

Geotechnical Engineering Report

N13(3-3) US 491 to Red Valley Pavement Rehabilitation Project

Station Nos. 10+00 to 599+50

Red Valley to MP 9.1

San Juan County, NM and Apache County, AZ

June 18, 2025

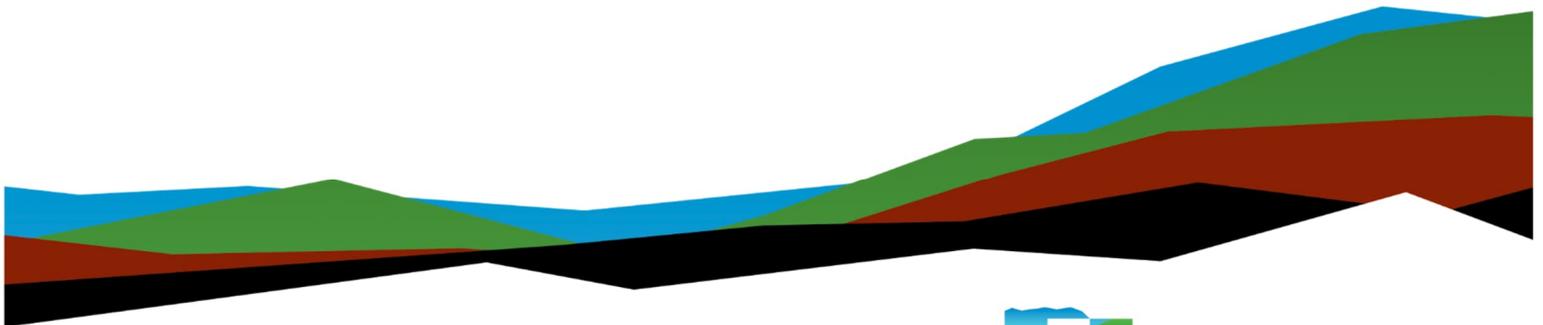
Terracon Project No. 66215110

Prepared for:

Wilson & Company, Inc.
Albuquerque, New Mexico

Prepared by:

Terracon Consultants, Inc.
Albuquerque, New Mexico



Nationwide
[Terracon.com](https://www.terracon.com)

- Facilities
- Environmental
- Geotechnical
- Materials

June 18, 2025



Wilson & Company, Inc.
4401 Masthead Street NE, Suite 150
Albuquerque, New Mexico 87109

Attn: Ms. Myra Candelaria, P.E.
P: (505) 348-4074
E: Myra.Candelaria@wilson.com

**Re: Geotechnical Engineering Report
N13(3-3) US 491 to Red Valley Rehabilitation Project
Station Nos. 10+00 to 599+50
Red Valley to MP 9.1
San Juan County, NM and Apache County, NM
Terracon Project No. 66215110**

Dear Ms. Candelaria:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering services for the above referenced project. These services were performed in general accordance with Wilson & Company Subconsultant Agreement No. 2 dated March 2, 2018, Navajo Department of Transportation (NDOT) Contract No. CO12695 and Task Order No. 51 dated February 7, 2018, Terracon Proposal Reference No. P66215110 dated April 25, 2023. This geotechnical engineering report presents the results of the subsurface exploration and provides geotechnical recommendations concerning pavements and earthwork for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

A handwritten signature in black ink that reads "m Bagtharia".

Mayank K. Bagtharia
Geotechnical Group Manager

A handwritten signature in black ink that reads "Isaac Willems".

Isaac Willems, P.E.
Senior Engineer



Copies to: Addressee (1 via email)



Terracon Consultants, Inc. 6805 Academy Parkway West NE Albuquerque, New Mexico 87109
P [505] 797 4287 F [505] 797 4288 terracon.com

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	i
1.0 INTRODUCTION	1
2.0 PROJECT INFORMATION	2
2.1 Project Description.....	2
2.2 Site Location and Description	3
3.0 SURFACE AND SUBSURFACE CONDITIONS	3
3.1 Typical Surface and Subsurface Profile	3
3.2 Groundwater	6
4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION	6
4.1 Geotechnical Considerations	6
4.2 Earthwork	8
4.2.1 Site Preparation	8
4.2.2 Excavation and Embankment.....	9
4.2.3 Subgrade Preparation	9
4.2.4 Structural Backfill Materials and Placement.....	9
4.2.5 Compaction Requirements.....	10
4.2.6 Grading and Drainage	11
4.2.7 Corrosion Potential.....	11
4.3 Pavements.....	12
4.3.1 Design Recommendations	12
4.3.2 Materials Specifications.....	14
4.3.3 Pavement Maintenance.....	15
5.0 GENERAL COMMENTS	15

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
June 18, 2025 ■ Terracon Project No. 66215110



TABLE OF CONTENTS– continued

Appendix A – Field Exploration

- Site Location Map
- Exploration Plans
- Field Exploration Description
- Boring Logs
- General Notes
- Unified Soil Classification System

Appendix B – Laboratory Testing

- Laboratory Test Description
- Grain Size Distribution
- Swell Consolidation
- Resistance Value (R-Value) of Compacted Soil
- Chemical/Corrosion Potential
- Summary of Laboratory Results

Appendix C – Traffic and Pavement Design Information

- ESAL Calculations and AASHTO Pavement Design Thickness Spreadsheet

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
June 18, 2025 ■ Terracon Project No. 66215110



EXECUTIVE SUMMARY

This geotechnical executive summary should be used in conjunction with the entire report for design and/or construction purposes. It should be recognized that specific details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled General Comments should be read for an understanding of the report limitations.

A geotechnical exploration has been performed for the proposed Pavement Rehabilitation Project along US 491 from Red Valley, AZ to MP 9.1 (Station Nos. 10+00 to 599+50) located in San Juan County, NM and Apache County, AZ. Terracon's geotechnical scope of work included the advancement of 81 test borings to approximate depths of 1 to 8.5 feet below existing site grades.

Based on the information obtained from our subsurface exploration, the site is suitable for the proposed improvements/reconstruction. The following geotechnical considerations were identified:

Existing Pavement Thickness: The existing pavement section thickness along the project alignment varies from approximately 1.5 to 15.5 inches of asphalt concrete. Base course was not encountered below the pavement materials.

The pavement section thickness along the majority of the project alignment (MP 3.5 to MP 9.1) ranges from about 8 to 15.5 inches, with the average thickness being on the order of about 10.5 inches. The pavement section thickness at west end of the project alignment (Red Valley, AZ to MP 3.5) ranges from about 1.5 to 7 inches, with the average asphalt concrete thickness being on the order of about 3.5 inches.

Subgrade Soils and Bedrock: The site subgrade soils consisted of sand with varying amounts of silt, clay, and gravel, clay with varying amounts of sand and gravel, and silt with varying amounts of sand and gravel. Sandstone and/or shale sedimentary bedrock was encountered in some borings at depths ranging from about 2.5 to 5 feet below existing site grade. The soils classified as A-2-4, A-2-6, A-3, A-4, A-6, and A-7-6 in accordance with the AASHTO Soil Classification system. Groundwater was not encountered in any the borings at the time of drilling. On-site sand soils are suitable for use as structural backfill. On-site soils are suitable for use as subgrade beneath pavements. Based upon the AASHTO soil classifications and R-value test results, the majority of the subgrade soils are considered to be relatively good quality for roadway/pavement support. However, relatively poor quality subgrade soils (A-7-6) were encountered in two (2) borings located within the western portion of the alignment. To improve long-term pavement performance, consideration should be given to the use of chemical or mechanical stabilization or removal and replacement of these A-7-6 subgrade soils with higher quality soils.

Pavement Section: It is our understanding that that the proposed new pavement section will consist of asphalt concrete (AC) pavement over aggregate base course and/or a continuous cold recycle asphalt course (CCRAC) is being considered for the project. The CCRAC performed on other segments of N13 consisted of milling/processing the upper 3 inches of the existing asphalt pavement surface to provide a CCRAC. The CCRAC was covered with the placement of a recycled fog seal followed by a rubberized asphalt chip seal layer and surface fog seal coat.

Based upon the field exploration, the existing pavement section thickness is variable. CCRAC appears to be feasible along the approximate eastern 2/3 of the project alignment, since the average existing asphalt concrete thickness is on the order of about 10.5 inches. However, CCRAC will be limited and/or not feasible along the approximate western 1/3 portion of the project alignment, since the average existing asphalt concrete thickness is on the order of about 3.5 inches. In areas of thin existing pavement section thickness, CCRAC will likely not be feasible if a 20 year design life is desired.

As an alternative to CCRAC, the existing pavement could be processed, placed and compacted in-place as a base course layer or incorporated into the existing subgrade to improve strength and pavement support

Responsive ■ Resourceful ■ Reliable

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
June 18, 2025 ■ Terracon Project No. 66215110



capabilities. The existing pavement should be adequately processed and blended resulting in a modified subgrade free of voids and “nesting” of the asphalt fragments.

The recommended new pavement section thicknesses are summarized below:

Approximate Station No.	MATERIAL	Recommended Pavement Section Thickness (in)
10+00 to 40+00	New Hot Mix Asphalt (HMA)	4.5
85+00 to 95+00	Continuous Cold Recycled Asphalt Course (CCRAC)	2.5 ¹
130+00 to 160+00		
200+00 to 210+00		
40+00 to 85+00	New Hot Mix Asphalt (HMA)	3.5 ²
95+00 to 130+00	Continuous Cold Recycled Asphalt Course (CCRAC)	2.5 ¹
160+00 to 200+00		
210+00 to 289+00		
289+00 to 599+50	New Hot Mix Asphalt (HMA)	N/A
	Continuous Cold Recycled Asphalt Course (CCRAC)	3 ^{3,4}

1. Assumes a minimum of 2.5 inches of CCRAC below new HMA layer
2. For construction consistency, the thicker section of 4.5" HMA over 2.5" CCRAC above could be used
3. Minimum 3 inch CCRAC followed by rubberized chip seal and fog seal.
4. Minimum average existing asphalt concrete thickness of 10.5 inches. Areas of existing pavement section thickness less than 10.5 inches have an estimated design life of about 16 to 19 years.

Subgrade Stability: Elevated moisture contents and loose soils were observed within the subgrade along portions of the project alignment. Therefore, drying, mechanical stabilization, chemical stabilization, and/or replacement of these soils may be required to provide a stable platform for construction.

Earthwork on the project should be observed and evaluated by Terracon or a qualified geotechnical engineer. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, and other geotechnical conditions exposed during construction.

GEOTECHNICAL ENGINEERING REPORT
N13(3-3) US 491 TO RED VALLEY PAVEMENT REHABILITATION
PROJECT
STATION NOS. 10+00 TO 599+50
RED VALLEY TO MP 9.1
SAN JUAN COUNTY, NM AND APACHE COUNTY, AZ

Terracon Project No. 66215110
June 18, 2025

1.0 INTRODUCTION

This report presents the results of our geotechnical engineering services performed for the proposed Pavement Rehabilitation Project along US 491 from Red Valley, AZ to MP 9.1 located in San Juan County, NM and Apache County, AZ. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- | | |
|--|--|
| ■ Subsurface soil and bedrock conditions | ■ Reuse of existing pavement materials |
| ■ Earthwork | ■ Pavement rehabilitation |
| ■ Pavement material specifications | ■ Pavement design and construction |
| ■ Groundwater conditions | ■ Concrete and metal corrosion |

Our geotechnical engineering scope of work for this project included the advancement of 81 test borings to depths of approximately 1 to 8.5 feet below existing site grades along the project alignment.

Logs of the borings along with a Site Location Map and Exploration Plan are included in Appendix A of this report. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included in Appendix B of this report. Descriptions of the field exploration and laboratory testing are included in their respective appendices.



Terracon Consultants, Inc. 6805 Academy Parkway West NE Albuquerque, New Mexico 87109
P [505] 797 4287 F [505] 797 4288 terracon.com

Geotechnical



Environmental



Construction Materials



Facilities

2.0 PROJECT INFORMATION

2.1 Project Description

ITEM	DESCRIPTION
Structures	The project will include improvements to an approximate 10-mile segment of roadway. The improvements addressed as part of this phase of the project include: <ul style="list-style-type: none"> ■ Pavement rehabilitation and/or reconstruction ■ Drainage improvements ■ Fencing ■ Guardrail ■ Cattle guard improvements ■ Signing ■ Striping ■ Other miscellaneous items
Cut and Fill Slopes	At or near existing alignment grade
Slope configuration	Not Applicable
Proposed pavement wearing surface	Asphalt concrete (AC) pavement over aggregate base course Continuous cold recycle asphalt course (CCRAC)
Traffic data	Average Adjusted Daily Traffic (AADT): <ul style="list-style-type: none"> ■ MP 4.8 – 2,018 ■ MP12.90 – 1,573 Truck Traffic: 15%
Specifications	2014 FP-14 Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects 2019 NMDOT Standard Specifications for Highway and Bridge Construction 1993 American Association of State Highway and Transportation Officials (AASHTO) Guide for the Design of Pavement Structures 2014 Federal Lands Highway (FLH) Project Development and Design Manual

2.2 Site Location and Description

ITEM	DESCRIPTION
Location	Red Valley, Arizona in Apache County, Arizona to MP 9.1 in San Juan County, New Mexico.
Length of improvements	Approximately 10 miles
Existing improvements	Existing two-lane asphalt paved roadway with narrow paved shoulders.
Pavement condition	<p>Poor to fair condition with longitudinal cracking, transverse cracking, block cracking, alligator cracking, patching, bleeding, weathering, and oxidation throughout the majority of the project alignment.</p> <p>The majority of the pavement distress consists of moderate to high severity transverse cracking and some limited undulations/subgrade instability in areas of existing cut embankments.</p> <p>Limited maintenance consisting of crack filling and patching has been performed along the project alignment.</p>
Highway classification	Rural Major Arterial/Collector (assumed)
Current ground cover	Paved highway and exposed earth with vegetation common to the area located adjacent to the highway.
Existing topography	Highway constructed on relatively flat to gently rolling terrain.

3.0 SURFACE AND SUBSURFACE CONDITIONS

3.1 Typical Surface and Subsurface Profile

Specific conditions encountered at the boring locations are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual. Details for each of the borings can be found on the boring logs included in Appendix A of this report. Based on the results of the borings, subsurface soil conditions on the project site can be generalized as follows:

Description	Approximate Depth to Bottom of Stratum (feet)	Material Encountered	Consistency/Density
Stratum 1	0.125 to 1.29	Asphalt Concrete – 1.5” to 15.5” ¹ Base Course – N/A	Not Applicable

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
 June 18, 2025 ■ Terracon Project No. 66215110



Description	Approximate Depth to Bottom of Stratum (feet)	Material Encountered	Consistency/Density
Stratum 2	4 to 6.5	Clay and Silt. The sand and gravel content varied ²	Medium Stiff to Hard
Stratum 3	4	Gravel. The sand and clay content varied ³	Medium Dense
Stratum 4	6 to 6.5	Sand. The silt, clay and gravel content varied	Loose to Dense
Stratum 5	6 to 6.5	Sandstone and/or Shale Sedimentary Bedrock ⁴	Firm to Very Hard

1. Pavement section thickness along the majority of the alignment ranges from about 3 to 4 inches. Pavement section thickness at east end of project alignment ranges from 10 to 15.5 inches. Average pavement section thickness along entire project alignment is about 4.25 inches.
2. Encountered in Boring Nos. B-6, B-14 and B-15, B-25, B-29, B-36 through B-38, B-42, B-44, B-49, and B-52
3. Encountered in Boring No. B-08
4. Encountered in Boring Nos. B-12, B-13, B-28, B-31, through B-33, B-43, an B-44

The subsurface sand and silt subgrade soils and sandstone bedrock were non-plastic to medium in plasticity. The subsurface clay subgrade soils and shale bedrock were low to high in plasticity.

The shallow subgrade soils are classified as outlined below:

Boring Nos.	Unified Soil Classification System (USCS)	AASHTO Soil Classification System
B-09, B-11 to B-13, B-16 to B-19, B-24, B-27, B-28, B-30, B-31, B-33 to B-35, B-39 to B-41, B-43, B-44, B-46, B-54 thru B-56, B-59, B-68. B-69, B-73, B-74	SP-SM SM	A-2-4
B-08	GC	A-2-6
B-05, B-26, B-32, B-42, B-45	SP SP-SM	A-3
B-01, B-04, B-07, B-10B-20 to B-22, B-25, B-29, B-36 to B-38, B-47 to B-53, B-57, B-63, B-65 thru B-67, B-72, B-73, B-75, B-76, HA-01, and HA-02	SM ML	A-4
B-03, B-14, B-15, B-23, B-58, B-60 thru B-61, B-64, B-78	SC CL	A-6
B-02, B-06 and B-62	SC CH	A-7-6

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
 June 18, 2025 ■ Terracon Project No. 66215110



The near surface subgrade soils exhibit in-situ dry density and moisture contents ranging from about 94 to 134 pounds per cubic foot (pcf) and 2 to 23 percent, respectively.

The results of the R-value testing of the shallow subgrade soils are outlined below:

Boring No.	Unified Soil Classification System (USCS)	AASHTO Soil Classification System	R-Value
B-02	SC	A-7-6	9
B-03	SC	A-6	67
B-04	SM	A-4	33
B-16	SM	A-2-4	72
B-24	SM	A-2-4	61
B-26	SP	A-3	52
B-41	SM	A-2-4	75
B-46	SM	A-2-4	66
B-55	SP-SM	A-2-4	70

The results of the corrosion potential tests are summarized below.

Boring No.	Unified Soil Classification System (USCS)	AASHTO Soil Classification System	Water Soluble Sulfates (mg/kg, ppm)	pH	Resitivity (ohm-cm)
B-04	SM	A-4	38	8.66	2,490
B-07	SM	A-4	81	9.15	2,380
B-13	SM	A-2-4	45	9.14	3,800
B-24	SM	A-2-4	<7.5	8.48	3,440
B-29	ML	A-4	30	9.04	4,210
B-32	SP-SM	A-3	140	8.93	1,710
B-38	ML	A-4	31	9.04	3,630
B-43	SM	A-2-4	24	9.74	4,850
B-45	SP-SM	A-3	160	9.21	1,390
B-53	SM	A-4	53	9.50	2,720

Laboratory tests are presented in Appendix B.

3.2 Groundwater

Groundwater was not observed in the test borings at the time of field exploration, nor when checked upon completion of drilling. These observations represent groundwater conditions at the time of the field exploration and may not be indicative of other times, or at other locations. Groundwater conditions can change with varying seasonal and weather conditions, and other factors.

Fluctuations in groundwater levels can best be determined by implementation of a groundwater monitoring plan. Such a plan would include installation of groundwater monitoring wells, and periodic measurement of groundwater levels over a sufficient period of time.

4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

4.1 Geotechnical Considerations

The site appears suitable for the proposed improvements based upon geotechnical conditions encountered in the test borings.

The existing pavement section thickness along the project alignment varies from approximately 1.5 to 15.5 inches of asphalt concrete. Base course was not encountered below the pavement materials.

The pavement section thickness along the majority of the project alignment (MP 3.5 to MP 9.1) ranges from about 8 to 15.5 inches, with the average thickness being on the order of about 10.5 inches. The pavement section thickness at west end of the project alignment (Red Valley, AZ to MP 3.5) ranges from about 1.5 to 7 inches, with the average asphalt concrete thickness being on the order of about 3.5 inches.

Based upon the AASHTO soil classifications and R-value test results, the majority of the subgrade soils are considered to be relatively good quality for roadway/pavement support. However, relatively poor quality subgrade soils (A-7-6) were encountered in two (2) borings located within the western portion of the alignment (approximate Station Nos. 277+00 and 299+00). In addition, the existing pavement section thickness at approximate Station No. 277+00 was on the order of about 2.5 inches thick. Therefore, to improve long-term pavement performance at approximate Station No. 277+00, consideration should be given to the use of chemical or mechanical stabilization or removal and replacement of these A-7-6 subgrade soils with higher quality soils.

It is our understanding that that the new pavement section will consist of hot mix asphalt (HMA) concrete pavement over a continuous cold recycle asphalt course (CCRAC) and/or CCRAC with surface treatments are being considered for the project. The CCRAC performed on other

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
June 18, 2025 ■ Terracon Project No. 66215110



segments of N13 consisted of milling/processing the upper 3 inches of the existing asphalt pavement surface to provide a CCRAC surface. The CCRAC was covered with the placement of a recycled fog seal followed by a rubberized asphalt chip seal layer and surface fog seal coat.

Based upon the field exploration, the existing pavement section thickness along the project alignment is variable. CCRAC appears to be feasible along the approximate eastern 2/3 of the project alignment, since the average existing asphalt concrete thickness is on the order of about 10.5 inches. However, CCRAC will be limited and/or not feasible along the approximate western 1/3 portion of the project alignment, since the average existing asphalt concrete thickness is on the order of about 3.5 inches.

Based upon the field exploration, the existing pavement section thickness is variable. It is our opinion that use of CCRAC using a rubberized chip seal and fog seal surface treatment is feasible for the approximate eastern 2/3 (approximate Station Nos. 289+00 to 599+50) of the project alignment where the average existing asphalt concrete pavement section thickness is 10.5 inches. Based upon the relatively thin existing pavement section along the approximate western 1/3 of the project alignment (approximate Station 10+00 to Station No. 289+00), it is our opinion that the use of CCRAC using a rubberized chip seal and fog seal may be limited and/or not feasible if a 20 year design life is desired. However, CCRAC could be used, but will require a hot mix asphalt (HMA) pavement surface layer to meet minimum pavement design life and traffic. During the CCRAC process, any unstable existing pavement/subgrade areas will require stabilization prior to the placement of new pavement materials. These locations will likely be associated with areas of existing thin pavement section, poor quality subgrade soils, structural pavement distress, high severity transverse and longitudinal cracking, and/or areas exhibiting low density and elevated moisture contents within the underlying subgrade. Based upon the boring log data, low density and elevated moisture content subgrade materials were encountered along approximate Station Nos. 277+00 through 299+00.

As an alternative to CCRAC, the existing pavement could be processed, placed and compacted as an untreated base course layer or incorporated into the existing subgrade to improve strength and pavement support capabilities. The existing pavement should be adequately processed and blended resulting in a modified subgrade free of voids and “nesting” of the asphalt fragments. If this option is being considered, we can provide supplemental recommendations.

Geotechnical engineering recommendations for pavements and other earth connected phases of the project are outlined below. The recommendations contained in this report are based upon the results of field and laboratory testing (which are presented in Appendices A and B), engineering analyses, and our current understanding of the proposed project.

4.2 Earthwork

The following presents recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project. The recommendations presented for design and construction of earth supported elements including pavements are contingent upon following the recommendations outlined in this section. The *Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-14*, referred hereafter as the Specifications, should be used for the project.

Earthwork, site preparation, and excavations should be performed in accordance with Section 200, “*Earthwork*” of the Specifications.

Earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of structural fill, backfill, subgrade preparation, and other geotechnical conditions exposed during the construction of the project.

4.2.1 Site Preparation

Site preparation should be performed in accordance with Section 201, “*Clearing and Grubbing*”, Section 203 “*Removal of structures and Obstructions*”, Section 209 “*Structure Excavation and Backfill*”, and Section 211, “*Obliterating Old Road*” (if applicable) of the Specifications.

Strip and remove existing pavement (where applicable), vegetation, debris, and other deleterious materials from proposed new pavement reconstruction or rehabilitation areas. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

If CCRAC is performed, the existing pavement surface will be modified in-situ to provide a new pavement surface or used as a base course for new pavement surface in accordance with Section 310, *Cold In-Place Recycled Asphalt Base Course*” of the Specifications.

Stripped materials consisting of vegetation and organic materials (where encountered) should be wasted from the site, or used to revegetate exposed slopes after completion of grading operations (if required). If it is necessary to dispose of organic materials on-site, they should be placed in non-structural areas, and in fill sections not exceeding five (5) feet in height.

Evidence indicating the potential presence of underground utilities adjacent to and within the project alignment was observed during the field operations. If abandoned utilities or loose fills or other underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

4.2.2 Excavation and Embankment

Excavation and embankment construction (if applicable) should be performed in accordance with Section 204, “*Excavation and Embankment*” of the Specifications.

It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. Based upon the subsurface conditions determined from the geotechnical exploration, excavations into the on-site soils will likely encounter caving soils.

Based on the results from the soil borings, we do not anticipate groundwater control measures will be necessary in excavations up to about 8.5 feet below existing site grades.

The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. Excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

4.2.3 Subgrade Preparation

Subgrade preparation should be conducted in accordance with Section 212 “*Linear Grading*” of the Specifications.

We anticipate that the subgrade soils will be relatively stable. However, loose soils and elevated moisture contents were encountered within the subgrade along portions of the project alignment. The stability of the subgrade may also be affected by precipitation, repetitive construction traffic or other factors. If unstable conditions develop, workability may be improved by scarifying and drying. Overexcavation of wet zones and replacement with granular materials may be necessary. Lightweight excavation equipment may be required to reduce subgrade pumping.

Based upon the AASHTO soil classifications and R-value test results, the majority of the subgrade soils are considered to be relatively good quality for roadway/pavement support. In addition, the existing pavement section thickness at approximate Station No. 277+00 was on the order of about 2.5 inches thick. Therefore, to improve long-term pavement performance at approximate Station No. 277+00, consideration should be given to the use of chemical or mechanical stabilization or removal and replacement of these A-7-6 subgrade soils with higher quality soils.

Subgrade stabilization should be performed in accordance with Section 207 “*Earthwork Geosynthetics*” and/or Section 213 “*Subgrade Stabilization*” of the Specifications.

4.2.4 Structural Backfill Materials and Placement

All fill materials should be inorganic soils free of vegetation, debris, and fragments larger than six (6) inches in size. Pea gravel or other similar non-cementitious, poorly graded materials should not be used as fill or backfill without the prior approval of the geotechnical engineer.

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
 June 18, 2025 ■ Terracon Project No. 66215110



Clean on-site sand soils or approved imported materials may be used as fill material for the following:

- general site grading
- utility trench backfill
- new pavement areas

On-site or imported soils for use as fill material should conform to low volume change materials as indicated in the following specifications:

<u>Gradation</u>	<u>Percent Finer by Weight (ASTM C 136)</u>
6"	100
3"	70-100
No. 4 Sieve	50-100
No. 200 Sieve	35 (max)
■ Liquid Limit	NV (max)
■ Plasticity Index	NP (max)
■ Minimum R-value	52

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Fill lifts should not exceed eight (8) inches loose thickness.

4.2.5 Compaction Requirements

Recommended compaction and moisture content criteria for engineered fill or backfill materials per Sections 204, 209, 212, 301, and 310 of the Specifications are as follows:

A-2-4 or Higher Quality Subgrade:

Material Type and Location	Per the Modified Proctor Test (AASHTO T180/ASTM D 1557)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction	
		Minimum	Maximum
Roadway Embankment	95	-3%	+3%
Beneath Pavements (top 6 inches)	95	-3%	+3%
Minor Structure or Utility Trench Backfill	95	-3%	+3%

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
June 18, 2025 ■ Terracon Project No. 66215110



All Other Soil Subgrade Types:

Material Type and Location	Per the Modified Proctor Test (AASHTO T99/ASTM D 698)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction	
		Minimum	Maximum
Roadway Embankment	95	-2%	+2%
Beneath Pavements (top 6 inches)	95	-2%	+2%
Minor Structure or Utility Trench Backfill	95	-2%	+2%

Base Course:

Material Type and Location	Per the Modified Proctor Test (AASHTO T180/ASTM D 1557)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction	
		Minimum	Maximum
Untreated Base Course	95	-3%	+3%
Cold In-Place Recycled Asphalt Base Course	97 ¹	N/A	N/A

1. Per Type A Control Strip Density or Type B prescriptive operations outlined in Section 310.09

4.2.6 Grading and Drainage

Positive drainage should be provided during construction and maintained throughout the life of the project. Infiltration of water into utility trenches, excavations, or adjacent to pavements should be prevented during construction. Backfill in utility trenches (if applicable) should be well compacted and free of any construction debris to reduce the possibility of moisture infiltration.

4.2.7 Corrosion Potential

Laboratory test results indicate that subgrade soil samples exhibit soluble sulfate concentrations ranging from less than 7.5 mg/kg to 160 mg/kg, pH values ranging from 8.5 to 9.7, and minimum resistivity values ranging from 1,390 to 4,850 ohm-cms. These values should be used to determine the appropriate metal pipes and conduits planned for the project.

Based upon the test results, it is our opinion that ASTM Type I or I-II Portland cement is suitable for all concrete on and below grade. Foundation concrete should be designed for negligible

Responsive ■ Resourceful ■ Reliable

sulfate exposure in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

4.3 Pavements

It is our understanding that that the proposed new pavement section will consist of hot mix asphalt (HMA) concrete pavement over a continuous cold recycle asphalt course (CCRAC) and/or CCRAC with surface treatments are being considered for the project. The CCRAC performed on other segments of N13 consisted of milling/processing the upper 3 inches of the existing asphalt pavement surface to provide a CCRAC surface. The CCRAC was covered with the placement of a recycled fog seal followed by a rubberized asphalt chip seal layer and surface fog seal coat.

Based upon the field exploration, the existing pavement section thickness is variable. It is our opinion that use of CCRAC using a rubberized chip seal and fog seal surface treatment is feasible for the approximate eastern 2/3 (approximate Station Nos. 289+00 to 599+50) of the project alignment where the existing asphalt concrete pavement section thickness is a minimum of 8 inches. Based upon the relatively thin existing pavement section along the approximate western 1/3 of the project alignment (approximate Station 10+00 to Station No. 289+00), it is our opinion that the use of CCRAC using a rubberized chip seal and fog seal may be limited and/or not feasible if a 20 year design life is desired. However, CCRAC could be used, but will require a hot mix asphalt (HMA) pavement surface layer to meet minimum pavement design life and traffic. During the CCRAC process, any unstable existing pavement/subgrade areas will require stabilization prior to the placement of new pavement materials. These locations will likely be associated with areas of existing thin pavement section, poor quality subgrade soils, structural pavement distress, high severity transverse and longitudinal cracking, and/or areas exhibiting low density and elevated moisture contents within the underlying subgrade. Based upon the boring log data, low density and elevated moisture content subgrade materials were encountered along approximate Station Nos. 277+00 through 299+00.

As an alternative to CCRAC, the existing pavement could be processed, placed and compacted as an untreated base course layer or incorporated into the existing subgrade to improve strength and pavement support capabilities. The existing pavement should be adequately processed and blended resulting in a modified subgrade free of voids and “nesting” of the asphalt fragments. If this option is being considered, we can provide supplemental recommendations.

4.3.1 Design Recommendations

Design of the pavement thickness has been performed based upon AASHTO criteria and design methodology. The traffic used in the pavement design was obtained from Navajo Department of Transportation (NDOT) and Wilson and included the following:

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
June 18, 2025 ■ Terracon Project No. 66215110



- AWDT (both directions) = 2,018
- 85% automobiles and pick-up trucks
- 12% Single Unit Truck (SUT) and Buses
- 1.5% Single Trailer Truck (STT)
- 1.5% Multi Trailer Truck (MTT)
- No annual growth rate

Using the estimated traffic data above, the 18-Kip Equivalent Single Axle Load (ESAL) was calculated as follows:

ROADWAY SECTION	18-KIP EQUIVALENT SINGLE AXLE LOAD (ESAL)
N 13(3-3) – Red Valley, AZ to MP 9.1 (Approximate Station Nos. 10+00 to 599+50)	626,149

A detailed summary of the ESAL calculation is included in Appendix C.

Design of pavements was based upon AASHTO design methodology utilizing R-values of 33 and 52 and FP-14 specifications. The following parameters were used in the design of the flexible pavement:

- Initial serviceability index (P_i) of 4.2
- Terminal serviceability index (P_t) of 2.0
- Reliability of 65%
- Standard deviation of 0.45
- Layer structural coefficients of 0.44 for new hot mix asphalt (HMA) and 0.25 for continuous cold recycled asphalt course (CCRAC) and existing asphalt concrete.
- 20 year design life

Based upon AASHTO design methodology, the recommended new pavement section thickness is outlined below:

Approximate Station No.	MATERIAL	Recommended Pavement Section Thickness (in)
10+00 to 40+00	New Hot Mix Asphalt (HMA)	4.5
85+00 to 95+00 130+00 to 160+00	Continuous Cold Recycled Asphalt Course (CCRAC)	2.5 ¹

Responsive ■ Resourceful ■ Reliable

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
June 18, 2025 ■ Terracon Project No. 66215110



200+00 to 210+00		
40+00 to 85+00	New Hot Mix Asphalt (HMA)	3.5 ²
95+00 to 130+00	Continuous Cold Recycled Asphalt Course (CCRAC)	2.5 ¹
160+00 to 200+00		
210+00 to 289+00		
289+00 to 599+50	New Hot Mix Asphalt (HMA)	N/A
	Continuous Cold Recycled Asphalt Course (CCRAC)	3 ^{3,4}

1. Assumes a minimum of 2.5 inches of CCRAC below new HMA layer
2. For construction consistency, the thicker section of 4.5" HMA over 2.5" CCRAC above could be used
3. Minimum 3 inch CCRAC followed by rubberized chip seal and fog seal.
4. Minimum average existing asphalt concrete thickness of 10.5 inches. Areas of existing pavement section thickness less than 10.5 inches have an estimated design life of about 16 to 19 years.

It should be noted that during the CCRAC process, any unstable existing pavement/subgrade areas will require stabilization prior to the placement of new pavement materials. These locations will likely be associated with areas of existing thin pavement section, structural pavement distress, high severity transverse and longitudinal cracking, and/or areas exhibiting low density and elevated moisture contents within the underlying subgrade.

The AASHTO pavement design thickness spreadsheets are included in Appendix C.

4.3.2 Materials Specifications

The recommended pavement sections should consist of asphalt concrete, meeting the gradation and properties of Type I or II per Section 401, "Asphalt Concrete Pavement By Gyratory Mix Design Method", Section 403 "Asphalt Concrete", Section 702 "Asphalt Material", and Section 703 "Aggregate" of the Specifications. CCRAC should be performed in accordance with Section 310, "Cold In-Place Recycled Asphalt Base Course" of the Specifications. The asphalt concrete, HMA, and CCRAC mix design should be submitted prior to construction to verify its adequacy and should be placed and compacted in accordance with procedures outlined in the Specifications.

The asphalt concrete should be compacted to a minimum density of at least 91% of the theoretical maximum density as determined by AASHTO T 209.

The base course should consist of a blend of sand and gravel, which meets strict specifications for quality and gradation. Use of materials meeting Type I of Section 301, "Untreated Base Course" or Section 310 "Cold-in-Place Recycled Asphalt Base Course" of the Specifications, is required. Base course material should be tested to determine compliance with these specifications prior to importation to the site. Aggregate base course should be compacted to a

Responsive ■ Resourceful ■ Reliable

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
June 18, 2025 ■ Terracon Project No. 66215110



minimum 95% of maximum dry density and within 2 percent of optimum moisture content as determined by AASHTO T180.

4.3.3 Pavement Maintenance

Service life of the pavement is based on periodic pavement maintenance, adequate drainage, and traffic consistent with the stated assumptions in this report. Preventive maintenance should be planned and provided for through an on-going pavement management program. Preventive maintenance activities are intended to slow the rate of pavement deterioration, and to preserve the pavement investment. Preventive maintenance consists of both localized maintenance (e.g. crack and joint sealing and patching) and global maintenance (e.g. surface sealing). Preventive maintenance is usually the first priority when implementing a planned pavement maintenance program and provides the highest return on investment for pavements. Prior to implementing any maintenance, additional engineering observation is recommended to determine the type and extent of preventive maintenance.

