SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

May 26, 2023 (revised February 16, 2024)

Fifth & Sterling, LLC,
a Delaware Limited Liability Company
3501 Jamboree Road, Suite 230
Newport Beach, California 92660

Attention: David Drake
Executive Vice President

Project No.: **23G142-2R**

Subject: **Results of Infiltration Testing**
Proposed Industrial Building
NEC 5th Street at Sterling Avenue
San Bernardino, California

Reference: Geotechnical Investigation, Proposed Industrial Building, NEC 5th Street at Sterling Avenue, San Bernardino, California, prepared by Southern California Geotechnical, Inc. (SCG) for Fifth & Sterling, LLC, SCG Project No. 23G142-1R, revision date February 16, 2024.

Mr. Drake:

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. 23P229, dated April 20, 2023. 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 infiltration testing was performed in general accordance with the guidelines published in the Riverside County – Low Impact Development BMP Design Handbook – Section 2.3 of Appendix A, prepared for the Riverside County Department of Environmental Health (RCDEH), dated December, 2013. The San Bernardino County standards defer to the guidelines published by the RCDEH.

Site and Project Description

The subject site is located at the southeast corner of 6th Street and Sterling Avenue in San Bernardino, California. The site is bounded to the north by 6th Street, to the east by Armada Towing and an RV and trailer storage lot, to the south by 5th Street, and to the west by Sterling Avenue. The general location of the site is illustrated on the Site Location Map, included as Plate 1 of this report.

The site consists of an irregularly shaped parcel, 25.12± acres in size. Based on our subsurface investigation, the site is currently vacant and undeveloped except for the remnants of a concrete slab in the northeastern area of the site and associated foundations. The ground surface cover throughout the site generally consists of exposed soil with sparse native grass and weed growth, and areas of scattered debris including trash and furniture.

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 level with an overall site topography gently sloping downward to the west at a gradient less than 1 percent with an elevation differential of approximately 14 feet.

Proposed Development

Based on a conceptual site plan prepared by RGA, the site will be developed with one (1) new industrial building. The new building will be 537,618± ft² in size and will be located in the north-central area of the site. Dock-high doors will be constructed along the southern building wall. The building is expected to be surrounded by asphaltic concrete pavements in the parking and drive lanes, Portland cement concrete pavements in the loading dock areas, and limited areas of landscape planters.

An infiltration testing location plan, prepared by Kimley Horn, the project civil engineer, was provided to our office. This plan indicates the proposed location of five (5) infiltration borings. Two are located in the southern half of the western-most area of the site, two are located in the proposed southern truck lot, and the final infiltration boring is located in the south-eastern area of the site. The south-eastern area of the site is proposed as a water quality basin.

Concurrent Study

SCG concurrently conducted 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 50± feet below the existing site grades. In addition to the borings, ten (10) trenches were excavated to depths of 8 to 10± feet below the existing site grades.

Artificial fill soils were encountered at the ground surface at all of the boring and trench locations, extending to depths of 2 to 5½± feet below the existing site grades. The fill soils generally consist of very loose to medium dense silty sands, sandy silts, and sands with varying amounts of silt and fine gravel. The fill soils possess a disturbed and mottled appearance resulting in the classification of artificial fill. Native alluvial soils were encountered beneath the artificial fill soils at all of the boring and trench locations, extending to at least the maximum depth explored of 50± feet below existing site grades. The near surface alluvium generally consists of medium dense to very dense silty sands, sandy silts, and poorly- to well-graded sands with varying amounts of fine to coarse gravel, cobbles, and boulders, extending to depths of 12 to 25± feet below existing site grades. Deeper alluvial soils consist of dense to very dense silty sands, sandy silts and poorly-graded sands with varying amounts of fine to coarse gravel, cobbles, and boulders, extending to the maximum depth explored of 50± feet below the site grades. Boring Nos. B-5 and B-7 encountered loose poorly- to well-graded sands at depths of 4½ to 5½± feet. Boring No. B-3 encountered a layer of loose silty sands and medium dense well-graded sands at a depth of 22± feet.

Groundwater

Free water was encountered during the drilling at a depth of 37± feet below existing site grade at Boring No. B-3. Delayed groundwater level readings were taken at Boring No. B-3 approximately two hours after completion. Water was measured in this boring at a depth of 37± feet. The remaining boreholes were dry at the completion of drilling. Very moist samples were also encountered at Boring No. B-1, at a depth of 42± feet and extending to the maximum depth explored of 50± feet. Based on the water level measurements and the moisture contents of the recovered soil samples, the static groundwater table is considered to have existed at a depth of 37± feet below existing site grades, at the time of the subsurface investigation.

A groundwater contour map titled, "Contour Map Showing Minimum Depth to Ground Water, San Bernardino Valley and Vicinity, 1973-1983," prepared by Carson and Matti in 1986 indicates that the minimum depth to groundwater at the site could be approximately 37 to 45 feet.

As a part of our research, we reviewed available groundwater data in order to determine groundwater levels for the site. Recent water level data was obtained from the California Department of Water Resources website, https://wdl.water.ca.gov/waterdatalibrary/. One monitoring well (Well No. 341072N1172350W001) is located approximately 1,675 feet southeast of the site. Water level readings within this monitoring well indicates a high groundwater level of 163± feet below the ground surface in April 2008.

