SIERRA GEOTECHNICAL SERVICES, INC.

GEOTECHNICAL • GEOLOGY • HYDROGEOLOGY • MATERIALS TESTING • INSPECTION

P.N. 3.31411

Tom Wabinski
817 York Street
San Francisco, CA 94110
tomwabinski@icloud.com

May 16, 2017

Subject: **GEOTECHNICAL INVESTIGATION**
Lot 32 Lakeside Drive (APN 008-171-007)
Bridgeport, California

Dear Mr. Wabinski,

In accordance with your authorization, we herein submit the results of our geotechnical investigation for the subject property. The purpose of this study was to assess the geotechnical constraints to development and provide geotechnical recommendations relative to the future development of the proposed projects.

Construction on the property can be considered feasible from a geotechnical standpoint if the recommendations included herein are incorporated during design and construction. The primary geologic and geotechnical constraints to development are the potential seismic hazards associated with strong ground shaking, as well as shallow groundwater.

Foundation design should be prepared in accordance with the recommendations contained within this report. Foundation plans should be reviewed by our office prior to construction to assure that they will be in conformance with our recommendations.

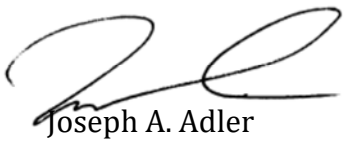
The conclusions and recommendations presented herein are considered site specific and based upon the subsurface conditions encountered at the locations of the explorations

SIERRA GEOTECHNICAL SERVICES, INC.

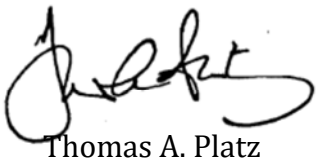
We appreciate the opportunity to be of service to you. Should you have any questions regarding this report, please do not hesitate to contact us.

Respectfully,

SIERRA GEOTECHNCIAL SERVICES, INC.



Joseph A. Adler
Principal Geologist
CEG 2198 (exp 3/31/2019)



Thomas A. Platz
Principal Engineer
PE C41039 (exp 3/31/2019)

SITE DESCRIPTION AND SCOPE

The subject site is located on the east side of Lakeside Drive, west of US Highway 182, approximately 3 miles north of the intersection of US Highways 395 and 182 in the town of Bridgeport, Mono County, California (Figures 1 and 2). The property is approximately 1.0 acres, roughly square, and slightly west sloping. The elevation near the future building areas is approximately 6480' MSL. The site is currently undeveloped; however two dirt roads trending north/northeast were observed on site. Vegetation includes a moderate groundcover consisting of sage and shrubs.

A field investigation which included the excavation of two test pits was performed in on April 27th, 2017 by a geologist from our office. Logs of the exploratory test pits are presented in Appendix A. The location of the exploratory test pits is presented in the Subsurface Location Map (Figure 2). A bulk sample of the soil encountered was obtained during the field investigation for laboratory testing. Details of the laboratory testing are presented in Appendix B.

Detailed plans for construction are currently not available. SGSI should review foundation plans prior to construction to assure that they will be in conformance with the recommendations herein.

PROPOSED DEVELOPMENT

It is our understanding that the proposed construction will include a single level Connect Homes 5 Series single-family manufactured residence, a standalone two-car garage, access drives, walkways, and other associated appurtenances. The foundation is anticipated to consist of a shallow perimeter footing with either a concrete or CMU stem wall, and interior concrete pad footings with concrete or CMU support piers. Neither a basement nor retaining wall is anticipated. Grading is expected to be minor with the building situated at or near existing grades.

SUBSURFACE CONDITIONS

As observed during this investigation, Alluvium underlies the site to the depths explored. A log of the subsurface conditions encountered in the test pit is provided in Appendix A. Generalized descriptions of the materials encountered during this investigation follow.

Alluvium

Alluvium was encountered in both the test pits. In general, the alluvium consisted of a dark brown to dark reddish-brown, moist, dense to very dense, silty to clayey, very fine to coarse SAND (Unified Soil Classification Symbol: SM and SC-SM). The alluvial deposits are considered suitable for additional fill and/or structural support provided the earthwork and grading recommendations included within this report are adhered to during construction.

