

May 4, 2016

Rockefeller Group Development Corporation
4 Park Plaza, Suite 840
Irvine, California 92614



**SOUTHERN
CALIFORNIA
GEOTECHNICAL**
A California Corporation

Attention: Mr. Michael M. Sajjadi
Vice President Design and Construction Western Division

Project No.: **16G106-2**

Subject: **Results of Infiltration Testing**
Tri-City Industrial Complex
SEC San Bernardino Avenue and Tippecanoe Avenue
San Bernardino, California

Reference: Geotechnical Investigation, Proposed Commercial/Industrial Development, SEC San Bernardino Avenue and Tippecanoe Avenue, San Bernardino, California, prepared for Rockefeller Group Development Corporation, prepared by Southern California Geotechnical, Inc. (SCG), SCG Project No. 16G106-1, dated February 10, 2016.

Gentlemen:

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. 16P102-2 dated April 11, 2016. The scope of services included surface reconnaissance, subsurface exploration, field testing, and engineering analysis to determine the infiltration rate 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 southeast corner of Tippecanoe Avenue and San Bernardino Avenue in San Bernardino, California. The site is bounded to the north by San Bernardino Avenue, to the east by a railroad easement and a warehouse building, to the south by Victoria Avenue, and to the west by Tippecanoe Avenue. The general location of the site is illustrated on the Site Location Map included as Plate 1 of this report.

The subject site consists of a nearly rectangular-shaped parcel, 19.2± acres in size. The site is currently developed with a warehouse building located in the south-central region of the site. Based on the ALTA survey that was provided to our office, the building is 213,375± ft² in size and is of metal-frame and concrete construction. The warehouse building is currently occupied by Loma Linda University and is being utilized for storage. The exterior of the site is being utilized as trailer-truck storage. The north half and southwest portion of the building is dock-high, with a concrete floor-slab

4± feet higher in elevation than the exterior pavements. The southern portion of the building is constructed at level grade with the exterior pavements. Loading docks are located along the north, west and southeast sides of the building. The pavement areas surrounding the building consist of asphaltic concrete pavements in the automobile parking and drive areas and Portland cement concrete (PCC) pavements in the loading dock areas. The pavements are in poor condition with moderate to severe cracking throughout. Landscaped planters with several large trees are located along the southern property line.

Topographical information for the subject site was obtained from the conceptual site plan prepared by Thienes Engineering, Inc., the project civil engineer. This plan indicates that the site grades range from elevations of 1064± feet mean sea level (msl) in the southeast portion of the site to an elevation of 1052± feet msl in the western portion of the site. The overall site topography generally slopes downward to the north at a gradient of approximately 1± percent.

Proposed Development

Our office was provided with a site plan prepared by Thienes Engineering, Inc. Based on the site plan, the site will be developed with two (2) commercial/industrial buildings. The buildings, identified as Buildings 1 and 2, will be 81,730± ft² and 333,170± ft² in size, respectively. Building 1 will be constructed in the south-central region of the site. Loading docks will be located on the north and south sides of Building 1. Building 2 will be located in the north-central region of the site, with loading docks located along the north side. The buildings will be surrounded by asphaltic concrete pavements in the parking and drive lanes and PCC pavements in the loading dock areas.

We understand that the site will utilize on-site storm water infiltration to dispose of storm water. Based on the infiltration test location plan prepared by Thienes Engineering, Inc., the storm water disposal system will consist of three (3) below grade chamber systems. One of the systems will be located in the northwest corner of the site, one of the systems will be located in the central area of the site, and the one of the systems will be located in the southern portion of the site. The bottom of the systems will range from 8½ to 13½± feet below the existing site grades.

Concurrent Study

Southern California Geotechnical, Inc. (SCG) previously conducted a geotechnical investigation of the subject site. As a part of this study, eight (8) borings were advanced to depths of 4½ to 50± feet below existing site grades. Two (2) of these borings were drilled to depths of 50± feet to evaluate the liquefaction potential of the on-site soils and four (4) of the borings were drilled in the building areas to depths of 15 to 25± feet. The remaining two (2) borings were drilled within the interior of the existing warehouse building to depths of 4½ and 10± feet below existing finish floor elevation. Due to access limitations, these borings were drilled using manually operated hand equipment. All of the borings were logged during exploration by members of our staff.

Boring Nos. B-5 and B-6 were drilled within the interior of the existing warehouse building through the existing PCC building slab. The existing slab section at these borings consists of 6 inches of PCC. No significant layer of underlying aggregate base or sand was observed at either of the boring locations. Asphaltic concrete pavements were encountered at the ground surface at all of the remaining boring locations. The pavements consist of 2 to 3± inches of asphaltic concrete underlain by 4 to 5± inches of aggregate base.

Artificial fill soils were encountered beneath the existing floor-slab and pavements at most of the boring locations, with the exception of Boring Nos. B-2 and B-7. These fill soils extend to depths of 1½ to 4½± feet below the existing site grades and consist of loose to medium dense silty fine sands and fine sandy silts, with varying medium to coarse sand and clay content. The fill soils possess a disturbed appearance, resulting in their classification as artificial fill. Boring No. B-5 was terminated within the fill soils due to a possible utility conduit which was encountered at a depth of 4½± feet below the existing floor-slab. Native alluvium was encountered beneath the fill soils or beneath the pavements at all boring locations, with the exception of Boring No. B-5 which was terminated within the fill. The alluvium generally consists of loose to dense silty fine sands, fine sands, and fine sandy silts and medium stiff to very stiff clayey silts and silty clays, with varying amounts medium to coarse sand, extending to at least the maximum depth explored of 50± feet.

Groundwater was not encountered at any of the borings. Based on the lack of any water within the borings, and the moisture contents of the recovered soil samples, the static groundwater table is considered to have existed at a depth in excess of 50± feet below existing site grades, at the time of the subsurface investigation.