Subsurface Exploration

Scope of Exploration

The subsurface exploration conducted for the infiltration testing consisted of five (5) infiltration test borings, advanced to a depth of 10± feet below the existing site grades. The infiltration borings were advanced using a truck-mounted drilling rig, equipped with 8-inch-diameter hollow-stem augers and were logged during drilling by a member of our staff. The approximate locations of the infiltration test borings (identified as I-1 through I-5) 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

Artificial fill soils were encountered at the ground surface at all of the infiltration boring locations, extending to a depth of 3½± feet below the existing site grades. The fill soils generally consist of loose silty sands with varying amounts of clay, and fine gravel. The fill soils possess a disturbed and mottled appearance resulting in the classification of artificial fill. The native alluvial soils were encountered beneath the artificial fill soils at all of the infiltration boring locations, extending to at least the maximum depth explored of 10± feet below existing site grades. Native alluvium consists of loose to very dense well-graded sands with varying amounts of fine to coarse gravel and cobbles. The Boring Logs, which illustrate the conditions encountered at the boring locations, are included with this report.

Infiltration Testing

As previously mentioned, the infiltration testing was performed in general accordance with the guidelines published in Riverside County – Low Impact Development BMP Design Handbook – Section 2.3 of Appendix A, which apply to San Bernardino County.

Pre-soaking

In accordance with the county infiltration standards for sandy soils, all infiltration test borings were pre-soaked 2 hours prior to the infiltration testing or until all of the water had percolated through the test holes. The pre-soaking process consisted of filling test borings by inverting a full 5-gallon bottle of clear water supported over each hole so that the water flow into the hole holds constant at a level at least 5 times the hole's radius above the gravel at the bottom of each hole. Pre-soaking was completed after all of the water had percolated through the test holes.

Infiltration Testing

Following the pre-soaking process of the infiltration test borings, SCG performed the infiltration testing. Each test hole was filled with water to a depth of at least 5 times the hole's radius above the gravel at the bottom of each test hole. In accordance with the Riverside County guidelines, in areas where "sandy soils" were encountered at the bottom of the infiltration test borings (where 6 inches of water infiltrated into the surrounding soils in less than 25 minutes for two (2) consecutive readings), readings were taken at 10-minute intervals for 1 hour at the test locations. The 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 from the test 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 as the design infiltration rate. The rates are summarized below:

Infiltration Test No.	**Depth (feet)**	**Soil Description**	**Measured Infiltration Rate (inches/hour)**
I-1	10	Fine to coarse Sand, trace Silt, little fine Gravel	12.6
I-2	10	Fine to medium Sand, little coarse Sand, trace Silt	10.2
I-3	10	Fine to medium Sand, trace to little coarse Sand, trace Silt, extensive Cobbles	15.5
I-4	10	Fine to coarse Sand, little fine to coarse Gravel, trace Silt, occasional Cobbles	7.7
I-5	10	Fine to medium Sand, little coarse Sand, little fine to coarse Gravel, trace Silt	7.6

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 through C-4 of this report.

Design Recommendations

Five (5) infiltration tests were performed at the subject site. As noted above, the infiltration rates at these locations vary from 7.6 to 15.5 inches per hour. The major factor affecting the difference in infiltration rates at the infiltration test locations is the presence of silt and the relative densities of the soils at the tested depths. Based on the infiltration test results, we recommend the following rates be used in the design of the infiltration systems:

Location	Design Infiltration Rate (Inches per Hour)
Proposed Water Quality Basin-Southeast of Site	12.6
Southern Truck Lot	10.2
Western Region	7.6

The design of the storm water infiltration system should be performed by the project civil engineer, in accordance with the City of San Bernadino 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 rates recommended above are 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 rate is based on infiltration testing at five (5) discrete locations and that the overall infiltration rate of the proposed infiltration system could vary considerably.

Infiltration Rate Considerations

The infiltration rate presented herein was determined in accordance with the San Bernardino County guidelines and is considered valid only for the time and place of the actual test. Varying subsurface conditions will exist in other areas of the site, which could alter the recommended infiltration rate presented above. The infiltration rate 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 rate.

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 system can significantly reduce the infiltration ability of the basins. 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 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 rate reported herein.

We recommend that scrapers and other rubber-tired heavy equipment not be operated on the basin 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 system should be excavated with non-rubber-tired equipment, such as excavators.

Infiltration Chamber or Basin Maintenance

The proposed project may include infiltration chambers or basins. Water flowing into these chambers will carry some level of sediment. This layer has the potential to significantly reduce the infiltration rate of the chamber subgrade soils. Therefore, a formal chamber maintenance program should be established to ensure that these silt and clay deposits are removed from the chamber on a regular basis.

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 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(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 system.

The infiltration system designer should also give special consideration to the effect that the proposed infiltration system 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.

