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PAVEMENT DESIGN REPORT
WINSOME FILING NO. 3
EL PASO COUNTY, COLORADO

Prepared for:
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Attn: Joseph W. DesJardin, P.E.

September 11, 2024

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Lucas Morrison
Geotechnical Engineering Staff

Reviewed by:

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El Paso County Department of Public Works

Entech Job No. 240824

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1 Introduction

Entech Engineering Inc. (Entech) completed a subsurface exploration program and pavement design for roadways within Winsome Filing No. 3 in El Paso County, Colorado. This report describes the subsurface exploration program conducted for the proposed roadway improvements and provides pavement section alternatives and construction recommendations. Entench participated in this project as a subconsultant to ProTerra Properties. The contents of this report, including the pavement design recommendations, are subject to the limitations and assumptions presented in Section 7.

2 Project Description

The site is located west of Meridian Road and north of Hodgen Road within the Winsome Filing No. 3 subdivision in El Paso County, Colorado (Figure 1). The proposed improvements include the paving of sections of Alamar Way and Twinkling Star Lane. The extent of our investigation is shown in Figure 2.

At the time of our subsurface exploration program, the existing roadway had been rough-graded and utilities had been installed. Surrounding properties are comprised of vacant land, land being developed for future residential lots, and an existing subdivision. Based on the development plans, the roadways are designated as rural local roadways.

3 Subsurface Explorations and Laboratory Testing

3.1 Subsurface Exploration Program

Subsurface conditions at the project site were explored by 20 test borings, designated TB-1 through TB-20, drilled on July 31, 2024. The locations of the test borings are shown on the Site and Exploration Plan (Figure 2). The borings were drilled to depths of 5 to 10 feet below the existing ground surface (bgs). The drilling was performed using a truck-mounted, continuous flight auger drill rig supplied and operated by Entech. Descriptive boring logs providing the lithologies of the subsurface conditions encountered during drilling are presented in Appendix A. Groundwater levels were measured in each of the open boreholes at the conclusion of drilling.

Soil and bedrock samples were obtained from the borings utilizing the Standard Penetration Test (ASTM D1586) using a split-barrel California sampler. Results of the Standard Penetration Test (SPT) are included on the boring logs in terms of N-values expressed in blows per foot (bpf). Soil

and bedrock samples recovered from the borings were visually classified and recorded on the boring logs. The soil classifications were later verified utilizing laboratory testing and grouped by soil type. The soil type numbers are included on the boring logs. It should be understood that the soil descriptions shown on the boring logs may vary between boring location and sample depths. It should also be noted that the lines of stratigraphic separation shown on the boring logs represent approximate boundaries between soil types and the actual stratigraphic transitions may be more gradual or variable with location.

3.2 Geotechnical Index and Engineering Property Testing

Water content testing (ASTM D2216) was performed on the samples recovered from the borings and the results are shown on the boring logs. Grain-Size Analysis (ASTM D422) and Atterberg Limits testing (ASTM D4318) were performed on selected samples to assist in classifying the materials encountered in the borings.

One-dimensional swell or collapse testing (ASTM D4546) was performed on select samples to determine the expansive or compressive characteristics of the soil. For pavement design, a Modified Proctor (ASTM D1557), a Standard Proctor (ASTM D698), and a California Bearing Ratio (CBR) test (ASTM D1883) were completed. Soluble sulfate testing was performed on select soil samples to evaluate the potential for below-grade degradation of concrete due to sulfate attack. The laboratory testing results are presented in Appendix B and summarized in Table B-1.

4 Subgrade Conditions

Four primary soil types were encountered in the test borings drilled for the subsurface investigation. Each soil type was classified in accordance with the Unified Soil Classification System (USCS) and the American Association of State Highway and Transportation Officials (AASHTO) soil classification system using the laboratory testing results and the observations made during drilling.

4.1 Subsurface Conditions

Subsurface conditions along the proposed roadway generally consisted of medium dense silty to clayey sand fill (Soil Type 1, AASTHO Classification A-1-b, A-2-4, A-2-6) and stiff to very stiff sandy clay fill (Soil Type 2, AASTHO Classification A-4 and A-6). Underlying Soil Type 1 and Soil Type 2 we encountered native dense to medium-dense sand with varying amounts of silt and clay (Soil Type 3, AASTHO Classification A-1-b, A-2-4, A-2-6, A-4) or sandy clay to clay with sand

(Soil Type 4, AASTHO Classification A-4, A-6, A-7-6). Water soluble sulfate tests indicated that the soils exhibit a negligible potential for sulfate attack.

4.2 Groundwater

Groundwater was not encountered in the test borings. Groundwater fluctuations are likely and will depend on seasonal variations, local precipitation, runoff, and other factors. We do not anticipate groundwater to affect the proposed construction.

5 Pavement Design Recommendations

Pavement design recommendations were made in accordance with the *El Paso County Pavement Design Criteria Manual.*

5.1 Subgrade Conditions

California Bearing Ratio (CBR) testing was performed on representative samples of the subgrade clayey sand fill (Soil Types 1 and 2) from TB-2 and TB-7 to determine the support characteristics of the subgrade soils for the roadway section. The results of the CBR testing are presented in Appendix B and summarized in Exhibit 1. The pavement design was analyzed using Soil Type 2, AASHTO Classification A-4.

Exhibit 1: Subsurface Laboratory Testing Summary

Design Parameter	Design Value	
Soil Type	1 – Clayey Sand Fill	2 – Sandy Clay Fill
CBR at 95%	24.81	3.85
Design CBR	10	3.8
Liquid Limit	32	33
Plasticity Index	10	9
Percent Passing 200	31.7	54.6
AASHTO Classification	A-2-4	A-4
Group Index	0	3
Unified Soils Classification	SC	CL

5.2 Swell Mitigation

El Paso County requires swell mitigation for soils with swell testing results greater than 2% under a 150 pounds per square foot (psf) surcharge. Based on the subgrade soils classification and swell testing, mitigation for expansive soils will not be required on this site.

5.3 Traffic Loading

Traffic data is not available for the future interior roads in the Winsome Filing No. 3 subdivision; however, the roads are classified as rural local roadways based on the current development plans. The *El Paso County Engineering Criteria Manual* provides default 18-kip equivalent single axle loadings (ESAL) based on the street classification. For design, a default ESAL value of 36,500 was used for the local rural road designation as referenced by the traffic impact study from Kellar Engineering dated February 22, 2023.

5.4 Pavement Design

The pavement sections were determined utilizing the *El Paso County Engineering Criteria Manual*, the CBR testing, and default ESAL values. Design parameters used in the pavement analysis are presented in Exhibit 2.

Exhibit 2: Pavement Design Parameters

Design Parameter	Value
Reliability- Local Roadway	75%
Standard Deviation	0.45
Serviceability Loss (Δ psi)	2.0
Design CBR	3.8
Resilient Modulus	5,700 psi
Structural Coefficients	
Hot Bituminous Pavement	0.44
Aggregate Base Course/Recycled Concrete Base	0.11

Pavement section alternatives recommended for the roadways included in this phase of the filing are summarized in Exhibit 3. The pavement design calculations are presented in Appendix C.

Exhibit 3: Recommended Pavement Sections

Pavement Area	Design ESAL	Alternative [1]
Alamar Way, Twinkling Star Lane	36,500	1. 4.0 inches HMA over 4.0 inches ABC/RCB

ABC = Aggregate Base Course; ESAL = equivalent single axle loads; HMA = Hot Mix Asphalt; RCB = Recycled Concrete Base

Notes:

1. The pavement alternative meets the minimum sections required per the *El Paso County Engineering Criteria Manual.*

6 Construction Recommendations

Pavement design recommendations provided herein are contingent on good construction practices, and poor construction techniques may result in poor performance. Our analyses assume that this project will be constructed according to the *El Paso County Engineering Criteria Manual* and the *Pikes Peak Region Asphalt Paving Specifications*.

6.1 Earthwork Recommendations for Pavement Subgrade

Proper subgrade preparation is required for adequate pavement performance. Paving areas should be cleared of all deleterious materials including but not limited to existing pavements, utility poles, and fence poles. Surface vegetation, if any, should be removed by stripping, with the depth to be field determined.

6.1.1 Subgrade Preparation

If pavement section alternatives are selected utilizing aggregate base course (ABC) or recycled concrete base (RCB), the final subgrade surface should be scarified to a depth of 8 inches, moisture conditioned within +/-2% of the optimum water content, and recompacted to 95% of the Modified Proctor (ASTM D1557) maximum dry density.

The compacted surface below pavements should be proof-rolled with a fully loaded, tandem-axle, 10-yard dump truck or equivalent. Any areas that are delineated to be soft, loose, or yielding during proof-rolling should be removed and reconditioned or replaced.

6.1.2 Fill Placement and Compaction

Granular fill placed as part of the pavement subgrade shall consist of nonexpansive, granular soil, free of organic matter, unsuitable materials, debris, and cobbles greater than 3 inches in diameter. Additionally, any granular fill placed as part of the roadway subgrade should have a minimum CBR of 5. All fill placed within the pavement subgrade should be compacted to a minimum of 95% of the Modified Proctor (ASTM D1557) for granular soils or Standard Proctor (ASTM D698) for cohesive soils at +/-2% of optimum moisture content. Fill material should be placed in horizontal lifts such that each finished lift has a compacted thickness of 6 inches or less. Entech should approve any imported fill to be used within the pavement subgrade area prior to delivery to the site.

6.2 Aggregate Base Course and Recycled Concrete Base

ABC or RCB materials shall conform to the *El Paso County Standard Specifications Manual*, Section 300 Aggregate Base Course. ABC or RCB materials should be compacted to a minimum of 95% of the Modified Proctor maximum dry density (ASTM D1557) at +/-2% of optimum moisture content.

6.3 Concrete Degradation Due to Sulfate Attack

Sulfate solubility testing was conducted on several samples recovered from the test borings to evaluate the potential for sulfate attack on concrete. The test results indicated 0.02% to less than 0.01% soluble sulfate (by weight). The test results indicate the sulfate component of the in-place soils presents a negligible exposure threat to concrete placed below the site grade.

Type I/IL or Type II cement is recommended for concrete on the site. To further avoid concrete degradation during construction, it is recommended that concrete not be placed on frozen or wet ground. Care should be taken to prevent the accumulation or ponding of water on the subgrade prior to the placement of concrete. If standing water is present on the subgrade, it should be removed by ditching to sumps and pumping the water away from the subgrade area prior to concrete placement. If concrete is placed during periods of cold temperatures, the concrete must be kept from freezing. This may require covering the concrete with insulated blankets and adding heat to prohibit freezing.

6.4 Construction Observation

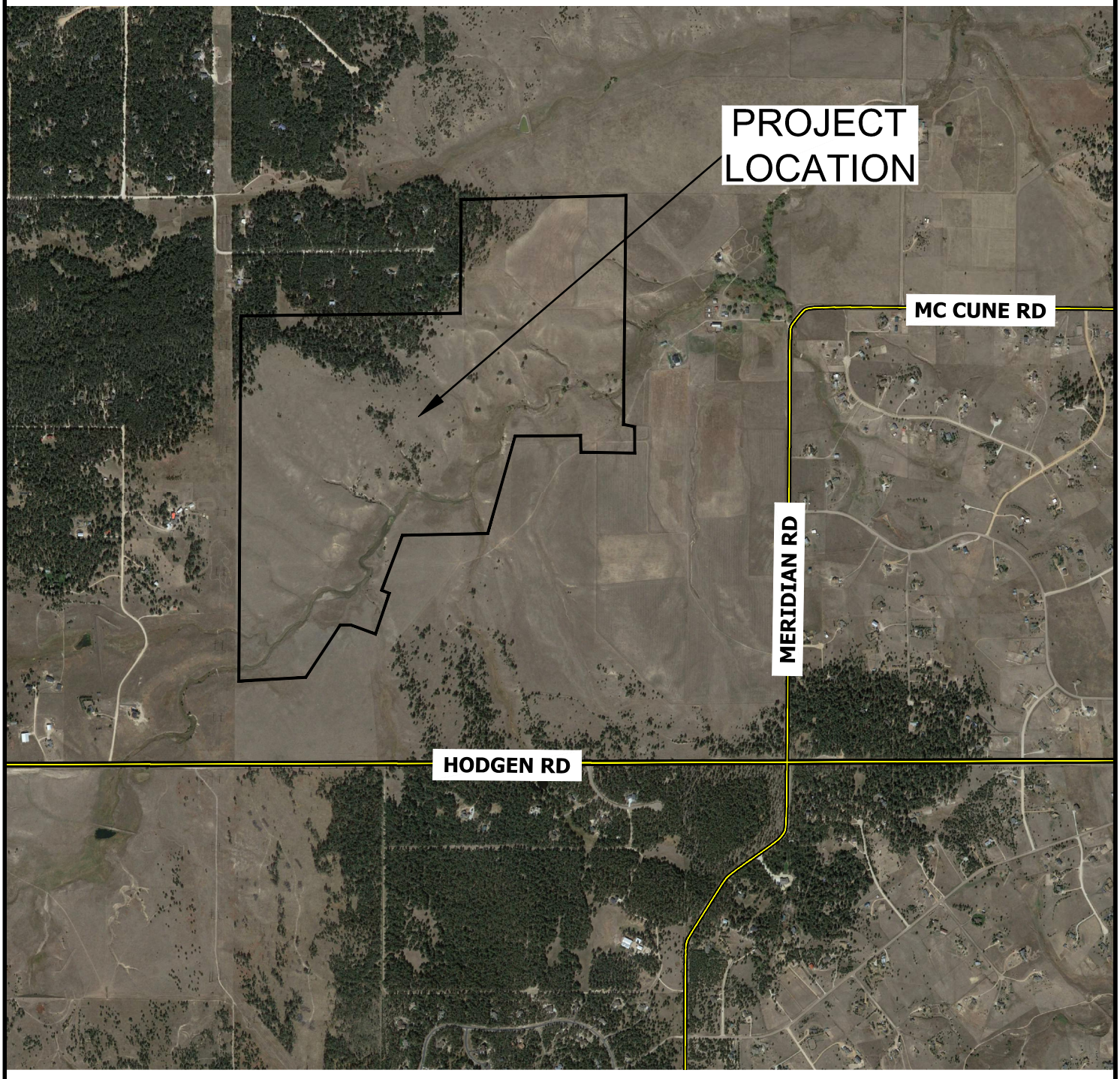
Subgrade preparation for pavement structures should be observed by Entech in order to verify that (1) no anomalies are present, (2) material similar to those described in this report have been encountered or placed, and (3) no soft spots, expansive or organic soil, or debris are present in the pavement subgrade prior to paving.

7 Closure

The subsurface investigation, geotechnical evaluation, and recommendations presented in this report are intended for use by ProTerra Properties with application to the interior roadway improvements within Winsome Filing No. 3 in El Paso County, Colorado. In conducting the subsurface investigation, laboratory testing, engineering evaluation, and reporting, Entech Engineering, Inc. endeavored to work in accordance with generally accepted professional geotechnical and geologic practices and principles consistent with the level of care and skill

ordinarily exercised by members of the geotechnical profession currently practicing in the same locality and under similar conditions. No other warranty, expressed or implied, is made. During final design and/or construction, if conditions are encountered that appear different from those described in this report, Entech Engineering, Inc. requests to be notified so that the evaluation and recommendations presented herein can be reviewed and modified as appropriate.

If there are any questions regarding the information provided herein, or if Entech Engineering, Inc. can be of further assistance, please do not hesitate to contact us.



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SITE AND EXPLORATION MAP

WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. 1

Almar Way, Twinkling Star Lane
Rural Local Roadway
Design 18-KIP ESAL=36,500
Soil Type 2 (AASHTO A-4)
Pavement Section:
1. 4" HMA over 4" ABC/RCB

N

TB- APPROXIMATE TEST BORING LOCATION AND NUMBER

SCALE: 1" = 500'-0" 0 250 500

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SITE AND EXPLORATION PLAN

WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. 2

APPENDIX A: Test Boring Logs

TEST BORING 1
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
FILL 0-5', SAND, SILTY, OLIVE, MEDIUM DENSE, MOIST			13	7.3	1
5			22	7.0	1
10					
15					
20					

TEST BORING 2
DATE DRILLED 7/31/2024

REMARKS

DRY TO 10', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
FILL 0-4', SAND, CLAYEY, OLIVE, MEDIUM DENSE, MOIST			28	6.1	1
5			26	9.7	4
CLAY, WITH SAND, OLIVE, VERY STIFF, MOIST					
SAND, SLIGHTLY SILTY, BROWN, MEDIUM DENSE, MOIST					
10			11	8.2	3
15					
20					

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TEST BORING LOGS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. A-1

TEST BORING 3
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
FILL 0-4', CLAY, SANDY, BROWN, VERY STIFF, MOIST			18	9.8	2
SAND, WITH SILT, OLIVE, MEDIUM DENSE, DRY			13	2.5	3
5					
10					
15					
20					

TEST BORING 4
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
FILL 0-2', CLAY, SANDY, DARK BROWN, VERY STIFF, MOIST			23	12.6	2
CLAY, SANDY, BROWN, VERY STIFF, MOIST			25	8.7	4
5					
10					
15					
20					

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TEST BORING LOGS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. A-2

TEST BORING 5
DATE DRILLED 7/31/2024

REMARKS

DRY TO 10', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	Description
			13	10.8	2	FILL 0-6', CLAY, SANDY, BROWN, STIFF to VERY STIFF, MOIST
5			16	7.8	2	
						SAND, SILTY, OLIVE, DENSE, MOIST
10			37	5.9	3	
15						
20						

TEST BORING 6
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	Description
			17	4.1	3	SAND, WITH SILT, OLIVE, MEDIUM DENSE, MOIST
5			26	8.6	3	
10						
15						
20						

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TEST BORING LOGS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. A-3

TEST BORING 7
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
						FILL 0-5', CLAY, SANDY, BROWN to DARK BROWN, STIFF, MOIST
			10	9.9	2	
5			12	7.6	2	
10						
15						
20						

TEST BORING 8
DATE DRILLED 7/31/2024

REMARKS

DRY TO 10', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
						FILL 0-4', CLAY, SANDY, BROWN, STIFF, MOIST
			11	14.6	2	
5			36	5.5	3	SAND, SILTY, OLIVE, DENSE, MOIST
10			18	11.2	4	SAND, CLAYEY, OLIVE, MEDIUM DENSE, MOIST
15						
20						

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TEST BORING LOGS

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PROTERRA

JOB NO. 240824

FIG. A-4

TEST BORING 9
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

CLAY, WITH SAND, BROWN, VERY STIFF to STIFF, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			17	11.6	4
5			10	6.4	4
10					
15					
20					

TEST BORING 10
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

FILL 0-2', CLAY, SANDY, DARK BROWN, VERY STIFF, MOIST
CLAY, SANDY, BROWN, VERY STIFF, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			23	8.9	2
5			17	16.0	4
10					
15					
20					

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TEST BORING LOGS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. A-5

TEST BORING 11
DATE DRILLED 7/31/2024

REMARKS

DRY TO 10', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			23	10.0	2
5			23	5.5	3
10			44	8.8	3
15					
20					

FILL 0-4', CLAY, SANDY, OLIVE, VERY STIFF, MOIST

SAND, CLAYEY, BROWN to OLIVE, MEDIUM DENSE to DENSE, MOIST

TEST BORING 12
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			18	9.6	2
5			12	10.6	4
10					
15					
20					

FILL 0-3', CLAY, SANDY, DARK BROWN, VERY STIFF, MOIST

CLAY, SANDY, DARK BROWN, STIFF, MOIST

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TEST BORING LOGS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. A-6

TEST BORING 13
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			20	8.7	2
5			14	10.9	3
10					
15					
20					

FILL 0-3', CLAY, SANDY, BROWN, VERY STIFF, MOIST

SAND, CLAYEY, OLIVE, MEDIUM DENSE, MOIST

TEST BORING 14
DATE DRILLED 7/31/2024

REMARKS

DRY TO 10', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			16	8.9	4
5			11	12.9	4
10			9	11.2	4
15					
20					

CLAY, SANDY, OLIVE to BROWN, VERY STIFF to STIFF, MOIST

ENTECH ENGINEERING, INC.

TEST BORING LOGS

WINSOME, FILING NO. 3
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JOB NO. 240824

FIG. A-7

TEST BORING 15
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

FILL 0-1', CLAY, SANDY, BROWN

CLAY, SANDY, STIFF to VERY STIFF, BROWN, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
			13	8.6	4
5			22	9.4	4
10					
15					
20					

TEST BORING 16
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

CLAY, SANDY, BROWN, STIFF, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			14	9.2	4
5			14	9.0	4
10					
15					
20					

ENTECH ENGINEERING, INC.

TEST BORING LOGS

WINSOME, FILING NO. 3
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FIG. A-8

TEST BORING 17
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
CLAY, WITH SAND, BROWN, STIFF, MOIST			11	17.7	4
5			12	5.9	4
10					
15					
20					

TEST BORING 18
DATE DRILLED 7/31/2024

REMARKS

DRY TO 10', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
CLAY, WITH SAND, BROWN, STIFF, MOIST			12	10.2	4
5			25	4.1	4
10			21	8.7	4
15					
20					

ENTECH ENGINEERING, INC.

TEST BORING LOGS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. A-9

TEST BORING 19
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
FILL 0-4', SAND, CLAYEY, DARK BROWN, MEDIUM DENSE, MOIST			19	4.9	1
5 CLAY, WITH SAND, OLIVE, VERY STIFF, MOIST			19	10.3	4
10					
15					
20					

TEST BORING 20
DATE DRILLED 7/31/2024

REMARKS

DRY TO 5', 7/31/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
FILL 0-4', SAND, SILTY, OLIVE, MEDIUM DENSE, MOIST			11	7.9	1
5 CLAY, WITH SAND, OLIVE, VERY STIFF, MOIST			11	18.9	4
10					
15					
20					

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TEST BORING LOGS

WINSOME, FILING NO. 3
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FIG. A-10

APPENDIX B: Laboratory Test Results

TABLE B-1
SUMMARY OF LABORATORY TEST RESULTS

ENTECH ENGINEERING, INC.

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SULFATE (WT %)	SWELL/ COLLAPSE (%)	AASHTO CLASS. (GROUP INDEX)	USCS	SOIL DESCRIPTION
1, CBR	2	0-3			31.7	32	22	10			A-2-4 (0)	SC	FILL, SAND, CLAYEY
1	1	1-2			13.8	NV	NP	NP			A-1-b (0)	SM	FILL, SAND, SILTY
1	2	1-2			18.9	32	21	11	<0.01		A-1-b (0)	SC	FILL, SAND, CLAYEY
1	19	1-2			24.5	26	15	11	0.02		A-2-6 (0)	SC	FILL, SAND, CLAYEY
1	20	1-2			20.5	NV	NP	NP			A-2-4 (0)	SM	FILL, SAND, SILTY
2, CBR	7	0-3			54.6	33	24	9			A-4 (3)	CL	FILL, CLAY, SANDY
2	10	0-2			65.9	33	20	13			A-6 (7)	CL	FILL, CLAY, SANDY
2	3	1-2	11.5	97.2	60.9	31	21	10		0.3	A-4 (4)	CL	FILL, CLAY, SANDY
2	5	1-2	14.2	95.6	68.8	38	22	16	0.00	1.4	A-6 (10)	CL	FILL, CLAY, SANDY
2	7	1-2	11.7	99.3	53.2	36	21	15		0.6	A-6 (5)	CL	FILL, CLAY, SANDY
2	8	1-2	16.5	104.4	65.0	38	23	15		1.3	A-6 (8)	CL	FILL, CLAY, SANDY
2	10	1-2	12.6	96.8	59.4	29	19	10	0.00	0.1	A-4 (3)	CL	FILL, CLAY, SANDY
2	11	1-2	10.7	112.6	51.2	32	18	14		1.1	A-6 (4)	CL	FILL, CLAY, SANDY
2	12	1-2	17.5	99.4	62.4	34	22	12		0.5	A-6 (6)	CL	FILL, CLAY, SANDY
2	13	1-2	11.8	103.9	51.9	25	18	7		0.3	A-4 (1)	CL	FILL, CLAY, SANDY
2	4	1-2	14.4	104.7	60.3	35	29	6		1.4	A-4 (3)	CL	FILL, CLAY, SANDY
3	6	1-2			8.1	NV	NP	NP			A-1-b (0)	SW-SM	SAND, WITH SILT
3	2	10			3.9	NV	NP	NP			A-1-b (0)	SW	SAND, SLIGHTLY SILTY
3	3	5			9.7	NV	NP	NP	<0.01		A-1-b (0)	SW-SM	SAND, WITH SILT
3	5	10			28.6	NV	NP	NP			A-2-4 (0)	SM	SAND, SILTY
3	8	5			21.2	NV	NP	NP	<0.01		A-2-4 (0)	SM	SAND, SILTY
3	11	5			28.4	22	14	8			A-2-4 (0)	SC	SAND, CLAYEY
3	13	5	10.4	111.8	22.8	31	19	12		-0.2	A-2-6 (0)	SC	SAND, CLAYEY
4	4	0-3			50.2	34	20	14			A-6 (4)	CL	CLAY, SANDY
4	15	1-3			73.2	32	22	10			A-4 (6)	CL	CLAY, WITH SAND
4	17	0-3			77.1	31	21	10			A-6 (7)	CL	CLAY, WITH SAND
4	9	1-2	12.9	96.0	78.7	40	21	19		1.0	A-6 (14)	CL	CLAY, WITH SAND
4	14	1-2	12.7	103.2	51.5	30	21	9		1.1	A-4 (2)	CL	CLAY, SANDY
4	15	1-2	9.3	100.3	67.7	38	22	16		0.4	A-6 (9)	CL	CLAY, SANDY
4	16	1-2	10.1	89.6	65.1	34	19	15		1.1	A-6 (8)	CL	CLAY, SANDY
4	17	1-2	17.2	101.6	77.1	38	23	15		-0.8	A-6 (11)	CL	CLAY, WITH SAND
4	18	1-2	10.1	102.3	71.2	33	22	11		-0.4	A-6 (7)	CL	CLAY, WITH SAND
4	2	5	13.1	105.1	84.9	41	24	17	0.00	-0.7	A-7-6 (16)	CL	CLAY, WITH SAND
4	4	5	11.2	100.2	62.5	39	23	16		1.4	A-6 (8)	CL	CLAY, SANDY
4	8	10	10.7	110.2	36.5	30	21	9		-0.3	A-4 (0)	SC	SAND, CLAYEY
4	12	5	12.2	114.6	52.9	26	17	9	<0.01	-0.7	A-4 (2)	CL	CLAY, SANDY

Project: Winsome, Filing No. 3
Client: ProTerra
Job No: 240824

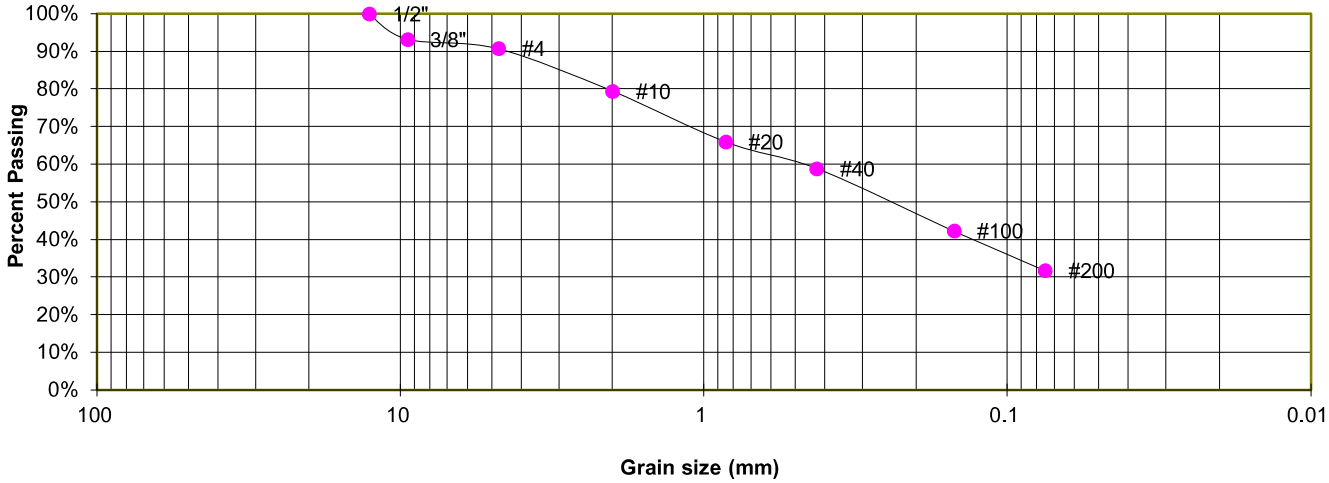
TABLE B-1
SUMMARY OF LABORATORY TEST RESULTS

ENTECH ENGINEERING, INC.

