GEO-TEST

GEOTECHNICAL ENGINEERING SERVICES REPORT JOB NO. 1-01203 SANTA FE RAIL TRAIL SEGMENTS 2 THROUGH 6 SANTA FE TO LAMY, NEW MEXICO

PREPARED FOR

LORIS & ASSOCIATES, INC.

GEO-TEST, INC.
3204 RICHARDS LANE
SANTA FE,
NEW MEXICO
87507
(505) 471-1101
FAX (505) 471-2245

8528 CALLE ALAMEDA NE
ALBUQUERQUE,
NEW MEXICO
87113
(505) 857-0933
FAX (505) 857-0803

2805-A LAS VEGAS CT.
LAS CRUCES,
NEW MEXICO
88007
(575) 526-6260
FAX (575) 523-1660

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October 31, 2011
Job No. 1-01203

Loris & Associates, Inc.
2585 Trailridge Drive East
Lafayette, Colorado 80026

Attn: **Mr. Scott Belonger, P.E.**

RE: **Geotechnical Engineering Services**
Santa Fe Rail Trail
Segments 2 Through 6
Santa Fe to Lamy, New Mexico

Dear Mr. Belonger:

Submitted herein is the Geotechnical Engineering Services Report for the above referenced project. The report contains the results of our field investigation and laboratory testing, and recommendations for foundation and retaining structure design, trail tread, compression of native soils due to compaction, allowable temporary and permanent slopes, as well as criteria for 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.

CHARLES M. MILLER
NEW MEXICO
6018
LICENSED PROFESSIONAL ENGINEER

Reviewed by:

Charles M. Miller, P.E.

Robert D. Booth, P.E.

cc: Addressee (3)

GEO-TEST, INC.
3204 RICHARDS LANE
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NEW MEXICO
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3204 RICHARDS LANE
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NEW MEXICO
87507
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INTRODUCTION

This report presents the results of the geotechnical investigation performed by this firm at the site of the proposed Santa Fe Rail Trail improvements, Segments 2 through 6, Santa Fe to Lamy, New Mexico.

The objectives of this investigation were to:

1) Evaluate the nature and engineering properties of the subsurface soils underlying the rail trail alignment.

2) Provide recommendations for the trail tread, allowable temporary and permanent slopes, as well as criteria for site grading. Estimates relative to shrinkage or compression of native soils due to compaction are also provided.

The investigation includes subsurface exploration, selective 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 improvements to Segment 2 through 6 of the Santa Fe Rail Trail. This includes a pedestrian/bicycle trail that is to be realigned and reconstructed along with drainage improvements.

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

FIELD EXPLORATION

A total of 10 field density tests (2 in each segment) were preformed at selected locations along the alignment of the proposed rail trail at existing grades. In addition, a soil sample at each test location was obtained from a depth of about 0 to 12 inches for laboratory testing. The results of the field density tests along with their locations are presented in a following section of this report.

LABORATORY TESTING

Sieve analysis, Atterberg limits, and moisture-density relationship tests (Proctors) were performed on each sample obtained to determine the classification of the soil in accordance with the Unified Soil Classification System and to determine the optimum moisture content and the maximum dry

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87113
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2805-A LAS VEGAS CT.
LAS CRUCES,
NEW MEXICO
88007
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densities of the soils. The results of these tests are presented in a following section of this report.

SUBSURFACE SOIL CONDITIONS

As indicated by the classification tests, the near surface native soils underlying the proposed rail trail alignment consist predominantly of silty clayey sands (SC-SM) in Segment 2, silty sands (SM) in Segment 3, silty sands and clayey sands (SM & SC) in Segment 4, sandy clays and sandy silt/clay mixtures (CL & CL-ML) in Segment 5, and of slightly silty sands and clayey sands (SP-SM & SC) in Segment 6 to the full depths explored. Most of these soils are non-plastic or of low plasticity although the sandy clays and clayey sands encountered in Segments 5 and 6 are of low to medium plasticity.

Soil moisture contents were relatively low to moderate at the sample locations generally being well below the optimum moisture content of the soils.

The results of the field density tests indicate that the near surface native soils at the test locations possess dry densities in the range of about 80 to 90 percent of maximum dry density in accordance with ASTM D 1557.

CONCLUSIONS

Based upon the above, it is concluded that the existing, near surface native soils underlying the alignment will be suitable for their intended purpose. However, due to their relatively low moisture contents and insitu densities, it is recommended that these soils be moisture conditioned and compacted prior to construction of the trail tread. Detailed recommendations for the construction of the trail are presented in the following sections of this report.

Moisture protection of the supporting soils is considered important for the satisfactory performance of the trail section. This should be reflected in overall site grading and drainage details as recommended in a following section of this report.

TRAIL TREAD

The near surface native soils along the proposed alignment would be weakened and their compressibility increased upon moisture increases. Accordingly, it is recommended that the trail section consist of a minimum of three inches of crusher fines placed over a minimum of 6 inches of compacted subgrade. The subgrade should be scarified to a depth of 8 inches, moisture conditioned within 2 percent of the optimum moisture content, and compacted to a minimum of 95 percent of maximum dry density as determined in

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88007
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accordance with ASTM D-1557. Any fill placed on the trail to raise the trail section above existing grades should also be compacted as recommended above. The crusher fines should have a plasticity index of 15 or less and should have a maximum of 20 percent passing the number 200 sieve. The crusher fines should also be moisture conditioned to within 2 percent of the optimum moisture content and compacted to a minimum of 95 percent of maximum dry density determined in accordance with ASTM D-1557.

EARTHWORK FACTORS

Loss of ground will occur due to clearing and grubbing, compression of the subgrade in both cut and fill sections due to compaction, and reduction in volume from cut to compacted fill sections. Based upon the in-situ densities and the results of the Proctor tests, we estimate that the total shrinkage will be on the order of 30 percent.

CUT AND FILL SLOPES

It is recommended that both cut and fill slopes on the project be made no steeper than 2 to1 (horizontal to vertical). Surface waters should not be allowed to run down the face of the slopes and the slopes should be protected from erosion with vegetation or other means. Temporary slopes should be no steeper than 1.5 to 1.

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 the observation of the geotechnical engineer and in accordance with the following:

1) After clearing and grubbing, the exposed native soils should be densified.

2) Densification should consist of scarification of the exposed subgrade to a depth of 6 inches, moisture conditioning to within 2 percent of the optimum moisture content and compacting the surface to a minimum of 95 percent of maximum dry density as determined in accordance with ASTM D-1557.

3) Native soil will be used for structural fill. All structural fill or backfill material should be free of vegetation, debris, and contain no rocks larger than 3 inches. Fill soils should be blended to avoid placing materials

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that differ greatly from one another in contact with each other.

4) Fill or backfill, consisting of soil approved by the geotechnical engineer, should be placed in controlled compacted layers with approved compaction equipment. All compaction of fill or backfill should be to a minimum of 95 percent of the maximum dry density as determined in accordance with the ASTM D-1557. The moisture content of the material should be within 2 percent of the optimum moisture content.

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

MOISTURE PROTECTION

Precautions should be taken during and after construction to minimize moisture increases of the subgrade soils. Positive drainage should be established away from the trail, and where possible, swales should be constructed to minimize off trail surface waters from crossing the trail except at controlled points to minimize erosion and subgrade moisture increases. Backfill should be well compacted and should meet the specifications outlined in the Site Grading section of this report.

FOUNDATION 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 determine whether the recommendations in this report are applicable to the final design. Review of the final design drawings and specifications will be noted in writing by the geotechnical engineer.

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.

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NEW MEXICO
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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 Loris & Associates, Inc., specifically to aid in the design of the Santa Fe Rail Trail Improvements, Segments 2 through 6, near 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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Job No.: 1-01203

PROJECT: **Santa Fe Rail Trail**

DATE TESTED: September 13, 2011

Results of Field Density tests performed at the above referenced project:

Test No.	Location	Dry Density (PCF)	% Moisture	Maximum Density (PCF)	Optimum Moisture	% Compac-tion	% Required
1	Seg. 2 @ Sta 58+00	109.5	7.7	132.1	7.3	82.9	
2	Seg. 2 @ Sta 97+80	114.8	4.8	132.6	8.2	86.6	
3	Seg. 3 @ Sta 2+00	117.1	4.0	129.4	8.4	90.5	
4	Seg. 3 @ Sta 112+20	116.1	2.9	134.4	7.2	86.4	
5	Seg. 4 @ Sta 18+95	114.9	3.7	132.7	7.9	86.6	
6	Seg. 4 @ Sta 37+00	119.2	4.4	135.8	6.9	87.8	
7	Seg. 5 @ Sta 12+00	101.4	6.4	123.5	9.6	82.1	
8	Seg. 5 @ Sta 79+50	97.2	4.2	123.6	8.9	78.6	
9	Seg. 6 @ Sta 76+00	105.2	4.7	131.4	7.2	80.1	
10	Seg. 6 @ Sta 47+20	109.5	1.7	137.3	5.9	79.8	

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2805-A LAS VEGAS CT.
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88007
(575) 526-6260
FAX (575) 523-1660

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"
Seg. 2 @ 58+00	1.0	SC-SM	10.0	18	4	41	54	66	94	99	100						
Seg. 2 @ 97+80	1.0	SC-SM	5.6	20	7	37	56	64	92	97	99	100					
Seg. 3 @ 112+20	1.0	SM	2.8	NP	NP	22	33	53	91	97	99	100					
Seg. 3 @ 2+00	1.0	SM	4.1	NP	NP	27	44	72	97	99	100						
Seg. 4 @ 18+95	1.0	SM	4.5	NP	NP	16	23	40	84	95	98	99	100				
Seg. 4 @ 37+00	1.0	SC	4.5	24	10	29	36	49	79	86	91	91	92	93	100		
Seg. 5 @ 12+00	1.0	CL	5.2	26	11	57	68	78	93	99	100						
Seg. 5 @ 79+50	1.0	CL-ML	5.5	24	4	76	83	89	95	98	99	99	100				
Seg. 6 @ 47+20	1.0	SP-SM	1.7	NP	NP	6	13	26	52	59	63	65	66	69	82	100	
Seg. 6 @ 76+00	1.0	SC	5.6	32	16	14	16	23	53	62	66	68	71	73	83	100	

