September 25, 2020

HPA Architecture
18831 Bardeen Avenue
Irvine, California 92612

Attention: Ms. Tammi Bailey
Regional Director

Project No.: **20G190-2**

Subject: **Results of Infiltration Testing**
Proposed Retaining Wall
6000 Condor Drive
Moorpark, California

Reference: Limited Geotechnical Investigation, Proposed Retaining Wall, Moorpark, California by Southern California Geotechnical, Inc. (SCG), prepared for HPA Architecture, SCG Project No. 20G190-1, dated September 23, 2020.

Ms. Bailey:

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 general accordance with our Proposal No. 20P302, dated August 5, 2020. The scope of services included site reconnaissance, subsurface exploration, field testing, and engineering analysis to determine the infiltration rates of the on-site soils. The double-ring infiltration testing was performed in general accordance with the ASTM test method D-3385-94, Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer. In addition, the Ventura County Technical Guidance Manual for Stormwater Quality Control Measures, updated June, 2011 was used in order to determine the infiltration rates for the borehole infiltration test.

Site and Project Description

The site is located at 6000 Condor Drive in Moorpark, California. The site is bounded to the northwest and southwest by existing commercial/industrial buildings, to the west by Condor Drive, and to the northeast, east and southeast by vacant lots. The general location of the site is illustrated on the Site Location Map, included as Plate 1 of this report.

The overall site consists of an irregular-shaped parcel, 11.78± acres in size. The overall site is developed with an existing 189,056± ft^2 commercial/industrial building located in the central portion of the site. The existing building is a 2-story concrete tilt-up building. Dock-high doors are located along the central portion of the building's north perimeter wall. The building is assumed to be supported on conventional shallow foundations with a concrete slab-on-grade floor. The building is surrounded by asphaltic concrete pavements in the parking and drive lane areas, Portland cement concrete pavements in the loading dock area, and concrete flatwork and landscaped planters located throughout the site. Landscaped slopes are located along the northern, western and eastern boundaries of the site.

Detailed topographic information was obtained from the precise grading plan prepared by Jensen Design & Survey, Inc. Based on this plan, a slope possessing an inclination of approximate 2h:1v descends from the western property line, downward towards the site. With the exception of this slope, the western portion of the site slopes gently downward to the northern area at a gradient of 1± percent. Descending slopes are located along the northern and eastern boundaries of the site. These slopes possess an inclination of approximately 2h:1v and are at least 10± feet in height. With the exception of these slopes, the northern and eastern areas of the site slope to the east at a gradient of less than 1± percent. The site elevation ranges from 604± feet mean sea level (msl) in the northwestern area to a 580± feet msl along the eastern boundary of the site.

Proposed Development

Based on a site plan that was provided to our office, three (3) new retaining walls will be constructed at the subject site. One wall will be located along the western property line with a maximum height of 10± feet and a length of 300± feet. This wall will be constructed in a cut condition in the area of the western slope. Cuts of up to 10± feet will be required in order to establish the new site grade within this portion of the site. The second wall will be located in the northwestern area of the site and will have a maximum height of 5± feet and a length of 55± feet. This wall will raise the grade up to 5± feet in order to construct an access drive which will extend into an adjacent parcel located northwest of the site. The last wall will be located in the southeastern area of the site and will have a maximum height of 2½± feet and will be 300± feet in length. As part of the new site improvements new pavements will be constructed throughout the overall site. Areas of new concrete flatwork and landscaping will also be constructed throughout the site.

The proposed development will include on-site infiltration to dispose of stormwater. The proposed infiltration system will consist of a below-grade chamber located in the eastern area of the site. The bottoms of the chambers will extend to a depth of 7± feet below the existing site grades.

Concurrent Study

Southern California Geotechnical, Inc. (SCG) concurrently conducted a limited geotechnical investigation at the subject site. The results of this investigation are presented in the above referenced report. As part of this study, five (5) borings were drilled to a depth of 20± feet below the existing site grades. Asphaltic concrete (AC) pavements were encountered at the ground surface of all of the boring locations. The pavement sections at these locations generally consist of 2½ to 4± inches of AC with no discernable layer of crushed aggregate base. Artificial fill soils were encountered beneath the pavements at Boring Nos. B-1, B-2, B-3 and B-5, extending to depths of 4½ to 6½± feet below the existing site grades. The artificial fill soils generally consist of medium dense to very dense silty fine to coarse sands with trace to little amounts of fine to coarse gravel. At Boring No. B-5, a hard fine sandy clay stratum was encountered between the depths of 2½ and 5½± feet below the existing site grades. Additional soils classified as possible fill were encountered beneath the fill soils of Boring Nos. B-1 through B-3, and beneath the pavements of B-4, extending to depths of 2½ to 8½± feet below the existing site grades. The possible fill soils consist of medium dense to dense silty fine to coarse sands, gravelly fine to coarse sands and fine to coarse sands. These soils possess trace to little fine to coarse gravel. Native alluvium was encountered beneath the possible fill at all of the boring locations, extending to at least the maximum depth explored of 20± feet. The native alluvial soils generally consist of loose to dense fine sands, fine to coarse sands, silty fine sands and silty fine to coarse sands. These soils possess trace to little fine to coarse gravel. Boring No. B-4 encountered a medium dense layer of fine sandy silt with little clay and iron oxide staining at depths of 19½ to 20 feet. Boring No. B-5 encountered a hard silty clay strata with little fine sand and some organic content, extending between the depths of 8½ and 12 feet.

Groundwater was not encountered at any of the borings. Based on the lack of any water within the borings, and the moisture contents of the recovered soil samples, the static groundwater table is considered to have existed at a depth in excess of 20± feet below existing site grades, at the time of the subsurface investigation.

