FINAL GEOTECHNICAL EXPLORATION REPORT
STACEY ROAD, HIGLEY ROAD TO 172ND STREET
ADOT PROJECT NO. T0423 03D
ADOT CONTRACT NO. 2022-006.12
GILBERT, ARIZONA

Prepared for:

POINT ENGINEERS

POINT Engineers
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Prepared by:

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Ethos Project No. 2024050
December 4, 2025

December 4, 2025
Ethos Project No. 2024050

Suzanne Deitering, P.E.
POINT Engineers
7600 North 16th Street, Suite 202
Phoenix, Arizona 85020

SUBJECT: Final Geotechnical Exploration Report
Stacey Road, Higley Road to 172nd Street
ADOT Project No. T0423 03D
ADOT Contract No. 2022-006.12
Gilbert, Arizona

Dear Suzanne:

Ethos Engineering, LLC (Ethos) is pleased to present the results of our geotechnical exploration performed for the Stacey Road; Higley Road to 172nd Street project. Our scope of services was performed in general accordance with our proposal dated October 27, 2023.

The results of our field investigation, laboratory testing, engineering analysis, and corresponding geotechnical engineering recommendations for support of the proposed improvements are presented herein. Additionally, the test results of the down-hole percolation testing are included with this report. Our Final Pavement Design Summary and Materials Design Report (2025) are presented under separate cover.

We appreciate the opportunity to be of service to Point Engineers on this project. If you have any questions regarding this report, please do not hesitate to contact us.

Sincerely,
Ethos Engineering, LLC

Sai Singhar, P.E.
Geotechnical Engineer

Reviewed By:

Kevin Porter, P.E.
Senior Geotechnical Engineer

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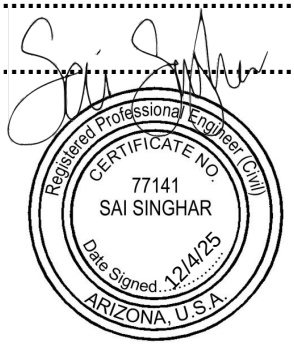

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1.0 PROJECT DESCRIPTION

The overall project includes design and construction of Stacey Road between Higley Road and 172nd Street in Gilbert, Arizona. The project is Arizona Department of Transportation (ADOT) administered Project Development On-call project for the Town of Gilbert (Town). Point Engineers is leading the design as the prime consultant, and Ethos Engineering, LLC (Ethos) is providing geotechnical engineering for the project as a subconsultant to POINT Engineers.

The project will pave the current unpaved roadway portion of Stacey Road in Gilbert, Arizona. The project will incorporate a new asphalt concrete (AC) paved roadway, curb and gutter, sidewalk, drainage improvements, lighting, and overhead utility relocation. In addition, a stormwater retention basin is also proposed at the northeast corner of Higley Road and Stacey Road.

2.0 FIELD EXPLORATION

2.1 Field Coordination and Permitting

Prior to our field exploration, Ethos prepared a Field Investigation Plan (FIP) to document the planned field exploration. Once we obtained Environmental Clearance, we coordinated with the Town to obtain right of entry to the gated parcel and right of way. Once obtained, Ethos marked the planned exploration locations and coordinated utility clearance of our work areas with Arizona 811.

2.2 Subsurface Exploration

The subsurface exploration for the project was performed including four (4) exploratory borings to depths ranging from 6.0 to 11.5 feet and one (1) down-hole percolation test at a depth of approximately 4 feet below existing grade.

Table 2.1 presents a summary of the drilling program. The boring locations are shown on the Site Plan Showing Test Locations included as Figure1.

Table 2.1: Boring Exploration Details

Location ID	Project Element	Latitude (°N)	Longitude (°E)	Depth (feet)
B-1	Pavement	33.20644	-111.72000	6
B-2	Pavement	33.20651	-111.71742	11.5
B-3	Pavement	33.20647	-111.71476	6
B-4	Pavement	33.20650	-111.71219	11.5

Drilling was performed by Integrity Drilling Service, LLC using a truck-mounted CME-55 drill rig utilizing hollow-stem auger drilling methods. Representative bulk samples of the near-surface soils were obtained from the drill cuttings at select intervals. Drive sampling was performed using standard penetration test (SPT) split spoon samplers or open-end drive samplers (2.42-inch-diameter brass rings) at maximum 2.5-foot intervals in each boring using a calibrated automatic hydraulic actuated 140-pound hammer, free falling 30 inches. The SPT and ring samplers were driven 18 and 12 inches, respectively, or to refusal (i.e. 50 blows for less than a 6-inch interval). Unless noted otherwise on the boring logs, the sample penetration resistance was recorded as

number of blows per six inches of penetration. The penetration results are presented on the borings logs adjacent to each sample.

The recovered soil samples were removed from the sampler, sealed to reduce moisture loss, and stored for subsequent review and laboratory testing. Upon completion, the borings were backfilled full depth with cuttings.

Encountered soils were visually inspected, labeled and classified in the field, and logged in general accordance with ASTM D2488, the Unified Soil Classification System (USCS), and Ethos guidelines. Field direction and logging of borings were performed by Ethos personnel. Logs of the borings are presented in Appendix A.

2.3 Percolation Testing

A percolation test was performed to evaluate the infiltration rate at the planned retention basin location. The test was performed following the EPA method as outlined in the Flood Control District of Maricopa County (FCDMC) Drainage Policies and Standards (FCDMC, 2018). Table 2.2 presents a summary of the percolation testing performed for the project. The test location is shown on the Site Plan Showing Test Locations included as Figure 1 attached to this report.

Table 2.2: Percolation Test Details

Test Location	Method	Latitude (°N)	Longitude (°E)	Approximate Depth [feet]
P-1	EPA	33.20667	-111.72008	4.0

3.0 LABORATORY TESTING

Selected laboratory tests were performed on representative samples recovered from the borings to support our field classifications and provide information regarding engineering characteristics and properties of the subsurface soils. The tests were assigned by Ethos and performed by Quality Testing, LLC (QT) subcontracted to Ethos.

A summary of the laboratory test results is presented in Table B-1 in Appendix B and listed in Table 3.1. Individual laboratory test worksheets are included in Appendix B following the summary table. The results of moisture content, in-place dry density, Atterberg Limits, and fines content (i.e., percent passing the #200 sieve) testing are also presented on the boring logs in Appendix A at the corresponding sample depth.

Table 3.1: Laboratory Testing Program

Item/Description	Number of Tests	Test Relevance
Grain Size Analysis (Total - Coarse and Fine) - ASTM C136 & C117	4	Soil classification
Atterberg Limits (Plasticity Index) - ASTM D4318	4	Soil classification
In-Place Dry Density - ASTM D2937	4	Determination of in-place density and moisture, used in compressibility and earthwork computations.
pH and Resistivity - AZ Method 236e	2	Corrosion Potential
Sulfates and Chlorides - AZ Method 733b	2	Degradation Potential

4.0 SITE CONDITIONS AND GEOTECHNICAL PROFILE

4.1 Site Conditions

The existing site is located east of the intersection of Higley Road and Stacey Road in the Town of Gilbert. The site is bounded by residential lots. Currently, the site is an unpaved roadway surfaced with asphalt millings. A study of Maricopa Historical Aerial Imagery showed that the site has been an open desert prior to the residential development surrounding the roadway. The site topography is flat.

4.2 Regional Geologic Setting

The project site is in the Basin and Range Geologic Province of the southwestern United States. The Basin and Range Province is characterized by a modern landscape consisting of broad alluvial valleys interspersed with and bounded by uplifted and fault-block mountain ranges, often with well-developed pediments and alluvial fans. Generally, the mountain ranges and valleys trend in a north-south to northwest-southeast direction. The modern landscape was formed by late Tertiary (Miocene-Pliocene) extensional tectonism and high-angle normal faulting, followed by subsequent erosion of the uplifted mountains and alluvial deposition of the sediments in the newly formed basins.