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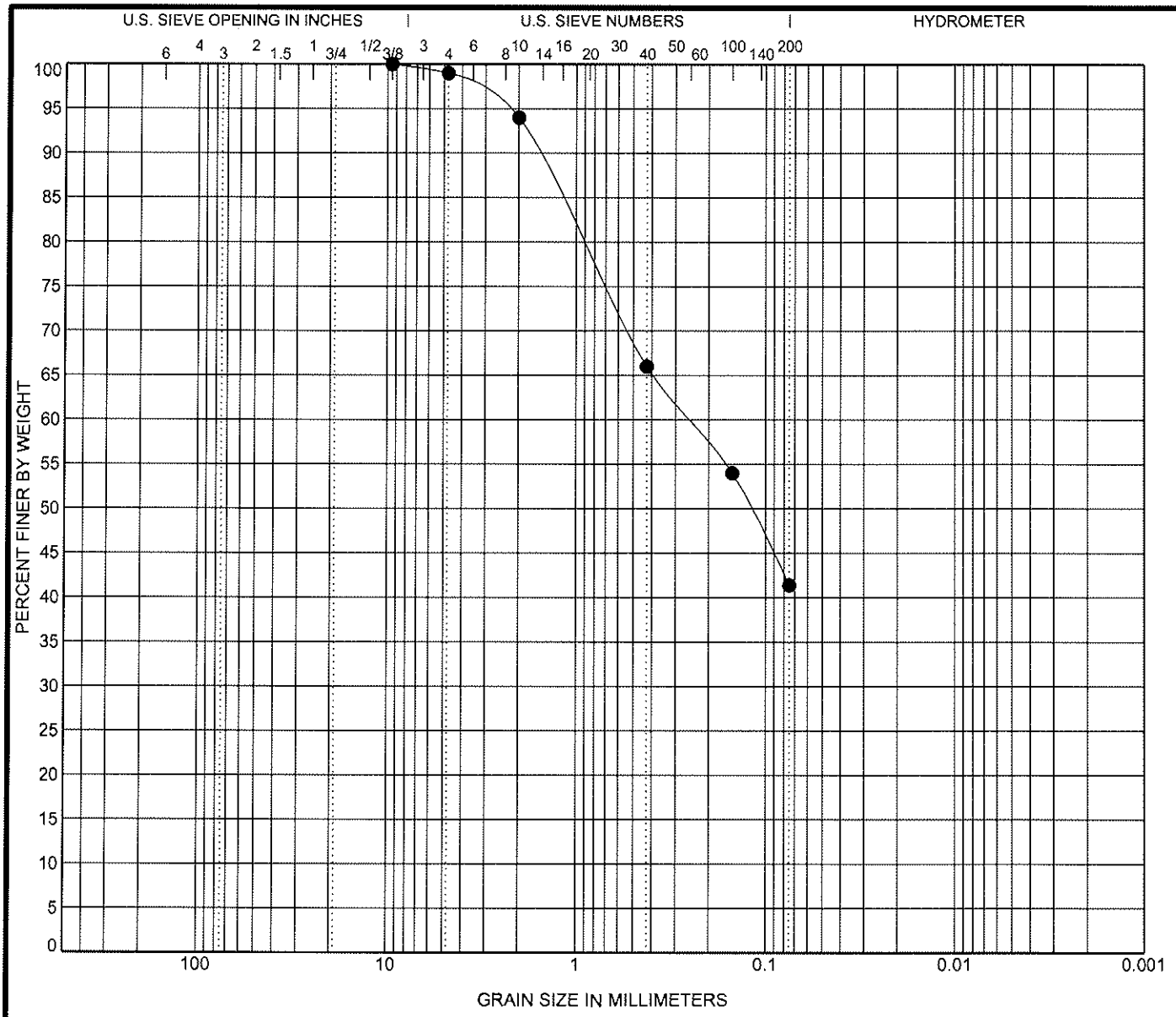
LL = LIQUID LIMIT
PI = PLASTICITY INDEX
NP = NON PLASTIC or NO VALUE

Project: Santa Fe Rail Trail
Location: Santa Fe, New Mexico
Number: 1-01203

SUMMARY OF LABORATORY RESULTS 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Seg. 2 @ 58+00 1.0**	**SILTY, CLAYEY SAND(SC-SM)**	**18**	**14**	**4**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Seg. 2 @ 58+00 1.0**	**9.5**	**0.252**			**1.0**	**57.6**	**41.4**	

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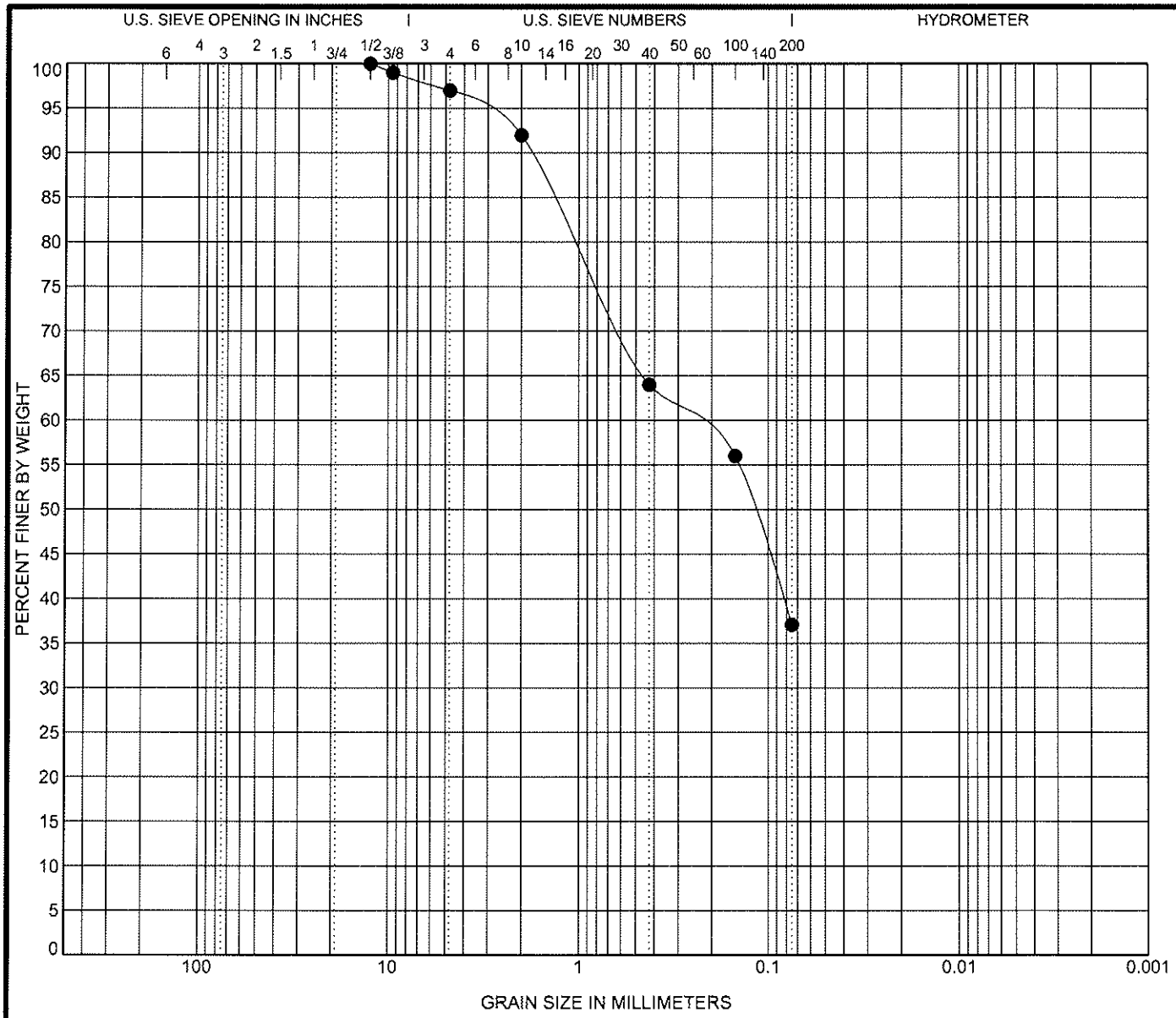
GRAIN SIZE DISTRIBUTION

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US GRAIN SIZE 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Seg. 2 @ 97+80 1.0**	**SILTY, CLAYEY SAND(SC-SM)**	**20**	**13**	**7**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Seg. 2 @ 97+80 1.0**	**12.5**	**0.252**			**3.0**	**59.9**	**37.1**	

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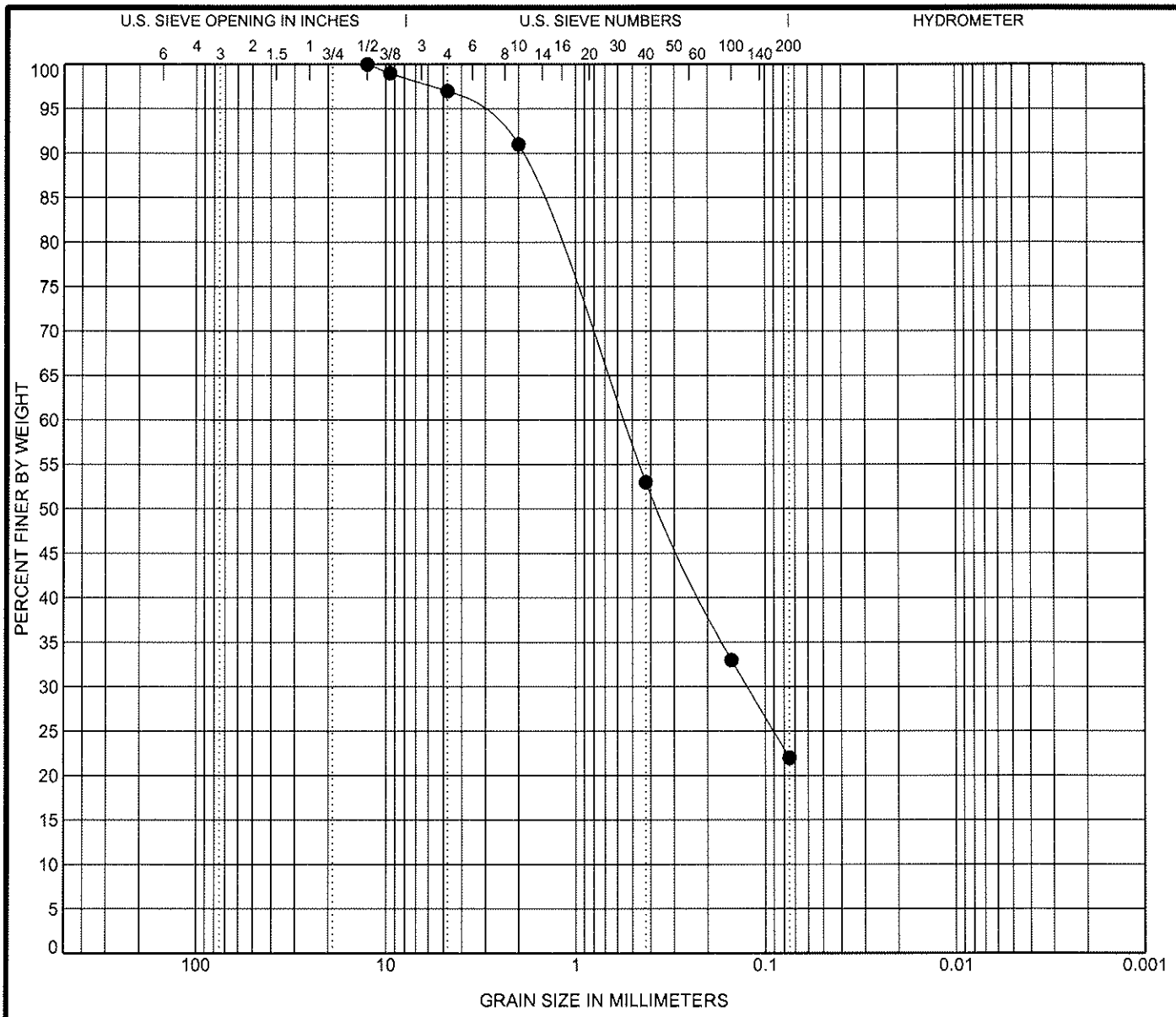
US GRAIN SIZE 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Seg. 3 @ 112+20 1.0**	**SILTY SAND(SM)**	**NP**	**NP**	**NP**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Seg. 3 @ 112+20 1.0**	**12.5**	**0.565**	**0.124**		**3.0**	**75.0**	**22.0**	

