December 18, 2019

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

First Industrial Realty Trust, Inc.
898 North Pacific Coast Highway, Suite 175
El Segundo, California 90245

Attention: Mr. Matt Pioli

Project No.: **19G237-2**

Subject: **Results of Infiltration Testing**
Proposed Warehouse
NEC Alabama Street and Pioneer Avenue
Redlands, California

Reference: Geotechnical Investigation, Proposed Warehouse, NEC Alabama Street and Pioneer Avenue, Redlands, California, prepared for First Industrial Realty Trust, by Southern California Geotechnical, Inc. (SCG), SCG Project No. 19G237-1, dated November 27, 2019.

Mr. Pioli:

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. 19P188, dated March 29, 2019. 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 the Technical Guidance Document for Water Quality Management Plans prepared for the County of San Bernardino Areawide Stormwater Program dated June 7, 2013. The San Bernardino County standards defer to guidelines published by Riverside County Department of Environmental Health (RCDEH).

Site and Project Description

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

The site consists of a nearly rectangular-shaped parcel, 22.7± acres in size. The site is presently utilized as a citrus orchard. A residential structure, 1,300± ft^2 in size is located in the south-central area of the site. The ground surface cover in the northwestern portion of the site consists of wood chips. Ground surface cover throughout the remaining areas of the site generally consists of exposed soil, medium-sized citrus trees, and sparse to moderate native weed growth.

Detailed topographic information was not available at the time of this report. However, based on topographic information obtained from Google Earth, the site topography ranges from 1224± feet mean sea level (msl) in the northwest corner of the site, to 1251± feet msl in the east-central area of the site. The site topography generally slopes to the west at a gradient of 3± percent.

Proposed Development

Based on the preliminary site plan (Scheme 5) provided to our office, the site will be developed with one (1) new warehouse located in the central area of the site. The building will be 451,110± ft² in size and dock-high doors will be constructed along the east and west sides of the building. The building will be surrounded by asphaltic concrete pavements in the parking and drive lanes, Portland cement concrete pavements in the loading dock area, concrete flatwork and landscape planters throughout.

Detailed structural information has not been provided. It is assumed that the new building will be a single-story structure of tilt-up concrete construction, typically supported on a conventional shallow foundation system with a concrete slab-on-grade floor. Based on the assumed construction, maximum column and wall loads are expected to be on the order of 100 kips and 3 to 5 kips per linear foot, respectively.

No significant amounts of below-grade construction, such as basements or crawl spaces, are expected to be included in the proposed development. Based on the assumed topography, cuts and fills of 2 to 3± feet are expected to be necessary to achieve the proposed site grades.

We understand that the proposed development may include on-site infiltration to dispose of storm water. Based on conversations with the project civil engineer, the system will likely consist of five (5) below-grade systems located in the western and eastern area of the site. The bottom of the proposed systems will be approximately 6 to 12 feet below the existing site grades.

Concurrent Study

SCG recently conducted a geotechnical investigation at the subject site, which is referenced above. As part of this study, eight (8) borings were advanced to depths of 15 to 25± feet below existing site grades. Native alluvial soils were encountered at the ground surface of all boring locations, extending to at least the maximum depth explored of 25± feet. The native alluvial soils generally consist of loose to medium dense fine sands with variable amounts of silt, and silty fine sands with variable amounts of medium to coarse sand. Occasional layers of loose to medium dense fine to medium sand were encountered between depths of 4½ to 12± feet. Boring No. B-7 encountered a layer of dense well-graded sand with trace amounts of fine to coarse gravel from 12 to 20± feet. Boring Nos. B-2 and B-6 encountered a fine sandy silt layer from 2½ to 5½± feet, and 17 to 22± feet, respectively.

Groundwater

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 25± feet at the time of the subsurface exploration.

As part of our research, we reviewed readily available groundwater data in order to determine regional groundwater depths. Recent water level data was obtained from the California State Water Resources Control Board, GeoTracker, website, http://geotracker.waterboards.ca.gov/. The nearest monitoring well in this database with available groundwater depth data is located approximately 3,550± feet northwest of the site. Water level readings within this monitoring well indicate a groundwater level of 170± feet (August 2019) below the ground surface.

Subsurface Exploration

Scope of Exploration

The subsurface exploration conducted for the infiltration testing consisted of five (5) infiltration test borings, advanced to depths of 6 to 12± 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

Native alluvium was encountered at all of the infiltration trench locations, extending to at least the maximum depth explored of 12± feet below the existing site grades. The native alluvial soils generally consist of very loose to loose silty fine sands and fine sandy silts, with varying medium to coarse sand content. The Boring Logs, which illustrate the conditions encountered at the infiltration test locations, are included with this report.

Infiltration Testing

As previously mentioned, the infiltration testing was performed in general accordance with Technical Guidance Document for Water Quality Management Plans, prepared for the County of San Bernardino Areawide Stormwater Program.

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 the test holes. In accordance with the San Bernardino County guidelines, since "sandy soils" were encountered at the bottom of both infiltration test borings (where 6 inches of water infiltrated into the surrounding soils for two consecutive 25-minute readings), readings were taken at 10-minute intervals for a total of 1 hour at both test locations. After each reading, water was added to the borings so that the depth of the water was at least 5 times the radius of the hole. 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	Infiltration Rate (inches/hour)
I-1	12	Gray Brown fine to medium Sand, little Silt	9.5
I-2	12	Light Gray Brown Silty fine Sand, little medium Sand	7.4
I-3	6	Brown fine Sandy Silt, trace medium Sand	3.9
I-4	12	Light Gray Brown fine to medium Sand, little Silt	15.0
I-5	12	Gray Brown Silty fine Sand	6.6

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 and C-5 of this report.

