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SOIL ENGINEERING INVESTIGATION REPORT

PROPOSED CLUB HOUSE AND NINETY-SIX MOBILE HOME PADS

APN: 0586-081-13
YUCCA TRAIL
YUCCA VALLEY, CA

PROJECT NO. ENG-25-047 **DATE: JULY 30, 2025**

PREPARED FOR:

Buildrite Construction, Inc.
Manuel Gomez

INTRODUCTION

This report presents the results of a soil engineering investigation performed on the property. The purpose of the investigation was to determine the soils parameters applicable to the design and construction of the proposed club house and ninety-six mobile home pads, to be located on a relatively flat site.

Based on the findings, the soil conditions at the subject site are suitable for the construction of the proposed improvements provided the recommendations included herein are incorporated into their design and construction.

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SCOPE

The scope of this investigation included the following items:

1. Inspected site conditions.
2. Performed exploratory work involving test borings to determine the depth and types of earth materials present and to obtain samples.
3. Laboratory testing of samples to determine their physical properties.
4. Reviewed an undated preliminary site plan provided by the owner.
5. Reviewed an undated topographic map provided by the owner.
6. Reviewed California Geological Survey, Official Map of Seismic Hazard Zones, “Yucca Valley South” Quadrangle, “Area Not Yet Evaluated”.
7. Reviewed California Geological Survey, “Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117".
8. Reviewed ICBO Maps of known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada.
9. Analyzed data, formulated conclusions and recommendations, and prepared the report.

PROPOSED IMPROVEMENTS

The preliminary site plan shows that the proposed improvements include a club house and ninety-six mobile home pads to be located on a relatively-flat site (Plate 1).

SITE CONDITIONS

The subject site is located north of 29 Palm Highway and east of Camino del Cielo Highway in the City of Yucca Valley.

The property is currently vacant, the surface is mostly bare with patches of wild grass and weeds. The site is an irregular shaped lot approximately 9.60 acres. Drainage is semi-controlled, sheet flow towards the south side of the site. The surrounding developments consist of mobile home lots and commercial buildings.

FIELD EXPLORATION

On May 29, 2025, six exploratory borings were dug with hand-held tools to a maximum depth of 8 feet. The earth materials were logged and classified using the visual and tactile field identification procedures of the Unified Soil Classification System. Undisturbed 2.5-inch diameter core samples were obtained for laboratory testing. The earth materials encountered are described in the Earth Materials Section and on the logs of borings included in the Appendix. The locations of the exploratory sites are shown on Plate 1.

EARTH MATERIALS

The earth materials encountered at the site consist of fill and native soils.

The fill soils are silty sands which are dry to slightly moist, firm, light brown. The maximum amount of fill soils was encountered in Test Boring No. 3, 4, and 5, and is about 3.5 feet.

The native soils are also silty sands and are slightly moist to moist, firm to very firm, light brown.

The earth materials encountered are described graphically on the logs of borings in the Appendix.

LABORATORY TESTS

Laboratory tests were performed on typical soil samples. Field moisture content, unit weight and shear strength characteristics were determined from these test results. The shear strength values determined are shown graphically in the Appendix.

Direct Shear

These tests were performed on representative samples of the native soils that were saturated at least 24 hours under a normal load prior to application of the shear load. Each sample was sheared at a constant rate of displacement of 0.05 inches per minute in accordance with the consolidated-drained shear test procedure.

Expansive Soils

The native soils are silty sands. Although no actual expansion index test was performed, the silty sands are considered to be low to non-expansive. However, footings into certified compacted fill should be provided with two, # 4 rebar at top and bottom and slabs-on-grade and concrete pavements supported or certified compacted fill or native soils should be reinforced with # 4 rebar spaced at 16 inches on center each way.

CONCLUSIONS AND RECOMMENDATIONS

The site is considered geotechnically suitable for the construction of the proposed Club house and ninety-six mobile home pads. Provided the recommendations herein are considered in the design and followed during construction.

Foundations

During our investigation, fill soil was encountered within the building area. Therefore, the proposed improvements should be supported on firm and competent certified compacted fill.

All soils within the building perimeter plus at least 5 feet to the sides should be entirely removed to a minimum depth of 3 feet below the bottom of the proposed footing or the total depth of the fill or loose material whichever is greater.