Published geologic mapping indicates that the surficial geologic unit along the project consists of Holocene aged surficial deposits (Richard et al. 2000) generally described as unconsolidated deposits associated with modern fluvial systems. This unit consists primarily of fine-grained, poorly graded sediment on alluvial plains.

4.3 Site Subsurface Conditions

The subsurface conditions along the project generally include medium to fine-grained, loose to medium dense silty sand (SM) soils and fine-grained silty clayey sand (SC-SM) soils to depths ranging from 6 to 11.5 feet. The fines contents range from 27 to 33 percent and are generally low in plasticity.

Refer to the boring logs in Appendix A and laboratory testing in Appendix B for additional details. The grain sizes of sand and gravel particles indicated on the logs are representative of the predominant grain sizes based on laboratory testing and visual inspection.

4.4 Groundwater Conditions

Groundwater was not encountered during the field investigation. Limited recent data is available from the Arizona Department of Water Resources (ADWR) database. The depth to regional groundwater was measured at approximately 338 feet (water surface elevation of approximately 1103 feet above mean sea level) in December 2024 at an ADWR index well site (Site ID: 33122411403701) located approximately 2.5 miles east of the site. Groundwater is not anticipated to impact construction of this project.

4.5 Percolation Rates

The percolation rate at the planned retention basin location was evaluated as described in Section 2.3. The results are summarized in Table 4.2.

The field measurements and results are provided in Appendix D and summarized below. These results should be viewed as approximate and are based on the site conditions at the test location and may differ at other locations. Appropriate reductions to the measured results should be considered by the drainage engineer to account for variable conditions, basin siltation, and other factors affecting loss of infiltration.

Table 4.1: Summary of Percolation Test Results

Test Location	Method	USCS Soil Type	Field Percolation Rate (inches/hour)	De-Rating Factor[1]	De-Rated Percolation Rate (inches/hour)
P-1	EPA	SC	33.0	0.5	16.5

Notes: EPA – Environmental Protection Agency

(1) Tests performed in a 12-inch diameter PVC-lined test hole. Sidewall correction factor not applied.

5.0 ENGINEERING ANALYSES AND RECOMMENDATIONS

The following sections of this report present our recommendations regarding the planned pavements and related geotechnical engineering considerations. These recommendations are based on our current understanding of the project, discussions with the project team, the results of field and laboratory testing, and engineering analyses.

5.1 Pavement Subgrade and Resilient Modulus

The near-surface subgrade soils at the site generally consist of low plasticity mixtures of medium to fine-grained silty sand (SM) soils and fine-grained silty clayey sand (SC-SM) soils. Based on our field investigation and laboratory results, the site soils have high correlated R-values and the site soils have good subgrade support for pavement. The results of subgrade testing are shown in Table 5.1.

Table 5.1- Results of Subgrade Testing

Boring ID & Depth (feet)	USCS	%Passing #200 Sieve	Plasticity Index	Correlated R-Value
B-1	SM	31.4	3	58
B-2	SM	26.8	3	61
B-3	SC-SM	32.5	6	50
B-4	SM	29.2	3	59
			Average	57.2
			Standard Deviation	4.8

A minimum R-value of 30 is recommended for design. Based on a design R-value of 30 and using a seasonal variation factor of 1.0 for Gilbert, a resilient modulus (M_R) of 17,875 psi was calculated according to ADOT Pavement Design Manual (2017) and utilized for design.

5.2 Slopes

5.2.1 Permanent Slopes

Non-stabilized embankment cut and fill slopes should be on the order of 3:1 (H:V) or flatter. Flatter slopes will promote re-vegetation and can accept landscaping. Slopes protected with slope paving or rock armored slopes should be no steeper than 2:1 (H:V).

5.2.2 Temporary Slopes

Temporary slopes should be excavated in accordance with OSHA (2020). In accordance with Subpart P, Appendix A, the near surface soils to an approximate depth of 20 feet are considered to be Type C soils. For excavations less than 20 feet in such soils, Subpart P, Appendix B indicates a maximum allowable unshored slope of 1.5H:1V for Type C soils. Flatter slopes may be required where either sandy soils are encountered or where the soils become excessively wet, and soft. Should steeper slopes be required due to the proximity of existing structures or other contractor needs, the stability of the slopes should be verified by a registered geotechnical engineer (State of Arizona) who is proficient in slope stability analyses.

The perimeter of all excavations should be protected against water runoff and infiltration near the edges to maintain stability. Heavy equipment and spoil piles should not be allowed within 10 feet of the edge of the excavation. The perimeter of all excavations should be protected against water runoff and infiltration near the edges to maintain stability.

5.3 Surface Drainage

Long-term performance of pavements and structures will require that the subgrade soils and backfill be protected against excessive water infiltration and/or saturation. Surface drainage should be established away from foundations and pavements to minimize moisture infiltration into the subgrade. Structural fill and backfill should be well compacted to reduce possible moisture infiltration through loose soil intervals.

5.4 Preliminary Soil Corrosion or Degradation Potential

5.4.1 Metal in Contact with Soil

The corrosion potential of near surface soils on corrugated metal pipes was characterized using laboratory pH and electrical resistivity testing, performed on two (2) samples in accordance with Arizona Test Method 236. The laboratory pH results ranged from 8.3 to 8.5 with an average of 8.4. The resistivity results ranged from 1,710 to 4,309 ohm-cm with an average of 3,010 ohm-cm. It is recommended that the type and/or coating of metal in direct contact with soil be selected in accordance with ADOT Pipe Selection Guidelines (ADOT, 1996). The test results are included in Appendix B and summarized in Table B-1.

Pipe locations where the pH is less than 6.0, greater than 9.0, and/or the resistivity is less than 2,000 ohm-cm require the use of special pipes and/or pipe coatings. Based on limited testing, it does appear that specialized pipe or pipe coatings may be required. The actual soils that will be placed as bedding and backfill around pipes should be further evaluated during construction.

5.4.2 Concrete in Contact with Soil

Two (2) samples from the current investigation was tested for soluble sulfates and chlorides (Arizona Test Method 733 and Arizona Test Method 736) to support design of concrete structures. The test results are included in Appendix B and summarized in Table B-1.

The total soluble sulfate result ranged from 92 to 116 parts per million (ppm) with an average of 104 ppm. The sulfate test measures the water-leachable or “available” sulfate content. These results were compared to Table 19.3.1.1, “Exposure Categories and Classes,” in Section 19.3.1, of the American Concrete Institute’s (ACI’s) *Building Code Requirements for Structural Concrete* (ACI 2019). All of the samples fall within Exposure Class S0 for water-soluble sulfate (SO_4^{2-}) in soil by percent mass (SO_4<0.1% or 1,000 ppm) and are categorized with a severity level of “not applicable” in terms of sulfate exposure. Based on ACI Table 19.3.2.1, “Requirements for Concrete by Exposure Class,” in Section 19.3.2 (ACI 2019), there is no restriction on Portland cement type for concrete structures in contact with these materials.

The total tested chloride level ranged from 16 to 100 parts per million (ppm) with an average of 58 ppm. Regarding chloride attack, Section 19.3.2 (ACI 2019) indicates that when concrete is exposed to external sources of chlorides, concrete should be proportioned to satisfy the requirements for the applicable exposure class in Table 19.3.1.1 (ACI 2019). A majority of the samples for within Exposure Class C1. Table 19.3.2.1 (ACI 2019) should be referred to for requirements for concrete by exposure class. For Exposure Class C1, the minimum compressive strength of concrete specified is 2,500 psi and the maximum water-soluble chloride ion content in concrete, by percent weight of cement, is 0.30% for non-prestressed concrete and 0.06% for prestressed concrete.

