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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.

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Reviewed by:



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LM:JCG/ed

Entech Job No. 240824

Table of Contents

1 Introduction 1

2 Project Description 1

3 Subsurface Explorations and Laboratory Testing 1

 3.1 Subsurface Exploration Program 1

 3.2 Geotechnical Index and Engineering Property Testing 2

4 Subgrade Conditions 2

 4.1 Subsurface Conditions 2

 4.2 Groundwater 3

5 Pavement Design Recommendations 3

 5.1 Subgrade Conditions 3

 5.2 Swell Mitigation 3

 5.3 Traffic Loading..... 4

 5.4 Pavement Design 4

6 Construction Recommendations 5

 6.1 Earthwork Recommendations for Pavement Subgrade 5

 6.1.1 Subgrade Preparation 5

 6.1.2 Fill Placement and Compaction 5

 6.2 Aggregate Base Course and Recycled Concrete Base..... 6

 6.3 Concrete Degradation Due to Sulfate Attack 6

 6.4 Construction Observation 6

7 Closure..... 6

Figures

Figure 1: Vicinity Map

Figure 2: Site and Exploration Plan

List of Appendices

Appendix A: Test Boring Logs

Appendix B: Laboratory Test Results

Appendix C: Pavement Design Calculations

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. Entech 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 | |
|------------------------------|----------------------|---------------------|
| | 1 – Clayey Sand Fill | 2 – Sandy Clay Fill |
| Soil Type | | |
| 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 recompact 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.

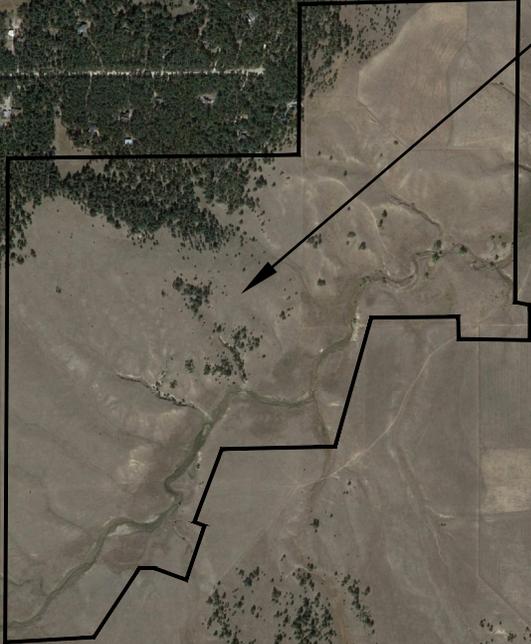


**PROJECT
LOCATION**

MC CUNE RD

MERIDIAN RD

HODGEN RD

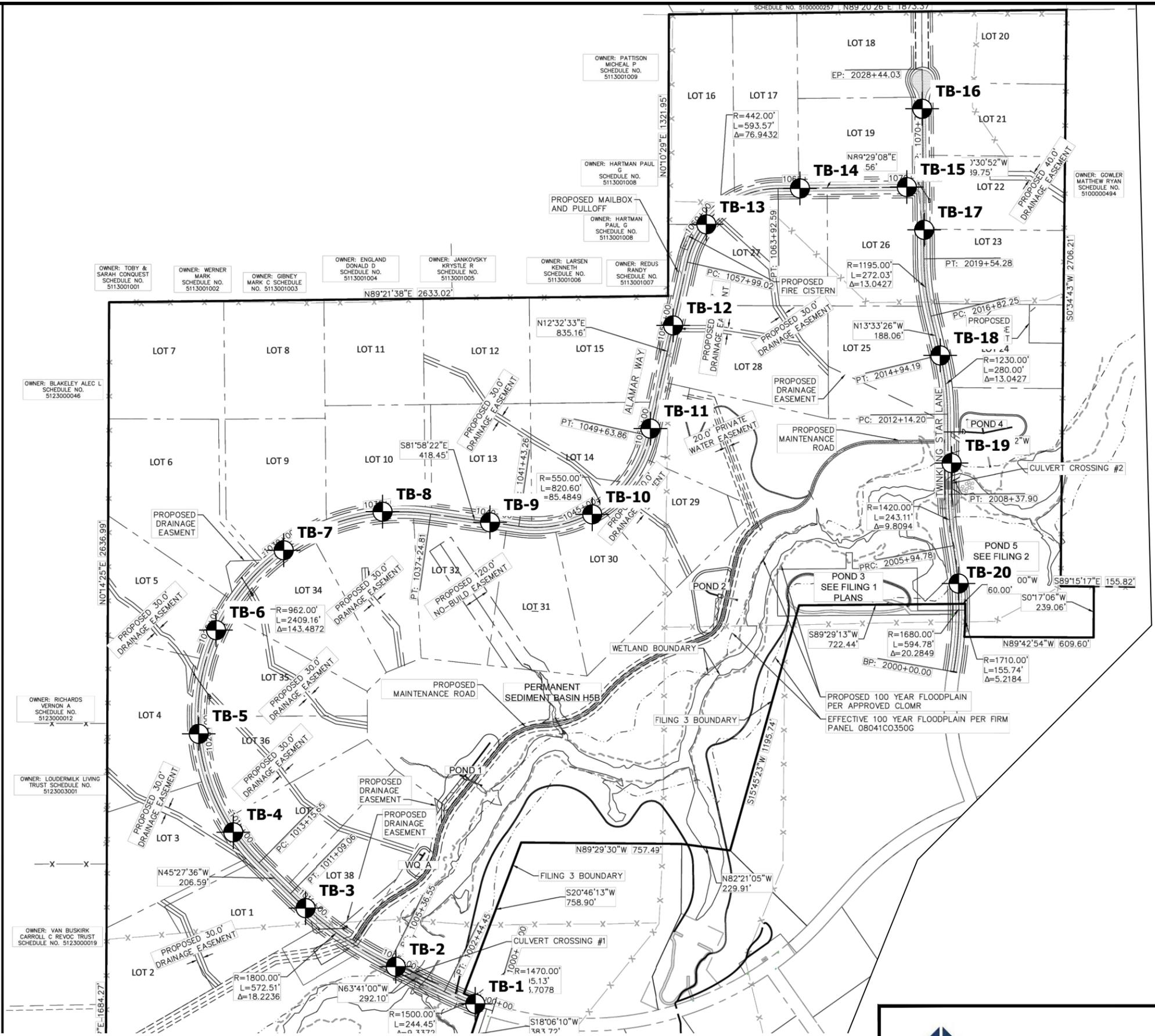


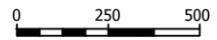
SITE AND EXPLORATION MAP
WINSOME, FILING NO. 3
PROTERRA

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



 **TB- APPROXIMATE TEST BORING LOCATION AND NUMBER**
 SCALE: 1" = 500'-0" 



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

TEST BORING 2
 DATE DRILLED 7/31/2024

REMARKS

REMARKS

DRY TO 5', 7/31/24

DRY TO 10', 7/31/24

FILL 0-5', SAND, SILTY, OLIVE,
 MEDIUM DENSE, MOIST

FILL 0-4', SAND, CLAYEY, OLIVE,
 MEDIUM DENSE, MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type | Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---------------------------------------|---------|----------------|----------------|-----------|------------|---------------------------------------|---------|----------------|----------------|-----------|
| 0-5 | (Symbol: Sand, silty, olive) | | 13 | 7.3 | 1 | 0-4 | (Symbol: Sand, clayey, olive) | | 28 | 6.1 | 1 |
| 5 | (Symbol: Clay, with sand, olive) | | 22 | 7.0 | 1 | 4-5 | (Symbol: Clay, with sand, olive) | | 26 | 9.7 | 4 |
| 5-10 | (Symbol: Sand, slightly silty, brown) | | | | | 10-11 | (Symbol: Sand, slightly silty, brown) | | 11 | 8.2 | 3 |



TEST BORING LOGS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. A-1

TEST BORING 3
 DATE DRILLED 7/31/2024

TEST BORING 4
 DATE DRILLED 7/31/2024

REMARKS

REMARKS

DRY TO 5', 7/31/24

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

SAND, WITH SILT, OLIVE,
 MEDIUM DENSE, DRY

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---------------------|---------|----------------|----------------|-----------|
| 0-4 | [Diagonal Hatching] | | 18 | 9.8 | 2 |
| 4-5 | [Dotted] | | 13 | 2.5 | 3 |

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 |
|------------|---------------------|---------|----------------|----------------|-----------|
| 0-2 | [Diagonal Hatching] | | 23 | 12.6 | 2 |
| 2-5 | [Dotted] | | 25 | 8.7 | 4 |



TEST BORING LOGS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. A-2

TEST BORING 5
 DATE DRILLED 7/31/2024

TEST BORING 6
 DATE DRILLED 7/31/2024

REMARKS

REMARKS

DRY TO 10', 7/31/24

FILL 0-6', CLAY, SANDY, BROWN,
 STIFF to VERY STIFF, MOIST

SAND, SILTY, OLIVE, DENSE,
 MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---------------------|---------|----------------|----------------|-----------|
| 0-6 | [Diagonal Hatching] | | 13 | 10.8 | 2 |
| 5 | [Diagonal Hatching] | | 16 | 7.8 | 2 |
| 10 | [Dotted] | | 37 | 5.9 | 3 |

DRY TO 5', 7/31/24

SAND, WITH SILT, OLIVE,
 MEDIUM DENSE, MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|----------|---------|----------------|----------------|-----------|
| 0-5 | [Dotted] | | 17 | 4.1 | 3 |
| 5 | [Dotted] | | 26 | 8.6 | 3 |



TEST BORING LOGS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. A-3

TEST BORING 7
 DATE DRILLED 7/31/2024

TEST BORING 8
 DATE DRILLED 7/31/2024

REMARKS

REMARKS

DRY TO 5', 7/31/24

FILL 0-5', CLAY, SANDY, BROWN
 to DARK BROWN, STIFF, MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---------------------|---------|----------------|----------------|--|
| 0-5 | [Diagonal Hatching] | | 10 | 9.9 | 2 |
| 5 | [Diagonal Hatching] | | 12 | 7.6 | 2 |
| 5-10 | [Dotted] | | | | SAND, SILTY, OLIVE, DENSE, MOIST |
| 10-15 | [Dotted] | | | | SAND, CLAYEY, OLIVE, MEDIUM DENSE, MOIST |
| 15-20 | [Dotted] | | | | |

DRY TO 10', 7/31/24

FILL 0-4', CLAY, SANDY, BROWN,
 STIFF, MOIST

SAND, SILTY, OLIVE, DENSE,
 MOIST

SAND, CLAYEY, OLIVE, MEDIUM
 DENSE, MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---------------------|---------|----------------|----------------|-----------|
| 0-4 | [Diagonal Hatching] | | 11 | 14.6 | 2 |
| 4-5 | [Diagonal Hatching] | | 36 | 5.5 | 3 |
| 5-10 | [Dotted] | | | | |
| 10-15 | [Dotted] | | 18 | 11.2 | 4 |
| 15-20 | [Dotted] | | | | |



TEST BORING LOGS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. A-4

TEST BORING 9
 DATE DRILLED 7/31/2024

TEST BORING 10
 DATE DRILLED 7/31/2024

REMARKS

 DRY TO 5', 7/31/24

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|-------------------|---------|----------------|----------------|-----------|
| 0-5 | Diagonal hatching | | 17 | 11.6 | 4 |
| 5-10 | Diagonal hatching | | 10 | 6.4 | 4 |
| 10-15 | | | | | |
| 15-20 | | | | | |

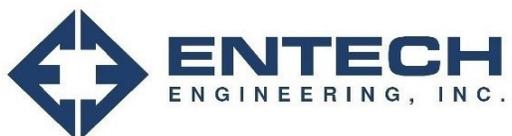
CLAY, WITH SAND, BROWN, VERY STIFF to STIFF, MOIST

REMARKS

 DRY TO 5', 7/31/24

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|-------------------|---------|----------------|----------------|-----------|
| 0-2 | Diagonal hatching | | 23 | 8.9 | 2 |
| 2-5 | Diagonal hatching | | 17 | 16.0 | 4 |
| 5-10 | | | | | |
| 10-15 | | | | | |
| 15-20 | | | | | |

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



TEST BORING LOGS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. A-5

TEST BORING 11
 DATE DRILLED 7/31/2024

TEST BORING 12
 DATE DRILLED 7/31/2024

REMARKS

REMARKS

DRY TO 10', 7/31/24

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

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

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---------------------|---------|----------------|----------------|-----------|
| 0-4 | [Diagonal Hatching] | | 23 | 10.0 | 2 |
| 4-5 | [Dotted] | | 23 | 5.5 | 3 |
| 5-10 | [Dotted] | | 44 | 8.8 | 3 |

DRY TO 5', 7/31/24

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

CLAY, SANDY, DARK BROWN,
 STIFF, MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---------------------|---------|----------------|----------------|-----------|
| 0-3 | [Diagonal Hatching] | | 18 | 9.6 | 2 |
| 3-5 | [Dotted] | | 12 | 10.6 | 4 |



TEST BORING LOGS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. A-6

TEST BORING 13
 DATE DRILLED 7/31/2024

TEST BORING 14
 DATE DRILLED 7/31/2024

REMARKS

REMARKS

DRY TO 5', 7/31/24

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

SAND, CLAYEY, OLIVE, MEDIUM
 DENSE, MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---------------------|---------|----------------|----------------|-----------|
| 0-3 | [Diagonal Hatching] | | 20 | 8.7 | 2 |
| 3-5 | [Dotted] | | 14 | 10.9 | 3 |
| 5-10 | [Diagonal Hatching] | | | | |
| 10-15 | [Diagonal Hatching] | | | | |
| 15-20 | [Diagonal Hatching] | | | | |

DRY TO 10', 7/31/24

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

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---------------------|---------|----------------|----------------|-----------|
| 0-3 | [Diagonal Hatching] | | 16 | 8.9 | 4 |
| 3-5 | [Dotted] | | 11 | 12.9 | 4 |
| 5-10 | [Diagonal Hatching] | | | | |
| 10-15 | [Diagonal Hatching] | | 9 | 11.2 | 4 |
| 15-20 | [Diagonal Hatching] | | | | |



TEST BORING LOGS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. A-7

TEST BORING 15
 DATE DRILLED 7/31/2024

TEST BORING 16
 DATE DRILLED 7/31/2024

REMARKS

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 |
|------------|-----------|---------|----------------|----------------|-----------|
| 0-1 | [Hatched] | | | | |
| 1-2 | [Hatched] | | 13 | 8.6 | 2 |
| 2-4 | [Hatched] | | | | 4 |
| 4-5 | [Hatched] | | 22 | 9.4 | 4 |
| 5-10 | [Blank] | | | | |
| 10-15 | [Blank] | | | | |
| 15-20 | [Blank] | | | | |
| 20-25 | [Blank] | | | | |

DRY TO 5', 7/31/24

CLAY, SANDY, BROWN, STIFF,
 MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|-----------|---------|----------------|----------------|-----------|
| 0-1 | [Hatched] | | | | |
| 1-2 | [Hatched] | | 14 | 9.2 | 4 |
| 2-5 | [Hatched] | | | | |
| 5-10 | [Blank] | | | | |
| 10-15 | [Blank] | | | | |
| 15-20 | [Blank] | | | | |
| 20-25 | [Blank] | | | | |



TEST BORING LOGS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. A-8

TEST BORING 17
 DATE DRILLED 7/31/2024

TEST BORING 18
 DATE DRILLED 7/31/2024

REMARKS

REMARKS

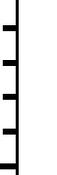
DRY TO 5', 7/31/24

DRY TO 10', 7/31/24

CLAY, WITH SAND, BROWN, STIFF,
 MOIST

CLAY, WITH SAND, BROWN, STIFF,
 MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---|---------|----------------|----------------|-----------|
| 5 |  | | 11 | 17.7 | 4 |
| 5 |  | | 12 | 5.9 | 4 |
| 10 | | | | | |
| 15 | | | | | |
| 20 | | | | | |

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|---|---------|----------------|----------------|-----------|
| 5 |  | | 12 | 10.2 | 4 |
| 5 |  | | 25 | 4.1 | 4 |
| 10 |  | | 21 | 8.7 | 4 |
| 15 | | | | | |
| 20 | | | | | |



TEST BORING LOGS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. A-9

TEST BORING 19
 DATE DRILLED 7/31/2024

TEST BORING 20
 DATE DRILLED 7/31/2024

REMARKS

REMARKS

DRY TO 5', 7/31/24

FILL 0-4', SAND, CLAYEY, DARK BROWN, MEDIUM DENSE, MOIST

CLAY, WITH SAND, OLIVE, VERY STIFF, MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|----------|---------|----------------|----------------|-----------|
| 0-4 | [Symbol] | | 19 | 4.9 | 1 |
| 4-5 | [Symbol] | | 19 | 10.3 | 4 |

DRY TO 5', 7/31/24

FILL 0-4', SAND, SILTY, OLIVE, MEDIUM DENSE, MOIST

CLAY, WITH SAND, OLIVE, VERY STIFF, MOIST

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|------------|----------|---------|----------------|----------------|-----------|
| 0-4 | [Symbol] | | 11 | 7.9 | 1 |
| 4-5 | [Symbol] | | 11 | 18.9 | 4 |



TEST BORING LOGS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. A-10



APPENDIX B: Laboratory Test Results

**TABLE B-1
SUMMARY OF LABORATORY TEST RESULTS**



| 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 |

**TABLE B-1
SUMMARY OF LABORATORY TEST RESULTS**

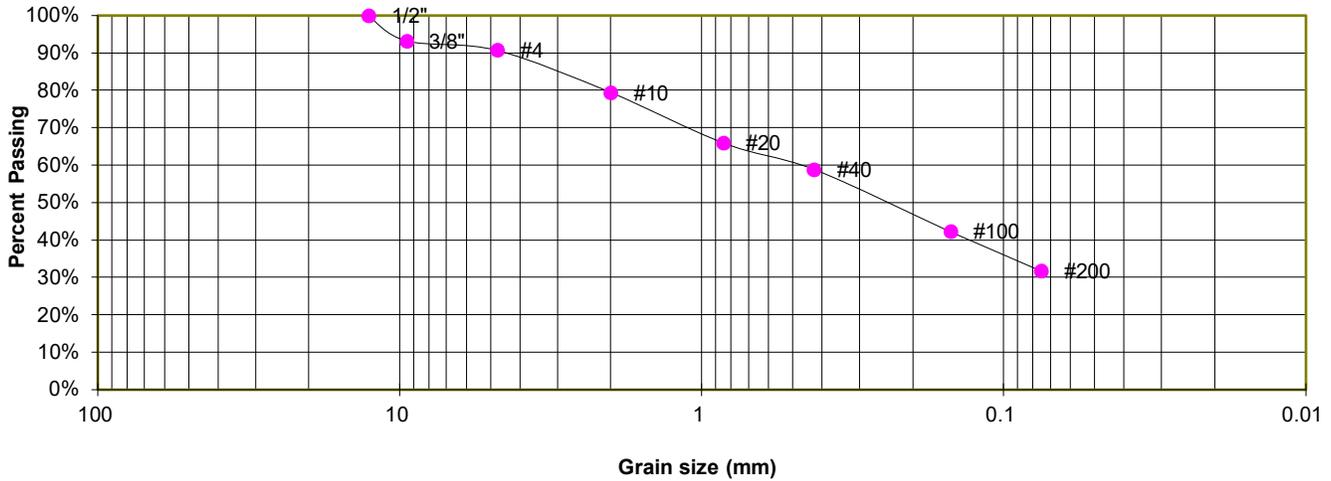


| SOIL TYPE | TEST BORING NO. | DEPTH (FT) | WATER (%) | DRY DENSITY (PCF) | PASSING NO. 200 SIEVE (%) | LIQUID LIMIT | PLASTIC LIMIT | PLASTIC INDEX | SULFATE (WT %) | SWELL/ COLLAPSE (%) | AASHTO CLASS. (GROUP INDEX) | USCS | SOIL DESCRIPTION |
|-----------|-----------------|------------|-----------|-------------------|---------------------------|--------------|---------------|---------------|----------------|---------------------|-----------------------------|------|------------------|
| 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 |

TEST BORING 2
 DEPTH (FT) 0-3

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

**Sieve Analysis
 Grain Size Distribution**



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



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

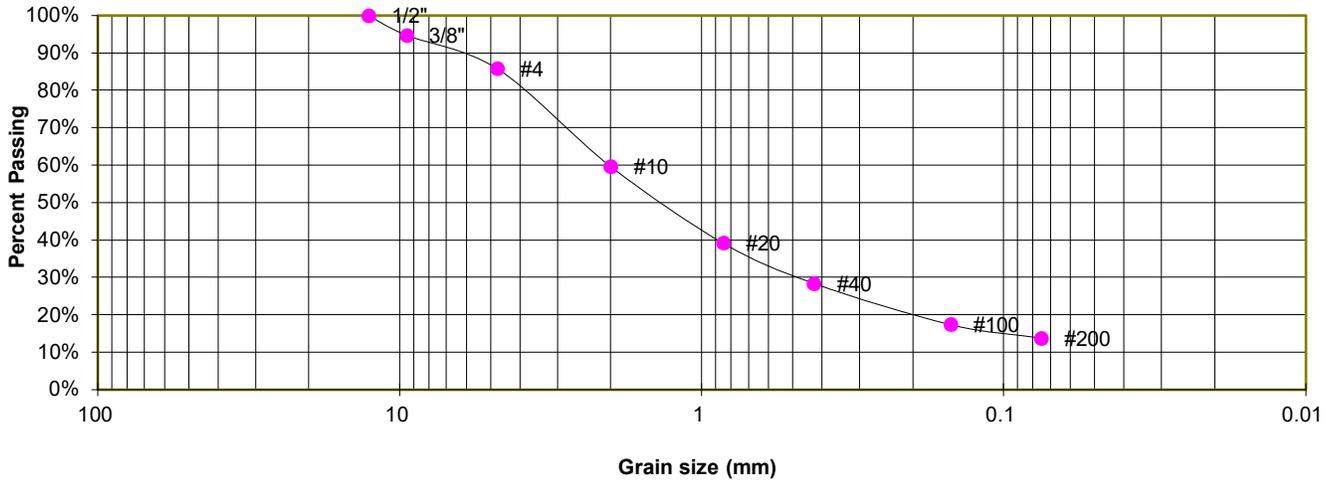
JOB NO.
 240824

FIG. B-1

TEST BORING 1
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, SAND, SILTY
 SOIL TYPE 1

**Sieve Analysis
 Grain Size Distribution**



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



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

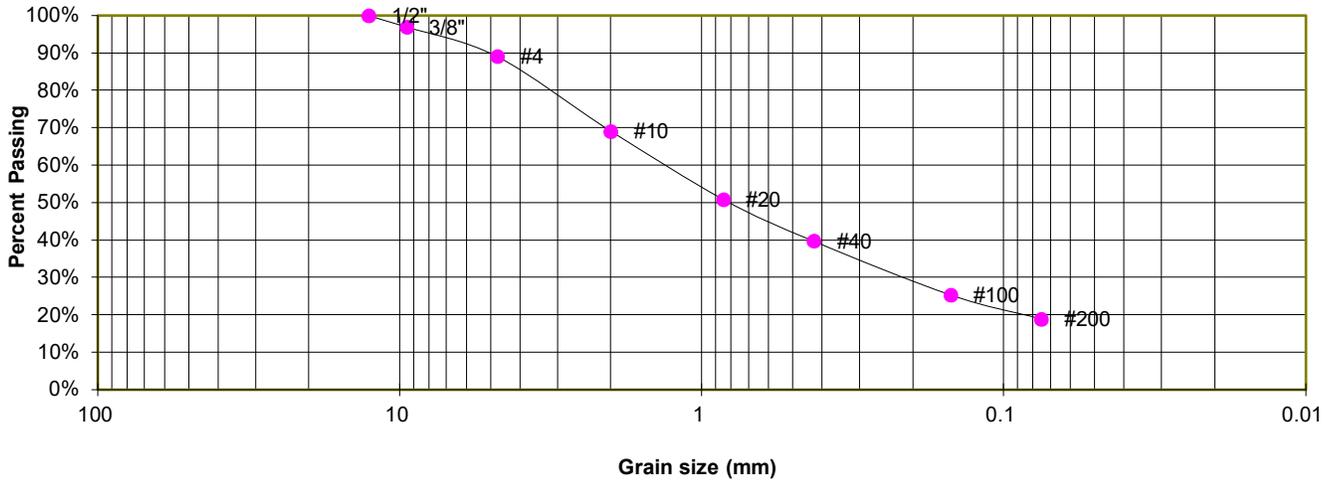
JOB NO.
 240824

FIG. B-2

TEST BORING 2
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, SAND, CLAYEY
 SOIL TYPE 1

**Sieve Analysis
 Grain Size Distribution**



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



LABORATORY TEST RESULTS

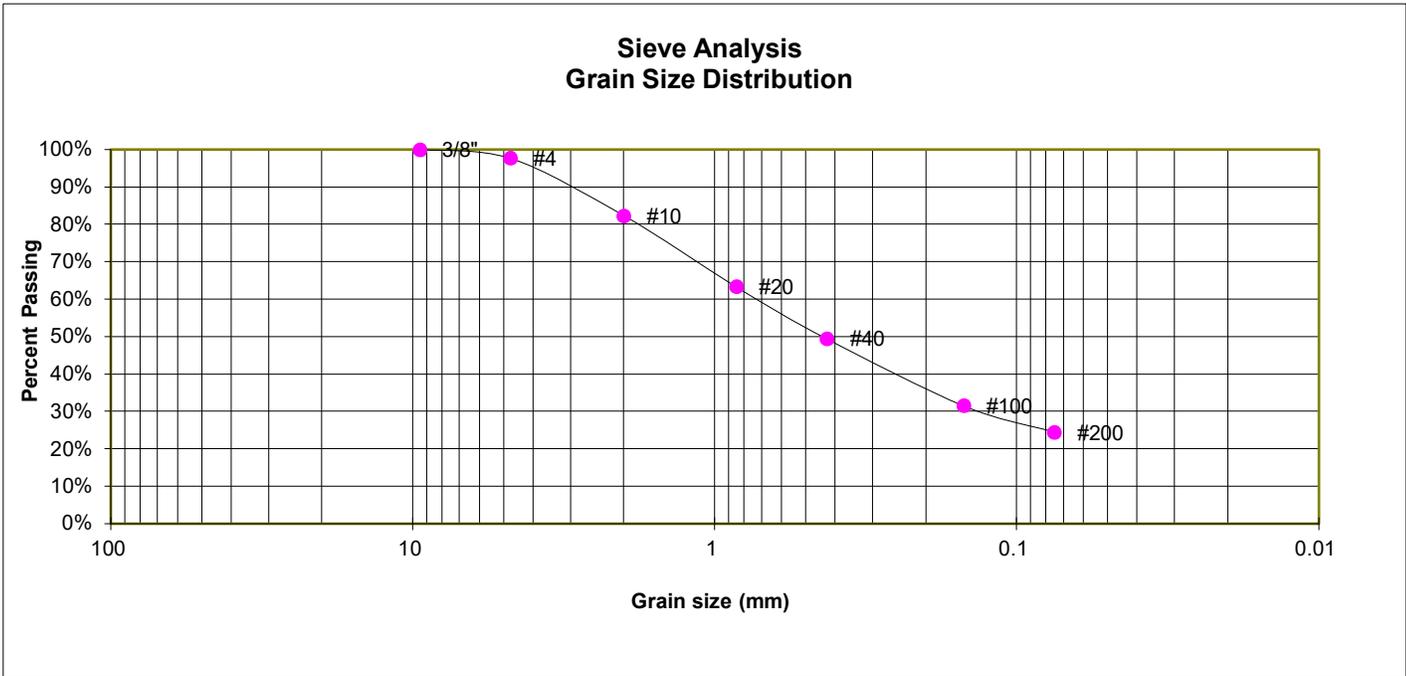
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-3

TEST BORING 19
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, SAND, CLAYEY
 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