Design Recommendations

Five (5) infiltration tests were performed at the subject site. As noted above, the calculated infiltration rates at the infiltration test locations are range from 3.9 to 15.0 inches per hour. **Based on the results of Infiltration Test Nos. I-1 and I-2, we recommend an infiltration rate of 7.4 inches per hour be used for the design of the proposed infiltration basin located in the western region of the subject site. Based on the results of Infiltration Test No. I-3 we recommend an infiltration rate of 3.9 inches per hour be used for the design of the proposed infiltration basin located in the south-western region of the subject site. Based on the results of Infiltration Test Nos. I-4 and I-5, we recommend an infiltration rate of 6.6 inches per hour be used for the design of the proposed infiltration basin located in the eastern region of the subject site. The infiltration rates were most likely affected by the varying silt contents.**

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 infiltration basin. It should be confirmed that the soils at the base of the proposed infiltration system corresponds 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 proposed storm water infiltration system should be performed by the project civil engineer, in accordance with the City of Redlands and/or County of San Bernardino guidelines. However, it is recommended that the systems be constructed so as to facilitate removal of silt and clay, or other deleterious materials from any water that may enter the 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 rate is based on infiltration testing at five (5) discrete locations, and the overall infiltration rate of the storm water 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 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 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 buildings, 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.