5.4.3 Further Evaluation

The corrosion results presented in this section are general in nature and may not be representative of site conditions. We recommend that the results of our laboratory testing be reviewed by a person or firm experienced in corrosion protection designs for the actual construction at the site, and/or by the appropriate pipe or material manufacturer. A qualified corrosion engineer should be consulted if corrosion of underground utilities is a concern or if a detailed evaluation is necessary.

Uniform Standard Specifications and Details for Public Works Construction Standard Specifications (MAG Standards), the TOG Town Supplement to the MAG Standards, and as modified herein. The recommendations presented in this report are contingent upon performing the earthwork recommended herein. The grading activities at the site should be performed under observation and testing directed by a Geotechnical Engineer.

5.5 Site Preparation

Completely remove all vegetation (including roots) and other organics, debris, any unstable (soft, loose, disturbed, water softened, etc.) soils, any uncontrolled fill, structural elements not intended to remain, and other deleterious materials from proposed pavement, embankment and structure areas prior to construction. This site grading should extend laterally a minimum of 2 feet beyond pavement, embankment and structure areas unless noted otherwise. All areas of excavation should be observed and approved by a representative of the geotechnical engineer after clearing and before any filling operations begin at the site.

5.6 Subgrade Preparation

The following sections outline subgrade preparation recommendations specific to the project. Subgrade preparation should be performed as outlined in Section 201 of the Standard Specifications (ADOT 2021). In proposed pavement areas, the subgrade shall be scarified and loosen to a depth of 6 inches and compacted to a minimum relative compaction of 95% percent of maximum dry density and within 2 percentage points of the optimum moisture content.

5.7 Earthwork Factors

Development of earthwork factors for near-surface materials is typically based on the evaluation and analysis of data from density tests on in-situ soil samples and laboratory moisture-density relationships. However, no proctor test was performed for the moisture-density relationship. In-situ dry density was determined on a total of 4 samples collected from within 10 feet of existing site grades. The results indicated the in-situ dry density ranged from 90.8 to 104.8 pcf, with an average of 100.3 pcf and standard deviation of 6.5. For estimating, we recommend a shrinkage value of 10 percent be utilized for the project.

5.8 Ground Compaction Factor

The ground compaction factor is an estimate of the ground height loss, including clearing and grubbing, that will result from compaction of the surface to 95% relative compaction. The impact of clearing and grubbing is a function of the existing ground cover. The existing ground cover is a desert landscape along the project and fill heights will be minimal. Based on these factors, the recommended ground compaction factor for the project is 0.1 feet.

6.0 CLOSURE

The geotechnical services were performed in a manner consistent with that level of care and skill ordinarily exercised by other members of the geotechnical profession practicing in the same locality, under similar conditions and at the date the services were provided. Our conclusions, opinions and recommendations are based on the completed test borings, visual observations and the review of plans prepared by others. It is possible that conditions could vary beyond the data

evaluated. Ethos makes no guarantee or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

This report may be used only by the Client and their representatives, and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on site and off site), or other factors may change over time, and additional work may be required with the passage of time. Any party other than the Client who wishes to use this report shall notify Ethos of such intended use. Based on the intended use of the report, Ethos may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release Ethos from any liability resulting from the use of this report by any unauthorized party.

7.0 REFERENCES

American Concrete Institute, 2019. *Building Code Requirements for Structural Concrete* (ACI 318-19) and Commentary. Reported by ACI Committee 318.

Arizona Department of Transportation (ADOT). 2017, Pavement Design Manual, Roadway Engineering Group, Pavement Design Section, September 29, 2017, Phoenix, AZ.

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Arizona Department of Water Resources (ADWR). 2025. Groundwater Site Inventory, *Accessed at*: https://gisweb.azwater.gov/waterresourcedata/GWSI.aspx in August 2025.

Flood Control District of Maricopa County (FCDMC), 2018. *Drainage Polices and Standards.* Section 6.10. Maricopa County. August 22, 2018.

Occupational Safety and Health Administration (OSHA). 2020. Code of Federal Regulations (CFR), Standard Number 1926 Safety and Health Regulations for Construction, Subpart P – Excavations, Appendices A & B. February 18.

Richard, S.M., Reynolds, S.J., Spencer, J.E., and Pearthree, P.A., 2000. *Geologic Map of Arizona: Arizona Geological Survey Map 35*, 1 sheet, scale 1:1,000,000.

FIGURES

Figure 1
Site Plan showing Test Locations
Stacey Road, Higley Road to 172nd Street
Gilbert, Arizona

APPENDIX A

Boring Logs

SOILS SAMPLING & BORING LOG INFORMATION

The material and in-situ moisture descriptions of soils presented on the boring logs are based on visual observation and classification in accordance with the Unified Soil Classification System (USCS), presented on the next page. The field logs were modified, where appropriate, based on laboratory testing of selected samples.

The relative density and firmness described on the test boring logs are generally based on standard penetration test (SPT) blows per foot (N) for mostly cohesionless and cohesive soils. 2-inch outside diameter (O.D.) SPT samplers are advanced up to 18 inches into undisturbed soils beyond the base of either a hollow stem auger or drill casing. The samplers are driven with a 140-pound hammer and a 30-inch drop. SPT values are recorded on the boring logs for each 6-inch increment of penetration with sampler refusal based on a penetration of less than 6 inches and a blowcount of 50.

Relative Density

Relative density for mostly cohesionless, uncemented sands and sand and gravel mixtures is described based on the following SPT blowcounts:

N	Relative Density
0-4	Very Loose
5-10	Loose
11-30	Medium Dense
31-50	Dense
>50	Very Dense

Relative Firmness

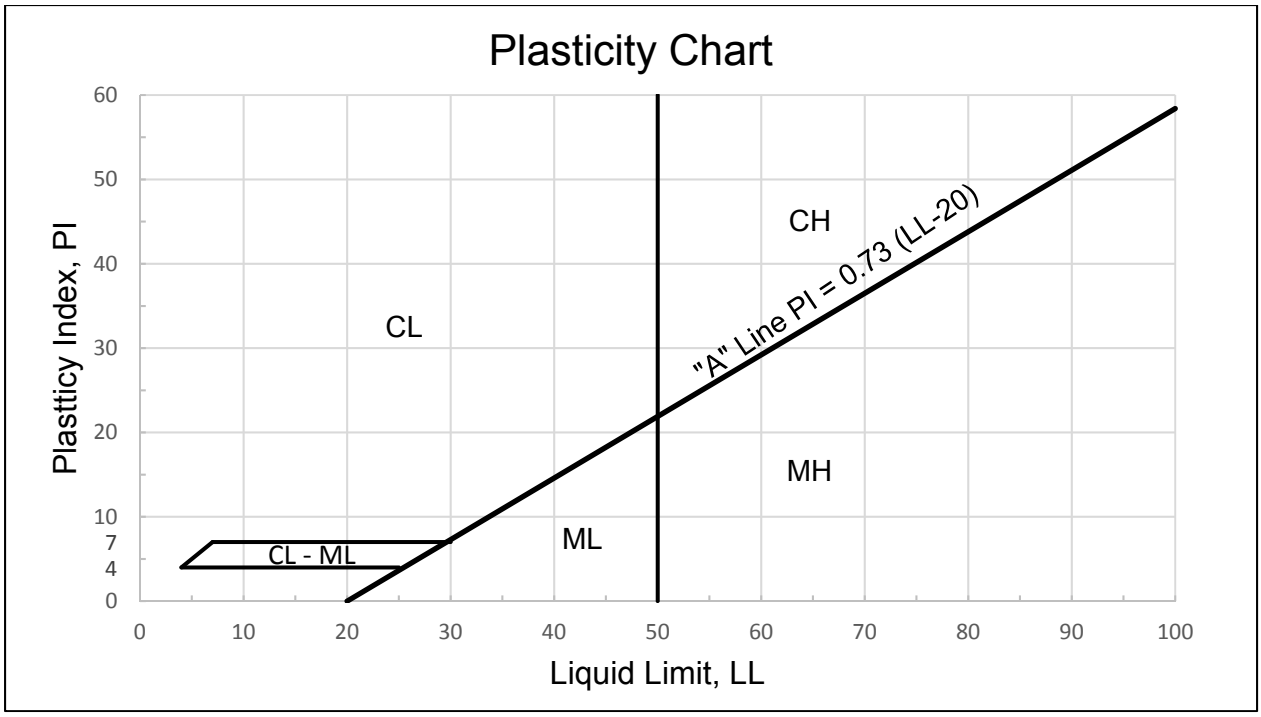
Relative Firmness for cohesive and/or cemented soils including silts, clays and silty to clayey sandy and gravelly soils is described based on the following SPT blowcounts:

N	Relative Firmness
0-4	Very Soft
5-8	Soft
9-15	Moderately Firm
16-30	Firm
31-49	Very Firm
50+	Hard

Undisturbed samples of firmer soils, typically present in the southwest, are obtained with 3-inch O.D. samplers lined with 2.42-inch inside diameter (I.D.) brass rings. The samplers are advanced up to 12 inches into undisturbed soils beyond the base of either a hollow stem auger or drill casing. The samplers are driven with a 140-pound hammer and a 30-inch drop. The N value blowcounts are recorded on the boring logs for each 6-inch increment of penetration with sampler refusal based on a penetration of less than 12 inches and a blowcount of 100.

Unified Soil Classification System
(ASTM D2487)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests				Group Symbol	Group Description
Coarse-Grained Soils (More than 50% Retained on No. 200 Sieve).	Gravels More than 50% of Coarse Fraction Retained on No. 4 Sieve	Clean Gravels Less than 5% Fines		GW	Well Graded Gravels, Gravel-Sand Mixtures or Sand-Gravel-Cobble Mixtures.
				GP	Poorly Graded Gravels, Gravel-Sand Mixtures or Sand-Gravel-Cobble Mixtures.
		Gravels with More than 12% Fines	Fines Classify as ML or MH	GM	Silty Gravels, Gravel-Sand-Silt Mixtures
			Fines Classify as CL or CH	GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sands 50% or More of Coarse Fraction Passes No. 4 Sieve	Clean Sands Less than 5% Fines		SW	Well Graded Sands, Gravelly Sands.
				SP	Poorly Graded Sands, Gravelly Sands.
		Sands with More than 12% Fines	Fines Classify as ML or MH	SM	Silty Sands, Sand-Silt Mixtures
			Fines Classify as CL or CH	SC	Clayey Sands, Sand-Clay Mixtures
Fine-Grained Soils (50% or More Passes No. 200 Sieve).	Silts and Clays (Liquid Limit less than 50)	PI > 7 and Plots on Above “A” Line		CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
		PI <4 or Plots Below “A” Line		ML	Inorganic Silts, Clayey Silts with Low Plasticity
	Silts and Clays (Liquid Limit 50 or More)	PI Plots on Above “A” Line		CH	Inorganic Clays of High Plasticity, Fat Clays, Silty and Sandy Clays of High Plasticity
		PI Plots Below “A” Line		MH	Inorganic Silts of High Plasticity, Silty Soils, Elastic Silts



Angularity	
Angular	
Subangular	
Subrounded	
Rounded	

Soil Particle Definitions	
Material	Particle Size Range
Boulders	Greater than 300 mm (12 in.)
Cobbles	300 mm to 75 mm (12 in. to 3
Coarse Gravel	75 mm to 19 mm (3 in. to ¾ in.)
Fine Gravel	19mm (3/4 in.) to No. 4 sieve
Coarse Sand	No. 4 Sieve to No. 10 Sieve
Medium Sand	No. 10 Sieve to No. 40 Sieve
Fine Sand	No. 40 Sieve to No. 200 Sieve
Fines (Silt or Clay)	Less than No. 200 Sieve

Plasticity	
PI = 0	Non-Plastic
1 ≤ PI ≤ 7	Low
8 ≤ PI ≤ 25	Medium
PI ≥ 25	High

Moisture
Slightly Moist
Moist
Wet
(Saturated)

ethos ENGINEERING, LLC.	**PROJECT NAME:** Stacey Road, Highley to 172nd St		**BORING ID:** B-1
	PROJECT LOCATION: Gilbert, AZ		AGENCY PROJECT NUMBER: ADOT PROJECT NO. T0423 03D
PROJECT NUMBER: 2024050	CLIENT NAME: POINT Engineers		DATE STARTED: 08/07/2025 / DATE COMPLETED: 08/07/2025
DRILLING METHOD(S): Hollow Stem Auger	TOOLING: 6-1/4" ID Hollow Stem Auger		HAMMER TYPE: Auto / HAMMER EFFICIENCY: 81%
SURFACE ELEVATION: 1368.00'	STATION: -	OFFSET AND OFFSET DIRECTION: -	
DRILLING FIRM: Integrity Drilling Services, LLC	DRILLER: J. Martinez	FIELD ENGINEER: R. Bohon	RIG TYPE: CME-45 / RIG NUMBER: 106
REPORTED DEPTH: 6'	GROUNDWATER DEPTH: N/A	REVIEWED BY: K. Porter	LATITUDE: 33.206441 / LONGITUDE: -111.719997

Elevation (feet)	Depth (feet)	Graphic Log	Soil Description and Remarks	Samples: Bulk	Samples: Driven	Samples: Blow Counts/6"	Laboratory Results: Moisture Content (%)	Laboratory Results: Dry Density (pcf)	Laboratory Results: Atterberg Limits (LL-PL-PI)	Laboratory Results: Fines (%)
1365	0		**SILTY SAND** (SM), occasional fine gravel, predominantly fine to medium sand, low plasticity, reddish brown, moist, loose to medium dense		X	7-2-2 (4)			22-19-3	31.4
	5				X	4-2-1 (3)				
			6.0			14-16	6.8	105		

End of Boring: Augered to 5 feet. Sampled to 6 feet. Backfilled with cuttings.

ethos ENGINEERING, LLC.	PROJECT NAME: Stacey Road, Highley to 172nd St		**BORING ID: B-2**
	PROJECT LOCATION: Gilbert, AZ		AGENCY PROJECT NUMBER: ADOT PROJECT NO. T0423 03D
PROJECT NUMBER: 2024050	CLIENT NAME: POINT Engineers		DATE STARTED: 08/07/2025 / DATE COMPLETED: 08/07/2025
DRILLING METHOD(S): Hollow Stem Auger	TOOLING: 6-1/4" ID Hollow Stem Auger		HAMMER TYPE: Auto / HAMMER EFFICIENCY: 81%
SURFACE ELEVATION: 1376.00'	STATION: -	OFFSET AND OFFSET DIRECTION: -	
DRILLING FIRM: Integrity Drilling Services, LLC	DRILLER: J. Martinez	FIELD ENGINEER: R. Bohon	RIG TYPE: CME-45 / RIG NUMBER: 106
REPORTED DEPTH: 11.5'	GROUNDWATER DEPTH: N/A	REVIEWED BY: K. Porter	LATITUDE: 33.206513 / LONGITUDE: -111.717420