REGISTERED PROFESSIONAL ENGINEER RICARDO FRIAS No. 91772 CIVIL STATE OF CALIFORNIA

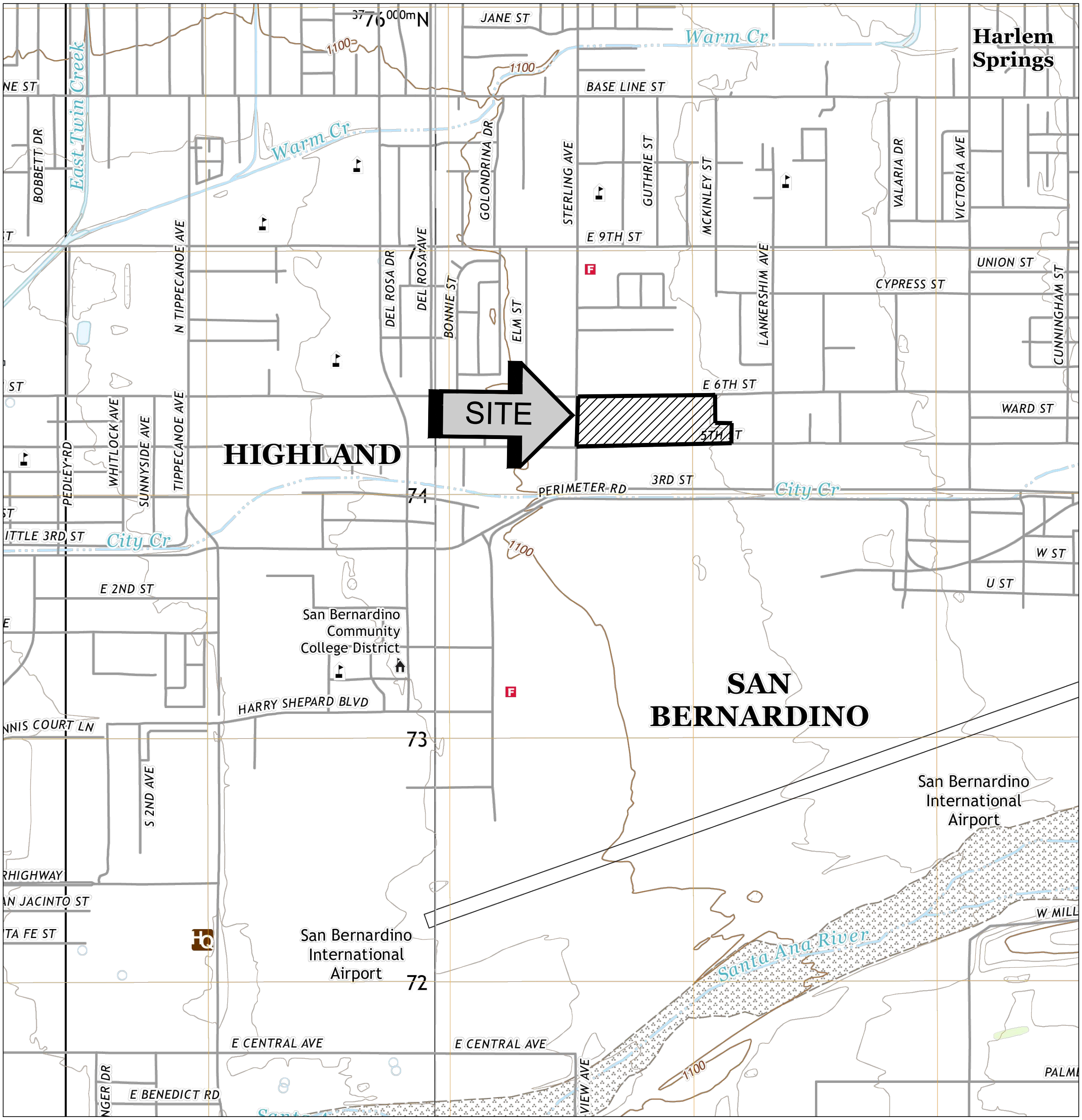
Ricardo Frias, RCE 91772
Project Engineer

REGISTERED PROFESSIONAL ENGINEER GREGORY K. MITCHELL No. 2364 GEOTECHNICAL STATE OF CALIFORNIA

Gregory K. Mitchell, GE 2364
Principal Engineer

Distribution: (1) Addressee

Enclosures:
- Plate 1 - Site Location Map
- Plate 2 - Infiltration Test Location Plan
- Boring Log Legend and Logs (7 pages)
- Infiltration Test Results Spreadsheets (5 pages)
- Grain Size Distribution Graphs (4 pages)



SOURCE: USGS TOPOGRAPHIC MAP OF THE REDLANDS AND SAN BERNARDINO SOUTH QUADRANGLES, SAN BERNARDINO COUNTY, CALIFORNIA, 2021.

SITE LOCATION MAP

PROPOSED INDUSTRIAL BUILDING

SAN BERNARDINO, CALIFORNIA

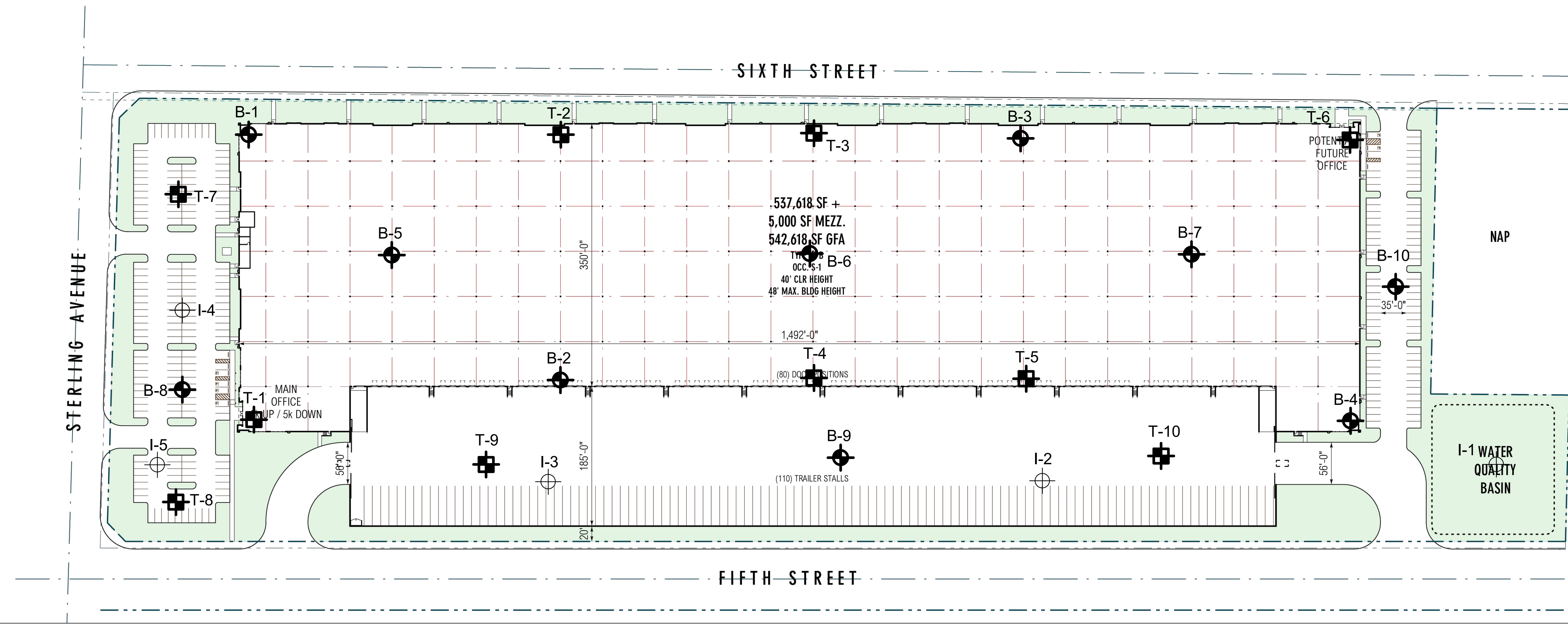
SCALE: 1" = 2000'