Subsurface Exploration

Scope of Exploration

The subsurface exploration conducted for this project consisted of a total of six (6) infiltration test borings. The borings were advanced to depths of 6½ to 13½± feet below existing site grades and were all logged during drilling by a member of our staff. The borings were advanced using a truck-mounted drilling rig, equipped with 8-inch diameter hollow stem augers. The approximate locations of the infiltration test borings (identified as I-1 through I-6) are indicated on the Infiltration Test Location Plan, enclosed as Plate 2 of this report.

Upon the completion of the infiltration borings, the bottoms of the test holes were 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

Pavements were encountered at the ground surface at all six (6) of the boring locations. The pavements consist of 3± inches of asphaltic concrete pavement underlain by 4 to 5± inches of aggregate base. Artificial fill soils were encountered beneath the pavements at Infiltration Test Nos. I-2, I-3, and I-6, extending to depths of 3 to 5½± feet below the existing site grades. The fill soils generally consist of medium dense silty fine sands to fine sandy silts and medium stiff to stiff fine sandy silts. Native alluvium was encountered beneath the fill soils and beneath the pavements at Infiltration Test Nos. I-1, I-4, and I-5, extending to the maximum depth explored of 13½± feet. The alluvium consists of stiff clayey silts and loose to medium dense fine sandy silts, silty fine sands, and fine sands with varying amounts of clay, silt, and medium sands.

Free water was not encountered within any of the infiltration test borings. The Boring Logs, which illustrate the conditions encountered at the infiltration boring locations, are included with this report.

Infiltration Testing

We understand that the results of the testing will be used to prepare a preliminary design for the proposed storm water infiltration system that will be used to dispose of storm water at the subject site. As previously stated, 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, dated June 7, 2013.

Pre-soaking

In accordance with the infiltration county standards for sandy soils, the infiltration test borings were pre-soaked 2 hours prior to infiltration testing or until all of the water had percolated through the test hole. The pre-soaking process consisted of filling the test borings by inverting a full 5 gallon bottle of clear water supported over the 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 the hole. Pre-soaking was completed after all of the water had percolated through each test hole.

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 radius above the gravel at the bottom of the test hole prior to each test interval. In accordance with the San Bernardino County guidelines, since "sandy soils" were encountered at the bottom of all the infiltration test borings (where 6 inches of water infiltrated into the surrounding soils for two consecutive 25-minute readings), readings were taken at an interval of 10 minutes for a total of 1 hour at each test location. After each reading, water was added to the boring 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 for the tests are tabulated in inches per hour. In accordance with typically accepted practice, it is recommended that the most conservative reading from the latter part of the infiltration test be used for design. The rate is summarized below:

| <u>Infiltration Test No.</u> | <u>Soil Description</u> | <u>Infiltration Rate (inches/hour)</u> |
|-------------------------------------|---|---|
| I-1 | Fine Sandy Silt, trace Clay, trace medium Sand | 2.2 |
| I-2 | Silty fine Sand, trace medium Sand | 1.4 |
| I-3 | Fine Sandy Silt, little Clay, trace medium Sand | 2.2 |
| I-4 | Fine to medium Sandy Silt, trace Clay | 1.4 |
| I-5 | Fine to medium Sandy Silt | 3.9 |
| I-6 | Silty fine to medium Sand | 3.7 |

Laboratory Testing

Grain Size Analysis

The grain size distribution of selected soils taken from the base of the infiltration test boring has been determined using a range of wire mesh screens. The analysis was 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 the analysis are presented at the end of this report.

Design Recommendations

A total of six (6) infiltration tests were performed at the subject site. As noted above, the infiltration rates at these locations ranged from 1.4 to 3.9 inches per hour. **Based on the infiltration test results, an infiltration rate of 1.4 inches per hour is recommended for the design of two of the proposed below grade chamber systems, one located in the northwest corner of the site and the other in the central area of the site. An infiltration rate of 3.0 inches per hour is recommended for the third proposed chamber system located in the southern portion of the site.**

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

The design of the proposed infiltration systems should be performed by the project civil engineer, in accordance with the city and/or San Bernardino County guidelines. **It is recommended that the project civil engineer apply an appropriate factor of safety.** 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. **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 six (6) discrete location and that the overall infiltration rate of the infiltration system 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 rate presented herein was determined in accordance with the San Bernardino County guidelines, and is considered valid for the time and place of the actual test. Changes in soil moisture content will affect the infiltration rate. Infiltration rates should be expected to decrease until the soils become saturated. Soil permeability values will then govern groundwater movement. Permeability values may be on the order of 10 to 20 times less than infiltration rates. The system designer should incorporate adequate factors of safety and allow for overflow design into appropriate traditional storm drain systems, which would transport storm water off-site.

Location of Infiltration System

The use of on-site storm water infiltration 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 subgrade soils. If possible, 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 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.



