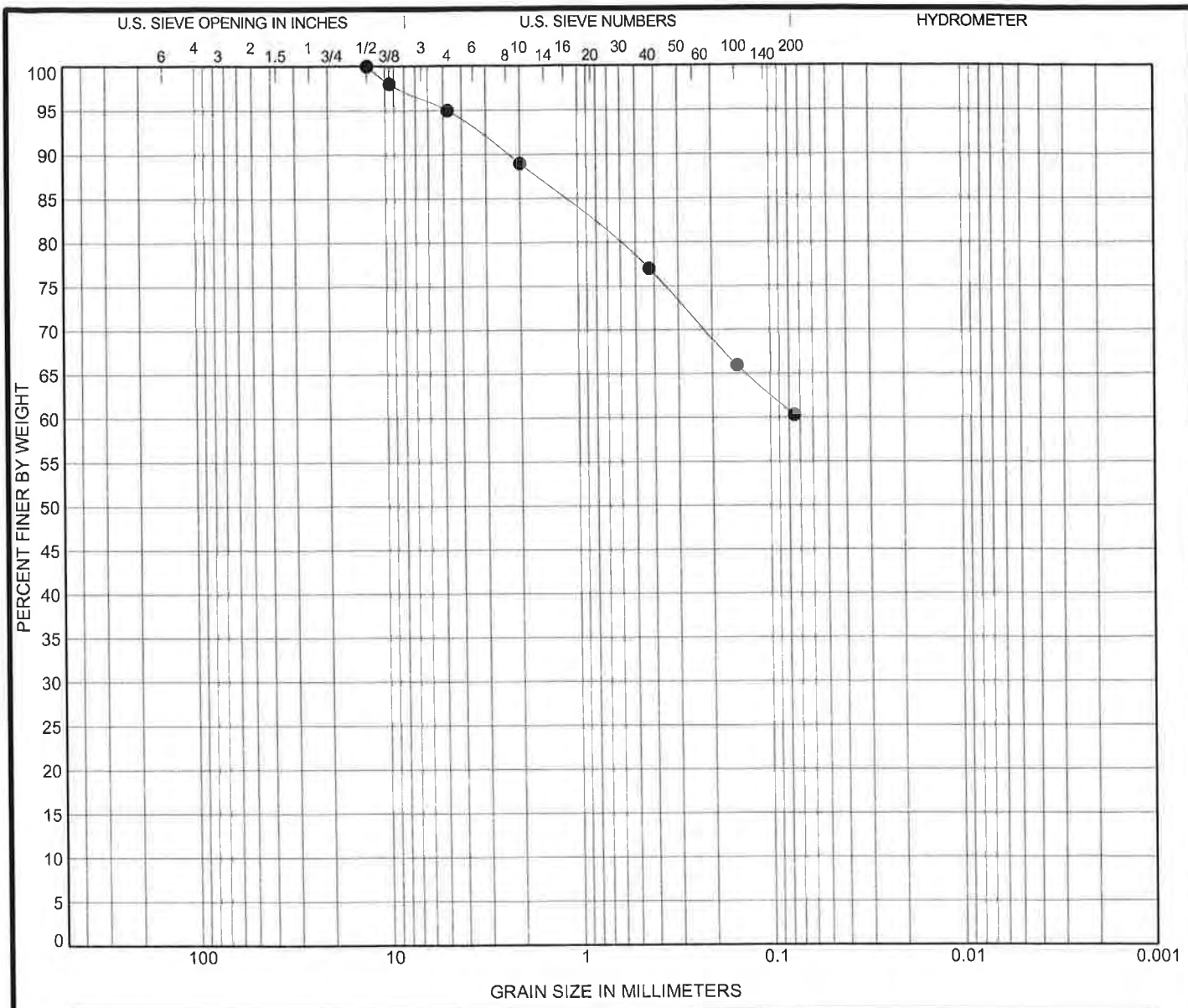
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	10	0-9.5	**SANDY LEAN CLAY(CL)**	**26**	**15**	**11**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	10	0-9.5	**12.5**				**5.0**	**34.7**	**60.3**	

