APPENDIX C
Geotechnical Investigation

GEOTECHNICAL AND INFILTRATION EVALUATION
PROPOSED INDUSTRIAL BUILDING
333 WEST GARDENA BOULEVARD
CARSON, LOS ANGELES COUNTY, CALIFORNIA

PREPARED FOR

CT REALTY INVESTORS
CLARION PARTNERS ACQUISITION, LLC
4343 VON KARMAN AVENUE, SUITE 200
NEWPORT BEACH, CALIFORNIA 92660

ATTENTION: MR. DAVID BALL

PREPARED BY

GEOTEK, INC.
1548 NORTH MAPLE STREET
CORONA, CALIFORNIA 92880

PROJECT NO. 2177-CR **AUGUST 9, 2019**

GEOTEK

GeoTek, Inc.
1548 North Maple Street, Corona, California 92880
(951) 710-1160 Office (951) 710-1167 Fax www.geotekusa.com

August 9, 2019
Project No. 2177-CR

CT Realty Investors
Clarion Partners Acquisition, LLC
4343 Von Karman Avenue, Suite 200
Newport Beach, California 92660

Attention: Mr. David Ball

Subject: Geotechnical and Infiltration Evaluation
Proposed Industrial Building
333 West Gardena Boulevard
Carson, Los Angeles County, California

Dear Mr. Ball:

We are pleased to provide the results of our geotechnical and infiltration evaluation for the proposed industrial building that will be constructed on the subject site in Carson, Los Angeles County, California. This report presents a discussion of our evaluation and provides preliminary geotechnical recommendations for site preparation, foundation design, infiltration rates and construction.

Based on the results of our evaluation, development of the property appears feasible from a geotechnical viewpoint provided that the recommendations presented in this report and in future reports are incorporated into design and construction.

The opportunity to be of service is sincerely appreciated. If you have any questions, please do not hesitate to contact our office.

Respectfully submitted,
GeoTek, Inc.

Robert R. Russell
GE 2042, Exp. 12/31/20
Senior Project Engineer

Edward H. LaMont
CEG 1892, Exp. 07/31/20
Principal Geologist

Anna M. Scott
Project Geologist

Distribution: (1) Addressee via email (one PDF file)

G:\Projects\2151 to 2200\2177CR CT Realty Investors Clarion Partners Acquistion 333 West Gardena Blvd Carson\Geotechnical and Infiltration Evaluation\2177CR Geotechnical and Infiltration Evaluation Carson.docx

TABLE OF CONTENTS

TABLE OF CONTENTS

1. PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to evaluate the geotechnical conditions for the proposed development. Services provided for this study included the following:

- Research and review of available geologic data and general information pertinent to the site,
- A site reconnaissance,
- Excavation and logging of six geotechnical exploratory borings,
- Logging and infiltration testing of two additional hollow stem auger borings in the vicinity of a planned storm water infiltration area,
- Collection of soil samples,
- Laboratory testing of selected soil samples,
- Review and evaluation of site seismicity, and;
- Compilation of this geotechnical report which presents our preliminary recommendations for site development.

The intent of this report is to aid in the evaluation of the site for future proposed development from a geotechnical perspective. The professional opinions and geotechnical information contained in this report may need to be updated based upon our review of the final site development plans. These plans should be provided to GeoTek, Inc. for review when available.

2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 SITE DESCRIPTION

The approximately 6.67-acre site is located on the north side of West Gardena Boulevard and is referenced by the street address of 333 W. Gardena Boulevard in Carson, Los Angeles County, California. The site location is presented on Figure 1. The site is currently developed with a few residential structures and outbuildings in the southern portion of the parcel with the remainder of the site undeveloped but with scattered junk and debris across the northern portion of the property. Topographically, the site is relatively level with less than about 5 feet of elevation differential across the site, sloping gently to the south.

The site is bounded by West Gardena Boulevard to the south and commercial/industrial properties to the north, east and west.

2.2 PROPOSED DEVELOPMENT

We understand that the planned development will consist of the construction of a 152,640 square foot industrial building within the majority of the property with parking and access drives around the perimeter of the building. A loading dock will be located along the east side of the building. Figure 3 is a copy of the *Conceptual Site Plan* prepared for the site by Ware-Malcomb. A stormwater infiltration area is also planned in the southwestern portion of the site. We anticipate that the building will be single-story concrete tilt-up structure with an office area, located in the southwest corner of the structure.

Although structural loading information has not been provided, we anticipate that the building will be supported by shallow wall and isolated column footings and will incorporate a conventional slab on-grade. Maximum column and wall loads on the order of 100 kips and 4 kips per foot, respectively, have been assumed for this report. Once actual loads are known, that information should be provided to GeoTek to determine if modifications to the recommendations presented in this report are warranted.

Based on the relatively flat surface topography, we anticipate that the maximum depths of cut and fill will be less than about 5 feet, not including any remedial grading.

3. FIELD EXPLORATION AND LABORATORY TESTING

3.1 FIELD EXPLORATION

Our field exploration was conducted on July 29, 2019 and consisted of six geotechnical test borings which were excavated with a hollow-stem auger drill rig to depths ranging from about 16-½ to 51-½ feet below ground surface (bgs). A hollow-stem auger with an outside diameter of about 8 inches and an inside diameter of about 4.5 inches was utilized. A geologist from

GeoTek, Inc. logged the exploratory borings. The boring locations are presented on Figure 2. Logs of the exploratory borings are included in Appendix A.

The exploration logs show subsurface conditions at the dates and locations indicated and may not be representative of other locations and times. The stratification lines presented on the logs represent the approximate boundaries between soil types and the transitions may be gradual.

Relatively undisturbed soil samples were recovered at various intervals in the geotechnical borings with a California sampler. The California sampler is a 3-inch outside diameter, 2.4-inch inside diameter, split barrel sampler lined with brass rings. The sampler was 18 inches long. The sampler conformed to the requirements of ASTM D 3550. A 140-pound automatic trip hammer was utilized, dropping 30 inches for each blow. The relatively undisturbed samples, together with bulk samples of representative soil types, were returned to the laboratory for testing and evaluation. In Boring 3, standard penetration tests were performed with a 2.0-inch outside diameter, 1.375-inch unlined inside diameter, split-barrel sampler. The sampler was 18 inches long. The sampler conformed to the requirements of ASTM D 1586. A 140-pound automatic trip hammer was utilized, dropping 30 inches for each blow. The standard penetration test and California Ring sampler data are presented on the boring logs.

Two borings (I-1 and I-2) were also excavated in the vicinity of the proposed stormwater management area to a depth of about 10 feet. Infiltration testing was conducted in these borings in general accordance with the requirements of the County of Los Angeles Administrative Manual (GS200.1). The infiltration tests consisted of drilling an eight-inch diameter test hole to the desired depth and installing approximately two inches of gravel in the bottom of the hole. A three-inch diameter perforated PVC pipe, wrapped in a filter sock, was placed in the excavations and the annular space was filled with gravel to prevent caving within the boring. Water was then placed in the borings to presoak the holes overnight and percolation testing was performed the following day. Results of the field infiltration testing is presented in Section 5.4 of this report and the field infiltration data is provided in Appendix D.

3.2 LABORATORY TESTING

Laboratory testing was performed on selected soil samples obtained during our field exploration. The purpose of the laboratory testing was to confirm the field classification of the soils encountered and to evaluate the physical properties of the soils for use in engineering design and analysis.

Included in our laboratory testing were moisture-density determinations on undisturbed samples. An optimum moisture content-maximum dry density relationship was established for a typical soil type so that the relative compaction of the subsoils could be determined. Direct shear testing was performed on two selected samples to help evaluate the bearing capacity of the soils. Expansion index testing was performed on a selected sample to evaluate the expansion potential of the on-site soils and collapse testing was performed on three samples to assess the hydro-consolidation potential of the site soils. Chemical testing comprised of pH, soluble sulfate, chloride and resistivity testing was conducted on selected samples. The moisture-density data are presented on the exploration logs in Appendix A. The maximum density, direct shear, expansion index, collapse tests and chemical test data are presented in Appendix B.

4. GEOLOGIC AND SOILS CONDITIONS

4.1 REGIONAL SETTING

The subject property is situated in the Peninsular Ranges geomorphic province. The Peninsular Ranges province is one of the largest geomorphic units in western North America. It extends approximately 975 miles south of the Transverse Ranges geomorphic province to the tip of Baja California. This province varies in width from about 30 to 100 miles. It is bounded on the west by the Pacific Ocean, on the south by the Gulf of California and on the east by the Colorado Desert Province.

The Peninsular Ranges are essentially a series of northwest-southeast oriented fault blocks. Several major fault zones are found in this province. The Elsinore Fault zone and the San Jacinto Fault zone trend northwest-southeast and are found near the middle of the province. The San Andreas Fault zone borders the northeasterly margin of the province.

More specific to the subject property, the site is located in an area geologically mapped to be underlain by alluvium and older alluvium (Dibblee, T.W. and Minch, J.A., 2007). No faults are shown in the immediate site vicinity on the maps reviewed for the area.

4.2 GENERAL SOIL/GEOLOGIC CONDITIONS

A brief description of the soils encountered on the site is presented in the following sections. Based on a review of the geologic map (Dibblee, T. W. and Minch, J. A, 2007), and our field exploration and observations, the site is underlain by alluvial gravel, sand and clay, slightly elevated and dissected (Map Symbol Qae).

4.2.1 Alluvium

Alluvium generally consisting of stiff to hard silty to sandy clay and silt and medium dense to very dense silty sand and sand were encountered in our geotechnical test borings. These alluvial soils were encountered to the maximum depth explored of about 51-½ feet below grade. Expansion index testing reveals that the near-surface soils exhibit a "very low" expansion potential.

4.3 SURFACE AND GROUNDWATER

4.3.1 Surface Water

Surface water was not observed during our site visit. If encountered during earthwork construction, surface water on this site is the result of precipitation or possibly some minor surface run-off from immediately surrounding properties. Overall site area drainage is generally in a easterly direction, as directed by site topography. Provisions for surface drainage will need to be accounted for by the project civil engineer.

4.3.2 Groundwater

Groundwater was encountered at a depth of about 44 feet below grade in our deepest test boring. Based on a review of Seismic Hazard Zone Report for the Inglewood Quadrangle, the depth to historic high groundwater at the site is about 15 feet below grade.

4.4 FAULTING AND SEISMICITY

The geologic structure of the entire southern California area is dominated mainly by northwest-trending faults associated with the San Andreas system. The site is in a seismically active region. No active or potentially active fault is presently known to exist at this site nor is the site situated within an *"Alquist-Priolo"* Earthquake Fault Zone (Bryant and Hart, 2007). The nearest known active faults are the Newport-Inglewood Fault Zone, located about 1.2 miles to the east.

4.4.1 Seismic Design Parameters

The site is located at approximately 33.8828^{0} Latitude and -118.2796^{0} Longitude. Site spectral accelerations (S_a and S_1), for 0.2 and 1.0 second periods for a Class "D" site, was determined from the SEAOC/OSHPD web interface that utilizes the USGS web services and retrieves the seismic design data and presents that information in a report format. The results are presented in the following table.

SITE SEISMIC PARAMETERS	
Mapped 0.2 sec Period Spectral Acceleration, S_S	1.64g
Mapped 1.0 sec Period Spectral Acceleration, S_1	0.606g
Site Coefficient for Site Class "D," F_a	1.0
Site Coefficient for Site Class "D," F_v	1.5
Maximum Considered Earthquake Spectral Response Acceleration for 0.2 Second, S_{MS}	1.64g
Maximum Considered Earthquake Spectral Response Acceleration for 1.0 Second, S_{M1}	0.909g
5% Damped Design Spectral Response Acceleration Parameter at 0.2 Second, S_{DS}	1.093g
5% Damped Design Spectral Response Acceleration Parameter at 1 second, S_{D1}	0.606g
PGA_M	0.61g
Seismic Design Category	D

Final selection of the appropriate seismic design coefficients should be made by the project structural engineer based upon the local practices and ordinances, expected building response and desired level of conservatism.

4.5 LIQUEFACTION AND SEISMICALLY INDUCED SETTLEMENT

Liquefaction describes a phenomenon in which cyclic stresses, produced by earthquake-induced ground motion, create excess pore pressures in relatively cohesionless soils. These soils may thereby acquire a high degree of mobility, which can lead to lateral movement, sliding, settlement of loose sediments, sand boils and other damaging deformations. This phenomenon occurs only below the water table, but, after liquefaction has developed, the effects can propagate upward into overlying non-saturated soil as excess pore water dissipates.

The factors known to influence liquefaction potential include soil type and grain size, relative density, groundwater level, soil plasticity, confining pressures, and both intensity and duration of ground shaking. In general, materials that are susceptible to liquefaction are loose, saturated granular soils having low fines content and some low plastic silts and clays under low confining pressures.

Based on a review of the map of the *Earthquake Zones of Required Investigation, Inglewood Quadrangle*, the project site is not located within an area mapped by the State of California for liquefaction potential. Due to the presence of generally dense/stiff soil and the mapping by the State of California, it is our opinion that the potential for liquefaction is very low.

The dry settlement potential, resulting from seismic ground shaking, was evaluated. For this analysis we utilized the computer software program LiquefyPro, the soil profile identified within Boring B-3, a PGA_M value of 0.61g and a mean moment magnitude of 6.75. The ground acceleration and earthquake magnitude values were obtained from the USGS websites. The results of this analysis indicate that a total and differential dynamic settlement of about 0.6 inch and 0.3 inch over a 40 foot span is possible. These estimated settlements are considered to be within tolerable limits but should be confirmed by the structural engineer. The results of the dry settlement analysis are presented in Appendix C.

Since liquefaction is not anticipated to occur on the site, lateral spread is not a consideration in the design of the structures.

4.6 OTHER SEISMIC HAZARDS

Evidence of ancient landslides or slope instability at this site was not observed during our investigation and the project site is relatively flat. Thus, the potential for landslides is considered negligible for design purposes.

The potential for secondary seismic hazards such as a seiche or tsunami is considered negligible due to site elevation and distance to an open body of water.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 GENERAL

The anticipated site development appears feasible from a geotechnical viewpoint provided that the following recommendations, and those provided by this firm at a later date are incorporated into the design and construction phases of development. Site development and grading plans should be reviewed by GeoTek, Inc. when they become available.

The on-site soils exhibit a "very low" expansion potential. Expansion index testing for near-surface soils should be conducted at the completion of earthwork operations to verify.

Undocumented fill soils were not encountered in our explorations. Undocumented fill may be present in areas that were not explored, especially beneath and adjacent to existing buildings.

5.2 EARTHWORK CONSIDERATIONS

Earthwork and grading should be performed in accordance with the applicable grading ordinances of the City of Carson/County of Los Angeles, the 2016 California Building Code (CBC) and recommendations contained in this report. The Grading Guidelines included in Appendix E outline general procedures and do not anticipate all site-specific situations. In the event of conflict, the recommendations presented in the text of this report should supersede those contained in Appendix E.

5.2.1 Demolition & Site Clearing

In areas of planned grading and improvements, the site should be cleared of vegetation, existing debris and other deleterious materials. Clearing should also include demolition of all existing buildings including foundations, floor slabs and any below-grade construction. Utilities should be properly capped off at the property boundaries and removed. Debris resulting from the demolition and clearing operations should be properly disposed of off-site. Voids resulting from site clearing should be replaced with engineered fill.

5.2.2 Building Area Preparation

Subsequent to site clearing and lowering of site grades, where necessary, we recommend that the natural soils below and within five feet of the building envelope (including truck loading dock area) and any screen wall footings should be removed to a depth of at least three feet below existing or proposed pad grade, whichever is greater. A representative of this firm should observe the bottom of all excavations. In areas where loose and/or porous soil is present in the bottom of the recommended over-excavations, the removals should continue until competent natural materials are encountered, as determined by GeoTek.

5.2.3 Pavement and Hardscape Areas

The exposed soils at the base of the building pad over-excavation and in pavement and hardscape areas should be proof rolled with a heavy rubber-tired piece of construction equipment approved by and in the presence of the geotechnical engineer. Proof rolling should be performed at the cut subgrade/over-excavation elevation and at the exposed subgrade in areas to receive fill. We recommend that the proof roll equipment possess a minimum weight of 15 tons and that the proof rolling consist of at least 4 passes, two in each perpendicular direction. Any soil that ruts or excessively deflects during proof rolling should be removed as recommended by the geotechnical engineering representative.

5.2.4 Preparation of Excavation Bottoms

A representative of this firm should observe the bottom of all excavations. Upon approval, the exposed soils should be scarified to a depth of approximately 12 inches, moistened to at least the optimum moisture content and compacted to a minimum relative compaction of 90 percent (ASTM D 1557).

5.2.5 Engineered Fills

The on-site soils are generally considered suitable for reuse as engineered fill provided that they are free from vegetation, debris and other deleterious material. Engineered fill should be placed in loose lifts with a thickness of eight inches or less, moisture conditioned to at least the optimum moisture content and compacted to a minimum relative compaction of 90 percent (ASTM D-1557).

5.2.6 Excavation Characteristics

Excavation in the on-site alluvial soils is expected to be feasible utilizing heavy-duty grading equipment in good operating condition. All temporary excavations for grading purposes and installation of underground utilities should be constructed in accordance with local and Cal-OSHA guidelines. Temporary excavations within the on-site materials should be stable at 1:1 (horizontal: vertical) inclinations for cuts less than five feet in height.

5.2.7 Shrinkage and Subsidence

Several factors will impact earthwork balancing on the site, including shrinkage, subsidence, trench spoil from utilities and footing excavations, as well as the accuracy of topography.

Shrinkage and subsidence are primarily dependent upon the degree of compactive effort achieved during construction. For planning purposes, a shrinkage factor of about 0 to 10 percent may be considered for the materials requiring removal and/or recompaction. Site balance areas should be available in order to adjust project grades, depending on actual field conditions at the conclusion of earthwork. Subsidence of less than about 0.10 foot may be anticipated for the underlying soils.

5.3 DESIGN RECOMMENDATIONS

5.3.1 Foundation Design Criteria

Foundation design criteria for a conventional foundation system, in general conformance with the 2016 CBC, are presented below. Based on laboratory test results, subsequent to earthwork operations it is anticipated that the near-surface soils may have a “very low” to “low” expansion potential.

Additional expansion index and soluble sulfate testing of the soils should be performed during construction to evaluate the as-graded conditions. Final recommendations should be based upon the as-graded soils conditions.

A summary of our foundation design recommendations is presented in the following table:

Design Parameter	"Very Low" Expansion Potential	"Low" Expansion Potential
Foundation Depth or Minimum Perimeter Beam Depth (inches below lowest adjacent grade)	One-Story – 12 Two-Stories – 12	One-Story – 12 Two-Stories – 18
Minimum Foundation Width (Inches)*	One-Story – 12 Two-Stories – 15	One-Story – 12 Two-Stories – 15
Minimum Slab Thickness (actual)[1]	4 – Actual	4 – Actual
Sand Blanket and Moisture Retardant Membrane Below On-Grade Building Slabs	2 inches of sand** overlying moisture vapor retardant membrane overlying 2 inches of sand**	2 inches of sand** overlying moisture vapor retardant membrane overlying 2 inches of sand**
Minimum Slab Reinforcing	6" x 6" – W1.4/W1.4 welded wire fabric or No. 3 bars at 24-inch centers, placed in middle of slab	6" x 6" – W2.9/W2.9 welded wire fabric or No. 3 bars placed at 18-inch centers, placed in middle of slab
Minimum Footing Reinforcement	Two No. 4 reinforcing bars, one placed near the top and one near the bottom	Two No. 4 reinforcing bars, one placed near the top and one near the bottom
Effective Plasticity Index***	N/A	15
Presaturation of Subgrade Soil (Percent of Optimum)	Minimum of 100% of the optimum moisture content to a depth of at least 12 inches prior to placing concrete	Minimum of 110% of the optimum moisture content to a depth of at least 12 inches prior to placing concrete

* Code minimums per Table 1809.7 of the 2016 CBC.
** Sand should have a sand equivalent of at least 30.
*** Effective plasticity index should be verified at the completion of rough grading.

1. Slab thickness and reinforcement should be determined necessary by the structural engineer.

It should be noted that the criteria provided are based on soil support characteristics only. The structural engineer should design the slab and beam reinforcement based on actual loading conditions.

The criteria for design of foundations are preliminary and should be re-evaluated based on the results of additional laboratory testing of samples obtained near finish pad grade.

An allowable bearing capacity of 3,000 pounds per square foot (psf) may be used for design of footings at least 12 inches deep and 12 inches wide. An increase of one-third may be applied when considering short-term live loads (e.g. seismic and wind loads).

Structural foundations may be designed in accordance with the 2016 CBC, and to withstand a total static settlement of 1 inch and maximum differential static settlement of one-half of the total settlement over a horizontal distance of 40 feet.

The passive earth pressure may be computed as an equivalent fluid having a density of 150 psf per foot of depth, to a maximum earth pressure of 2,000 psf for footings founded on engineered fill. A coefficient of friction between soil and concrete of 0.2 may be used with dead load forces.

If desired, the building floor slabs may be designed using an estimated subgrade modulus of 100 pci, which is based on a value typically obtained from a 1 foot by 1 foot plate bearing test. Depending on how the floor slab is loaded, the subgrade modulus may need to be geometrically modified.

A moisture and vapor retarding system should be placed below slabs-on-grade where moisture migration through the slab is undesirable. Guidelines for these are provided in the 2016 California Green Building Standards Code (CALGreen) Section 4.505.2, the 2013 CBC Section 1907.1 and ACI 360R-10. The vapor retarder design and construction should also meet the requirements of ASTM E 1643. A portion of the vapor retarder design should be the implementation of a moisture vapor retardant membrane.

It should be realized that the effectiveness of the vapor retarding membrane can be adversely impacted as a result of construction related punctures (e.g. stake penetrations, tears, punctures from walking on the vapor retarder placed on the underlying aggregate layer, etc.). These occurrences should be limited as much as possible during construction. Thicker membranes are generally more resistant to accidental puncture than thinner ones. Products specifically designed for use as moisture/vapor retarders may also be more puncture resistant. Although the CBC specifies a 6-mil vapor retarder membrane, a minimum 10 mil thick membrane with joints properly overlapped and sealed should be considered, unless otherwise specified by the slab design professional. The membrane should consist of Stego wrap or the equivalent.

A two-inch layer of clean sand with a sand equivalent of at least 30 should be placed over the moisture vapor retardant membrane to promote setting of the concrete. The moisture in the sand should not exceed two percent below the optimum moisture content.

Moisture and vapor retarding systems are intended to provide a certain level of resistance to vapor and moisture transmission through the concrete, but do not eliminate it. The acceptable level of moisture transmission through the slab is to a large extent based on the type of flooring used and environmental conditions. Ultimately, the vapor retarding system should be comprised of suitable elements to limit migration of water and reduce transmission of water vapor through the slab to acceptable levels. The selected elements should have suitable properties (i.e. thickness, composition, strength, and permeability) to achieve the desired performance level.

Moisture retarders can reduce, but not eliminate, moisture vapor rise from the underlying soils up through the slab. Moisture retarder systems should be designed and constructed in accordance with applicable American Concrete Institute, Portland Cement Association, Post-Tensioning Concrete Institute, ASTM and California Building Code requirements and guidelines.

GeoTek recommends that a qualified person, such as a flooring contractor, structural engineer, architect, and/or other experts specializing in moisture control within the buildings be consulted to evaluate the general and specific moisture and vapor transmission paths and associated potential impact on the proposed construction. That person should provide recommendations relative to the slab moisture and vapor retarder systems and for migration of potential adverse impact of moisture vapor transmission on various components of the structures, as deemed appropriate.

In addition, the recommendations in this report and our services in general are not intended to address mold prevention, since we, along with geotechnical consultants in general, do not practice in the area of mold prevention. If specific recommendations addressing potential mold issues are desired, then a professional mold prevention consultant should be contacted.

We recommend that control joints be placed in two directions spaced approximately 24 to 36 times the thickness of the slab in inches. These joints are a widely accepted means to control cracks and should be reviewed by the project structural engineer.

5.3.2 Miscellaneous Foundation Recommendations

To minimize moisture penetration beneath the slab-on-grade areas, utility trenches should be backfilled with engineered fill, lean concrete or concrete slurry where they intercept the perimeter footing or thickened slab edge.

Soils from the footing excavations should not be placed in the slab-on-grade areas unless properly compacted and tested. The excavations should be free of loose/sloughed materials and be neatly trimmed at the time of concrete placement.

5.3.3 Foundation Setbacks

Minimum setbacks for all foundations should comply with the 2016 CBC or City of Carson/County of Los Angeles requirements, whichever is more stringent. Improvements not conforming to these setbacks are subject to the increased likelihood of excessive lateral movement and/or differential settlement. If large enough, these movements can compromise the integrity of the improvements.

- The outside top edge of all footings should be set back a minimum of H/3 (where H is the slope height) from the face of any descending slope. The setback should be at least five feet and need not exceed 40 feet.

- The bottom of any proposed foundations should be deepened so as to extend below a 1:1 upward projection from the bottom edge of the nearest excavation and the bottom edge of the closest footing.

5.3.4 Soil Corrosivity

Based on the chemical test results presented in Appendix B, the corrosivity test results indicate that the on-site soils are "moderately corrosive" to buried ferrous metal. This corrosion classification is obtained from "Corrosion Basics: An Introduction," by Pierre R. Roberge, 2nd Edition, 2005. Recommendations for protection of buried ferrous metal should be provided by a corrosion engineer.

5.3.5 Soil Sulfate Content

Based on the chemical test results presented in Appendix B, the sulfate test results on samples obtained from the project site indicate soluble sulfate contents of less than 0.1 percent by weight should be expected. Soluble sulfate contents of this level would be in the range of "not applicable" (i.e. negligible) per Table 4.2.1 of ACI 318. Based on the test results and Table 4.3.1 of ACI 318, no special concrete mix design would be necessary to resist sulfate attack.

5.3.6 Import Soils

Import soils should have a "very low" expansion potential. GeoTek, Inc. also recommends that the proposed import soils be tested for expansion and corrosivity potential. GeoTek, Inc. should be notified a minimum of 72 hours prior to importing so that appropriate sampling and laboratory testing can be performed.

5.3.7 Concrete Flatwork

5.3.7.1 Exterior Concrete Slabs, Sidewalks and Driveways

Exterior concrete slabs, sidewalks and driveways should be designed using a four-inch minimum thickness. Some shrinkage and cracking of the concrete should be anticipated as a result of typical mix designs and curing practices typically utilized in construction.

Sidewalks and driveways may be under the jurisdiction of the governing agency. If so, jurisdictional design and construction criteria would apply, if more restrictive than the recommendations presented in this report.

Subgrade soils should be pre-moistened prior to placing concrete. The subgrade soils below exterior slabs, sidewalks, driveways, etc. should be pre-saturated to a minimum of 100 percent (for "very low) or 110 percent (for "low) of the optimum moisture content to a depth of 12 inches.

All concrete installation, including preparation and compaction of subgrade, should be done in accordance with the City of Carson/County of Los Angeles specifications, and under the observation and testing of GeoTek, Inc. and a City/County inspector, if necessary.

5.3.7.2 Concrete Performance

Concrete cracks should be expected. These cracks can vary from sizes that are essentially unnoticeable to more than 1/8 inch in width. Most cracks in concrete, while unsightly, do not significantly impact long-term performance. While it is possible to take measures (proper concrete mix, placement, curing, control joints, etc.) to reduce the extent and size of cracks that occur, some cracking will occur despite the best efforts to minimize it. Concrete undergoes chemical processes that are dependent on a wide range of variables, which are difficult, at best, to control. Concrete, while seemingly a stable material, is subject to internal expansion and contraction due to external changes over time.

One of the simplest means to control cracking is to provide weakened control joints for cracking to occur along. These do not prevent cracks from developing; they simply provide a relief point for the stresses that develop. These joints are a widely accepted means to control cracks but are not always effective. Control joints are more effective the more closely spaced they are. GeoTek, Inc. suggests that control joints be placed in two directions and located a distance apart approximately equal to 24 to 36 times the slab thickness.

5.4 RETAINING WALL DESIGN AND CONSTRUCTION

5.4.1 General Design Criteria

Recommendations presented in this report apply to typical masonry or concrete vertical retaining walls to a maximum height of nine feet. Additional review and recommendations should be requested for higher walls. These are typical design criteria and are not intended to supersede the design by the structural engineer.

Retaining wall foundations should be embedded a minimum of 12 inches into competent fill and/or native soil. Retaining wall foundations should be designed in accordance with Section 5.3.1 of this report. Structural needs may govern and should be evaluated by the project structural engineer.

All earth retention structure plans, as applicable, should be reviewed by this office prior to finalization. The seismic design parameters as discussed in this report remain applicable to all proposed earth retention structures at this site and should be properly incorporated into the design and construction of the structures.

Earthwork considerations, site clearing and remedial earthwork for all earth retention structures should meet the requirements of this report, unless specifically provided otherwise, or more stringent requirements or recommendations are made by the designer. The backfill material placement for all earth retention structures should meet the requirement of Section 5.4.3 in this report.

In general, cantilever earth retention structures, which are designed to yield at least 0.001H, where H is equal to the height of the wall to the base of the footing, may be designed using the active condition. Rigid earth retention structures (including but not limited to rigid walls, and walls braced at top, such as typical basement walls) should be designed using the at-rest condition.

In addition to the design lateral forces due to retained earth, surcharges due to improvements, such as an adjacent building or traffic loading, should be considered in the design of the earth retention structures. Loads applied within a 1:1 (horizontal:vertical) projection from the surcharge on the stem and footing of the earth retention structure should be considered in the design.

Final selection of the appropriate design parameters should be made by the designer of the earth retention structures.

5.4.2 Cantilevered Walls

The recommendations presented below are for cantilevered retaining walls up to six feet high. Active earth pressure may be used for retaining wall design, provided the top of the wall is not restrained from minor deflections. An equivalent fluid pressure approach may be used to compute the horizontal pressure against the wall. Appropriate fluid unit weights are given below for specific slope gradients of the retained material. These do not include other superimposed loading conditions such as traffic, structures, seismic events, or adverse geologic conditions.

ACTIVE EARTH PRESSURES	
Surface Slope of Retained Materials (h:v)	Equivalent Fluid Pressure (pcf)
Level	45
2:1	65

* The design pressures assume the backfill material will possess an expansion index less than or equal to 20. Backfill zone includes area between the back of the wall and footing to a plane (1:1 h:v) up from the bottom of the wall foundation to the ground surface.

For walls with a retained height greater than 6 feet (if any), incremental seismic pressures should be incorporated into the wall design. Using the Mononobe-Okabe method and in consideration of a mean peak ground acceleration (PGA_M) of 0.61g (USGS), we recommend that a seismic pressure of 25.4 pcf be included into the wall design, where required. The seismic load can be assumed to be a conventional triangular distribution.

5.4.3 Retaining Wall Backfill and Drainage

Retaining walls should be provided with an adequate pipe and gravel back drain system to help prevent buildup of hydrostatic pressures. Backdrains should consist of a four-inch diameter perforated collector pipe (Schedule 40, SDR 35, or approved equivalent) embedded in a minimum of one cubic foot per linear foot of ¾- to 1-inch clean crushed rock or an approved equivalent, wrapped in filter fabric (Mirafi 140N or an approved equivalent). The drain system should be connected to a suitable outlet. Waterproofing of site walls should be performed where moisture migration through the wall is undesirable.

Retaining wall backfill should consist of very low expansive soil (EI<20), should be placed in lifts no greater than eight inches in thickness and compacted to a minimum of 90 percent relative compaction in accordance with ASTM Test Method D 1557. The wall backfill should also include a minimum one-foot wide section of ¾- to 1-inch clean crushed rock (or an approved equivalent). The rock should be placed immediately adjacent to the back of the wall and extend up from a back drain to within approximately 12 inches of the finish grade. The upper 12 inches should consist of compacted on-site soil or pavement.

As an alternative to the drain rock and fabric, Miradrain 2000, or approved equivalent, may be used behind the retaining wall. The Miradrain 2000 should extend from the base of the wall to within 2 feet of the ground surface. A perforated pipe should be placed at the base of the wall in direct contact with the Miradrain 2000. The Miradrain fabric at the base of the Miradrain 2000 panel should be wrapped around the perforated pipe to prevent soil intrusion into the pipe.

The presence of other materials might necessitate revision to the parameters provided and modification of the wall designs. Proper surface drainage needs to be provided and maintained.

5.4.4 Restrained Retaining Walls

Retaining walls that will be restrained prior to placing and compacting backfill material or that have reentrant or male corners, should be designed for an at-rest equivalent fluid pressure of 65 pcf, plus any applicable surcharge loading. For areas of male or reentrant corners, the restrained wall design should extend a minimum distance of twice the height of the wall laterally from the corner, or a distance otherwise determined by the project structural engineer.

5.4.5 Other Design Considerations

- Retaining and garden wall foundation elements should be designed in accordance with building code setback requirements. A minimum horizontal setback distance of five feet as measured from the bottom outside edge of the footing to a sloped face is recommended.
- Wall design should consider the additional surcharge loads from superjacent slopes and/or footings, where appropriate.
- No backfill should be placed against concrete until minimum design strengths are evident by compression tests of cylinders.
- The retaining wall footing excavations, backcuts, and backfill materials should be approved by the project geotechnical engineer or their authorized representative.
- Positive separations should be provided in garden walls at horizontal distances not exceeding 20 feet.

5.5 INFILTRATION TEST RESULTS

Field percolation testing was performed on July 31, 2019. Percolation rates obtained from the infiltration testing were converted to a field infiltration rate using the reduction factor (Rf) outlined within the County of Los Angeles Administrative Manual (GS200.1). The field infiltration rates calculated are indicated in the following table:

SUMMARY OF FIELD INFILTRATION RATES				
Boring/Area	Depth of Test (Feet)	Material Encountered at Depth of Test	Calculated Reduction Factor (Rf)	Field Infiltration Rate (Inches per Hour)
I-1	10	Silty Clay to Silty Sand	15.5	0.57
I-2	10	Silty Clay to Silty Sand	5.8	0.43

The field percolation data sheets are presented in Appendix D. The field infiltration rates presented above do not incorporate any additional safety factor, other than the Rf values noted above. The civil engineer should assign a suitable safety factor to these values prior to determining the design infiltration rate.

In addition, over the lifetime of the detention or retention basin, the infiltration rates may be affected by silt build up and biological activities, as well as local variations in near surface soil conditions. A suitable factor of safety should be applied to the field rates to design the infiltration system.

It should be noted that the infiltration rates provided above were performed in relatively undisturbed native soils. Infiltration rates will vary and are mostly dependent on the underlying consistency of the site soils and relative density. Infiltration rates will be impacted by weight of equipment travelling over the soils, placement of engineered fill and other various factors. GeoTek, Inc. assumes no responsibility or liability for the ultimate design or performance of the storm water facility.

5.6 PRELIMINARY PAVEMENT DESIGN

Pavement design for areas to receive new pavements was conducted per Caltrans *Highway Design Manual* guidelines for flexible pavements. One representative sample of the near surface soil was tested to determine its resistance value (R-value). This testing was performed by our subconsultant (LaBelle Marvin) and the results of this test (R=58) is provided in Appendix B. Based on the laboratory R-value of 58 and assumed Traffic Indices (TIs) of 5.0, 7.0 and 10.0 for future vehicle parking and access drive areas, respectively. Based on these preliminary assumptions, the following preliminary sections were calculated:

GEOTECHNICAL RECOMMENDATION FOR MINIMUM PAVEMENT SECTION		
Traffic Index	Thickness of Asphalt Concrete (inches)	Thickness of Aggregate Base (inches)
5.0	3	4
7.0	4	6
10.0	5	8

All base material and the upper 12 inches of subgrade should be compacted to at least 95% of the material's maximum dry density, per ASTM D-1557.

Traffic Indices (TIs) used in our preliminary pavement design are considered reasonable values for the proposed pavement areas and should provide a pavement life of approximately 20 years with a normal amount of flexible pavement maintenance. Irrigation adjacent to pavements, without a deep curb or other cutoff to separate landscaping from the paving may result in premature pavement failure. Traffic parameters used for preliminary design were selected based upon engineering judgment and not upon information furnished to us such as an equivalent wheel load analysis or a traffic study. We recommend that final pavement design be based on R-value testing of the finished pavement subgrade soils along with the assigned TI values for the planned pavement areas.

Asphalt concrete and aggregate base should conform to current Caltrans Standard Specifications Section 39 and 26-1.02, respectively. As an alternative, asphalt concrete can conform to Section 203-6 of the current Standard Specifications for Public Work (Green Book). Crushed aggregate base or crushed miscellaneous base can conform to Section 200-2.2 and 200-2.4 of the Green Book, respectively.

All pavement installation, including preparation and compaction of subgrade, compaction of base material, placement and rolling of asphaltic concrete, should be done in accordance with the City of Carson/County of Los Angeles specifications, and under the observation and testing of GeoTek and a City/County Inspector where required. Jurisdictional minimum compaction requirements in excess of the aforementioned minimums may govern.

5.7 POST CONSTRUCTION CONSIDERATIONS

5.7.2 Landscape Maintenance and Planting

Water has been shown to weaken the inherent strength of soil, and slope stability is significantly reduced by overly wet conditions. Positive surface drainage away from graded slopes should be maintained and only the amount of irrigation necessary to sustain plant life should be provided for planted slopes. Controlling surface drainage and runoff and maintaining a suitable vegetation cover can minimize erosion. Plants selected for landscaping should be lightweight, deep-rooted types that require little water and are capable of surviving the prevailing climate.

Overwatering should be avoided. An abatement program to control ground-burrowing rodents should be implemented and maintained. Burrowing rodents can decrease the long-term performance of slopes.

It is common for planting to be placed adjacent to structures in planter or lawn areas. This will result in the introduction of water into the ground adjacent to the foundations. This type of landscaping should be avoided.

5.7.3 Drainage

Positive site drainage should be maintained at all times. Drainage should not flow uncontrolled down any descending slope. Water should be directed away from foundations and not allowed to pond or seep into the ground adjacent to the footings and floor-slabs. Pad drainage should be directed toward approved areas and not be blocked by other improvements.

Roof gutters should be installed that will direct the collected water at least 10 feet from the building.

5.8 PLAN REVIEW AND CONSTRUCTION OBSERVATIONS

We recommend that specifications and foundation plans be reviewed by this office prior to construction to check for conformance with the recommendations of this report. We also recommend that GeoTek, Inc. representatives be present during site grading and foundation construction to observe and document proper implementation of the geotechnical recommendations. The owner/developer should verify that GeoTek, Inc. representatives perform at least the following duties:

- Observe site clearing and grubbing operations for proper removal of unsuitable materials.
- Observe and test bottom of removals prior to fill placement.

- Evaluate the suitability of on-site and import materials for fill placement and collect soil samples for laboratory testing where necessary.
- Observe the fill for uniformity during placement, including utility trench backfill. Also, perform field density testing of the fill materials.
- Observe and probe foundation excavations to confirm suitability of bearing materials with respect to density.

If requested, a construction observation and compaction report can be provided by GeoTek, Inc. which can comply with the requirements of the governmental agencies having jurisdiction over the project. We recommend that these agencies be notified prior to commencement of construction so that necessary grading permits can be obtained.

6. INTENT

It is the intent of this report to aid in the design and construction of the proposed development. Implementation of the advice presented in this report is intended to reduce risk associated with construction projects. The professional opinions and geotechnical advice contained in this report are not intended to imply total performance of the project or guarantee that unusual or variable conditions will not be discovered during or after construction.

The scope of our evaluation is limited to the boundaries of the subject property. This review does not and should in no way be construed to encompass any areas beyond the specific area of the proposed construction as indicated to us by the client. Further, no evaluation of any existing site improvements is included. The scope is based on our understanding of the project and geotechnical engineering standards normally used on similar projects in this locality.

7. LIMITATIONS

Our findings are based on site conditions observed and the stated sources. Thus, our comments are professional opinions that are limited to the extent of the available data.

GeoTek has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report.

Our recommendations are based on the site conditions observed and encountered, and laboratory testing. Our conclusions and recommendations are professional opinions that are limited to the extent of the available data. Observations during construction are important to allow for any change in recommendations found to be warranted. These opinions have been derived in accordance with current standards of practice and no warranty of any kind is expressed or implied. Standards of care/practice are subject to change with time.

8. SELECTED REFERENCES

American Concrete Institute (ACI), 2006, Publication 302.2R-06, Guide for Concrete Slabs That Receive Moisture Sensitive Flooring Materials.

______, 2010, Publications 360R-10, Guide to Design of Slabs-On-Ground.

American Society of Civil Engineers (ASCE), 2013, "Minimum Design Loads for Buildings and Other Structures," ASCE/SEI 7-10, Third Printing, Errata Incorporated through March 15.

Bowles, J. E., 1977, "Foundation Analysis and Design", Second Edition.

Bryant, W.A., and Hart, E.W., 2007, "Fault Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps," California Geological Survey: Special Publication 42.

California Code of Regulations, Title 24, 2016, "California Building Code," 3 volumes.

Department of the Navy, 1982, "Foundations and Earth Structures", Design Manual 7.2.

Dibblee, T.W. and Minch, J.A., 2007, "Geologic Map of the Venice and Inglewood Quadrangles, Los Angeles County, California", Dibblee Geological Foundation, Dibblee Foundation Map DF-322.

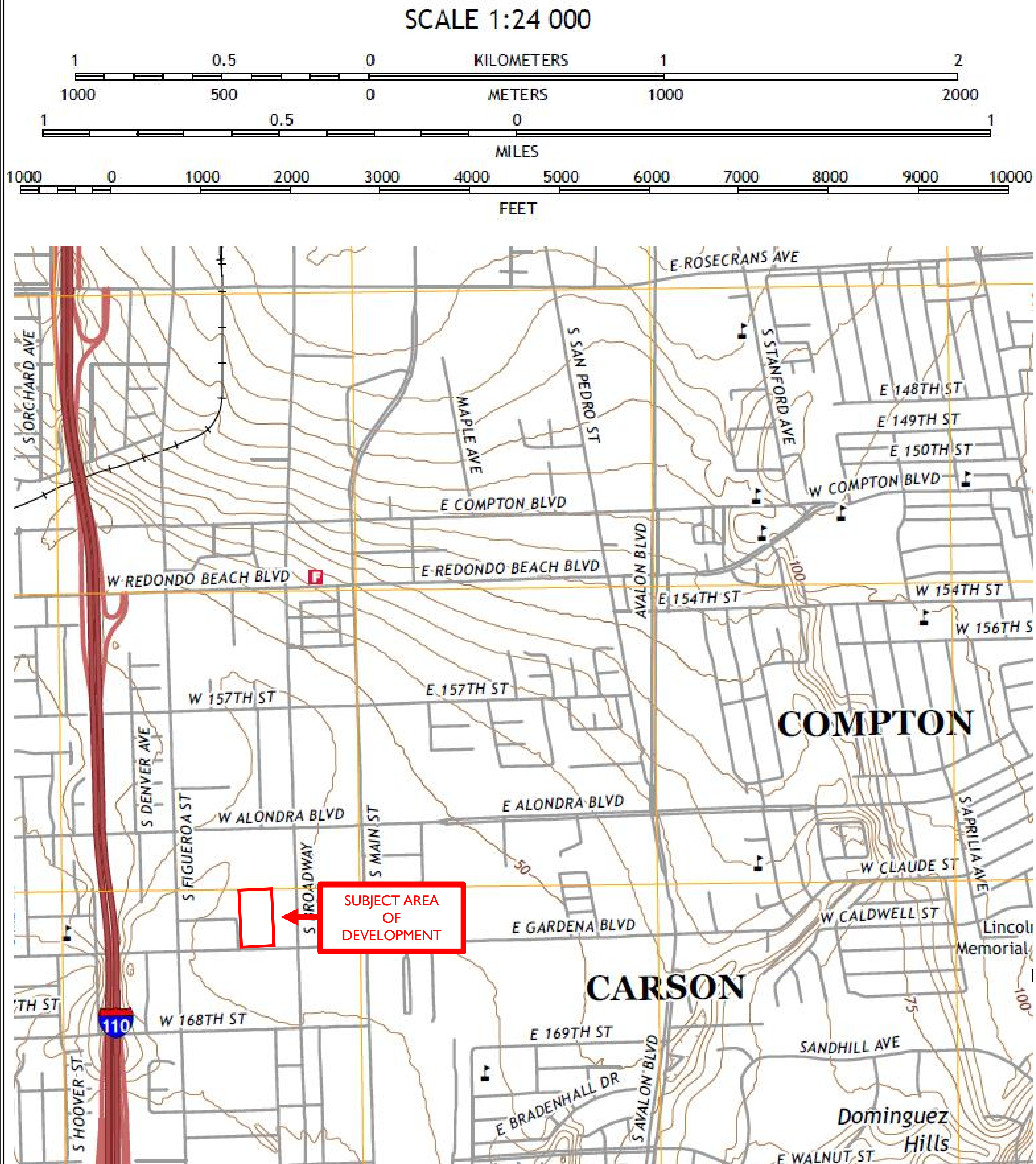
Roberge, P. R., 2005, "Corrosion Basics: An Introduction", second edition.

SEA/OSHPD web service, "Seismic Design Maps" (https://seismicmaps.org)

Southern California Earthquake Center (SCEC), 1999, Martin, G. R., and Lew, M., ed., "Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California,", dated March 1999.

State of California, California Geological Survey (CGS, formerly referred to as the California Division of Mines and Geology), 2008, "Guidelines for Evaluating and Mitigating Seismic Hazards in California," Special Publication 117A.

Terzaghi, K and Peck, R. B., 1967, "Soil Mechanics in Engineering Practice", second edition.



CT Realty Investors
Clarion Partners Acquisition, LLC
Proposed Industrial Building
333 West Gardena Boulevard
Carson, Los Angeles County, California

GeoTek Project No. 2177-CR

N

Modified from USGS 7.5-minute Inglewood Topographic Map

Figure 1
Site
Location and
General Topography
Map

GEOTEK

CT Realty Investors
Clarion Partners Acquisition, LLC
Proposed Industrial Building
333 West Gardena Boulevard
Carson, Los Angeles County, California

GeoTek Project No. 2177-CR

GEOTEK

Figure 2

Boring Location Map

PROJECT DATA:

SITE AREA:		
GROSS:		6.67 AC
		290,357 SF
BUILDING FOOTPRINT:		152,640 SF
BUILDING USE:		
WAREHOUSE		146,534 SF
OFFICE	@ 4%	6,106 SF
COVERAGE:		
GROSS:		53%
PARKING REQUIRED:		
WAREHOUSE	1/1500 SF	98 STALLS
OFFICE	1/300 SF	20 STALLS
TOTAL		118 STALLS
PARKING PROVIDED:		
AUTO:		120 STALLS
		@0.79/1000 SF
REQ. ACCESSIBLE		*5 STALLS*
TRUCK DOCKS:		
▲ DOCK-HIGH DOORS		22
△ KNOCK-OUTS OR RATED		3
○ GRADE-LEVEL DOORS		2

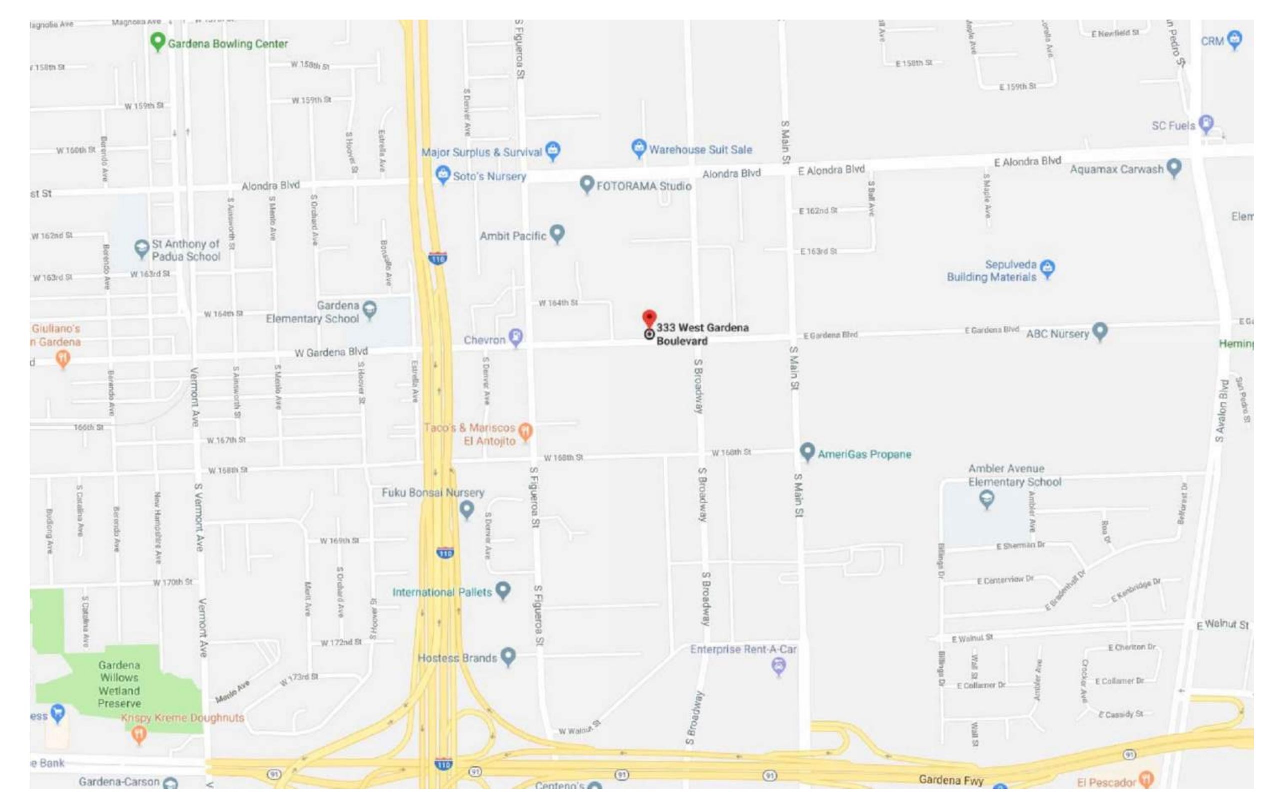
DEVELOPMENT STANDARDS:

ZONING:	D-ML
MAX. F.A.R.:	0.50
MAX. COVERAGE:	n/a
MAX. HEIGHT:	n/a
BUILDING SETBACKS:	
FRONT:	25 FT [1]
SIDE:	0 FT [2]
REAR:	0 FT [2]
LANDSCAPE SETBACKS:	
FRONT:	5 FT
SIDE:	5 FT
REAR:	5 FT
LANDSCAPE REQ.:	5%
OFF-STREET PARKING:	
STANDARD:	8.5X18
COMPACT:	8X15
COMPACT %:	33%
DRIVE AISLE:	26 FT
FIRE LANE:	20 FT
OVERHANG:	0 FT
TREE WELL:	5 FT
REQ. PARKING RATIO BY USE:	
WAREHOUSE:	1/1500 SF
OFFICE:	1/300 SF

NOTES:

1 Or 25% of the lot depth, whichever is less. For any building over 50 feet in height, the required front yard setback shall be increased by 1 foot for every 2 feet in height above 50 feet.

2 10 feet if abutting street. 10% width of lot; at least 5 feet and need not be greater than 10 feet. Over 50 feet 3 feet plus 1 foot for every 2 feet in height above 50 feet.



This conceptual design is based upon a preliminary review of entitlement requirements and on unverified and possibly incomplete site and/or building information, and is intended merely to assist in exploring how the project might be developed.

1" = 40'

0 20 40 80 200

NORTH

scheme: 1

Conceptual Site Plan

333 West Gardena Boulevard
Gardena, CA 90248

CT

WARE MALCOMB

IRV18-0219-00
11.02.2018

SHEET
1

Figure 3

APPENDIX A

LOGS OF EXPLORATORY BORINGS

Proposed Industrial Building
Carson, Los Angeles County, California
Project No. 2177-CR

GEOTEK

A - FIELD TESTING AND SAMPLING PROCEDURES

The Modified Split-Barrel Sampler (Ring)
The Ring sampler is driven into the ground in accordance with ASTM Test Method D 3550. The sampler, with an external diameter of 3.0 inches, is lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sampler is typically driven into the ground 12 or 18 inches with a 140-pound hammer free falling from a height of 30 inches. Blow counts are recorded for every 6 inches of penetration as indicated on the log of boring. The samples are removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

Bulk Samples (Large)
These samples are normally large bags of earth materials over 20 pounds in weight collected from the field by means of hand digging or exploratory cuttings.

Bulk Samples (Small)
These are plastic bag samples which are normally airtight and contain less than 5 pounds in weight of earth materials collected from the field by means of hand digging or exploratory cuttings. These samples are primarily used for determining natural moisture content and classification indices.

B – BORING/TRENCH LOG LEGEND

The following abbreviations and symbols often appear in the classification and description of soil and rock on the logs of borings/trenches:

SOILS

USCS	Unified Soil Classification System
f-c	Fine to coarse
f-m	Fine to medium

GEOLOGIC

B: Attitudes	Bedding: strike/dip
J: Attitudes	Joint: strike/dip
C: Contact line	
………..	Dashed line denotes USCS material change
———	Solid Line denotes unit / formational change
━━━	Thick solid line denotes end of boring/trench

(Additional denotations and symbols are provided on the log of borings/trenches)

GeoTek, Inc.
LOG OF EXPLORATORY BORING

CLIENT:	CT Realty investors	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	333 West Gardena Boulevard	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Jeff
PROJECT NO.:	2177-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Exploration Location Maps			**DATE:**	7/29/2019

BORING NO.: B-1

Depth (ft)	Sample Type	Blows/ 6 in	Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Water Content (%)	Dry Density (pcf)	Others
					Alluvium:			
	SPT	16 20 28		ML	F sandy clayey SILT, reddish brown, moist, hard	8.8	126.0	Collapse
5	SPT	16 34 50		CL	Silty CLAY, brown	14.0	125.7	SH
10	SPT	14 14 21		SM	Silty f SAND, light brown, slightly moist, medium dense	4.0	106.4	
15	SPT	36 50/5"			Silty f-m SAND, brown, slightly moist, very dense			
20	SPT	18 50/6"		ML	F sandy SILT, light yellowish brown, slightly moist, hard			
					BORING TERMINATED AT 21 FEET No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	CT Realty investors	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	333 West Gardena Boulevard	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Jeff
PROJECT NO.:	2177-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Exploration Location Maps			**DATE:**	7/29/2019

BORING NO.: B-2

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Alluvium:			
		50/5"		ML	F sandy clayey SILT, reddish brown, slightly moist to moist, hard	7.0	119.8	
5								
		15 24 36		CL/ML	Silty CLAY to clayey SILT, reddish brown to brown, moist, hard	14.5	122	
10								
		18 22 26		SM	Silty f-m SAND, light gray, slightly moist, dense	2.7	107.4	
15								
		12 24 37		SM/SW	Silty f-c SAND to f-c SAND, light grayish brown, dry to slightly moist, dense			
					BORING TERMINATED AT 18.5 FEET			
20					No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing:
AL = Atterberg Limits | EI = Expansion Index | SA = Sieve Analysis | RV = R-Value Test
SR = Sulfate/Resisitivity Test | SH = Shear Test | HC= Consolidation | MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	CT Realty investors	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	333 West Gardena Boulevard	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Jeff
PROJECT NO.:	2177-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Exploration Location Maps			**DATE:**	7/29/2019

BORING NO.: B-3

Depth (ft)	Sample Type	Blows/ 6 in	Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Water Content (%)	Dry Density (pcf)	Others
					Alluvium:			SR, MD EI=15
	Large Bulk; Ring	18 26 22		ML	Clayey SILT, reddish brown, slightly moist to moist, hard, trace fine to medium grained sand	9.1	131.9	
5	Ring	15 28 40			Clayey SILT, brown, moist, hard	15.8	117.3	Collapse
	Ring	7 10 15		SC	Silty f-c SAND, light brown, moist, medium dense	3.9	102.9	
10	Ring	5 7 10			Same as above	5.0	99.9	
15	Ring	12 25 36		CL	Silty CLAY, brown, moist, hard			
20	Ring	50/6"		ML	F sandy SILT, yeloowish brown, slightly moist, hard			
25	SPT	10 14 18		SM	Silty f-m SAND, yellowish brown, slightly moist, dense			
30	SPT	7 10 14			Same as above, medium dense			

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY BORING

CLIENT:	CT Realty investors	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	333 West Gardena Boulevard	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Jeff
PROJECT NO.:	2177-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Exploration Location Maps			**DATE:**	7/29/2019

BORING NO.: B-3

Depth (ft)	Sample Type	Blows/ 6 in	Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Water Content (%)	Dry Density (pcf)	Others
					continued:			
35	SPT	7 10 10		SM	Silty f-m SAND, light gray, slightly moist, medium dense			
40	SPT	9 22 24			Same as above			
44 (Water Table)								
45	SPT	3 4 8		CL	Silty CLAY, brown, very moist to wet, brown, stiff			
50	SPT	4 5 7		CL/ML	Silty CLAY to clayey SILT, light brown to brown, very moist, stiff			
					BORING TERMINATED AT 51.5 FEET Groundwater encountered at 44 feet Boring backfilled with soil cuttings			
55								
60								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing:
AL = Atterberg Limits | EI = Expansion Index | SA = Sieve Analysis | RV = R-Value Test
SR = Sulfate/Resisitivity Test | SH = Shear Test | HC= Consolidation | MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	CT Realty investors	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	333 West Gardena Boulevard	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Jeff
PROJECT NO.:	2177-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Exploration Location Maps			**DATE:**	7/29/2019

BORING NO.: B-4

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Alluvium:			
	SPT	22 25 31		ML	Clayey SILT, reddish brown, moist, hard	11.4	123.6	
5	SPT	10 10 12		SW	F-c SAND with minor CLAY, brown, moist, medium dense	13.4	121.8	
10	SPT	7 9 10		SM	Silty f-c SAND, brown, slightly moist, medium dense	4.7	109.4	
15	SPT	8 20 24		CL	Silty CLAY, dark brown, mosit, very stiff			
20	SPT	10 20 25		ML	Clayey SILT, brown, moist, very stiff			
					BORING TERMINATED AT 21.5 FEET			
					No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing:
AL = Atterberg Limits
EI = Expansion Index
SA = Sieve Analysis
RV = R-Value Test
SR = Sulfate/Resisitivity Test
SH = Shear Test
HC= Consolidation
MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	CT Realty investors	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	333 West Gardena Boulevard	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Jeff
PROJECT NO.:	2177-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Exploration Location Maps			**DATE:**	7/29/2019

BORING NO.: B-5

Depth (ft)	Sample Type (SAMPLES)	Blows/ 6 in (SAMPLES)	Sample Number (SAMPLES)	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Water Content (%) (Laboratory Testing)	Dry Density (pcf) (Laboratory Testing)	Others (Laboratory Testing)
					Alluvium:			
	Ring	7 15 22		ML	Clayey SILT, brown, dry, very stiff	4.6	120.5	Collapse
5								
	Ring	16 20 26		SM	Silty f-c SAND with minor CLAY, grayish brown, slightly moist, dense	5.2	122.9	
10	Ring	22 27 32			Silty f-c SAND, grayish brown, slightly moist, dense	4.5	107.9	
	Ring	22 34 43			Same as above			
15	Ring	15 30		SW	Gracelly f-c SAND, gray, slightly moist, dense			
					BORING TERMINATED AT 16.5 FEET No groundwater encountered Boring backfilled with soil cuttings			
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY BORING

CLIENT:	CT Realty investors	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	333 West Gardena Boulevard	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Jeff
PROJECT NO.:	2177-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Exploration Location Maps			**DATE:**	7/29/2019

BORING NO.: B-6

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
	Large Bulk				**Alluvium:**			RV
	Ring	7 20 40		ML	Clayey SILT, reddish brown, slightly moist, hard, trace fine to coarse grained sand	4.7	125.5	
5	Ring	20 50/6"			Same as above	4.1	112.3	
10	Ring	22 40 50/5"		SM/SC	Silty calyey f-c SAND, reddish brown, slightly moist, very dense	4.2	121.3	SH
15	Ring	15 50/6"		SM	Silty f-c SAND, gray, dry to slightly moist, very dense			
20	Ring	15 35 50/5"		ML/CL	Clayey SILT to silty CLAY, olive brown, slightly moist to moist, hard			
					BORING TERMINATED AT 21.5 FEET No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits EI = Expansion Index SA = Sieve Analysis RV = R-Value Test
SR = Sulfate/Resisitivity Test SH = Shear Test HC= Consolidation MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY BORING

CLIENT:	CT Realty investors	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	333 West Gardena Boulevard	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Jeff
PROJECT NO.:	2177-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Exploration Location Maps			**DATE:**	7/29/2019

Depth (ft)	SAMPLES: Sample Type	Blows/ 6 in	Sample Number	USCS Symbol	**BORING NO.: I-1** MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Dry Density (pcf)	Others
					Alluvium:			
				ML	Clayey SILT, reddish brown, slightly moist, trace fine to coarse grained sand			
5					Clayey SILT, brown, slightly moist to moist			
				SM	Silty f SAND, light brown, slightly moist to moist			
10					**BORING TERMINATED AT 10 FEET**			
					No groundwater encountered Boring backfilled with soil cuttings			
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing:
AL = Atterberg Limits
EI = Expansion Index
SA = Sieve Analysis
RV = R-Value Test
SR = Sulfate/Resisitivity Test
SH = Shear Test
HC= Consolidation
MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	CT Realty Investors	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	DRW
PROJECT NAME:	333 West Gardena Boulevard	**DRILL METHOD:**	Hollw stem Auger	**OPERATOR:**	Jeff
PROJECT NO.:	2177-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME 75
LOCATION:	See Exploration Location Maps			**DATE:**	7/29/2019

BORING NO.: I-2

Depth (ft)	SAMPLES: Sample Type	Blows/ 6 in	Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Dry Density (pcf)	Others
					Alluvium:			
				CL/ML	Silty CLAY to clayey SILT, reddish brown, slightly moist, trace fine to coarse grained sand			
5								
				ML	Clayey SILT, brown, slightly moist to moist, trace fine grained sand			
				SM	Silty f SAND, light brown, slightly moist to moist			
10					**BORING TERMINATED AT 10 FEET**			
					No groundwater encountered Boring backfilled with soil cuttings			
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

APPENDIX B

LABORATORY TEST RESULTS

Proposed Industrial Development
Carson, Los Angeles County, California
Project No. 2177-CR

GEOTEK

SUMMARY OF LABORATORY TESTING

Classification

Soils were classified visually in general accordance to the Unified Soil Classification System (ASTM Test Method D 2487). The soil classifications are shown on the log of borings in Appendix A.

Collapse

Collapse testing was performed on selected samples of the site soils according to ASTM Test Method D 4546. The results of this testing are presented in Appendix B.

Direct Shear

Shear testing was performed in a direct shear machine of the strain-control type in general accordance with ASTM Test Method D 3080. The rate of deformation is approximately 0.035 inch per minute. The samples were sheared under varying confining loads in order to determine the coulomb shear strength parameters, angle of internal friction and cohesion. The results of the testing are presented in Appendix B.

Expansion Index

The expansion potential of the soils was determined by performing expansion index testing on one sample in general accordance with ASTM D 4829. The results of the testing are provided below.

Boring No.	Depth (ft.)	Soil Type	Expansion Index	Classification
B-3	0-5	Silty Clay	15	Very Low

In-Situ Moisture and Density

The natural water content was determined (ASTM D 2216) on samples of the materials recovered from the subsurface exploration. In addition, in-place dry density determination (ASTM D 2937) were performed on relatively undisturbed samples to measure the unity weight of the subsurface soils. Results of these tests are shown on the logs at the appropriate sample depths in Appendix A.

Moisture-Density Relationship

Laboratory testing was performed on a sample obtained during the subsurface exploration. The laboratory maximum dry density and optimum moisture content was determined in general accordance with ASTM D 1557. The results of the testing are provided below and in Appendix B.

Boring No.	Depth (ft.)	Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-3	0-5	Silty Clay	130.0	9.5

R-Value

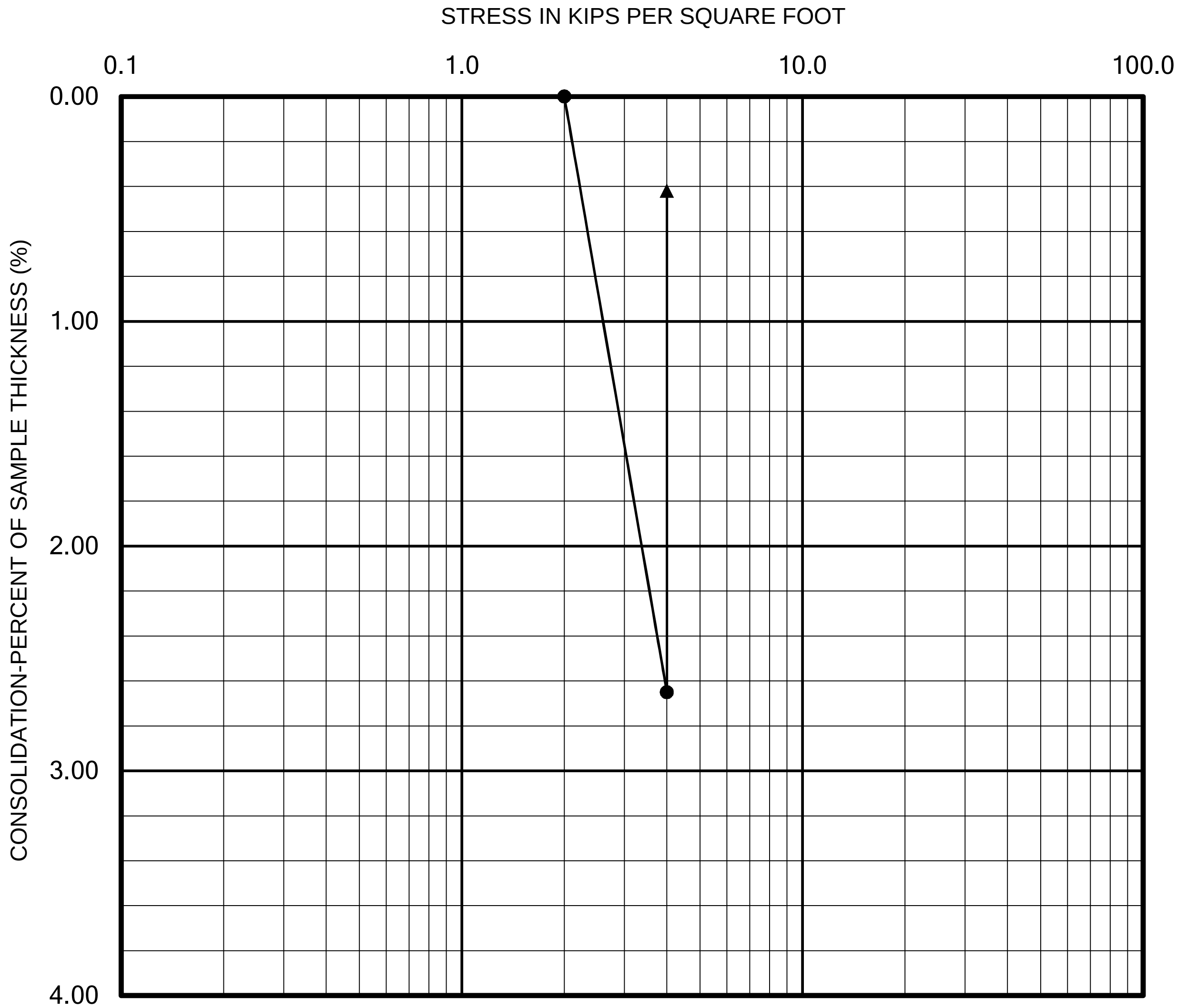
Laboratory testing was performed by others in general accordance with Caltrans Test Method CT 301. The results of the testing are presented in Appendix B.

Sulfate Content, Resistivity and Chloride Content

Testing to determine the water-soluble sulfate content was performed by others in general accordance with ASTM D4327. Resistivity testing was completed by others in general accordance with ASTM G187.

Testing to determine the chloride content was performed by others in general accordance with ASTM D4327. The results of the testing are provided below and in Appendix B.

Boring No.	Depth (ft.)	pH ASTM G51	Chloride ASTM D4327 (ppm)	Sulfate ASTM D4327 (% by weight)	Resistivity ASTM G187 (ohm-cm)
B-3	0-5	8.2	3.3	0.0006	5,360



- - ● - - -	Seating Cycle
—●—	Loading Prior to Inundation
—▲—	Loading After Inundation
- - ▲ - - -	Rebound Cycle

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

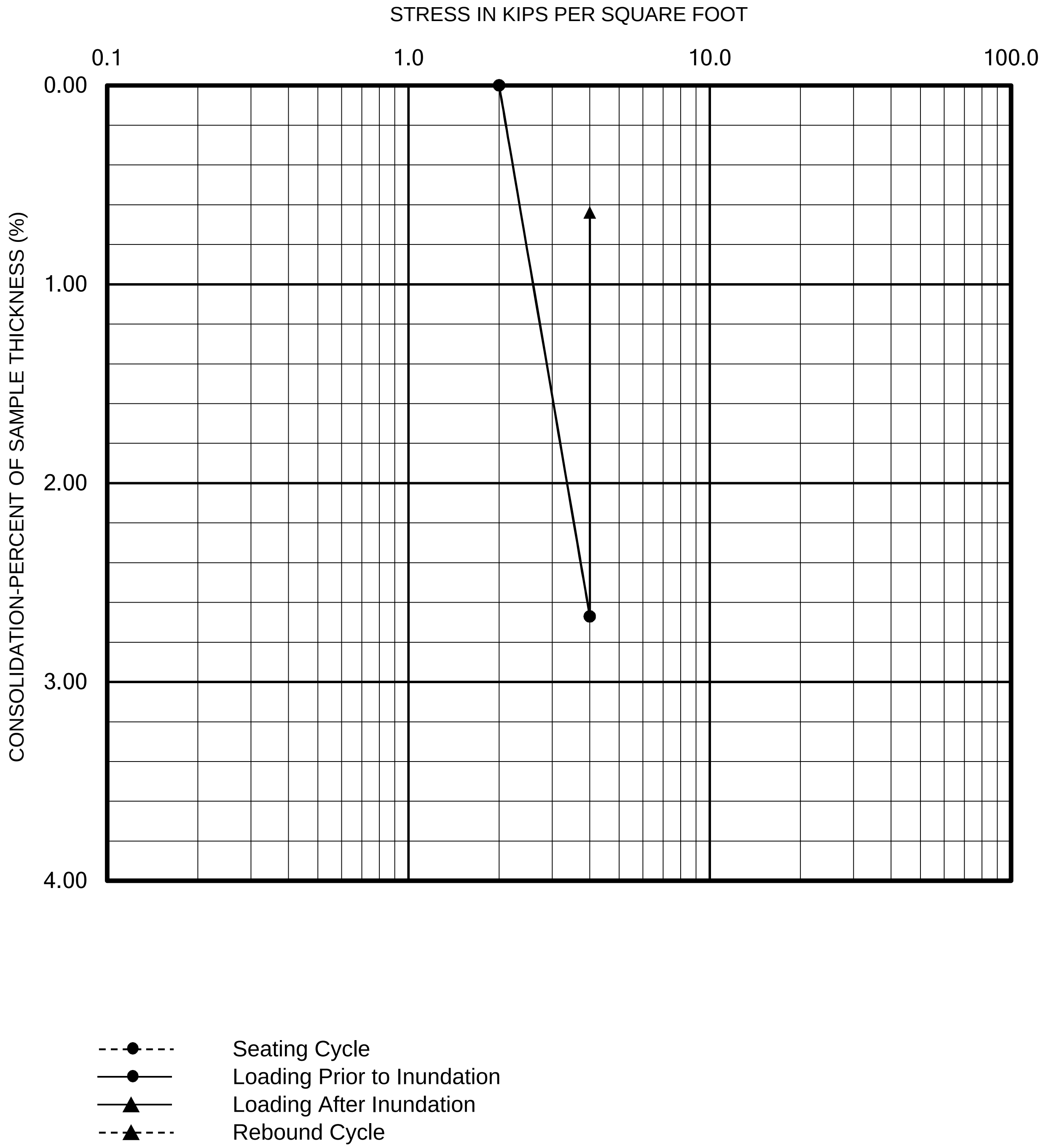
GEOTEK

COLLAPSE REPORT

Sample: B-1 @ 2'

333 West Gardena Boulevard
Carson, California

CHECKED BY: RRR	Lab: DI
PROJECT NO.: 2177-CR	Date: 8/2019



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

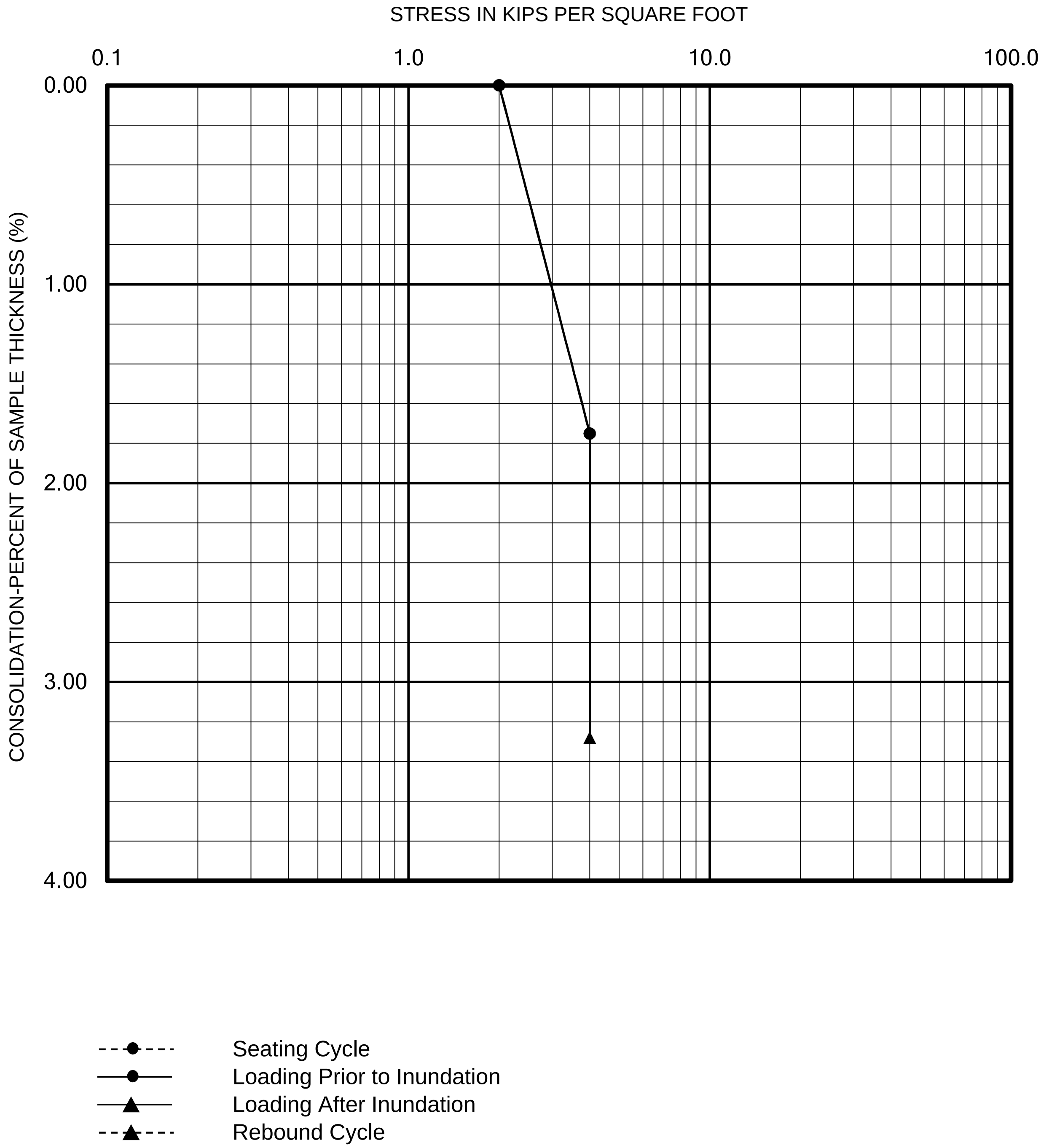
GEOTEK

COLLAPSE REPORT

Sample: B-3 @ 5'

333 West Gardena Boulevard
Carson, California

CHECKED BY: RRR	Lab: DI
PROJECT NO.: 2177-CR	Date: 8/2019



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

CHECKED BY: RRR	Lab: DI
PROJECT NO.: 2177-CR	Date: 8/2019

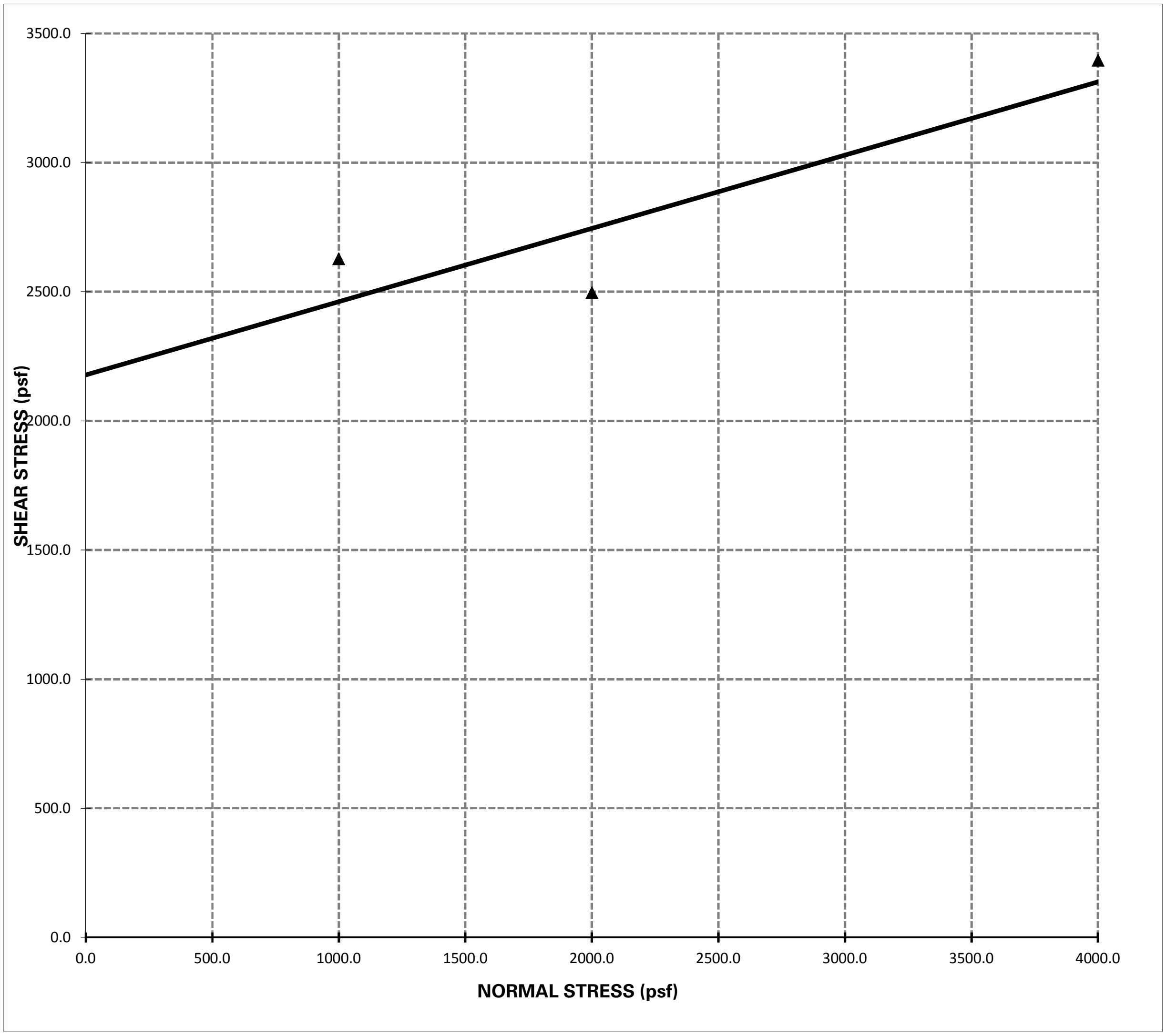
COLLAPSE REPORT

Sample: B-5 @3'

333 West Gardena Boulevard
Carson, California

DIRECT SHEAR TEST

Project Name:	333 West Gardena Blvd.	***Sample Location:***	B-1 @ 5
Project Number:	2177-CR	***Date Tested:***	8/2/2019

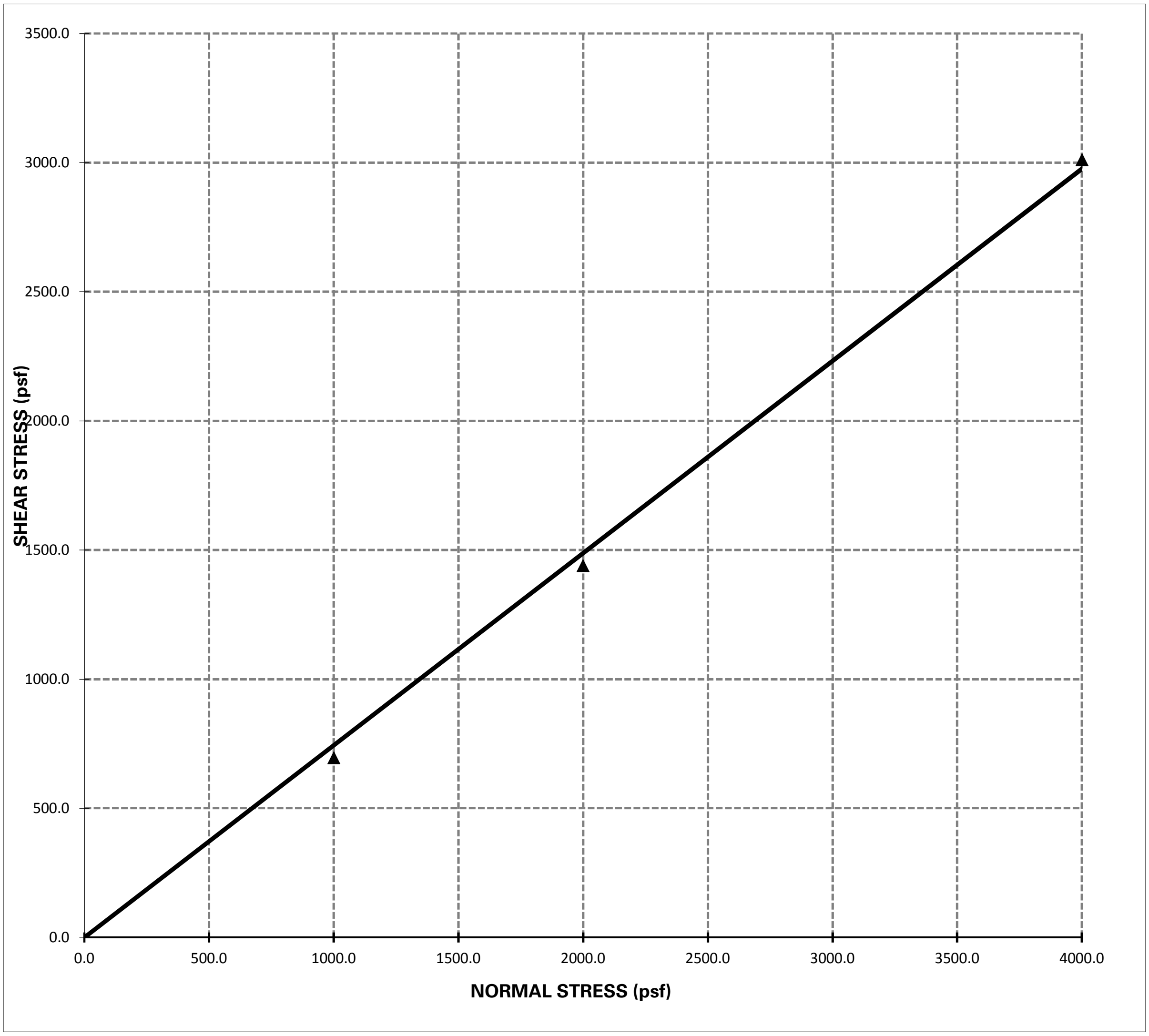


Shear Strength: Φ = 15.8 °, C = 2178.0 psf

Notes: 1 - The soil specimens sheared were "undisturbed" ring samples.
2 - The above reflect direct shear strength at saturated conditions.
3 - The tests were run at a shear rate of 0.010 in/min.

DIRECT SHEAR TEST

Project Name:	333 West Gardena Blvd.	***Sample Location:***	B-6 @ 10
Project Number:	2177-CR	***Date Tested:***	8/2/2019



Shear Strength: **Φ = 36.6 °** , **C = 0.00 psf**

Notes: 1 - The soil specimens sheared were "undisturbed" ring samples.
2 - The above reflect direct shear strength at saturated conditions.
3 - The tests were run at a shear rate of 0.035 in/min.

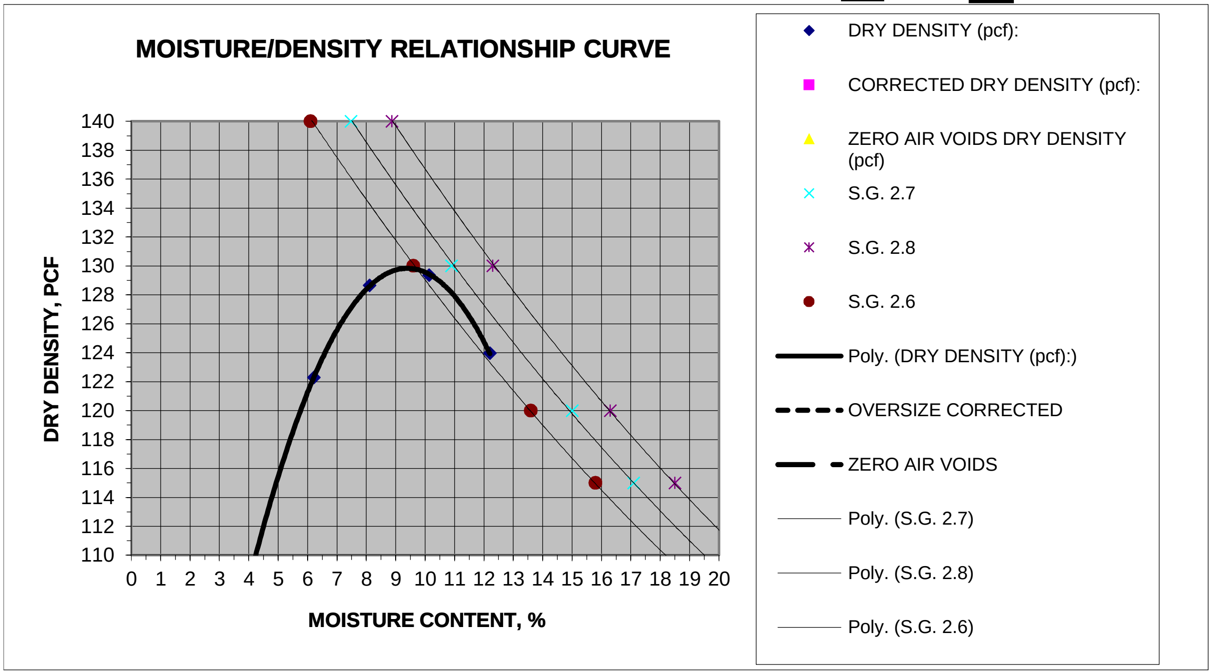
GEOTEK

MOISTURE/DENSITY RELATIONSHIP

Client:	CT Realty Investors	**Job No.:**	2177-CR
Project:	333 West Gardena Blvd.	**Lab No.:**	Corona
Location:	Carson		
Material Type:	Red Brown Silty F-M Sand w/Clay		
Material Supplier:	-		
Material Source:	-		
Sample Location:	B-3 @ 0 - 5		
	-		
Sampled By:	DRW	**Date Sampled:**	7/29/2019
Received By:	DLI	**Date Received:**	7/30/2019
Tested By:	MC	**Date Tested:**	7/30/2019
Reviewed By:	RRR	**Date Reviewed:**	8/7/2019

Test Procedure: ASTM D1557 **Method:** A

Oversized Material (%): 5.6 **Correction Required:** ☐ yes ☒ no



MOISTURE DENSITY RELATIONSHIP VALUES

Maximum Dry Density, pcf	130.0	**@ Optimum Moisture, %**	9.5
Corrected Maximum Dry Density, pcf		**@ Optimum Moisture, %**	

MATERIAL DESCRIPTION

Grain Size Distribution:

	% Gravel (retained on No. 4)
	% Sand (Passing No. 4, Retained on No. 200)
	% Silt and Clay (Passing No. 200)

Atterberg Limits:

	Liquid Limit, %
	Plastic Limit, %
	Plasticity Index, %

Classification:

Unified Soils Classification: ________

AASHTO Soils Classification: ________

• ANALYSIS
• DESIGN

LaBelle • Marvin

PROFESSIONAL PAVEMENT ENGINEERING
A CALIFORNIA CORPORATION

• SOILS, ASPHALT TECHNOLOGY

August 6, 2019

Ms. Anna Scott
GeoTek Inc.
1548 North Maple Street
Corona, California 92880

Project No. 45198

Attention Ms. Scott:
Laboratory testing of the bulk soil sample delivered to our laboratory on 8/5/2019 has been completed.

Reference:	W.O. # 2177-CR3
Project:	CT Realty Investors, 333 W. Gardena Boulevard
Sample:	B-6 @ 0'-5'

Data sheets are transmitted herewith for your use and information. Any untested portion of the samples will be retained for a period of sixty (60) days prior to disposal. The opportunity to be of service is appreciated, and should you have any questions, kindly call.

Very truly yours,

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. MARVIN
NO. 30659
CIVIL
STATE OF CALIFORNIA

Steven R. Marvin
RCE 30659

SRM:tw
Enclosures

2700 S. GRAND AVENUE • SANTA ANA, CA 92705-5404 • (714) 546-3468 • FAX (714) 546-5841
INFO@LABELLEMARVIN.COM

LaBelle Marvin

R - VALUE DATA SHEET

PROJECT No. 45198
DATE: 8/6/2019

BORING NO. B-6 @ 0'-5'
CT Realty Investors, 333 W. Gardena Boulevard
W.O.# 2177-CR3

SAMPLE DESCRIPTION: Brown Silty Sand

R-VALUE TESTING DATA | CA TEST 301

	SPECIMEN ID		
	a	b	c
Mold ID Number	4	6	7
Water added, grams	40	57	35
Initial Test Water, %	8.2	9.8	7.7
Compact Gage Pressure,psi	350	200	350
Exudation Pressure, psi	407	190	619
Height Sample, Inches	2.46	2.50	2.45
Gross Weight Mold, grams	3085	3093	3077
Tare Weight Mold, grams	1957	1955	1953
Sample Wet Weight, grams	1128	1138	1124
Expansion, Inches x 10exp-4	9	0	11
Stability 2,000 lbs (160psi)	20 / 38	40 / 82	17 / 31
Turns Displacement	4.20	5.55	4.05
R-Value Uncorrected	66	30	72
R-Value Corrected	66	30	72
Dry Density, pcf	128.5	125.6	129.1

DESIGN CALCULATION DATA

Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.35	0.72	0.29
G. E. by Expansion	0.30	0.00	0.37

Equilibrium R-Value	**58** by EXUDATION	Examined & Checked: 8 /6/ 19
REMARKS:	Gf = 1.25 0.3% Retained on the 3/4" Sieve.	Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

LaBelle Marvin

R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 45198

DATE: 8 /6/ 19

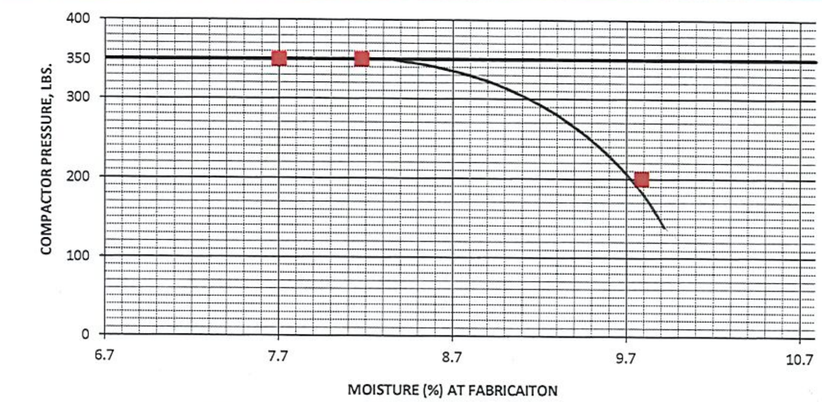
REMARKS:

BORING NO. B-6 @ 0'-5'

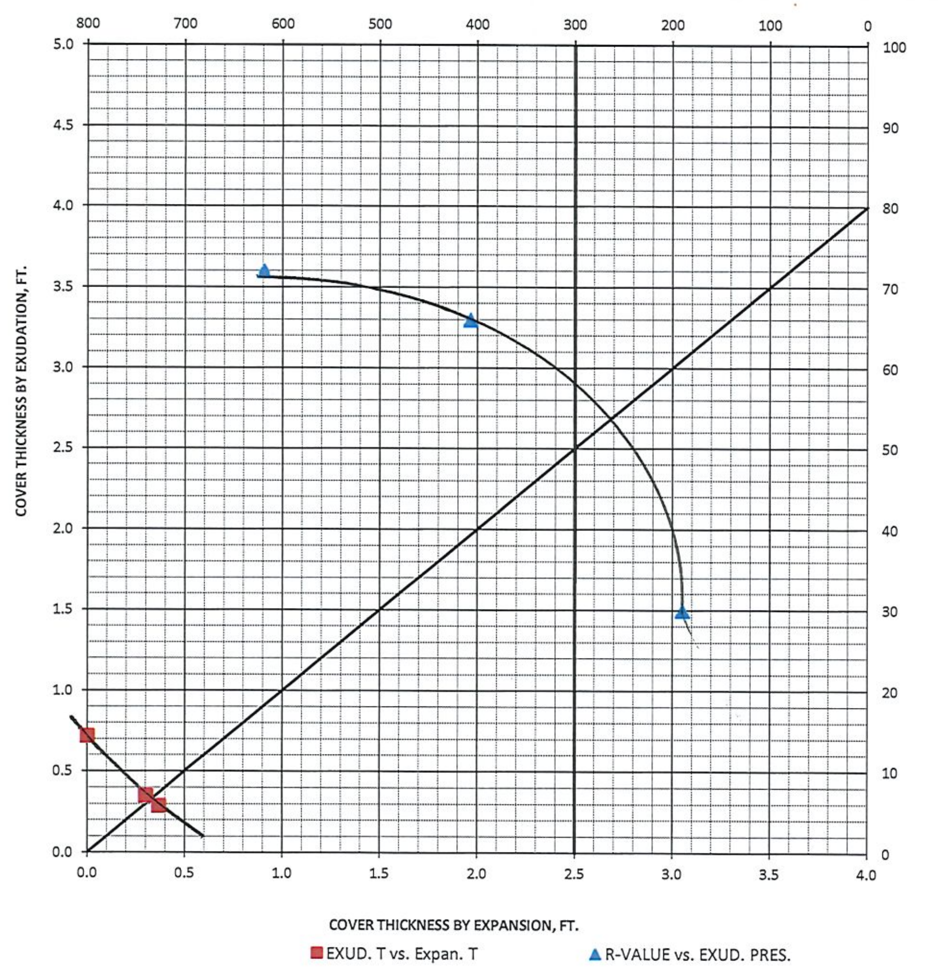
CT Realty Investors, 333 W. Gardena Boulevard

W.O.# 2177-CR3

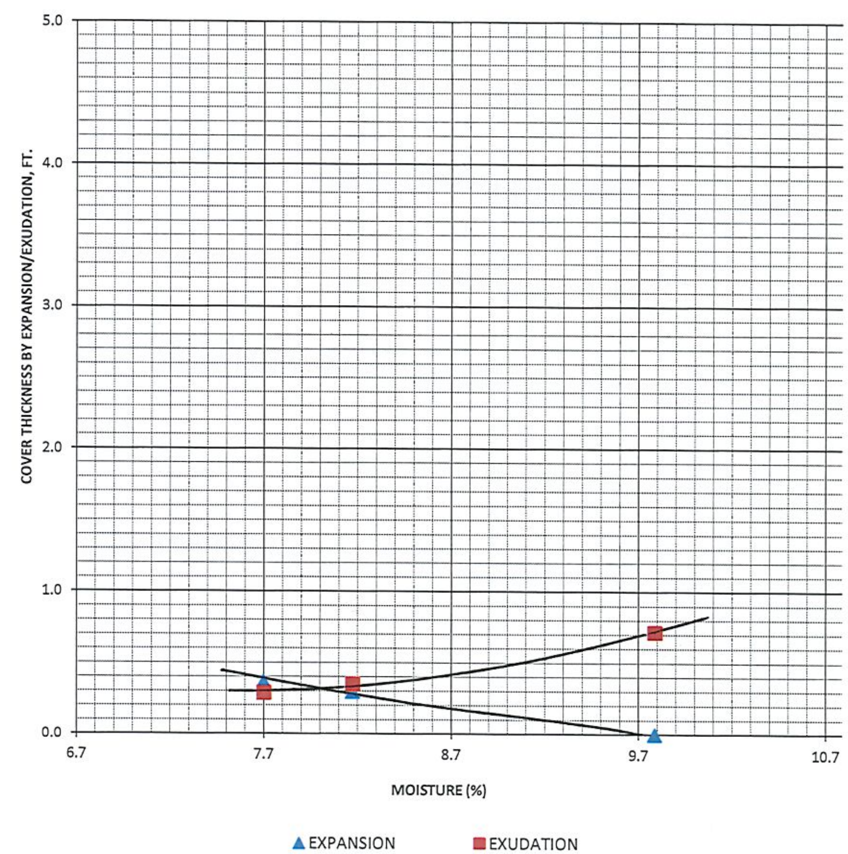
COMPACTOR PRESSURE vs MOISTURE %



COVER THICKNESS BY EXUDATION vs COVER THICKNESS BY EXPANSION



COVER THICKNESS vs MOISTURE %



Soil Analysis Lab Results

Client: GeoTek, Inc.
Job Name: 333 West Gardena Blvd
Client Job Number: 2177-CR
Project X Job Number: S190802B
August 6, 2019

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM G51	ASTM G200	SM 4500-S2-D	ASTM D4327	ASTM D4327	ASTM D4327	ASTM D4327	ASTM D4327	ASTM D4327	ASTM D4327	ASTM D4327	ASTM D4327	SM-2320B
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity**		**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium**	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Flouride** F_2^{--}	**Phosphate** PO_4^{3-}	**Bicarbonate** HCO_3^-
						As Rec'd	**Minimum**													
	(ft)	**(mg/kg)**	**(wt%)**	**(mg/kg)**	**(wt%)**	**(Ohm-cm)**	**(Ohm-cm)**		**(mV)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**
B-3	0.0-5.0	5.8	0.0006	3.3	0.0003	12,060	5,360	8.2	150.0	3.4	0.9	0.7	0.0	28.5	2.6	20.4	69.5	5.4	2.8	50

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract

APPENDIX C

SEISMIC SETTLEMENT ANALYSIS

Proposed Industrial Building
Carson, Los Angeles County, California
Project No. 2177-CR

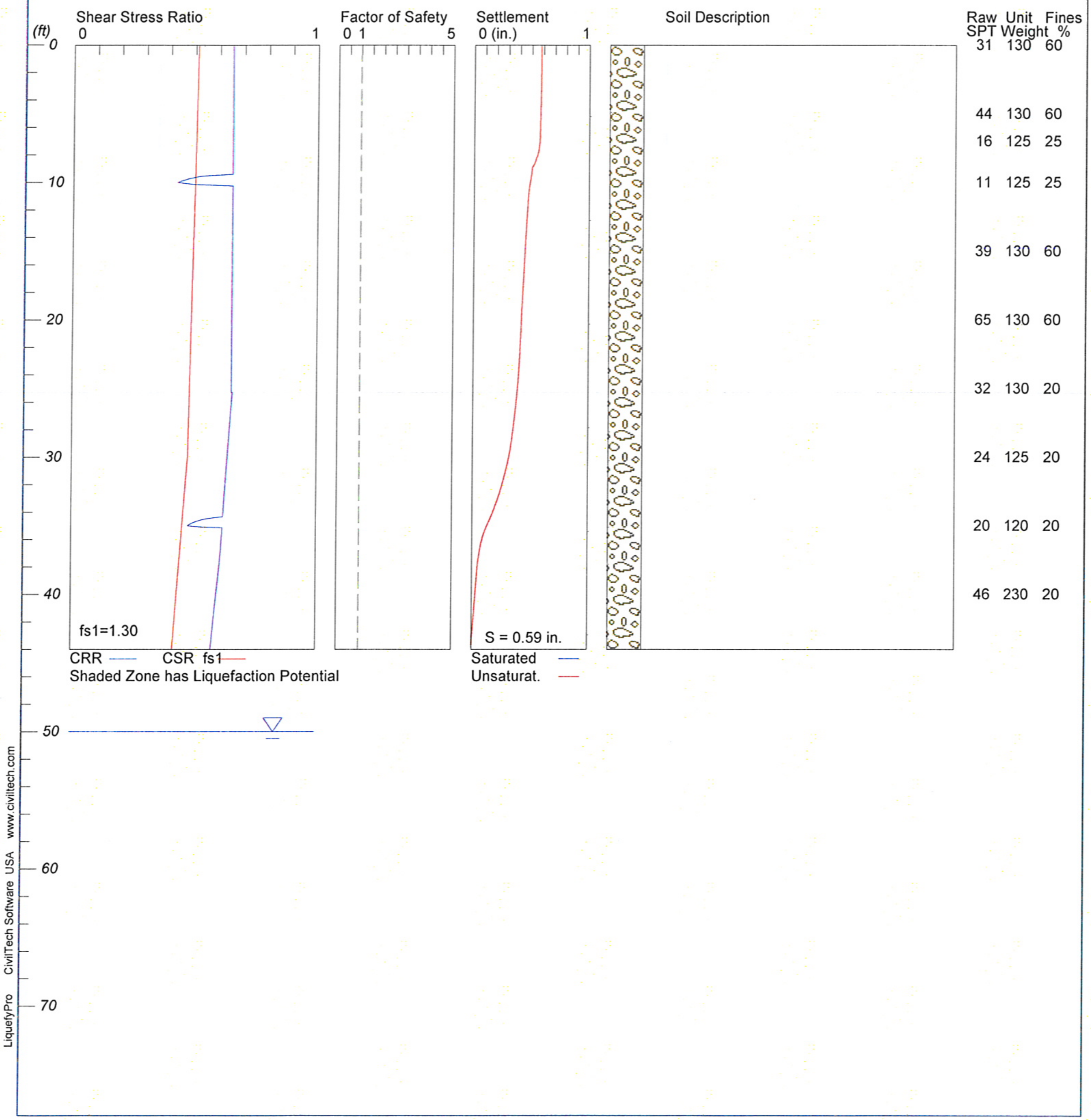
GEOTEK

LIQUEFACTION ANALYSIS

Gardena Industrial Bldg

Hole No.=   Water Depth=50 ft

Magnitude=6.75
Acceleration=0.61g



GeoTek, Inc. **2177-CR** **Plate A-1**

****
****

LIQUEFACTION ANALYSIS SUMMARY

****
****

Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to , 8/5/2019 11:09:34 AM

Input File Name: UNTITLED
Title: Gardena Industrial Bldg
Subtitle: 2177-CR

Surface Elev.=
Hole No.=
Depth of Hole= 44.00 ft
Water Table during Earthquake= 50.00 ft
Water Table during In-Situ Testing= 44.00 ft
Max. Acceleration= 0.61 g
Earthquake Magnitude= 6.75

Input Data:
Surface Elev.=
Hole No.=
Depth of Hole=44.00 ft
Water Table during Earthquake= 50.00 ft
Water Table during In-Situ Testing= 44.00 ft
Max. Acceleration=0.61 g
Earthquake Magnitude=6.75
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1.15
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1.3
   Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.00	31.00	130.00	60.00
5.00	44.00	130.00	60.00
7.00	16.00	125.00	25.00
10.00	11.00	125.00	25.00
15.00	39.00	130.00	60.00
20.00	65.00	130.00	60.00
25.00	32.00	130.00	20.00
30.00	24.00	125.00	20.00
35.00	20.00	120.00	20.00
40.00	46.00	230.00	20.00

Output Results:

Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.59 in.
Total Settlement of Saturated and Unsaturated Sands=0.59 in.
Differential Settlement=0.295 to 0.389 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	0.65	0.52	5.00	0.00	0.59	0.59
1.00	0.65	0.51	5.00	0.00	0.59	0.59
2.00	0.65	0.51	5.00	0.00	0.59	0.59
3.00	0.65	0.51	5.00	0.00	0.59	0.59
4.00	0.65	0.51	5.00	0.00	0.58	0.58
5.00	0.65	0.51	5.00	0.00	0.58	0.58
6.00	0.65	0.51	5.00	0.00	0.58	0.58
7.00	0.65	0.51	5.00	0.00	0.58	0.58
8.00	0.65	0.51	5.00	0.00	0.56	0.56
9.00	0.65	0.50	5.00	0.00	0.51	0.51
10.00	0.43	0.50	5.00	0.00	0.49	0.49
11.00	0.65	0.50	5.00	0.00	0.48	0.48
12.00	0.65	0.50	5.00	0.00	0.47	0.47
13.00	0.65	0.50	5.00	0.00	0.47	0.47
14.00	0.65	0.50	5.00	0.00	0.46	0.46
15.00	0.65	0.50	5.00	0.00	0.45	0.45
16.00	0.65	0.50	5.00	0.00	0.45	0.45
17.00	0.65	0.50	5.00	0.00	0.44	0.44
18.00	0.65	0.49	5.00	0.00	0.44	0.44
19.00	0.65	0.49	5.00	0.00	0.43	0.43
20.00	0.65	0.49	5.00	0.00	0.42	0.42
21.00	0.65	0.49	5.00	0.00	0.42	0.42
22.00	0.65	0.49	5.00	0.00	0.42	0.42

23.00	0.65	0.49	5.00	0.00	0.41	0.41
24.00	0.65	0.49	5.00	0.00	0.40	0.40
25.00	0.65	0.49	5.00	0.00	0.39	0.39
26.00	0.66	0.48	5.00	0.00	0.38	0.38
27.00	0.65	0.48	5.00	0.00	0.37	0.37
28.00	0.65	0.48	5.00	0.00	0.36	0.36
29.00	0.64	0.48	5.00	0.00	0.34	0.34
30.00	0.64	0.48	5.00	0.00	0.32	0.32
31.00	0.64	0.48	5.00	0.00	0.30	0.30
32.00	0.63	0.47	5.00	0.00	0.27	0.27
33.00	0.63	0.47	5.00	0.00	0.23	0.23
34.00	0.63	0.46	5.00	0.00	0.19	0.19
35.00	0.48	0.46	5.00	0.00	0.14	0.14
36.00	0.62	0.45	5.00	0.00	0.09	0.09
37.00	0.61	0.45	5.00	0.00	0.07	0.07
38.00	0.61	0.45	5.00	0.00	0.05	0.05
39.00	0.60	0.44	5.00	0.00	0.04	0.04
40.00	0.60	0.44	5.00	0.00	0.04	0.04
41.00	0.59	0.43	5.00	0.00	0.03	0.03
42.00	0.59	0.43	5.00	0.00	0.02	0.02
43.00	0.58	0.42	5.00	0.00	0.01	0.01
44.00	0.58	0.42	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

---

1 atm (atmosphere) = 1 tsf (ton/ft2)

CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

APPENDIX D

INFILTRATION TEST DATA

Proposed Industrial Building
Carson, Los Angeles County, California
Project No. 2177-CR

GEOTEK

PERCOLATION DATA SHEET

Project: 333 W. GARDENA BLVD Job No.: 2177-CR

Test Hole No.: I-1 NORTH Tested By: DVG Date: 7/31/2019

Depth of Hole As Drilled: 120" Before Test: 120" After Test: 120"

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Comments
							PREWATER 5 GAL
	907		120	60			
	932	25			54 1/4	5 3/4	1ST 25 MIN.
	934		120	60			
	959	25			54 1/4	5 3/4	2ND 25 MIN.
	1001		120	60			
	1031	30			53 1/2	6 1/2	1ST 30 MIN.
	1033		120	60			
	1103	30			53 3/4	6 1/4	2ND 30 MIN
	1105		120	60			
	1135	30			54	6	3RD 30 MIN.
	1137		120	60			
	1207	30			54 1/2	5 1/2	4TH 30 MIN
	1209		120	60			
	1239	30			54 3/4	5 1/4	5TH 30 MIN
	1241		120	60			
	111	30			55	5	6TH 30 MIN
	113		120	60			
	143	30			55	5	7TH 30 MIN

PERCOLATION DATA SHEET

Project: 333 W. GARDENA BLVD. Job No.: 2177-CR

Test Hole No.: I-1 NORTH Tested By: DVG Date: 7/31/2019

Depth of Hole As Drilled: 120" Before Test: 120" After Test: 120"

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Comments
	145		120	60			
	215	30			55 1/4	4 3/4	8TH 30 MIN.
	217		120	60			
	247	30			55 1/2	4 1/2	9TH 30 MIN.
	249		120	60			
	319	30			55 1/2	4 1/2	10TH 30 MIN.
	321		120	60			
	351	30			55 3/4	4 1/4	11TH 30 MIN.
	353		120	60			
	423	30			55 3/4	4 1/4	12TH 30 MIN.

PERCOLATION DATA SHEET

Project: 333 W. GARDENA BLVD. Job No.: 2177-CR

Test Hole No.: I-2 SOUTH Tested By: DVG Date: 7/31/2019

Depth of Hole As Drilled: 120" Before Test: 120" After Test: 120"

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Comments
							PREWATER 5 GAL
	922		120	20			
	947	25			17 3/4	2 1/4	1ST 25 MIN.
	949		120	20			
	1014	25			17 3/4	2 1/4	2ND 25 MIN
	1016		120	20			
	1046	30			17 1/2	2 1/2	1ST 30 MIN.
	1048		120	20			
	1118	30			17 3/4	2 1/4	2ND 30 MIN.
	1120		120	20			
	1150	30			18	2	3RD 30 MIN.
	1152		120	20			
	1222	30			18	2	4TH 30 MIN.
	1224		120	20			
	1254	30			18	2	5TH 30 MIN.
	1256		120	20			
	126	30			18 1/4	1 3/4	6TH 30 MIN.
	128		120	20			
	158	30			18 1/4	1 3/4	7TH 30 MIN.

PERCOLATION DATA SHEET

Project: 333 W. GARDENA BLVD. Job No.: 2177-CR

Test Hole No.: I-2 SOUTH Tested By: DVG Date: 7/31/2019

Depth of Hole As Drilled: 120" Before Test: 120" After Test: 120"

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Comments
	200		120	20			
	230	30			18¼	1¾	8TH 30 MIN.
	232		120	20			
	302	30			18½	1½	9TH 30 MIN.
	304		120	20			
	334	30			18½	1½	10TH 30 MIN.
	336		120	20			
	406	30			18¾	1¼	11TH 30 MIN.
	408		120	20			
	438	30			18¾	1¼	12TH 30 MIN.

APPENDIX E

GENERAL GRADING GUIDELINES

Proposed Industrial Building
Carson, Los Angeles County, California
Project No. 2177-CR

GEOTEK

GENERAL GRADING GUIDELINES

Guidelines presented herein are intended to address general construction procedures for earthwork construction. Specific situations and conditions often arise which cannot reasonably be discussed in general guidelines, when anticipated these are discussed in the text of the report. Often unanticipated conditions are encountered which may necessitate modification or changes to these guidelines. It is our hope that these will assist the contractor to more efficiently complete the project by providing a reasonable understanding of the procedures that would be expected during earthwork and the testing and observation used to evaluate those procedures.

General

Grading should be performed to at least the minimum requirements of governing agencies, Chapters 18 and 33 of the Uniform Building Code, CBC (2016) and the guidelines presented below.

Preconstruction Meeting

A preconstruction meeting should be held prior to site earthwork. Any questions the contractor has regarding our recommendations, general site conditions, apparent discrepancies between reported and actual conditions and/or differences in procedures the contractor intends to use should be brought up at that meeting. The contractor (including the main onsite representative) should review our report and these guidelines in advance of the meeting. Any comments the contractor may have regarding these guidelines should be brought up at that meeting.

Grading Observation and Testing

1. Observation of the fill placement should be provided by our representative during grading. Verbal communication during the course of each day will be used to inform the contractor of test results. The contractor should receive a copy of the "Daily Field Report" indicating results of field density tests that day. If our representative does not provide the contractor with these reports, our office should be notified.
2. Testing and observation procedures are, by their nature, specific to the work or area observed and location of the tests taken, variability may occur in other locations. The contractor is responsible for the uniformity of the grading operations; our observations and test results are intended to evaluate the contractor's overall level of efforts during grading. The contractor's personnel are the only individuals participating in all aspect of site work. Compaction testing and observation should not be considered as relieving the contractor's responsibility to properly compact the fill.
3. Cleanouts, processed ground to receive fill, key excavations, and subdrains should be observed by our representative prior to placing any fill. It will be the contractor's responsibility to notify our representative or office when such areas are ready for observation.

4. Density tests may be made on the surface material to receive fill, as considered warranted by this firm.
5. In general, density tests would be made at maximum intervals of two feet of fill height or every 1,000 cubic yards of fill placed. Criteria will vary depending on soil conditions and size of the fill. More frequent testing may be performed. In any case, an adequate number of field density tests should be made to evaluate the required compaction and moisture content is generally being obtained.
6. Laboratory testing to support field test procedures will be performed, as considered warranted, based on conditions encountered (e.g. change of material sources, types, etc.) Every effort will be made to process samples in the laboratory as quickly as possible and in progress construction projects are our first priority. However, laboratory workloads may cause in delays and some soils may require a **minimum of 48 to 72 hours to complete test procedures**. Whenever possible, our representative(s) should be informed in advance of operational changes that might result in different source areas for materials.
7. Procedures for testing of fill slopes are as follows:
   a) Density tests should be taken periodically during grading on the flat surface of the fill, three to five feet horizontally from the face of the slope.
   b) If a method other than over building and cutting back to the compacted core is to be employed, slope compaction testing during construction should include testing the outer six inches to three feet in the slope face to determine if the required compaction is being achieved.
8. Finish grade testing of slopes and pad surfaces should be performed after construction is complete.

Site Clearing

1. All vegetation, and other deleterious materials, should be removed from the site. If material is not immediately removed from the site it should be stockpiled in a designated area(s) well outside of all current work areas and delineated with flagging or other means. Site clearing should be performed in advance of any grading in a specific area.
2. Efforts should be made by the contractor to remove all organic or other deleterious material from the fill, as even the most diligent efforts may result in the incorporation of some materials. This is especially important when grading is occurring near the natural grade. All equipment operators should be aware of these efforts. Laborers may be required as root pickers.
3. Nonorganic debris or concrete may be placed in deeper fill areas provided the procedures used are observed and found acceptable by our representative.

Treatment of Existing Ground

1. Following site clearing, all surficial deposits of alluvium and colluvium as well as weathered or creep effected bedrock, should be removed unless otherwise specifically indicated in the text of this report.
2. In some cases, removal may be recommended to a specified depth (e.g. flat sites where partial alluvial removals may be sufficient). The contractor should not exceed these depths unless directed otherwise by our representative.
3. Groundwater existing in alluvial areas may make excavation difficult. Deeper removals than indicated in the text of the report may be necessary due to saturation during winter months.
4. Subsequent to removals, the natural ground should be processed to a depth of six inches, moistened to near optimum moisture conditions and compacted to fill standards.
5. Exploratory back hoe or dozer trenches still remaining after site removal should be excavated and filled with compacted fill if they can be located.

Fill Placement

1. Unless otherwise indicated, all site soil and bedrock may be reused for compacted fill; however, some special processing or handling may be required (see text of report).
2. Material used in the compacting process should be evenly spread, moisture conditioned, processed, and compacted in thin lifts six (6) to eight (8) inches in compacted thickness to obtain a uniformly dense layer. The fill should be placed and compacted on a nearly horizontal plane, unless otherwise found acceptable by our representative.
3. If the moisture content or relative density varies from that recommended by this firm, the contractor should rework the fill until it is in accordance with the following:
   a) Moisture content of the fill should be at or above optimum moisture. Moisture should be evenly distributed without wet and dry pockets. Pre-watering of cut or removal areas should be considered in addition to watering during fill placement, particularly in clay or dry surficial soils. The ability of the contractor to obtain the proper moisture content will control production rates.
   b) Each six-inch layer should be compacted to at least 90 percent of the maximum dry density in compliance with the testing method specified by the controlling governmental agency. In most cases, the testing method is ASTM Test Designation D 1557.
4. Rock fragments less than eight inches in diameter may be utilized in the fill, provided:
   a) They are not placed in concentrated pockets;
   b) There is a sufficient percentage of fine-grained material to surround the rocks;
   c) The distribution of the rocks is observed by, and acceptable to, our representative.

5. Rocks exceeding eight (8) inches in diameter should be taken off site, broken into smaller fragments, or placed in accordance with recommendations of this firm in areas designated suitable for rock disposal. On projects where significant large quantities of oversized materials are anticipated, alternate guidelines for placement may be included. If significant oversize materials are encountered during construction, these guidelines should be requested.
6. In clay soil, dry or large chunks or blocks are common. If in excess of eight (8) inches minimum dimension, then they are considered as oversized. Sheepsfoot compactors or other suitable methods should be used to break up blocks. When dry, they should be moisture conditioned to provide a uniform condition with the surrounding fill.

Slope Construction

1. The contractor should obtain a minimum relative compaction of 90 percent out to the finished slope face of fill slopes. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment.
2. Slopes trimmed to the compacted core should be overbuilt by at least three (3) feet with compaction efforts out to the edge of the false slope. Failure to properly compact the outer edge results in trimming not exposing the compacted core and additional compaction after trimming may be necessary.
3. If fill slopes are built "at grade" using direct compaction methods, then the slope construction should be performed so that a constant gradient is maintained throughout construction. Soil should not be "spilled" over the slope face nor should slopes be "pushed out" to obtain grades. Compaction equipment should compact each lift along the immediate top of slope. Slopes should be back rolled or otherwise compacted at approximately every 4 feet vertically as the slope is built.
4. Corners and bends in slopes should have special attention during construction as these are the most difficult areas to obtain proper compaction.
5. Cut slopes should be cut to the finished surface. Excessive undercutting and smoothing of the face with fill may necessitate stabilization.

UTILITY TRENCH CONSTRUCTION AND BACKFILL

Utility trench excavation and backfill is the contractors responsibility. The geotechnical consultant typically provides periodic observation and testing of these operations. While efforts are made to make sufficient observations and tests to verify that the contractors' methods and procedures are adequate to achieve proper compaction, it is typically impractical to observe all backfill procedures. As such, it is critical that the contractor use consistent backfill procedures.

Compaction methods vary for trench compaction and experience indicates many methods can be successful. However, procedures that "worked" on previous projects may or may not prove effective on a given site. The contractor(s) should outline the procedures proposed, so that we may discuss them **prior** to construction. We will offer comments based on our knowledge of site conditions and experience.

1. Utility trench backfill in slopes, structural areas, in streets and beneath flat work or hardscape should be brought to at least optimum moisture and compacted to at least 90 percent of the laboratory standard. Soil should be moisture conditioned prior to placing in the trench.
2. Flooding and jetting are not typically recommended or acceptable for native soils. Flooding or jetting may be used with select sand having a Sand Equivalent (SE) of 30 or higher. This is typically limited to the following uses:
   a) shallow (12 + inches) under slab interior trenches and,
   b) as bedding in pipe zone.

   The water should be allowed to dissipate prior to pouring slabs or completing trench compaction.
3. Care should be taken not to place soils at high moisture content within the upper three feet of the trench backfill in street areas, as overly wet soils may impact subgrade preparation. Moisture may be reduced to 2% below optimum moisture in areas to be paved within the upper three feet below sub grade.
4. Sand backfill should not be allowed in exterior trenches adjacent to and within an area extending below a 1:1 projection from the outside bottom edge of a footing, unless it is similar to the surrounding soil.
5. Trench compaction testing is generally at the discretion of the geotechnical consultant. Testing frequency will be based on trench depth and the contractors procedures. A probing rod would be used to assess the consistency of compaction between tested areas and untested areas. If zones are found that are considered less compact than other areas, this would be brought to the contractors attention.

JOB SAFETY

General

Personnel safety is a primary concern on all job sites. The following summaries are safety considerations for use by all our employees on multi-employer construction sites. On ground personnel are at highest risk of injury and possible fatality on grading construction projects. The company recognizes that construction activities will vary on each site and that job site safety is the contractor's responsibility. However, it is, imperative that all personnel be safety conscious to avoid accidents and potential injury.

In an effort to minimize risks associated with geotechnical testing and observation, the following precautions are to be implemented for the safety of our field personnel on grading and construction projects.

1. Safety Meetings: Our field personnel are directed to attend the contractor's regularly scheduled safety meetings.
2. Safety Vests: Safety vests are provided for and are to be worn by our personnel while on the job site.
3. Safety Flags: Safety flags are provided to our field technicians; one is to be affixed to the vehicle when on site, the other is to be placed atop the spoil pile on all test pits.

In the event that the contractor's representative observes any of our personnel not following the above, we request that it be brought to the attention of our office.

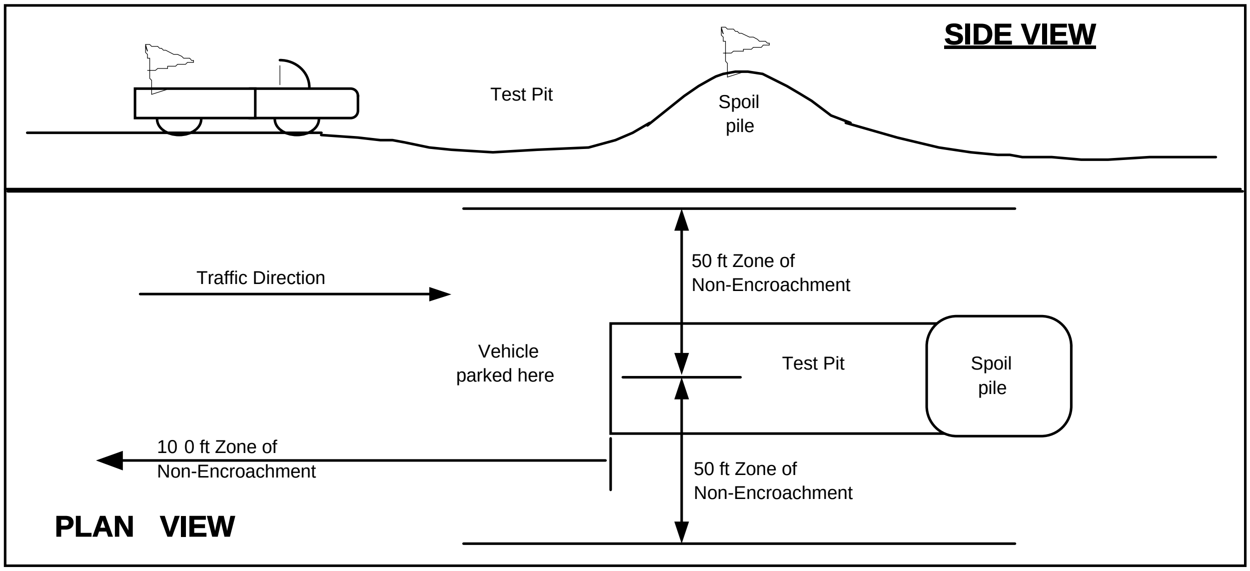
Test Pits Location, Orientation and Clearance

The technician is responsible for selecting test pit locations. The primary concern is the technician's safety. However, it is necessary to take sufficient tests at various locations to obtain a representative sampling of the fill. As such, efforts will be made to coordinate locations with the grading contractors authorized representatives (e.g. dump man, operator, supervisor, grade checker, etc.), and to select locations following or behind the established traffic pattern, preferably outside of current traffic. The contractors authorized representative should direct excavation of the pit and safety during the test period. Again, safety is the paramount concern.

Test pits should be excavated so that the spoil pile is placed away from oncoming traffic. The technician's vehicle is to be placed next to the test pit, opposite the spoil pile. This necessitates that the fill be maintained in a drivable condition. Alternatively, the contractor may opt to park a piece of equipment in front of test pits, particularly in small fill areas or those with limited access.

A zone of non-encroachment should be established for all test pits (see diagram below). No grading equipment should enter this zone during the test procedure. The zone should extend outward to the sides approximately 50 feet from the center of the test pit and 100 feet in the direction of traffic flow. This zone is established both for safety and to avoid excessive ground vibration, which typically decreases test results.

TEST PIT SAFETY PLAN



Slope Tests

When taking slope tests, the technician should park their vehicle directly above or below the test location on the slope. The contractor's representative should effectively keep all equipment at a safe operation distance (e.g. 50 feet) away from the slope during testing.

The technician is directed to withdraw from the active portion of the fill as soon as possible following testing. The technician's vehicle should be parked at the perimeter of the fill in a highly visible location.

Trench Safety

It is the contractor's responsibility to provide safe access into trenches where compaction testing is needed. Trenches for all utilities should be excavated in accordance with CAL-OSHA and any other applicable safety standards. Safe conditions will be required to enable compaction testing of the trench backfill.

All utility trench excavations in excess of 5 feet deep, which a person enters, are to be shored or laid back. Trench access should be provided in accordance with OSHA standards. Our personnel are directed not to enter any trench by being lowered or "riding down" on the equipment.

Our personnel are directed not to enter any excavation which;

1. is 5 feet or deeper unless shored or laid back,
2. exit points or ladders are not provided,
3. displays any evidence of instability, has any loose rock or other debris which could fall into the trench, or
4. displays any other evidence of any unsafe conditions regardless of depth.

If the contractor fails to provide safe access to trenches for compaction testing, our company policy requires that the soil technician withdraws and notifies their supervisor. The contractors representative will then be contacted in an effort to effect a solution. All backfill not tested due to safety concerns or other reasons is subject to reprocessing and/or removal.

Procedures

In the event that the technician's safety is jeopardized or compromised as a result of the contractor's failure to comply with any of the above, the technician is directed to inform both the developer's and contractor's representatives. If the condition is not rectified, the technician is required, by company policy, to immediately withdraw and notify their supervisor. The contractor's representative will then be contacted in an effort to effect a solution. No further testing will be performed until the situation is rectified. Any fill placed in the interim can be considered unacceptable and subject to reprocessing, recompaction or removal.

In the event that the soil technician does not comply with the above or other established safety guidelines, we request that the contractor bring this to technicians attention and notify our project manager or office. Effective communication and coordination between the contractors' representative and the field technician(s) is strongly encouraged in order to implement the above safety program and safety in general.

The safety procedures outlined above should be discussed at the contractor's safety meetings. This will serve to inform and remind equipment operators of these safety procedures particularly the zone of non-encroachment.

The safety procedures outlined above should be discussed at the contractor's safety meetings. This will serve to inform and remind equipment operators of these safety procedures particularly the zone of non-encroachment.