Oscar Sandoval

Robert G. Trazo, GE 2655
Principal Engineer

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

Distribution: (1) Addressee

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

SOURCE: SAN BERNARDINO COUNTY
THOMAS GUIDE, 2009

SITE LOCATION MAP

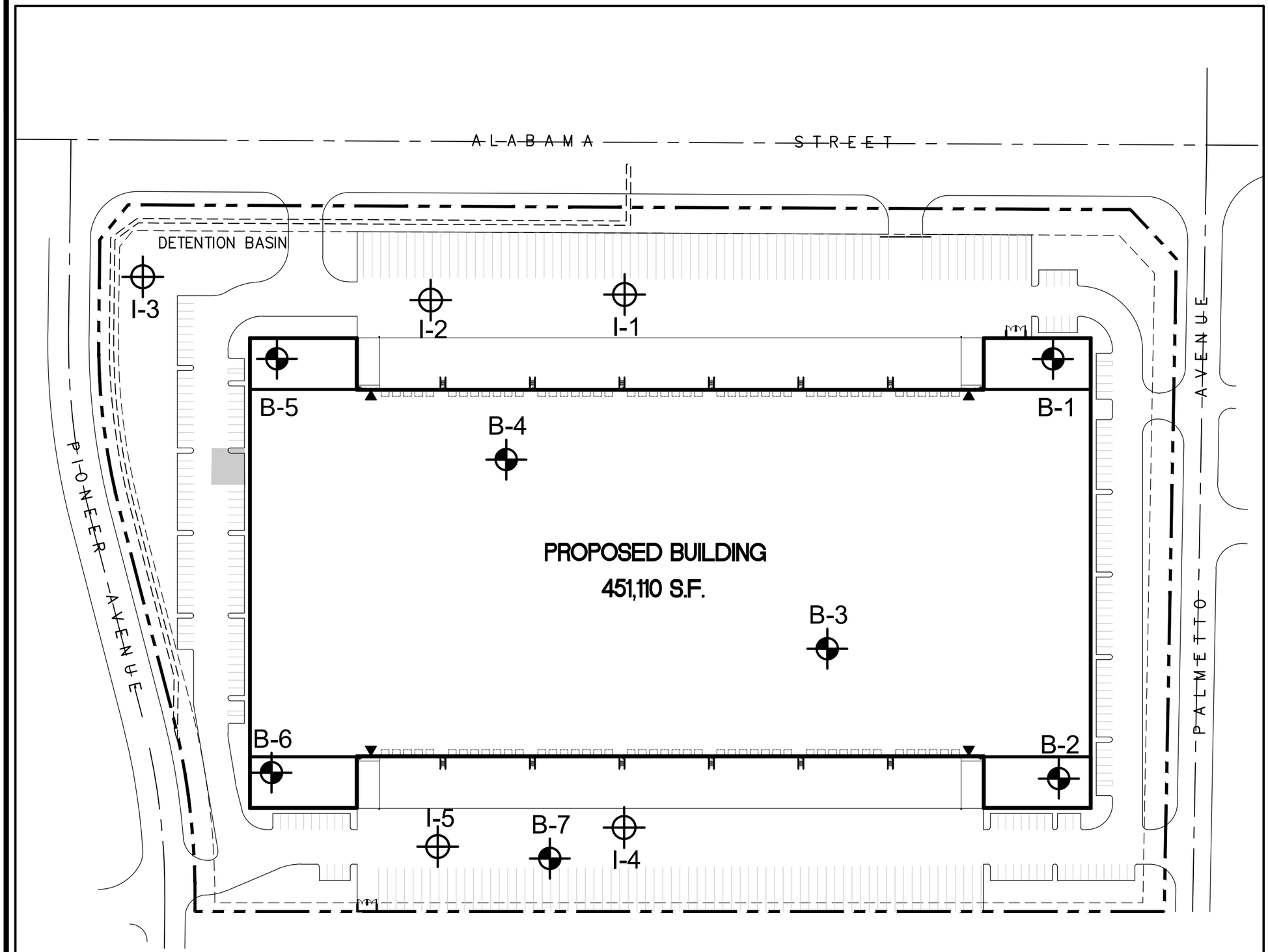
PROPOSED WAREHOUSE

REDLANDS, CALIFORNIA

SCALE: 1" = 2400'	
DRAWN: OS CHKD: RGT	
SCG PROJECT 19G237-2	
PLATE 1	

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



GEOTECHNICAL LEGEND

- APPROXIMATE INFILTRATION LOCATION
- APPROXIMATE BORING LOCATION FROM CONCURRENT STUDY (SCG PROJECT NO. 19G237-1)
- EXISTING STRUCTURE TO BE DEMOLISHED

NOTE: CONCEPTUAL SITE PLAN PROVIDED BY HPA ARCITECTURE.

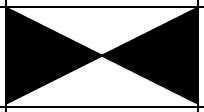
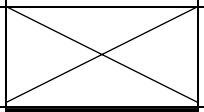
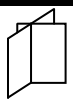
INFILTRAION TEST LOCATION PLAN - SCHEME 5

PROPOSED WAREHOUSE

REDLANDS, CALIFORNIA

SCALE: 1" = 120'	SOUTHERN CALIFORNIA GEOTECHNICAL
DRAWN: OS CHKD: RGT	
SCG PROJECT 19G237-2	
PLATE 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.

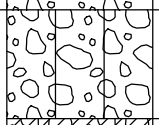
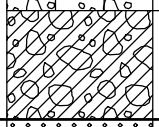
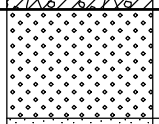
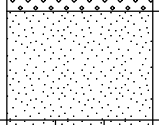
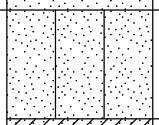
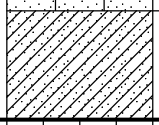
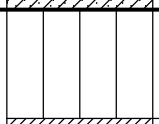
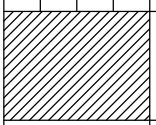
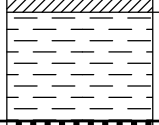
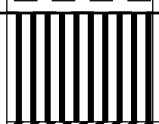
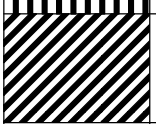
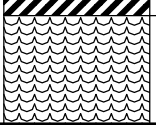
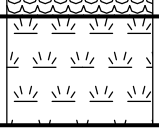
LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

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
A California Corporation

BORING NO. I-1

JOB NO.: 19G237-2
PROJECT: Proposed Warehouse
LOCATION: Redlands, California

DRILLING DATE: 12/2/19
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

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

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
		2			ALLUVIUM: Gray Brown Silty fine Sand, trace medium Sand, very loose-moist		6					
		3					8					
5												
		5			Light Gray Brown fine Sand, little Silt, trace medium Sand, loose-damp to moist		8					
		6					8					
10												
		8			Gray Brown fine to medium Sand, little Silt, loose-damp		6					
					Boring Terminated at 12'							

TBL 19G237-2.GPJ SOCALGEO.GDT 12/23/19

TEST BORING LOG **PLATE B-1**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-2

JOB NO.: 19G237-2
PROJECT: Proposed Warehouse
LOCATION: Redlands, California

DRILLING DATE: 12/2/19
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

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

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
		3			ALLUVIUM: Brown Silty fine Sand, very loose-damp to moist		8					
		5			Light Gray Brown fine Sand, trace to little Silt, loose-damp		4					
5		5			Light Gray Brown Silty fine Sand to fine Sandy Silt, loose-damp		9					
		6			Light Gray Brown Silty fine Sand, little medium Sand, loose-moist to very moist		14					
10		4					10					
					Boring Terminated at 12'							

TBL 19G237-2.GPJ SOCALGEO.GDT 12/23/19

TEST BORING LOG

PLATE B-2

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-3

JOB NO.: 19G237-2
PROJECT: Proposed Warehouse
LOCATION: Redlands, California

DRILLING DATE: 12/2/19
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

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

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
		10			ALLUVIUM: Brown Silty fine Sand, medium dense-very moist		16					
5		4			Brown fine Sandy Silt, trace medium Sand, loose-damp to moist		8					
					Boring Terminated at 6'							

TBL 19G237-2.GPJ SOCALGEO.GDT 12/23/19

TEST BORING LOG

PLATE B-3

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-4

JOB NO.: 19G237-2
PROJECT: Proposed Warehouse
LOCATION: Redlands, California

DRILLING DATE: 12/2/19
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

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

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
		4			ALLUVIUM: Gray Brown Silty fine Sand, loose-moist		10					
		4			Gray Brown fine Sand, little Silt, loose to medium dense-moist to very moist		9					
5		4					13					
		13					12					
10		11			Light Gray Brown fine to medium Sand, little Silt, medium dense-damp		6					
					Boring Terminated at 12'							

TBL 19G237-2.GPJ SOCALGEO.GDT 12/23/19

TEST BORING LOG **PLATE B-4**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-5

JOB NO.: 19G237-2
PROJECT: Proposed Warehouse
LOCATION: Redlands, California

DRILLING DATE: 12/2/19
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Jamie Hayward