Scott McCann
Staff Scientist

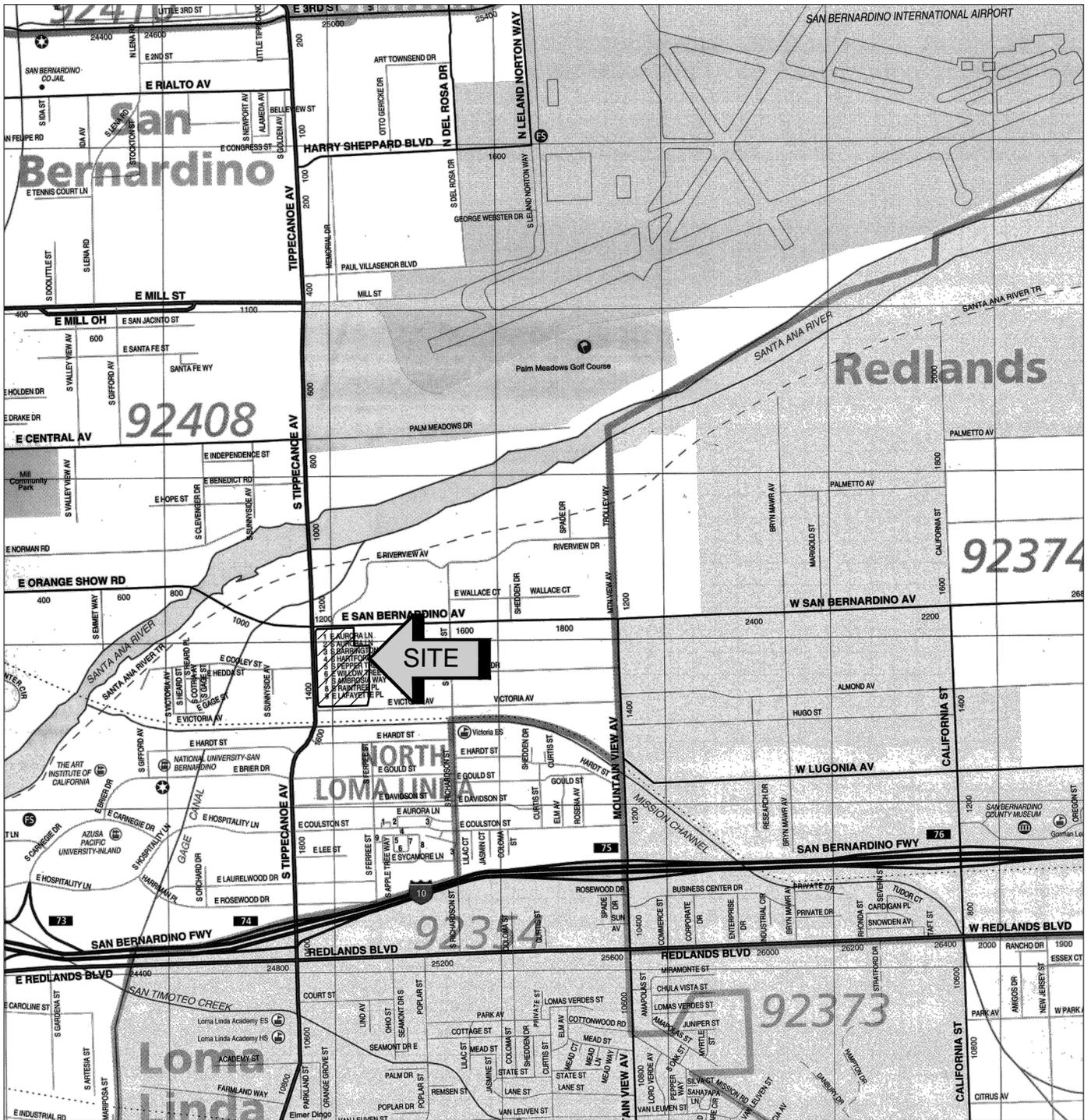


John A. Seminara, GE 2294
Principal Engineer



Distribution: (1) Addressee

Enclosures: Plate 1 - Site Location Map
Plate 2 - Infiltration Test Location Plan
Boring Log Legend and Boring Logs (8 pages)
Infiltration Test Results Spreadsheet (12 pages)
Grain Size Distribution Graph (6 page)



SOURCE: SAN BERNARDINO COUNTY
THOMAS GUIDE, 2013



| | |
|-----------------------------|---|
| SITE LOCATION MAP | |
| TRI-CITY INDUSTRIAL COMPLEX | |
| SAN BERNARDINO, CALIFORNIA | |
| SCALE: 1" = 2400' |  |
| DRAWN: JLH | |
| CHKD: JAS | |
| SCG PROJECT 16G106-2 | |
| PLATE 1 |  |