LABORATORY TEST RESULTS

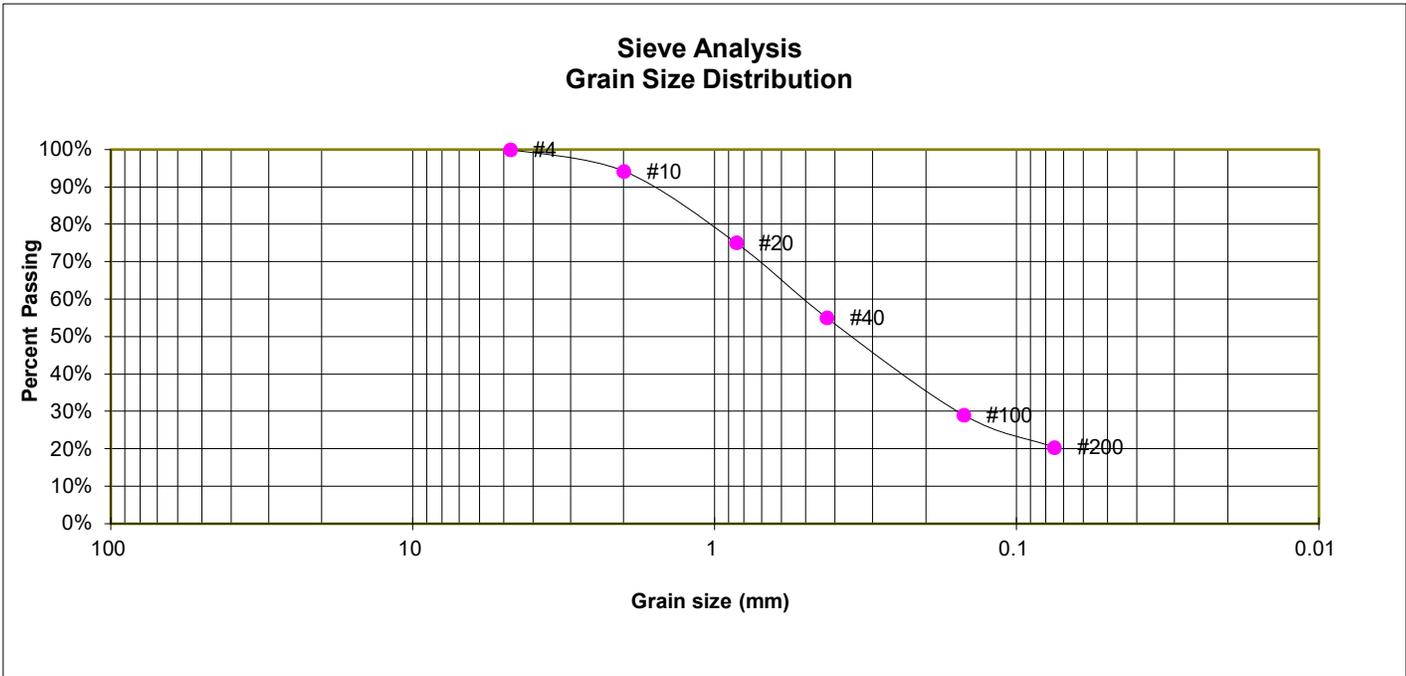
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-4

TEST BORING 20
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, SAND, SILTY
 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



LABORATORY TEST RESULTS

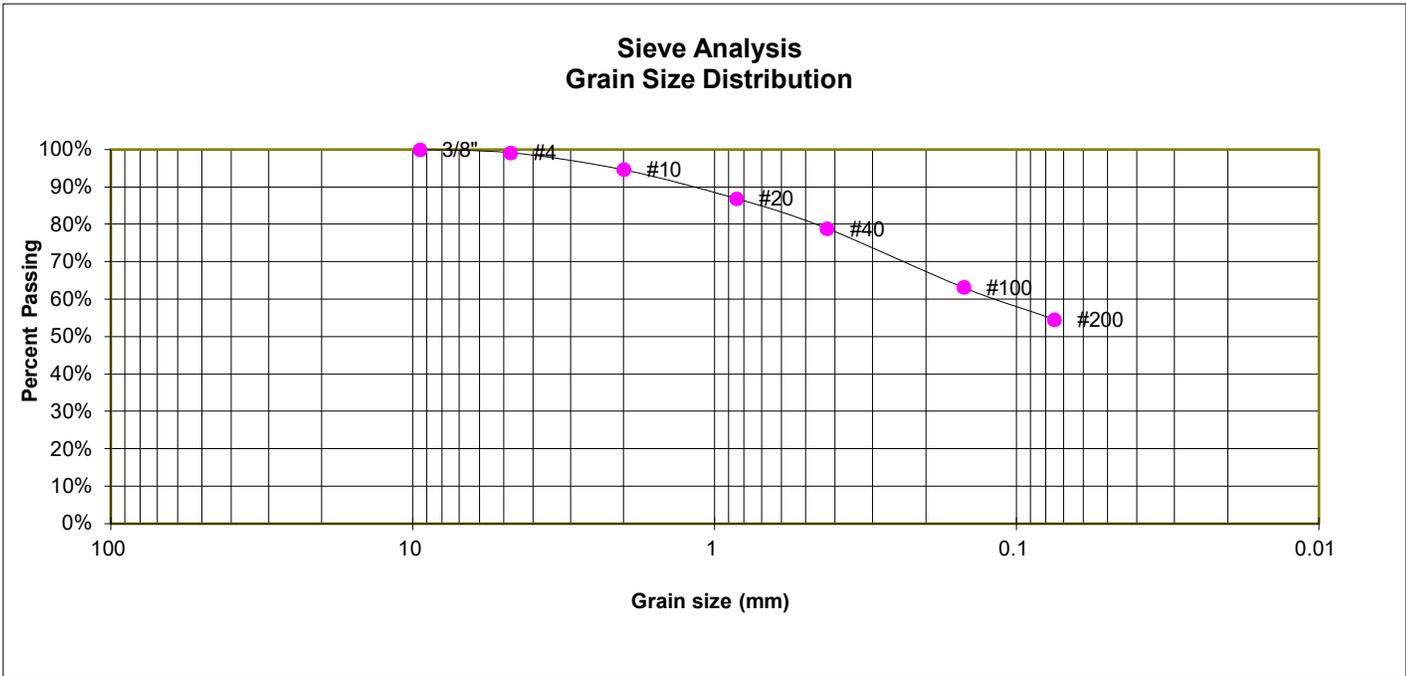
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-5

TEST BORING 7
 DEPTH (FT) 0-3

SOIL DESCRIPTION FILL, CLAY, SANDY
 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



LABORATORY TEST RESULTS

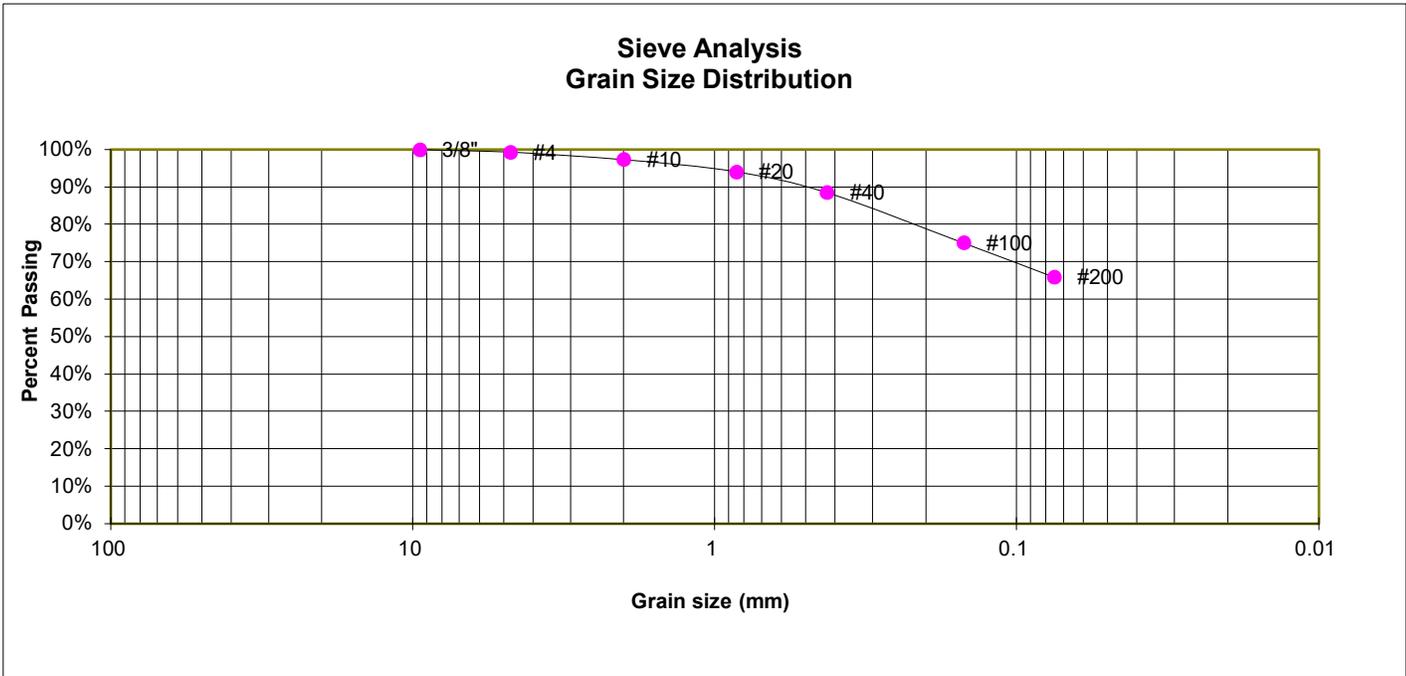
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-6

TEST BORING 10
 DEPTH (FT) 0-2

SOIL DESCRIPTION FILL, CLAY, SANDY
 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



LABORATORY TEST RESULTS

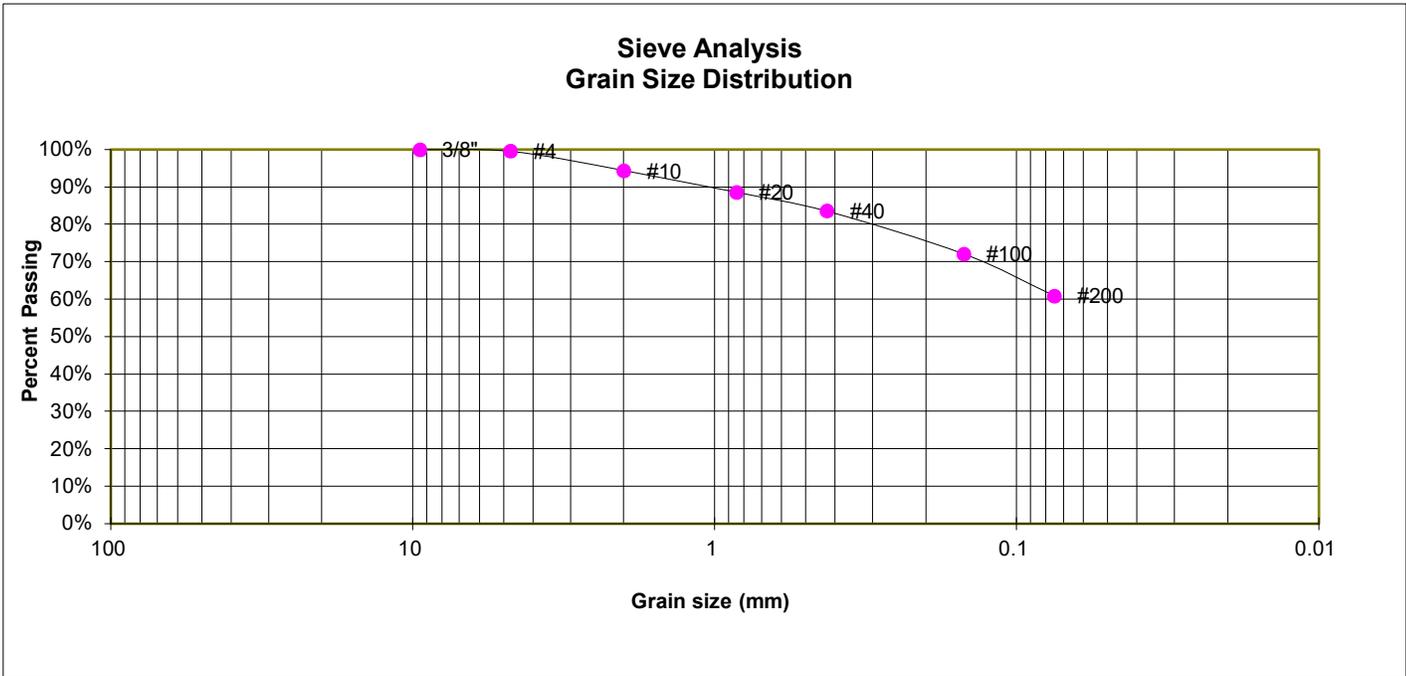
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-7

TEST BORING 3
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
 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



LABORATORY TEST RESULTS

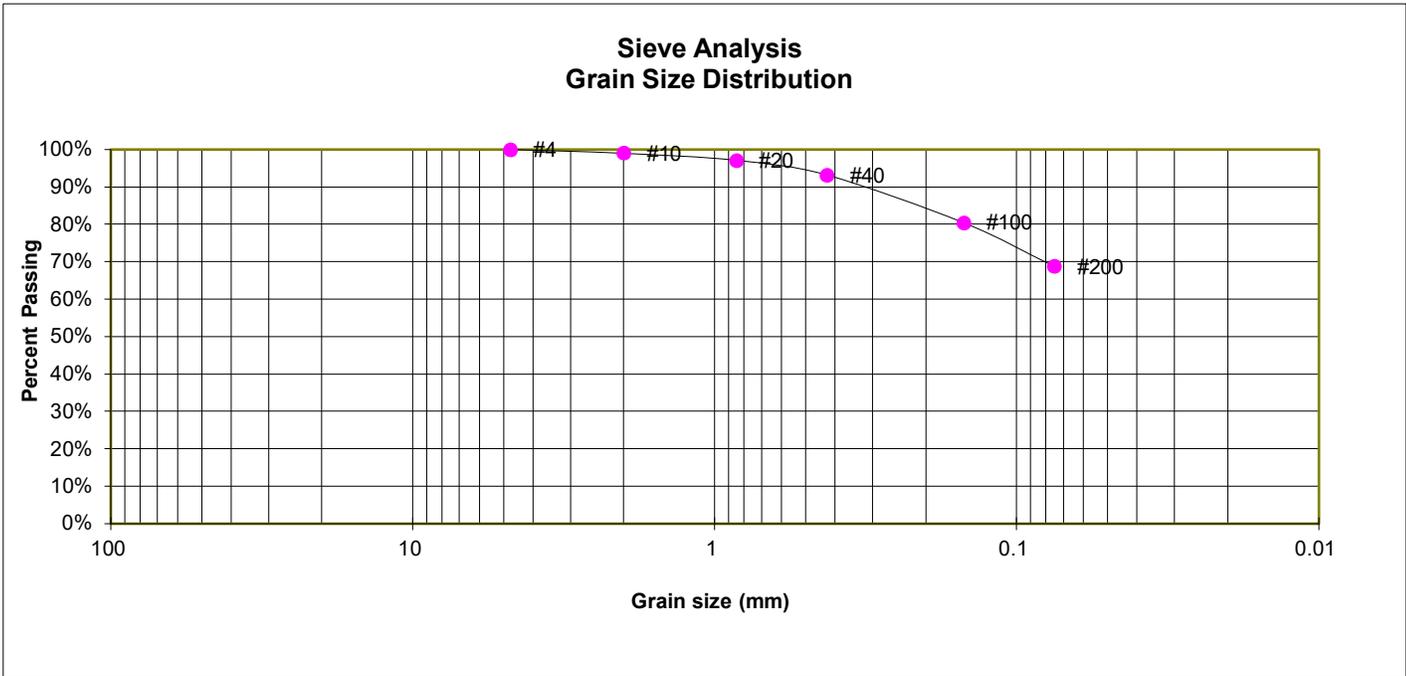
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-8

TEST BORING 5
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
 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 |



LABORATORY TEST RESULTS

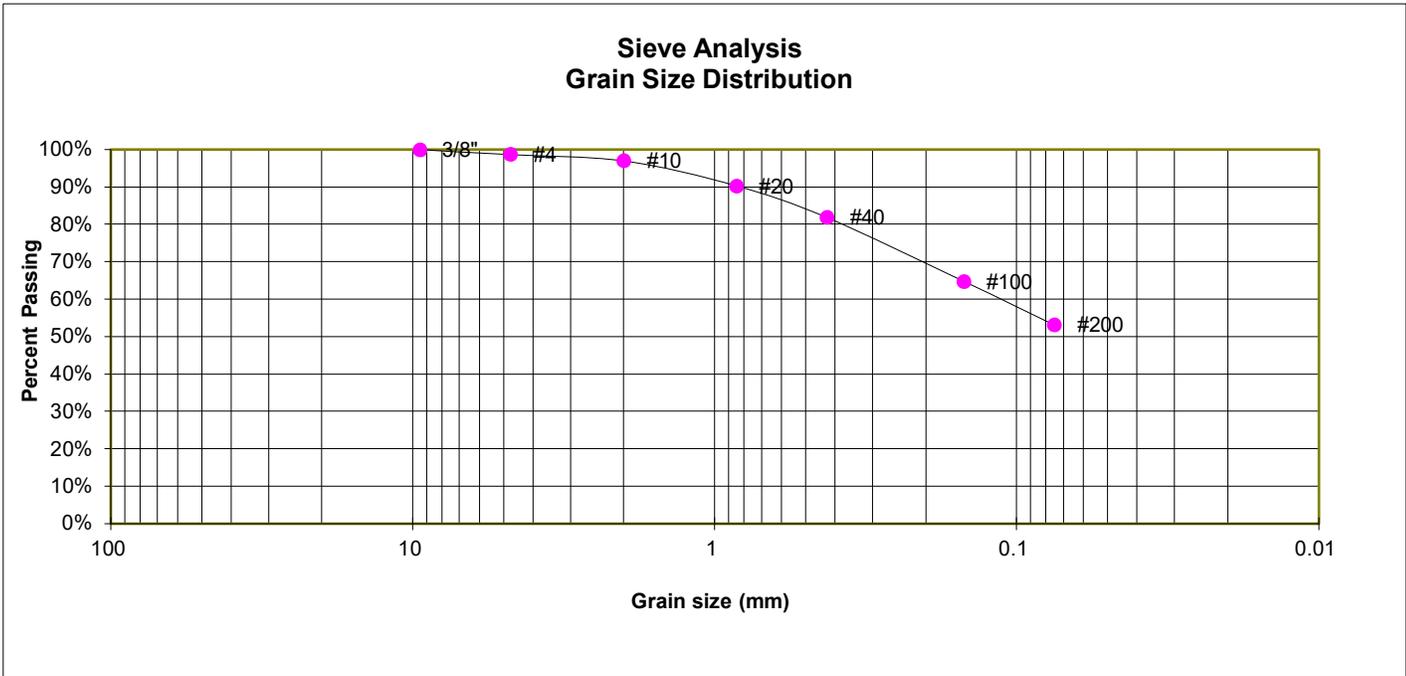
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-9

TEST BORING 7
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
 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 |



LABORATORY TEST RESULTS

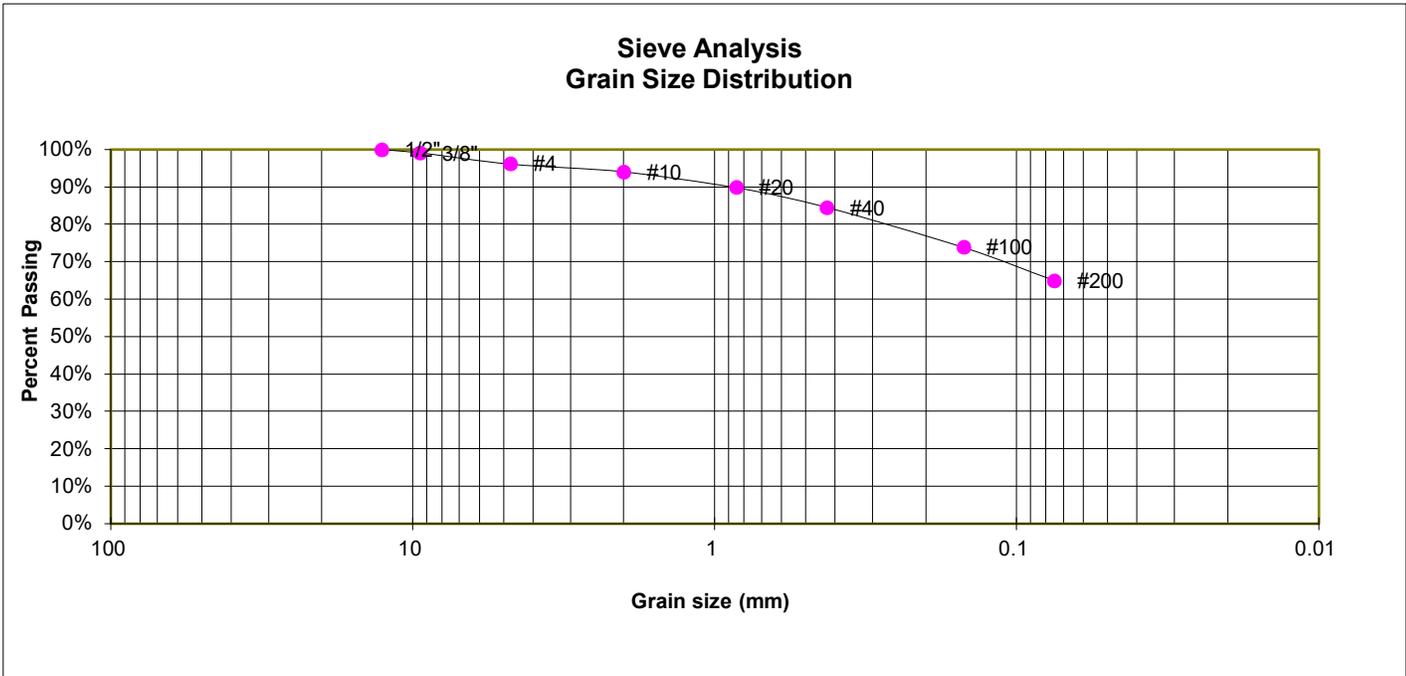
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-10

TEST BORING 8
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
 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 |



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

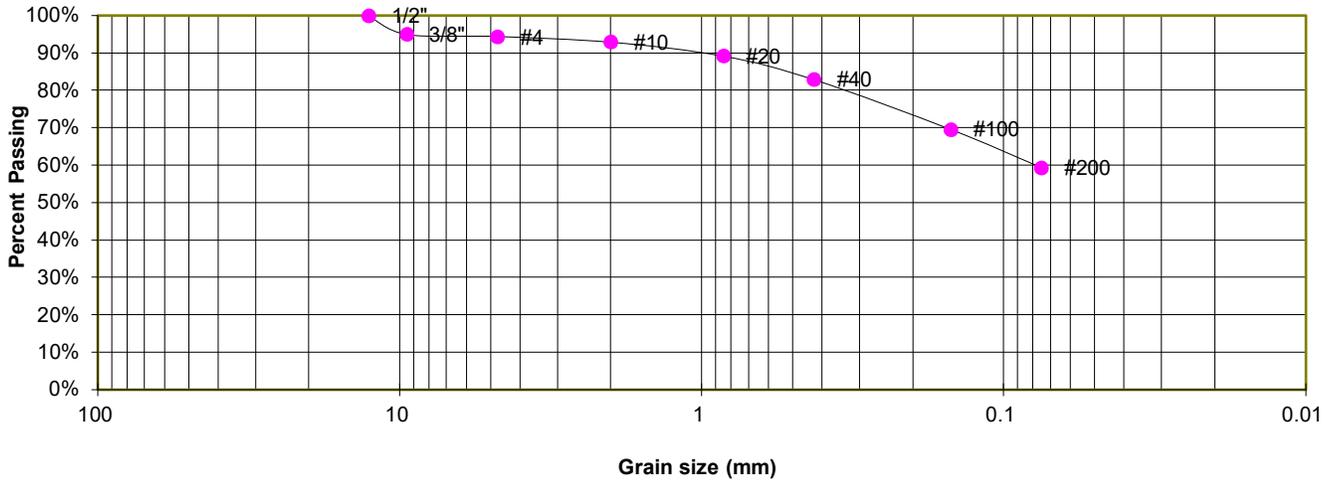
JOB NO.
 240824

FIG. B-11

TEST BORING 10
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
 SOIL TYPE 2

**Sieve Analysis
 Grain Size Distribution**



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



LABORATORY TEST RESULTS

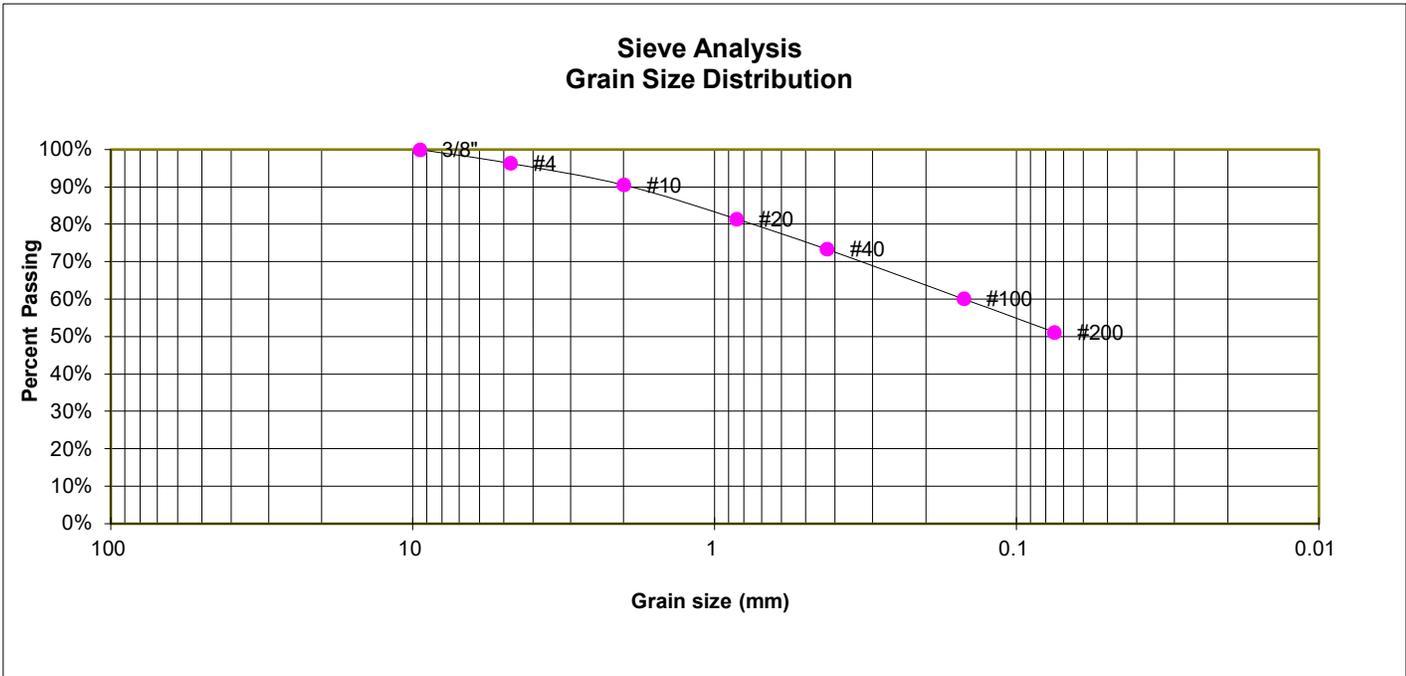
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-12

TEST BORING 11
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
 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 |