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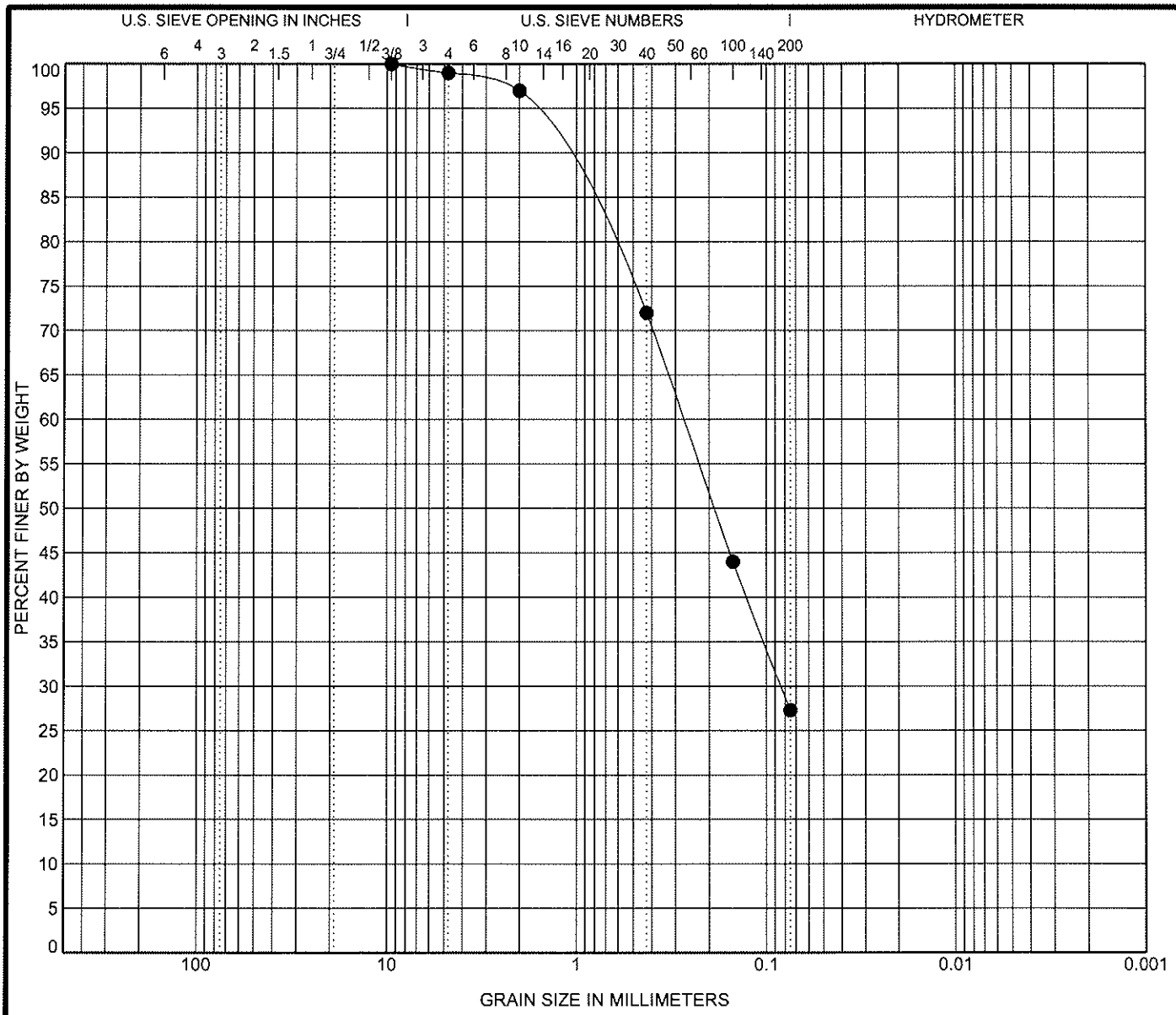
US GRAIN SIZE 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● **Seg. 3 @ 2+00 1.0**	**SILTY SAND(SM)**	**NP**	**NP**	**NP**		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **Seg. 3 @ 2+00 1.0**	**9.5**	**0.272**	**0.084**		**1.0**	**71.7**	**27.3**	

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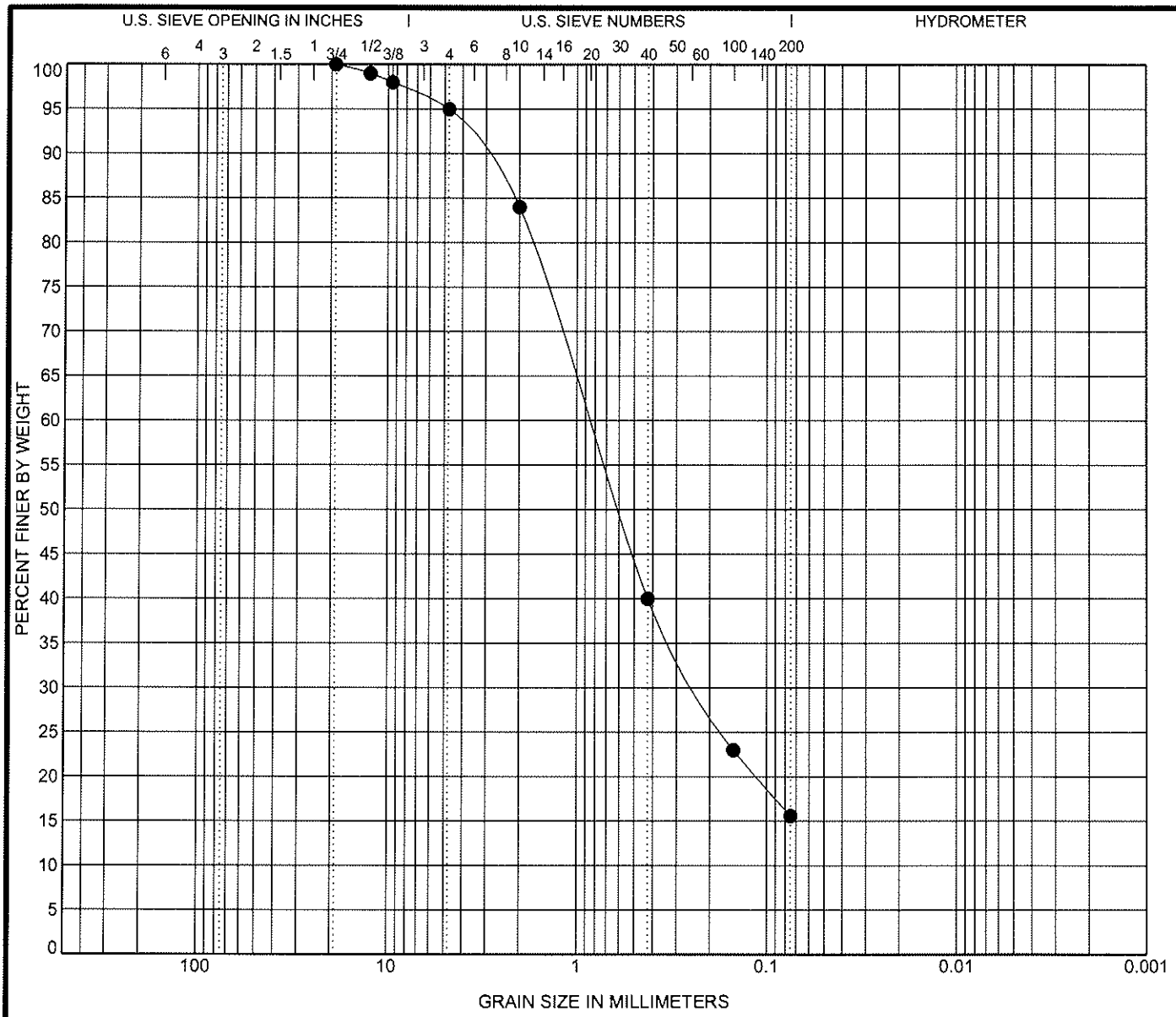

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Seg. 4 @ 18+95 1.0**	**SILTY SAND(SM)**	**NP**	**NP**	**NP**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Seg. 4 @ 18+95 1.0**	**19**	**0.859**	**0.23**		**5.0**	**79.4**	**15.6**	

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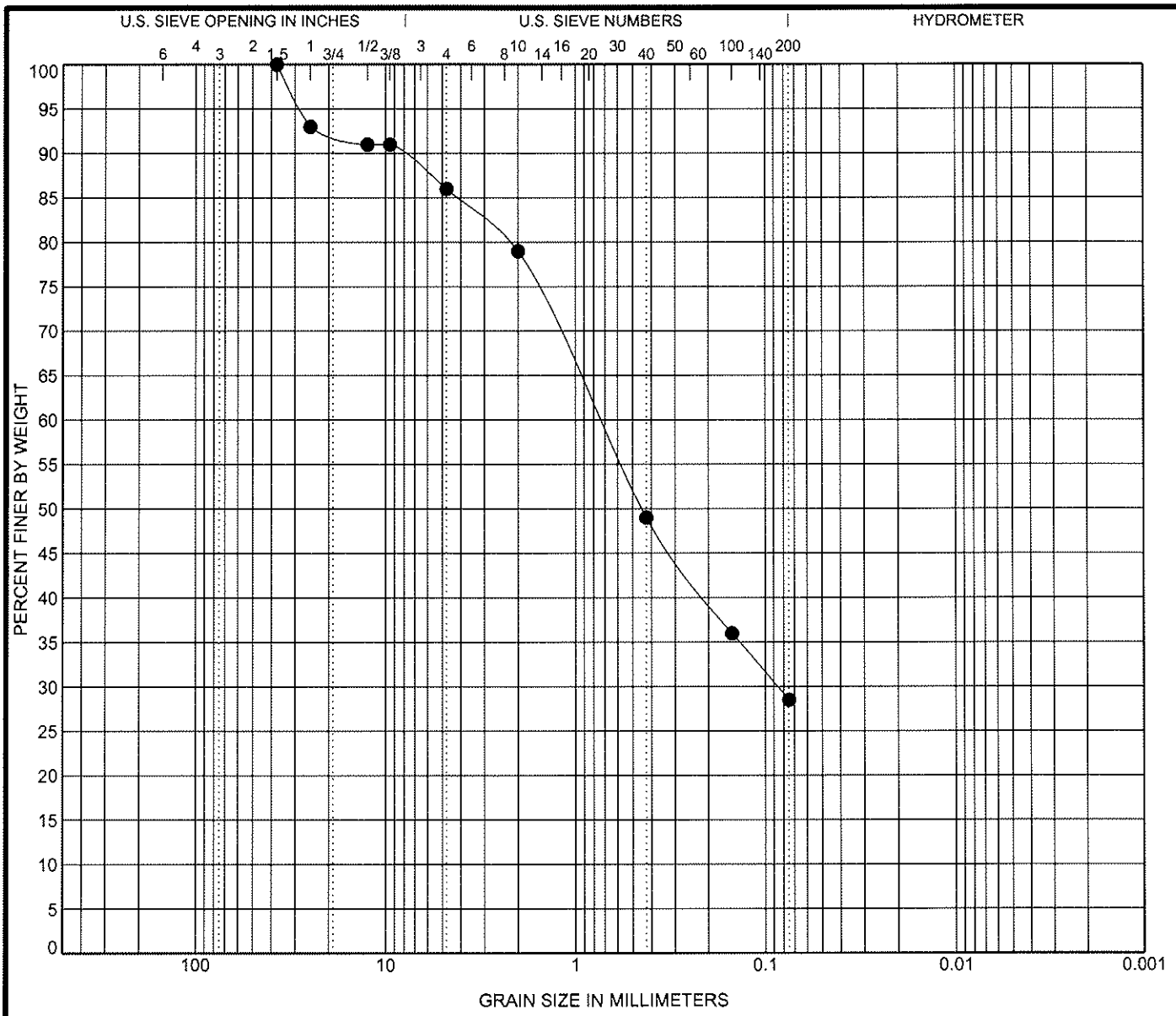

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Seg. 4 @ 37+00 1.0**	**CLAYEY SAND(SC)**	**24**	**14**	**10**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Seg. 4 @ 37+00 1.0**	**37.5**	**0.75**	**0.086**		**14.0**	**57.5**	**28.5**	