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

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
		4			ALLUVIUM: Brown to Gray Brown fine Sand, little Silt, loose-damp		3					
		7			Gray Brown fine Sand, trace to little Silt, loose-damp to moist		3					
5		8					7					
		8					7					
10		8			Gray Brown Silty fine Sand, loose-very moist		13					
					Boring Terminated at 12'							

TBL 19G237-2.GPJ SOCALGEO.GDT 12/23/19

TEST BORING LOG

PLATE B-5

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse
Project Location	Redlands, CA
Project Number	19G237-2
Engineer	Oscar Sandoval

Test Hole Radius	4	(in)
Test Depth	11.7	(ft)

Infiltration Test Hole	I-1

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	11:55 AM	25.0	9.90	1.60	0.95	6.88
	Final	12:20 PM		11.50			
2	Initial	12:20 PM	25.0	9.90	1.65	0.93	7.25
	Final	12:45 PM		11.55			
3	Initial	12:45 PM	10.0	9.90	1.10	1.20	9.66
	Final	12:55 PM		11.00			
4	Initial	12:55 PM	10.0	9.90	1.10	1.20	9.66
	Final	1:05 PM		11.00			
5	Initial	1:05 PM	10.0	9.90	1.10	1.20	9.66
	Final	1:15 PM		11.00			
6	Initial	1:15 PM	10.0	9.90	1.07	1.22	9.29
	Final	1:25 PM		10.97			
7	Initial	1:25 PM	10.0	9.88	1.10	1.22	9.52
	Final	1:35 PM		10.98			
8	Initial	1:35 PM	10.0	9.90	1.09	1.21	9.54
	Final	1:45 PM		10.99			

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 Warehouse
Project Location	Redlands, CA
Project Number	19G237-2
Engineer	Oscar Sandoval

Test Hole Radius	4	(in)
Test Depth	11.8	(ft)

Infiltration Test Hole	I-2

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	11:12 AM	25.0	10.00	1.75	0.88	8.06
	Final	11:37 AM		11.75			
2	Initial	11:37 AM	25.0	10.00	1.75	0.88	8.06
	Final	12:02 PM		11.75			
3	Initial	12:02 PM	10.0	10.00	1.10	1.20	9.66
	Final	12:12 PM		11.10			
4	Initial	12:12 PM	10.0	10.00	1.00	1.25	8.47
	Final	12:22 PM		11.00			
5	Initial	12:22 PM	10.0	10.00	0.95	1.28	7.91
	Final	12:32 PM		10.95			
6	Initial	12:32 PM	10.0	10.00	0.90	1.30	7.36
	Final	12:42 PM		10.90			
7	Initial	12:42 PM	10.0	9.75	0.95	1.53	6.74
	Final	12:52 PM		10.70			
8	Initial	12:52 PM	10.0	10.00	0.90	1.30	7.36
	Final	1:02 PM		10.90			

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 Warehouse
Project Location	Redlands, CA
Project Number	19G237-2
Engineer	Oscar Sandoval

Test Hole Radius	4	(in)
Test Depth	6.3	(ft)

Infiltration Test Hole	I-3

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	9:50 AM	25.0	4.30	2.00	1.00	8.23
	Final	10:15 AM		6.30			
2	Initial	10:15 AM	25.0	4.30	1.60	1.20	5.62
	Final	10:40 AM		5.90			
3	Initial	10:40 AM	10.0	4.30	0.70	1.65	4.62
	Final	10:50 AM		5.00			
4	Initial	10:50 AM	10.0	4.30	0.70	1.65	4.62
	Final	11:00 AM		5.00			
5	Initial	11:00 AM	10.0	4.30	0.65	1.68	4.24
	Final	11:10 AM		4.95			
6	Initial	11:10 AM	10.0	4.30	0.65	1.68	4.24
	Final	11:20 AM		4.95			
7	Initial	11:20 AM	10.0	4.30	0.60	1.70	3.86
	Final	11:30 AM		4.90			
8	Initial	11:40 AM	10.0	4.30	0.60	1.70	3.86
	Final	11:50 AM		4.90			

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 Warehouse
Project Location	Redlands, CA
Project Number	19G237-2
Engineer	Oscar Sandoval

Test Hole Radius	4	(in)
Test Depth	11.8	(ft)

Infiltration Test Hole	I-4

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	1:55 PM	22.0	10.00	1.80	0.90	9.20
	Final	2:17 PM		11.80			
2	Initial	2:17 PM	20.0	10.00	1.80	0.90	10.13
	Final	2:37 PM		11.80			
3	Initial	2:37 PM	10.0	10.00	1.30	1.15	11.85
	Final	2:47 PM		11.30			
4	Initial	2:47 PM	10.0	9.80	1.55	1.23	13.37
	Final	2:57 PM		11.35			
5	Initial	2:57 PM	10.0	10.00	1.50	1.05	14.79
	Final	3:07 PM		11.50			
6	Initial	3:07 PM	10.0	10.00	1.51	1.05	14.95
	Final	3:17 PM		11.51			
7	Initial	3:17 PM	10.0	10.00	1.51	1.05	14.95
	Final	3:27 PM		11.51			
8	Initial	3:27 PM	10.0	10.00	1.51	1.05	14.95
	Final	3:37 PM		11.51			

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 Warehouse
Project Location	Redlands, CA
Project Number	19G237-2
Engineer	Oscar Sandoval

Test Hole Radius	4	(in)
Test Depth	11.8	(ft)