The bearing capacity for continuous footings with a minimum width and depth of 12 inches is 2,500 psf for certified compacted fill. The bearing value may be increased 20 percent for each additional foot of width or depth to a maximum of 3,000 psf. The bearing capacity allowed is for the total of dead and frequently applied live loads and may be increased by one- third for short duration wind and seismic loading.

Lateral Design

Resistance to lateral loads may be derived from the skin frictional forces acting at the base of footings and by passive pressure.

The skin friction coefficient for use with dead load forces is 0.30 for certified compacted fill. The unit passive pressure for the first foot of depth using both internal frictional and cohesive shear strength components is 300 psf, with an increase of 100 percent for each additional foot of depth to a maximum of 3,000 psf.

If the passive and skin frictional components are combined, the passive components should be reduced by a factor of one third.

Settlement

Settlement of the foundation is expected to occur immediately upon initial load application. Maximum settlement is expected to be less than ½-inch and differential settlement is expected to be less than ¼-inch provided all foundations are supported as recommended.

Slabs-On-Grade and Concrete Pavements

Floor slabs-on-grade and concrete pavements should be at least 4 inches of concrete reinforced with # 4 rebar spaced at 16 inches on center each way entirely supported on a 12-inch layer of certified compacted fill. Slabs on-grade and concrete pavements on native soil/certified compacted fill transition areas are not allowed.

All soils within the building pad areas plus at least 5 feet to the sides should be entirely removed to a minimum depth of total depth of the fill or loose material whichever is greater. (In this case it will vary between 2 feet and 3.5 feet below pad elevation.

Concrete slabs which are to be covered with flooring should be underlain by a plastic vapor barrier that should consist of a 10-mil gauge polyvinyl chloride plastic film or equivalent (A vapor barrier is not required for the garage slabs). Because the vapor barrier prevents moisture from draining from fresh concrete, a better concrete finish can usually be obtained if at least 2 inches of sand is spread over the vapor barrier prior to placing the concrete. This sand layer also protects the plastic sheet while the concrete is being placed.

The sub-grade materials should be thoroughly saturated and maintained saturated at least 24 hours prior to placing the vapor barrier.

Liquefaction Potential

The Official Map of, "California Geological Survey, Official Map of Seismic Hazard Zones" "Yucca Valley South" (Reference # 6), shows that the subject site has not been evaluated yet. Therefore, special recommendations to mitigate potential soil liquefaction are not necessary.

Seismic Coefficients

2022 California Building Code **Site Class "D"**			
Ss = 2.47	S1 = 0.78	Fa = 0.96	Fv = 2.34
SMs = 2.36	SM1 = 1.83	SDS = 1.58	SD1 = 1.22

**Sms/Ss=Fa, Sm_1/S_1=Fv

The southern California region can be subject to heavy shaking as a result of moderate to major earthquakes with a magnitude of 6 or greater. The use of the seismic coefficients included herein is intended to prevent loss of life and to minimize but not entirely eliminate structural damage.

Moreover, major foundation problems are not anticipated as a result of earthquake-induced liquefaction, fault ground rupture or displacement and settlement provided the proposed foundation system is constructed as recommended with the limitations mentioned herein above.

Drainage

The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than one unit vertical in 20 units horizontal (5-percent slope) for a minimum distance of 10 feet measured perpendicular to the face of the wall. If physical obstructions or lot lines prohibit 10 feet of horizontal distance, a 5-percent slope shall be provided to an approved alternative method of diverting water away from the foundation. Swales used for this purpose shall be sloped not less than 2 percent where located within 10 feet of the building foundation.

Grading

Grading operations shall be in conformance with the following specifications:

1. Excavation soils may be used as compacted fill provided that it is clean and free of debris.
2. Areas to be covered with compacted fill should be grubbed and stripped of all vegetation, debris and other deleterious materials.
3. Soils within the garage area should be removed to a minimum depth of at least 12 inches below slabs on-grade and pavements. Footings, slabs on-grade and pavements on cut/fill transition areas are not allowed.
4. The top 6 inches of the exposed surface(s) should be scarified, watered as needed to reach its near-optimum moisture content and thoroughly-compacted to a minimum relative compaction of 90 percent.
5. The soils to be used for compaction should be watered and mixed to obtain a uniform optimum moisture content, placed in layers not thicker than 8 inches and mechanically compacted to a minimum relative compaction of 90 percent. Crushed miscellaneous or aggregate base materials should be compacted to a minimum relative compaction of 95 percent. This should be confirmed by a relative compaction test performed by the Soils Engineer or his representative at intervals not to exceed 2 feet in thickness. This procedure of layering, compaction, and testing should be continued until final grade is reached.