GEO-TEST

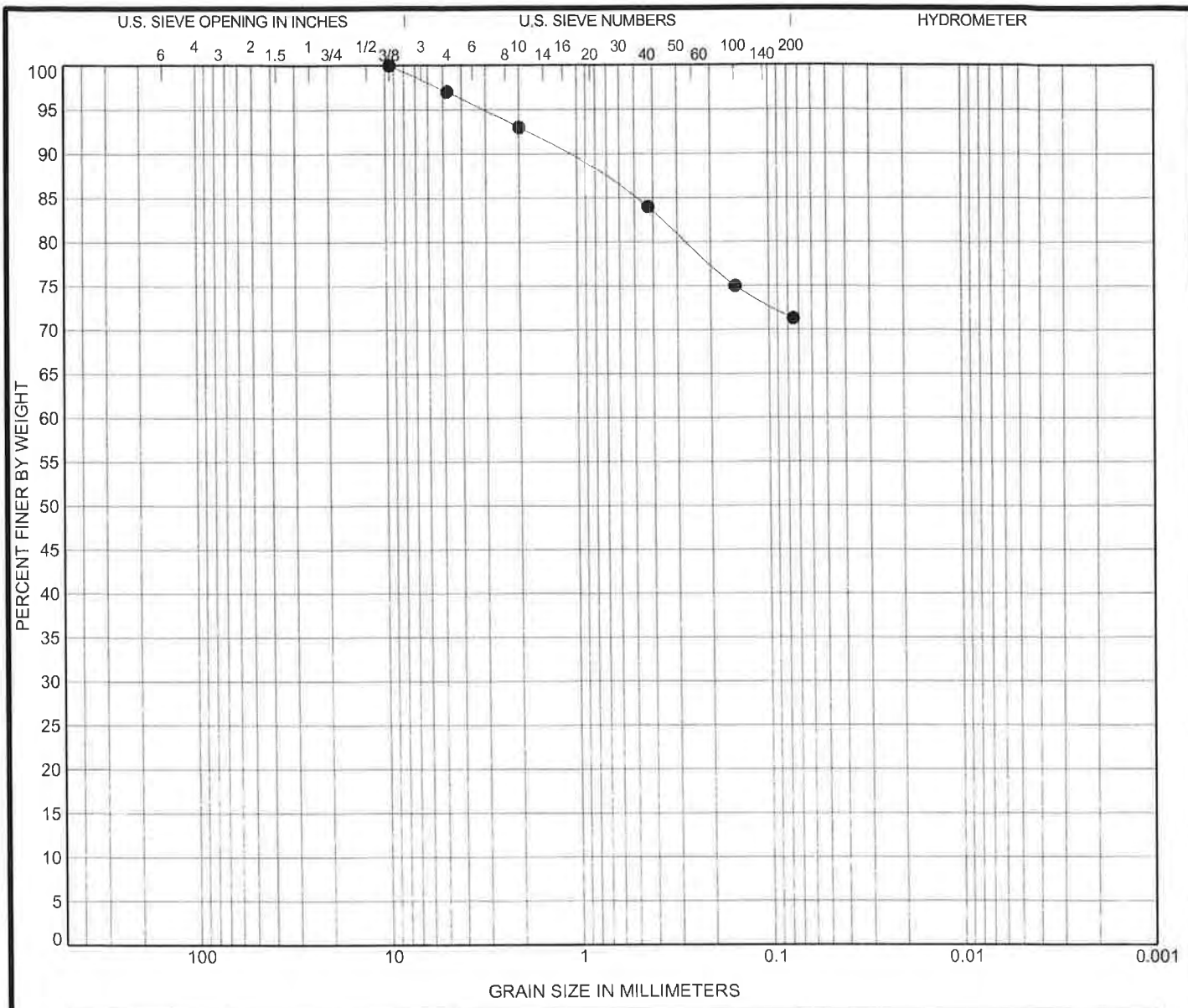
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	11	0-9.5	**LEAN CLAY with SAND(CL)**	**37**	**16**	**21**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	11	0-9.5	**9.5**				**3.0**	**25.7**	**71.3**	