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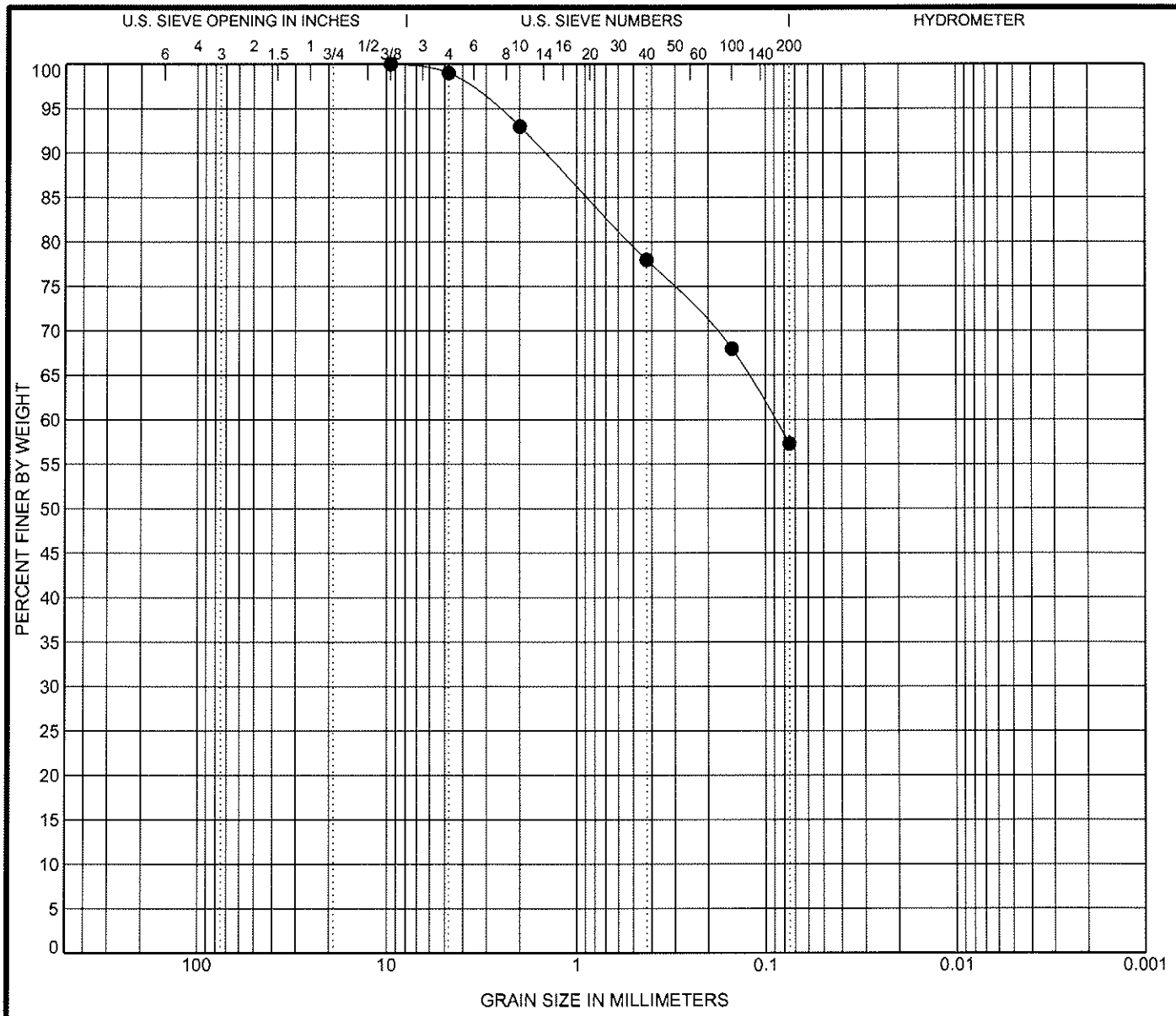

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Seg. 5 @ 12+00 1.0**	**SANDY LEAN CLAY(CL)**	**26**	**15**	**11**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Seg. 5 @ 12+00 1.0**	**9.5**	**0.089**			**1.0**	**41.7**	**57.3**	

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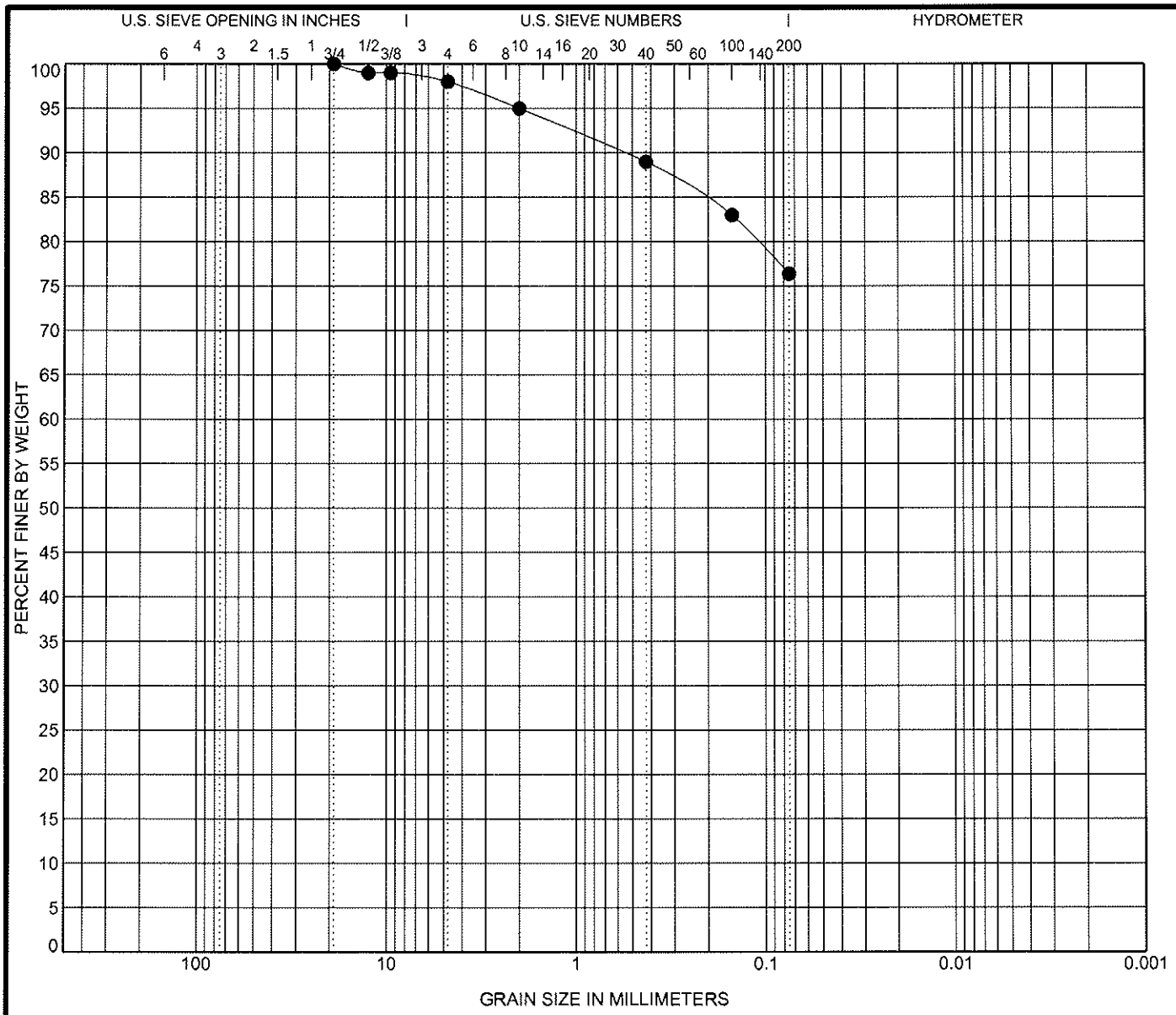

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Seg. 5 @ 79+50 1.0**	**SILTY CLAY with SAND(CL-ML)**	**24**	**20**	**4**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Seg. 5 @ 79+50 1.0**	**19**				**2.0**	**21.6**	**76.4**	

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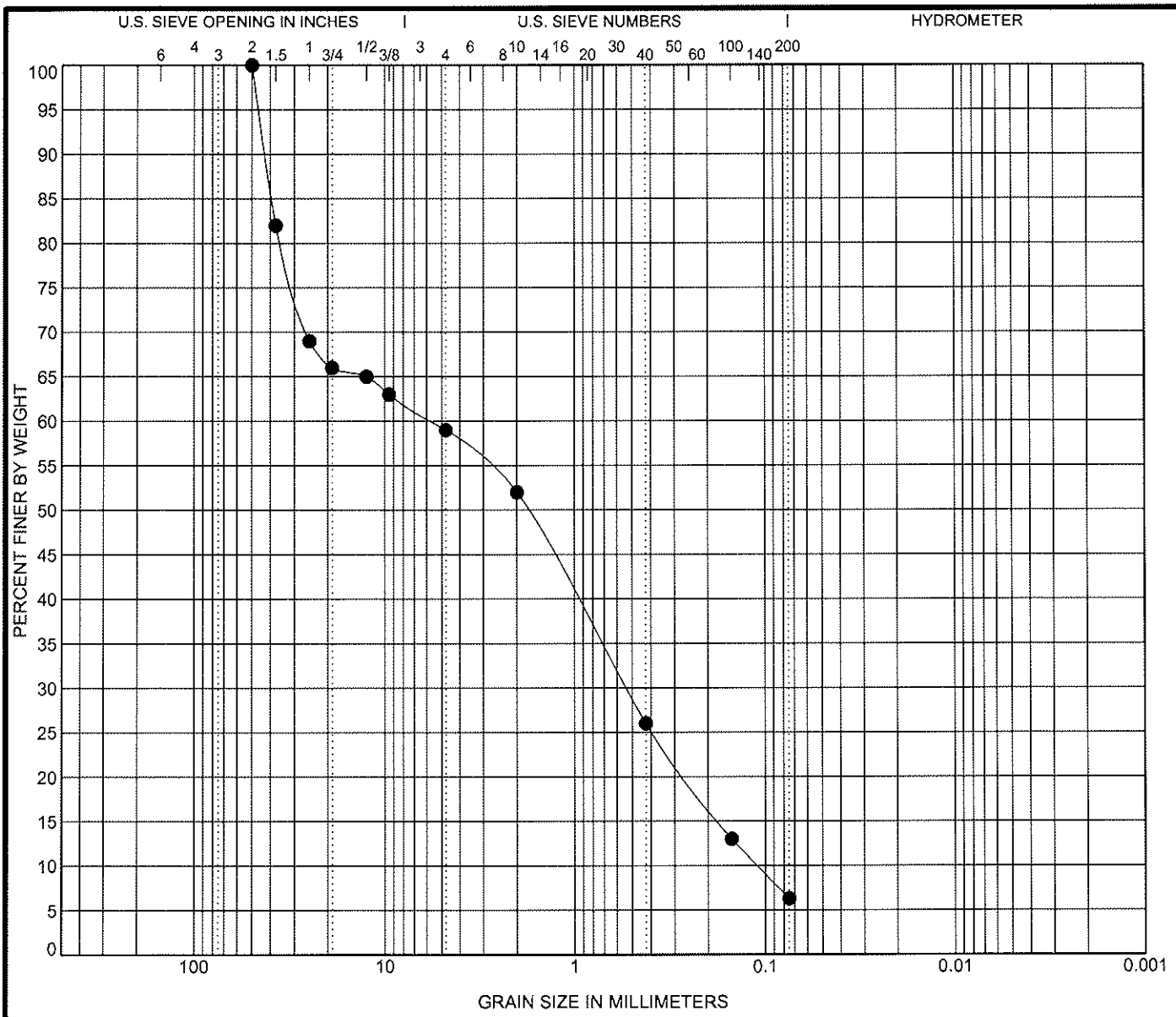


