April 10, 2018

Duke Realty
200 Spectrum Center Drive, Suite 1600
Irvine, California 92618

Attention: Mr. Adam Schmid
Development Services Manager

Project No.: **17G218-2**

Subject: **Results of Infiltration Testing**
Proposed Commercial/Industrial Building
NWC Alabama Street and Palmetto Avenue
San Bernardino County, California

Reference: Geotechnical Investigation, Proposed Commercial/Industrial Building, NWC Alabama Street and Palmetto Avenue, San Bernardino, California, prepared by Southern California Geotechnical, Inc. (SCG) for Duke Realty, SCG Project No. 17G218-1, dated December 15, 2017.

Dear Mr. Schmid:

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 Change Order 17G218-CO, dated March 9, 2018. The scope of services included site reconnaissance, subsurface exploration, field testing, and engineering analysis to determine the infiltration rates of the onsite soils. The infiltration testing was performed in general accordance with ASTM Test Method D-3385-03, Standard Test Method for Infiltration Rate of Soils in Field Using Double Ring Infiltrometer.

Site and Project Description

The subject site is located at the northwest corner of Palmetto Avenue and Alabama Street in an unincorporated portion of San Bernardino County near Redlands, California. The site is bounded to the north by a vacant lot, to the west by vacant land and a commercial/industrial building, to the south by Palmetto Avenue, and to the east by Alabama Street. The general location of the site is illustrated on the Site Location Map, included as Plate 1 of this report.

The site consists of several parcels, which total 56± acres in size. The majority of the site is vacant and undeveloped. The ground surface cover generally consists of exposed soil with moderate to dense native grass and weed growth, with several large trees located throughout the site. The northern region of the western parcel is developed with a small farm house. The majority of this parcel is currently being utilized for agricultural purposes. Ground surface cover

in this area and surrounding the farm house consists of exposed soil with moderate to dense native grass, weed growth, and planted crops. Multiple small to large trees are located throughout this parcel. A natural drainage course is present in the northeast corner of the overall site that is 20± feet lower in elevation than the adjacent site grades.

Detailed topographic information was provided by Albert A. Webb Associates (Webb). The site topography generally ranges from 1199± feet mean sea level (msl) in northwestern corner of the site to 1226± feet msl in the southeastern corner of the site. However, the bottom of the existing drainage course, located at the northeast corner of the site is at an elevation of 1186± feet msl. With the exception of the drainage course, the site topography slopes gently downward to the northwest at a gradient of 1± percent. In the northeast corner of the site, the site grades slope downward into the drainage course at an approximate inclination of ½h:1v (horizontal to vertical).

Proposed Development

A conceptual site plan, prepared by Albert A. Webb Associates (Webb), was provided to our office by the client. The plan indicates that the subject site will be developed with one (1) new commercial/industrial building. The proposed building will be 1,192,671± ft^2 in size, located in the central area of the site. The building will be constructed in a cross-dock configuration with loading docks along both the east and west sides of the building. The building will be surrounded by asphaltic concrete pavements for automobile parking and drive lanes and Portland cement concrete pavements for the loading dock areas. Several landscape planters and concrete flatwork are expected to be included throughout the site. The site plan does not indicate any proposed development within the existing drainage course located at the northeast corner of the site.

We understand that the proposed development will include on-site infiltration to dispose of storm water. Based on an Infiltration Test Exhibit, prepared by Webb, the project civil engineer, the proposed infiltration system will consist of two (2) detention/infiltration basins. The basins will be located in the northwest corner and in the southwest region of the site. The bottoms of the basins will extend to depths ranging from 4 to 7± feet below the existing site grades.

Previous Study

Southern California Geotechnical, Inc. (SCG) previously performed a geotechnical investigation at the subject site, referenced above. As a part of this study, ten (10) borings were advanced to depths of 5 to 30± feet below existing site grades. Artificial fill soils were encountered at the ground surface at one of the boring locations, extending to a depth of 6½± feet below the existing site grades. The fill soils generally consisted of very loose to loose fine to medium sands with varying amounts of coarse sand, silt, and fine gravel content. Native alluvial soils were encountered beneath the fill soils and at the ground surface at the remaining boring locations. The near-surface alluvium possessed a disturbed appearance and was identified as disturbed alluvium. These soils generally consisted of very loose to loose silty fine sands to fine sandy silts with trace amounts of fine root fibers. Undisturbed native alluvial soils were encountered at all of the boring locations, beneath the disturbed alluvium or fill soils, extending to the maximum depth explored of 30± feet below existing site grades. The native alluvium generally consisted of very loose to medium dense silty fine sands, fine sandy silts, and fine to medium sands. Free

water was not encountered during the drilling of 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 is considered to have existed at a depth in excess of 30± feet at the time of the subsurface exploration. The approximate locations of the ten (10) borings from the previous study are indicated on the Infiltration Test Location Plan, included as Plate 2 of this report.

Subsurface Exploration

Scope of Exploration

The subsurface exploration consisted of five (5) backhoe excavated trenches, extending to depths of 4 to 7± feet below existing site grades. The trenches were logged during excavation by a member of our staff. The approximate locations of the infiltration trenches (identified as I-1 through I-5) are indicated on the Infiltration Test Location Plan, enclosed as Plate 2 of this report.

Geotechnical Conditions

Native alluvium was encountered at the ground surface at all of the infiltration trench locations, extending to at least the maximum depth explored of 7± feet below existing site grades. The alluvial soils generally consist of very loose to medium dense silty fine sands and fine sandy silts with varying amounts of medium to coarse sands. The Trench Logs, which illustrate the conditions encountered at the infiltration trench locations, are included with this report.

Groundwater

As part of our research, we reviewed available groundwater data in order to determine the historic high groundwater level for the site. Recent water level data was obtained from the California Department of Water Resources website, http://www.water.ca.gov/waterdatalibrary/. The nearest monitoring well is located in the southeastern region of the subject site. Water level readings within this monitoring well indicates high groundwater levels of 130± feet (April 2005) below the ground surface.

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-3385-03, 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. The rings were driven into the soil using a ten-pound sledge hammer. The soil surrounding the wall of the infiltration rings was only slightly disturbed during the driving process.

Infiltration Testing Procedure

Infiltration testing was performed at all five (5) of the test locations. 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 using constant-head 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. A cap was placed over the rings to minimize the evaporation of water during the tests.

The schedule for readings was determined based on the observed soil type at the base of each backhoe-excavated trench. Based on the existing soils at each infiltration test location, the volumetric measurements were made at increments of 10 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.

The infiltration rates for the infiltration tests are calculated in centimeters per hour and then converted to inches per hour. The rates are summarized below:

Infiltration Test No.	Test Elevation (msl)	Soil Description	Infiltration Rate (inches/hour)
I-1	1198.5	Silty fine Sand	3.6
I-2	1198	Silty fine Sand, trace medium Sand	3.1
I-3	1198.5	Silty fine Sand	3.2
I-4	1195	Silty fine Sand	3.7
I-5	1197	Silty fine Sand, little medium Sand	2.5

Laboratory Testing

In-situ Moisture Content

The moisture contents for selected soil samples collected from 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 Trench Logs.

Grain Size Analysis

The grain size distribution of selected soils collected from the base of each infiltration test trench has 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 at the end of this report.

Design Recommendations

A total of five (5) infiltration tests were performed at the subject site. As noted above, the calculated infiltration rates at the infiltration test locations range from 2.5 to 3.7 inches per hour. The primary factors affecting the infiltration rates are the varying relative densities and silt content of the encountered soils, which vary at different depths and locations at the subject site.

Based on the infiltration test results, we recommend a design infiltration rate of 3 inches per hour be used for the proposed detention/infiltration basin located in the northwest corner of the site and a design rate of 2.5 inches per hour for the basin located in the southwest region of the subject site.