Long term pavement performance depends on several factors, including maintaining subgrade moisture levels and providing for preventive maintenance. The following recommendations should be considered the minimum:

- Site grading at a minimum 2% grade away from the pavements;
- The subgrade and the pavement surface have a minimum $\frac{3}{4}$ inch per foot slope to promote proper surface drainage.
- Consider appropriate edge drainage and pavement under drain systems,
- Install joint sealant and seal cracks immediately

5.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, pavement construction and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be

Responsive ■ Resourceful ■ Reliable

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
June 18, 2025 ■ Terracon Project No. 66215110



immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

APPENDIX A
FIELD EXPLORATION

Geotechnical Engineering Report

Red Valley Pavement Rehabilitation | Red Valley, AZ

June 18, 2025 | Terracon Project No. 66215110



Site Location

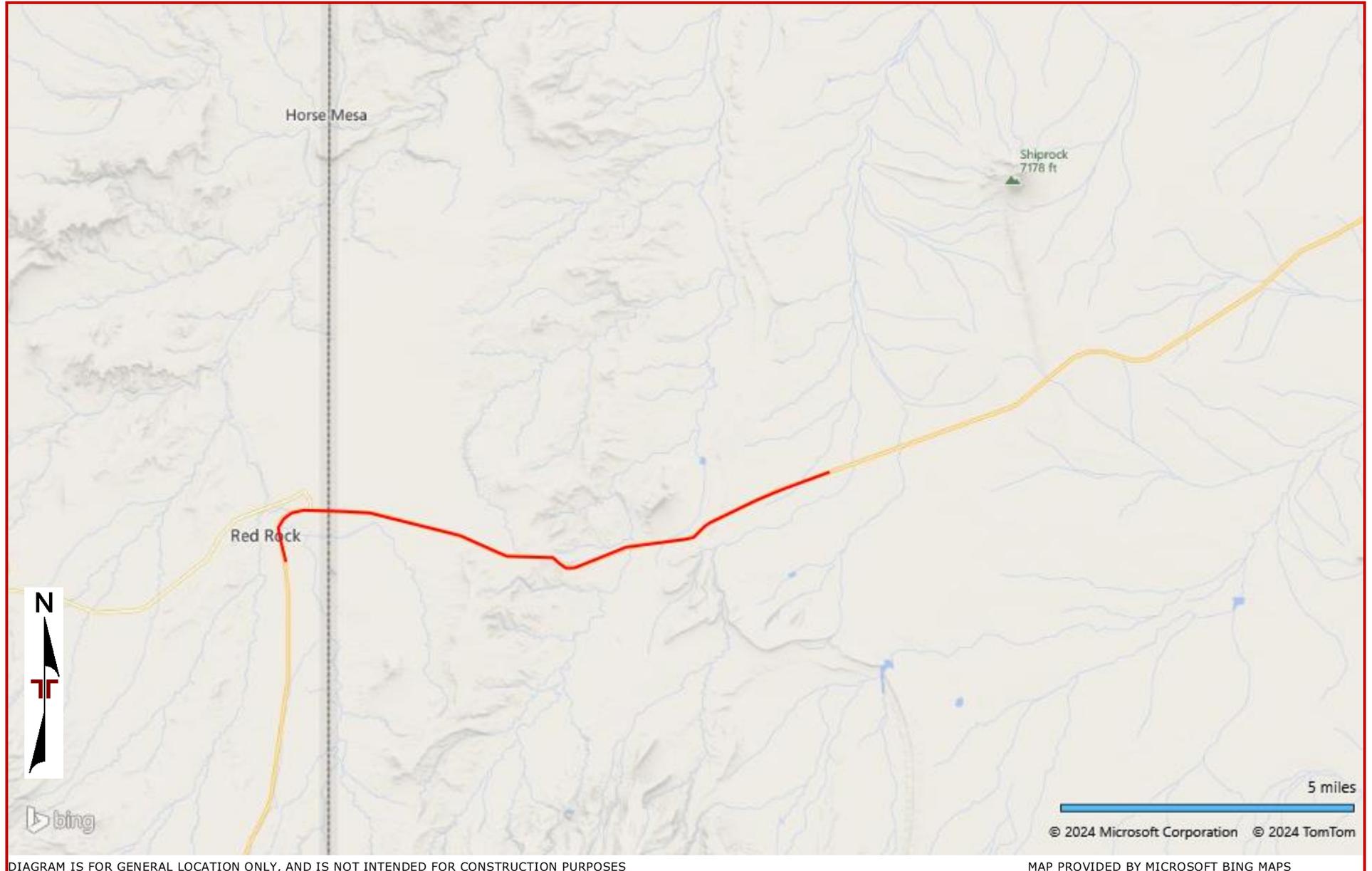


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Geotechnical Engineering Report

Red Valley Pavement Rehabilitation | Red Valley, AZ

June 18, 2025 | Terracon Project No. 66215110



Exploration Plan

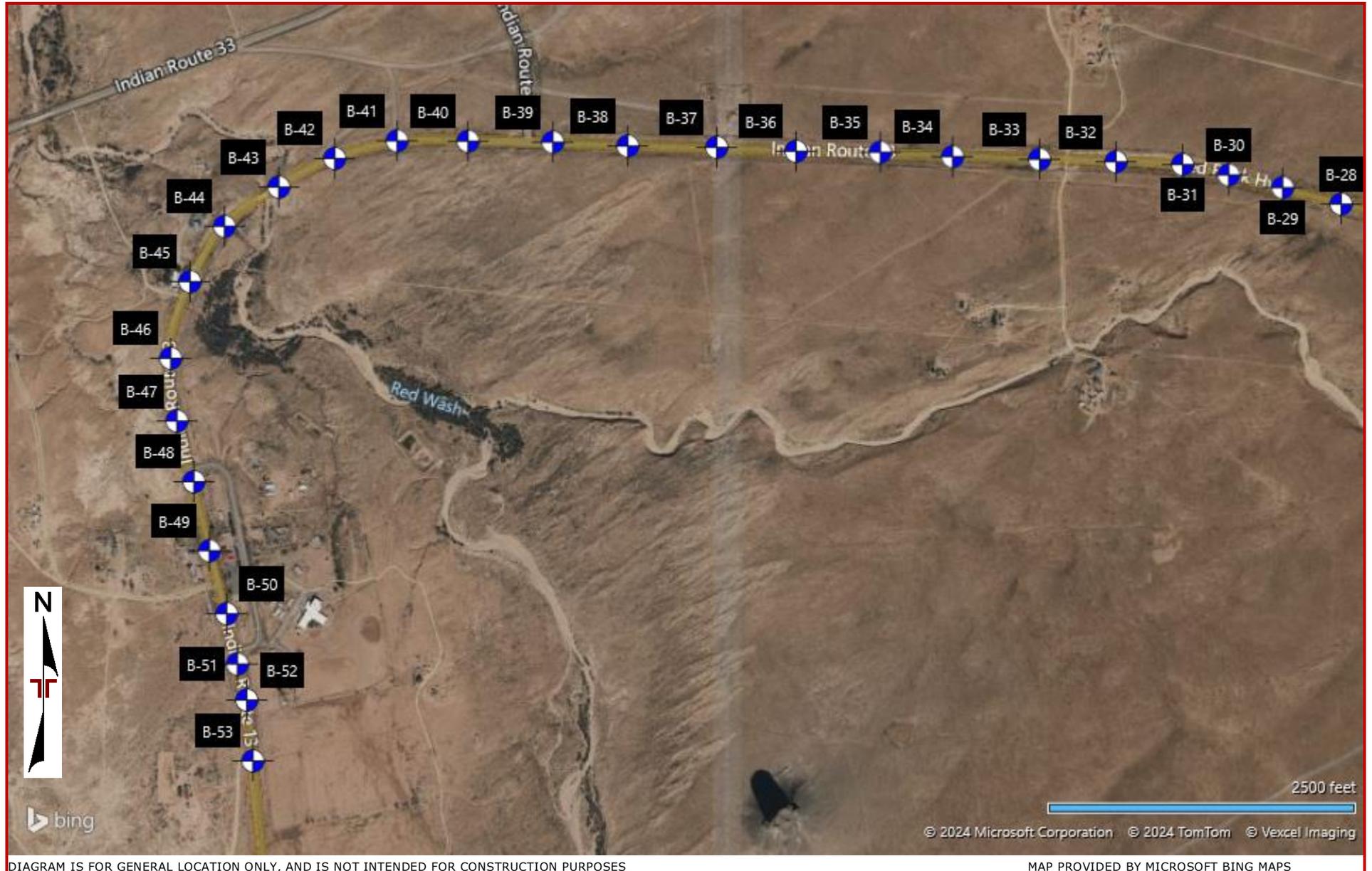


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Geotechnical Engineering Report

Red Valley Pavement Rehabilitation | Red Valley, AZ

June 18, 2025 | Terracon Project No. 66215110



Exploration Plan

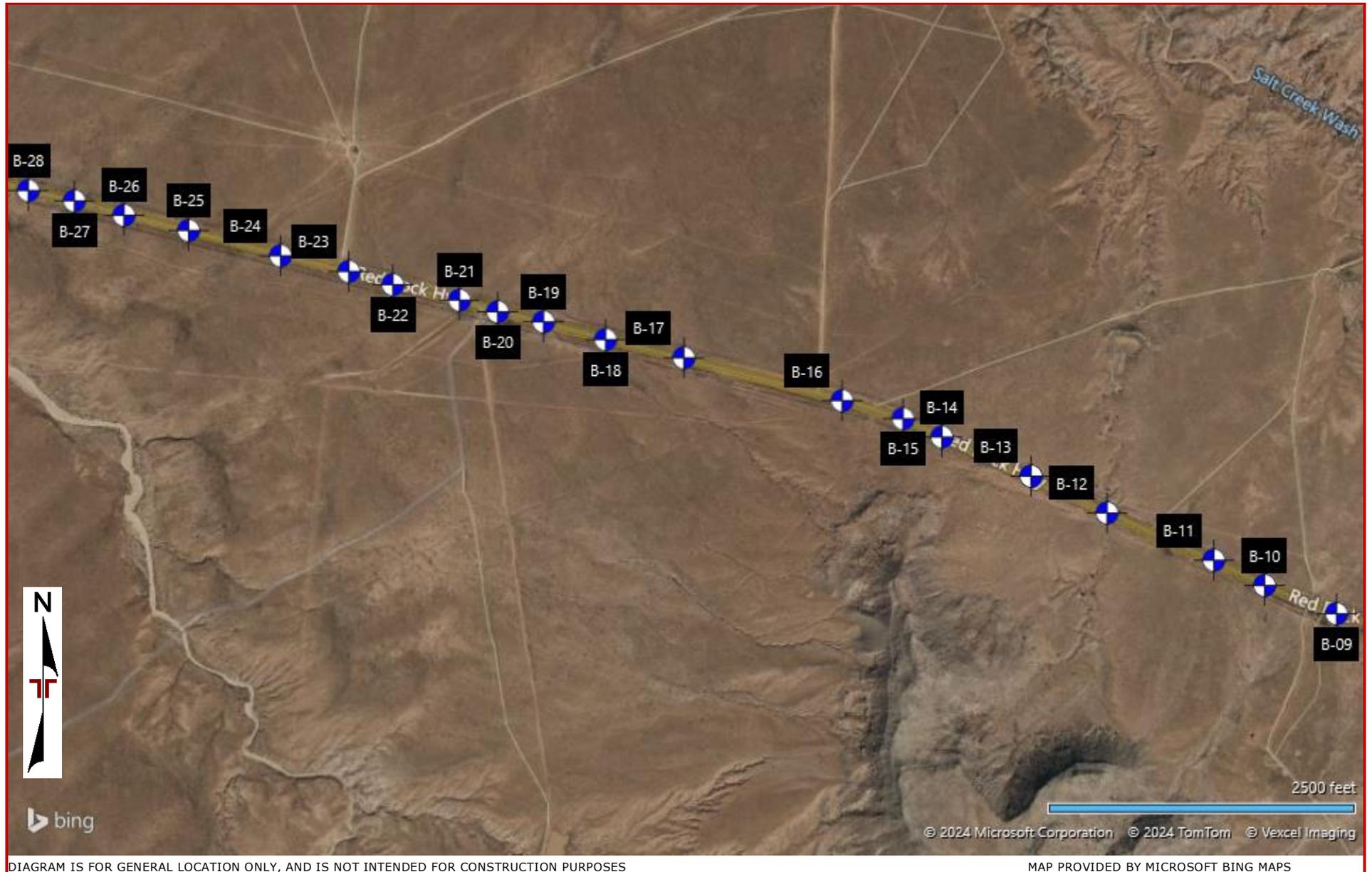


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Geotechnical Engineering Report

Red Valley Pavement Rehabilitation | Red Valley, AZ

June 18, 2025 | Terracon Project No. 66215110



Exploration Plan

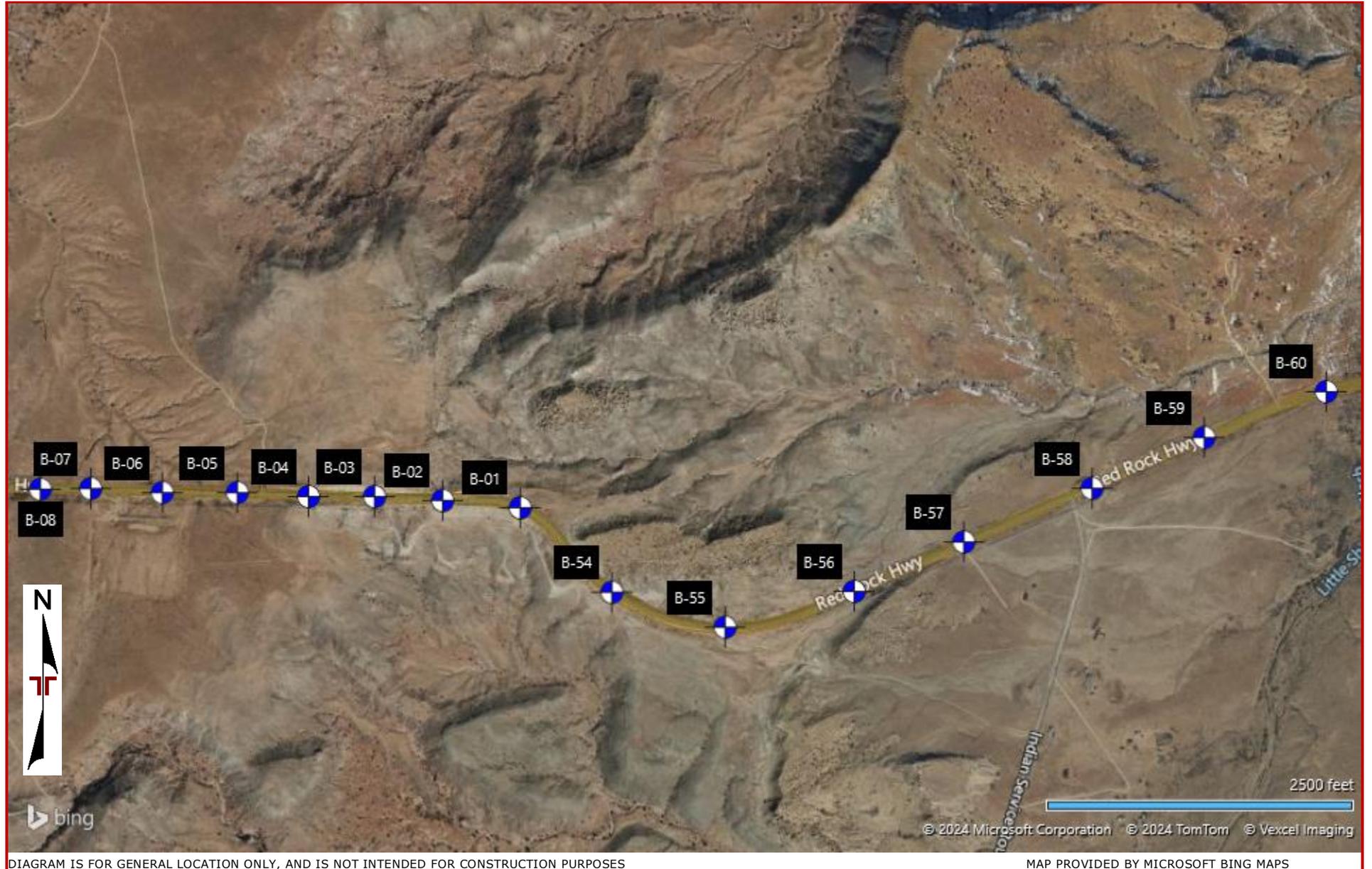


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Geotechnical Engineering Report

Red Valley Pavement Rehabilitation | Red Valley, AZ

June 18, 2025 | Terracon Project No. 66215110



Exploration Plan

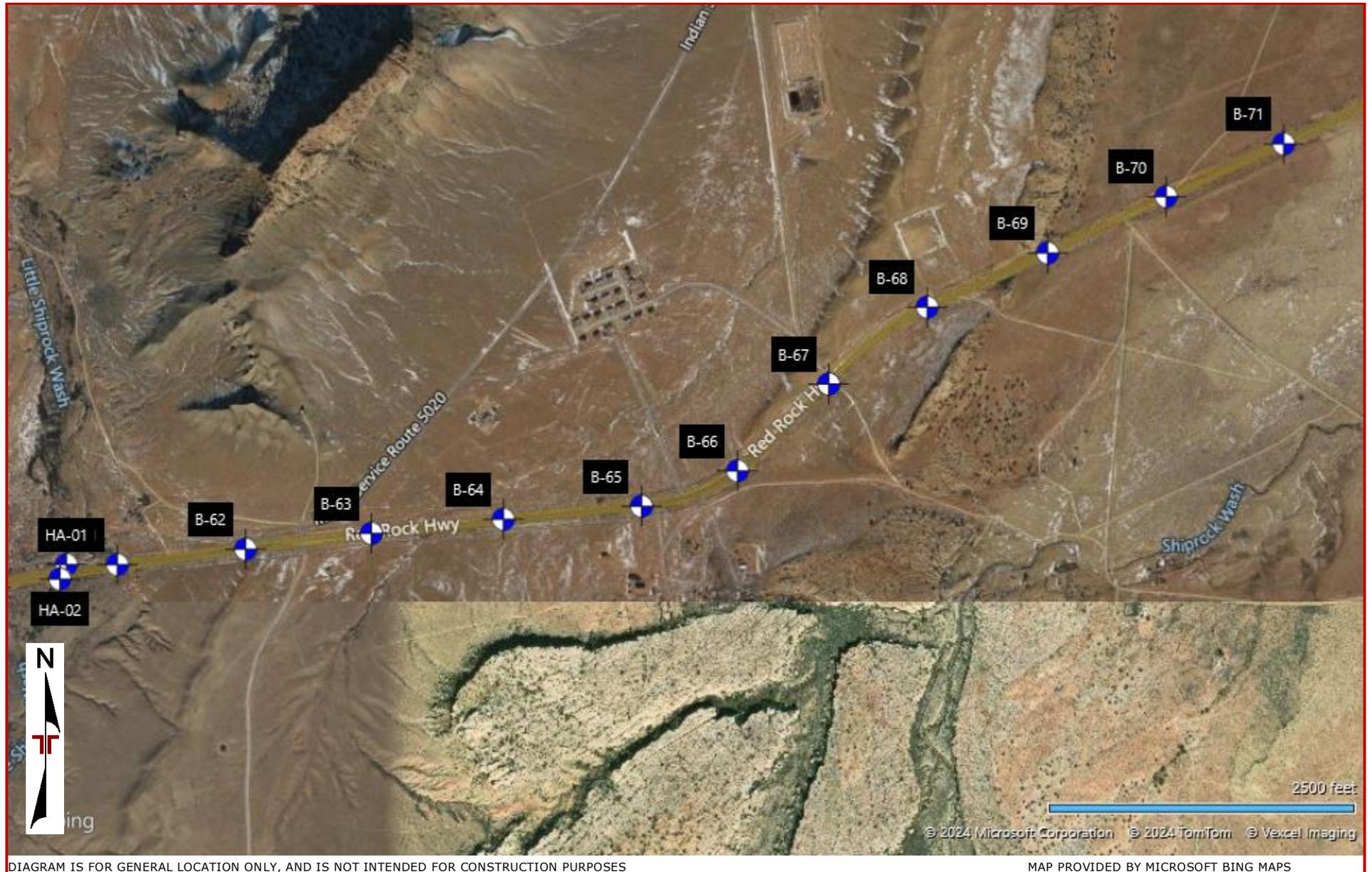


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Geotechnical Engineering Report

Red Valley Pavement Rehabilitation | Red Valley, AZ

June 18, 2025 | Terracon Project No. 66215110



Exploration Plan

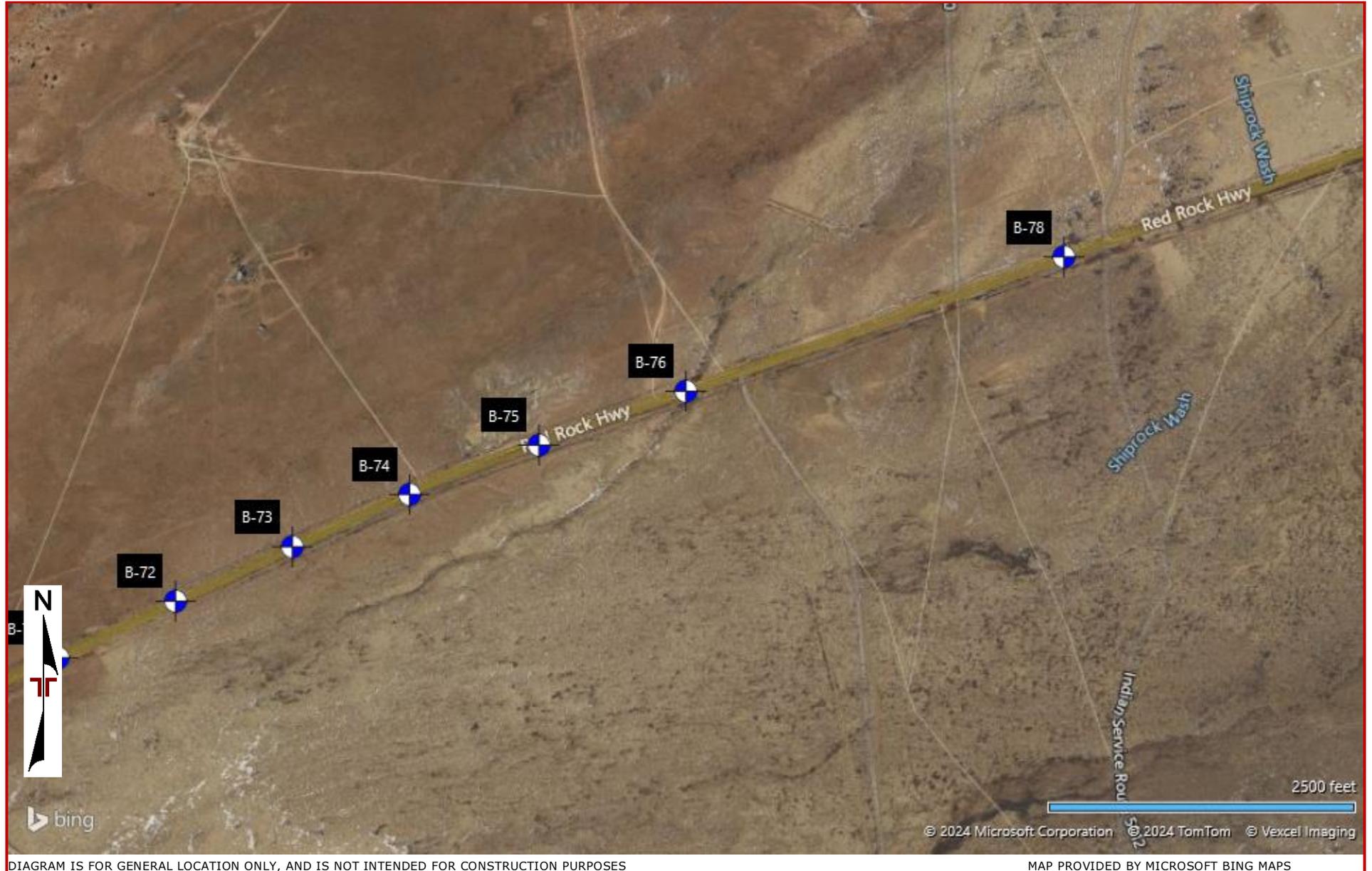


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ
June 18, 2025 ■ Terracon Project No. 66215110



Field Exploration Description

A total of 81 test borings were advanced along the roadway alignment between the period of December 19 through 21, 2023 and February 19 to 21, 2024. The borings were advanced to depths of approximately 1 to 8.5 feet below the ground surface at the approximate locations shown on the attached Site Location Map and Exploration Plan.

The test borings along the existing roadway alignment were advanced with a truck-mounted CME-75 drill rig utilizing 7-½ inch outside diameter hollow-stem augers. The test borings located at the proposed drainage improvements were advanced using hand auger operations.

The borings were located in the field by using existing site features and the Google Earth.kmz file provided by WCI. The latitude, longitude, elevation, and project stationing were obtained at each boring location using a hand-held GPS unit and the provided project Roadway Plan View Sheets dated September 20, 2023. The accuracy of boring locations and elevations should only be assumed to the level implied by the method used.

Lithologic logs of the borings were recorded by the Terracon representative during the drilling and hand auger operations. The existing pavement materials along the existing roadway were measured and documented at each boring location. At selected intervals, samples of the subsurface materials were taken by driving split-spoon or ring-barrel samplers. In addition, bulk samples were obtained at selected intervals within some borings.

Within the borings along the existing roadway alignment, penetration resistance measurements were obtained by driving the split-spoon and ring-barrel samplers into the subsurface materials with a 140-pound automatic hammer falling 30 inches. The penetration resistance value is a useful index in estimating the consistency or relative density of materials encountered.

A CME automatic SPT hammer was used to advance the split-barrel sampler in the borings performed along the existing roadway. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

Groundwater conditions were evaluated in the borings at the time of site exploration. Due to safety considerations, the existing borings were backfilled with native soils and patched (where applicable) upon completion of drilling operations.

Boring Log No. B-01

Graphic Log	Location: See Exploration Plan Latitude: 36.5956° Longitude: -108.9771° Station: 305+00 Depth (Ft.) Elevation: 6036 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 10"										
0.8	6035.17	1								
SILTY SAND (SM) , trace gravel, red, loose, AASHTO: A-4		2								
4.0	6032	3	X		4-11	+0.30 @ 500psf	9.1	116	NP	45
CLAYEY SAND (SC) , trace gravel, green, medium dense		4								
6.5	6029.5	5								
Boring Terminated at 6.5 Feet		6	X		12-13-10 N=23		19.0			

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
Notes	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-02

Graphic Log	Location: See Exploration Plan Latitude: 36.5958° Longitude: -108.9793° Station: 299+00 Depth (Ft.) Elevation: 6068 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 10"										
	0.8 6067.17 CLAYEY SAND (SC) , trace gravel, red to green, loose to medium dense, AASHTO: A-7-6	1								
		2								
		3	X		3-4-5 N=9		15.3			
		4								
		5	X		7-14		23.2	97	45-21-24	48
	6.0 6062 Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-03

Graphic Log	Location: See Exploration Plan Latitude: 36.5958° Longitude: -108.9812° Station: 294+00 Depth (Ft.) Elevation: 6092 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 15.5"									
	1.3 CLAYEY SAND (SC) , trace gravel, green and red, medium dense, AASHTO: A-6 6090.75	1								
		2								
		3			18-14		14.9	121	34-15-19	47
		4								
		5								
		6			6-12-14 N=26		21.0			
	6.5 Boring Terminated at 6.5 Feet 6085.5									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-04

Graphic Log	Location: See Exploration Plan		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
	Latitude: 36.5958° Longitude: -108.9830°	Station: 289+00								Elevation: 6096 (Ft.) +/-	LL-PL-PI
ASPHALT - 13.5"											
1.1		6094.87	1								
SILTY SAND (SM), trace gravel, red, loose, AASHTO: A-4			2								
3			3			3-3-4 N=7		16.1		NP	46
4.0		6092	4								
CLAYEY SAND (SC), trace gravel, green, loose			5								
6.0		6090	6			8-8		17.5	107		
Boring Terminated at 6 Feet											

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
Notes	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-05

Graphic Log	Location: See Exploration Plan Latitude: 36.5959° Longitude: -108.9850° Station: 283+00 Depth (Ft.) Elevation: 6084 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 5"	0.4								
	POORLY GRADED SAND WITH SILT (SP-SM) , trace gravel, orange, loose	1								
		2								
		3			4-5		14.0	98		
	CLAYEY SAND (SC) , trace gravel, orange and green, medium dense, AASHTO: A-6	4								
		5								
		6			1-4-11 N=15		17.3		28-14-14	48
		6.5								
	Boring Terminated at 6.5 Feet	6077.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-06

Graphic Log	Location: See Exploration Plan Latitude: 36.5959° Longitude: -108.9871° Station: 277+00 Depth (Ft.) Elevation: 6072 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	0.2 ASPHALT - 2.5" 6071.79 SANDY FAT CLAY (CH) , trace gravel, light brown and green, stiff, AASHTO: A-7-6	1								
	4.0 CLAYEY SAND (SC) , trace gravel, light brown and green, medium dense 6068	2			6-6-7 N=13		20.2		50-15-35	52
	6.0 Boring Terminated at 6 Feet 6066	3		12-18		23.0	102			
		4								
		5								
		6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p> <p>Notes</p>	<p>Water Level Observations Groundwater not encountered</p> <p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p> <p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>
--	--	--

Boring Log No. B-07

Graphic Log	Location: See Exploration Plan Latitude: 36.5960° Longitude: -108.9891° Station: 272+00 Depth (Ft.) Elevation: 6073 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 6"		0.5								
SILTY SAND (SM), trace gravel, red, medium dense, AASHTO: A-4		6072.5								
		1								
		2								
		3			11-18		11.0	116		
		4								
		5								
		6			6-6-6 N=12		14.5		NP	40
		6.5								
	Boring Terminated at 6.5 Feet	6066.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-08

Graphic Log	Location: See Exploration Plan Latitude: 36.5960° Longitude: -108.9905° Station: 267+00 Depth (Ft.) _____ Elevation: 6074 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 3.5"	0.3								
	CLAYEY GRAVEL WITH SAND (GC) , green and red, medium dense, AASHTO: A-2-6	6073.71								
		1								
		2								
		3			8-6-5 N=11		12.6		39-13-26	20
		4								
	CLAYEY SAND (SC) , trace gravel, green, medium dense	4.0								
		5								
		6			18-13		14.6	113		
	Boring Terminated at 6 Feet	6.0								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-10

Graphic Log	Location: See Exploration Plan Latitude: 36.5968° Longitude: -108.9940° Station: 256+00 Depth (Ft.) Elevation: 6073 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.4	ASPHALT - 4.5"	0.4								
0.4	SILTY SAND (SM) , trace gravel, orange and light brown, loose to medium dense, AASHTO: A-4	0.4								
		1								
		2								
		3	X		22-19		13.0	114		
		4								
		5								
		6	X		3-4-3 N=7		8.2		NP	49
		6.5								
	Boring Terminated at 6.5 Feet	6.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-11

Graphic Log	Location: See Exploration Plan Latitude: 36.5974° Longitude: -108.9955° Station: 250+00 Depth (Ft.) Elevation: 6071 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.4	ASPHALT - 4.5"	0.4								
0.4	SILTY SAND (SM) , trace gravel, orange, loose to medium dense, AASHTO: A-2-4	0.4								
		1								
		2								
		3	X		9-11		9.7	134	NP	29
		4								
		5	X							
		6	X		6-9	-0.24 @ 500psf	7.4	112		
	Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>

Boring Log No. B-12

Graphic Log	Location: See Exploration Plan Latitude: 36.5984° Longitude: -108.9984° Station: 239+00 Depth (Ft.) _____ Elevation: 6069 (Ft.) +/- _____	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.2	ASPHALT - 2"	0.2								
2.5	SILTY SAND (SM) , trace gravel, red, medium dense to very dense, AASHTO: A-2-4	2.5								
6.0	SANDSTONE , moderate to strong cementation	6.0	X		20-34-38 N=72		4.6		NP	22
6.0	Boring Terminated at 6 Feet	6.0	X		30-23		9.2			

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-13

Graphic Log	Location: See Exploration Plan Latitude: 36.5993° Longitude: -109.0005° Station: 234+00 Depth (Ft.) Elevation: 6077 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 6"										
0.5	6076.5	1								
SILTY SAND (SM) , red, medium dense to dense, AASHTO: A-2-4		2								
3		3			4-6-7 N=13		12.1			
4		4								
5.0	6072	5								
SANDSTONE , weak to moderate cementation		6			20-33		4.9	116	NP	15
6.0	6071	6								
Boring Terminated at 6 Feet										

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p> <p>Notes</p>	<p>Water Level Observations Groundwater not encountered</p> <p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p> <p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>
--	--	--

Boring Log No. B-14

Graphic Log	Location: See Exploration Plan Latitude: 36.6001° Longitude: -109.0030° Station: 226+00 Depth (Ft.) _____ Elevation: 6086 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 6"		0.5								
LEAN CLAY WITH SAND (CL) , orange and red, medium stiff to stiff, AASHTO: A-6		6085.5								
		1								
		2								
		3		9-9	9-9		5.9	109		
		4								
		5								
		6		3-3-3 N=6	3-3-3 N=6		12.2		27-15-12	70
	Boring Terminated at 6.5 Feet	6.5								6079.5

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p> <p>Notes</p>	<p>Water Level Observations Groundwater not encountered</p> <p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p> <p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>
--	--	--

Boring Log No. B-15

Graphic Log	Location: See Exploration Plan Latitude: 36.6005° Longitude: -109.0041° Station: 223+00 Depth (Ft.) Elevation: 6082 (Ft.) +/- 6081.83	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 2"	ASPHALT - 2"	0.2								
SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	1								
SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	2								
SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	3	X		15-6-5 N=11		11.2		26-14-12	56
SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	4								
SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	5	X		6-9	-0.54 @ 500psf	9.8	111		
SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	SANDY LEAN CLAY (CL), orange, stiff, AASHTO: A-6	6								
	Boring Terminated at 6 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-16

Graphic Log	Location: See Exploration Plan Latitude: 36.6009° Longitude: -109.0058° Station: 217+00 Depth (Ft.) _____ Elevation: 6068 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3.5"	0.3								
0.3	SILTY SAND (SM) , trace gravel, orange and red, medium dense, AASHTO: A-2-4	0.3								
		1								
		2								
		3	X		11-18		14.4	119		
		4								
		5								
		6	X		8-4-6 N=10		7.4		NP	25
		6.5								
	Boring Terminated at 6.5 Feet	6.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-17

Graphic Log	Location: See Exploration Plan Latitude: 36.6019° Longitude: -109.0102° Station: 206+00 Depth (Ft.) _____ Elevation: 6024 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 3.5"	0.3 _____ 6023.71	1								
SILTY SAND (SM), trace gravel, red and orange, medium dense, AASHTO: A-2-4		2								
		3	X		4-4-10 N=14		12.2		NP	33
		4								
		5	X		27-24		7.1	125		
Boring Terminated at 6 Feet	6.0 _____ 6018	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p> <p>Notes</p>	<p>Water Level Observations Groundwater not encountered</p> <p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p> <p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>
--	--	--

Boring Log No. B-18

Graphic Log	Location: See Exploration Plan Latitude: 36.6023° Longitude: -109.0124° Station: 198+00 Depth (Ft.) _____ Elevation: 6005 (Ft.) +/- _____	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	6004.71									
ASPHALT - 3.5"		1								
SILTY SAND (SM), trace gravel, red and orange, medium dense, AASHTO: A-2-4		2								
		3			10-15		12.2	120		
		4								
		5								
		6			5-6-6 N=12		10.0		NP	23
6.5	5998.5									
	Boring Terminated at 6.5 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-19

Graphic Log	Location: See Exploration Plan Latitude: 36.6027° Longitude: -109.0141° Station: 193+00 Depth (Ft.) Elevation: 5993 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 7"		0.6								
SILTY SAND (SM), trace gravel, orange and light brown, loose to medium dense, AASHTO: A-2-4		5992.42								
		1								
		2								
		3	X		4-4-4 N=8		10.9		NP	30
		4								
		5	X		10-12		9.7	120		
	Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>

Boring Log No. B-20

Graphic Log	Location: See Exploration Plan Latitude: 36.6029° Longitude: -109.0154° Station: 189+00 Depth (Ft.) _____ Elevation: 5987 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 4"	0.3								
0.3	SILTY SAND (SM) , orange, medium dense, AASHTO: A-4	0.3								
1		1								
2		2								
3		3	X		4-4-8 N=12		10.9		NP	40
4		4								
5		5	X		15-21		8.2	118		
6		6								
	Boring Terminated at 6 Feet	6.0								5981

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-21

Graphic Log	Location: See Exploration Plan Latitude: 36.6032° Longitude: -109.0164° Station: 186+00 Depth (Ft.) _____ Elevation: 5986 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3"	0.3								
0.3	SILTY SAND (SM) , trace gravel, red and orange, medium dense, AASHTO: A-4	0.3								
1		1								
2		2								
3		3	X		16-17		10.0	125		
4		4								
5		5								
6		6	X		5-6-6 N=12		5.7		NP	37
6.5	Boring Terminated at 6.5 Feet	6.5								
		6.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-22

Graphic Log	Location: See Exploration Plan Latitude: 36.6035° Longitude: -109.0183° Station: 181+00 Depth (Ft.) _____ Elevation: 5982 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 4"	0.3								
0.3	SILTY SAND (SM) , orange, loose to medium dense, AASHTO: A-4	0.3								
1		1								
2		2								
3		3	X		17-19		8.4	118		
4		4								
5		5								
6		6	X		4-5-4 N=9		7.9		NP	47
6.5	Boring Terminated at 6.5 Feet	6.5								
		6.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p> <p>Notes</p>	<p>Water Level Observations Groundwater not encountered</p> <p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p> <p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>
--	--	--