LABORATORY TEST RESULTS

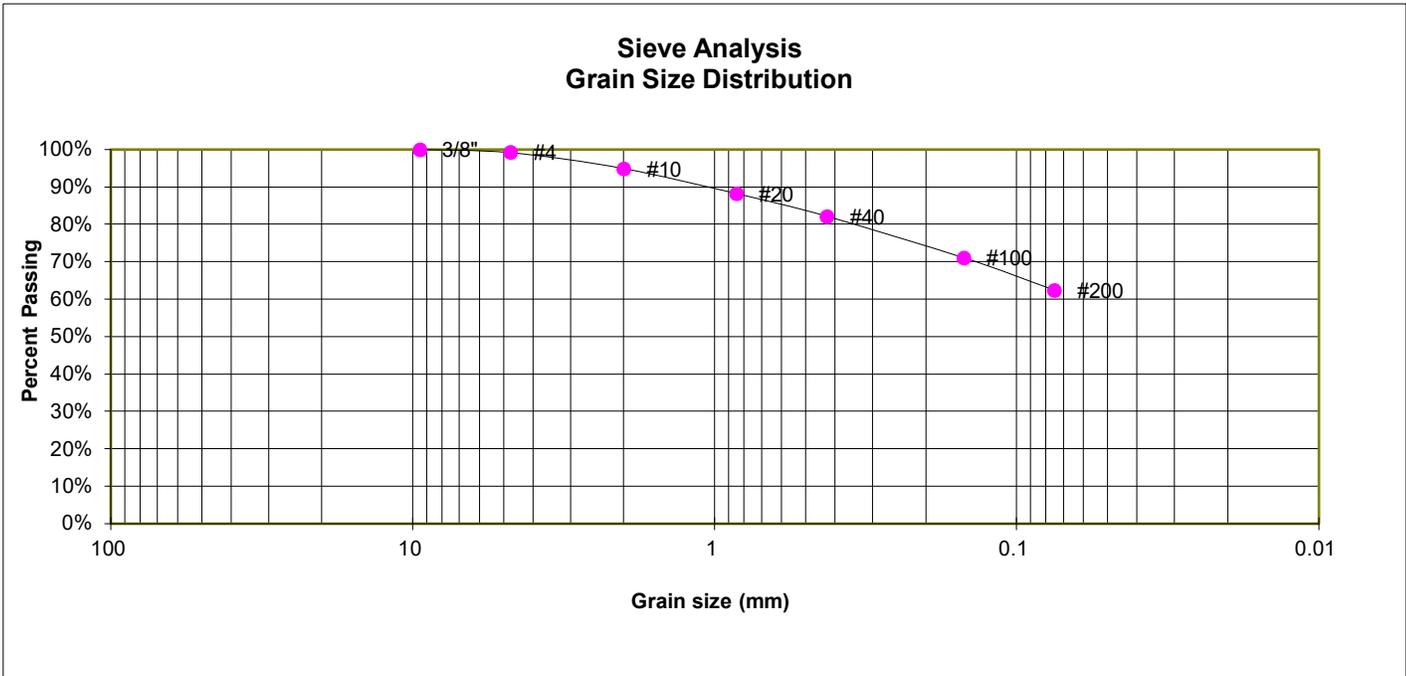
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-13

TEST BORING 12
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
 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 |



LABORATORY TEST RESULTS

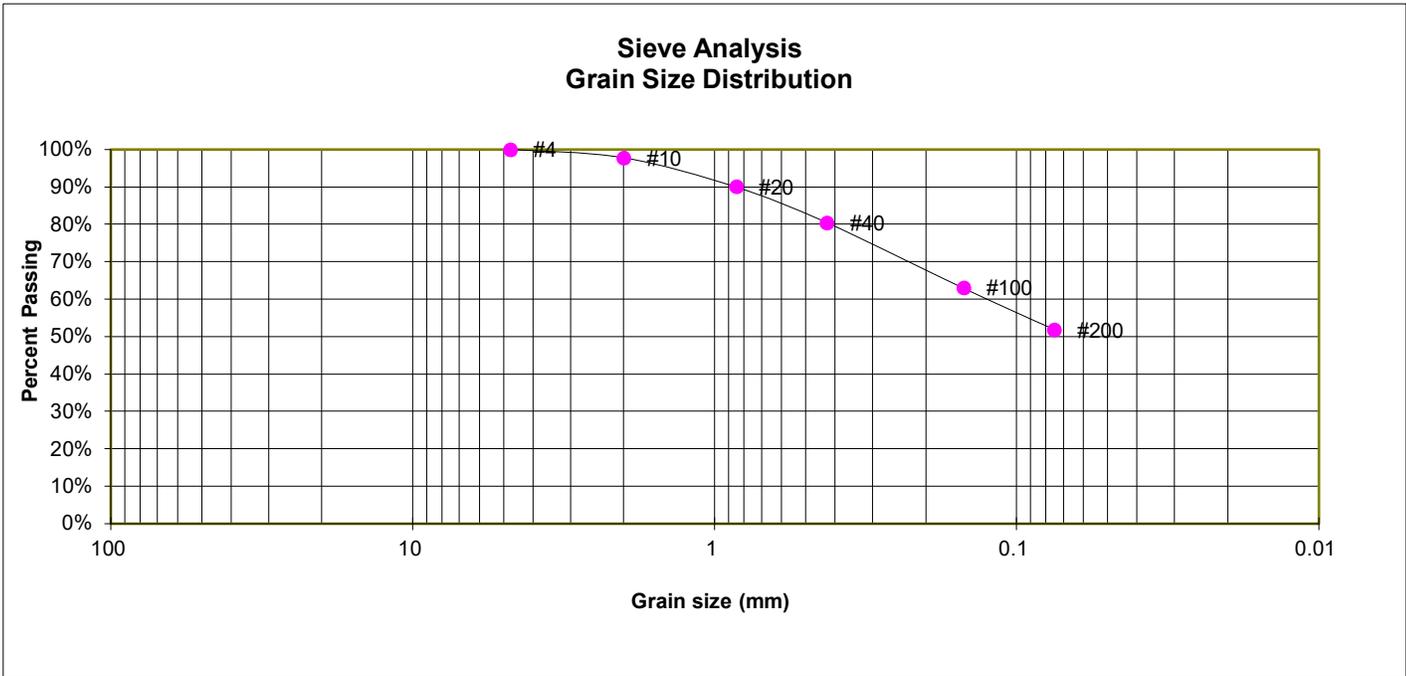
WINSOME, FILING NO. 3
 PROTERRA

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 240824

FIG. B-14

TEST BORING 13
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
 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



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

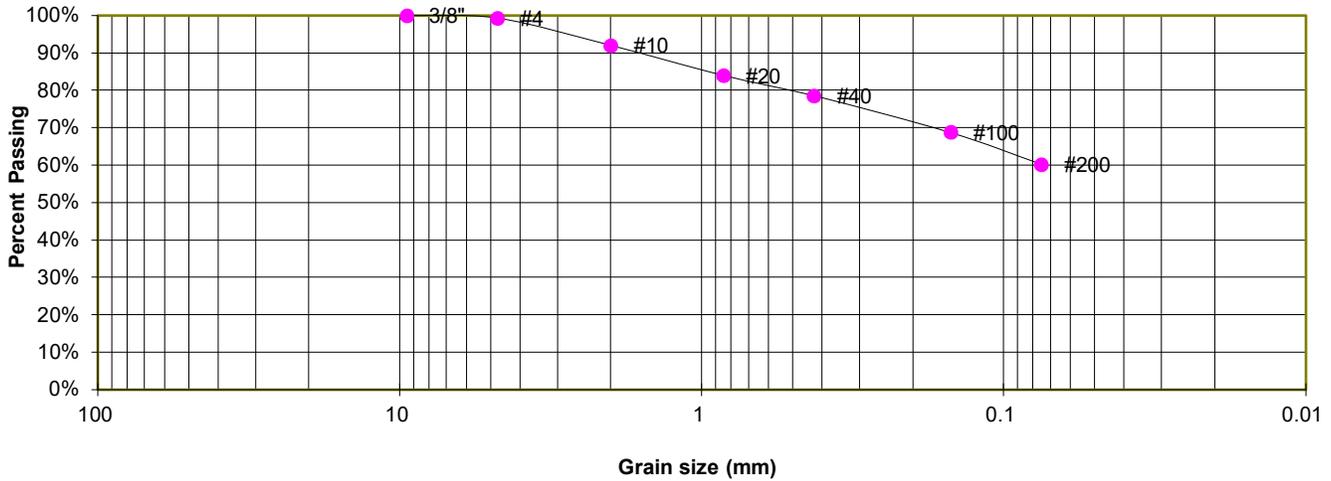
JOB NO.
 240824

FIG. B-15

TEST BORING 4
 DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
 SOIL TYPE 2

**Sieve Analysis
 Grain Size Distribution**



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 |



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

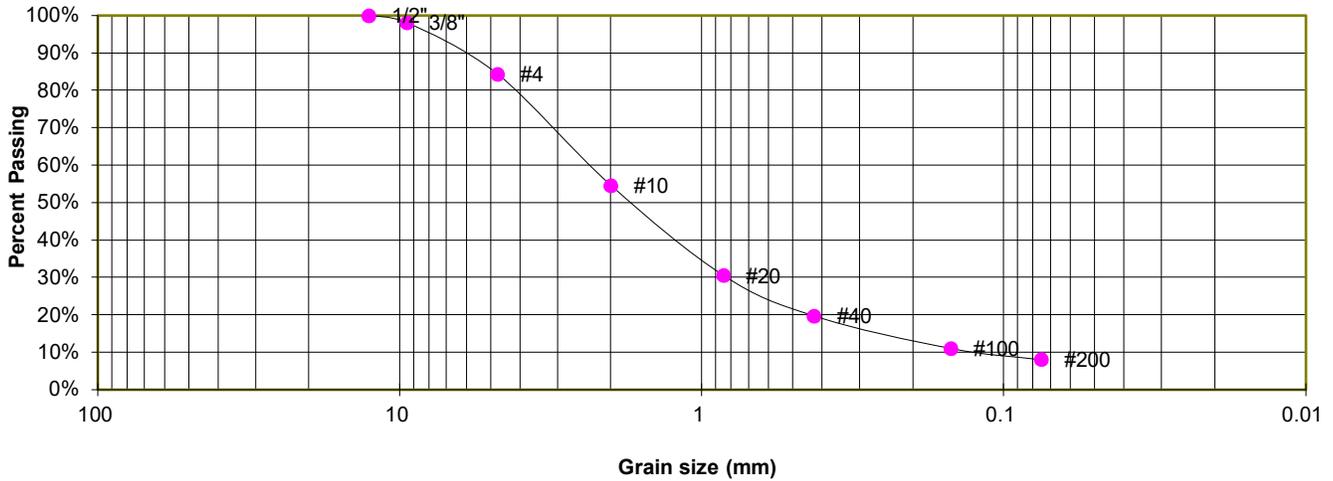
JOB NO.
 240824

FIG. B-16

TEST BORING 6
 DEPTH (FT) 1-2

SOIL DESCRIPTION SAND, WITH SILT
 SOIL TYPE 3

**Sieve Analysis
 Grain Size Distribution**



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



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

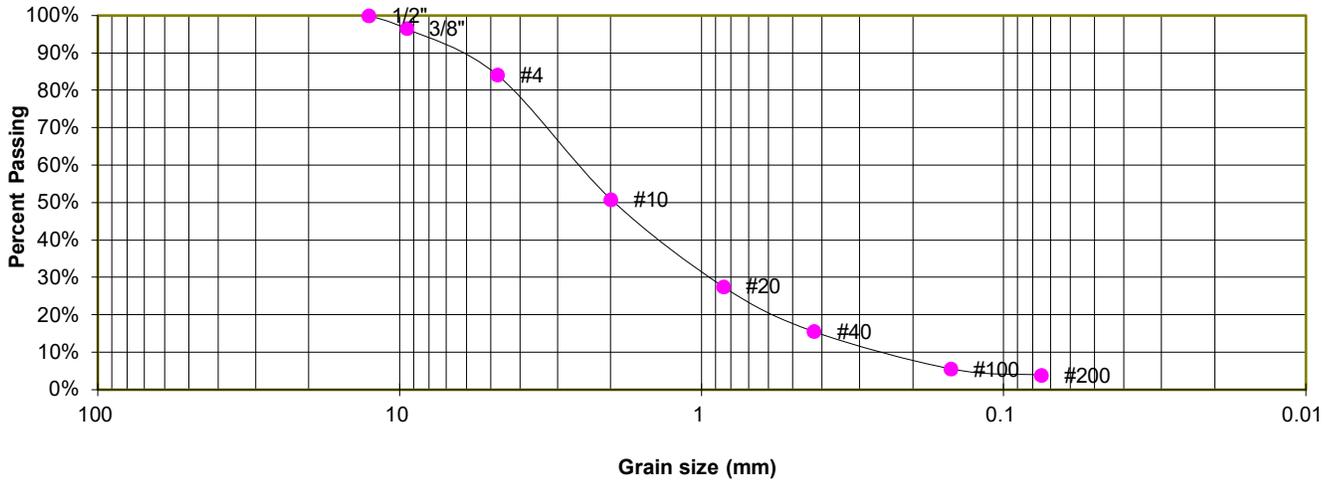
JOB NO.
 240824

FIG. B-17

TEST BORING 2
 DEPTH (FT) 10

SOIL DESCRIPTION SAND, SLIGHTLY SILTY
 SOIL TYPE 3

**Sieve Analysis
 Grain Size Distribution**



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



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

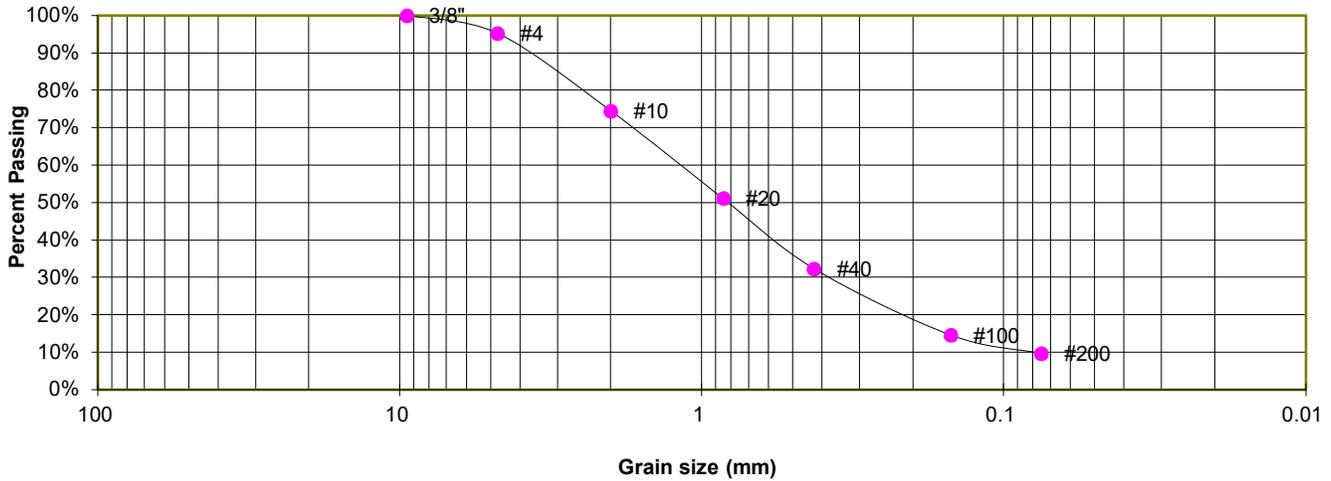
JOB NO.
 240824

FIG. B-18

TEST BORING 3
 DEPTH (FT) 5

SOIL DESCRIPTION SAND, WITH SILT
 SOIL TYPE 3

**Sieve Analysis
 Grain Size Distribution**



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



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

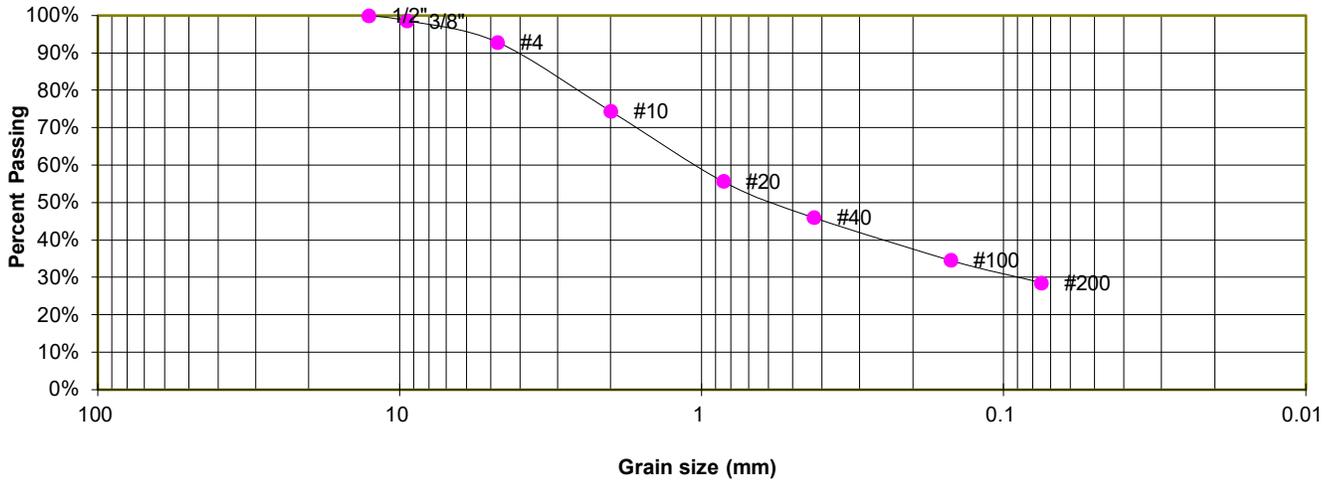
JOB NO.
 240824

FIG. B-19

TEST BORING 5
 DEPTH (FT) 10

SOIL DESCRIPTION SAND, SILTY
 SOIL TYPE 3

**Sieve Analysis
 Grain Size Distribution**



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



LABORATORY TEST RESULTS

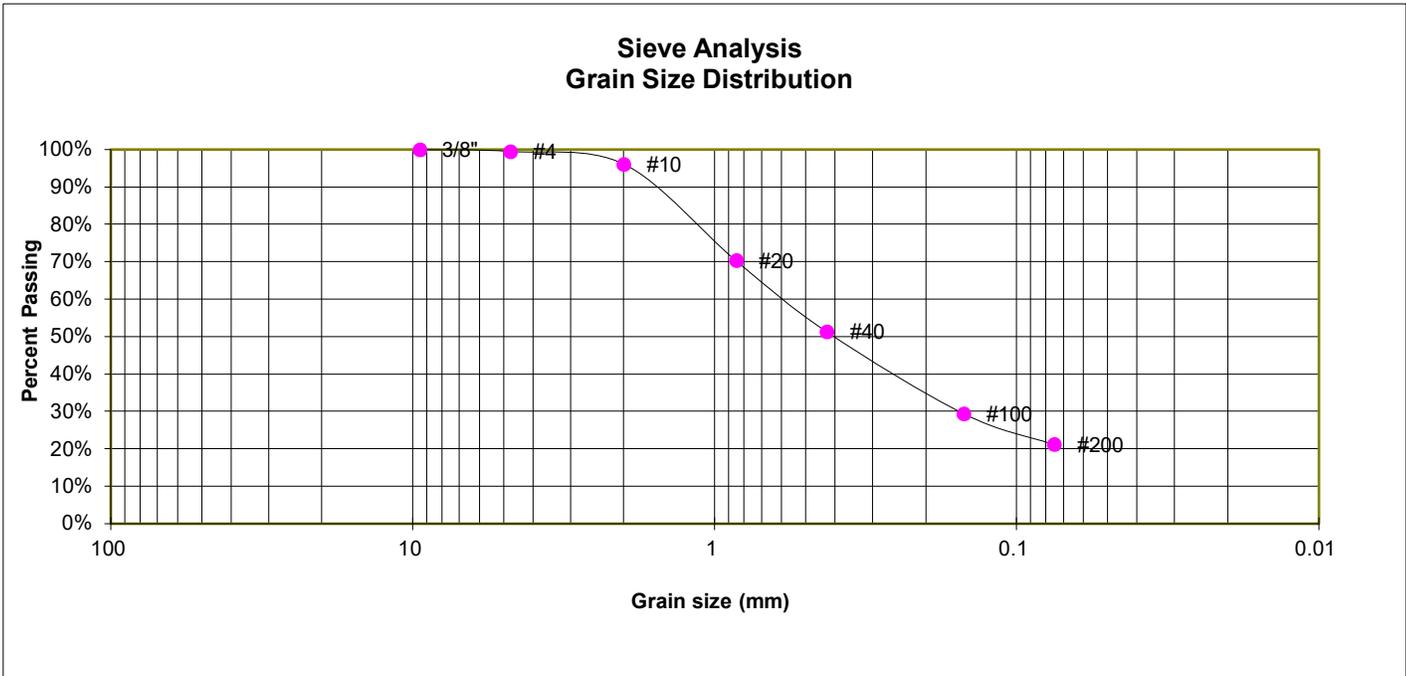
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-20

TEST BORING 8
 DEPTH (FT) 5

SOIL DESCRIPTION SAND, SILTY
 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



LABORATORY TEST RESULTS

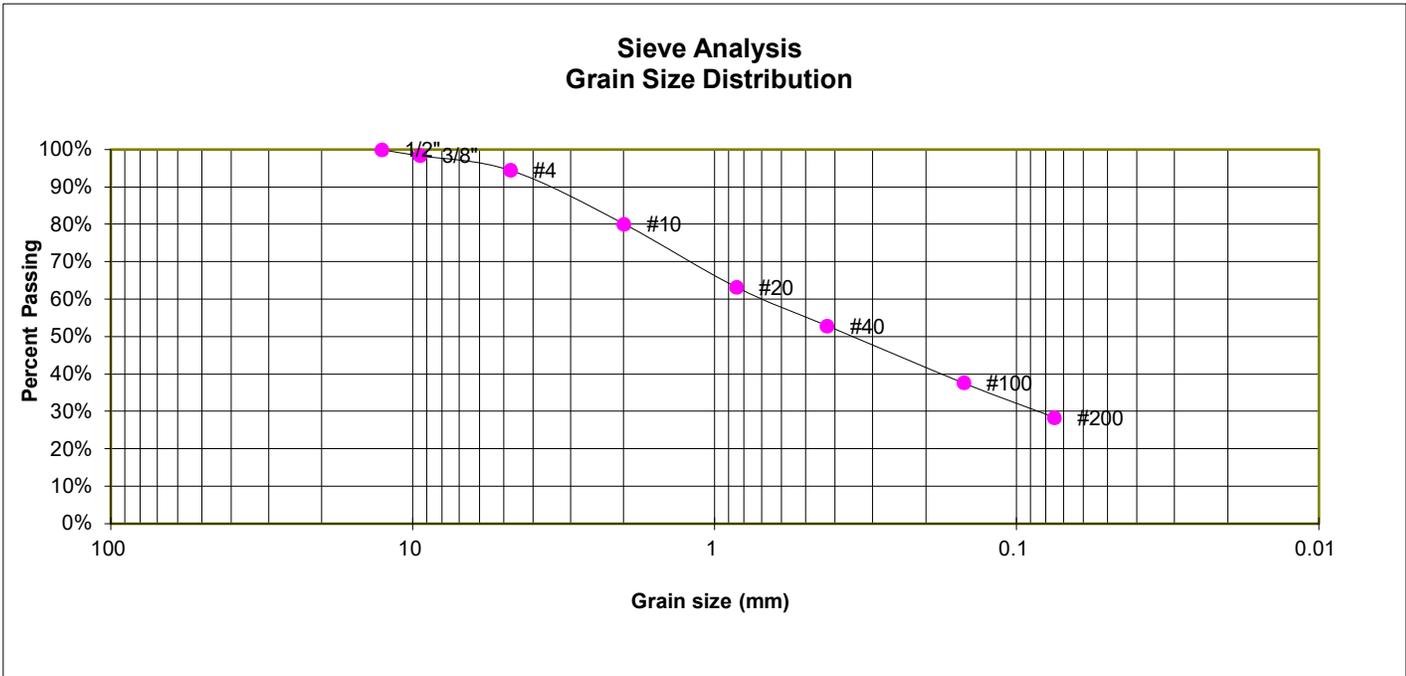
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-21

TEST BORING 11
 DEPTH (FT) 5

SOIL DESCRIPTION SAND, CLAYEY
 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



LABORATORY TEST RESULTS

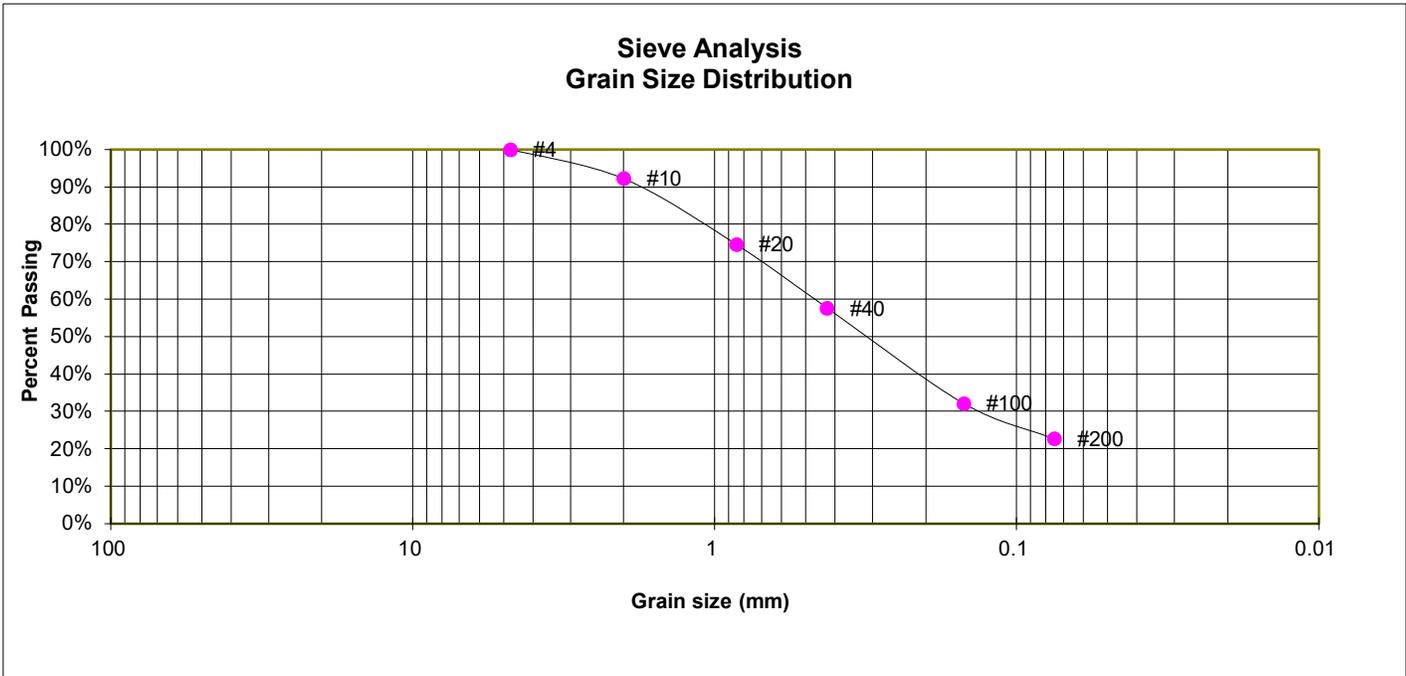
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-22

TEST BORING 13
 DEPTH (FT) 5

SOIL DESCRIPTION SAND, CLAYEY
 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