Groundwater

Light to moderate groundwater seepage was encountered from within test pit excavation TP-2 at an approximate depth of 5 feet below grade. Groundwater could be encountered at the location of the building pad during site development. Groundwater conditions at the site appear to be relatively constant, with minimal decrease, but could significantly rise during heavy runoff years. Mitigation measures for groundwater are presented in this report.

FAULTING

Based on our review, the site is **not** located within any "Earthquake Fault Zones" or Alquist-Priolo Hazard Zones. Recent faulting (surface rupture less than 11,000 years ago) and historic faults (surface rupture less than 200 years ago) are located regionally near the site.

SITE SEISMICITY

Site coordinates of latitude 38.2969, -119.2137 were estimated using the computer program Google Earth. The site sits approximately 1.2 mi southeast of the Robinson Creek Fault zone. Table I presents the Seismic Parameters for use in preparing a Design Response Spectra for the site.

TABLE I

SEISMIC PARAMETER	RECOMMENDED VALUE
Site Class	D
F_a	1.2
F_v	1.9
S_S	1.224
S_1	0.404
S_{MS}	1.468
S_{M1}	0.766
S_{DS}	0.979
S_{D1}	0.510
PGA	0.539
F_{PGA}	1.2
Occupancy Category	II
S_{DC}	D

Conformance to the above criteria for strong ground shaking does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur during a large magnitude earthquake. Design of structures should comply with the requirements of the governing jurisdictions, building codes, and standard practices of the Association of Structural Engineers of California.

SECONDARY EARTHQUAKE EFFECTS

Secondary effects that can be associated with severe ground shaking following a relatively large earthquake include shallow ground rupture, soil lurching, liquefaction, Seiches, and lateral spreading. These secondary effects of seismic shaking are discussed in the following sections.

Shallow Ground Rupture

Ground surface rupture results when the movement along a fault is sufficient to cause a gap or break along the upper edge of the fault zone on the surface. Our review of available geologic literature indicated that there are no known active, potentially active, or inactive faults that transect the subject site.

Soil Lurching

Soil lurching refers to the rolling motion on the ground surface by the passage of seismic surface waves. Effects of this nature are likely to be most severe where the thickness of soft sediments varies appreciably under structures. In its present condition, the potential at the site is considered moderate due to the existence of potentially compressible soils within the upper one foot of material below existing grades.

Liquefaction

Liquefaction of cohesionless soils can be caused by strong vibratory motion due to earthquakes. Liquefaction is characterized by a loss of shear strength in the affected soil layers, thereby causing the soil to behave as a viscous liquid. This effect may be manifested at the ground surface by settlement and, possibly, sand boils where insufficient confining overburden is present over layers. In order for the potential effects of liquefaction to be manifested at the ground surface, the soils generally have to be granular, loose to medium-dense and saturated relatively near the ground surface, and must be subjected to ground shaking of a sufficient magnitude and duration.

A detailed liquefaction potential analysis and earthquake-included settlement calculations were outside the scope of services for this study and therefore not conducted for the subject site. The potential for liquefaction is prevalent throughout the Bridgeport area where relatively loose to medium-dense, granular soils and shallow groundwater conditions exist. In the event of the design level earthquake, liquefaction of these soils may locally reduce the factor of safety against liquefaction, causing settlement to occur. Total dynamic settlement as well as differential settlement therefore may exceed tolerances calculated by a structural engineer for any proposed structures.

Seiches

Normally caused by earthquake activity, seiches can affect harbors, bays, lakes, rivers, and canals. Usually, earthquake-induced events do not occur close to the epicenter of an earthquake, but hundreds of miles away. Earthquake shock waves close to the epicenter consist of high frequency vibrations, while those at much

greater distances are of lower frequency. It is the low frequency vibrations that move bodies of water. The biggest seiches develop when the period of ground movement matches the frequency of oscillation in the body of water.

Presently, there is no available evidence that seiches have occurred in Mono County lakes and reservoirs and as a result the County does not have a hazard mitigation ordinance in effect. That said, the potential of seiches because of the design level earthquake in a nearby fault is considered moderate due to the relative proximity of Bridgeport Reservoir to the project site.

Lateral Spreading

Lateral spreading is a type of liquefaction induced ground failure that forms on gentle slopes as a result of seismic activity and has a fluid like movement. It differs from slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Due to the site being relatively flat and the lack of an adjacent free face to drive lateral spreading, the potential for lateral spreading is considered negligible.

LANDSLIDES

Evidence of past landslides was not observed either during aerial photographic review or in the field.