Boring Log No. B-23

Graphic Log	Location: See Exploration Plan Latitude: 36.6038° Longitude: -109.0195° Station: 173+00 Depth (Ft.) _____ Elevation: 5978 (Ft.) +/- _____	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	0.2 ASPHALT - 2" _____ 5977.83									
	CLAYEY SAND (SC) , trace gravel, orange and light brown, medium dense, AASHTO: A-6	1								
		2								
		3	X		4-3-7 N=10		11.5		27-14-13	37
	4.0 _____ 5974	4								
	POORLY GRADED SAND (SP) , trace gravel, light brown, medium dense	5		X						
		6			22-20		9.9	117		
	6.0 _____ 5972 Boring Terminated at 6 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-20-2023</p> <p>Boring Completed 12-20-2023</p>

Boring Log No. B-24

Graphic Log	Location: See Exploration Plan Latitude: 36.6042° Longitude: -109.0214° Station: 172+00 Depth (Ft.) _____ Elevation: 5967 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3.5"	0.3								
0.3 - 6.5	SILTY SAND (SM) , trace gravel, orange and light brown, medium dense, AASHTO: A-2-4	0.3 - 6.5		1 2 3 4 5 6	14-14 5-7-7 N=14		9.9 4.8	113 	NP	19
6.5	Boring Terminated at 6.5 Feet	6.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p> <p>Notes</p>	<p>Water Level Observations Groundwater not encountered</p> <p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p> <p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>
--	--	--

Boring Log No. B-25

Graphic Log	Location: See Exploration Plan		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
	Latitude: 36.6047° Longitude: -109.0240°	Station: 163+00								Elevation: 5952 (Ft.) +/-	LL-PL-PI
	0.3	ASPHALT - 3"	5951.75								
		SANDY LEAN CLAY (CL) , orange, stiff, AASHTO: A-4									
	1										
	2										
	3			X		7-5-6 N=11		8.7		22-14-8	50
	4										
	5			X		5-8	-0.23 @ 500psf	6.4	110		
	6										
	6.0	Boring Terminated at 6 Feet									
			5946								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-26

Graphic Log	Location: See Exploration Plan		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
	Latitude: 36.6051° Longitude: -109.0258°	Station: 158+00								Elevation: 5945 (Ft.) +/-	LL-PL-PI
	ASPHALT - 3.5"		0.3								
	POORLY GRADED SAND (SM) , orange, medium dense, AASHTO: A-3		4.0			18-20		5.3	118		
	CLAYEY SAND (SC) , light brown, medium dense, AASHTO: A-4		6.5			4-5-7 N=12		18.5		26-16-10	48
	Boring Terminated at 6.5 Feet		6.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-27

Graphic Log	Location: See Exploration Plan Latitude: 36.6054° Longitude: -109.0271° Station: 154+00 Depth (Ft.) _____ Elevation: 5941 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3"	0.3								
0.3 - 4.0	SILTY SAND (SM) , red and light brown, medium dense, AASHTO: A-2-4	1 2 3								
4.0	5937	4			12-12-12 N=24		9.6		NP	24
4.0 - 6.0	POORLY GRADED SAND (SP) , orange, medium dense	5 6			10-23		13.3	117		
6.0	5935	6								
Boring Terminated at 6 Feet										

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
Notes	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-28

Graphic Log	Location: See Exploration Plan Latitude: 36.6056° Longitude: -109.0284° Station: 150+00 Depth (Ft.) Elevation: 5937 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.2	ASPHALT - 2.5" 5936.79	0.2								
2.5	SILTY SAND (SM) , light brown and orange, dense, AASHTO: A-2-4 5934.5	2.5								
3	SANDSTONE , weak to moderate cementation 5930.5	3		X	25-50		5.8	118		
6	Boring Terminated at 6.5 Feet 5930.5	6		X	15-25-15 N=40		7.4		NP	35

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p> <p>Notes</p>	<p>Water Level Observations Groundwater not encountered</p> <p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p> <p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>
--	--	--

Boring Log No. B-29

Graphic Log	Location: See Exploration Plan Latitude: 36.6060° Longitude: -109.0300° Station: 145+00 Depth (Ft.) _____ Elevation: 5930 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 4" 0.3 _____ 5929.67 SANDY SILT (ML) , orange and light brown, very stiff, AASHTO: A-4 _____ 4.0 _____ 5926 POORLY GRADED SAND (SP) , orange, medium dense _____ 6.0 _____ 5924	1 2 3 4 5 6			_____ _____ 7-8-10 N=18 _____ _____ 18-30 _____	_____ _____ _____ _____ _____ _____	_____ _____ 7.3 _____ _____ _____ _____	_____ _____ 114 _____ _____ _____ _____	_____ _____ NP _____ _____ _____ _____	_____ _____ 63 _____ _____ _____ _____
	Boring Terminated at 6 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>

Boring Log No. B-30

Graphic Log	Location: See Exploration Plan Latitude: 36.6063° Longitude: -109.0315° Station: 141+00 Depth (Ft.) Elevation: 5922 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3"	0.3								
0.3	SILTY SAND (SM) , orange, loose to dense, AASHTO: A-2-4	0.3								
		1								
		2								
		3	X		13-17-14 N=31		5.1		NP	18
		4								
		5	X							
		5		X	6-10	-0.25 @ 500psf	7.7	107		
		6								
	Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-31

Graphic Log	Location: See Exploration Plan		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
	Latitude: 36.6065° Longitude: -109.0328°	Station: 136+00								Elevation: 5917 (Ft.) +/-	LL-PL-PI
0.4	ASPHALT - 4.5"		0.4								
	POORLY GRADED SAND WITH SILT (SP-SM) , trace gravel, orange to light brown, medium dense to very dense, AASHTO: A-3		1								
	4.5		4.5			13-20		7.5	116		
	SANDSTONE , moderate to strong cementation		5								
	5.7		5.7			25-50/2"		5.9		NP	7
Boring Terminated at 5.7 Feet											

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>

Boring Log No. B-32

Graphic Log	Location: See Exploration Plan Latitude: 36.6066° Longitude: -109.0347° Station: 132+00 Depth (Ft.) _____ Elevation: 5909 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 4"	0.3 _____ 5908.67	1								
POORLY GRADED SAND WITH SILT (SP-SM), red and green to light brown, medium dense to very dense, AASHTO: A-3		2								
SANDSTONE, moderate to strong cementation	4.0 _____ 5905	3			22-26		10.3	116		
SANDSTONE, moderate to strong cementation		4								
SANDSTONE, moderate to strong cementation	5.9 _____ 5903.1	5			40-50/5"		7.6		NP	10
Boring Terminated at 5.9 Feet										

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-34

Graphic Log	Location: See Exploration Plan Latitude: 36.6067° Longitude: -109.0392° Station: 117+00 Depth (Ft.) _____ Elevation: 5886 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 4"	0.3 _____ 5885.67									
SILTY SAND (SM), orange, medium dense, AASHTO: A-2-4		1								
		2								
		3	X		18-18		10.7	125		
		4								
		5								
		6	X		10-10-7 N=17		6.7		NP	27
	6.5 _____ 5879.5									
Boring Terminated at 6.5 Feet										

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-35

Graphic Log	Location: See Exploration Plan Latitude: 36.6068° Longitude: -109.0412° Station: 112+00 Depth (Ft.) _____ Elevation: 5879 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 5"	0.4 _____ 5878.58									
SILTY SAND (SM), orange, medium dense, AASHTO: A-2-4		1								
		2								
		3	X		13-17		11.7	117	NP	21
		4								
		5	X		14-18		10.5	120		
	6.0 _____ 5873 Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p> <p>Notes</p>	<p>Water Level Observations Groundwater not encountered</p> <p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p> <p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>
--	--	--

Boring Log No. B-36

Graphic Log	Location: See Exploration Plan Latitude: 36.6068° Longitude: -109.0436° Station: 105+00 Depth (Ft.) _____ Elevation: 5868 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	0.3	5867.67								
	ASPHALT - 4"									
	6.0	5862								
Boring Terminated at 6 Feet										
					9-6-5 N=11		10.8		NP	60
					4-11	-1.6 @ 500psf	8.2	107		

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-37

Graphic Log	Location: See Exploration Plan Latitude: 36.6069° Longitude: -109.0458° Station: 97+00 Depth (Ft.) Elevation: 5858 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	0.3 ASPHALT - 3" SANDY SILT (ML) , orange, stiff to very stiff, AASHTO: A-4	0.3 5857.75 1 2 3 4 5 6 6.5 5851.5	(Empty) (Empty)	(Empty) (Empty)	(Empty) 20-20 4-5-6 N=11	(Empty) (Empty)	(Empty) 12.6 7.6	(Empty) 120	(Empty) NP	(Empty) 60
	Boring Terminated at 6.5 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-38

Graphic Log	Location: See Exploration Plan Latitude: 36.6069° Longitude: -109.0483° Station: 92+00 Depth (Ft.) _____ Elevation: 5850 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 3.5"	0.3 _____ 5849.71	1								
	SANDY SILT (ML) , orange, very stiff, AASHTO: A-4	2								
		3			13-16-14 N=30		9.7		NP	50
		4								
		5			10-10		5.8	107		
	6.0 _____ 5844 Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
Notes	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-39

Graphic Log	Location: See Exploration Plan Latitude: 36.6070° Longitude: -109.0503° Station: 85+00 Depth (Ft.) _____ Elevation: 5842 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3"	0.3								
1.0	SILTY SAND (SM) , orange, loose to medium dense, AASHTO: A-2-4	1.0								
3.0		3.0			7-7-7 N=14		8.8		NP	27
5.0		5.0			9-8	-0.06 @ 500psf	9.7	118		
6.0	Boring Terminated at 6 Feet	6.0								
	5836									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>

Boring Log No. B-40

Graphic Log	Location: See Exploration Plan Latitude: 36.6070° Longitude: -109.0527° Station: 77+00 Depth (Ft.) Elevation: 5836 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	0.2 ASPHALT - 2.5" 5835.79									
	SILTY SAND (SM) , orange, medium dense, AASHTO: A-2-4	1								
		2								
		3	X		15-24		8.9	118		
		4								
		5								
		6	X		8-9-9 N=18		8.4		NP	30
	6.5 5829.5 Boring Terminated at 6.5 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-41

Graphic Log	Location: See Exploration Plan Latitude: 36.6070° Longitude: -109.0547° Station: 72+00 Depth (Ft.) _____ Elevation: 5825 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3"	5824.75								
0.3	SILTY SAND (SM) , orange, medium dense to very dense, AASHTO: A-2-4									
		1								
		2								
		3	X		16-25-25 N=50		3.2		NP	17
		4								
		5	X		10-12		4.0	110		
		6								
	Boring Terminated at 6 Feet	6.0								5819

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-42

Graphic Log	Location: See Exploration Plan Latitude: 36.6066° Longitude: -109.0564° Station: 66+00 Depth (Ft.) _____ Elevation: 5813 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3"	0.3								
	POORLY GRADED SAND WITH SILT (SP-SM) , light brown and orange, loose	1								
		2								
		3		9-9	9-9		1.6	104		
		4								
	SANDY SILT (ML) , orange, very stiff, AASHTO: A-4	4								
		5		11-10	11-10		6.7	104	NP	51
		6								
	Boring Terminated at 6 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-43

Graphic Log	Location: See Exploration Plan Latitude: 36.6060° Longitude: -109.0580° Station: 61+00 Depth (Ft.) Elevation: 5793 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3" 5792.75									
0.3 - 2.5	SILTY SAND (SM) , light brown, very dense, AASHTO: A-2-4	1 2								
2.5	SANDSTONE , light brown, very dense, moderate cementation 5790.5	3		X	50/3"		5.1		NP	13
3 - 5.5		4 5								
5.5	Boring Terminated at 5.5 Feet 5787.5			X	50		5.4		NP	8

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-44

Graphic Log	Location: See Exploration Plan Latitude: 36.6051° Longitude: -109.0595° Station: 55+00 Depth (Ft.) Elevation: 5782 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.2	ASPHALT - 2.5" 5781.79									
0.2	SILTY SAND (SM) , trace gravel, gray, very dense, AASHTO: A-2-4									
2.5	5779.5									
2.5	SANDSTONE , gray, strong cementation				50/1"		4.8		NP	34
4.0	5778									
4.0	SHALE , gray and red, moderate to strong cementation									
5.5	5776.5				50		5.7		21-14-7	55
5.5	Boring Terminated at 5.5 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-19-2023</p> <p>Boring Completed 12-19-2023</p>

Boring Log No. B-45

Graphic Log	Location: See Exploration Plan Latitude: 36.6039° Longitude: -109.0604° Station: 50+00 Depth (Ft.) _____ Elevation: 5791 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 3.5"	0.3								
	POORLY GRADED SAND WITH SILT (SP-SM) , red and light brown, medium dense, AASHTO: A-3	5790.71								
		1								
		2								
		3			13-30		6.5	119		
		4								
	CLAYEY SAND (SC) , trace gravel, red and orange, loose, AASHTO: A-2-4	5787								
		5								
		6			5-4-2 N=6		8.5		24-14-10	24
	Boring Terminated at 6.5 Feet	5784.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>

Boring Log No. B-46

Graphic Log	Location: See Exploration Plan Latitude: 36.6022° Longitude: -109.0610° Station: 44+00 Depth (Ft.) _____ Elevation: 5805 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75	0.3								
0.3	5804.75									

Boring Log No. B-47

Graphic Log	Location: See Exploration Plan Latitude: 36.6008° Longitude: -109.0608° Station: 39+00 Depth (Ft.) _____ Elevation: 5816 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3.5"	0.3								
0.3	SILTY SAND (SM) , trace gravel, orange, medium dense to dense, AASHTO: A-4	0.3								
		1								
		2								
		3	X		16-30		11.2	111		
		4								
		5								
		6	X		10-18-20 N=38		6.3		NP	37
		6.5								
	Boring Terminated at 6.5 Feet	6.5								
		5809.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>

Boring Log No. B-48

Graphic Log	Location: See Exploration Plan Latitude: 36.5994° Longitude: -109.0603° Station: 34+00 Depth (Ft.) Elevation: 5822 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 3"	0.3 5821.75	1								
SILTY SAND (SM), trace gravel, red and orange, medium dense to dense, AASHTO: A-4		2								
		3	X		16-21		9.4	121		
		4								
		5								
		6	X		10-15-16 N=31		7.6		NP	41
6.5	6.5 5815.5 Boring Terminated at 6.5 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-18-2023</p> <p>Boring Completed 12-18-2023</p>

Boring Log No. B-49

Graphic Log	Location: See Exploration Plan Latitude: 36.5979° Longitude: -109.0599° Station: 28+00 Depth (Ft.) _____ Elevation: 5831 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	<p>0.3 ASPHALT - 3.5"</p> <p>SANDY SILT (ML), orange, very stiff, AASHTO: A-4</p>	<p>0.3 5830.71</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p>	<p></p> <p></p> <p>20-21</p> <p></p> <p>12-18</p> <p></p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p>	<p></p> <p></p> <p>10.0</p> <p></p> <p>7.6</p> <p></p>	<p></p> <p></p> <p>113</p> <p></p> <p>109</p> <p></p>	<p></p> <p></p> <p></p> <p></p> <p>NP</p> <p></p>	<p></p> <p></p> <p></p> <p></p> <p>56</p> <p></p>
	<p>6.0 Boring Terminated at 6 Feet</p> <p>5825</p>									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>

Boring Log No. B-50

Graphic Log	Location: See Exploration Plan Latitude: 36.5965° Longitude: -109.0594° Station: 23+00 Depth (Ft.) _____ Elevation: 5836 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.3	ASPHALT - 3.5"	0.3								
0.3 - 6.0	SILTY SAND (SM) , trace gravel, orange, medium dense to dense, AASHTO: A-4	0.3 - 6.0								
		1								
		2								
		3	X		13-19-15 N=34		7.5		NP	41
		4								
		5	X		11-15		9.5	116		
		6								
	Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-18-2023</p> <p>Boring Completed 12-18-2023</p>

Boring Log No. B-51

Graphic Log	Location: See Exploration Plan		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
	Latitude: 36.5954° Longitude: -109.0591°	Station: 19+00								Elevation: 5842 (Ft.) +/-	LL-PL-PI
	ASPHALT - 3.5"		0.3								
	SILTY SAND (SM) , orange and light brown, loose to medium dense, AASHTO: A-4		5841.71								
			1								
			2								
			3	X		13-32		6.0	109	NP	48
			4								
			5	X		4-7	-1.1 @ 500psf	5.1	105		
	Boring Terminated at 6 Feet		6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-21-2023</p> <p>Boring Completed 12-21-2023</p>

Boring Log No. B-52

Graphic Log	Location: See Exploration Plan Latitude: 36.5946° Longitude: -109.0589° Station: 16+00 Depth (Ft.) _____ Elevation: 5849 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.1	ASPHALT - 1.5" SILTY SAND (SM) , trace gravel, orange, medium dense	1								
4.0	SANDY LEAN CLAY (CL) , orange, medium dense, AASHTO: A-4	4			20-29		8.2	117		
6.5	Boring Terminated at 6.5 Feet	6			8-9-10 N=19		7.8		22-13-9	69

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-18-2023</p> <p>Boring Completed 12-18-2023</p>

Boring Log No. B-53

Graphic Log	Location: See Exploration Plan Latitude: 36.5932° Longitude: -109.0587° Station: 11+00 Depth (Ft.) _____ Elevation: 5859 (Ft.) +/- _____	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
0.2	ASPHALT - 2.5"									
	SILTY SAND (SM) , orange, medium dense to very dense									
1		1								
2		2								
3		3			20-30-50 N=80					
4		4								
5		5								
6		6			11-12-12 N=24		5.9			
7		7								
8		8			10-15		5.8	94		
8.5		8.5								
	Boring Terminated at 8.5 Feet	8.5								
		5850.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro (2024).</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem Auger</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 12-18-2023</p> <p>Boring Completed 12-18-2023</p>

Boring Log No. B-54

Graphic Log	Location: See Exploration Plan Latitude: 36.5937° Longitude: -108.9746° Station: 316+00 Depth (Ft.) Elevation: 5976 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT-10"									
	0.8 5975.2 SANDY LEAN CLAY (CL) , red, stiff, AASHTO: A-4	1								
		2								
		3	X		4-4		13.7		25-15-10	50
		4								
		5								
	5.3 5970.7	6	X		3-5-7 N=12					
	Boring Terminated at 6.5 Feet									

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).
 See [Supporting Information](#) for explanation of symbols and abbreviations.
 Elevation Reference: Elevations were provided by Google Earth Pro

Water Level Observations
 Groundwater not encountered

Drill Rig
CME 75
Hammer Type
Automatic
Driller
EDI

Notes

Advancement Method
8" Diameter Hollow Stem

Logged by
MBG
Boring Started
02-20-2024
Boring Completed
02-20-2024

Abandonment Method
Boring backfilled with Auger Cuttings
Surface capped with asphalt

Boring Log No. B-55

Graphic Log	Location: See Exploration Plan Latitude: 36.5929° Longitude: -108.9714° Station: 326+00 Depth (Ft.) Elevation: 5920 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT-10"		0.8								
SANDY LEAN CLAY (CL) , with sand, red and green, stiff, AASHTO: A-6		5919.2								
		1								
		2								
		3		X	6-8-6 N=14					
		4								
		5		X	13-15		20.5		32-19-13	70
	Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
Notes	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-56

Graphic Log	Location: See Exploration Plan Latitude: 36.5937° Longitude: -108.9678° Station: 337+00 Depth (Ft.) Elevation: 5871 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT-11"									
	0.9 5870.1									
	SILTY SAND (SM) , red, medium dense, AASHTO: A-2-4	1								
		2								
		3			1-3-5 N=8					
		4								
		5		8-8			10.4		NP	32
	6.0 5865	6								
	Boring Terminated at 6 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-57

Graphic Log	Location: See Exploration Plan Latitude: 36.5948° Longitude: -108.9648° Station: 347+00 Depth (Ft.) Elevation: 5842 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT-10"									
	0.8 5841.2 SANDY SILTY CLAY (CL-ML) , red, medium dense, AASHTO: A-4	1								
		2								
		3	X		15-19		10.7		23-16-7	55
		4								
	5.3 5836.75	5	X		50/3"					
	Boring Terminated at 5.25 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-58

Graphic Log	Location: See Exploration Plan Latitude: 36.5960° Longitude: -108.9612° Station: 358+00 Depth (Ft.) Elevation: 5806 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 9.5"		0.8								
LEAN CLAY WITH SAND (CL) , trace gravel, red and brown, medium dense to very dense, AASHTO: A-6		1								
		2								
		3	X				13.3		31-17-14	78
		4								
		5								
		6	X		12-24-26 N=50					
Boring Terminated at 6.5 Feet										

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-59

Graphic Log	Location: See Exploration Plan Latitude: 36.5972° Longitude: -108.9581° Station: 368+00 Depth (Ft.) Elevation: 5774 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 8"	0.7								
	SILTY SAND (SM) , trace gravel, white and brown, very dense to loose, AASHTO: A-2-4	1								
		2								
		3	X		50/4"					
		4								
		5	X		4-4		9.2		NP	28
	Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-60

Graphic Log	Location: See Exploration Plan Latitude: 36.5982° Longitude: -108.9547° Station: 380+00 Depth (Ft.) Elevation: 5749 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 9"		0.8								
LEAN CLAY WITH SAND (CL), brown and red, stiff, AASHTO: A-6		5748.25								
		1								
		2								
		3	X		4-4-6 N=10		15.0		27-15-12	71
		4								
		5	X		9-9					
	Boring Terminated at 6 Feet	6								
		5743								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-61

Graphic Log	Location: See Exploration Plan Latitude: 36.5987° Longitude: -108.9512° Station: 391+00 Depth (Ft.) Elevation: 5739 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 9"									
	0.8 5738.25 CLAYEY SAND (SC) , trace gravel, tan, dense to very dense, AASHTO: A-6	1								
		2								
		3	X		18-25		6.8		35-19-16	46
		4								
		5	X		50					
	Boring Terminated at 5.5 Feet									
	6.0 5733									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-62

Graphic Log	Location: See Exploration Plan Latitude: 36.5990° Longitude: -108.9476° Station: 401+00 Depth (Ft.) Elevation: 5759 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 11"		0.9 5758.08								
LEAN CLAY WITH SAND (CL), trace gravel, brown, stiff, AASHTO: A-7-6		1								
		2								
		3	X		8-8-10 N=18					
		4								
		5	X		14-14		16.0		44-15-29	83
	Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-63

Graphic Log	Location: See Exploration Plan Latitude: 36.5994° Longitude: -108.9441° Station: 411+00 Depth (Ft.) Elevation: 5756 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 9"		0.8								
	SANDY SILTY CLAY (CL-ML) , trace gravel, tan, stiff, AASHTO: A-4	1								
		2								
		3	X		12-8		10.3		22-16-6	54
		4								
		5								
		6	X		3-4-5 N=9					
	Boring Terminated at 6.5 Feet	6.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-64

Graphic Log	Location: See Exploration Plan Latitude: 36.5997° Longitude: -108.9404° Station: 421+00 Depth (Ft.) Elevation: 5739 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 10"									
	0.8 5738.17 SANDY LEAN CLAY (CL) , tan, stiff to very stiff, AASHTO: A-6	1								
		2								
		3	X		14-22					
		4								
		5								
	6.5 5732.5 Boring Terminated at 6.5 Feet	6	X		6-7-10 N=17		6.9		27-15-12	64

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2021</p> <p>Boring Completed 02-20-2021</p>

Boring Log No. B-65

Graphic Log	Location: See Exploration Plan Latitude: 36.6000° Longitude: -108.9366° Station: 433+00 Depth (Ft.) Elevation: 5730 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 10"									
	0.8 5729.17 SILTY SAND (SM) , brown, medium dense, AASHTO: A-4	1								
		2								
		3	X		4-6-8 N=14		8.8		NP	47
		4								
		5	X		17-19					
	6.0 5724 Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-66

Graphic Log	Location: See Exploration Plan Latitude: 36.6008° Longitude: -108.9339° Station: 442+00 Depth (Ft.) Elevation: 5731 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 12"									
	1.0 5730 CLAYEY SAND (SC) , trace gravel, brown, medium dense, AASHTO: A-4	1								
		2								
		3	X		5-5-6 N=11					
		4	X							
		5	X		12-15		10.8		24-16-8	49
	6.0 5725 Boring Terminated at 6 Feet	6								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2021</p> <p>Boring Completed 02-20-2021</p>

Boring Log No. B-67

Graphic Log	Location: See Exploration Plan Latitude: 36.6027° Longitude: -108.9314° Station: 452+00 Depth (Ft.) Elevation: 5735 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 14"		1								
1.2	5733.8	2								
SILTY CLAYEY SAND (SC-SM), trace gravel, tan, medium dense to dense, AASHTO: A-4		3	X		14-16		7.3		25-18-7	48
		4								
		5								
		6	X		5-7-10 N=17					
6.5	5728.5									
	Boring Terminated at 6.5 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2024</p> <p>Boring Completed 02-20-2024</p>

Boring Log No. B-68

Graphic Log	Location: See Exploration Plan Latitude: 36.6044° Longitude: -108.9286° Station: 462+00 Depth (Ft.) Elevation: 5723 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 11"	0.9								
	SILTY SAND (SM) , tan and orange, loose to medium dense, AASHTO: A-2-4	1								
		2								
		3		X	9-12					
		4								
		5								
		6		X	1-1-1 N=2		5.5		NP	28
	Boring Terminated at 6.5 Feet	6.5								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2021</p> <p>Boring Completed 02-20-2021</p>

Boring Log No. B-69

Graphic Log	Location: See Exploration Plan Latitude: 36.6056° Longitude: -108.9253° Station: 473+00 Depth (Ft.) _____ Elevation: 5695 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 9.5"		0.8								
SILTY SAND WITH GRAVEL (SM) , yellowish brown, medium dense to dense, AASHTO: A-2-4		1								
SILTY SAND WITH GRAVEL (SM) , yellowish brown, medium dense to dense, AASHTO: A-2-4		2								
SILTY SAND WITH GRAVEL (SM) , yellowish brown, medium dense to dense, AASHTO: A-2-4		3	X		18-14-17 N=31					
SILTY SAND WITH GRAVEL (SM) , yellowish brown, medium dense to dense, AASHTO: A-2-4		4								
SILTY SAND WITH GRAVEL (SM) , yellowish brown, medium dense to dense, AASHTO: A-2-4		5	X		13-13		8.1		NP	12
SILTY SAND WITH GRAVEL (SM) , yellowish brown, medium dense to dense, AASHTO: A-2-4		6								
Boring Terminated at 6 Feet		6.0								
		5689								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
Notes	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-21-2024</p> <p>Boring Completed 02-21-2024</p>

Boring Log No. B-70

Graphic Log	Location: See Exploration Plan Latitude: 36.6069° Longitude: -108.9220° Station: 484+00 Depth (Ft.) Elevation: 5673 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 10"									
	0.8 5672.17 POORLY GRADED GRAVEL WITH SILT (GP-GM) , tan, very dense, AASHTO: A-1	1								
		2								
		3			22-50 N=					
		4								
	5.3 5667.75	5		X	50/3"		6.1		NP	10
	Boring Terminated at 5.25 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-20-2021</p> <p>Boring Completed 02-20-2021</p>

Boring Log No. B-71

Graphic Log	Location: See Exploration Plan Latitude: 36.6081° Longitude: -108.9187° Station: 494+00 Depth (Ft.) Elevation: 5663 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 9.5"									
	0.8 5662.21 SILTY SAND (SM) , trace gravel, tan and red, medium dense, AASHTO: A-2-4	1								
		2								
		3	X		50		6.7		NP	19
		4								
		5								
		6	X		18-15-13 N=28					
	6.5 5656.5 Boring Terminated at 6.5 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
Notes	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-21-2024</p> <p>Boring Completed 02-21-2024</p>

Boring Log No. B-72

Graphic Log	Location: See Exploration Plan Latitude: 36.6093° Longitude: -108.9155° Station: 505+00 Depth (Ft.) Elevation: 5649 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 12"									
	1.0 5648 SILTY SAND (SM) , trace gravel, tan, medium dense to dense, AASHTO: A-4	1								
		2								
		3	X		20-25					
		4								
		5								
		6	X		22-22-25 N=47		6.6		NP	36
	6.5 5642.5 Boring Terminated at 6.5 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-19-2024</p> <p>Boring Completed 02-19-2024</p>

Boring Log No. B-73

Graphic Log	Location: See Exploration Plan Latitude: 36.6106° Longitude: -108.9122° Station: 515+00 Depth (Ft.) Elevation: 5640 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 9"										
0.8	5639.25	1								
SILTY SAND (SM) , trace gravel, tan to orange, medium dense, AASHTO: A-4		2								
3		3	X		20-25		8.2		NP	41
4		4								
5		5								
6		6	X		11-8-15 N=23					
6.5	5633.5									
	Boring Terminated at 6.5 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-19-2024</p> <p>Boring Completed 02-19-2024</p>

Boring Log No. B-74

Graphic Log	Location: See Exploration Plan Latitude: 36.6117° Longitude: -108.9089° Station: 526+00 Depth (Ft.) Elevation: 5634 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 8.5"									
	0.7 5633.29	1								
	SILTY SAND (SM) , trace gravel, red to tan, medium dense, AASHTO: A-2-4	2								
		3			7-10-16 N=26					
		4								
		5		X						
	6.0 5628	6		X	16-23		7.4		NP	33
	Boring Terminated at 6 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-21-2024</p> <p>Boring Completed 02-21-2024</p>

Boring Log No. B-75

Graphic Log	Location: See Exploration Plan Latitude: 36.6128° Longitude: -108.9053° Station: 537+00 Depth (Ft.) Elevation: 5612 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 9.5"									
	0.8 5611.21 SANDY SILT (ML) , red, medium dense to dense, AASHTO: A-4	1								
		2								
		3	X		50		7.9		NP	54
		4								
		5								
		6	X		9-10-16 N=26					
	6.5 5605.5 Boring Terminated at 6.5 Feet									

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-21-2024</p> <p>Boring Completed 02-21-2024</p>

Boring Log No. B-76

Graphic Log	Location: See Exploration Plan Latitude: 36.6140° Longitude: -108.9013° Station: 549+00 Depth (Ft.) _____ Elevation: 5588 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	ASPHALT - 9"									
	0.8 _____ 5587.25 SANDY SILT (ML) , brown, loose to medium dense, AASHTO: A-4	1								
		2								
		3			1-2-3 N=5					
		4								
		5								
	6.0 _____ 5582 Boring Terminated at 6 Feet	6			4-7		13.1		NP	58

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-19-2024</p> <p>Boring Completed 02-19-2024</p>

Boring Log No. B-78

Graphic Log	Location: See Exploration Plan Latitude: 36.6170° Longitude: -108.8907° Station: 582+00 Depth (Ft.) Elevation: 5574 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
ASPHALT - 14"		1								
CLAYEY GRAVEL WITH SAND (GC), tan and brown, medium dense, AASHTO: A-2-6	5572.8	2								
CLAYEY GRAVEL WITH SAND (GC), tan and brown, medium dense, AASHTO: A-2-6		3	X		6-10		6.3		34-15-19	26
CLAYEY GRAVEL WITH SAND (GC), tan and brown, medium dense, AASHTO: A-2-6		4								
CLAYEY GRAVEL WITH SAND (GC), tan and brown, medium dense, AASHTO: A-2-6		5								
CLAYEY GRAVEL WITH SAND (GC), tan and brown, medium dense, AASHTO: A-2-6		6	X		3-5-9 N=14					
CLAYEY GRAVEL WITH SAND (GC), tan and brown, medium dense, AASHTO: A-2-6	5567.5									
Boring Terminated at 6.5 Feet										

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
Notes	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-19-2024</p> <p>Boring Completed 02-19-2024</p>

Boring Log No. HA-01

Graphic Log	Location: See Exploration Plan Latitude: 36.5987° Longitude: -108.9526° Station: 387+00 Depth (Ft.) Elevation: 5729 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	Percent Fines
									LL-PL-PI	
	<p>SANDY SILT (ML), tan, AASHTO: A-4</p>	1							NP	51
	<p>3.0 5726</p> <p>Boring Terminated at 3 Feet</p>	3								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-19-2024</p> <p>Boring Completed 02-19-2024</p>

Boring Log No. HA-02

Graphic Log	Location: See Exploration Plan Latitude: 36.5984° Longitude: -108.9528° Station: 386+00 Depth (Ft.) Elevation: 5733 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
									LL-PL-PI	Percent Fines
	<p>SANDY SILT (ML), tan, AASHTO: A-4</p>	1 2 3					6.1		NP	56
	<p>Boring Terminated at 3 Feet</p>	3								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevations were provided by Google Earth Pro</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 75</p> <p>Hammer Type Automatic</p> <p>Driller EDI</p>
<p>Notes</p>	<p>Advancement Method 8" Diameter Hollow Stem</p> <p>Abandonment Method Boring backfilled with Auger Cuttings Surface capped with asphalt</p>	<p>Logged by MBG</p> <p>Boring Started 02-19-2024</p> <p>Boring Completed 02-19-2024</p>

APPENDIX B
LABORATORY TESTING

Geotechnical Engineering Report

N13(3-3) Red Valley to MP 9.1 ■ San Juan County, NM and Apache County, AZ

June 18, 2025 ■ Terracon Project No. 66215110



Laboratory Testing

Samples retrieved during the field exploration were taken to the laboratory for further observation by the project geotechnical engineer and were classified in accordance with the Unified Soil Classification System (USCS) described in Appendix A. At that time, the field descriptions were confirmed or modified as necessary and an applicable laboratory testing program was formulated to determine engineering properties of the subsurface materials.

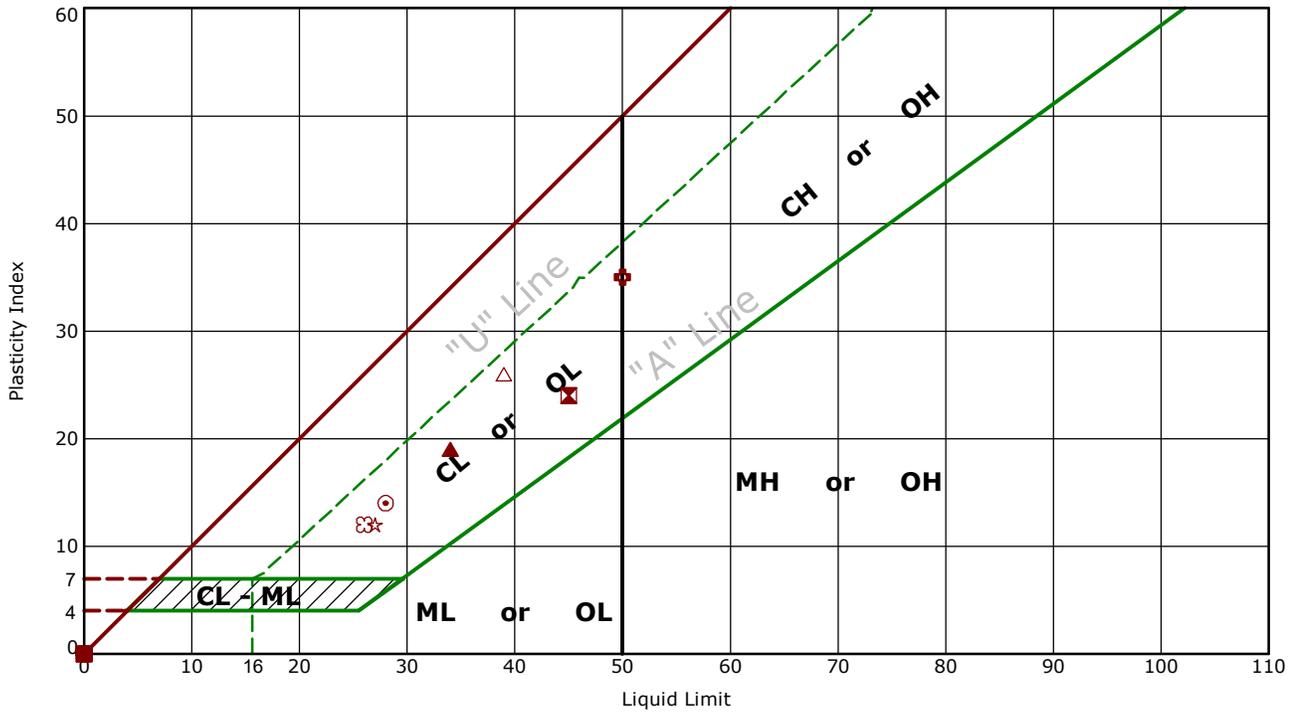
Laboratory tests were conducted on selected soil samples and the test results are presented in this appendix. Selected bulk samples of the site soils were combined to make composite samples, and these composite samples were tested in the laboratory. The laboratory test results were used for the geotechnical engineering analyses, and the development of foundation and earthwork recommendations. Laboratory tests were performed in general accordance with the applicable ASTM, local or other accepted standards.

