

November 12, 2025

Project No. 040. 0000036026

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FivePoint  
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**Subject: As-Built Compaction Report  
Geotechnical Observation and Testing Services During Re-Grading of  
Lot 1 of Tract 61105-40A, Mission Village Fire Station 46  
26720 Bombero Lane, Valencia, California**

## Introduction

Per your request, Verdantas Inc. (formerly Leighton and Associates, Inc.) has prepared this as-built compaction report summarizing our observation and testing services performed during the recent re-grading of **Lot 1 of Tract 61105-40A, Mission Village Fire Station 46** (Project Site), located at 26720 Bombero Lane in Mission Village Project, Valencia, California.

Earthwork construction at the Project Site was performed by Stice Company between September 22 and October 08, 2025. Geotechnical observation and testing were performed by Verdantas technician(s) on a full- and part-time basis during the grading activities.

## Project Background

The previous as-graded conditions of the Project Site are documented in the referenced *As-Built Compaction Report, Geotechnical Observation and Testing Services During Mass and Rough Grading, Phase 6 Planning Area, Portion of Mission Village Tract 61105-01, Vesting Tentative Tract Map 61105 phases 1, 2, 5, and 6, Mission Village Project, Newhall Ranch, Los Angeles County, California*, dated February 23, 2023 (Leighton, 2023). This report was reviewed and approved by the County of Los Angeles Geotechnical Materials Engineering Division (GMED).

## Grading Activities

Prior to the initiation of re-grading activities and placement of new engineered fill, the Project Site was cleared of all vegetation, debris, and any other material deemed unsuitable for re-use as compacted fill.

The re-grading of the Project Site consisted of minor cut and fills of up to approximately 4 feet. The building areas for the fire station and the ancillary buildings located along the southerly perimeter of the Project Site were overexcavated (and replaced with engineered fill) to a minimum depth of 8 feet below finish grades to reestablish the overexcavation recommendations for mitigation of expansive clayey bedrock materials in accordance with the Mission Village Project requirements.

## Field Materials and Placement

All engineered fill material was derived from onsite sources. Prior to fill placement, the exposed surfaces were scarified, moisture-conditioned to approximately 2 to 3 percentage points above optimum moisture content, and compacted to a minimum of 90 percent of the ASTM D 1557 (Modified Proctor) laboratory measured maximum dry density. Field density testing of the new fill was performed using the Nuclear Gauge (ASTM D6938) and Sand Cone (ASTM D-1556) test methods. The field density test locations are shown on the attached Plate 1, *Field Density Test Location Map*. The field density test results are attached in Table 1, *Field Density Tests*.

## Geotechnical Laboratory Testing

A Modified Proctor (ASTM D1557) compaction test was performed on a selected onsite soil sample considered representative of the fill soils during grading for use as the baseline criteria to document the in-place moisture and density of the compacted fill at the locations of field compaction tests. The Modified Proctor test result is presented in Appendix A, *Geotechnical Laboratory Testing. Maximum Density Test Results* (Proctor Summary) are presented in Table 2. In addition, finish grade soil samples were collected for the following tests:

- ▶ Expansion Index (ASTM D4829)
- ▶ Atterberg Limits (ASTM D4318)
- ▶ Sieve and Hydrometer (ASTM D7928 and D6913)
- ▶ Corrosivity (soluble sulfate [CT417], soluble chloride [CT422], resistivity [CT643], and pH [CT643])
- ▶ R-Value (CT301)

The samples were collected to a depth of 1.5 feet below finish pad grade. The locations of the finish grade soil samples are shown on Plate 1. Laboratory test results are attached in Appendix A, *Geotechnical Laboratory Testing*. The following discussion and data presentation tables summarize the results of testing.

### Soil Expansion Potential

Evaluation of the expansion potential of the soils was performed via Expansion Index (EI) testing on bulk samples of the near surface soils and Atterberg Limits testing to evaluate soil plasticity. The results of the EI tests generally indicated low expansion potential (EI = 10-11). The results of the tests and test data are summarized in the following table.

**Summary of Expansion Index Tests**

Sample I.D.	Expansion Index
FGS-1	11
FGS-2	10



Atterberg limits provide a qualitative measure of soil expansion potential through correlation with plasticity index (PI). Plasticity index values less than 15 suggest low expansion potential; between 15 to 25 indicate a moderate expansion potential; and PI greater than 25 indicate high potential.

#### Summary of Atterberg Limits Tests

Sample I.D.	Liquid Limit	Plastic Limit	Plasticity Index
FGS-1	31	18	13
FGS-2	30	18	12

#### Soil Gradation Characteristics

The samples collected from finish pad grade were also subjected to grain size distribution testing through convention sieve analysis of the coarse fraction and hydrometer (sedimentation cylinder) of the fine fraction.

#### Summary of Grain Size Distribution Testing

Sample I.D.	Gravel (%)	Sand (%)	Fines (%)	< 0.002 mm (%)
FGS-1	15	45	40	N/A
FGS-2	11	42	47	N/A

#### Soil Corrosivity

Degradation of typical construction materials in contact with soil is dependent upon factors such as soil moisture content, resistivity, permeability and pH as well as chloride and sulfate concentration. Soil resistivity is the most influential factor and is inversely related to corrosion potential to ferrous metals. Based upon studies presented in ASTM STP 1013 titled, "Effects of Soil Characteristics on Corrosion" (February 1989), the approximate relationship between soil resistivity and corrosion is as follows:

In general, soil resistivity, which is a measure of how easily electrical current flows through soils, is the most influential factor for corrosion to ferrous metals.



The following table presents an approximate relationship between soil resistivity and soil corrosiveness.

**Soil Corrosivity as a Function of Resistivity**

Soil Resistivity (ohm-cm)	Classification of Soil Corrosiveness
0 to 900	Very severe corrosion
900 to 2,300	Severely corrosive
2,300 to 5,000	Moderately corrosive
5,000 to 10,000	Mildly corrosive
10,000 to >100,000	Very mildly corrosive
Note:	<sup>1</sup> ASTM STP 1013 titled <i>Effects of Soil Characteristics on Corrosion</i> (February, 1989).

In addition to resistivity, acidity is a significant factor in corrosion potential. As pH decreases (soil becomes more acidic), the corrosive potential increases with respect to buried metallic structures and utilities. As soil pH increases above 7, the soil is increasingly more alkaline and less corrosive to buried steel structures due to protective films that form on steel in high pH environments. A pH in the range of 5 to 8.5 is generally considered to be passive from a corrosion standpoint. Chloride and sulfate ion concentrations and pH appear to be secondary characteristics in affecting corrosion potential. High chloride levels tend to reduce soil resistivity and degrade otherwise protective surface deposits which can result in corrosion of buried steel or reinforced concrete structures.

Sulfate ions in the soil can lower soil resistivity becoming highly aggressive to Portland cement concrete by combining chemically with certain constituents of concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. A high sulfate content could also cause corrosion of the reinforcing steel in concrete.

Representative bulk samples of the near-surface soils (1 to 2 feet) from the locations noted on Plate 1 were tested to evaluate the potential for structures in contact with the soils to be adversely affected. The chemical analysis test results are included in Appendix A of this report and are summarized in the table below.



### Corrosion Test Results

Test Parameter	Test Results		General Classification of Hazard
	FGS-1	FGS-2	
Water-soluble sulfate content (ppm)	132	62	Negligible sulfate exposure to buried concrete (per ACI 318)
Water-soluble chloride content (ppm)	90	70	Low-corrosive to buried steel and reinforced concrete structures
pH	8	8	Alkaline Soils
Minimum resistivity (ohm-cm) (in saturated condition)	1,500	1,647	Severe corrosive potential to buried ferrous pipes (per ASTM <sup>1</sup> )

Chloride - The sample tested for water-soluble chloride content indicate a low potential for corrosion of steel in concrete due to the chloride content of the soil.

Sulfate - The results of laboratory testing indicated a concentration of soluble sulfate less than 0.1 percent. The test results indicate a sulfate Exposure Class designation of "S0" appears to be appropriate for the project site based upon criteria presented in ACI 318. However, if the concrete is expected to be in contact with reclaimed water, Type V cement and a water/cement ratio of 0.45 should be used.