Elevation (feet)	Depth (feet)	Graphic Log	Soil Description and Remarks	Samples: Bulk	Samples: Driven	Samples: Blow Counts/6"	Laboratory Results: Moisture Content (%)	Laboratory Results: Dry Density (pcf)	Laboratory Results: Atterberg Limits (LL-PL-PI)	Laboratory Results: Fines (%)
1375			**ASPHALT MILLINGS** 0.2			13-7-7 (14)				
			SILTY SAND (SM), occasional fine gravel, predominantly fine to medium sand, low plasticity, light reddish brown, slightly moist, medium dense			6-13	2.9	104	22-19-3	26.8
1370	5					10-7-6 (13)				
1365	10		11.5			5-7-3 (10)				

End of Boring: Augered to 10 feet. Sampled to 11.5 feet. Backfilled with cuttings.

ethos ENGINEERING, LLC.	PROJECT NAME: Stacey Road, Highley to 172nd St		**BORING ID: B-3**
	PROJECT LOCATION: Gilbert, AZ		AGENCY PROJECT NUMBER: ADOT PROJECT NO. T0423 03D
PROJECT NUMBER: 2024050	CLIENT NAME: POINT Engineers		DATE STARTED: 08/07/2025 / DATE COMPLETED: 08/07/2025
DRILLING METHOD(S): Hollow Stem Auger	TOOLING: 6-1/4" ID Hollow Stem Auger		HAMMER TYPE: Auto / HAMMER EFFICIENCY: 81%
SURFACE ELEVATION: 1383.00'	STATION: -	OFFSET AND OFFSET DIRECTION: -	
DRILLING FIRM: Integrity Drilling Services, LLC	DRILLER: J. Martinez	FIELD ENGINEER: R. Bohon	RIG TYPE: CME-45 / RIG NUMBER: 106
REPORTED DEPTH: 6.0'	GROUNDWATER DEPTH: N/A	REVIEWED BY: K. Porter	LATITUDE: 33.206469 / LONGITUDE: -111.714757

Elevation (feet)	Depth (feet)	Graphic Log	Soil Description and Remarks	Samples: Bulk	Samples: Driven	Samples: Blow Counts/6"	Laboratory Results: Moisture Content (%)	Laboratory Results: Dry Density (pcf)	Laboratory Results: Atterberg Limits (LL-PL-PI)	Laboratory Results: Fines (%)
			ASPHALT MILLINGS 0.2							
1380			**SILTY, CLAYEY SAND** (SC-SM), occasional fine gravel, predominantly fine to medium sand, low plasticity, light reddish brown, moist, loose to medium dense			5-2-3 (5)				
						6-2-2 (4)			28-22-6	32.5
	5		6.0			7-9	8.1	91		

End of Boring: Augered to 5 feet. Sampled to 6 feet. Backfilled with cuttings.

ethos ENGINEERING, LLC.	PROJECT NAME: Stacey Road, Highley to 172nd St		**BORING ID: B-4**
	PROJECT LOCATION: Gilbert, AZ		AGENCY PROJECT NUMBER: ADOT PROJECT NO. T0423 03D
PROJECT NUMBER: 2024050	CLIENT NAME: POINT Engineers		DATE STARTED: 08/07/2025 / DATE COMPLETED: 08/07/2025
DRILLING METHOD(S): Hollow Stem Auger	TOOLING: 6-1/4" ID Hollow Stem Auger		HAMMER TYPE: Auto / HAMMER EFFICIENCY: 81%
SURFACE ELEVATION: 1391.00'	STATION: -	OFFSET AND OFFSET DIRECTION: -	
DRILLING FIRM: Integrity Drilling Services, LLC	DRILLER: J. Martinez	FIELD ENGINEER: R. Bohon	RIG TYPE: CME-45 / RIG NUMBER: 106
REPORTED DEPTH: 11.5'	GROUNDWATER DEPTH: N/A	REVIEWED BY: K. Porter	LATITUDE: 33.206495 / LONGITUDE: -111.712190

Elevation (feet)	Depth (feet)	Graphic Log	Soil Description and Remarks	Samples: Bulk	Samples: Driven	Samples: Blow Counts/6"	Laboratory Results: Moisture Content (%)	Laboratory Results: Dry Density (pcf)	Laboratory Results: Atterberg Limits (LL-PL-PI)	Laboratory Results: Fines (%)
1390	0		**ASPHALT MILLINGS** 0.2			6-4-8 (12)				
			SILTY SAND (SM), occasional fine gravel, predominantly fine to medium sand, low plasticity, light reddish brown, slightly moist, medium dense			6-9	3.2	101	25-22-3	29.2
1385	5		Note: Very dense, cobble at 5 feet.			36-50/6"				
1380	10		11.5			9-12-10 (22)				

End of Boring: Augered to 10 feet. Sampled to 11.5 feet. Backfilled with cuttings.

ethos ENGINEERING, LLC.

PROJECT NAME: Stacey Road, Highley to 172nd St			**BORING ID: P-1**
PROJECT LOCATION: Gilbert, AZ			AGENCY PROJECT NUMBER: ADOT PROJECT NO. T0423 03D
PROJECT NUMBER: 2024050	CLIENT NAME: POINT Engineers		DATE STARTED: 08/07/2025 / DATE COMPLETED: 08/07/2025
DRILLING METHOD(S): Hollow Stem Auger	TOOLING: 6-1/4" ID Hollow Stem Auger		HAMMER TYPE: Auto / HAMMER EFFICIENCY: 81%
SURFACE ELEVATION: 1367.00'	STATION: -	OFFSET AND OFFSET DIRECTION: -	
DRILLING FIRM: Integrity Drilling Services, LLC	DRILLER: J. Martinez	FIELD ENGINEER: R. Bohon	RIG TYPE: CME-45 / RIG NUMBER: 106
REPORTED DEPTH: 4.0'	GROUNDWATER DEPTH: N/A	REVIEWED BY: K. Porter	LATITUDE: 33.206678 / LONGITUDE: -111.720080

Elevation (feet)	Depth (feet)	Graphic Log	Soil Description and Remarks	Samples: Bulk	Samples: Driven	Samples: Blow Counts/6"	Laboratory Results: Moisture Content (%)	Laboratory Results: Dry Density (pcf)	Laboratory Results: Atterberg Limits (LL-PL-PI)	Laboratory Results: Fines (%)
1365			**CLAYEY SAND** (SC), occasional fine gravel, fine to coarse sand, low plasticity, light reddish brown, slightly moist to moist							
			4.0							

End of Boring: Augered to 4 feet. Performed percolation test. Backfilled with cuttings.

APPENDIX B

Laboratory Test Results

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth [feet]		USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content [%] (ASTM D2216/T265)	In-Place Dry Density [pcf] (ASTM D2937)	pH (AZ 236)	Resistivity [ohm-cm] (AZ 236)	Sulfates [ppm] (AZ 733)	Chlorides [ppm] (AZ 736)
	Begin	End										
B-1	0.0	5.0	SM	31.4	22	3						
	5.0	6.0					6.8	104.8				
B-2	0.0	5.0	SM	26.8	22	3			8.5	4,309	116	16
	2.5	2.8					2.9	104.3				
B-3	0.0	5.0	SC-SM	32.5	28	6						
	5.0	6.0					8.1	90.8				
B-4	0.0	5.0	SM	29.2	25	3			8.3	1,710	92	100
	2.5	2.8					3.2	101.4				
Average				**30.0**	**24.3**	**3.8**	**5.3**	**100.3**	**8.4**	**3010**	**104.0**	**58.0**
Standard Deviation				**2.5**	**2.9**	**1.5**	**2.6**	**6.5**	**0.1**	**1838**	**17.0**	**59.4**
Maximum				**32.5**	**28.0**	**6.0**	**8.1**	**104.8**	**8.5**	**4309**	**116.0**	**100.0**
Minimum				**26.8**	**22.0**	**3.0**	**2.9**	**90.8**	**8.3**	**1710**	**92.0**	**16.0**
Count				**4**	**4**	**4**	**4**	**4**	**2**	**2**	**2**	**2**

Notes: pcf = pounds per cubic foot; ohm-cm = ohm-centimeters; ppm = parts per million

Ethos Engineering, LLC
9180 S Kyrene Road, Suite # 104
Tempe, AZ 85284
Attention: Sai Singhar
Phone: (480) 687-7063

8/20/2025

Subject: **Geotechnical Services**
Stacey Rd-Higley Rd to 172nd St Lab Testing
Client Project No. 2024050
QT Project No. 25094.00

Report No. 1 - For Period 8/1/2025 thru 8/20/2025

This report includes test data for geotechnical samples delivered to our laboratory for the above referenced project.

If there are any questions, please do not hesitate to call me at (480) 496-2000.

Sincerely,

Shekhar R. Shah
Quality Testing, LLC
Project Supervisor

Email: ssinghar@ethosengineers.com

Email: rbohon@ethosengineers.com

SOIL & AGGREGATE SAMPLE SUMMARY

Sample Id **S-013229**

Project No.	Project Name					Project Number(s)	
25094.00	Stacey Rd-Higley Rd to 172nd St Lab Testing						
Sampled By	**Sample Date**	**Logged By**	**Date Logged**	**Released By**	**Release Date**	**Approved By†**	**Date Approved**
Client	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/20/2025
Material Source	**Material Type**	**Sampled From**		**Reference Line**		**Station**	**Offset**
Native	0	B-1 (0.0'-5.0')					
Remarks							

Sample Intended Uses

Material Code	Material Description	Project Activity	Activity Description
BULK	Bulk Sample		

Specifications

Material Code	Spec Section	Test Property	Lower Limit	Upper Limit

SPECIFICATION STATUS

Sample In Compliance With Referenced Specifications

TEST RESULTS

Sieve Analysis of Soils and Aggregates

ASTM C136

Percent Passing Sieve Size																	
3" (75)	2 ½" (63)	2" (50)	1 ½" (38)	1" (25)	¾" (19.0)	½" (12.5)	⅜" (9.5)	¼" (6.3)	#4 (4.75)	#8 (2.36)	#10 (2.00)	#16 (1.180)	#30 (0.600)	#40 (0.425)	#50 (0.300)	#100 (0.150)	#200 (0.075)
100	100	100	100	100	100	98	97	94	92	84	82	73	62	57	53	43	31.4

Tested By: Jessica Pena-Melroy 8/8/2025

Atterberg Limits

ASTM D4318

Liquid Limit	Plastic Limit	Plasticity Index
22	19	3

Tested By: Charly Guefack 8/13/2025

USCS Classification (ASTM D2487): SM : Silty Sand

AASHTO Classification (AASHTO M145): A-2-4 (0)

† Denotes name of P.E. or his designee who accepts responsibility for the contents of this report, technical or otherwise.

SOIL & AGGREGATE SAMPLE SUMMARY

Sample Id **S-013230**

Project No.	Project Name	Project Number(s)
25094.00	Stacey Rd-Higley Rd to 172nd St Lab Testing	

Sampled By	Sample Date	Logged By	Date Logged	Released By	Release Date	Approved By†	Date Approved
Client	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/20/2025

Material Source	Material Type	Sampled From	Reference Line	Station	Offset
Native	0	B-1 (5.0'-6.0')			

Remarks

Sample Intended Uses

Material Code	Material Description	Project Activity	Activity Description
RING	Ring Sample		

Specifications

Material Code	Spec Section	Test Property	Lower Limit	Upper Limit

SPECIFICATION STATUS

Sample In Compliance With Referenced Specifications

TEST RESULTS

USCS Classification (ASTM D2487):

AASHTO Classification (AASHTO M145): A-1-a (2)

In-Situ Unit Weight / Moisture Content

ASTM D7263

Dry Unit Weight pcf	Percent Moisture
104.80	6.8%

Tested By: Charles Patti 8/8/2025

† Denotes name of P.E. or his designee who accepts responsibility for the contents of this report, technical or otherwise.

SOIL & AGGREGATE SAMPLE SUMMARY

Sample Id **S-013231**

Project No.	Project Name					Project Number(s)	
25094.00	Stacey Rd-Higley Rd to 172nd St Lab Testing						
Sampled By	**Sample Date**	**Logged By**	**Date Logged**	**Released By**	**Release Date**	**Approved By†**	**Date Approved**
Client	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/20/2025
Material Source	**Material Type**	**Sampled From**		**Reference Line**		**Station**	**Offset**
Native	0	B-2 (0.0'-5.0')					
Remarks							

Sample Intended Uses

Material Code	Material Description	Project Activity	Activity Description
BULK	Bulk Sample		

Specifications

Material Code	Spec Section	Test Property	Lower Limit	Upper Limit

SPECIFICATION STATUS

Sample In Compliance With Referenced Specifications

TEST RESULTS

Sieve Analysis of Soils and Aggregates

ASTM C136

Percent Passing Sieve Size																	
3" (75)	2 ½" (63)	2" (50)	1 ½" (38)	1" (25)	¾" (19.0)	½" (12.5)	⅜" (9.5)	¼" (6.3)	#4 (4.75)	#8 (2.36)	#10 (2.00)	#16 (1.180)	#30 (0.600)	#40 (0.425)	#50 (0.300)	#100 (0.150)	#200 (0.075)
100	100	100	100	100	100	99	99	97	95	88	84	74	60	55	49	38	26.8

Tested By: Jessica Pena-Melroy 8/8/2025

Atterberg Limits

ASTM D4318

Liquid Limit	Plastic Limit	Plasticity Index
22	19	3

Tested By: Charly Guefack 8/13/2025

USCS Classification (ASTM D2487): SM : Silty Sand

AASHTO Classification (AASHTO M145): A-2-4 (0)

pH & Resistivity

ARIZ 236c-PHR

pH	Min Resisitivity ohm-cm
8.5	4309

Tested By: Marco Solano 8/13/2025

† Denotes name of P.E. or his designee who accepts responsibility for the contents of this report, technical or otherwise.

Sample Id **S-013231**

Chlorides

ARIZ 736b

Chlorides (ppm)
16

Tested By: Marco Solano 8/25/2025

Sulfates

ARIZ 733b

Sulfates (ppm)
116

Tested By: Marco Solano 8/25/2025

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SOIL & AGGREGATE SAMPLE SUMMARY

Sample Id **S-013232**

Project No.	Project Name	Project Number(s)
25094.00	Stacey Rd-Higley Rd to 172nd St Lab Testing	

Sampled By	Sample Date	Logged By	Date Logged	Released By	Release Date	Approved By†	Date Approved
Client	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/20/2025

Material Source	Material Type	Sampled From	Reference Line	Station	Offset
Native	0	B-2 (2.5'-2.8')			

Remarks

Sample Intended Uses

Material Code	Material Description	Project Activity	Activity Description
RING	Ring Sample		

Specifications

Material Code	Spec Section	Test Property	Lower Limit	Upper Limit

SPECIFICATION STATUS

Sample In Compliance With Referenced Specifications

TEST RESULTS

USCS Classification (ASTM D2487):

AASHTO Classification (AASHTO M145): A-1-a (2)

In-Situ Unit Weight / Moisture Content

ASTM D7263

Dry Unit Weight pcf	Percent Moisture
104.30	2.9%

Tested By: Charles Patti 8/8/2025

† Denotes name of P.E. or his designee who accepts responsibility for the contents of this report, technical or otherwise.

SOIL & AGGREGATE SAMPLE SUMMARY

Sample Id **S-013233**

Project No.	Project Name					Project Number(s)	
25094.00	Stacey Rd-Higley Rd to 172nd St Lab Testing						
Sampled By	**Sample Date**	**Logged By**	**Date Logged**	**Released By**	**Release Date**	**Approved By†**	**Date Approved**
Client	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/20/2025
Material Source	**Material Type**	**Sampled From**		**Reference Line**		**Station**	**Offset**
Native	0	B-3 (0.0'-5.0')					
Remarks							

Sample Intended Uses

Material Code	Material Description	Project Activity	Activity Description
BULK	Bulk Sample		

Specifications

Material Code	Spec Section	Test Property	Lower Limit	Upper Limit

SPECIFICATION STATUS

Sample In Compliance With Referenced Specifications

TEST RESULTS

Sieve Analysis of Soils and Aggregates

ASTM C136

Percent Passing Sieve Size																	
3" (75)	2 ½" (63)	2" (50)	1 ½" (38)	1" (25)	¾" (19.0)	½" (12.5)	⅜" (9.5)	¼" (6.3)	#4 (4.75)	#8 (2.36)	#10 (2.00)	#16 (1.180)	#30 (0.600)	#40 (0.425)	#50 (0.300)	#100 (0.150)	#200 (0.075)
100	100	100	100	100	99	99	98	97	95	87	84	73	60	55	50	42	32.5

Tested By: Jessica Pena-Melroy 8/8/2025

Atterberg Limits

ASTM D4318

Liquid Limit	Plastic Limit	Plasticity Index
28	22	6

Tested By: Connor LaPose 8/12/2025

USCS Classification (ASTM D2487): SC-SM : Silty clayey Sand

AASHTO Classification (AASHTO M145): A-2-4 (0)

† Denotes name of P.E. or his designee who accepts responsibility for the contents of this report, technical or otherwise.

SOIL & AGGREGATE SAMPLE SUMMARY

Sample Id **S-013234**

Project No.	Project Name	Project Number(s)
25094.00	Stacey Rd-Higley Rd to 172nd St Lab Testing	

Sampled By	Sample Date	Logged By	Date Logged	Released By	Release Date	Approved By†	Date Approved
Client	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/20/2025

Material Source	Material Type	Sampled From	Reference Line	Station	Offset
Native	0	B-3 (5.0'-6.0')			

Remarks

Sample Intended Uses

Material Code	Material Description	Project Activity	Activity Description
RING	Ring Sample		

Specifications

Material Code	Spec Section	Test Property	Lower Limit	Upper Limit

SPECIFICATION STATUS

Sample In Compliance With Referenced Specifications

TEST RESULTS

USCS Classification (ASTM D2487):

AASHTO Classification (AASHTO M145): A-1-a (2)

In-Situ Unit Weight / Moisture Content

ASTM D7263

Dry Unit Weight pcf	Percent Moisture
90.75	8.1%

Tested By: Charles Patti 8/8/2025

† Denotes name of P.E. or his designee who accepts responsibility for the contents of this report, technical or otherwise.

SOIL & AGGREGATE SAMPLE SUMMARY

Sample Id **S-013235**

Project No.	Project Name					Project Number(s)	
25094.00	Stacey Rd-Higley Rd to 172nd St Lab Testing						
Sampled By	**Sample Date**	**Logged By**	**Date Logged**	**Released By**	**Release Date**	**Approved By†**	**Date Approved**
Client	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/20/2025
Material Source	**Material Type**	**Sampled From**		**Reference Line**		**Station**	**Offset**
Native	0	B-4 (0.0'-5.0')					
Remarks							

Sample Intended Uses

Material Code	Material Description	Project Activity	Activity Description
BULK	Bulk Sample		

Specifications

Material Code	Spec Section	Test Property	Lower Limit	Upper Limit

SPECIFICATION STATUS

Sample In Compliance With Referenced Specifications

TEST RESULTS

Sieve Analysis of Soils and Aggregates

ASTM C136

Percent Passing Sieve Size																	
3" (75)	2 ½" (63)	2" (50)	1 ½" (38)	1" (25)	¾" (19.0)	½" (12.5)	⅜" (9.5)	¼" (6.3)	#4 (4.75)	#8 (2.36)	#10 (2.00)	#16 (1.180)	#30 (0.600)	#40 (0.425)	#50 (0.300)	#100 (0.150)	#200 (0.075)
100	100	100	100	100	100	99	98	96	94	86	83	71	57	52	48	38	29.2

Tested By: Jessica Pena-Melroy 8/8/2025

Atterberg Limits

ASTM D4318

Liquid Limit	Plastic Limit	Plasticity Index
25	22	3

Tested By: Connor LaPose 8/14/2025

USCS Classification (ASTM D2487): SM : Silty Sand

AASHTO Classification (AASHTO M145): A-2-4 (0)

pH & Resistivity

ARIZ 236c-PHR

pH	Min Resisitivity ohm-cm
8.3	1710

Tested By: Connor LaPose 8/12/2025

† Denotes name of P.E. or his designee who accepts responsibility for the contents of this report, technical or otherwise.

Sample Id **S-013235**

Chlorides

ARIZ 736b

Chlorides (ppm)
100

Tested By: Marco Solano 8/25/2025

Sulfates

ARIZ 733b

Sulfates (ppm)
92

Tested By: Marco Solano 8/25/2025

† Denotes name of P.E. or his designee who accepts responsibility for the contents of this report, technical or otherwise.

SOIL & AGGREGATE SAMPLE SUMMARY

Sample Id **S-013236**

Project No.	Project Name	Project Number(s)
25094.00	Stacey Rd-Higley Rd to 172nd St Lab Testing	

Sampled By	Sample Date	Logged By	Date Logged	Released By	Release Date	Approved By†	Date Approved
Client	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/8/2025	Shekhar R. Shah	8/20/2025

Material Source	Material Type	Sampled From	Reference Line	Station	Offset
Native	0	B-4 (2.5'-2.8')			

Remarks

Sample Intended Uses

Material Code	Material Description	Project Activity	Activity Description
RING	Ring Sample		

Specifications

Material Code	Spec Section	Test Property	Lower Limit	Upper Limit

SPECIFICATION STATUS

Sample In Compliance With Referenced Specifications

TEST RESULTS

USCS Classification (ASTM D2487):

AASHTO Classification (AASHTO M145): A-1-a (2)

In-Situ Unit Weight / Moisture Content

ASTM D7263

Dry Unit Weight pcf	Percent Moisture
101.40	3.2%

Tested By: Charles Patti 8/8/2025

† Denotes name of P.E. or his designee who accepts responsibility for the contents of this report, technical or otherwise.

MOTZZ LABORATORY, INC.

Report: 957258
Reported: 8/24/2025
Received: 8/20/2025
PO: 25094.00 702

Laboratory Analysis Report

Quality Testing
Marco Solano
175 S. Hamilton Place
Bldg 6, Ste 114

Project: 25094.00 PO#702

Lab Number	Sample ID
957258-1	S-13231 B-2 (0-5')

Test Parameter

Test	*Method*	*Result*	*Units*
Chloride	ARIZ 736b	16	ppm
Sulfate	ARIZ 733b	116	ppm

Lab Number	Sample ID
957258-2	S-13235 B-4(0-5')

Test Parameter

Test	*Method*	*Result*	*Units*
Chloride	ARIZ 736b	100	ppm
Sulfate	ARIZ 733b	92	ppm

APPENDIX C

Resilient Modulus Calculation

Mean R-Value and Modulus Calculations

Project Name:	Stacey Road, Higley Road to 172nd Stree
Roadway Name	Stacy Road
Roadway Segment:	Higley Road to 172nd Street

Mean R-Value Equation

$$R_{mean} = \frac{N_t \overline{R_t} \sigma_c^2 + N_c \overline{R_c} \sigma_t^2}{N_t \sigma_c^2 + N_c \sigma_t^2}$$

Tested R-Values

Boring ID	Depth	R-Value
B-1	0-5	58
B-2	0-5	61
B-3	0-5	50
B-4	0-5	59

Number of R-Value Tests (N_t):	4
Mean R-Value Tests (R_t):	57.1
Std Dev. of R-Values (σ_t):	5.0
Adjusted Mean R-Value (R_t'):	57.1

Correlated R-Values

Boring ID	Depth	PI	-#200	R-Value
B-1	0-5	3	31	58
B-2	0-5	3	27	61
B-3	0-5	6	33	50
B-4	0-5	3	29	59

Number of Correlated R-Values (N_c):	4
Mean of Correlated R-Value Results (R_c):	57.2
Std Dev. of Correlated R-Values (σ_c):	4.8
Adjusted Mean of Correlated R-Value (R_c'):	57.2

Calculated R_{mean}	57.2
Design R_{mean}	**30**
Calculated Control R_c	49.4
Design Control R_c	**20**

Resilient Modulus Equation

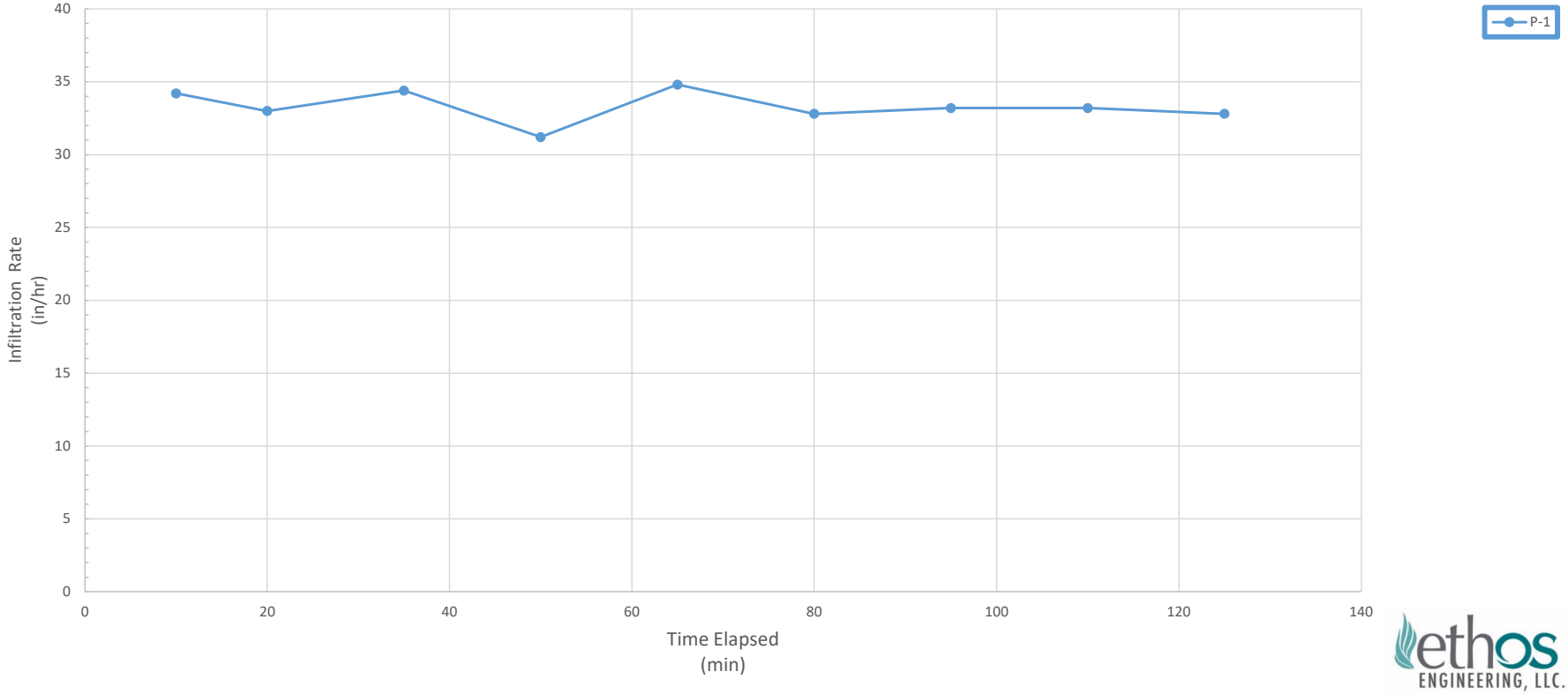
$$M_R = \frac{1815 + 225(R_{mean}) + 2.40(R_{mean})^2}{0.6(SVF)^{0.6}}$$

Maximum Allowable Resilient Modulus $(M_R)_{max}$	26,000
Seasonal Variation Factor, SVF	1.0
Calculated Resilient Modulus M_R (adjusted for SVF) (psi)	17,875
Design Resilient Modulus M_R (psi)	**17,875**

APPENDIX D

Percolation Test Results

Stacey Road, Higley Road to 172nd Street
Infiltration Rate vs. Time Elapsed
Ethos No. 2024111050 Test ID: P-1



ethos ENGINEERING, LLC.

Project Name:	Stacey Road, Higley Road to 172nd Street					Test Location/ Number:	
Project Number:	2024050					P-1	
Project Location:	NE Corner of Stacey Road and Higley Road Intersection						
Field Engineer:	R. Bohon					ethos ENGINEERING, LLC.	
Coordinates:	33.20668, -111.72008						
Date:	8/8/2025						
Top of Pipe (ft):	6	**Pipe Diameter (in):**	12.00			**Test Type:**	Falling Head Method
Pipe Stick Up (ft):	2	**Pipe Type:**	PVC			**Bedding Material:**	Sand / Clayey Sand
Depth of Boring (ft):	4.0	**Pipe Area (sq in):**	113.10				

Reading Number		Time (hr:min)	Elasped Time: Δ (min)	Flow Readings: Reading: Reading (inch)	Flow Readings: Reading: Flow ($ft^3/hr/ft^2$)	Incremental Infiltration Rate (in/hr)	Notes
1	S	9:20	10	36.00	2.850	34.20	
	E	9:30		41.70			
2	S	9:33	10	36.00	2.750	33.00	
	E	9:43		41.50			
3	S	9:45	15	36.00	2.867	34.40	
	E	10:00		44.60			
4	S	10:09	15	36.00	2.600	31.20	
	E	10:24		43.80			
5	S	10:26	15	36.00	2.900	34.80	
	E	10:41		44.70			
6	S	10:47	15	36.00	2.733	32.80	
	E	11:02		44.20			
7	S	11:10	15	36.00	2.767	33.20	
	E	11:25		44.30			
8	S	11:41	15	36.00	2.767	33.20	
	E	11:56		44.30			
9	S	12:00	15	36.00	2.733	32.80	
	E	12:15		44.20			
10	S						
	E						
11	S						
	E						
12	S						
	E						
13	S						
	E						
14	S						
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16	S						
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