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

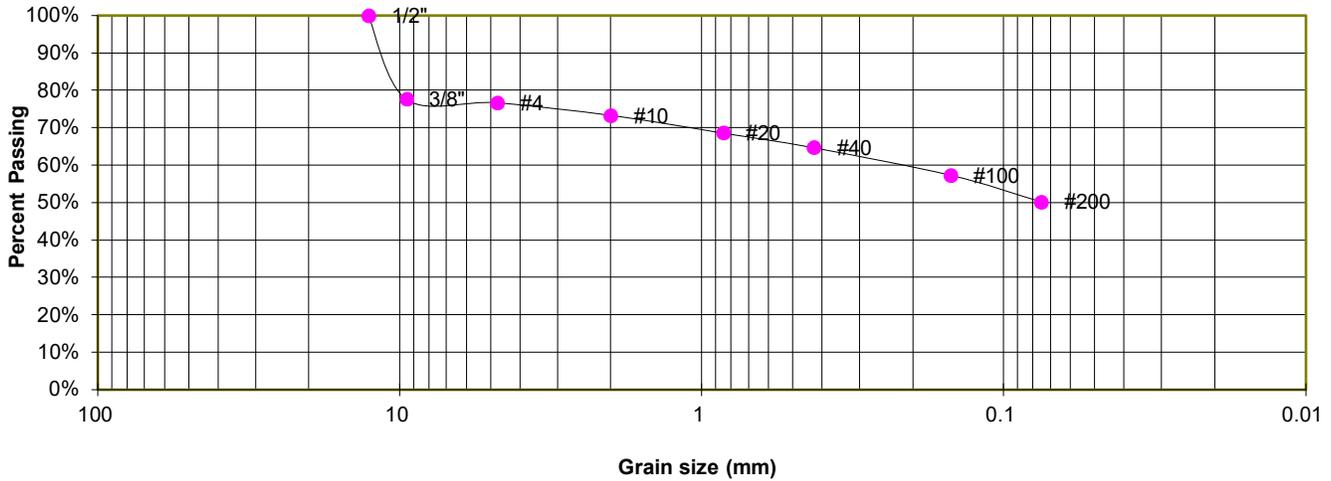
JOB NO.
 240824

FIG. B-23

TEST BORING 4
 DEPTH (FT) 0-3

SOIL DESCRIPTION CLAY, SANDY
 SOIL TYPE 4

**Sieve Analysis
 Grain Size Distribution**



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



LABORATORY TEST RESULTS

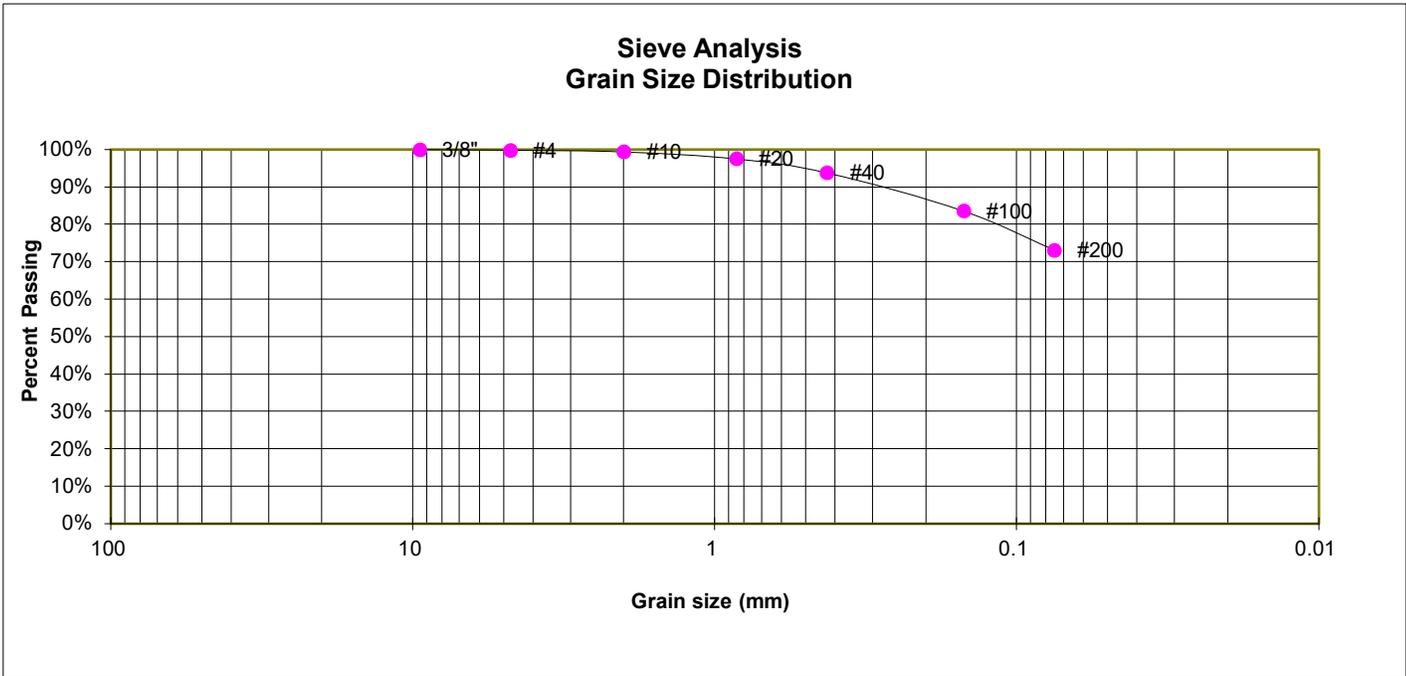
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-24

TEST BORING 15
 DEPTH (FT) 1-3

SOIL DESCRIPTION CLAY, WITH SAND
 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



LABORATORY TEST RESULTS

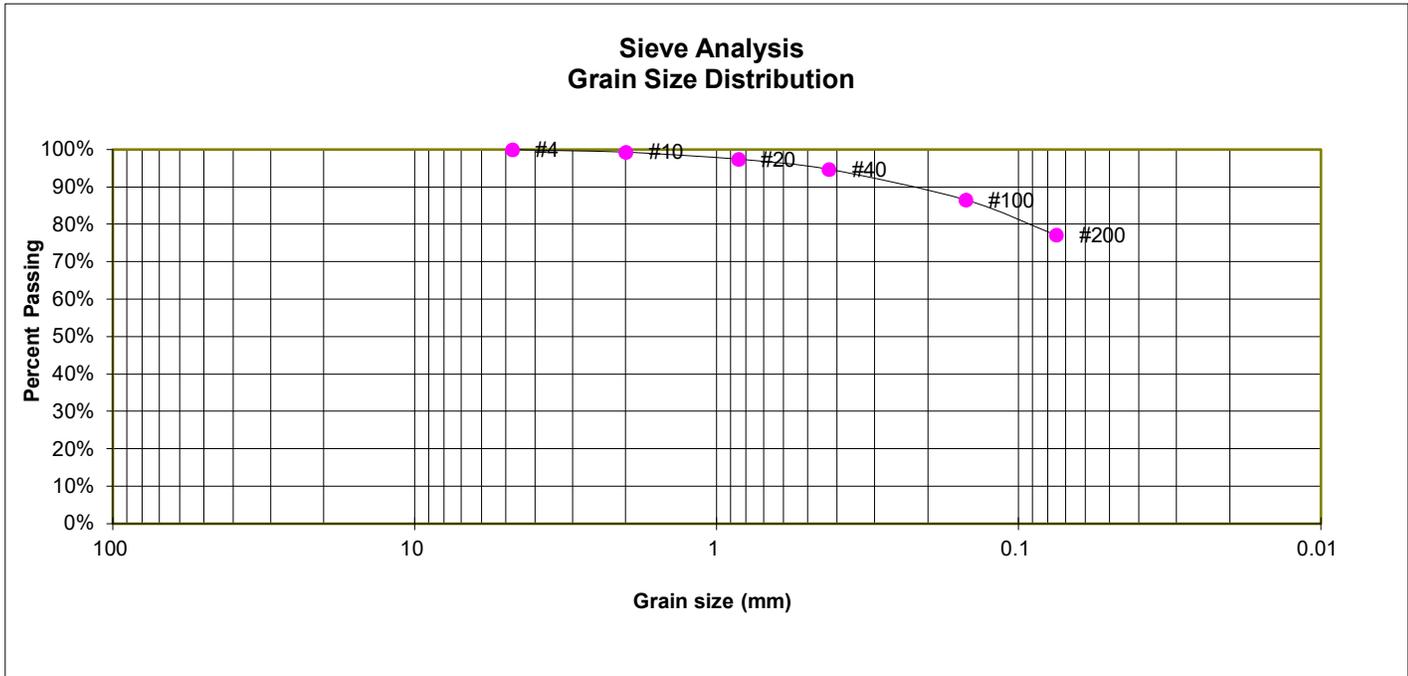
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-25

TEST BORING 17
 DEPTH (FT) 0-3

SOIL DESCRIPTION CLAY, WITH SAND
 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 |



LABORATORY TEST RESULTS

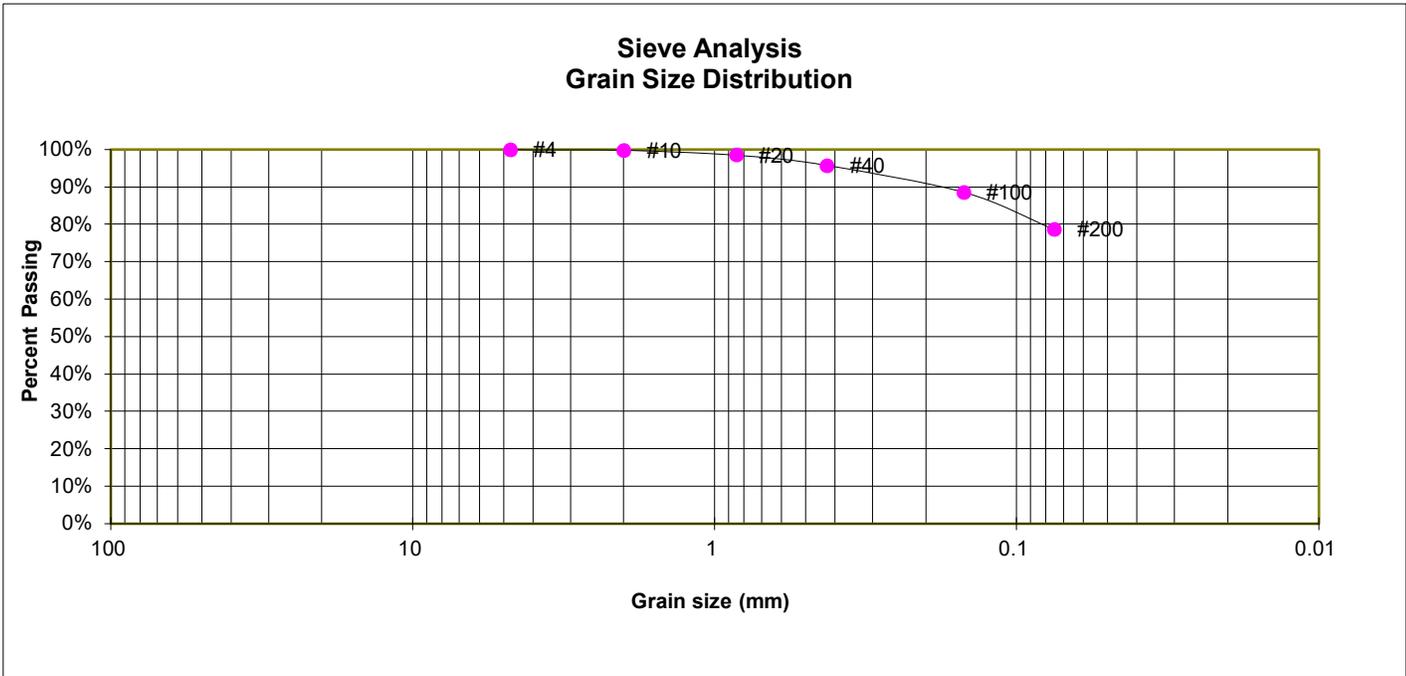
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-26

TEST BORING 9
 DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, WITH SAND
 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 |



LABORATORY TEST RESULTS

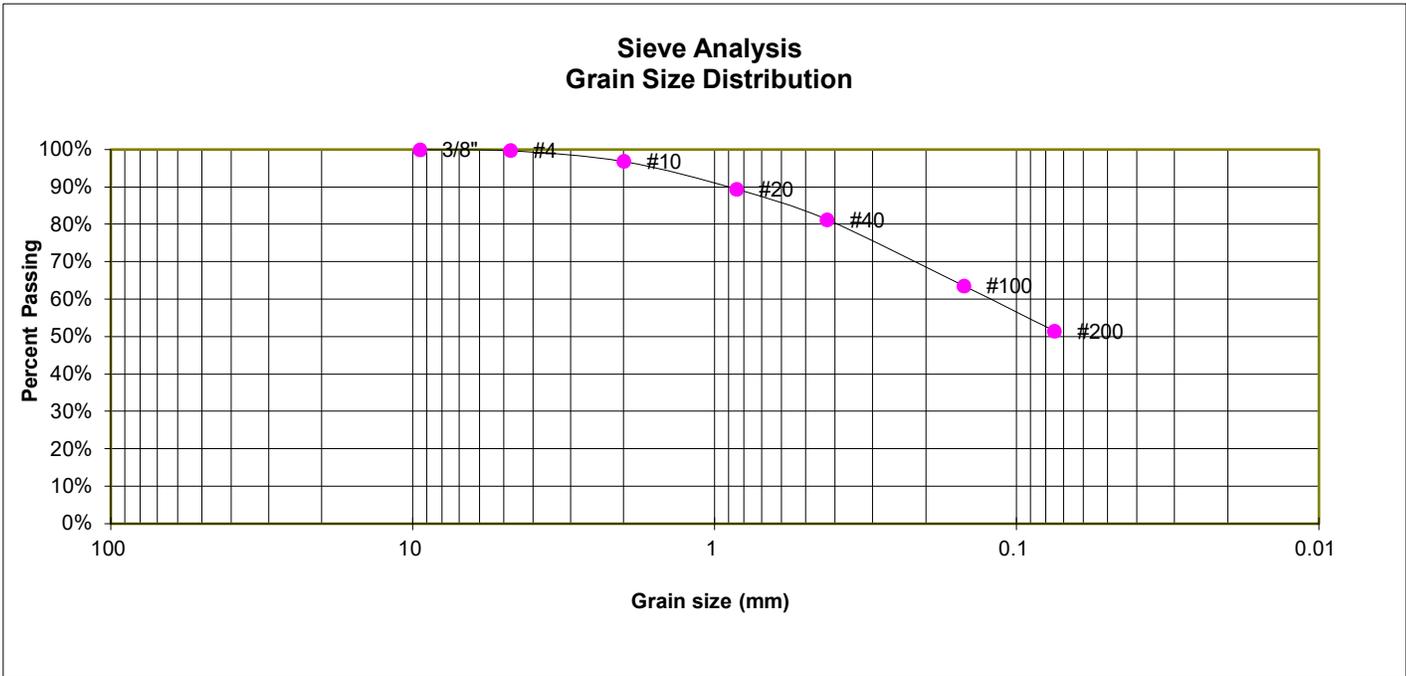
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-27

TEST BORING 14
 DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, SANDY
 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



LABORATORY TEST RESULTS

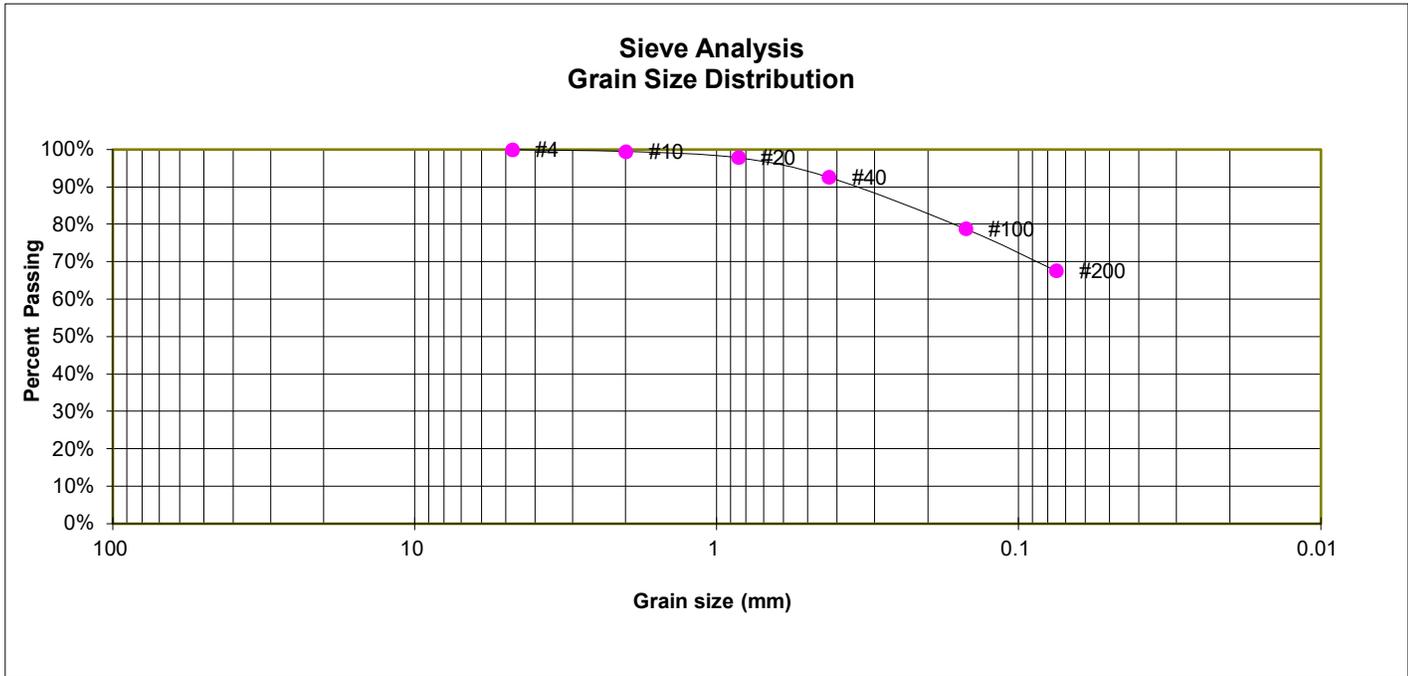
WINSOME, FILING NO. 3
 PROTERRA

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 240824

FIG. B-28

TEST BORING 15
 DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, SANDY
 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



LABORATORY TEST RESULTS

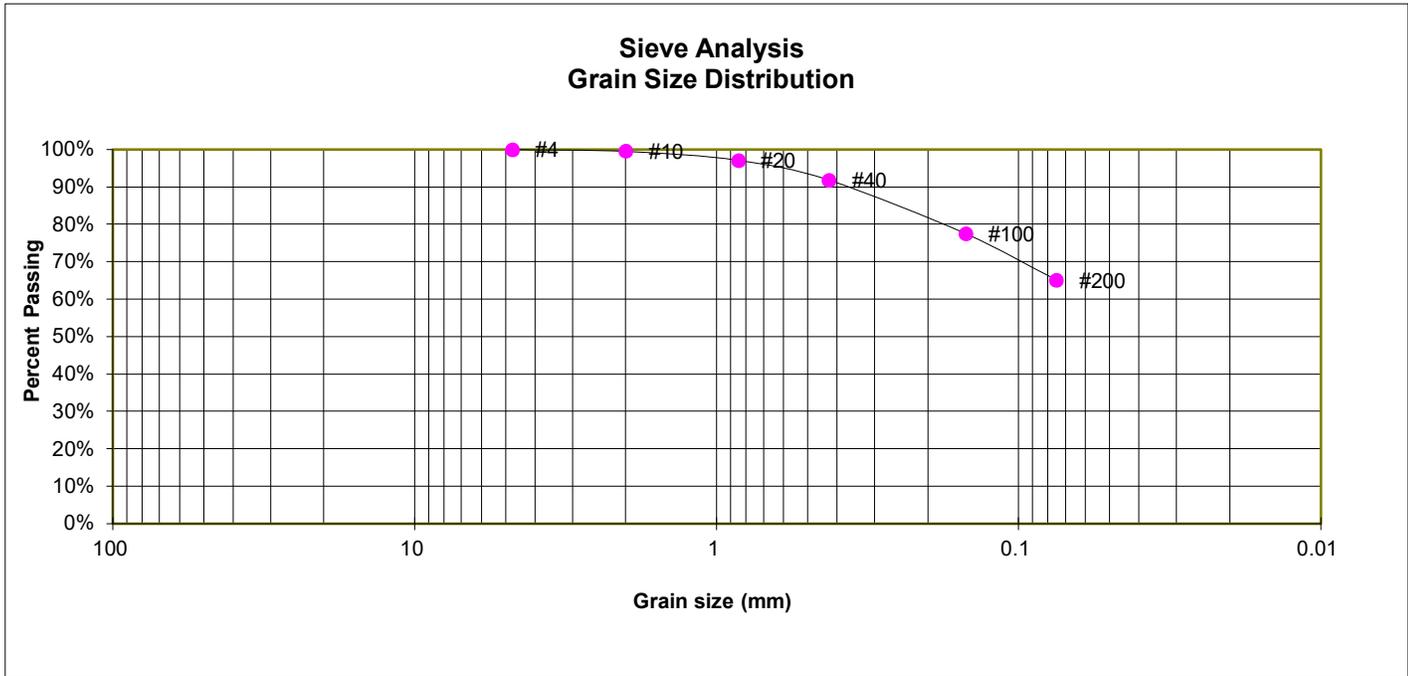
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-29

TEST BORING 16
 DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, SANDY
 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 |



LABORATORY TEST RESULTS

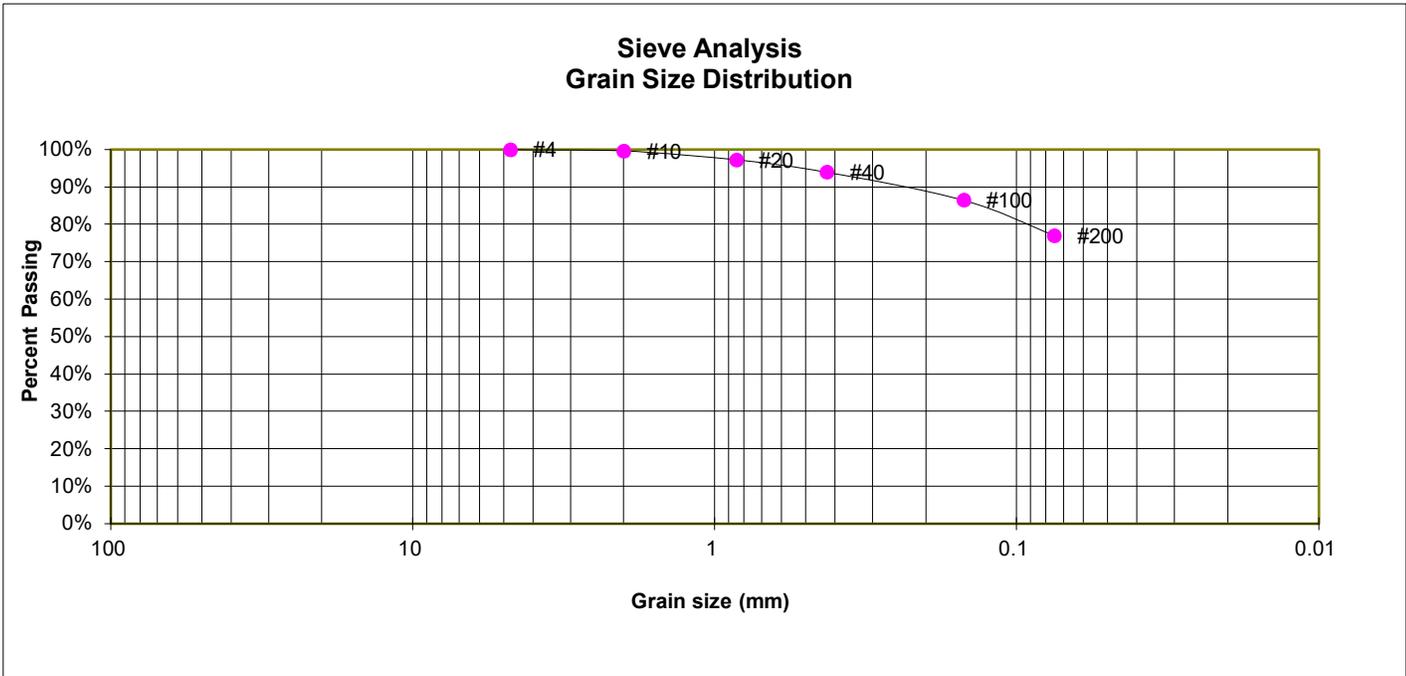
WINSOME, FILING NO. 3
 PROTERRA

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 240824

FIG. B-30

TEST BORING 17
 DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, WITH SAND
 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 |



LABORATORY TEST RESULTS

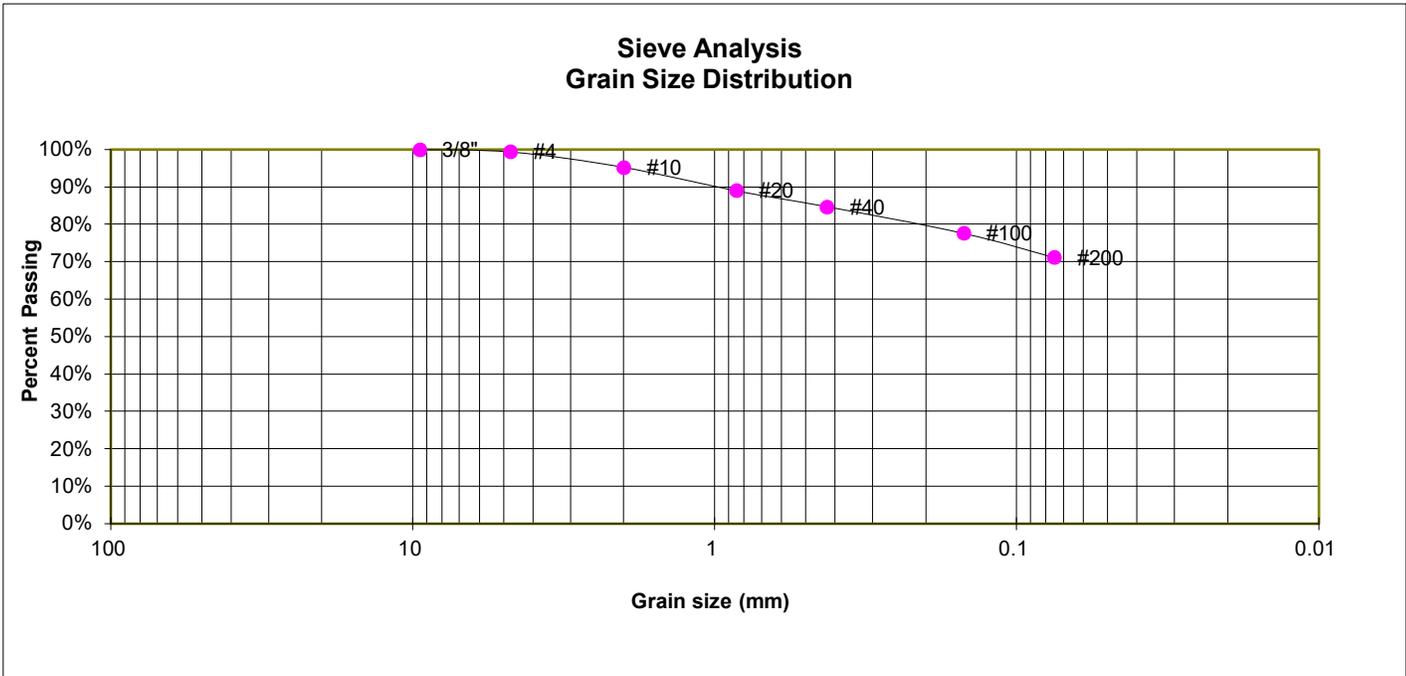
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-31

TEST BORING 18
 DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, WITH SAND
 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 |