Corrosivity - The results of the resistivity test indicate a significant corrosive to buried ferrous metals per ASTM STP 1013. Consequently, based on the test results, ferrous pipes buried in moist to wet site earth materials should be avoided by using high-density polyethylene (HDPE), polyvinyl chloride (PVC) and/or other non-ferrous pipe when possible provided the pipe walls possess sufficient strength for the embedment and external loading to which the pipe will be subjected. Ferrous pipe can also be protected by polyethylene bags, tape or coatings, di-electric fittings or other means to separate pipe from on-site soils.

## Conclusions

The re-grading of the Project Site was carried out under Verdantas observation and testing. The work performed was in substantial conformance with the Rough Grading Plan, Delta 9, prepared by Hunsaker (Hunsaker, 2025) and the Los Angeles County Grading Code, and in general accordance with applicable geotechnical recommendations of the geotechnical reports (Leighton, 2023 and 2025).



## County of Los Angeles Building Code Section J105.12 Statement

Based on the findings presented in this report, it is our professional opinion that the completed site grading and proposed development at the Project Site will be safe from the hazards of landslide, settlement or slippage. Furthermore, the completed site grading will not adversely affect adjacent properties. This statement assumes that the recommendations contained herein and the County of Los Angeles Building Code are followed during future design and construction.

## Recommendations

The geotechnical recommendations contained in Leighton's As-Built Compaction Report dated February 23, 2023 (Leighton, 2023) generally remain applicable for the future improvements at the Project Site. The following recommendations are presented based upon the results of laboratory testing discussed herein.

### Foundation Design

Design of post-tensioned slab foundation systems is recommended to be performed in accordance with the parameters and moisture conditioning recommendations stated in the referenced grading report associated with the Expansion Index range of EI = 10 to 11.

### Preliminary Pavement Design

The following pavement design recommendations are intended for the proposed in-tract streets within the project Site.

**Pavement Subgrades:** Prior to placement of the base course materials associated with construction, subgrades for new pavement should be prepared as described in Section 4.2 of the referenced report (Leighton, 2021). Subgrade preparation and compaction operations should be observed, tested and documented by the project geotechnical engineer.

**Hot Mix Asphalt (HMA) Sections:** The recommended minimum section thicknesses for asphalt concrete pavement are presented in the following table. The pavement sections have been based on the anticipated subgrade conditions after the recommended subgrade preparation and the conditions that have resulted from grading operations described in this report.

Based upon testing of a representative sample of the subgrade soils, an R-value of 35 has been used to determine the pavement sections corresponding to various traffic intensities (i.e., Traffic Index) as indicated in the table.

Based on the design procedures outlined in the current Caltrans Highway Design Manual and using an R-value of 78 for the pavement base course, the following flexible pavement sections may be used for Traffic Index values that correspond to various levels of vehicle traffic intensity.



### Asphalt Pavement Sections

Traffic Index	Asphalt Concrete (inches)	Base Course (inches)	
		CAB	CMB
4 or less	3	5	5
5.0	3	6	6
7.0	4	9	9
9.0	5	12	12
Notes:	CAB – Crushed Aggregate Base Course; Caltrans Class 2, Section 26 or SSPWC Section 200-2.2		
	CMB – Crushed Miscellaneous Base Course; SSPWC Section 200-2.4		

The asphalt concrete should conform to the specifications outlined in Section 203-6 of the Standard Specifications for Public Works Construction (SSPWC, a.k.a. “Greenbook”), and asphalt concrete construction methods should meet the requirements of Section 302-5 of the Greenbook.

The base course should conform to requirements of Section 26 of State of California Department of Transportation Standard Specifications (Caltrans), latest edition, or meet the specifications for untreated base as defined in Section 200-2.2 of the SSPWC (Greenbook). As an alternate, the base course may comply with the specifications for Crushed Miscellaneous Base per SSPWC Section 200-2.4.

Base course should be placed in thin lifts, moisture conditioned, as necessary, and compacted to a minimum of 95 percent relative compaction.

**Construction and Performance** All pavement construction should be performed in accordance with the *Standard Specifications for Public Works Construction* (SSPWC, “Greenbook”) or the project specifications as prepared by others. Field observation and periodic testing, as needed during placement of the base course materials, should be undertaken to ensure that the requirements of the project specifications are fulfilled.

## Limitations

The presence of our field representative at the site was intended to provide FivePoint professional advice, opinions, and recommendations based on observations of the contractor’s work. Although Verdantas observations did not reveal obvious deficiencies, Verdantas does not guarantee the contractor’s work, nor do our services relieve the contractor or its subcontractors of their responsibility if defects are subsequently discovered in their work. This report is based on test results and observations of the grading procedures used and represents our engineering opinion as to the contractor’s compliance with project specifications. Verdantas responsibilities did not include any supervision or direction of the actual work of the contractor or the contractor’s personnel or subcontractors. Verdantas is also not responsible for line and grade.



## Closure

We appreciate the opportunity to be of continued service to you on this project. Should you have any questions regarding this report, please contact us at your convenience.

Respectfully submitted,

**Verdantas Inc.**



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JGS/RA/bmm

Attachments:

References

Table 1 Field Density Tests

Table 2 Maximum Density Test Results

Appendix A – Geotechnical Laboratory Testing

Plate 1 Field Density Test Location Map

Distribution:

(1) Addressee:

## References

ENGEO, 2025, Geotechnical Exploration and Engineering Geology Report, Fire Station 46, 26720 Bombero Lane, Valencia, California, Project No. 6538.100.312 dated April 14 2025.

Hunsaker and Associates, Los Angeles, Inc., 2025, Mission Village Tract 61105-01, Rough Grading Plan, VTTM 61105 Phases 1, 2, 5, and 6, Plan Sheet 23A, Scale 1"=40', Delta 9 dated April 21, 2025, Approved by Los Angeles County, Department of Public Works Land Development Division on May 5, 2025.

Leighton and Associates, Inc., 2023, As-Built Compaction Report, Geotechnical Observation and Testing Services During Mass and Rough Grading, Phase 6 Planning Area, Portion of Mission Village Tract 61105-01, Vesting Tentative Tract Map 61105 phases 1, 2, 5, and 6, Mission Village Project, Newhall Ranch, Los Angeles County, California, Project No. 11688.100, dated February 23, 2023.

\_\_\_\_\_, 2025, Geotechnical Recommendations for Precise Grading, Mission Village Fire Station 46, 26720 Bombero Lane, Valencia, California, Project No. 040. 0000036026, Revised, dated August 20, 2025.



