SOILS ENGINEERING INVESTIGATION

Proposed 4-Story Apartment Building On-Grade
Tract: Athens; Block: 18; Lot: FR 16
512 W. Laconia Boulevard
Los Angeles, California

November 7, 2022
Project No. 32-6274-00

Prepared for:

BIF NON OZ 512 W. Laconia Blvd., LLC
Attn: Mr. Jared Warren
1000 E. 60th St.
Los Angeles, CA 90001

A. G. I. GEOTECHNICAL, INC.
16555 Sherman Way, Suite A - Van Nuys, CA 91406 - Office: (818) 785-5244 - Facsimile: (818) 785-6251

November 7, 2022

Project No. 32-6274-00

BIF NON OZ 512 W. Laconia Blvd., LLC
1000 E. 60th St.
Los Angeles, CA 90001

Attention: Mr. Jared Warren

Subject: **SOILS ENGINEERING INVESTIGATION**
Proposed 4-Story Apartment Building On-Grade
APN: 6132-001-020
Tract: Athens; Block: 18; Lot: FR 16
512 W. Laconia Boulevard
Los Angeles, California

Dear Mr. Warren:

This report presents the results of the soils engineering investigation for the proposed 4-story apartment building. The purpose of this investigation was to assess the geotechnical conditions of the site and provide design recommendations for the proposed development. The investigation was performed consisting of field exploration, laboratory testing, engineering analyses of field and laboratory data, and preparation of this report. *The scope of geotechnical services provided did not include an environmental site assessment for the presence of hazardous/toxic materials in the on-site soils and is beyond the scope of this investigation.*

We appreciate the opportunity to be of service. If you should have any questions regarding this report, please contact this office.

Respectfully submitted,
A.G.I. GEOTECHNICAL, INC.

Bruce Smith, R.G.E. 2673
Senior Engineer

REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

MBS:af

Distribution: (3) BIF NON OZ 512 W. Laconia Blvd., LLC

Enclosures:
- Location Map (Figure 1)
- Site Plan (Figure 2)
- Plot Plan (Figure 3)
- Boring Logs
- Laboratory Test Results
- U.S. Seismic Design Map
- Shrinkage/Bulking Determination
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INTRODUCTION

SITE CONDITIONS

The subject site is located at 512 West Laconia Boulevard in the Harbor Gateway area of the city of Los Angeles, California. The site is currently vacant and is bound by the I-110 Freeway to the northwest, by Figueroa Street to the east, and commercial properties to the south. The topography at and in the vicinity of the site is relatively level with minor ground surface elevation changes. Drainage at the site primarily occurs by infiltration into existing dirt surfaces and vegetated areas. The location of the site is shown on the enclosed Location Map, (Figure 1).

PROPOSED SITE DEVELOPMENT

The proposed development consists of a 4-story apartment building on-grade. Structural loads are anticipated to be relatively light: 10 to 15 kips per linear foot for continuous footings and 100 to 150 kips for column footings. Miscellaneous improvements including paved walkways and landscaped areas are anticipated as part of the proposed development. The proposed development is shown on the enclosed Site Plan, (Figure 2).

FIELD EXPLORATION

Subsurface conditions were explored by drilling four exploratory borings at the locations shown on the enclosed Plot Plan, (Figure 3). The borings were advanced to a maximum depth of 13.5 feet below the existing ground surface using a hand auger.

The drilling of the borings was supervised by our field engineer who logged the materials brought up from the borings. Undisturbed and bulk samples were collected at depths appropriate to the investigation. The undisturbed samples were sealed immediately in watertight containers for shipment to our laboratory. The soil sampler used in our investigation consisted of a 2.50-inch I.D. drive barrel lined with 1-inch brass rings which was driven to a depth of nine inches with a 40-pound hammer falling from a height of 18 inches. The number of blows needed to drive the sampler nine inches is shown on the enclosed Boring Logs.

SUBSURFACE CONDITIONS

Soil Profile

The materials encountered during field explorations consisted of fill and natural alluvial soils. The fill was encountered in exploratory Borings B-1, B-2, and B-3. The fill ranged in depth from about 2 to 4.5 feet below existing surface, and it comprises moderately compact silty clayey sands with concrete and red brick pieces. The alluvium comprises very stiff to hard sandy lean clays and dense to very dense clayey sands. The on-site soil was observed to be moist. More detailed descriptions of the soils encountered may be obtained from individual logs of the exploratory borings enclosed in this report.

Groundwater

No groundwater was encountered in the exploratory borings to the depth explored, 13.5 feet below the existing ground surface. According to the "Seismic Hazard Evaluation of the Inglewood 7.5-Minute Quadrangle, Los Angeles County, California" dated 1998 by the Department of Conservation - Division of Mines and Geology, the historically highest groundwater level is approximately 50 feet below the ground surface. The groundwater level may fluctuate because of seasonal changes, injection or extraction of water, variations in temperature and other causes.

ON-SITE INFILTRATION FACILITIES

Various municipalities and jurisdictions have leaned towards the increased implementation of Low Impact Development (LID) requirements to infiltrate stormwater into the on-site soils of a proposed development to reduce surface runoff draining into public storm drains. It is critical that the infiltration of stormwater does not undermine the integrity of underlying materials or any existing structures.

The soil profile, as depicted in the borings to the depth explored, consists of fill and alluvium comprising silty clayey sands, silty sands, and sandy lean clays. These soils are potentially expansive or collapsible and are not recommended for on-site infiltration of stormwater. We recommend that capture and reuse be selected as the method of stormwater management on this project.

METHANE MITIGATION

The subject site is located in a Methane Zone. A methane mitigation design must be prepared by a Civil Engineer experienced in the design of subsurface gas-control systems and conform with the Methane Seepage Regulations of Division 71 of the Los Angeles Building Code.

SEISMIC HAZARDS AND SEISMIC DESIGN CRITERIA

The subject site is situated in a seismically active region. The primary seismic hazard is moderate to strong ground shaking caused by an earthquake on local or regional faults. The potential for other seismically-induced hazards have been evaluated and are discussed below.

Surface Rupture

The Alquist-Priolo Earthquake Fault Zoning Act requires the California Geological Survey (CGS) to zone "active faults" within the State of California. "Active" faults, as defined by CGS, have exhibited surface displacement within the last 11,000 years. It is this recent fault movement that the CGS considers a characteristic for faults that have a relatively high potential for ground rupture in the future.

CGS policy is to delineate a boundary from 200 to 500 feet wide on each side of the known fault trace based on the location precision, the complexity, or the regional significance of the fault. If a site lies within an Earthquake Fault Zone, a geologic fault rupture investigation must be performed that demonstrates that the proposed building site is not threatened by surface displacement from the fault before development permits may be issued.

Review of the Earthquake Zones of Required Investigation for the Inglewood Quadrangle indicates that the subject site is **not** located within an Alquist-Priolo Earthquake Fault Zone. Based on this data, the potential for surface rupture resulting from the movement of nearby faults is low.

Liquefaction

Liquefaction is the sudden decrease in the strength and stiffness of unconsolidated, saturated cohesionless soils typically resulting from seismic ground shaking. For soils to liquefy, the intensity and duration of the seismically induced cyclic loading must be enough to increase the excess pore water pressures to such an extent that the effective stresses on the soil particles reduces to zero. If liquefaction is initiated, the saturated soils behave temporarily as a viscous fluid and, consequently, lose their capacity to support the structures founded on them. The potential for liquefaction decreases with increasing clay and gravel content. Liquefaction potential has been found to be the greatest where the groundwater level and loose cohesionless soils occur within 50 feet of the ground surface.

According to the State of California Seismic Hazards Zone Map for the Inglewood Quadrangle (CDMG, 1998), the site is **not** located in a liquefiable area. This determination is based on groundwater depth records, soil type and distance to a fault capable of producing a substantial earthquake. Based on this data, the potential for liquefaction at the site is low.

Landslides

Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes. Review of the Seismic Hazard Zones Map of the Inglewood Quadrangle indicates that the site is **not** located within a designated earthquake-induced landslide zone. In the absence of significant ground slopes near the subject site, the potential for seismically induced landslides to affect the proposed development site is low.

California Building Code Seismic Parameters

Based on information derived from the subsurface exploration, the subject site is classified as **Site Class D**, which corresponds to a "Stiff Soil" Profile, in accordance with the 2019 California Building Code (2019 CBC) and the 2020 Los Angeles Building Code (LABC), and ASCE 7-16.

Site class information and site coordinates were input into the U.S. Seismic Design Map web resource (https://seismicmaps.org) to calculate the ground motions associated with the risk-targeted maximum considered earthquake (MCE_R). The seismic design parameters are provided in the table below:

2020 LABC/2019 CBC Seismic Design Parameters (Site Class D)

Site Location (Latitude, Longitude): (33.9186 N, 118.2834 W)				
Spectral Period, T (Seconds)	MCE_R Ground Motion (g)	Site-Modified Spectral Acceleration (g)		Seismic Design Acceleration (g)
0.2	$S_S = 1.830$	$F_a = 1.0$	$S_{MS} = 1.830$	$S_{DS} = 1.220$
1.0	$S_1 = 0.648$	$*F_v = 1.7$	$S_{M1} = 1.102$	$S_{D1} = 0.734$
Site Modified Peak Ground Acceleration $PGA_M = 0.869g$				

*Per Section 11.4.8 of ASCE 7-16, a Long Period Site Coefficient (F_v) of 1.7 may be used for structures on Site Class D provided the Seismic Response Coefficient C_S is determined by Eq. (12.8-2) for values of $T \leq 1.5\ T_S$, and taken as 1.5 times the value computed in accordance with Eq. (12.8-3) for $T_L \geq T > 1.5\ T_S$, or as 1.5 times the value computed in accordance with Eq. 37.5 (12.8-4) for $T > T_L$ where:

T = the fundamental period of the building
$T_S = S_{D1}/S_{DS}$
T_L = long-period transition period

Present building codes and construction practices, and the recommendations presented in this report, are intended to minimize structural damage to buildings and prevent loss of life due to a moderate or a major earthquake; they are not intended to totally prevent damage to structures, graded slopes, and natural hillsides. While it may be possible to design structures and graded slopes to withstand strong ground motion, the construction costs associated with such designs are usually prohibitive, and the design restrictions may be severely limiting. Earthquake insurance is often the only economically feasible form of protection for your property against major earthquake damage. Damage to sidewalks, steps, decks, patios, and similar exterior improvements can be expected as these are not normally controlled by the Building Code.

LABORATORY TESTING

Laboratory tests were conducted on representative soil samples for the purpose of classification and evaluation of pertinent engineering properties. The quantity and selection of tests were based on the geotechnical requirements of the project.

CLASSIFICATION

Soils were classified visually according to the Unified Soil Classification System. Unit weight and moisture determinations were performed for each undisturbed sample. Results of density and moisture determinations, together with classifications, are shown on the enclosed Boring Logs.

LOAD CONSOLIDATION TEST (ASTM:D-2435)

To investigate the settlement of the soils under the pressure of the proposed foundations, a consolidation test was performed on an undisturbed sample of the on-site soils. Axial loads were carried to a maximum of 9,400psf. To hasten consolidation, investigate the collapse potential and simulate possible adverse field conditions, water was added at an axial load of 2,350psf. Compressibility of the soils within the zone of significant stress was investigated and the results considered in our engineering analyses. A graphic plot of the load consolidation curve is enclosed.

DIRECT SHEAR TESTS (ASTM:D-3080)

In order to determine the shear strength of the soils, direct shear tests were performed on remolded and undisturbed samples of the on-site soils. The remolded sample was tested at 90% of the maximum dry density. To simulate possible adverse field conditions, samples were saturated prior to shearing. Graphic summaries of the test results, including moisture content at the time of shearing, are included in this report.

GRAIN SIZE DISTRIBUTION (ASTM:D-422-63)

To aid in classification, sieve analyses and a hydrometer test were performed on typical samples of the on-site soils. Results of the tests are shown on the enclosed Grain Size Distribution Charts.

ATTERBERG LIMITS (ASTM:D-4318)

To characterize the fine-grained fractions of the on-site soils, the liquid limits, plastic limits, and plasticity indexes, known as the Atterberg Limits, was determined. These values are utilized to correlate with various engineering properties of fine-grained soils, including liquefaction susceptibility. Results from Atterberg Limits testing are shown on the enclosed Boring Logs.

MAXIMUM DENSITY/OPTIMUM MOISTURE (ASTM:D-1557)

Maximum dry density/optimum moisture content relationship test was performed on a representative bulk sample of the surficial soils. The test was conducted in accordance with the ASTM:D-1557 laboratory procedure. A graphic summary of the test result is enclosed.

EXPANSION TEST (ASTM:D-4829)

An expansion test was performed on a representative sample of the on-site soils in accordance with ASTM:D-4829 to evaluate its volume change with increasing moisture conditions. The surficial materials exhibited very low expansion potential. The result is provided in the table below:

Location	Depth (ft.)	Expansion Index	Expansion Potential
B-1	0-5	6	Very Low

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

Based on the findings from field exploration, laboratory testing, and engineering analyses, the site is considered suitable for construction of the proposed 4-story apartment building on-grade from a geotechnical engineering standpoint.

The subsurface materials underlying the site consist of fill and natural alluvial soils. Fill was encountered in Borings B-1, B-2, and B-3. The fill ranged in depth from about 2 to 4.5 feet below existing surface, and it comprises moderately compact silty clayey sands with concrete and red brick pieces. The alluvium comprises very stiff to hard sandy lean clays and dense to very dense clayey sands. The on-site soil was observed to be moist. No groundwater was encountered to a maximum depth explored, 13.5 feet below the existing ground surface. The surficial on-site soils exhibited very low expansion potential.