The design of the proposed storm water infiltration systems should be performed by the project civil engineer, in accordance with the County of San Bernardino guidelines. However, 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 rate. **It is recommended that the project civil engineer apply an appropriate factor of safety. The infiltration rates 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 five (5) discrete locations and the overall infiltration rates of the storm water infiltration systems could vary considerably.

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 ASTM Test Method D-3385-03 standard and are considered valid for the time and place of the actual test. Changes in soil moisture content will affect these infiltration rates. 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 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 areas could potentially be

damaged due to saturation of 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, 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 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 rates 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 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 trench 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.

Scott McCann
Staff Scientist

Gregory K. Mitchell, GE 2364
Principal Engineer

Distribution: (1) Addressee

Enclosures: Plate 1 - Site Location Map
Plate 2 - Infiltration Test Location Plan
Trench Logs (5 pages)
Infiltration Test Results Spreadsheets (5 pages)
Grain Size Distribution Graphs (5 pages)

SOURCE: SAN BERNARDINO COUNTY
THOMAS GUIDE, 2013

SITE LOCATION MAP

PROPOSED COMMERCIAL/INDUSTRIAL BUILDING

SAN BERNARDINO COUNTY, CALIFORNIA

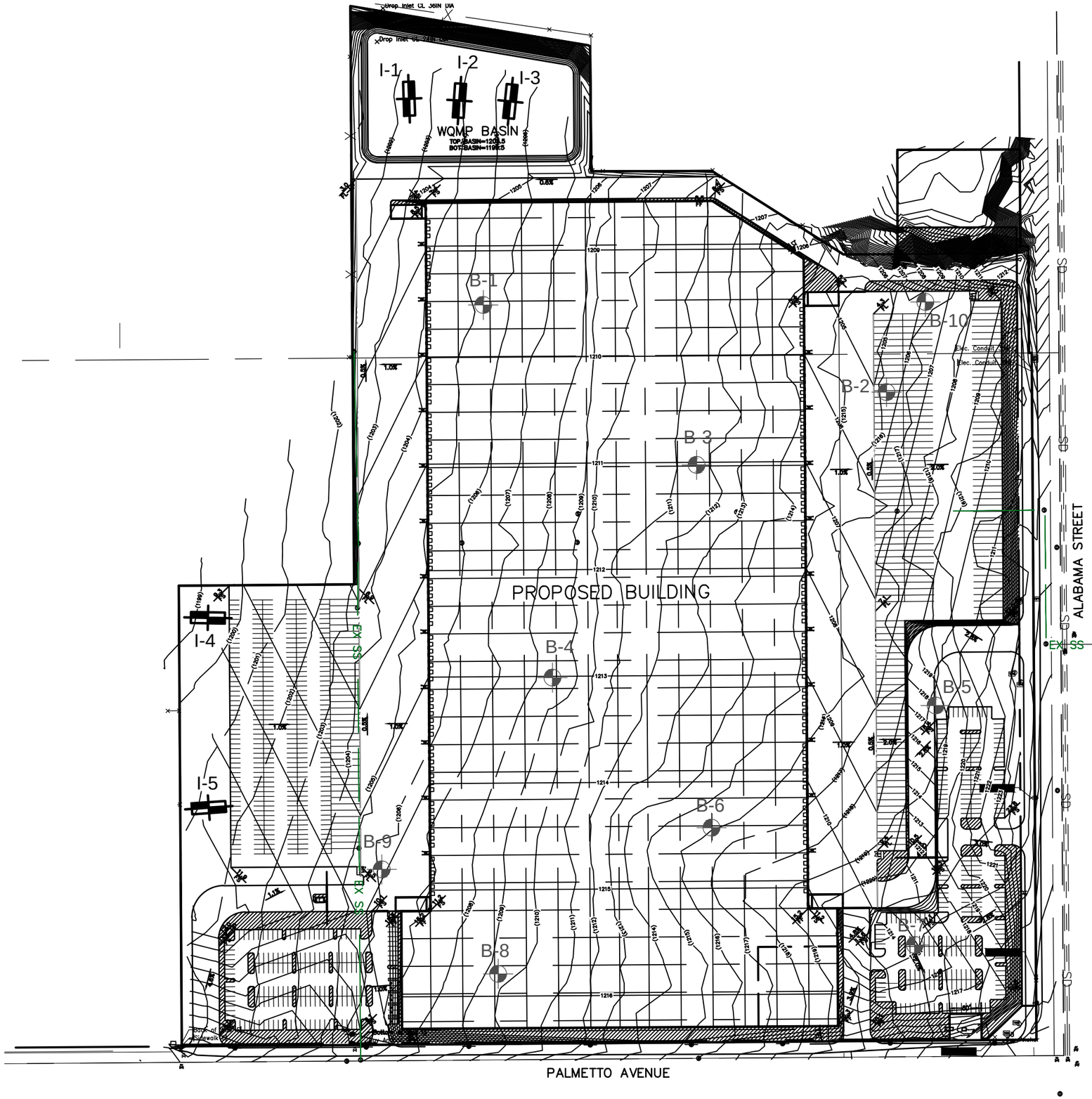
SCALE: 1" = 2400'

DRAWN: SM
CHKD: RGT

SCG PROJECT
17G218-2

PLATE 1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



NORTH
SoCalGeo

GEOTECHNICAL LEGEND

APPROXIMATE INFILTRATION TEST LOCATION

APPROXIMATE BORING LOCATION FROM PREVIOUS STUDY (SCG PROJECT NO. 17G218-1)

