July 29, 2022

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Covington Development Partners, LLC
3 Corporate Plaza, Suite 230
Newport Beach, California 92660

Attention: Mr. Michael Di Sano
Sr. Director - Entitlements

Project No.: **22G205-2**

Subject: **Results of Infiltration Testing**
Lancaster Forbes Industrial Park
South Terminus of Forbes Street
Lancaster, California

Reference: Geotechnical Investigation, Lancaster Forbes Industrial Park, Lancaster, California, Prepared by Southern California Geotechnical, Inc. (SCG) for Covington Development Partners, LLC, SCG Project No. 22G205-1, dated July 25, 2022.

Mr. Di Sano:

In accordance with your request, we have conducted infiltration testing at the subject site. We are pleased to present this report summarizing the results of the infiltration testing and our design recommendations.

Scope of Services

The scope of services performed for this project was in accordance with our Proposal No. 22P209R, dated June 8, 2022. The scope of the infiltration testing consisted of site reconnaissance, subsurface exploration, field testing, and engineering analysis to determine the infiltration rates of the on-site soils. The infiltration testing was performed in general accordance with the guidelines published by the County of Los Angeles – Department of Public Works Geotechnical and Materials Engineering Division. These guidelines are dated June 30, 2021 and titled Guidelines for Design, Investigation, and Reporting Low Impact Development Stormwater Infiltration, GS200.1.

Site Description

The subject site is located at the southern terminus of Forbes Street in Lancaster, California. The site is bounded to the north by a vacant lot and the termini of Forbes Street and Market Street, to the west by a vacant lot, to the south by West Avenue L-8, and to the east by an existing commercial building and a motel. The general location of the site is illustrated on the Site Location Map, enclosed as Plate 1 of this report.

The site consists of an irregular-shaped parcel, 11.58± acres in size. The site is currently vacant and generally undeveloped, with the exception of a few dirt and gravel access roads. The ground surface cover consists of exposed soil with sparse to moderate native shrubs and brush growth.

Detailed topographic information was not available at the time of this report. Based on elevations obtained from Google Earth and visual observations made at the time of the subsurface investigation, the site is relatively flat with an overall site topography gently sloping downward to the north at a gradient of approximately 1 percent.

Proposed Development

A conceptual site plan identified as Scheme A1.1, prepared by GAA Architects, has been provided to our office by the client. Based on this plan, the subject site will be developed with two (2) commercial/industrial buildings (identified as Building 1 and Building 2). Building 1 will be 147,000± ft² in size and will be located in the western region of the site. Building 2 will be 82,500± ft² in size and will be located in the eastern region of the site. Dock-high doors will be constructed along a portion of one building wall for each building. The proposed buildings are expected to be surrounded by asphaltic concrete (AC) pavements in the parking and drive areas, Portland cement concrete (PCC) pavements in the loading dock areas, and concrete flatwork and landscaped planters throughout the site.

We understand that this project may use on-site storm water infiltration. The conceptual site plan indicates that two (2) detention basins will be constructed in the south-central and north-central areas of the site, in between the proposed buildings. The depths of the proposed basins were unknown at the time of this report. Based on our experience with similar projects, the bottoms of the basins are expected to be 10 to 12± feet below the existing site grades.

Concurrent Study

SCG concurrently conducted a geotechnical investigation at the subject site, referenced above. As a part of this study, eight (8) borings (identified as Boring Nos. B-1 through B-8) were advanced to depths of 10 to 25± feet below the existing site grades.

Artificial fill soils were encountered at the ground surface at Boring Nos. B-1, B-2, B-4, B-7 and B-8, extending to depths of 2½ to 4½± feet below the existing site grades. The artificial fill soils generally consist of loose to medium dense silty sands with varying fine to coarse gravel content. Boring No. B-8 encountered a stratum consisting of silty sands to sandy silts, extending to a depth of 3± feet from the ground surface. Boring No. B-7 was drilled through a 1±-inch-thick open-graded gravel surficial layer. Native alluvial soils were encountered beneath the fill soils at Boring Nos. B-1, B-2, B-4, B-7 and B-8, and at the ground surface at the remaining boring locations, extending to at least the maximum depth explored of 25± feet below the existing site grades. The near-surface alluvium generally consists of loose to medium dense sands and silty sands with varying fine to coarse gravel content, extending to depths of 5½ to 8½± feet. At greater depths, the alluvium generally consists of medium dense sands and silty sands with varying fine to coarse gravel content, with occasional dense silty sands. Boring No. B-1 encountered a stratum consisting of medium dense silty sands to sandy silts at a depth of 12 to 17± feet.

Groundwater

Free water was not encountered during the drilling of any of the borings. Based on the moisture content of the recovered soil samples and the lack of free water in the borings, the static groundwater table is at a greater depth than 25± feet below existing site grades.

As part of our research, we reviewed readily available groundwater data in order to determine regional groundwater depths. The primary reference used to determine the groundwater depths in the subject site area is the California Department of Water Resources website, https://wdl.water.ca.gov/waterdatalibrary/. Three monitoring wells are located within a 1,500±-foot radius of the site. Water level readings within these monitoring wells indicate a high groundwater level of 121± feet below the ground surface in February 1922.

Subsurface Exploration

Scope of Exploration

The subsurface exploration for the infiltration testing consisted of two (2) infiltration test borings advanced to a depth of 11± feet below the existing site grades. The borings were logged during drilling by a member of our staff and were advanced using a truck-mounted drilling rig, equipped with 8-inch-diameter hollow stem augers. The approximate locations of the infiltration test borings (identified as Infiltration Test Nos. I-1 through I-4) are indicated on the Infiltration Test Location Plan, enclosed as Plate 2 of this report.