Subsurface Exploration

Scope of Exploration

The subsurface exploration conducted for the infiltration testing consisted of two (2) infiltration trenches and one (1) infiltration boring, advanced to a depth of 7± feet below the existing site grades using a conventional rubber tire backhoe. The trenches were logged during excavation by a member of our staff. The approximate locations of the infiltration tests (identified as Infiltration Test No. I-3 through I-5) are indicated on the Infiltration Test Location Plan, enclosed as Plate 2 of this report.

Geotechnical Conditions

Pavements

Asphaltic Concrete (AC) pavements were encountered at Infiltration Test No. I-5. The AC pavements consist of 3± inches of AC with no discernable layer of crushed aggregate base.

Artificial Fill

Artificial fill soils were encountered beneath the AC pavements at Infiltration Test No. I-5, and at the ground surface at Infiltration Test No. I-3 and I-4, extending to depths of 3 to 6± feet below existing site grades. The artificial fill soils consist of medium dense to dense silty fine sands, with little medium to coarse sands, little fine to coarse graves, and occasional cobbles. The fill soils possess a disturbed appearance and moderate strengths, resulting in their classification as artificial fill.

Additional soils classified as possible fill were encountered beneath the artificial fill soils at Infiltration Test No. I-5. The possible fill soils consist of dense to very dense silty fine sands with varying fine to coarse sand, clay and gravel content. These soils are similar in composition to the artificial fill soils, but lack any indicators of fill, resulting in their classification as possible fill.

Infiltration Test No. I-5 was terminated within the possible fill soils at a depth of 7± feet below the existing stie grads.

Alluvium

Native alluvial soils were encountered at the ground surface, beneath the artificial fill soils at Infiltration Nos. I-3 and I-4, extending to the maximum explored depth of 7± feet below existing site grades. The alluvial soils consist of dense silty fine to coarse sands. Trace to little Clay nodules were encountered with variable quantities fine to coarse Gravel and occasional Cobbles.

Groundwater

Free water was not encountered during the drilling or excavation of any borings or trenches. Based on the lack of water within the borings/trenches and the moisture contents of the recovered samples, the static groundwater table is considered to have existed at a depth in excess of 7± feet at the time of the subsurface exploration.

As part of our research, we reviewed available groundwater data in order to determine the historic high groundwater level for the site. The primary reference used to determine the historic groundwater depths in this area is CGS Open File Report 2000-07 for the Moorpark Quadrangle, which identify historic high groundwater contours extending through the site indicating depths between 10 to 30± feet below the ground surface. More recent water level data was obtained from the California Department of Water Resources website, http://www.water.ca.gov/waterdatalibrary/. The nearest monitoring well on record is located approximately 500 feet northwest of the site. Water level readings within this monitoring well indicate a groundwater level of 7± feet below the ground surface in May 1991.

The Trench Logs and Boring Log, which illustrate the conditions encountered at the infiltration test locations, are included with this report.

Infiltration Testing

Double-Ring Infiltration Testing

We understand that the results of the testing will be used to prepare a preliminary design for the storm water infiltration system that will be used at the subject site. As previously mentioned, the infiltration testing was performed in general accordance with ASTM Test Method D-3385-94, Standard Test Method for Infiltration Rate of Soils in Field Using Double Ring Infiltrometer.

Two stainless steel infiltration rings were used for the infiltration testing. The outer infiltration ring is 2 feet in diameter and 20 inches in height. The inner infiltration ring is 1 foot in diameter and 20 inches in height. At the test locations, the outer ring was driven 3± inches into the soil at the base of each trench. The inner ring was centered inside the outer ring and subsequently driven 3± inches into the soil at the base of the trench. These drive depths were adequate for the existing soil conditions and no water seepage was observed during testing. The rings were driven into the soil using a ten-pound sledge hammer.

Borehole Percolation Test

The falling-head borehole percolation test was performed in accordance to Ventura County Technical Guidance Manual for Stormwater Quality Control Measures, updated June 2018.

Pre-soaking

The infiltration test boring was pre-soaked, for 24 hours to ensure the gravel 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 24± inches below the top of the test boring.

Infiltration Testing Procedure

Double-Ring Infiltration

Infiltration testing was performed at two (2) trench locations, I-3 and I-4. The infiltration testing consisted of filling the inner ring and the annular space (the space between the inner and outer rings) with water, approximately 3 to 4 inches above the soil. To prevent the flow of water from one ring to the other, the water level in both the inner ring and the annular space between the rings was maintained at a constant head using float valves. The volume of water that was added to maintain a constant head in the inner ring and the annular space during each time interval was determined and recorded.

The schedule for readings was determined based on the observed soil type at the base of each backhoe-excavated trench. Based on the observed infiltration rate at each test location, the volumetric measurements were made at increments of 20 minutes. The water volume measurements are presented on the spreadsheets enclosed with this report. The infiltration rates for each of the timed intervals are also tabulated on these spreadsheets.

Borehole Infiltration

After the completion of the pre-soaking process, SCG performed the infiltration testing at Infiltration Test No. I-5. A sufficient amount of water was added to the test borings so that the water level was approximately 48± inches lower than the top of the boring and less than or equal to the water level used during the pre-soaking process. Readings were taken at 1-hour intervals at the boring infiltration test location. 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 the test boring. 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 each infiltration tests are calculated in centimeters per hour and then converted to inches per hour. The rates are summarized below:

Infiltration Test No.	Test Depth (feet)	Soil Description	Infiltration Rate (inches/hour)
I-3	7	Silty fine to coarse Sand, trace to little Clay, some fine to coarse Gravel, occasional Cobbles	3.4
I-4	7	Silty fine to coarse Sand, some fine to coarse Gravel, little Clay nodules, extensive Cobbles	3.2
I-5	7	Silty fine Sand, little medium to coarse Sand, little Clay nodules, trace fine Gravel	3.0

Laboratory Testing

Moisture Content

The moisture contents for the recovered soil samples within the trenches 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 Log and Trench 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 through C-3 of this report.