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● **Seg. 6 @ 47+20 1.0**	**POORLY GRADED SAND with SILT and GRAVEL(SP-SM)**	**NP**	**NP**	**NP**	**0.47**	**51.36**

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **Seg. 6 @ 47+20 1.0**	**50**	**5.649**	**0.539**	**0.11**	**41.0**	**52.7**	**6.3**	

GEO-TEST

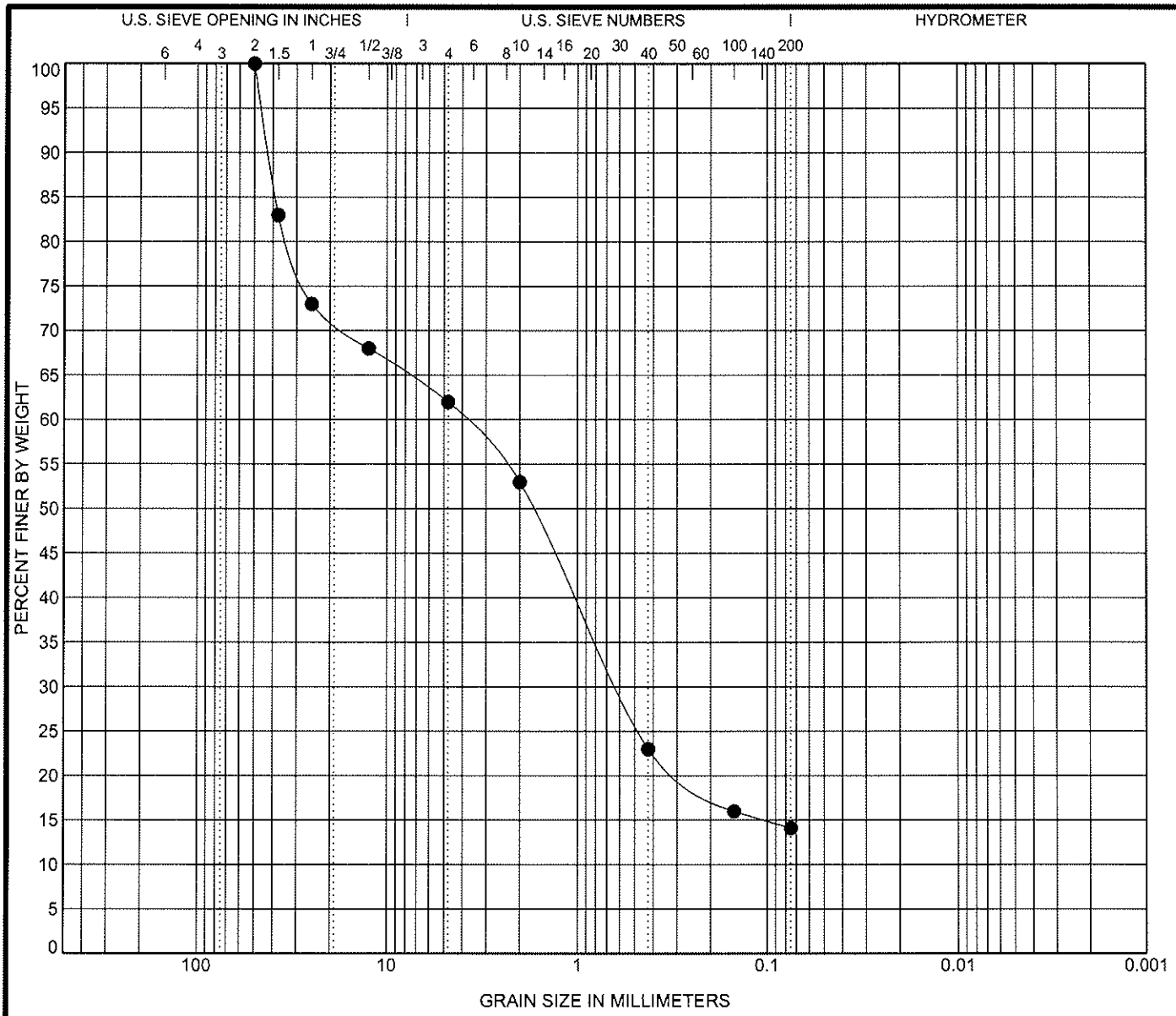
GRAIN SIZE DISTRIBUTION

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US GRAIN SIZE 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Seg. 6 @ 76+00 1.0**	**CLAYEY SAND with GRAVEL(SC)**	**32**	**16**	**16**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Seg. 6 @ 76+00 1.0**	**50**	**3.919**	**0.61**		**38.0**	**47.9**	**14.1**	

GEO-TEST

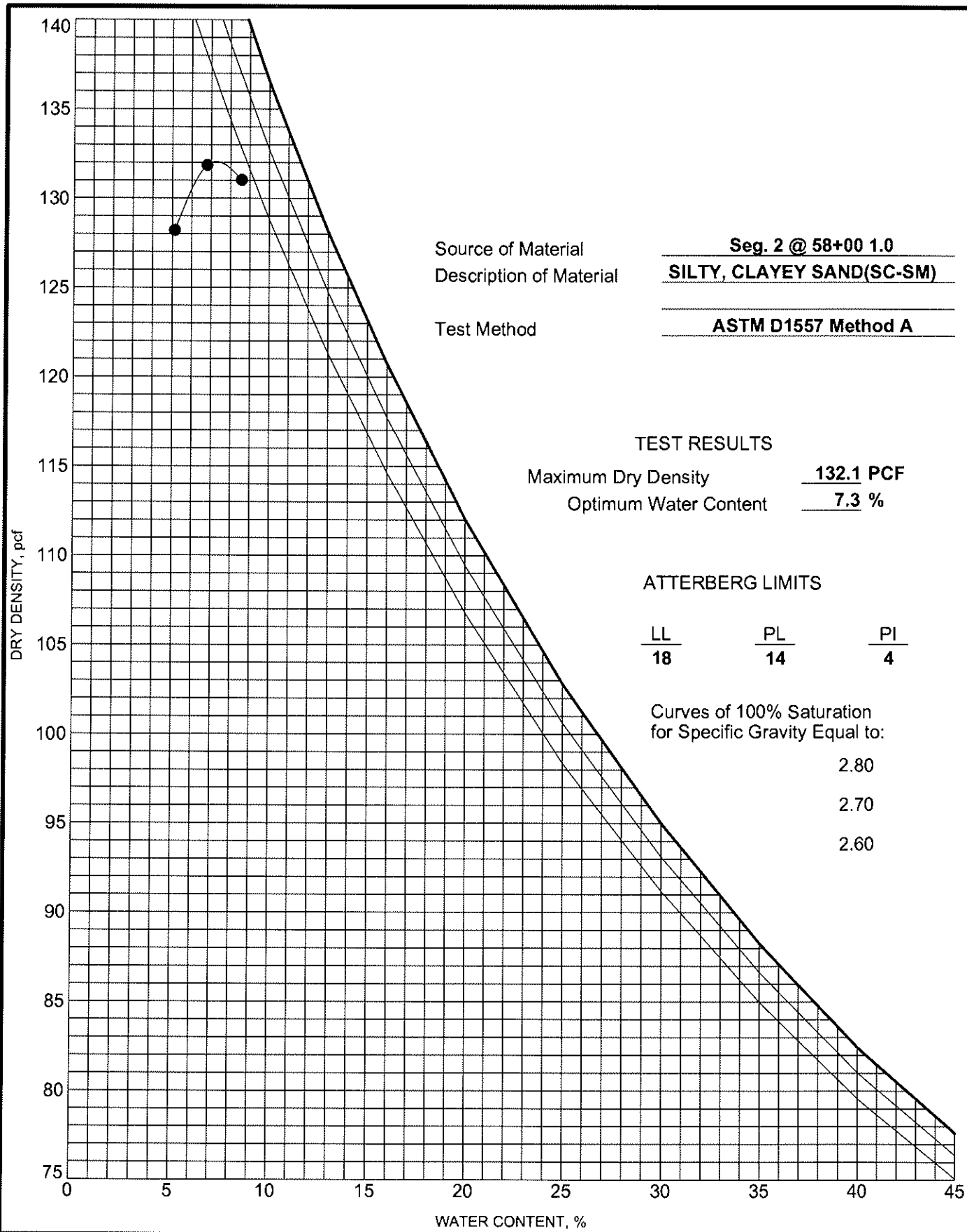
GRAIN SIZE DISTRIBUTION

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US GRAIN SIZE 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



Source of Material: **Seg. 2 @ 58+00 1.0**

Description of Material: **SILTY, CLAYEY SAND(SC-SM)**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density: **132.1 PCF**

Optimum Water Content: **7.3 %**

ATTERBERG LIMITS

LL	PL	PI
18	14	4

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

GEO-TEST

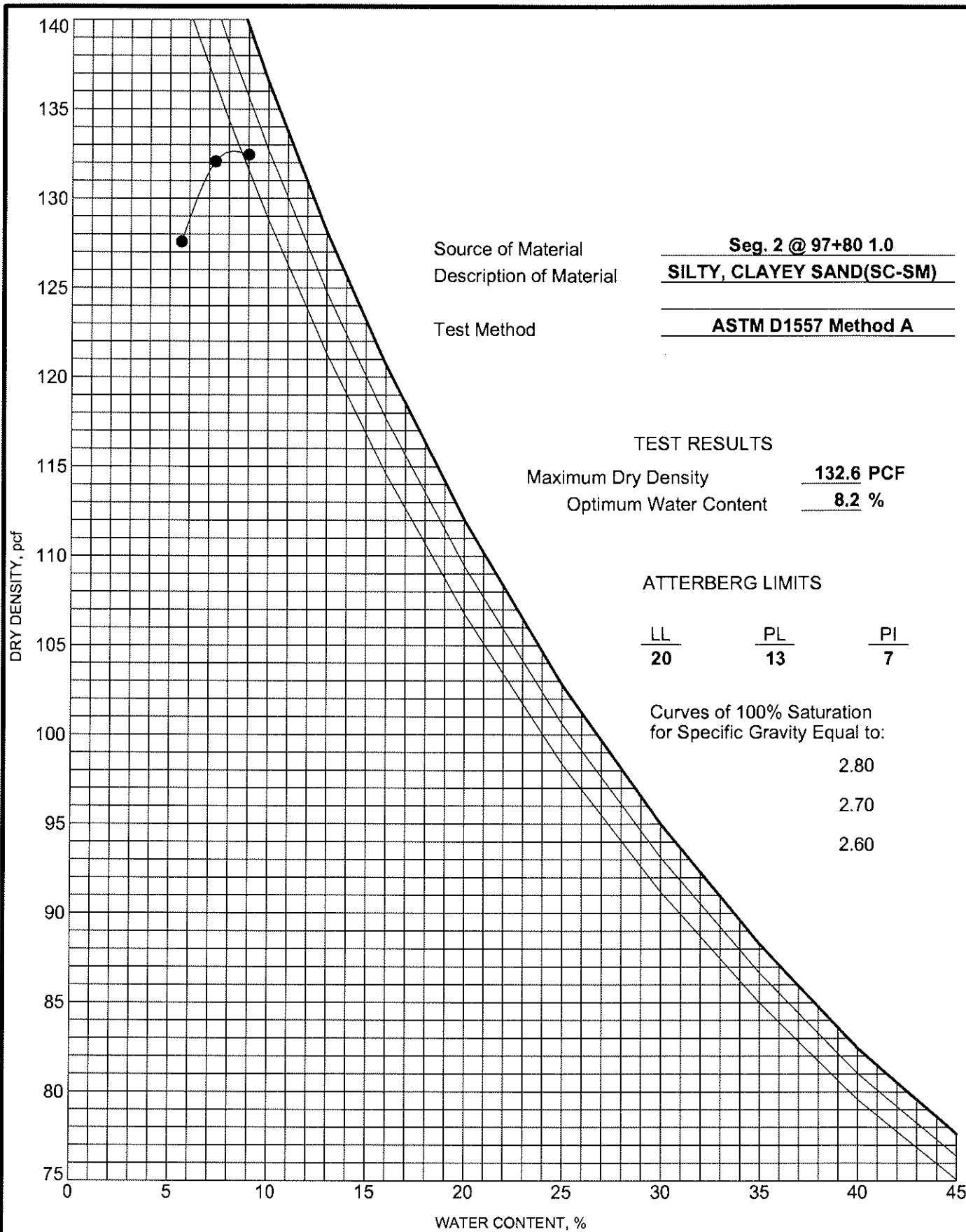
MOISTURE-DENSITY RELATIONSHIP

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US COMPACTION 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