DRAWN: MK
CHKD: RF

SCG PROJECT 23G142-2

PLATE 1

SOUTHERN CALIFORNIA GEOTECHNICAL



GEOTECHNICAL LEGEND

APPROXIMATE INFILTRATION TEST LOCATION

APPROXIMATE BORING LOCATION
(SCG PROJECT NO. 23G142-1)

APPROXIMATE TRENCH LOCATION
(SCG PROJECT NO. 23G142-1)

NORTH
SoCalGeo

NOTE: SITE PLAN PROVIDED BY RGA.

INFILTRATION TEST LOCATION PLAN

PROPOSED INDUSTRIAL BUILDING

SAN BERNARDINO, CALIFORNIA

SCALE: 1" = 150'

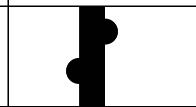
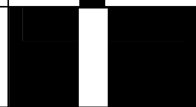
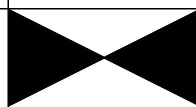
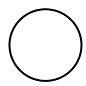
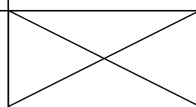
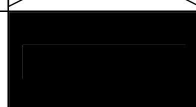
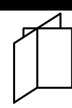
DRAWN: MK
CHKD: RF

SCG PROJECT
23G142-2

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
A California Corporation

BORING NO. I-1

JOB NO.: 23G142-2
PROJECT: Proposed Industrial Building
LOCATION: San Bernardino, California

DRILLING DATE: 4/27/23
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
	X	4			FILL: Dark Brown Silty fine Sand, trace to little medium Sand, trace coarse Sand, loose-damp		7					
5	X	6			ALLUVIUM: Light Brown fine to coarse Sand, trace fine Gravel, trace Silt, trace to little iron oxide staining, loose to medium dense-dry to damp		5					
	X	14					3					
10					Boring Terminated at 10'							

TBL 23G142-2.GPJ SOCALGEO.GDT 5/26/23

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-2

JOB NO.: 23G142-2
PROJECT: Proposed Industrial Building
LOCATION: San Bernardino, California

DRILLING DATE: 4/27/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

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

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
	X	7			FILL: Dark Brown Silty fine Sand, trace medium to coarse Sand, trace fine Gravel, loose-damp		7					
5	X	11			ALLUVIUM: Light Red Brown fine to medium Sand, little coarse Sand, trace Silt, trace to little iron oxide staining, medium dense-damp		3					
	X	24					5					
10					Boring Terminated at 10'							

TBL 23G142-2.GPJ SOCALGEO.GDT 5/26/23

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-3

JOB NO.: 23G142-2
PROJECT: Proposed Industrial Building
LOCATION: San Bernardino, California

DRILLING DATE: 4/27/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

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

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
	X	4			FILL: Dark Brown Silty fine Sand, trace medium to coarse Sand, loose-moist		11					
5	X	10			ALLUVIUM: Light Red Brown fine to medium Sand, trace Silt, trace to little coarse Sand, trace fine Gravel, medium dense-damp		5					
	X	50/3"			@ 8½ feet, extensive Cobbles, very dense-dry		1					
10					Boring Terminated at 10'							

TBL 23G142-2.GPJ SOCALGEO.GDT 5/26/23

TEST BORING LOG

BORING NO. I-4

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

JOB NO.: 23G142-2	DRILLING DATE: 4/27/23	WATER DEPTH: Dry
PROJECT: Proposed Industrial Building	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: ---
LOCATION: San Bernardino, California	LOGGED BY: Michelle Krizek	READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						COMMENTS
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	
	X	3			FILL: Dark Gray Brown Silty fine Sand, trace medium Sand, trace Clay, trace fine root fibers, loose-moist		10					
5	X	7			FILL: Dark Brown fine Sandy Silt, trace Clay, trace medium to coarse Sand, trace iron oxide staining, loose-moist		17					
	X	44			ALLUVIUM: Light Brown fine to coarse Sand, little fine to coarse Gravel, trace Silt, occasional Cobbles, dense-dry		1					
10					Boring Terminated at 10'							

TBL 23G142-2.GPJ SOCALGEO.GDT 5/26/23

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-5

JOB NO.: 23G142-2
PROJECT: Proposed Industrial Building
LOCATION: San Bernardino, California

DRILLING DATE: 4/27/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

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

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					FILL: Dark Brown Silty fine Sand, trace medium to coarse Sand, trace roots, loose-moist							
	X	5					9					
					ALLUVIUM: Light Red Brown fine to medium Sand, little coarse Sand, little fine to coarse Gravel, trace Silt, trace to little iron oxide staining, medium dense-damp							
5	X	11					3					
	X	33			@ 8½ feet, occasional Cobbles, dense		3					
10												
					Boring Terminated at 10'							