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SULFATE (WT %)	SWELL/ COLLAPSE (%)	AASHTO CLASS. (GROUP INDEX)	USCS	SOIL DESCRIPTION
4	19	5	9.8	105.7	71.3	38	22	16	<0.01	-0.2	A-6 (10)	CL	CLAY, WITH SAND
4	20	5	20.5	103.9	83.7	36	21	15		0.3	A-6 (12)	CL	CLAY, WITH SAND

Project: Winsome, Filing No. 3
Client: ProTerra
Job No: 240824

TEST BORING	2	SOIL DESCRIPTION	FILL, SAND, CLAYEY
DEPTH (FT)	0-3	SOIL TYPE	1, CBR



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	93.2%
4	90.7%
10	79.4%
20	66.0%
40	58.9%
100	42.3%
200	31.7%

ATTERBERG LIMITS

Plastic Limit	22
Liquid Limit	32
Plastic Index	10

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SC
AASHTO CLASSIFICATION:	A-2-4
AASHTO GROUP INDEX:	0

ENTECH ENGINEERING, INC.

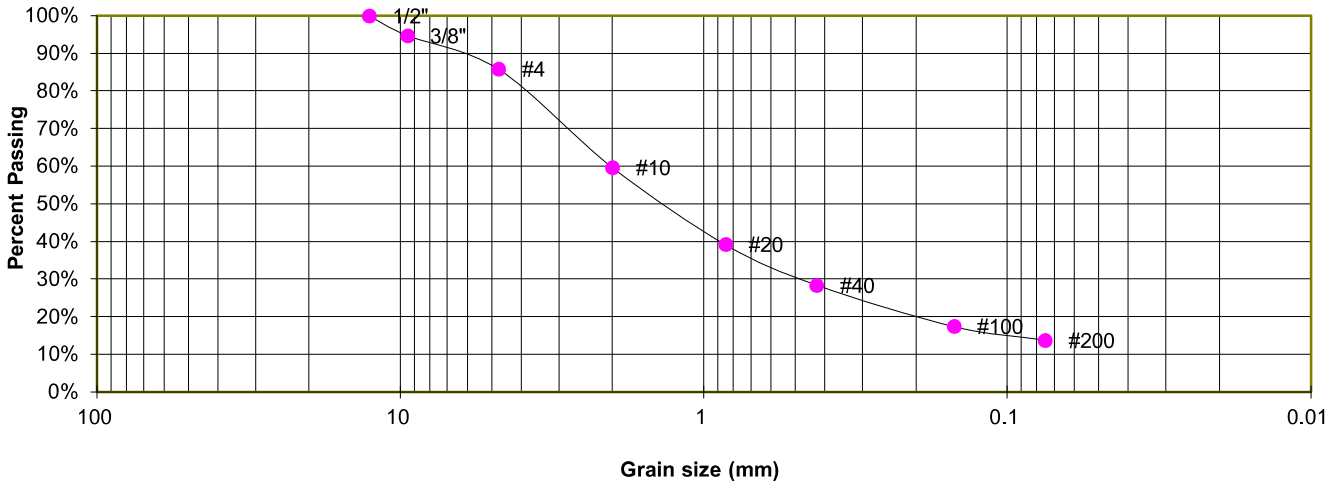
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-1

TEST BORING	1	SOIL DESCRIPTION	FILL, SAND, SILTY
DEPTH (FT)	1-2	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	94.7%
4	85.8%
10	59.6%
20	39.2%
40	28.4%
100	17.4%
200	13.8%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SM
AASHTO CLASSIFICATION:	A-1-b
AASHTO GROUP INDEX:	0

ENTECH ENGINEERING, INC.

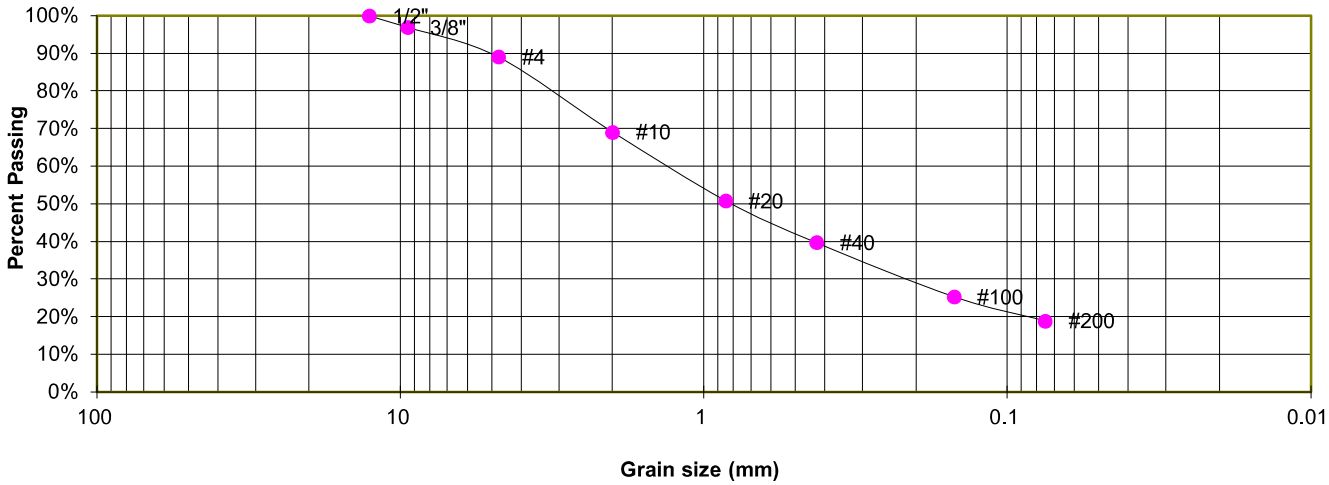
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-2

TEST BORING	2	SOIL DESCRIPTION	FILL, SAND, CLAYEY
DEPTH (FT)	1-2	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.0%
4	89.1%
10	69.1%
20	50.9%
40	39.7%
100	25.4%
200	18.9%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	32
Plastic Index	11

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SC
AASHTO CLASSIFICATION:	A-1-b
AASHTO GROUP INDEX:	0

ENTECH ENGINEERING, INC.

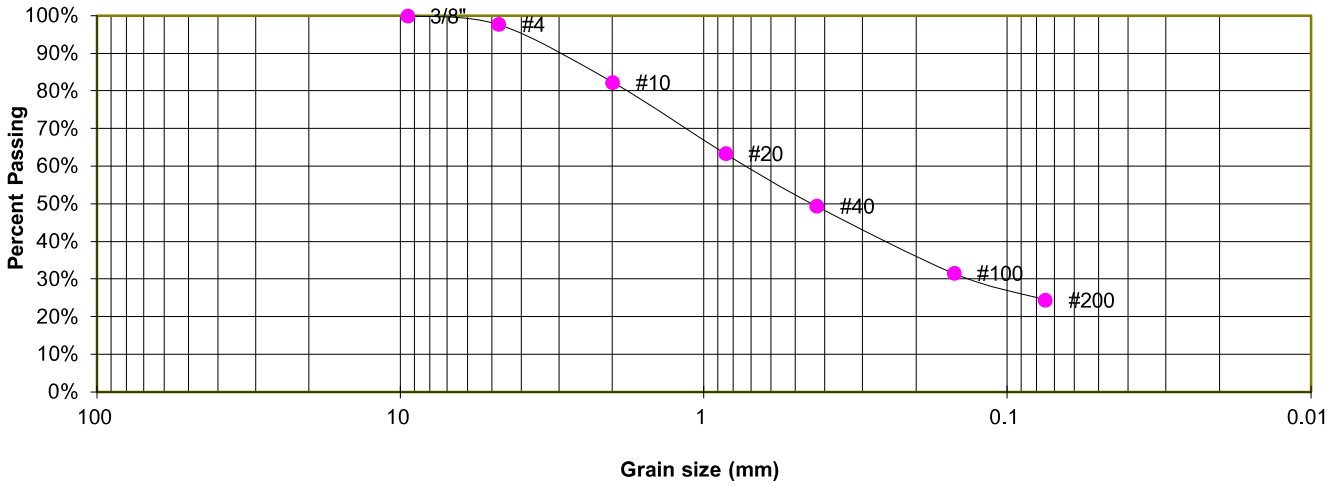
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-3

TEST BORING	19	SOIL DESCRIPTION	FILL, SAND, CLAYEY
DEPTH (FT)	1-2	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.7%
10	82.3%
20	63.4%
40	49.4%
100	31.5%
200	24.5%

ATTERBERG LIMITS

Plastic Limit	15
Liquid Limit	26
Plastic Index	11

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SC
AASHTO CLASSIFICATION:	A-2-6
AASHTO GROUP INDEX:	0

ENTECH ENGINEERING, INC.

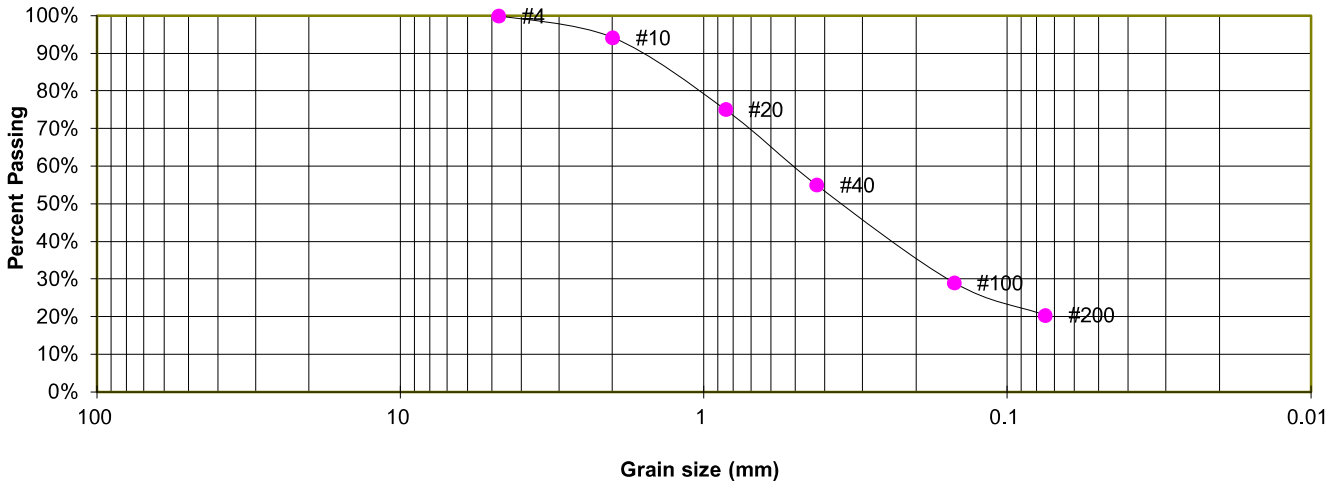
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-4

TEST BORING	20	SOIL DESCRIPTION	FILL, SAND, SILTY
DEPTH (FT)	1-2	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	94.2%
20	75.1%
40	55.1%
100	29.1%
200	20.5%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SM
AASHTO CLASSIFICATION:	A-2-4
AASHTO GROUP INDEX:	0

ENTECH ENGINEERING, INC.

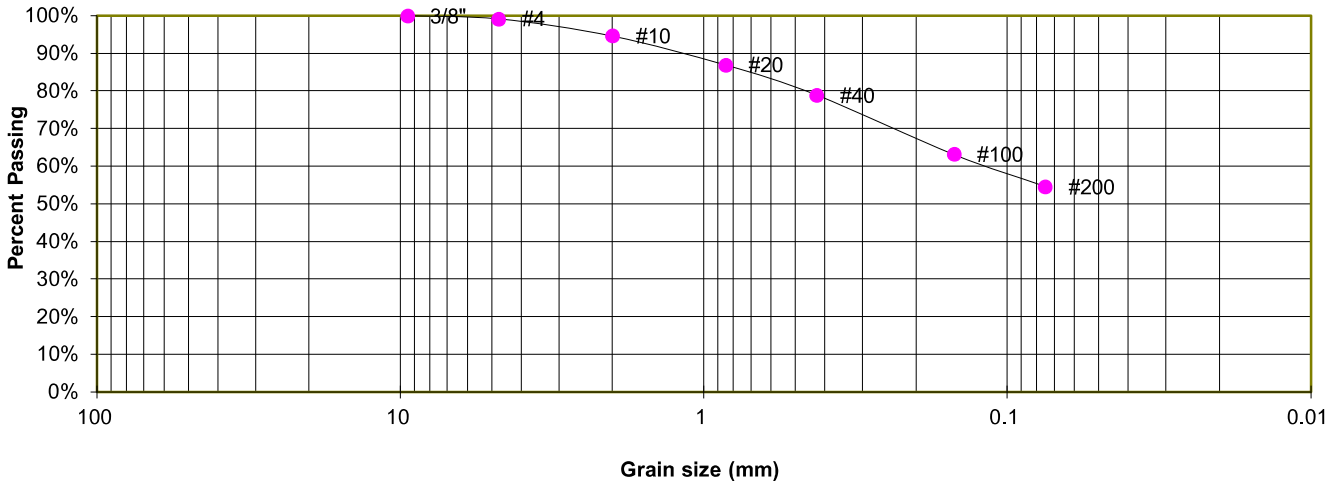
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-5

TEST BORING	7	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	0-3	SOIL TYPE	2, CBR



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.2%
10	94.7%
20	87.0%
40	78.9%
100	63.2%
200	54.6%

ATTERBERG LIMITS

Plastic Limit	24
Liquid Limit	33
Plastic Index	9

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-4
AASHTO GROUP INDEX:	3

ENTECH ENGINEERING, INC.

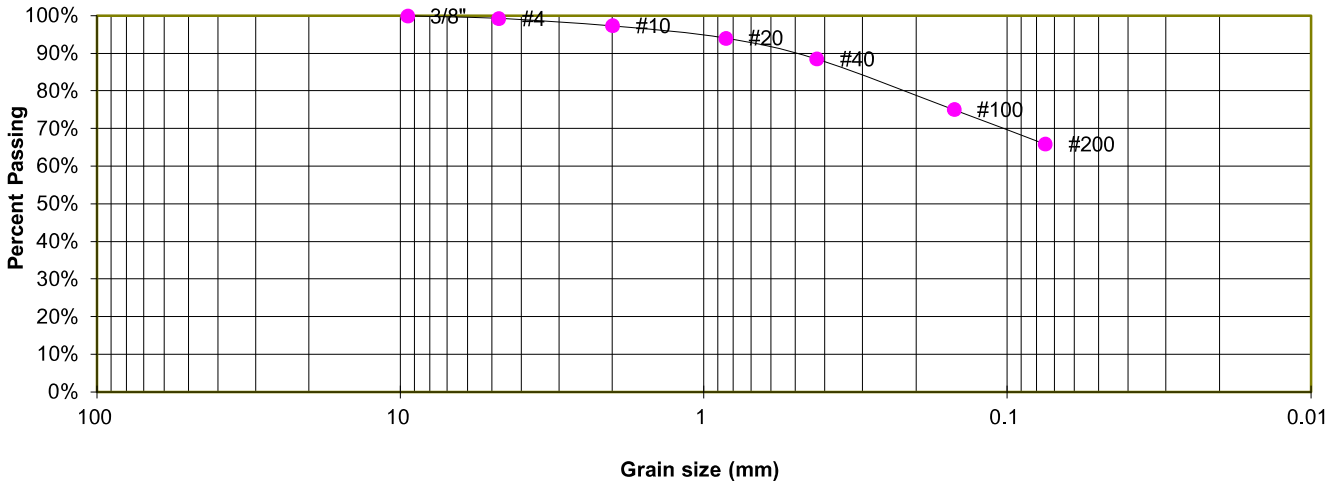
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-6

TEST BORING	10	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	0-2	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.3%
10	97.4%
20	94.1%
40	88.5%
100	75.1%
200	65.9%

ATTERBERG LIMITS

Plastic Limit	20
Liquid Limit	33
Plastic Index	13

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	7

ENTECH ENGINEERING, INC.

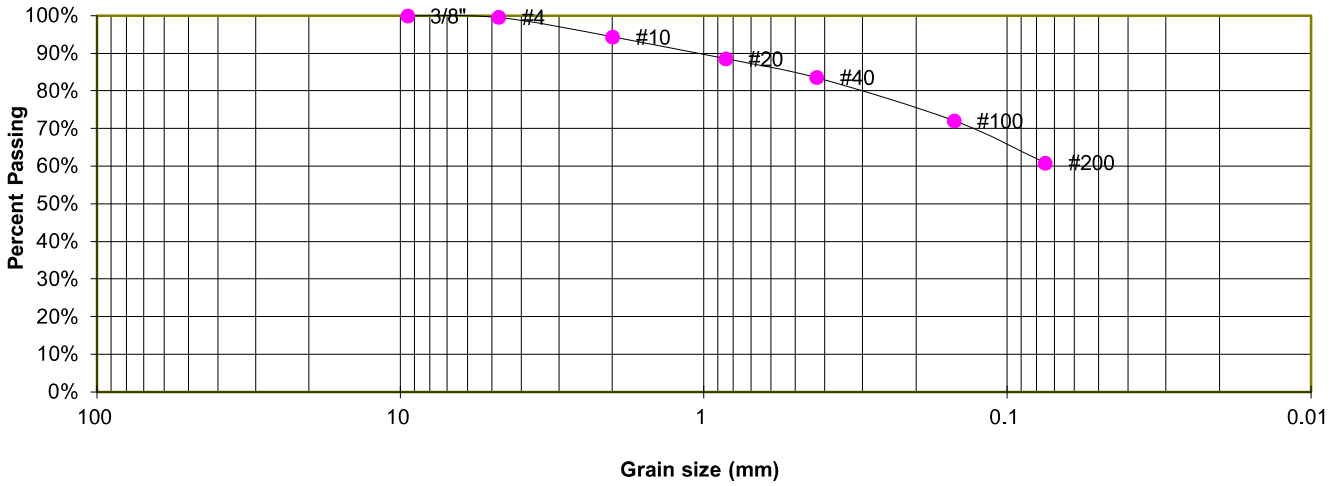
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-7

TEST BORING	3	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.6%
10	94.4%
20	88.6%
40	83.6%
100	72.1%
200	60.9%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	31
Plastic Index	10

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-4
AASHTO GROUP INDEX:	4

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

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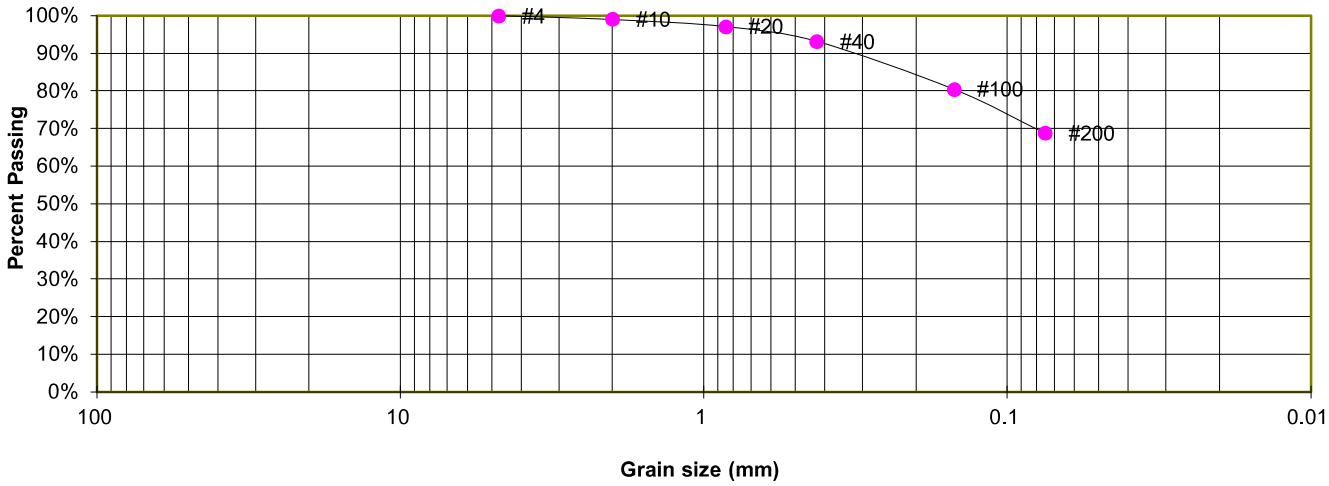
FIG. B-8

TEST BORING	5	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.0%
20	97.2%
40	93.2%
100	80.5%
200	68.8%

ATTERBERG LIMITS

Plastic Limit	22
Liquid Limit	38
Plastic Index	16

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	10

ENTECH ENGINEERING, INC.

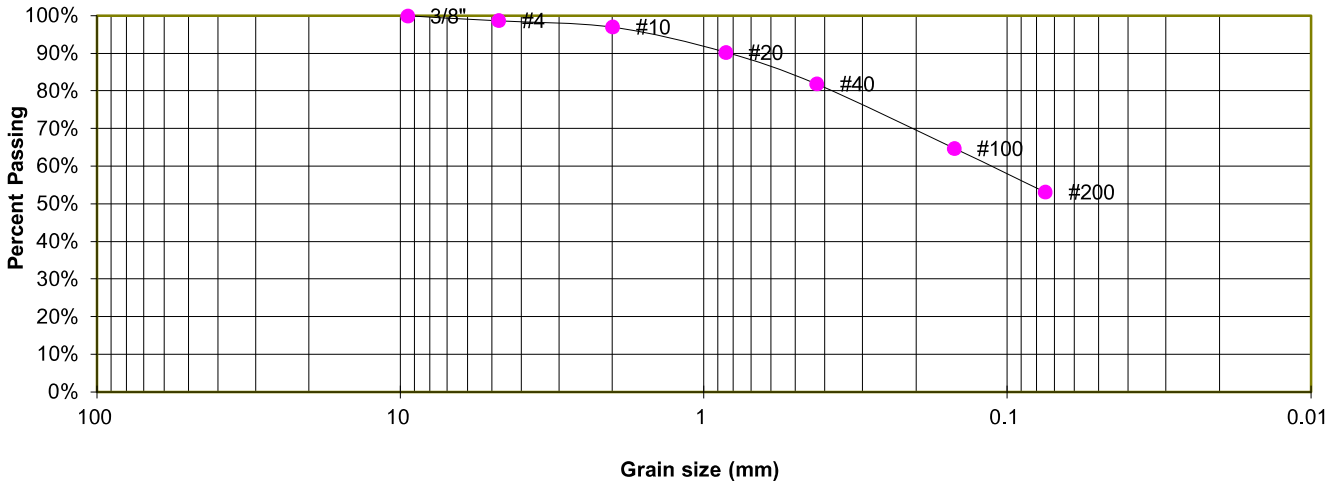
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-9

TEST BORING	7	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.7%
10	97.0%
20	90.3%
40	81.9%
100	64.8%
200	53.2%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	36
Plastic Index	15

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	5

ENTECH ENGINEERING, INC.

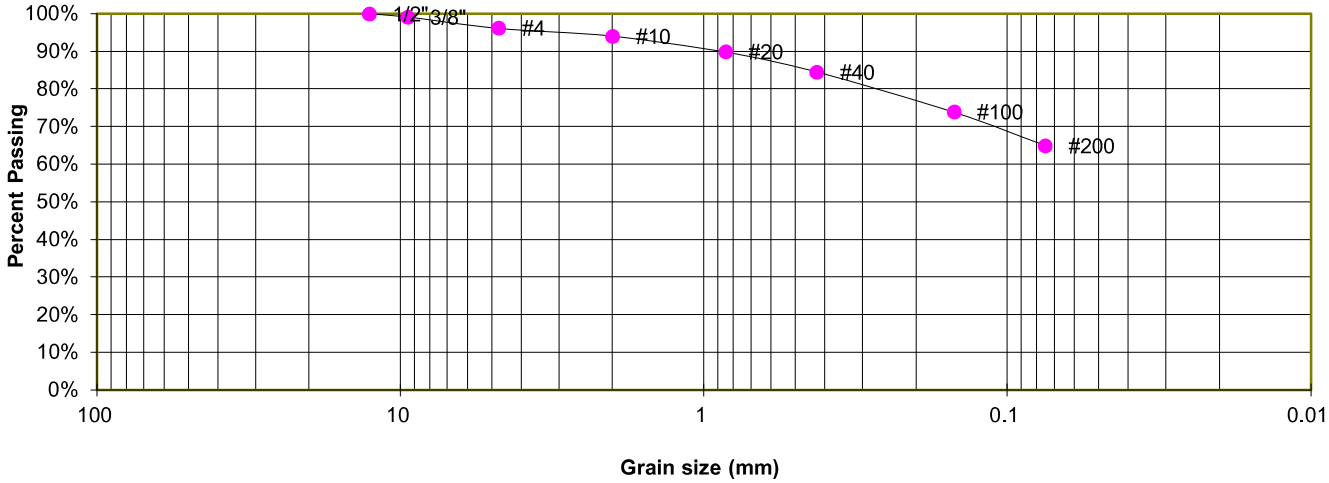
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-10

TEST BORING	8	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	99.1%
4	96.2%
10	94.0%
20	89.9%
40	84.5%
100	73.9%
200	65.0%

ATTERBERG LIMITS

Plastic Limit	23
Liquid Limit	38
Plastic Index	15

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	8

ENTECH ENGINEERING, INC.

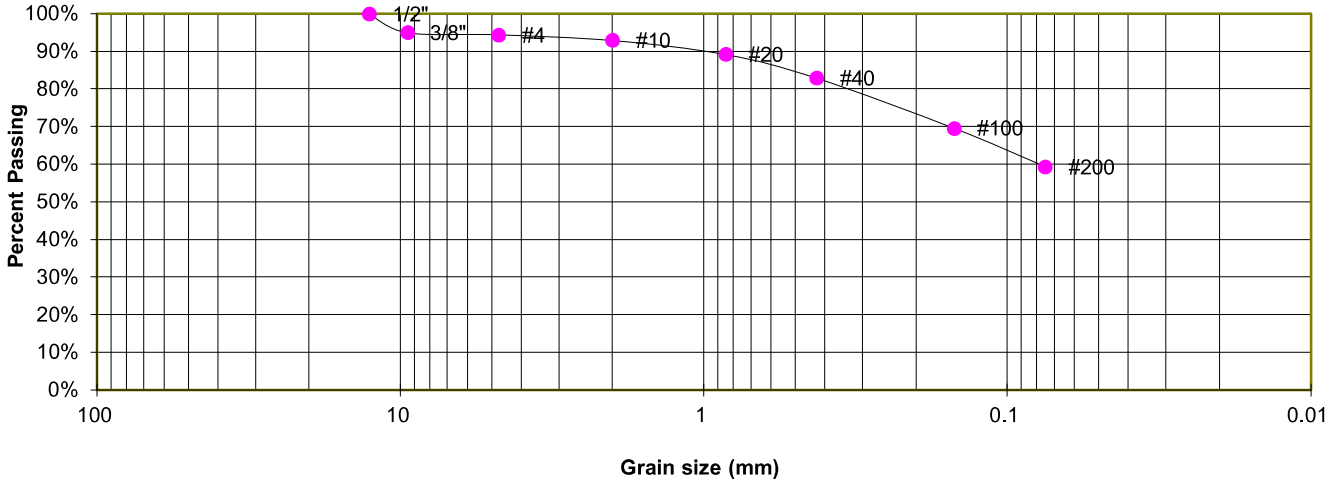
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-11

TEST BORING	10	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	95.0%
4	94.4%
10	93.0%
20	89.2%
40	82.9%
100	69.6%
200	59.4%

ATTERBERG LIMITS

Plastic Limit	19
Liquid Limit	29
Plastic Index	10

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-4
AASHTO GROUP INDEX:	3

ENTECH ENGINEERING, INC.

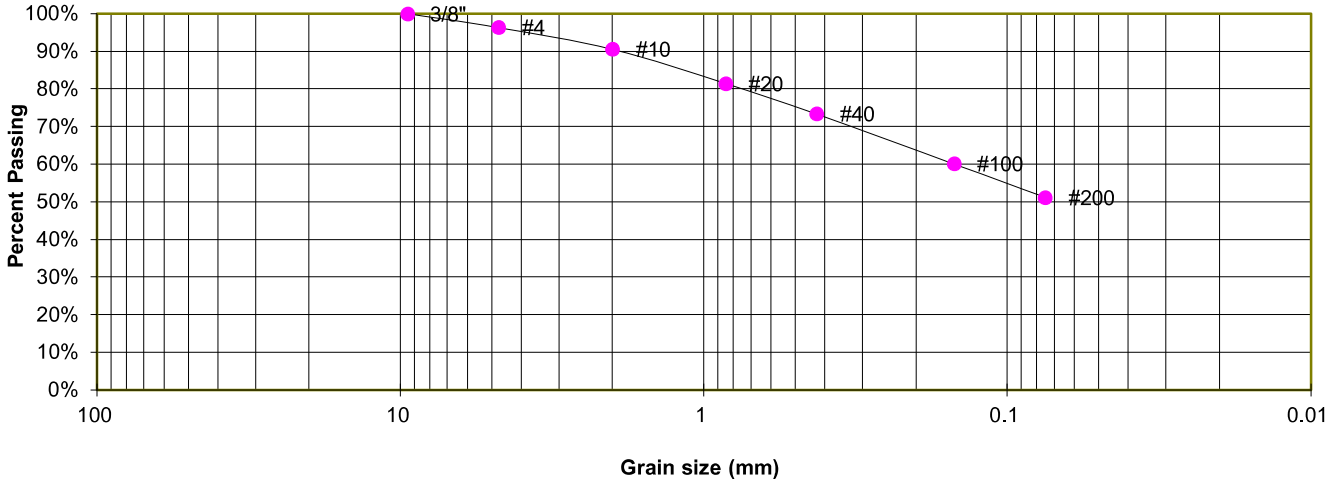
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-12

TEST BORING	11	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.4%
10	90.6%
20	81.5%
40	73.4%
100	60.1%
200	51.2%

ATTERBERG LIMITS

Plastic Limit	18
Liquid Limit	32
Plastic Index	14

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	4

ENTECH ENGINEERING, INC.