FLOOD HAZARDS

The subject parcel is located within Flood Hazard Zone D – areas in which flood hazards are undetermined, but possible - per FEMA Flood Hazard Map 06051C0375D (2/18/2011).

SUBSIDENCE

The subject site is not within an area known for past cases of substantial subsidence due to fluid removal. It is our opinion that the potential for significant subsidence due to the extraction of fluids is negligible. Soils subject to hydro-collapse, such as loose cemented silty and clayey soils were not observed in the test pits. The site is not located in an area

noted for hydro-collapse. Significant soil settlement associated with wetting of the subgrade materials is not anticipated.

EXPANSIVE SOILS

Expansive soils are soils that swell when subjected to moisture. Shrink/swell potential is the relative change in volume to be expected with changes in moisture content; that is, the extent to which the soil shrinks as it dries or swells when it gets wet. The extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils causes' damage to building foundations, roads, and other structures. Soils in the immediate vicinity of the building site consist of medium dense to dense, sands with minor fines and gravels. Based on these findings, there is a very low shrink/swell potential at the site.

CONCLUSIONS

The following conclusions and recommendations contained within this report should be incorporated into the design and construction. The conclusions included below highlight the salient features relative to the project site.

- There are no known active, potentially active, or inactive faults that transect the subject site. Seismic hazards at the site may be caused by ground shaking during seismic events on regional active faults.

- Evidence of past soil failures, or landslides, was not encountered.

- The subject parcel is located within Flood Zone D per the FEMA flood zone map.

- Light to moderate groundwater seepage was encountered during our field investigation in Test Pit 2 at a depth of 5'. Groundwater could be encountered at the location of the building pad during site development.

- Site soils encountered during our field investigation consist of very fine to medium silty sands (see Appendix A). Expansive clayey soils were not encountered.

- The proposed building areas are underlain by up to approximately 12 inches of loose surficial soils considered "unsuitable" for the support of new fill or structural loads. Where these soils will be subjected to increased loads from new fills or structures, remedial grading consisting of over-excavation and compaction is

recommended to improve the bearing capacity of those materials. These soils may be used as fill.

- Because of the relatively shallow groundwater conditions, which could rise in heavy run-off years, site grades should be raised a minimum of 18-inches above existing grade with a uniform compacted fill. The grading area should be observed by the geotechnical consultant prior to placing additional fill soils.

- The depth of the unsuitable soils is based upon the areas observed during the field investigation. It should be anticipated that the overall depth of the unsuitable materials exposed during construction may vary from that encountered in the borings. Reasonably continuous construction observation and review during site grading and foundation installation allows for evaluation of the actual soil conditions and the ability to provide appropriate revisions where required during construction.

RECOMMENDATIONS

The following recommendations should be adhered to during site development. These recommendations are based on empirical and analytical methods typical of the standard of practice in California. If these recommendations appear not to cover any specific feature of the project, please contact our office for additions or revisions to the recommendations.

Geotechnical Review

Geotechnical review is of paramount importance in engineering practice. The poor performance of many foundation and earthwork projects has been attributed to inadequate construction review. Sierra Geotechnical Services, Inc. should be provided the opportunity to review the following items or we waive all liability for all geotechnical issues associated with grading or construction relative to the subject site.

Plan and Specification Review

Detailed foundation plans were not available at the time of this report. SGSI should review foundation plans prior to construction to assure that they are in conformance with this report; some of the recommendations contained herein may need to be revised after reviewing.

Earthwork

Earthwork should be performed in accordance with the General Earthwork and Grading Specifications in Appendix C and the following recommendations. The recommendations contained in Appendix C are general grading specifications provided for typical grading projects. Some of the recommendations may not be strictly applicable to this project. The specific recommendations contained in the text of this report supersede the general recommendations in Appendix C. The contract between the developer and earthwork contractor should be worded such that it is the responsibility of the contractor to place the fill properly in accordance with the recommendations of this report and the specifications in Appendix C notwithstanding the testing and observation of the geotechnical consultant.

Site Preparation

Prior to grading, the proposed structural improvement areas (i.e. all structural fill, pavements areas and structural building, etc.) of the site should be cleared of surface and subsurface obstructions, including vegetation. Vegetation and debris should be disposed of offsite. Holes resulting from removal of buried obstructions, which extend below the recommended removal depths described herein or below finished site grades (whichever is lower) should be filled with properly compacted soil. Should existing underground utilities be encountered they should be completely removed and properly backfilled. Alternatively, if the utility is not within the influence zone of the foundation it may be abandoned in place by fully grouting the pipe.