## Tables

Table 1 – Field Density Tests

Table 2 – Maximum Density Test Results



**TABLE 1  
FIELD DENSITY TESTS**

Test #	Retest of	Test Date	Test of	Test Type	Location	Elev	Proctor ID	Dry Density (pcf)		Moisture (%)		Rel. Comp. (%)		Req. Comp. (%)	Remarks
								Field	Max	Field	Opt				
1		09/24/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1257	#1 (09-22-25)	118.4	131.1	10.6	9	90	90	90	DP/MP
1		09/29/25	Compacted Fill (CF)	S	Lot 1, TM 61105-40A	1263	#1 (09-22-25)	122.6	131.1	11.5	9	94	90	90	DP/MP
2		09/24/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1257	#1 (09-22-25)	119.5	131.1	9.5	9	91	90	90	DP/MP
2		10/01/25	Compacted Fill (CF)	S	Lot 1, TM 61105-40A	1261	#1 (09-22-25)	122.2	131.1	11.9	9	93	90	90	DP/MP
3		09/29/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1259	#1 (09-22-25)	121.2	131.1	9.9	9	92	90	90	DP/MP
3		10/02/25	Compacted Fill (CF)	S	Lot 1, TM 61105-40A	1263	#1 (09-22-25)	122.8	131.1	11.9	9	94	90	90	DP/MP
4		09/29/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1259	#1 (09-22-25)	121.1	131.1	10.7	9	92	90	90	DP/MP
4		10/03/25	Compacted Fill (CF)	S	Lot 1, TM 61105-40A	1265	#1 (09-22-25)	121.3	131.1	11.1	9	93	90	90	DP/MP
5		09/29/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1261	#1 (09-22-25)	117.7	131.1	11	9	90	90	90	DP/MP
6		09/29/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1261	#1 (09-22-25)	116.9	131.1	12.4	9	89	90	90	DF/MP
7	6	09/29/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1261	#1 (09-22-25)	119.9	131.1	12.1	9	91	90	90	DP/MP
8		09/29/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1263	#1 (09-22-25)	121.3	131.1	11.7	9	93	90	90	DP/MP
9		09/30/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1257	#1 (09-22-25)	121.6	131.1	9.9	9	93	90	90	DP/MP
10		09/30/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1257	#1 (09-22-25)	120.6	131.1	9.3	9	92	90	90	DP/MP
11		09/30/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1259	#1 (09-22-25)	118.9	131.1	11.6	9	91	90	90	DP/MP
12		09/30/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1259	#1 (09-22-25)	119.4	131.1	11.5	9	91	90	90	DP/MP
13		10/01/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1261	#1 (09-22-25)	118.2	131.1	12.2	9	90	90	90	DP/MP
14		10/01/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1263	#1 (09-22-25)	119.6	131.1	9.9	9	91	90	90	DP/MP
15		10/01/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1263	#1 (09-22-25)	115.9	131.1	12	9	88	90	90	DF/MP
16	15	10/01/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1263	#1 (09-22-25)	118.6	131.1	11.3	9	90	90	90	DP/MP
17		10/02/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1257	#1 (09-22-25)	120.9	131.1	9.4	9	92	90	90	DP/MP
18		10/02/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1257	#1 (09-22-25)	121.4	131.1	9.7	9	93	90	90	DP/MP
19		10/02/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1259	#1 (09-22-25)	120.3	131.1	10.5	9	92	90	90	DP/MP
20		10/02/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1259	#1 (09-22-25)	118.0	131.1	9.9	9	90	90	90	DP/MP
21		10/02/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1261	#1 (09-22-25)	118.9	131.1	11.6	9	91	90	90	DP/MP
22		10/02/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1261	#1 (09-22-25)	122.8	131.1	10.9	9	94	90	90	DP/MP
23		10/02/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1263	#1 (09-22-25)	118.5	131.1	11.1	9	90	90	90	DP/MP
24		10/03/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1265	#1 (09-22-25)	121.9	131.1	11.2	9	93	90	90	DP/MP
25		10/06/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1265	#1 (09-22-25)	117.8	131.1	10.7	9	90	90	90	DP/MP
26		10/06/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1265	#1 (09-22-25)	122.6	131.1	9.9	9	94	90	90	DP/MP
27		10/06/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1265	#1 (09-22-25)	120.6	131.1	10.3	9	92	90	90	DP/MP
28		10/06/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1265	#1 (09-22-25)	118.8	131.1	11.6	9	91	90	90	DP/MP
29		10/06/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1262	#1 (09-22-25)	117.4	131.1	10.5	9	90	90	90	DP/MP
30		10/06/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1263	#1 (09-22-25)	118.8	131.1	10.9	9	91	90	90	DP/MP
31		10/06/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1364	#1 (09-22-25)	125.5	131.1	9.9	9	96	90	90	DP/MP
32		10/06/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1265	#1 (09-22-25)	119.6	131.1	9.5	9	91	90	90	DP/MP
33		10/06/25	Compacted Fill (CF)	N	Lot 1, TM 61105-40A	1265	#1 (09-22-25)	118.8	131.1	12.8	9	91	90	90	DP/MP

**TABLE 2**  
**Maximum Density Test Results**

Proctor ID	Soil Description	Optimum Moisture (%)	Maximum Dry Density (pcf)
#1 (09-22-25)	Silty Sand	9	131.1

## Appendix A

### Geotechnical Laboratory Testing

ADDENDUM #2 - APRIL 24, 2026



# EXPANSION INDEX of SOILS

## ASTM D 4829

Project Name: FivePoint/Fire Station 46, MV Tested By: G. Berdy Date: 10/14/25  
 Project No.: 040.00000036026 Checked By: J. Ward Date: 10/20/25  
 Location: FS Bldg Depth (ft.): 1.5  
 Sample No.: FGS-1  
 Soil Identification: Yellowish brown clayey sand with gravel (SC)g

Dry Wt. of Soil + Cont.	(g)	1000.00
Wt. of Container No.	(g)	0.00
Dry Wt. of Soil	(g)	1000.00
Weight Soil Retained on #4 Sieve		0.00
Percent Passing # 4		100.00

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0095
Wt. Comp. Soil + Mold (g)	615.16	447.02
Wt. of Mold (g)	187.59	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	0	0
Wet Wt. of Soil + Cont. (g)	847.55	634.61
Dry Wt. of Soil + Cont. (g)	786.22	584.22
Wt. of Container (g)	0.00	187.59
Moisture Content (%)	7.80	12.70
Wet Density (pcf)	129.0	133.6
Dry Density (pcf)	119.6	118.5
Void Ratio	0.409	0.422
Total Porosity	0.290	0.297
Pore Volume (cc)	60.1	62.1
Degree of Saturation (%) [ S meas]	51.5	81.2

**SPECIMEN INUNDATION** in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
10/14/25	10:50	1.0	0	0.4925
10/14/25	11:00	1.0	10	0.4910
Add Distilled Water to the Specimen				
10/14/25	12:10	1.0	70	0.4970
10/15/25	6:36	1.0	1176	0.5020
10/15/25	7:47	1.0	1247	0.5020

Expansion Index (EI <sub>meas</sub> ) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	11
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# EXPANSION INDEX of SOILS

## ASTM D 4829

Project Name: FivePoint/Fire Station 46, MV Tested By: G. Berdy Date: 10/14/25  
 Project No.: 040.00000036026 Checked By: J. Ward Date: 10/20/25  
 Location: Ancillary Bldg Depth (ft.): 1.5  
 Sample No.: FGS-2  
 Soil Identification: Yellowish brown clayey sand (SC)

Dry Wt. of Soil + Cont.	(g)	1000.00
Wt. of Container No.	(g)	0.00
Dry Wt. of Soil	(g)	1000.00
Weight Soil Retained on #4 Sieve		0.00
Percent Passing # 4		100.00

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0050
Wt. Comp. Soil + Mold (g)	596.64	458.54
Wt. of Mold (g)	163.26	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	0	0
Wet Wt. of Soil + Cont. (g)	859.91	621.80
Dry Wt. of Soil + Cont. (g)	801.41	567.16
Wt. of Container (g)	0.00	163.26
Moisture Content (%)	7.30	13.53
Wet Density (pcf)	130.7	137.6
Dry Density (pcf)	121.8	121.2
Void Ratio	0.384	0.391
Total Porosity	0.277	0.281
Pore Volume (cc)	57.4	58.4
Degree of Saturation (%) [ S meas]	51.4	93.5

**SPECIMEN INUNDATION** in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
10/14/25	11:31	1.0	0	0.3550
10/14/25	11:41	1.0	10	0.3500
Add Distilled Water to the Specimen				
10/14/25	12:51	1.0	70	0.3565
10/15/25	6:37	1.0	1136	0.3600
10/15/25	7:54	1.0	1213	0.3600

Expansion Index (EI <sub>meas</sub> ) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	10
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# ATTERBERG LIMITS ASTM D 4318

Project Name: FivePoint/Fire Station 46, MV Tested By: J. Domingo Date: 10/16/25  
 Project No. : 040.0000036026 Input By: JD/JHW Date: 10/17/25  
 Location: FS Bldg Checked By: J. Ward  
 Sample No.: FGS-1 Depth (ft.) 1.5  
 Soil Identification: Yellowish brown clayey sand with gravel (SC)g

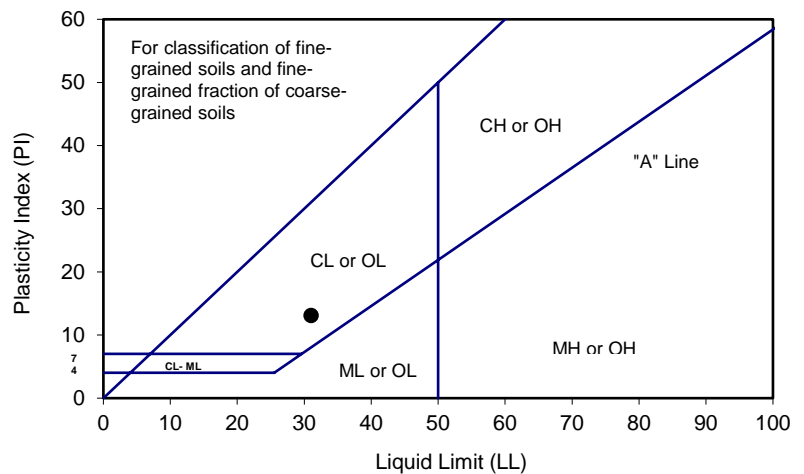
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			33	24	15	
Wet Wt. of Soil + Cont. (g)	9.19	9.30	18.09	18.39	18.66	
Dry Wt. of Soil + Cont. (g)	7.96	8.05	14.18	14.27	14.30	
Wt. of Container (g)	1.06	1.09	1.02	1.07	1.05	
Moisture Content (%) [Wn]	17.83	17.96	29.71	31.21	32.91	