6. The compaction characteristics of compacted fill should be based on a laboratory maximum compaction test performed in accordance with ASTM Method D1557. The field unit dry weight should be determined by the Sand Cone Method, ASTM Method D1556.
7. No jetting or flooding of fill or backfill soils is permitted.
8. Care shall be exercised during rough grading so that affected areas will drain properly without causing erosion offsite.
9. Inspection and testing of all compaction work shall be under the supervision of the Soil Engineer or his representative. Please allow at least 24 hours to schedule the required inspections or tests.
10. The Contractor shall have a responsible field superintendent on the project, in full charge of the work, with authority to make decisions. He shall cooperate fully with the Soil Engineer in carrying out the work.
11. Fill or backfill soils shall not be placed, spread or rolled during unfavorable weather. When the work is interrupted by rain, operations shall not be resumed until the Soil Engineer in collaboration with the Contractor determine that conditions will permit satisfactory results.

12. An abandoned sewage disposal system encountered during grading operations should be treated in the following manner. Liquids and compressible materials in a septic tank and seepage pit should be pumped out. Any structural portion within 5 feet of finish grade should be removed, and the cavity should be filled with suitable compacted soil, gravel or clean sand. A two-sack cement-sand slurry mix may be used in lieu of compacted materials except within 5 feet below any footing bottom. Septic tanks should be removed entirely and the cavity backfilled entirely with compacted soil, sand, or with gravel up to within 2 feet of the surface and capped with soil.

    No evidence of the existence of a sewage disposal system was noticed during the field investigation but such structures may have been used and abandoned.

Inspections and Approval

The bottom of the proposed fill areas and all footing excavations should be inspected and approved by this firm prior to the placement of compacted fill or placing forms. Approval by the City Inspector may also be required. Compacted materials should be tested to confirm that the required minimum relative compaction values of 90 percent have been achieved based on ASTM Test Method D1557. Please advise this office at least 24 hours prior to any required inspection or compaction testing.

Limitations

This report has been prepared for the exclusive use of Manuel Gomez. It is his responsibility to ensure that the information and recommendations contained herein are made available to the designers and contractors of this project. This report is subject to review and approval by the Building Official.

This report is based on the information obtained from exploratory borings and sampling locations using generally accepted soils engineering practices. However, conditions can be expected to vary between points of exploration. No warranty expressed or implied is made or intended in connection with this report or by any other oral or written statement. Any liability in connection herein shall not exceed the fees for the investigation.

The opportunity to be of professional service is sincerely appreciated. Please call if you have any questions concerning this report.

Respectfully submitted,
A.E. Engineering, Corp.