Removals and Compaction

The subject property is underlain by up to approximately 12-inches of loose, damp to moist, surficial deposits considered unsuitable for the support of structural loads. This unsuitable material shall be removed and compacted. The removal area should extend a minimum horizontal distance of one-half the footing width or 3-feet (whichever is greater) horizontally outside the footing footprint. Site grades should then be raised a minimum of 18-inches above existing grade with a uniform compacted fill. The grading area should be observed by the geotechnical consultant prior to placing additional fill soils.

Approved fill soils should be placed in thin lifts (6 to 8-inches loose thickness) and moisture conditioned to at least optimum moisture content. All fill should be

compacted to a minimum of 95-percent of the laboratory maximum dry density per ASTM D-1557.

The onsite granular soils are suitable for use as compacted fill. All fill (either native or import) should be relatively free of organics, any oversized rock (greater than 6-inches in diameter) and any deleterious materials.

Any import soils shall be tested for suitability in advance by the project Geotechnical Engineer. Earth fill material shall not contain more than 1-percent of organic materials (by volume). Imported fill shall have a maximum plasticity index of ≤ 12, and a liquid limit less than 40 when measured in accordance with ASTM D 4318.

Preliminary Foundation Preparation and Design

The following preliminary recommendations are presented as minimum design recommendations; they are not intended to supersede design by the structural engineer. Preliminary foundations should be designed in accordance with structural considerations and the following. Upon the completion of the structural plans, Sierra Geotechnical Services Inc. should review the foundation loads and embedment to confirm the implementation of the recommendations herein.

Continuous or pad footings may be used to support the proposed structures provided they are founded entirely upon properly compacted fill, or competent native deposits encountered approximately 12-inches below existing grades. Continuous and isolated column foundations should be sized according to the allowable soil bearing pressures shown in Table II below. The pressures shown on Table II are for dead load plus long-term live load, including snow load, and for total load including wind and seismic forces.

Table II – Allowable Soil Bearing Pressures

Depth Below Existing Ground Surface	Allowable Soil Bearing Pressure (psf)
Compacted Fill or Competent Alluvial Deposits	2,000

The allowable pressure may be increased by one-third when considering loads of short duration such as wind or seismic forces. A friction coefficient for concrete/soil interface of 0.25 and a passive resistance of 200 psf may be employed to resist lateral loads. Passive resistance may be combined with friction without reduction in evaluating the total lateral resistance.

Foundation Construction

Based upon our observations and experience relative to the general site area, non-expansive soils exist onsite.

- Footings should be designed in accordance with the structural engineer requirements regarding width. Exterior and interior foundations shall be founded within compacted fill or competent native deposits. Exterior foundations shall have a minimum embedment depth of 18-inches below outside adjacent grade.

- All footing excavations should be observed by a representative of SGSI prior to placement of reinforcing steel, to assure proper embedment into suitable soils.

- Footing trench excavations should be moisture conditioned prior to pouring concrete.

- Footing trenches should not have any rocks or boulders protruding into the trench bottom. Soft soil pockets created by rock removal during foundation excavation shall be replaced with approved fill material, and compacted to 95-percent of the material's maximum dry density.

Foundation Setback

Utility trenches that parallel or nearly parallel structure footings should not encroach within a 1:1 plane extending downward and outward from the outside edge of the footing.

CONCRETE SLAB-ON-GRADE

Slab thickness and reinforcement will meet the requirements of the Structural Engineer of record. Compacted fill materials will provide adequate support for concrete slabs provided

the on-site materials are prepared per our grading recommendations prior to placement of the slab.

Structural fill and subgrade soils underlying concrete slabs shall be compacted to a minimum of 95-percent of the material's maximum dry density for the upper 12-inches. Concrete slabs should be underlain by a 1-inch layer of clean sand (SE greater than 30) to aid in concrete curing, which is underlain by a 10-mil (or heavier) moisture barrier, which is, in turn, underlain by a 1-inch layer of clean sand or 4" layer of clean crushed aggregate to act as a capillary break. All penetrations and laps in the moisture barrier should be appropriately sealed.