Selected soil samples obtained from the site were tested for the following engineering properties:

- Sieve Analysis
- Atterberg Limits
- R-value
- pH
- Compression/Consolidation
- In-situ Dry Density
- In-situ Water Content
- Soluble Sulfates
- Resistivity

Atterberg Limit Results

ASTM D4318

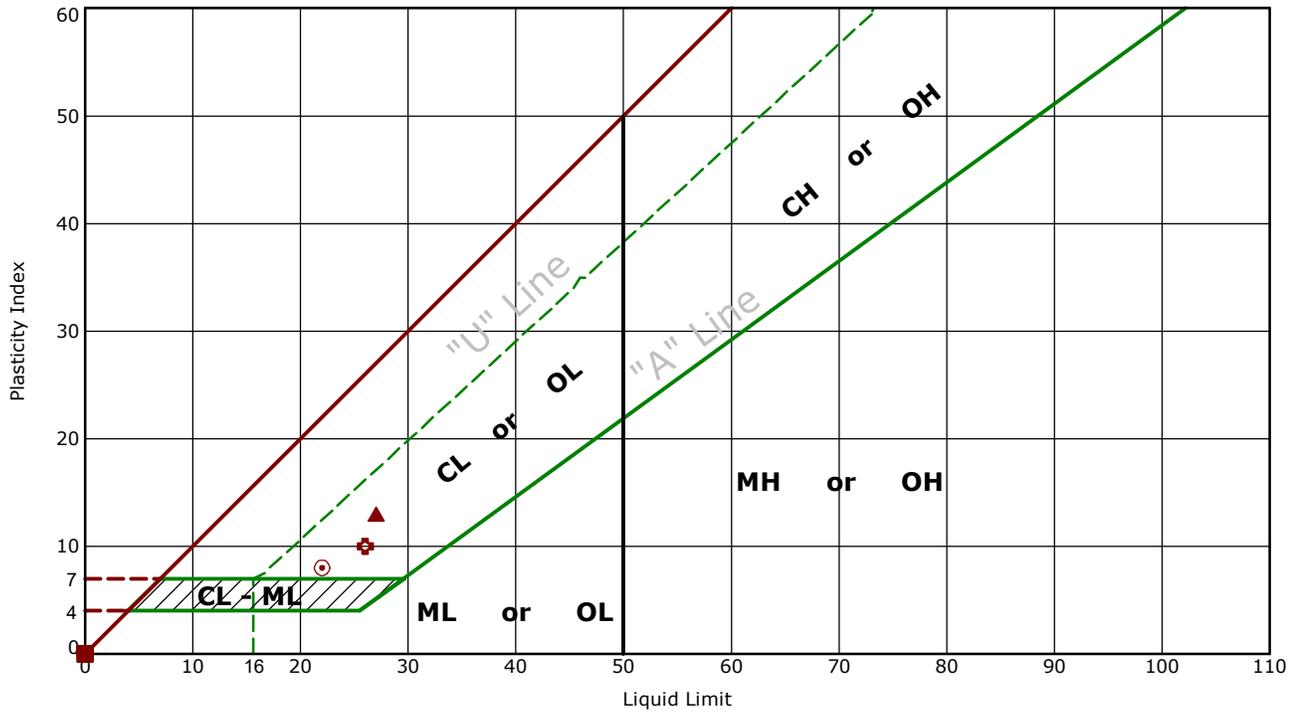


	Boring ID	Depth (Ft)	LL	PL	PI	Fines	AASHTO	Description
●	B-01	2.5 - 3.5	NP	NP	NP	44.8	A-4 (0)	SILTY SAND
⊠	B-02	5 - 6	45	21	24	47.5	A-7-6 (8)	CLAYEY SAND
▲	B-03	2.5 - 3.5	34	15	19	47.2	A-6 (5)	CLAYEY SAND
★	B-04	2.5 - 4	NP	NP	NP	46.0	A-4 (0)	SILTY SAND
⊙	B-05	5 - 6.5	28	14	14	47.8	A-6 (3)	CLAYEY SAND
⊕	B-06	2.5 - 4	50	15	35	52.5	A-7-6 (14)	SANDY FAT CLAY
○	B-07	5 - 6.5	NP	NP	NP	39.6	A-4 (0)	SILTY SAND
△	B-08	2.5 - 4	39	13	26	19.9	A-2-6 (1)	CLAYEY GRAVEL with SAND
⊗	B-09	5 - 6	NP	NP	NP	31.0	A-2-4 (0)	SILTY SAND
⊕	B-10	5 - 6.5	NP	NP	NP	49.2	A-4 (0)	SILTY SAND
□	B-11	2.5 - 3.5	NP	NP	NP	28.7	A-2-4 (0)	SILTY SAND
⊕	B-12	2.5 - 4	NP	NP	NP	22.4	A-2-4 (0)	SILTY SAND
⊕	B-13	5 - 6	NP	NP	NP	14.8	A-2-4 (0)	SILTY SAND
★	B-14	5 - 6.5	27	15	12	70.0	A-6 (6)	LEAN CLAY with SAND
⊗	B-15	2.5 - 4	26	14	12	55.8	A-6 (4)	SANDY LEAN CLAY
■	B-16	5 - 6.5	NP	NP	NP	25.3	A-2-4 (0)	SILTY SAND
◆	B-17	2.5 - 4	NP	NP	NP	33.2	A-2-4 (0)	SILTY SAND
◇	B-18	5 - 6.5	NP	NP	NP	23.1	A-2-4 (0)	SILTY SAND
×	B-19	2.5 - 4	NP	NP	NP	30.1	A-2-4 (0)	SILTY SAND
■	B-20	2.5 - 4	NP	NP	NP	39.6	A-4 (0)	SILTY SAND

Laboratory tests are not valid if separated from original report.

Atterberg Limit Results

ASTM D4318

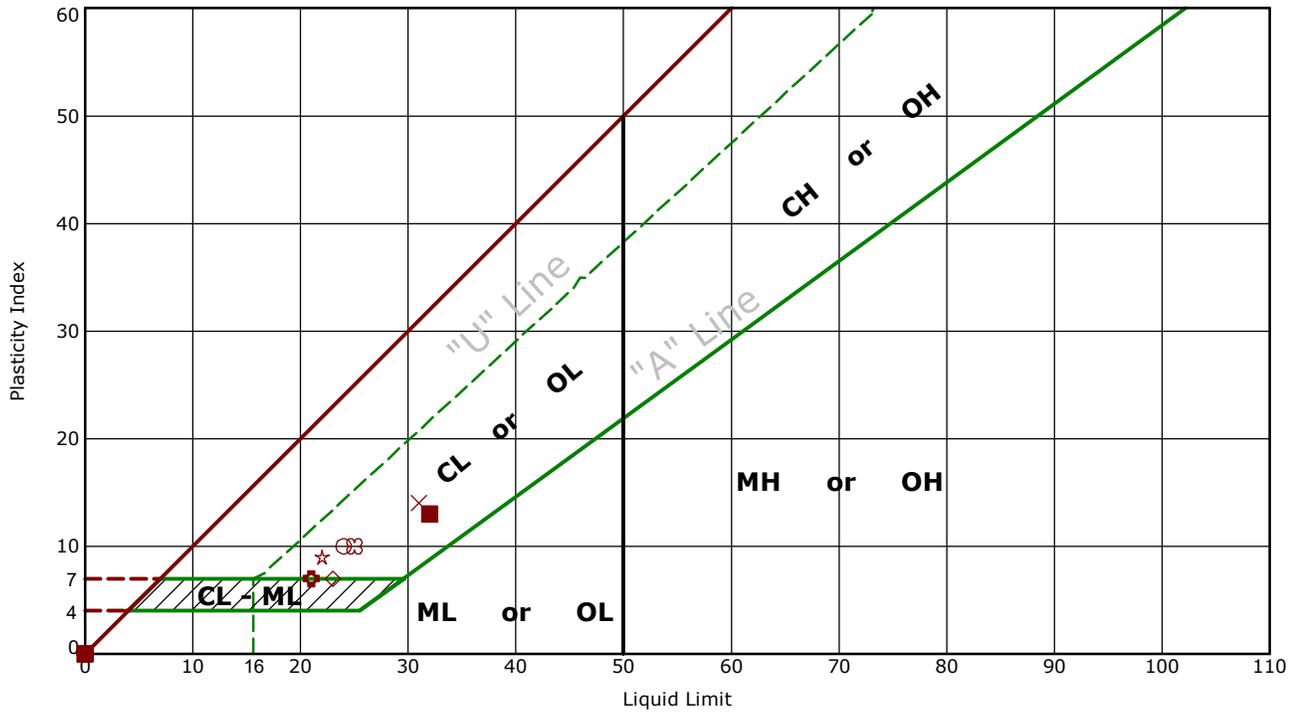


	Boring ID	Depth (Ft)	LL	PL	PI	Fines	AASHTO	Description
●	B-21	5 - 6.5	NP	NP	NP	37.2	A-4 (0)	SILTY SAND
⊠	B-22	5 - 6.5	NP	NP	NP	47.0	A-4 (0)	SILTY SAND
▲	B-23	2.5 - 4	27	14	13	36.5	A-6 (1)	CLAYEY SAND
★	B-24	5 - 6.5	NP	NP	NP	19.4	A-2-4 (0)	SILTY SAND
⊙	B-25	2.5 - 4	22	14	8	50.3	A-4 (1)	SANDY LEAN CLAY
⊕	B-26	5 - 6.5	26	16	10	48.4	A-4 (2)	CLAYEY SAND
○	B-27	2.5 - 4	NP	NP	NP	24.3	A-2-4 (0)	SILTY SAND
△	B-28	5 - 6.5	NP	NP	NP	35.0	A-2-4 (0)	SILTY SAND
⊗	B-29	2.5 - 4	NP	NP	NP	62.8	A-4 (0)	SANDY SILT
⊕	B-30	2.5 - 4	NP	NP	NP	17.7	A-2-4 (0)	SILTY SAND
□	B-31	5 - 5.7	NP	NP	NP	7.2	A-3 (0)	POORLY GRADED SAND with SILT
⊕	B-32	5 - 5.9	NP	NP	NP	9.9	A-3 (0)	POORLY GRADED SAND with SILT
⊕	B-33	2.5 - 4	NP	NP	NP	32.1	A-2-4 (0)	SILTY SAND
★	B-34	5 - 6.5	NP	NP	NP	26.5	A-2-4 (0)	SILTY SAND
⊗	B-35	2.5 - 3.5	NP	NP	NP	20.8	A-2-4 (0)	SILTY SAND
■	B-36	2.5 - 4	NP	NP	NP	60.0	A-4 (0)	SANDY SILT
◆	B-37	2.5 - 3.5	NP	NP	NP	59.9	A-4 (0)	SANDY SILT
◇	B-38	2.5 - 4	NP	NP	NP	50.5	A-4 (0)	SANDY SILT
×	B-39	2.5 - 4	NP	NP	NP	27.3	A-2-4 (0)	SILTY SAND
■	B-40	5 - 6.5	NP	NP	NP	29.5	A-2-4 (0)	SILTY SAND

Laboratory tests are not valid if separated from original report.

Atterberg Limit Results

ASTM D4318

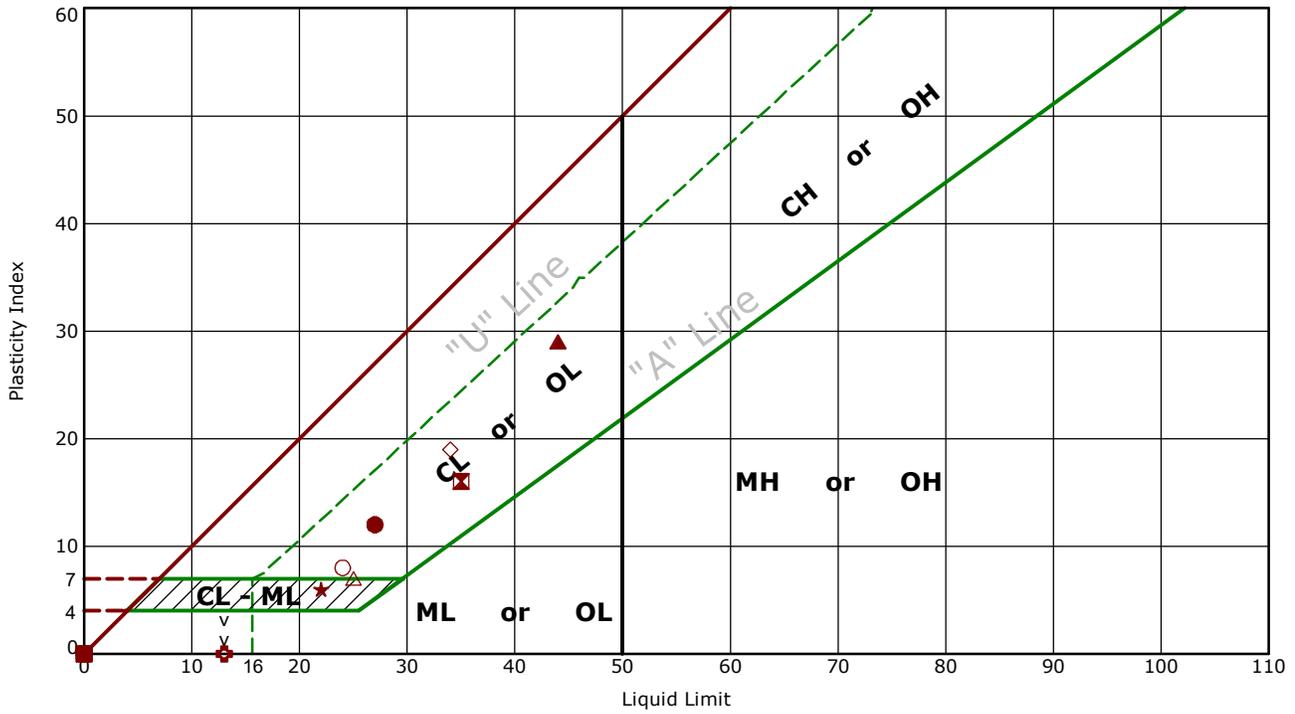


	Boring ID	Depth (Ft)	LL	PL	PI	Fines	AASHTO	Description
●	B-41	2.5 - 4	NP	NP	NP	17.1	A-2-4 (0)	SILTY SAND
⊠	B-42	5 - 6	NP	NP	NP	51.4	A-4 (0)	SANDY SILT
▲	B-43	2.5 - 2.8	NP	NP	NP	13.5	A-2-4 (0)	SILTY SAND
★	B-43	5 - 5.5	NP	NP	NP	7.9	A-3 (0)	POORLY GRADED SAND with SILT and GRAVEL
⊙	B-44	2.5 - 2.6	NP	NP	NP	34.1	A-2-4 (0)	SILTY SAND
⊕	B-44	5 - 5.5	21	14	7	55.4	A-4 (1)	SANDY SILTY CLAY
○	B-45	5 - 6.5	24	14	10	24.3	A-2-4 (0)	CLAYEY SAND
△	B-46	2.5 - 4	NP	NP	NP	12.8	A-2-4 (0)	SILTY SAND
⊗	B-47	5 - 6.5	NP	NP	NP	36.5	A-4 (0)	SILTY SAND
⊕	B-48	5 - 6.5	NP	NP	NP	40.8	A-4 (0)	SILTY SAND
□	B-49	5 - 6	NP	NP	NP	56.1	A-4 (0)	SANDY SILT
⊕	B-50	2.5 - 4	NP	NP	NP	41.4	A-4 (0)	SILTY SAND
⊕	B-51	2.5 - 3.5	NP	NP	NP	47.8	A-4 (0)	SILTY SAND
★	B-52	5 - 6.5	22	13	9	69.3	A-4 (3)	SANDY LEAN CLAY
⊗	B-54	2.5 - 3.5	25	15	10	50.1	A-4 (2)	SANDY LEAN CLAY
■	B-55	5 - 6	32	19	13	70.0	A-6 (7)	SANDY LEAN CLAY
◆	B-56	5 - 6	NP	NP	NP	32.3	A-2-4 (0)	SILTY SAND
◇	B-57	2.5 - 3.5	23	16	7	54.9	A-4 (1)	SANDY SILTY CLAY
×	B-58	2.5 - 3.5	31	17	14	77.9	A-6 (9)	LEAN CLAY with SAND
■	B-59	5 - 6	NP	NP	NP	27.9	A-2-4 (0)	SILTY SAND

Laboratory tests are not valid if separated from original report.

Atterberg Limit Results

ASTM D4318

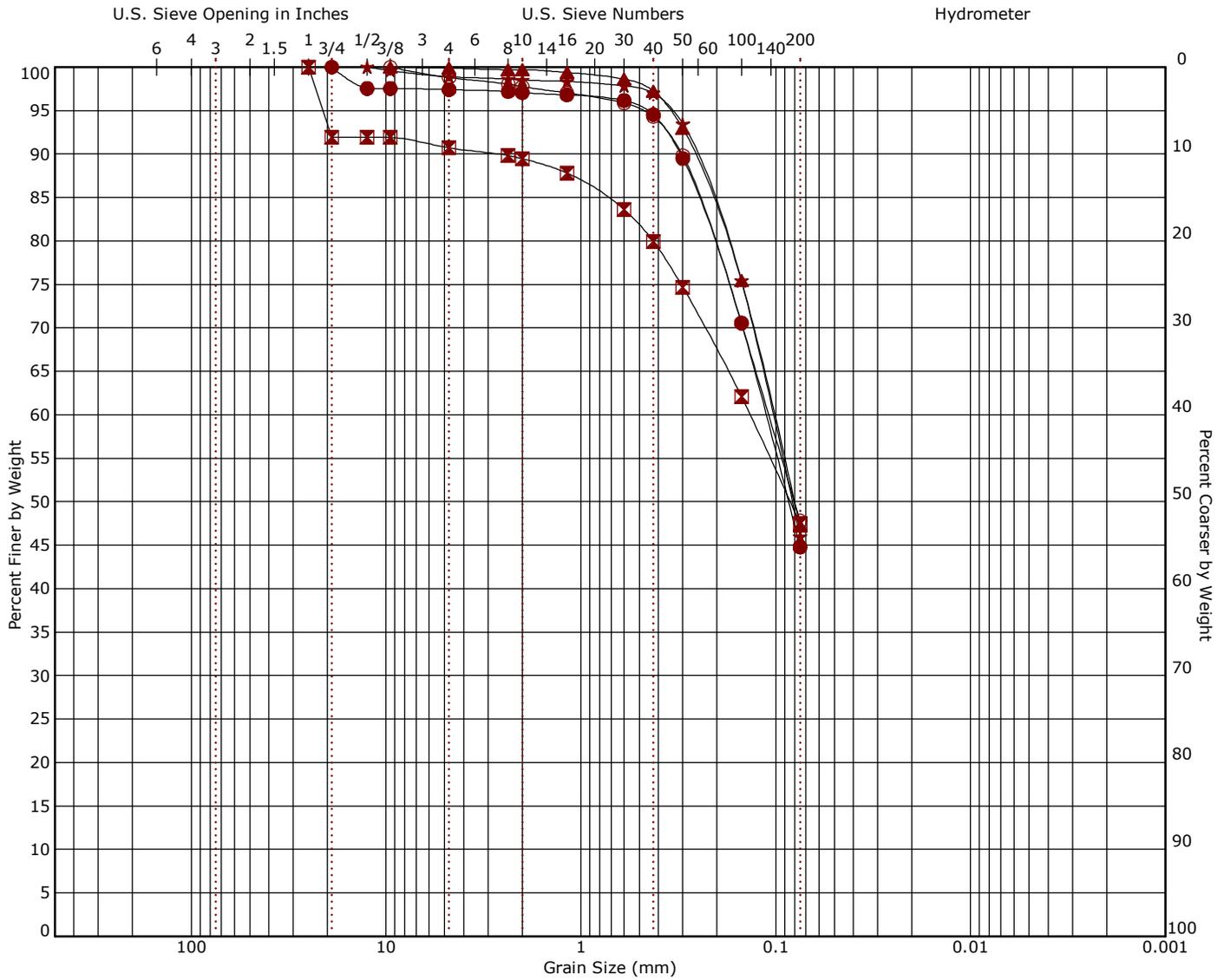


	Boring ID	Depth (Ft)	LL	PL	PI	Fines	AASHTO	Description
●	B-60	2.5 - 4	27	15	12	70.6	A-6 (6)	LEAN CLAY with SAND
⊠	B-61	2.5 - 3.5	35	19	16	45.7	A-6 (4)	CLAYEY SAND
▲	B-62	5 - 6	44	15	29	83.0	A-7-6 (23)	LEAN CLAY with SAND
★	B-63	2.5 - 3.5	22	16	6	54.5	A-4 (1)	SANDY SILTY CLAY
⊙	B-64	5 - 6.5	27	15	12	63.7	A-6 (5)	SANDY LEAN CLAY
⊕	B-65	2.5 - 4	13	15	NP	47.1	A-4 (0)	SILTY SAND
○	B-66	5 - 6	24	16	8	49.0	A-4 (1)	CLAYEY SAND
△	B-67	2.5 - 3.5	25	18	7	47.7	A-4 (1)	SILTY, CLAYEY SAND
⊗	B-68	5 - 6.5	NP	NP	NP	27.9	A-2-4 (0)	SILTY SAND
⊕	B-69	5 - 6	NP	NP	NP	12.5	A-2-4 (0)	SILTY SAND with GRAVEL
□	B-70	5 - 5.3	NP	NP	NP	10.3	A-1-b (0)	POORLY GRADED GRAVEL with SILT and SAND
⊕	B-71	2.5 - 3.5	NP	NP	NP	19.3	A-2-4 (0)	SILTY SAND
⊕	B-72	5 - 6.5	NP	NP	NP	36.3	A-4 (0)	SILTY SAND
★	B-73	2.5 - 3.5	NP	NP	NP	41.5	A-4 (0)	SILTY SAND
⊗	B-74	5 - 6	NP	NP	NP	33.0	A-2-4 (0)	SILTY SAND
■	B-75	2.5 - 3.5	NP	NP	NP	54.3	A-4 (0)	SANDY SILT
◆	B-76	5 - 6	NP	NP	NP	58.4	A-4 (0)	SANDY SILT
◇	B-78	2.5 - 3.5	34	15	19	25.9	A-2-6 (1)	CLAYEY GRAVEL with SAND
×	HA-01	0 - 3	NP	NP	NP	51.0	A-4 (0)	SANDY SILT
■	HA-02	0 - 3	NP	NP	NP	55.6	A-4 (0)	SANDY SILT

Laboratory tests are not valid if separated from original report.

Grain Size Distribution

ASTM D422 / ASTM C136



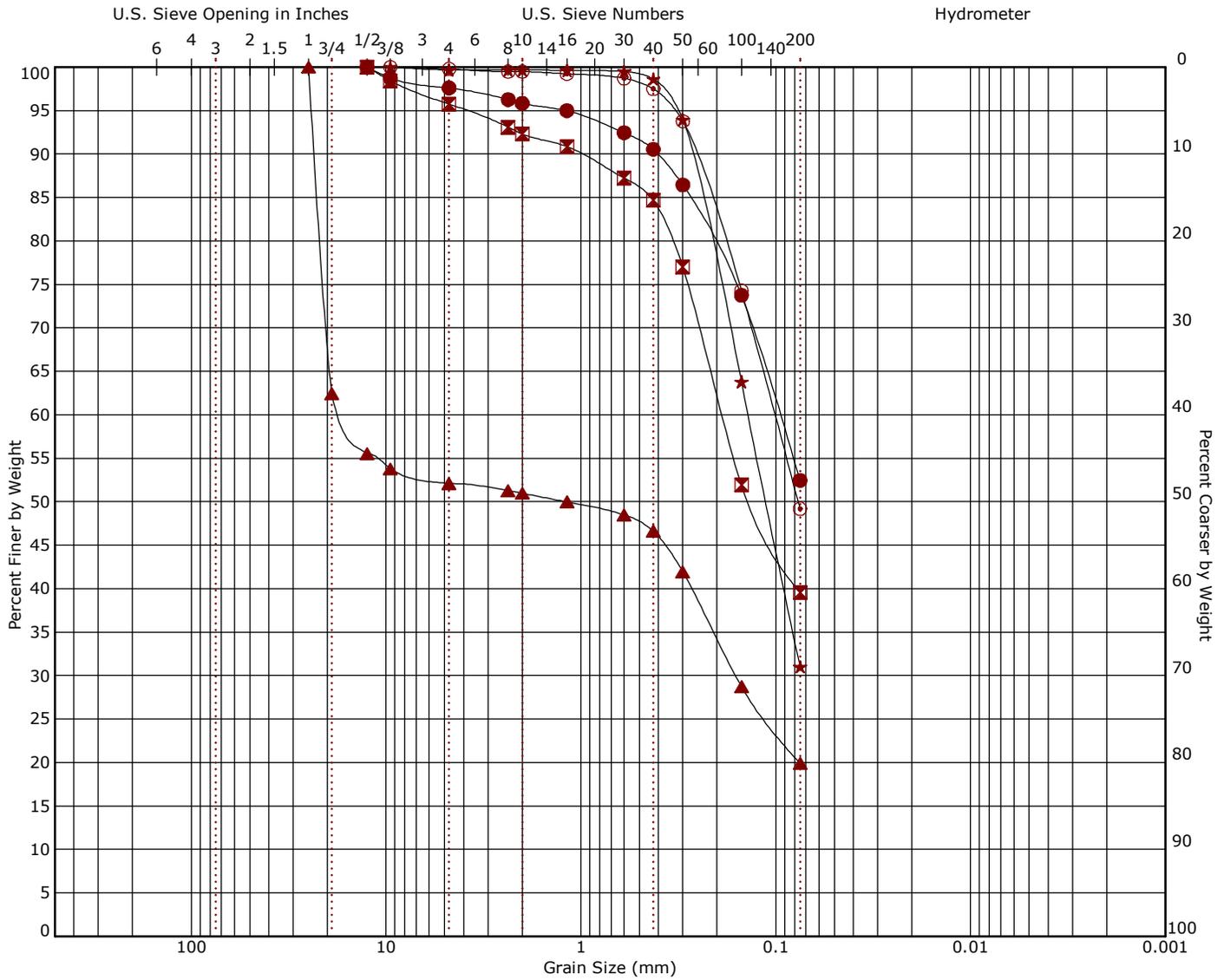
Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-01	2.5 - 3.5	SILTY SAND	SM	A-4 (0)	NP	NP	NP		
⊠ B-02	5 - 6	CLAYEY SAND	SC	A-7-6 (8)	45	21	24		
▲ B-03	2.5 - 3.5	CLAYEY SAND	SC	A-6 (5)	34	15	19		
★ B-04	2.5 - 4	SILTY SAND	SM	A-4 (0)	NP	NP	NP		
⊙ B-05	5 - 6.5	CLAYEY SAND	SC	A-6 (3)	28	14	14		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-01	2.5 - 3.5	19	0.113			0.0	2.6	52.6	44.8		
⊠ B-02	5 - 6	25	0.136			0.0	9.3	43.2	47.5		
▲ B-03	2.5 - 3.5	9.5	0.103			0.0	0.1	52.7	47.2		
★ B-04	2.5 - 4	12.5	0.104			0.0	1.1	52.9	46.0		
⊙ B-05	5 - 6.5	9.5	0.109			0.0	1.2	51.0	47.8		

Grain Size Distribution

ASTM D422 / ASTM C136



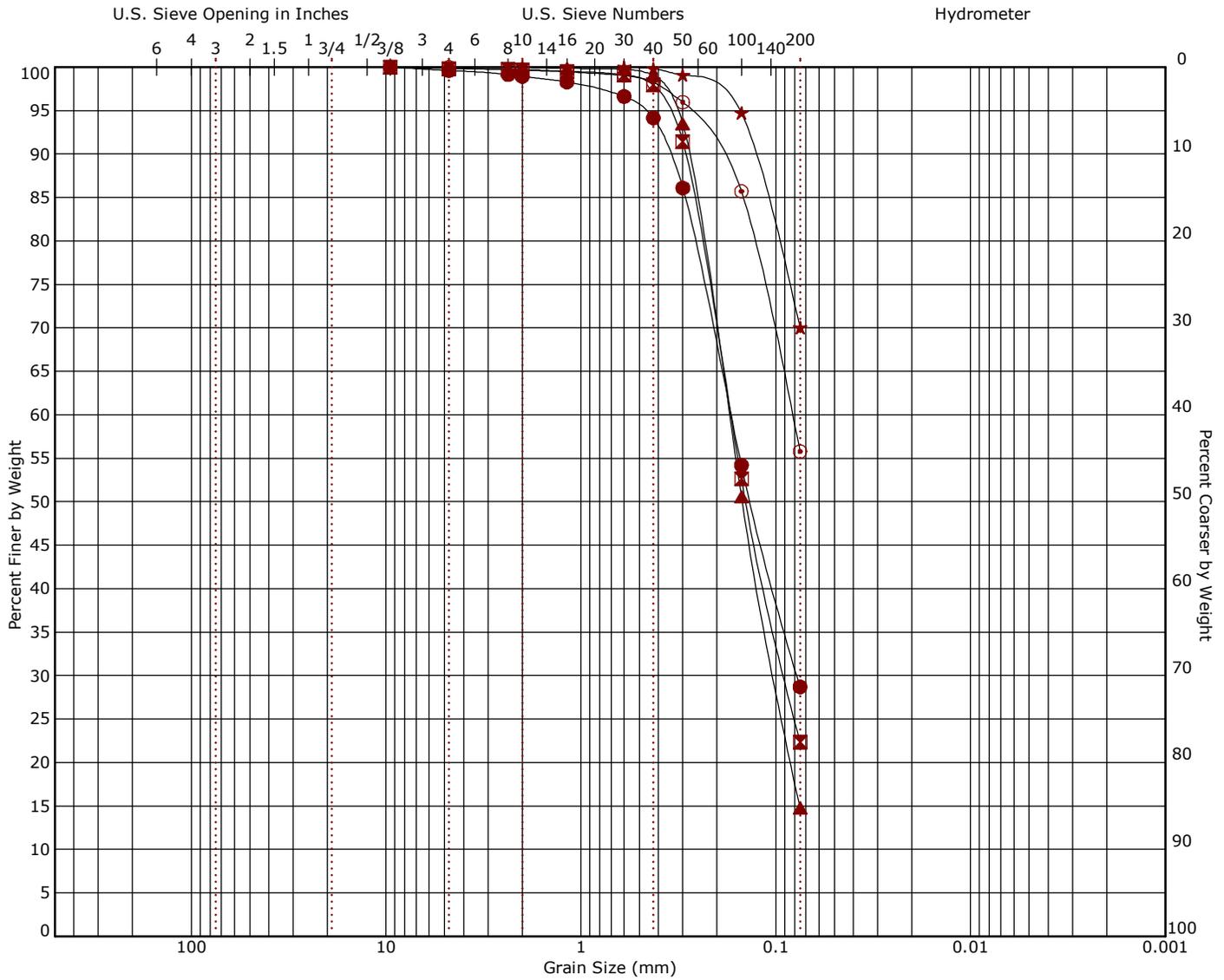
Cobbles	Gravel					Sand			Silt or Clay		
	coarse	fine	coarse	medium	fine						

Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-06	2.5 - 4	SANDY FAT CLAY	CH	A-7-6 (14)	50	15	35		
⊠ B-07	5 - 6.5	SILTY SAND	SM	A-4 (0)	NP	NP	NP		
▲ B-08	2.5 - 4	CLAYEY GRAVEL with SAND	GC	A-2-6 (1)	39	13	26		
★ B-09	5 - 6	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
⊙ B-10	5 - 6.5	SILTY SAND	SM	A-4 (0)	NP	NP	NP		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-06	2.5 - 4	12.5	0.096			0.0	2.4	45.1	52.5		
⊠ B-07	5 - 6.5	12.5	0.188			0.0	4.2	56.2	39.6		
▲ B-08	2.5 - 4	25	16.388	0.16		0.0	47.9	32.2	19.9		
★ B-09	5 - 6	9.5	0.138			0.0	0.3	68.7	31.0		
⊙ B-10	5 - 6.5	9.5	0.101			0.0	0.2	50.6	49.2		

Grain Size Distribution

ASTM D422 / ASTM C136

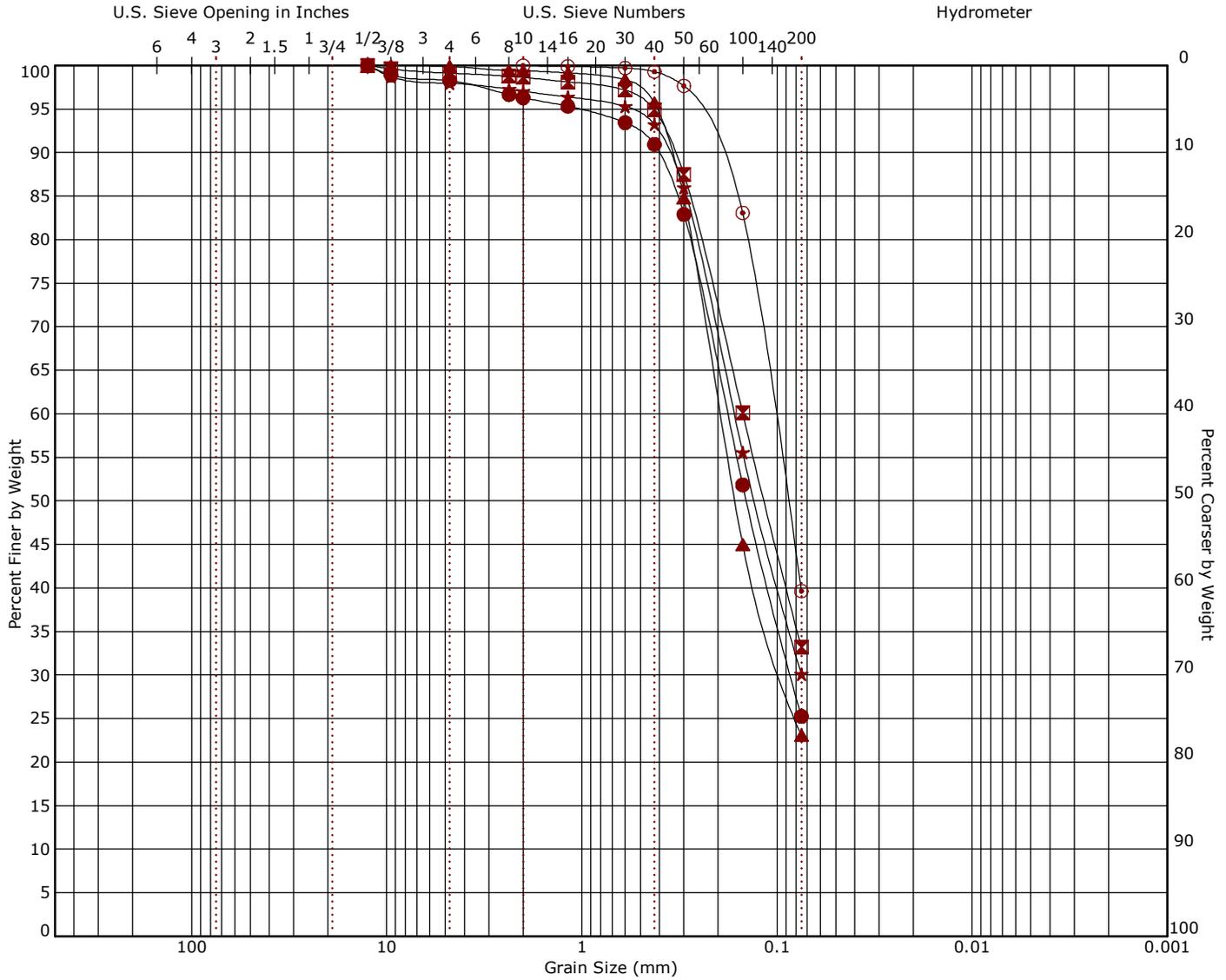


Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-11	2.5 - 3.5	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
☒ B-12	2.5 - 4	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
▲ B-13	5 - 6	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
★ B-14	5 - 6.5	LEAN CLAY with SAND	CL	A-6 (6)	27	15	12		
⊙ B-15	2.5 - 4	SANDY LEAN CLAY	CL	A-6 (4)	26	14	12		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-11	2.5 - 3.5	9.5	0.17	0.078		0.0	0.4	70.9	28.7		
☒ B-12	2.5 - 4	9.5	0.171	0.089		0.0	0.2	77.5	22.4		
▲ B-13	5 - 6	2	0.175	0.101		0.0	0.0	85.2	14.8		
★ B-14	5 - 6.5	0.6				0.0	0.0	30.0	70.0		
⊙ B-15	2.5 - 4	4.75	0.083			0.0	0.0	44.2	55.8		