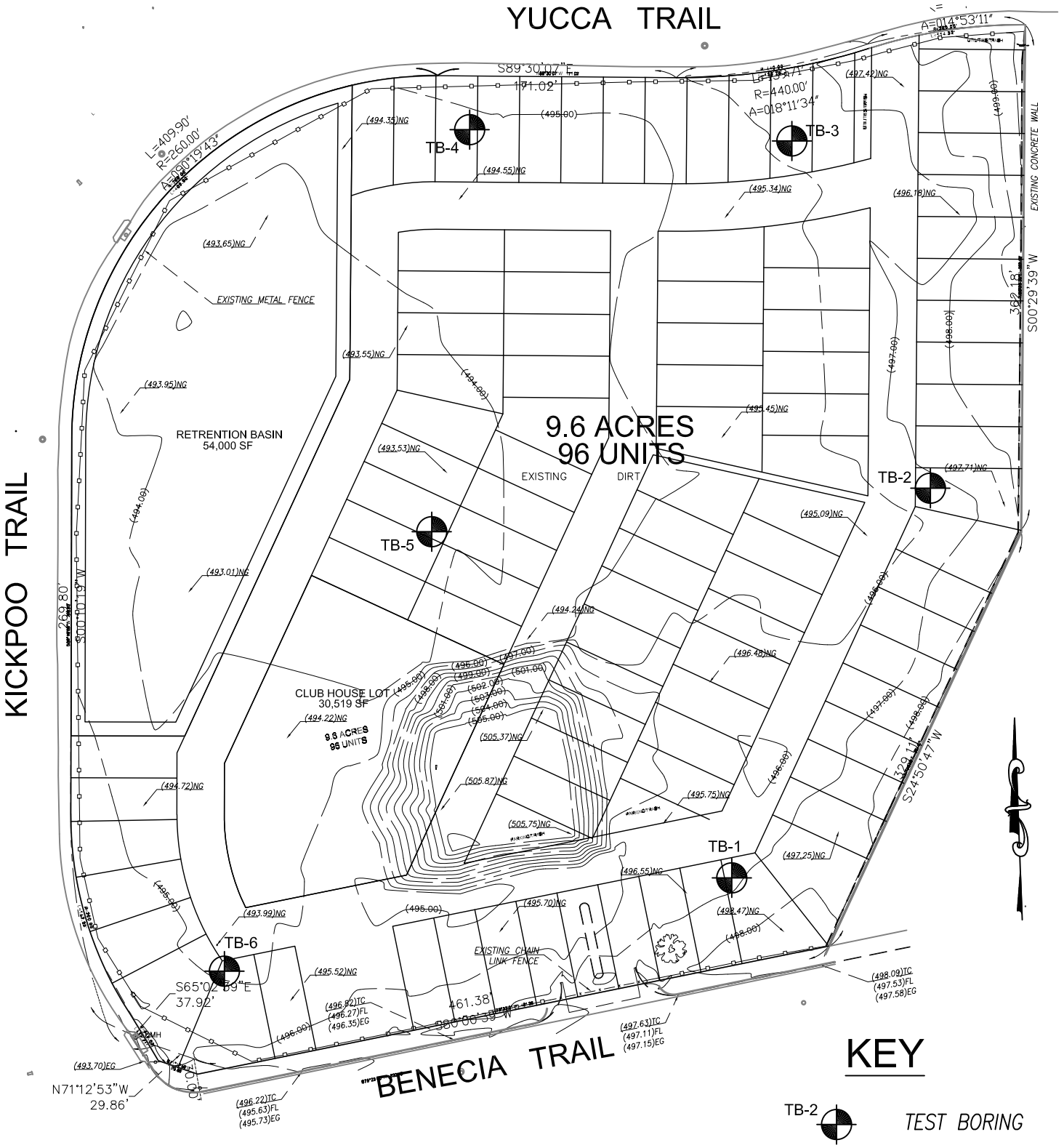
Ed Eckert
Chief Engineer
R.C.E. # 34587
Exp. 09-30-25

REGISTERED PROFESSIONAL ENGINEER
ED ECKERT
No. 34587
Exp. 9/30/25
CIVIL
STATE OF CALIFORNIA

Alejandro Encizo
Project Engineer

Attachments: Appendix with 9 Plates

APPENDIX



A.E. ENGINEERING, CORP. CIVIL SOILS SURVEY 17579 EL CAJON DRIVE HESPERIA, CA 92345 (562) 397-5229 aesoiltest@gmail.com	PLOT PLAN APN: 0586-081-13 YUCCA TRAIL YUCCA VALLEY, CA	BY: A. ENCIZO DATE: 7-29-25 SCALE: 1'=100' PLATE: 1

LOG OF BORING

PROJECT YUCCA TRAIL PROJECT No. ENG-25-047 BORING No. 1

LOCATION SEE PLOT PLAN LOGGED BY AE DATE 5-29-25

SAMPLE No.	SAMPLE DEPTH (FT.)	TUBE	DRY DENSITY (PCF)	FIELD MOISTURE (%)			DEPTH (FT.)	GRAPHIC LOG	CLASSIFICATION, MOISTURE, TIGHTNESS
							1		(0-2.5') SILTY SAND (FILL); DRY TO SLIGHTLY MOIST, FIRM, LIGHT BROWN.
							2		
							3		(2.5'-6') SILTY SAND (SC); SLIGHTLY MOIST TO MOIST, FIRM TO VERY FIRM, LIGHT BROWN.
							4		
							5		
							6		NO GROUNDWATER, NO CAVING STOPPED @ 6'
							7		
							8		
							9		
							10		