NOTE: BASE MAP PREPARED BY ALBERT A. WEBB ASSOCIATES

INFILTRATION TEST LOCATION PLAN

PROPOSED COMMERCIAL/INDUSTRIAL BUILDING

SAN BERNARDINO COUNTY, CALIFORNIA

SCALE: 1" = 200'	
DRAWN: SM CHKD: GKM	
SCG PROJECT 17G218-2	
PLATE 2	

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL

SOUTHERN CALIFORNIA GEOTECHNICAL

TRENCH NO. I-1

JOB NO.: 17G218-2

PROJECT: Proposed Commercial/Industrial Building

LOCATION: San Bernardino County, CA

DATE: 3-20-2018

EQUIPMENT USED: Backhoe

LOGGED BY: Scott McCann

ORIENTATION: S 2 E

TOP OF TRENCH ELEVATION: 1202.5 feet msl

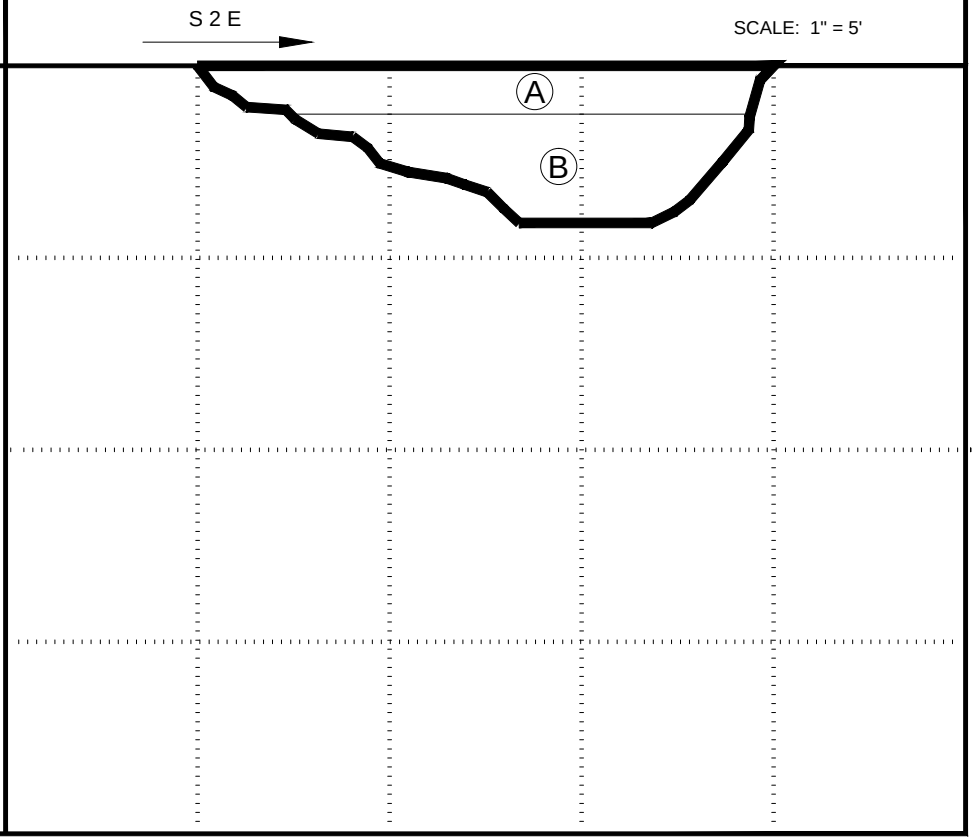
WATER DEPTH: Dry

SEEPAGE DEPTH: Dry

READINGS TAKEN: At Completion

DEPTH	SAMPLE	DRY DENSITY (PCF)	MOISTURE (%)	EARTH MATERIALS DESCRIPTION
				A: ALLUVIUM: Gray Brown Silty fine Sand, little medium Sand, trace coarse Sand, abundant fine root fibers, loose - moist
	b		4	B: ALLUVIUM: Light Gray Brown Silty fine Sand, trace fine root fibers, loose to medium dense - damp
5				Trench Terminated @ 4 feet Bottom of Trench Elevation: 1198.5 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

PLATE B-1

SOUTHERN CALIFORNIA GEOTECHNICAL

TRENCH NO. I-2

JOB NO.: 17G218-2

PROJECT: Proposed Commercial/Industrial Building

LOCATION: San Bernardino County, CA

DATE: 3-20-2018

EQUIPMENT USED: Backhoe

LOGGED BY: Scott McCann

ORIENTATION: N 4 E

TOP OF TRENCH ELEVATION: 1204 feet msl

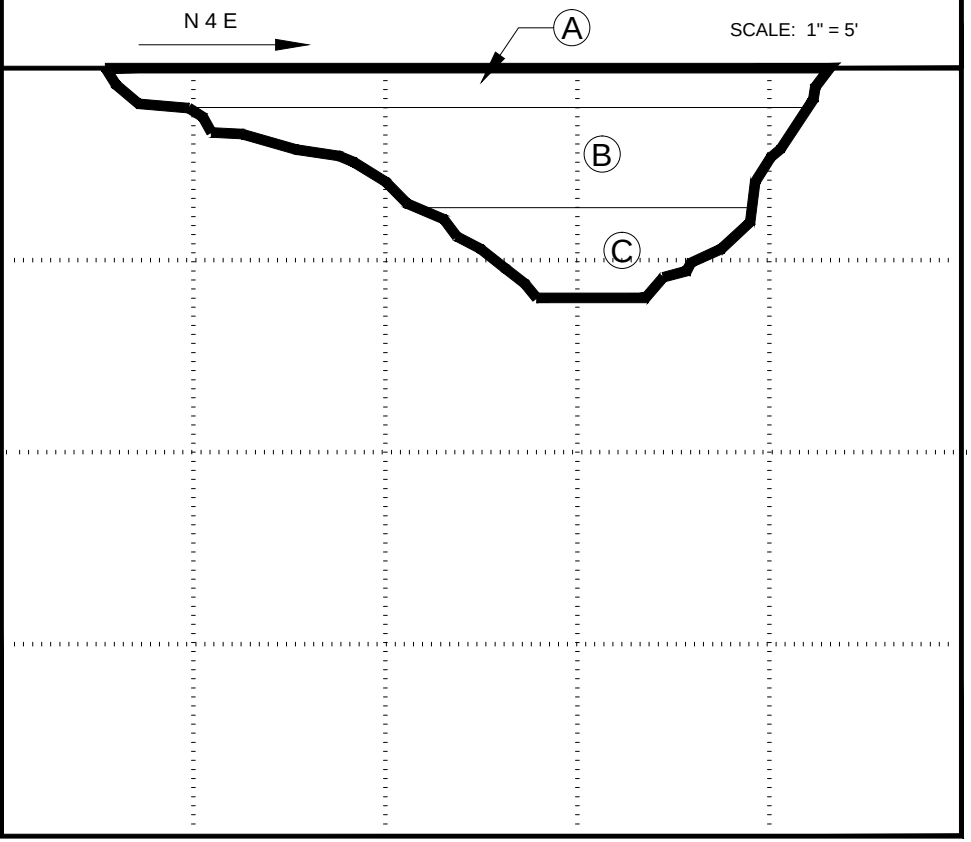
WATER DEPTH: Dry

SEEPAGE DEPTH: Dry

READINGS TAKEN: At Completion

DEPTH	SAMPLE	DRY DENSITY (PCF)	MOISTURE (%)	EARTH MATERIALS DESCRIPTION
5	b		5	A: ALLUVIUM: Gray Brown Silty fine Sand, little medium Sand, trace coarse Sand, abundant fine root fibers, loose - moist B: ALLUVIUM: Light Gray Brown Silty fine Sand, trace fine root fibers, loose to medium dense - damp C: ALLUVIUM: Light Gray Brown Silty fine Sand, trace medium Sand, medium dense - damp Trench Terminated @ 6 feet Bottom of Trench Elevation: 1198 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