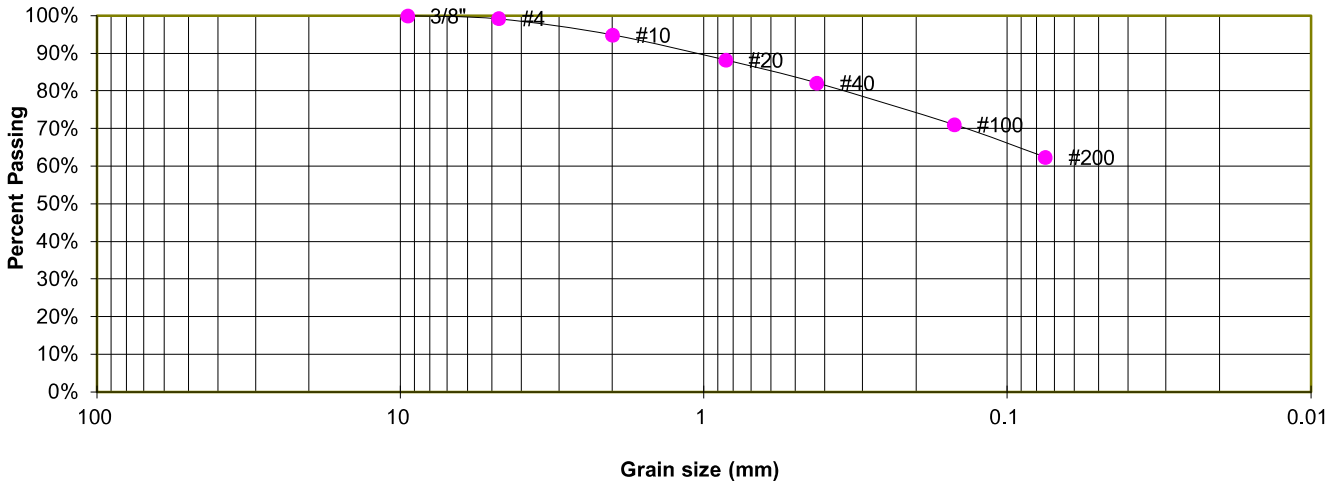
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-13

TEST BORING	12	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.3%
10	94.9%
20	88.3%
40	82.2%
100	71.1%
200	62.4%

ATTERBERG LIMITS

Plastic Limit	22
Liquid Limit	34
Plastic Index	12

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	6

ENTECH ENGINEERING, INC.

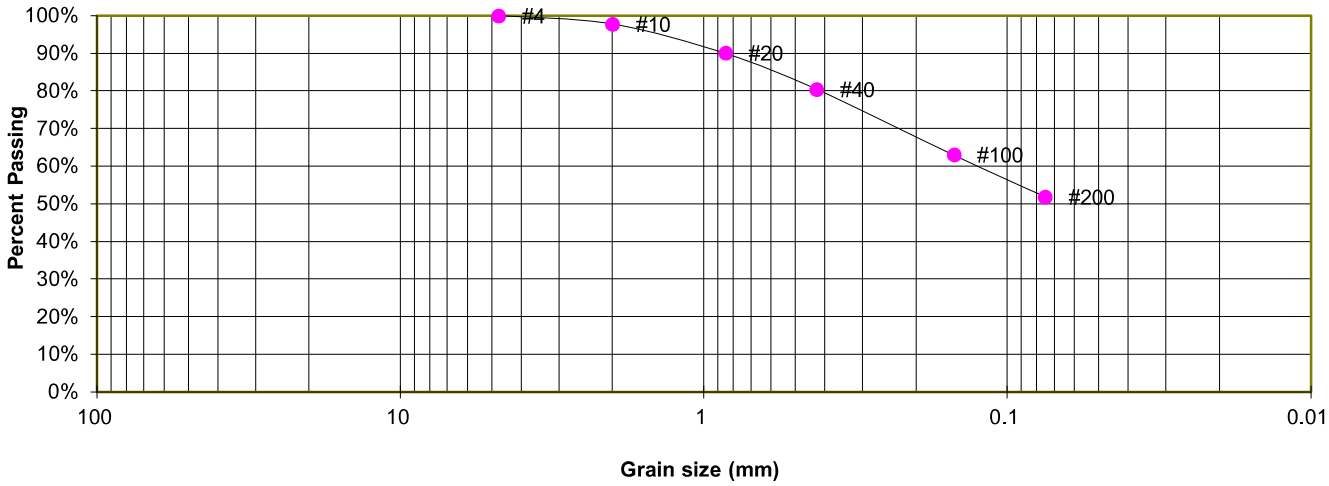
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-14

TEST BORING	13	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	97.8%
20	90.1%
40	80.5%
100	63.0%
200	51.9%

ATTERBERG LIMITS

Plastic Limit	18
Liquid Limit	25
Plastic Index	7

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-4
AASHTO GROUP INDEX:	1

ENTECH ENGINEERING, INC.

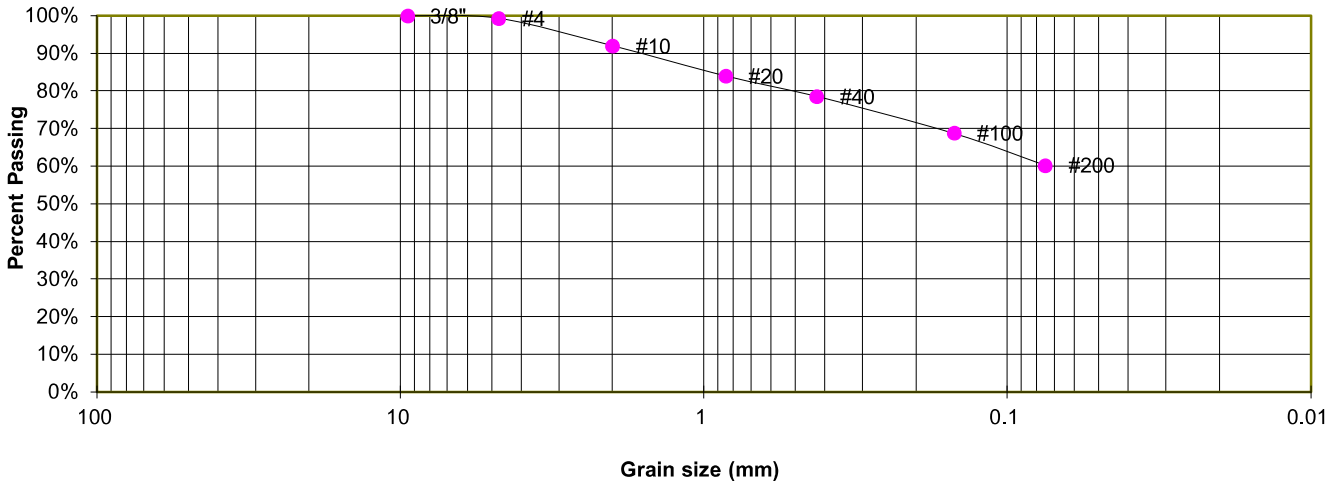
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-15

TEST BORING	4	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.3%
10	92.0%
20	84.0%
40	78.6%
100	68.8%
200	60.3%

ATTERBERG LIMITS

Plastic Limit	29
Liquid Limit	35
Plastic Index	6

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-4
AASHTO GROUP INDEX:	3

ENTECH ENGINEERING, INC.

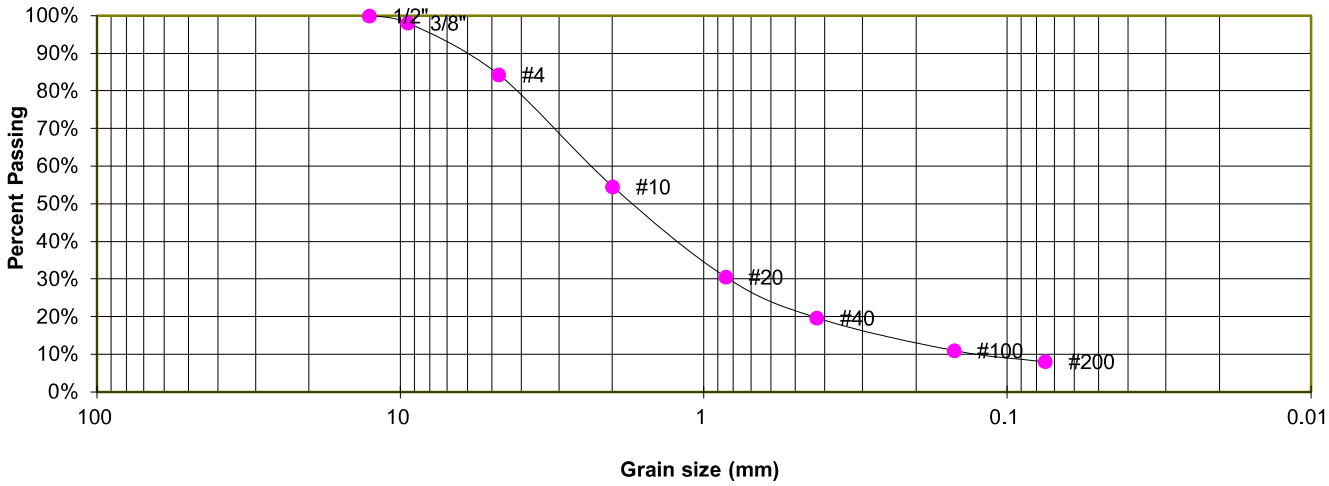
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-16

TEST BORING	6	SOIL DESCRIPTION	SAND, WITH SILT
DEPTH (FT)	1-2	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.2%
4	84.3%
10	54.6%
20	30.6%
40	19.7%
100	11.1%
200	8.1%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM
AASHTO CLASSIFICATION: A-1-b
AASHTO GROUP INDEX: 0

ENTECH ENGINEERING, INC.

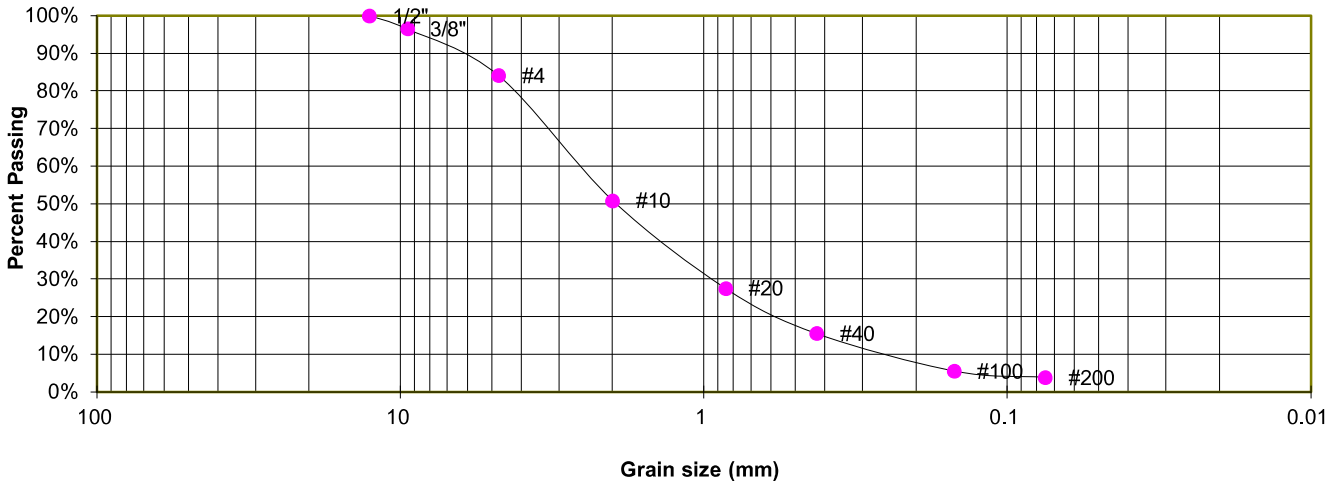
LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-17

TEST BORING	2	SOIL DESCRIPTION	SAND, SLIGHTLY SILTY
DEPTH (FT)	10	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	96.5%
4	84.2%
10	50.9%
20	27.6%
40	15.6%
100	5.6%
200	3.9%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SW
AASHTO CLASSIFICATION:	A-1-b
AASHTO GROUP INDEX:	0

ENTECH ENGINEERING, INC.

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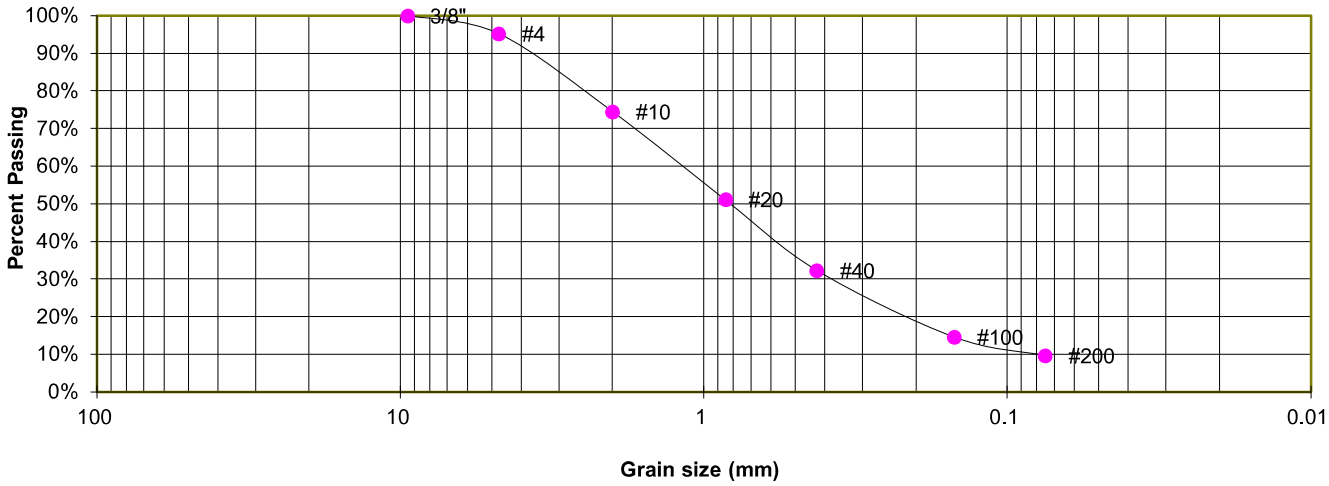
FIG. B-18

TEST BORING	3	SOIL DESCRIPTION	SAND, WITH SILT
DEPTH (FT)	5	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.3%
10	74.5%
20	51.1%
40	32.3%
100	14.6%
200	9.7%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SW-SM
AASHTO CLASSIFICATION:	A-1-b
AASHTO GROUP INDEX:	0

ENTECH ENGINEERING, INC.

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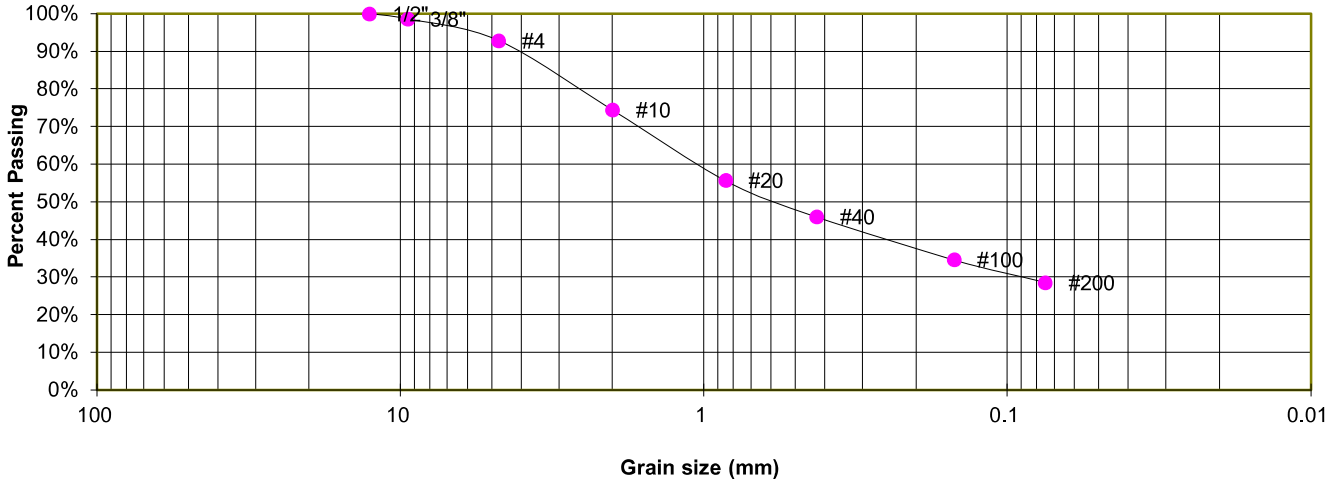
FIG. B-19

TEST BORING	5	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	10	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.7%
4	92.9%
10	74.4%
20	55.7%
40	46.0%
100	34.6%
200	28.6%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SM
AASHTO CLASSIFICATION:	A-2-4
AASHTO GROUP INDEX:	0

ENTECH ENGINEERING, INC.

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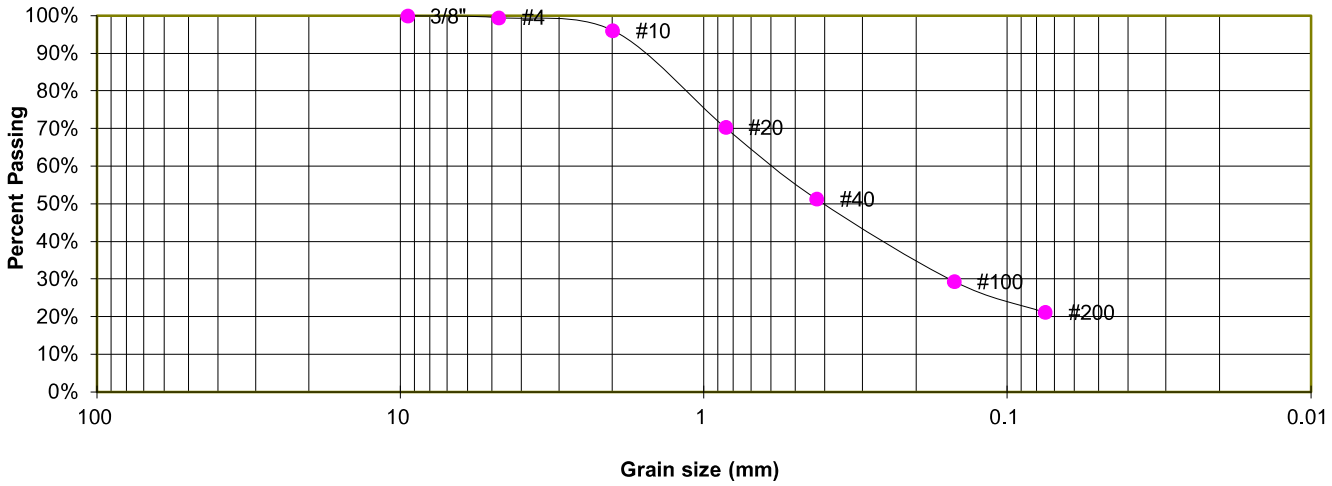
FIG. B-20

TEST BORING	8	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	5	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.5%
10	96.1%
20	70.4%
40	51.3%
100	29.4%
200	21.2%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SM
AASHTO CLASSIFICATION:	A-2-4
AASHTO GROUP INDEX:	0

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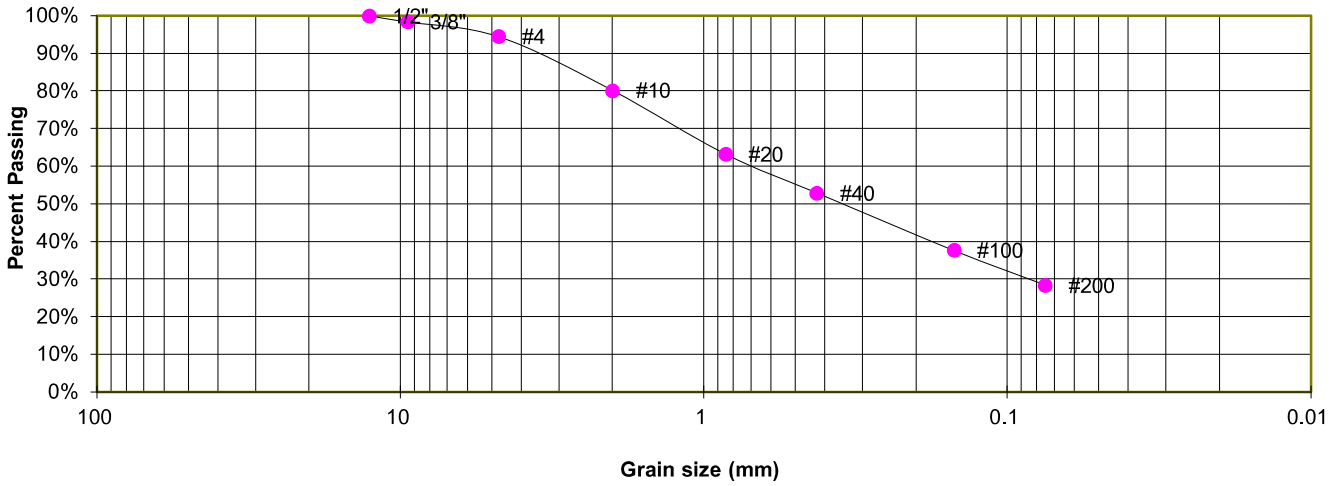
FIG. B-21

TEST BORING	11	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	5	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.4%
4	94.5%
10	80.1%
20	63.2%
40	52.9%
100	37.7%
200	28.4%

ATTERBERG LIMITS

Plastic Limit	14
Liquid Limit	22
Plastic Index	8

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SC
AASHTO CLASSIFICATION:	A-2-4
AASHTO GROUP INDEX:	0

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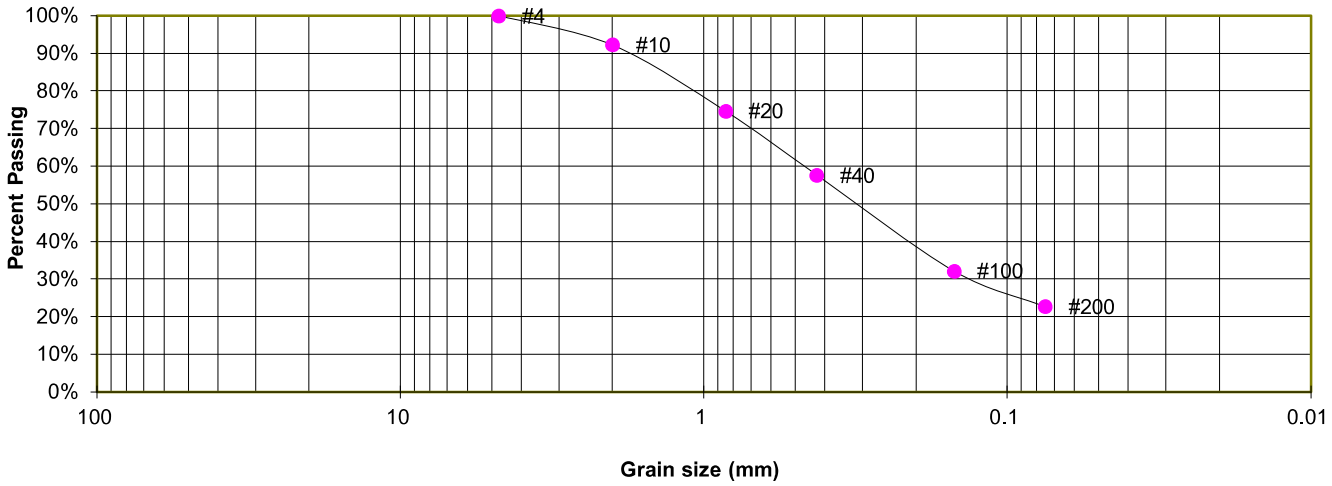
FIG. B-22

TEST BORING	13	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	5	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	92.3%
20	74.7%
40	57.7%
100	32.2%
200	22.8%

ATTERBERG LIMITS

Plastic Limit	19
Liquid Limit	31
Plastic Index	12

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SC
AASHTO CLASSIFICATION:	A-2-6
AASHTO GROUP INDEX:	0

ENTECH ENGINEERING, INC.

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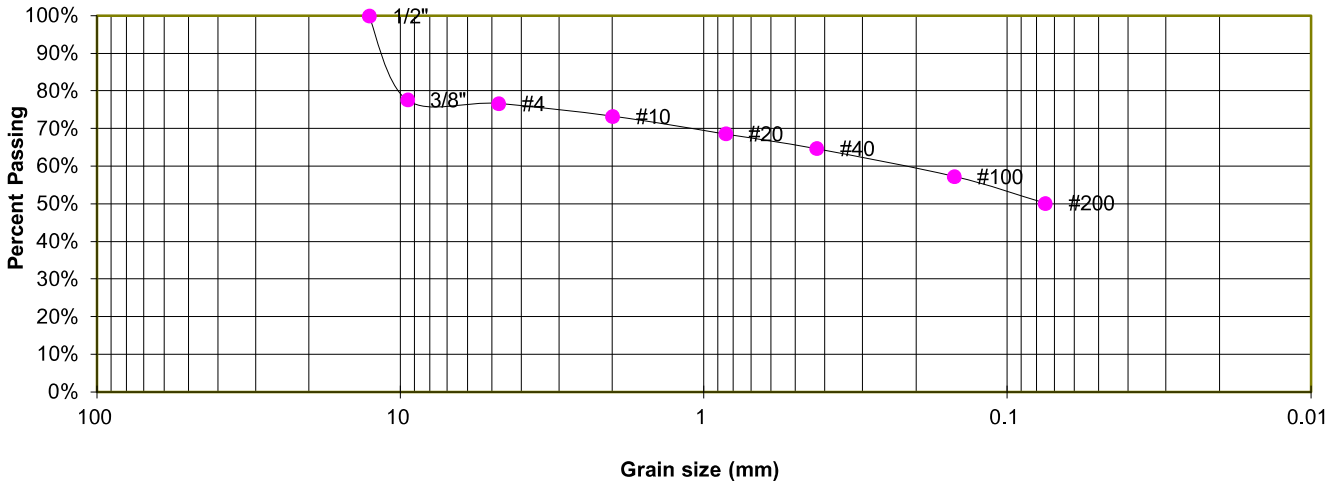
FIG. B-23

TEST BORING	4	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	0-3	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	77.6%
4	76.7%
10	73.3%
20	68.7%
40	64.7%
100	57.3%
200	50.2%

ATTERBERG LIMITS

Plastic Limit	20
Liquid Limit	34
Plastic Index	14

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	4

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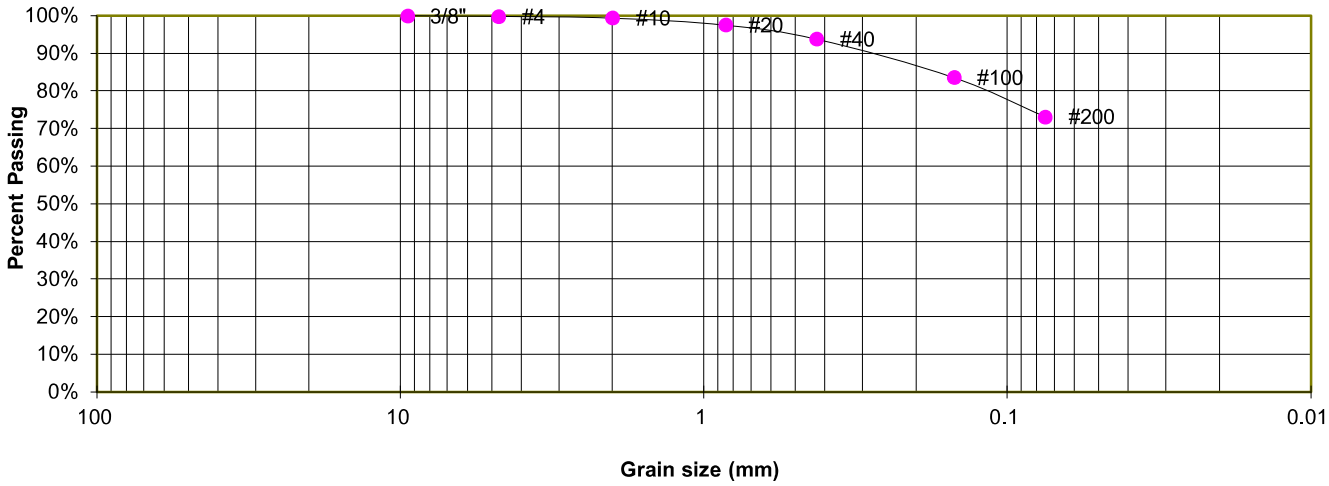
FIG. B-24

TEST BORING	15	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	1-3	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.9%
10	99.4%
20	97.6%
40	93.8%
100	83.6%
200	73.2%

ATTERBERG LIMITS

Plastic Limit	22
Liquid Limit	32
Plastic Index	10

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-4
AASHTO GROUP INDEX:	6

ENTECH ENGINEERING, INC.