Moisture barriers can retard, but not eliminate moisture vapor movement from the underlying soils up through the slab. We recommend that the floor coverings installer test the moisture vapor flux rate prior to attempting application of the flooring. "Breathable" floor coverings should be considered if the vapor flux rates are high. A slipsheet should be used if crack sensitive floor coverings are planned

DRAINAGE

We recommend that measures be taken to properly finish grade the building area, such that drainage water from the building area is directed away from building foundations (2-percent minimum grade on soil or sod for a distance of 5-feet). Ponding of water should not be permitted. Erosion is possible on the pad if left unprotected.

CRAWLSPACE PROTECTION

Crawlspace areas should be covered by at least a 4" thick layer of clean crushed gravel aggregate which in turn is overlain by a 10-mil minimum thickness Stego-wrap moisture barrier. All penetrations and laps in the moisture barrier should be appropriately sealed. The membrane should have a high puncture resistance and should be installed so that there are no openings or holes. All seams should be overlapped and sealed at the laps per the manufacturers recommendations. Where pipes extend through the membrane, the barrier should be sealed to the pipes. In addition, crawlspace areas shall be well ventilated.

QUALITY CONTROL

The recommendations in this report are based on limited subsurface information. The nature and extent of variation across the site may not become evident until construction. If variations are exposed during construction, it may be necessary to re-evaluate our recommendations.

The recommendations presented herein are based on the assumption that sufficient field testing and construction review will be provided during all phases of construction. We should review the final plans and specifications to check for conformance with the intent of our recommendations.

Prior to construction, a pre-job conference should be scheduled to include, but not be limited to, the owner, civil engineer, the general contractor, earthwork and materials subcontractors, building official, and geotechnical engineer. The conference will allow parties to review the project plans, specifications, and recommendations presented in this report and discuss applicable material quality and mix design requirements.

LIMITATIONS

This report has been prepared for the sole use and benefit of our client. The conclusions of this report pertain only to the site investigated. The intent of the report is to advise our client of the geologic and geotechnical recommendations relative to the future development of the proposed project. It should be understood that the consulting provided and the contents of this report are not perfect. Any errors or omissions noted by any party reviewing this report, and/or any other geologic or geotechnical aspects of the project should be reported to this office in a timely fashion. The client is the only party intended by this office to directly receive this advice. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Sierra Geotechnical Services Incorporated from and against any liability, which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Sierra Geotechnical Services Incorporated.

Conclusions and recommendations presented herein are based upon the evaluation of technical information gathered, experience, and professional judgment. Other consultants could arrive at different conclusions and recommendations. Final decisions on matters presented are the responsibility of the client and/or the governing agencies. No warranties in any respect are made as to the performance of the project.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings within this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