GEO-TEST

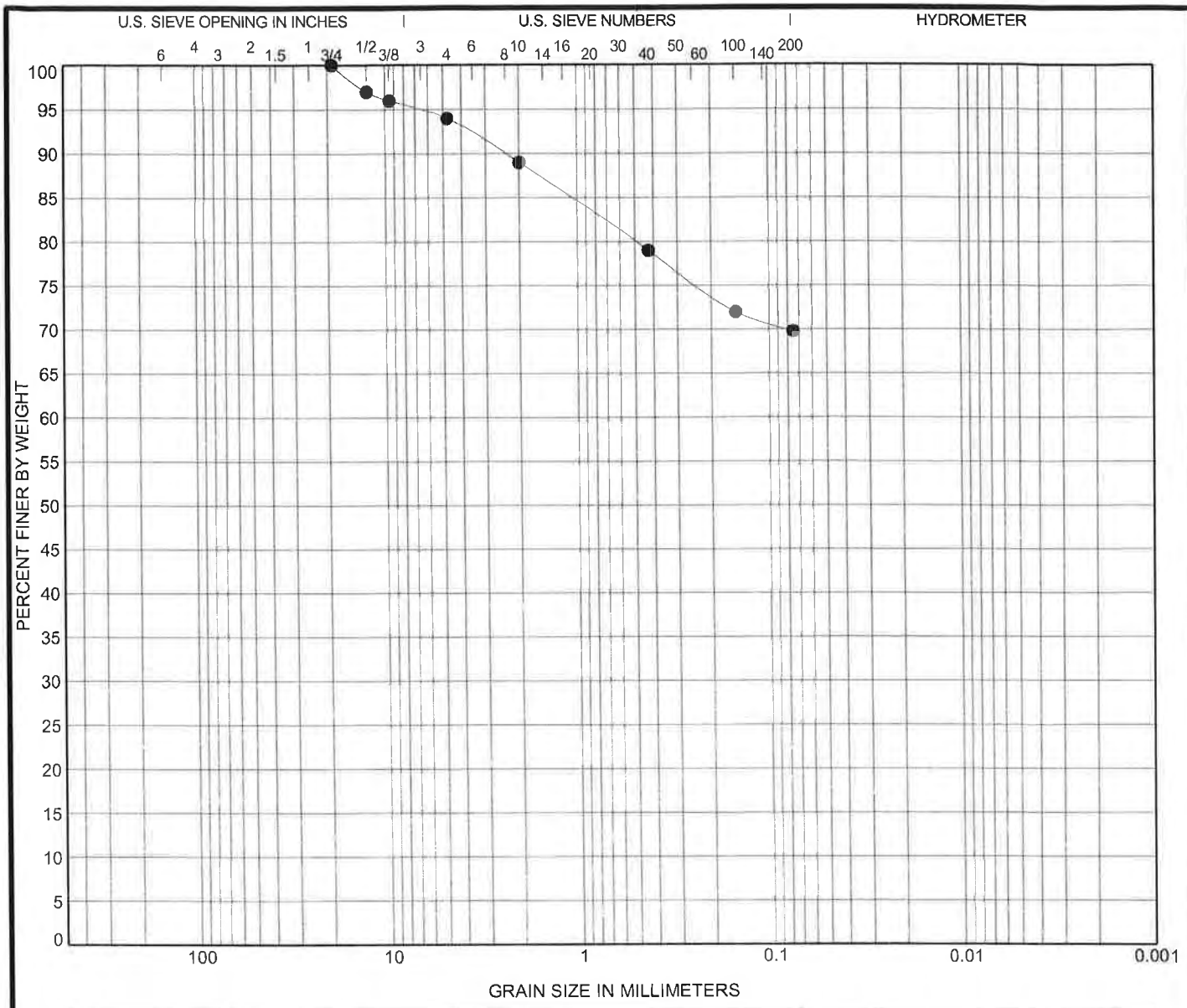
GRAIN SIZE DISTRIBUTION

Project: Tierra Contenta, Phase III

Location: Santa Fe, New Mexico

Number: 1-50405

US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	12	0-9.5	**SANDY LEAN CLAY(CL)**	**29**	**15**	**14**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	12	0-9.5	**19**				**6.0**	**24.2**	**69.8**	