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PLATE 2

LOG OF BORING

PROJECT YUCCA TRAIL PROJECT No. ENG-25-047 BORING No. 2

LOCATION SEE PLOT PLAN LOGGED BY AE DATE 5-29-25

SAMPLE No.	SAMPLE DEPTH (FT.)	TUBE	DRY DENSITY (PCF)	FIELD MOISTURE (%)			DEPTH (FT.)	GRAPHIC LOG	CLASSIFICATION, MOISTURE, TIGHTNESS
							1		(0-2') SILTY SAND (FILL); DRY TO SLIGHTLY MOIST, FIRM, LIGHT BROWN.
							2		(2'-6') SILTY SAND (SC); SLIGHTLY MOIST TO MOIST, FIRM TO VERY FIRM, LIGHT BROWN.
1	4	*	104.7	9.3			3		
							4		
							5		
							6		NO GROUNDWATER, NO CAVING
							7		STOPPED @ 6'
							8		
							9		
							10		

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PLATE 3

LOG OF BORING

PROJECT YUCCA TRAIL PROJECT No. ENG-25-047 BORING No. 3

LOCATION SEE PLOT PLAN LOGGED BY AE DATE 5-29-25

SAMPLE No.	SAMPLE DEPTH (FT.)	TUBE	DRY DENSITY (PCF)	FIELD MOISTURE (%)			DEPTH (FT.)	GRAPHIC LOG	CLASSIFICATION, MOISTURE, TIGHTNESS
							1 2 3		(0-3.5') SILTY SAND (FILL); DRY TO SLIGHTLY MOIST, FIRM, LIGHT BROWN.
							4 5 6 7		(3.5'-8') SILTY SAND (SC); SLIGHTLY MOIST TO MOIST, FIRM TO VERY FIRM, LIGHT BROWN. NO GROUNDWATER, NO CAVING
							8 9 10		STOPPED @ 8'

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PLATE 4

LOG OF BORING

PROJECT YUCCA TRAIL PROJECT No. ENG-25-047 BORING No. 4

LOCATION SEE PLOT PLAN LOGGED BY AE DATE 5-29-25

SAMPLE No.	SAMPLE DEPTH (FT.)	TUBE	DRY DENSITY (PCF)	FIELD MOISTURE (%)			DEPTH (FT.)	GRAPHIC LOG	CLASSIFICATION, MOISTURE, TIGHTNESS
							1 2 3		(0-3.5') SILTY SAND (FILL); DRY TO SLIGHTLY MOIST, FIRM, LIGHT BROWN.
							4 5 6 7		(3.5'-6') SILTY SAND (SC); SLIGHTLY MOIST TO MOIST, FIRM TO VERY FIRM, LIGHT BROWN.
							8		NO GROUNDWATER, NO CAVING STOPPED @ 8'
							9 10		

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PLATE 5

LOG OF BORING

PROJECT YUCCA TRAIL PROJECT No. ENG-25-047 BORING No. 5

LOCATION SEE PLOT PLAN LOGGED BY AE DATE 5-29-25

SAMPLE No.	SAMPLE DEPTH (FT.)	TUBE	DRY DENSITY (PCF)	FIELD MOISTURE (%)			DEPTH (FT.)	GRAPHIC LOG	CLASSIFICATION, MOISTURE, TIGHTNESS
							1 2 3		(0-3.5') SILTY SAND (FILL); DRY TO SLIGHTLY MOIST, FIRM, LIGHT BROWN.
							4 5 6 7		(3.5'-6') SILTY SAND (SC); SLIGHTLY MOIST TO MOIST, FIRM TO VERY FIRM, LIGHT BROWN. NO GROUNDWATER, NO CAVING
							8 9 10		STOPPED @ 8'

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PLATE 6

LOG OF BORING

PROJECT YUCCA TRAIL PROJECT No. ENG-25-047 BORING No. 6

LOCATION SEE PLOT PLAN LOGGED BY AE DATE 5-29-25

SAMPLE No.	SAMPLE DEPTH (FT.)	TUBE	DRY DENSITY (PCF)	FIELD MOISTURE (%)			DEPTH (FT.)	GRAPHIC LOG	CLASSIFICATION, MOISTURE, TIGHTNESS
							1		(0-2.5') SILTY SAND (FILL); DRY TO SLIGHTLY MOIST, FIRM, LIGHT BROWN.
							2		
							3		(2.5'-6') SILTY SAND (SC); SLIGHTLY MOIST TO MOIST, FIRM TO VERY FIRM, LIGHT BROWN.
1	4	*	103.6	10.5			4		
							5		
							6		
							7		
							8		NO GROUNDWATER, NO CAVING STOPPED @ 8'
							9		
							10		