REFERENCES

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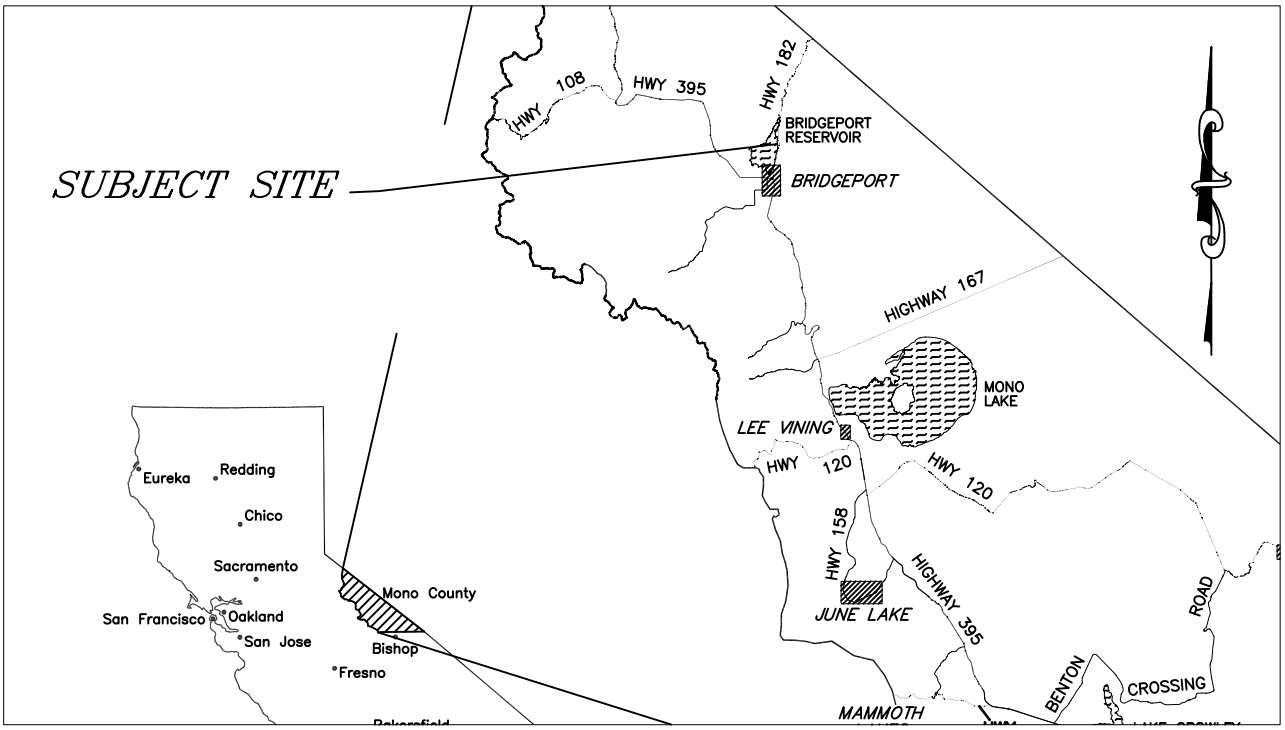
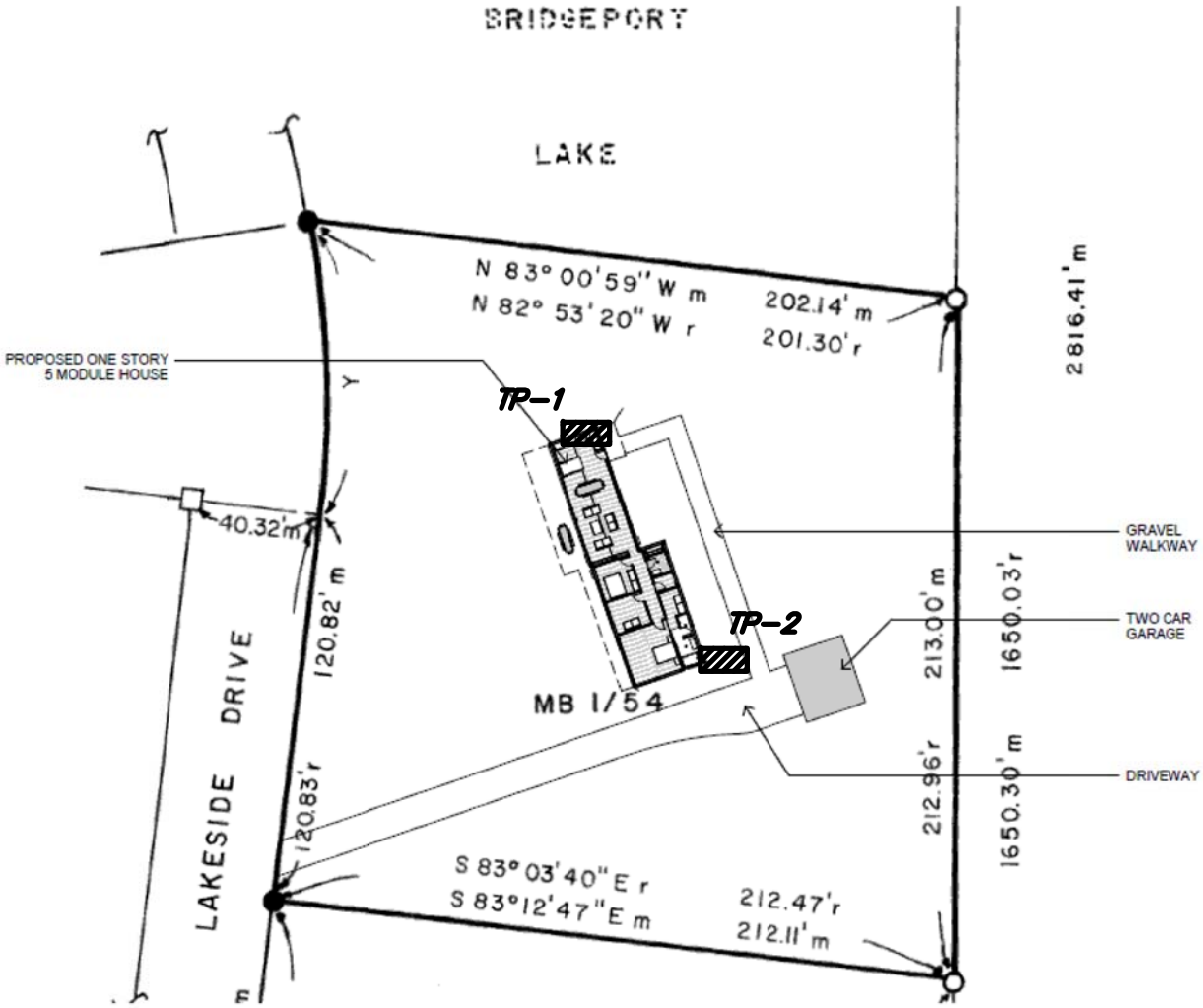