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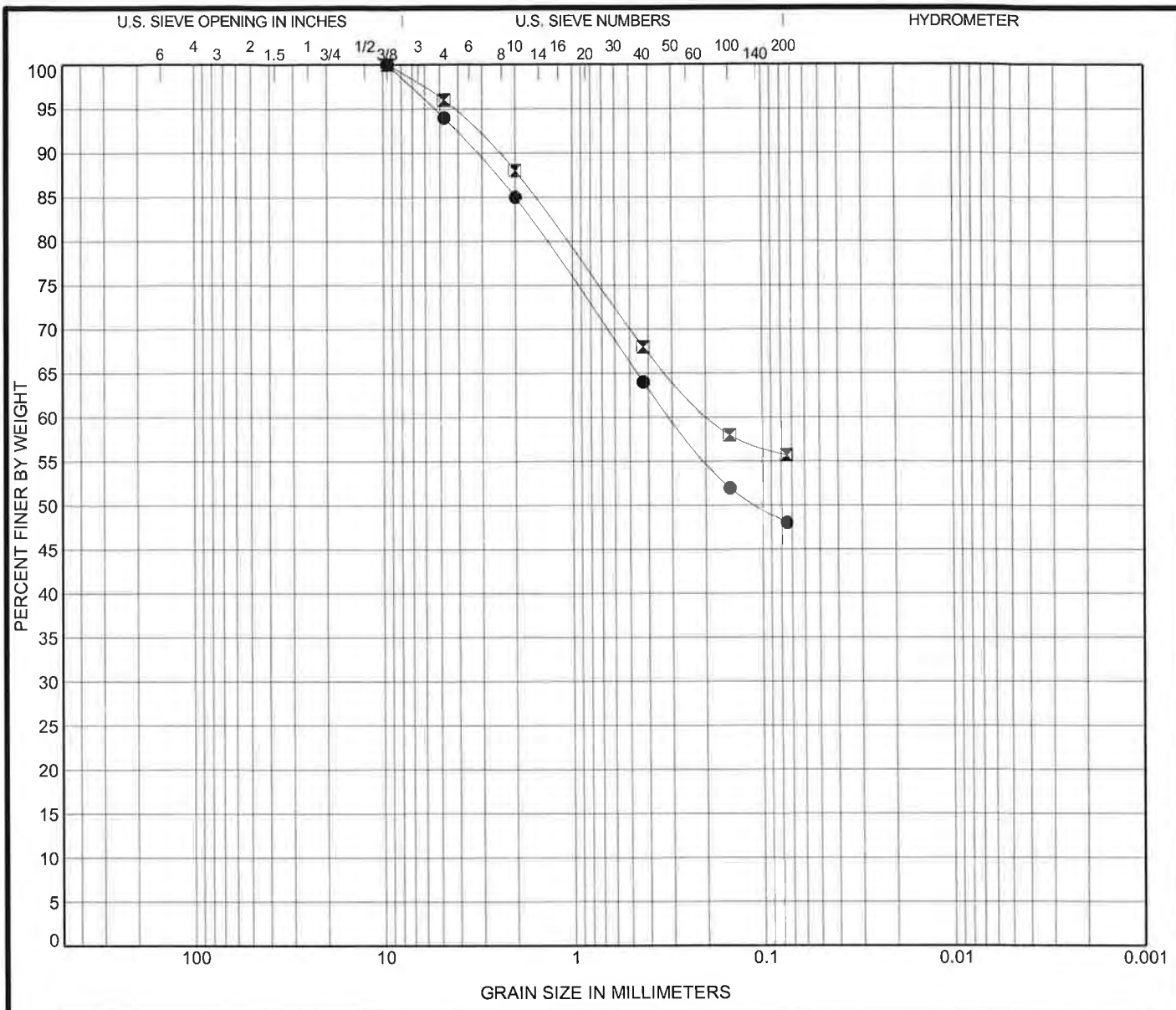

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	13	2.5	**CLAYEY SAND(SC)**	26	16	10		
⧓	13	4.5	**SANDY LEAN CLAY(CL)**	28	14	14		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	13	2.5	9.5	0.3			6.0	46.0	48.0	
⧓	13	4.5	9.5	0.185			4.0	40.3	55.7	