<b>Liquid Limit</b>	<b>31</b>
<b>Plastic Limit</b>	<b>18</b>
<b>Plasticity Index</b>	<b>13</b>
<b>Type of Fines</b>	<b>CL</b>

PI at "A" - Line =  $0.73(LL-20)$  8.03

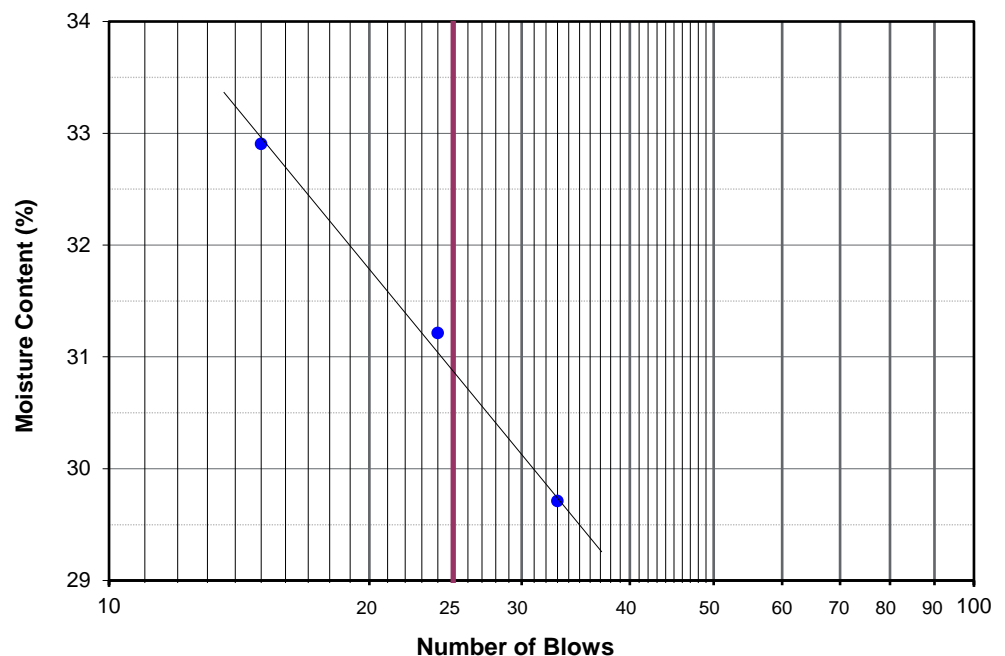
One - Point Liquid Limit Calculation

$$LL = Wn(N/25)^{0.12}$$



## PROCEDURES USED

- ☐ Wet Preparation  
Multipoint - Wet
- ☒ Dry Preparation  
Multipoint - Dry
- ☒ Procedure A  
Multipoint Test
- ☐ Procedure B  
One-point Test



# ATTERBERG LIMITS ASTM D 4318

Project Name: FivePoint/Fire Station 46, MV Tested By: J. Domingo Date: 10/16/25  
 Project No. : 040.0000036026 Input By: JD/JHW Date: 10/17/25  
 Location: Ancillary Bldg Checked By: J. Ward  
 Sample No.: FGS-2 Depth (ft.) 1.5  
 Soil Identification: Yellowish brown clayey sand (SC)

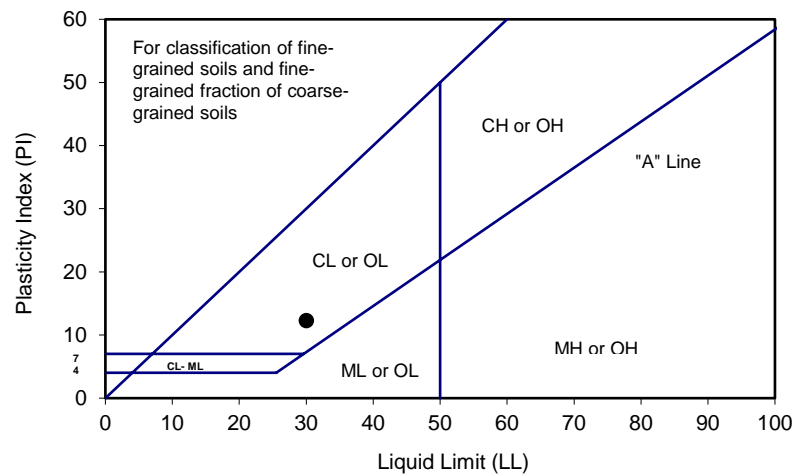
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			32	23	15	
Wet Wt. of Soil + Cont. (g)	9.15	9.18	21.45	21.82	21.92	
Dry Wt. of Soil + Cont. (g)	7.94	7.95	16.77	17.01	16.83	
Wt. of Container (g)	1.05	1.05	1.04	1.06	1.07	
Moisture Content (%) [Wn]	17.56	17.83	29.75	30.16	32.30	

<b>Liquid Limit</b>	<b>30</b>
<b>Plastic Limit</b>	<b>18</b>
<b>Plasticity Index</b>	<b>12</b>
<b>Type of Fines</b>	<b>CL</b>

PI at "A" - Line =  $0.73(LL-20)$  7.3

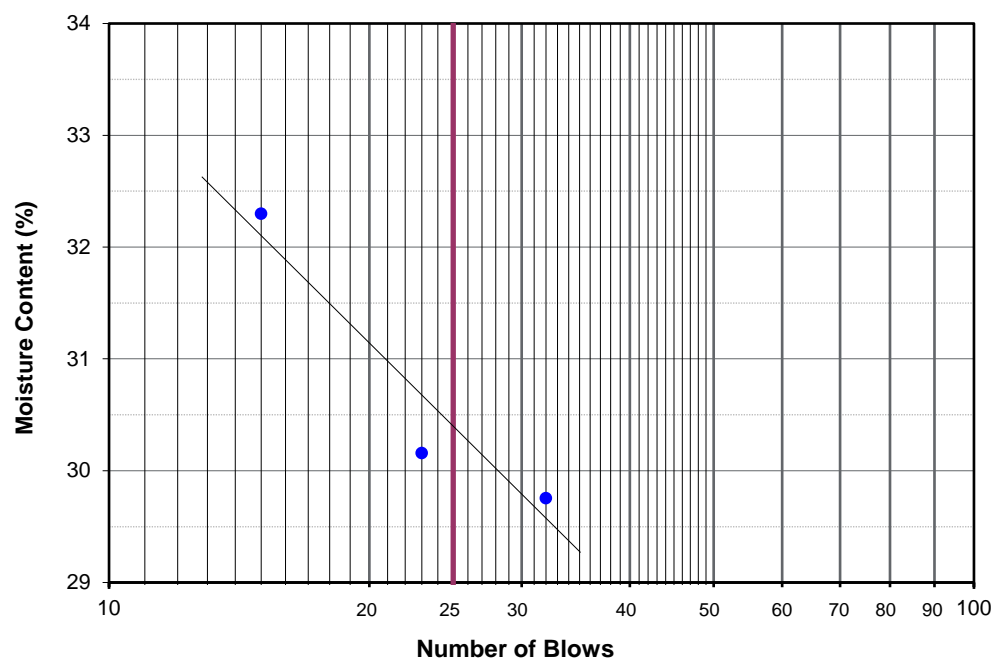
One - Point Liquid Limit Calculation

$$LL = Wn(N/25)^{0.12}$$



## PROCEDURES USED

- ☐ Wet Preparation  
Multipoint - Wet
- ☒ Dry Preparation  
Multipoint - Dry
- ☒ Procedure A  
Multipoint Test
- ☐ Procedure B  
One-point Test



# PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 7928 & D 6913

Project Name: FivePoint/Fire Station 46, MV

Tested By: KJ/GEB

Date: 10/09/25

Project No.: 040.0000036026

Data Input By: J. Ward

Date: 10/20/25

Location: FS Bldg

Sample No.: FGS-1

Depth (feet): 1.5

Soil Identification: Yellowish brown clayey sand with gravel (SC)g

% Gravel	15	Soil Type  (SC)g	Dry Weight of Oven-Dry Soil Passing #4	Moisture Content of Oven-Dry Soil Passing #10	After Hydrometer & Wet Sieve ret. in #200 Sieve
% Sand	45				
% Fines	40				