Upon the completion of the infiltration borings, the bottom of each test boring was covered with 2± inches of clean ¾-inch gravel. A sufficient length of 3-inch-diameter perforated PVC casing was then placed into each test hole so that the PVC casing extended from the bottom of the test hole to the ground surface. Clean ¾-inch gravel was then installed in the annulus surrounding the PVC casing.

Geotechnical Conditions

Native alluvium was encountered at the ground surface at both infiltration test locations, extending to at least the maximum depth explored of 11± feet below the existing site grades. The near-surface alluvium generally consists of loose silty sands with varying fine gravel content, extending to a depth of 7± feet. At greater depths, the alluvium generally consists of medium dense sands and gravelly sands with varying silt and clay content. The Boring Logs, which illustrate the conditions encountered at each test location are included within this report.

Infiltration Testing

We understand that the results of the testing will be used to prepare a preliminary design for the storm water infiltration systems that will be used at the subject site. The infiltration testing was performed in general accordance with the guidelines published by the County of Los Angeles – Department of Public Works Geotechnical and Materials Engineering Division. These guidelines are dated June 30, 2021 and titled Guidelines for Design, Investigation, and Reporting Low Impact Development Stormwater Infiltration, GS200.1.

Pre-soaking

The infiltration test boring was pre-soaked for at least 1 hour to ensure the sand around the annulus of the perforated pipe was fully saturated. The pre-soaking procedure consisted of filling each test boring with clean potable water to an elevation of at least 12± inches above the bottom of each test boring. In accordance with the Los Angeles County guidelines, since the water in the infiltration test borings did not completely infiltrate within a 30-minute time period after filling each boring, a falling head test was the appropriate test method. Based on the conditions encountered at each of the infiltration test borings, 26-minute measurement intervals were assigned at Infiltration Test No. I-1, and 30-minute measurement intervals were assigned at Infiltration Test No. 2.

Infiltration Testing Procedure

After the completion of the pre-soaking process, SCG performed the infiltration testing. A sufficient amount of water was added to the test borings so that the water level was approximately 3± feet higher than the bottom of the borings and less than or equal to the water level used during the pre-soaking process. As indicated above, 26-minute measurement intervals were assigned at Infiltration Test No. I-1, and 30-minute measurement intervals were assigned at Infiltration Test No. 2. A stabilized rate of drop, where the highest and lowest readings from three consecutive readings are within 10 percent of each other, was obtained for each of the test borings. These water level readings are presented on the spreadsheets enclosed with this report. The infiltration rates for each of the timed intervals are also tabulated on the spreadsheets.

The infiltration rates for the tests are tabulated in inches per hour. In accordance with the typically accepted practice, it is recommended that the most conservative reading from the latter part of the infiltration tests be used for design. These rates are summarized below:

Infiltration Test No.	**Depth (feet)**	**Soil Description**	**Measured Infiltration Rate (inches/hour)**
I-1	11	Light Gray Brown fine to coarse Sand, trace to little Silt, trace Clay, trace fine Gravel	7.4
I-2	11	Light Gray Brown Gravelly fine to coarse Sand, little Clay, trace Silt	4.9

Laboratory Testing

Moisture Content

The moisture contents for the recovered soil samples within the borings were determined in accordance with ASTM D-2216 and are expressed as a percentage of the dry weight. These test results are presented on the Boring Logs.

Grain Size Analysis

The grain size distribution of selected soils collected from the base of each infiltration test boring have been determined using a range of wire mesh screens. These tests were performed in general accordance with ASTM D-422 and/or ASTM D-1140. The weight of the portion of the sample retained on each screen is recorded and the percentage finer or coarser of the total weight is calculated. The results of these tests are presented on Plates C-1 and C-2 of this report.

Design Recommendations

Two (2) infiltration tests were performed in the south-central and north-central areas of the site, in between the proposed buildings. The measured infiltration rates at these infiltration test locations were 4.9 and 7.4 inches per hour. The Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration, GS200.1 prepared by the County of Los Angeles, Department of Public Works, Geotechnical and Materials Division (GMED) on June 30, 2021 dictate that a reduction factor be utilized in the design infiltration rate. The following reduction factors are considered in the design infiltration rate (DIR):

Reduction Factors	
Small Diameter Boring	$RF_t = 1$
Site Variability, number of tests, and thoroughness of subsurface investigation	$RF_v = 2$
Long-term siltation plugging and maintenance	$RF_s = 1$
Total Reduction Factor, $RF = RF_t + RF_v + RF_s$	RF = 4
Design Infiltration Rate (DIR) = Measured Percolation Rate/RF	DIR = See Below

Based on the results of the infiltration testing, the silt and clay content, and reduction factors, we recommend an infiltration rate of 1.9 inches per hour for the proposed detention basin located in the north-central area of the subject site, and an infiltration rate of 1.2 inches per hour for the proposed detention basin located in the south-central area.