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PLATE 7

DIRECT SHEAR TEST

PROJECT NAME: YUCCA TRAIL JOB No.: ENG-25-047

SOIL CLASSIFICATION: SILTY SAND (SC) SAMPLE No.: 2-1 @ 4'

PLOTTED BY: AE DATE: 6-17-25 CHECKED BY: EE

Ws 24.1 % Wf 9.3 % γ_d 104.7 PCF C 120 PSF φ 28 °

UNDISTURBED * REMOLDED RESIDUAL

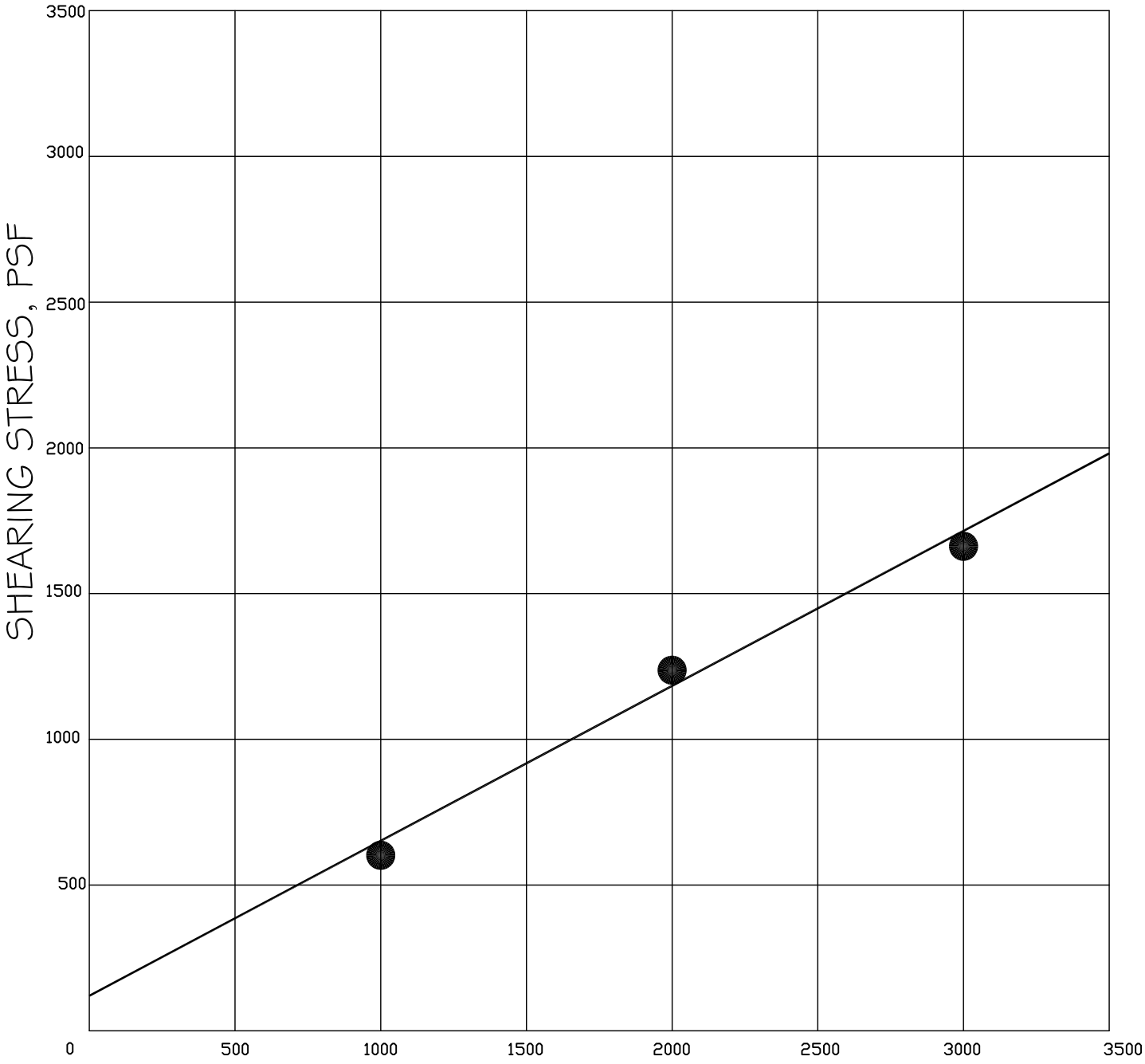

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PLATE 8

DIRECT SHEAR TEST

PROJECT NAME: YUCCA TRAIL JOB No.: ENG-25-047

SOIL CLASSIFICATION: SILTY SAND (SC) SAMPLE No.: 6-1 @ 4'