Specific Gravity (Assumed)	2.70	Wt. of Air-Dry Soil + Cont. (g)	0.00	82.43	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (g)	501.40	82.30	125.58
Wt. of Air-Dry Soil + Cont. (g)	4278.20	Wt. of Container No. ____ (g)	0.00	68.90	74.72
Wt. of Container	230.30	Moisture Content (%)	N/A	0.97	
Dry Wt. of Soil (g)	4047.90	Wt. of Dry Soil (g)	501.40		50.86

Coarse Sieve		
U.S. Sieve	Cumulative Wt. Of Dry Soil Retained (g)	% Passing
6"	0.00	100.0
3"	0.00	100.0
1 1/2"	0.00	100.0
3/4"	173.10	95.7
3/8"	385.25	90.5
No. 4	602.06	85.1
No. 10	40.67	78.2
Pan		

1st sample split  
2nd sample split

Sieve after Hydrometer & Wet Sieve			
U.S. Sieve Size	Cumulative Wt. Of Dry Soil Retained (g)	% Passing	% Total Sample
No. 10	0.00	100.0	78.2
No. 16	5.78	94.2	73.7
No. 30	16.81	83.2	65.1
No. 50	28.92	71.1	55.6
No. 100	39.12	60.8	47.6
No. 200	49.09	50.9	39.8
Pan			

## Hydrometer

Wt. of Air-Dry Soil (g)

100.89

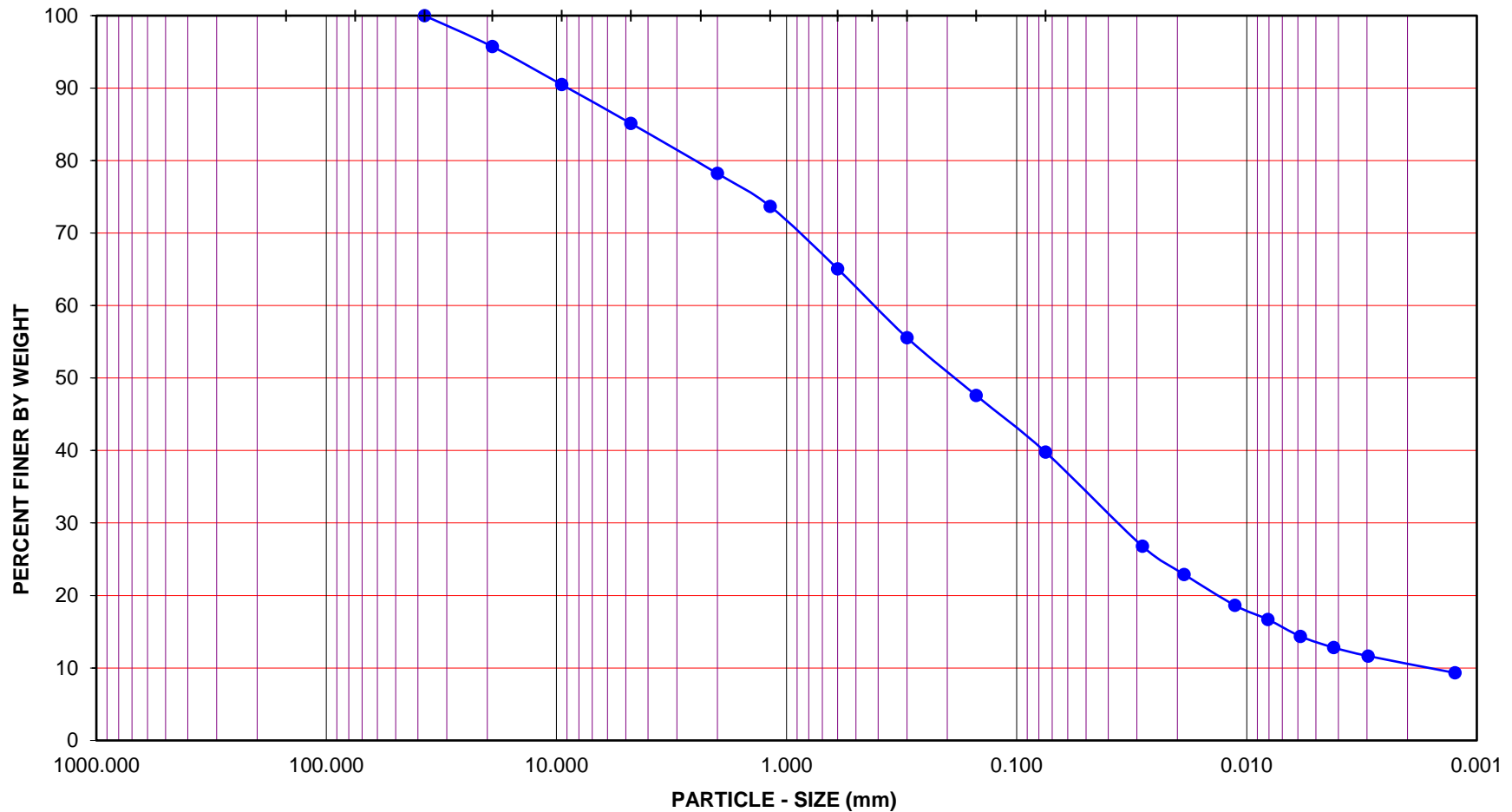
Wt. of Dry Soil (g)

99.92

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature (°C)	Composite Correction 152H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
10-Oct-25	6:54	0		6.5			
	6:56	2	23.4	6.5	41.0	26.8	0.0284
	6:59	5	23.5	6.5	36.0	22.9	0.0187
	7:09	15	23.5	6.5	30.5	18.6	0.0113
	7:24	30	23.4	6.5	28.0	16.7	0.0081
	7:54	60	23.2	6.5	25.0	14.4	0.0058
	8:54	120	23.1	6.5	23.0	12.8	0.0042
	11:04	250	22.9	6.5	21.5	11.6	0.0030
11-Oct-25	6:54	1440	23.0	6.5	18.5	9.3	0.0012

BOULDERS	COBBLES		GRAVEL			SAND					FINES		
			COARSE		FINE	COARSE	MEDIUM			FINE	SILT		CLAY
U.S. STANDARD SIEVE OPENING						U.S. STANDARD SIEVE NUMBER						HYDROMETER	
	6"	3"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200	



Project Name: FivePoint/Fire Station 46, MV

Project No.: 040.0000036026

Location: FS Bldg

Sample No.: FGS-1

Depth (feet): 1.5

Soil Type : (SC)g

Soil Identification: Yellowish brown clayey sand with gravel (SC)g

GR:SA:FI : (%)      15   :   45   :   40

**verdantas**

**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 7928 & D 6913**

Oct-25

ADDENDUM #2 - APRIL 24, 2026

# PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 7928 & D 6913

Project Name: FivePoint/Fire Station 46, MV

Tested By: KJ/GEB

Date: 10/09/25

Project No.: 040.0000036026

Data Input By: J. Ward

Date: 10/20/25

Location: Ancillary Bldg

Sample No.: FGS-2

Depth (feet): 1.5

Soil Identification: Yellowish brown clayey sand (SC)

% Gravel	11	Soil Type
% Sand	42	SC
% Fines	47	

Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(g)	0.00	78.82	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (g)	502.00	78.74	122.71
Wt.of Air-Dry Soil + Cont. (g)	3641.60	Wt. of Container No.____ (g)	0.00	65.79	74.83
Wt. of Container	230.40	Moisture Content (%)	N/A	0.62	
Dry Wt. of Soil (g)	3411.20	Wt. of Dry Soil (g)	502.00		47.88

Coarse Sieve		
U.S. Sieve	Cumulative Wt. Of Dry Soil Retained (g)	% Passing
6"	0.00	100.0
3"	0.00	100.0
1 1/2"	0.00	100.0
3/4"	138.50	95.9
3/8"	253.22	92.6
No. 4	358.52	89.5
No. 10	27.18	84.6
Pan		