Design Recommendations

Three (3) infiltration tests were performed at the subject site. As noted above, the infiltration rates at both these locations range between 3.0 and 3.4 inches per hour. **Based on the infiltration test results from Infiltration Test Nos. I-3 through I-5, we recommend infiltration rate of 3.0 inches per hour.**

We recommend that a representative from the geotechnical engineer be on-site during the construction of the proposed infiltration system to identify the soil classification at the base of the system. It should be confirmed that the soils at the base of the proposed infiltration system correspond with those presented in this report to ensure that the performance of the system will be consistent with the rates reported herein.

The design of the storm water infiltration systems should be performed by the project civil engineer, in accordance with the City of Moorpark and/or County of Ventura guidelines. It is recommended that the system be constructed so as to facilitate removal of silt and clay, or other deleterious materials from any water that may enter the system. 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 rate.** It should be noted that the recommended infiltration rates are based on infiltration testing at three (3) discrete locations and that the overall infiltration rates of the proposed infiltration system could vary considerably.

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. 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.**

Infiltration versus Permeability

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. The infiltration rates presented herein were determined in accordance with the Ventura County guidelines and are considered valid for the time and place of the actual tests. 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.

Location of Infiltration System

The use of on-site storm water infiltration system 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 subgrade soils. **The proposed infiltration system 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, 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 system.

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.

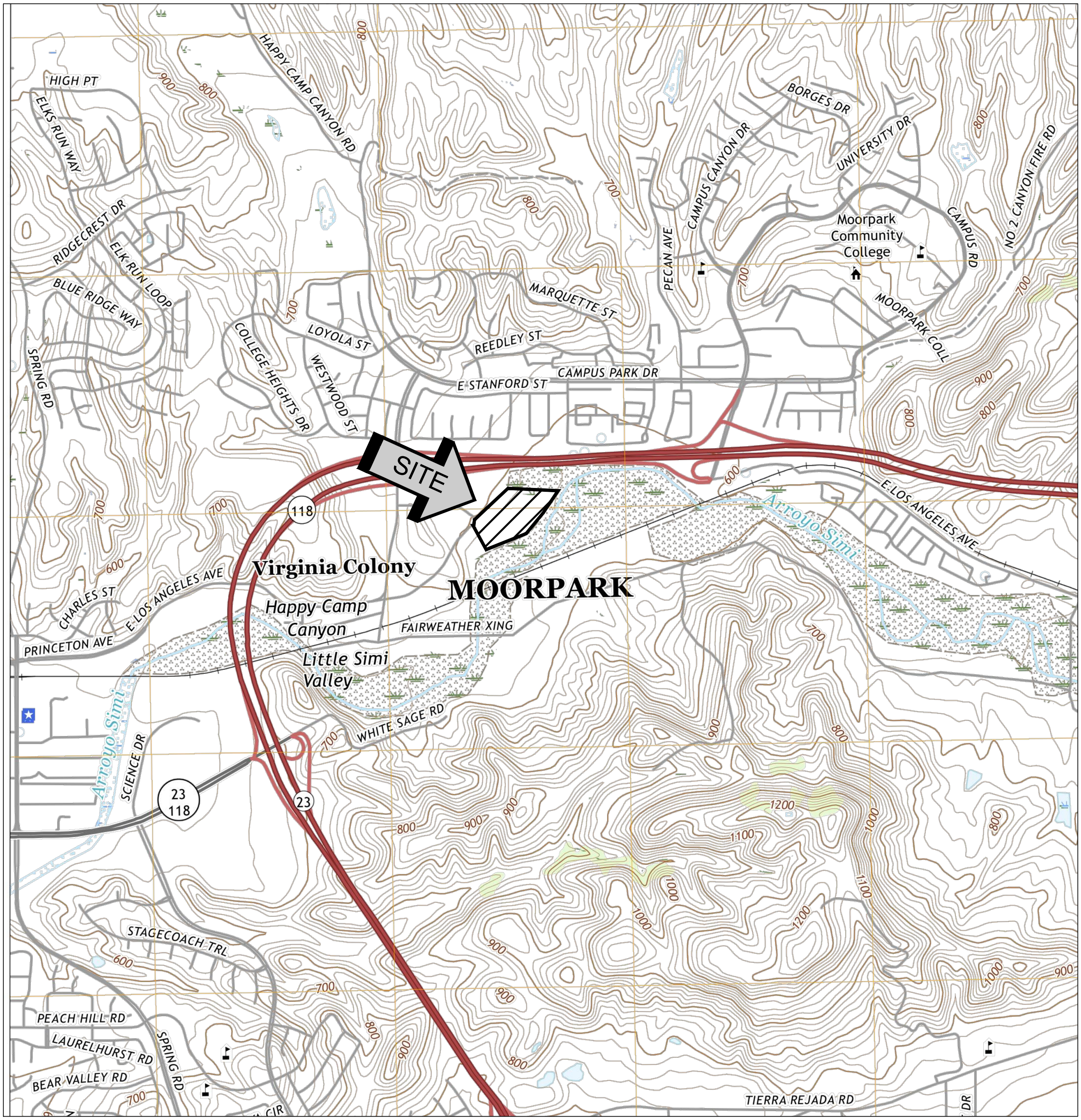
Ryan Bremer
Staff Geologist

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
- Trench Logs (2 pages)
- Boring Logs and Legend (3 pages)
- Infiltration Test Results Spreadsheets (3 pages)
- Grain Size Distribution Graphs (3 pages)