PLATE B-2

SOUTHERN CALIFORNIA GEOTECHNICAL

TRENCH NO. I-3

JOB NO.: 17G218-2

PROJECT: Proposed Commercial/Industrial Building

LOCATION: San Bernardino County, CA

DATE: 3-20-2018

EQUIPMENT USED: Backhoe

LOGGED BY: Scott McCann

ORIENTATION: N 6 E

TOP OF TRENCH ELEVATION: 1205.5 feet msl

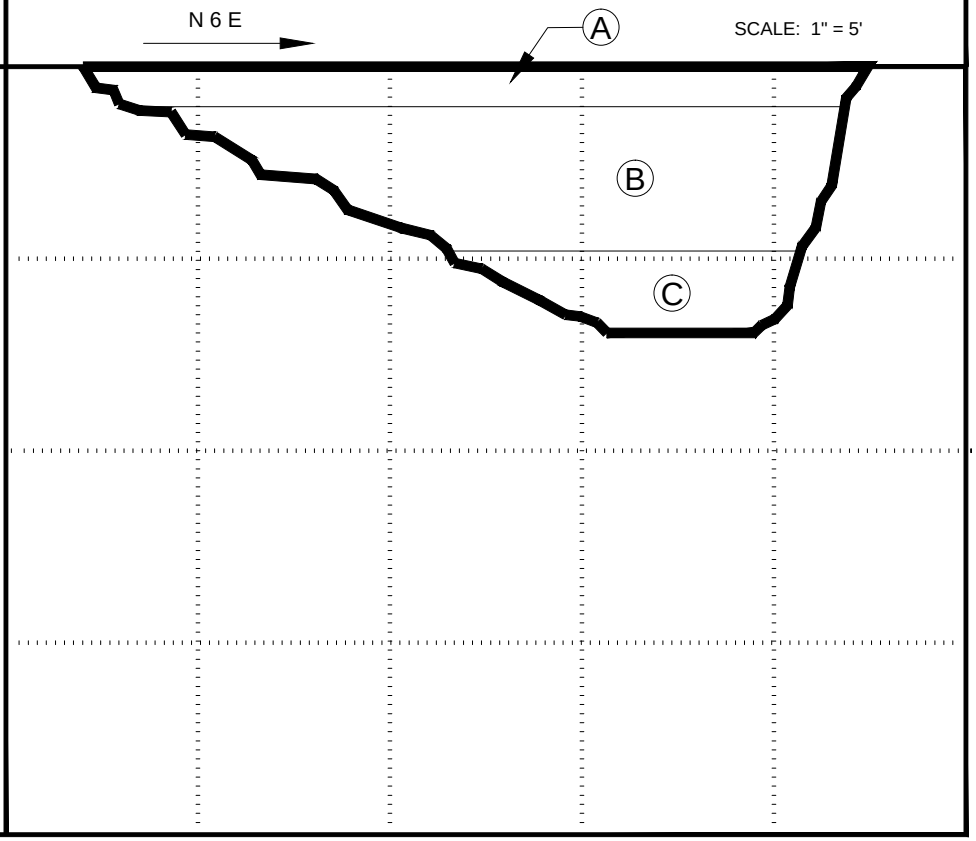
WATER DEPTH: Dry

SEEPAGE DEPTH: Dry

READINGS TAKEN: At Completion

DEPTH	SAMPLE	DRY DENSITY (PCF)	MOISTURE (%)	EARTH MATERIALS DESCRIPTION
				A: ALLUVIUM: Gray Brown Silty fine Sand, little medium to coarse Sand, abundant fine root fibers, loose - damp to moist
				B: ALLUVIUM: Light Gray Brown Silty fine Sand, trace medium Sand, trace fine root fibers, medium dense - damp
5				C: ALLUVIUM: Light Gray Brown Silty fine Sand, medium dense - damp
	b		5	
				Trench Terminated @ 7 feet Bottom of Trench Elevation: 1198.5 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

PLATE B-3

SOUTHERN CALIFORNIA GEOTECHNICAL

TRENCH NO. I-4

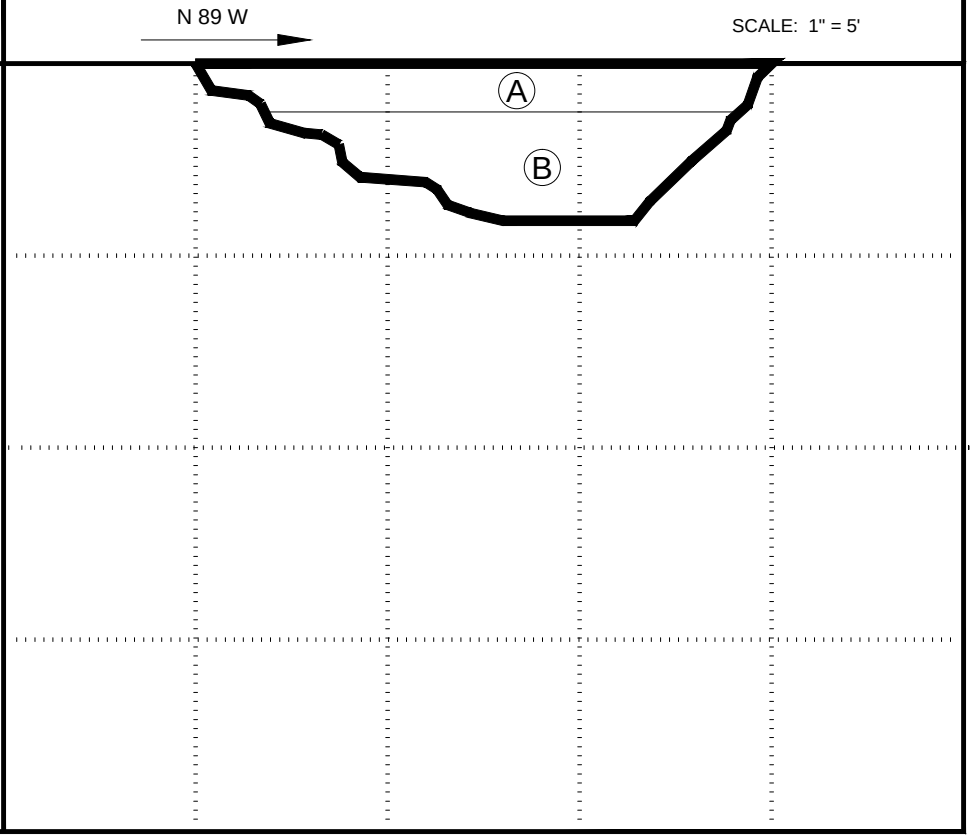
JOB NO.: 17G218-2
PROJECT: Proposed Commercial/Industrial Building
LOCATION: San Bernardino County, CA
DATE: 3-20-2018

EQUIPMENT USED: Backhoe
LOGGED BY: Scott McCann
ORIENTATION: N 89 W
TOP OF TRENCH ELEVATION: 1199 feet msl

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

DEPTH	SAMPLE	DRY DENSITY (PCF)	MOISTURE (%)	EARTH MATERIALS DESCRIPTION
				A: ALLUVIUM: Gray Brown Silty fine Sand, little medium Sand, trace coarse Sand, abundant fine root fibers, very loose - damp to moist
	b		3	B: ALLUVIUM: Light Gray Brown Silty fine Sand, trace fine root fibers, loose to medium dense - dry to damp
5				Trench Terminated @ 4 feet Bottom of Trench Elevation: 1195 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