1st sample split  
2nd sample split

Sieve after Hydrometer & Wet Sieve			
U.S. Sieve Size	Cumulative Wt. Of Dry Soil Retained (g)	% Passing	% Total Sample
No. 10	0.00	100.0	84.6
No. 16	5.68	94.3	79.8
No. 30	13.73	86.2	73.0
No. 50	23.63	76.3	64.6
No. 100	33.38	66.5	56.3
No. 200	44.26	55.6	47.1
Pan			

## Hydrometer

Wt. of Air-Dry Soil (g)

100.34

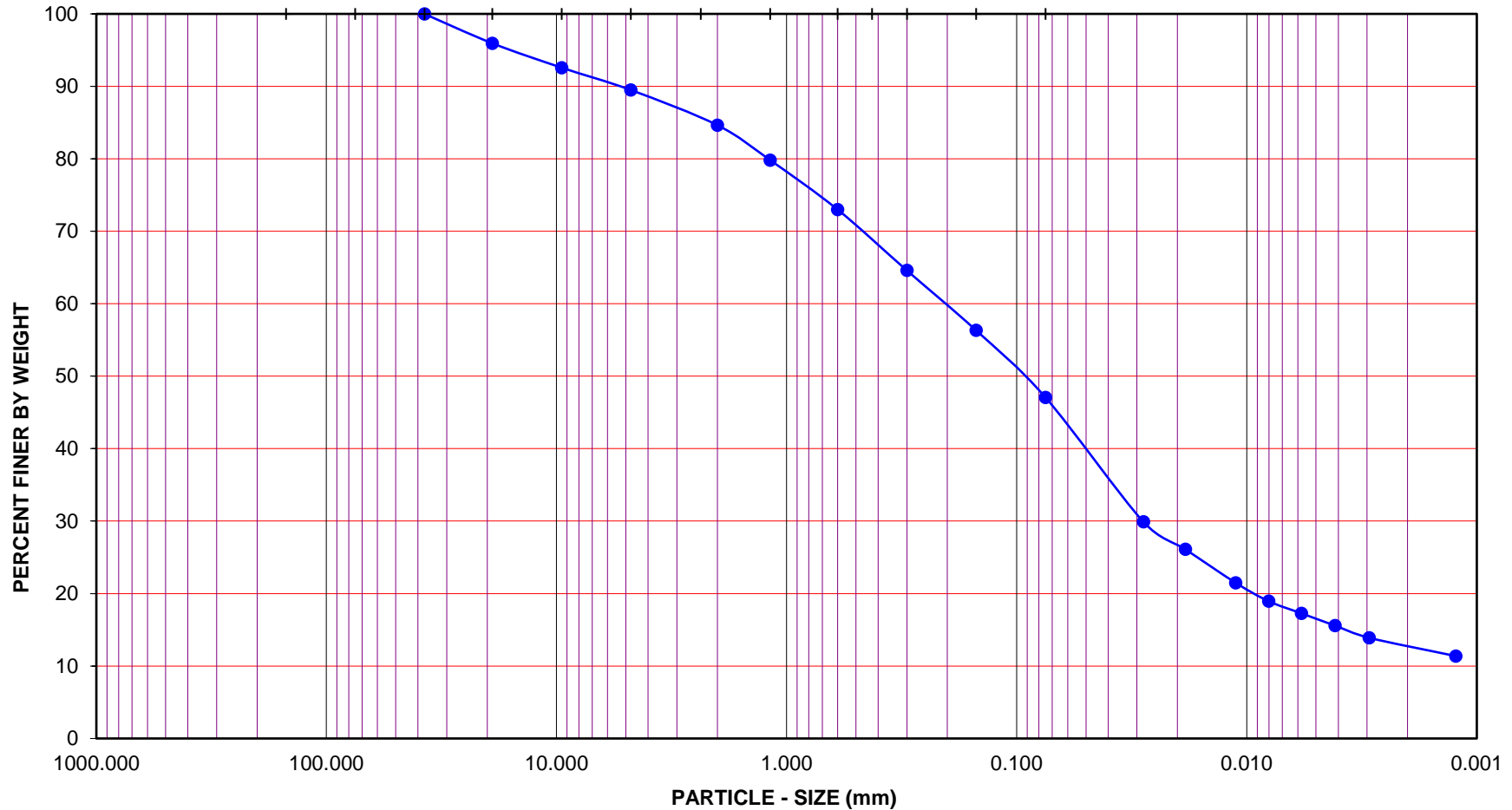
Wt. of Dry Soil (g)

99.72

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature (°C)	Composite Correction 152H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
10-Oct-25	6:58	0		6.5			
	7:00	2	23.6	6.5	42.0	29.9	0.0281
	7:03	5	23.6	6.5	37.5	26.1	0.0185
	7:13	15	23.5	6.5	32.0	21.5	0.0112
	7:28	30	23.4	6.5	29.0	18.9	0.0080
	7:58	60	23.2	6.5	27.0	17.3	0.0058
	8:58	120	23.0	6.5	25.0	15.6	0.0041
	11:08	250	22.9	6.5	23.0	13.9	0.0029
11-Oct-25	6:58	1440	23.0	6.5	20.0	11.4	0.0012

BOULDERS	COBBLES		GRAVEL			SAND					FINES		
			COARSE	FINE		COARSE	MEDIUM	FINE				SILT	CLAY
U.S. STANDARD SIEVE OPENING						U.S. STANDARD SIEVE NUMBER						HYDROMETER	
	6"	3"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200	



Project Name: FivePoint/Fire Station 46, MV

Project No.: 040.0000036026

Location: Ancillary Bldg

Sample No.: FGS-2

Depth (feet): 1.5

Soil Type : SC

Soil Identification: Yellowish brown clayey sand (SC)

GR:SA:FI : (%) **11 : 42 : 47**

Oct-25



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 7928 & D 6913**

## TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Project Name: FivePoint/Fire Station 46, MV Tested By : G. Berdy Date: 10/10/25  
Project No. : 040.0000036026 Checked By: J. Ward Date: 10/20/25

Location	FS Bldg	Ancillary Bldg		
Sample No.	FGS-1	FGS-2		
Sample Depth (ft)	1.5	1.5		
Soil Identification:	Yellowish brown (SC)g	Yellowish brown (SC)		
Wet Weight of Soil + Container (g)	0.00	0.00		
Dry Weight of Soil + Container (g)	0.00	0.00		
Weight of Container (g)	1.00	1.00		
Moisture Content (%)	0.00	0.00		
Weight of Soaked Soil (g)	100.09	100.23		

### SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	405	9		
Crucible No.	304	300		
Furnace Temperature (°C)	860	860		
Time In / Time Out	7:15/8:00	7:15/8:00		
Duration of Combustion (min)	45	45		
Wt. of Crucible + Residue (g)	65.4513	58.5271		
Wt. of Crucible (g)	65.4481	58.5256		
Wt. of Residue (g) (A)	0.0032	0.0015		
PPM of Sulfate (A) x 41150	131.68	61.73		
<b>PPM of Sulfate, Dry Weight Basis</b>	<b>132</b>	<b>62</b>		

### CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30	30		
ml of AgNO <sub>3</sub> Soln. Used in Titration (C)	1.1	0.9		
PPM of Chloride (C -0.2) * 100 * 30 / B	90	70		
<b>PPM of Chloride, Dry Wt. Basis</b>	<b>90</b>	<b>70</b>		

### pH TEST, DOT California Test 643

pH Value	7.97	8.03		
Temperature °C	23.0	22.8		

# SOIL RESISTIVITY TEST

## DOT CA TEST 643

Project Name: FivePoint/Fire Station 46, MV  
 Project No. : 040.0000036026  
 Location: FS Bldg  
 Sample No. : FGS-1

Tested By : G. Berdy Date: 10/15/25  
 Checked By: J. Ward Date: 10/20/25  
 Depth (ft.) : 1.5