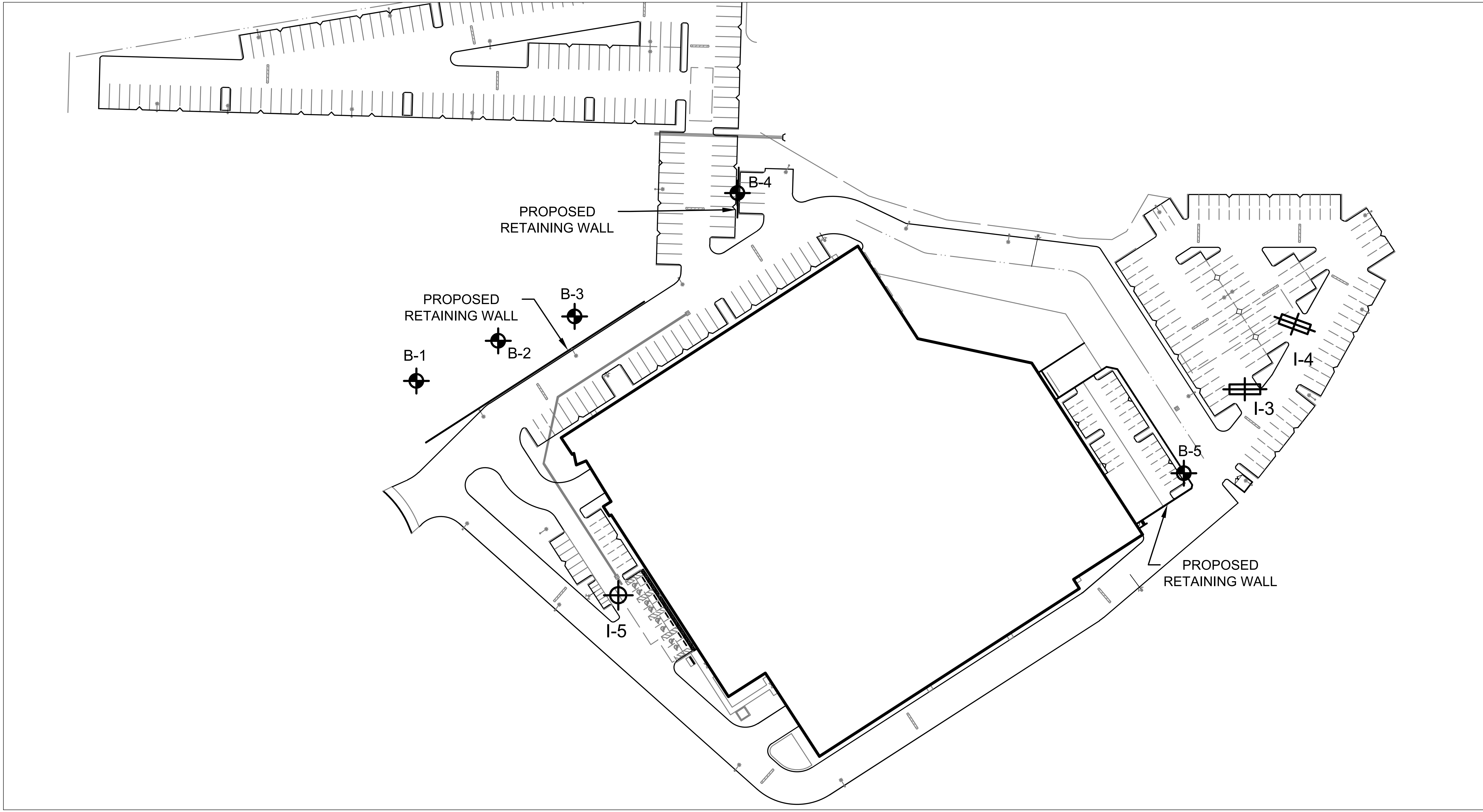
SOURCE: USGS TOPOGRAPHIC MAP OF THE SIMI VALLEY QUADRANGLE, VENTURA COUNTY, CALIFORNIA, 2018

SITE LOCATION MAP

PROPOSED RETAINING WALL

MOORPARK, CALIFORNIA

SCALE: 1" = 2000'	SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
DRAWN: JAH CHKD: RGT	
SCG PROJECT 20G190-2	
PLATE 1	



GEOTECHNICAL LEGEND

- APPROXIMATE BORING INFILTRATION TEST LOCATION
- APPROXIMATE TRENCH INFILTRATION TEST LOCATION
- APPROXIMATE BORING LOCATION (SCG PROJECT NO. 20G190-1)

NOTE: CONCEPTUAL SITE PLAN PROVIDED BY JENSEN DESIGN AND SURVEY, INC.