GEO-TEST

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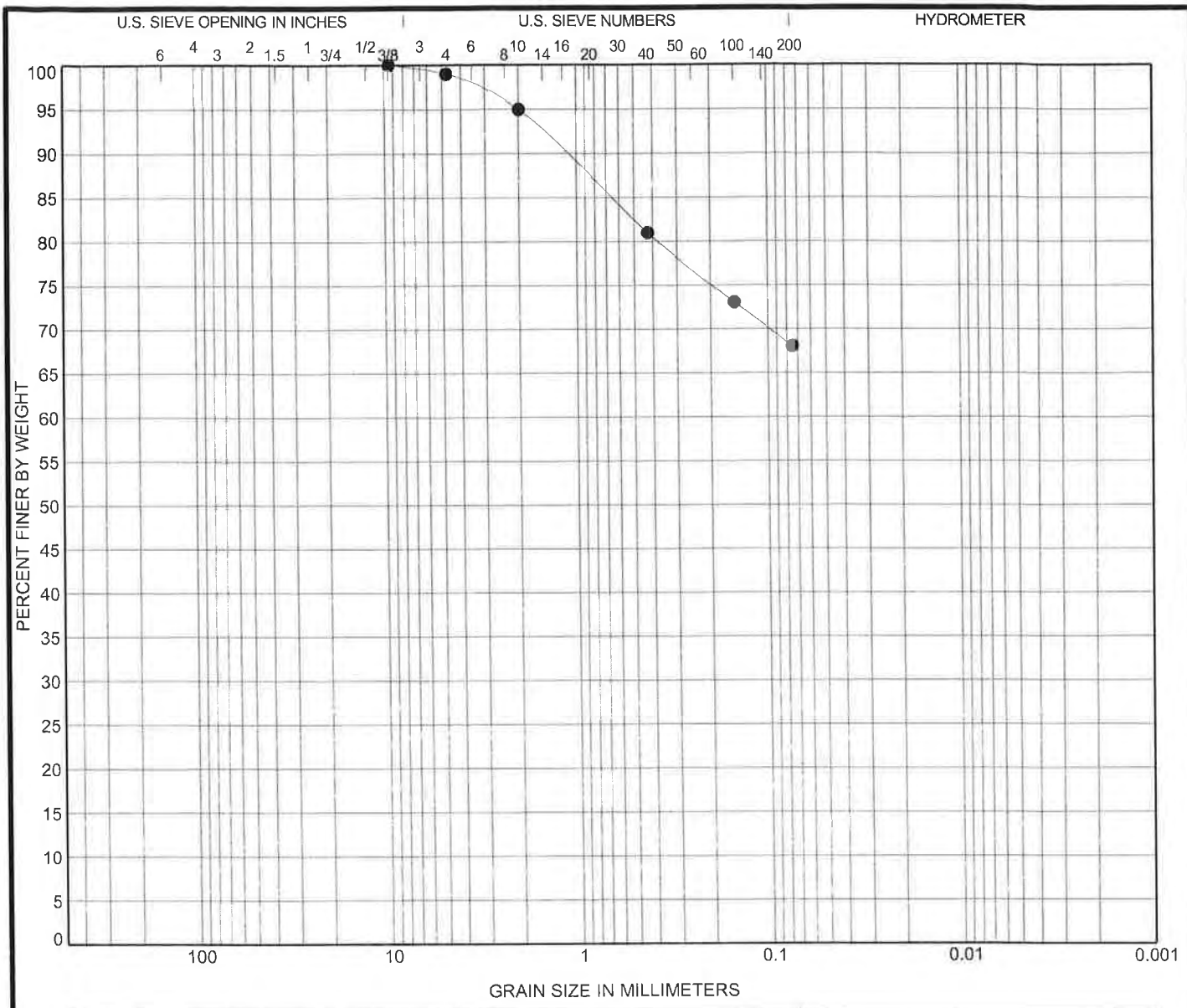
US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	14	0-4.5	**SANDY LEAN CLAY(CL)**	**27**	**15**	**12**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	14	0-4.5	**9.5**				**1.0**	**30.9**	**68.1**	