SITE PREPARATION

In preparation of the site and prior to the start of construction, all existing fill materials, vegetation, and loose soils should be removed to firm, competent materials. Any existing or abandoned utilities or structures located within the footprint of the proposed grading should be removed or relocated as appropriate. All debris, vegetation, or deleterious materials should be removed from the development site. **The excavated areas shall be observed by the geotechnical engineer or his/her representative prior to placing compacted fill**. A shrinkage value of 10%-15% is estimated for the on-site soils as a result of compaction.

All excavations resulting from removal of existing obstructions (e.g., foundations, tree roots) should be backfilled with soil compacted to at least 95% of the maximum dry density as determined by ASTM:D-1557. If any cesspools or seepage pits are encountered during grading, they should be backfilled with two-sack slurry mix to five feet below finish grade. The upper five feet should be backfilled with compacted fill.

For support of the proposed development, it is recommended that the materials within the footprint of the structures be removed and properly compacted. For placement of newly compacted fill, removal and recompaction should extend to a minimum depth of two feet below the bottom of the foundations. The newly compacted fill shall extend beyond the footings a minimum distance equal to the depth of the fill below the bottom of footings or a minimum of three feet, whichever is greater.

FILL PLACEMENT

All exposed excavated bottoms should be observed by a geotechnical engineer or his/her representative prior to placement of fill. Following observation of the excavation bottoms, soil surfaces should be scarified to a depth of at least eight inches and moisture-conditioned near optimum moisture. If soft or loose soil conditions are encountered at any excavation bottom, deeper excavations shall be performed until a firm bottom is reached.

Fill soils should be cleared of debris, organic materials, and oversized particles (larger than six inches) before placing as compacted fill. All fill should be placed in six to eight inch lifts, brought to near optimum moisture content, and compacted to at least 95% of the laboratory dry density as determined by ASTM: D-1557. **Imported fill should be tested and approved by the geotechnical engineer or his/her representative**. Imported fill should have an expansion index (EI) less than 20.

The placement of compacted fill is to be performed under the observation and testing of a representative of our office to confirm that the required degree of compaction has been obtained. Where compaction is less than that specified, additional compaction effort should be made with adjustment of the moisture content as necessary, until the specified compaction is obtained.

FOUNDATION DESIGN

Type of Foundation

The proposed building may be supported on conventional shallow foundations bearing on a compacted fill pad. It is recommended that all continuous and isolated footings be embedded at least 24 inches below lowest adjacent grade. The conventional foundations shall be designed with a minimum recommended width of 24 inches. The minimum reinforcement in continuous footings should consist of four No. 4 bars: two placed about four inches from the top and two placed about four inches from the bottom.

Soil Bearing Pressures

Conventional foundations founded on compacted fill may be designed for an allowable soil bearing pressure of 3,500psf. The recommended soil bearing pressure may be increased by 400psf per each additional foot of embedment over 24 inches and by 200psf per each additional foot in width over 24 inches up to 5,000psf. A factor of safety of 3 was employed to determine the allowable bearing pressures. The bearing pressures indicated are for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces.

Expected Settlements

The settlement of a structure will depend on the actual footing dimensions and the imposed vertical loads. Based on the allowable soil bearing pressures presented above, the maximum settlement of the recommended conventional foundations is not expected to exceed one inch. Differential settlement is not expected to exceed 0.5 inch in a 30-foot span.

SLABS-ON-GRADE

If used, concrete floor slabs-on-grade thickness and reinforcement should reflect the anticipated use of the slabs and should be designed by the structural engineer. Concrete floor slabs-on-grade should be a minimum of four inches (full) thick with minimum reinforcement consisting of No. 4 deformed bars spaced a maximum of 16 inches each way. Concrete slabs-on-grade should be underlain by four inches of ½ inch or larger clean aggregate base. In areas where floor coverings or equipment that are sensitive to moisture are contemplated a 10-mil moisture barrier membrane (e.g., Visqueen) should be placed on the granular base in direct contact with the concrete slab. Cracking of reinforced concrete is a relatively common occurrence. Some cracking of reinforced concrete, including slabs, can be anticipated. Irregularities in new slabs are also common. If cracking of slabs cannot be tolerated, heavily reinforced structural slabs are an option.

The recommendations presented above are intended to reduce the potential for random cracking to which concrete flatwork is often prone. Judicious spacing of crack control joints has proven effective in further reducing random cracking. A structural engineer may recommend the desirable spacing. Usually crack control joints are placed 12 to 15 feet apart in each direction. Factors influencing cracking of concrete flatwork, (other than expansion, settlement, and creep of soils), and which should be avoided, include: poor-quality concrete, excessive time passing between the mixing and placement of the concrete (concrete should be rejected if this time interval exceeds two hours), temperature, and wind conditions at the time of placement, curing, and workmanship. Concrete should be maintained in a moist condition (curing) for at least the first seven days after placement. During hot weather, proper attention should be given to the ingredients, production methods, handling, placement, protection, and curing to prevent excessive concrete temperature or water evaporation. In hot weather and windy conditions, water evaporates more rapidly from the surface of the concrete flatwork. This requires more frequent moistening of the concrete during the curing period or the use of a protective chemical film to prevent evaporation.

RETAINING WALLS

There are no retaining walls proposed. Backfill for retaining walls, if any, should consist of granular, free-draining material. Cantilevered retaining walls should be designed to resist an active pressure of 30pcf equivalent fluid pressure (EFP). Restrained walls should be designed for an earth pressure of 45pcf EFP. Walls subject to surcharge loads should be designed to include the additional lateral pressure. Walls should have adequate drainage to prevent build-up of hydrostatic pressure.

LATERAL RESISTANCE

An allowable lateral bearing of 300psf per foot of depth may be assumed up to a maximum of 4,500psf. A coefficient of friction between soil and concrete of 0.4 may be used.

PAVEMENT SECTIONS

New pavement sections may be constructed as part of the proposed development. The pavement may comprise flexible (asphalt) or rigid (Portland Cement Concrete) sections. For areas where new paving is placed, the subgrade should be scarified to a depth of 12 inches, moistened as required to near optimum moisture content, and recompacted to 95% of the maximum dry density as determined by ASTM:D-1557. The client should be aware that removal of all existing fill in the area of new paving is not required; however, pavement constructed in this manner will most likely have a shorter design life and increased maintenance costs.

The following pavement design sections are based on an assumed "R" Value of 30. Once site grading has begun, an "R" Value should be obtained by laboratory testing to confirm the properties of the subgrade soils prior to placing pavement. Traffic loading is anticipated to be primarily light vehicles. The Traffic Indices used for the pavement design sections provided below are estimates and should be verified by the project civil engineer.

PAVEMENT DESIGN SECTIONS		
Vehicular Service Estimated Traffic Index (TI)	Asphalt Concrete Thickness (Inches)	Base Course Thickness (Inches)
Parking Lot, Driveways (TI = 4)	3	4

Where rigid concrete paving will be used, it is recommended that the concrete be at least four inches thick underlain by a minimum of four inches of compacted base material. This rigid concrete pavement section is based on a minimum 28-day Modulus of Rupture of 550psi and a compressive strength of 3,000psi. The third point method of testing beams should be used to evaluate Modulus of Rupture. The modulus of subgrade reaction (k) was set at 125 pounds per square inch per inch. Transverse expansion/contraction joints should not be spaced more than ten feet and should be cut to a depth of ¼ the thickness of the slab.

Base materials which underlie flexible or rigid pavements should be compacted to a minimum of 95% of the maximum dry density as determined by ASTM:D-1557. Base materials shall conform to requirements for Crushed Miscellaneous Base (CMB) or equivalent and should be placed in accordance with the requirements of the Standard Specifications for Public Works Construction (SSPWC, latest edition). Asphaltic materials should conform to Section 203-1, "Paving Asphalt," of the SSPWC and should be placed in accordance with Section 302-5, "Asphalt Concrete Pavement," of the SSPWC.

The performance of pavement is highly dependent upon providing positive surface drainage away from the edges. Ponding of water on or adjacent to pavement can result in saturation of the subgrade materials and subsequent pavement distress. If planter islands are planned, the perimeter curb should extend a minimum of 12 inches below the bottom of the base course.

CONSTRUCTION CUTS

Construction cuts up to five feet high may be excavated vertically for their entire length and height provided they do not undermine adjacent buildings or property line walls; otherwise, the construction cuts will need to be excavated using the 'A, B, C' slot-cutting method. If the slot-cutting method is used, the cut should be opened at a gradient of 1:1 first, then each slot opened, and the removed soils replaced as engineered compacted fill before the subsequent slot is opened. The slots should not exceed 8 feet in width or 12 feet in height. If the construction cuts are to remain open for more than two weeks or if rain is expected while they are open, they should be covered by a plastic membrane kept in place by holding blocks or driven re-bars at the top and bottom of the membrane. No equipment or personnel should stand closer than ten feet from the top of the temporary cut. **A representative of this office should examine the construction cuts periodically to verify performance.** All construction cuts should comply with the State of California Construction Safety Orders (CAL/OSHA).

BACKFILL

All backfill of walls, footings, or trenches should be compacted to 95% of the maximum dry density as determined by ASTM:D-1557 **and is to be tested by the geotechnical engineer or his/her representative**.

DRAINAGE

Adequate drainage is essential to the performance of the project. Saturation of soils can cause a reduction in shear strength and increase in compressibility, resulting in a change in the designed engineering properties of the soils. Proper site drainage should be continuously maintained and conducted away from any structures to prevent ponding and to reduce infiltration of water into the bearing soils.

All pad and roof drainage should be collected and transferred to an adjacent street/alleyway or an approved area in non-erosive drainage devices. Drainage should not be allowed to descend upon any slope in a concentrated manner. The installation of roof gutters and downspouts which deposit water into a buried drain system should be installed instead of discharging surface water into planter areas adjacent to structures.

It is recommended for all drainage adjacent to footings be conducted away from structures by a minimum 3-foot-wide apron measured perpendicular to the face of the wall and sloped at a minimum 2% gradient into an approved non-erosive device. Alternatively, we recommend a minimum 5% slope away from the face of a building wall for a minimum horizontal distance of ten feet (where space permits). Any proposed planters or landscaped areas immediately adjacent to structures should be sloped at a minimum gradient of 5% away from the structure. Additionally, where new planters or landscaped areas will be placed adjacent to the structure, provisions for drainage may also include bottom impermeable liners, catch basins, or area drains to minimize infiltration into the subgrade soils.

WORKMAN SAFETY-EXCAVATIONS

It is essential for the contractor to provide adequate shoring and safety equipment as required by the State or Federal OSHA regulations. All regulations of the State or Federal OSHA should be followed before allowing workmen in a trench or other excavation. If excavations are to be made during the rainy season, particular care should be given to ensure that berms or other devices will prevent surface water from flowing over the top of the excavation or ponding at the top of the excavations.

EXCAVATION OBSERVATIONS

Excavation bottoms are to be observed and approved by a representative of our office as well as the City Inspector before fill is placed. All footing excavations should be observed by a representative of this office prior to forming or placement of reinforcement steel to confirm that soil conditions meet the requirements set by this report. Footing excavations are to be kept moist and concrete should be placed as soon as possible after excavations are completed, examined, and approved by a representative of our office and the City Inspector.

REVIEW

The geotechnical consultants shall review and sign all plans and specifications.

REGULATORY AGENCY REVIEW AND ADDITIONAL CONSULTING

All geotechnical and/or engineering geologic aspects of the proposed development are subject to review and approval by the authority having jurisdiction. The government reviewing agency may approve or deny any portion of the proposed development which may require additional geotechnical services by this office. Additional geotechnical services may include review responses, supplemental letters, plan reviews, construction/site observations, meetings, etc. The fees for generating additional reports, letters, exploration, analyses, etc. will be billed on a time and material basis.

COMMENTS

The conclusions and recommendations presented in this report are based on research, site observations, and limited subsurface information. The conclusions and recommendations presented are based on the supposition that subsurface conditions do not vary significantly from those indicated. Although no significant variations in subsurface conditions are anticipated, the possibility of significant variations cannot be ruled out. If such conditions are encountered, this consultant should be contacted immediately to consider the need for modification of this project.

This report was prepared for the exclusive use of BIF NON OZ 512 W. Laconia Blvd., LLC and their design consultants for the specific project outlined herein. This report may not be suitable for use by other parties or other uses. This report is subject to review by regulatory agencies and these agencies may require their approval before the project can proceed. No guarantee that the regulatory public agency or agencies will approve the project is intended, expressed, or implied.

One of the purposes of this report is to provide the client with advice regarding geotechnical conditions at the site. It is important to recognize that other consultants could arrive at different conclusions and recommendations. No warranties of future site performance are intended, expressed, or implied.

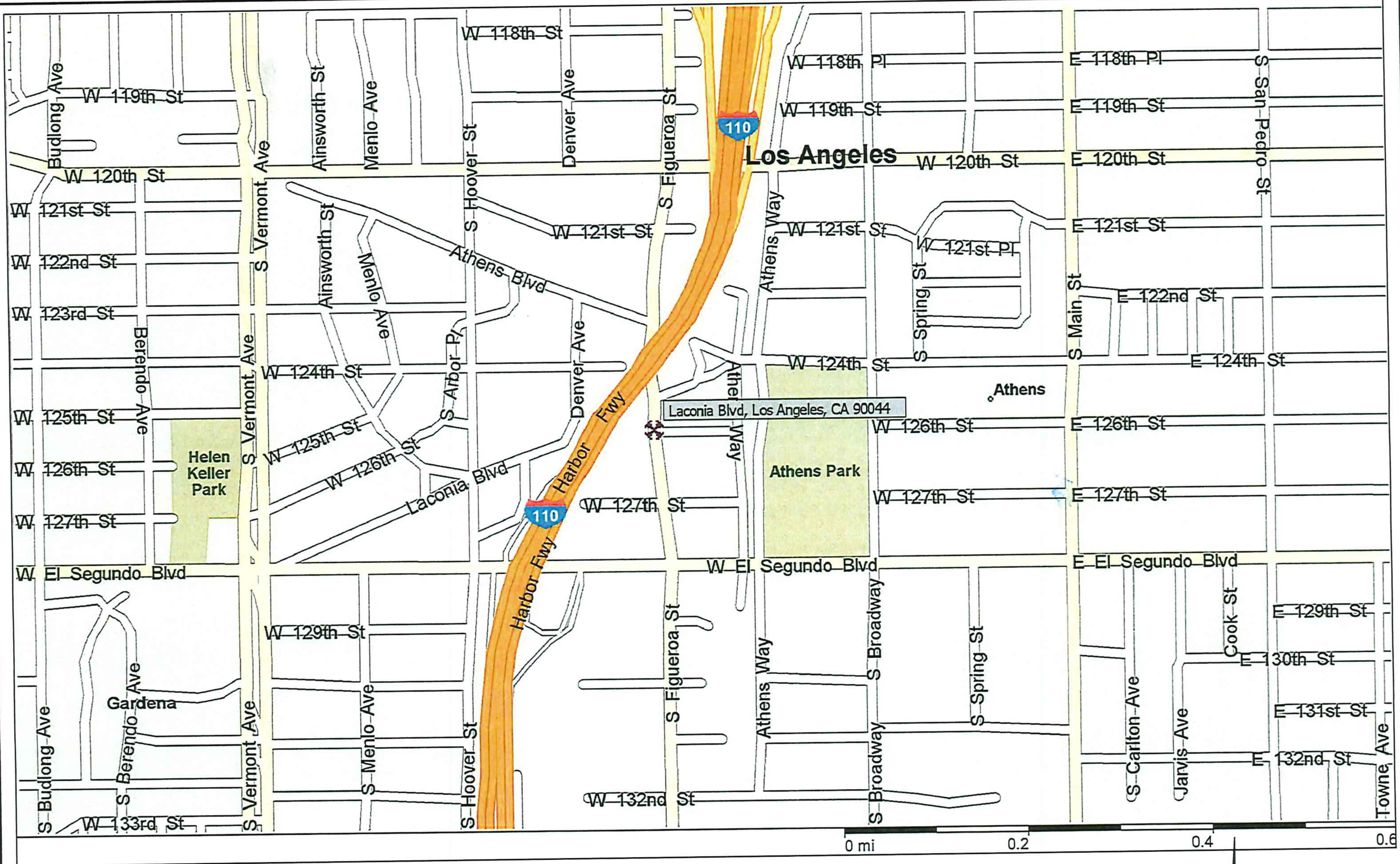

FIGURE 1

PROJECT NO.	32-6274-00
DATE	8-2022
PREPARED BY	AM
APPROVED BY	MBS

LOCATION MAP

512 W. Laconia Blvd., Los Angeles

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Scale 1" = 40'

FIGURE 2

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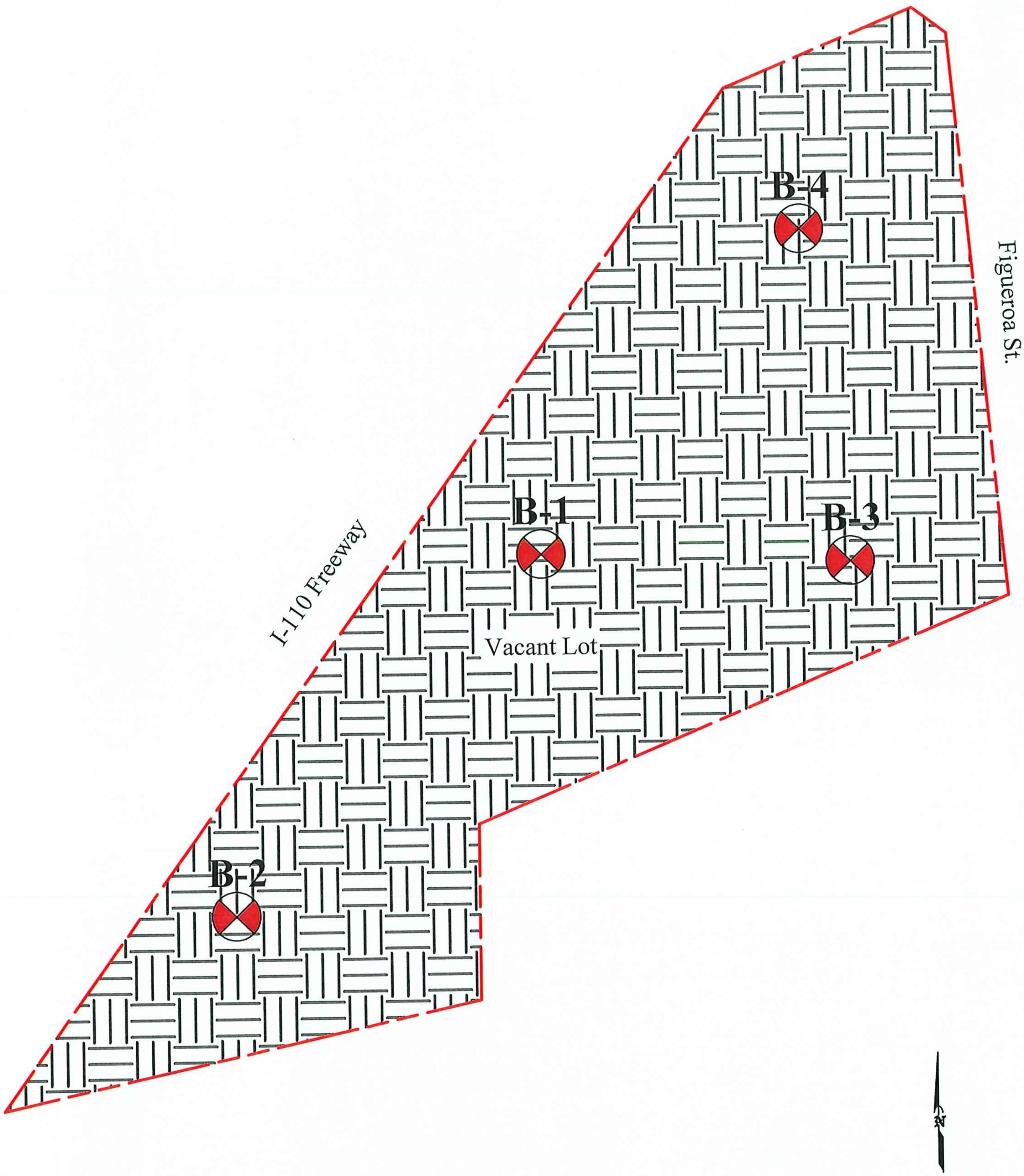
SITE PLAN

512 W. Laconia Blvd., Los Angeles

PROJECT NO.	32-6274-00
DATE	11-2022
PREPARED BY	AGF
APPROVED BY	MBS



EXPLANATION

B-1 Approximate Location of Exploratory Boring

Scale 1" = 30'

FIGURE 3

AGI
A.G.I. GEOTECHNICAL, INC.
Engineering Geology • Geotechnical Engineering
16555 Sherman Way, Ste. A • Van Nuys, CA 91406
(818) 785-5244 • Fax (818) 785-6251

PLOT PLAN

512 W. Laconia Blvd., Los Angeles

PROJECT NO.	32-6274-00
DATE	11-2022
PREPARED BY	AGF
APPROVED BY	MBS

BORING LOGS

LEGEND

Ring Sample, or Bulk Sample

Standard Penetration Test (SPT)

Ground Water Level

SOIL SIZE	
COMPONENT	SIZE RANGE
Boulders	Above 12"
Cobbles	3"-12"
Gravel	#4 - 3"
coarse	¾" - 3"
fine	#4 - ¾"
Sand	#200-#4
coarse	#10-#4
medium	#40-#10
fine	#200-#40
Fines (Silt or Clays)	Below #200

PLASTICITY OF FINE GRAINED SOILS	
PLASTICITY INDEX	VOLUME CHANGE POTENTIAL
0-15	Probably Low
15-30	Probably Moderate
30 or more	Probably High

WATER CONTENT
Dry: No feel of moisture
Damp: Much less than normal moisture
Moist: Normal moisture
Wet: Much greater than normal moisture
Saturated: At or near saturation

RELATIVE DENSITY	
SANDS & GRAVELS	BLOWS PER FOOT
Very loose	0-4
Loose	4-10
Medium dense	10-30
Dense	30-50
Very dense	Over 50

	GROUP SYMBOLS	DESCRIPTIONS	DIVISIONS
COARSE-GRAINED SOILS (Less than 50% Fines)	GW	Well-graded gravels or gravel-sand mixtures, less than 5% fines	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size
	GP	Poorly-graded gravels or gravel-sand mixtures, less than 5% fines	
	GM	Silty gravels, gravel-sand silt mixtures, more than 12% fines	
	GC	Clayey gravels, gravel-sand-clay mixtures, more than 12% fines	
	SW	Well-graded sands or gravelly sands, less than 5% fines	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
	SP	Poorly-graded sands or gravelly sands, less than 5% fines	
	SM	Silty sands, sand-silt mixtures, more than 12% fines	
	SC	Clayey sands, sand-clay mixtures, more than 12% fines	
FINE-GRAINED SOILS (More than 50% Fines	ML	Inorganic silt, very fine sands, rock flour, silty or clayey fine sands	SILTS AND CLAYS Liquid limit less than 50
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
	OL	Organic silts or organic silt-clays of low plasticity	
	MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts	SILTS AND CLAYS Liquid limit less than 50
	CH	Inorganic clays of high plasticity, fat clays	
	OH	Organic clays of medium to high plasticity	
	PT	Peat, mulch, and other highly organic soils	HIGHLY ORGANIC SOILS

CONSISTENCY	
CLAYS & SILTS	BLOWS PER FOOT
Very soft	0-2
Soft	2-4
Firm	4-8
Stiff	8-15
Very stiff	15-30
Hard	Over 30

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A.G.I. Geotechnical, Inc. 16555 Sherman Way, Unit A Van Nuys, California 91406 Telephone: (818) 785-5244 Fax: (818) 785-6251

BORING NUMBER B-1

CLIENT: BIF NON OZ 512 W. Laconia Blvd., LLC PROJECT NAME: Proposed 4-Story Apartment Building On-Grade

PROJECT NUMBER: 32-6274-00 PROJECT LOCATION: 512 W. Laconia Blvd., Los Angeles

DATE STARTED: 10/14/2022 COMPLETED: 10/14/2022 GROUND ELEVATION: N/A BORING DIAMETER: 4"

EXCAVATION METHOD: Hand Auger GROUND WATER LEVELS: Not Encountered

DRILLING CONTRACTOR: American Vector SAMPLING METHOD: Manual Drop Hammer, 40 lb., 18" Drop

LOGGED BY: CWL CHECKED BY: AGF

DEPTH (ft)	DRIVE SAMPLE	BLOW COUNT	BULK SAMPLE	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	Wet UNIT WT. (pcf)	SAT. MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MATERIAL DESCRIPTION	<200	D 50	Classification
0			X								Fill Silty Clayey SAND with concrete & red bricks (Light brown, moist, moderately compact) @ 0-5'; EI = 6, Very Low	33		SC-SM
	X	50/6"		11.0	110	122	19.5	22	19	4				
5	X	50/6"		16.7	111	130	19.0				Alluvium Sandy Lean CLAY (Dark to light brown, moist, hard)			CL
	X	50/6"		29.5	87	112	35.1							
10	X	80/6"		15.3	102	118	24.2							
	X	50/6"		18.5	98	116	26.9							
15											Total Depth: 13.5' Groundwater Not Encountered			
20														
25														
30														

BORING NUMBER B-2

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CLIENT: BIF NON OZ 512 W. Laconia Blvd., LLC PROJECT NAME: Proposed 4-Story Apartment Building On-Grade

PROJECT NUMBER: 32-6274-00 PROJECT LOCATION: 512 W. Laconia Blvd., Los Angeles

DATE STARTED: 10/14/2022 COMPLETED: 10/14/2022 GROUND ELEVATION: N/A BORING DIAMETER: 4"

EXCAVATION METHOD: Hand Auger GROUND WATER LEVELS: Not Encountered

DRILLING CONTRACTOR: American Vector SAMPLING METHOD: Manual Drop Hammer, 40 lb., 18" Drop

LOGGED BY: CWL CHECKED BY: AGF

DEPTH (ft)	DRIVE SAMPLE	BLOW COUNT	BULK SAMPLE	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	Wet UNIT WT. (pcf)	SAT. MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MATERIAL DESCRIPTION	<200	D 50	Classification
0											Fill Silty Clayey Sand with concrete & red bricks (Light brown, moist, moderately compact)			SC-SM
	X	50/6"		10.5	105	116	22.7				Alluvium Sandy Lean CLAY to Clayey SAND (Dark brown to brown, moist, hard or very dense)			CL/SC
5	X	80/3"		9.3	111	121	19.4					43		
	X	70/6"		24.7	92	115	30.8				Sandy Lean CLAY (Brown to light brown, moist, hard)			CL
10	X	60/3"		13.2	88	99	34.0							
	X	90/4"		12.3	88	99	33.8							
15											Total Depth: 13.5' Groundwater Not Encountered			
20														
25														
30														

BORING NUMBER B-3

A.G.I. GEOTECHNICAL, INC.

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CLIENT: BIF NON OZ 512 W. Laconia Blvd., LLC PROJECT NAME: Proposed 4-Story Apartment Building On-Grade

PROJECT NUMBER: 32-6274-00 PROJECT LOCATION: 512 W. Laconia Blvd., Los Angeles

DATE STARTED: 10/14/2022 COMPLETED: 10/14/2022 GROUND ELEVATION: N/A BORING DIAMETER: 4"

EXCAVATION METHOD: Hand Auger GROUND WATER LEVELS: Not Encountered

DRILLING CONTRACTOR: American Vector SAMPLING METHOD: Manual Drop Hammer, 40 lb., 18" Drop

LOGGED BY: CWL CHECKED BY: AGF

DEPTH (ft)	DRIVE SAMPLE	BLOW COUNT	BULK SAMPLE	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	Wet UNIT WT. (pcf)	SAT. MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MATERIAL DESCRIPTION	<200	D 50	Classification
0											Fill Silty Clayey Sand with concrete & red bricks (Light brown, moist, compact)			SC-SM
	X	40		10.2	119	131	15.5				Alluvium Sandy Lean CLAY to Clayey SAND (Dark brown to brown, moist, very stiff to hard or dense to very dense)			CL/SC
5	X	50/6"		10.8	121	134	14.6							
	X	50/6"		21.8	102	125	23.9				Sandy Lean CLAY (Brown to light brown, moist, hard)			CL
10	X	70/5"		14.0	103	117	23.7							
	X	60/6"		22.4	98	120	26.8							
15											Total Depth: 13.5' Groundwater Not Encountered			
20														
25														
30														

BORING NUMBER B-4

A.G.I. GEOTECHNICAL, INC.

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CLIENT: BIF NON OZ 512 W. Laconia Blvd., LLC PROJECT NAME: Proposed 4-Story Apartment Building On-Grade

PROJECT NUMBER: 32-6274-00 PROJECT LOCATION: 512 W. Laconia Blvd., Los Angeles

DATE STARTED: 10/14/2022 COMPLETED: 10/14/2022 GROUND ELEVATION: N/A BORING DIAMETER: 4"

EXCAVATION METHOD: Hand Auger GROUND WATER LEVELS: Not Encountered

DRILLING CONTRACTOR: American Vector SAMPLING METHOD: Manual Drop Hammer, 40 lb., 18" Drop

LOGGED BY: CWL CHECKED BY: AGF

DEPTH (ft)	DRIVE SAMPLE	BLOW COUNT	BULK SAMPLE	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	Wet UNIT WT. (pcf)	SAT. MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MATERIAL DESCRIPTION	<200	D 50	Classification
0											Alluvium Sandy Lean CLAY (Dark to light brown, moist, hard)			CL
	X	50/6"		7.9	108	116	20.8							
5	X	50/6"		6.9	99	106	26.0							
	X	50/6"		17.9	102	120	24.0					55		
10	X	80/3"		NR										
	X	60/6"		14.6	92	105	31.0							
15											Total Depth: 13.5' Groundwater Not Encountered			
20														
25														
30														

LABORATORY TEST RESULTS

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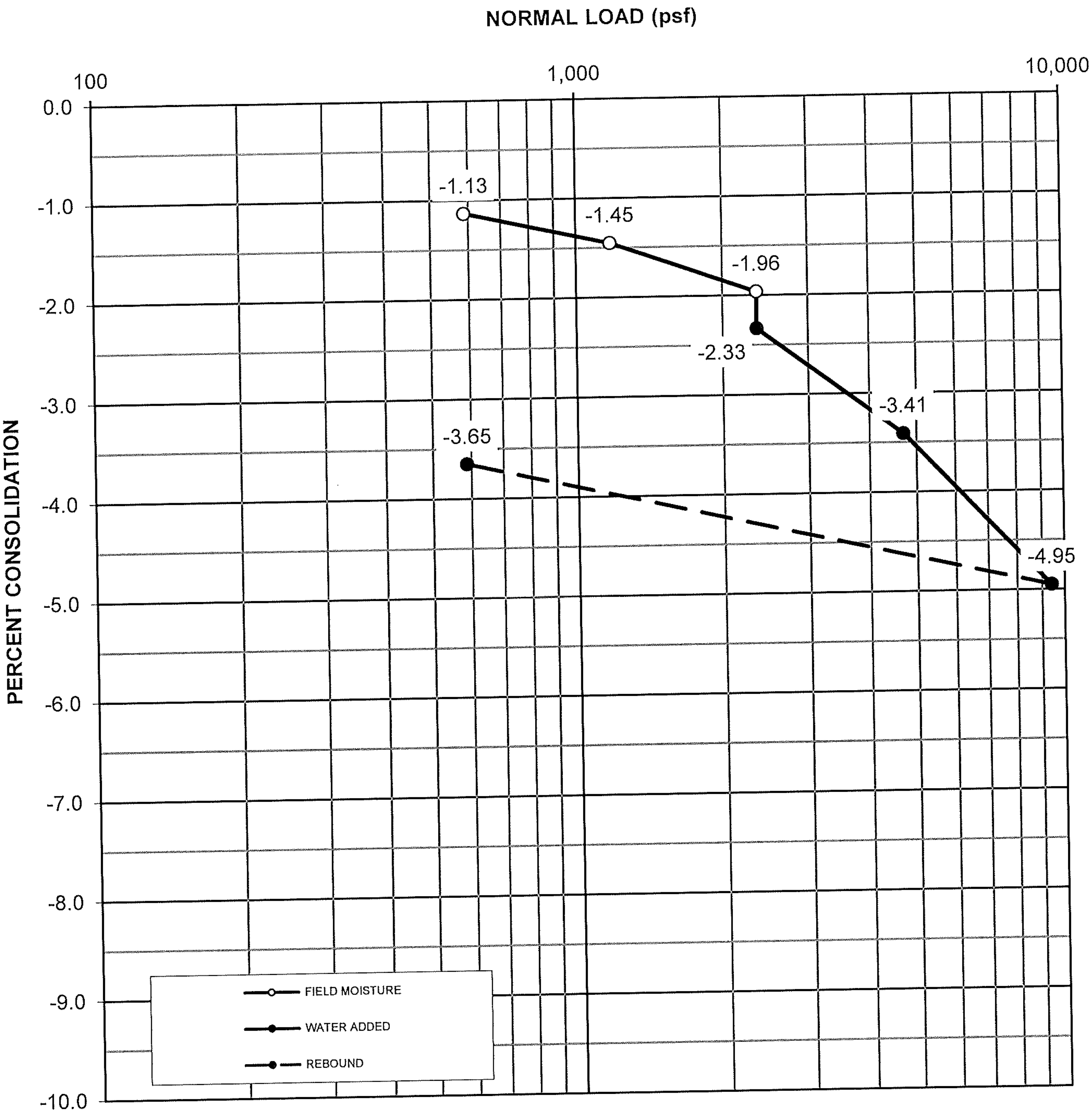

PROJECT NO. 32-6274-00 BORING NO. B-1 DEPTH (FT) 7.5

REPRESENTATIVE FOR Alluvium

SOIL TYPE AND DESCRIPTION Sandy Lean CLAY (CL)

HYDROCONSOLIDATION (%) 0.37

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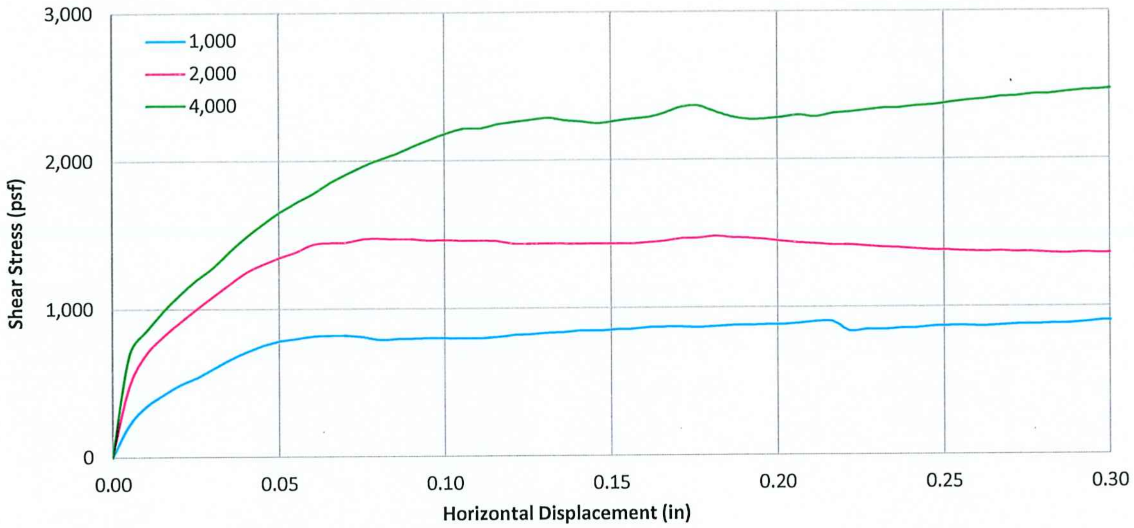
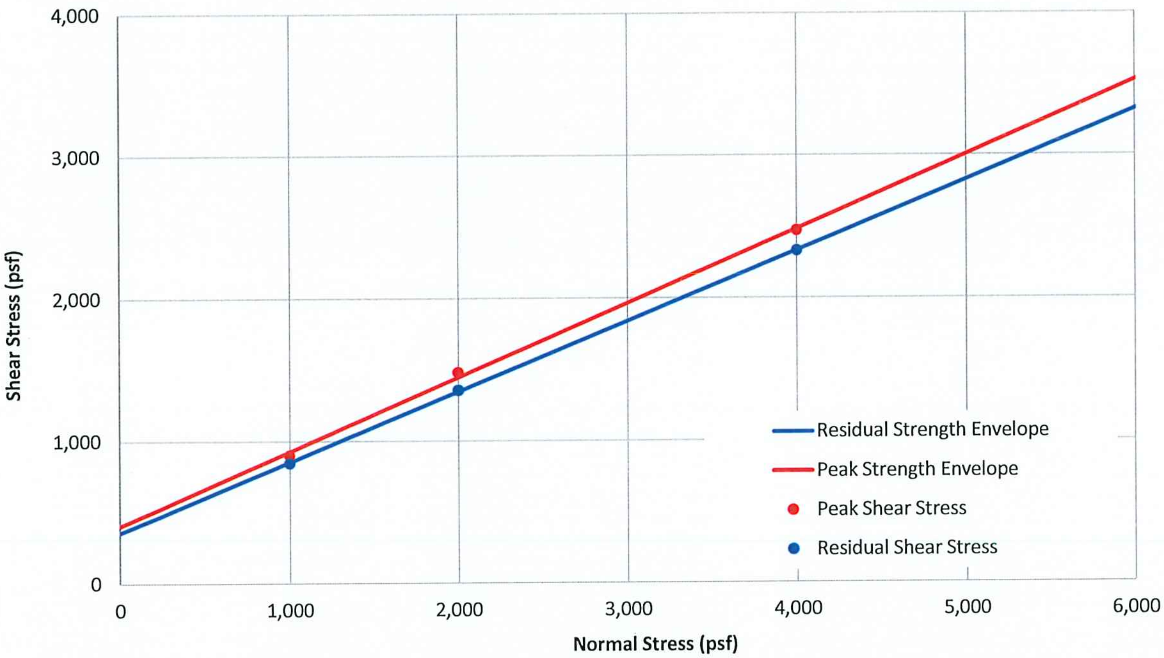
REMOLDED SATURATED DIRECT SHEAR TEST (ASTM:D-3080)

Boring: B-1
Depth (ft): 0-5
Geology: Fill-Alluvium
Classification: Silty Clayey SAND (SC-SM)

Specimen	Load (psf)	Water (%)	Dry γ (pcf)	Wet γ (pcf)
1	1,000	15.9	116.4	135.0
2	2,000	16.5	117.5	136.9
3	4,000	15.9	115.8	134.3





Normal Stress (psf)	Peak Shear Stress (psf)	Residual Shear Stress (psf)
1,000	902	846
2,000	1,482	1,358
4,000	2,474	2,331

Peak Cohesion (psf)	Peak Friction (deg)
406	27.5

Residual Cohesion (psf)	Residual Friction (deg)
359	26.3

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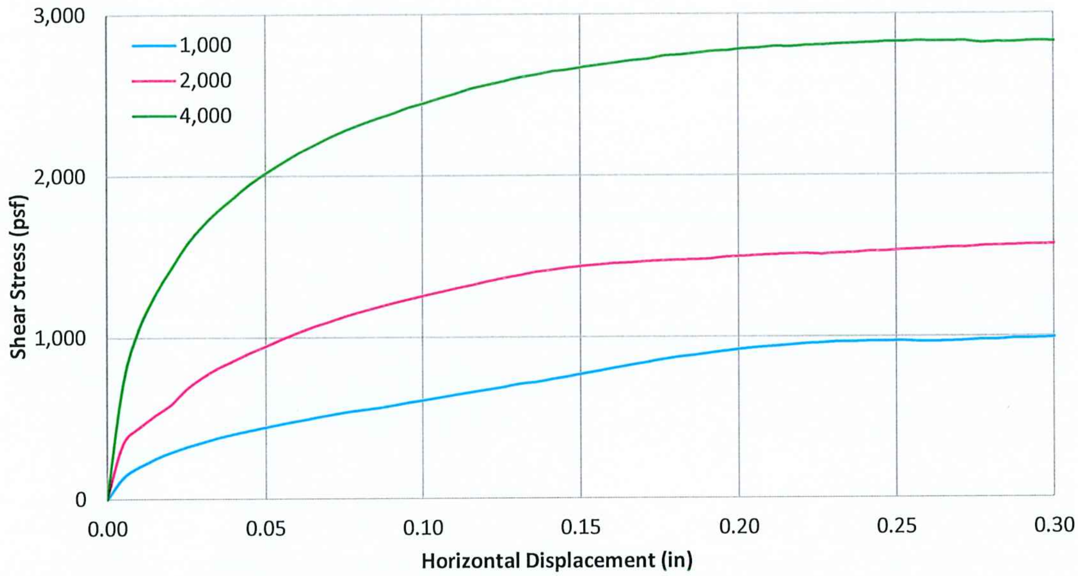
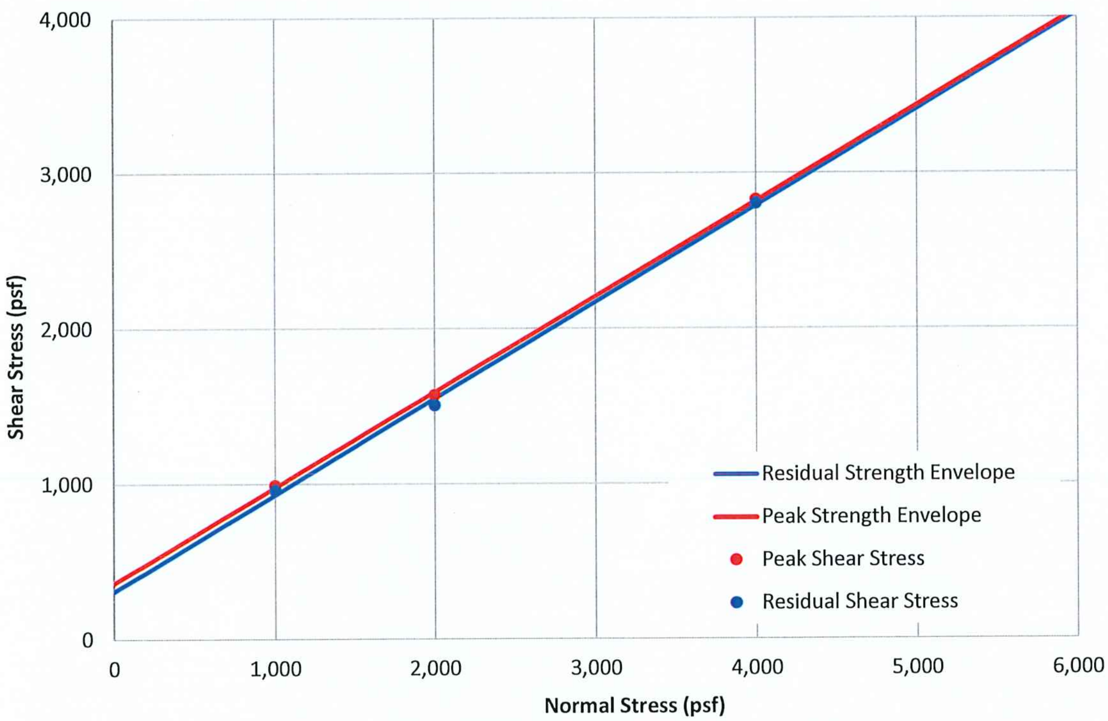
Proj. No.:	32-6274-00	Date: October 2022
Project:	512 W. Laconia Blvd., Los Angeles	
Calc. By:	AGF	

UNDISTURBED SATURATED DIRECT SHEAR TEST (ASTM:D-3080)

		Specimen	Load (psf)	Water (%)	Dry γ (pcf)	Wet γ (pcf)
Boring:	B-1	1	1,000	18.0	112.3	132.5
Depth (ft):	5.0	2	2,000	17.2	112.4	131.7
Geology:	Alluvium	3	4,000	17.6	111.3	130.9
Classification:	Sandy Lean CLAY (CL)					





Normal Stress (psf)	Peak Shear Stress (psf)	Residual Shear Stress (psf)
1,000	992	959
2,000	1,573	1,507
4,000	2,829	2,806

Peak Cohesion (psf)	Peak Friction (deg)
364	31.6
Residual Cohesion (psf)	**Residual Friction (deg)**
310	31.8

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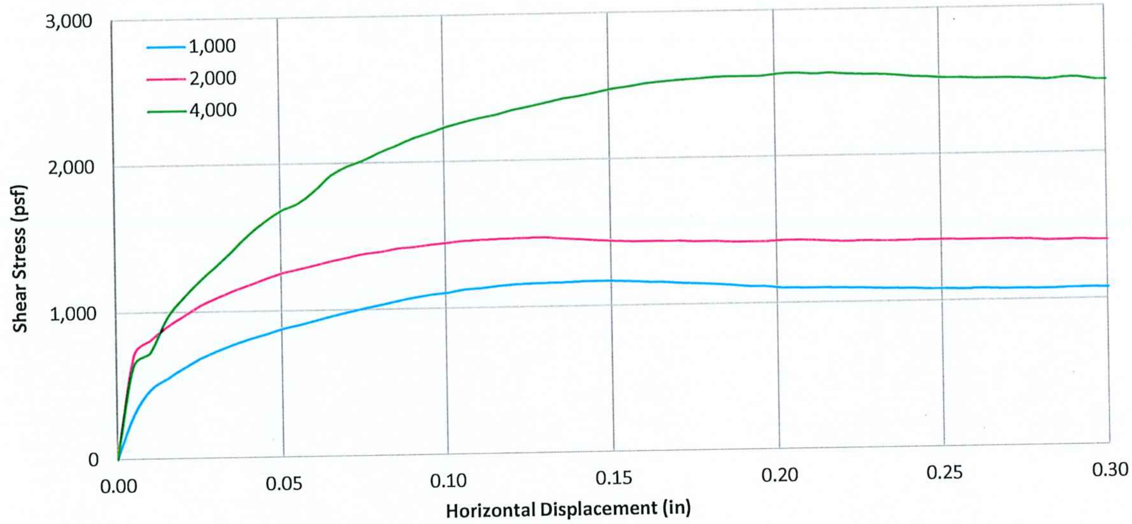
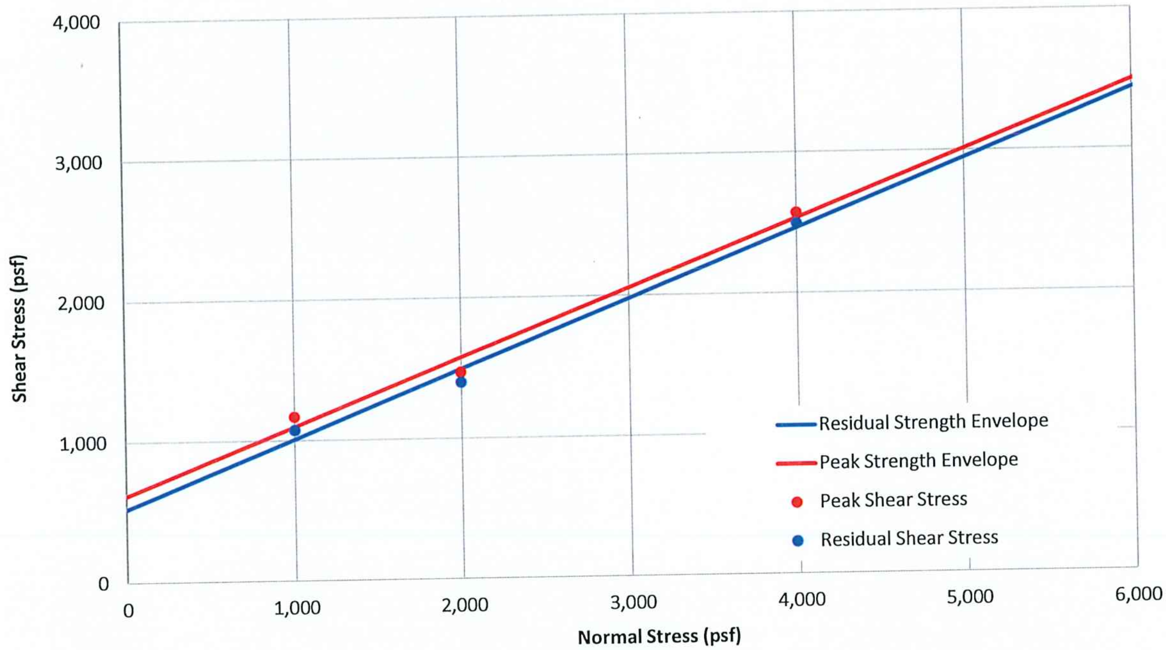
Proj. No.:	32-6274-00	Date: October 2022
Project:	512 W. Laconia Blvd., Los Angeles	
Calc. By:	AGF	

UNDISTURBED SATURATED DIRECT SHEAR TEST (ASTM:D-3080)

Boring: B-3
Depth (ft): 5.0
Geology: Alluvium
Classification: Sandy Lean CLAY to Clayey SAND (CL/SC)

Specimen	Load (psf)	Water (%)	Dry γ (pcf)	Wet γ (pcf)
1	1,000	14.5	119.4	136.7
2	2,000	13.9	120.7	137.5
3	4,000	14.5	120.8	138.3





Normal Stress (psf)	Peak Shear Stress (psf)	Residual Shear Stress (psf)
1,000	1,168	1,072
2,000	1,469	1,399
4,000	2,570	2,496

Peak Cohesion (psf)	Peak Friction (deg)
618	25.6

Residual Cohesion (psf)	Residual Friction (deg)
524	25.9

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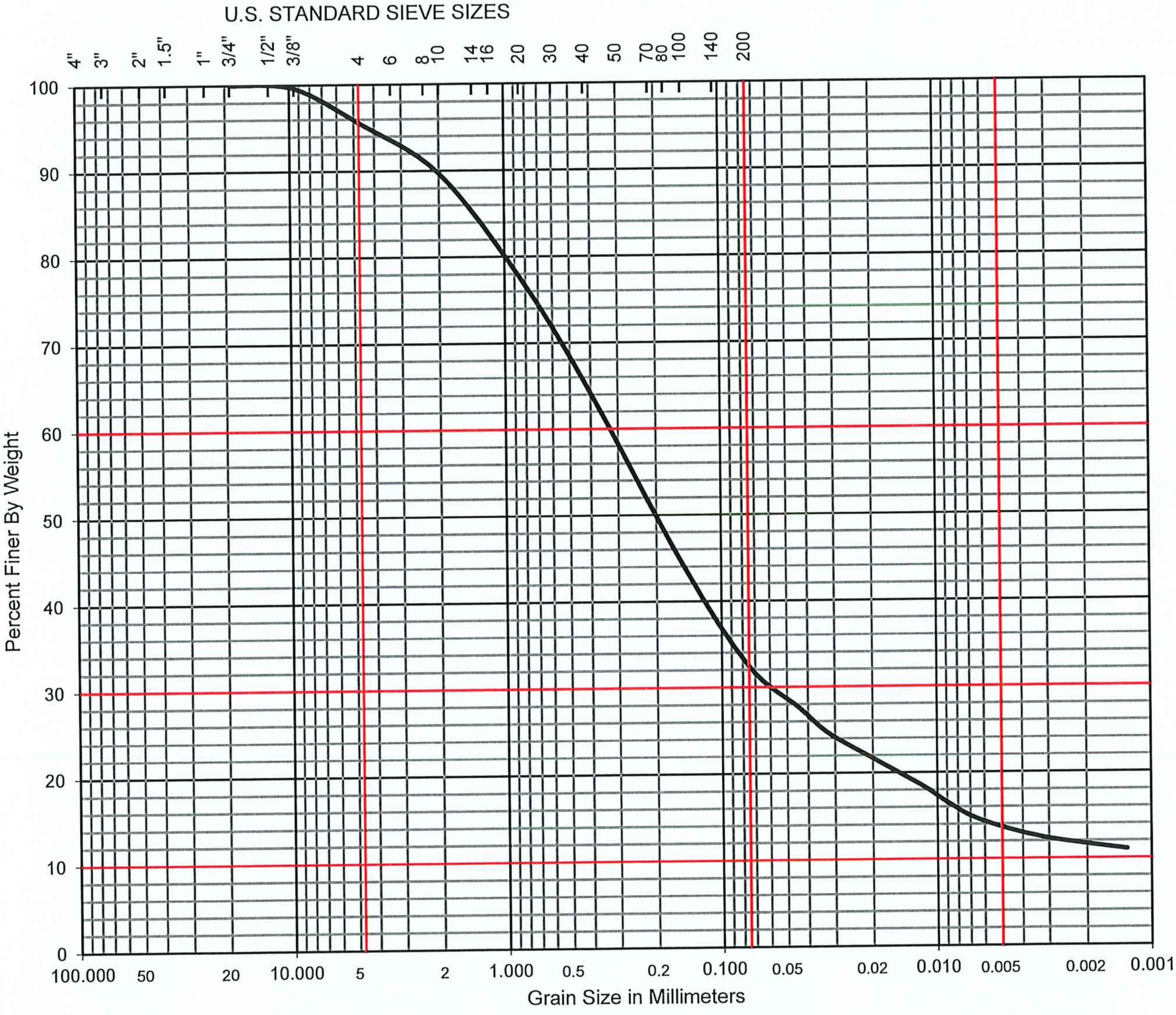
Proj. No.:	32-6274-00	Date: October 2022
Project:	512 W. Laconia Blvd., Los Angeles	
Calc. By:	AGF	

GRAIN SIZE DISTRIBUTION

PROJECT NO.	32-6274-00	BORING NO.	B-1	DEPTH (feet)	0-5
Liquid Limit (LL)	22	Plastic Limit (PL)	19	Plasticity Index (PI)	4
Gravel (%)	4.4	Sand (%)	63.1	% Silt & Clay (<#200)	32.5
D_{10} (mm)	-	D_{30} (mm)	-	D_{60} (mm)	-
D_{50} (mm)	-	C_u	-	C_c	-
% < 0.005 mm	14				

REPRESENTATIVE FOR Existing Fill

SOIL TYPE AND DESCRIPTION Silty Clayey SAND (SC-SM); EI=6, Very Low



GRAVEL		SAND			SILT & CLAY
Coarse	Fine	Coarse	Medium	Fine	

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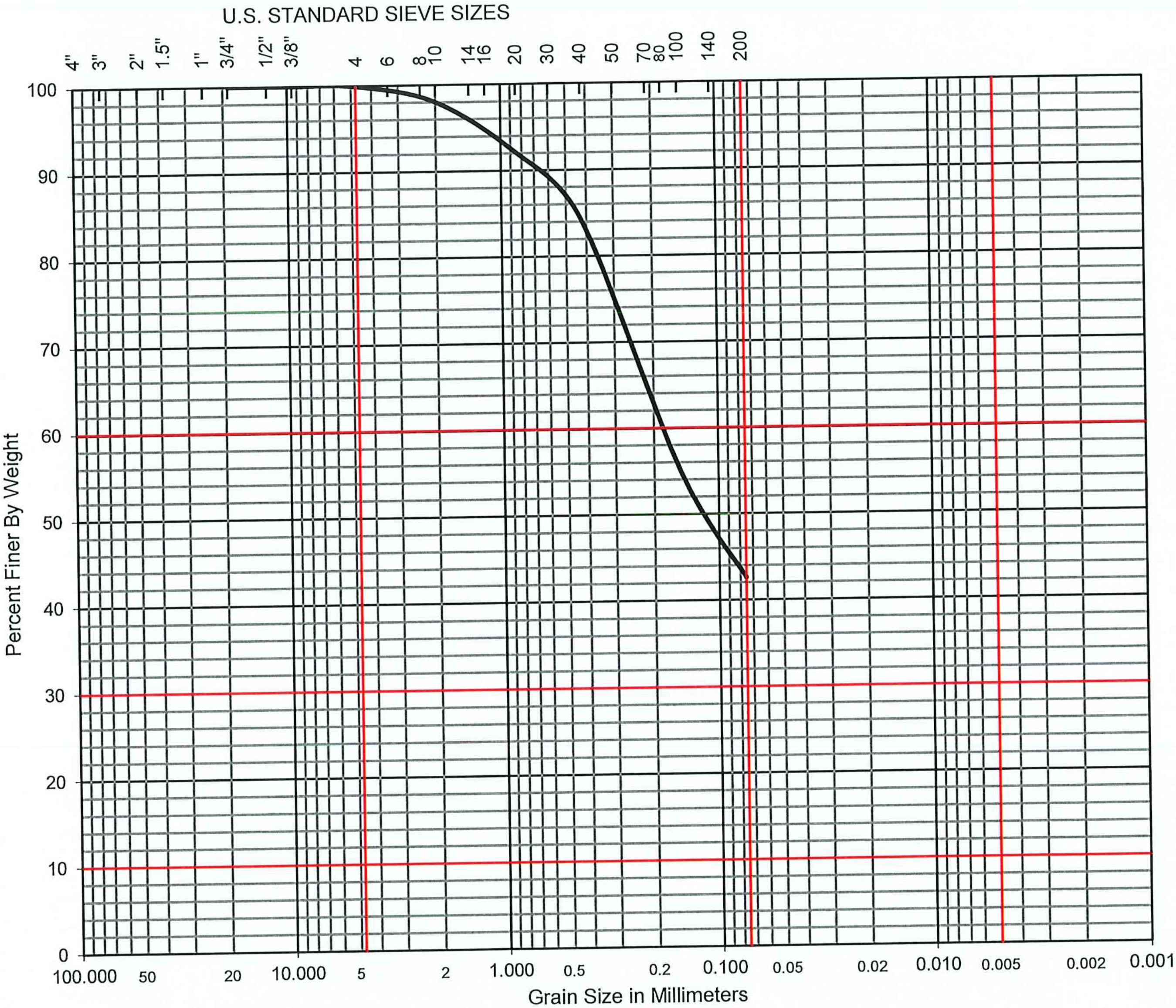
Project: 512 W. Laconia Blvd.
Date: October 2022

GRAIN SIZE DISTRIBUTION

PROJECT NO.	32-6274-00	BORING NO.	B-2	DEPTH (feet)	5
Liquid Limit (LL)	-	Plastic Limit (PL)	-	Plasticity Index (PI)	-
Gravel (%)	0.1	Sand (%)	57.3	% Silt & Clay (<#200)	42.6
D_{10} (mm)	-	D_{30} (mm)	-	D_{60} (mm)	-
D_{50} (mm)	-	C_u	-	C_c	-
% < 0.005 mm	NA				

REPRESENTATIVE FOR: Alluvium

SOIL TYPE AND DESCRIPTION: Sandy Lean CLAY to Clayey SAND (CL/SC)



GRAVEL		SAND			SILT & CLAY
Coarse	Fine	Coarse	Medium	Fine	

A.G.I. GEOTECHNICAL, INC.

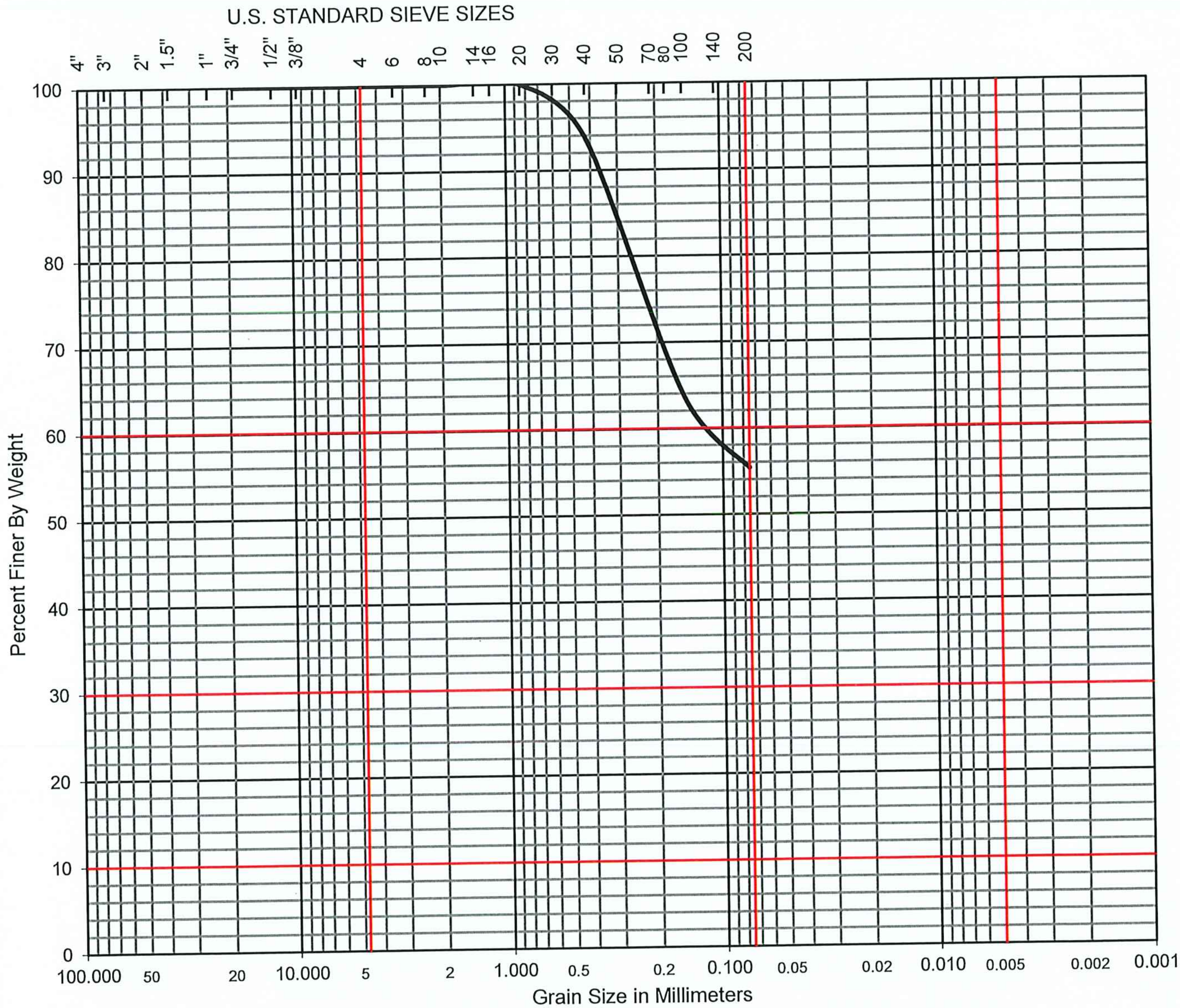
Project: 512 W. Laconia Blvd.
Date: October 2022

GRAIN SIZE DISTRIBUTION

PROJECT NO.	32-6274-00	BORING NO.	B-4	DEPTH (feet)	7.5
Liquid Limit (LL)	-	Plastic Limit (PL)	-	Plasticity Index (PI)	-
Gravel (%)	-	Sand (%)	44.6	% Silt & Clay (<#200)	55.4
D_{10} (mm)	-	D_{30} (mm)	-	D_{60} (mm)	-
				D_{50} (mm)	-
C_u	-	C_c	-	% < 0.005 mm	NA

REPRESENTATIVE FOR: Alluvium

SOIL TYPE AND DESCRIPTION: Sandy Lean CLAY (CL)



GRAVEL		SAND			SILT & CLAY
Coarse	Fine	Coarse	Medium	Fine	

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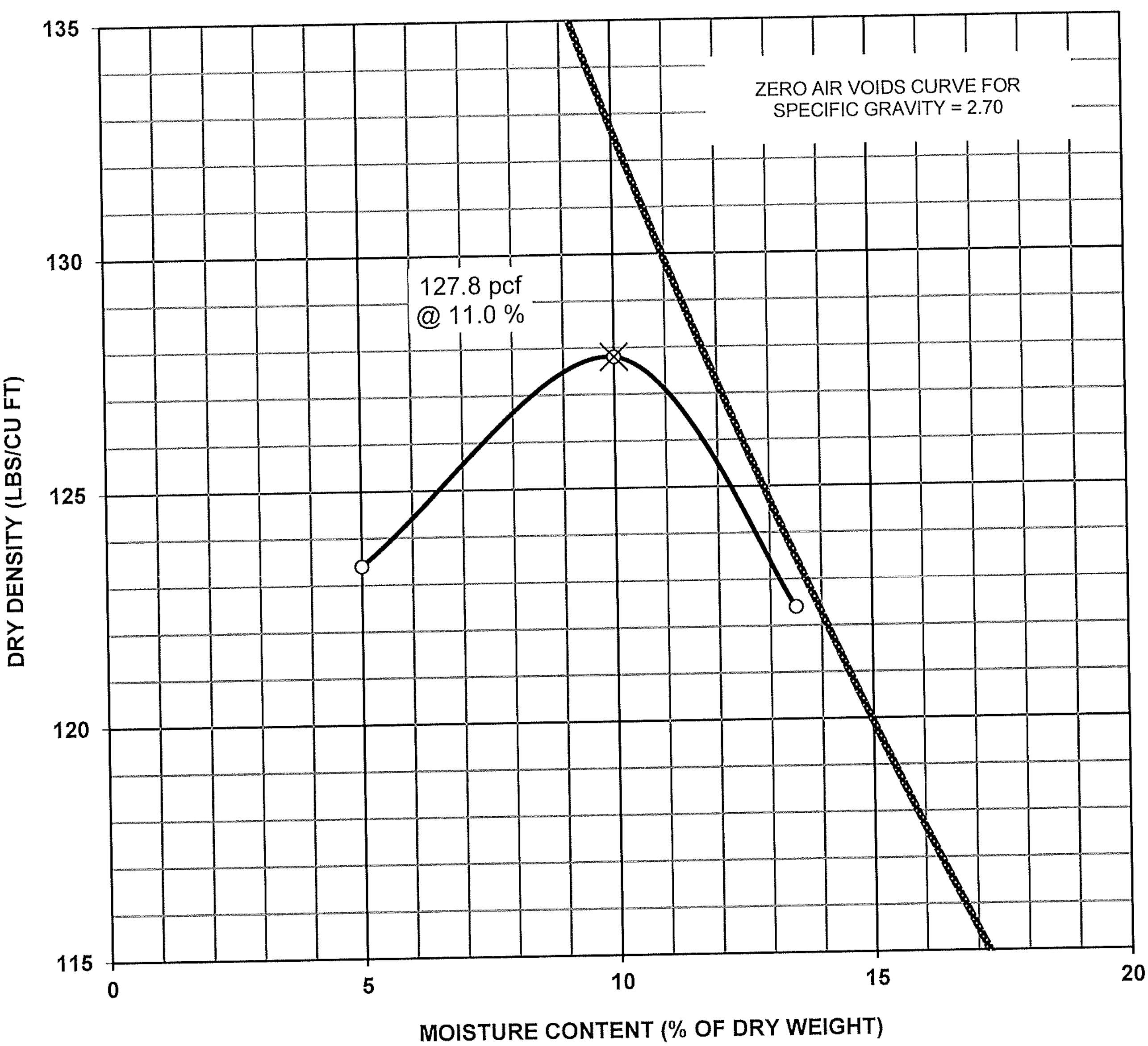
Project: 512 W. Laconia Blvd.
Date: October 2022

MAXIMUM DRY DENSITY CURVE



PROJECT NO. 32-6274-00 BORING NO. B-1 DEPTH (FT) 0-5

REPRESENTATIVE FOR Existing Fill

SOIL TYPE AND DESCRIPTION Silty Clayey SAND (SC-SM); EI=6, Very Low

MAXIMUM DRY DENSITY (LBS/CU FT) 127.8

OPTIMUM MOISTURE CONTENT (% OF DRY WEIGHT) 10.0

METHOD OF COMPACTION
ASTM Standard Test Method D-1557

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U.S. SEISMIC DESIGN MAP

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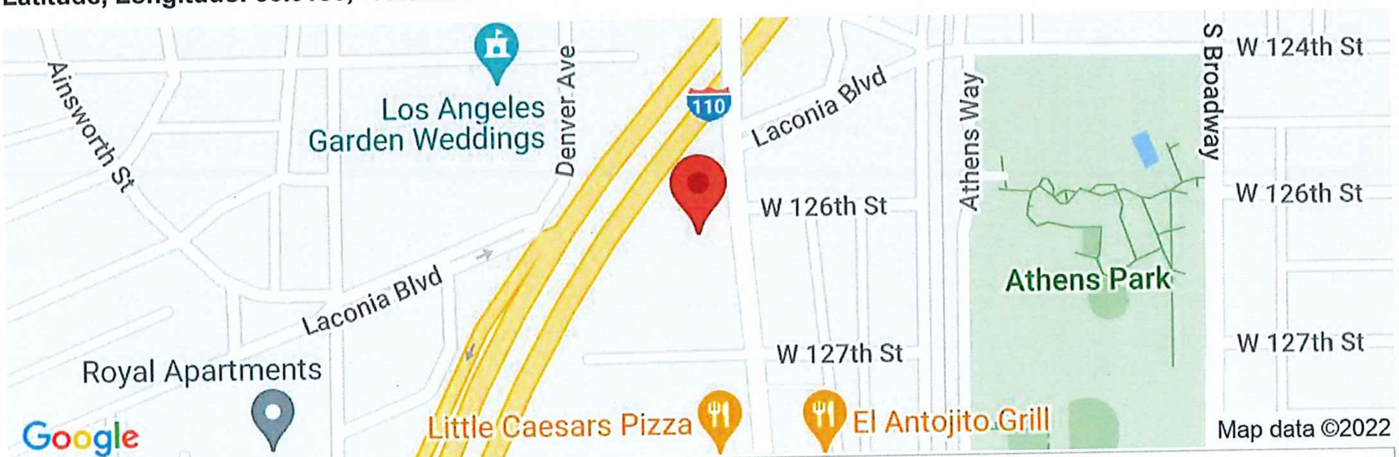
OSHPD

512 W. Laconia Blvd., Los Angeles; 32-6274-00

Latitude, Longitude: 33.9186, -118.2834



Date	10/26/2022, 3:16:11 PM
Design Code Reference Document	ASCE7-16
Risk Category	III
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.83	MCE_R ground motion. (for 0.2 second period)
S_1	0.648	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.83	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.22	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.79	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.869	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.83	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.023	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.463	Factored deterministic acceleration value. (0.2 second)
S1RT	0.648	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.718	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.834	Factored deterministic acceleration value. (1.0 second)
PGAd	0.997	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.79	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.905	Mapped value of the risk coefficient at short periods
C_{R1}	0.903	Mapped value of the risk coefficient at a period of 1 s
C_V	1.466	Vertical coefficient

SHRINKAGE/BULKING DETERMINATION

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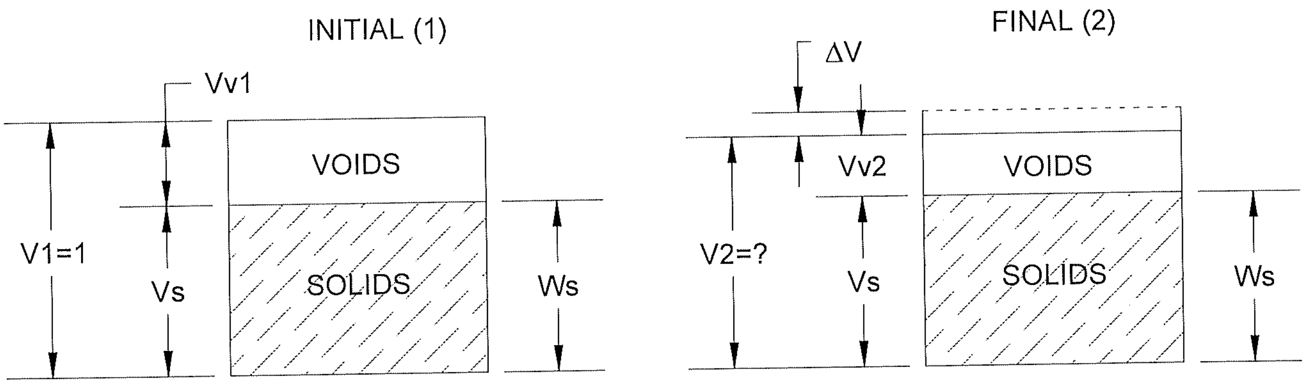
SHRINKAGE (-) / BULKING (+) DETERMINATION



$$\gamma d1 = \frac{Ws}{V1} = \frac{Ws}{1} = Ws$$

$$\gamma d2 = \frac{Ws}{V2}$$

$$V2 = \frac{Ws}{\gamma d2} = \frac{\gamma d1}{\gamma d2}$$

$$\Delta V = V2 - V1 = \frac{\gamma d1}{\gamma d2} - 1$$

$$\Delta V\% = \frac{V2 - V1}{V1} = 100 \times \frac{\frac{\gamma d1}{\gamma d2} - 1}{1} = 100 \times \left(\frac{\gamma d1}{\gamma d2} - 1\right)$$

1) γ_{d1}, INITIAL DRY DENSITY (pcf) | 110 | (IN-SITU)

2) γ_{d2}, FINAL DRY DENSITY (pcf) | 125 | (COMPACTED OR EXCAVATED)

ΔV, VOLUME CHANGE (ft^3) -0.119 ($\gamma_{d1} / \gamma_{d2}$ - 1)

ΔV%, VOLUME CHANGE (%) -11.9 SHRINKAGE

Reference: NAVFAC DM-7.01, Chapter 3, Section 2, Table 6, September 1, 1986

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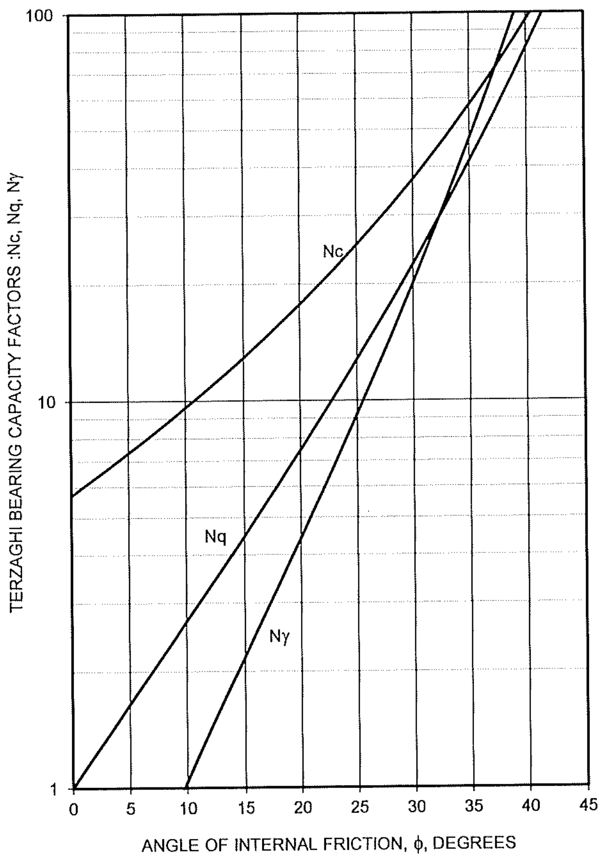
Proj. No.: 32-6274-00		**Date:** Nov. 2022
Project:	512 W. Laconia Blvd., Los Angeles	
Calc. By:	AGF	

BEARING CAPACITY ANALYSES

A.G.I. GEOTECHNICAL, INC.

BEARING CAPACITY OF CONTINUOUS FOOTING FOUNDATION



SOIL DESCRIPTION :

COMPACTED SANDY LEAN CLAY

ULTIMATE BEARING CAPACITY = q_{ult}

$$q_{ult} = cN_c + \gamma DN_q + 0.5\gamma BN_\gamma$$

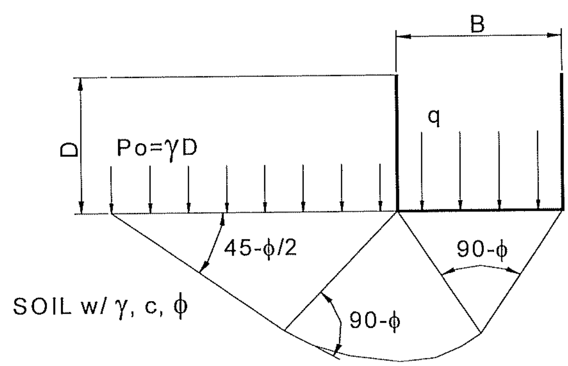
ALLOWABLE BEARING PRESSURE = $q_{allow} = q_{ult}/FOS$

BEARING CAPACITY FACTORS

$$N_q = \frac{e^{2\pi(0.75-\phi/360)\tan\phi}}{2\cos^2(45+\phi/2)}$$

$$N_c = \frac{N_q-1}{\tan\phi}$$

$$N_\gamma = \frac{2(N_q+1)\tan\phi}{1+0.4\sin4\phi}$$



SOIL PROPERTIES:

UNIT WEIGHT, γ (pcf)	121
COHESION, c, (psf)	359
FRICTION ANGLE, φ (deg)	26.3

FOUNDATION PROPERTIES:

WIDTH, B (feet)	2
DEPTH, D (feet)	2
FACTOR OF SAFETY, FOS	3

BEARING CAPACITY FACTORS:

Nq	14.69
Nc	27.71
Nγ	11.19

ULTIMATE BEARING CAPACITY, q_{ult} : 14,869 psf

ALLOWABLE BEARING PRESSURE, q_{allow} : 4,956 psf

RECOMMENDED BEARING PRESSURE, q : 3,500 psf

References:
1. Coduto, Donald (2001), Foundation Design, Prentice-Hall, ISBN 0-13-589706-8
2. Das, Braja (2007), Principles of Foundation Engineering (6th ed.), Stamford, CT: Cengage Publisher
3. Das, Braja (1999), Bearing Capacity and Settlement, Boca Raton, FL: CRC Press LLC

AGI GEOTECHNICAL, INC.

16555 Sherman Way, Van Nuys, California, Ph (818) 785-5244, Fax (818) 785-6251

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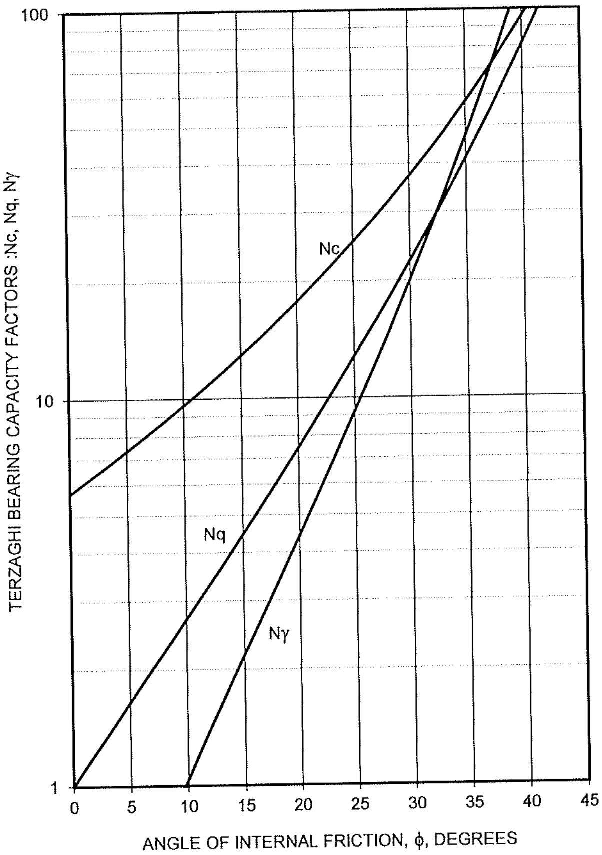
Calc. By: AGF	

BEARING CAPACITY OF SQUARE FOOTING FOUNDATION



SOIL DESCRIPTION :

COMPACTED SANDY LEAN CLAY

ULTIMATE BEARING CAPACITY = q_{ult}

$q_{ult} = 2.6cN_c + \gamma DN_q + 0.4\gamma BN_\gamma + \gamma D$

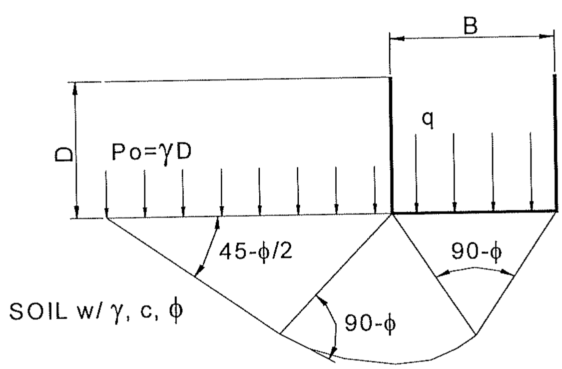
ALLOWABLE BEARING PRESSURE = $q_{allow} = q_{ult}/FOS$

BEARING CAPACITY FACTORS

$$N_q = \frac{e^{2\pi(0.75-\phi/360)\tan\phi}}{2\cos^2(45+\phi/2)}$$

$$N_c = \frac{N_q - 1}{\tan\phi}$$

$$N_\gamma = \frac{2(N_q+1)\tan\phi}{1+0.4\sin 4\phi}$$



SOIL PROPERTIES:

UNIT WEIGHT, γ (pcf)	121
COHESION, c, (psf)	359
FRICTION ANGLE, ϕ (deg)	26.3

FOUNDATION PROPERTIES:

WIDTH, B (feet)	2
DEPTH, D (feet)	2
FACTOR OF SAFETY, FOS	3

BEARING CAPACITY FACTORS:

Nq	14.69
Nc	27.71
Nγ	11.19

ULTIMATE BEARING CAPACITY, q_{ult} : 30,503 psf

ALLOWABLE BEARING PRESSURE, q_{allow} : 10,168 psf

RECOMMENDED BEARING PRESSURE, q : 3,500 psf

References:
1. Coduto, Donald (2001), Foundation Design, Prentice-Hall, ISBN 0-13-589706-8
2. Das, Braja (2007), Principles of Foundation Engineering (6th ed.), Stamford, CT: Cengage Publisher
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SLOT CUT STABILITY ANALYSIS

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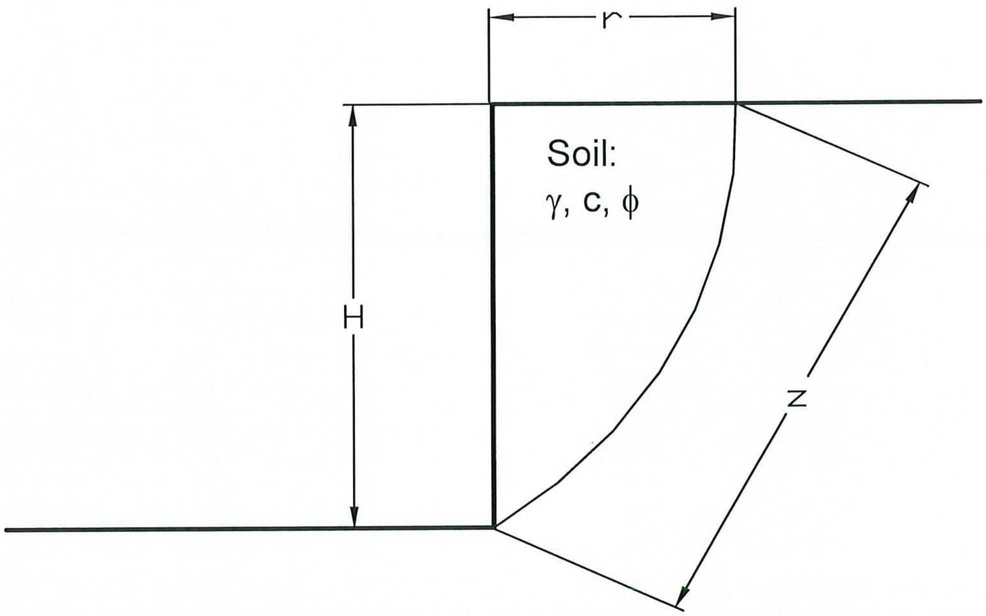
SLOT CUT STABILITY ANALYSIS



Description	Value
Unit Weight, γ (pcf)	117
Friction, ϕ (deg)	25.9
Cohesion, c (psf)	310

Cut Height, H (ft)	12.0
Failure Radius, r (ft)	4.0
Failure Width, B = 2r (ft)	8.0

Volume, $V = \pi r^2 H / 4$ (ft^3)	151
Weight, $W = V\gamma$ (lb)	17,649
Surcharge, Q (lb)	3,000
Weight+Surcharge, W + Q, (lb)	20,649

Surface Area, $A = 0.5236r\ ((r^2+4H^2)^{3/2} - r^3)$ (ft^2)	104
Driving Force, $F_D = WH / (r^2+H^2)^{1/2}$ (lb)	19,590
Normal Force, $F_N = Wr / (r^2+H^2)^{1/2}$ (lb)	6,530
Frictional Resistance, $R_F = F_N \tan\phi$ (lb)	3,171
Cohesive Resistance, $R_C = A\ c$ (lb)	32,240
Total Resistance, $R = R_F + R_C$ (lb)	35,411
Factor of Safety, $FS = R / F_D$	1.81

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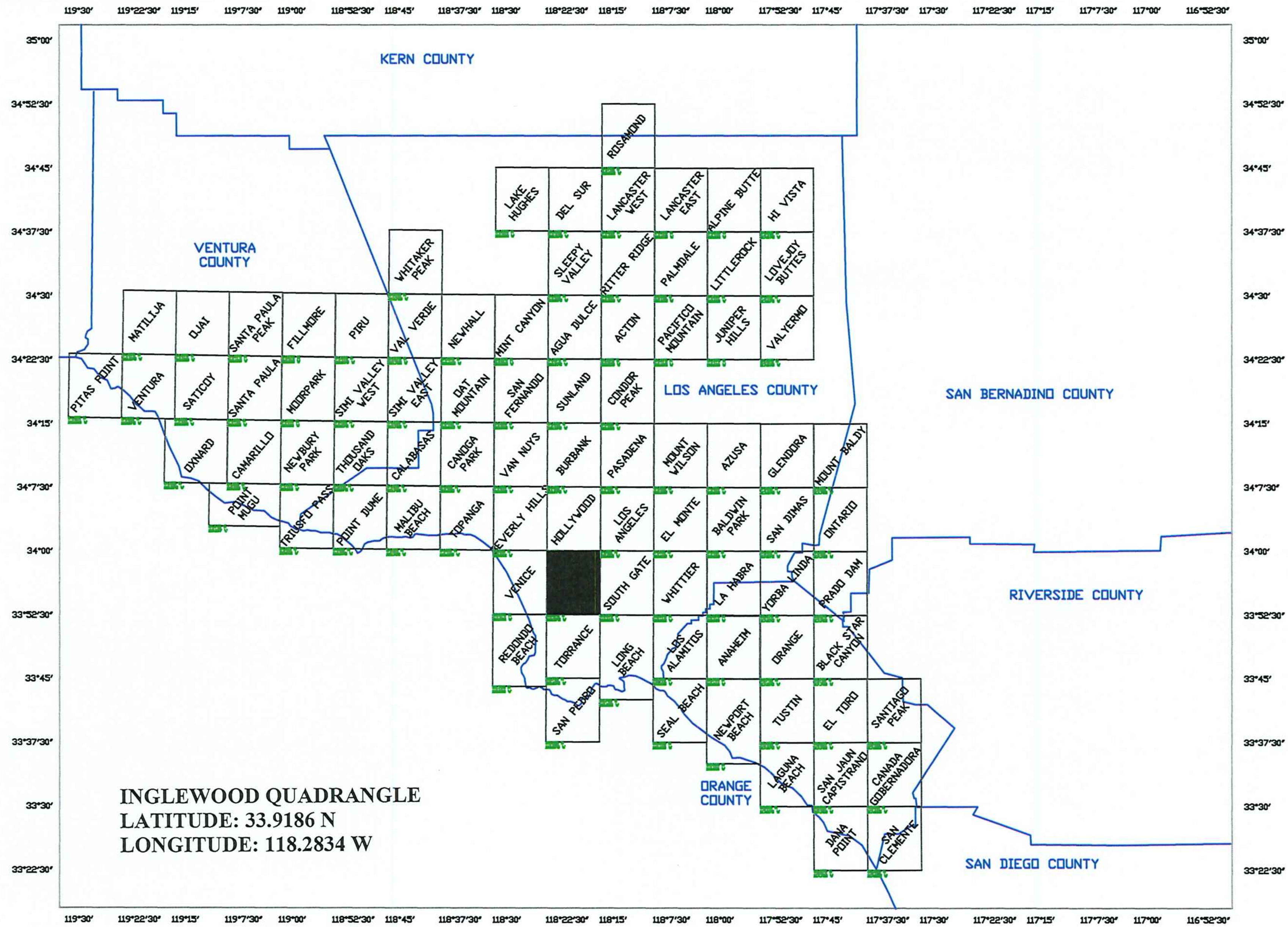
QUADRANGLE LOCATION MAP

A.G.I. GEOTECHNICAL, INC.



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QUADRANGLE LOCATION MAP

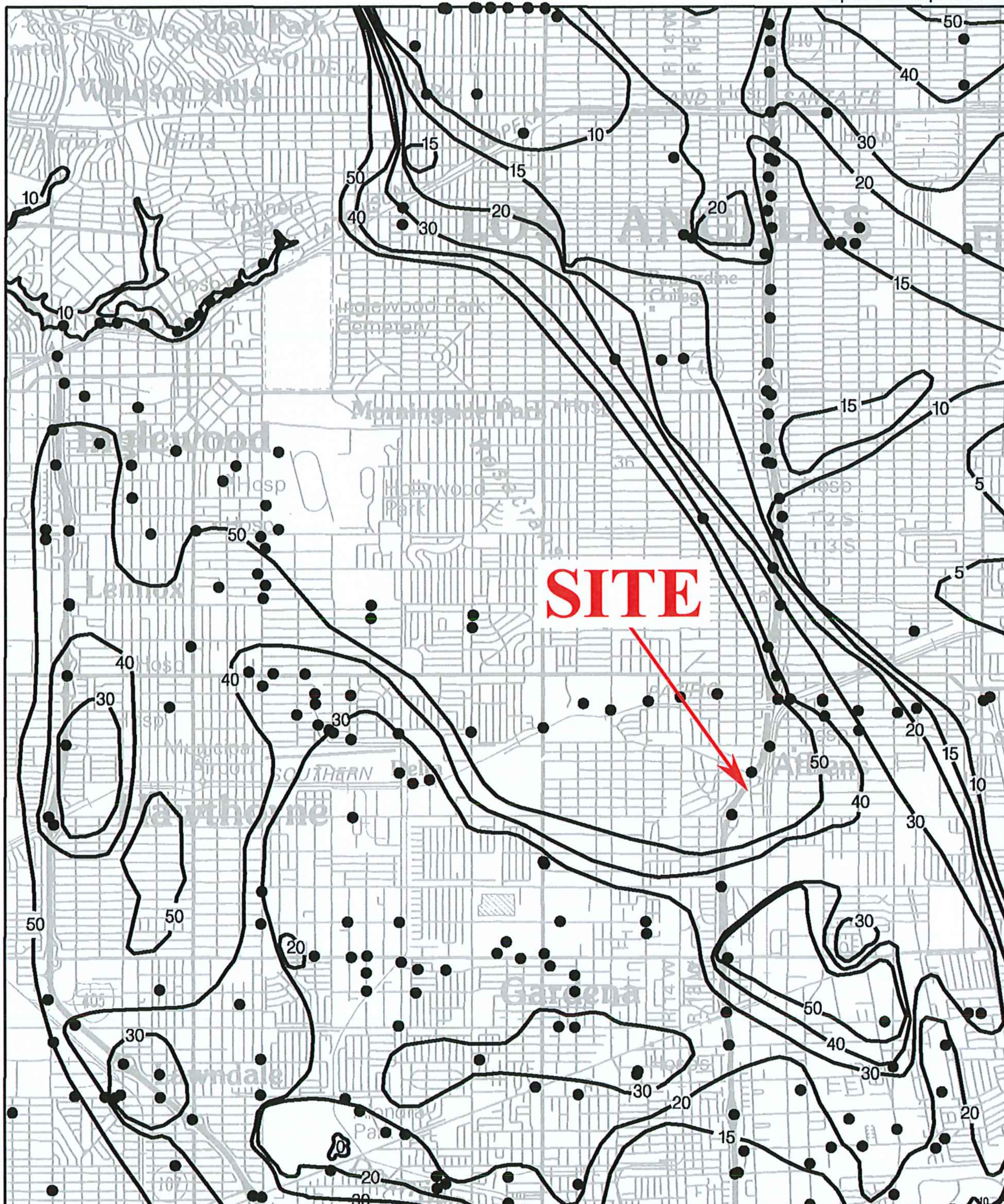
512 W. Laconia Boulevard,
Los Angeles

PROJECT NO.	32-6274-00
DATE	09-2022
PREPARED BY	WFB
APPROVED BY	MBS

GROUNDWATER MAP

A.G.I. GEOTECHNICAL, INC.

Open-File Report 98-18



Base map enlarged from U.S.G.S. 30 x 60-minute series

Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, Inglewood Quadrangle.

● Borehole Site — 30 — Depth to ground water in feet

ONE MILE

SCALE

Lat.: 33.9186; Long.: -118.2834

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GROUNDWATER MAP
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