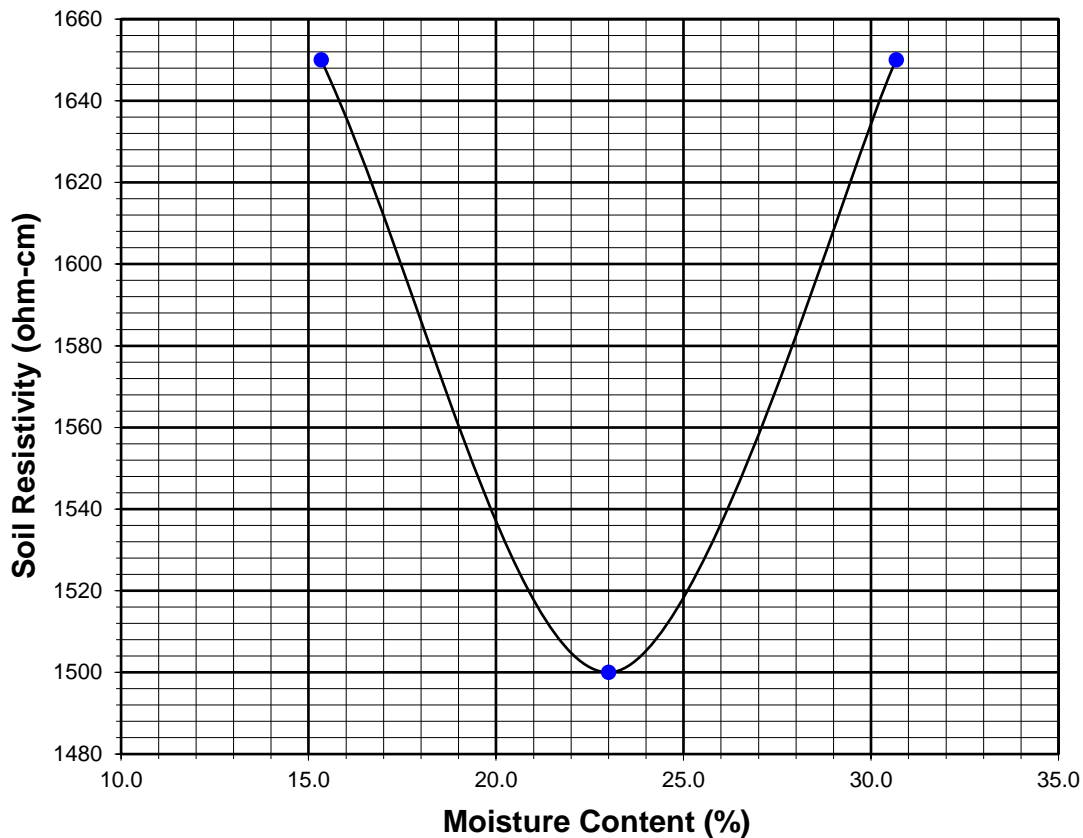
Soil Identification:\* Yellowish brown (SC)g

\*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	20	15.34	1650	1650
2	30	23.00	1500	1500
3	40	30.67	1650	1650
4				
5				

Moisture Content (%) (Mci)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.42
Box Constant	1.000
$MC = (((1 + Mci/100) \times (Wa/Wt + 1)) - 1) \times 100$	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1500	23.0	132	90	7.97	23.0



# SOIL RESISTIVITY TEST

## DOT CA TEST 643

Project Name: FivePoint/Fire Station 46, MV  
 Project No. : 040.0000036026  
 Location: Ancillary Bldg  
 Sample No. : FGS-2

Tested By : G. Berdy Date: 10/15/25  
 Checked By: J. Ward Date: 10/20/25  
 Depth (ft.) : 1.5

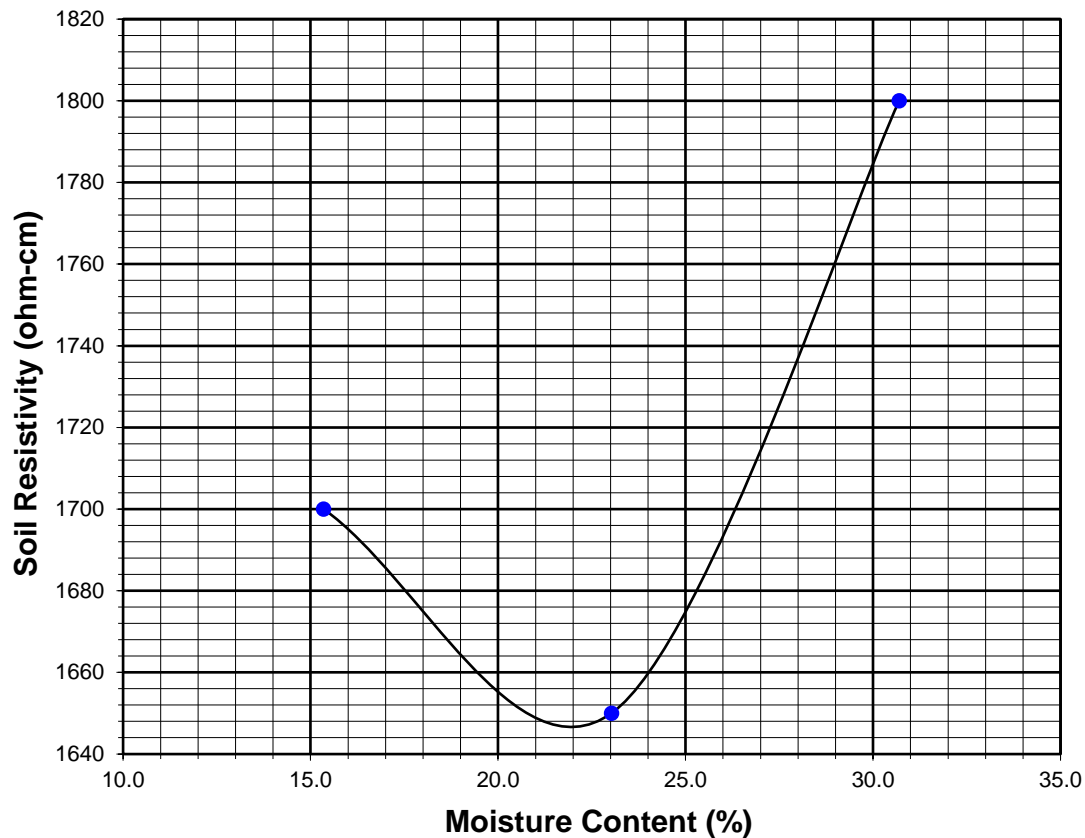
Soil Identification:\* Yellowish brown (SC)

\*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	20	15.35	1700	1700
2	30	23.02	1650	1650
3	40	30.70	1800	1800
4				
5				

Moisture Content (%) (Mci)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.30
Box Constant	1.000
$MC = (((1 + Mci/100) \times (Wa/Wt + 1)) - 1) \times 100$	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1647	22.0	62	70	8.03	22.8



October 14, 2025

Mr. James Ward  
Verdantas  
16691 Millikan St.  
Irvine, CA 92606

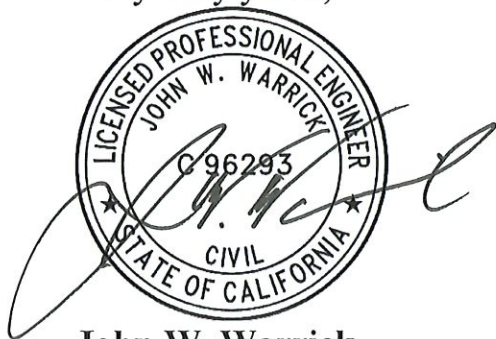
Project No. 51282

Dear Mr. Ward:  
Laboratory testing of the bulk soil sample delivered to our laboratory on 10/9/2025 has been completed.

Reference: 040.0000036026  
Project: Mission Village Fire Station 46  
Sample: FS Building @ 1.5'

A tabulation of test data is transmitted herewith for your use and information. Any untested portion of the sample will be retained for a period of 60 days prior to disposal. The opportunity to be of services is appreciated. Should you have any questions, kindly call.

Very truly yours,



**John W. Warrick**  
RCE 96293

JWW:tw  
Enclosures



# R - VALUE DATA SHEET

PROJECT No. 51282  
DATE: 10/14/2025

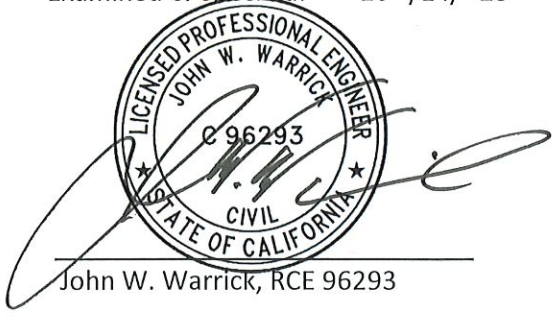
BORING NO. FS Building @ 1.5'  
Mission Village Fire Station 46  
P.N. 040.0000036026

SAMPLE DESCRIPTION: Brown Sandy Silt

R-VALUE TESTING DATA   CA TEST 301			
	SPECIMEN ID		
	a	b	c
Mold ID Number	10	11	12
Water added, grams	82	63	48
Initial Test Water, %	13.2	11.3	9.8
Compact Gage Pressure, psi	40	80	220
Exudation Pressure, psi	145	269	541
Height Sample, Inches	2.50	2.42	2.36
Gross Weight Mold, grams	3074	3055	3031
Tare Weight Mold, grams	1952	1947	1941
Sample Wet Weight, grams	1122	1108	1090
Expansion, Inches x 10exp-4	0	22	25
Stability 2,000 lbs (160psi)	57 / 133	37 / 86	26 / 52
Turns Displacement	4.28	4.23	3.77
R-Value Uncorrected	11	34	58
R-Value Corrected	11	32	54
Dry Density, pcf	120.1	124.6	127.5

## DESIGN CALCULATION DATA

Traffic Index	Given:	5.0	5.0	5.0
G.E. by Stability		1.14	0.87	0.59
G. E. by Expansion		0.00	0.73	0.83

Equilibrium R-Value		35 by EXUDATION	Examined & Checked: 10 /14/ 25
REMARKS:	Gf = 1.25 2.6% Retained on the 3/4" Sieve		 John W. Warrick, RCE 96293

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.



# R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 51282

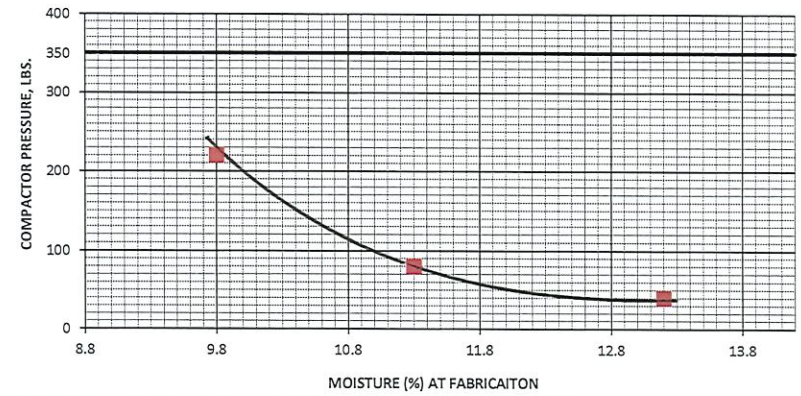
DATE: 10 /14/ 25

REMARKS: \_\_\_\_\_

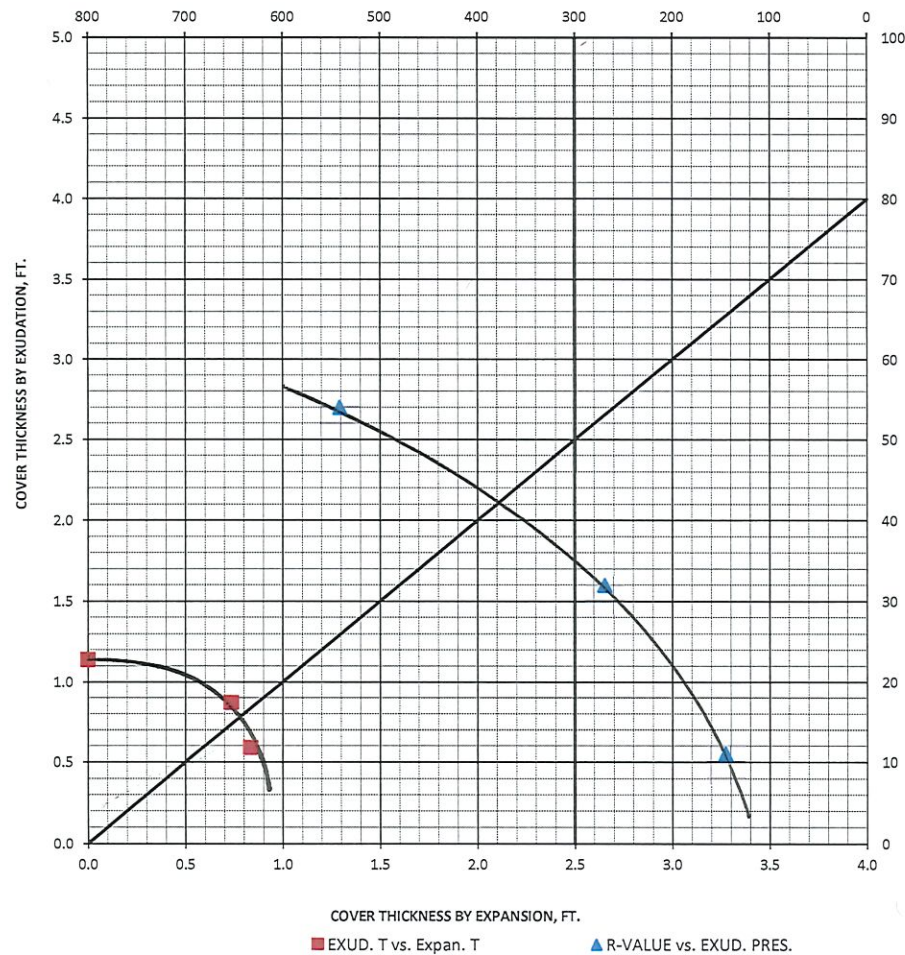
BORING NO. FS Building @ 1.5'  
Mission Village Fire Station 46  
P.N. 040.0000036026

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

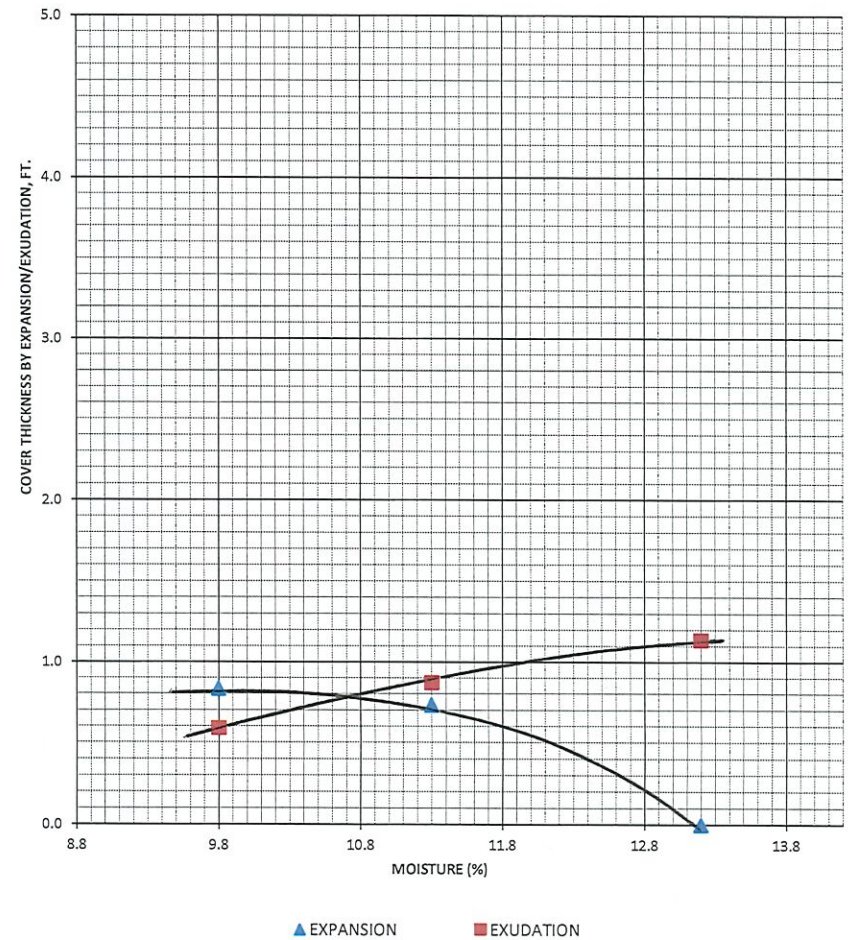
## COMPACTOR PRESSURE vs MOISTURE %



## COVER THICKNESS BY EXUDATION vs COVER THICKNESS BY EXPANSION



## COVER THICKNESS vs MOISTURE %



## Plate 1

Field Density Test Location Map

ADDENDUM #2 - APRIL 24, 2026