The design of the proposed storm water infiltration systems should be performed by the project civil engineer, in accordance with the City of Lancaster and/or County of Los Angeles guidelines. However, it is recommended that the systems be constructed so as to facilitate removal of silt and clay, or other deleterious materials from any water that may enter the systems. The presence of such materials would decrease the effective infiltration rates. **It is recommended that the project civil engineer apply an appropriate factor of safety. The infiltration rate recommended above is based on the assumption that only clean water will be introduced to the subsurface profile. Any fines, debris, or organic materials could significantly impact the infiltration rates.** It should be noted that the recommended infiltration rates are based on infiltration testing at two (2) discrete locations and the overall infiltration rates of the storm water infiltration systems could vary considerably.

Infiltration Rate Considerations

The infiltration rates presented herein were determined in accordance with the Los Angeles County guidelines and are considered valid only for the time and place of the actual tests. Varying subsurface conditions will exist in other areas of the site, which could alter the recommended infiltration rates presented above. The infiltration rates will decline over time between maintenance cycles as silt or clay particles accumulate on the BMP surface. The infiltration rate is highly dependent upon a number of factors, including density, silt and clay content, grainsize distribution throughout the range of particle sizes, and particle shape. Small changes in these factors can cause large changes in the infiltration rates.

Infiltration rates are based on unsaturated flow. As water is introduced into soils by infiltration, the soils become saturated and the wetting front advances from the unsaturated zone to the saturated zone. Once the soils become saturated, infiltration rates become zero, and water can only move through soils by hydraulic conductivity at a rate determined by pressure head and soil permeability. Changes in soil moisture content will affect the infiltration rate. Infiltration rates should be expected to decrease until the soils become saturated. Soil permeability values will then govern groundwater movement. Permeability values may be on the order of 10 to 20 times less than infiltration rates. The system designer should incorporate adequate factors of safety and allow for overflow design into appropriate traditional storm drain systems, which would transport storm water off-site.

Construction Considerations

The infiltration rates presented in this report are specific to the tested locations and tested depths. Infiltration rates can be significantly reduced if the soils are exposed to excessive disturbance or compaction during construction. Compaction of the soils at the bottom of the infiltration systems can significantly reduce the infiltration ability of the systems. Therefore, the subgrade soils within proposed infiltration system areas should not be over-excavated, undercut or compacted in any significant manner. **It is recommended that a note to this effect be added to the project plans and/or specifications.**

We recommend that a representative from the geotechnical engineer be on-site during the construction of the proposed infiltration systems to identify the soil classification at the base of each infiltration system. The infiltration rate of the system will likely vary significantly if the composition of the soil located beneath the system is not consistent with the tested soils.

We recommend that scrapers and other rubber-tired heavy equipment not be operated on the system bottom, or at levels lower than 2 feet above the bottom of the system, particularly within basins. As such, the bottom 24 inches of the infiltration systems should be excavated with non-rubber-tired equipment, such as excavators.

Basin Maintenance

The proposed project will include infiltration basins. Water flowing into these basins will carry some level of sediment. Wind-blown sediments and erosion of the basin side walls will also contribute to sediment deposition at the bottom of the basin. This layer has the potential to significantly reduce the infiltration rate of the basin subgrade soils. Therefore, a formal basin maintenance program should be established to ensure that these silt and clay deposits are removed from the basin on a regular basis. Appropriate vegetation on the basin sidewalls and bottom may reduce erosion and sediment deposition.

Basin maintenance should also include measures to prevent animal burrows, and to repair any burrows or damage caused by such. Animal burrows in the basin sidewalls can significantly increase the risk of erosion and piping failures.

Location of Infiltration Systems

The use of on-site storm water infiltration systems carries a risk of creating adverse geotechnical conditions. Increasing the moisture content of the soil can cause the soil to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. Overlying structures and pavements in the infiltration area could potentially be damaged due to saturation of the subgrade soils. **The proposed infiltration systems for this site should be located at least 25 feet away from any structures, including retaining walls.** Even with this provision of locating the infiltration system at least 25 feet from the building(s), it is possible that infiltrating water into the subsurface soils could have an adverse effect on the proposed or existing structures. It should also be noted that utility trenches which happen to collect storm water can also serve as conduits to transmit storm water toward the structure, depending on the slope of the utility trench. Therefore, consideration should also be given to the proposed locations of underground utilities which may pass near the proposed infiltration systems.

The infiltration system designer should also give special consideration to the effect that the proposed infiltration systems may have on nearby subterranean structures, open excavations, or descending slopes. In particular, infiltration systems should not be located near the crest of descending slopes, particularly where the slopes are comprised of granular soils. Such systems will require specialized design and analysis to evaluate the potential for slope instability, piping failures and other phenomena that typically apply to earthen dam design. This type of analysis is beyond the scope of this infiltration test report, but these factors should be considered by the infiltration system designer when locating the infiltration systems.

General Comments

This report has been prepared as an instrument of service for use by the client in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, structural engineer, and/or civil engineer. The design of the proposed storm water infiltration system is the responsibility of the civil engineer. The role of the geotechnical engineer is limited to determination of infiltration rate only. By using the design infiltration rate contained herein, the civil engineer agrees to indemnify, defend, and hold harmless the geotechnical engineer for all aspects of the design and performance of the proposed storm water infiltration system. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur.

The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between boring locations and testing depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.