Source of Material: **Seg. 2 @ 97+80 1.0**

Description of Material: **SILTY, CLAYEY SAND(SC-SM)**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density: **132.6** PCF

Optimum Water Content: **8.2** %

ATTERBERG LIMITS

LL	PL	PI
20	13	7

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

MOISTURE-DENSITY RELATIONSHIP

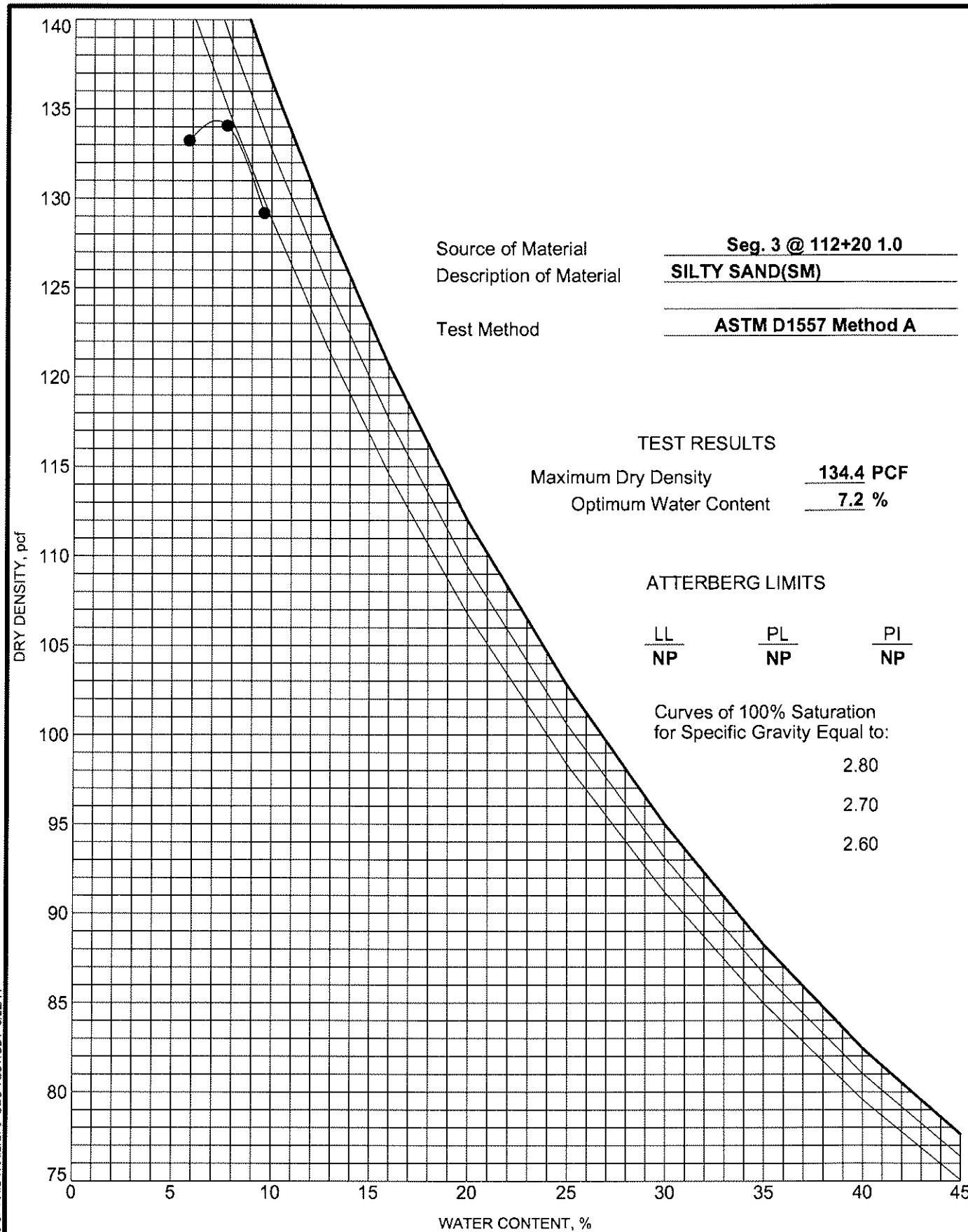
GEO-TEST

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US COMPACTION 1-01203 SF RAIL TRAIL.GPJ .GEO TEST.GDT 9/22/11



Source of Material: **Seg. 3 @ 112+20 1.0**

Description of Material: **SILTY SAND(SM)**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density: **134.4 PCF**

Optimum Water Content: **7.2 %**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

GEO-TEST

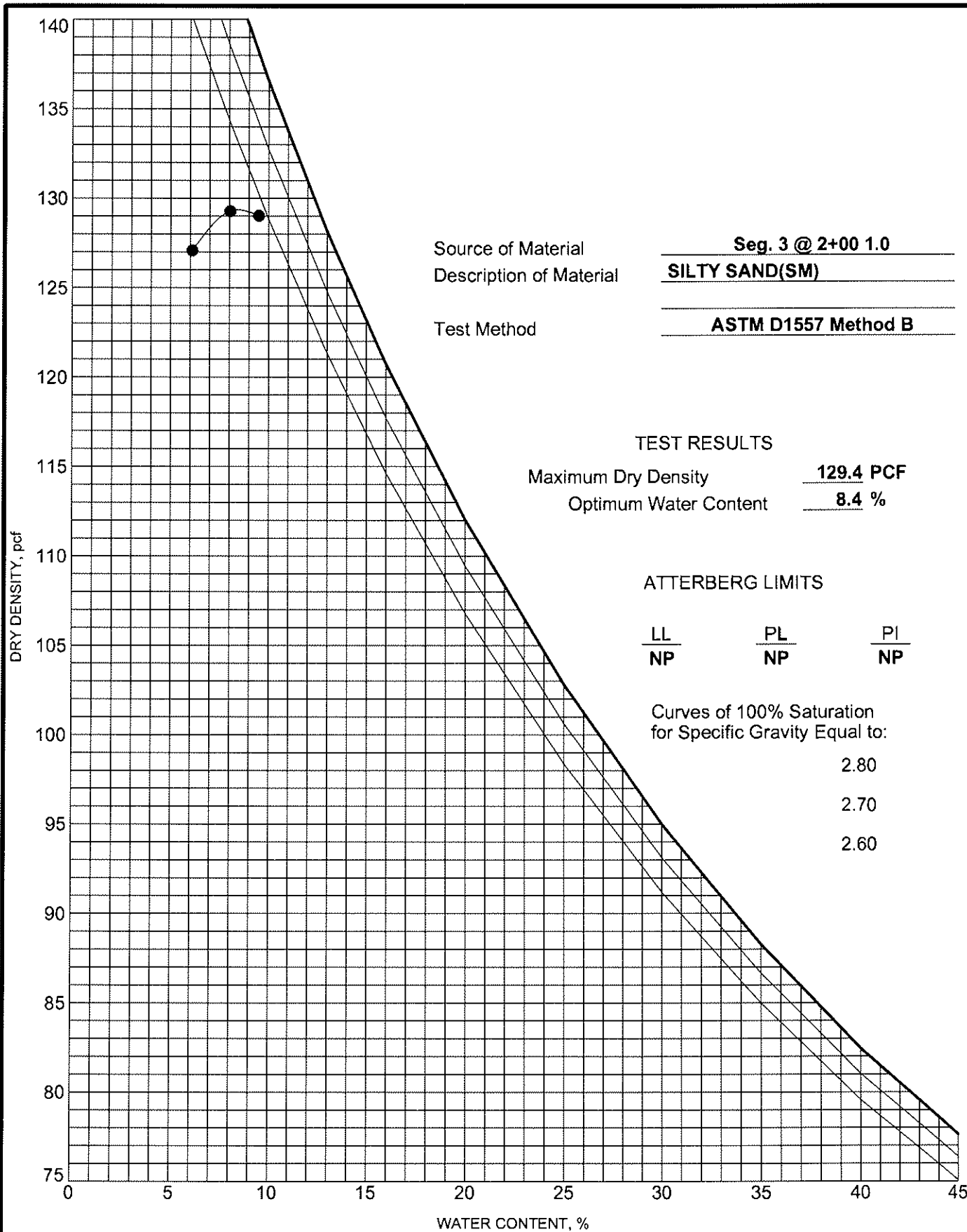
MOISTURE-DENSITY RELATIONSHIP

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US COMPACTION 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