INFILTRATION TEST LOCATION PLAN

PROPOSED RETAINING WALL

MOORPARK, CALIFORNIA

SCALE: 1" = 80'	SOUTHERN CALIFORNIA GEOTECHNICAL
DRAWN: JAH CHKD: PM	
SCG PROJECT 20G190-2	
PLATE 2	

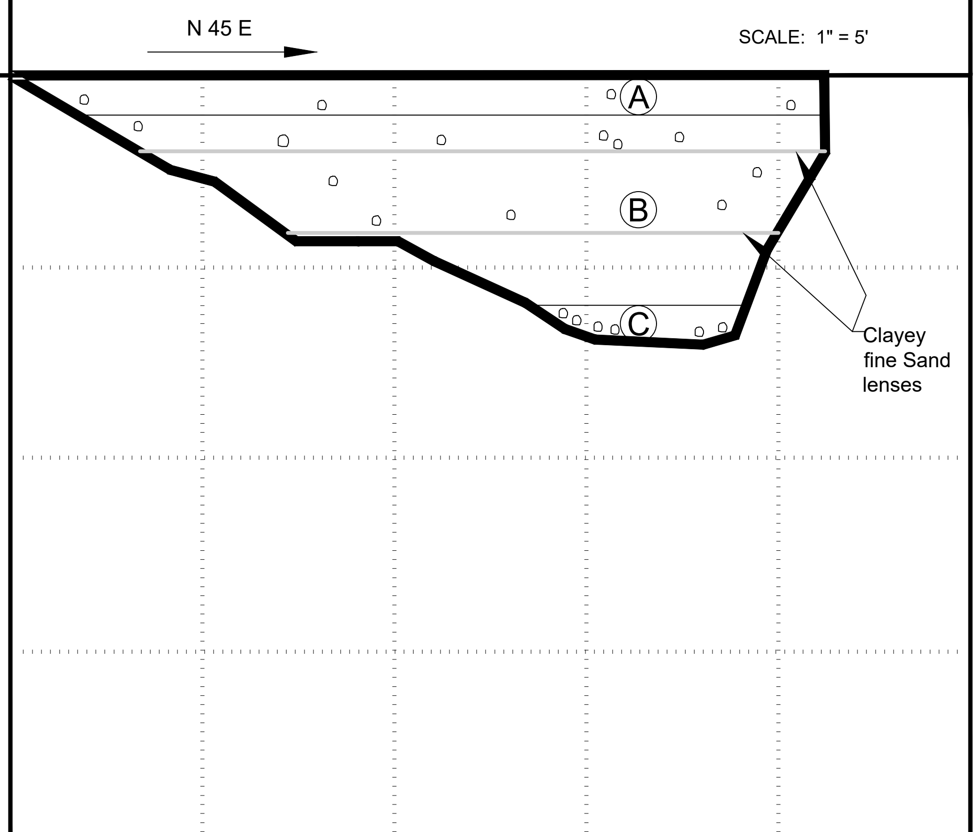
SOUTHERN CALIFORNIA GEOTECHNICAL

TRENCH NO. I-3

JOB NO.: 20G190-2	EQUIPMENT USED: Backhoe	WATER DEPTH: Dry
PROJECT: Proposed Retaining Wall	LOGGED BY: Ryan Bremer	SEEPAGE DEPTH: Dry
LOCATION: Moorpark, California	ORIENTATION: N 45 E	READINGS TAKEN: At Completion
DATE: 9/1/2020	ELEVATION: 589.5 feet msl	

DEPTH	SAMPLE	DRY DENSITY (PCF)	MOISTURE (%)	EARTH MATERIALS DESCRIPTION
				A: FILL: Light Brown Silty fine Sand, little medium to coarse Sand, little fine to coarse Gravel, occasional Cobbles, trace fine root fibers, medium dense to dense-dry B: FILL: Light Yellow Brown Silty fine Sand, little fine to coarse Gravel, trace to little medium to coarse Sand, trace to little Clay nodules, occasional cobbles, dense-damp @ 2 to 4 feet - 4 to 5-inch Red Brown Clayey fine Sand lenses, trace fine to coarse Gravel, little medium to coarse Sand
5	b		5	C: ALLUVIUM: Gray Brown Silty fine to coarse Sand, trace to little Clay nodules, some fine to coarse Gravel, occasional Cobbles, dense-damp
				Trench Terminated @ 7 feet Bottom of Trench Elevation: 582.5 feet msl
10				
15				