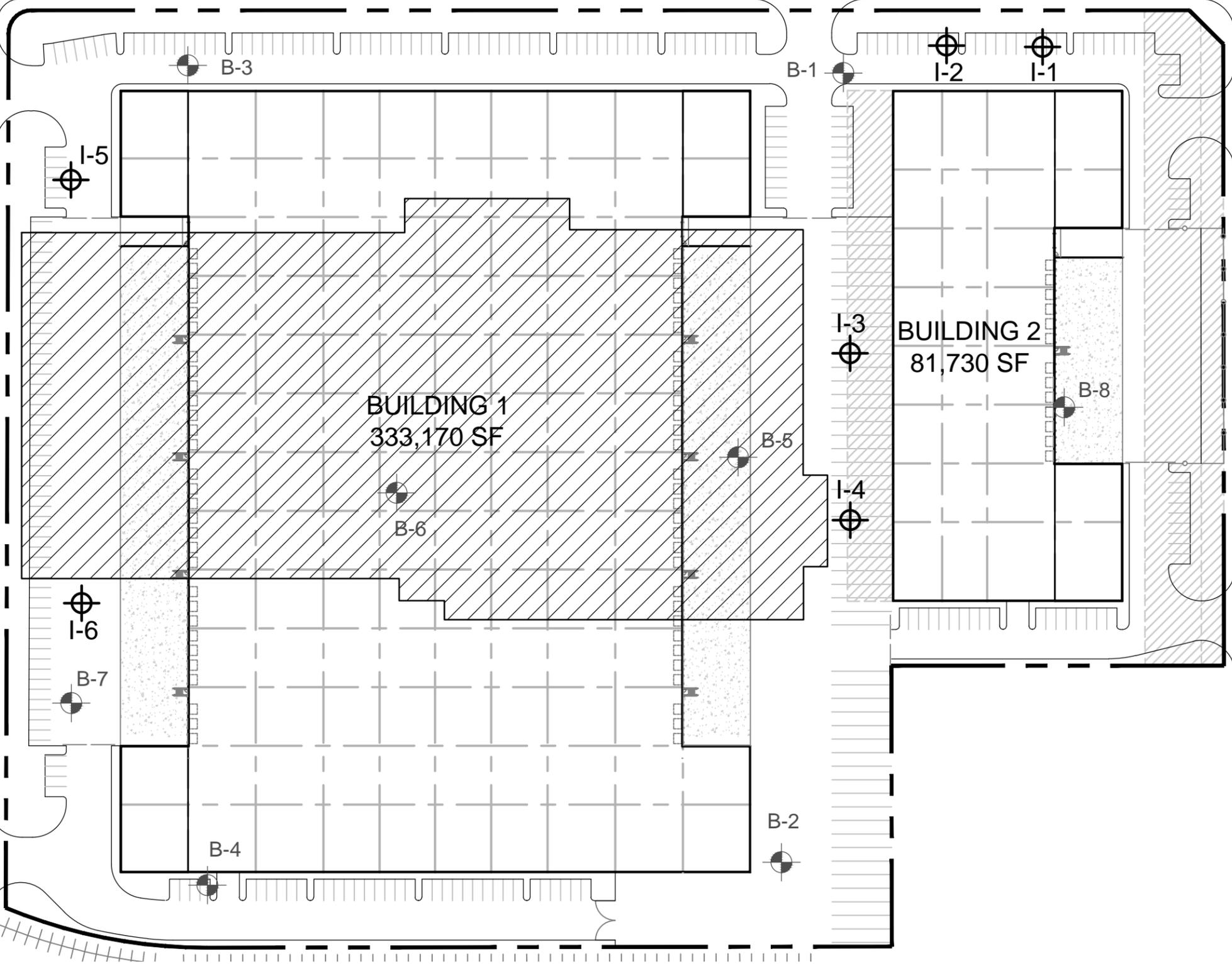
TIPPECANOE AVENUE

SAN BERNARDINO AVENUE

VICTORIA AVENUE



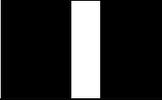
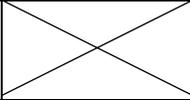
- GEOTECHNICAL LEGEND**
- APPROXIMATE INFILTRATION TEST LOCATION
 - APPROXIMATE BORING LOCATION FROM CONCURRENT STUDY (SCG PROJECT NO. 16G106-1)
 - EXISTING BUILDING TO BE DEMOLISHED



NOTE: BASE SITE MAP PREPARED BY HPA ARCHITECTS.

| | |
|--|---|
| INFILTRATION TEST LOCATION PLAN | |
| TRI-CITY INDUSTRIAL COMPLEX | |
| SAN BERNARDINO, CALIFORNIA | |
| SCALE: 1" = 100' |  SOUTHERN CALIFORNIA GEOTECHNICAL |
| DRAWN: JLH | |
| CHKD: JAS | |
| SCG PROJECT 16G106-2 | |
| 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/ft³.

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 | | |
| <p>COARSE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE</p> | <p>GRAVEL AND GRAVELLY SOILS</p> | <p>CLEAN GRAVELS</p> <p>(LITTLE OR NO FINES)</p> | | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES | |
| | | <p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p> | | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES | |
| | | <p>MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE</p> | <p>CLEAN SANDS</p> <p>(LITTLE OR NO FINES)</p> | | SW | WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES |
| | | | <p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p> | | SP | POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES |
| | <p>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE</p> | <p>SAND AND SANDY SOILS</p> | <p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p> | | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | | <p>CLEAN SANDS</p> <p>(LITTLE OR NO FINES)</p> | | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| | <p>FINE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE</p> | <p>SILTS AND CLAYS</p> | <p>LIQUID LIMIT LESS THAN 50</p> | | 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 |
| | | <p>SILTS AND CLAYS</p> | <p>LIQUID LIMIT GREATER THAN 50</p> | | 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 | |
| <p>HIGHLY ORGANIC SOILS</p> | | | | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS | |

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



| | | |
|--------------------------------------|------------------------------------|------------------------------|
| JOB NO.: 16G106-2 | DRILLING DATE: 4/19/16 | WATER DEPTH: Dry |
| PROJECT: Tri-City Industrial Complex | DRILLING METHOD: Hollow Stem Auger | CAVE DEPTH: --- |
| LOCATION: San Bernardino, California | LOGGED BY: Jason Hiskey | READING TAKEN: At Completion |

| FIELD RESULTS | | | | GRAPHIC LOG | DESCRIPTION | LABORATORY RESULTS | | | | | COMMENTS |
|----------------------------|--------|------------|-------------------|-------------|--|--------------------|----------------------|--------------|---------------|------------------------|----------|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | | | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | |
| SURFACE ELEVATION: --- MSL | | | | | | | | | | | |
| | | | | | 3± inches Asphaltic concrete, 4± inches Aggregate base | | | | | | |
| | | | | | <u>ALLUVIUM</u> : Gray Brown fine Sandy Silt, medium dense-moist to very moist | | | | | | |
| 5 | | 16 | | | | 13 | | | | | |
| | | 18 | | | Gray Brown Silty fine Sand, medium dense-moist | 29 | 10 | | | | |
| | | 13 | | | Gray Brown Silty fine Sand, medium dense-moist to very moist | 35 | | | | | |
| 10 | | 8 | | | Gray Brown fine Sandy Silt, trace Clay, loose-moist | 12 | | | | | |
| Boring Terminated at 11½' | | | | | | | | | | | |

TBL_16G106-2.GPJ_SOCALGEO.GDT_5/4/16



| | | |
|--------------------------------------|------------------------------------|------------------------------|
| JOB NO.: 16G106-2 | DRILLING DATE: 4/19/16 | WATER DEPTH: Dry |
| PROJECT: Tri-City Industrial Complex | DRILLING METHOD: Hollow Stem Auger | CAVE DEPTH: --- |
| LOCATION: San Bernardino, California | LOGGED BY: Jason Hiskey | READING TAKEN: At Completion |

| FIELD RESULTS | | | | GRAPHIC LOG | DESCRIPTION | LABORATORY RESULTS | | | | | | COMMENTS |
|----------------------------|--------|------------|-------------------|-------------|---|--------------------|----------------------|--------------|---------------|------------------------|------------------------|----------|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | | | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | UNCONFINED SHEAR (TSF) | |
| SURFACE ELEVATION: --- MSL | | | | | | | | | | | | |
| | | | | | 3± inches Asphaltic concrete, 5± inches Aggregate base | | | | | | | |
| | | 16 | | | <u>FILL</u> : Dark Gray Brown fine Sandy Silt to Silty fine Sand, medium dense-very moist | | 20 | | | | | |
| | | 11 | | | <u>ALLUVIUM</u> : Gray Brown fine Sandy Silt, medium dense-very moist | | 24 | | | | | |
| 5 | | | | | Gray Brown Silty fine Sand, medium dense-very moist | | 18 | | | | | |
| | | 17 | | | Gray Brown fine Sand, trace Silt nodules, medium dense-moist | | 15 | | | | | |
| | | 13 | | | | | 10 | | | | | |
| 10 | | | | | Gray Brown Silty fine Sand, medium dense-very moist | | 11 | | | | | |
| | | 15 | | | Gray Brown Silty fine Sand, trace medium Sand, medium dense-moist | | 20 | | | | | |
| | | | | | | | 14 | | | | | |
| Boring Terminated at 12½' | | | | | | | | | | | | |