Source of Material: **Seg. 3 @ 2+00 1.0**

Description of Material: **SILTY SAND(SM)**

Test Method: **ASTM D1557 Method B**

TEST RESULTS

Maximum Dry Density: **129.4** PCF

Optimum Water Content: **8.4** %

ATTERBERG LIMITS

LL	PL	PI
NP	NP	NP

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

GEO-TEST

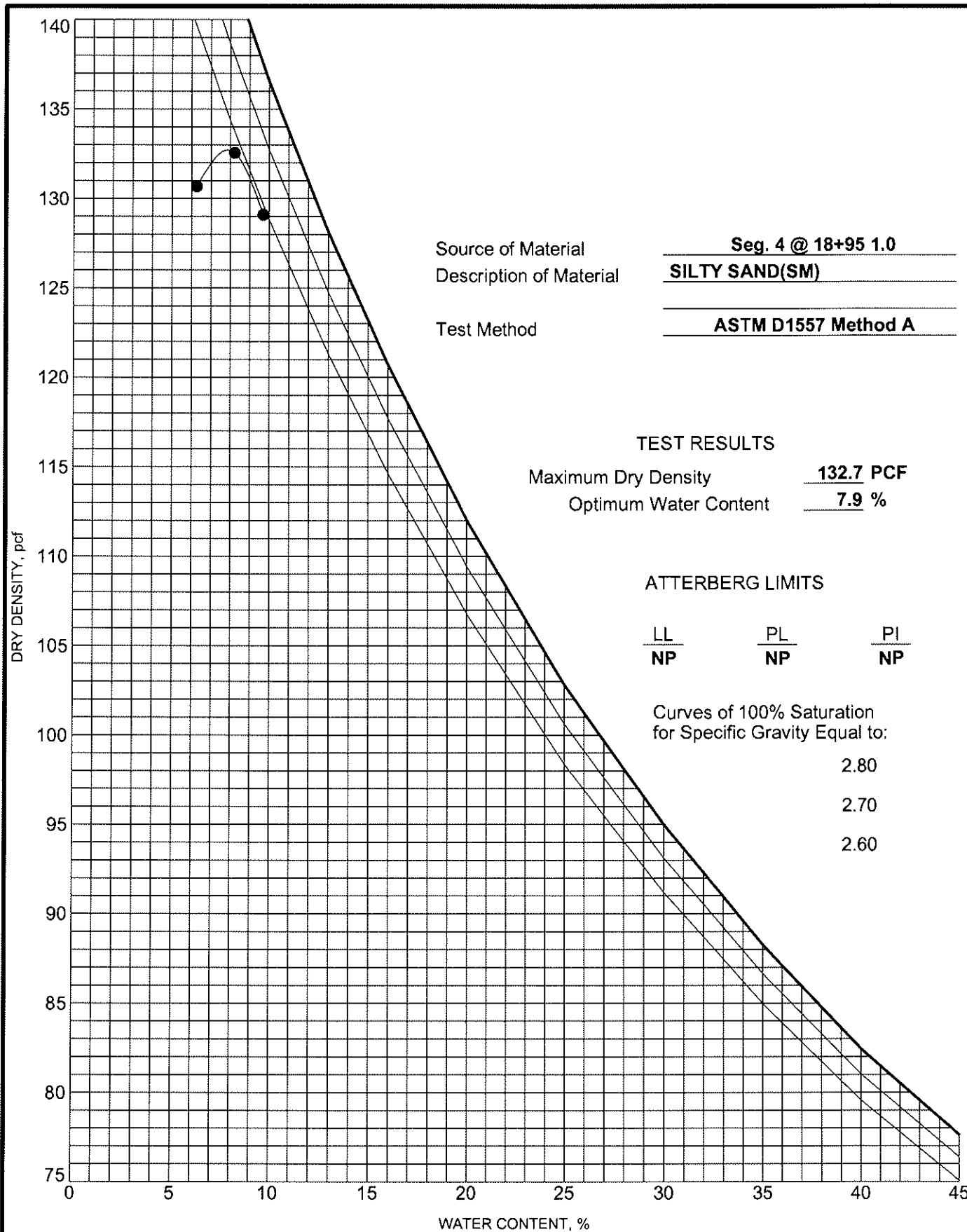
MOISTURE-DENSITY RELATIONSHIP

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US COMPACTION 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



Source of Material: **Seg. 4 @ 18+95 1.0**

Description of Material: **SILTY SAND(SM)**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density: **132.7 PCF**

Optimum Water Content: **7.9 %**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

GEO-TEST

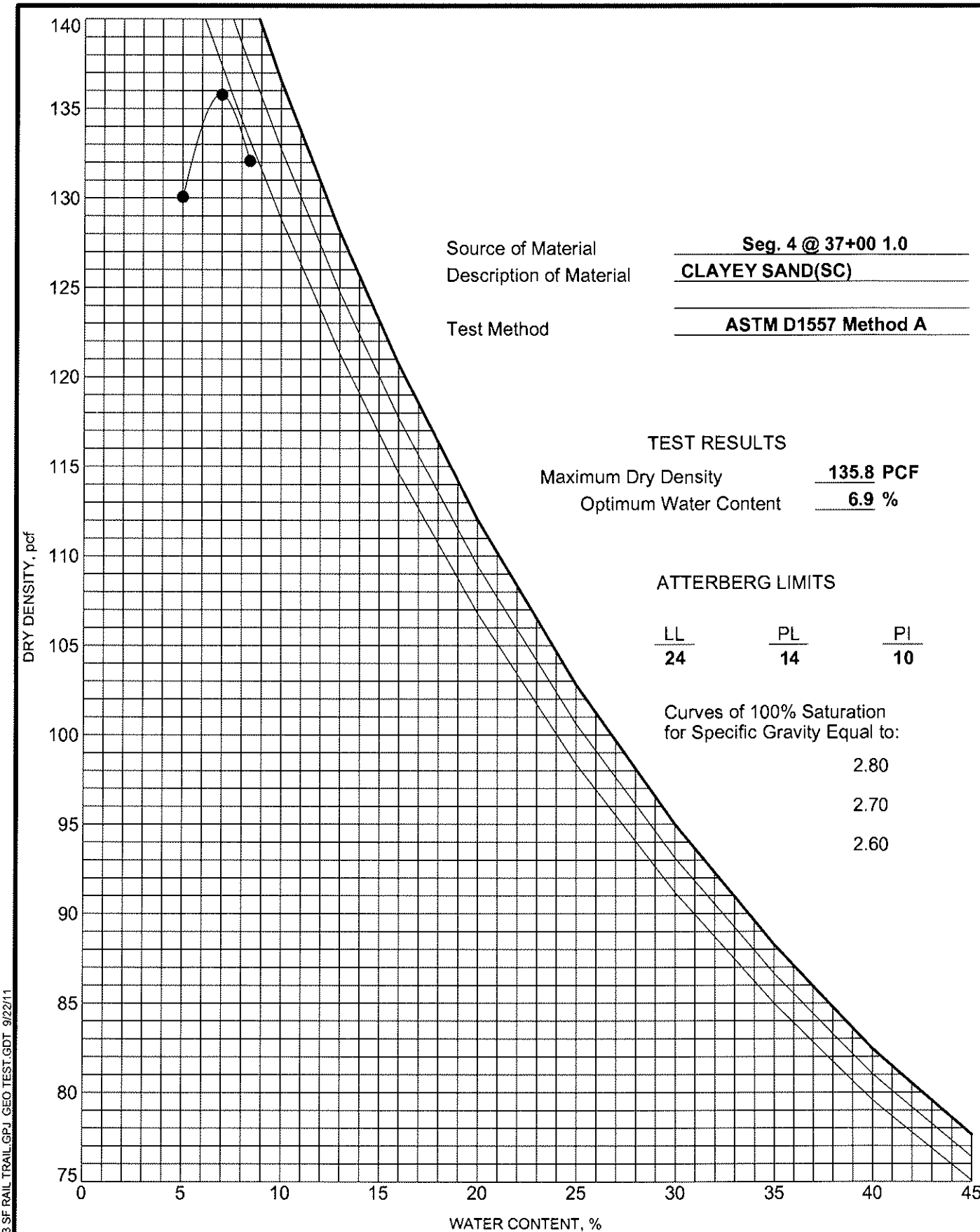
MOISTURE-DENSITY RELATIONSHIP

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US COMPACTION 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



Source of Material: **Seg. 4 @ 37+00 1.0**

Description of Material: **CLAYEY SAND(SC)**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density: **135.8 PCF**

Optimum Water Content: **6.9 %**

ATTERBERG LIMITS

LL	PL	PI
24	14	10

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

GEO-TEST

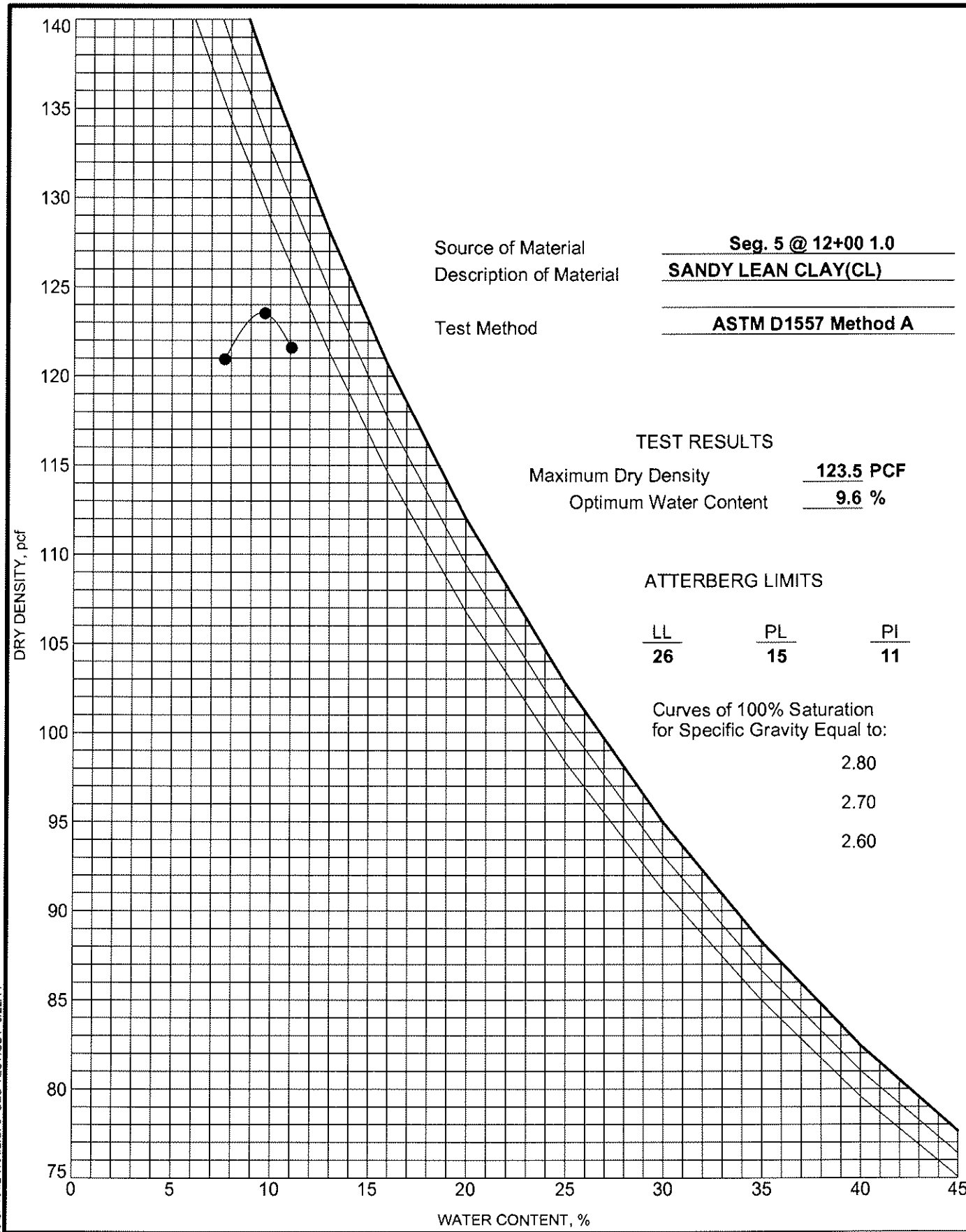
MOISTURE-DENSITY RELATIONSHIP

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US COMPACTION 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



Source of Material: **Seg. 5 @ 12+00 1.0**

Description of Material: **SANDY LEAN CLAY(CL)**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density: **123.5** PCF