This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted. The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

Closure

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

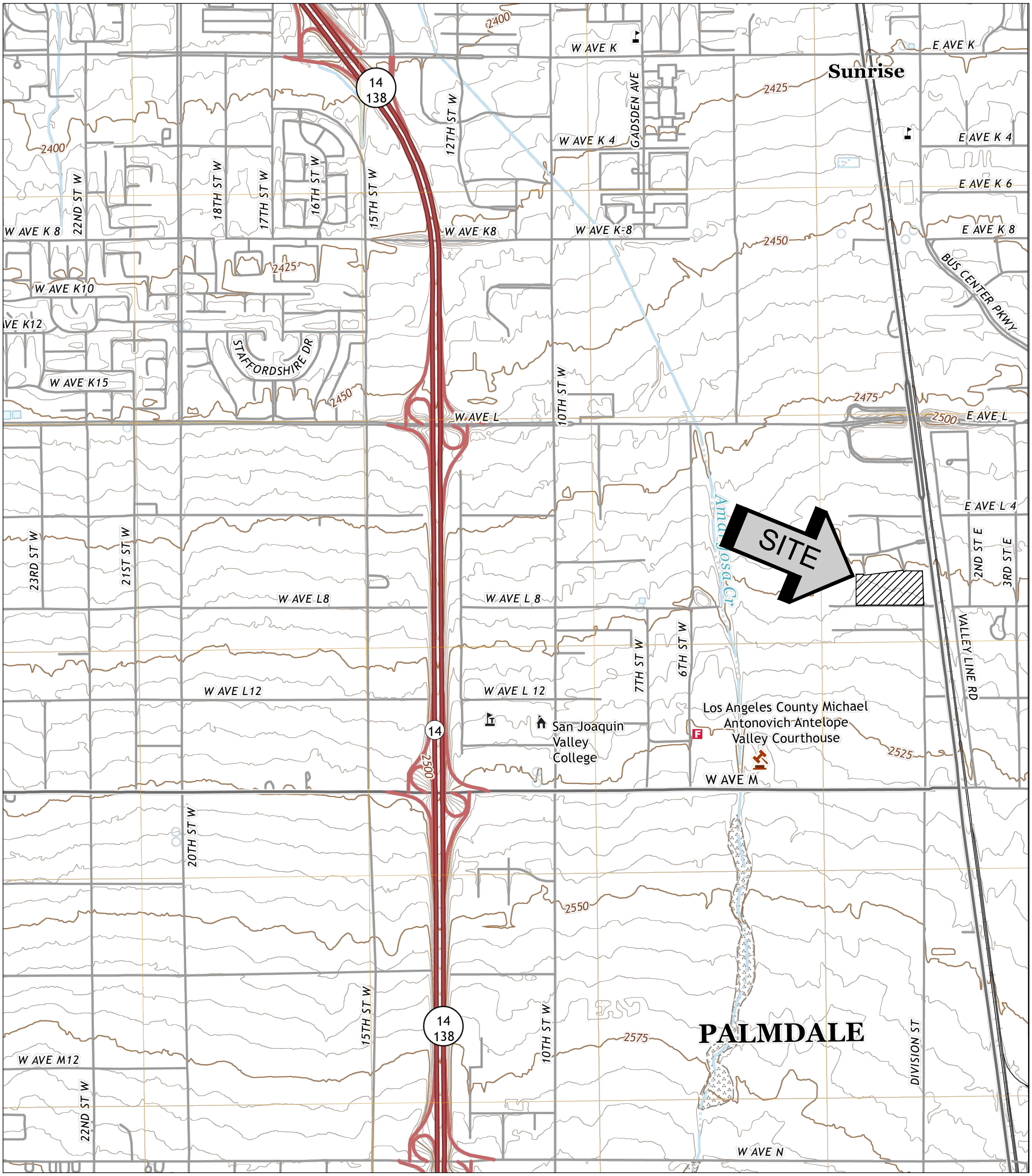
Joseph Lozano Leon
Staff Engineer

Robert G. Trazo, GE 2655
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
ROBERT TRAZO
No. 2655
GEOTECHNICAL
STATE OF CALIFORNIA

Distribution: (1) Addressee

Enclosures: Plate 1 - Site Location Map
Plate 2 - Infiltration Test Location Plan
Boring Log Legend and Logs (4 pages)
Infiltration Test Results Spreadsheets (4 pages)
Grain Size Distribution Graphs (2 pages)



SOURCE: USGS TOPOGRAPHIC MAP OF THE LANCASTER WEST QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA, 2022.

SITE LOCATION MAP

LANCASTER FORBES INDUSTRIAL PARK

LANCASTER, CALIFORNIA

SCALE: 1" = 2000'