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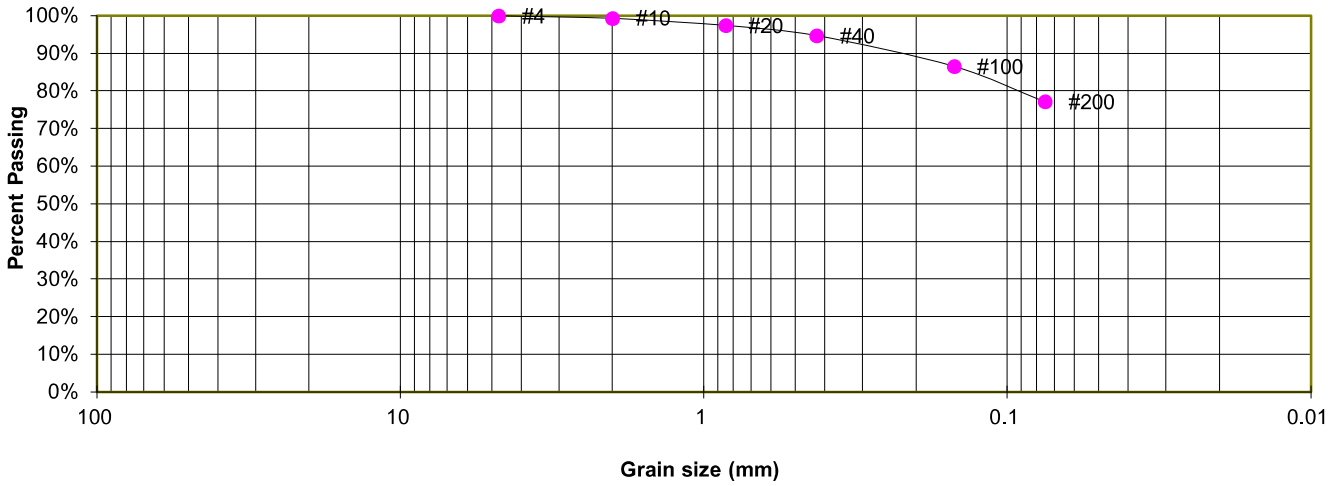
FIG. B-25

TEST BORING	17	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	0-3	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.4%
20	97.5%
40	94.7%
100	86.5%
200	77.1%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	31
Plastic Index	10

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	7

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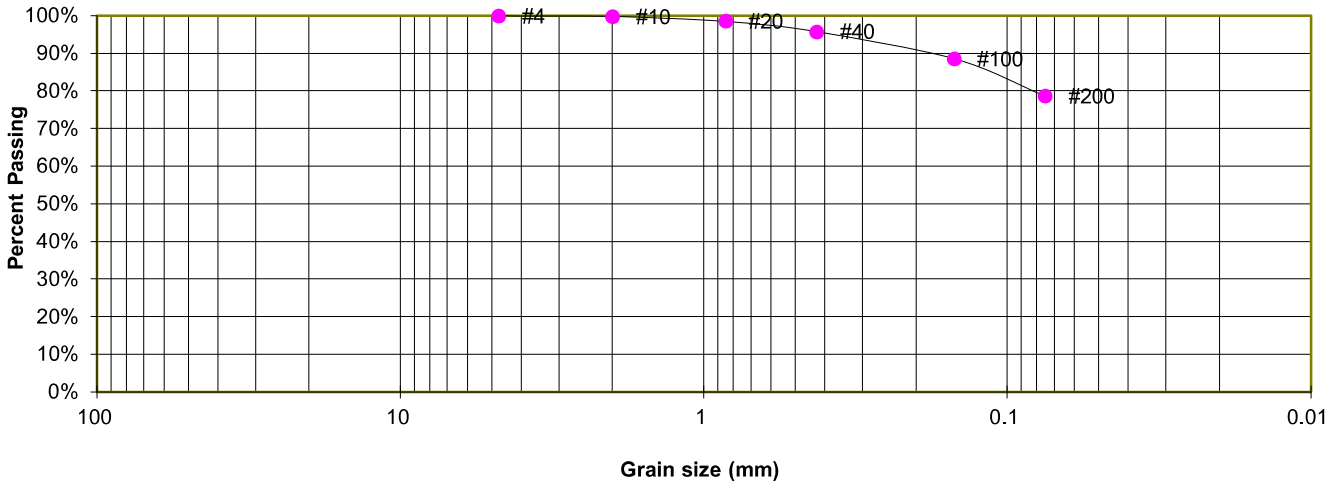
FIG. B-26

TEST BORING	9	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	1-2	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.8%
20	98.6%
40	95.8%
100	88.6%
200	78.7%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	40
Plastic Index	19

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	14

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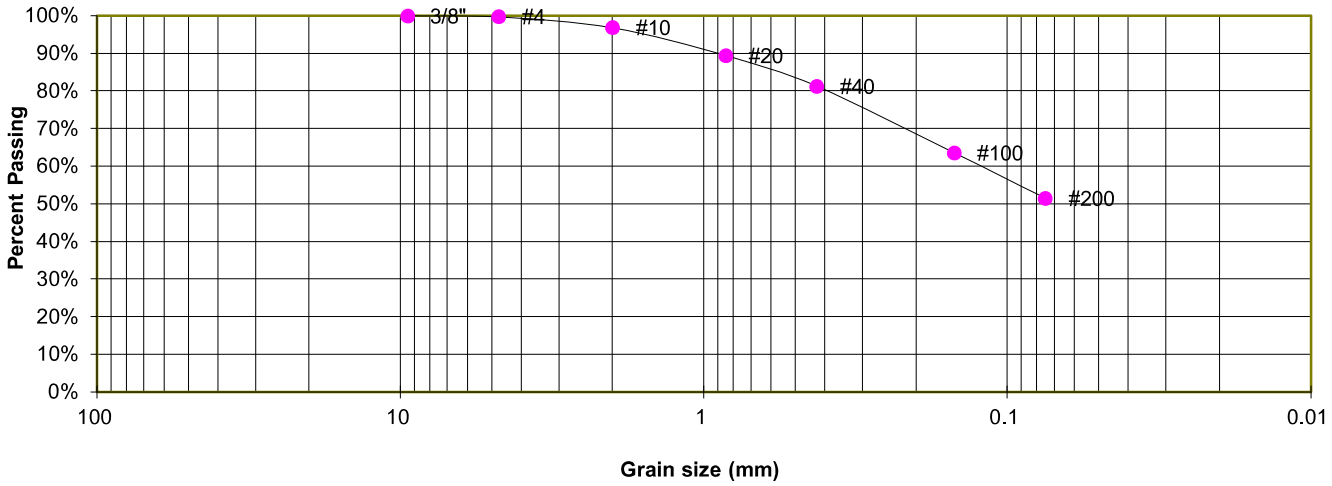
FIG. B-27

TEST BORING	14	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.7%
10	96.9%
20	89.4%
40	81.3%
100	63.6%
200	51.5%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	30
Plastic Index	9

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-4
AASHTO GROUP INDEX:	2

ENTECH ENGINEERING, INC.

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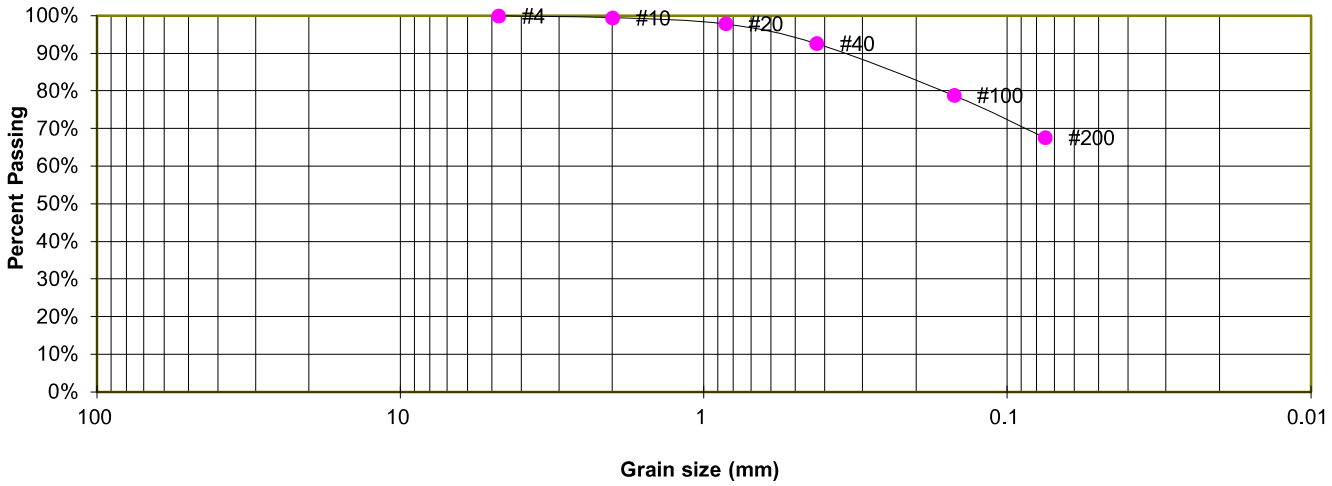
FIG. B-28

TEST BORING	15	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.5%
20	97.9%
40	92.7%
100	78.8%
200	67.7%

ATTERBERG LIMITS

Plastic Limit	22
Liquid Limit	38
Plastic Index	16

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	9

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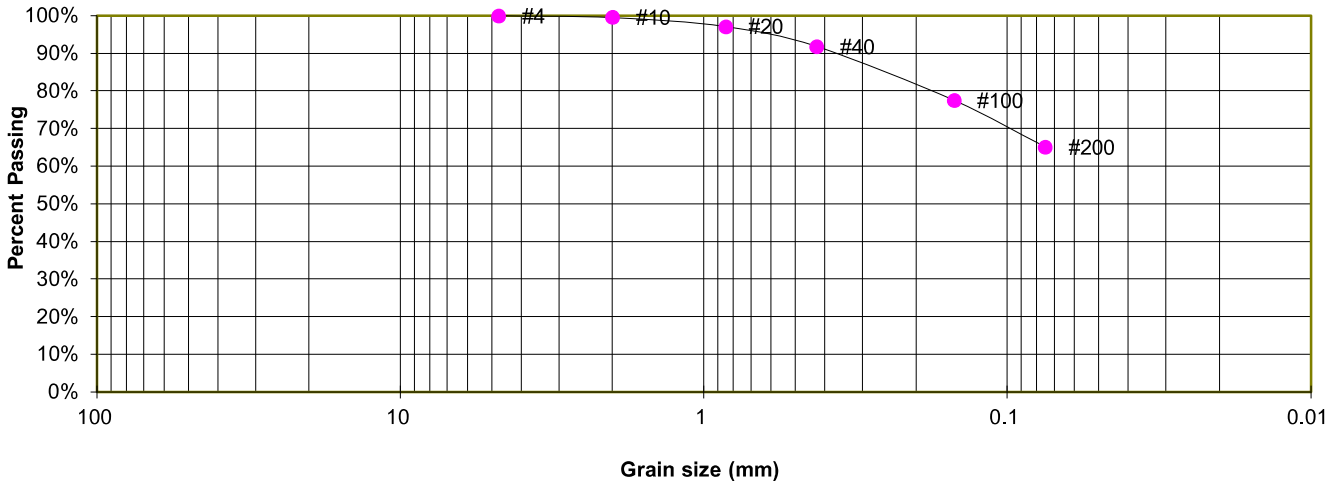
FIG. B-29

TEST BORING	16	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.6%
20	97.2%
40	91.8%
100	77.5%
200	65.1%

ATTERBERG LIMITS

Plastic Limit	19
Liquid Limit	34
Plastic Index	15

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	8

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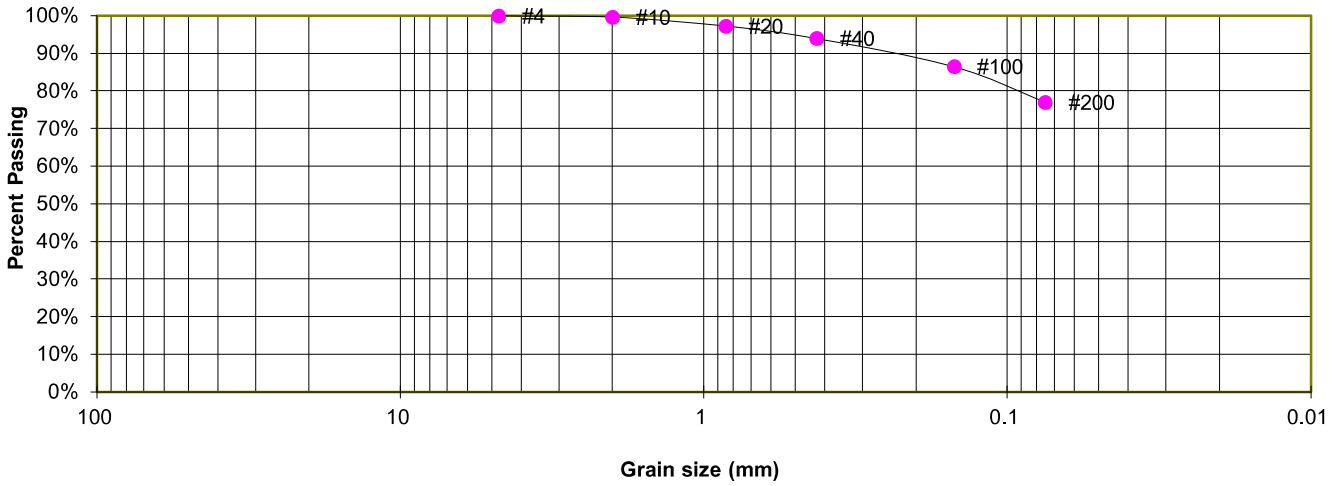
FIG. B-30

TEST BORING	17	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	1-2	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.6%
20	97.3%
40	93.9%
100	86.5%
200	77.1%

ATTERBERG LIMITS

Plastic Limit	23
Liquid Limit	38
Plastic Index	15

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	11

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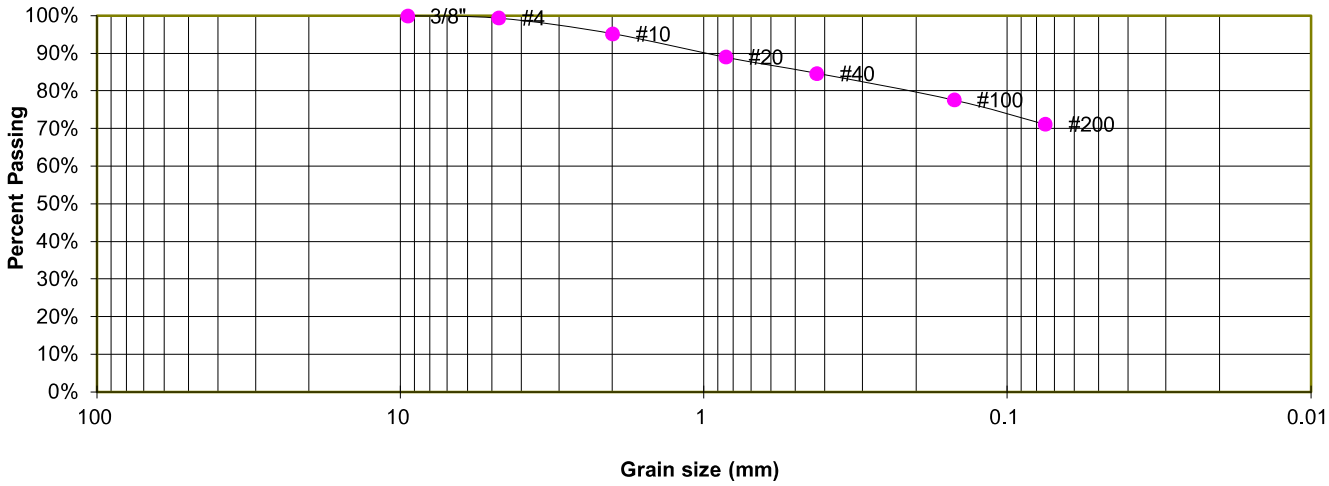
FIG. B-31

TEST BORING	18	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	1-2	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.4%
10	95.2%
20	89.1%
40	84.7%
100	77.7%
200	71.2%

ATTERBERG LIMITS

Plastic Limit	22
Liquid Limit	33
Plastic Index	11

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	7

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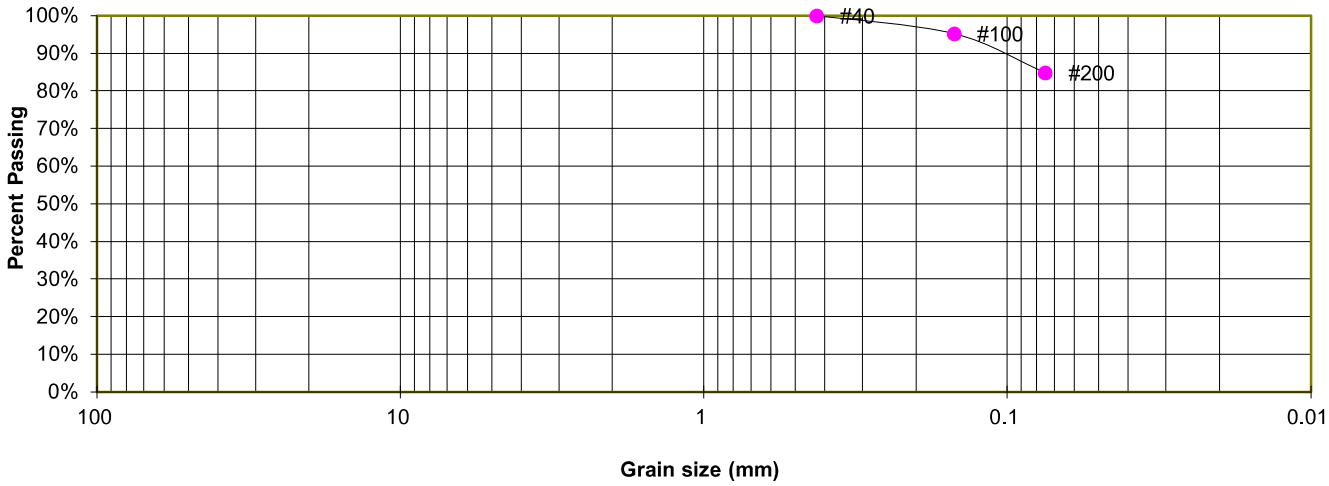
FIG. B-32

TEST BORING	2	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	5	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	100.0%
100	95.2%
200	84.9%

ATTERBERG LIMITS

Plastic Limit	24
Liquid Limit	41
Plastic Index	17

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-7-6
AASHTO GROUP INDEX:	16

ENTECH ENGINEERING, INC.

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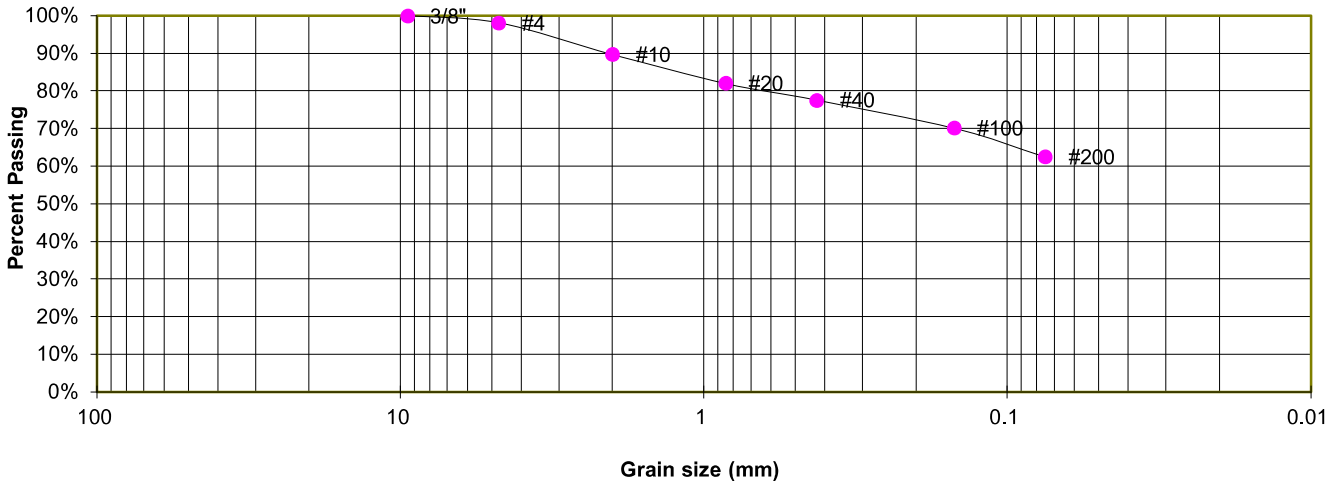
FIG. B-33

TEST BORING	4	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	5	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.1%
10	89.8%
20	82.1%
40	77.6%
100	70.2%
200	62.5%

ATTERBERG LIMITS

Plastic Limit	23
Liquid Limit	39
Plastic Index	16

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	8

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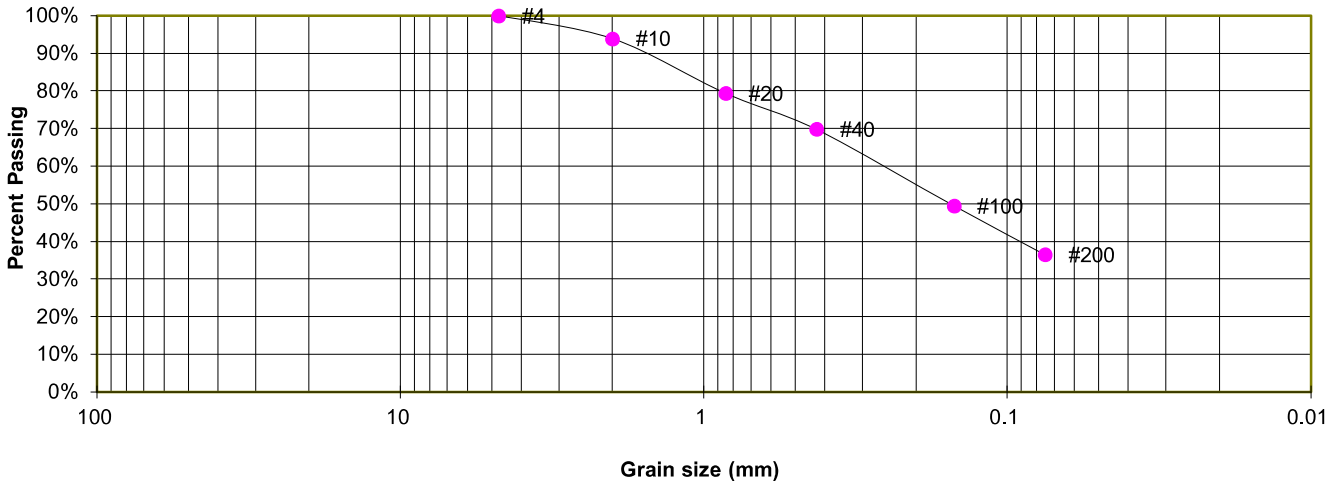
FIG. B-34

TEST BORING	8	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	10	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	93.9%
20	79.4%
40	69.8%
100	49.5%
200	36.5%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	30
Plastic Index	9

SOIL CLASSIFICATION

USCS CLASSIFICATION:	SC
AASHTO CLASSIFICATION:	A-4
AASHTO GROUP INDEX:	0

ENTECH ENGINEERING, INC.

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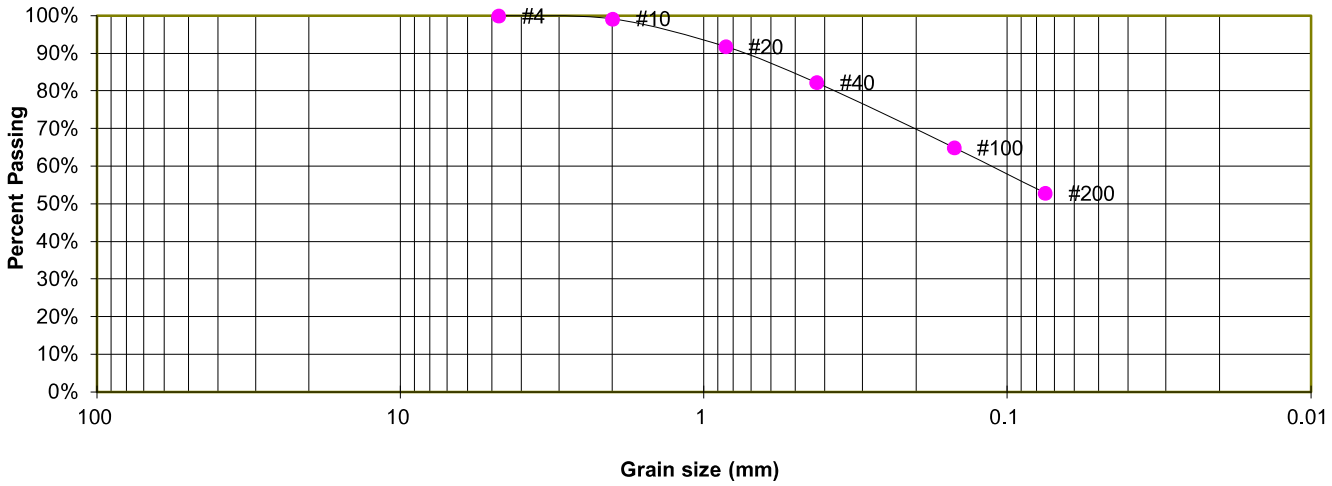
FIG. B-35

TEST BORING	12	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	5	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.2%
20	91.8%
40	82.2%
100	65.0%
200	52.9%

ATTERBERG LIMITS

Plastic Limit	17
Liquid Limit	26
Plastic Index	9

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-4
AASHTO GROUP INDEX:	2

ENTECH ENGINEERING, INC.

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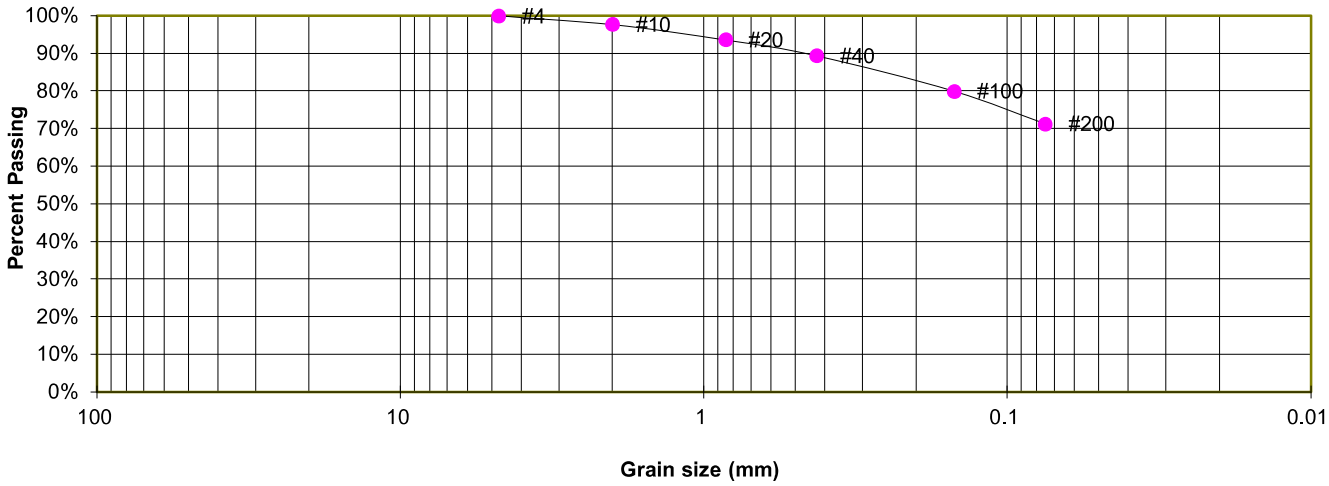
FIG. B-36

TEST BORING	19	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	5	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	97.7%
20	93.6%
40	89.4%
100	80.0%
200	71.3%

ATTERBERG LIMITS

Plastic Limit	22
Liquid Limit	38
Plastic Index	16

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	10

ENTECH ENGINEERING, INC.