TBL_16G106-2.GPJ_SOCALGEO.GDT_5/4/16



| | | |
|--------------------------------------|------------------------------------|------------------------------|
| JOB NO.: 16G106-2 | DRILLING DATE: 4/19/16 | WATER DEPTH: Dry |
| PROJECT: Tri-City Industrial Complex | DRILLING METHOD: Hollow Stem Auger | CAVE DEPTH: --- |
| LOCATION: San Bernardino, California | LOGGED BY: Jason Hiskey | READING TAKEN: At Completion |

| FIELD RESULTS | | | | GRAPHIC LOG | DESCRIPTION | LABORATORY RESULTS | | | | | | COMMENTS |
|----------------------------|--------|------------|-------------------|-------------|---|--------------------|----------------------|--------------|---------------|------------------------|------------------------|----------|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | | | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | UNCONFINED SHEAR (TSF) | |
| SURFACE ELEVATION: --- MSL | | | | | | | | | | | | |
| | | | | | 3± inches Asphaltic concrete, 4± inches Aggregate base | | | | | | | |
| | | 8 | | | <u>FILL:</u> Dark Gray Brown fine Sandy Silt, slightly mottled, medium dense-very moist | | 20 | | | | | |
| | | 10 | | | <u>ALLUVIUM:</u> Gray Brown Silty fine Sand, medium dense-damp to moist | | 8 | | | | | |
| 5 | | | | | | | | | | | | |
| | | 12 | | | Gray Brown fine Sandy Silt to Silty fine Sand, medium dense-very moist | | 18 | | | | | |
| | | 20 | | | Gray Brown fine Sand, trace Silt, medium dense-damp to moist | | 5 | | | | | |
| 10 | | | | | | | | | | | | |
| | | 8 | | | Gray Brown fine Sandy Silt, little Clay, trace medium Sand, loose-very moist | | 9 | | | | | |
| | | | | | | | 28 | | | | | |
| Boring Terminated at 13½' | | | | | | | | | | | | |

TBL_16G106-2.GPJ_SOCALGEO.GDT_5/4/16



| | | |
|--------------------------------------|------------------------------------|------------------------------|
| JOB NO.: 16G106-2 | DRILLING DATE: 4/19/16 | WATER DEPTH: Dry |
| PROJECT: Tri-City Industrial Complex | DRILLING METHOD: Hollow Stem Auger | CAVE DEPTH: --- |
| LOCATION: San Bernardino, California | LOGGED BY: Jason Hiskey | READING TAKEN: At Completion |

| FIELD RESULTS | | | | DESCRIPTION | LABORATORY RESULTS | | | | | | COMMENTS |
|----------------------------|--------|------------|-------------------|--|--------------------|-------------------|----------------------|--------------|---------------|------------------------|----------|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | | GRAPHIC LOG | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | |
| SURFACE ELEVATION: --- MSL | | | | | | | | | | | |
| | | | | 3± inches Asphaltic concrete, 4± inches Aggregate base | | | | | | | |
| | | | | <u>ALLUVIUM</u> : Gray Brown Silty fine Sand, loose to medium dense-moist | | 11 | | | | | |
| 5 | X | 15 | | | | | | | | | |
| | | 9 | | | | 10 | | | | | |
| | | 13 | | Gray Brown Clayey Silt, trace fine Sand, Iron oxide staining, stiff-very moist | | 37 | | | | | |
| | | 12 | | Gray Brown fine Sand, trace Silt, medium dense-moist | | 9 | | | | | |
| 10 | X | | | Gray Brown Clayey Silt, trace fine Sand, stiff-very moist | | 30 | | | | | |
| | | 11 | | Dark Gray Brown fine to medium Sandy Silt, trace Clay, medium dense-very moist | | 23 | | | | | |
| Boring Terminated at 13' | | | | | | | | | | | |

TBL_16G106-2.GPJ_SOCALGEO.GDT_5/4/16



| | | |
|--------------------------------------|------------------------------------|------------------------------|
| JOB NO.: 16G106-2 | DRILLING DATE: 4/19/16 | WATER DEPTH: Dry |
| PROJECT: Tri-City Industrial Complex | DRILLING METHOD: Hollow Stem Auger | CAVE DEPTH: --- |
| LOCATION: San Bernardino, California | LOGGED BY: Jason Hiskey | READING TAKEN: At Completion |

| FIELD RESULTS | | | | GRAPHIC LOG | DESCRIPTION | LABORATORY RESULTS | | | | | | COMMENTS |
|----------------------------|--------|------------|-------------------|-------------|---|--------------------|----------------------|--------------|---------------|------------------------|------------------------|----------|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | | | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | UNCONFINED SHEAR (TSF) | |
| SURFACE ELEVATION: --- MSL | | | | | | | | | | | | |
| | X | 16 | | | 3± inches Asphaltic concrete, 5± inches Aggregate base | | 10 | | | | | |
| | X | 14 | | | ALLUVIUM: Gray Brown Silty fine Sand to fine Sandy Silt, medium dense-moist | | | | | | | |
| 5 | X | | | | Dark Brown fine to medium Sandy Silt, medium dense-very moist | | 19 | | | | | |
| Boring Terminated at 6½' | | | | | | | | | | | | |