Infiltration Test Hole	I-5

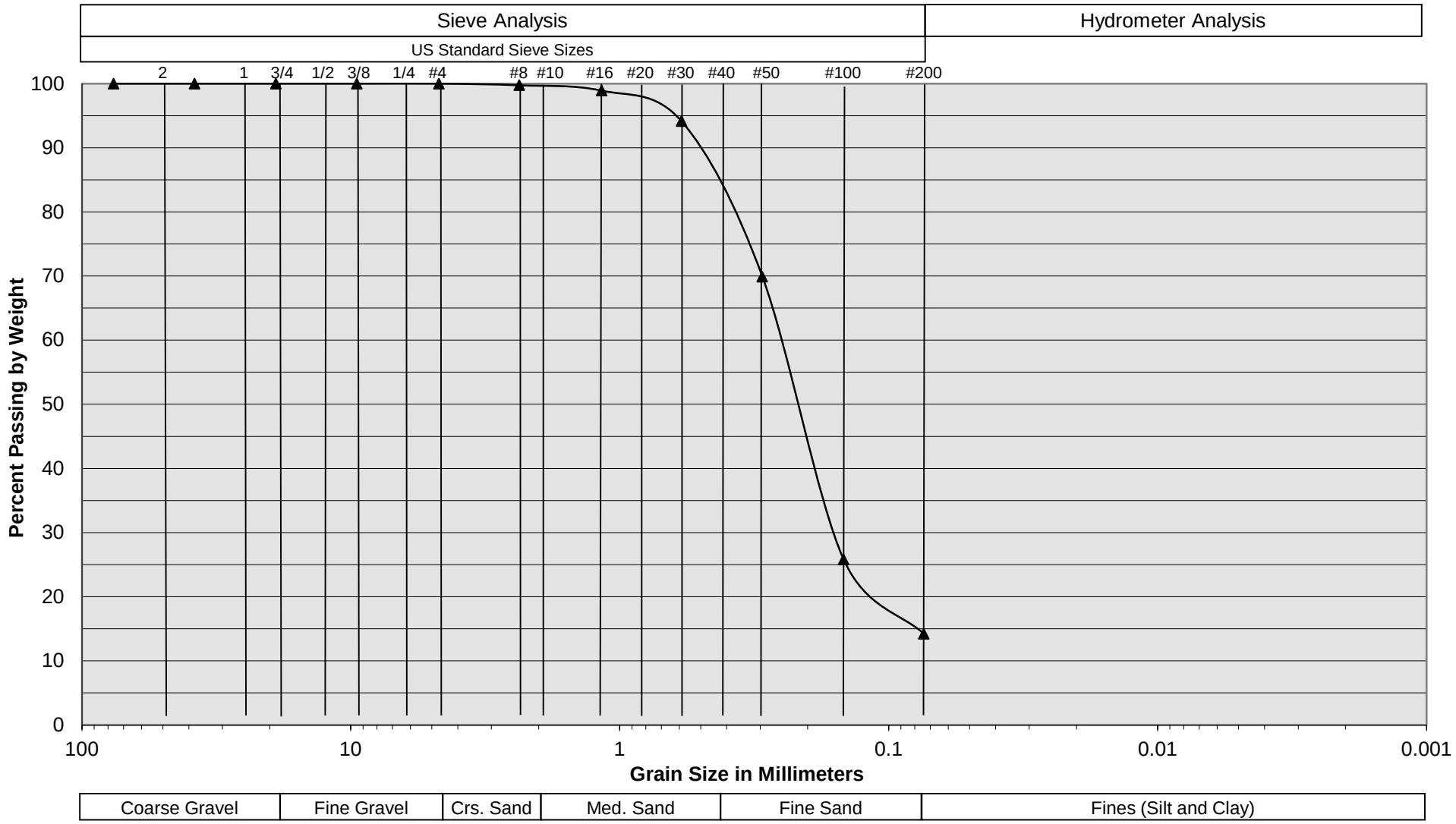
Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	2:05 PM	21.0	9.80	1.95	0.98	9.76
	Final	2:26 PM		11.75			
2	Initial	2:26 PM	22.0	10.00	1.75	0.88	9.16
	Final	2:48 PM		11.75			
3	Initial	2:48 PM	10.0	10.00	1.05	1.23	9.05
	Final	2:58 PM		11.05			
4	Initial	2:58 PM	10.0	10.00	1.00	1.25	8.47
	Final	3:08 PM		11.00			
5	Initial	3:08 PM	10.0	10.00	0.88	1.31	7.15
	Final	3:18 PM		10.88			
6	Initial	3:18 PM	10.0	10.00	0.86	1.32	6.94
	Final	3:28 PM		10.86			
7	Initial	3:28 PM	10.0	10.00	0.85	1.33	6.84
	Final	3:38 PM		10.85			
8	Initial	3:38 PM	10.0	10.00	0.83	1.34	6.63
	Final	3:48 PM		10.83			

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 @ 10½ feet
Soil Classification	Gray Brown fine to medium Sand, little Silt