GRAPHIC REPRESENTATION



KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

TRENCH LOG

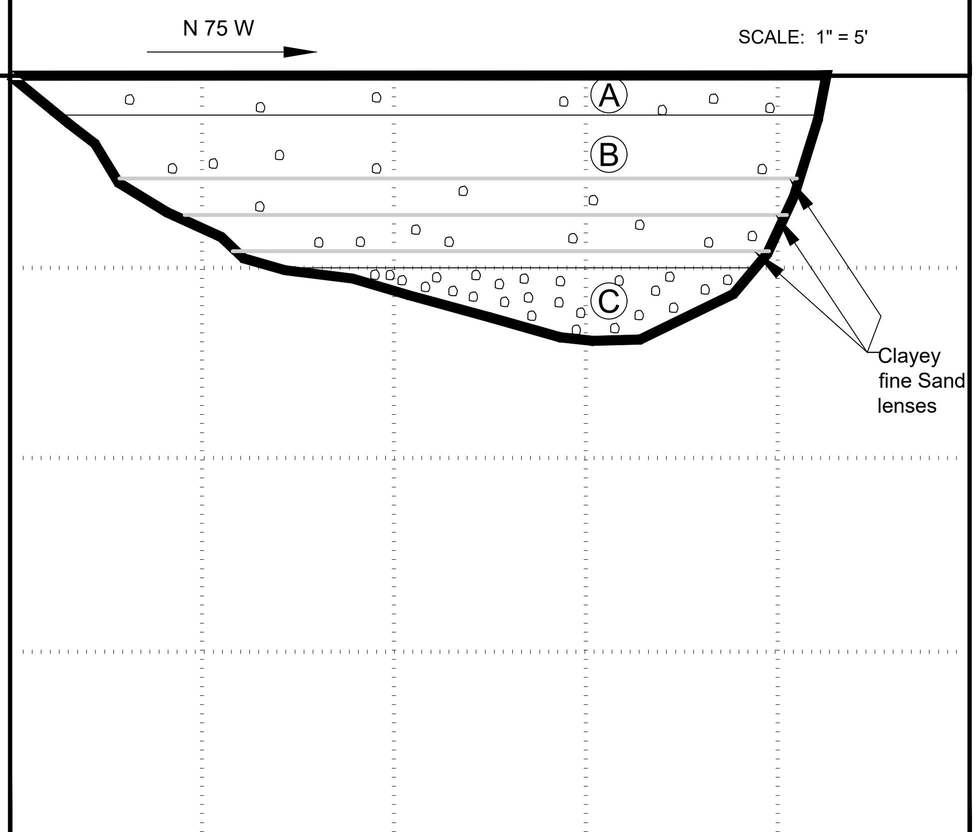
SOUTHERN CALIFORNIA GEOTECHNICAL

TRENCH NO. I-4

JOB NO.: 20G190-2	EQUIPMENT USED: Backhoe	WATER DEPTH: Dry
PROJECT: Proposed Retaining Wall	LOGGED BY: Ryan Bremer	SEEPAGE DEPTH: Dry
LOCATION: Moorpark, California	ORIENTATION: N 75 W	READINGS TAKEN: At Completion
DATE: 9/1/2020	ELEVATION: 589.0 feet msl	

DEPTH	SAMPLE	DRY DENSITY (PCF)	MOISTURE (%)	EARTH MATERIALS DESCRIPTION
				A: FILL: Yellow Brown Silty fine to medium Sand, little coarse Sand, trace Clay, trace fine to coarse Gravel, trace trash debris, mottled, medium dense to dense-dry
				B: FILL: Yellow Brown Silty fine to medium Sand, trace Clay, trace fine to coarse Gravel, occasional Cobbles, dense-damp @ 3 to 6.5 feet, 4 to 5-inch Red Brown Clayey fine Sand lenses with occasional Cobbles and little fine to coarse Gravel
5				
	b		3	C: ALLUVIUM: Gray Brown Silty fine to coarse Sand, some fine to coarse Gravel, extensive Cobbles, little Clay nodules, dense-dry to damp
				Trench Terminated @ 7 feet Bottom of Trench Elevation: 582.0
10				
15				

GRAPHIC REPRESENTATION

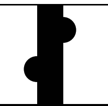
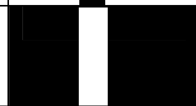
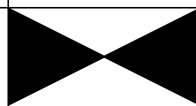
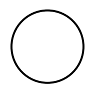
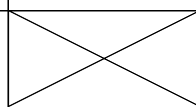
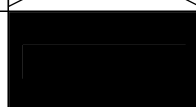
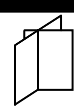


KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER
(RELATIVELY UNDISTURBED)

TRENCH LOG

PLATE B-2

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		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
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-5

JOB NO.: 20G190-2	DRILLING DATE: 9/1/20	WATER DEPTH: Dry
PROJECT: Proposed Retaining Wall	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: ---
LOCATION: Moorpark, California	LOGGED BY: Jamie Hayward	READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: 590 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					3± inches Asphaltic Concrete with no discernable Aggregate Base							
	X	28			FILL Yellow Brown Silty fine Sand, trace medium to coarse Sand, trace fine Gravel, trace Iron oxide staining, medium dense-damp		4					
	X	50			POSSIBLE FILL: Yellow Brown Silty fine Sand, little medium to coarse Sand, little Clay nodules, trace fine Gravel, dense to very dense-damp		5					
5												
	X	64					6					
					Boring Terminated at 7'							

TBL 20G190-2.GPJ SOCALGEO.GDT 9/28/20

INFILTRATION CALCULATIONS

Project Name	Proposed Retaining Wall
Project Location	Moorpark, California
Project Number	20G190-2
Engineer	Ryan Bremer

Infiltration Test No: I-3

Constants	Diameter (ft)	Area (ft^2)	Area (cm^2)
Inner	1	0.79	730
Anlr. Spac	2	2.36	2189

*Note: The infiltration rate was calculated based on current time interval

				Flow Readings				Infiltration Rates			
Test Interval		Time (hr)	Interval **Elapsed** (min)	Inner Ring (ml)	Ring Flow (cm^3)	Annular Ring (ml)	Space Flow (cm^3)	Inner Ring* (cm/hr)	Annular Space* (cm/hr)	Inner Ring* (in/hr)	Annular Space* (in/hr)
1	Initial	9:48 AM	20	0	2150	1000	9000	8.84	12.33	3.48	4.86
	Final	10:08 AM	**20**	2150		10000					
2	Initial	10:09 AM	20	0	2100	0	3200	8.63	4.39	3.40	1.73
	Final	10:29 AM	**41**	2100		3200					
3	Initial	10:30 AM	20	0	2100	0	3800	8.63	5.21	3.40	2.05
	Final	10:50 AM	**62**	2100		3800					
4	Initial	10:51 AM	20	0	2100	0	3700	8.63	5.07	3.40	2.00
	Final	11:11 AM	**83**	2100		3700					

INFILTRATION CALCULATIONS

Project Name	Proposed Retaining Wall
Project Location	Moorpark, California
Project Number	20G190-2
Engineer	Ryan Bremer

Infiltration Test No	I-4

Constants			
	Diameter (ft)	Area (ft^2)	Area (cm^2)
Inner	1	0.79	730
Anlr. Spac	2	2.36	2189