TBL_16G106-2.GPJ_SOCALGEO.GDT_5/4/16



| | | |
|--------------------------------------|------------------------------------|------------------------------|
| JOB NO.: 16G106-2 | DRILLING DATE: 4/19/16 | WATER DEPTH: Dry |
| PROJECT: Tri-City Industrial Complex | DRILLING METHOD: Hollow Stem Auger | CAVE DEPTH: --- |
| LOCATION: San Bernardino, California | LOGGED BY: Jason Hiskey | READING TAKEN: At Completion |

| FIELD RESULTS | | | | DESCRIPTION | LABORATORY RESULTS | | | | | | COMMENTS |
|----------------------------|--------|------------|-------------------|-------------|--|-------------------|----------------------|--------------|---------------|------------------------|----------|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | | GRAPHIC LOG | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | |
| SURFACE ELEVATION: --- MSL | | | | | | | | | | | |
| | | | | | 3± inches Asphaltic concrete, 4± inches Aggregate base | | | | | | |
| | | 12 | | | <u>FILL</u> : Gray Brown fine Sandy Silt, medium dense-moist to very moist | | 20 | | | | |
| | | 9 | | | | | 20 | | | | |
| 5 | | | | | | | | | | | |
| | | 17 | | | <u>ALLUVIUM</u> : Gray Brown fine Sand, some Silt, medium dense-moist | | 9 | | | | |
| | | 15 | | | | | 10 | | | | |
| 10 | | | | | | | | | | | |
| | | 23 | | | Gray Brown Silty fine to medium Sand, medium dense-damp to moist | | 6 | | | | |
| Boring Terminated at 12' | | | | | | | | | | | |

TBL_16G106-2.GPJ_SOCALGEO.GDT_5/4/16

INFILTRATION CALCULATIONS

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 9.90 | (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 | 10:56 AM | 10.00 | 7.70 | 0.43 | 1.99 | 2.40 |
| | Final | 11:06 AM | | 8.13 | | | |
| 2 | Initial | 11:07 AM | 10.00 | 7.86 | 0.38 | 1.85 | 2.26 |
| | Final | 11:17 AM | | 8.24 | | | |
| 3 | Initial | 11:18 AM | 10.00 | 7.39 | 0.85 | 2.09 | 4.54 |
| | Final | 11:28 AM | | 8.24 | | | |
| 4 | Initial | 11:29 AM | 10.00 | 7.89 | 0.37 | 1.83 | 2.23 |
| | Final | 11:39 AM | | 8.26 | | | |
| 5 | Initial | 11:40 AM | 10.00 | 7.88 | 0.38 | 1.83 | 2.28 |
| | Final | 11:50 AM | | 8.26 | | | |
| 6 | Initial | 11:51 AM | 10.00 | 7.91 | 0.37 | 1.81 | 2.25 |
| | Final | 12:01 PM | | 8.28 | | | |

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 (PRE-SOAKING)

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 9.90 | (ft) |

Infiltration Test Hole

| 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 | 10:25 AM | 12.00 | 7.80 | 6.48 | YES | SANDY SOILS |
| | Final | 10:37 AM | | 8.34 | | | |
| 2 | Initial | 10:38 AM | 15.00 | 7.76 | 7.08 | YES | SANDY SOILS |
| | Final | 10:53 AM | | 8.35 | | | |

| | |
|--|----|
| Is 15 to 26 hour Pre-Soaking Required? (Sandy Soils = NO, Non-Sandy Soils = YES) | NO |
|--|----|

| Pre-Soaking | | Time | Time Interval (hrs) | Was Pre-Soaking accomplished? |
|-------------|---------|----------|---------------------|-------------------------------|
| | Initial | 1:45 PM | 20.58 | YES |
| | Final | 10:20 AM | | |

INFILTRATION CALCULATIONS

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|-------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 12.00 | (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 | 11:11 AM | 10.00 | 9.98 | 0.27 | 1.89 | 1.58 |
| | Final | 11:21 AM | | 10.25 | | | |
| 2 | Initial | 11:22 AM | 10.00 | 9.98 | 0.25 | 1.90 | 1.46 |
| | Final | 11:32 AM | | 10.23 | | | |
| 3 | Initial | 11:33 AM | 10.00 | 9.94 | 0.24 | 1.94 | 1.37 |
| | Final | 11:43 AM | | 10.18 | | | |
| 4 | Initial | 11:44 AM | 10.00 | 9.94 | 0.24 | 1.94 | 1.37 |
| | Final | 11:54 AM | | 10.18 | | | |
| 5 | Initial | 11:55 AM | 10.00 | 9.93 | 0.25 | 1.95 | 1.42 |
| | Final | 12:05 PM | | 10.18 | | | |
| 6 | Initial | 12:06 PM | 10.00 | 9.95 | 0.25 | 1.93 | 1.43 |
| | Final | 12:16 PM | | 10.20 | | | |

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 (PRE-SOAKING)

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|-------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 12.00 | (ft) |

Infiltration Test Hole

| 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 | 10:33 AM | 17.00 | 9.85 | 6.24 | YES | SANDY SOILS |
| | Final | 10:50 AM | | 10.37 | | | |
| 2 | Initial | 10:51 AM | 17.00 | 9.43 | 6.60 | YES | SANDY SOILS |
| | Final | 11:08 AM | | 9.98 | | | |

| | |
|--|----|
| Is 15 to 26 hour Pre-Soaking Required? (Sandy Soils = NO, Non-Sandy Soils = YES) | NO |
|--|----|

| Pre-Soaking | | Time | Time Interval (hrs) | Was Pre-Soaking accomplished? |
|-------------|---------|----------|---------------------|-------------------------------|
| | Initial | 1:40 PM | 20.80 | YES |
| | Final | 10:28 AM | | |

INFILTRATION CALCULATIONS

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|-------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 13.10 | (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 | 11:03 AM | 10.00 | 5.80 | 1.59 | 6.51 | 2.86 |
| | Final | 11:13 AM | | 7.39 | | | |
| 2 | Initial | 11:14 AM | 10.00 | 6.11 | 1.24 | 6.37 | 2.28 |
| | Final | 11:24 AM | | 7.35 | | | |
| 3 | Initial | 11:25 AM | 10.00 | 6.01 | 1.26 | 6.46 | 2.28 |
| | Final | 11:35 AM | | 7.27 | | | |
| 4 | Initial | 11:36 AM | 10.00 | 5.87 | 1.24 | 6.61 | 2.20 |
| | Final | 11:46 AM | | 7.11 | | | |
| 5 | Initial | 11:47 AM | 10.00 | 6.04 | 1.28 | 6.42 | 2.33 |
| | Final | 11:57 AM | | 7.32 | | | |
| 6 | Initial | 11:58 AM | 10.00 | 5.98 | 1.23 | 6.51 | 2.21 |
| | Final | 12:08 PM | | 7.21 | | | |

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 (PRE-SOAKING)

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|-------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 13.10 | (ft) |

Infiltration Test Hole I-3

| 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 | 10:49 AM | 5.00 | 5.82 | 10.80 | YES | SANDY SOILS |
| | Final | 10:54 AM | | 6.72 | | | |
| 2 | Initial | 10:55 AM | 5.00 | 5.72 | 9.12 | YES | SANDY SOILS |
| | Final | 11:00 AM | | 6.48 | | | |

| | |
|--|----|
| Is 15 to 26 hour Pre-Soaking Required? (Sandy Soils = NO, Non-Sandy Soils = YES) | NO |
|--|----|

| Pre-Soaking | | Time | Time Interval (hrs) | Was Pre-Soaking accomplished? |
|-------------|---------|----------|---------------------|-------------------------------|
| | Initial | 11:49 AM | 22.90 | YES |
| | Final | 10:43 AM | | |

INFILTRATION CALCULATIONS

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|-------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 12.30 | (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 | 11:08 AM | 10.00 | 5.19 | 0.88 | 6.67 | 1.54 |
| | Final | 11:18 AM | | 6.07 | | | |
| 2 | Initial | 11:19 AM | 10.00 | 5.24 | 0.82 | 6.65 | 1.44 |
| | Final | 11:29 AM | | 6.06 | | | |
| 3 | Initial | 11:30 AM | 10.00 | 5.13 | 0.81 | 6.77 | 1.40 |
| | Final | 11:40 AM | | 5.94 | | | |
| 4 | Initial | 11:41 AM | 10.00 | 5.17 | 0.81 | 6.73 | 1.41 |
| | Final | 11:51 AM | | 5.98 | | | |
| 5 | Initial | 11:52 AM | 10.00 | 6.15 | 0.81 | 5.75 | 1.64 |
| | Final | 12:02 PM | | 6.96 | | | |
| 6 | Initial | 12:03 PM | 10.00 | 5.17 | 0.81 | 6.73 | 1.41 |
| | Final | 12:13 PM | | 5.98 | | | |

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 (PRE-SOAKING)

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|-------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 10.00 | (ft) |

Infiltration Test Hole I-4

| 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 | 10:43 AM | 8.00 | 5.20 | 13.56 | YES | SANDY SOILS |
| | Final | 10:51 AM | | 6.33 | | | |
| 2 | Initial | 10:52 AM | 6.00 | 5.22 | 6.48 | YES | SANDY SOILS |
| | Final | 10:58 AM | | 5.76 | | | |

| | |
|--|----|
| Is 15 to 26 hour Pre-Soaking Required? (Sandy Soils = NO, Non-Sandy Soils = YES) | NO |
|--|----|

| Pre-Soaking | | Time | Time Interval (hrs) | Was Pre-Soaking accomplished? |
|-------------|---------|----------|---------------------|-------------------------------|
| | Initial | 1:30 PM | 21.17 | YES |
| | Final | 10:40 AM | | |

INFILTRATION CALCULATIONS

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 6.50 | (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 | 9:06 AM | 10.00 | 3.00 | 1.23 | 2.89 | 4.84 |
| | Final | 9:16 AM | | 4.23 | | | |
| 2 | Initial | 9:17 AM | 10.00 | 2.96 | 1.19 | 2.95 | 4.59 |
| | Final | 9:27 AM | | 4.15 | | | |
| 3 | Initial | 9:28 AM | 10.00 | 3.45 | 0.98 | 2.56 | 4.31 |
| | Final | 9:38 AM | | 4.43 | | | |
| 4 | Initial | 9:39 AM | 10.00 | 3.60 | 0.91 | 2.45 | 4.18 |
| | Final | 9:49 AM | | 4.51 | | | |
| 5 | Initial | 9:50 AM | 10.00 | 3.50 | 0.90 | 2.55 | 3.98 |
| | Final | 10:00 AM | | 4.40 | | | |
| 6 | Initial | 10:01 AM | 10.00 | 3.51 | 0.89 | 2.55 | 3.94 |
| | Final | 10:11 AM | | 4.40 | | | |

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 (PRE-SOAKING)

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|-------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 10.00 | (ft) |

Infiltration Test Hole

| 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 | 8:56 AM | 3.00 | 2.60 | 6.24 | YES | SANDY SOILS |
| | Final | 8:59 AM | | 3.12 | | | |
| 2 | Initial | 9:00 AM | 4.00 | 3.20 | 6.60 | YES | SANDY SOILS |
| | Final | 9:04 AM | | 3.75 | | | |

| | |
|--|----|
| Is 15 to 26 hour Pre-Soaking Required? (Sandy Soils = NO, Non-Sandy Soils = YES) | NO |
|--|----|

| Pre-Soaking | | Time | Time Interval (hrs) | Was Pre-Soaking accomplished? |
|-------------|---------|---------|---------------------|-------------------------------|
| | Initial | 9:15 AM | 23.65 | YES |
| | Final | 8:54 AM | | |

INFILTRATION CALCULATIONS

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|-------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 11.40 | (ft) |