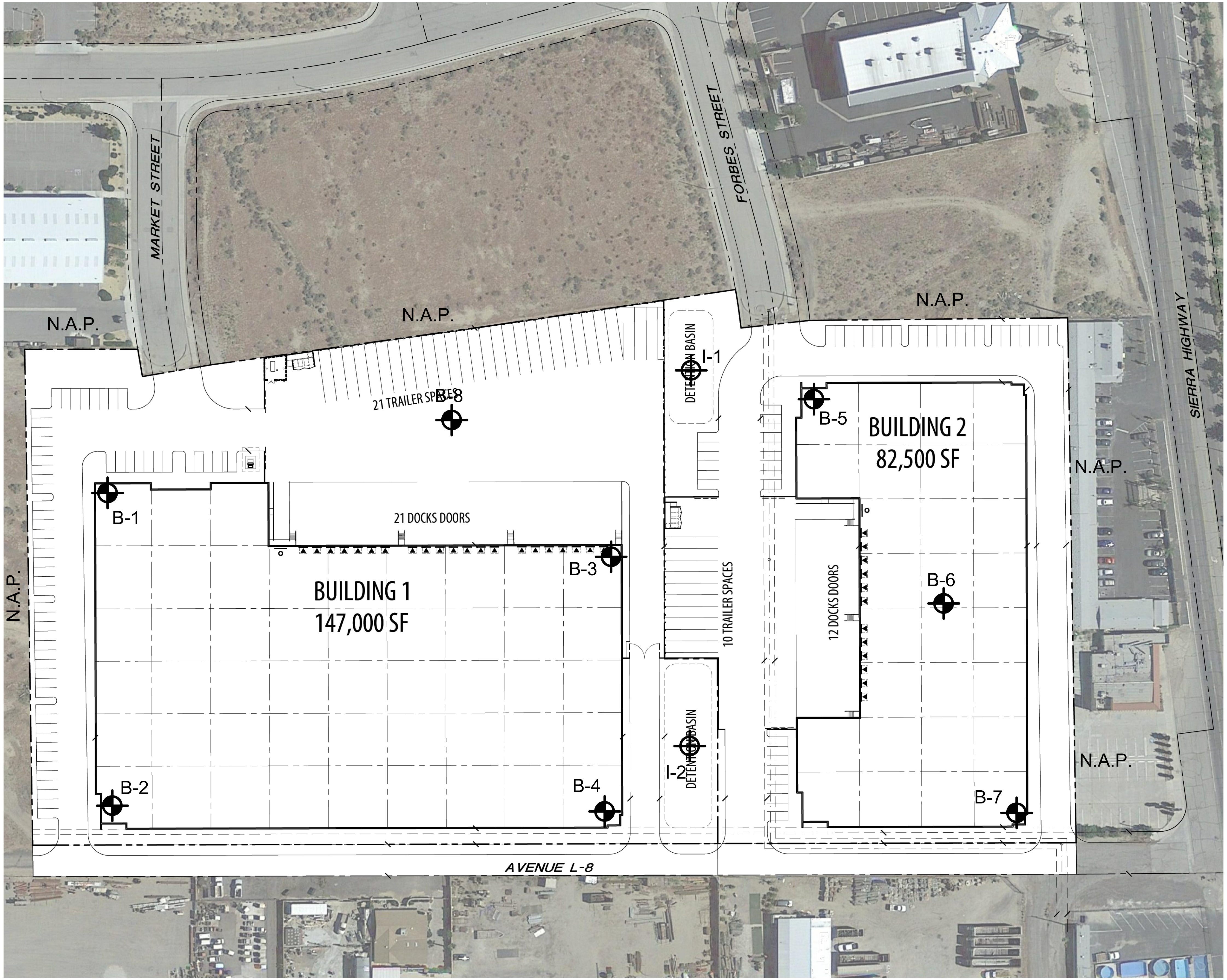
DRAWN: ME
CHKD: RGT

SCG PROJECT
22G205-2

PLATE 1

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



NORTH
SoCalGeo

GEOTECHNICAL LEGEND

- APPROXIMATE INFILTRATION TEST LOCATION
- APPROXIMATE BORING LOCATION FROM CONCURRENT STUDY (SCG PROJECT NO. 22G205-1)

NOTE: SITE MAP PREPARED BY GAA ARCHITECTS.

INFILTRATION TEST LOCATION PLAN

LANCASTER FORBES INDUSTRIAL PARK

LANCASTER, CALIFORNIA

SCALE: 1" = 100'

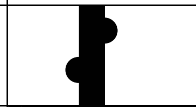
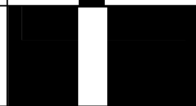
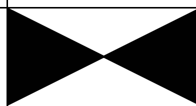
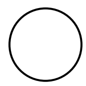
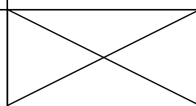
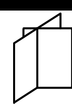
DRAWN: JLL
CHKD: RGT

SCG PROJECT 22G205-2

PLATE 2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL

BORING LOG LEGEND

SAMPLE TYPE	GRAPHICAL SYMBOL	SAMPLE DESCRIPTION
AUGER		SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED)
CORE		ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK.
GRAB		SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED)
CS		CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED)
NSR		NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL.
SPT		STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED)
SH		SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED)
VANE		VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED.

COLUMN DESCRIPTIONS

DEPTH: Distance in feet below the ground surface.

SAMPLE: Sample Type as depicted above.

BLOW COUNT: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

POCKET PEN.: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

GRAPHIC LOG: Graphic Soil Symbol as depicted on the following page.

DRY DENSITY: Dry density of an undisturbed or relatively undisturbed sample in lbs/ft^3.

MOISTURE CONTENT: Moisture content of a soil sample, expressed as a percentage of the dry weight.

LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

PLASTIC LIMIT: The moisture content above which a soil behaves as a plastic.

PASSING #200 SIEVE: The percentage of the sample finer than the #200 standard sieve.