GEO-TEST

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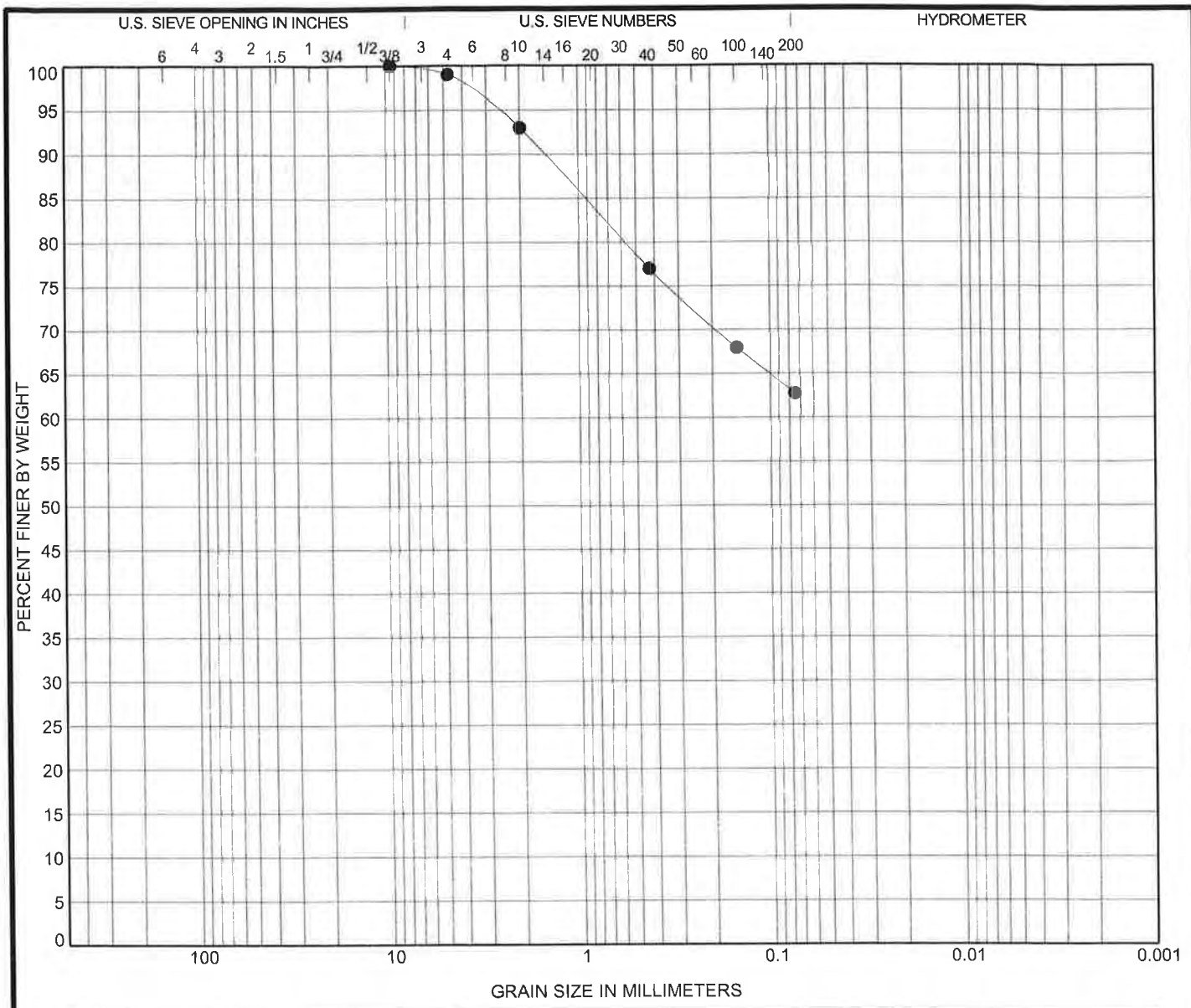
US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	15	0-4.5	SANDY LEAN CLAY(CL)	27	14	13		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	15	0-4.5	9.5				1.0	36.2	62.8	