Infiltration Test Hole I-6

| 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 | 8:56 AM | 10.00 | 9.17 | 0.79 | 1.84 | 4.74 |
| | Final | 9:06 AM | | 9.96 | | | |
| 2 | Initial | 9:07 AM | 10.00 | 9.50 | 0.41 | 1.70 | 2.64 |
| | Final | 9:17 AM | | 9.91 | | | |
| 3 | Initial | 9:18 AM | 10.00 | 9.11 | 0.74 | 1.92 | 4.26 |
| | Final | 9:28 AM | | 9.85 | | | |
| 4 | Initial | 9:29 AM | 10.00 | 9.17 | 0.70 | 1.88 | 4.10 |
| | Final | 9:39 AM | | 9.87 | | | |
| 5 | Initial | 9:40 AM | 10.00 | 9.22 | 0.66 | 1.85 | 3.93 |
| | Final | 9:50 AM | | 9.88 | | | |
| 6 | Initial | 9:51 AM | 10.00 | 9.38 | 0.58 | 1.73 | 3.67 |
| | Final | 10:01 AM | | 9.96 | | | |

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 (PRE-SOAKING)

| | |
|------------------|-----------------------------|
| Project Name | Tri-City Industrial Complex |
| Project Location | San Bernardino, California |
| Project Number | 16G106-2 |
| Engineer | PM |

| | | |
|--------------------|-------|------|
| Test Hole Diameter | 8 | (in) |
| Test Hole Radius | 4 | (in) |
| Test Depth | 11.40 | (ft) |

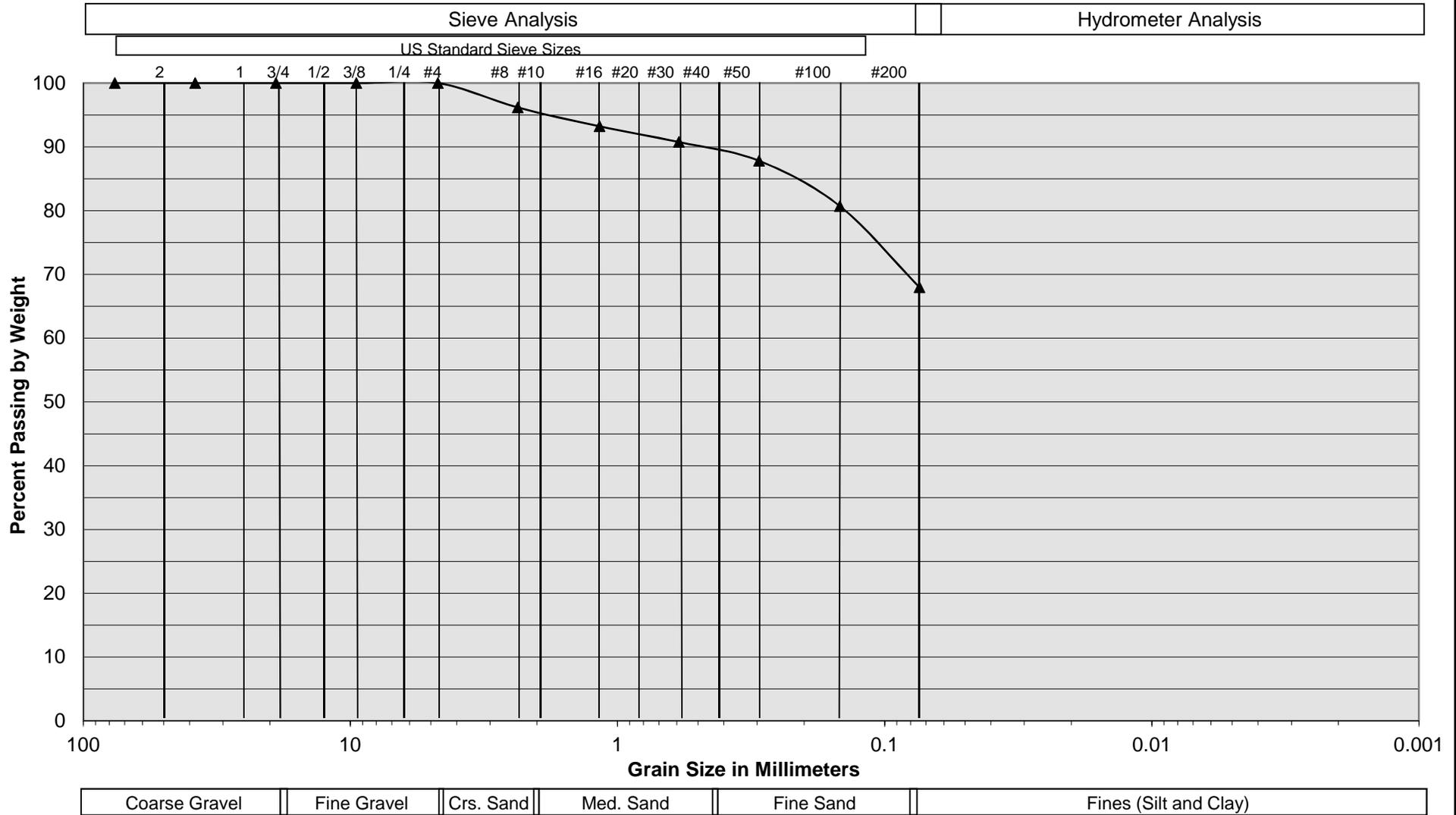
Infiltration Test Hole I-6

| 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 | 8:43 AM | 5.00 | 9.27 | 7.08 | YES | SANDY SOILS |
| | Final | 8:48 AM | | 9.86 | | | |
| 2 | Initial | 8:49 AM | 6.00 | 9.25 | 6.48 | YES | SANDY SOILS |
| | Final | 8:55 AM | | 9.79 | | | |

| | |
|--|----|
| Is 15 to 26 hour Pre-Soaking Required? (Sandy Soils = NO, Non-Sandy Soils = YES) | NO |
|--|----|

| Pre-Soaking | | Time | Time Interval (hrs) | Was Pre-Soaking accomplished? |
|-------------|---------|---------|---------------------|-------------------------------|
| | Initial | 1:55 PM | 18.75 | YES |
| | Final | 8:40 AM | | |

Grain Size Distribution



| | |
|---------------------|---|
| Sample Description | I-4 @ 11.5 feet |
| Soil Classification | Dark Gray Brown fine to medium Sandy Silt, trace Clay |

Tri-City Industrial Complex
 San Bernardino, California
 Project No. 16G106-2
PLATE C-4



SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