Proposed Warehouse
Redlands, CA
Project No. 19G237-2
PLATE C-1

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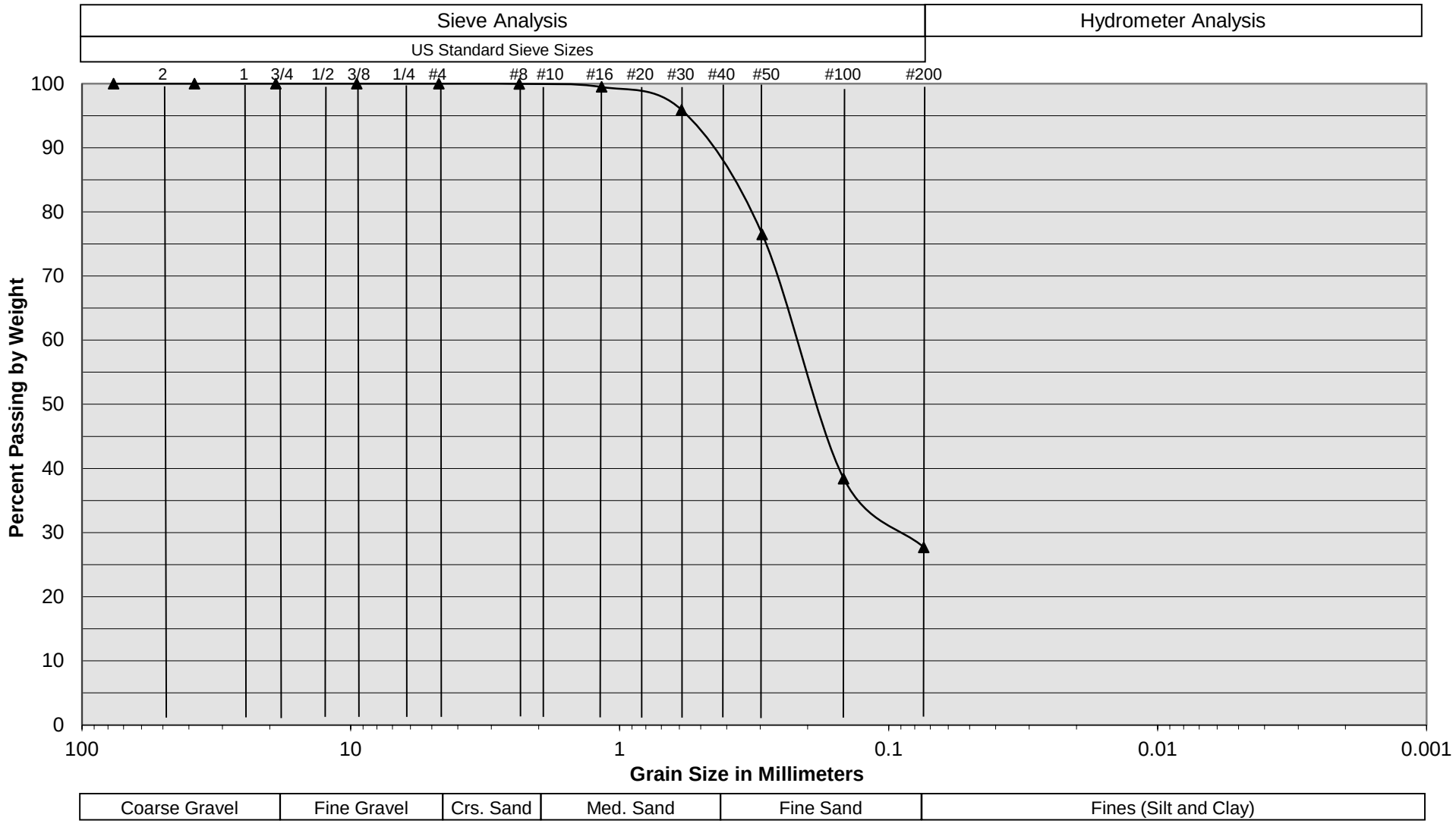
Grain Size Distribution



Sample Description	I-2 @ 10½ feet
Soil Classification	Light Gray Brown Silty fine Sand, little medium Sand