UNCONFINED SHEAR: The shear strength of a cohesive soil sample, as measured in the unconfined state.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOUTHERN CALIFORNIA GEOTECHNICAL
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BORING NO. I-1

JOB NO.: 22G205-2	DRILLING DATE: 6/27/22	WATER DEPTH: Dry
PROJECT: Lancaster Forbes Industrial Park	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: ---
LOCATION: Lancaster, California	LOGGED BY: Michelle Krizek	READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					ALLUVIUM: Light Brown Silty fine Sand, little medium to coarse Sand, trace to little fine Gravel, loose-damp							
	X	6					4					
5												
					Light Gray Brown fine to coarse Sand, trace to little Silt, trace Clay, trace fine Gravel, medium dense-dry to damp							
	X	10					2					
10	X	10					3			9		
					Boring Terminated at 11'							

TBL 22G205-2.GPJ SOCALGEO.GDT 7/29/22

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-2

JOB NO.: 22G205-2
PROJECT: Lancaster Forbes Industrial Park
LOCATION: Lancaster, California

DRILLING DATE: 6/27/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					ALLUVIUM: Gray Brown Silty fine to medium Sand, trace coarse Sand, trace fine Gravel, loose-damp							
5	X	5					3					
					Light Gray Brown Gravelly fine to coarse Sand, little Clay, trace Silt, medium dense-damp							
	X	14					3					
10	X	16					3			10		
					Boring Terminated at 11'							

TBL 22G205-2.GPJ SOCALGEO.GDT 7/29/22

INFILTRATION CALCULATIONS

Project Name	Lancaster Forbes Industrial Park
Project Location	Lancaster, California
Project Number	22G205-2
Engineer	Michelle Krizek

Test Hole Radius	4.00	(in)
Test Depth	10.99	(ft)

Infiltration Test Hole	I-1

Start Time for Pre-Soak	7:05 AM	Water Remaining in Boring (Y/N)	Y
Start Time for Standard	8:05 AM	Time Interal Between Readings	26 min

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Measured Infiltration Rate Q (in/hr)	Reduction Factor (RF)	Design Infiltration Rate Q (in/hr)
1	Initial	8:10 AM	26.0	7.91	3.06	1.6	8.2	4.0	2.1
	Final	8:36 AM		10.97					
2	Initial	8:36 AM	26.0	7.91	3.05	1.6	8.2	4.0	2.0
	Final	9:02 AM		10.96					
3	Initial	9:02 AM	26.0	7.91	3.05	1.6	8.2	4.0	2.0
	Final	9:28 AM		10.96					
4	Initial	9:28 AM	26.0	7.91	3.06	1.6	8.2	4.0	2.1
	Final	9:54 AM		10.97					
5	Initial	9:54 AM	26.0	7.91	3.05	1.6	8.2	4.0	2.0
	Final	10:20 AM		10.96					
6	Initial	10:20 AM	26.0	7.91	3.04	1.6	8.1	4.0	2.0
	Final	10:46 AM		10.95					
7	Initial	10:46 AM	26.0	7.91	3.03	1.6	8.1	4.0	2.0
	Final	11:12 AM		10.94					
8	Initial	11:12 AM	26.0	7.91	3.01	1.6	8.0	4.0	2.0
	Final	11:38 AM		10.92					
9	Initial	11:38 AM	26.0	7.91	3.01	1.6	8.0	4.0	2.0
	Final	12:04 PM		10.92					
10	Initial	12:04 PM	26.0	7.91	3.02	1.6	8.0	4.0	2.0
	Final	12:30 PM		10.93					
11	Initial	12:30 PM	26.0	7.91	3.00	1.6	7.9	4.0	2.0
	Final	12:56 PM		10.91					
12	Initial	12:56 PM	26.0	7.91	2.98	1.6	7.8	4.0	2.0
	Final	1:22 PM		10.89					
13	Initial	1:22 PM	26.0	7.91	2.97	1.6	7.8	4.0	1.9
	Final	1:48 PM		10.88					
14	Initial	1:48 PM	26.0	7.91	2.96	1.6	7.7	4.0	1.9
	Final	2:14 PM		10.87					
15	Initial	2:14 PM	26.0	7.91	2.92	1.6	7.5	4.0	1.9
	Final	2:40 PM		10.83					
16	Initial	2:40 PM	26.0	7.91	2.89	1.6	7.4	4.0	1.9
	Final	3:06 PM		10.80					

Design Infiltration Rate = (Measured Infiltration Rate)/(Reduction Factor)
Reduction Factor (RF) = RF_t+RF_v+RF_s

Reduction Factors	
Double-ring Infiltrometer	RF_t = 1 to 3
Shallow Test Pit	
Small Diameter Boring	
Large Diameter Boring	
High Flow-rate	RF_t = 3
Grain Size Analysis Method	RF_t = 2 to 3
Site variability, number of tests and thoroughness of subsurface investigation	RF_v = 1 to 3
Long-term siltation, plugging, and maintenance	RF_s = 1 to 3

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where: Q = Measured Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Lancaster Forbes Industrial Park
Project Location	Lancaster, California
Project Number	22G205-2
Engineer	Michelle Krizek

Test Hole Radius	4.00	(in)
Test Depth	10.91	(ft)

Infiltration Test Hole	I-2

Start Time for Pre-Soak	8:47 AM	Water Remaining in Boring (Y/N)	Y
Start Time for Standard	9:47 AM	Time Interal Between Readings	30 min