PLOTTED BY: AE DATE: 6-17-25 CHECKED BY: EE

Ws 23.9 % Wf 10.5 % γ_d 103.6 PCF C 120 PSF φ 28 °

UNDISTURBED * REMOLDED RESIDUAL

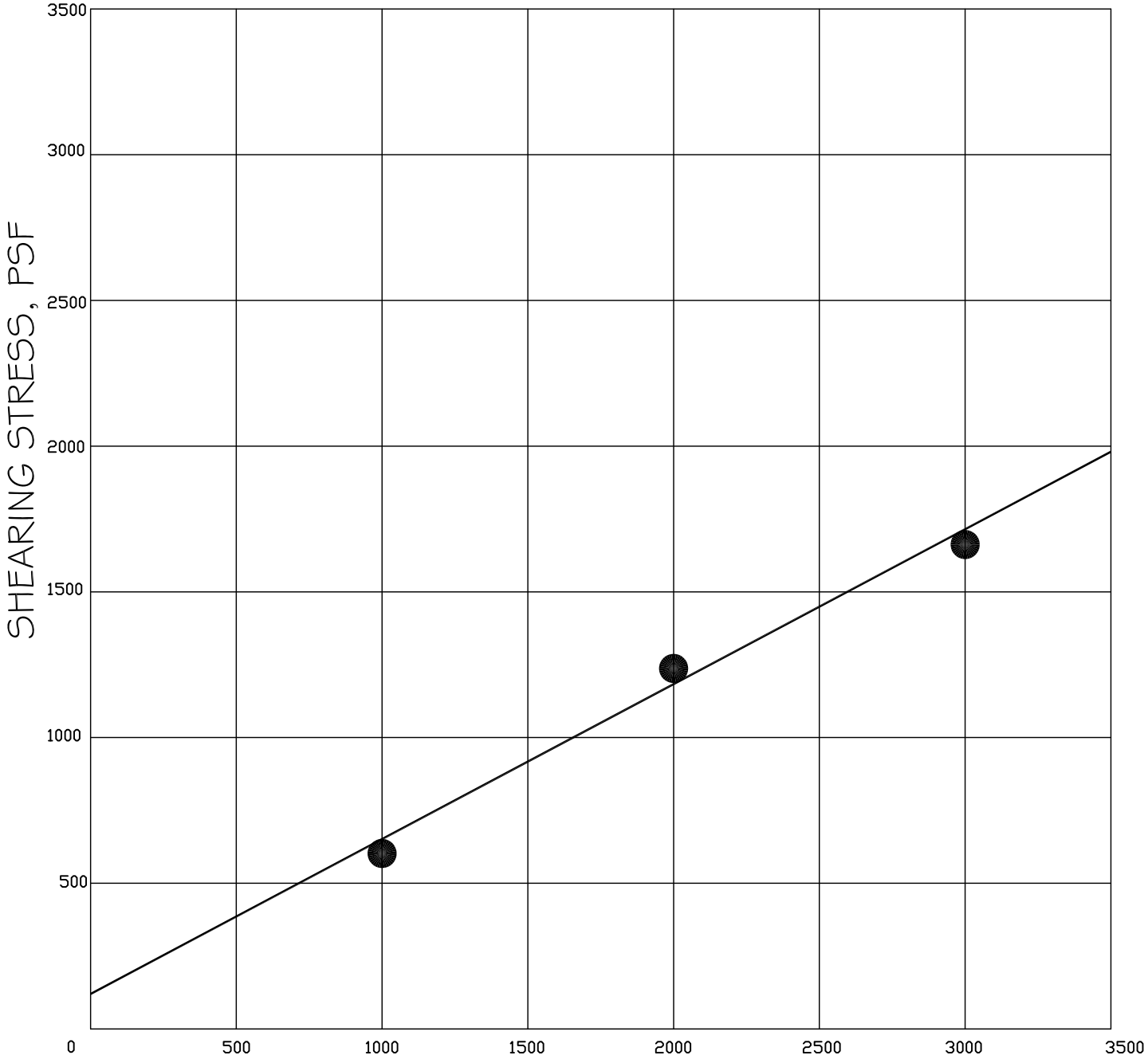

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PLATE 9