Proposed Warehouse
Redlands, CA
Project No. 19G237-2
PLATE C-2

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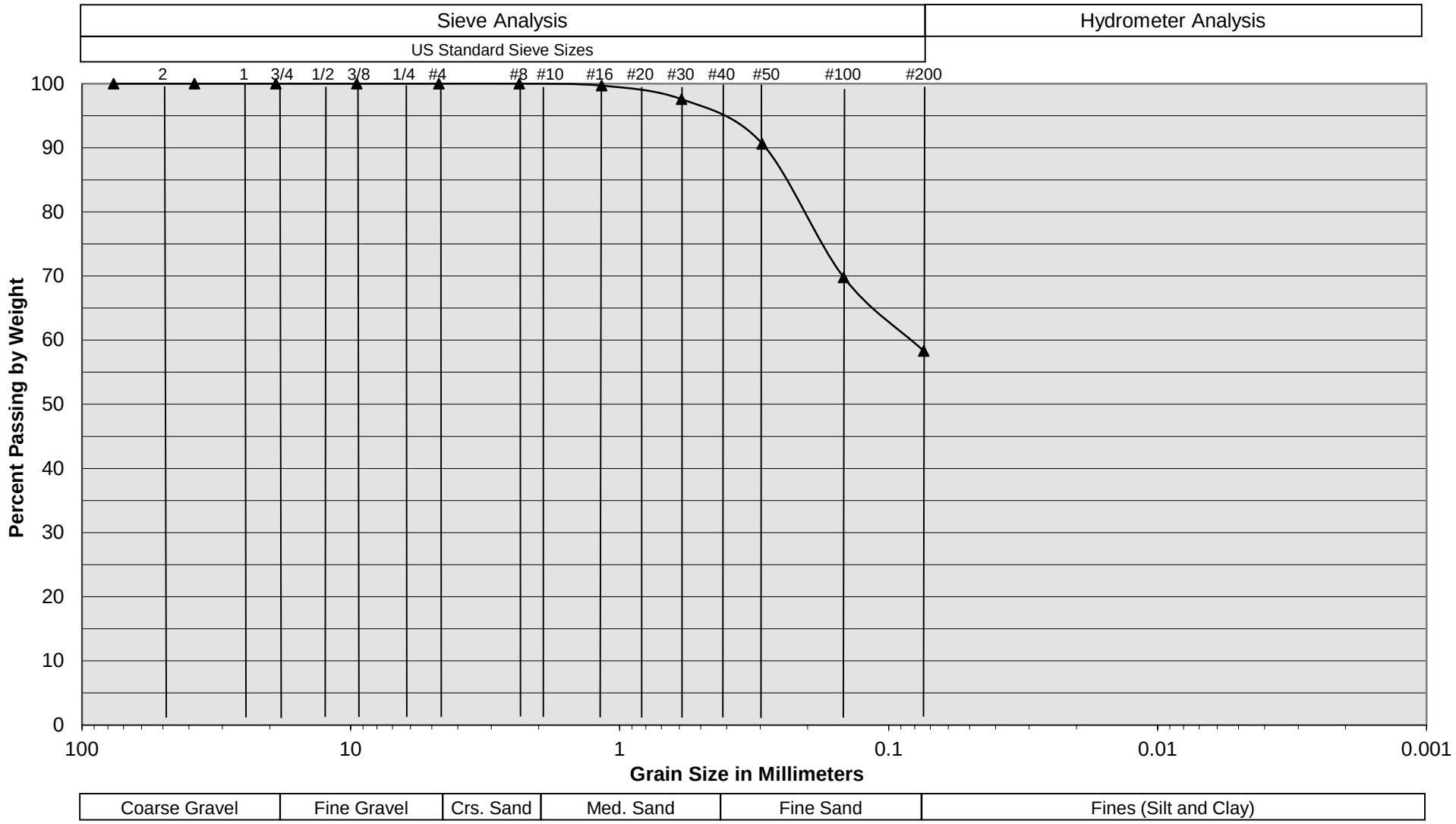
Grain Size Distribution



Sample Description	I-3 @ 4½ feet
Soil Classification	Brown fine Sandy Silt, trace medium Sand

Proposed Warehouse
Redlands, CA
Project No. 19G237-2
PLATE C-3

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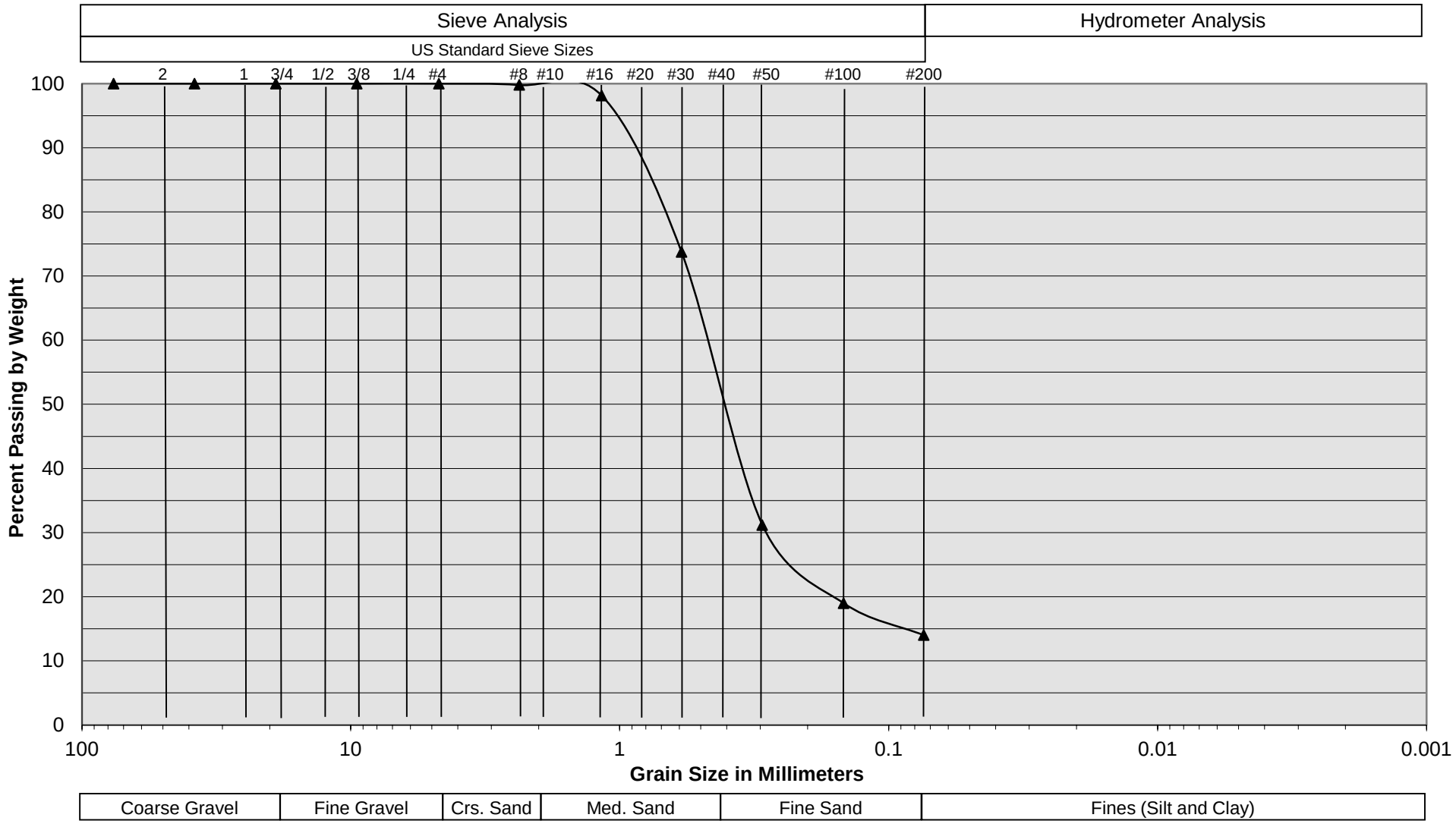
Grain Size Distribution