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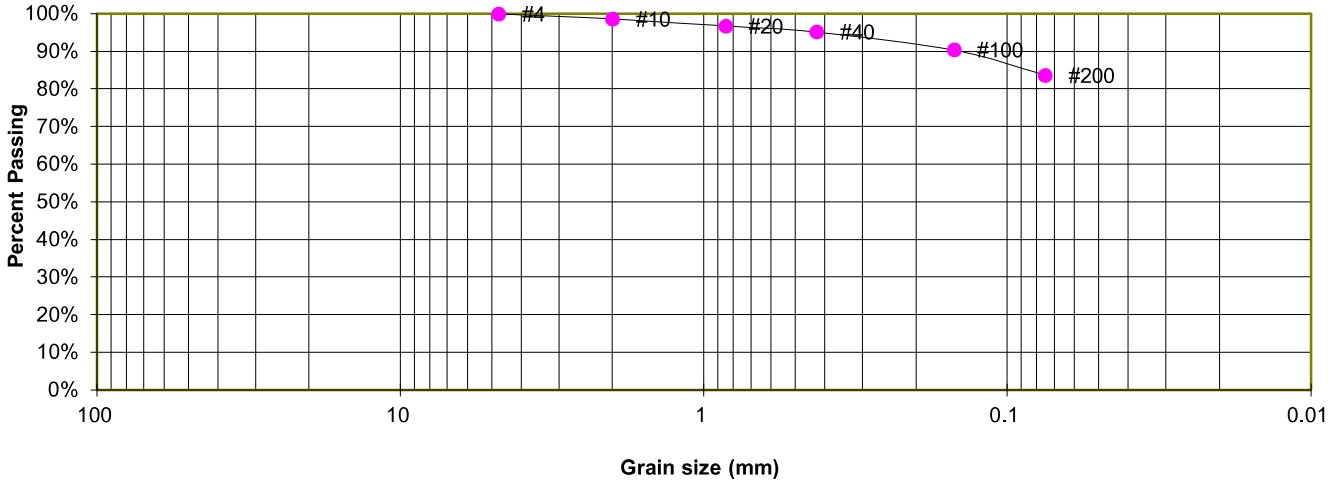
FIG. B-37

TEST BORING	20	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	5	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	98.6%
20	96.8%
40	95.2%
100	90.4%
200	83.7%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	36
Plastic Index	15

SOIL CLASSIFICATION

USCS CLASSIFICATION:	CL
AASHTO CLASSIFICATION:	A-6
AASHTO GROUP INDEX:	12

ENTECH ENGINEERING, INC.

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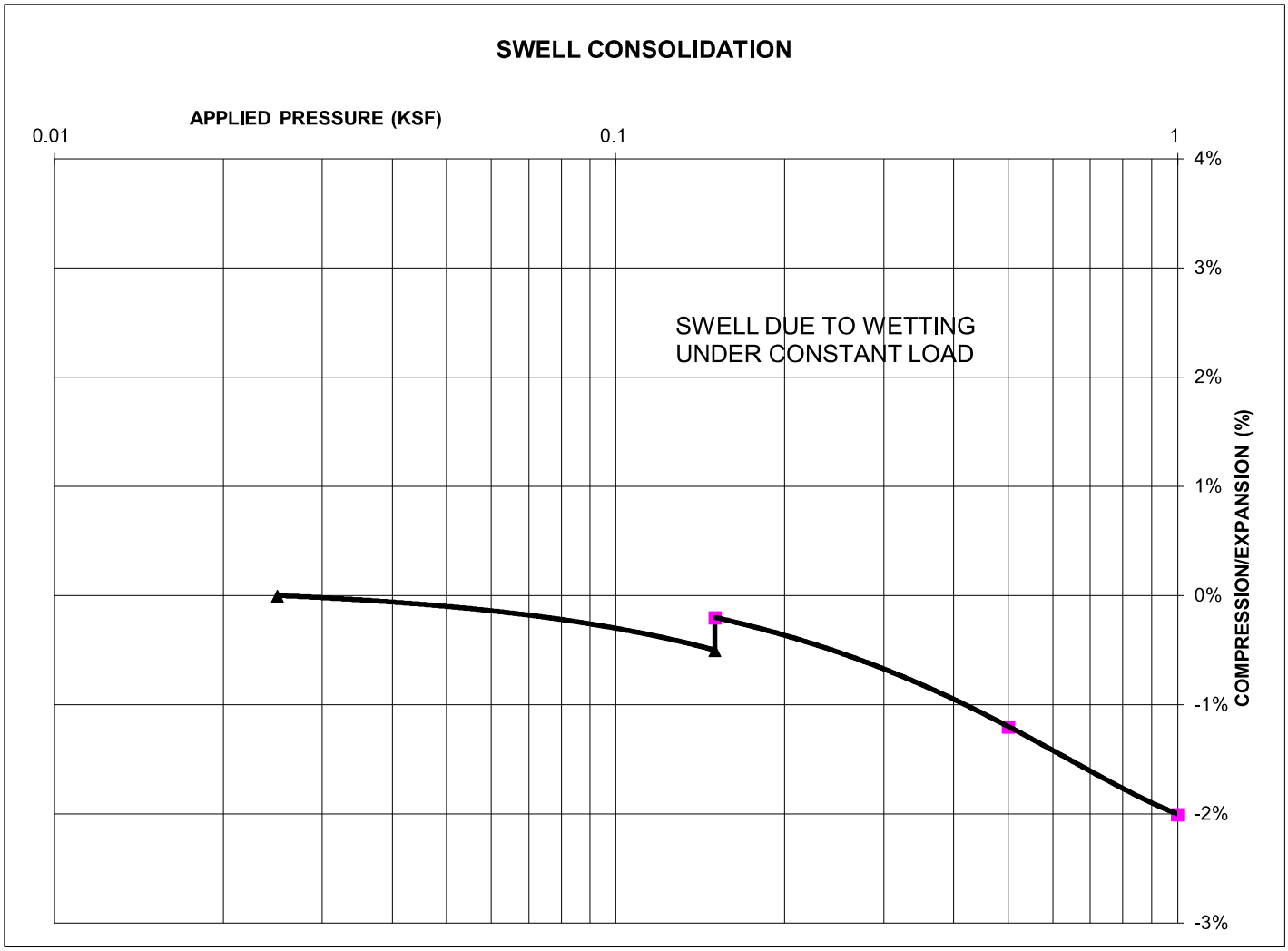
FIG. B-38

TEST BORING	3	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	97
NATURAL MOISTURE CONTENT:	11.5%
SWELL/COLLAPSE (%):	0.3%

ENTECH ENGINEERING, INC.

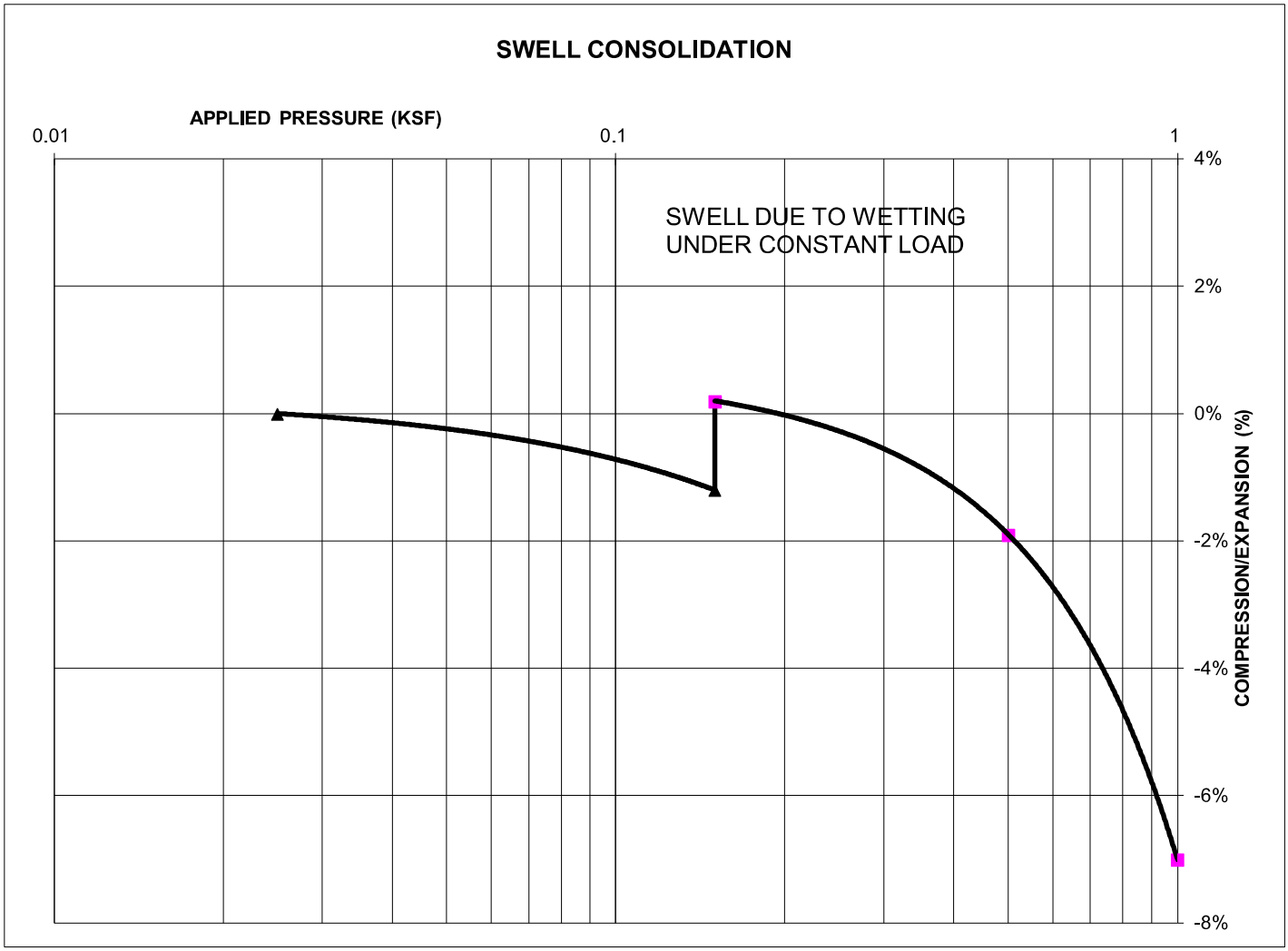
SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-39

TEST BORING	5	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	96
NATURAL MOISTURE CONTENT:	14.2%
SWELL/COLLAPSE (%):	1.4%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

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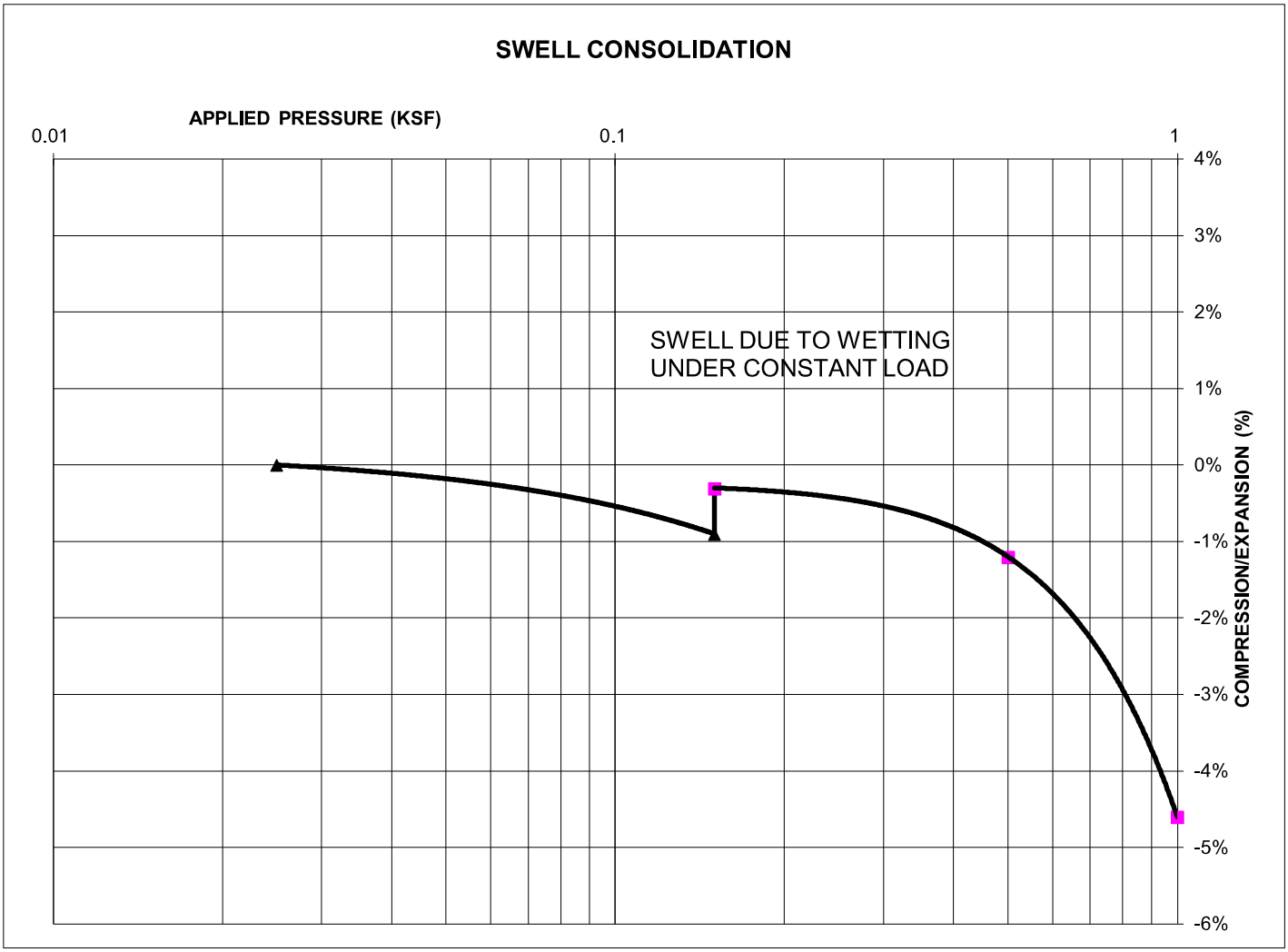
JOB NO.
240824

FIG. B-40

TEST BORING	7	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	99
NATURAL MOISTURE CONTENT:	11.7%
SWELL/COLLAPSE (%):	0.6%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

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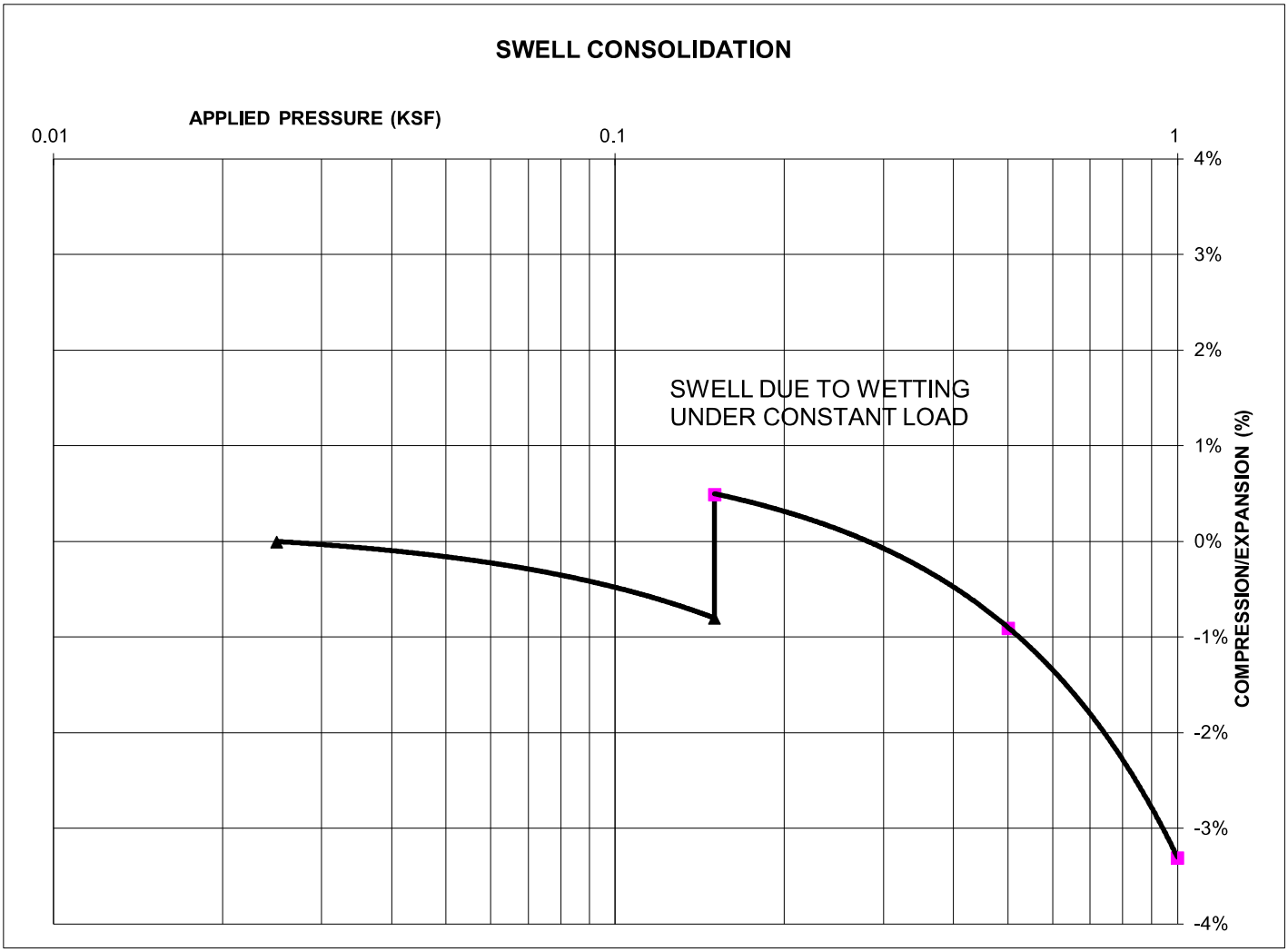
PROTERRA

JOB NO. 240824

FIG. B-41

TEST BORING	8	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 104
NATURAL MOISTURE CONTENT: 16.5%
SWELL/COLLAPSE (%): 1.3%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

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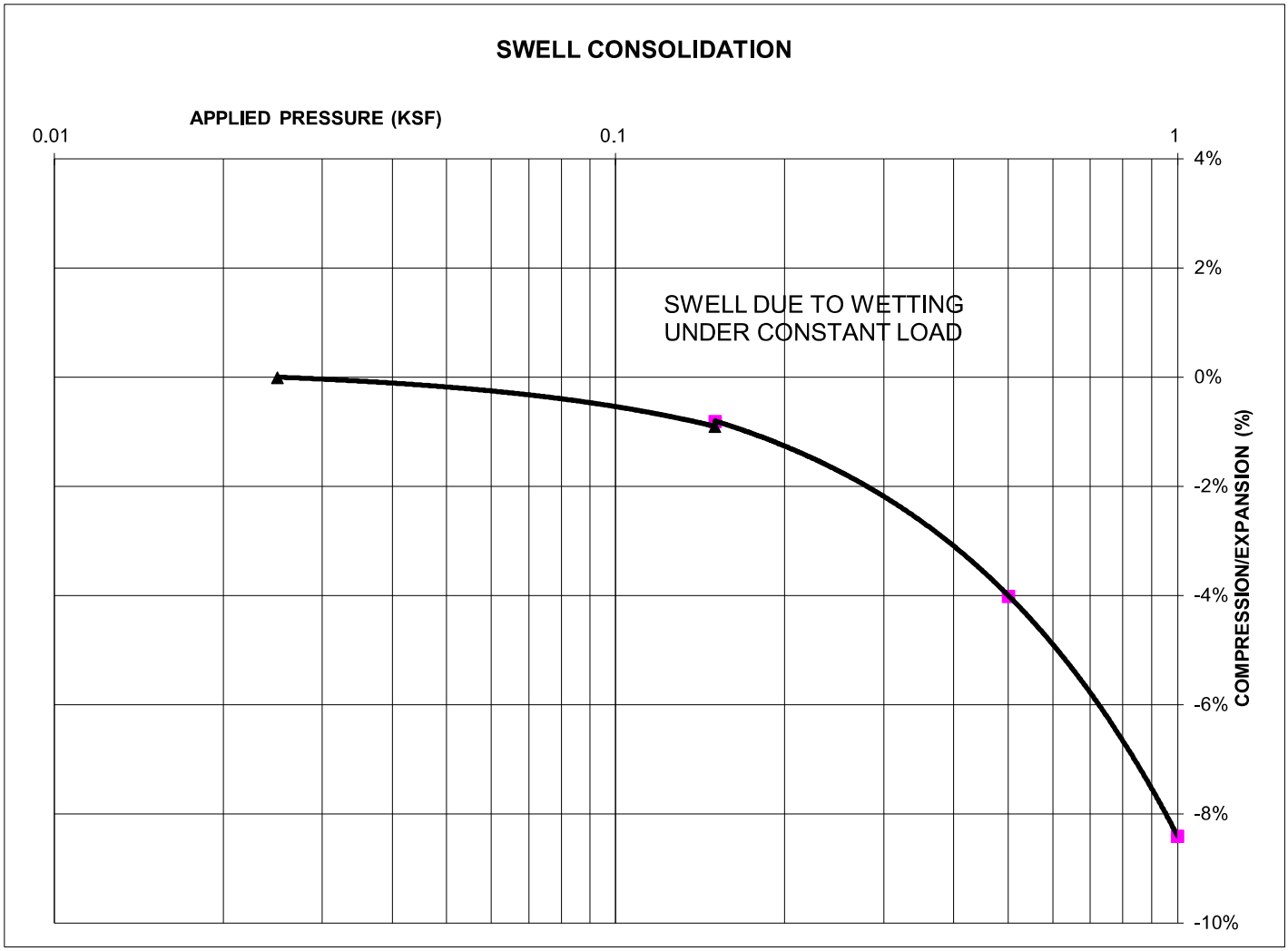
JOB NO. 240824

FIG. B-42

TEST BORING	10	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	97
NATURAL MOISTURE CONTENT:	12.6%
SWELL/COLLAPSE (%):	0.1%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

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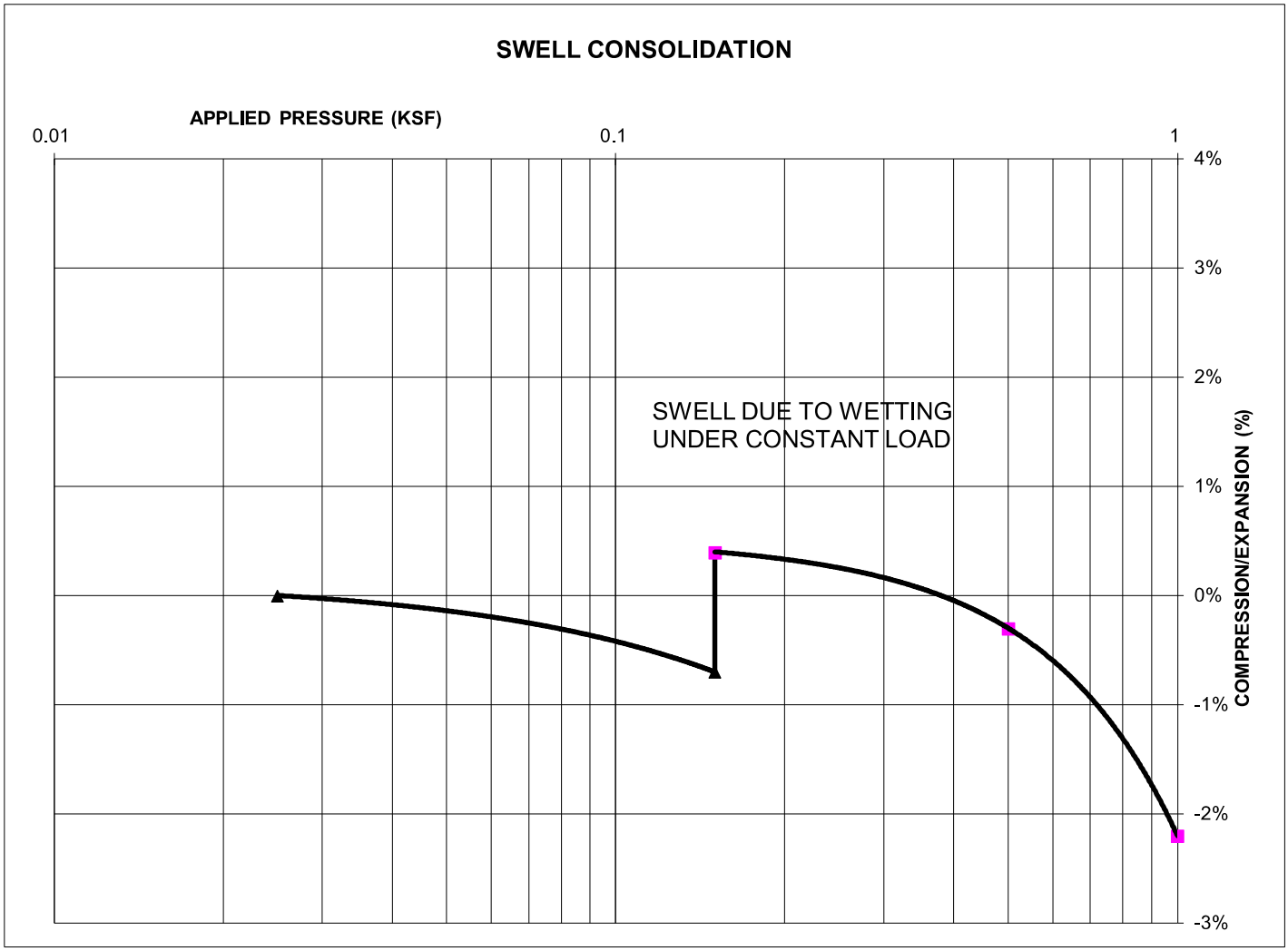
JOB NO.
240824

FIG. B-43

TEST BORING	11	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 113
NATURAL MOISTURE CONTENT: 10.7%
SWELL/COLLAPSE (%): 1.1%

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SWELL TEST RESULTS

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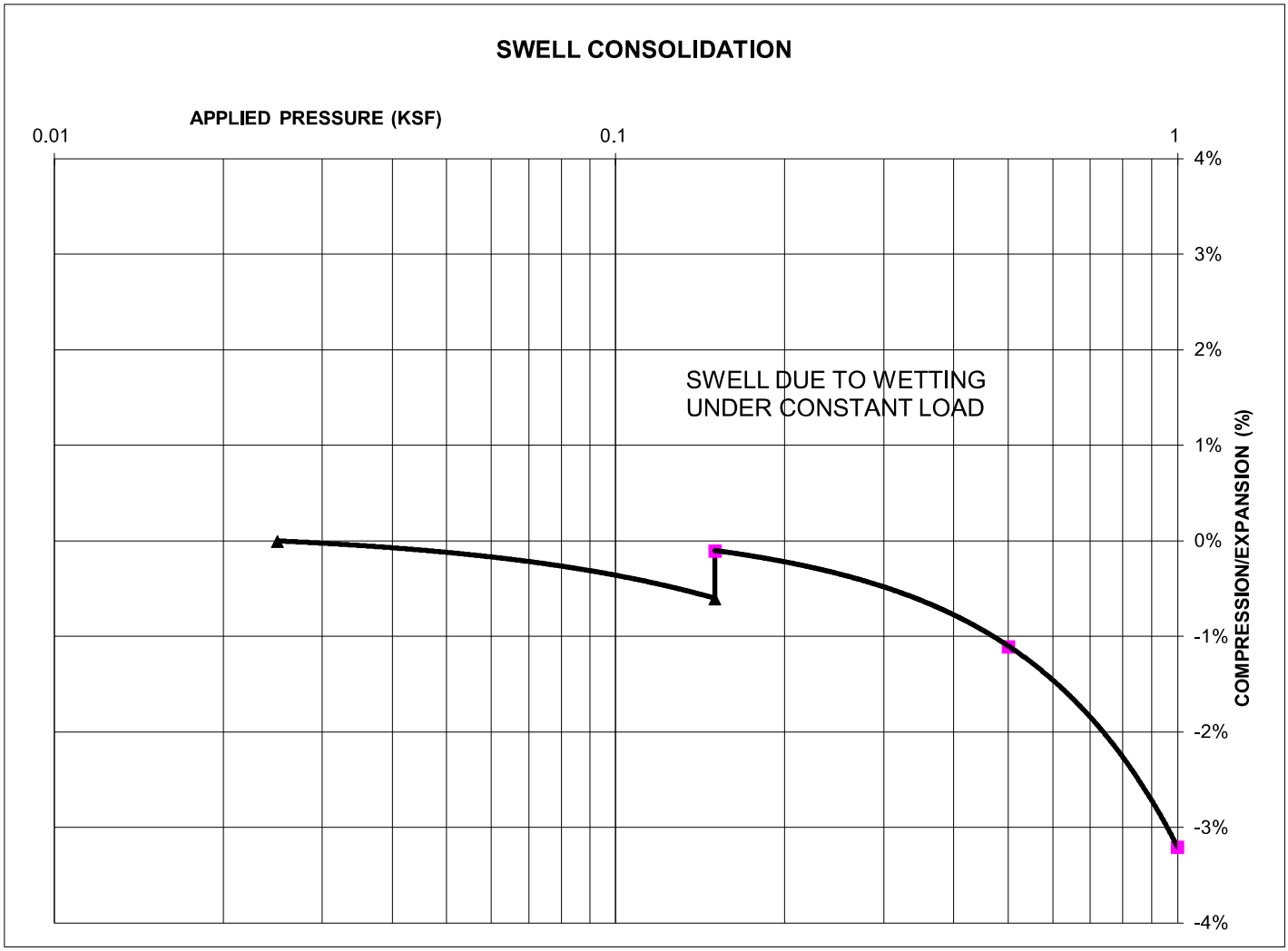
JOB NO. 240824

FIG. B-44

TEST BORING	12	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 99
NATURAL MOISTURE CONTENT: 17.5%
SWELL/COLLAPSE (%): 0.5%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

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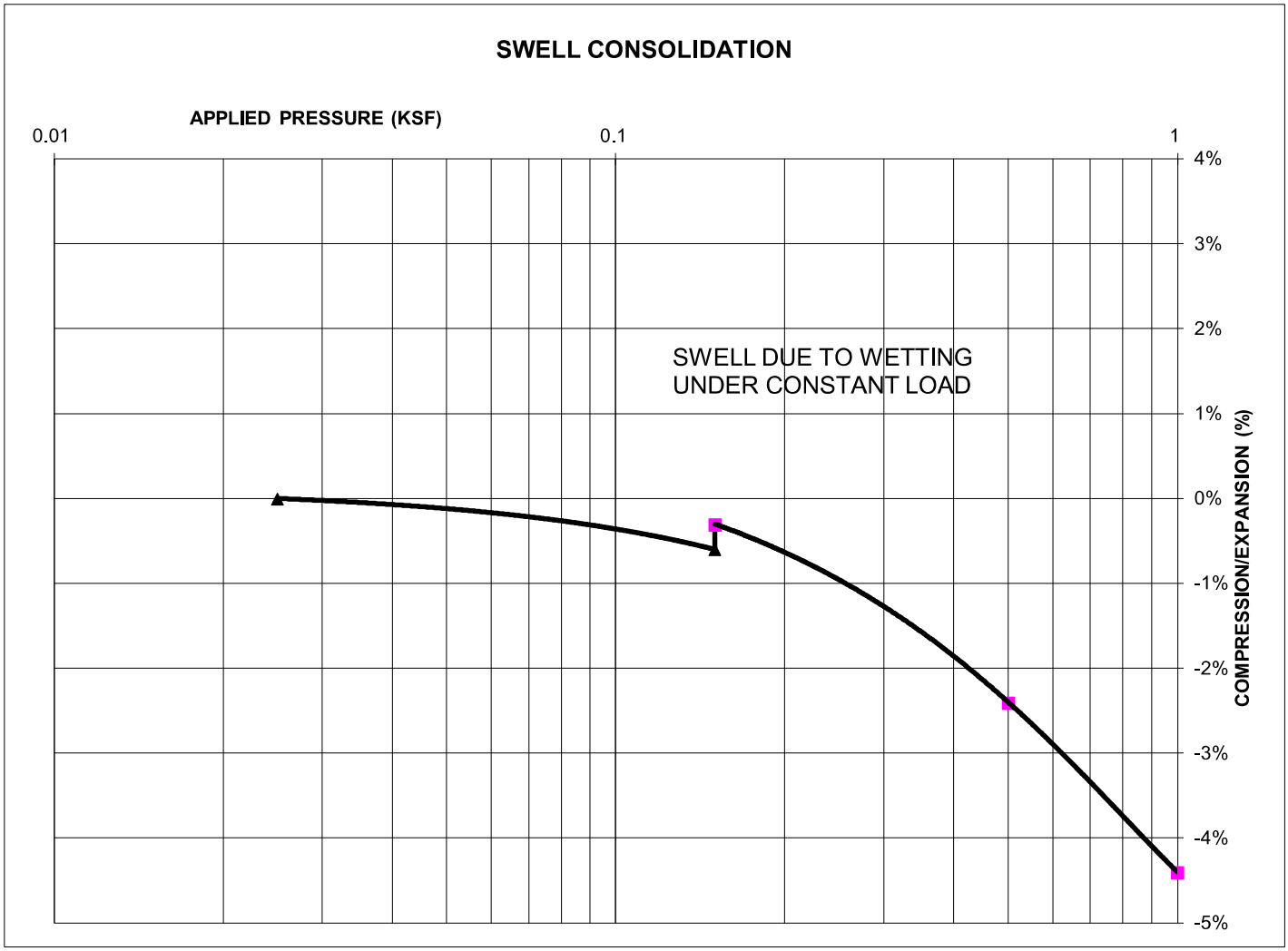
FIG. B-45

TEST BORING	13	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 104
NATURAL MOISTURE CONTENT: 11.8%
SWELL/COLLAPSE (%): 0.3%

ENTECH ENGINEERING, INC.

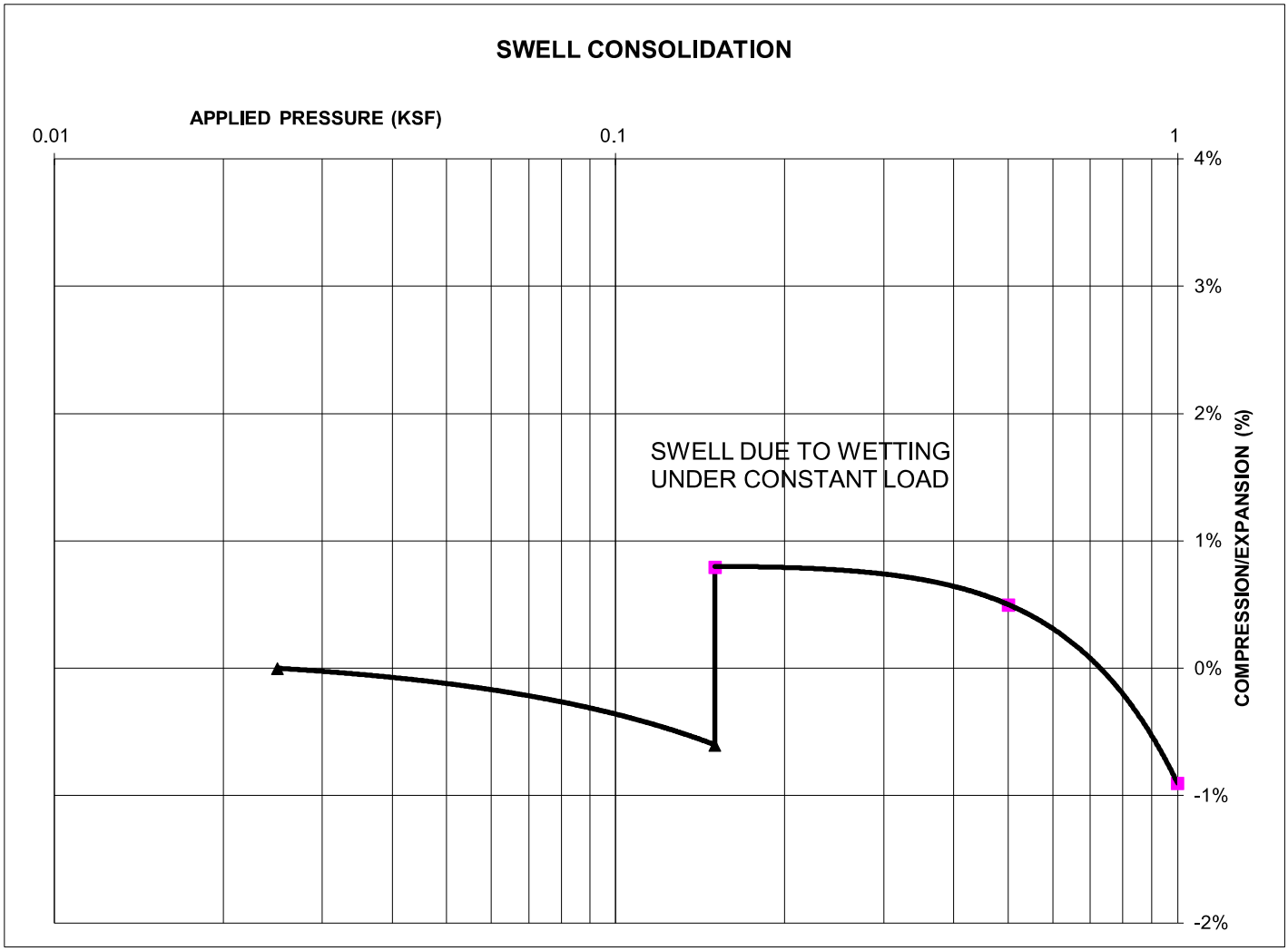
SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-46

TEST BORING	4	SOIL DESCRIPTION	FILL, CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	2



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 105
NATURAL MOISTURE CONTENT: 14.4%
SWELL/COLLAPSE (%): 1.4%

ENTECH ENGINEERING, INC.

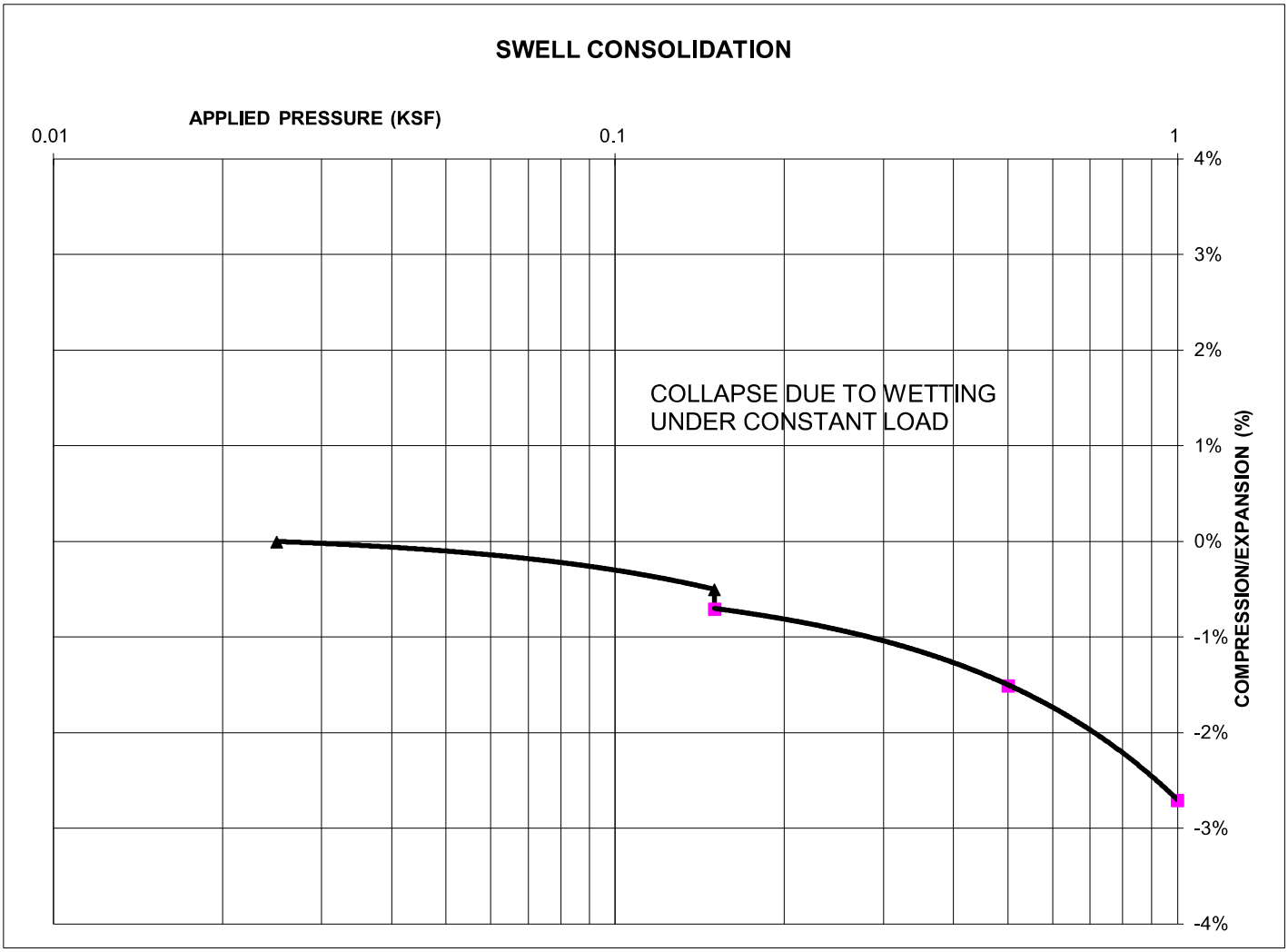
SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-47

TEST BORING	13	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	5	SOIL TYPE	3



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	112
NATURAL MOISTURE CONTENT:	10.4%
SWELL/COLLAPSE (%):	-0.2%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

WINSOME, FILING NO. 3
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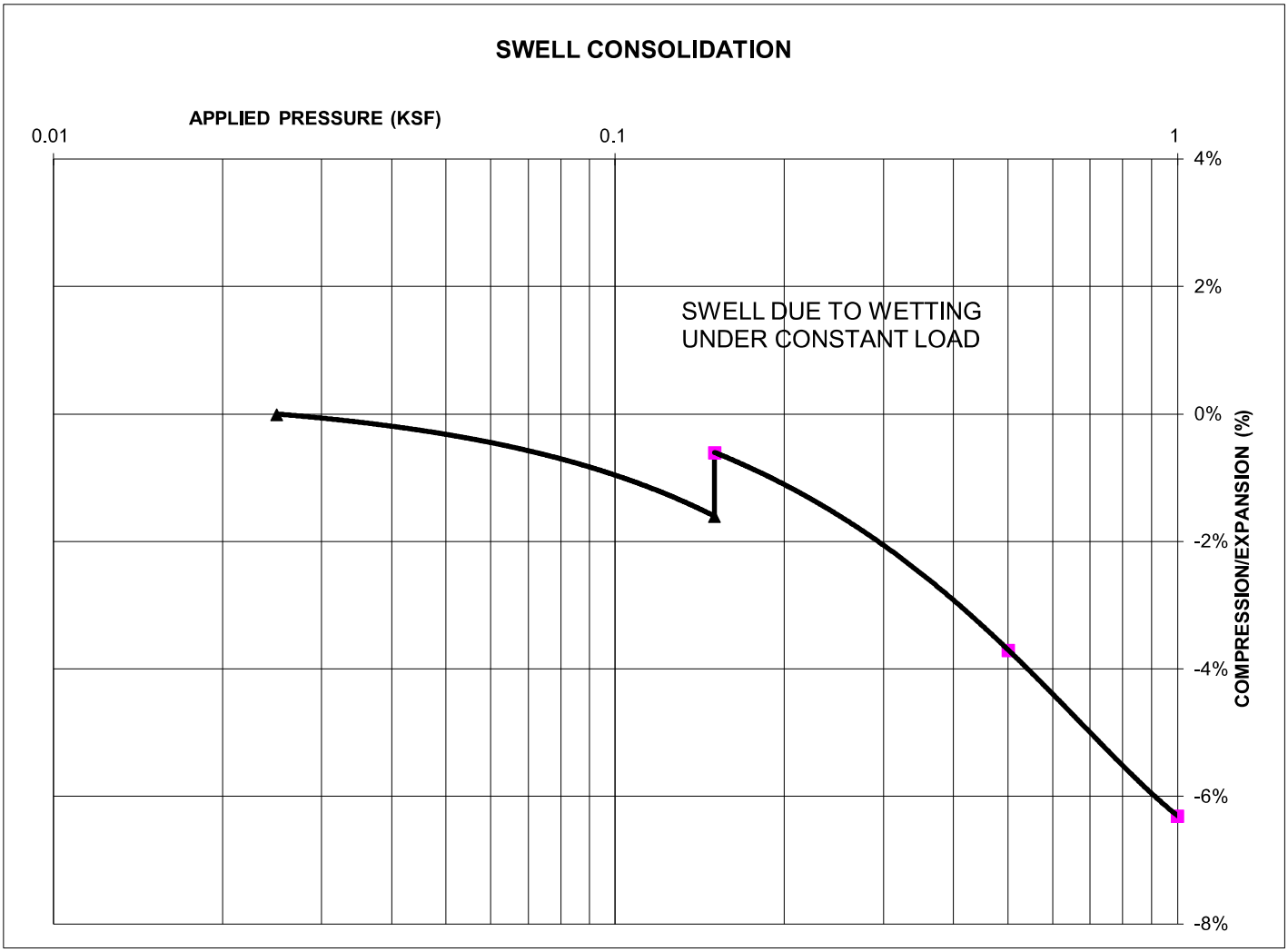
JOB NO.
240824

FIG. B-48

TEST BORING	9	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	1-2	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	96
NATURAL MOISTURE CONTENT:	12.9%
SWELL/COLLAPSE (%):	1.0%

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SWELL TEST RESULTS

WINSOME, FILING NO. 3
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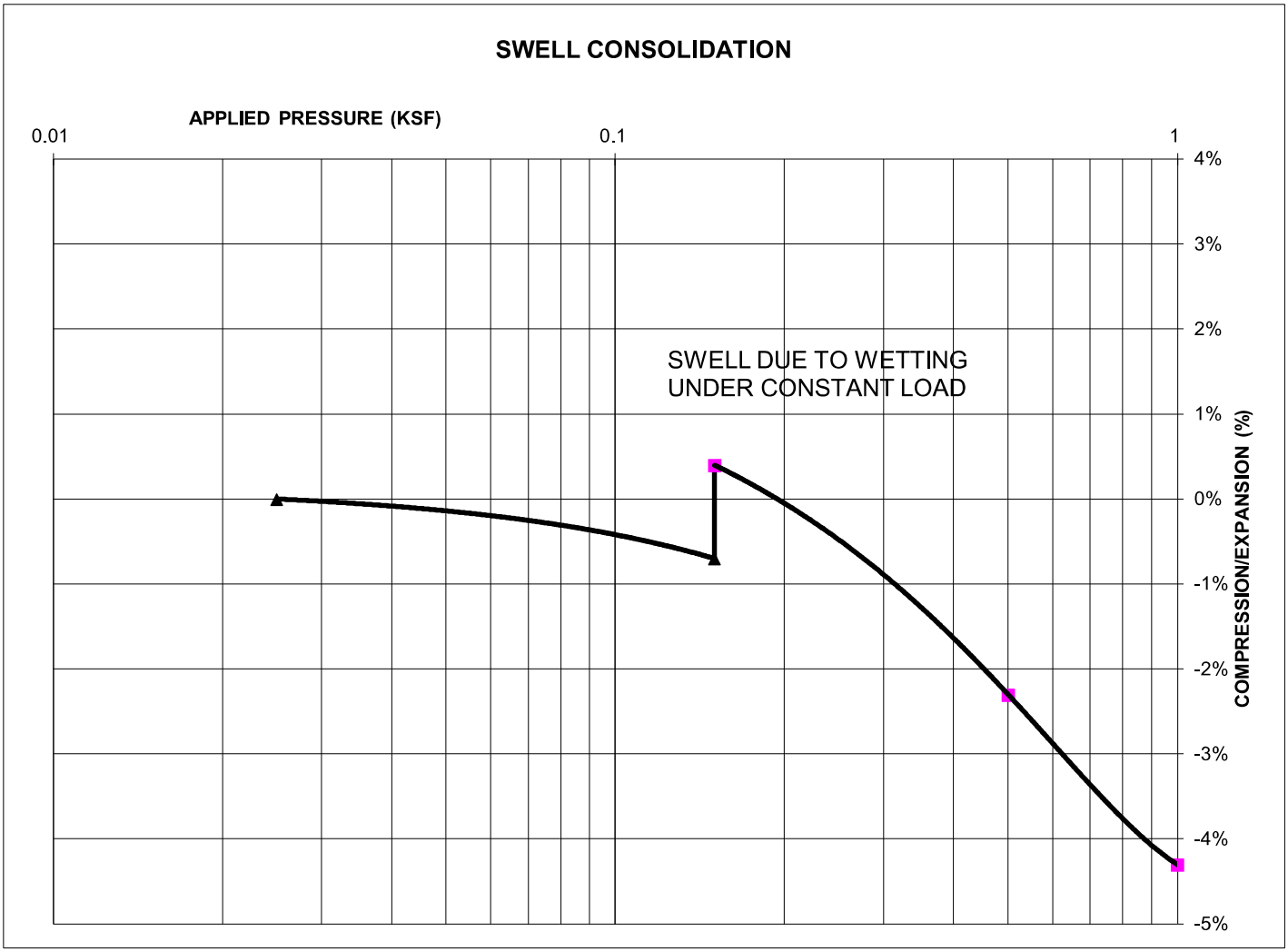
JOB NO. 240824

FIG. B-49

TEST BORING	14	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 103
NATURAL MOISTURE CONTENT: 12.7%
SWELL/COLLAPSE (%): 1.1%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

WINSOME, FILING NO. 3
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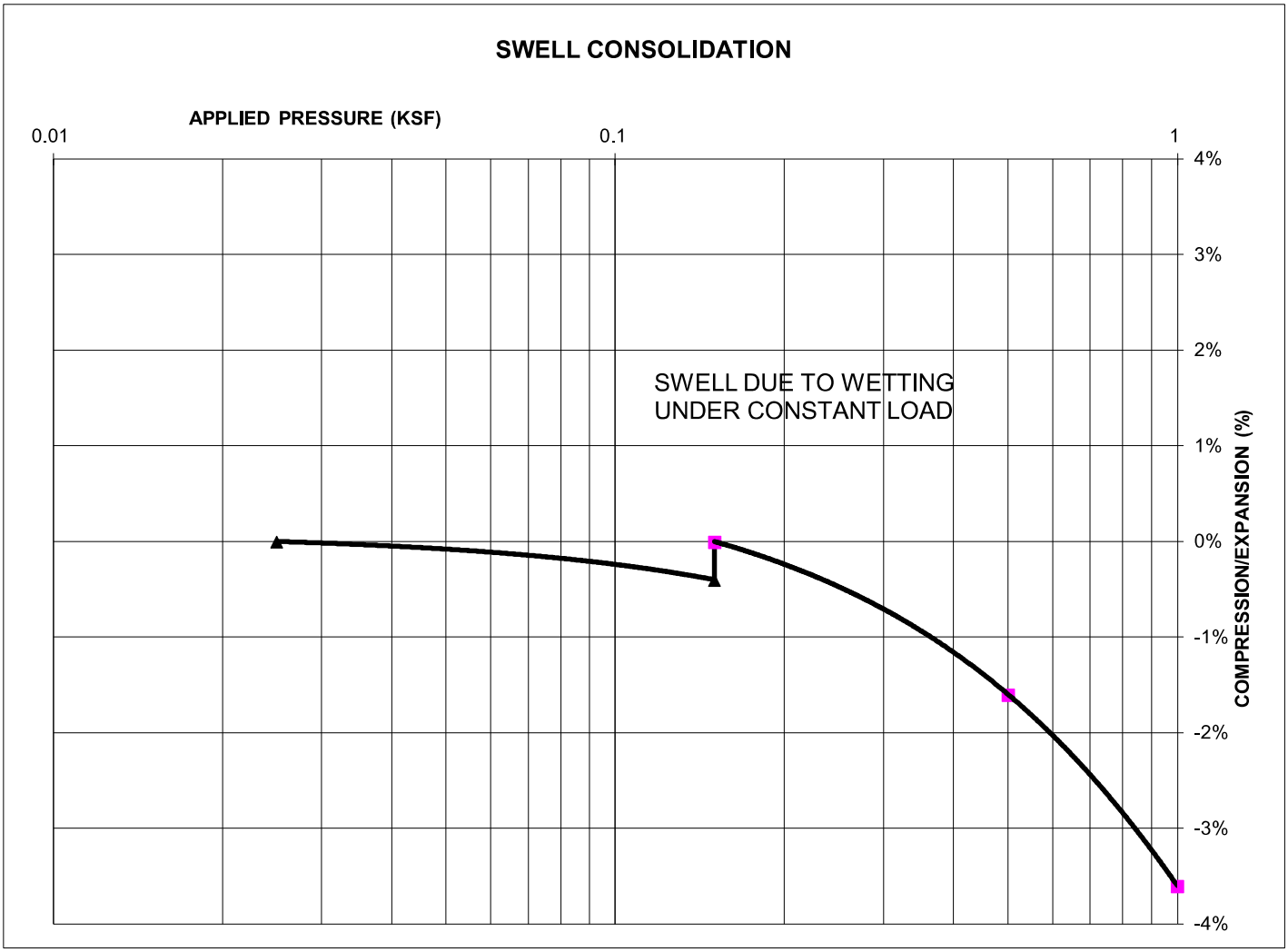
JOB NO. 240824

FIG. B-50

TEST BORING	15	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	100
NATURAL MOISTURE CONTENT:	9.3%
SWELL/COLLAPSE (%):	0.4%

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SWELL TEST RESULTS

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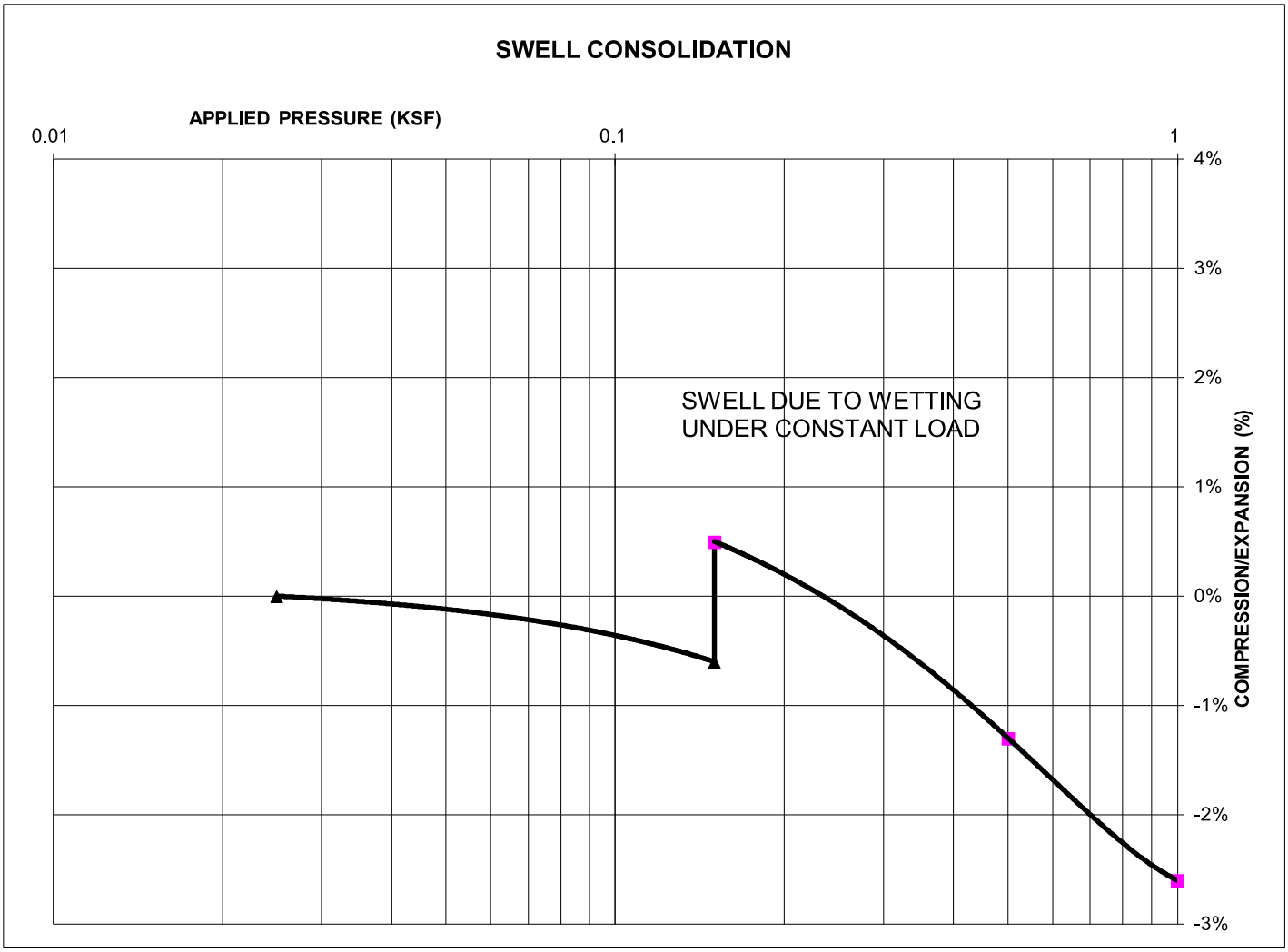
JOB NO.
240824

FIG. B-51

TEST BORING	16	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	1-2	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 90
NATURAL MOISTURE CONTENT: 10.1%
SWELL/COLLAPSE (%): 1.1%

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SWELL TEST RESULTS

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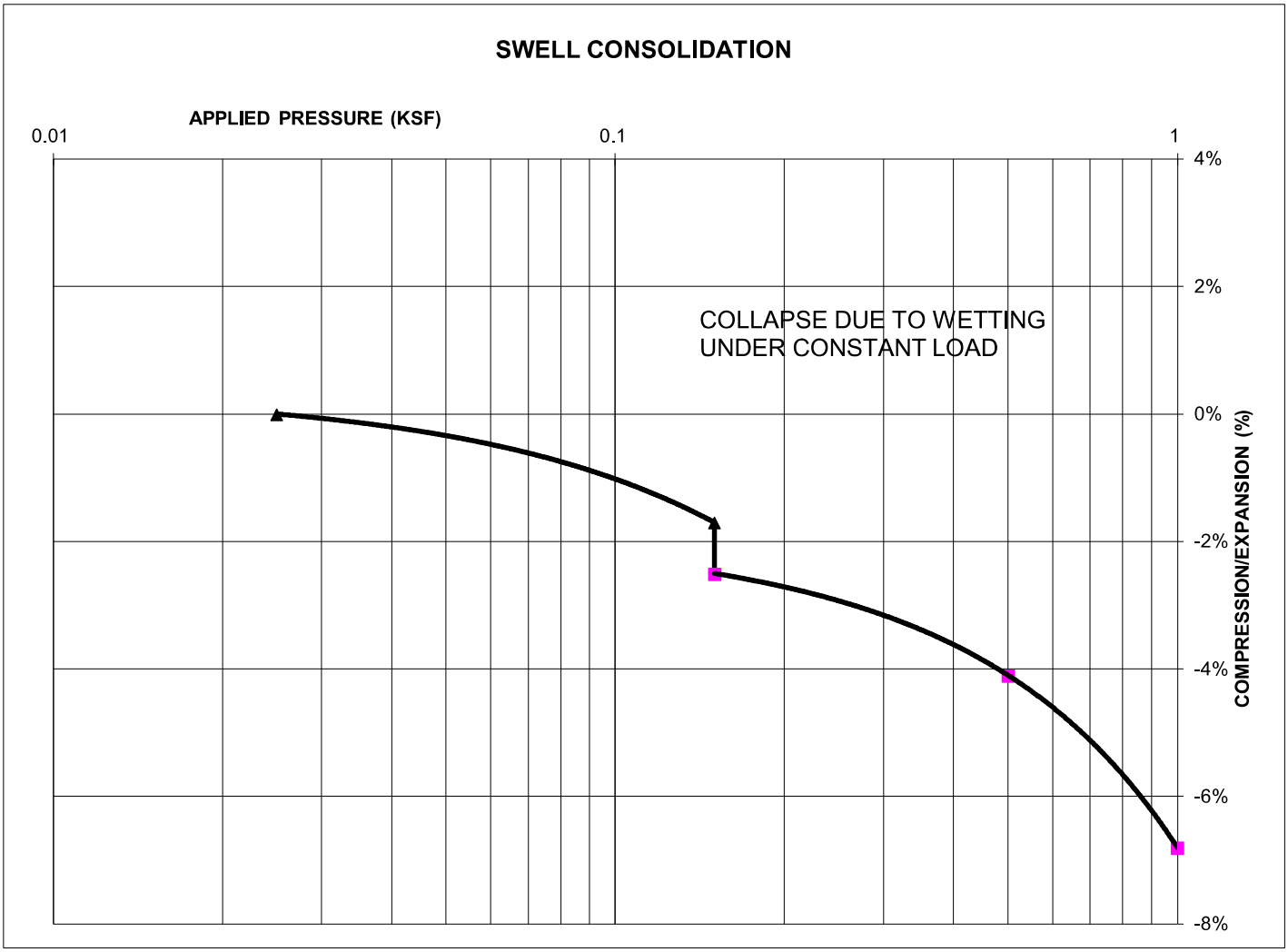
JOB NO. 240824

FIG. B-52

TEST BORING	17	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	1-2	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 102
NATURAL MOISTURE CONTENT: 17.2%
SWELL/COLLAPSE (%): -0.8%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

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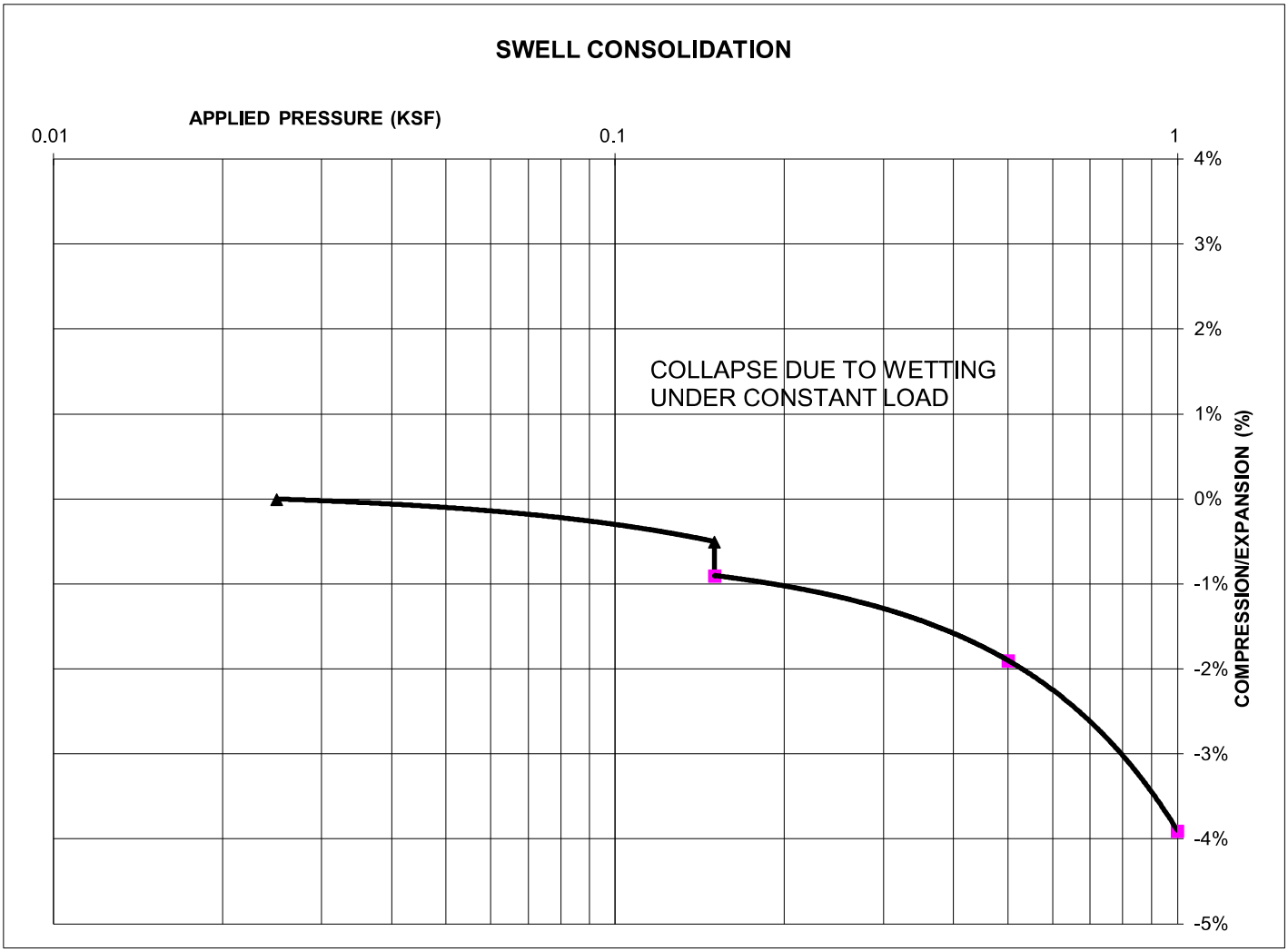
JOB NO. 240824

FIG. B-53

TEST BORING	18	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	1-2	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 102
NATURAL MOISTURE CONTENT: 10.1%
SWELL/COLLAPSE (%): -0.4%

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SWELL TEST RESULTS

WINSOME, FILING NO. 3
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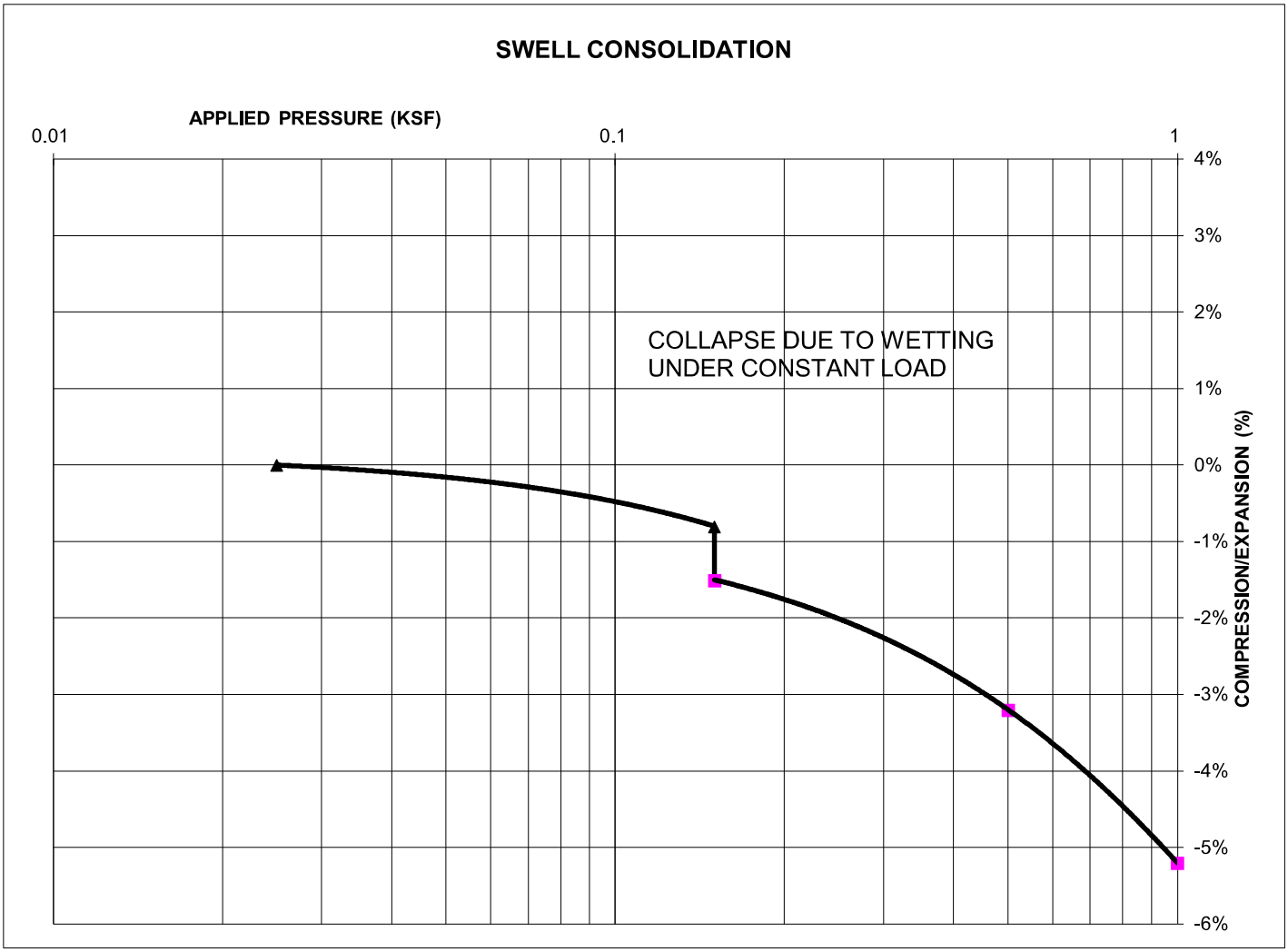
JOB NO. 240824

FIG. B-54

TEST BORING	2	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	5	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 105
NATURAL MOISTURE CONTENT: 13.1%
SWELL/COLLAPSE (%): -0.7%

ENTECH ENGINEERING, INC.

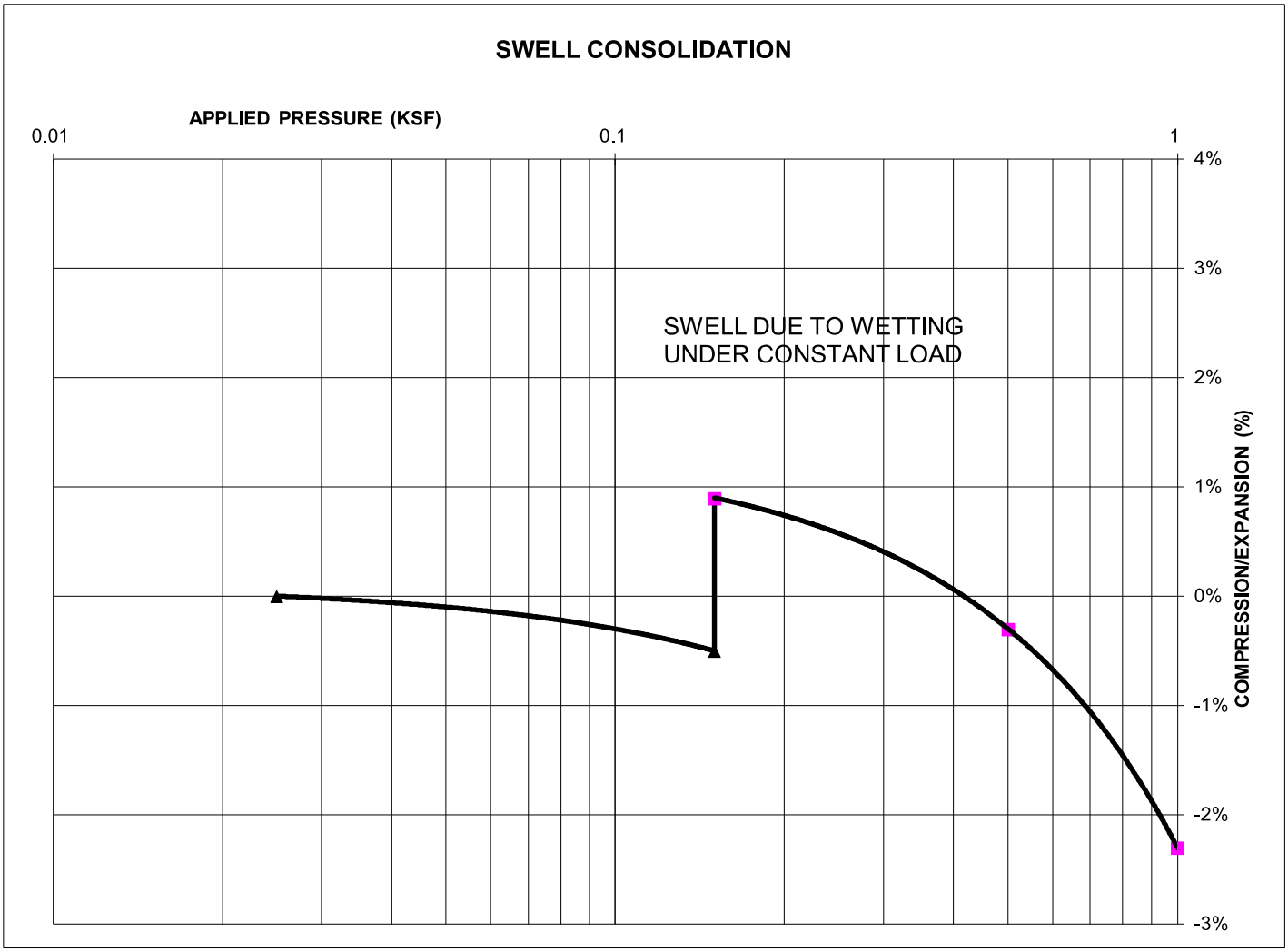
SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-55

TEST BORING	4	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	5	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 100
NATURAL MOISTURE CONTENT: 11.2%
SWELL/COLLAPSE (%): 1.4%

ENTECH ENGINEERING, INC.

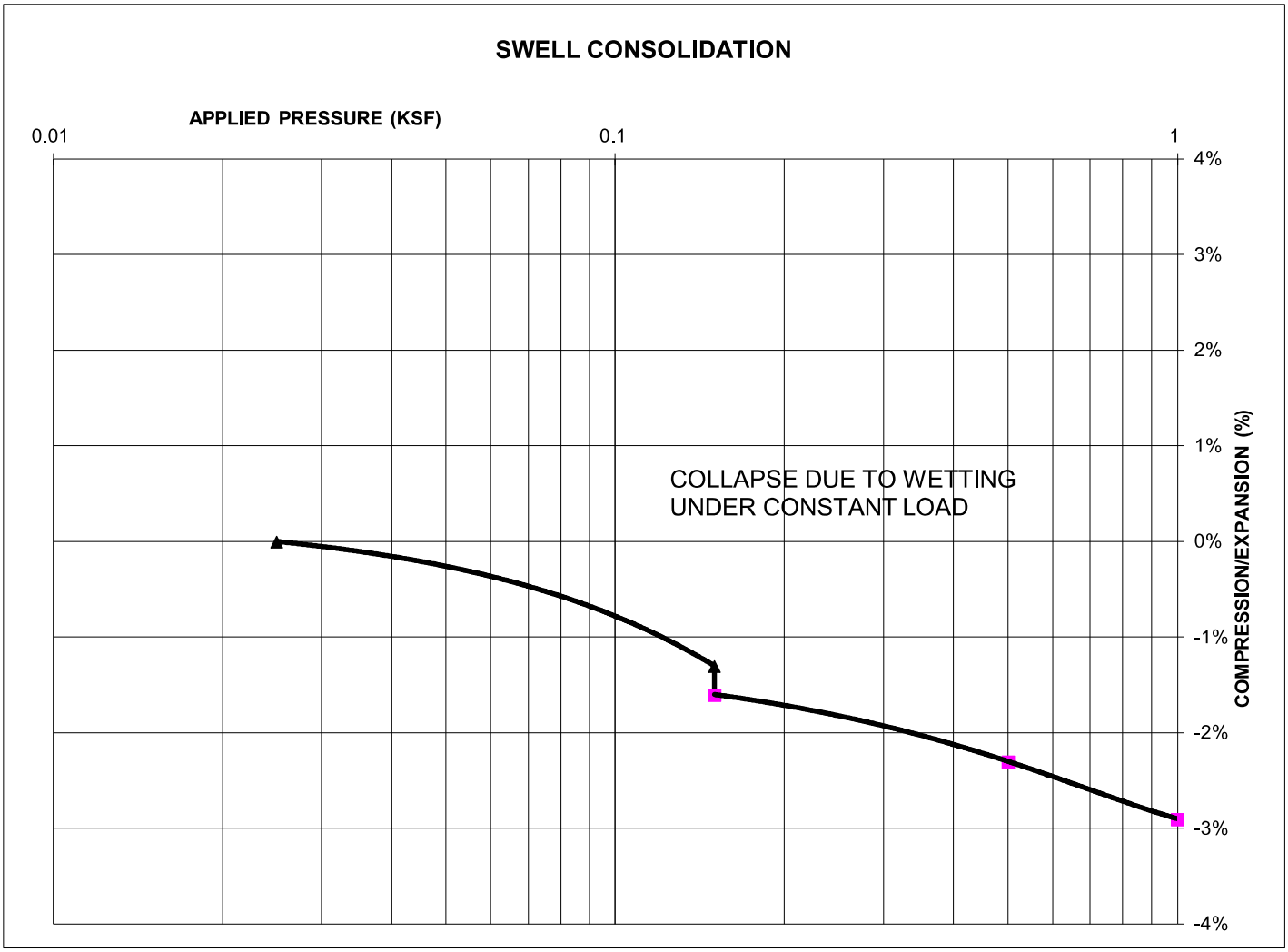
SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-56

TEST BORING	8	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	10	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	110
NATURAL MOISTURE CONTENT:	10.7%
SWELL/COLLAPSE (%):	-0.3%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

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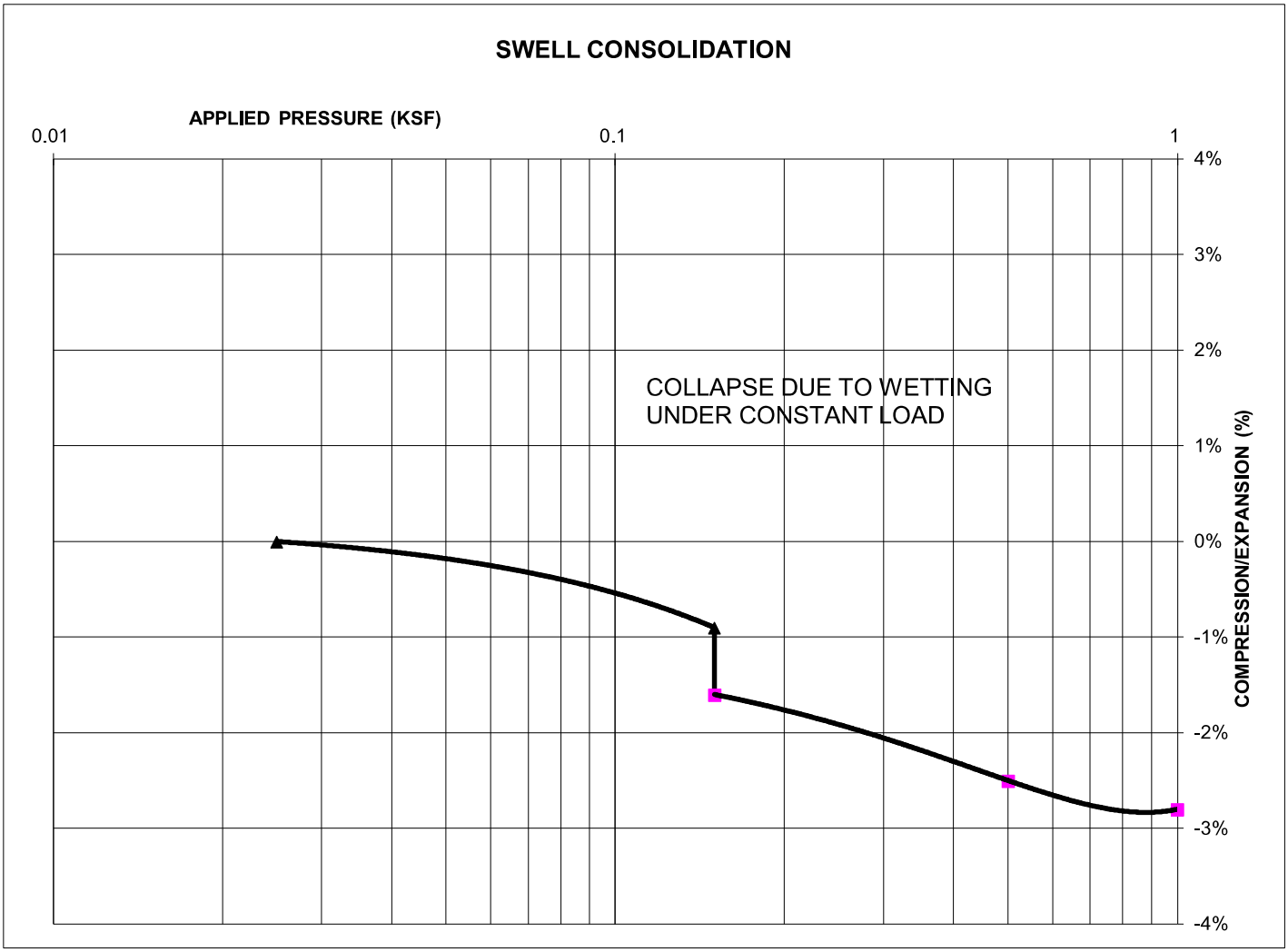
PROTERRA

JOB NO. 240824

FIG. B-57

TEST BORING	12	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	5	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	115
NATURAL MOISTURE CONTENT:	12.2%
SWELL/COLLAPSE (%):	-0.7%

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SWELL TEST RESULTS

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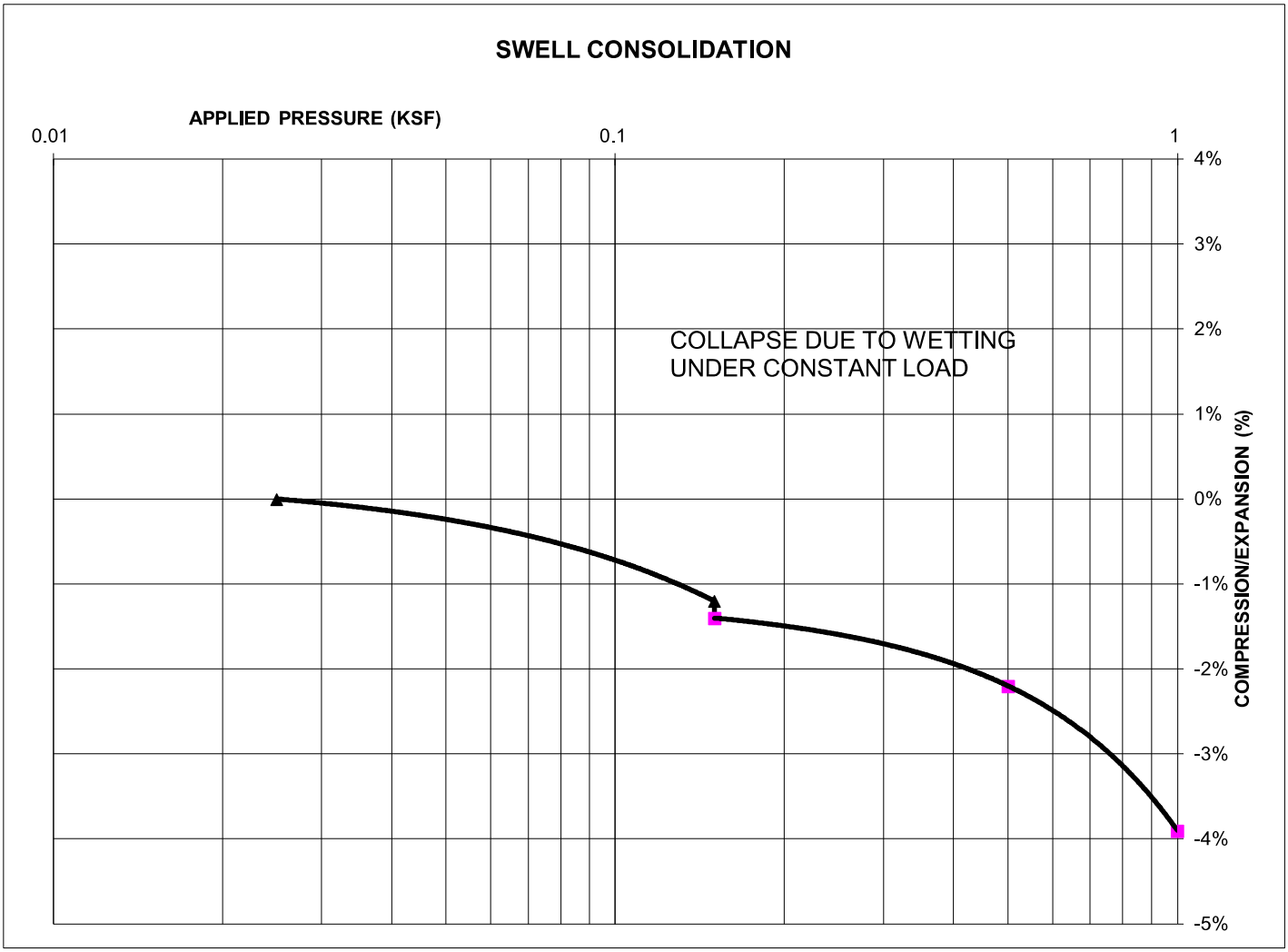
JOB NO.
240824

FIG. B-58

TEST BORING	19	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	5	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	106
NATURAL MOISTURE CONTENT:	9.8%
SWELL/COLLAPSE (%):	-0.2%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

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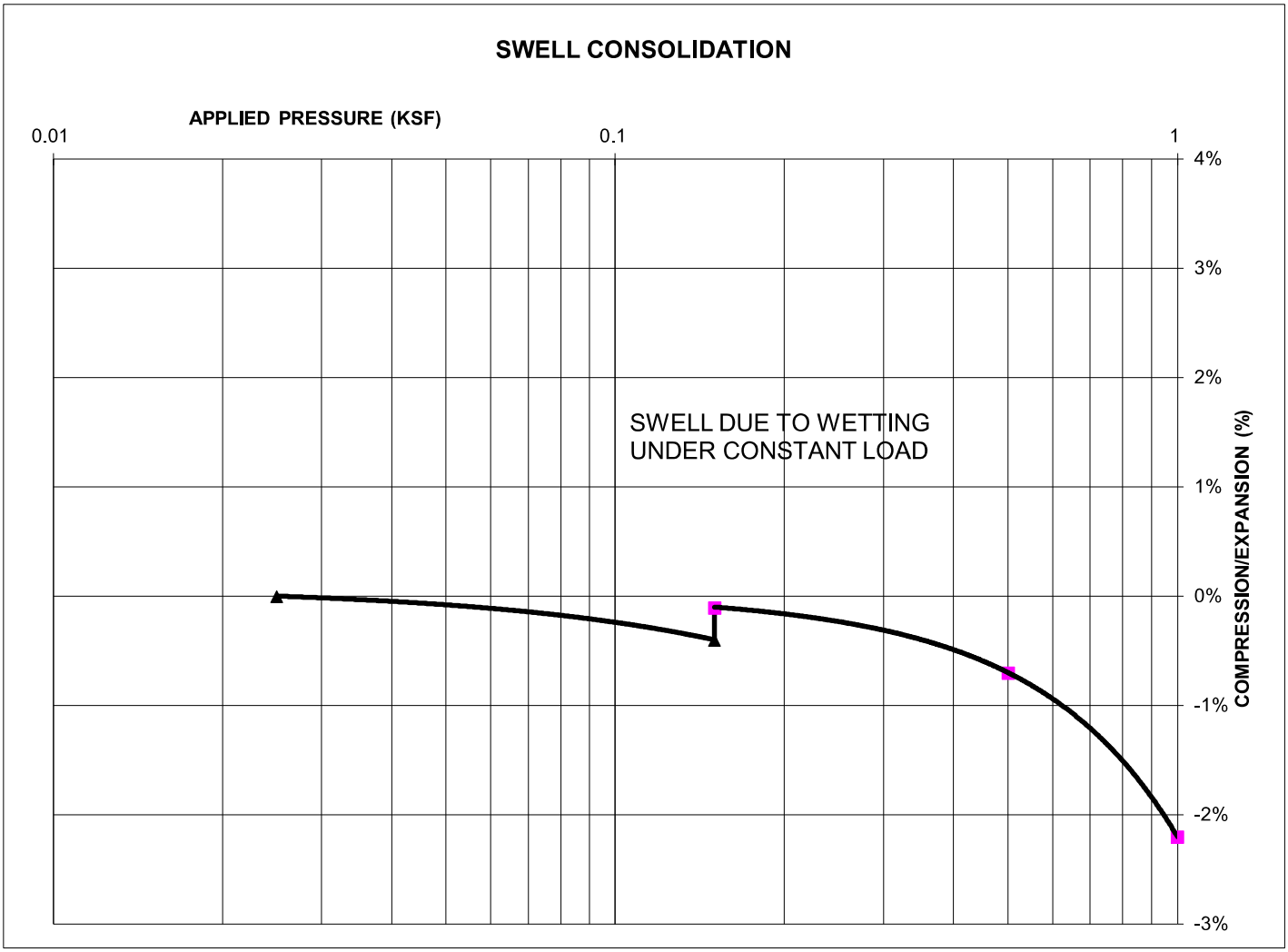
JOB NO. 240824

FIG. B-59

TEST BORING	20	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	5	SOIL TYPE	4



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 104
NATURAL MOISTURE CONTENT: 20.5%
SWELL/COLLAPSE (%): 0.3%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

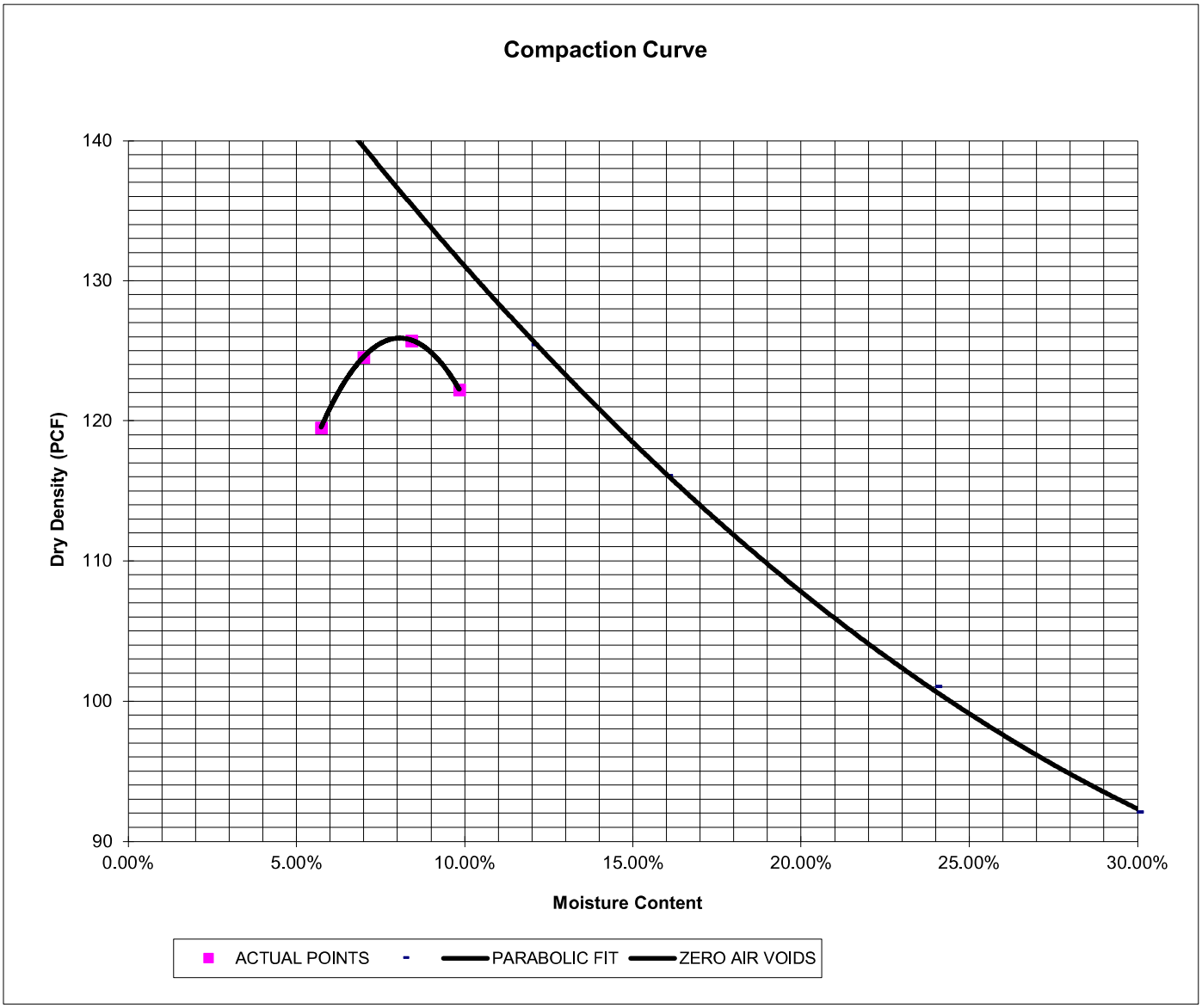
JOB NO. 240824

FIG. B-60

SAMPLE LOCATION TB-2 @ 0-3'	SOIL DESCRIPTION FILL, SAND, CLAYEY, BROWN
	SOIL TYPE 1

PROCTOR DATA

IDENTIFICATION:	SC
PROCTOR TEST #:	1
TEST BY:	PH
TEST DESIGNATION:	ASTM-1557-A
MAXIMUM DRY DENSITY (PCF):	122.9
OPTIMUM MOISTURE:	9.1



ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO. 240824

FIG. B-61

SAMPLE LOCATION TB-2 @ 0-3' | SOIL DESCRIPTION FILL, SAND, CLAYEY, BROWN
SOIL TYPE 1

CBR TEST LOAD DATA

Piston Diameter (cm): 4.958
Piston Area (in^2): 2.993

Penetration Depth (inches)	*10 BLOWS* Mold # 1 Load (lbs)	Stress (psi)	*25 BLOWS* Mold # 2 Load (lbs)	Stress (psi)	*56 BLOWS* Mold # 3 Load (lbs)	Stress (psi)
0.000	0	0.00	0	0.00	0	0.00
0.025	79	26.40	158	52.80	194	64.83
0.050	195	65.16	389	129.99	445	148.70
0.075	269	89.89	533	178.11	737	246.28
0.100	342	114.29	604	201.84	1136	379.61
0.125	454	151.71	828	276.69	1635	546.36
0.150	530	177.11	1041	347.87	2054	686.38
0.175	636	212.53	1232	411.69	2524	843.44
0.200	720	240.60	1504	502.59	2830	945.69
0.300	998	333.50	1955	653.30	3791	1266.83
0.400	1123	375.27	2291	765.58	4058	1356.05
0.500	1325	442.77	2564	856.81	4456	1489.05

MOISTURE AND DENSITY DATA

	Mold # 1	Mold # 2	Mold # 3
Can #	346	348	358
Wt. Can	6.89	6.93	6.76
Wt. Can+Wet	161.37	169.83	190.8
Wt. Can+Dry	145.55	155.24	174.92
Wt. H20	15.82	14.59	15.88
Wt. Dry Soil	138.66	148.31	168.16
Moisture Content	11.41%	9.84%	9.44%
Wet Density (PCF)	115.0	125.3	133.2
Dry Density (PCF)	105.4	114.9	122.1
% Compaction	86%	93%	99%
CBR	11.43	20.18	37.96

PROCTOR DATA

Maximum Dry Density (pcf)	122.9
Optimum Moisture	9.1
90% of Max. Dry Density (pcf)	110.6
95% of Max. Dry Density (pcf)	116.8

CBR at 90% of Max. Density = 16.25	~ R VALUE 55
CBR at 95% of Max. Density = 24.81	~ R VALUE 71

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

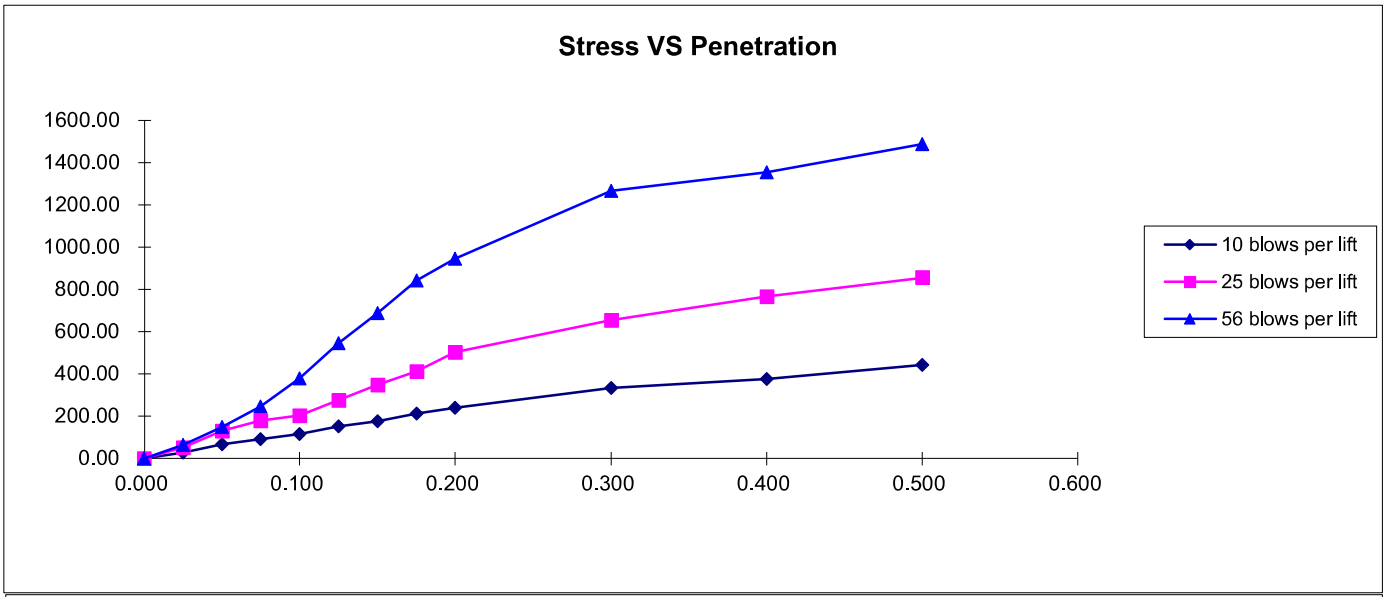
WINSOME, FILING NO. 3
PROTERRA

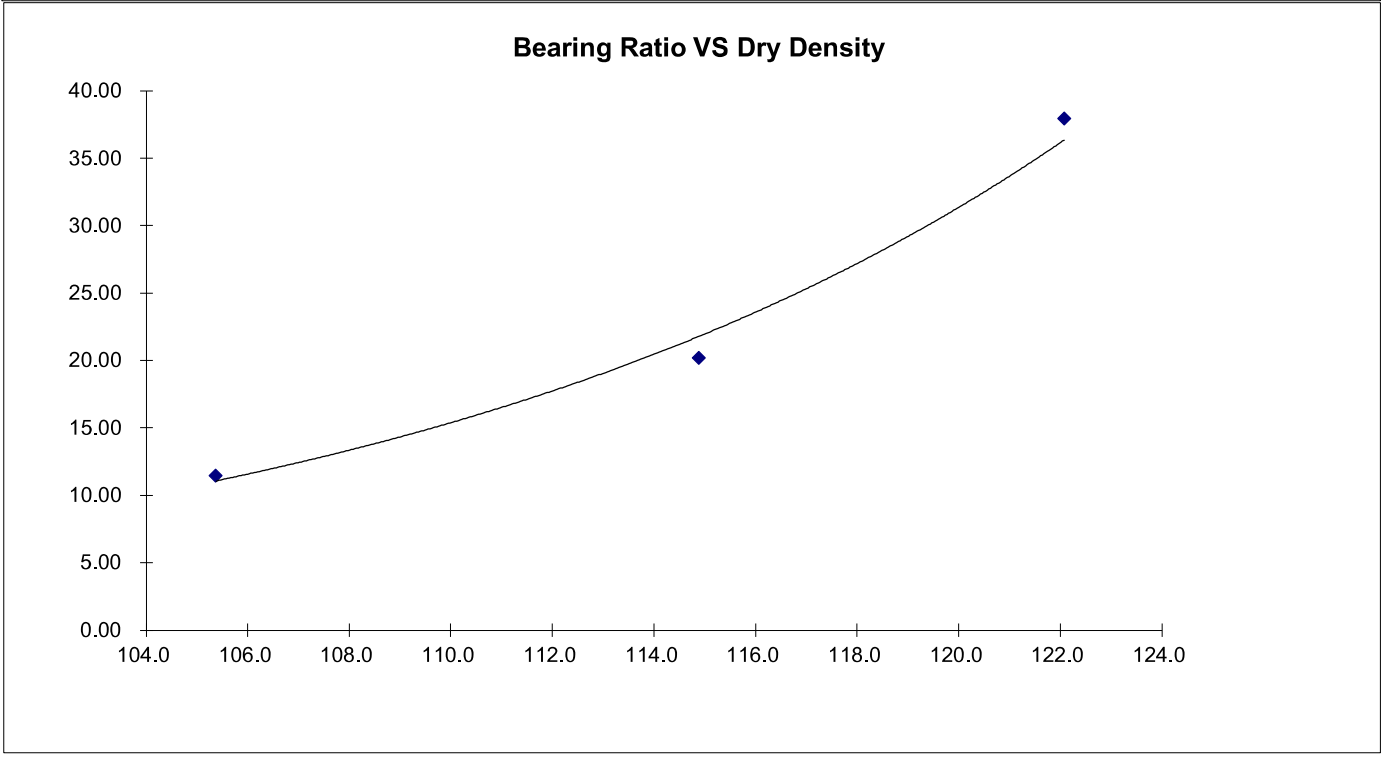
JOB NO. 240824

FIG. B-62

SAMPLE LOCATION TB-2 @ 0-3'

SOIL DESCRIPTION FILL, SAND, CLAYEY, BROWN
SOIL TYPE 1





ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

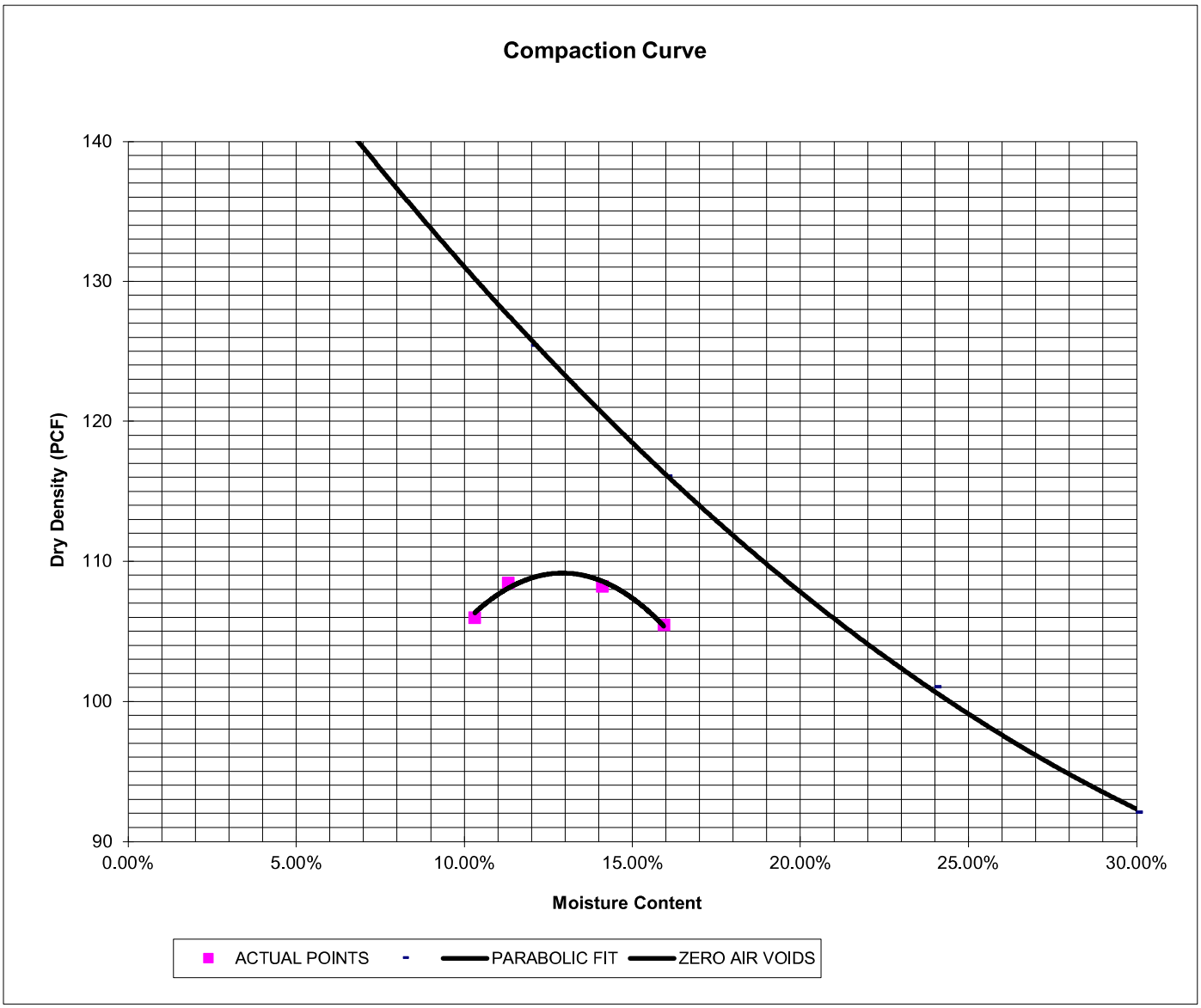
JOB NO. 240824

FIG. B-63

SAMPLE LOCATION TB-7 @ 0-3'	SOIL DESCRIPTION FILL, CLAY, SANDY, BROWN SOIL TYPE 1

PROCTOR DATA

IDENTIFICATION:	CL
PROCTOR TEST #:	2
TEST BY:	PH
TEST DESIGNATION:	ASTM-698-A
MAXIMUM DRY DENSITY (PCF):	109.1
OPTIMUM MOISTURE:	13



ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-64

SAMPLE LOCATION TB-7 @ 0-3' | SOIL DESCRIPTION FILL, CLAY, SANDY, BROWN
SOIL TYPE 2

CBR TEST LOAD DATA

Piston Diameter (cm): 4.958
Piston Area (in^2): 2.993

Penetration Depth (inches)	*10 BLOWS* Mold # 1 Load (lbs)	Stress (psi)	*25 BLOWS* Mold # 2 Load (lbs)	Stress (psi)	*56 BLOWS* Mold # 3 Load (lbs)	Stress (psi)
0.000	0	0.00	0	0.00	0	0.00
0.025	35	11.70	58	19.38	93	31.08
0.050	38	12.70	71	23.73	128	42.77
0.075	40	13.37	79	26.40	146	48.79
0.100	40	13.37	86	28.74	158	52.80
0.125	43	14.37	94	31.41	177	59.15
0.150	45	15.04	101	33.75	191	63.83
0.175	46	15.37	106	35.42	204	68.17
0.200	48	16.04	109	36.42	211	70.51
0.300	50	16.71	116	38.76	244	81.54
0.400	51	17.04	128	42.77	276	92.23
0.500	51	17.04	138	46.12	305	101.92

MOISTURE AND DENSITY DATA

	Mold # 1	Mold # 2	Mold # 3
Can #	420	307	351
Wt. Can	8.3	8.48	7.99
Wt. Can+Wet	138.73	91.56	111.03
Wt. Can+Dry	115.54	77.5	95.47
Wt. H20	23.19	14.06	15.56
Wt. Dry Soil	107.24	69.02	87.48
Moisture Content	21.62%	20.37%	17.79%
Wet Density (PCF)	107.0	114.8	120.6
Dry Density (PCF)	94.7	101.6	106.7
% Compaction	87%	93%	98%
CBR	1.34	2.87	5.28

PROCTOR DATA

Maximum Dry Density (pcf)	109.1
Optimum Moisture	13
90% of Max. Dry Density (pcf)	98.2
95% of Max. Dry Density (pcf)	103.6

CBR at 90% of Max. Density = 2.12	~ R VALUE 6
CBR at 95% of Max. Density = 3.85	~ R VALUE 7.5

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

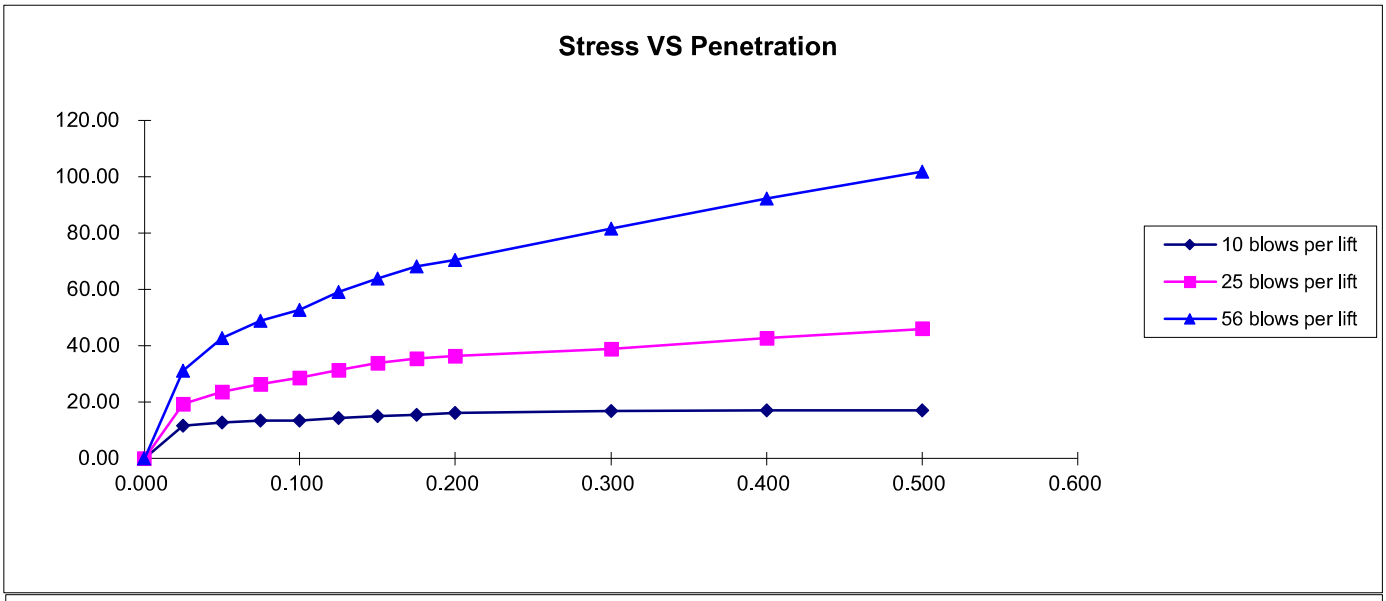
WINSOME, FILING NO. 3
PROTERRA

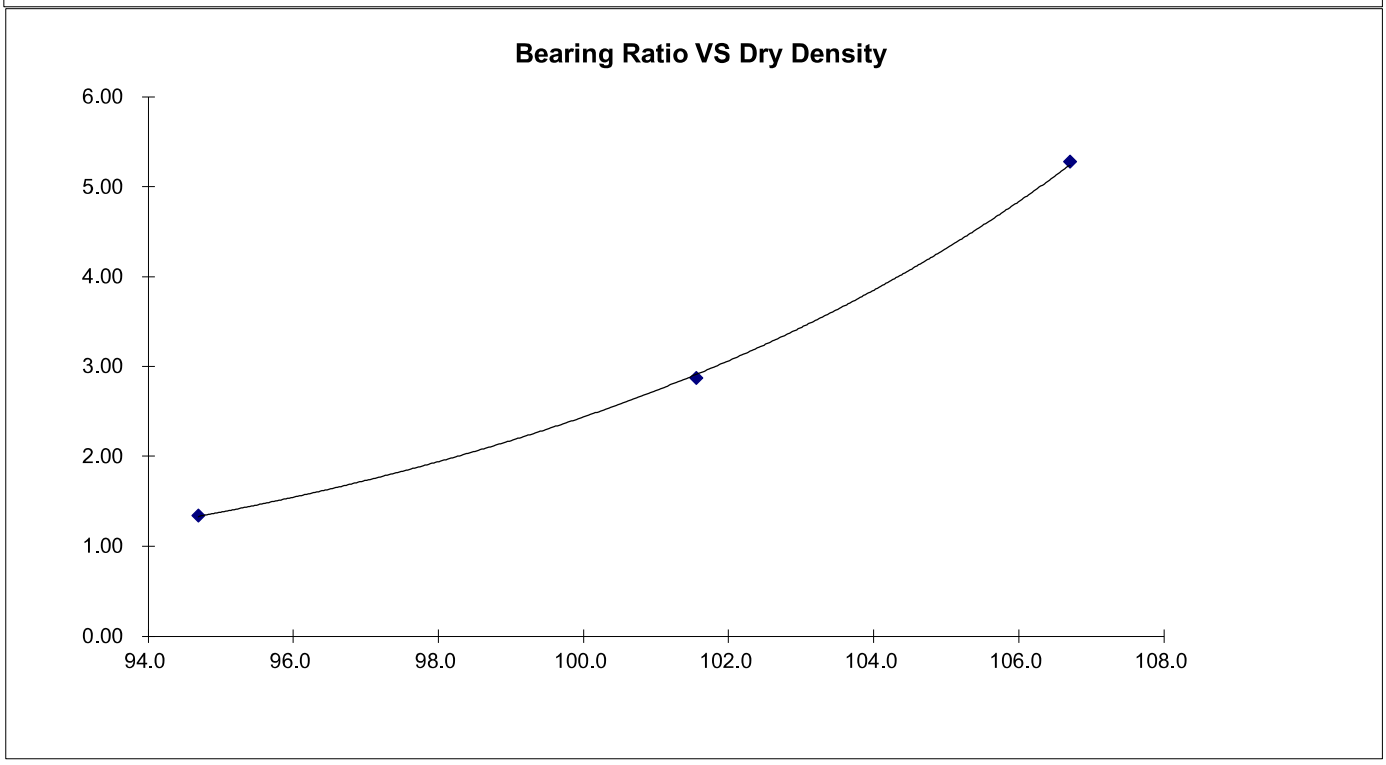
JOB NO. 240824

FIG. B-65

SAMPLE LOCATION TB-7 @ 0-3'

SOIL DESCRIPTION FILL, CLAY, SANDY, BROWN
SOIL TYPE 2





ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-66

APPENDIX C: Pavement Design Calculations

FLEXIBLE PAVEMENT DESIGN

PROJECT DATA

Project Location: Winsome Filing 3

Job Number: 240824

DESIGN DATA

Equivalent (18-kip) Single Axle Load Applications (ESAL):	ESAL (W_{18}) =	36,500
Design CBR	CBR =	3.8
Standard Deviation	S_o =	0.45
Loss in Serviceability	Δpsi =	2.5
Reliability	Reliability =	75
Reliability (z-statistic)	Z_R =	-0.67
Soil Resilient Modulus	M_R =	5,700 psi

Required Structural Number (SN): → SN = 1.97

DESIGN EQUATIONS

Resilient Modulus

If using CBR:

M_R = (CBR) x 1,500

If using R-Value:

$M_R = 10^{[(S_1 + 18.72) / 6.24]}$ where S_1 = [(R-value - 5) / 11.29] + 3

Required Structural Number

$$\log_{10}W_{18} = Z_R * S_O + 9.36*\log_{10}(SN+1) - 0.20 + \frac{\log_{10}\left[\frac{\Delta PSI}{4.2 - 1.5}\right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32*\log_{10}M_R - 8.07$$

Pavement Section Thickness

$SN^* = C_1D_1 + C_2D_2$ where:

C_1 = Strength Coefficient - HMA

C_2 = Strength Coefficient - ABC

D_1 = Depth of HMA (inches)

D_2 = Depth of ABC (inches)

RECOMMENED THICKNESSES

Layer	Material	Structural Layer	Thickness (D^*_i)	SN^*_i	SN
1	HMA	C_1 = 0.44	4.0 inches	1.760	-
2	ABC	C_2 = 0.11	4.0 inches	0.440	
			SN* = 2.200		1.97

Pavement SN > Required SN, Design is Acceptable

FIG. C-1