TBL 23G142-2.GPJ SOCALGEO.GDT 5/26/23

INFILTRATION CALCULATIONS

Project Name	Proposed Industrial Building
Project Location	San Bernardino
Project Number	23G142-2
Engineer	Michelle Krizek

Test Hole Radius	4	(in)
Test Depth	10.12	(ft)

Infiltration Test Hole	I-1

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	7:05 AM	24.00	7.00	37.44	YES	SANDY SOILS
	Final	7:29 AM		10.12			
2	Initial	7:31 AM	25.00	7.00	36.00	YES	SANDY SOILS
	Final	7:56 AM		10.00			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	7:59 AM	10.00	7.00	2.41	1.92	13.89
	Final	8:09 AM		9.41			
2	Initial	8:11 AM	10.00	7.00	2.31	1.97	13.00
	Final	8:21 AM		9.31			
3	Initial	8:24 AM	10.00	7.00	2.31	1.97	13.00
	Final	8:34 AM		9.31			
4	Initial	8:35 AM	10.00	7.00	2.28	1.98	12.75
	Final	8:45 AM		9.28			
5	Initial	8:48 AM	10.00	7.00	2.27	1.99	12.66
	Final	8:58 AM		9.27			
6	Initial	9:01 AM	10.00	7.00	2.27	1.99	12.66
	Final	9:11 AM		9.27			

Per County Standards, Infiltration Rate calculated as follows:

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

Where: Q = 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	Proposed Industrial Building
Project Location	San Bernardino
Project Number	23G142-2
Engineer	Michelle Krizek

Test Hole Radius	4	(in)
Test Depth	10.13	(ft)

Infiltration Test Hole	I-2

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	9:26 AM	12.00	7.40	32.76	YES	SANDY SOILS
	Final	9:38 AM		10.13			
2	Initial	9:41 AM	20.00	7.40	32.76	YES	SANDY SOILS
	Final	10:01 AM		10.13			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	10:03 AM	10.00	7.40	1.82	1.82	10.99
	Final	10:13 AM		9.22			
2	Initial	10:16 AM	10.00	7.40	1.79	1.84	10.73
	Final	10:26 AM		9.19			
3	Initial	10:28 AM	10.00	7.40	1.77	1.85	10.56
	Final	10:38 AM		9.17			
4	Initial	10:39 AM	10.00	7.40	1.76	1.85	10.47
	Final	10:49 AM		9.16			
5	Initial	10:54 AM	10.00	7.40	1.74	1.86	10.30
	Final	11:04 AM		9.14			
6	Initial	11:06 AM	10.00	7.40	1.73	1.87	10.22
	Final	11:16 AM		9.13			

Per County Standards, Infiltration Rate calculated as follows:

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

Where:
- Q = 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	Proposed Industrial Building
Project Location	San Bernardino
Project Number	23G142-2
Engineer	Michelle Krizek

Test Hole Radius	4	(in)
Test Depth	10.13	(ft)

Infiltration Test Hole	I-3

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	11:38 AM	25.00	7.50	31.08	YES	SANDY SOILS
	Final	12:03 PM		10.09			
2	Initial	12:04 PM	25.00	7.50	31.08	YES	SANDY SOILS
	Final	12:29 PM		10.09			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	12:32 PM	10.00	7.50	2.51	1.38	19.54
	Final	12:42 PM		10.01			
2	Initial	12:45 PM	10.00	7.50	2.50	1.38	19.40
	Final	12:55 PM		10.00			
3	Initial	12:57 PM	10.00	7.50	2.51	1.38	19.54
	Final	1:07 PM		10.01			
4	Initial	1:11 PM	10.00	7.50	2.45	1.41	18.71
	Final	1:21 PM		9.95			
5	Initial	1:23 PM	10.00	7.50	2.20	1.53	15.56
	Final	1:33 PM		9.70			
6	Initial	1:37 PM	10.00	7.50	2.20	1.53	15.56
	Final	1:47 PM		9.70			

Per County Standards, Infiltration Rate calculated as follows:

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

Where:
- Q = 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	Proposed Industrial Building
Project Location	San Bernardino
Project Number	23G142-2
Engineer	Michelle Krizek

Test Hole Radius	4	(in)
Test Depth	10.13	(ft)

Infiltration Test Hole	I-4

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	7:03 AM	22.00	7.60	30.36	YES	SANDY SOILS
	Final	7:25 AM		10.13			
2	Initial	7:27 AM	25.00	7.60	29.76	YES	SANDY SOILS
	Final	7:52 AM		10.08			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	8:04 AM	10.00	7.60	1.45	1.81	8.83
	Final	8:14 AM		9.05			
2	Initial	8:17 AM	10.00	7.60	1.37	1.85	8.17
	Final	8:27 AM		8.97			
3	Initial	8:19 AM	10.00	7.60	1.34	1.86	7.93
	Final	8:29 AM		8.94			
4	Initial	8:30 AM	10.00	7.60	1.32	1.87	7.78
	Final	8:40 AM		8.92			
5	Initial	8:42 AM	10.00	7.60	1.32	1.87	7.78
	Final	8:52 AM		8.92			
6	Initial	8:56 AM	10.00	7.60	1.31	1.88	7.70
	Final	9:06 AM		8.91			

Per County Standards, Infiltration Rate calculated as follows:

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

Where:
- Q = 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	Proposed Industrial Building
Project Location	San Bernardino
Project Number	23G142-2
Engineer	Michelle Krizek

Test Hole Radius	4	(in)
Test Depth	10.15	(ft)

Infiltration Test Hole	I-5

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	9:21 AM	10.00	6.90	39.00	YES	SANDY SOILS
	Final	9:31 AM		10.15			
2	Initial	9:35 AM	17.00	6.90	39.00	YES	SANDY SOILS
	Final	9:52 AM		10.15			