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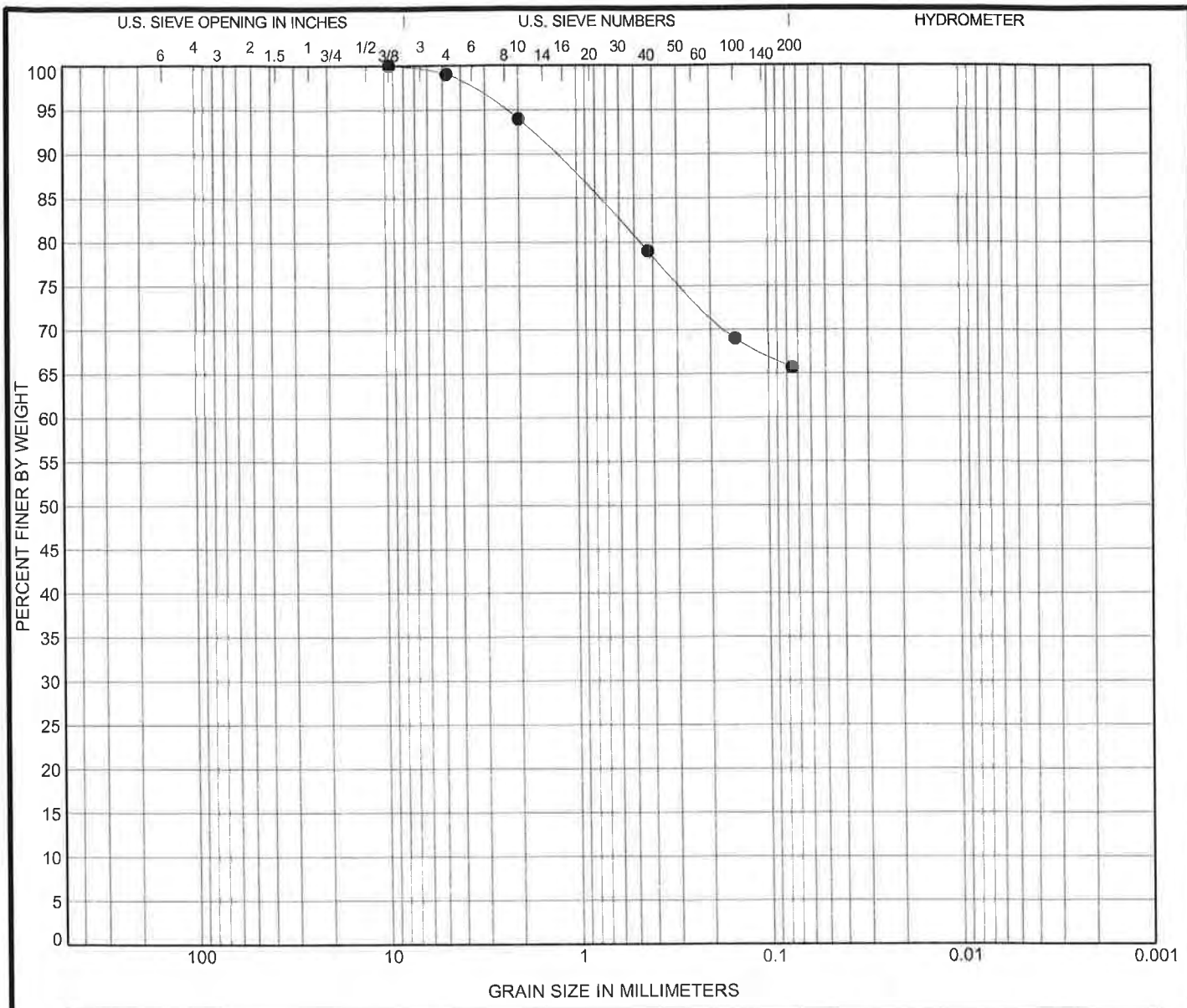
US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	16	0-9.5	**SANDY LEAN CLAY(CL)**	**31**	**16**	**15**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	16	0-9.5	9.5				1.0	33.3	65.7	