LABORATORY TEST RESULTS

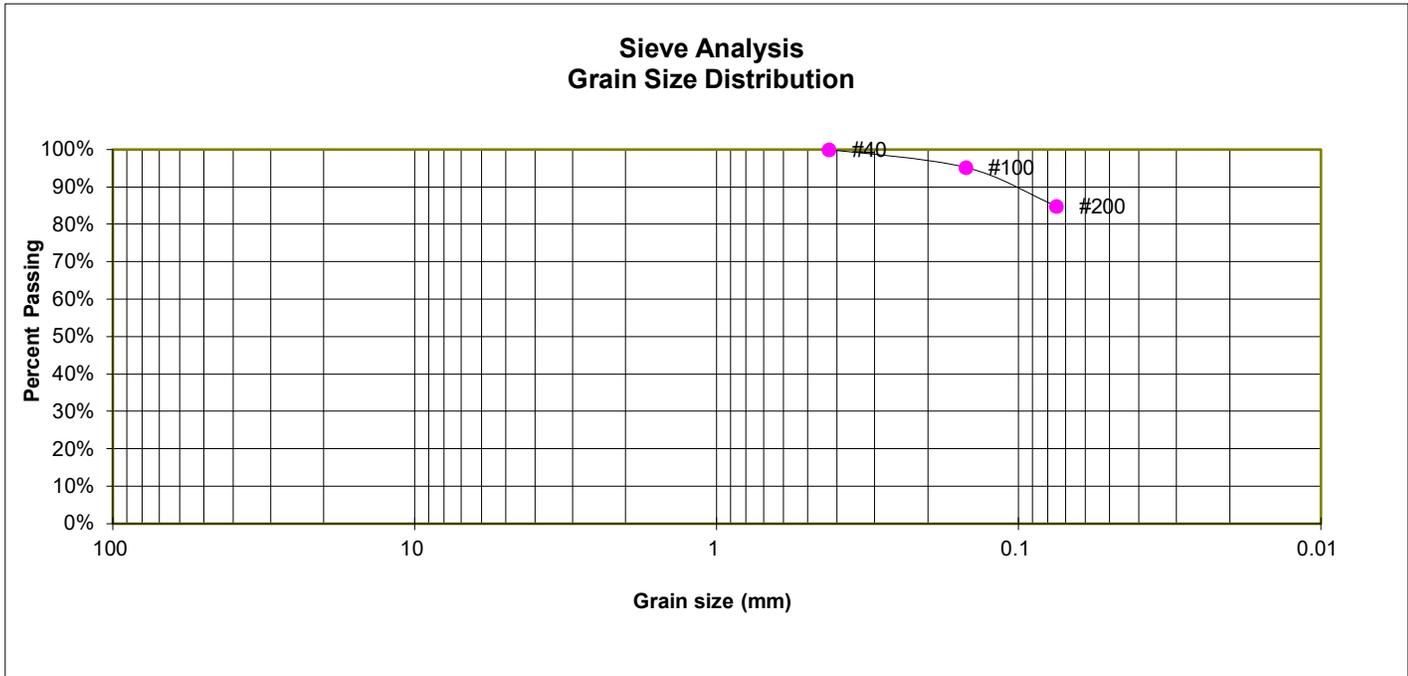
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-32

TEST BORING 2
 DEPTH (FT) 5

SOIL DESCRIPTION CLAY, WITH SAND
 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



LABORATORY TEST RESULTS

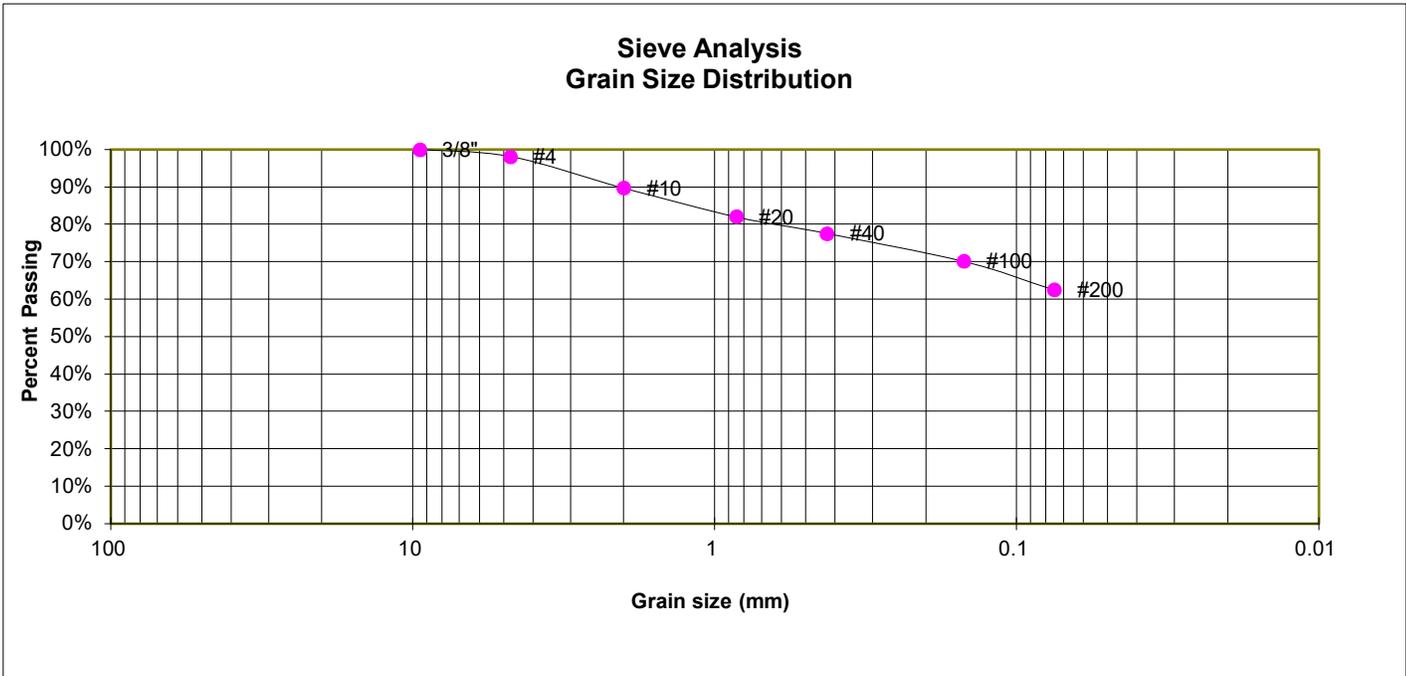
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-33

TEST BORING 4
 DEPTH (FT) 5

SOIL DESCRIPTION CLAY, SANDY
 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 |



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

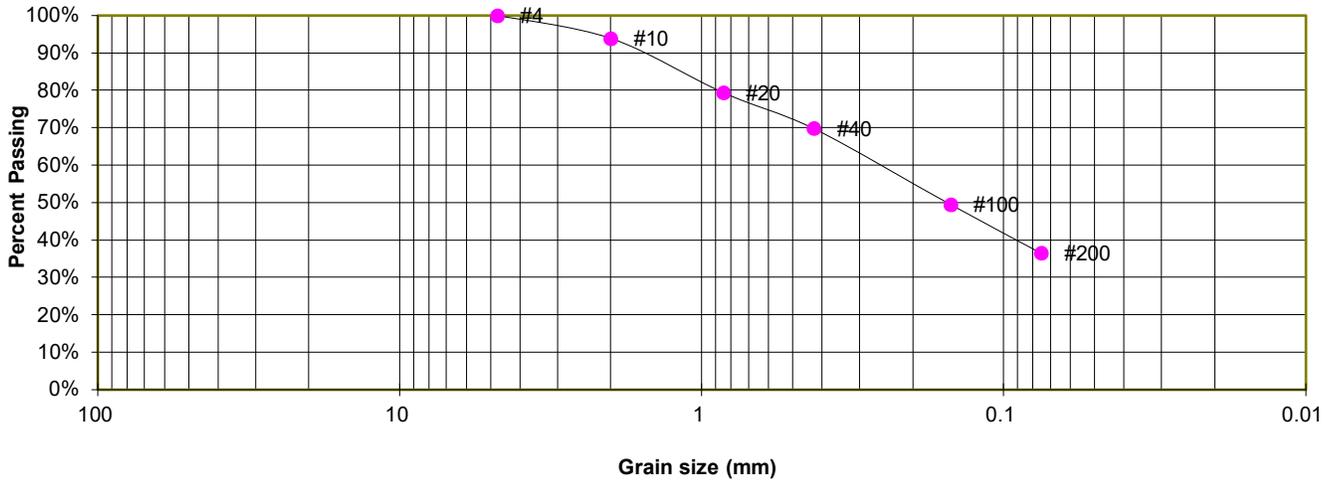
JOB NO.
 240824

FIG. B-34

TEST BORING 8
 DEPTH (FT) 10

SOIL DESCRIPTION SAND, CLAYEY
 SOIL TYPE 4

**Sieve Analysis
 Grain Size Distribution**



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



LABORATORY TEST RESULTS

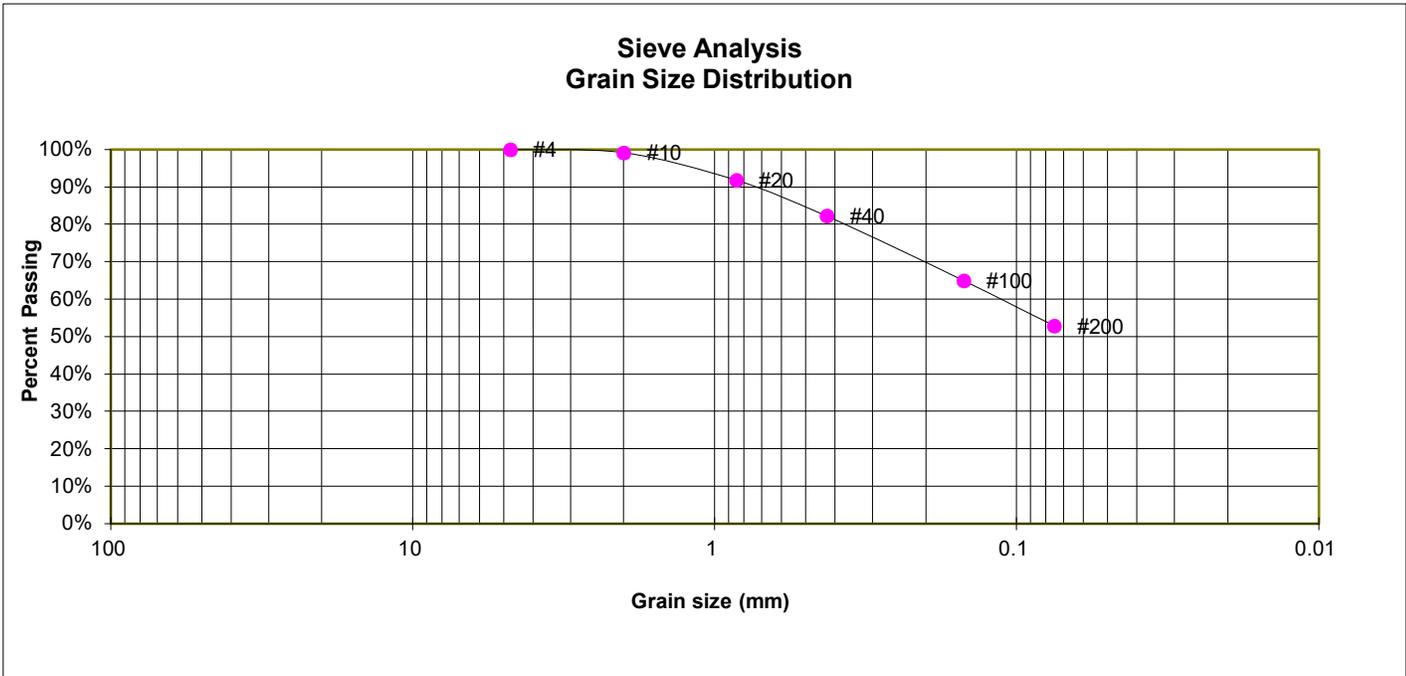
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-35

TEST BORING 12
 DEPTH (FT) 5

SOIL DESCRIPTION CLAY, SANDY
 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 |



LABORATORY TEST RESULTS

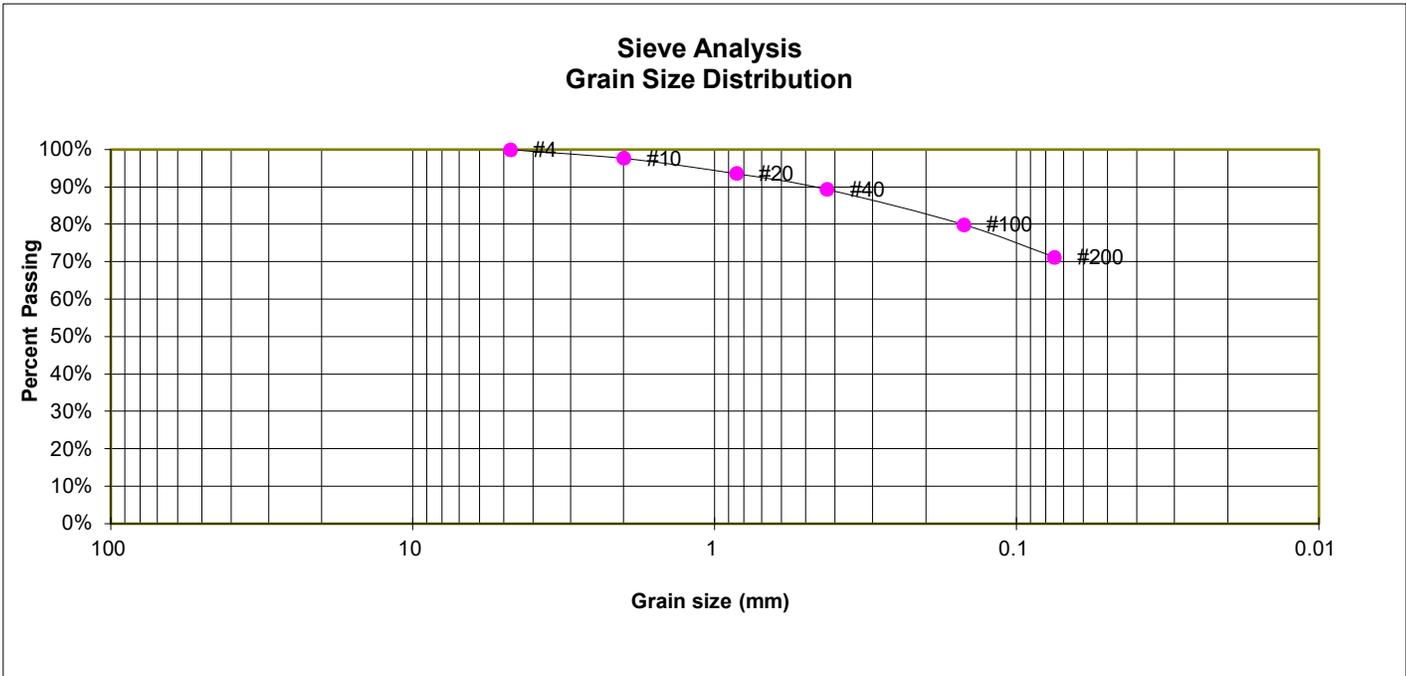
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-36

TEST BORING 19
 DEPTH (FT) 5

SOIL DESCRIPTION CLAY, WITH SAND
 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 |



LABORATORY TEST RESULTS

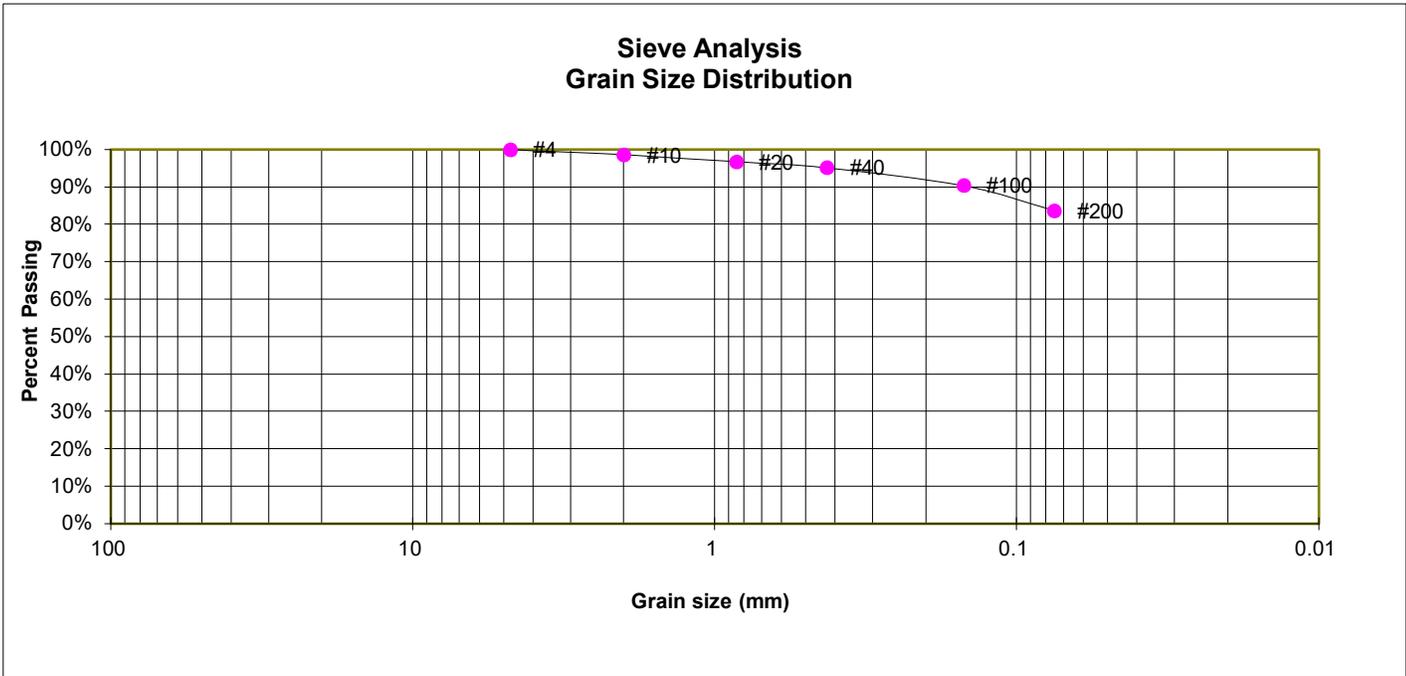
WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-37

TEST BORING 20
 DEPTH (FT) 5

SOIL DESCRIPTION CLAY, WITH SAND
 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 |



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
 PROTERRA

JOB NO.
 240824

FIG. B-38

TEST BORING 3
DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
SOIL TYPE 2



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

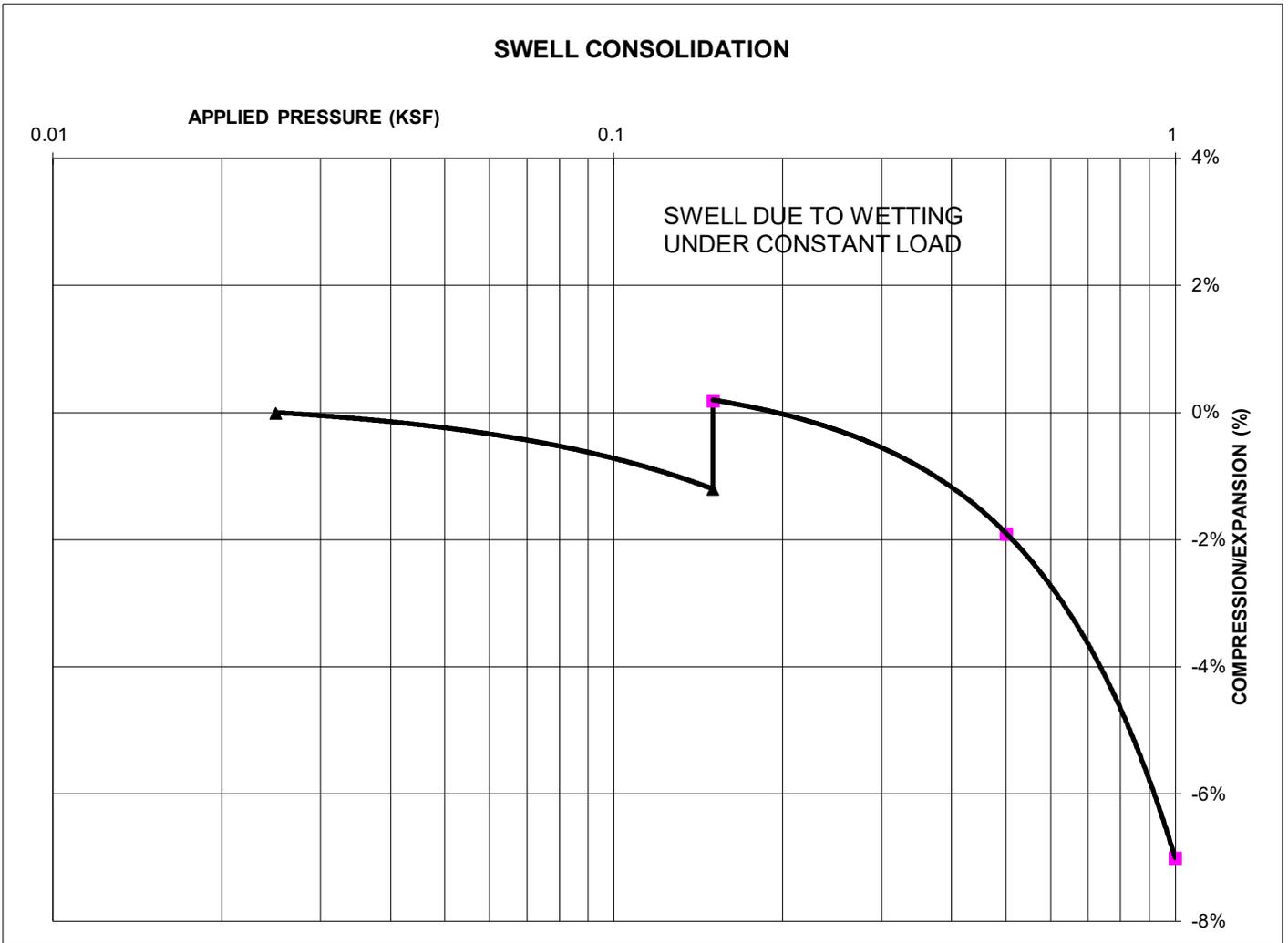
WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-39

TEST BORING 5
DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
SOIL TYPE 2



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-40

TEST BORING 7
DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
SOIL TYPE 2



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

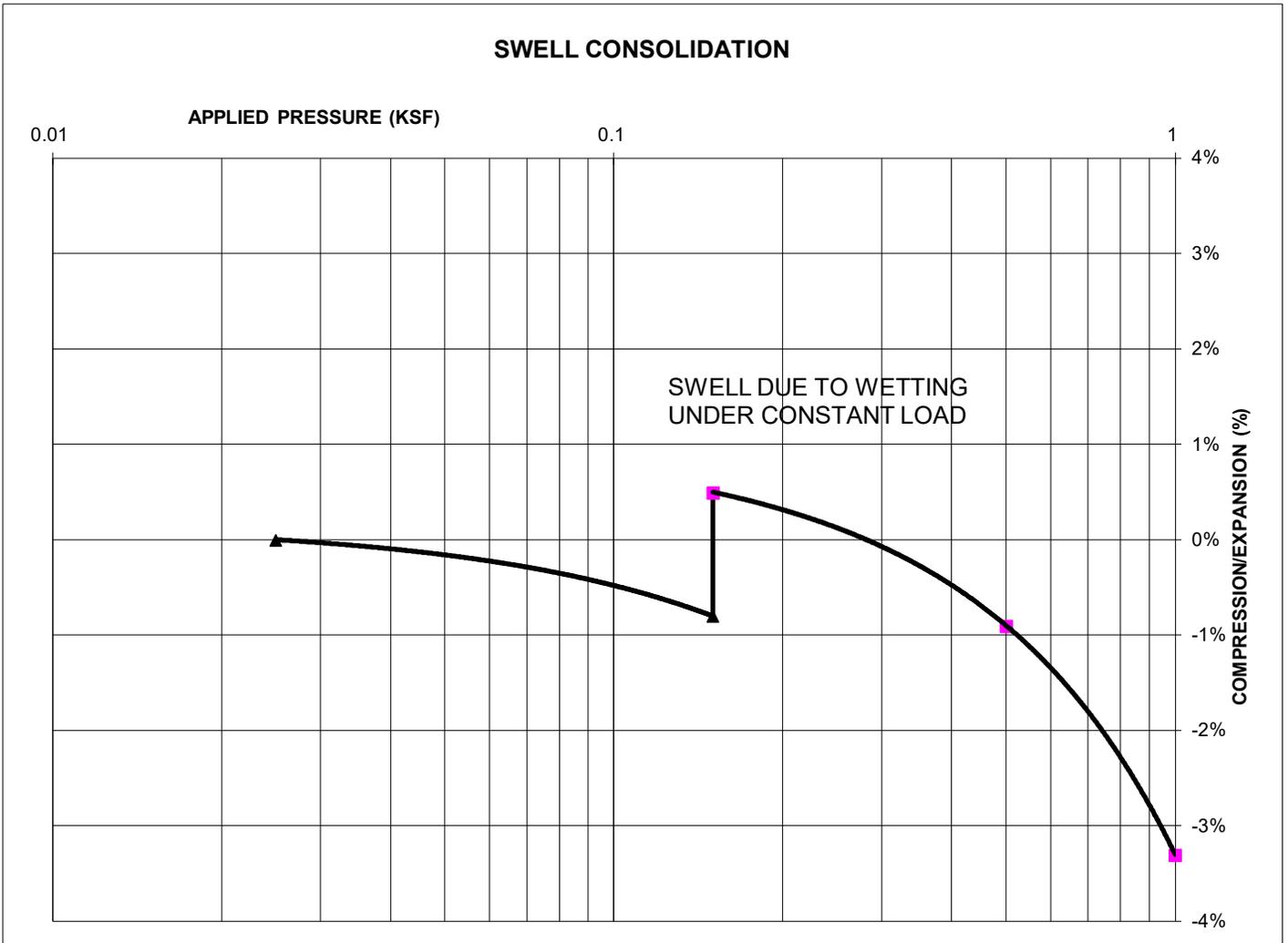
WINSOME, FILING NO. 3
PROTERRA

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240824

FIG. B-41

TEST BORING 8
DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
SOIL TYPE 2



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

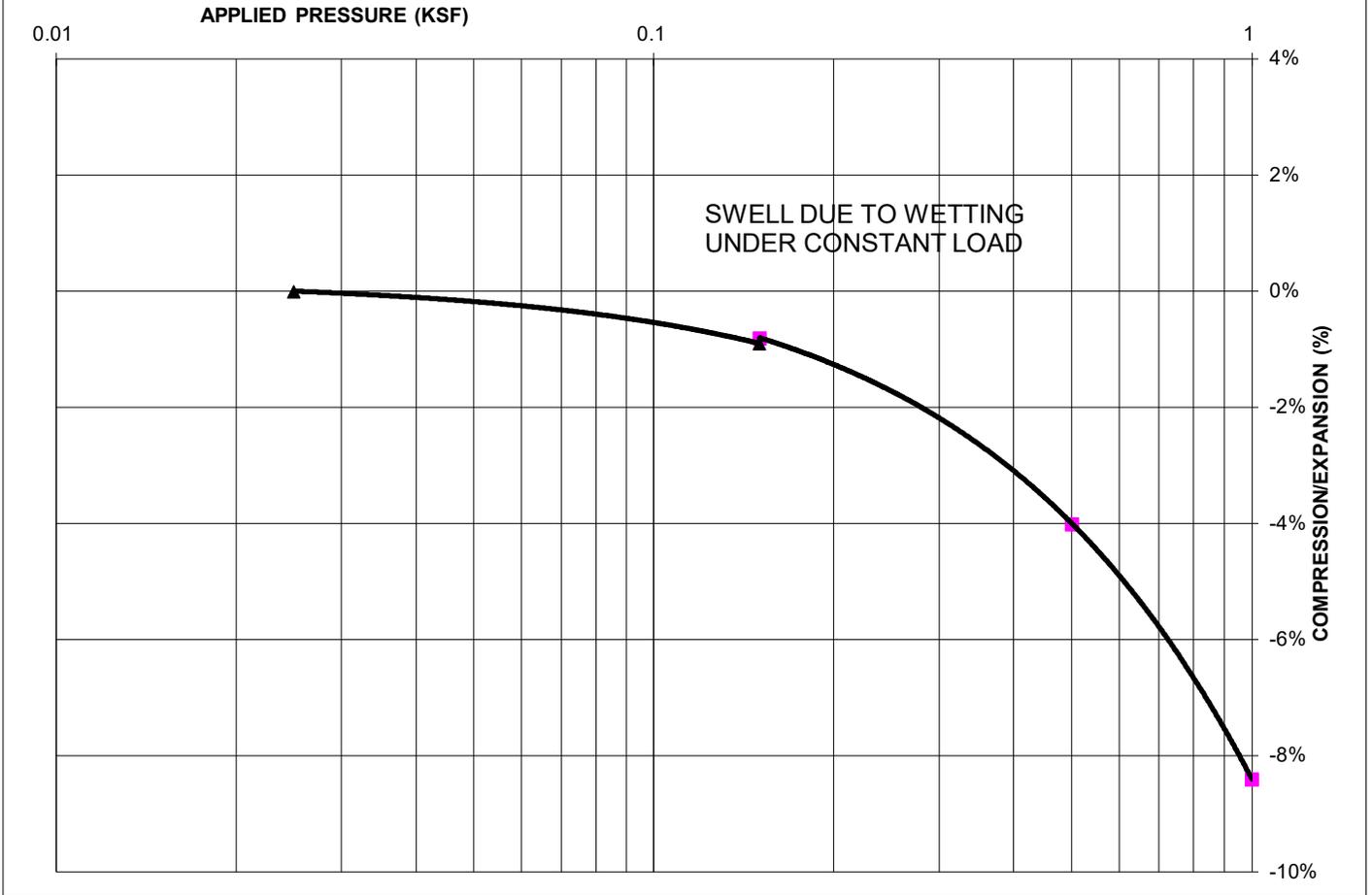
JOB NO.
240824

FIG. B-42

TEST BORING 10
DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
SOIL TYPE 2