*Note: The infiltration rate was calculated based on current time interval

Test Interval		Time (hr)	Interval **Elapsed** (min)	Flow Readings: Inner Ring (ml)	Ring Flow (cm^3)	Annular Ring (ml)	Space Flow (cm^3)	Infiltration Rates: Inner Ring* (cm/hr)	Annular Space* (cm/hr)	Inner Ring* (in/hr)	Annular Space* (in/hr)
1	Initial	12:20 PM	20	0	2050	0	6200	8.43	8.50	3.32	3.35
	Final	12:40 PM	**20**	2050		6200					
2	Initial	12:40 PM	20	0	2000	0	6400	8.22	8.77	3.24	3.45
	Final	1:00 PM	**40**	2000		6400					
3	Initial	1:00 PM	20	0	2000	0	6500	8.22	8.91	3.24	3.51
	Final	1:20 PM	**60**	2000		6500					
4	Initial	1:20 PM	20	0	2000	0	6300	8.22	8.63	3.24	3.40
	Final	1:40 PM	**80**	2000		6300					

INFILTRATION CALCULATIONS

Project Name	Proposed Retaining Wall
Project Location	Moorpark, CA
Project Number	20G190-2
Engineer	Jose Zuniga

Test Hole Diameter	8.00	(in)
Test Depth	7.10	(ft)

Infiltration Test Hole	I-5

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Preadjusted Percolation Rate Q (min/in)	Preadjusted Percolation Rate Q (in/hr)	Reduction Factor	Infiltration Rate Q (in/hr)	
1	Initial	8:28 AM	25.0	4.00	1.15	1.8	33.1	8.6	3.9	Infiltration Testing
	Final	8:53 AM		5.15						
2	Initial	8:58 AM	25.0	3.90	1.15	1.8	33.1	8.9	3.7	
	Final	9:23 AM		5.05						
3	Initial	9:31 AM	10.0	4.00	0.49	1.7	35.3	9.6	3.7	
	Final	9:41 AM		4.49						
4	Initial	9:45 AM	10.0	4.00	0.45	1.9	32.4	9.6	3.4	
	Final	9:55 AM		4.45						
5	Initial	10:01 AM	10.0	4.00	0.42	2.0	30.2	9.7	3.1	
	Final	10:11 AM		4.42						
6	Initial	10:17 AM	10.0	4.00	0.42	2.0	30.2	9.7	3.1	
	Final	10:27 AM		4.42						
7	Initial	10:32 AM	10.0	4.00	0.41	2.0	29.5	9.7	3.0	
	Final	10:42 AM		4.41						
8	Initial	10:49 AM	10.0	4.00	0.40	2.1	28.8	9.7	3.0	
	Final	10:59 AM		4.40						

Infiltration Rate = (Preadjusted Percolation Rate)/(Reduction Factor)
Reduction Factor (Rf) = ((2d-Δd)/(DIA))+1

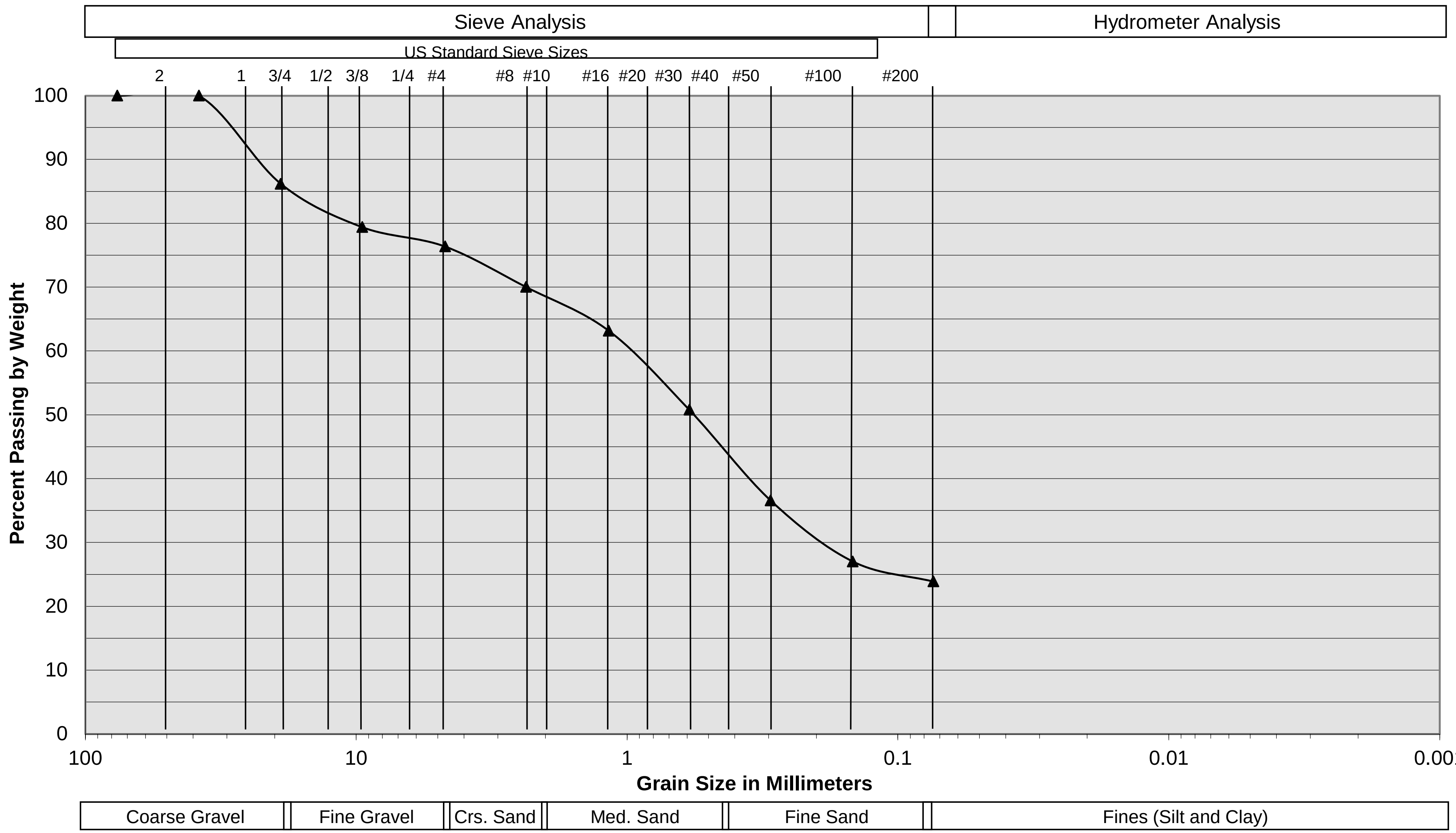
Where:

d = Initial Water Depth

Δd = Average/Final Water Level Drop

DIA = Diameter of the boring (in.)

Grain Size Distribution



Sample Description	I-3 @ 7'
Soil Classification	Gray Brown Silty fine to coarse Sand, trace to little Clay, some fine to coarse Gravel, occasional Cobbles

Proposed Retaining Wall
Moorpark, California
Project No. 20G190-2
PLATE C- 1

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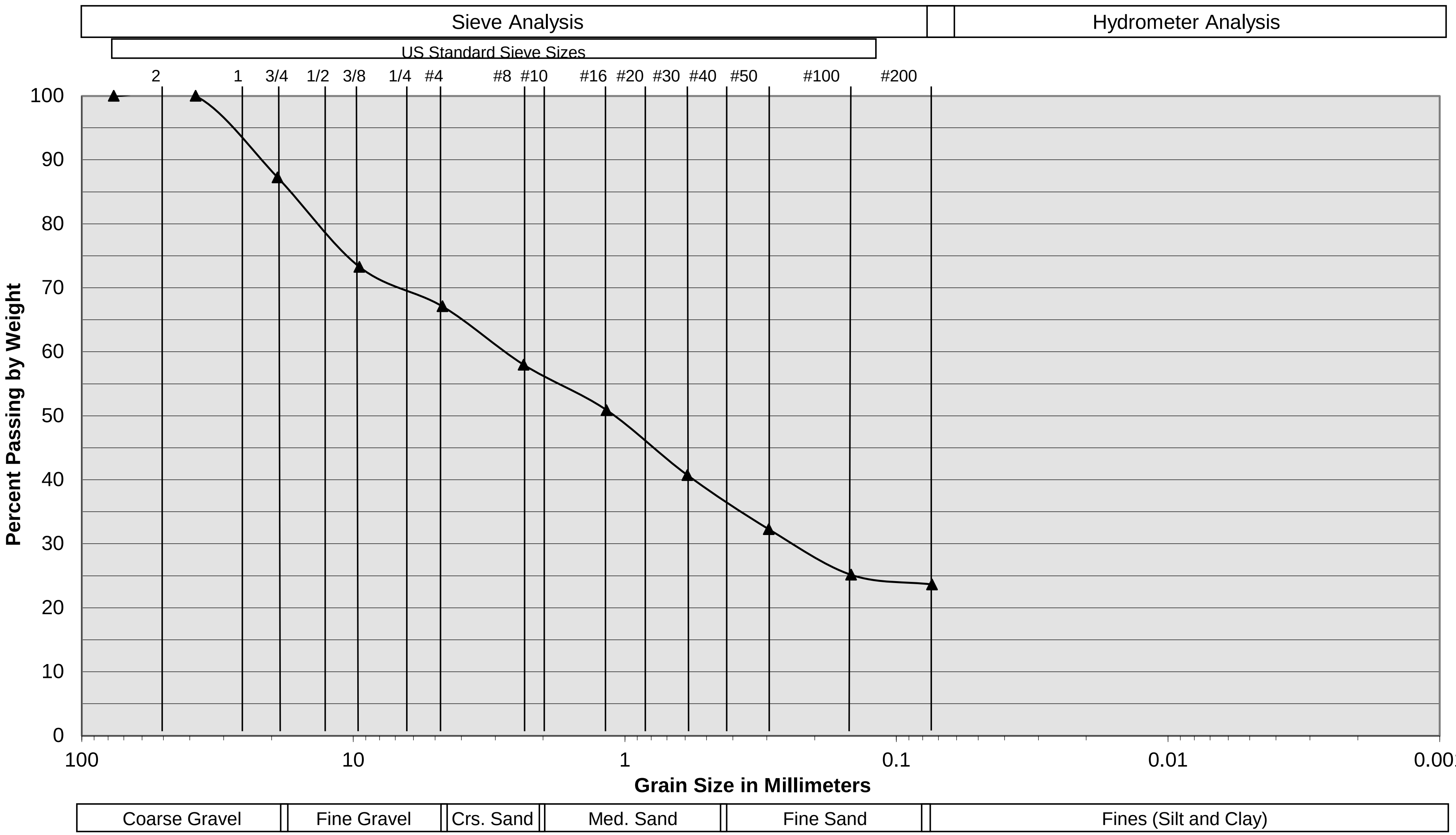
Grain Size Distribution



Sample Description	I-4 @ 7'
Soil Classification	Gray Brown Silty fine to coarse Sand, some fine to coarse Gravel, little Clay nodules, extensive Cobbles

Proposed Retaining Wall
Moorpark, California
Project No. 20G190-2
PLATE C- 2

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Grain Size Distribution

Sample Description	I-5 @ 7'
Soil Classification	Yellow Brown Silty fine Sand, little medium to coarse Sand, little Clay nodules, trace fine Gravel

Proposed Retaining Wall
Moorpark, California
Project No. 20G190-2
PLATE C- 3

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