PLATE B-4

SOUTHERN CALIFORNIA GEOTECHNICAL

TRENCH NO. I-5

JOB NO.: 17G218-2

PROJECT: Proposed Commercial/Industrial Building

LOCATION: San Bernardino County, CA

DATE: 3-20-2018

EQUIPMENT USED: Backhoe

LOGGED BY: Scott McCann

ORIENTATION: S 86 W

TOP OF TRENCH ELEVATION: 1201 feet msl

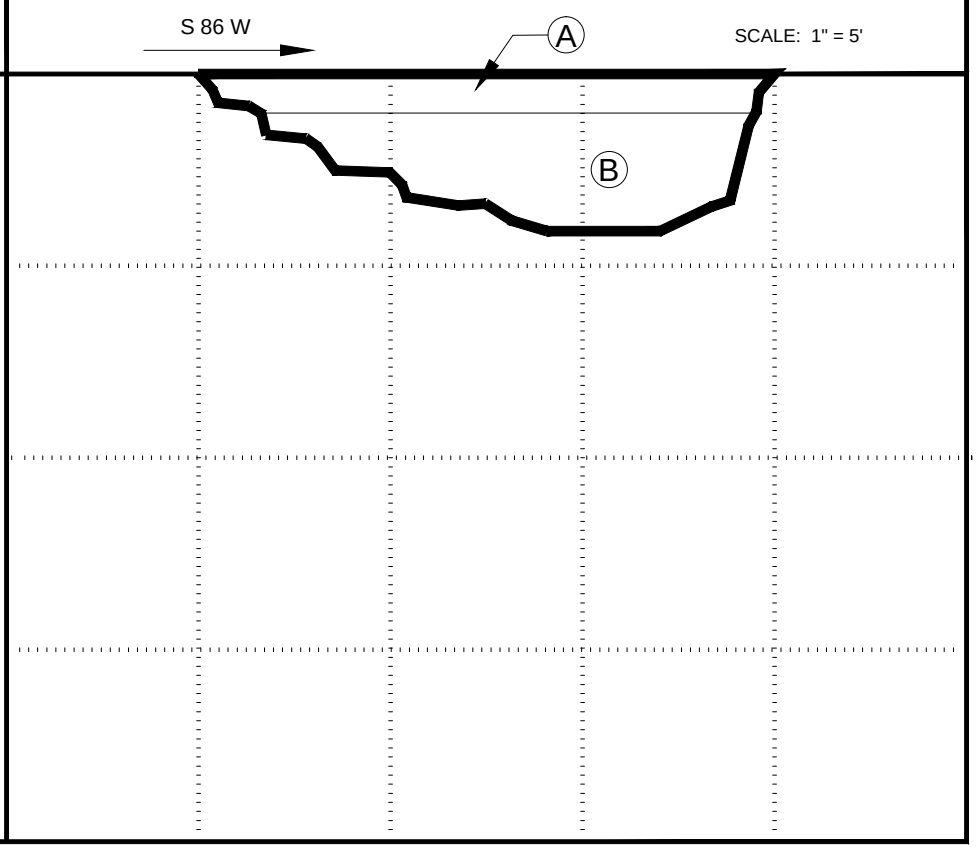
WATER DEPTH: Dry

SEEPAGE DEPTH: Dry

READINGS TAKEN: At Completion

DEPTH	SAMPLE	DRY DENSITY (PCF)	MOISTURE (%)	EARTH MATERIALS DESCRIPTION
				A: ALLUVIUM: Gray Brown Silty fine Sand to fine Sandy Silt, little medium Sand, trace coarse Sand, abundant fine root fibers, loose - moist
	b		2	B: ALLUVIUM: Light Gray Brown Silty fine Sand, little medium Sand, trace fine root fibers, medium dense - dry to damp
5				Trench Terminated @ 4 feet Bottom of Trench Elevation: 1197 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

PLATE B-5

INFILTRATION CALCULATIONS

Project Name	Proposed Commercial/Industrial Building
Project Location	San Bernardino County, CA
Project Number	17G218-2
Engineer	Scott McCann

Infiltration Test No: I-1

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)	Flow Readings: Ring Flow (cm^3)	Flow Readings: Annular Ring (ml)	Flow Readings: Space Flow (cm^3)	Infiltration Rates: Inner Ring* (cm/hr)	Infiltration Rates: Annular Space* (cm/hr)	Infiltration Rates: Inner Ring* (in/hr)	Infiltration Rates: Annular Space* (in/hr)
1	Initial	10:45 AM	10	250	1750	1000	5450	14.39	14.94	5.67	5.88
	Final	10:55 AM	**10**	2000		6450					
2	Initial	10:56 AM	10	300	1400	200	4500	11.51	12.33	4.53	4.86
	Final	11:06 AM	**21**	1700		4700					
3	Initial	11:07 AM	10	50	1250	0	4150	10.28	11.38	4.05	4.48
	Final	11:17 AM	**32**	1300		4150					
4	Initial	11:18 AM	10	50	1175	600	3900	9.66	10.69	3.80	4.21
	Final	11:28 AM	**43**	1225		4500					
5	Initial	11:29 AM	10	150	1125	500	3900	9.25	10.69	3.64	4.21
	Final	11:39 AM	**54**	1275		4400					
6	Initial	11:40 AM	10	200	1150	350	3850	9.46	10.55	3.72	4.15
	Final	11:50 AM	**65**	1350		4200					
7	Initial	11:51 AM	10	0	1125	200	3850	9.25	10.55	3.64	4.15
	Final	12:01 PM	**75**	1125		4050					

INFILTRATION CALCULATIONS

Project Name	Proposed Commercial/Industrial Building
Project Location	San Bernardino County, CA
Project Number	17G218-2
Engineer	Scott McCann

Infiltration Test No I-2

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)	Flow Readings: Ring Flow (cm^3)	Flow Readings: Annular Ring (ml)	Flow Readings: Space Flow (cm^3)	Infiltration Rates: Inner Ring* (cm/hr)	Infiltration Rates: Annular Space* (cm/hr)	Infiltration Rates: Inner Ring* (in/hr)	Infiltration Rates: Annular Space* (in/hr)
1	Initial	9:15 AM	10	300	1500	900	4600	12.33	12.61	4.86	4.96
	Final	9:25 AM	**10**	1800		5500					
2	Initial	9:26 AM	10	200	1175	600	4250	9.66	11.65	3.80	4.59
	Final	9:36 AM	**21**	1375		4850					
3	Initial	9:37 AM	10	0	1075	250	4100	8.84	11.24	3.48	4.42
	Final	9:47 AM	**32**	1075		4350					
4	Initial	9:48 AM	10	50	1000	100	3950	8.22	10.83	3.24	4.26
	Final	9:58 AM	**43**	1050		4050					
5	Initial	9:59 AM	10	350	950	50	3850	7.81	10.55	3.08	4.15
	Final	10:09 AM	**54**	1300		3900					
6	Initial	10:10 AM	10	250	925	500	3850	7.61	10.55	2.99	4.15
	Final	10:20 AM	**65**	1175		4350					
7	Initial	10:21 AM	10	200	950	350	3850	7.81	10.55	3.08	4.15
	Final	10:31 AM	**75**	1150		4200					

INFILTRATION CALCULATIONS

Project Name	Proposed Commercial/Industrial Building
Project Location	San Bernardino County, CA
Project Number	17G218-2
Engineer	Scott McCann

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

Test Interval		Time (hr)	Interval **Elapsed** (min)	Flow Readings: Inner Ring (ml)	Flow Readings: Ring Flow (cm^3)	Flow Readings: Annular Ring (ml)	Flow Readings: Space Flow (cm^3)	Infiltration Rates: Inner Ring* (cm/hr)	Infiltration Rates: Annular Space* (cm/hr)	Infiltration Rates: Inner Ring* (in/hr)	Infiltration Rates: Annular Space* (in/hr)
1	Initial	7:45 AM	10	450	1450	600	5400	11.92	14.80	4.69	5.83
	Final	7:55 AM	**10**	1900		6000					
2	Initial	7:56 AM	10	0	1225	200	4950	10.07	13.57	3.97	5.34
	Final	8:06 AM	**21**	1225		5150					
3	Initial	8:07 AM	10	200	1175	250	4700	9.66	12.88	3.80	5.07
	Final	8:17 AM	**32**	1375		4950					
4	Initial	8:18 AM	10	100	1050	350	4550	8.63	12.47	3.40	4.91
	Final	8:28 AM	**43**	1150		4900					
5	Initial	8:29 AM	10	150	1025	900	4450	8.43	12.20	3.32	4.80
	Final	8:39 AM	**54**	1175		5350					
6	Initial	8:40 AM	10	150	1025	1100	4400	8.43	12.06	3.32	4.75
	Final	8:50 AM	**65**	1175		5500					
7	Initial	8:51 AM	10	300	1000	400	4300	8.22	11.79	3.24	4.64
	Final	9:01 AM	**75**	1300		4700					

INFILTRATION CALCULATIONS

Project Name	Proposed Commercial/Industrial Building
Project Location	San Bernardino County, CA
Project Number	17G218-2
Engineer	Scott McCann