Optimum Water Content: **9.6** %

ATTERBERG LIMITS

LL	PL	PI
26	**15**	**11**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

GEO-TEST

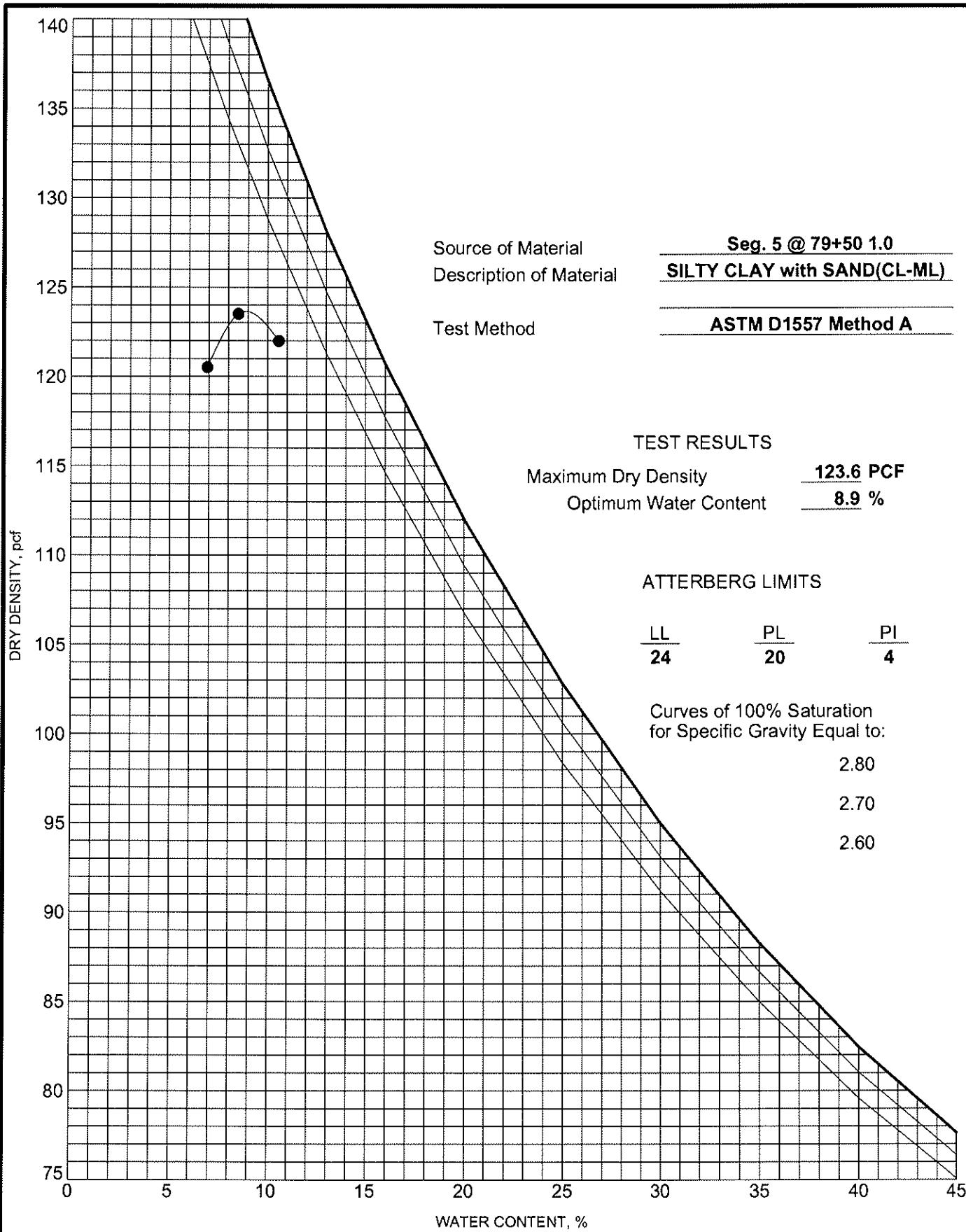
MOISTURE-DENSITY RELATIONSHIP

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US COMPACTION 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



Source of Material: **Seg. 5 @ 79+50 1.0**

Description of Material: **SILTY CLAY with SAND(CL-ML)**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density: **123.6 PCF**

Optimum Water Content: **8.9 %**

ATTERBERG LIMITS

LL	PL	PI
24	**20**	**4**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

GEO-TEST

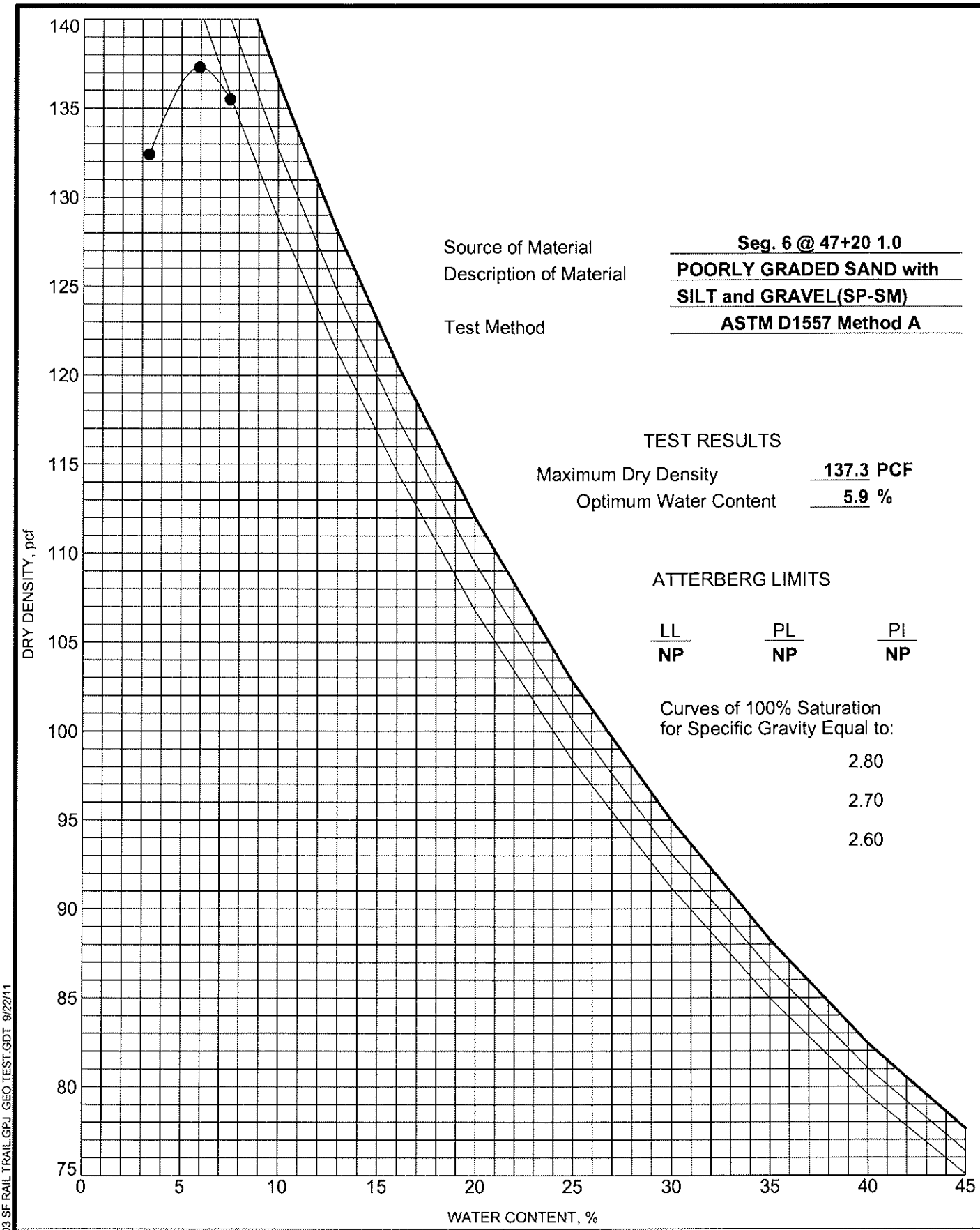
MOISTURE-DENSITY RELATIONSHIP

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US.COMPACTION 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



Source of Material: **Seg. 6 @ 47+20 1.0**

Description of Material: **POORLY GRADED SAND with SILT and GRAVEL(SP-SM)**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density	**137.3** PCF
Optimum Water Content	**5.9** %

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

GEO-TEST

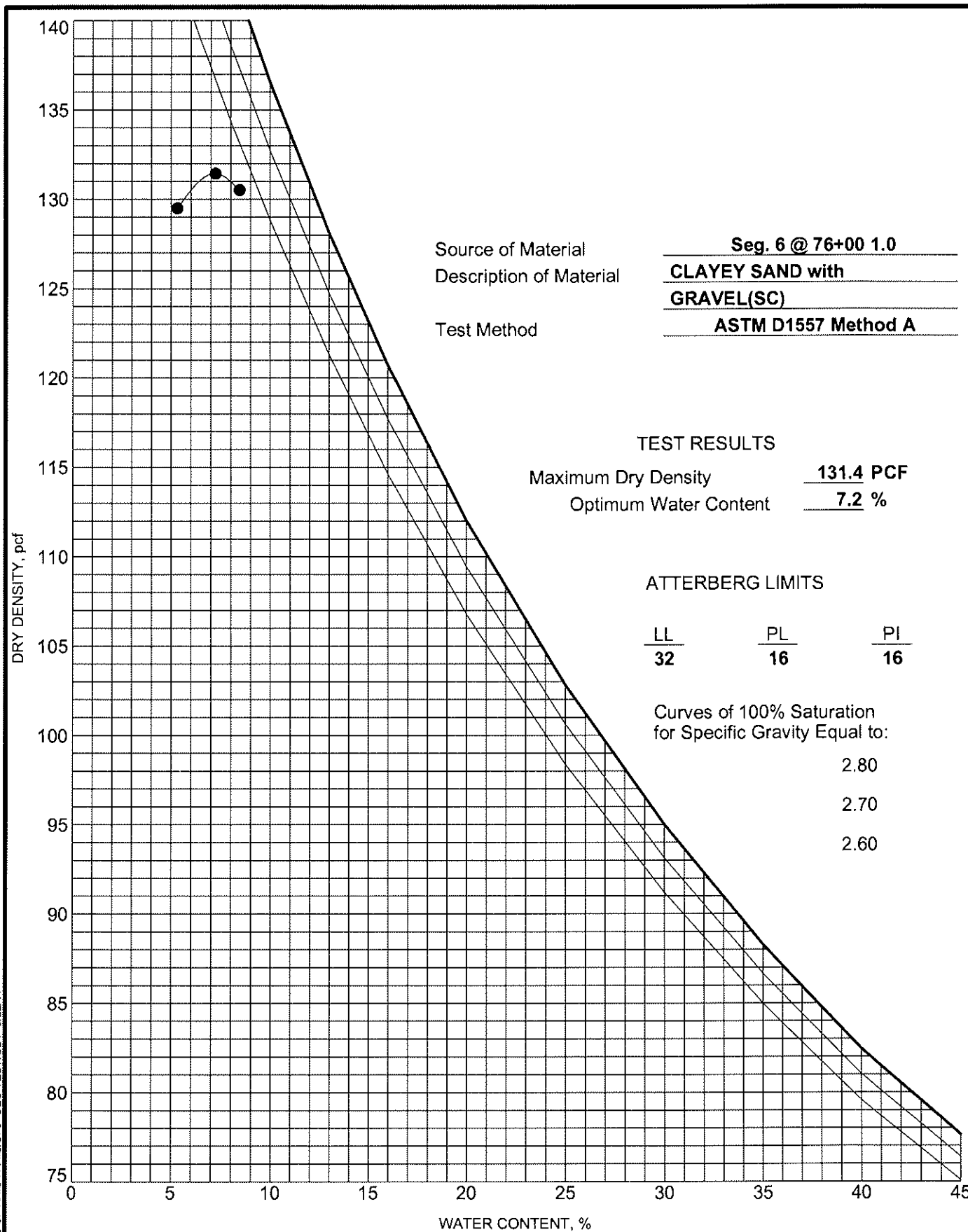
MOISTURE-DENSITY RELATIONSHIP

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US COMPACTION 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11



Source of Material: **Seg. 6 @ 76+00 1.0**

Description of Material: **CLAYEY SAND with GRAVEL(SC)**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density	**131.4 PCF**
Optimum Water Content	**7.2 %**

ATTERBERG LIMITS

LL	PL	PI
32	**16**	**16**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

GEO-TEST

MOISTURE-DENSITY RELATIONSHIP

Project: Santa Fe Rail Trail

Location: Santa Fe, New Mexico

Number: 1-01203

US COMPACTION 1-01203 SF RAIL TRAIL.GPJ GEO TEST.GDT 9/22/11