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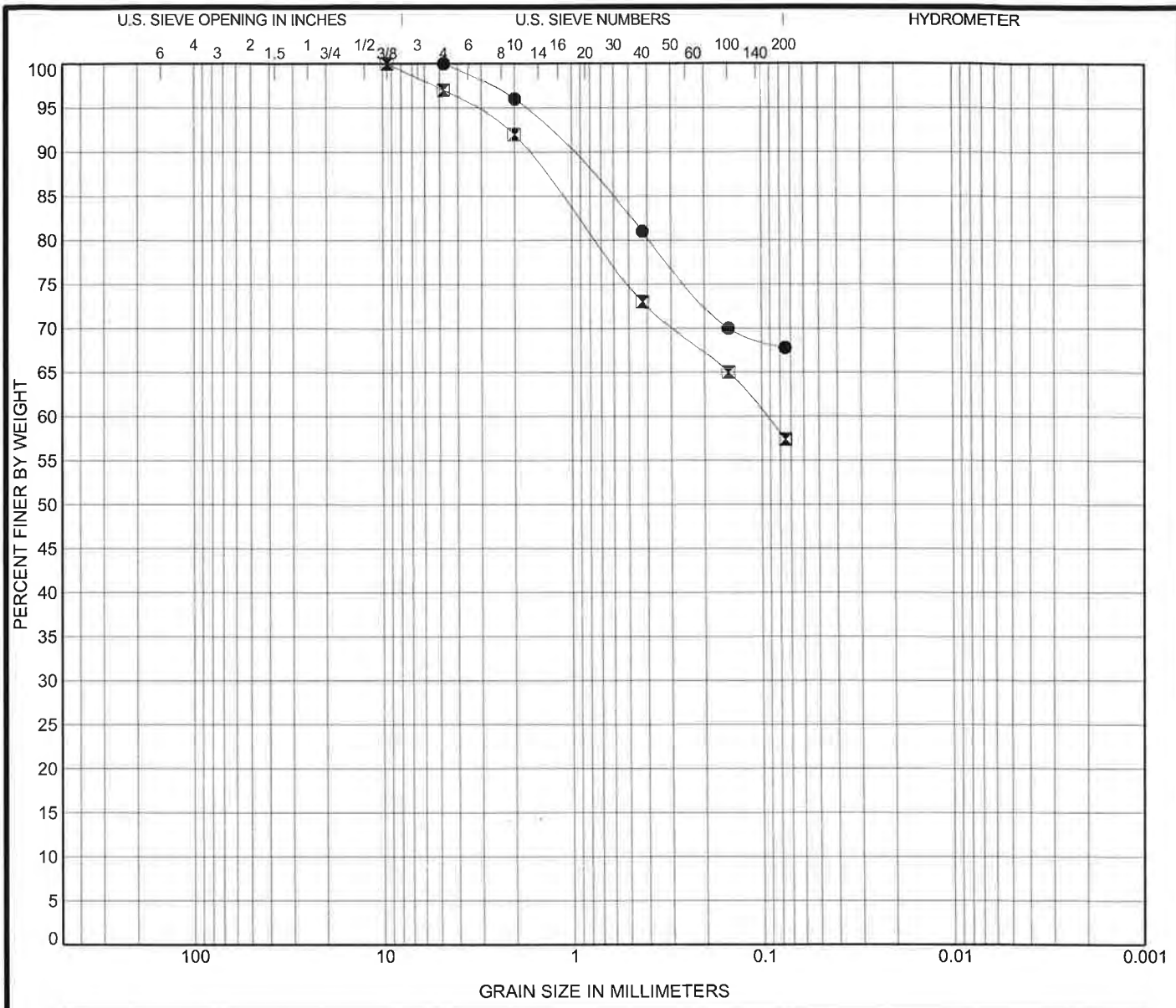

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	17	2.5	**SANDY LEAN CLAY(CL)**	**43**	**18**	**25**		
⧓	17	4.5	**SANDY LEAN CLAY(CL)**	**43**	**17**	**26**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	17	2.5	**4.75**				**0.0**	**32.2**	**67.8**	
⧓	17	4.5	**9.5**	**0.095**			**3.0**	**39.6**	**57.4**	

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US GRAIN SIZE 1-50405 TIERRA CONTENTA.GPJ GEO TEST.GDT 6/10/15