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)	Flow Readings: Ring Flow (cm^3)	Flow Readings: Annular Ring (ml)	Flow Readings: Space Flow (cm^3)	Infiltration Rates: Inner Ring* (cm/hr)	Infiltration Rates: Annular Space* (cm/hr)	Infiltration Rates: Inner Ring* (in/hr)	Infiltration Rates: Annular Space* (in/hr)
1	Initial	12:30 PM	10	250	1600	700	4850	13.16	13.29	5.18	5.23
	Final	12:40 PM	**10**	1850		5550					
2	Initial	12:41 PM	10	0	1325	800	3900	10.90	10.69	4.29	4.21
	Final	12:51 PM	**21**	1325		4700					
3	Initial	12:52 PM	10	0	1225	450	3850	10.07	10.55	3.97	4.15
	Final	1:02 PM	**32**	1225		4300					
4	Initial	1:03 PM	10	0	1175	300	3900	9.66	10.69	3.80	4.21
	Final	1:13 PM	**43**	1175		4200					
5	Initial	1:14 PM	10	125	1175	650	3750	9.66	10.28	3.80	4.05
	Final	1:24 PM	**54**	1300		4400					
6	Initial	1:25 PM	10	1350	1150	4300	3650	9.46	10.01	3.72	3.94
	Final	1:35 PM	**65**	2500		7950					
7	Initial	1:36 PM	10	2550	1150	8150	3600	9.46	9.87	3.72	3.89
	Final	1:46 PM	**75**	3700		11750					

INFILTRATION CALCULATIONS

Project Name	Proposed Commercial/Industrial Building
Project Location	San Bernardino County, CA
Project Number	17G218-2
Engineer	Scott McCann

Infiltration Test No: I-5

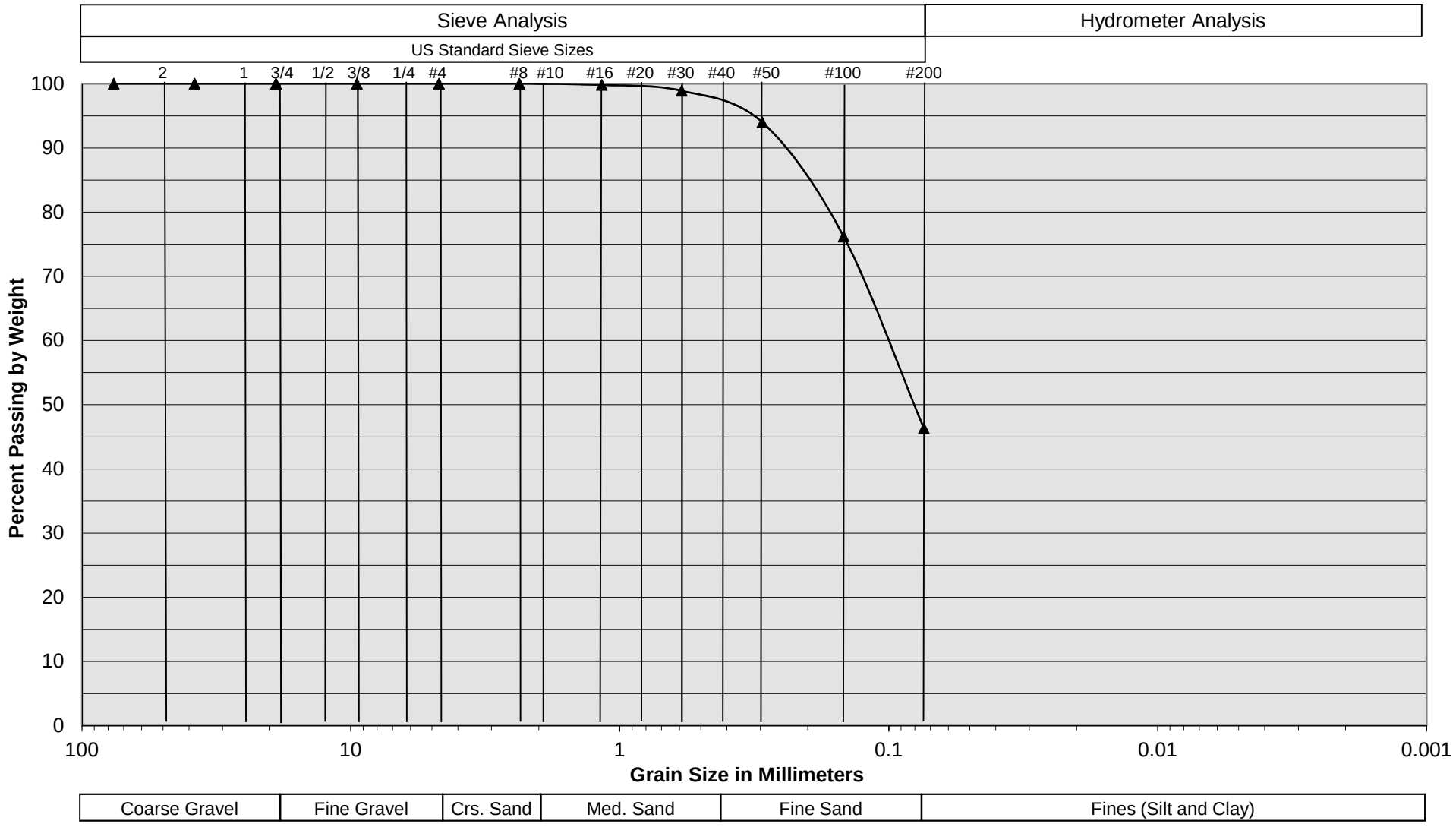
Constants

	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)	Flow Readings: Ring Flow (cm^3)	Flow Readings: Annular Ring (ml)	Flow Readings: Space Flow (cm^3)	Infiltration Rates: Inner Ring* (cm/hr)	Infiltration Rates: Annular Space* (cm/hr)	Infiltration Rates: Inner Ring* (in/hr)	Infiltration Rates: Annular Space* (in/hr)
1	Initial	2:10 PM	10	250	1400	900	4400	11.51	12.06	4.53	4.75
	Final	2:20 PM	**10**	1650		5300					
2	Initial	2:21 PM	10	50	950	100	3850	7.81	10.55	3.08	4.15
	Final	2:31 PM	**21**	1000		3950					
3	Initial	2:32 PM	10	50	825	300	3700	6.78	10.14	2.67	3.99
	Final	2:42 PM	**32**	875		4000					
4	Initial	2:43 PM	10	900	825	4100	3350	6.78	9.18	2.67	3.62
	Final	2:53 PM	**43**	1725		7450					
5	Initial	2:54 PM	10	50	800	300	3350	6.58	9.18	2.59	3.62
	Final	3:04 PM	**54**	850		3650					
6	Initial	3:05 PM	10	900	800	3900	3400	6.58	9.32	2.59	3.67
	Final	3:15 PM	**65**	1700		7300					
7	Initial	3:16 PM	10	1725	775	7450	3350	6.37	9.18	2.51	3.62
	Final	3:26 PM	**75**	2500		10800					