Test Data

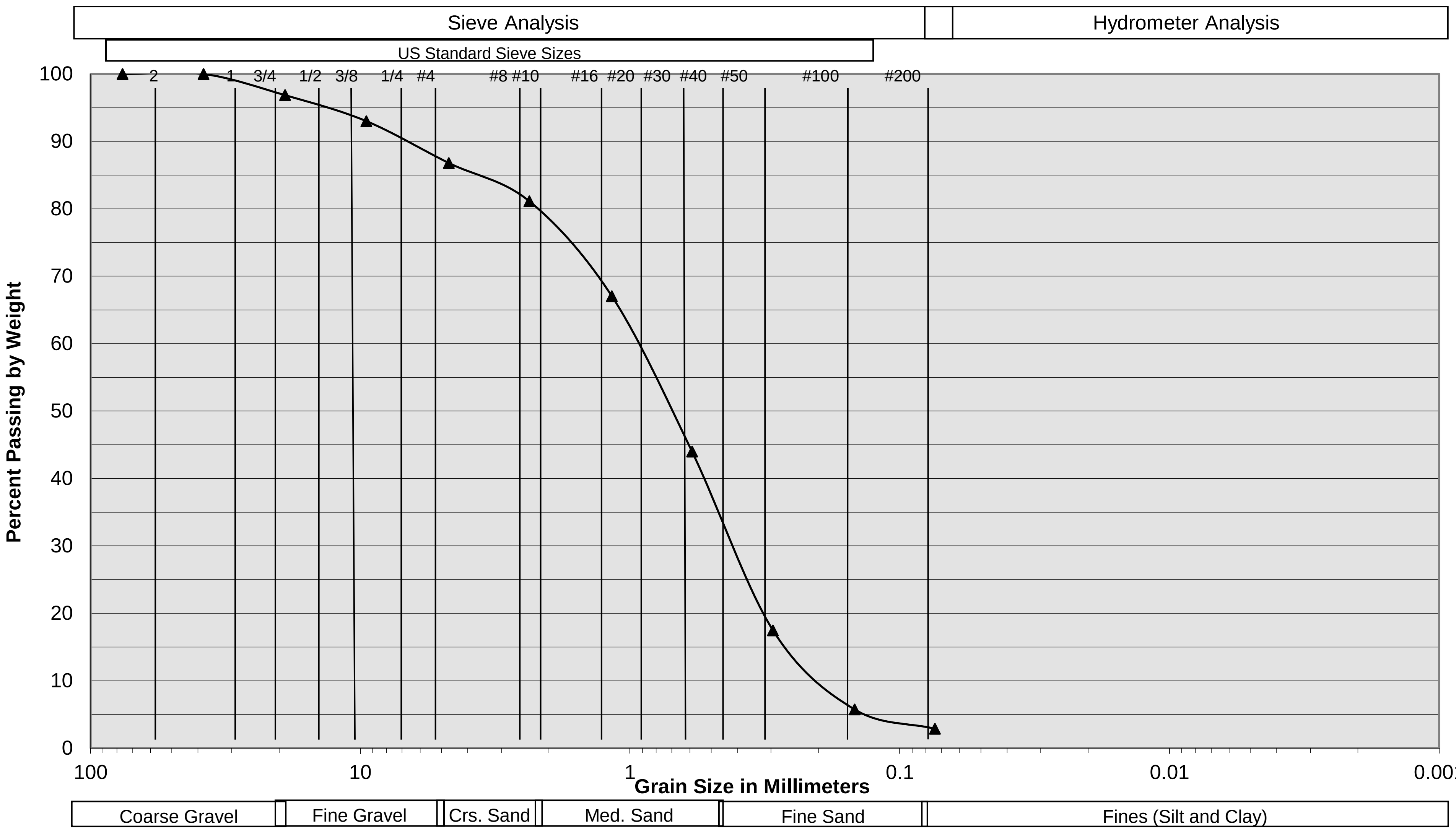
Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	9:56 AM	10.00	6.90	1.67	2.42	7.76
	Final	10:06 AM		8.57			
2	Initial	10:08 AM	10.00	6.90	1.58	2.46	7.22
	Final	10:18 AM		8.48			
3	Initial	10:22 AM	10.00	6.90	1.65	2.43	7.64
	Final	10:32 AM		8.55			
4	Initial	10:35 AM	10.00	6.90	1.69	2.41	7.89
	Final	10:45 AM		8.59			
5	Initial	10:50 AM	10.00	6.90	1.65	2.43	7.64
	Final	11:00 AM		8.55			
6	Initial	11:02 AM	10.00	6.90	1.65	2.43	7.64
	Final	11:12 AM		8.55			

Per County Standards, Infiltration Rate calculated as follows:

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

Where:
- Q = 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

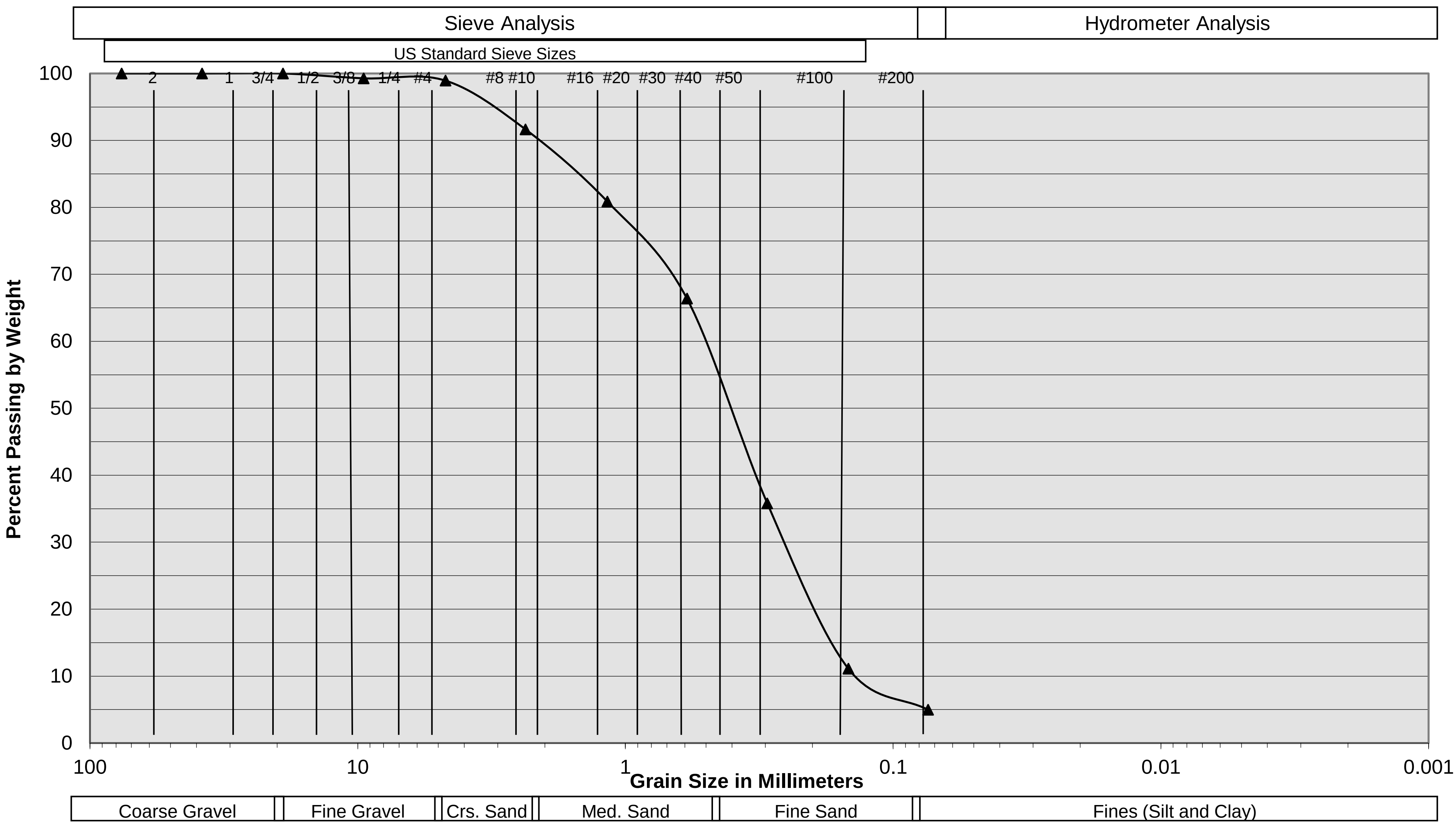


Sample Description	I-1 @ 8½'
Soil Classification	Light Brown fine to coarse Sand, trac fine Gravel, trace Silt

Proposed Industrial Building
San Bernardino, California
Project No. 23G142-2
PLATE C- 1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution

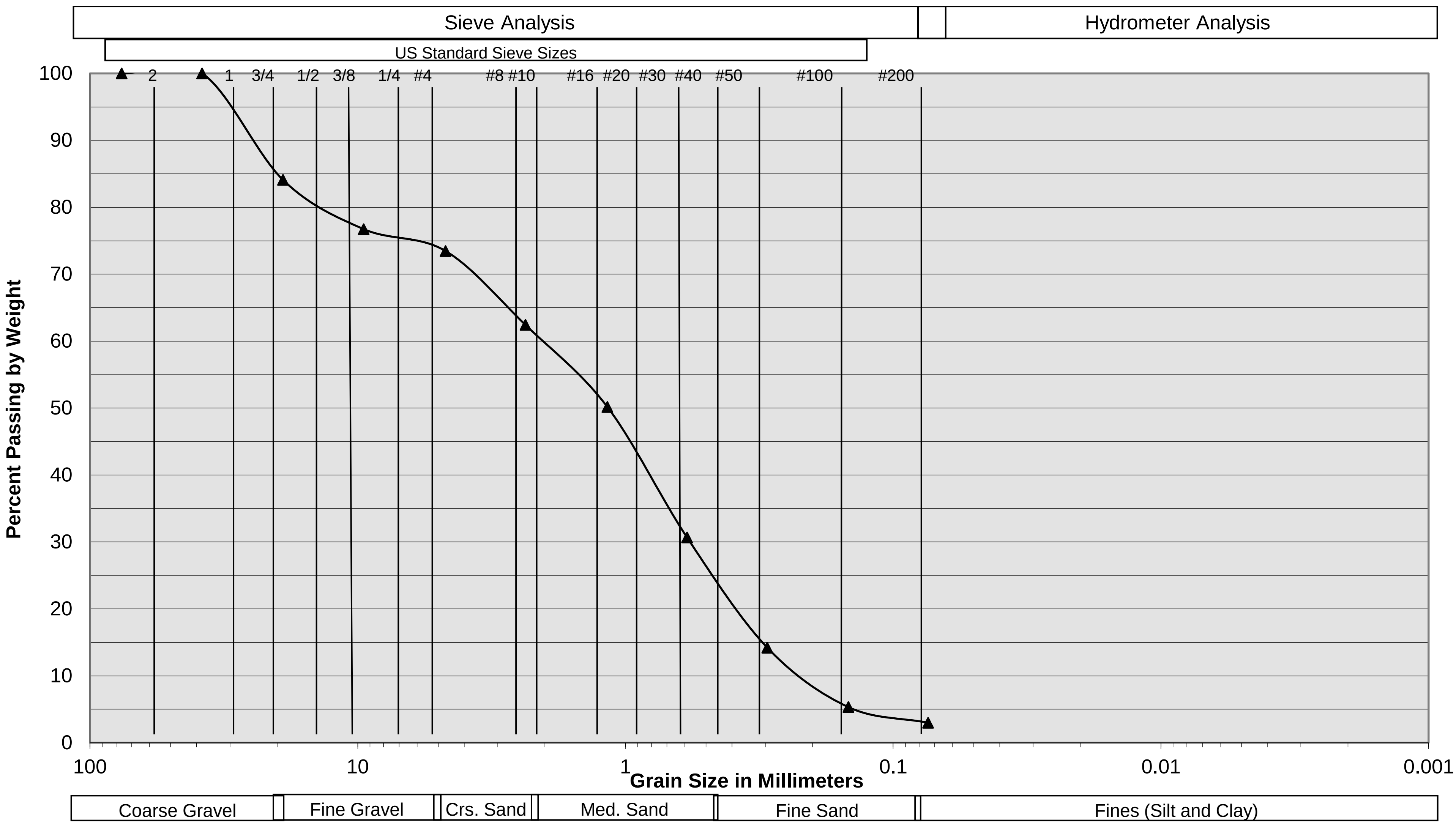


Sample Description	I-2 @ 8½'
Soil Classification	Light Red Brown fine to medium Sand, little coarse Sand, trace Silt

Proposed Industrial Building
San Bernardino, California
Project No. 23G142-2
PLATE C- 2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution

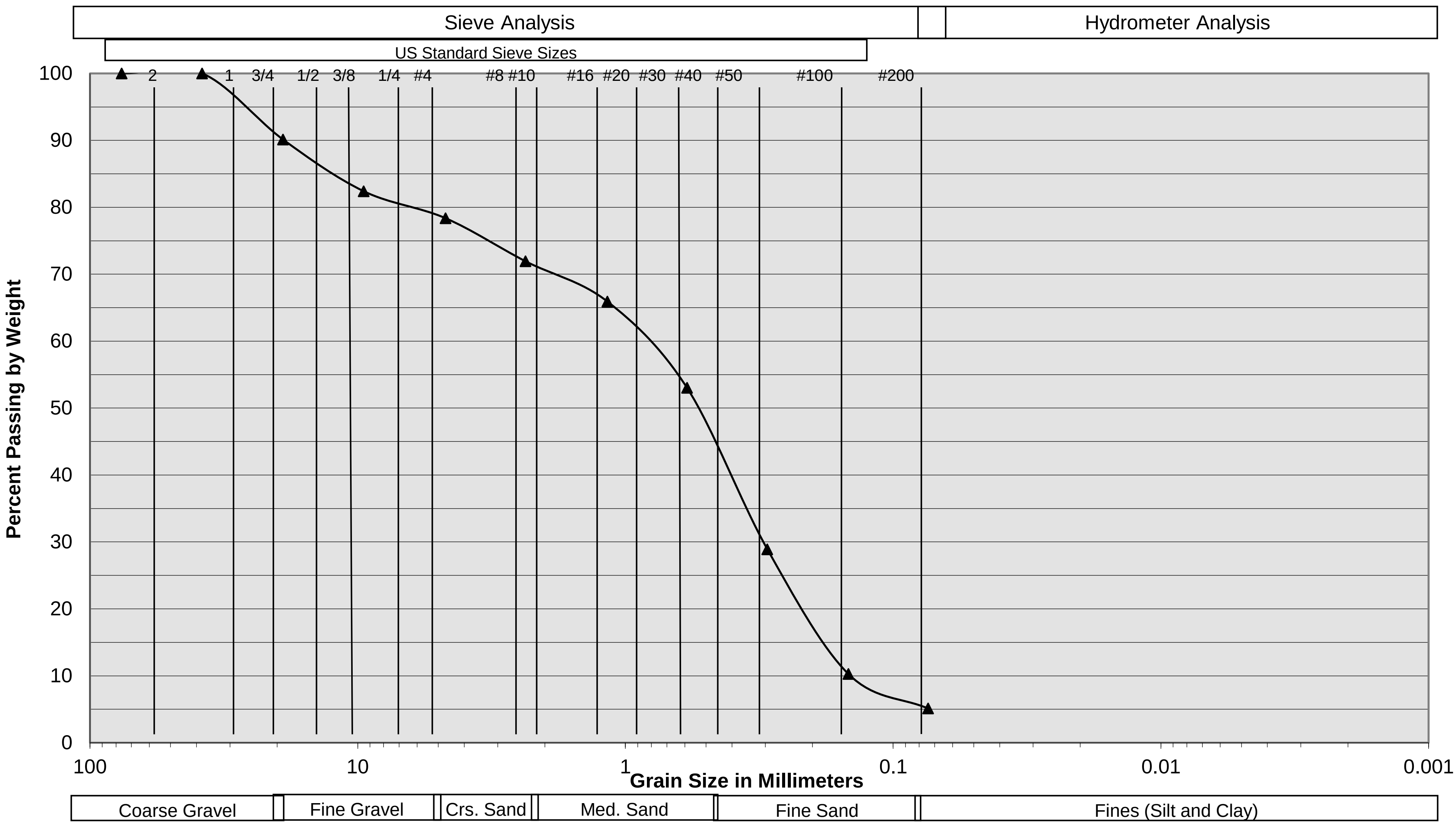


Sample Description	I-4 @ 8½'
Soil Classification	Light Brown fine to coarse Sand, little fine to coarse Gravel, trace Silt

Proposed Industrial Building
San Bernardino, California
Project No. 23G142-2
PLATE C- 3

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution



Sample Description	I-5 @ 8½'
Soil Classification	Light Red Brown fine to medium Sand, little coarse Sand, little fine to coarse Gravel, trace Silt

Proposed Industrial Building San Bernardino, California Project No. 23G142-2 **PLATE C- 4**		SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL *A California Corporation*