SWELL CONSOLIDATION



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

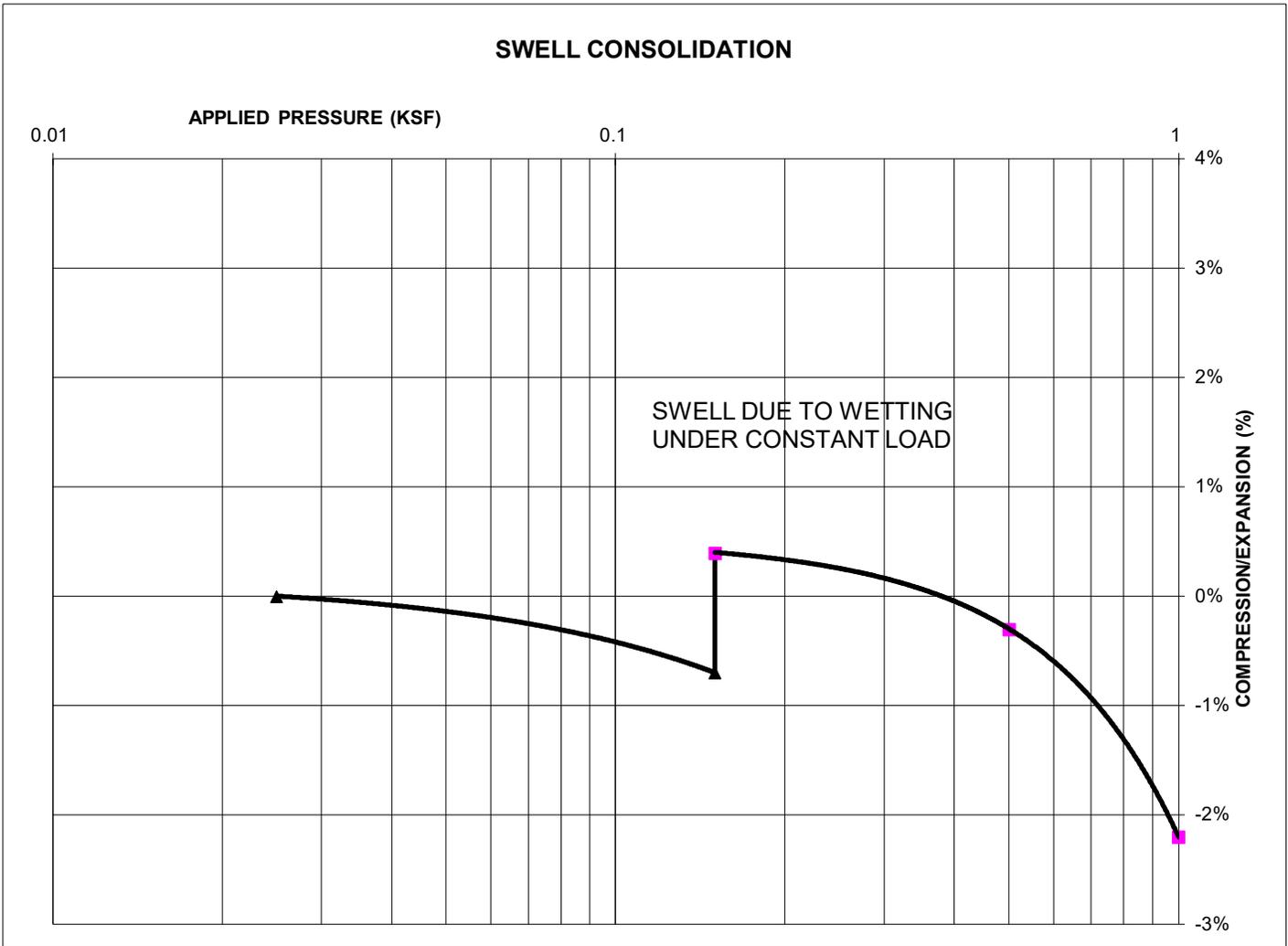
WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-43

TEST BORING 11
DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
SOIL TYPE 2



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

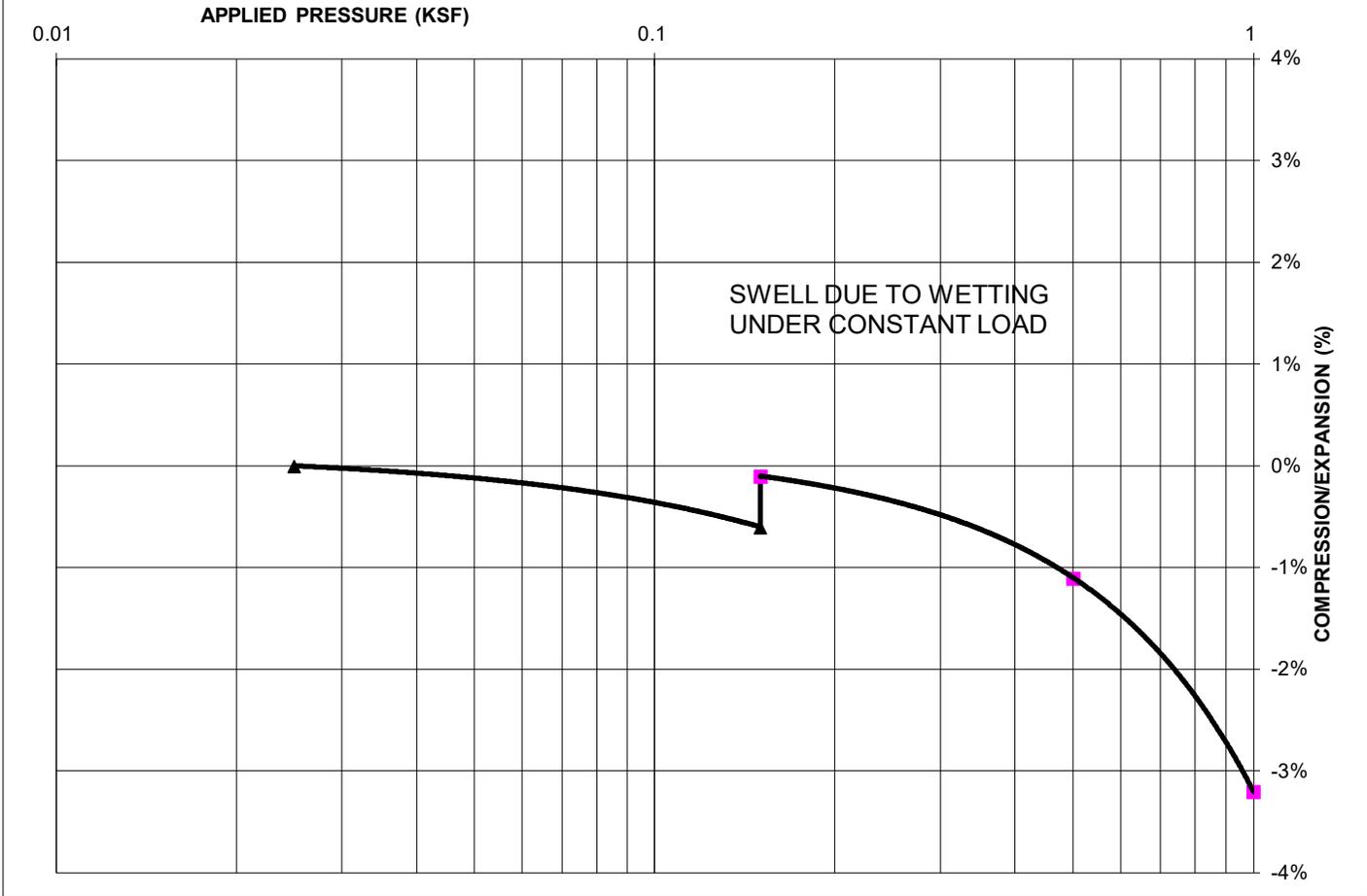
JOB NO.
240824

FIG. B-44

TEST BORING 12
DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
SOIL TYPE 2

SWELL CONSOLIDATION



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

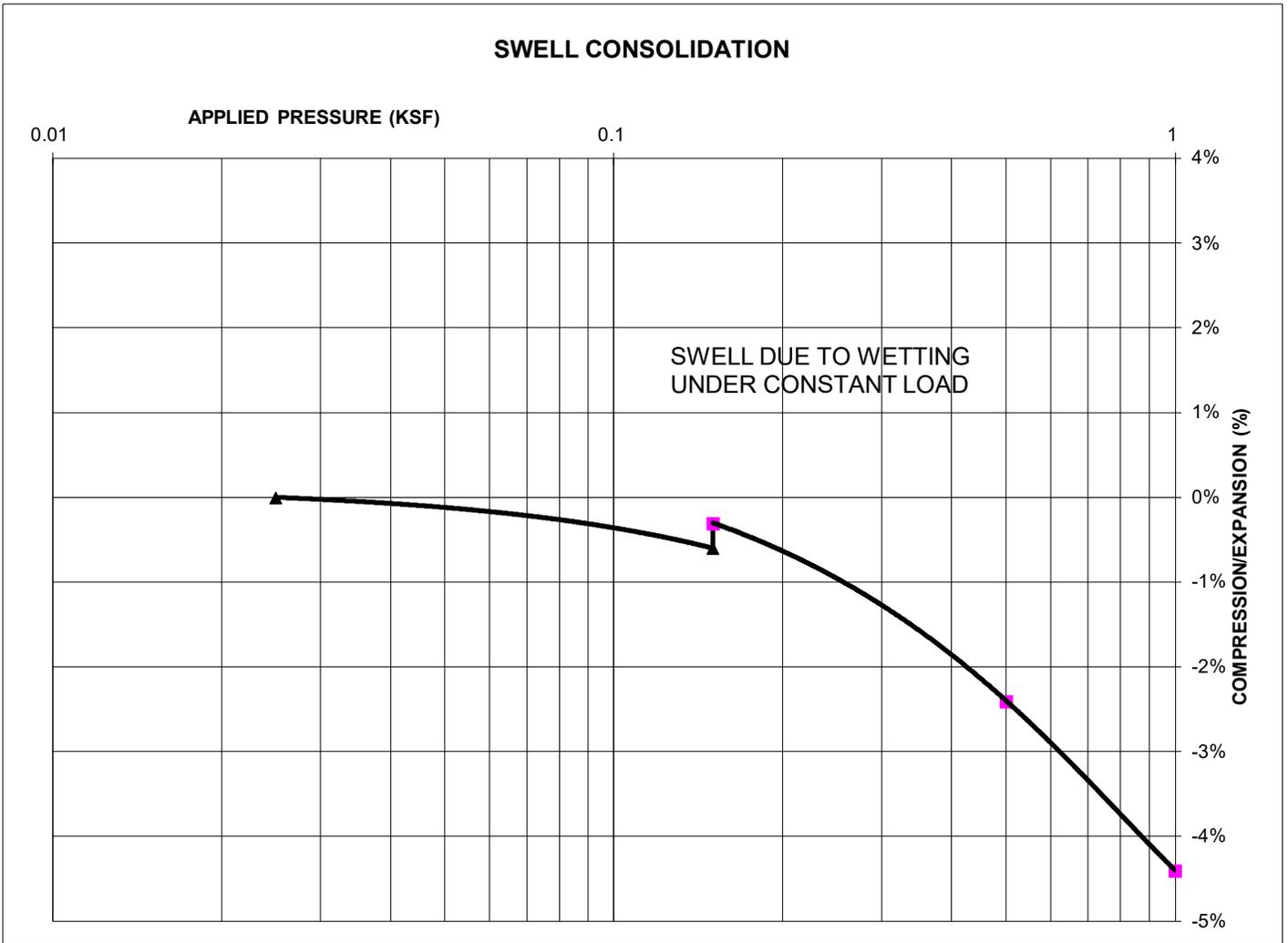
WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-45

TEST BORING 13
DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
SOIL TYPE 2



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

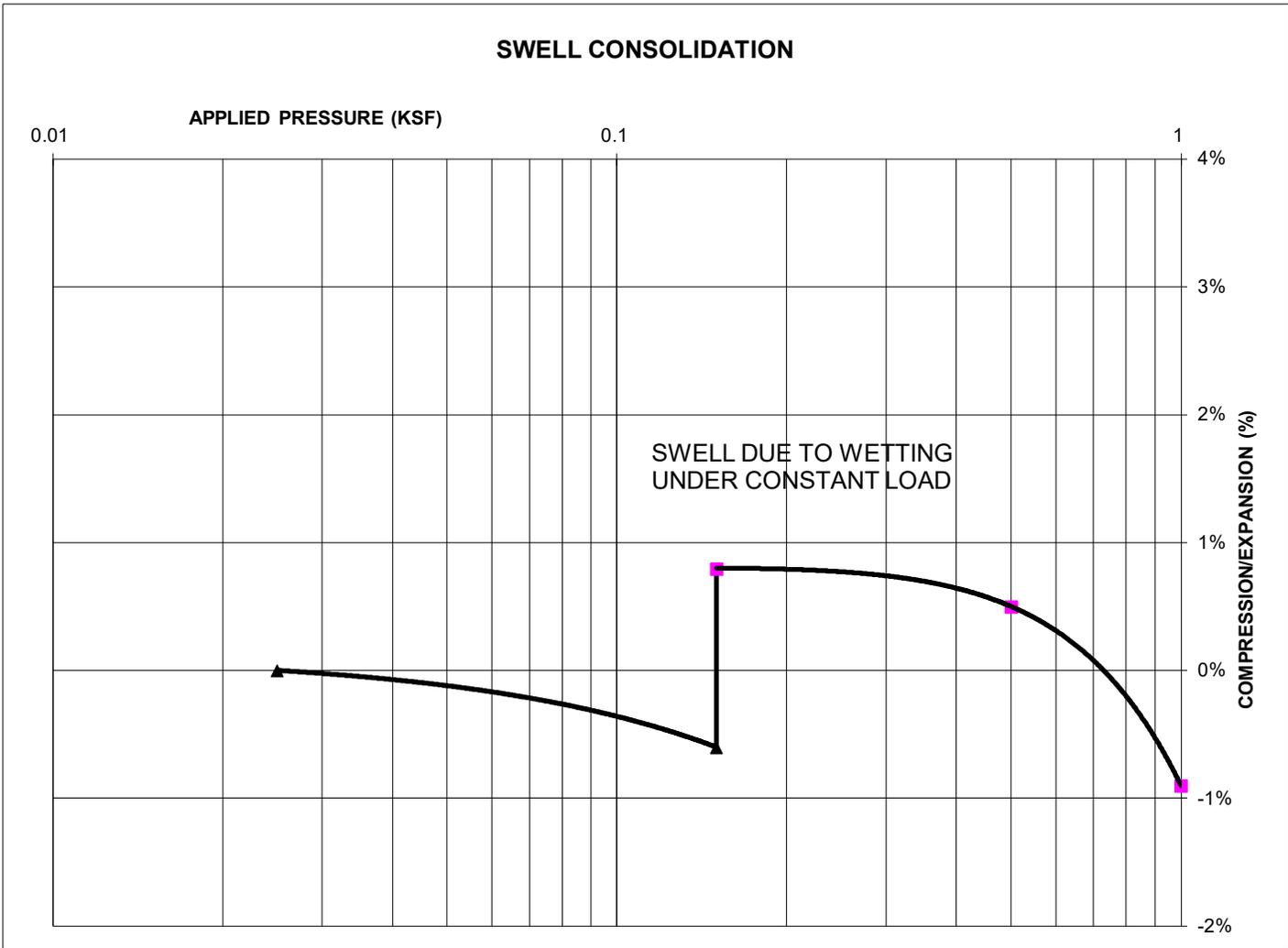
WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-46

TEST BORING 4
DEPTH (FT) 1-2

SOIL DESCRIPTION FILL, CLAY, SANDY
SOIL TYPE 2



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

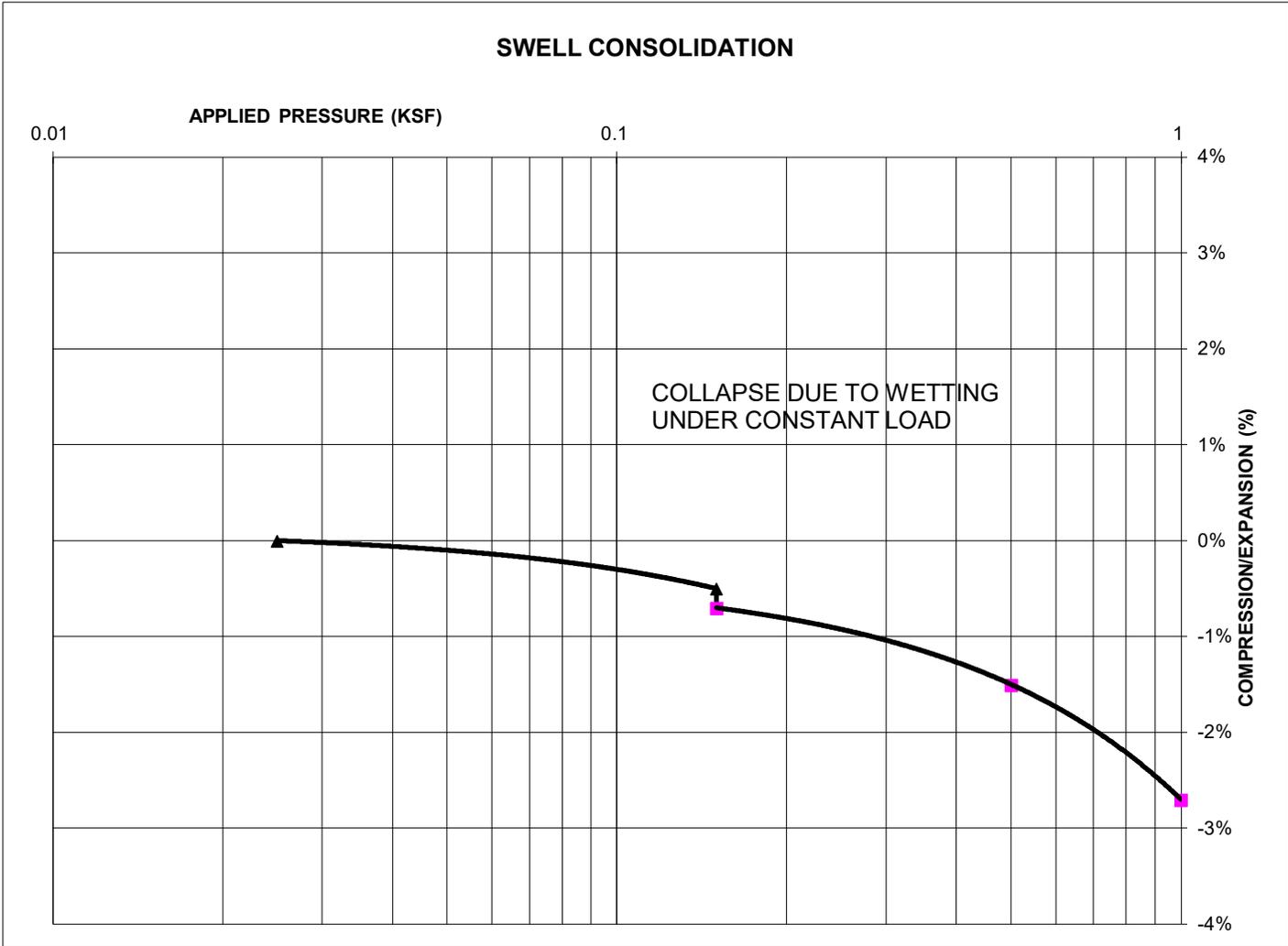
WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-47

TEST BORING 13
DEPTH (FT) 5

SOIL DESCRIPTION SAND, CLAYEY
SOIL TYPE 3



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

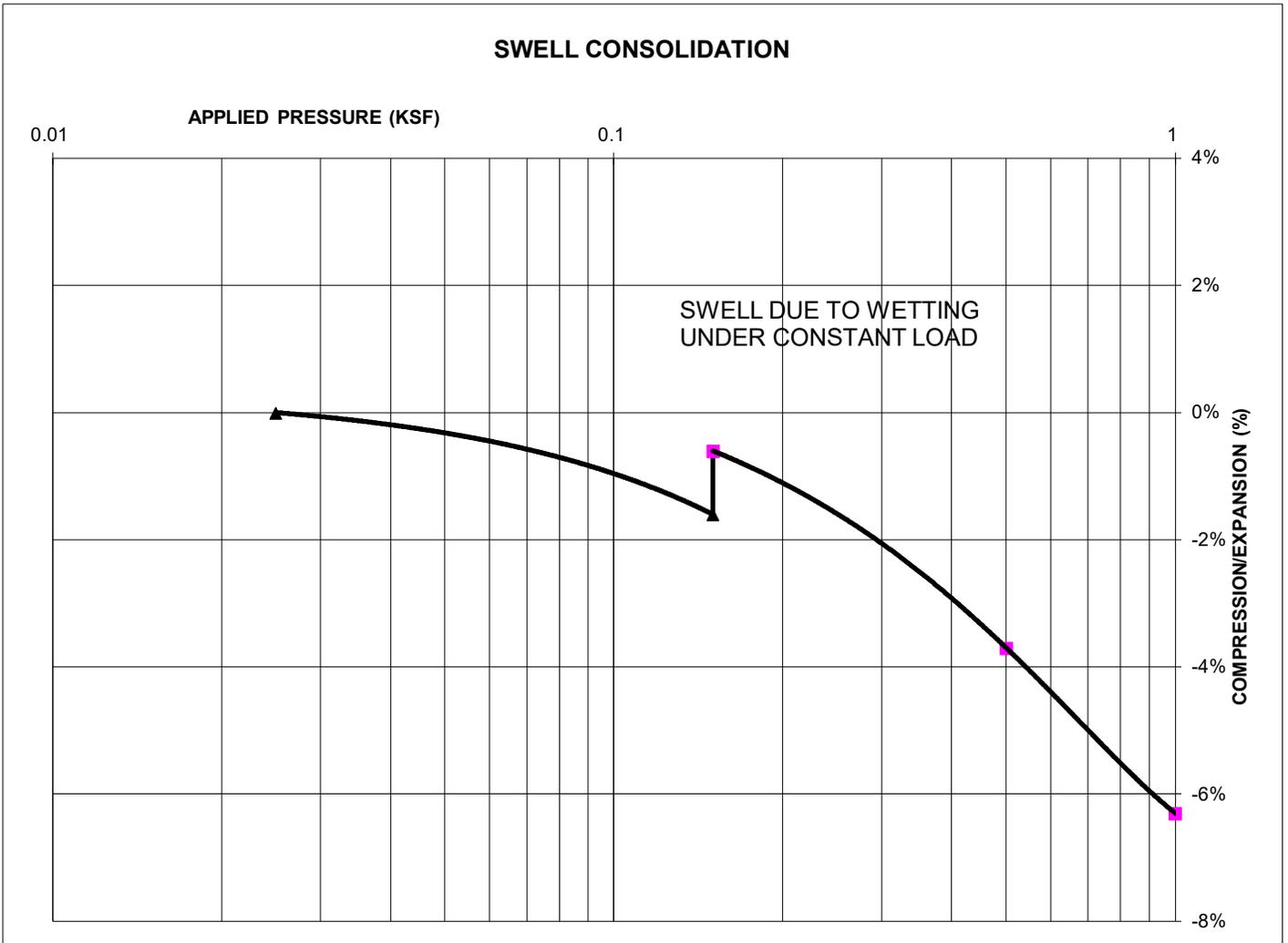
WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-48

TEST BORING 9
DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, WITH SAND
SOIL TYPE 4



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

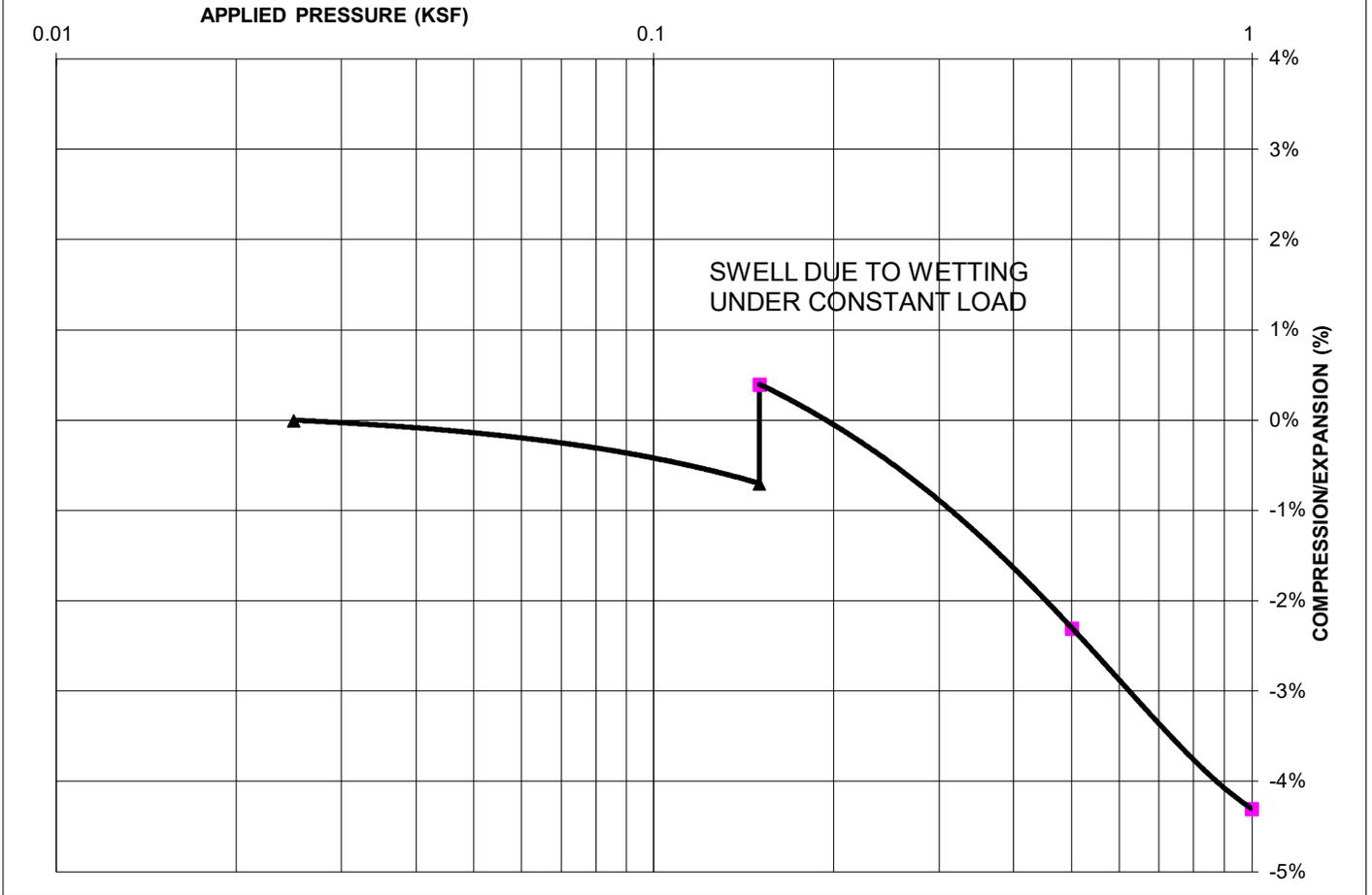
JOB NO.
240824

FIG. B-49

TEST BORING 14
DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, SANDY
SOIL TYPE 4

SWELL CONSOLIDATION



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

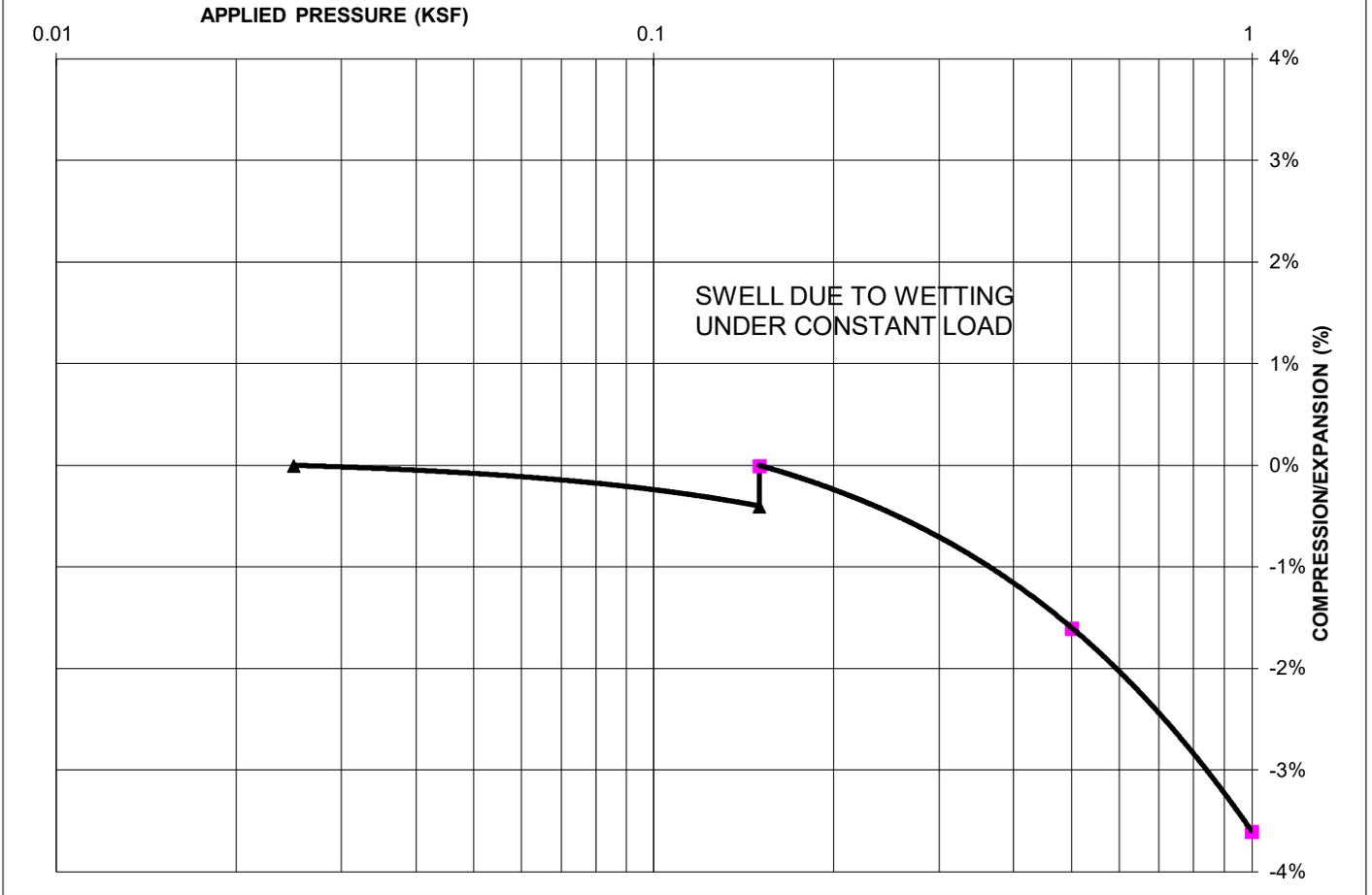
JOB NO.
240824

FIG. B-50

TEST BORING 15
DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, SANDY
SOIL TYPE 4

SWELL CONSOLIDATION



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

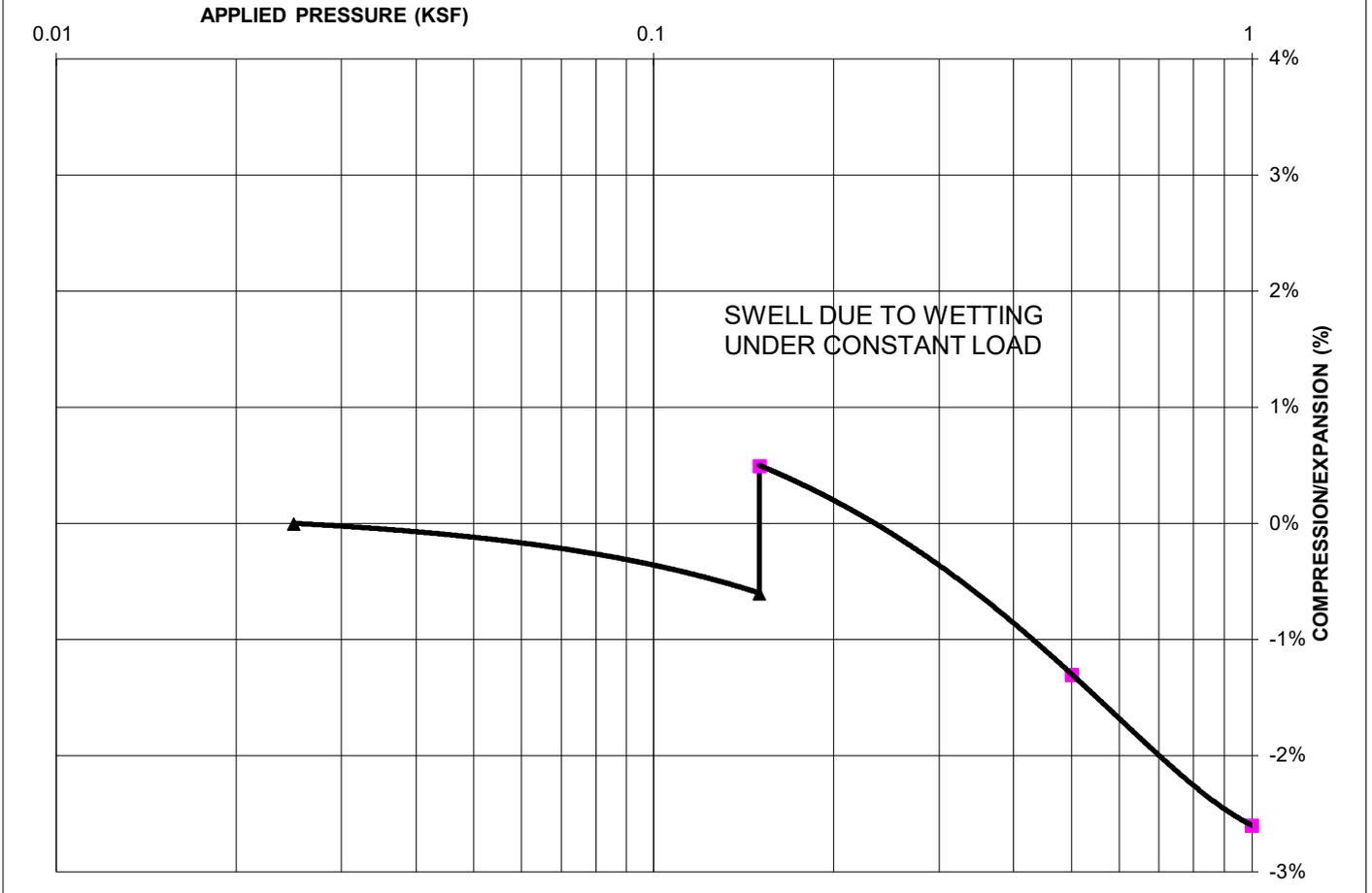
JOB NO.
240824

FIG. B-51

TEST BORING 16
DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, SANDY
SOIL TYPE 4

SWELL CONSOLIDATION



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

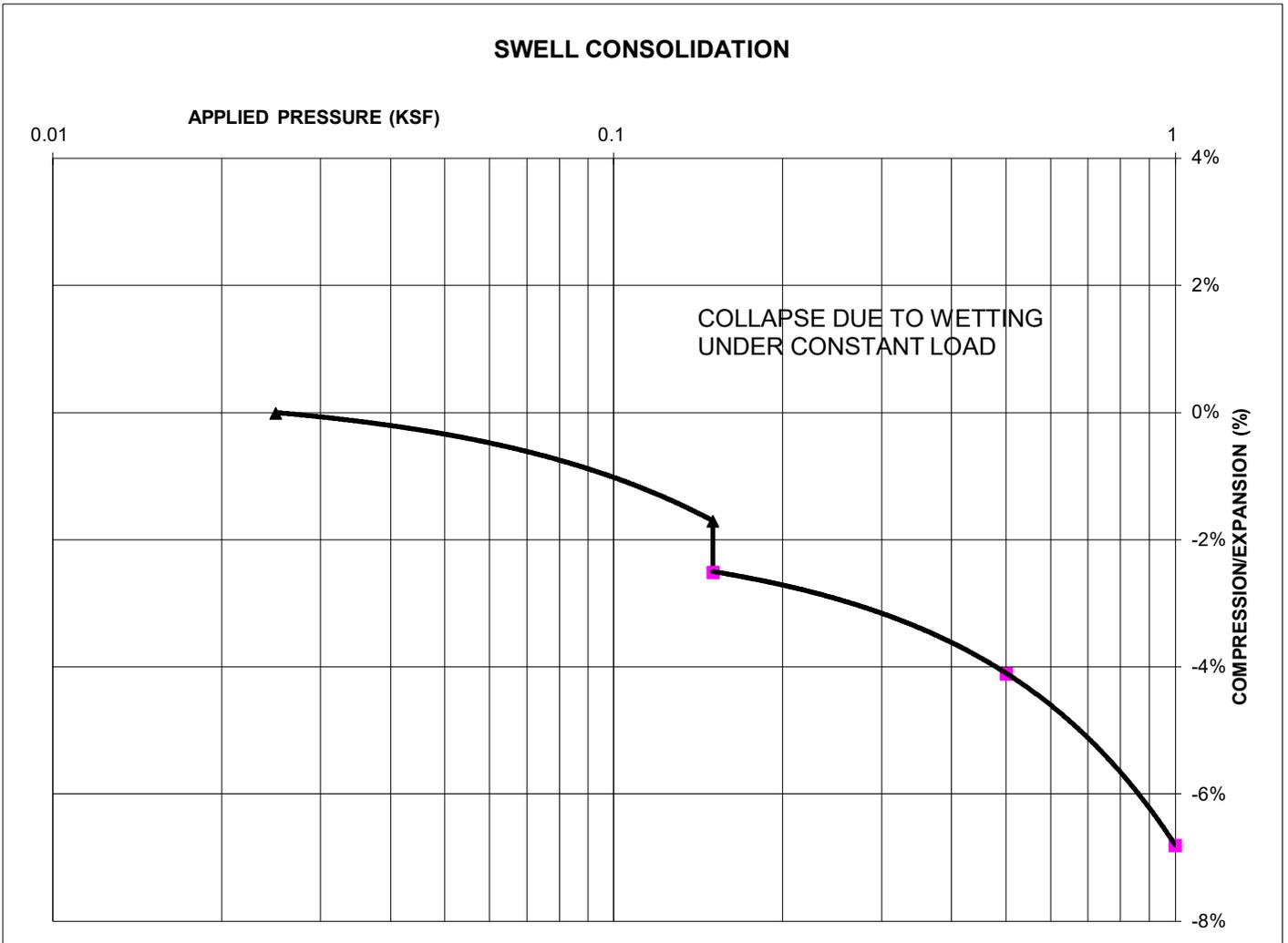
WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-52

TEST BORING 17
DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, WITH SAND
SOIL TYPE 4



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

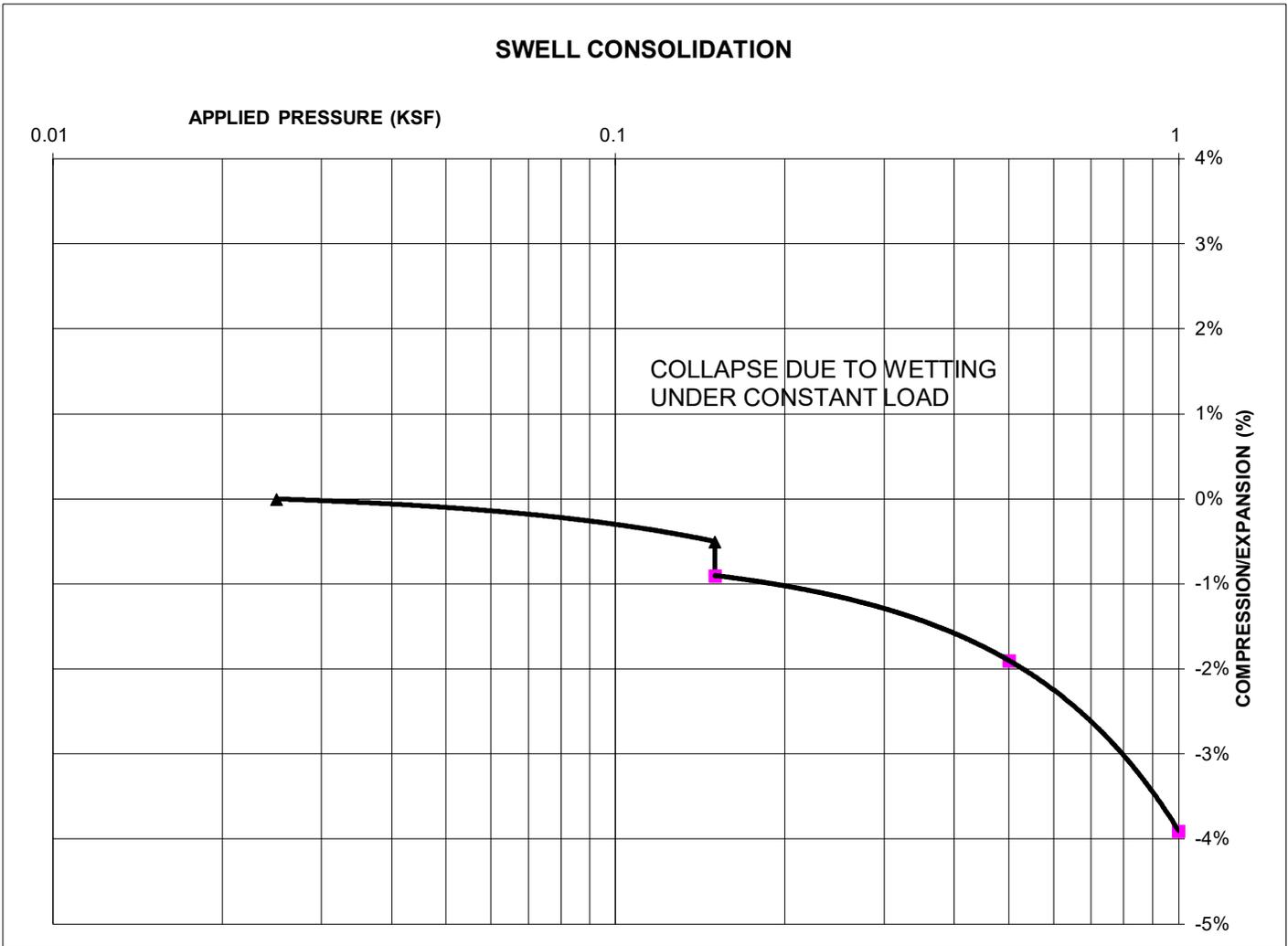
WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-53

TEST BORING 18
DEPTH (FT) 1-2

SOIL DESCRIPTION CLAY, WITH SAND
SOIL TYPE 4



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

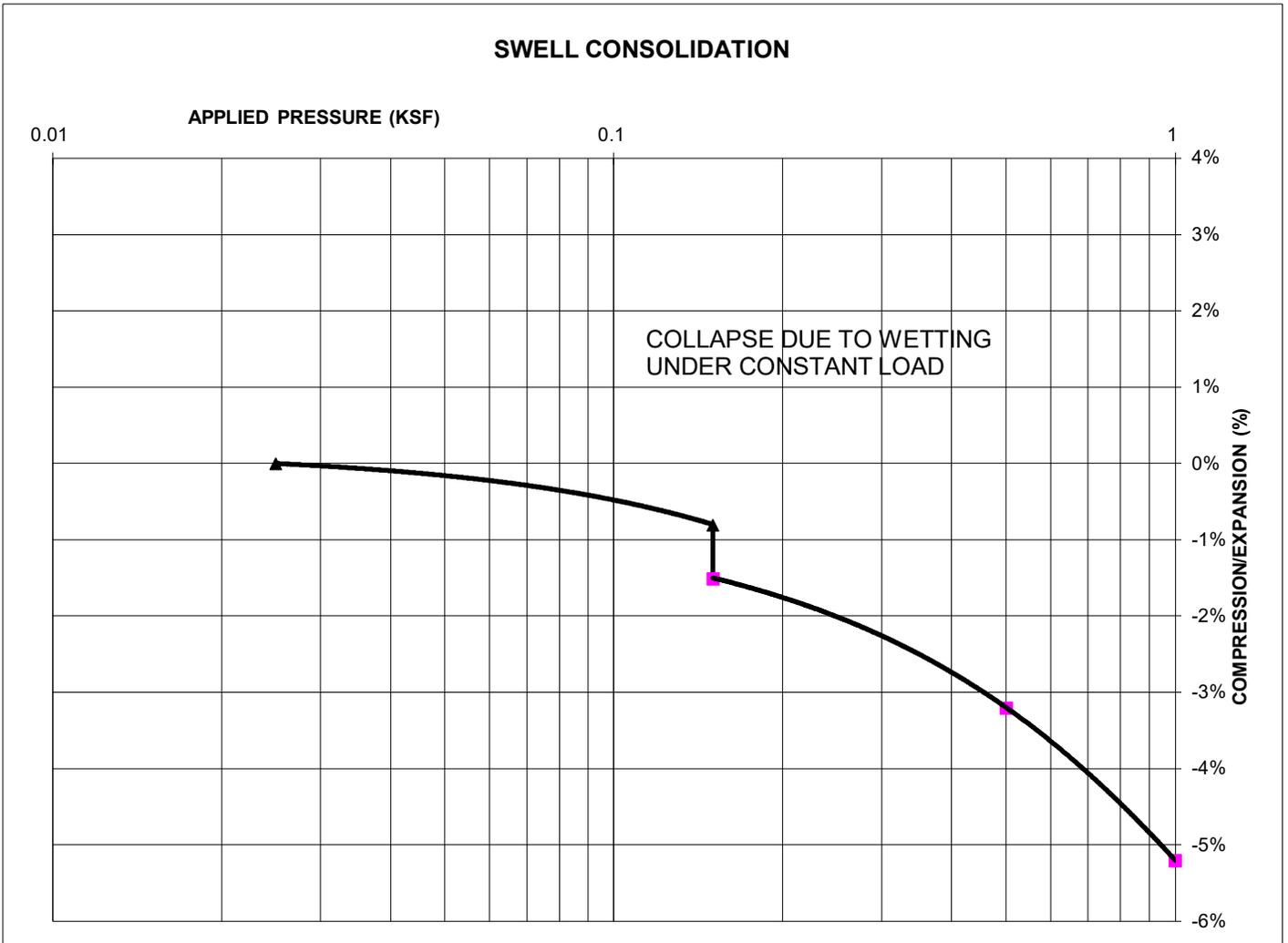
WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-54

TEST BORING 2
DEPTH (FT) 5

SOIL DESCRIPTION CLAY, WITH SAND
SOIL TYPE 4



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

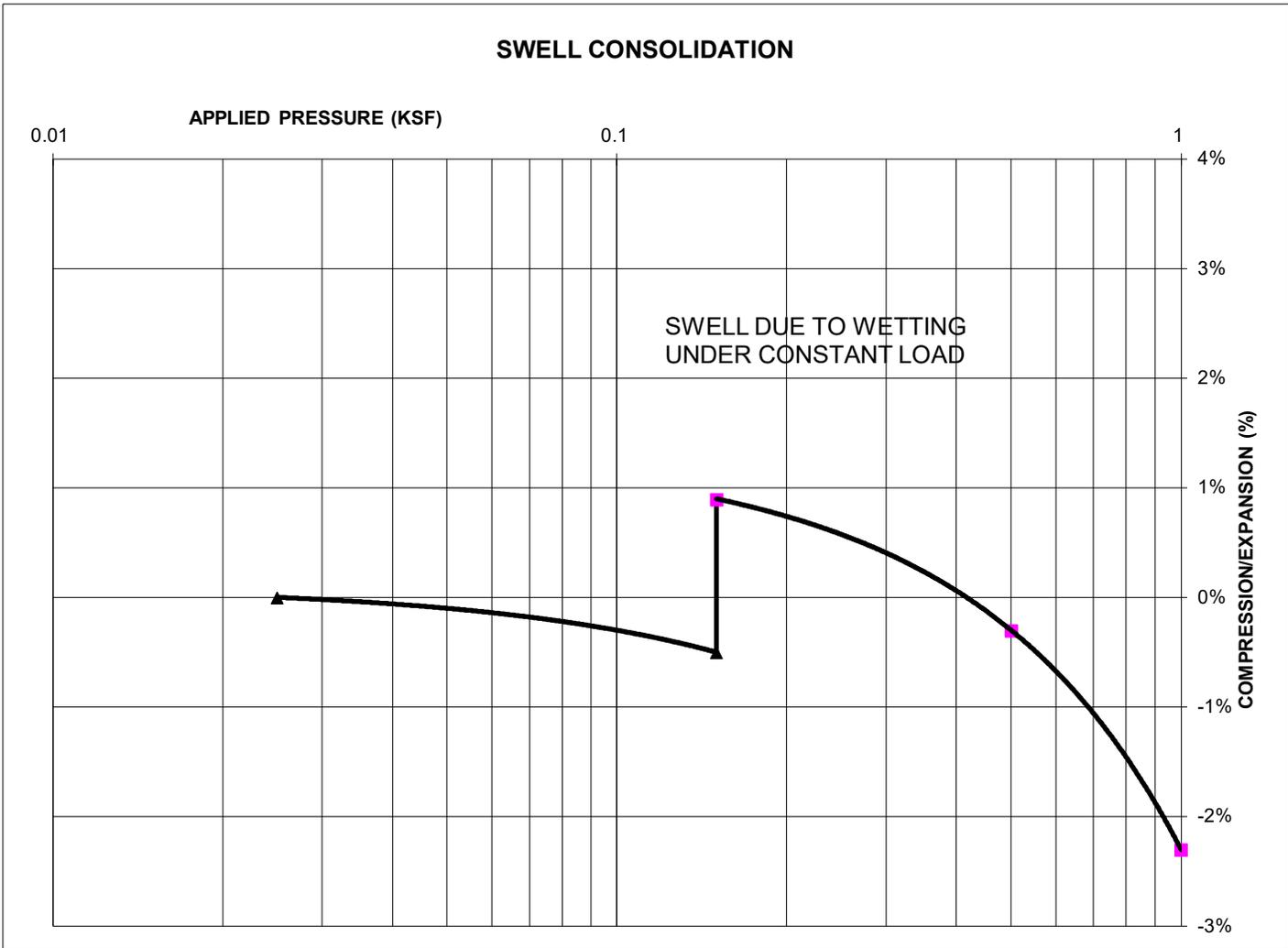
WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

FIG. B-55

TEST BORING 4
DEPTH (FT) 5

SOIL DESCRIPTION CLAY, SANDY
SOIL TYPE 4



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

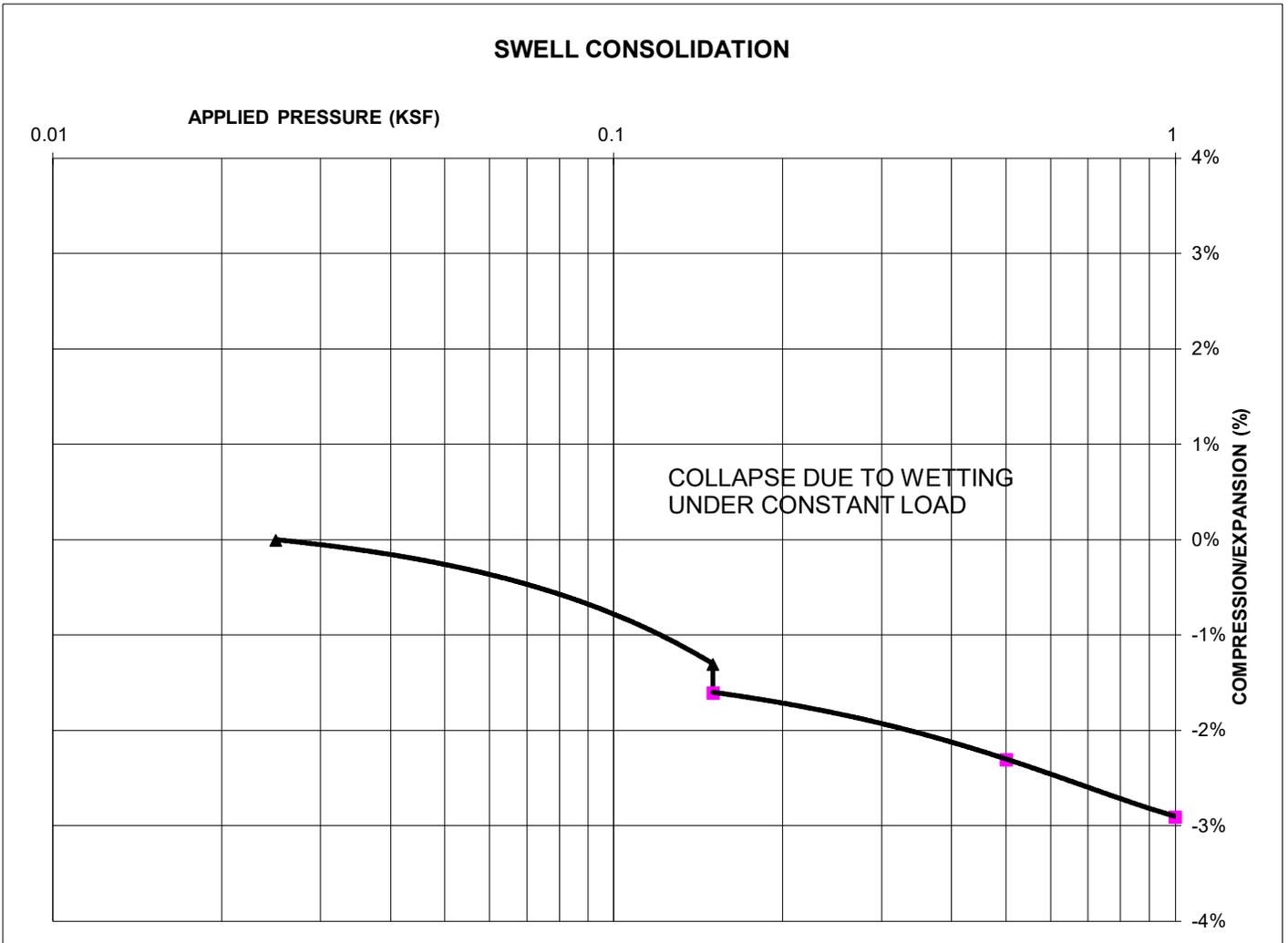
WINSOME, FILING NO. 3
PROTERRA

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FIG. B-56

TEST BORING 8
DEPTH (FT) 10

SOIL DESCRIPTION SAND, CLAYEY
SOIL TYPE 4



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

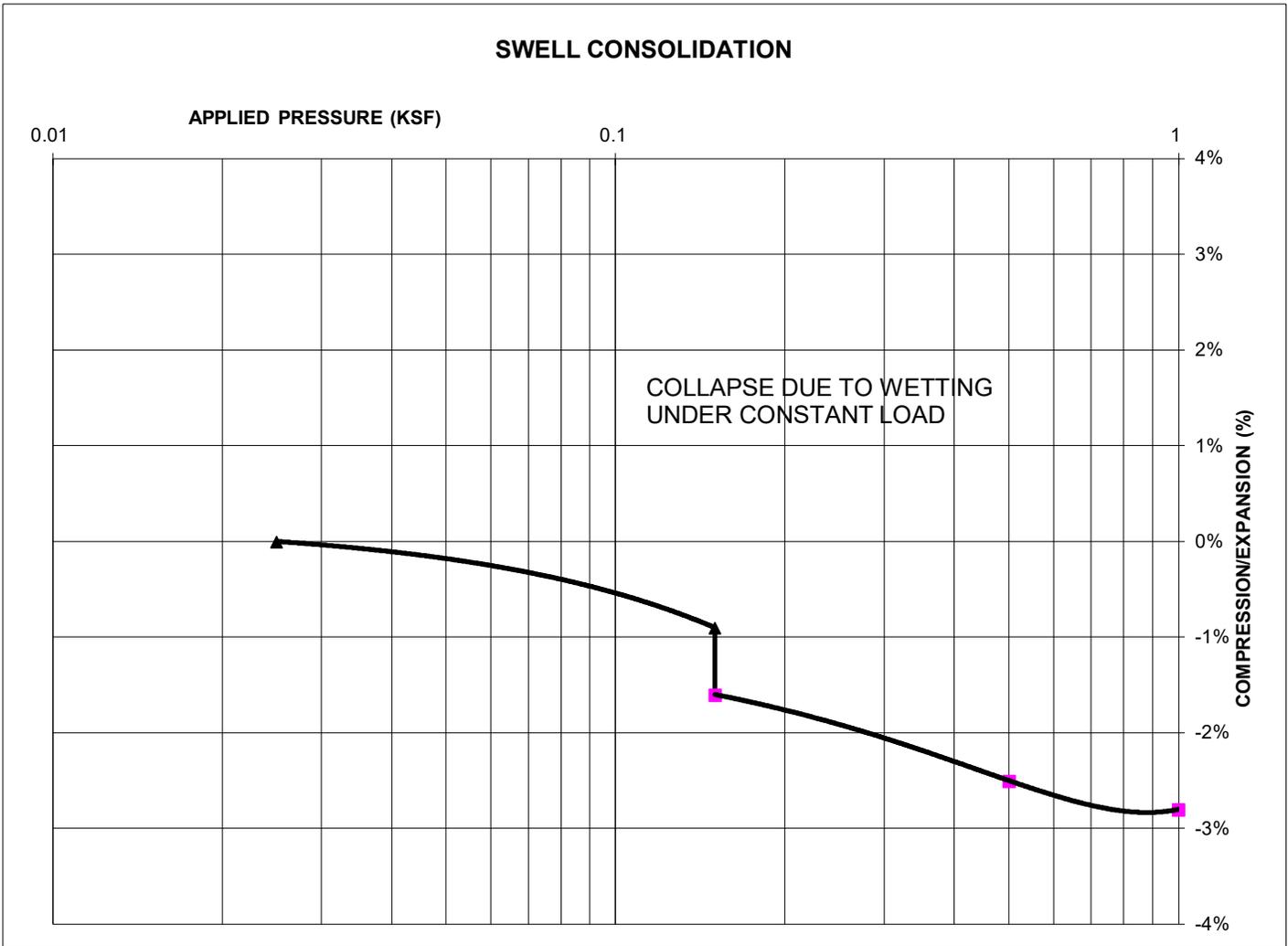
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PROTERRA

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240824

FIG. B-57

TEST BORING 12
DEPTH (FT) 5

SOIL DESCRIPTION CLAY, SANDY
SOIL TYPE 4



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

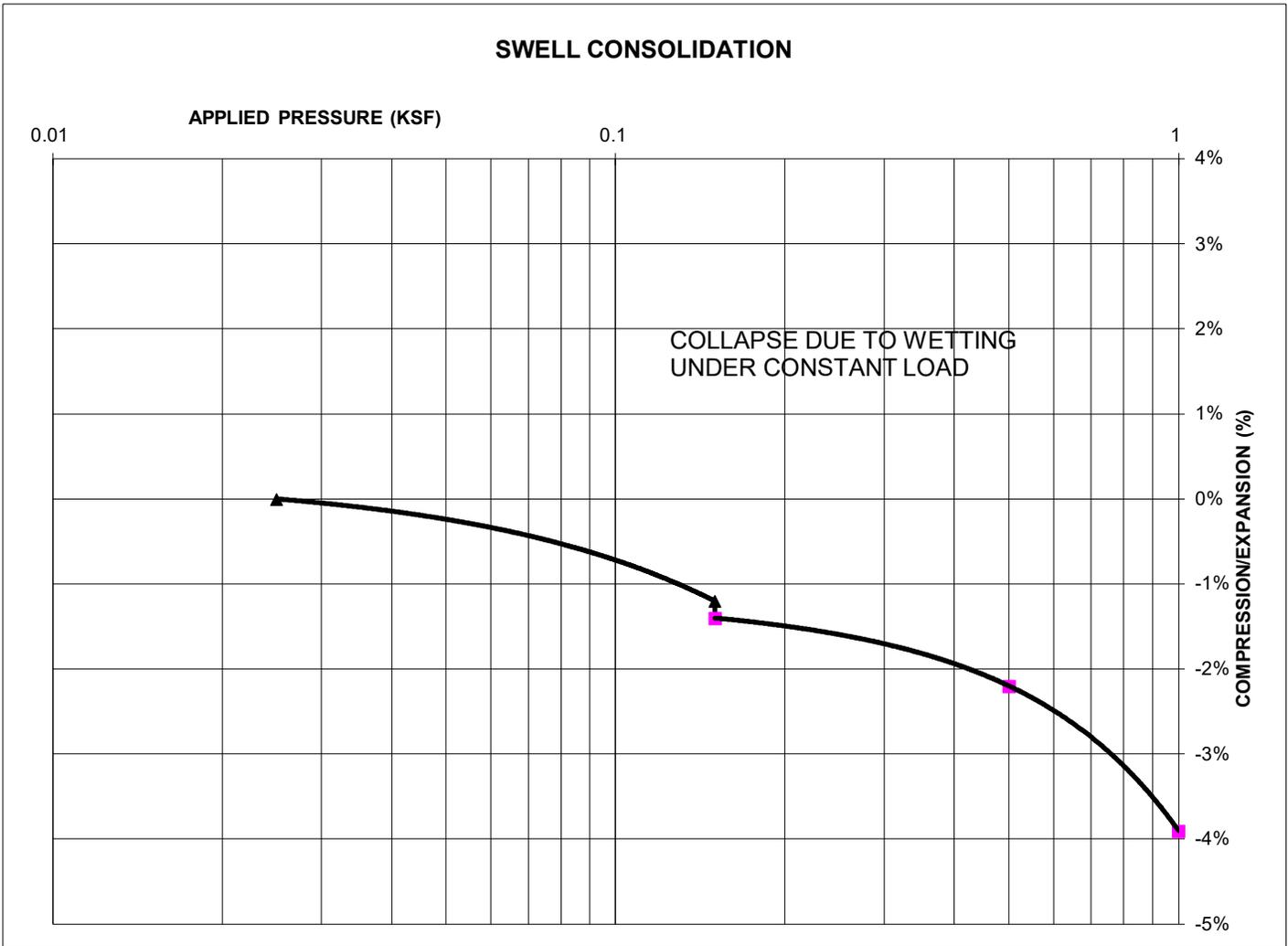
WINSOME, FILING NO. 3
PROTERRA

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240824

FIG. B-58

TEST BORING 19
DEPTH (FT) 5

SOIL DESCRIPTION CLAY, WITH SAND
SOIL TYPE 4



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

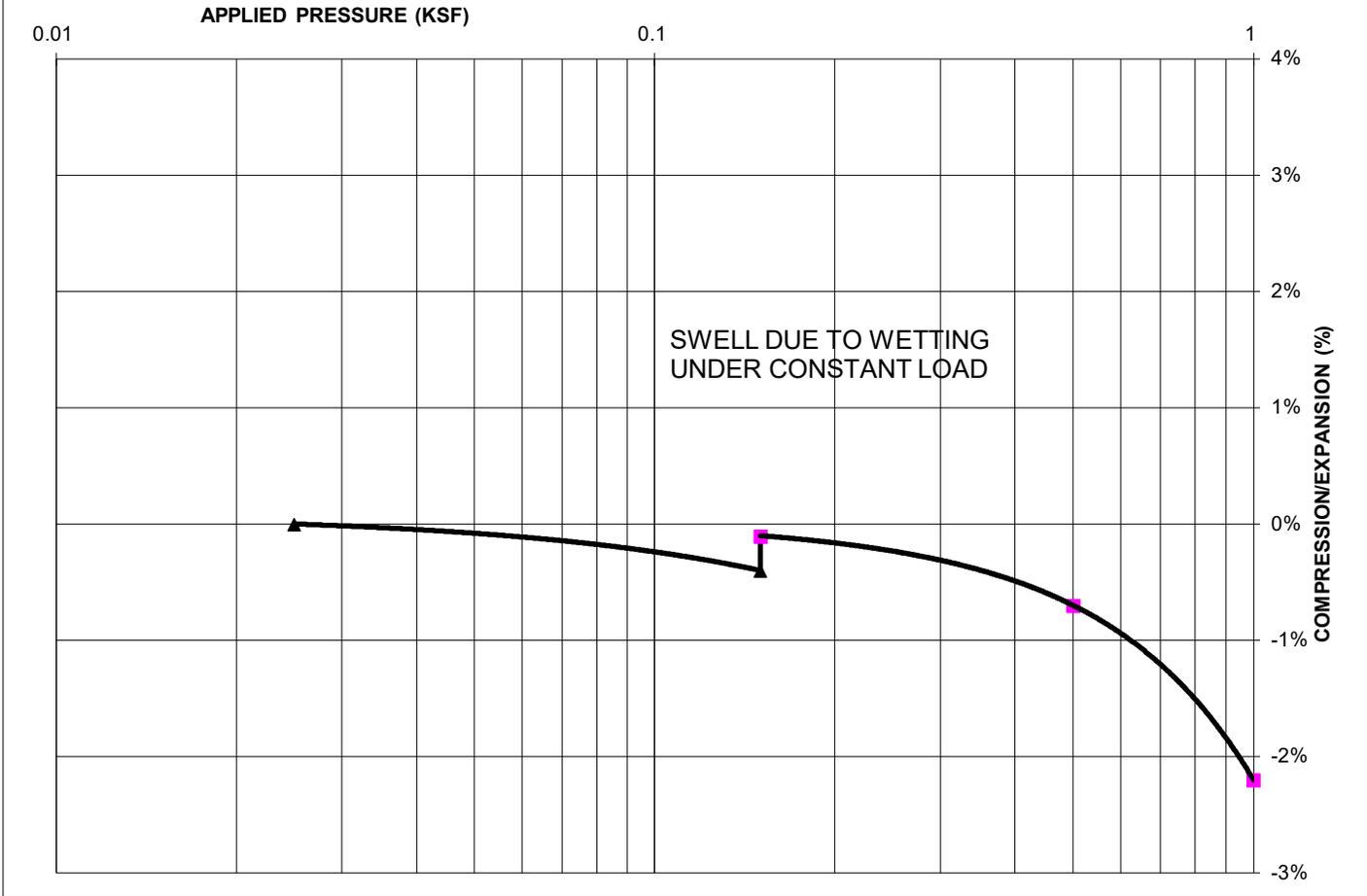
JOB NO.
240824

FIG. B-59

TEST BORING 20
DEPTH (FT) 5

SOIL DESCRIPTION CLAY, WITH SAND
SOIL TYPE 4

SWELL CONSOLIDATION



SWELL/COLLAPSE TEST RESULTS

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



SWELL TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

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240824

FIG. B-60

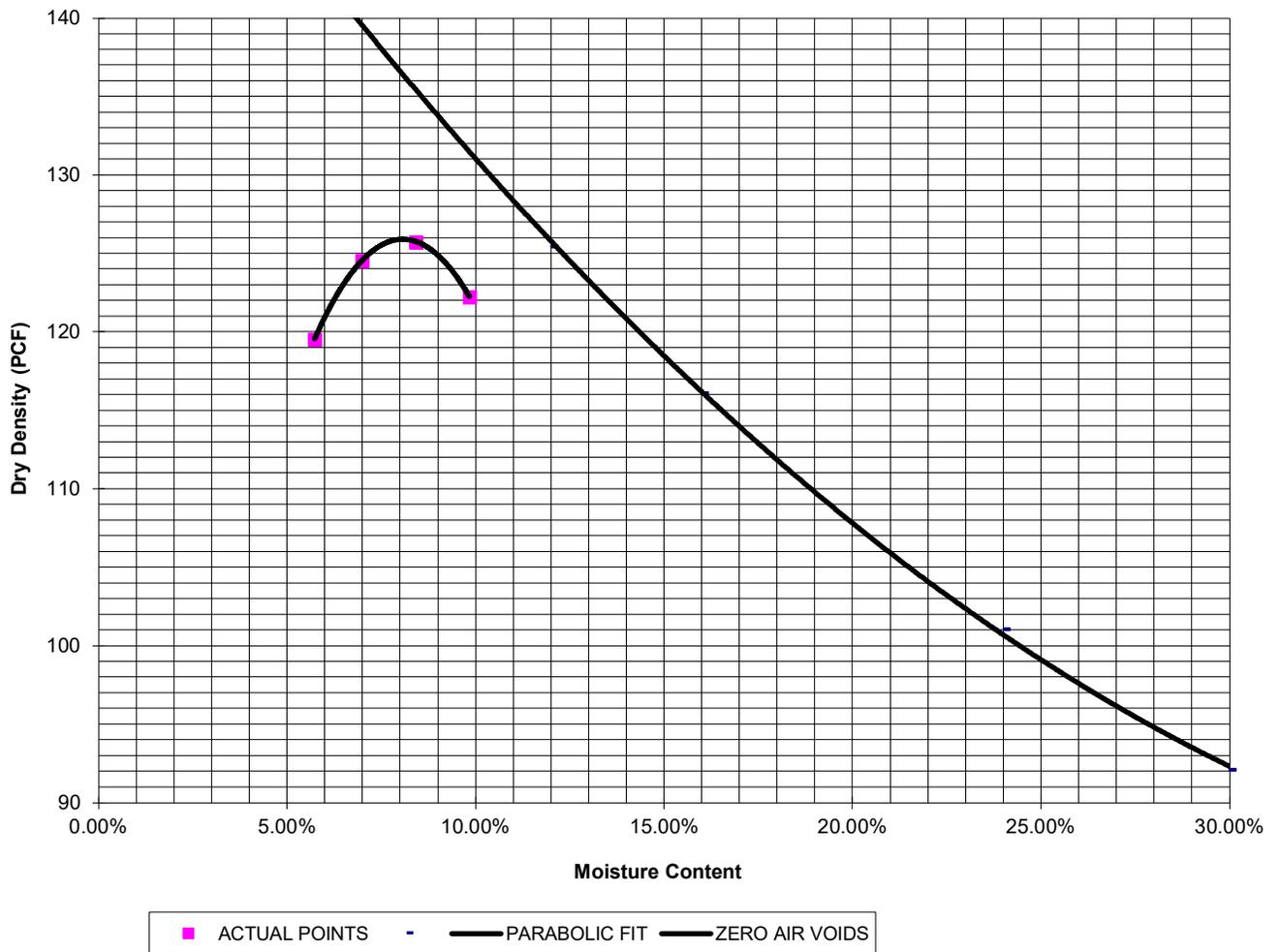
SAMPLE LOCATION TB-2 @ 0-3'

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

Compaction Curve



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 (in²): 2.993

| Penetration Depth (inches) | 10 BLOWS Mold # 1 | | 25 BLOWS Mold # 2 | | 56 BLOWS Mold # 3 | |
|----------------------------------|----------------------|-----------------|----------------------|-----------------|----------------------|-----------------|
| | Load (lbs) | Stress (psi) | Load (lbs) | Stress (psi) | 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. H2O | 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



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
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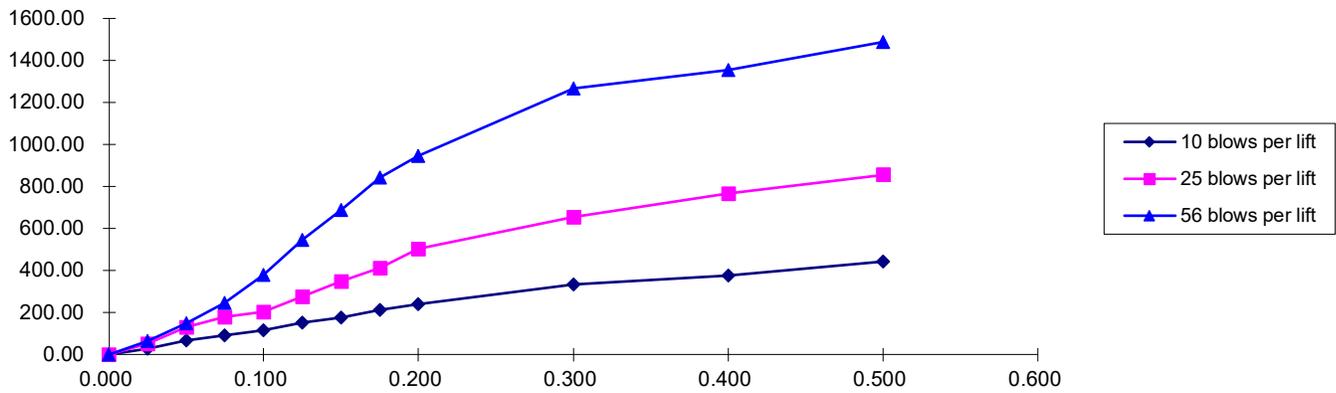
JOB NO.
240824

FIG. B-62

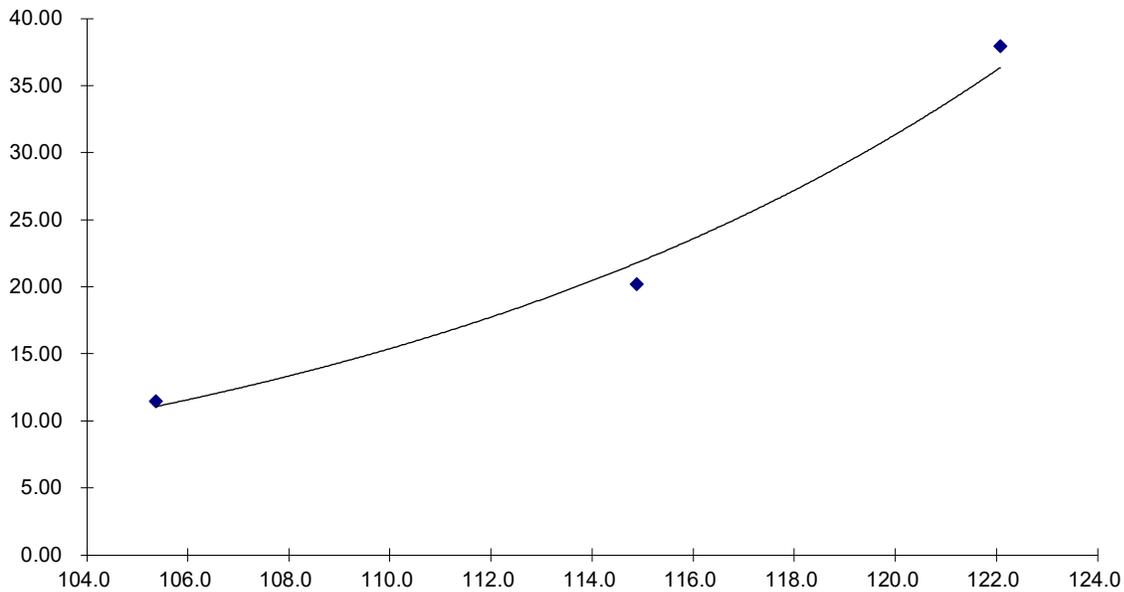
SAMPLE LOCATION TB-2 @ 0-3'

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

Stress VS Penetration



Bearing Ratio VS Dry Density



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

JOB NO.
240824

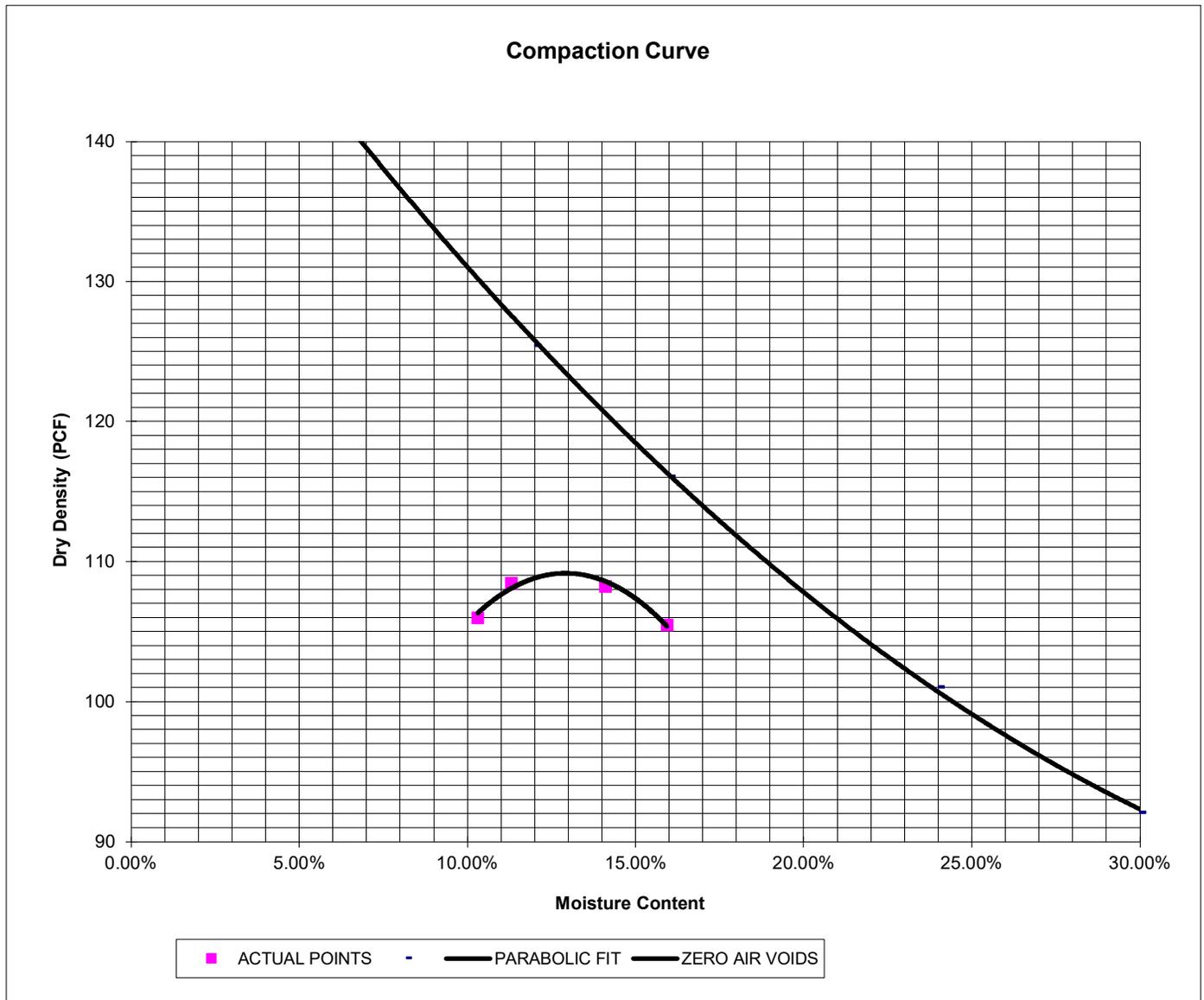
FIG. B-63

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



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 (in²): 2.993

| Penetration Depth (inches) | 10 BLOWS Mold # 1 | | 25 BLOWS Mold # 2 | | 56 BLOWS Mold # 3 | |
|----------------------------------|----------------------|-----------------|----------------------|-----------------|----------------------|-----------------|
| | Load (lbs) | Stress (psi) | Load (lbs) | Stress (psi) | 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. H2O | 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



LABORATORY TEST RESULTS

WINSOME, FILING NO. 3
PROTERRA

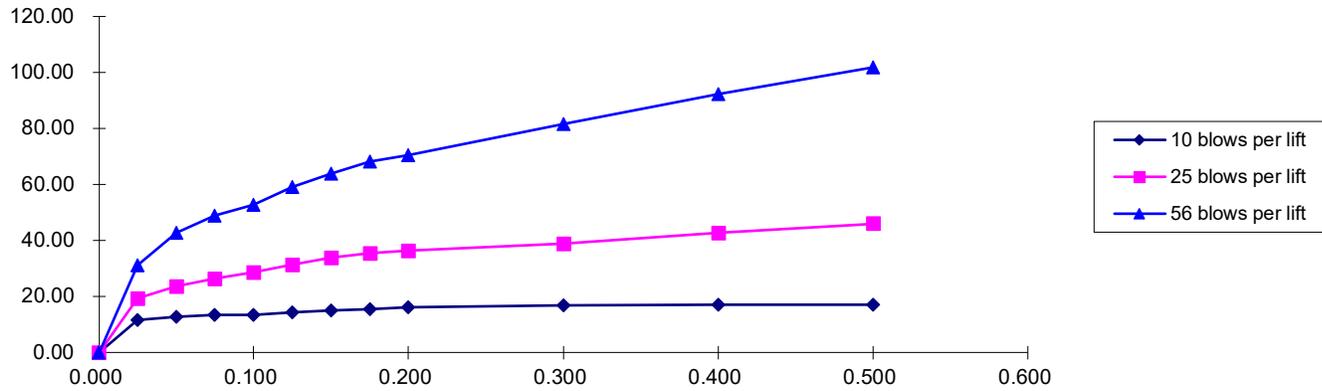
JOB NO.
240824

FIG. B-65

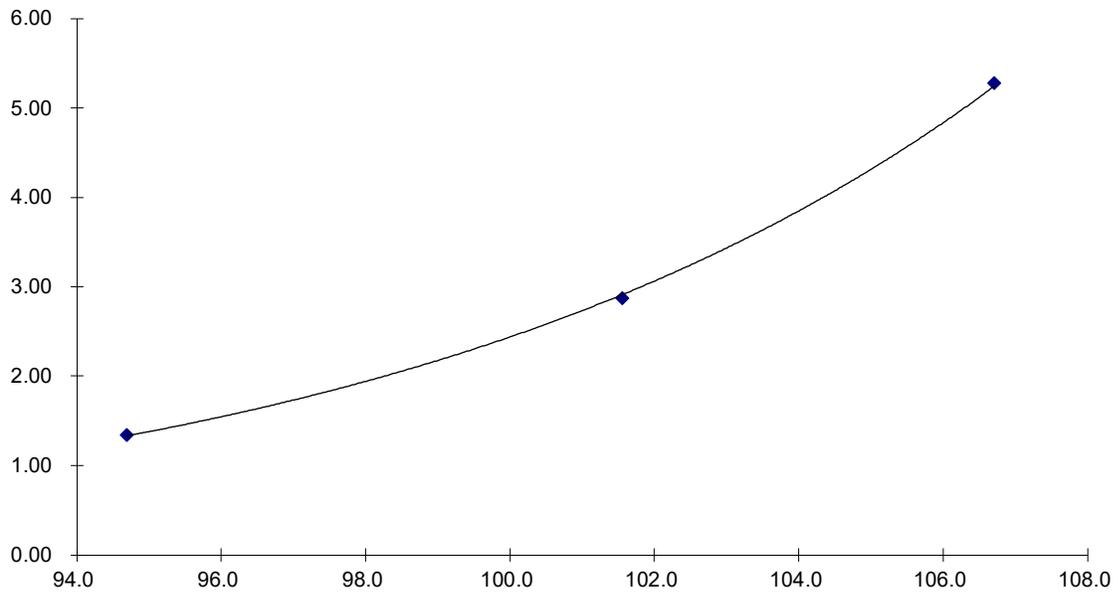
SAMPLE LOCATION TB-7 @ 0-3'

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

Stress VS Penetration



Bearing Ratio VS Dry Density



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 | $\Delta\psi$ = | 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:

$$M_R = (\text{CBR}) \times 1,500$$

If using R-Value:

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

Required Structural Number

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

Pavement Section Thickness

$SN^* = C_1 D_1 + C_2 D_2$ 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