Sample Description	I-4 @ 10½ feet
Soil Classification	Light Gray Brown fine to medium Sand, little Silt

Proposed Warehouse
Redlands, CA
Project No. 19G237-2
PLATE C-4

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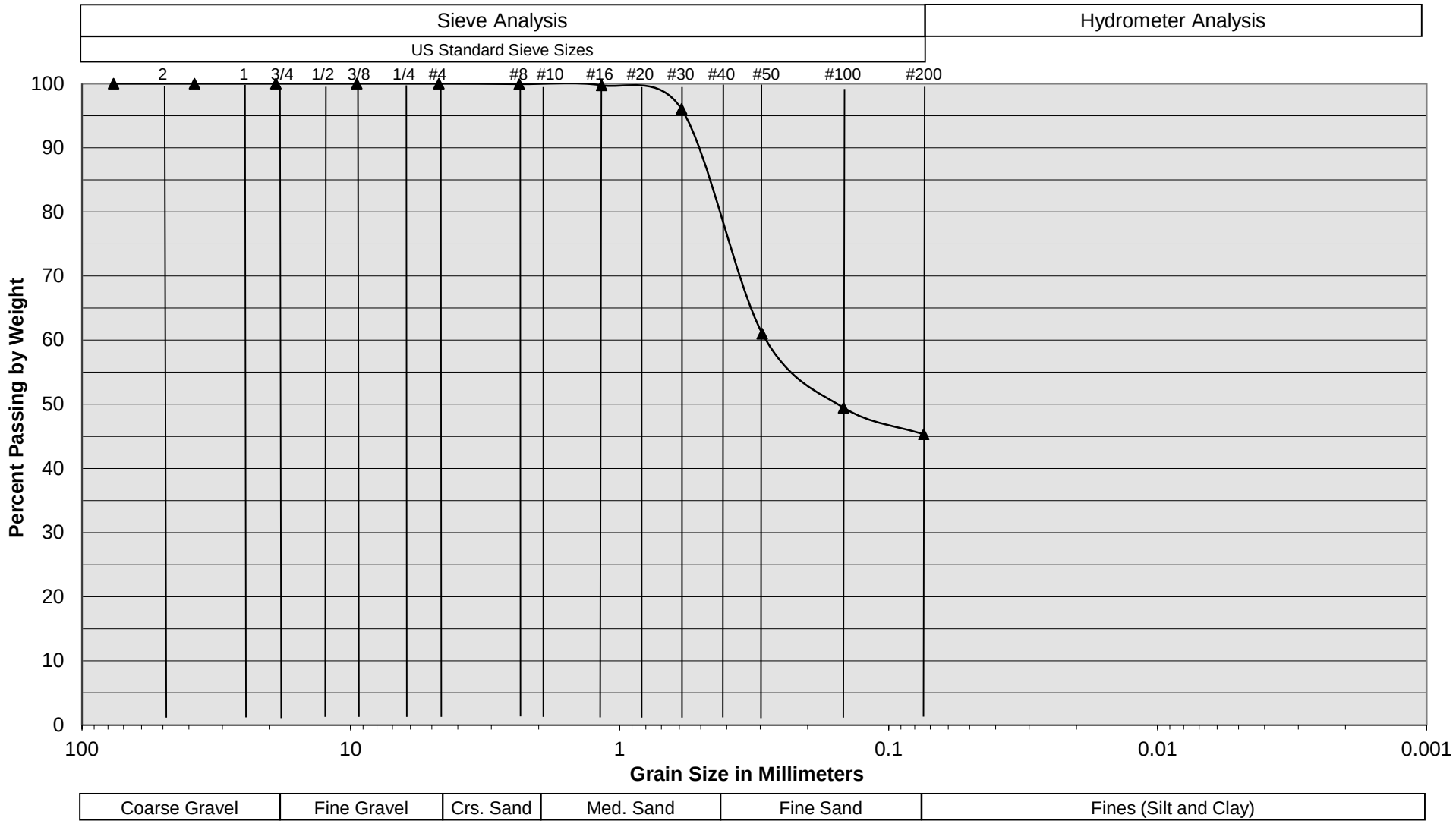
Grain Size Distribution



Sample Description	I-5 @ 10½ feet
Soil Classification	Gray Brown Silty fine Sand

Proposed Warehouse
Redlands, CA
Project No. 19G237-2
PLATE C-5

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