Grain Size Distribution

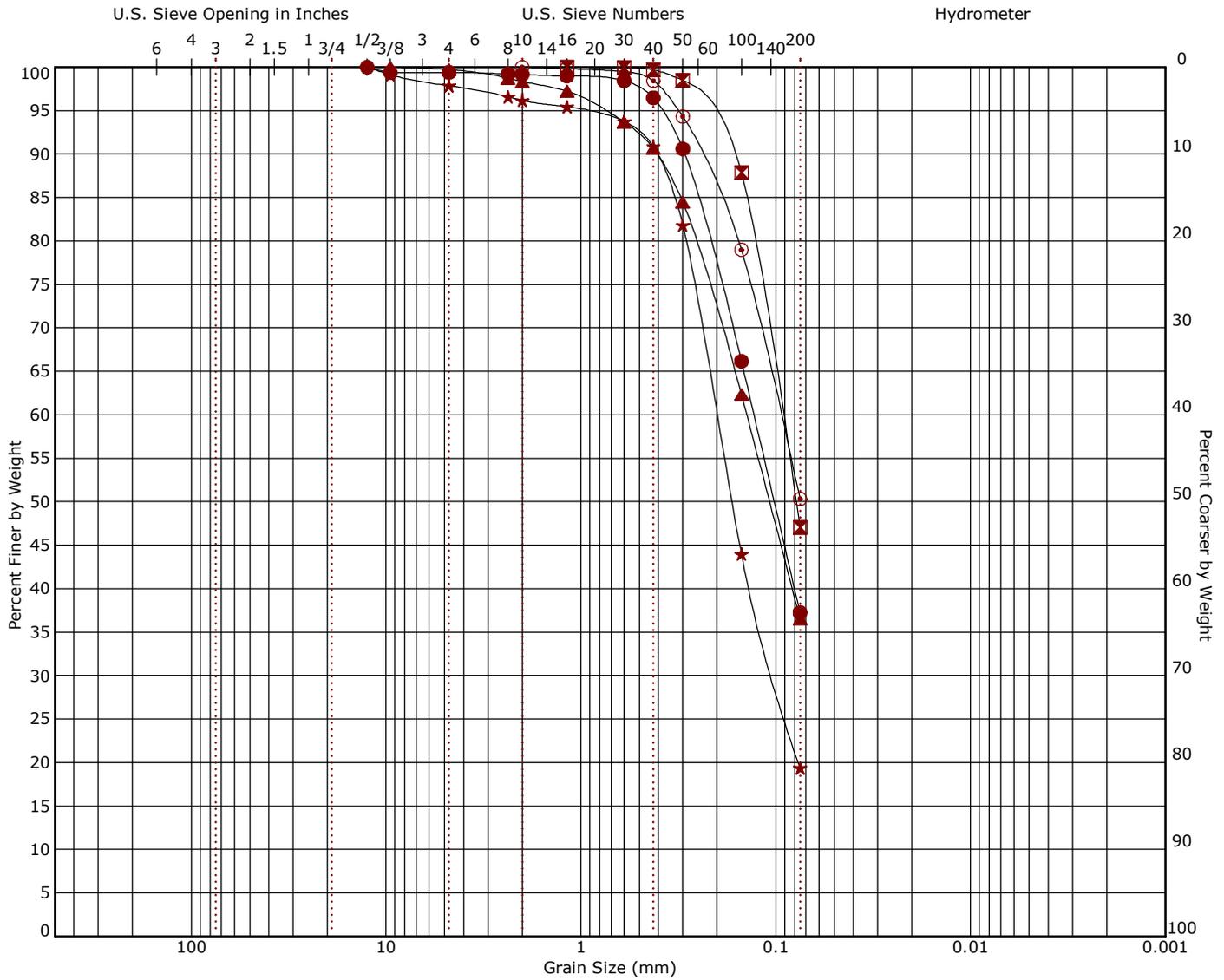
ASTM D422 / ASTM C136



Boring ID	Depth (Ft)	Grain Size (mm)					%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
		D ₁₀₀	D ₆₀	D ₃₀	D ₁₀							
B-16	5 - 6.5	12.5	0.18	0.085			0.0	1.7	73.0	25.3		
B-17	2.5 - 4	12.5	0.15				0.0	0.9	65.9	33.2		
B-18	5 - 6.5	9.5	0.195	0.093			0.0	0.1	76.9	23.1		
B-19	2.5 - 4	12.5	0.166				0.0	2.0	67.9	30.1		
B-20	2.5 - 4	2	0.104				0.0	0.0	60.4	39.6		

Grain Size Distribution

ASTM D422 / ASTM C136

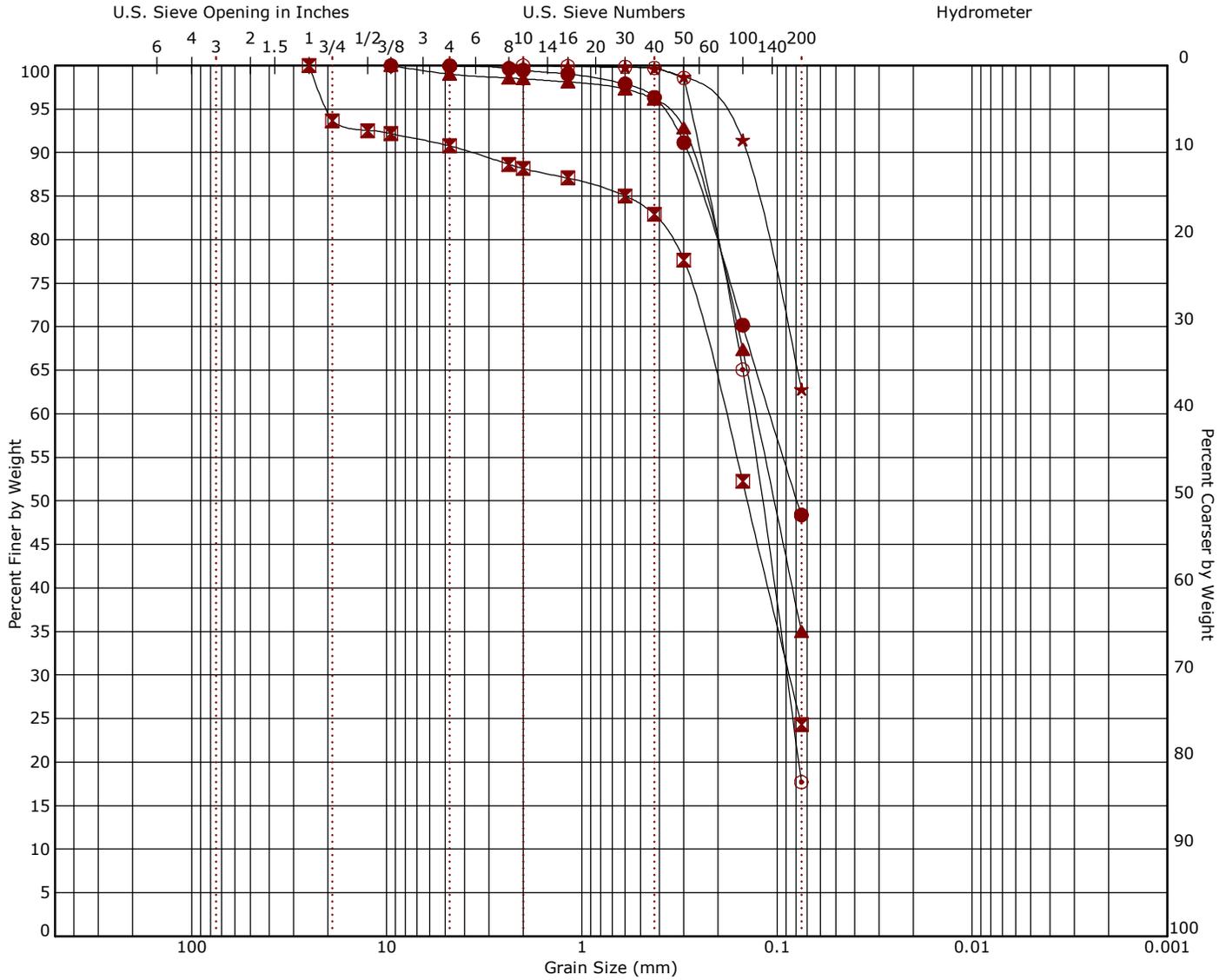


Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-21	5 - 6.5	SILTY SAND	SM	A-4 (0)	NP	NP	NP		
☒ B-22	5 - 6.5	SILTY SAND	SM	A-4 (0)	NP	NP	NP		
▲ B-23	2.5 - 4	CLAYEY SAND	SC	A-6 (1)	27	14	13		
★ B-24	5 - 6.5	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
⊙ B-25	2.5 - 4	SANDY LEAN CLAY	CL	A-4 (1)	22	14	8		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-21	5 - 6.5	12.5	0.129			0.0	0.6	62.1	37.2		
☒ B-22	5 - 6.5	1.18	0.093			0.0	0.0	53.0	47.0		
▲ B-23	2.5 - 4	9.5	0.141			0.0	0.3	63.2	36.5		
★ B-24	5 - 6.5	12.5	0.201	0.101		0.0	2.1	78.5	19.4		
⊙ B-25	2.5 - 4	2	0.095			0.0	0.0	49.7	50.3		

Grain Size Distribution

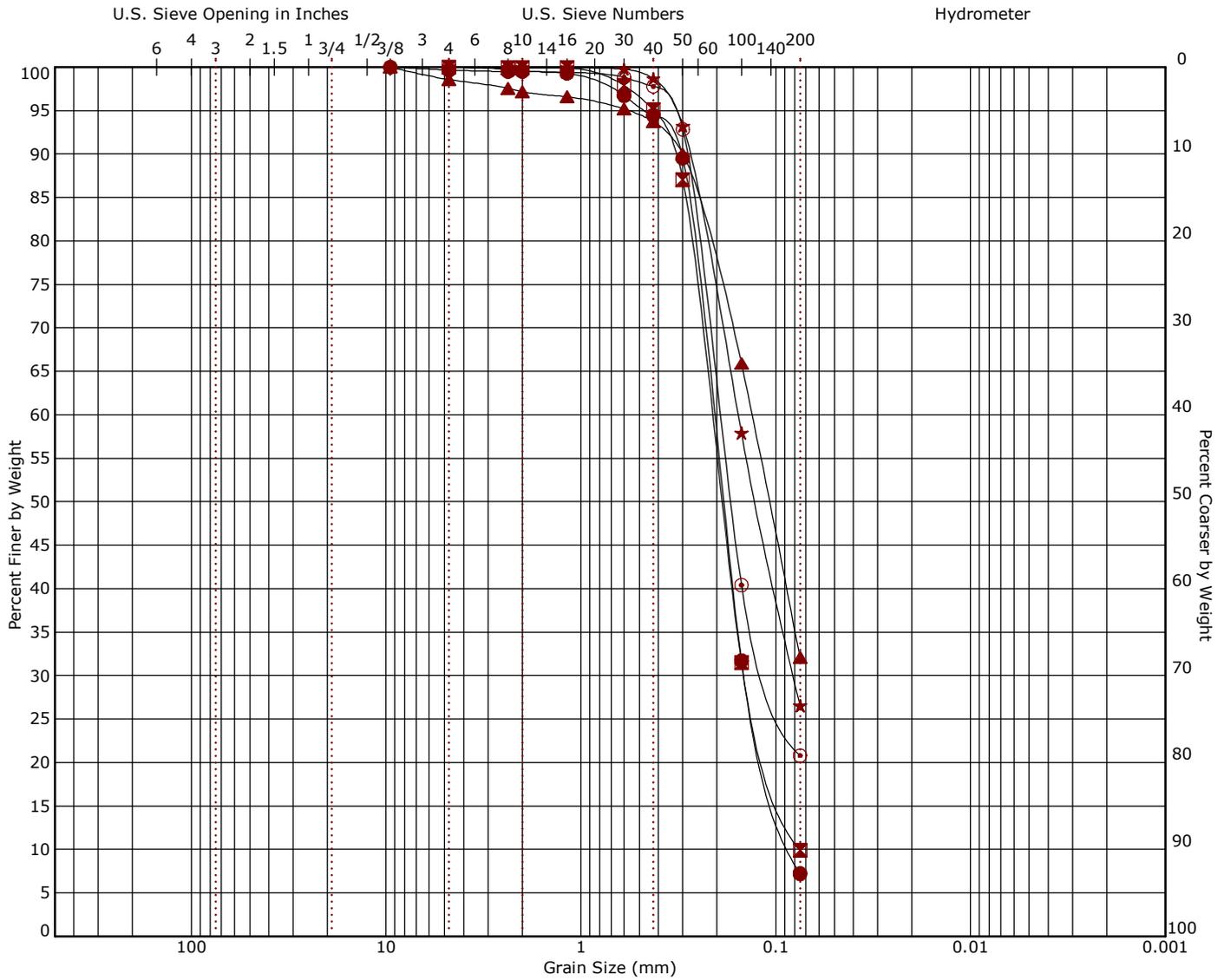
ASTM D422 / ASTM C136



Boring ID	Depth (Ft)	Grain Size					%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
		coarse	fine	coarse	medium	fine						
B-26	5 - 6.5	9.5	0.109				0.0	0.0	51.6	48.4		
B-27	2.5 - 4	25	0.185	0.086			0.0	9.2	66.4	24.3		
B-28	5 - 6.5	9.5	0.128				0.0	1.0	64.0	35.0		
B-29	2.5 - 4	9.5					0.0	0.0	37.1	62.8		
B-30	2.5 - 4	2	0.139	0.09			0.0	0.0	82.3	17.7		

Grain Size Distribution

ASTM D422 / ASTM C136

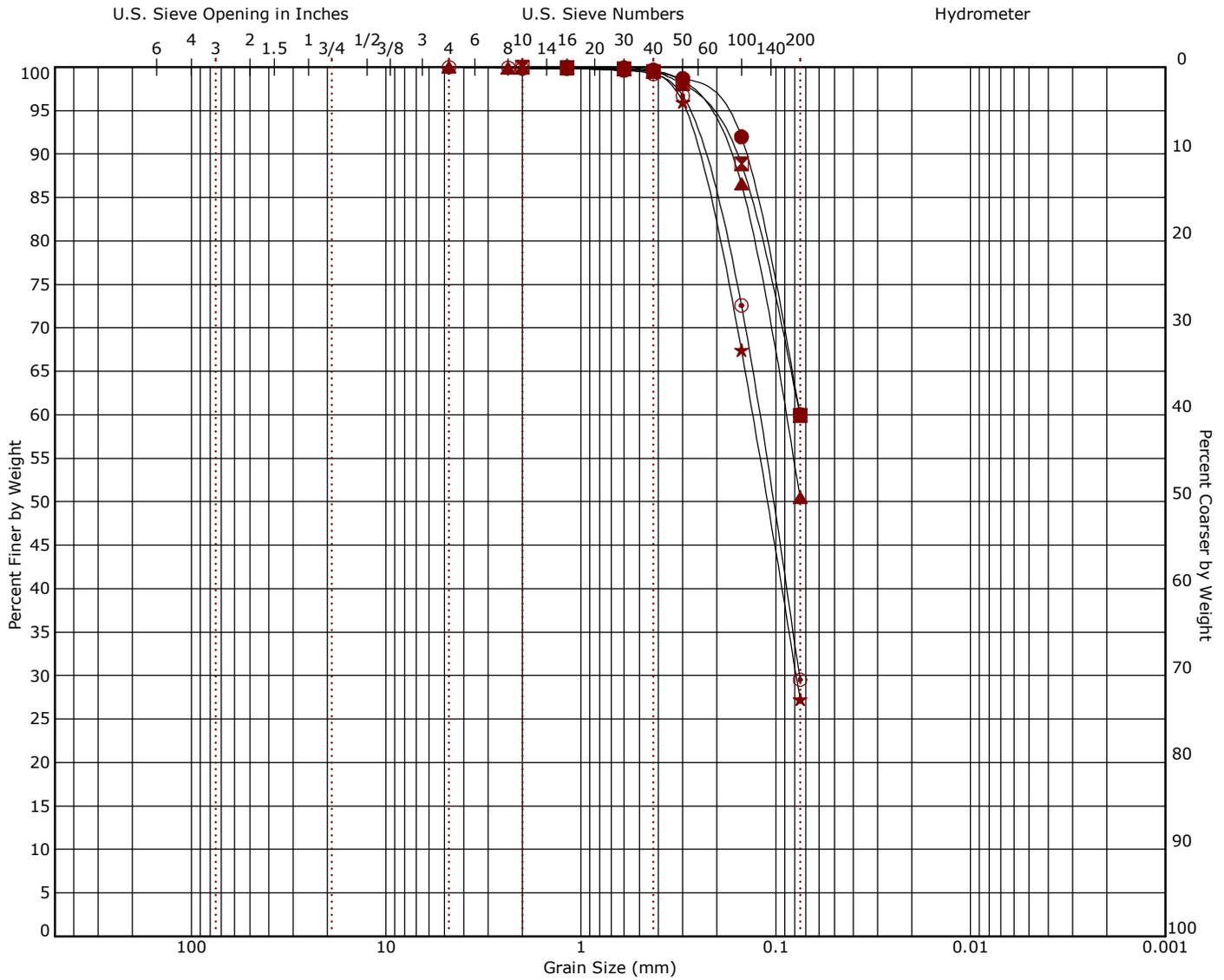


Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-31	5 - 5.7	POORLY GRADED SAND with SILT	SP-SM	A-3 (0)	NP	NP	NP	1.20	2.60
⊠ B-32	5 - 5.9	POORLY GRADED SAND with SILT	SP-SM	A-3 (0)	NP	NP	NP	1.27	2.84
▲ B-33	2.5 - 4	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
★ B-34	5 - 6.5	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
⊙ B-35	2.5 - 3.5	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-31	5 - 5.7	9.5	0.211	0.143	0.081	0.0	0.3	92.4	7.2		
⊠ B-32	5 - 5.9	4.75	0.214	0.143	0.075	0.0	0.0	90.1	9.9		
▲ B-33	2.5 - 4	9.5	0.133			0.0	1.4	66.5	32.1		
★ B-34	5 - 6.5	4.75	0.156	0.081		0.0	0.0	73.5	26.5		
⊙ B-35	2.5 - 3.5	4.75	0.194	0.104		0.0	0.0	79.2	20.8		

Grain Size Distribution

ASTM D422 / ASTM C136



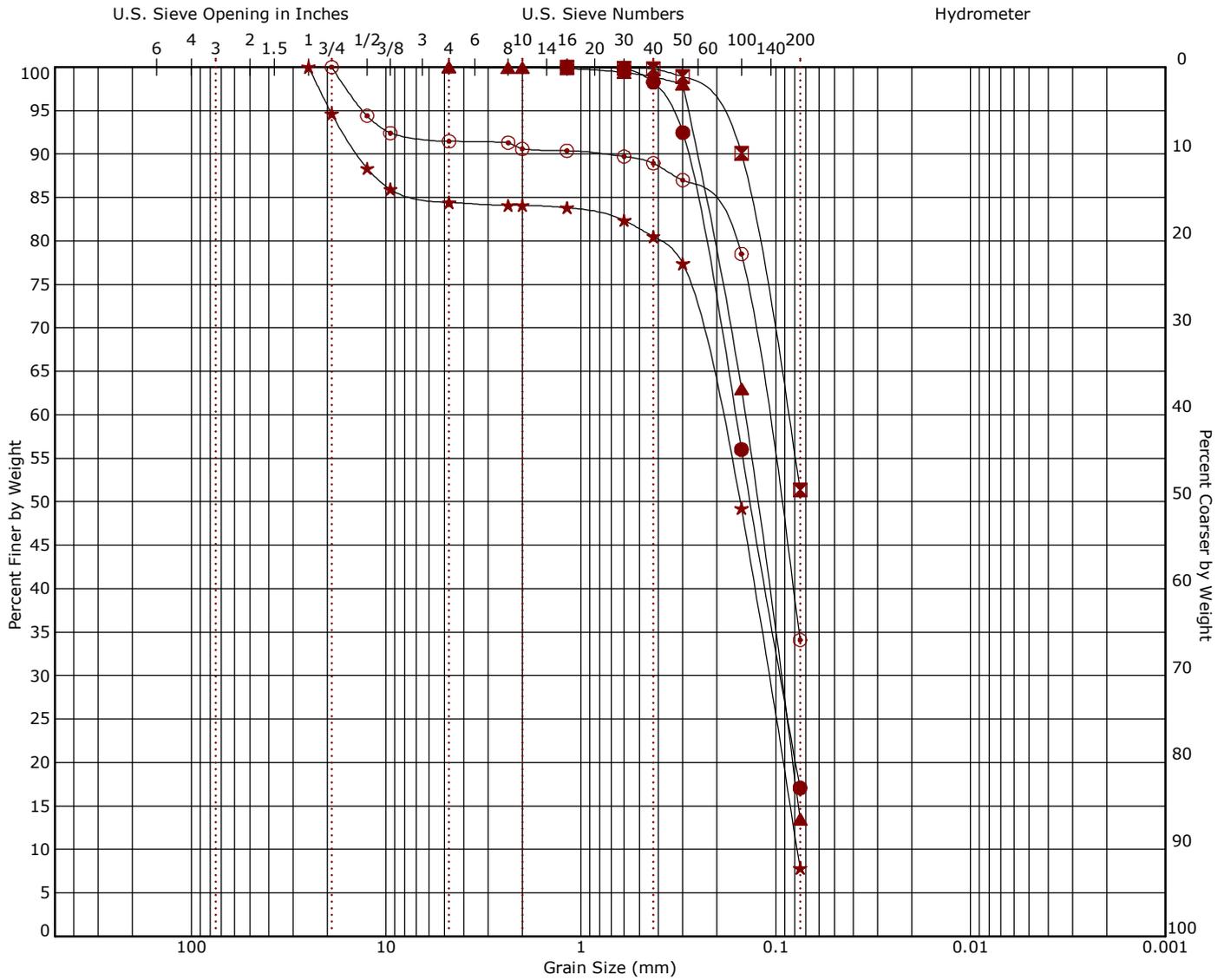
Cobbles	Gravel					Sand			Silt or Clay	
	coarse	fine	coarse	medium	fine					

Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-36	2.5 - 4	SANDY SILT	ML	A-4 (0)	NP	NP	NP		
☒ B-37	2.5 - 3.5	SANDY SILT	ML	A-4 (0)	NP	NP	NP		
▲ B-38	2.5 - 4	SANDY SILT	ML	A-4 (0)	NP	NP	NP		
★ B-39	2.5 - 4	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
⊙ B-40	5 - 6.5	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-36	2.5 - 4	1.18				0.0	0.0	40.0	60.0		
☒ B-37	2.5 - 3.5	2	0.075			0.0	0.0	40.1	59.9		
▲ B-38	2.5 - 4	4.75	0.09			0.0	0.0	49.5	50.5		
★ B-39	2.5 - 4	1.18	0.132	0.079		0.0	0.0	72.7	27.3		
⊙ B-40	5 - 6.5	4.75	0.122	0.076		0.0	0.0	70.5	29.5		

Grain Size Distribution

ASTM D422 / ASTM C136



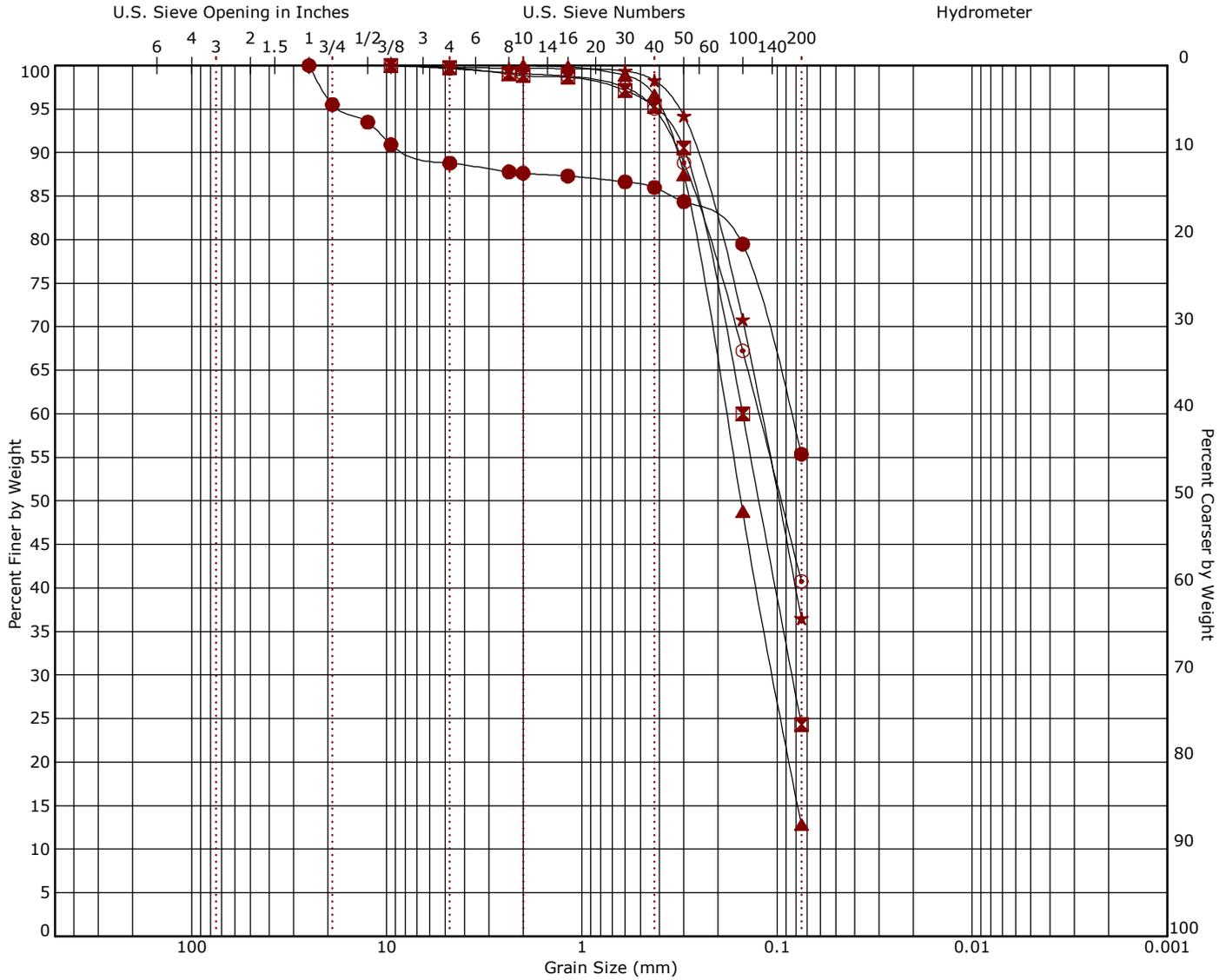
Cobbles	Gravel		Sand			Silt or Clay			
	coarse	fine	coarse	medium	fine				

Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-41	2.5 - 4	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
⊠ B-42	5 - 6	SANDY SILT	ML	A-4 (0)	NP	NP	NP		
▲ B-43	2.5 - 2.8	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
★ B-43	5 - 5.5	POORLY GRADED SAND with SILT and GRAVEL	SP-SM	A-3 (0)	NP	NP	NP	0.78	2.51
⊙ B-44	2.5 - 2.6	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-41	2.5 - 4	1.18	0.162	0.094		0.0	0.0	82.9	17.1		
⊠ B-42	5 - 6	1.18	0.088			0.0	0.0	48.6	51.4		
▲ B-43	2.5 - 2.8	4.75	0.144	0.095		0.0	0.0	86.5	13.5		
★ B-43	5 - 5.5	25	0.195	0.109	0.078	0.0	15.6	76.6	7.9		
⊙ B-44	2.5 - 2.6	19	0.112			0.0	8.5	57.4	34.1		

Grain Size Distribution

ASTM D422 / ASTM C136

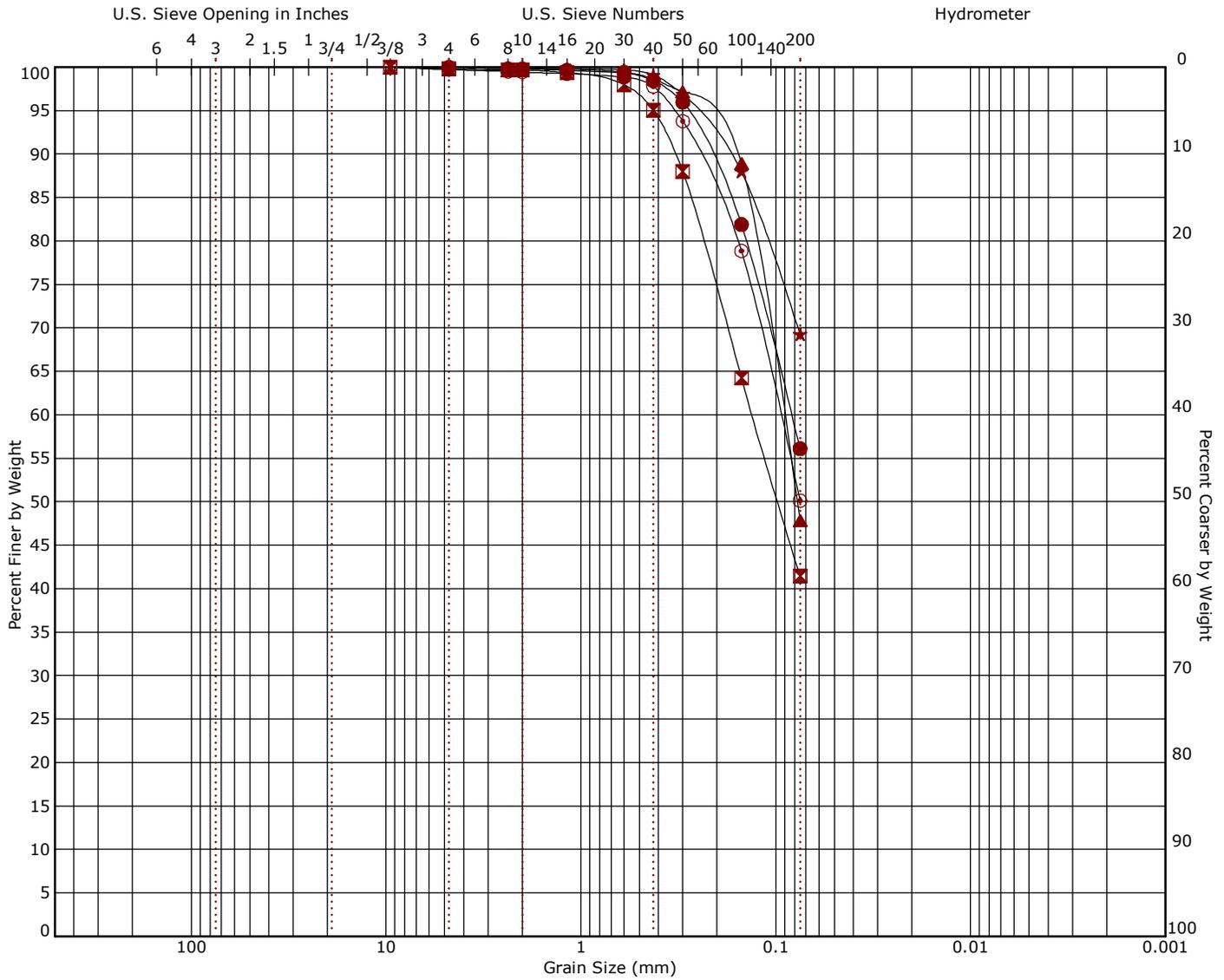


Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-44	5 - 5.5	SANDY SILTY CLAY	CL-ML	A-4 (1)	21	14	7		
⊠ B-45	5 - 6.5	CLAYEY SAND	SC	A-2-4 (0)	24	14	10		
▲ B-46	2.5 - 4	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
★ B-47	5 - 6.5	SILTY SAND	SM	A-4 (0)	NP	NP	NP		
⊙ B-48	5 - 6.5	SILTY SAND	SM	A-4 (0)	NP	NP	NP		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-44	5 - 5.5	25	0.086			0.0	11.2	33.4	55.4		
⊠ B-45	5 - 6.5	9.5	0.15	0.084		0.0	0.2	75.4	24.3		
▲ B-46	2.5 - 4	2	0.183	0.104		0.0	0.0	87.2	12.8		
★ B-47	5 - 6.5	9.5	0.121			0.0	0.2	63.3	36.5		
⊙ B-48	5 - 6.5	9.5	0.124			0.0	0.4	58.9	40.8		

Grain Size Distribution

ASTM D422 / ASTM C136



Cobbles |
 Gravel |
 Sand |
 Silt or Clay

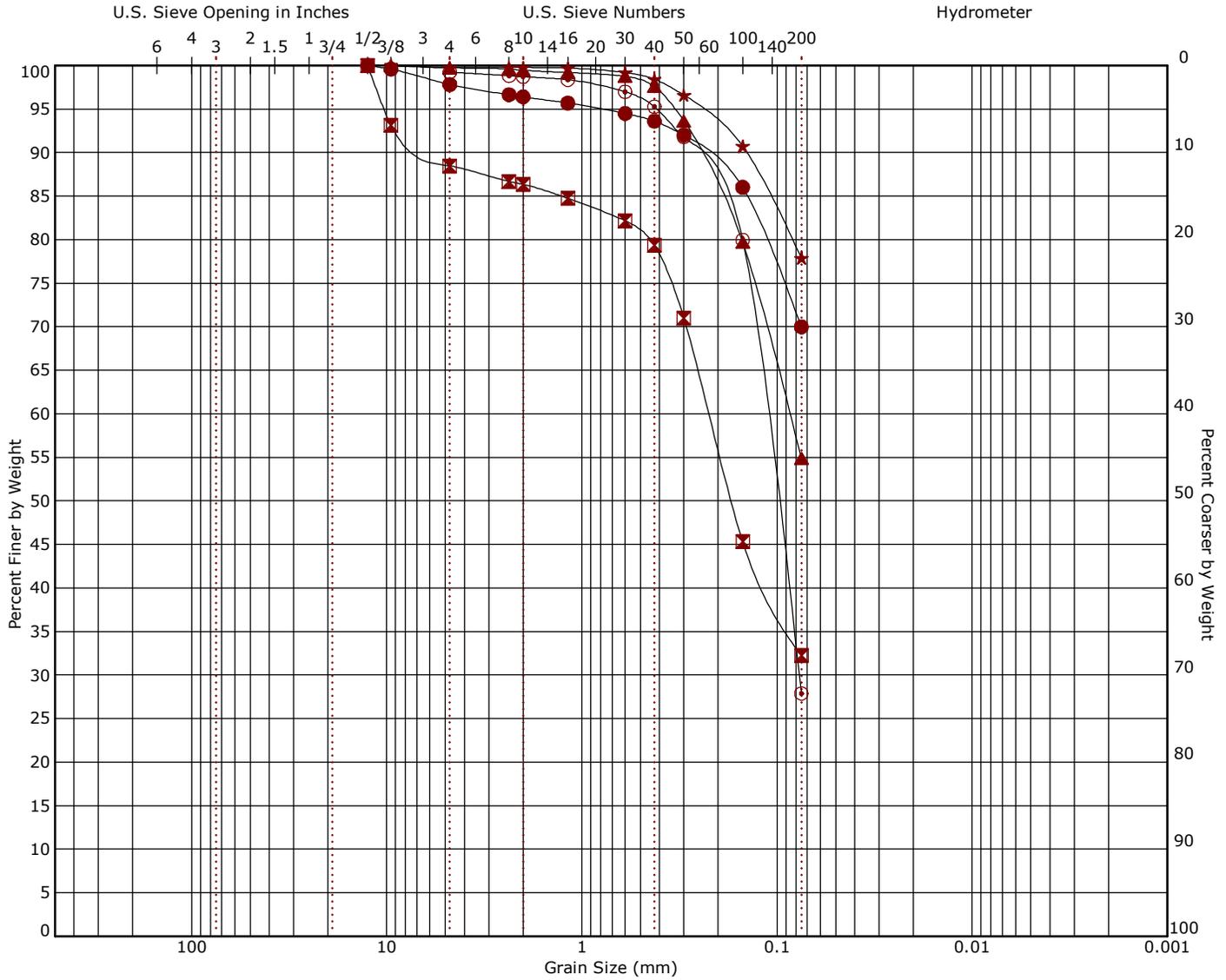
coarse |
 fine |
 coarse |
 medium |
 fine

Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-49	5 - 6	SANDY SILT	ML	A-4 (0)	NP	NP	NP		
⊠ B-50	2.5 - 4	SILTY SAND	SM	A-4 (0)	NP	NP	NP		
▲ B-51	2.5 - 3.5	SILTY SAND	SM	A-4 (0)	NP	NP	NP		
★ B-52	5 - 6.5	SANDY LEAN CLAY	CL	A-4 (3)	22	13	9		
⊙ B-54	2.5 - 3.5	SANDY LEAN CLAY	CL	A-4 (2)	25	15	10		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-49	5 - 6	4.75	0.083			0.0	0.0	43.9	56.1		
⊠ B-50	2.5 - 4	9.5	0.132			0.0	0.2	58.4	41.4		
▲ B-51	2.5 - 3.5	2.36	0.092			0.0	0.0	52.2	47.8		
★ B-52	5 - 6.5	4.75				0.0	0.0	30.7	69.3		
⊙ B-54	2.5 - 3.5	9.5	0.095			0.0	0.3	49.6	50.1		

Grain Size Distribution

ASTM D422 / ASTM C136

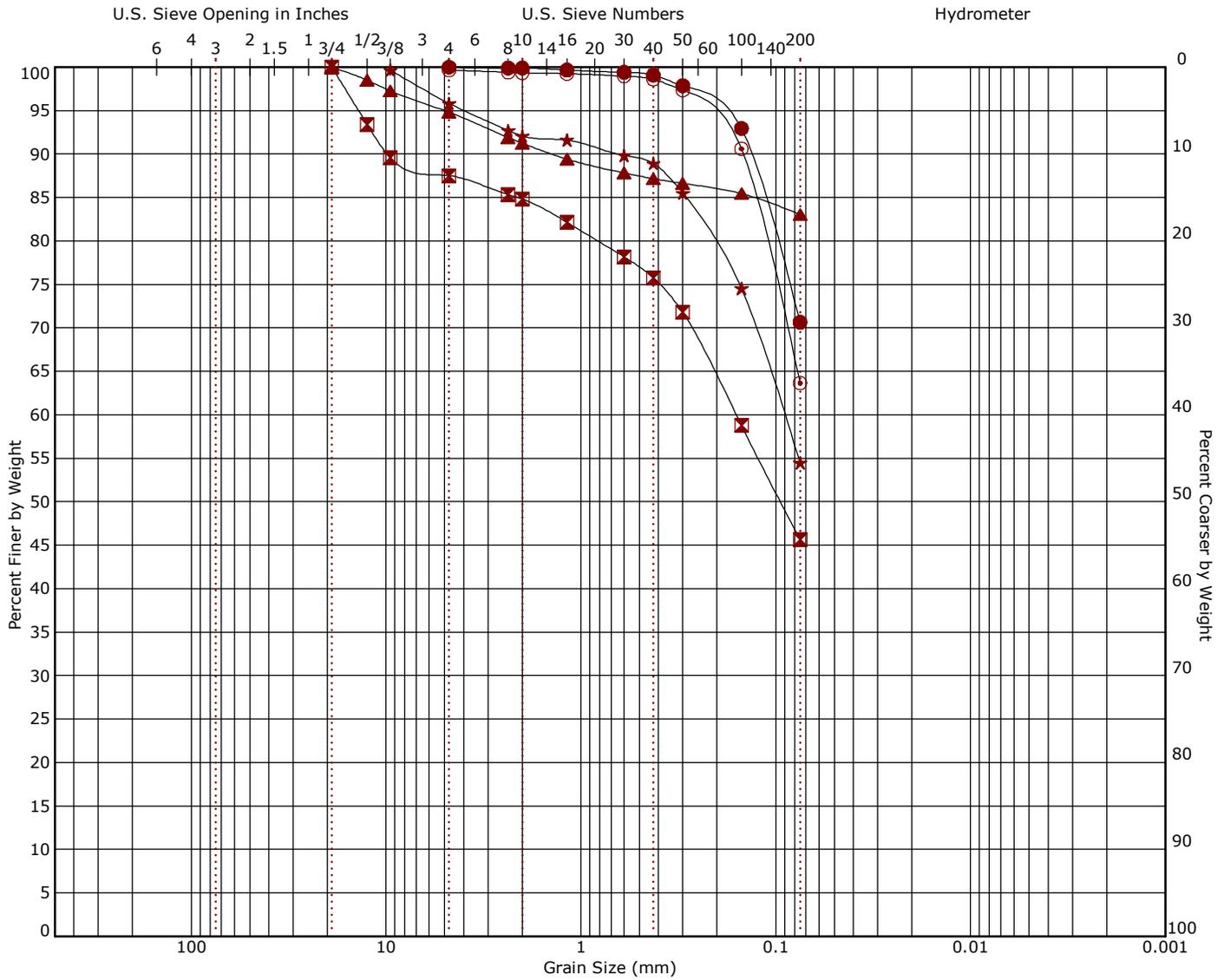


Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-55	5 - 6	SANDY LEAN CLAY	CL	A-6 (7)	32	19	13		
☒ B-56	5 - 6	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
▲ B-57	2.5 - 3.5	SANDY SILTY CLAY	CL-ML	A-4 (1)	23	16	7		
★ B-58	2.5 - 3.5	LEAN CLAY with SAND	CL	A-6 (9)	31	17	14		
⊙ B-59	5 - 6	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-55	5 - 6	12.5				0.0	2.2	27.8	70.0		
☒ B-56	5 - 6	12.5	0.223			0.0	11.5	56.2	32.3		
▲ B-57	2.5 - 3.5	9.5	0.087			0.0	0.3	44.9	54.9		
★ B-58	2.5 - 3.5	9.5				0.0	0.2	21.9	77.9		
⊙ B-59	5 - 6	4.75	0.115	0.077				71.3	27.9		

Grain Size Distribution

ASTM D422 / ASTM C136

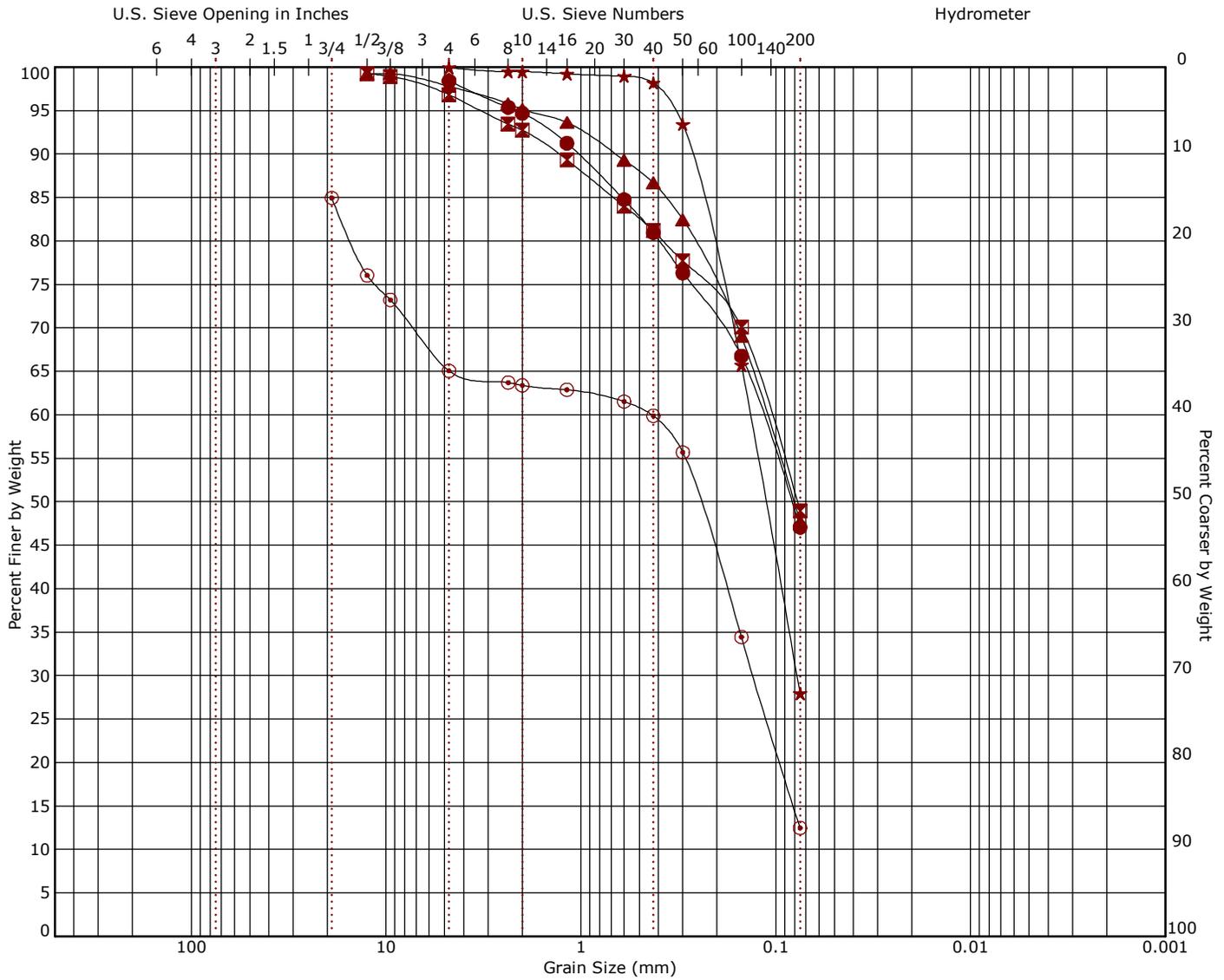


Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-60	2.5 - 4	LEAN CLAY with SAND	CL	A-6 (6)	27	15	12		
☒ B-61	2.5 - 3.5	CLAYEY SAND	SC	A-6 (4)	35	19	16		
▲ B-62	5 - 6	LEAN CLAY with SAND	CL	A-7-6 (23)	44	15	29		
★ B-63	2.5 - 3.5	SANDY SILTY CLAY	CL-ML	A-4 (1)	22	16	6		
⊙ B-64	5 - 6.5	SANDY LEAN CLAY	CL	A-6 (5)	27	15	12		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-60	2.5 - 4	4.75				0.0	0.0	29.4	70.6		
☒ B-61	2.5 - 3.5	19	0.16			0.0	12.5	41.8	45.7		
▲ B-62	5 - 6	19				0.0	5.2	11.8	83.0		
★ B-63	2.5 - 3.5	9.5	0.091				3.8	41.3	54.5		
⊙ B-64	5 - 6.5	4.75						36.0	63.7		

Grain Size Distribution

ASTM D422 / ASTM C136



Cobbles |
 Gravel |
 Sand |
 Silt or Clay

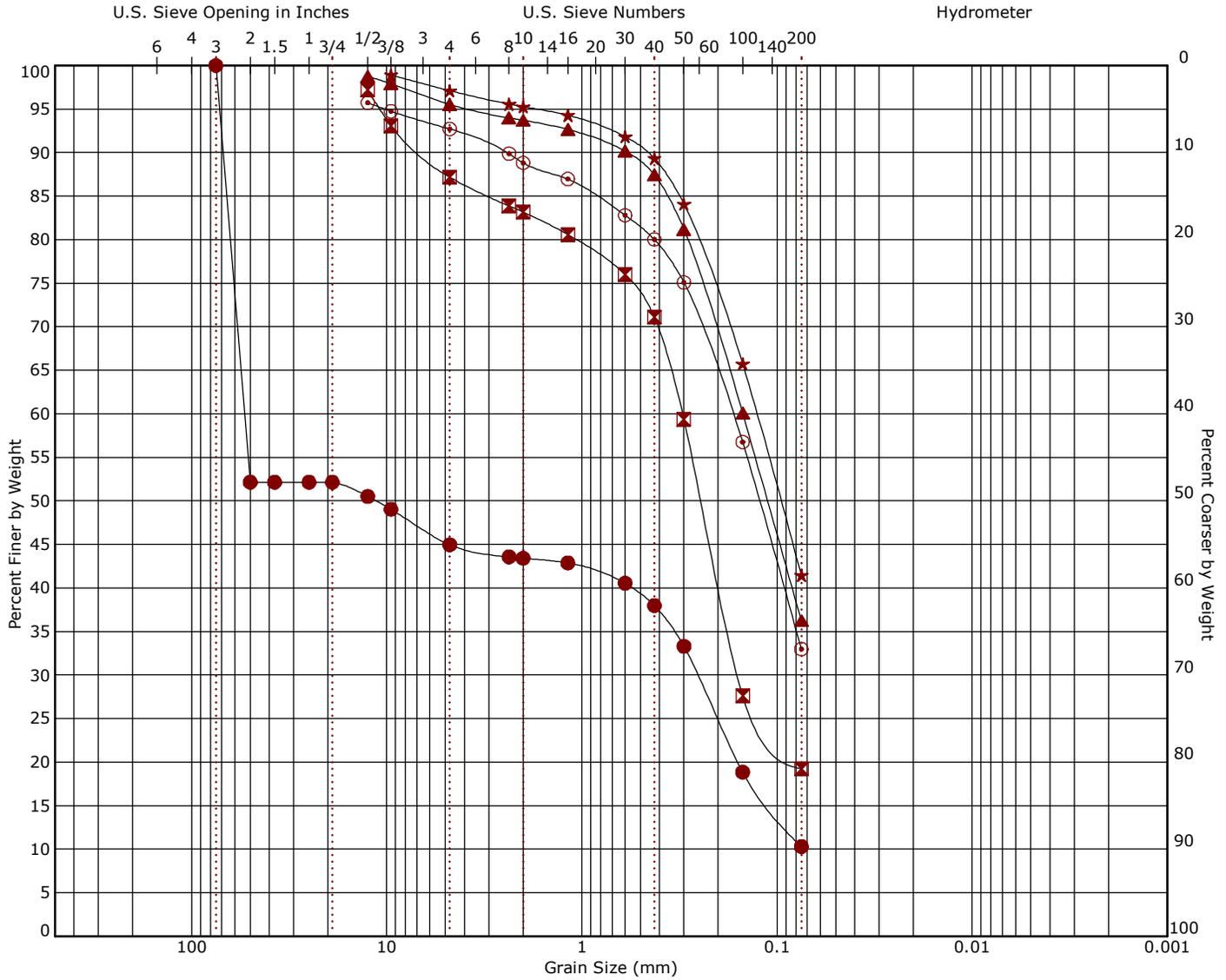
coarse |
 fine |
 coarse |
 medium |
 fine

Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-65	2.5 - 4	SILTY SAND	SM	A-4 (0)	13	15	NP		
⊠ B-66	5 - 6	CLAYEY SAND	SC	A-4 (1)	24	16	8		
▲ B-67	2.5 - 3.5	SILTY, CLAYEY SAND	SC-SM	A-4 (1)	25	18	7		
★ B-68	5 - 6.5	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
⊙ B-69	5 - 6	SILTY SAND with GRAVEL	SM	A-2-4 (0)	NP	NP	NP	0.56	6.27

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-65	2.5 - 4	4.75	0.118					51.3	47.1		
⊠ B-66	5 - 6	12.5	0.108				2.4	47.9	49.0		
▲ B-67	2.5 - 3.5	12.5	0.112				1.5	50.1	47.7		
★ B-68	5 - 6.5	4.75	0.135	0.078				72.0	27.9		
⊙ B-69	5 - 6	19	0.435	0.13			19.9	52.6	12.5		

Grain Size Distribution

ASTM D422 / ASTM C136

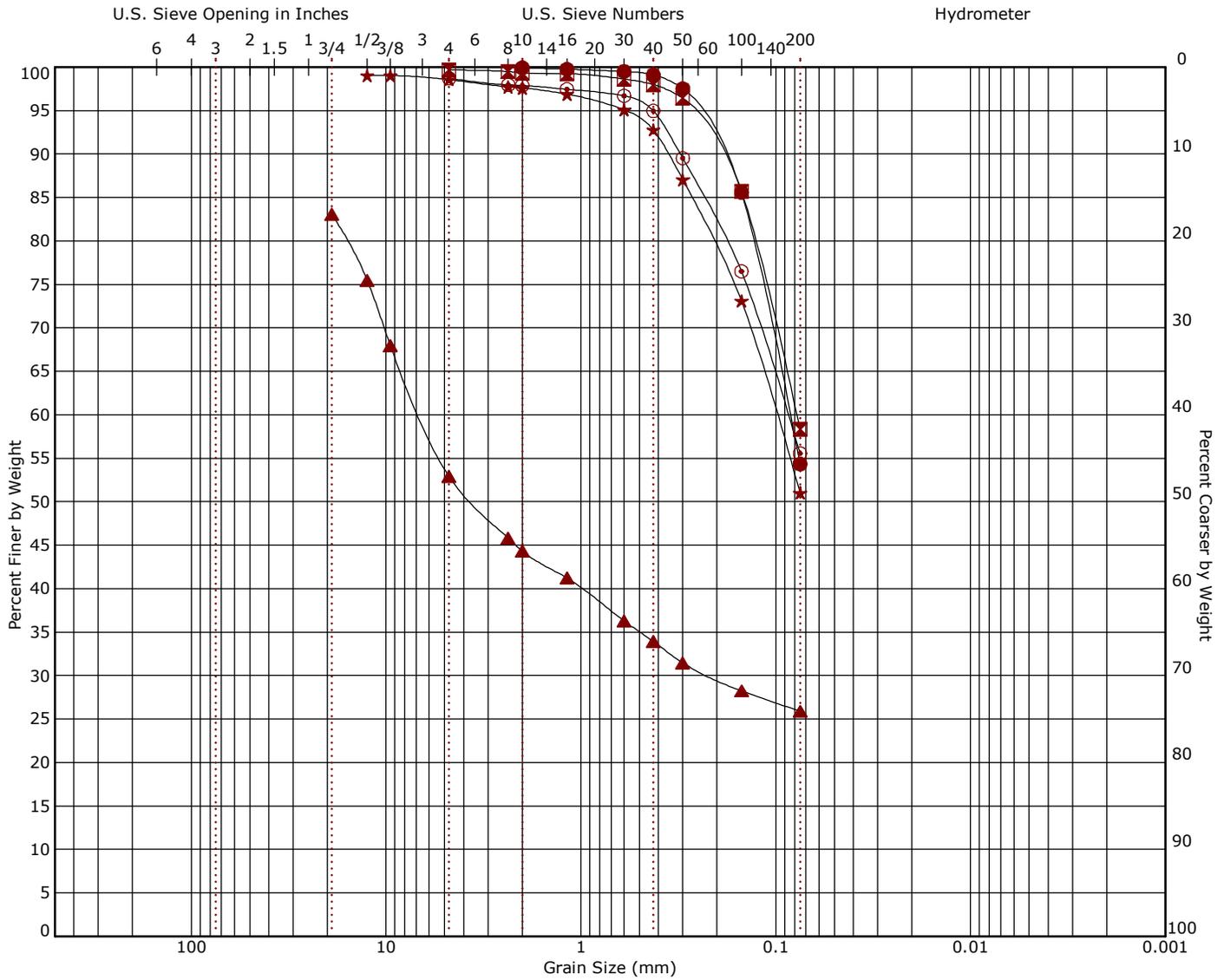


Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-70	5 - 5.3	POORLY GRADED GRAVEL with SILT and SAND	GP-GM	A-1-b (0)	NP	NP	NP	0.02	730.17
☒ B-71	2.5 - 3.5	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		
▲ B-72	5 - 6.5	SILTY SAND	SM	A-4 (0)	NP	NP	NP		
★ B-73	2.5 - 3.5	SILTY SAND	SM	A-4 (0)	NP	NP	NP		
⊙ B-74	5 - 6	SILTY SAND	SM	A-2-4 (0)	NP	NP	NP		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-70	5 - 5.3	75	53.44	0.256		0.0	55.0	34.7	10.3		
☒ B-71	2.5 - 3.5	12.5	0.306	0.158			10.0	67.9	19.3		
▲ B-72	5 - 6.5	12.5	0.15				3.2	59.3	36.3		
★ B-73	2.5 - 3.5	9.5	0.127				1.8	55.6	41.5		
⊙ B-74	5 - 6	12.5	0.17				3.0	59.7	33.0		

Grain Size Distribution

ASTM D422 / ASTM C136



Cobbles |
 Gravel |
 Sand |
 Silt or Clay

coarse | fine | coarse | medium | fine

Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● B-75	2.5 - 3.5	SANDY SILT	ML	A-4 (0)	NP	NP	NP		
☒ B-76	5 - 6	SANDY SILT	ML	A-4 (0)	NP	NP	NP		
▲ B-78	2.5 - 3.5	CLAYEY GRAVEL with SAND	GC	A-2-6 (1)	34	15	19		
★ HA-01	0 - 5	SANDY SILT	ML	A-4 (0)	NP	NP	NP		
⊙ HA-02	0 - 5	SANDY SILT	ML	A-4 (0)	NP	NP	NP		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-75	2.5 - 3.5	2	0.085					45.6	54.3		
☒ B-76	5 - 6	4.75	0.078					41.3	58.4		
▲ B-78	2.5 - 3.5	19	6.583	0.219			30.2	27.0	25.9		
★ HA-01	0 - 5	12.5	0.099				0.5	47.5	51.0		
⊙ HA-02	0 - 5	4.75	0.087					43.1	55.6		

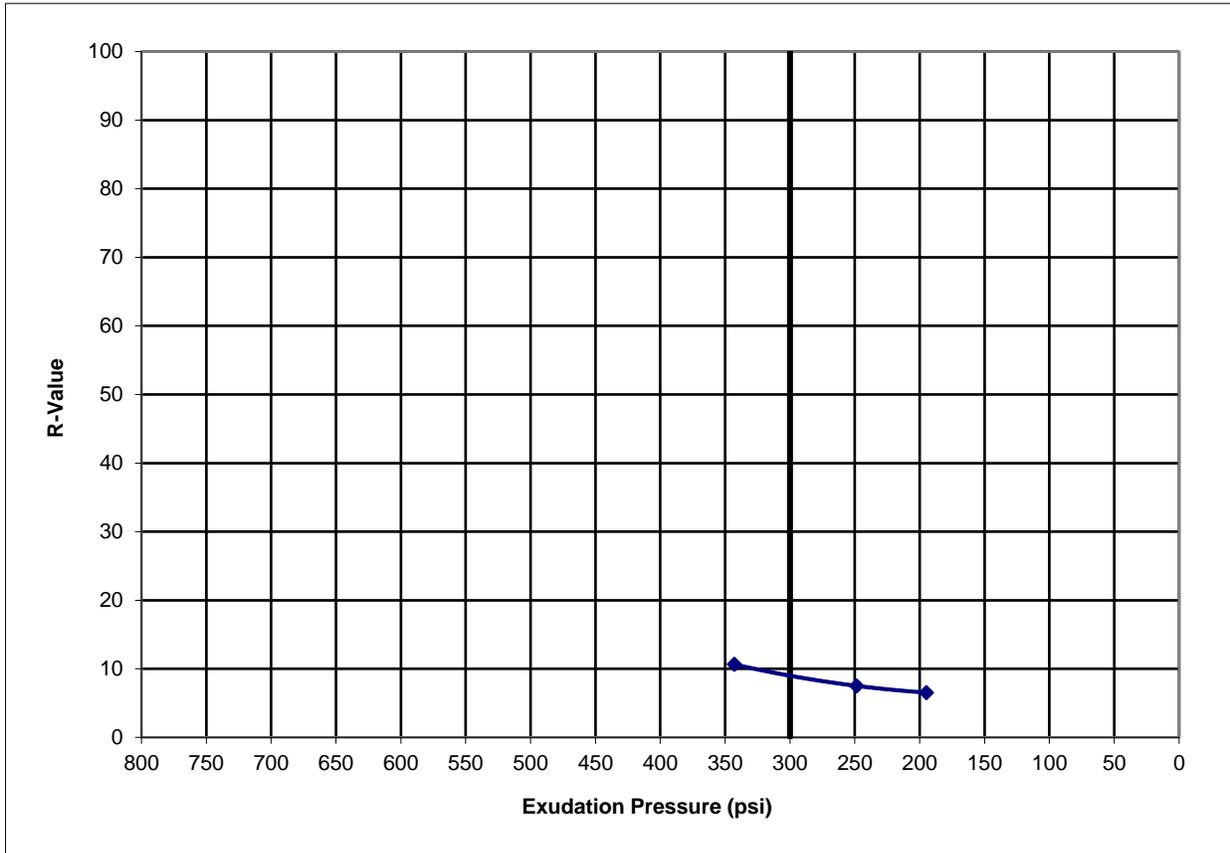


PROJECT: N13(3-3) US 491 to Red Valley Pavement Rehabilitation
JOB NO: 66215110
LOCATION: San Juan County, NM
MATERIAL: Clayey Sand (SC) A-7-6
SAMPLE SOURCE: B-02@0'-1'

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	23.3%	20.5%	17.7%
Compaction Pressure (psi)	*	*	75
Specimen Height (inches)	2.52	2.47	2.51
Dry Density (pcf)	100.0	106.4	111.8
Horiz. Pres. @ 1000lbs (psi)	68.0	66.0	59.0
Horiz. Pres. @ 2000lbs (psi)	140.0	140.0	135.0
Displacement	5.11	4.40	3.89
Expansion Pressure (psi)	0.0	0.0	0.0
Exudation Pressure (psi)	195	249	343
R Value	7	8	11

* HAND TAMPED



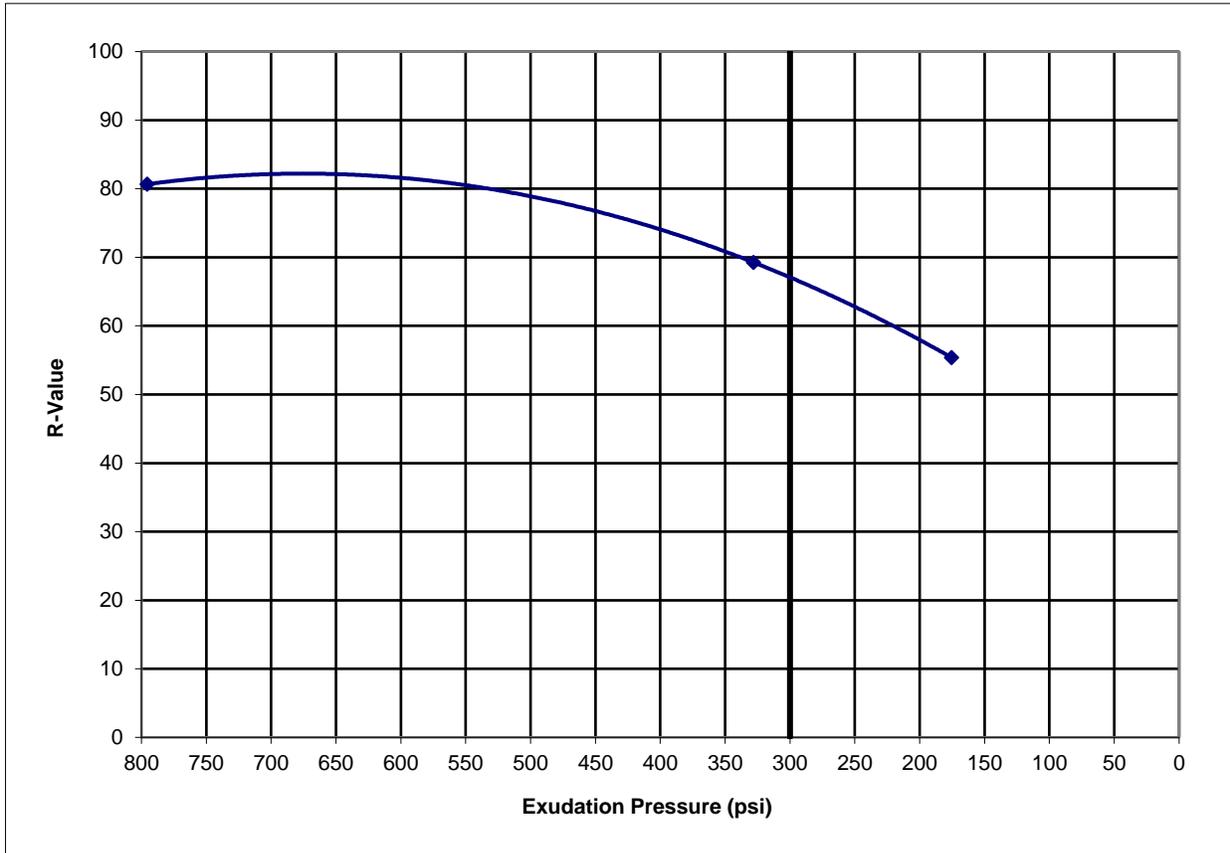
R Value at 300 PSI = 9.0



PROJECT: N13(3-3) US 491 to Red Valley Pavement Rehabilitation
JOB NO: 66215110
LOCATION: San Juan County, NM
MATERIAL: Clayey Sand (SC) A-6
SAMPLE SOURCE: B-03@0'-1'

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	12.2%	11.3%	10.4%
Compaction Pressure (psi)	100	300	350
Specimen Height (inches)	2.53	2.50	2.53
Dry Density (pcf)	121.2	123.0	123.7
Horiz. Pres. @ 1000lbs (psi)	26.0	19.0	13.0
Horiz. Pres. @ 2000lbs (psi)	46.0	34.0	22.0
Displacement	4.99	4.11	3.76
Expansion Pressure (psi)	0.0	0.0	0.1
Exudation Pressure (psi)	175	328	796
R Value	55	69	81



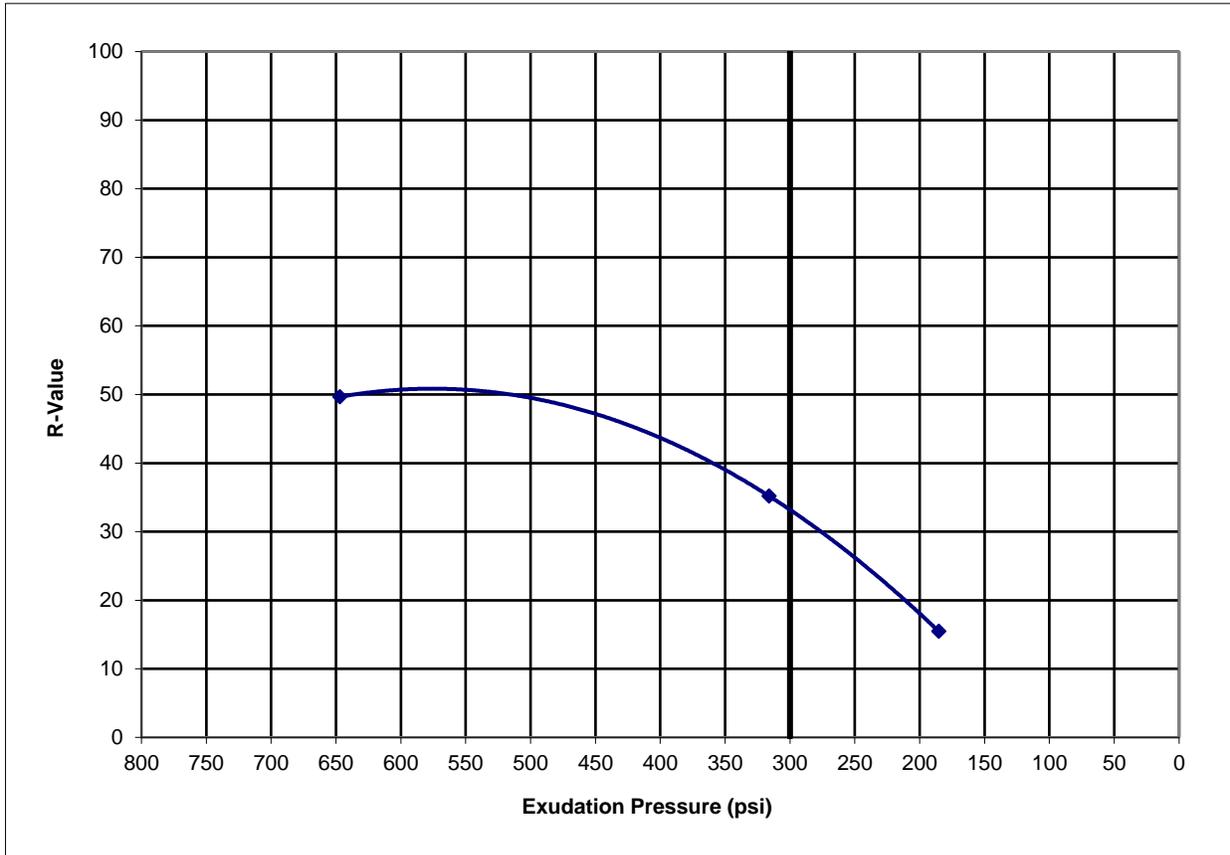
R Value at 300 PSI = 67.1



PROJECT: N13(3-3) US 491 to Red Valley Pavement Rehabilitation
JOB NO: 66215110
LOCATION: San Juan County, NM
MATERIAL: Silty Sand (SM) A-4
SAMPLE SOURCE: B-04@0'-1'

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	14.3%	12.9%	11.6%
Compaction Pressure (psi)	100	150	300
Specimen Height (inches)	2.51	2.49	2.34
Dry Density (pcf)	119.3	123.1	126.9
Horiz. Pres. @ 1000lbs (psi)	52.0	38.0	26.0
Horiz. Pres. @ 2000lbs (psi)	124.0	87.0	59.0
Displacement	3.97	3.86	3.70
Expansion Pressure (psi)	0.0	0.1	0.2
Exudation Pressure (psi)	185	316	647
R Value	15	35	50



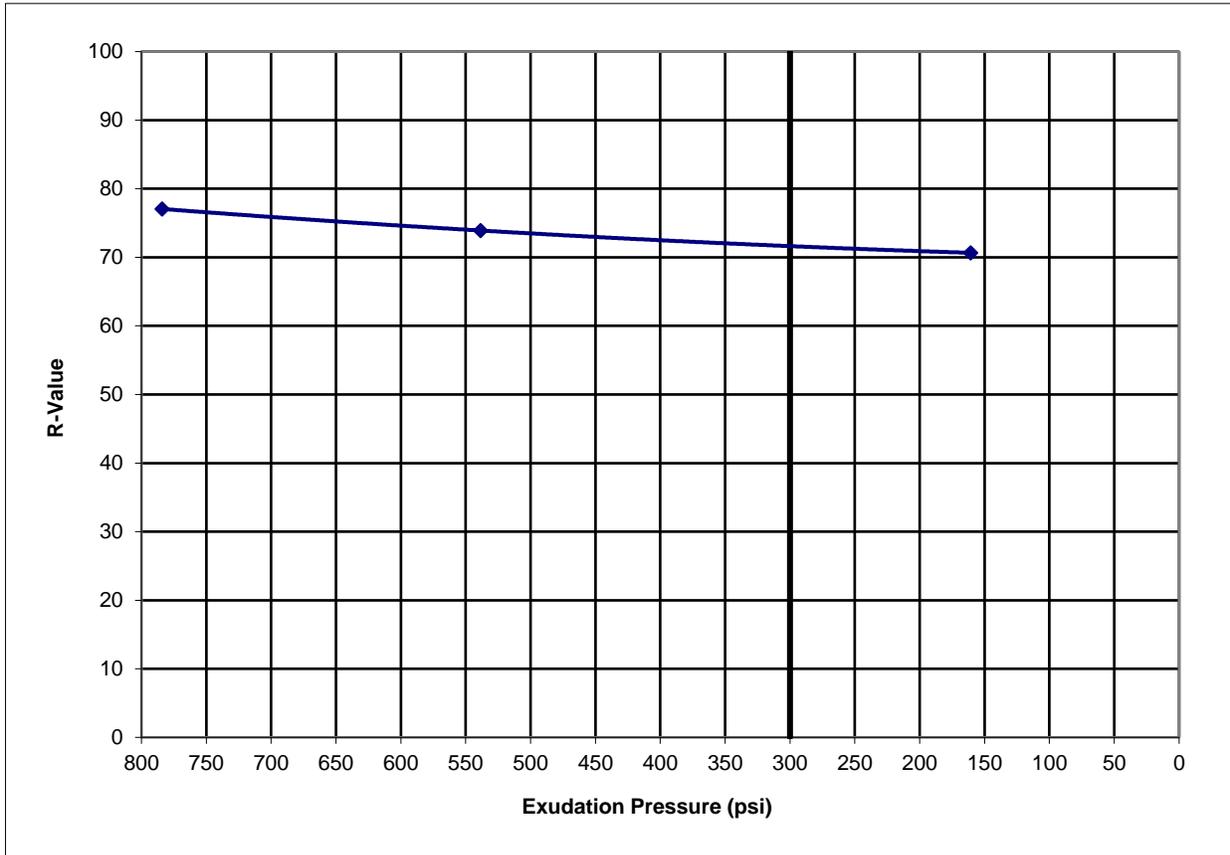
R Value at 300 PSI = 33.2



PROJECT: N13(3-3) US 491 to Red Valley Pavement Rehabilitation
JOB NO: 66215110
LOCATION: San Juan County, NM
MATERIAL: Silty Sand (SM) A-2-4
SAMPLE SOURCE: B-16@0'-1'

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	11.5%	10.7%	10.2%
Compaction Pressure (psi)	150	150	175
Specimen Height (inches)	2.53	2.54	2.50
Dry Density (pcf)	119.9	121.1	121.9
Horiz. Pres. @ 1000lbs (psi)	17.0	16.0	15.0
Horiz. Pres. @ 2000lbs (psi)	31.0	28.0	25.0
Displacement	4.32	4.16	4.02
Expansion Pressure (psi)	0.0	0.0	0.0
Exudation Pressure (psi)	161	539	784
R Value	71	74	77



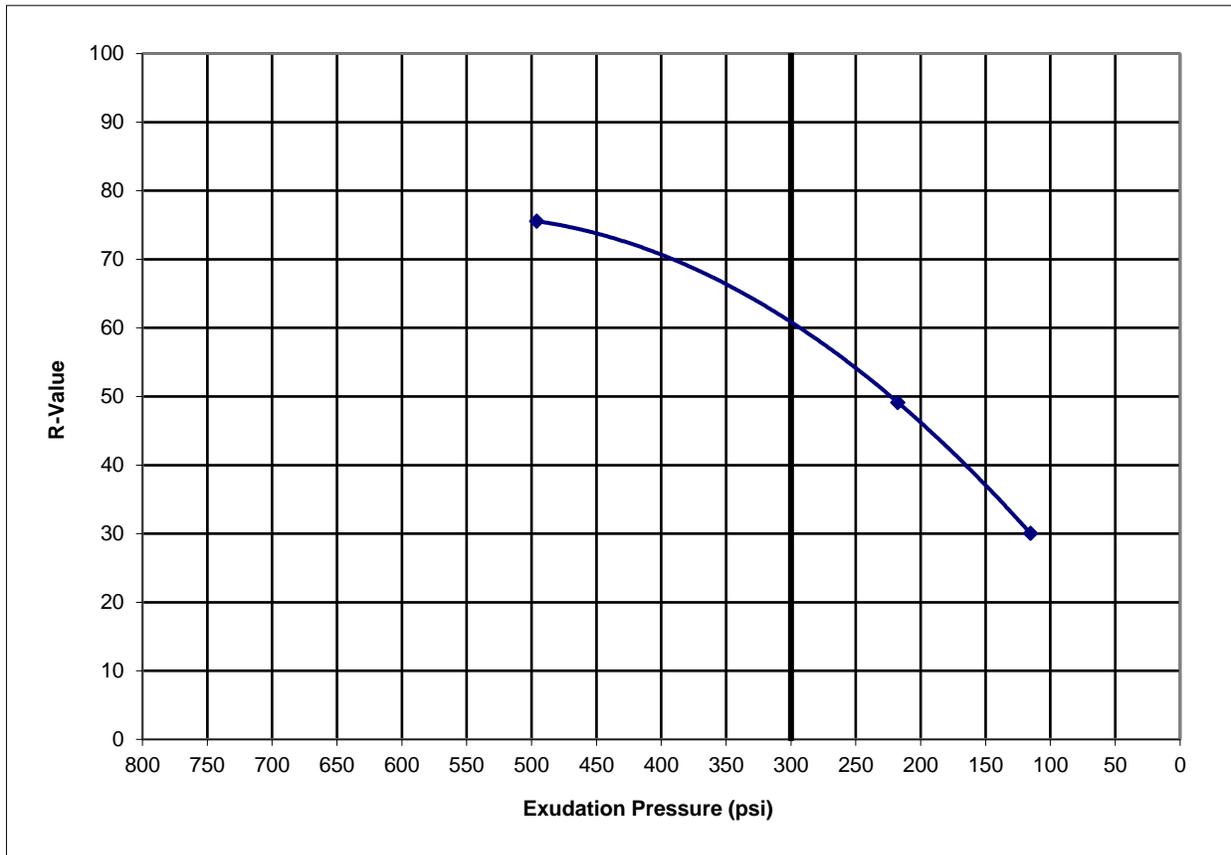
R Value at 300 PSI = 71.6



PROJECT: N13(3-3) US 491 to Red Valley Pavement Rehabilitation
JOB NO: 66215110
LOCATION: San Juan County, NM
MATERIAL: Silty Sand (SM) A-2-4
SAMPLE SOURCE: B-24@0'-1'

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	11.6%	9.8%	8.9%
Compaction Pressure (psi)	75	150	350
Specimen Height (inches)	2.53	2.51	2.50
Dry Density (pcf)	121.7	125.4	127.4
Horiz. Pres. @ 1000lbs (psi)	42.0	30.0	16.0
Horiz. Pres. @ 2000lbs (psi)	84.0	55.0	28.0
Displacement	5.27	4.94	3.81
Expansion Pressure (psi)	0.0	0.0	0.0
Exudation Pressure (psi)	115	218	496
R Value	30	49	76



R Value at 300 PSI = 60.9

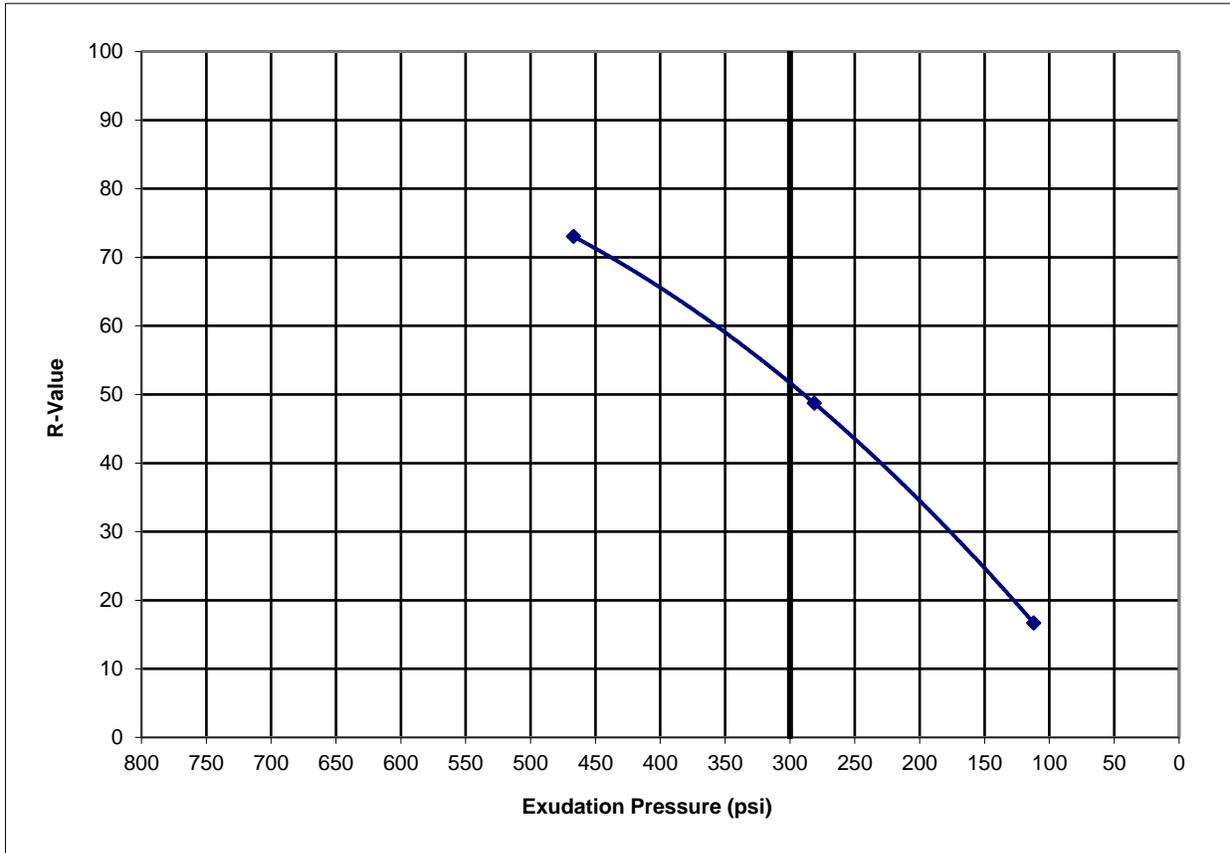


PROJECT: N13(3-3) US 491 to Red Valley Pavement Rehabilitation
JOB NO: 66215110
LOCATION: San Juan County, NM
MATERIAL: Poorly Graded Sand (SP) A-3
SAMPLE SOURCE: B-26@0'-1'

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	15.2%	13.4%	12.5%
Compaction Pressure (psi)	*	225	350
Specimen Height (inches)	2.49	2.47	2.47
Dry Density (pcf)	119.9	123.4	124.6
Horiz. Pres. @ 1000lbs (psi)	53.0	30.0	17.0
Horiz. Pres. @ 2000lbs (psi)	118.0	61.0	31.0
Displacement	4.44	4.27	3.84
Expansion Pressure (psi)	0.0	0.0	0.0
Exudation Pressure (psi)	112	281	467
R Value	17	49	73

* HAND TAMPED



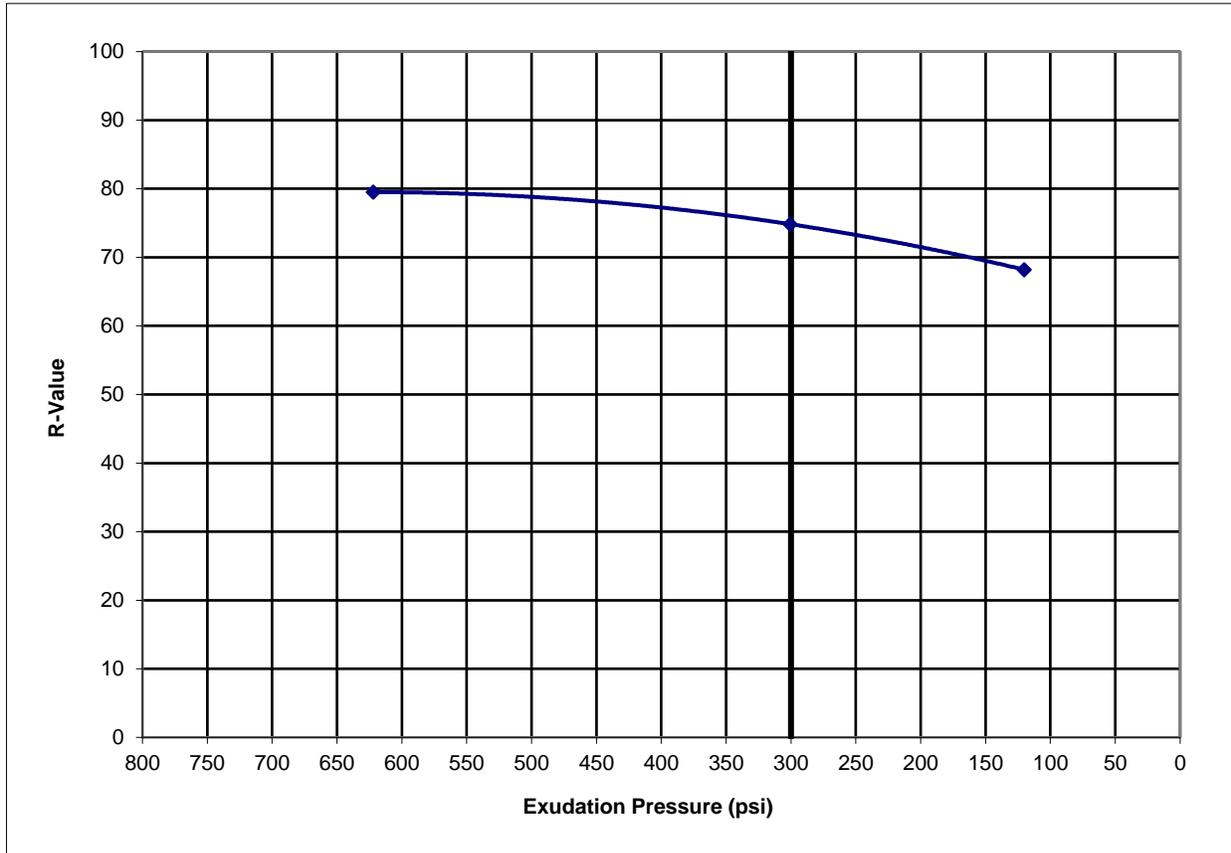
R Value at 300 PSI = 51.7



PROJECT: N13(3-3) US 491 to Red Valley Pavement Rehabilitation
JOB NO: 66215110
LOCATION: San Juan County, NM
MATERIAL: Silty Sand (SM) A-2-4
SAMPLE SOURCE: B-41@0'-1'

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	11.1%	10.3%	9.8%
Compaction Pressure (psi)	150	350	350
Specimen Height (inches)	2.49	2.53	2.46
Dry Density (pcf)	120.2	120.8	121.6
Horiz. Pres. @ 1000lbs (psi)	18.0	16.0	14.0
Horiz. Pres. @ 2000lbs (psi)	34.0	27.0	24.0
Displacement	4.32	4.14	3.65
Expansion Pressure (psi)	0.0	0.0	0.0
Exudation Pressure (psi)	120	301	622
R Value	68	75	80



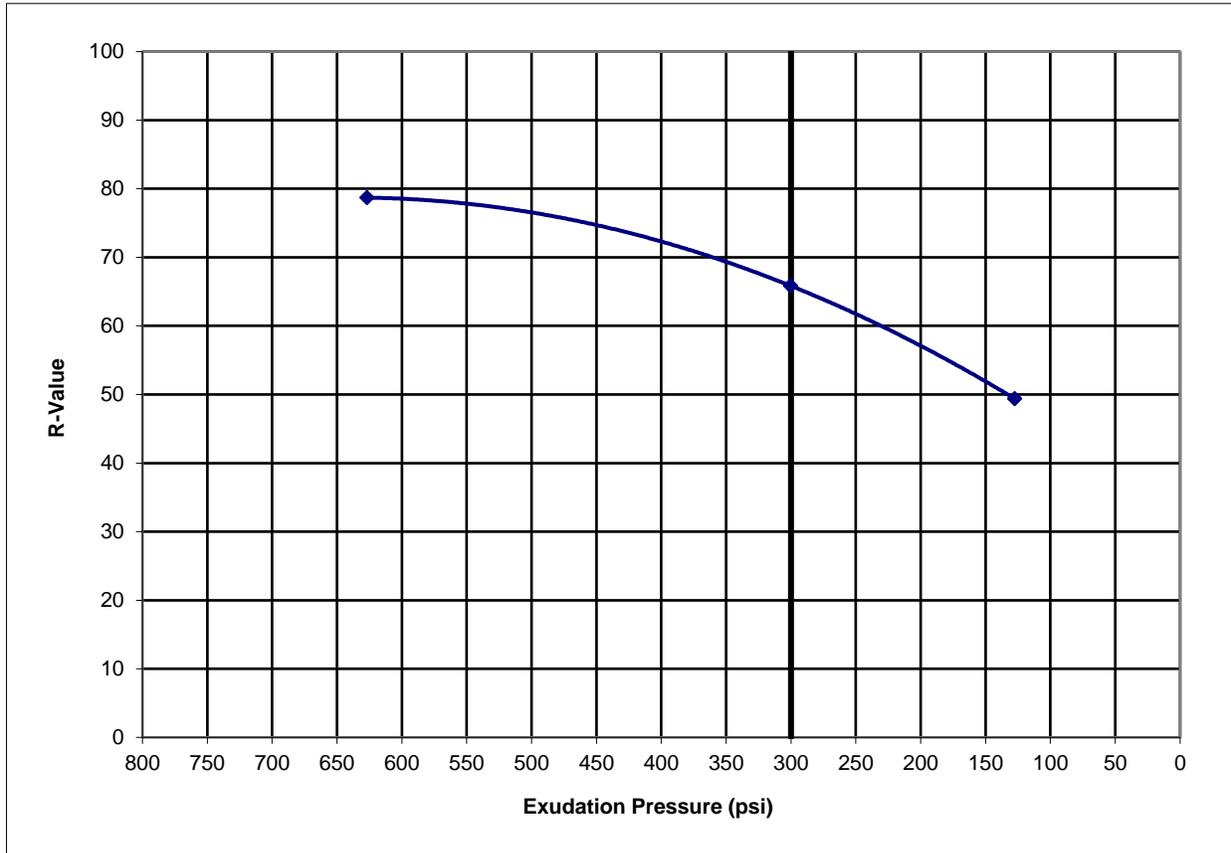
R Value at 300 PSI = 74.8



PROJECT: N13(3-3) US 491 to Red Valley Pavement Rehabilitation
JOB NO: 66215110
LOCATION: San Juan County, NM
MATERIAL: Silty Sand (SM) A-2-4
SAMPLE SOURCE: B-46@0'-1'

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	11.2%	10.3%	9.5%
Compaction Pressure (psi)	100	225	350
Specimen Height (inches)	2.52	2.50	2.51
Dry Density (pcf)	122.4	124.9	125.8
Horiz. Pres. @ 1000lbs (psi)	29.0	18.0	13.0
Horiz. Pres. @ 2000lbs (psi)	53.0	35.0	23.0
Displacement	5.17	4.63	4.03
Expansion Pressure (psi)	0.0	0.0	0.0
Exudation Pressure (psi)	128	300	627
R Value	49	66	79



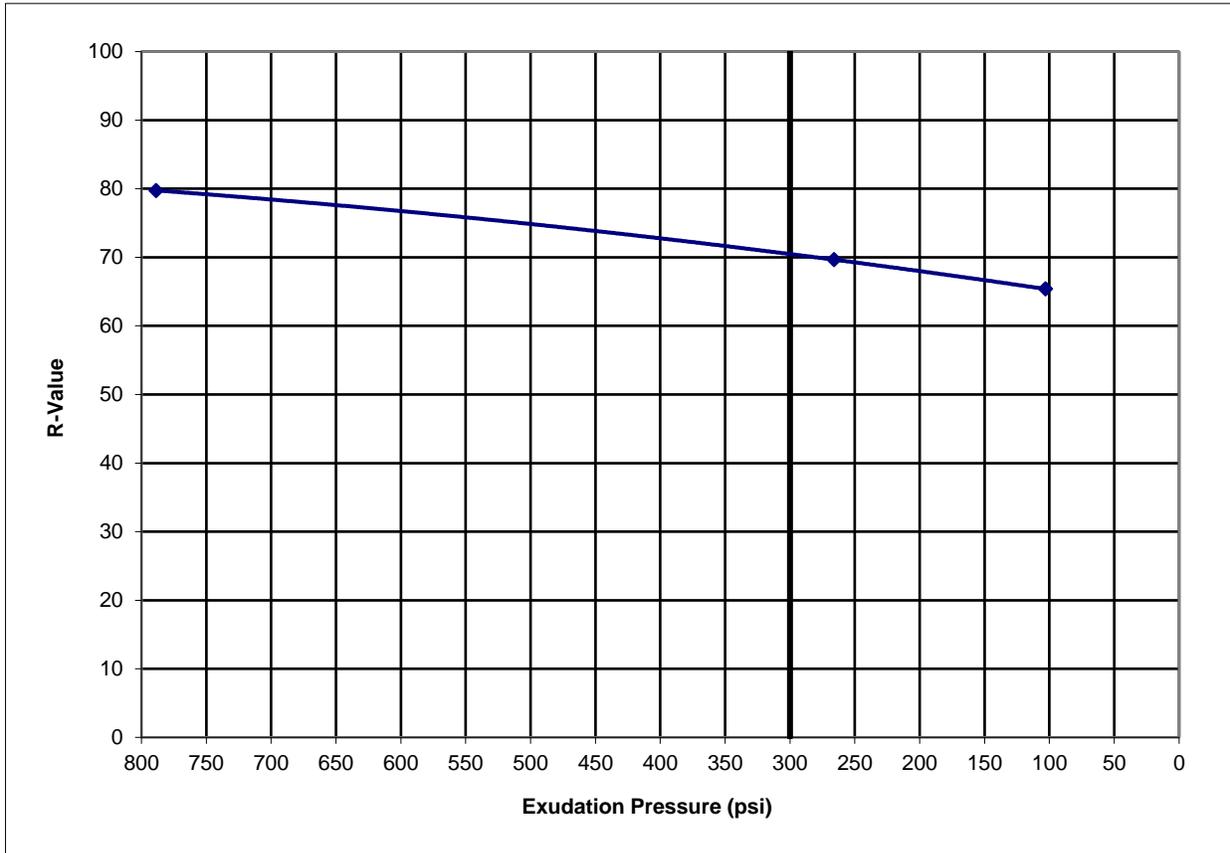
R Value at 300 PSI = 65.8



PROJECT: N13(3-3) US 491 to Red Valley Pavement Rehabilitation
JOB NO: 66215110
LOCATION: San Juan County, NM
MATERIAL: Poorly Gaded Sand with Silt (SP-SM) A-2-4
SAMPLE SOURCE: B-55@0'-1'

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

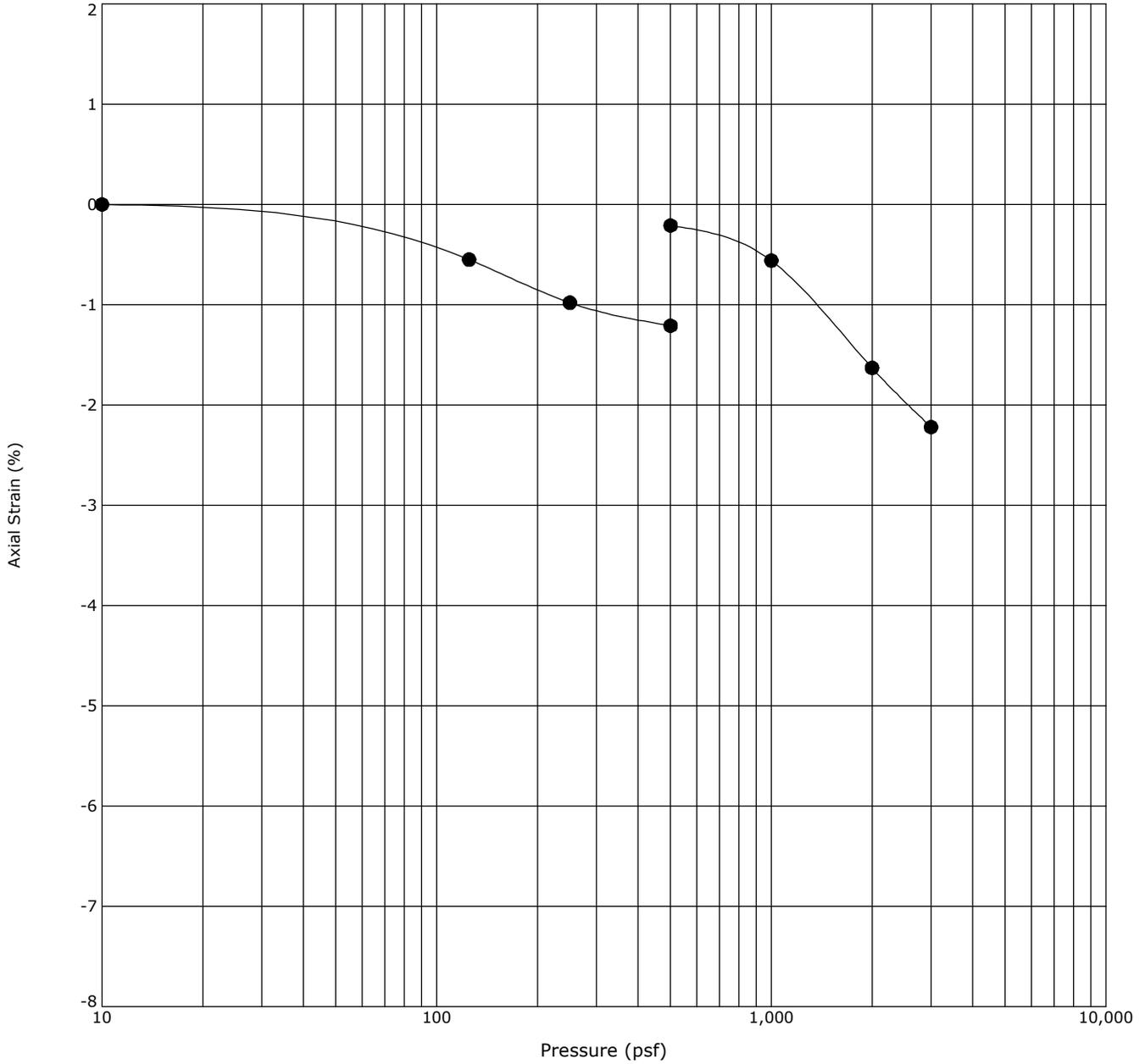
SPECIMEN I. D.	A	B	C
Moisture Content	13.3%	12.5%	11.6%
Compaction Pressure (psi)	100	175	250
Specimen Height (inches)	2.54	2.47	2.50
Dry Density (pcf)	113.7	115.7	115.5
Horiz. Pres. @ 1000lbs (psi)	19.0	16.0	13.0
Horiz. Pres. @ 2000lbs (psi)	37.0	33.0	22.0
Displacement	4.40	4.19	3.98
Expansion Pressure (psi)	0.0	0.0	#VALUE!
Exudation Pressure (psi)	103	266	789
R Value	65	70	80



R Value at 300 PSI = 70.5

Swell Consolidation Test

ASTM ASTM D4546

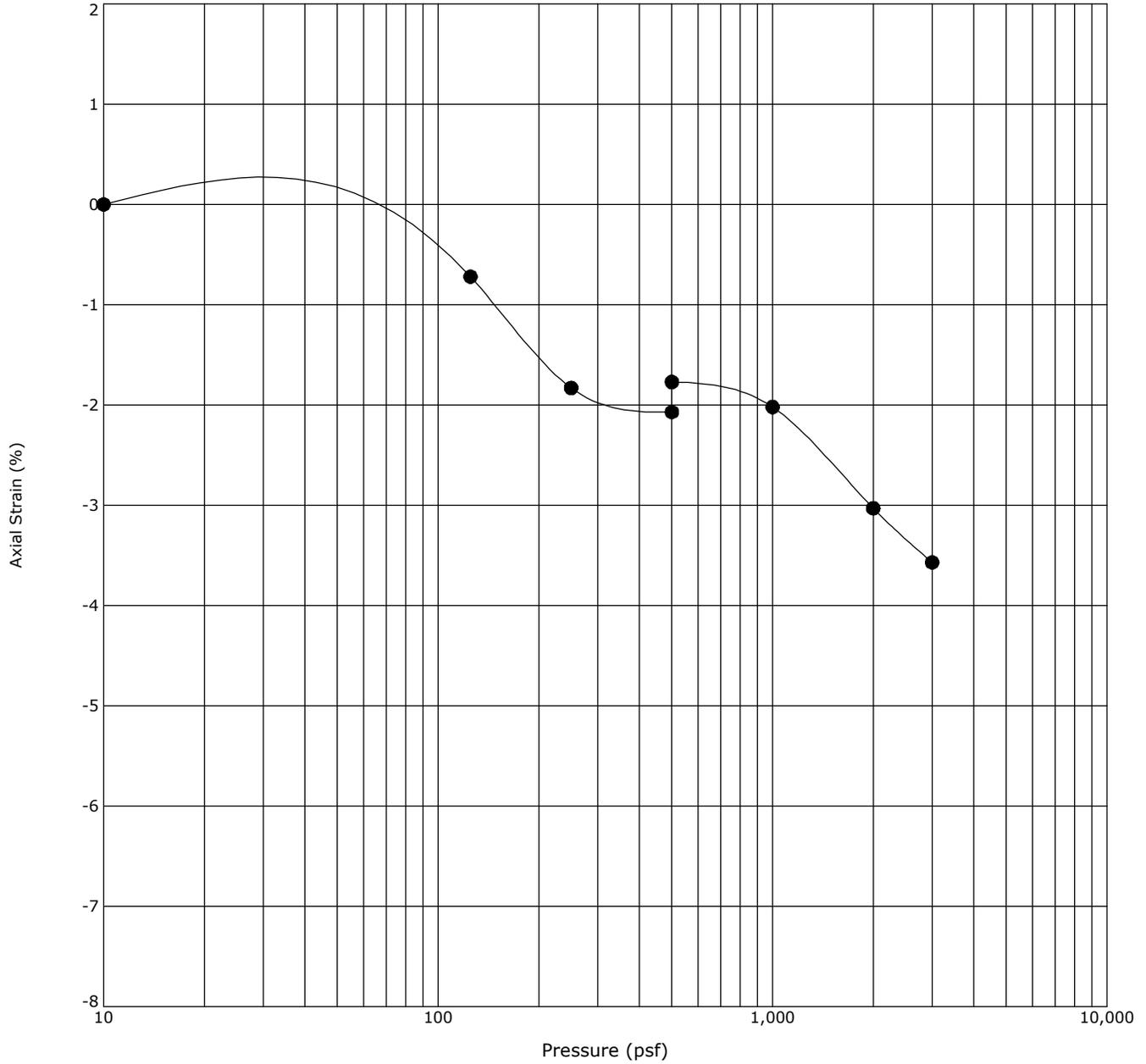


Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● B-01	2.5 - 3.5	SILTY SAND (SM)	SM	116	9.1

Notes: Sample inundated with water at 500 pounds per square foot (psf).

Swell Consolidation Test

ASTM ASTM D4546

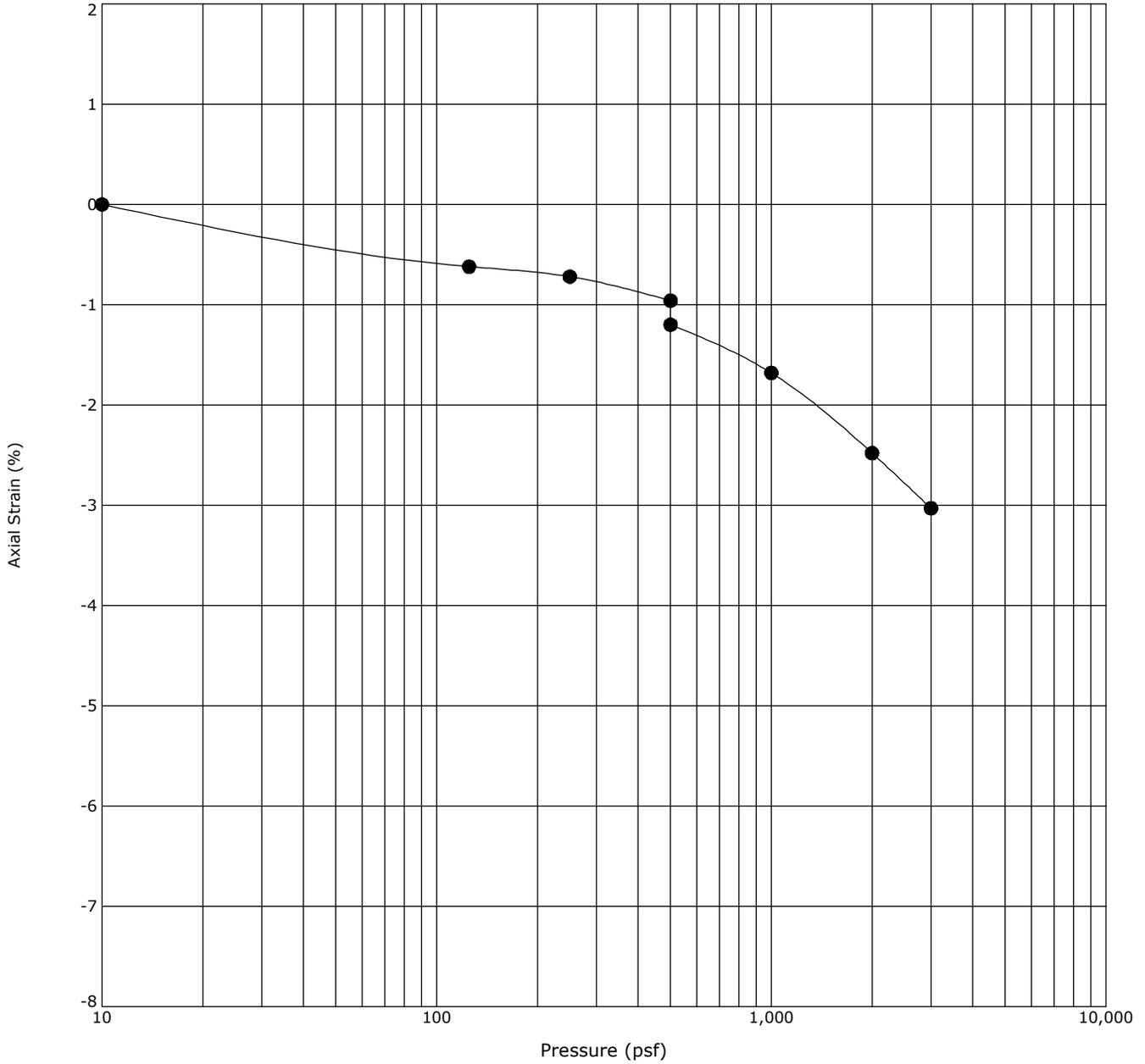


Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● B-05	2.5 - 3.5	POORLY GRADED SAND W/SILT	SP-SM	98	14.0

Notes: Sample inundated with water at 500 pounds per square foot (psf).

Swell Consolidation Test

ASTM ASTM D4546

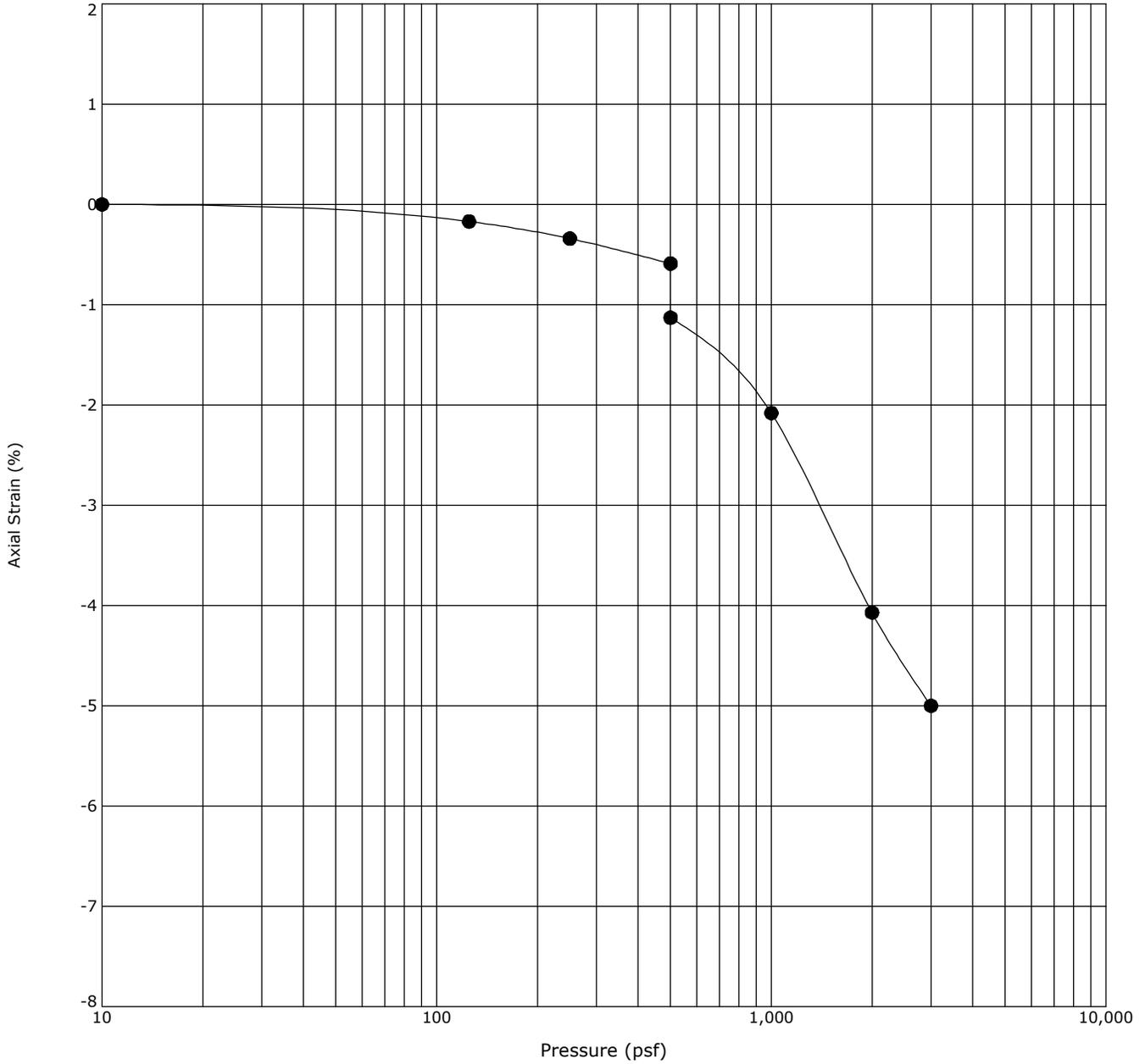


Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● B-11	5 - 6	SILTY SAND	SM	112	7.4

Notes: Sample inundated with water at 500 pounds per square foot (psf).

Swell Consolidation Test

ASTM ASTM D4546

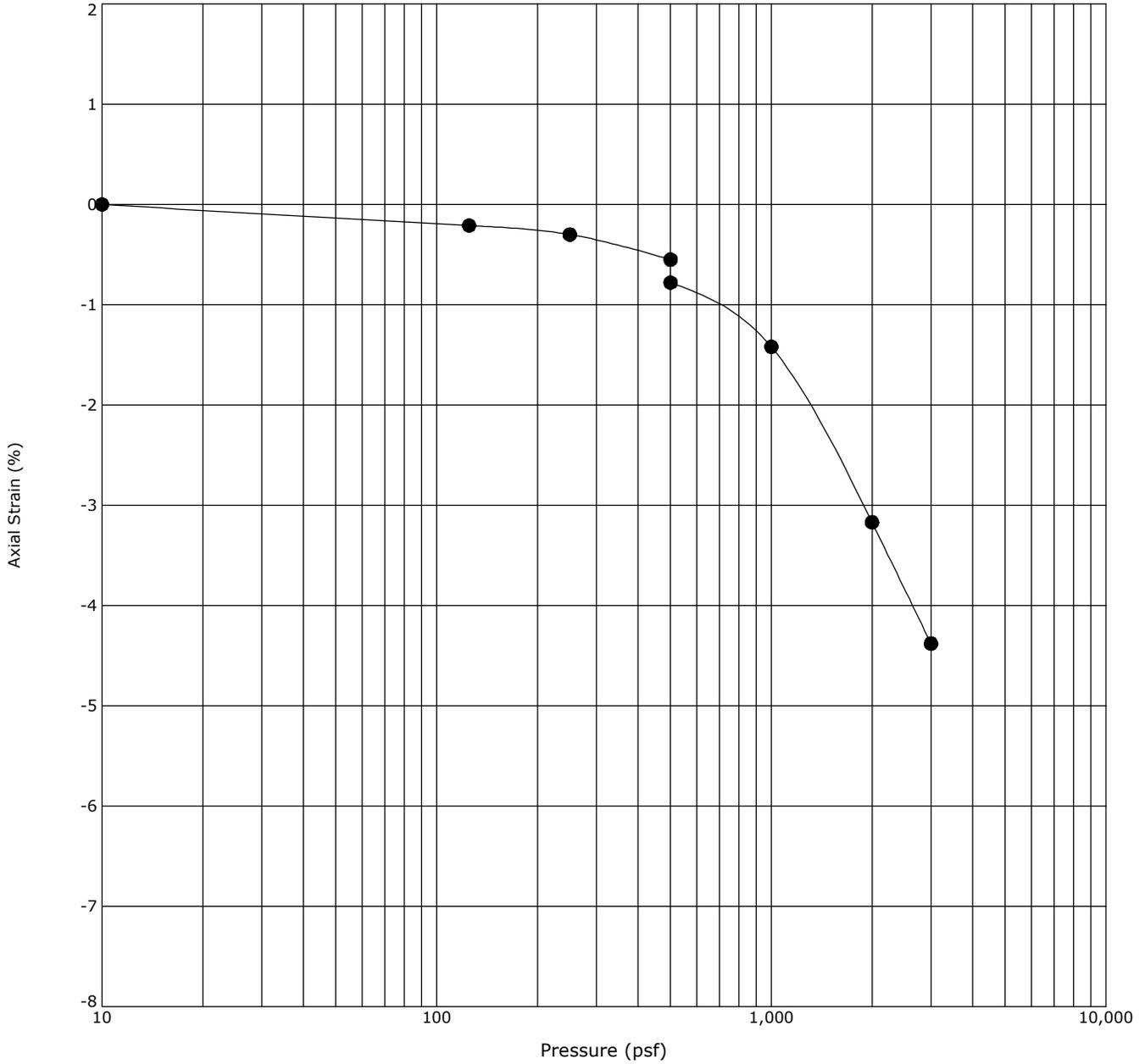


Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● B-15	5 - 6	SANDY LEAN CLAY	CL	111	9.8

Notes: Sample inundated with water at 500 pounds per square foot (psf).

Swell Consolidation Test

ASTM ASTM D4546

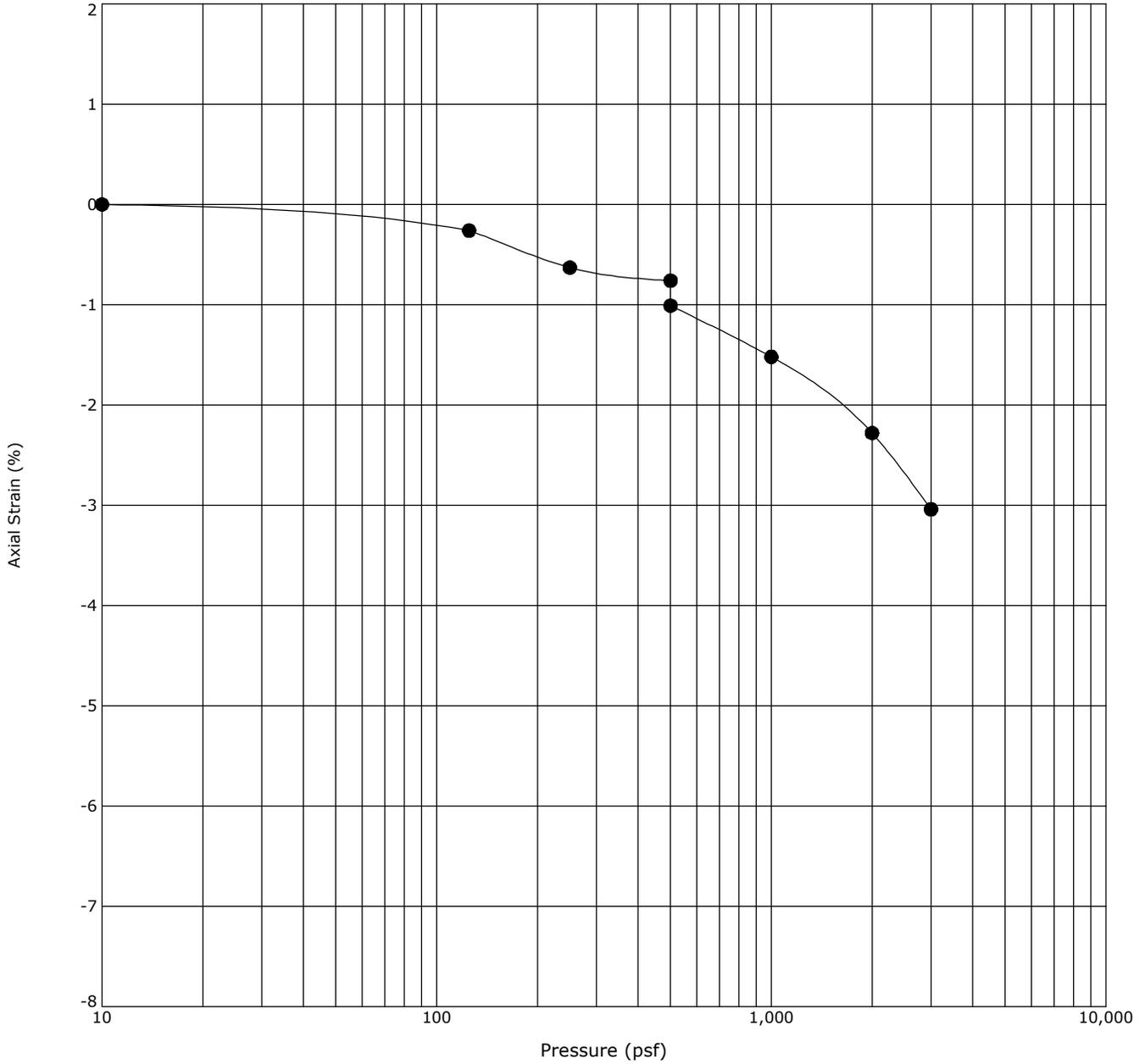


Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● B-25	5 - 6	SANDY LEAN CLAY	CL	118	8.4

Notes: Sample inundated with water at 500 pounds per square foot (psf).

Swell Consolidation Test

ASTM ASTM D4546

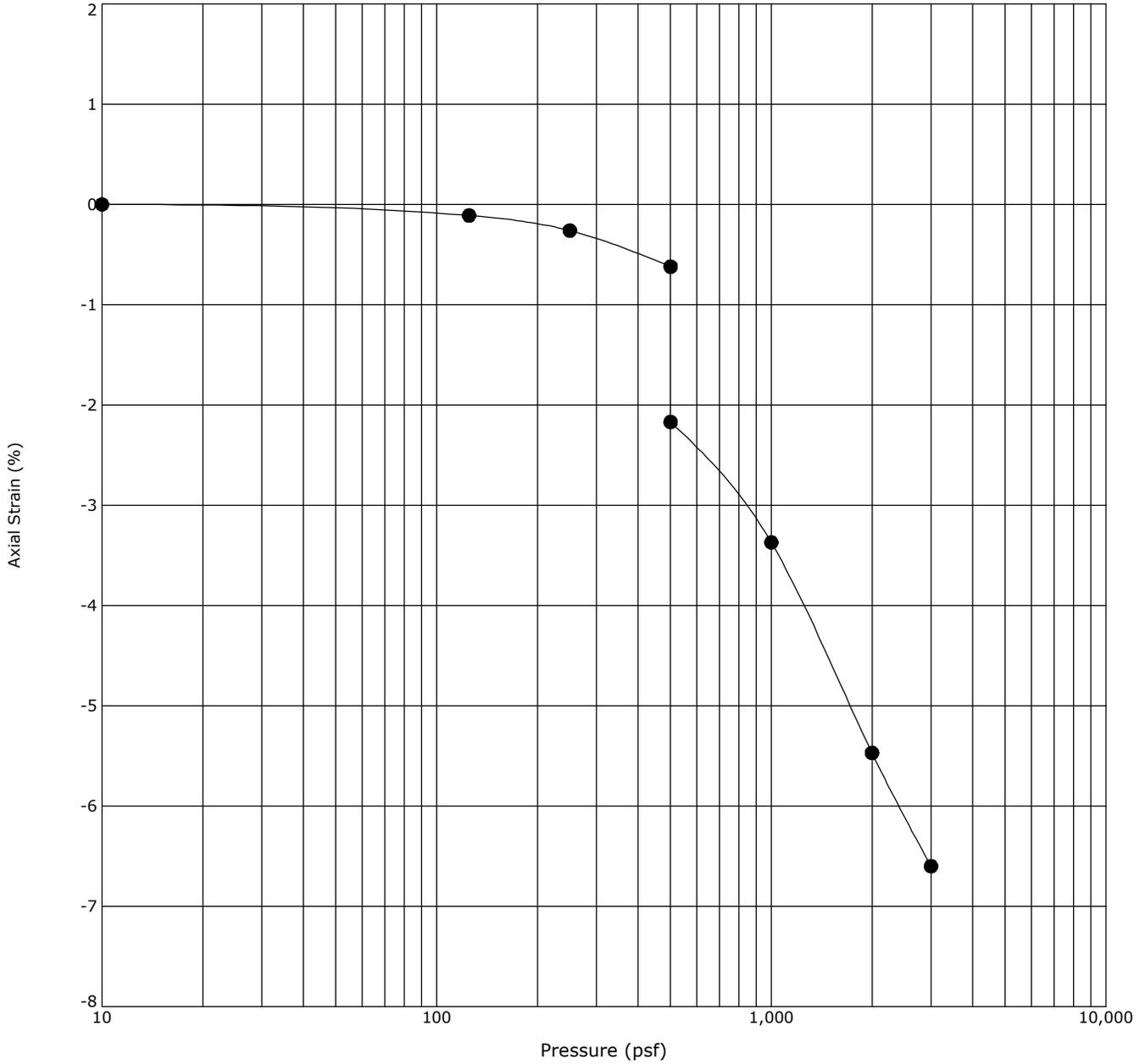


Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● B-30	5 - 6	SILTY SAND	SM	107	7.7

Notes: Sample inundated with water at 500 pounds per square foot (psf).

Swell Consolidation Test

ASTM ASTM D4546

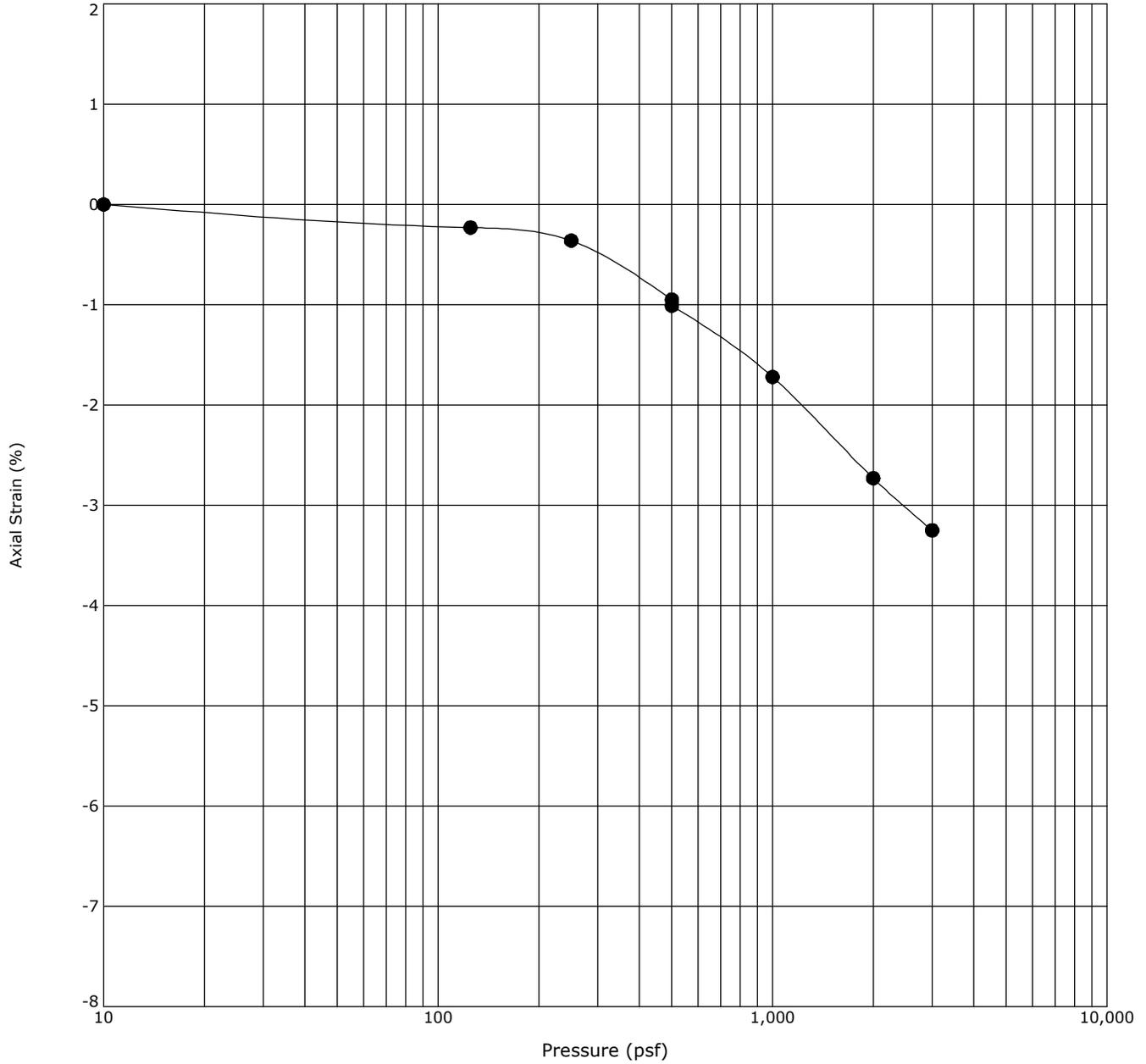


Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● B-36	5 - 6	SANDY SILT	ML	107	8.2

Notes: Sample inundated with water at 500 pounds per square foot (psf).

Swell Consolidation Test

ASTM ASTM D4546

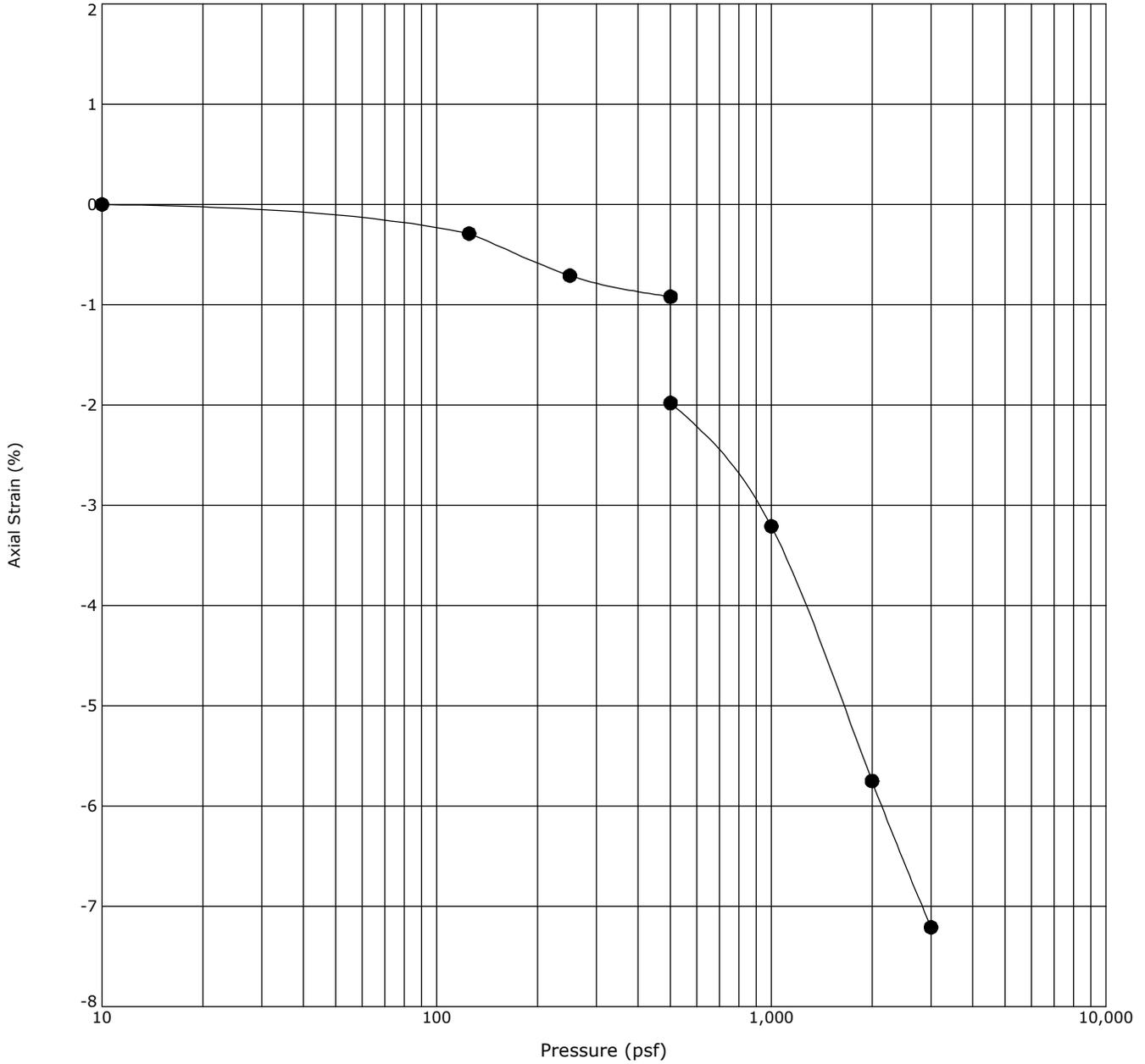


Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● B-39	5 - 6	SILTY SAND	SM	118	9.7

Notes: Sample inundated with water at 500 pounds per square foot (psf).

Swell Consolidation Test

ASTM ASTM D4546



Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● B-51	5 - 6	SILTY SAND	SM	105	5.1

Notes: Sample inundated with water at 500 pounds per square foot (psf).

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2401491

Date Reported: 1/25/2024

CLIENT: Terracon

Client Sample ID: B04 @ 1

Project: N 13

Collection Date: 1/11/2024

Lab ID: 2401491-001

Matrix: SOIL

Received Date: 1/11/2024 3:46:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: KCB
Sulfate	38	7.5		mg/Kg	5	1/12/2024 9:09:20 PM	79886
RESISTIVITY AND EC SOIL							Analyst: JMT
Resistivity	2490	100		Ohms * c	1	1/12/2024 4:31:00 PM	79879
SM4500H+B/EPA 9040C							Analyst: SNS
pH	8.66			pH Units	1	1/18/2024 4:16:00 PM	R102538

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2401491

Date Reported: 1/25/2024

CLIENT: Terracon

Client Sample ID: B07 @ 1

Project: N 13

Collection Date: 1/11/2024

Lab ID: 2401491-002

Matrix: SOIL

Received Date: 1/11/2024 3:46:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: KCB
Sulfate	81	7.5		mg/Kg	5	1/12/2024 9:34:10 PM	79886
RESISTIVITY AND EC SOIL							Analyst: JMT
Resistivity	2380	100		Ohms * c	1	1/12/2024 4:31:00 PM	79879
SM4500H+B/EPA 9040C							Analyst: SNS
pH	9.15			pH Units	1	1/18/2024 4:16:00 PM	R102538

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2401491

Date Reported: 1/25/2024

CLIENT: Terracon

Client Sample ID: B13 @ 1

Project: N 13

Collection Date: 1/11/2024

Lab ID: 2401491-003

Matrix: SOIL

Received Date: 1/11/2024 3:46:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: RBC
Sulfate	45	7.5		mg/Kg	5	1/12/2024 8:01:56 PM	79886
RESISTIVITY AND EC SOIL							Analyst: JMT
Resistivity	3800	100		Ohms * c	1	1/12/2024 4:31:00 PM	79879
SM4500H+B/EPA 9040C							Analyst: SNS
pH	9.14			pH Units	1	1/18/2024 4:16:00 PM	R102538

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **2401491**

Date Reported: 1/25/2024

CLIENT: Terracon

Client Sample ID: B24 @ 1

Project: N 13

Collection Date: 1/11/2024

Lab ID: 2401491-004

Matrix: SOIL

Received Date: 1/11/2024 3:46:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: RBC
Sulfate	ND	7.5		mg/Kg	5	1/12/2024 8:26:46 PM	79886
RESISTIVITY AND EC SOIL							Analyst: JMT
Resistivity	3440	100		Ohms * c	1	1/12/2024 4:31:00 PM	79879
SM4500H+B/EPA 9040C							Analyst: SNS
pH	8.48			pH Units	1	1/18/2024 4:16:00 PM	R102538

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2401491

Date Reported: 1/25/2024

CLIENT: Terracon

Client Sample ID: B29 @ 1

Project: N 13

Collection Date: 1/11/2024

Lab ID: 2401491-005

Matrix: SOIL

Received Date: 1/11/2024 3:46:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: RBC
Sulfate	30	7.5		mg/Kg	5	1/12/2024 9:16:25 PM	79886
RESISTIVITY AND EC SOIL							Analyst: JMT
Resistivity	4210	100		Ohms * c	1	1/12/2024 4:31:00 PM	79879
SM4500H+B/EPA 9040C							Analyst: SNS
pH	9.04			pH Units	1	1/18/2024 4:16:00 PM	R102538

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2401491

Date Reported: 1/25/2024

CLIENT: Terracon

Client Sample ID: B32 @ 1

Project: N 13

Collection Date: 1/11/2024

Lab ID: 2401491-006

Matrix: SOIL

Received Date: 1/11/2024 3:46:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: RBC
Sulfate	140	7.5		mg/Kg	5	1/12/2024 10:06:04 PM	79886
RESISTIVITY AND EC SOIL							Analyst: JMT
Resistivity	1710	100		Ohms * c	1	1/12/2024 4:31:00 PM	79879
SM4500H+B/EPA 9040C							Analyst: SNS
pH	8.93			pH Units	1	1/18/2024 4:16:00 PM	R102538

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2401491

Date Reported: 1/25/2024

CLIENT: Terracon

Client Sample ID: B38 @ 1

Project: N 13

Collection Date: 1/11/2024

Lab ID: 2401491-007

Matrix: SOIL

Received Date: 1/11/2024 3:46:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: KCB
Sulfate	31	7.5		mg/Kg	5	1/15/2024 11:34:18 AM	79906
RESISTIVITY AND EC SOIL							Analyst: JMT
Resistivity	3630	100		Ohms * c	1	1/12/2024 4:31:00 PM	79879
SM4500H+B/EPA 9040C							Analyst: SNS
pH	9.04			pH Units	1	1/18/2024 4:16:00 PM	R102538

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2401491

Date Reported: 1/25/2024

CLIENT: Terracon

Client Sample ID: B43 @ 1

Project: N 13

Collection Date: 1/11/2024

Lab ID: 2401491-008

Matrix: SOIL

Received Date: 1/11/2024 3:46:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: KCB
Sulfate	24	7.5		mg/Kg	5	1/15/2024 1:04:44 PM	79906
RESISTIVITY AND EC SOIL							Analyst: JMT
Resistivity	4850	100		Ohms * c	1	1/12/2024 4:31:00 PM	79879
SM4500H+B/EPA 9040C							Analyst: SNS
pH	9.74			pH Units	1	1/18/2024 4:16:00 PM	R102538

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **2401491**

Date Reported: 1/25/2024

CLIENT: Terracon

Client Sample ID: B45 @ 1

Project: N 13

Collection Date: 1/11/2024

Lab ID: 2401491-009

Matrix: SOIL

Received Date: 1/11/2024 3:46:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: KCB
Sulfate	160	7.5		mg/Kg	5	1/15/2024 2:05:21 PM	79906
RESISTIVITY AND EC SOIL							Analyst: JMT
Resistivity	1390	100		Ohms * c	1	1/12/2024 4:31:00 PM	79879
SM4500H+B/EPA 9040C							Analyst: SNS
pH	9.21			pH Units	1	1/18/2024 4:16:00 PM	R102538

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2401491

Date Reported: 1/25/2024

CLIENT: Terracon

Client Sample ID: B53 @ 1

Project: N 13

Collection Date: 1/11/2024

Lab ID: 2401491-010

Matrix: SOIL

Received Date: 1/11/2024 3:46:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: KCB
Sulfate	53	7.5		mg/Kg	5	1/15/2024 2:35:38 PM	79906
RESISTIVITY AND EC SOIL							Analyst: JMT
Resistivity	2720	100		Ohms * c	1	1/12/2024 4:31:00 PM	79879
SM4500H+B/EPA 9040C							Analyst: SNS
pH	9.50			pH Units	1	1/18/2024 4:16:00 PM	R102538

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

APPENDIX C
TRAFFIC AND PAVEMENT DESIGN INFORMATION

Pavement Design

(AASHTO 1993 Method)

Design Inputs

Sugrade Support

	<u>Asphalt</u>			<u>Concrete</u>	
CBR =	6				
Mr =	8000	psi	k =	200	pci
Reliability	65	%		65	%
Standard Deviation	So = 0.45			0.35	
Initial Serviceability	Po = 4.2			4.5	
Terminal Serviceability	Pt = 2.0			2.5	
Design Serviceability Loss,	ΔPSI = 2.2			2.0	

Layer Coefficients:

AC Surface and Binder	a ₁ =	0.44
AC Base	a ₂ =	0.25

Concrete Compressive Strength =	4000	psi
Modulus of Elasticity of Concrete =	3,600	ksi
Modulus of Rupture of Concrete: =	580	
Load Transfer ("J" Factor) =	4.2	
Drainage Coefficient =	1.2	

Asphalt Section Traffic (18 kip ESAL) =

N13(3-3)
626,149

Asphalt Pavement Section

AC Surface + Binder
Asphalt Base

Drainage, m

3.0 in.
7.5 in.

Structural Number: 3.20

Structural Number - Required 2.63

Rigid - Heavy Duty Pavement

Concrete Section Traffic (18 kip ESAL) =

0

Concrete Pavement Section

5.0 in.

Project: N 13

Location: Apache Co., AZ and San Juan Co., NM

Project No. 66215110

Date: 02/13/24



Pavement Design

(AASHTO 1993 Method)

Design Inputs

	<u>Asphalt</u>		<u>Concrete</u>
Sugrade Support	CBR = 6		
	Mr = 8000	psi	k = 200
Reliability		%	pci
Standard Deviation	So = 0.45		65
Initial Serviceability	Po = 4.2		%
Terminal Serviceability	Pt = 2.0		0.35
Design Serviceability Loss,	ΔPSI = 2.2		4.5
			2.5
			2.0

Layer Coefficients:

AC Surface and Binder	a ₁ = 0.44
AC Base	a ₂ = 0.25

Concrete Compressive Strength =	4000	psi
Modulus of Elasticity of Concrete =	3,600	ksi
Modulus of Rupture of Concrete: =	580	
Load Transfer ("J" Factor) =	4.2	
Drainage Coefficient =	1.2	

Asphalt Section Traffic (18 kip ESAL) = **N13(3-3)**
550,000

Asphalt Pavement Section

	<u>Drainage, m</u>		
AC Surface + Binder	3.0	in.	
Asphalt Base	5.0	in.	

Structural Number: 2.57

Structural Number - Required 2.57

Rigid - Heavy Duty Pavement

Concrete Section Traffic (18 kip ESAL) = 0

Concrete Pavement Section 5.0 in.

Project: N 13

Location: Apache Co., AZ and San Juan Co., NM

Project No. 66215110

Date: 02/13/24



Pavement Design

(AASHTO 1993 Method)

Design Inputs

	<u>Asphalt</u>		<u>Concrete</u>	
Sugrade Support	CBR = 6		k = 200	pci
Reliability	Mr = 8000	psi		
Standard Deviation		%	65	%
Initial Serviceability	So = 0.45		0.35	
Terminal Serviceability	Po = 4.2		4.5	
Design Serviceability Loss,	Pt = 2.0		2.5	
	Δ PSI = 2.2		2.0	

Layer Coefficients:

AC Surface and Binder	a ₁ = 0.44
AC Base	a ₂ = 0.25

Concrete Compressive Strength =	4000	psi
Modulus of Elasticity of Concrete =	3,600	ksi
Modulus of Rupture of Concrete: =	580	
Load Transfer ("J" Factor) =	4.2	
Drainage Coefficient =	1.2	

Asphalt Section Traffic (18 kip ESAL) = **N13(3-3)**
626,149

Asphalt Pavement Section

	<u>Drainage, m</u>			
AC Surface + Binder	3.0		in.	
Asphalt Base	5.0		in.	

Structural Number: 2.57

Structural Number - Required 2.63

Rigid - Heavy Duty Pavement

Concrete Section Traffic (18 kip ESAL) = 0

Concrete Pavement Section 5.0 in.

Project: N 13

Location: Apache Co., AZ and San Juan Co., NM

Project No. 66215110

Date: 02/13/24



Pavement Design

(AASHTO 1993 Method)

Design Inputs

	<u>Asphalt</u>		<u>Concrete</u>	
Sugrade Support	CBR = 2.5			
	Mr = 4500	psi	k = 200	pci
Reliability	65	%	65	%
Standard Deviation	So = 0.45		0.35	
Initial Serviceability	Po = 4.2		4.5	
Terminal Serviceability	Pt = 2.0		2.5	
Design Serviceability Loss,	Δ PSI = 2.2		2.0	

Layer Coefficients:

AC Surface and Binder	a ₁ = 0.44
AC Base	a ₂ = 0.25

Concrete Compressive Strength =	4000	psi
Modulus of Elasticity of Concrete =	3,600	ksi
Modulus of Rupture of Concrete: =	580	
Load Transfer ("J" Factor) =	4.2	
Drainage Coefficient =	1.2	

Asphalt Section Traffic (18 kip ESAL) =

N13(3-3)
626,149

Asphalt Pavement Section

	<u>Drainage, m</u>			
AC Surface + Binder	3.0		in.	
Asphalt Base	7.5		in.	

Structural Number: 3.20

Structural Number - Required 3.22

Rigid - Heavy Duty Pavement

Concrete Section Traffic (18 kip ESAL) =

0

Concrete Pavement Section

5.0 in.

Project: N 13

Location: Apache Co., AZ and San Juan Co., NM

Project No. 66215110

Date: 02/13/24



Pavement Design

(AASHTO 1993 Method)

Design Inputs

	<u>Asphalt</u>			<u>Concrete</u>	
Sugrade Support	CBR = 2.5				
Reliability	Mr = 4500	psi	k =	200	pci
Standard Deviation	65	%		65	%
Initial Serviceability	So = 0.45			0.35	
Terminal Serviceability	Po = 4.2			4.5	
Design Serviceability Loss,	Pt = 2.0			2.5	
	Δ PSI = 2.2			2.0	

Layer Coefficients:

AC Surface and Binder	a ₁ = 0.44
AC Base	a ₂ = 0.25

Concrete Compressive Strength =	4000	psi
Modulus of Elasticity of Concrete =	3,600	ksi
Modulus of Rupture of Concrete: =	580	
Load Transfer ("J" Factor) =	4.2	
Drainage Coefficient =	1.2	

Asphalt Section Traffic (18 kip ESAL) =

N13(3-3)
626,149

Asphalt Pavement Section

	<u>Drainage, m</u>			
AC Surface + Binder	3.0	in.		
Asphalt Base	5.0	in.		

Structural Number: 2.57

Structural Number - Required 3.22

Rigid - Heavy Duty Pavement

Concrete Section Traffic (18 kip ESAL) =

0

Concrete Pavement Section

5.0 in.

Project: N 13

Location: Apache Co., AZ and San Juan Co., NM

Project No. 66215110

Date: 02/13/24



Pavement Design

(AASHTO 1993 Method)

Design Inputs

Sugrade Support

Asphalt
 CBR = 2.5
 Mr = 4500

psi
%

Concrete

k = 200
 pci
 %

Reliability
 Standard Deviation

So = 0.45

0.35

Initial Serviceability

Po = 4.2

4.5

Terminal Serviceability

Pt = 2.0

2.5

Design Serviceability Loss,

Δ PSI = 2.2

2.0

Layer Coefficients:

AC Surface and Binder $a_1 = 0.44$

Aggregate Base $a_2 = 0.12$

Concrete Compressive Strength = 4000 psi
 Modulus of Elasticity of Concrete = 3,600 ksi
 Modulus of Rupture of Concrete: = 580
 Load Transfer ("J" Factor) = 4.2
 Drainage Coefficient = 1.2

Light Duty Pavement

Asphalt Section Traffic (18 kip ESAL) =

626,149

Asphalt Pavement Section

Drainage, m

AC Surface + Binder

6.0 in.

Aggregate Base

1.0 **6.0** in.

Structural Number: 3.36

Structural Number - Required 3.22

Rigid - Heavy Duty Pavement

Concrete Section Traffic (18 kip ESAL) =

0

Concrete Pavement Section

5.0 in.

Project: N 13

Location: Apache Co., AZ and San Juan Co., NM

Project No. 66215110

Date: 02/13/24



Pavement Design

(AASHTO 1993 Method)

Design Inputs

	<u>Asphalt</u>			<u>Concrete</u>	
Sugrade Support	CBR = 6			k = 200	pci
Reliability	Mr = 8000	psi		65	%
Standard Deviation	So = 0.45			0.35	
Initial Serviceability	Po = 4.2			4.5	
Terminal Serviceability	Pt = 2.0			2.5	
Design Serviceability Loss,	Δ PSI = 2.2			2.0	

Layer Coefficients:

AC Surface and Binder	a ₁ = 0.44
AC Base	a ₂ = 0.25

Concrete Compressive Strength =	4000	psi
Modulus of Elasticity of Concrete =	3,600	ksi
Modulus of Rupture of Concrete: =	580	
Load Transfer ("J" Factor) =	4.2	
Drainage Coefficient =	1.2	

Asphalt Section Traffic (18 kip ESAL) = **N13(3-3)**
626,149

Asphalt Pavement Section

	<u>Drainage, m</u>			
AC Surface + Binder	4.6	in.		
Asphalt Base	2.5	in.		

Structural Number: 2.63

Structural Number - Required 2.63

Rigid - Heavy Duty Pavement

Concrete Section Traffic (18 kip ESAL) = 0

Concrete Pavement Section 5.0 in.

Project: N 13

Location: Apache Co., AZ and San Juan Co., NM

Project No. 66215110

Date: 02/13/24



Pavement Design

(AASHTO 1993 Method)

Design Inputs

	<u>Asphalt</u>		<u>Concrete</u>
Sugrade Support	CBR = 16		
	Mr = 15000	psi	k = 200
Reliability		%	pci
Standard Deviation	So = 0.45		65
Initial Serviceability	Po = 4.2		%
Terminal Serviceability	Pt = 2.0		0.35
Design Serviceability Loss,	ΔPSI = 2.2		4.5
			2.5
			2.0

Layer Coefficients:

AC Surface and Binder	a ₁ = 0.44
AC Base	a ₂ = 0.25

Concrete Compressive Strength =	4000	psi
Modulus of Elasticity of Concrete =	3,600	ksi
Modulus of Rupture of Concrete: =	580	
Load Transfer ("J" Factor) =	4.2	
Drainage Coefficient =	1.2	

Asphalt Section Traffic (18 kip ESAL) = **N13(3-3)**
626,149

Asphalt Pavement Section

	<u>Drainage, m</u>	
AC Surface + Binder	3.5	in.
Asphalt Base	2.5	in.

Structural Number: 2.17

Structural Number - Required 2.08

Rigid - Heavy Duty Pavement

Concrete Section Traffic (18 kip ESAL) = 0

Concrete Pavement Section 5.0 in.

Project: N 13

Location: Apache Co., AZ and San Juan Co., NM

Project No. 66215110

Date: 02/13/24