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Measured Infiltration Rate Q (in/hr)	Reduction Factor (RF)	Design Infiltration Rate Q (in/hr)
1	Initial	10:06 AM	30.0	7.99	2.41	1.7	5.1	4.0	1.3
	Final	10:36 AM		10.40					
2	Initial	10:36 AM	30.0	7.99	2.42	1.7	5.2	4.0	1.3
	Final	11:06 AM		10.41					
3	Initial	11:06 AM	30.0	7.99	2.39	1.7	5.1	4.0	1.3
	Final	11:36 AM		10.38					
4	Initial	11:36 AM	30.0	7.99	2.38	1.7	5.0	4.0	1.3
	Final	12:06 PM		10.37					
5	Initial	12:06 PM	30.0	7.99	2.37	1.7	5.0	4.0	1.2
	Final	12:36 PM		10.36					
6	Initial	12:36 PM	30.0	7.99	2.38	1.7	5.0	4.0	1.3
	Final	1:06 PM		10.37					
7	Initial	1:06 PM	30.0	7.99	2.35	1.7	4.9	4.0	1.2
	Final	1:36 PM		10.34					
8	Initial	1:36 PM	30.0	7.99	2.36	1.7	5.0	4.0	1.2
	Final	2:06 PM		10.35					
9	Initial	2:06 PM	30.0	7.99	2.37	1.7	5.0	4.0	1.2
	Final	2:36 PM		10.36					
10	Initial	2:36 PM	30.0	7.99	2.36	1.7	5.0	4.0	1.2
	Final	3:06 PM		10.35					
11	Initial	3:06 PM	30.0	7.99	2.35	1.7	4.9	4.0	1.2
	Final	3:36 PM		10.34					
12	Initial	3:36 PM	30.0	7.99	2.35	1.7	4.9	4.0	1.2
	Final	4:06 PM		10.34					
13	Initial	4:06 PM	30.0	7.99	2.35	1.7	4.9	4.0	1.2
	Final	4:36 PM		10.34					
14	Initial	4:36 PM	30.0	7.99	2.35	1.7	4.9	4.0	1.2
	Final	5:06 PM		10.34					
15	Initial	5:06 PM	30.0	7.99	2.35	1.7	4.9	4.0	1.2
	Final	5:36 PM		10.34					
16	Initial	5:36 PM	30.0	7.99	2.34	1.8	4.9	4.0	1.2
	Final	6:06 PM		10.33					

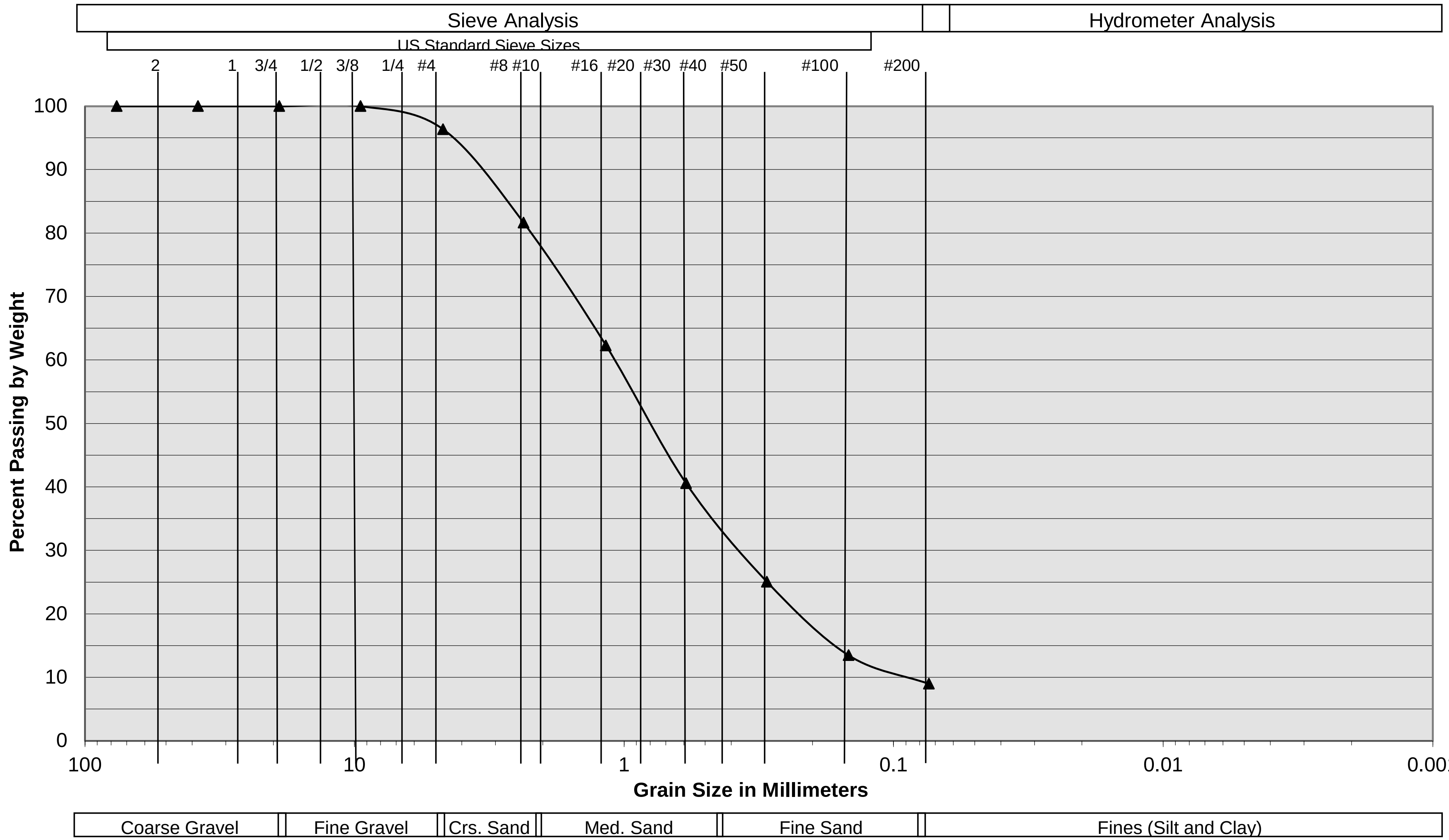
Design Infiltration Rate = (Measured Infiltration Rate)/(Reduction Factor)
Reduction Factor (RF) = $RF_t+RF_v+RF_s$