Grain Size Distribution

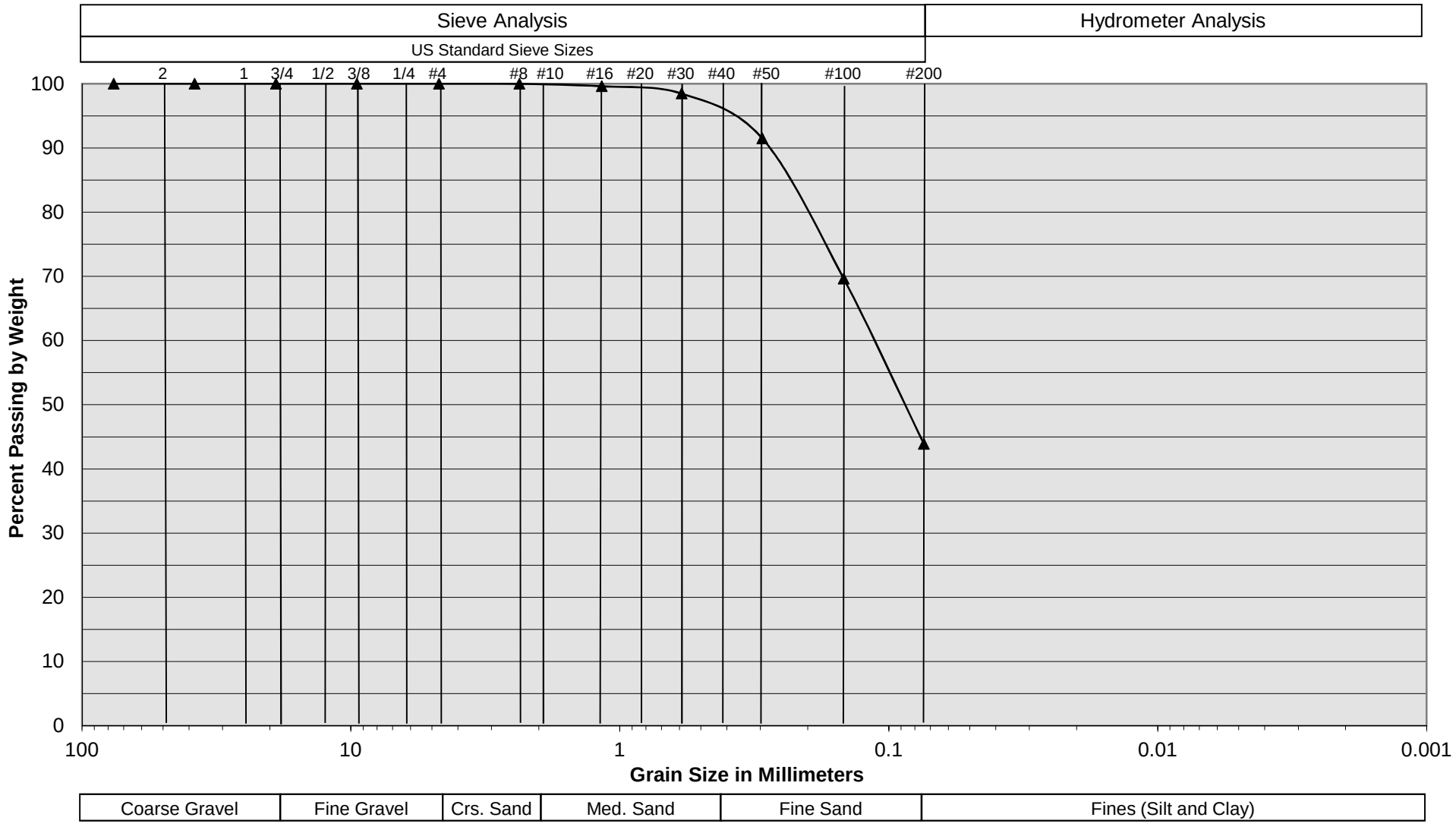


Sample Description	I-1 @ 4 feet
Soil Classification	Light Gray Brown Silty fine Sand

Proposed Commercial/Industrial Building
San Bernardino County, CA
Project No. 17G218-2
PLATE C-1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution

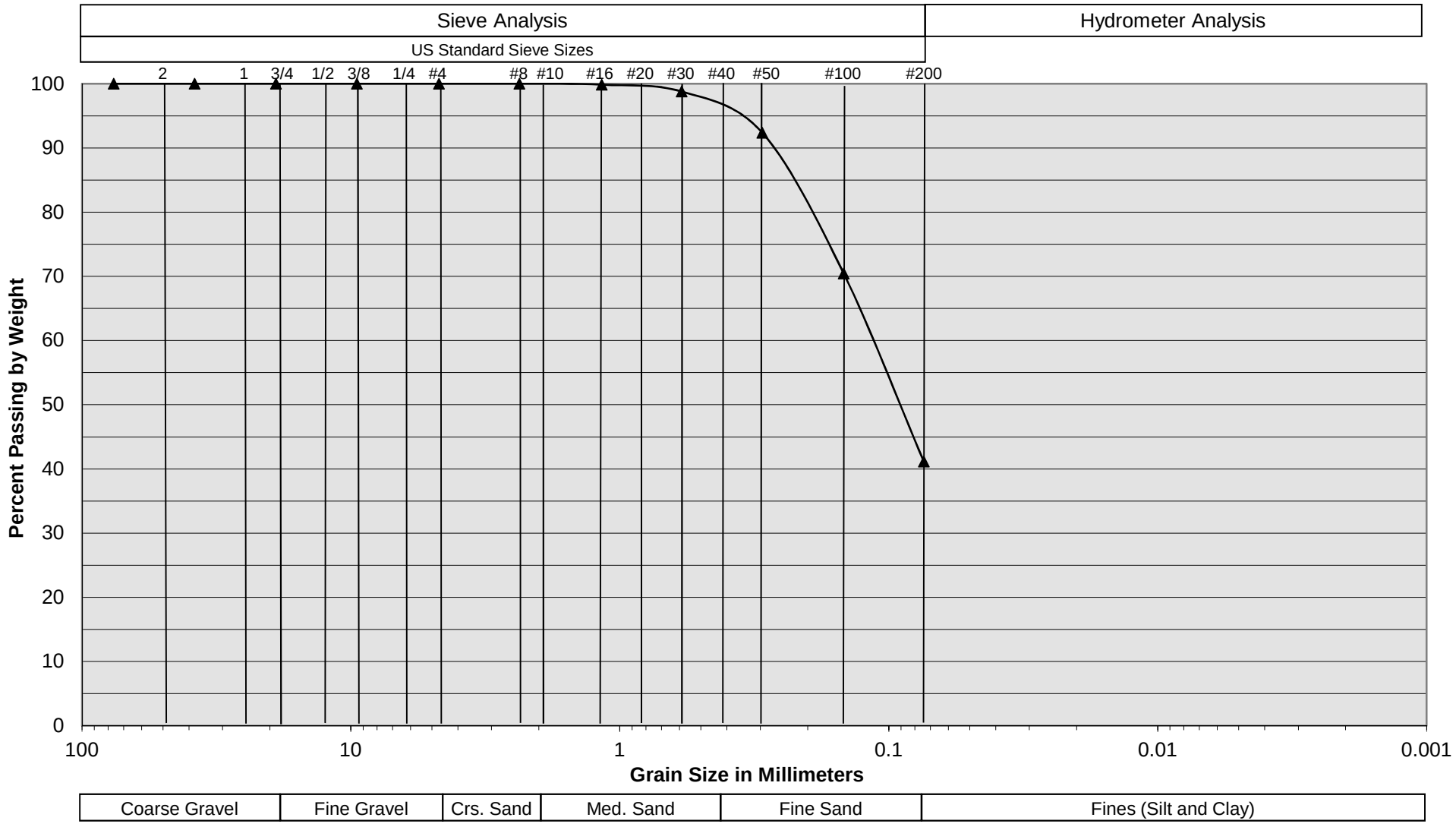


Sample Description	I-2 @ 6 feet
Soil Classification	Light Gray Brown Silty fine Sand, trace medium Sand

Proposed Commercial/Industrial Building
San Bernardino County, CA
Project No. 17G218-2
PLATE C-2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution

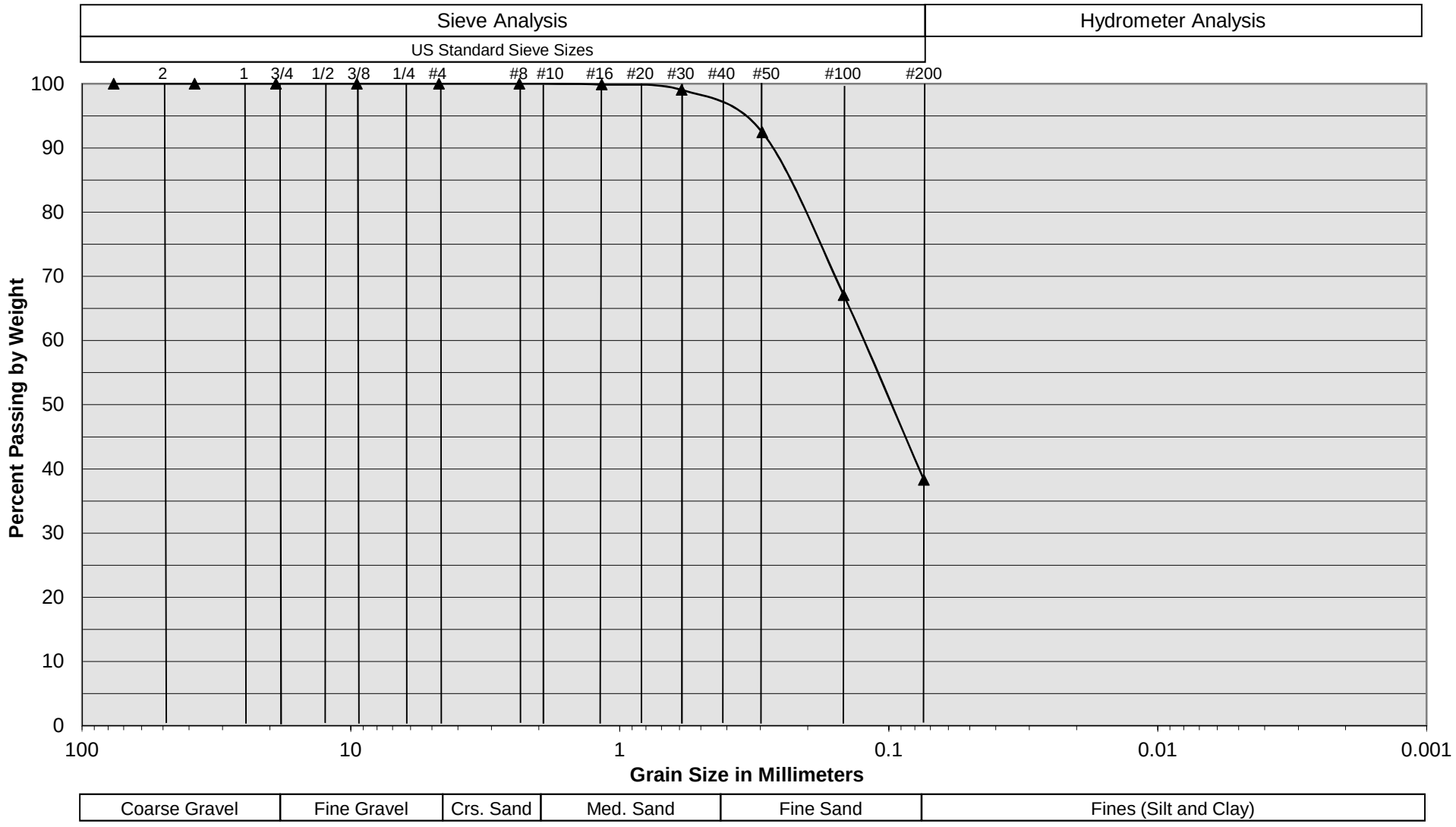


Sample Description	I-3 @ 7 feet
Soil Classification	Light Gray Brown Silty fine Sand

Proposed Commercial/Industrial Building
San Bernardino County, CA
Project No. 17G218-2
PLATE C-3

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution

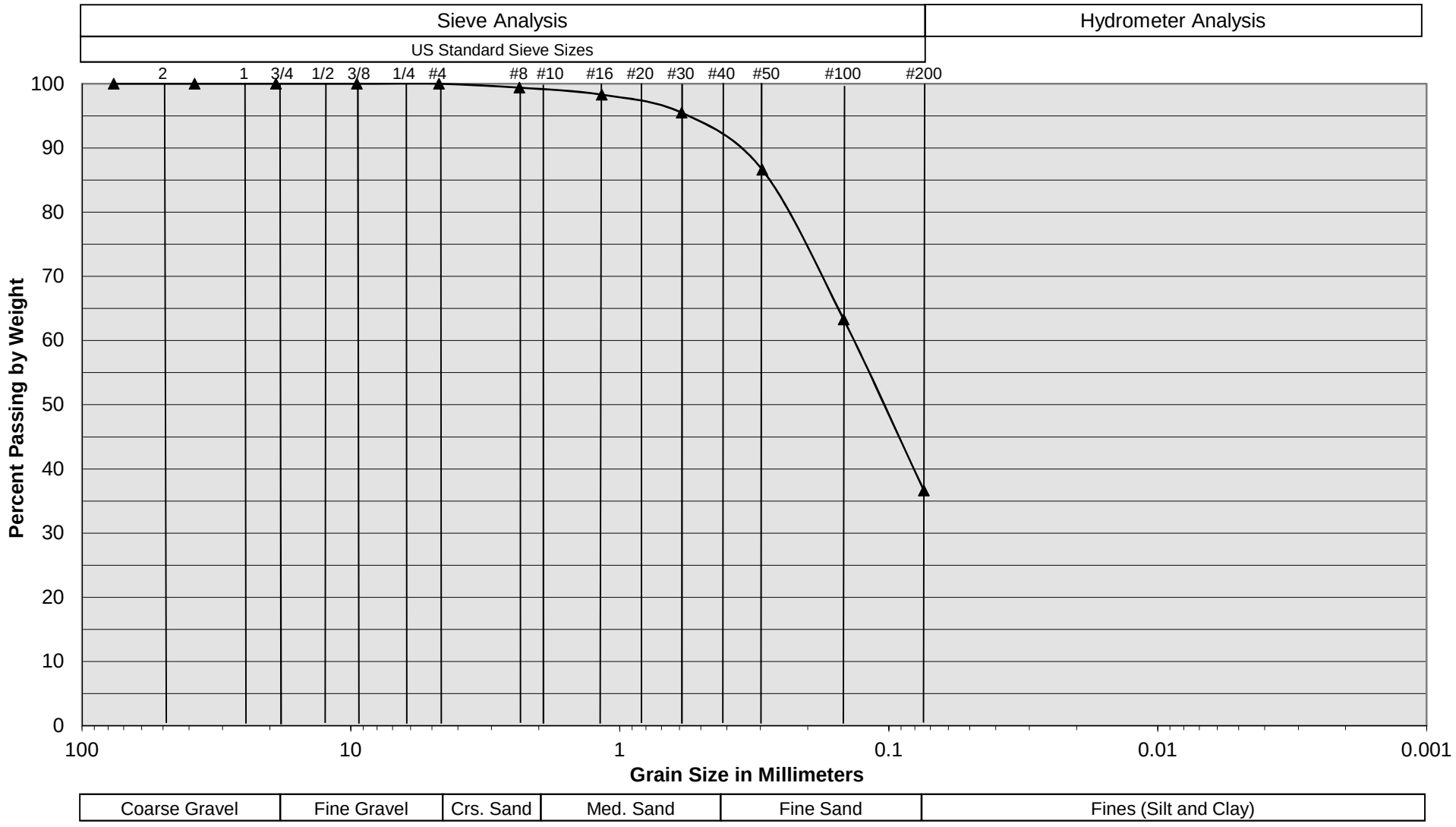


Sample Description	I-4 @ 4 feet
Soil Classification	Light Gray Brown Silty fine Sand

Proposed Commercial/Industrial Building
San Bernardino County, CA
Project No. 17G218-2
PLATE C-4

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution



Sample Description	I-5 @ 4 feet
Soil Classification	Light Gray Brown Silty fine Sand, little medium Sand

Proposed Commercial/Industrial Building
San Bernardino County, CA
Project No. 17G218-2
PLATE C-5

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation