GLOBAL GEO-ENGINEERING, INC.

January 19, 2024
Project 9937-04

GM Properties Inc.
13305 Penn Street, Suite 200
Whittier, California 90602

Attention: Mr. Tyler Portman

Subject: Geotechnical Investigation
Proposed Industrial Development
NWC Avenue M and Division Street
APN's 3128-013-010 and 3128-013-011
Lancaster, California

References: *See Appendix A*

Dear Mr. Portman:

1. INTRODUCTION

a) In accordance with your request, we have conducted a geotechnical investigation for the proposed industrial development located in Lancaster, California.

b) It is our understanding that the proposed development will include the construction of two 394,560-square-foot and 413,408-square-foot warehouse/office buildings on a 40-acre parcel of land. In addition, infiltration systems are planned to be installed for potential stormwater runoff.

c) Grading and structural plans are not available at present. We are assuming that the existing grades will remain unchanged. We anticipate the loads from the proposed structures will not exceed 3 kip/ft for the continuous footings and 50 kips for the column footings.

2. SCOPE

The scope of services we provided was as follows:

a) Preliminary planning and evaluations, and review of geotechnical reports related to the project site and nearby surrounding area *(See References – Appendix A)*;

3 Corporate Park, Suite 270, Irvine, California 92606
Office (949) 221-0900
Email: global@globalgeo.net

b) Excavation of fourteen (14) borings utilizing a hollow stem auger drill rig to a maximum depth of 25 feet below ground surface. Six of the borings (Borings P-1 through P-6) were drilled to depths ranging from 4 to 11 feet below ground surface for the purpose of percolation testing;

c) Sampling and logging of subsurface materials encountered in the borings;

d) Field percolation testing to determine the infiltration rate;

e) Laboratory testing of samples representative of those obtained in the field, in order to evaluate relevant engineering properties;

f) Engineering and geologic analyses of the field and laboratory data;

g) Preparation of a report presenting our findings, conclusions and recommendations.

3. FIELD EXPLORATION AND LABORATORY TESTING

The field exploration program is given in *Appendix B*, which includes the Logs of Boring. The results of the laboratory testing are included in *Appendix C.*

4. SITE DESCRIPTION

4.1 Location

a) The project site is located at the northwestern corner of the intersection of Avenue M and Division Street in the city of Lancaster, California.

b) The approximate site location is shown on the *Location Map, Figure 1.*

4.2 Existing Surface Conditions

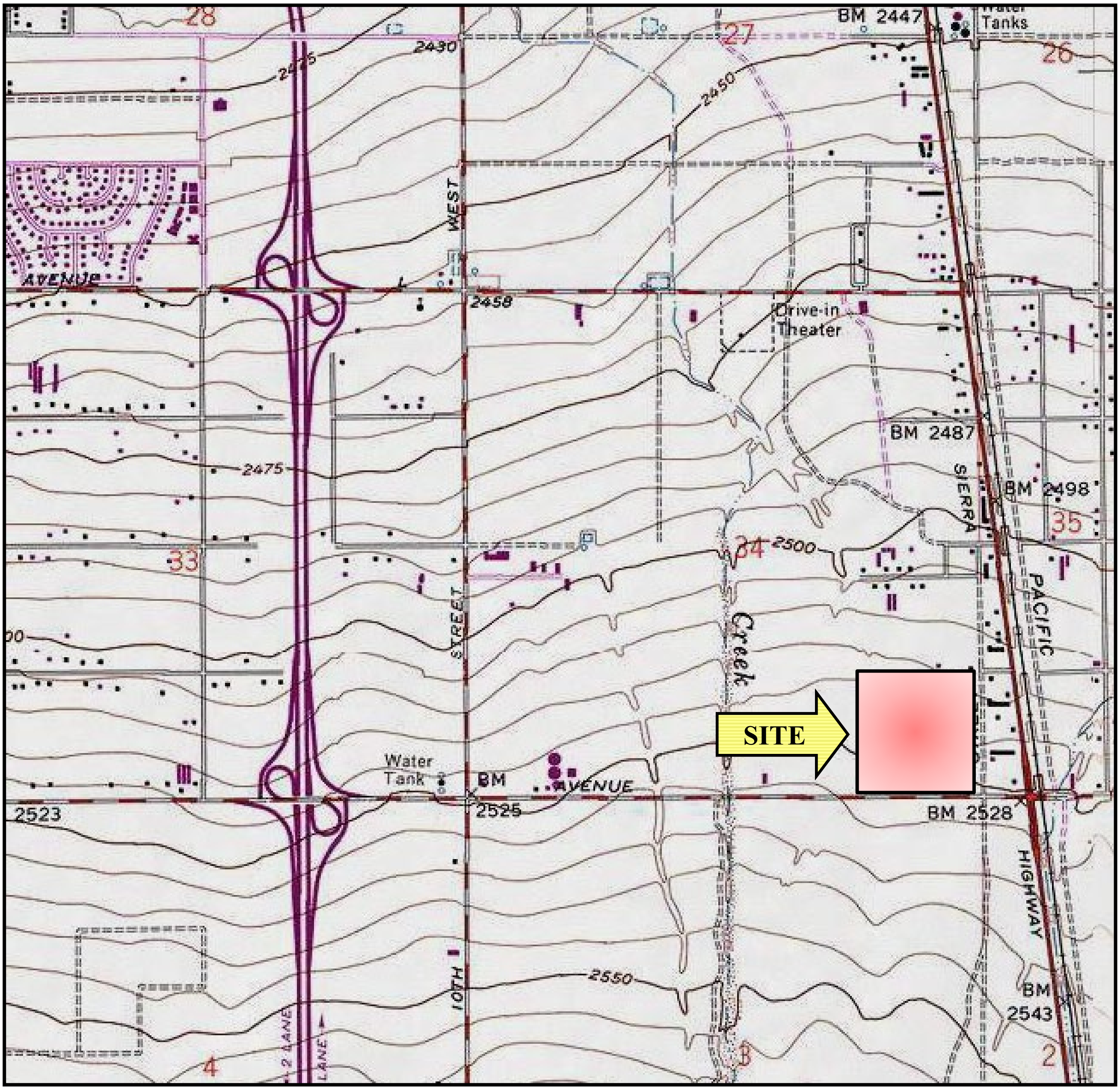
a) The subject property is currently vacant and void of any building structures.

b) The ground surface within the site area generally descends to the north at an approximate gradient of one percent.

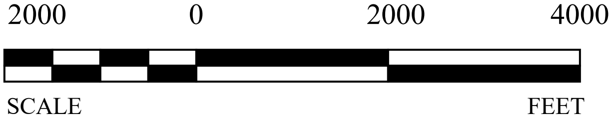
c) Vegetation consists of a light to moderate growth of native brush. Shallow stockpiles of soils and debris are present throughout the site.

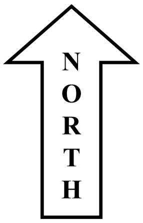
d) Surface drainage consists of sheet flow runoff of incident rainfall water derived primarily within the property boundaries and adjacent properties.

LOCATION MAP



BASE MAP: USGS 7.5-Minute Topographic Map,
Lancaster West, Quadrangle, 1974





GLOBAL GEO-ENGINEERING, INC.

GEOLOGIC AND SOILS ENGINEERING IRVINE, CALIFORNIA

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Figure No: 1

4.3 Geology

4.3.1 Regional Geologic Setting

a) The project site is situated within the south-central portion of the Antelope Valley, which forms part of the Mojave Desert Geomorphic Province in Southern California. The prevailing geologic structure is comprised of a massive east-west trending fault-bounded wedge. The province consists of a vast array of geologic rock types and structure, including massive pre-Cambrian rock, severely folded and deformed metamorphic rock, and scattered meta-sedimentary rock, all deposited in separate basins.

b) The Mojave Desert province is both bounded and transected by several major fault zones. Principal bounding faults include the San Andreas Fault along the south and the Garlock Fault along the north.

4.3.2 Local Geologic Setting

In general, the project site area is underlain by a thick sequence of Recent- to Older-aged alluvial deposits, derived primarily from the erosional processes within the San Gabriel Mountains and other upland regions, situated southwest of the project site.

4.4 Subsurface Conditions

a) The subsurface conditions, as encountered in our explorations, are described in the following sections.

b) More detailed descriptions of the subsurface conditions are presented in our *Logs of Borings,* which are enclosed as *Figures B-2* through *B-17* in *Appendix B*. The locations of the borings are shown on our *Boring Location Plan, Figure B-18.*

4.4.1 Fill

a) Approximately 12 inches of fill material were encountered in Boring B-4, which was drilled within the northeastern portion of the lot.

b) The fill exposed in our boring generally consisted of dry and loose Gravelly SAND with pieces of concrete.

4.4.2 Alluvium

a) Alluvial deposits were encountered in all of our borings to the excavated depths.

b) The alluvium was found to generally consist of layers of Silty SAND, SAND, Gravelly SAND, and Sandy SILT.

c) The Silty SAND, SAND, and Gravelly SAND sediments were generally found to be fine- to coarse-grained, dry to slightly moist and loose to medium dense.

d) The Sandy SILT deposits were found to be slightly moist to moist and medium stiff.

e) The average Standard Penetration Test (SPT) blow count for the upper Silty SAND was 8 and for the underlying SAND was 17. The average relative compaction of the Silty SAND was 82 percent and for the SAND was 79 percent. Most significantly, the average moisture content of the Silty SAND was 3.3 percent and for the SAND was 2.3 percent considered to be very dry. In general, the subgrade soils under the present conditions are not considered suitable to support the structures without overexcavation.

4.4.3 Groundwater

a) No groundwater or seepage was encountered in any of our exploratory borings at the time of our investigation.

b) The *California Department of Water Resources* internet website shows the closest well with the most recent data to be located approximately 300 feet north of the project site. Several measurements were recorded from this well during the period from January 1948 to November 1987. The ground water levels during this period were reported to range between 209 feet and 370 feet below ground surface.

5. SEISMICITY

5.1 General

a) The property is located in the general proximity of several active and potentially active faults, which are typical for sites in the Southern California region. Earthquakes occurring on active faults within a 70-mile radius are capable of generating ground shaking of engineering significance to the proposed construction.

b) In Southern California, most of the seismic damage to manmade structures results from ground shaking and, to a lesser degree, from liquefaction and ground rupture caused by earthquakes along active fault zones. In general, the greater the magnitude of the earthquake, greater is the potential damage.

5.2 Ground Surface Rupture

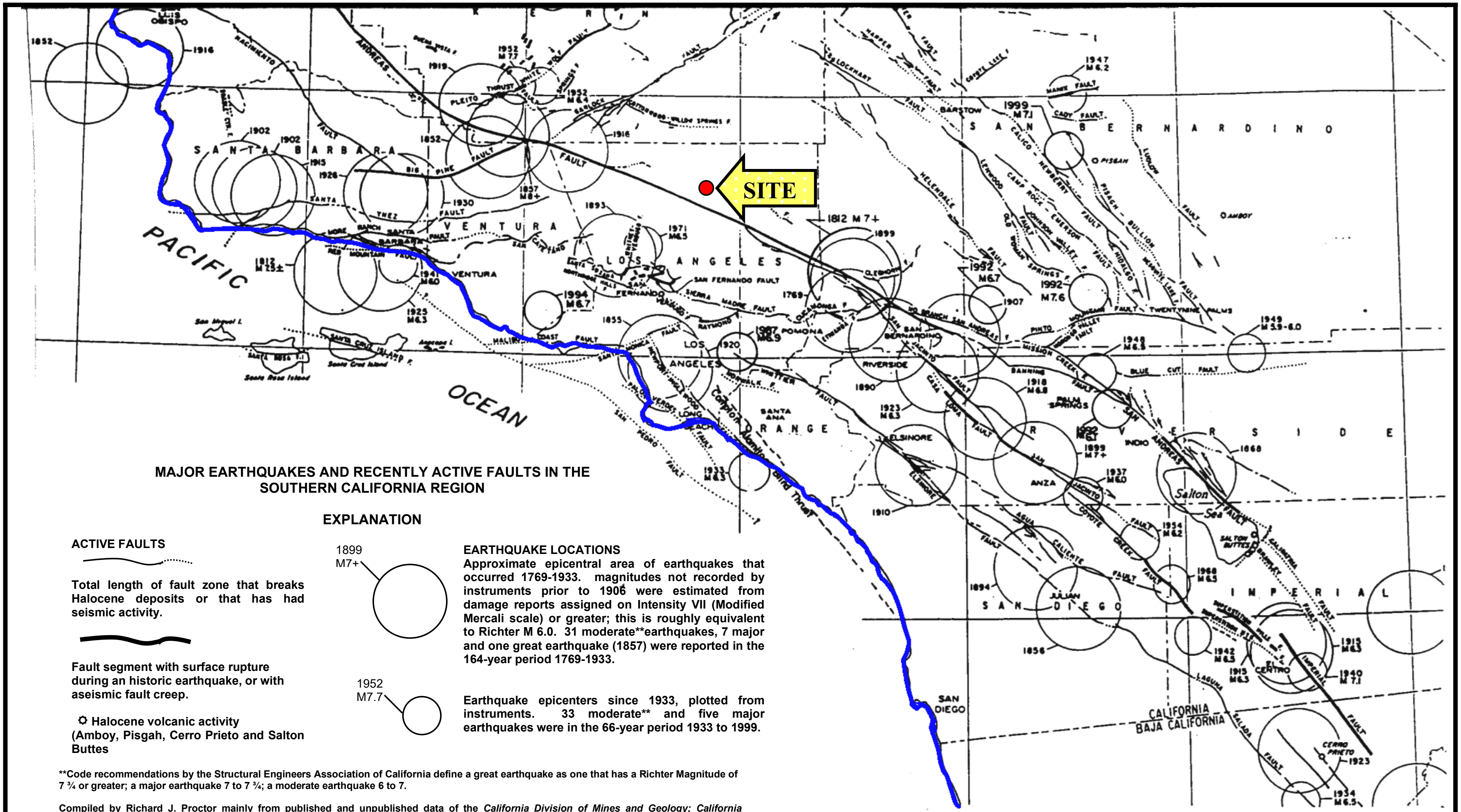
a) The closest known active fault is the San Andreas Fault, located at a distance of 5.2 miles southwest of the project site. Other nearby active or potentially active faults include the Northridge Blind Thrust Fault and the Garlock Fault located at distances of about 27.2 and 32.6 miles, respectively, from the subject property.

b) Due to the distance of the closest active fault to the site, ground rupture is not considered a significant hazard at the site.

5.3 Ground Shaking

a) We utilized the California Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps internet program to calculate the peak ground acceleration (PGA) at the project site location. Using the ASCE 7-16 standard and Site Class D, the PGA_M at the subject property resulted to be 0.761g.

b) *Figure 2* shows the geographical relationships among the site locations, nearby faults and the epicenters of significant occurrences. The project site is not located within any State of California delineated Earthquake Fault Zone; however, during historic times, a number of major earthquakes have occurred along the active faults in Southern California. From the seismic history of the region and proximity, the San Andreas Fault has the greatest potential for causing earthquake damage related to ground shaking at this site.



MAJOR EARTHQUAKES AND RECENTLY ACTIVE FAULTS IN THE SOUTHERN CALIFORNIA REGION

EXPLANATION

ACTIVE FAULTS

Total length of fault zone that breaks Halocene deposits or that has had seismic activity.

Fault segment with surface rupture during an historic earthquake, or with aseismic fault creep.

☼ Halocene volcanic activity (Amboy, Pisgah, Cerro Prieto and Salton Buttes

1899
M7+

EARTHQUAKE LOCATIONS
Approximate epicentral area of earthquakes that occurred 1769-1933. magnitudes not recorded by instruments prior to 1906 were estimated from damage reports assigned on Intensity VII (Modified Mercali scale) or greater; this is roughly equivalent to Richter M 6.0. 31 moderate**earthquakes, 7 major and one great earthquake (1857) were reported in the 164-year period 1769-1933.

1952
M7.7

Earthquake epicenters since 1933, plotted from instruments. 33 moderate** and five major earthquakes were in the 66-year period 1933 to 1999.

**Code recommendations by the Structural Engineers Association of California define a great earthquake as one that has a Richter Magnitude of 7 ¾ or greater; a major earthquake 7 to 7 ¾; a moderate earthquake 6 to 7.

Compiled by Richard J. Proctor mainly from published and unpublished data of the *California Division of Mines and Geology; California Department of Water Resources Bulletin 116-2* (1964); selections from bulletins of the *Geological* and *Seismological Societies of America*; from C.F. Richter, *Elementary Seismology* (1958); and the *National Atlas*, p. 66, and from Working Group on California Earthquake Probabilities- SSA Bulletin V 85.

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Figure No:
2

5.4 Liquefaction

Groundwater is anticipated to be deeper than 50 feet below existing ground surface. The potential for the liquefaction is considered to be low.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 General

a) It is our opinion that the site will be suitable for the proposed development, from a geotechnical aspect, assuming that our recommendations are implemented.

b) We are of the opinion that the proposed structures can be supported on shallow spread footings founded in the existing competent soils.

c) In our opinion, the proposed development will be safe against hazards from landslides settlement or slippage, provided the recommendations included in this report are implemented during the design and the construction. All grading and earthwork should be performed under the observation and testing firm to achieve proper subgrade preparation, selection of satisfactory materials, and placement and compaction of all structural fills.

d) The final grading plans and foundation plans/design loads should be reviewed by the Geotechnical Engineer.

e) The design recommendations in the report should be reviewed during the construction phase.

6.2 Grading

6.2.1 Processing of On-Site Soils

a) The existing native soils, in the present conditions, are not considered suitable for supporting the proposed structures. Therefore, to provide uniform support conditions and reduce the effects of the potential settlement, we recommend that the soils below the footings should be overexcavated to a depth equal to twice the footing width, but not to exceed 4 feet below the bottom of the footings. The overexcavation should extend laterally beyond the edges of the footings a distance equal to the depth of the overexcavation below the footing bottom.

b) The subgrade soils below the proposed interior slab-on-grade should be overexcavated to a depth of three feet.

c) The subgrade soils below the proposed exterior slab-on-grade and pavement should be overexcavated to a depth of one foot.

d) Wherever structural fills are to be placed, the upper 18 inches to be overexcavated and the 6 to 8 inches of the exposed subgrade should be scarified.

e) The underlying soils are very dry. In order to reduce the potential for hydroconsolidation, we recommend that the site after the overexcavation should be heavy watered for a period of at least one week prior to backfilling the overexcavation. The site should be watered before the sunrise for a period of two hours every day for a week. If the grading is during the summer months, the watering period may be extended to three hours.

f) Wherever structural fills are to be placed, the upper 6 to 8 inches of the subgrade should, after stripping or overexcavation, first be scarified, reworked and wetted down thoroughly.

g) Any loosening of reworked or native material, consequent to the passage of construction traffic, weathering, etc., should be made good prior to further construction.

h) The depths of overexcavation should be reviewed by the Geotechnical Engineer during the actual construction. Any surface or subsurface obstructions, or questionable material encountered during grading should be brought immediately to the attention of the Geotechnical Engineer for proper exposure, removal or processing as directed. No underground obstructions or facilities should remain in any structural areas. Depressions and/or cavities created as a result of the removal of obstructions should be backfilled properly with suitable material, and compacted.

6.2.2 Material Selection

After the site has been stripped of any debris, vegetation and organic soils, excavated on-site soils are considered satisfactory for reuse in the construction of on-site fills, with the following provisions:

a) Significant water will be required to be added to the existing soils;

b) The organic content does not exceed 3 percent by volume;

c) Large size rocks greater than 8 inches in diameter should not be incorporated in compacted fill;

d) Rocks greater than 4 inches in diameter should not be incorporated in compacted fill to within one foot of the underside of the footings and slabs.

6.2.3 Compaction Requirements

a) Reworking/compaction shall include moisture-conditioning as needed to bring the soils to slightly above the optimum moisture content. All reworked soils and structural fills should be densified to achieve at least 92 percent relative compaction with reference to laboratory compaction standard. The optimum moisture content and maximum dry density should be determined in the laboratory in accordance with ASTM Test Designation D1557.

b) Fill should be compacted in lifts not exceeding 8 inches (loose).

6.2.4 Excavating Conditions

a) Excavation of on-site materials may be accomplished with standard earthmoving or trenching equipment. No hard rock was encountered which will require blasting.

b) No seepage or ground water was encountered in any of the borings drilled at the site. Dewatering is not anticipated.

6.2.5 Shrinkage

For preliminary earthwork calculation, an average shrinkage factor of approximately 10 percent is recommended for the soils (this does not include handling losses).

6.2.6 Expansion Potential

a) Based upon our visual observations, the expansion potential for the on-site soils is considered to be *low*.

b) Any imported material, or doubtful material exposed during grading, should be evaluated for its expansive properties.

c) In any event, the subgrade soils should be tested for their expansion potential or during the final stages of grading.

6.2.7 Sulphate Content

a) The sulphate contents of representative samples of the soil are less than 0.1%. The sulphate exposure is considered to be *negligible*. Type II Portland cement is recommended for the construction.

b) The fill materials should be tested for their sulphate content during the final stage of rough grading.

6.2.8 Utility Trenching

a) The walls of temporary construction trenches in fill should stand nearly vertical, with only minor sloughing, provided the total depth does not exceed 3 feet (approximately). Shoring of excavation walls or flattening of slopes may be required, if greater depths are necessary.

b) Trenches should be located so as not to impair the bearing capacity or to cause settlement under foundations. As a guide, trenches should be clear of a 45-degree plane, extending outward and downward from the edge of foundations. Shoring should comply with Cal-OSHA regulations.

c) Existing soils may be utilized for trenching backfill, provided they are free of organic materials.

d) All work associated with trench shoring must conform to the state and federal safety codes.

6.2.9 Surface Drainage Provisions

Positive surface gradients should be provided adjacent to the buildings to direct surface water run-off away from structural foundations and to suitable discharge facilities.

6.2.10 Grading Control

All grading and earthwork should be performed under the observation of a Geotechnical Engineer in order to achieve proper subgrade preparation, selection of satisfactory materials, placement and compaction of all structural fill. Sufficient notification prior to stripping and earthwork construction is essential to make certain that the work will be adequately observed and tested.

6.3 Slab-on-Grade

a) Concrete floor slabs may be founded on the reworked existing soils or compacted fill.

b) The slab should be underlain by four inches of SAND. A plastic vapor barrier is recommended to be placed at the mid-height of the SAND layer.

c) It is recommended that #4 bars on 16-inch center, both ways, or equivalent be provided as minimum reinforcement in slabs-on-grade. Joints should be provided and slabs supporting no vehicular traffic should be at least 5 inches thick. Thicker warehouse slabs which will support heavy loads and forklift traffic will be required The structural engineer should design the slabs.

d) The FFL should be at least 6 inches above highest adjacent grade.

e) The subgrade soils should be kept moist prior to the concrete pour.

6.4 Spread Foundations

The proposed structures can be founded on shallow spread footings. The criteria presented as follows should be adopted:

6.4.1 Dimensions/Embedment Depths

	Minimum Width (ft.)	**Minimum Footing Thickness (in.)**	**Minimum Embedment Below Lowest Finished Surface (ft.)**	
Equivalent 2-story Wall Footing	1.0	6	Perimeter	2.0
			Interior	1.5
Square Column Footings To 50 kip	2.0	12		2.0

6.4.2 Allowable Bearing Capacity

Embedment Depth (ft.)	**Allowable Bearing Capacity (lb/ft^2)**
1.0	2,500

(Notes:

- The allowable bearing capacity may be increased by 800 lb/ft^2 for each additional foot increase in the depth or by 300 lb/ft^2 he width to a maximum value of 5,000 lb/ft^2;

- These values may be increased by one-third in the case of short-duration loads, such as induced by wind or seismic forces;
- At least 2x#4 bars should be provided in wall footings, one on top and one at the bottom;
- In the event that footings are founded in structural fills consisting of imported materials, the allowable bearing capacities will depend on the type of these materials, and should be re-evaluated;
- Bearing capacities should be re-evaluated when loads have been obtained and footings sized during the preliminary design;
- Planter areas should not be sited adjacent to walls;
- Footing excavations should be observed by the Geotechnical Engineer;
- Footing excavations should be kept moist prior to the concrete pour;
- It should be insured that the embedment depths do not become reduced or adversely affected by erosion, softening, planting, digging, etc.)

6.4.3 Settlements

Total and differential settlements under spread footings are expected to be within tolerable limits and are not expected to exceed 1 and ¾ inches in a horizontal distance of 40 feet, respectively.

6.5 Lateral Pressures

a) The following lateral pressures are recommended for the design of retaining structures.

		Pressure (lb/ft^2/ft depth)	
Lateral Force	**Soil Profile**	**Unrestrained Wall**	**Rigidly Supported Wall**
Active Pressure	Level	34	-
At-Rest Pressure	Level	-	63
Passive Resistance (ignore upper 1.5 ft.)	Level	350	-

b) Friction coefficient: 0.40 (includes a Factor of Safety of 1.5). While combining friction with passive resistance, reduce passive by 1/3.

c) These values apply to the existing soil, and to compacted backfill generated from in-situ material. Imported material should be evaluated separately. It is recommended that where feasible, imported granular backfill be utilized, for a width equal to approximately one-quarter the wall height, and not less than 1.5 feet.

d) Backfill should be placed under engineering control.

e) Subdrains comprised of 4-inch perforated SDR-35 or equivalent PVC pipe covered in a minimum of one cubic foot per linear foot of filter rock and wrapped in Mirafi 140N filter fabric should be provided behind retaining walls.

6.6 Seismic Coefficients

For seismic analysis of the proposed project in accordance with the seismic provisions of ASCE 7-16, we recommend the following:

ITEM	VALUE
Site Latitude (Decimal-degrees)	34.6479
Site Longitude (Decimal-degrees)	-118.1323
Site Class	D
Risk Category	II
Mapped Spectral Response Acceleration-Short Period (0.2 Sec) - S_S	1.581
Mapped Spectral Response Acceleration-1 Second Period – S_1	0.651
Short Period Site Coefficient-F_a	1.0
Long Period Site Coefficient F_v	1.7
Adjusted Spectral Response Acceleration @ 0.2 Sec. Period (Sms)	1.581
Adjusted Spectral Response Acceleration @ 1Sec.Period (S_{m1})	1.107
Design Spectral Response Acceleration @ 0.2 Sec. Period (S_{Ds})	1.054
Design Spectral Response Acceleration @ 1-Sec. Period (S_{D1})	0.738

6.7 Pavement Design

6.7.1 Asphalt Pavement Section

a) Based on Traffic Indices (T.I) and on the anticipated "R" – Value of 42 of the subgrade, the following tentative structural pavement sections are recommended.

Location	**T.I.**	**Asphaltic Concrete (inches)**	**Aggregate Base (inches)**
Parking and Driveways	Up to 5.0	3	4
Driveway (light truck traffic)	6.0	3	6
Driveway (medium truck traffic0	7.0	4	6.5

b) The subgrade soils should be tested for R-Value at the conclusion of rough grading and the pavement sections should be finalized then.

6.7.2 Subgrade Preparation

Subgrade soils within the upper 12 inches of finished grade shall be moisture-conditioned where necessary, shall be compacted to at least 92 percent relative compaction per ASTM D1557, and shall be free of any loose or soft areas.

6.7.3 Base Preparation

Unless otherwise specified, the base shall consist of Class II ¾-inch aggregate base or approved Crushed Miscellaneous Base. The base shall be compacted to a minimum of 95 percent relative compaction in accordance with the procedures described in ASTM Test Method D1557.

6.7.4 Concrete Pavement

a) If proposed, the concrete pavement sections are recommended as follow:

Location	T.I.	Asphaltic Concrete (inches)	Aggregate Base (inches)
Parking and Driveways	Up to 5.0	4	4
Driveway (light truck traffic)	6.0	4	4
Driveway (medium truck traffic0	7.0	5.25	4

b) The sections should be reinforced with #3 bars on 18 inches center bothways or as recommended by the structural engineer.

6.8 Corrosion Potential

a) Soil Corrosion potential for metal and concrete was estimated by performing water-soluble sulfate, chloride, pH, and electrical resistivity tests during this investigation.

b) Electrical resistivity is a measure of soil resistance to the flow of corrosion currents. Corrosion currents are generally high in low resistivity soils. The electrical resistivity of a soil decreases primarily with an increase in its chemical and moisture contents. A commonly accepted correlation between electrical resistivity and corrosivity for buried ferrous metals is presented below:

Electrical Resistivity, Ohm-cm	Corrosion Potential
Less than 1,000	Severe
1,000-2,000	Corrosive
2,000-10,000	Moderate
Greater than 10,000	Mild

c) Results of electrical resistivity test indicate a minimum value of 10,684 ohm-cm for the near-surface soils. Based on this data, it is our opinion that, in general, on-site near-surface soils are considered *mildly corrosive* in nature. This potential should be considered in design of underground metal pipes.

6.9 Percolation Study

a) The subgrade soils throughout the site were determined to be very consistent. Two representative locations were selected for the shallow and deeper percolation testing, the study was conducted in Borings P-1 at 11 feet below grade and P-2 at 4 feet below grade.

b) The holes were thoroughly pre-soaked for a period of 24 hours. The percolation testing was conducted on the next day following the pre-soak. From a fixed reference point, the drop in the water level was measured in 2-minute (for P-1) and 5 minutes (for P-2) intervals, refilling after every reading until at least 8 stable readings were recorded.

c) Based on the drop in the water level in the last recording period of the test, the percolation rate was determined. The drops in the water during the last reading period were as follows.

Boring No.	Final Drop Rate (inch)	Date
P-1	42	December 19, 2023
P-2	16	December 19, 2023

d) The computed infiltration rates using a Porchet method were:

Boring No.	Infiltration Rate (inch/hour)
P-1	16.8
P-2	6.9

e) These rates are calculated using a factor of safety of 1.0. Appropriate factor of safety should be utilized while designing the basin.

7. LIMITATIONS

a) Soils and bedrock over an area show variations in geological structure, type, strength and other properties from what can be observed, sampled and tested from specimens extracted from necessarily limited exploratory borings. Therefore, there are natural limitations inherent in making geologic and soil engineering studies and analyses. Our findings, interpretations, analyses and recommendations are based on observation, laboratory data and our professional experience; and the projections we make are professional judgments conforming to the usual standards of the profession. No other warranty is herein expressed or implied.

b) In the event that during construction, conditions are exposed which are significantly different from those described in this report, they should be brought to the attention of the Geotechnical Engineer.

c) The recommendations included in this report are intended to minimize the potential of distress caused by the underlying soils. However, it should be noted that certain amount of cracking, uplifting and tilting of may be unavoidable and should be anticipated during the lifetime of the proposed structures.

d) Other factors that should be considered with respect to the stability of temporary excavation sidewalls include construction traffic and storage of materials on or near the tops of the slopes, construction scheduling, and weather conditions at the time of construction. All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act of 1970, and the Construction Safety Act should also be followed. No temporary excavations should be left open without proper protections to mitigate safety hazards. **The contractor is solely responsible for ensuring the safety of construction personnel and the general public, and for appointing a designated *Competent Person* to observe and classify temporary excavation sidewalls pursuant to OSHA Safety and Health Regulations for Construction.**

The opportunity to be of service is sincerely appreciated. If you have any questions or if we can be of further assistance, please call.

Very truly yours,

GLOBAL GEO-ENGINEERING, INC.

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CEG 2253
(Exp. October 31, 2025)

MBU/KBY: fdg

Enclosures:

Location Map	- Figure 1
Seismicity Map	- Figure 2
References	- Appendix A
Field Exploration	- Appendix B
Unified Soils Classification System	Figure B-1
Logs of Borings	Figures B-2 through B-17
Boring Location Plan	Figure B-18
Laboratory Testing	- Appendix C

APPENDIX A

References

1. California Department of Water Resources, Data Retrieved December 26, 2023, *Water Data Library, Historical Data Map Inter*face (Internet).

2. California Geological Survey, *Earthquake Fault Zones of Required Investigation,* (Internet).

3. California Geological Survey, 2005, *Seismic Hazard Zone Report for the Lancaster West 7.5-Minute Quadrangle, Los Angeles County, California,* Seismic Hazard Zone Report 95.

4. California Office of Statewide Health Planning and Development, Seismic Design Maps Web Tool, ASCE 7-16 Standard (Internet).

5. United States Geological Survey, 1958 (Photorevised 1974), Lancaster West Quadrangle, 7.5-Minute Topographic Series.

APPENDIX B

Field Exploration

a) The site was explored on December 18, 2023, utilizing a B-61 Mobile hollow stem drill rig to excavate sixteen borings to a maximum depth of 25 feet below the existing ground surface. Eight of the borings were subsequently backfilled with the drill cuttings. Three-inch diameter perforated pipe with gravel rock encasement was installed in Borings P-1 through P-6 for the purpose of percolation testing

b) The soils encountered in the excavations were logged and sampled by our Engineering Geologist. The soils were classified in accordance with the Unified Soil Classification System described in *Figure B-1*. The Logs of Boring are presented in *Figures B-2 through B-17*. The approximate locations of the borings are shown on the *Boring Location Plan, Figure B-18*. The logs, as presented, are based on the field logs, modified as required from the results of the laboratory tests. Driven ring and bulk samples were obtained from the excavations for laboratory inspection and testing. The depths at which the samples were obtained are indicated on the logs.

c) The number of blows of the driving weight during sampling was recorded, together with the depth of penetration, the driving weight and the height of fall. The blows required per foot of penetration for given samples was then calculated and shown on the logs.

d) Groundwater was not encountered in any of our borings excavated on-site.

e) Caving occurred in all of the borings to the depths noted on the logs.

UNIFIED SOILS CLASSIFICATION (ASTM D-2487)

PRIMARY DIVISION			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS More than half of materials is larger than #200 sieve size	GRAVELS More than half of coarse fraction is larger than #4 sieve	Clean Gravels (<5% fines)	GW	Well graded gravels, gravel-sand mixture, little or no fines
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		Gravel with Fines	GM	Silty gravels, gravel-sand-silt mixture. Non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures. Plastic fines
	SANDS More than half of coarse fraction is smaller than #4 sieve	Clean Sands (<5% fines)	SW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		Sands with Fines	SM	Silty sands, sand-silt mixtures. Non-Plastic fines.
			SC	Clayey sands, sand-clay mixtures. Plastic fines.
FINE GRAINED SOILS More than half of material is smaller than #200 sieve size	SILTS AND CLAYS	LIQUID LIMIT IS LESS THAN 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts, with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS	LIQUID LIMIT IS GREATER THAN 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts.
	Highly Organic Soils		PT	Peat and other highly organic soils.

CLASSIFICATION BASED ON FIELD TESTS

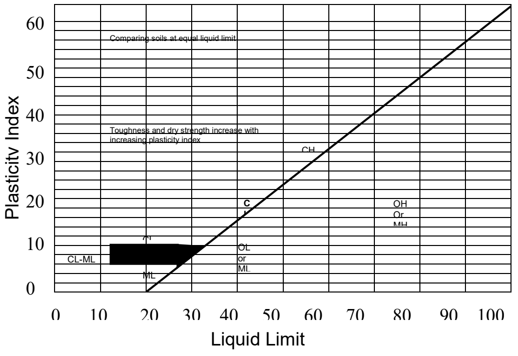
PENETRATION RESISTANCE (PR)	
Sands and Gravels	
Relative Density	Blows/foot
Very loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

Clays and Silts		
Consistency	Blows/foot*	Strength**
Very Soft	0-2	0-½
Soft	2-4	¼-½
Firm	4-8	½-1
Stiff	8-15	1-2
Very Stiff	15-30	2-4
Hard	Over 30	Over 4

*Numbers of blows of 140 lb hammer falling 30 inches to drive a 2-inch O.D. (1 3/8 in. I.D.) Split Barrel sampler (ASTM-1568 Standard Penetration Test)

**Unconfined Compressive strength in tons/sq. ft. Read from pocket penetrometer

CLASSIFICATION CRITERIA BASED ON LAB TESTS



Plasticity chart for laboratory
Classification of Fine-grained soils

GW and SW – $C_u = D_{60}/D_{10}$ greater than 4 for GW and 6 for SW; $C_c = (D_{30})^2/D_{10} x D_{60}$ between 1 and 3

GP and SP – Clean gravel or sand not meeting requirement for GW and SW

GM and SM – Atterberg limit below “A” line or P.I. less than 4

GC and SC – Atterberg limit above “A” line P.I. greater than 7

CLASSIFICATION OF EARTH MATERIAL IS BASED ON FIELD INSPECTION AND SHOULD NOT BE CONSTRUED TO IMPLY LABORATORY ANALYSIS UNLESS SO STATED.

Fines (Silty or Clay)	Fine Sand	Medium Sand	Coarse Sand	Fine Gravel	Coarse Gravel	Cobbles	Boulders
Sieve Sizes 200	40	10	4	¾”	3”	10”	

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GEOLOGIC AND SOILS ENGINEERING, IRVINE, CALIFORNIA

NWC of Avenue M and Division Street
APN# 3128-013-010/011
Lancaster, California

Date: January 2024

Project No.: 9937-04

Figure No.: B-1

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Geologists and Geotechnical Engineers

Northwest Corner of Avenue M and
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Project 9937-04

LOG OF BORING B-1

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
- ☒ Ring
- ▨ Bulk
- ■ Standard Penetration Testing

Water Levels
- ▼ Groundwater Encountered
- ▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM		Silty SAND: fine to medium grained, dark yellow brown, slightly moist, loose
	☒ ▨	3.1	108.9	9					
5	☒	3.5	108.1	11					@5' slightly coarser grained
10	☒ ▨	2.8	117.0	27			SP		SAND: fine to coarse grained, dark yellow brown, slightly moist, medium dense
							SM/ML		Silty SAND: fine grained,dark yellow brown, slightly moist, medium dense with SILT interbeds
15	☒ ▨	14.7	108.7	25					
									@18' fine to medium grained
	☒	4.1	111.5	34					ALLUVIUM
20									Bottom of Boring at 20 feet: Notes: 1. Caving to 15 feet after augers were removed 2. No groundwater or seepage encountered 3. Boring backfilled
25									

Figure B-2

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Project 9937-04

LOG OF BORING B-2

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
☒ Ring
▨ Bulk
■ Standard Penetration Testing

Water Levels
▼ Groundwater Encountered
▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM		Silty SAND: fine to medium grained, yellow brown, slightly moist, loose to medium dense
	☒	2.8	110.4	13					
5	☒	2.6	106.5	14					@5' medium dense
10	☒	1.9	115.8	34			SP		Gravelly SAND: fine to coarse grained, dark yellow to light reddish brown, slightly moist, medium dense
							SM		Silty SAND: fine to medium grained, dark yellow brown, slightly moist, medium dense ALLUVIUM
15	☒	2.1	105.4	45					
									Bottom of Boring at 15 feet: Notes: 1. Caving to 8 feet after augers were removed 2. No groundwater or seepage encountered 3. Boring backfilled
20									
25									

Figure B-3

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Project 9937-04

LOG OF BORING B-3

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
- ☒ Ring
- ▨ Bulk
- ■ Standard Penetration Testing

Water Levels
- ▼ Groundwater Encountered
- ▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM	▥	Silty SAND: fine to medium grained, yellow brown, dry to slightly moist, loose
	☒	1.6	102.6	12					
5	☒	2.1	106.2	13			SP	░	SAND: fine to medium grained, yellow brown, slightly moist, medium dense
10	☒	3.4	104.7	30					@9' gravelly, dark yellow to light reddish brown
							SM	▥	Silty SAND: fine grained, dark yellow brown, slightly moist, medium dense
15	☒	4.8	100.5	35					
							SP	░	SAND: fine to medium grained, dark yellow brown, slightly moist, medium dense ALLUVIUM
20	☒	1.2	96.6	32					Bottom of Boring at 20 feet:
25									

Notes:
1. Caving to 8 feet after augers were removed
2. No groundwater or seepage encountered
3. Boring backfilled

01-18-2024 C:\Program Files (x86)\mtech2022\temp\temp\Boring Logs 2002 Editon\9937-04 - GM Properties, Lancaster - B-3.bo

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Lancaster, California

Project 9937-04

LOG OF BORING B-4

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
☒ Ring
▨ Bulk
■ Standard Penetration Testing

Water Levels
▼ Groundwater Encountered
▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SP		Gravelly SAND: fine to medium grained, olive gray, dry, loose with pieces of concrete FILL
							SM		Silty SAND: fine to medium grained, dark yellow brown, slightly moist to moist, loose
	☒	6.5	108.8	12					
5	☒	4.3	107.4	11					
							SP		SAND: fine to medium grained, dark yellow brown, slightly moist, medium dense
10	☒	3.0	109.9	20					
									@14' slightly Silty
	☒	2.6	102.9	22					ALLUVIUM
15									Bottom of Boring at 15 feet:
20									
25									

Notes:
1. Caving to 8 feet after augers were removed
2. No groundwater or seepage encountered
3. Boring backfilled

Figure B-5

01-18-2024 C:\Program Files (x86)\mtech2022\temp\temp\Boring Logs 2002 Editon\9937-04 - GM Properties, Lancaster - B-4.bo

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Lancaster, California

Project 9937-04

LOG OF BORING B-5

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
☒ Ring
▨ Bulk
■ Standard Penetration Testing

Water Levels
▼ Groundwater Encountered
▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	DESCRIPTION
0							SM	Silty SAND: fine to medium grained, olive to dark yellow brown, slightly moist to moist, loose
	☒	2.6	104.5	10				
5	☒	1.8	109.9	12			SP	SAND: fine to medium grained, dark yellow brown, slightly moist, loose to medium dense
	☒	6.7	98.2	20			ML	Sandy SILT: yellow brown, slightly moist to moist, medium stiff
10	▨							
	☒	1.8	98.1	14			ML/SM	@14' with Silty SAND interbeds
15								
							SM	Silty SAND: fine grained, dark yellow brown, slightly moist, medium dense
	☒	5.2	98.3	20				ALLUVIUM
20								Bottom of Boring at 20 feet: Notes: 1. Caving to 5 feet after augers were removed 2. No groundwater or seepage encountered 3. Boring backfilled
25								

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Lancaster, California

Project 9937-04

LOG OF BORING B-6

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
☒ Ring
▨ Bulk
■ Standard Penetration Testing

Water Levels
▼ Groundwater Encountered
▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM		Silty SAND: fine to medium grained, dark yellow brown, slightly moist, loose
	☒	1.7	100.8	9					
5	☒	3.2	105.3	10					@5' more Silty
							SP		Gravelly SAND: fine to medium grained, dark yellow to light reddish brown, slightly moist, medium dense
10	☒	2.8	104.2	20					
									@14' less gravelly
15	☒	1.8	105.6	23					ALLUVIUM
20									
25									

Bottom of Boring at 15 feet:

Notes:
1. Caving to 7 feet after augers were removed
2. No groundwater or seepage encountered
3. Boring backfilled

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Project 9937-04

LOG OF BORING B-7

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
- ☒ Ring
- ▨ Bulk
- ■ Standard Penetration Testing

Water Levels
- ▼ Groundwater Encountered
- ▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0									Silty SAND: fine to medium grained, yellow brown, slightly moist, loose
	☒	2.1	107.3	10			SM		
5	☒	2.7	105.3	15					SAND: fine to medium grained, dark yellow to light reddish brown, slightly moist, medium dense, slightly gravelly
10	☒	2.0	114.0	24					@9' fine to coarse grained
15	☒	1.8	102.8	33			SP		
20	☒	2.6	109.1	39					
25	☒	2.6	105.4	47					@24' fine to medium grained, slightly Silty ALLUVIUM

Bottom of Boring at 25 feet:
Notes:

1. Caving to 19 feet
2. No groundwater or seepage encountered
3. Boring backfilled

Figure B-8

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Project 9937-04

LOG OF BORING B-8

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
☒ Ring
▨ Bulk
■ Standard Penetration Testing

Water Levels
▼ Groundwater Encountered
▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM		Silty SAND: fine to medium grained, dark yellow brown, slightly moist, loose to medium dense
	☒	2.1	106.4	14					
							SP		SAND: fine to medium grained, dark yellow brown, slightly moist, medium dense
5	☒	0.9	100.8	14					
									@9' dark yellow to light reddish brown
10	☒	2.6	109.7	33					
									@14' fine to coarse grained
15	☒	1.2	106.8	43					ALLUVIUM
									Bottom of Boring at 15 feet:
20									
25									

Notes:
1. Caving to 4 feet after augers were removed
2. No groundwater or seepage encountered
3. Boring backfilled

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Project 9937-04

LOG OF BORING P-1

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
☒ Ring
▨ Bulk
■ Standard Penetration Testing

Water Levels
▼ Groundwater Encountered
▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM	▥	Silty SAND: fine to medium grained, dark yellow brown, slightly moist to moist, loose
5									
							SP	░	SAND: fine to medium grained, dark yellow brown, slightly moist, medium dense
10									ALLUVIUM
									Bottom of Boring at 11 feet: Notes: 1. No groundwater or seepage encountered 2. 3-inch diameter perforated pipe installed; Pipe encased with gravel rock
15									
20									
25									

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Project 9937-04

LOG OF BORING P-2

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type

- ⊠ Ring
- ▨ Bulk
- ■ Standard Penetration Testing

Water Levels

- ▼ Groundwater Encountered
- ▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM	▥	Silty SAND: fine to medium grained, dark yellow brown, slightly moist to moist ALLUVIUM
5									Bottom of Boring at 4 feet: Notes: 1. No groundwater or seepage encountered 2. 3-inch diameter perforated pipe installed; Pipe encased with gravel rock
10									
15									
20									
25									

Figure B-11

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Project 9937-04

LOG OF BORING P-1

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
☒ Ring
▨ Bulk
■ Standard Penetration Testing

Water Levels
▼ Groundwater Encountered
▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0 5							SM		Silty SAND: fine to medium grained, dark yellow brown, slightly moist to moist, loose
10							SP		SAND: fine to medium grained, dark yellow brown, slightly moist, medium dense ALLUVIUM
15 20 25									Bottom of Boring at 11 feet: Notes: 1. No groundwater or seepage encountered 2. 3-inch diameter perforated pipe installed; Pipe encased with gravel rock

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Project 9937-04

LOG OF BORING P-2

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
☒ Ring
▨ Bulk
■ Standard Penetration Testing

Water Levels
▼ Groundwater Encountered
▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM	▨	Silty SAND: fine to medium grained, dark yellow brown, slightly moist to moist ALLUVIUM
5									Bottom of Boring at 4 feet: Notes: 1. No groundwater or seepage encountered 2. 3-inch diameter perforated pipe installed; Pipe encased with gravel rock
10									
15									
20									
25									

Figure B-13

01-18-2024 C:\Program Files (x86)\mtech2022\temp\temp\Boring Logs 2002 Editon\9937-04 - GM Properties, Lancaster - P-4.bo

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Project 9937-04

LOG OF BORING P-5

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
⊠ Ring
▨ Bulk
■ Standard Penetration Testing

Water Levels
▼ Groundwater Encountered
▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM		Silty SAND: fine to medium grained, olive to dark yellow brown, slightly moist to moist, loose
4									Bottom of Boring at 4 feet: Notes: 1. No groundwater or seepage encountered 2. 3-inch diameter perforated pipe installed; Pipe encased with gravel rock
5									
10									
15									
20									
25									

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Lancaster, California

Project 9937-04

LOG OF BORING P-6

Date : December 18, 2023
Logged By : KBY
Diameter of Boring : 6"
Drilling Company : Cal Pac
Drilling Rig : Mobile B-61

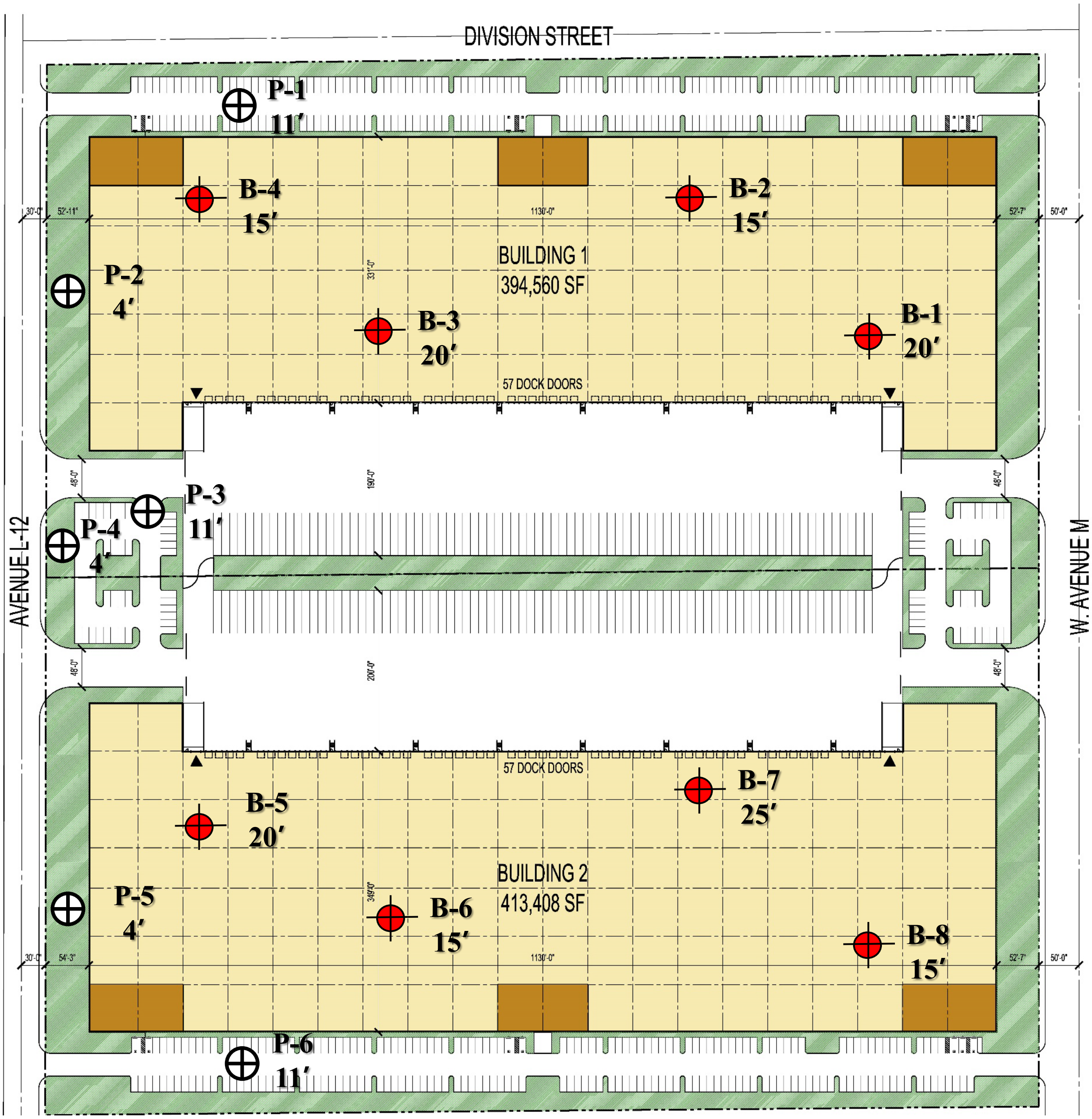
Drilling Method : Hollow Stem
Sampling Method : California Modified
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
- ☒ Ring
- ▨ Bulk
- ■ Standard Penetration Testing

Water Levels
- ▼ Groundwater Encountered
- ▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Count	Relative Compaction	Water Level	USCS	GRAPHIC	DESCRIPTION
0							SM		Silty SAND: fine to medium grained, olive to dark yellow brown, slightly moist to moist, loose
5							SP		SAND: fine to medium grained, dark yellow brown, slightly moist, loose to medium dense @9' more Silty ALLUVIUM
10									
									Bottom of Boring at 11 feet: Notes: 1. No groundwater or seepage encountered 2. 3-inch diameter perforated pipe installed; Pipe encased with gravel rock
15									
20									
25									

BORING LOCATION PLAN



KEY

B-8
15′ Approximate Location of Boring, Showing Total Depth

P-6
11′ Approximate Location of Percolation Boring, Showing Total Depth

N

200 0 200 400

APPROXIMATE SCALE FEET

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NWC of Avenue M and Division Street
APN# 3128-013-010/011
Lancaster, California

Date: January 2024

Project No.: 9937-04

Figure No: B-16

APPENDIX C

Laboratory Testing Program

The laboratory-testing program was directed towards providing quantitative data relating to the relevant engineering properties of the soils. Samples considered representative of site conditions were tested as described below.

a) Moisture and Density

Moisture-density information usually provides a gross indication of soil consistency. Local variations at the time of the investigation can be delineated, and a correlation obtained between soils found on this site and nearby sites. The dry unit weights and field moisture contents were determined for selected samples. The results are shown on the Logs of Borings.

b) Compaction

Representative soil samples were tested in the laboratory to determine the maximum dry density and optimum moisture content, using the ASTM D1557 compaction test method. This test procedure requires 25 blows of a 10-pound hammer falling a height of 18 inches on each of five layers, in a 1/30 cubic foot cylinder. The results of the test are presented below.

Boring No.	Sample Depth (ft.)	Soil Description	Optimum Moisture Content (%)	Maximum Dry Density (lb/ft^3)
B-1	1-3	Silty SAND	8.0	130.0
B-1	10-12	SAND	7.0	134.2

c) Direct Shear

Direct shear tests were made on remolded and relatively undisturbed soil samples, using a direct shear machine at a constant rate of strain. Variable normal or confining loads are applied vertically and the soil shear strengths are obtained at these loads. The angle of internal friction and the cohesion are then evaluated. The samples were tested at saturated moisture contents. The results are shown below in terms of the Coulomb shear strength parameters.

Boring No.	**Sample Depth (ft)**	**Soil Description**	**Coulomb Cohesion (lb/ft^2)**	**Angle of Internal Friction (°)**	**Peak/Residual**
B-1	1-3	Silty SAND (Remolded)	250 150	31 31	Peak Ultimate
B-5	5-6	SAND (Undisturbed)	100 100	30 29	Peak Ultimate

d) Sulfate Content

Representative soil samples were analyzed for its sulphate content. The results are given below:

Boring No.	**Sample Depth (ft.)**	**Soil Description**	**Sulphate Content (%)**
B-1	1-3	Silty SAND	0.0015
B-2	2-3	Silty SAND	0.0029

e) Chloride Content

Representative soil samples were analyzed for chloride content in accordance with California Test Method CA422. The result is given on the following page:

Boring No.	Sample Depth (ft)	Soil Description	Chloride Content (%)
B-1	1-3	Silty SAND	0.0016
B-1	2-3	Silty SAND	0.0018

f) Resistivity and pH

Representative soil samples were analyzed in accordance with California Test Methods CA532 and CA643 to determine the minimum resistivity and pH. The result is provided below:

Boring No.	Sample Depth (ft)	Soil Description	pH	Minimum Resistivity (Ohm-cm)
B-1	1-3	Silty SAND	7.3	23,036
B-2	2-3	Silty SAND	7.9	10,684