Reduction Factors	
Double-ring Infiltrometer	RF_t = 1 to 3
Shallow Test Pit	
Small Diameter Boring	
Large Diameter Boring	
High Flow-rate	RF_t = 3
Grain Size Analysis Method	RF_t = 2 to 3
Site variability, number of tests and thoroughness of subsurface investigation	RF_v = 1 to 3
Long-term siltation, plugging, and maintenance	RF_s = 1 to 3

$$Q=\frac{\Delta H(60r)}{\Delta t(r+2H_{avg})}$$

Where: Q = Measured Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

Grain Size Distribution



Sample Description	I-1 @ 9½ to 11'
Soil Classification	Light Gray Brown fine to coarse Sand, trace to little Silt, trace Clay, trace fine Gravel

Lancaster Forbes Industrial Park
Lancaster, California
Project No. 22G205-2
PLATE C- 1

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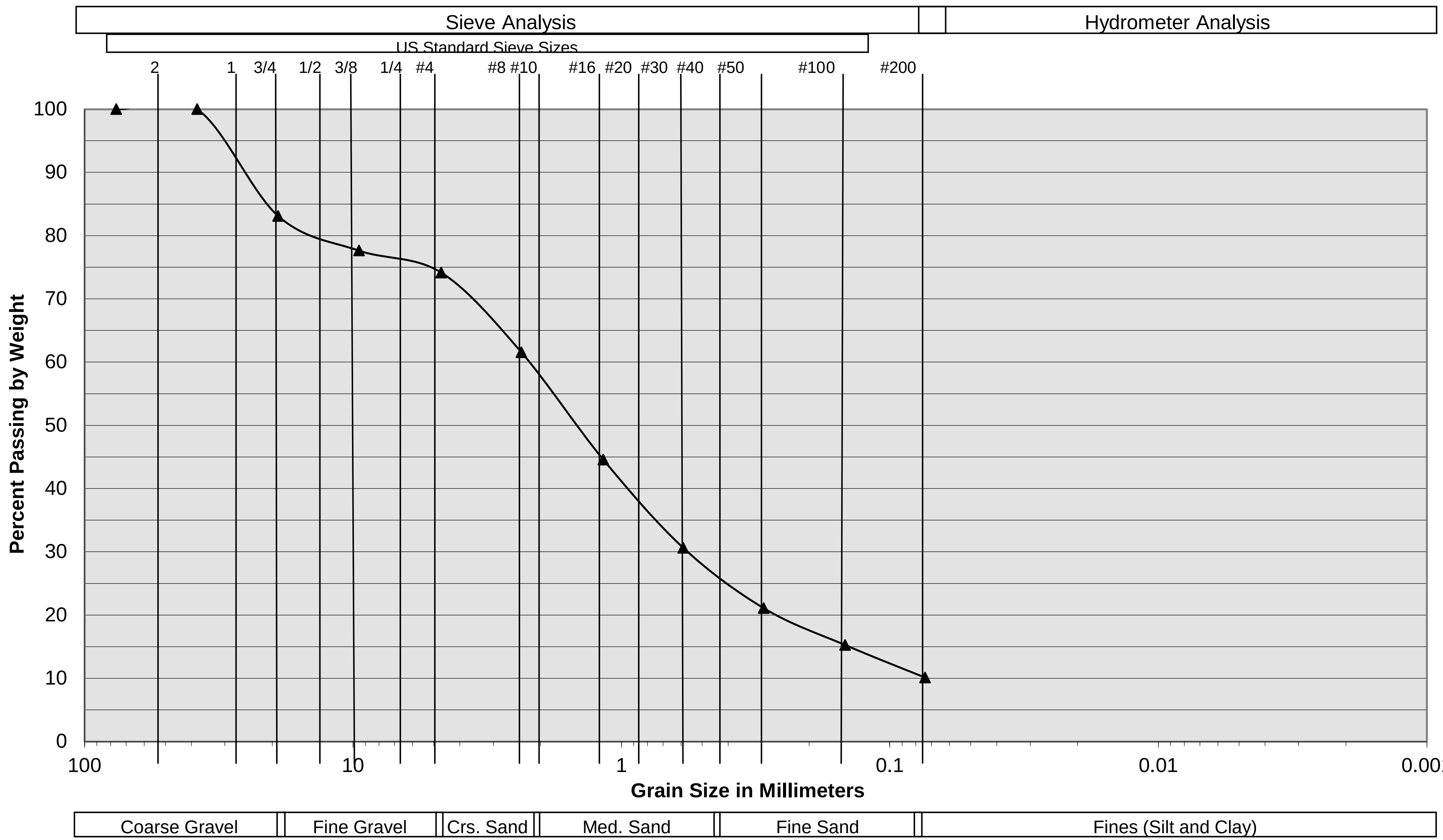
Grain Size Distribution



Sample Description	I-2 @ 9½ to 11'
Soil Classification	Light Gray Brown Gravelly fine to coarse Sand, little Clay, trace Silt

Lancaster Forbes Industrial Park
Lancaster, California
Project No. 22G205-2
PLATE C- 2

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