PROJECT: VICINITY MAP LOT 32 LAKESIDE DRIVE	
SCALE: N.T.S	DATE: 5/2017
DRAWING:	DRAWN BY: JA
JOB NO.: 3.31411	FIGURE: FIGURE 1

Sierra Geotechnical Services



CONTOUR INTERVAL: 1'

LEGEND

TP–2

APPROXIMATE LOCATION OF TEST PIT

SIERRA GEOTECHNICAL SERVICES INC.

PROJECT: *SUBSURFACE GEOTECHNICAL MAP* *LOT 32 LAKESIDE DRIVE*	
SCALE: *NTS*	DATE: *5/2017*
DRAWING: *FIG3.DWG*	DRAWN BY: *JAA*
JOB NO.: *3.31411*	FIGURE: *FIGURE 2*

APPENDIX A

EXPLORATORY TEST PITS

A subsurface field investigation was performed by SGSI on the subject site on April 27th, 2017 and included the excavation of two exploratory test pits in the building area. Soil materials were visually classified in the field according to the Unified Soil Classification System (USCS). Logs of the test pits are presented herein. The approximate locations of the test pits are shown on the Subsurface Location Map (Figure 2).

SIERRA GEOTECHNICAL SERVICES INC.
P.O. BOX 5024
MAMMOTH LAKES, CA 93546

TEST PIT LOGS

JOB NO: **3.31411** **PROJECT:** **Lot 32 Lakeside Drive**
DATE: **4/27/2017** **LOGGED BY:** **JA**
EQUIP: **Case Backhoe W/ 24" BUCKET**

TEST PIT	DEPTH (ft)	U.S.C.S. GROUP SYMBOL	SAMPLE DEPTH (ft)	PERCENT MOISTURE	DRY DENSITY (pcf)	DESCRIPTION
1	0 - 8	SM	6" - 1'	4.0	102.1	**TOPSOIL** Dark brown, moist, loose, silty, very fine to medium SAND, few roots.
	8" – 5½	SM				**Alluvium** Dark reddish-brown, moist, dense, silty, very fine to medium SAND, few gravels. --- *Total depth = 5½-feet. No groundwater encountered. Backfilled 4/27/2017*
2	0 – 8"	SM				**TOPSOIL** Dark brown, moist, loose, silty, very fine to medium SAND, few roots.
	8" – 2½	SM				**Alluvium** Dark reddish-brown, moist, dense, silty, very fine to medium SAND, few gravels.
	2½ - 5	SC-SM				Dark brown moist, very dense, silty to clayey, very fine SAND. (B Horizon?)
	5 -5½	SM				Dark brown to brown, wet, dense, silty, very fine to coarse SAND, few gravels. Light to moderate groundwater seepage. --- *Total depth = 5½-feet. Groundwater seepage at 5 feet. Backfilled 4/27/2017*

APPENDIX B

LABORATORY TESTING

A fine aggregate sieve analysis and a maximum density test (Proctor) were performed on a representative test sample to provide a basis for development of design parameters. Soil materials were visually classified in the field according to the Unified Soil Classification System (USCS). Laboratory testing was performed in general accordance with the American Society of Testing and Materials (ASTM) procedures. The results of our laboratory testing are presented herein. The results of USCS classifications are presented on the test pit logs (Appendix A).

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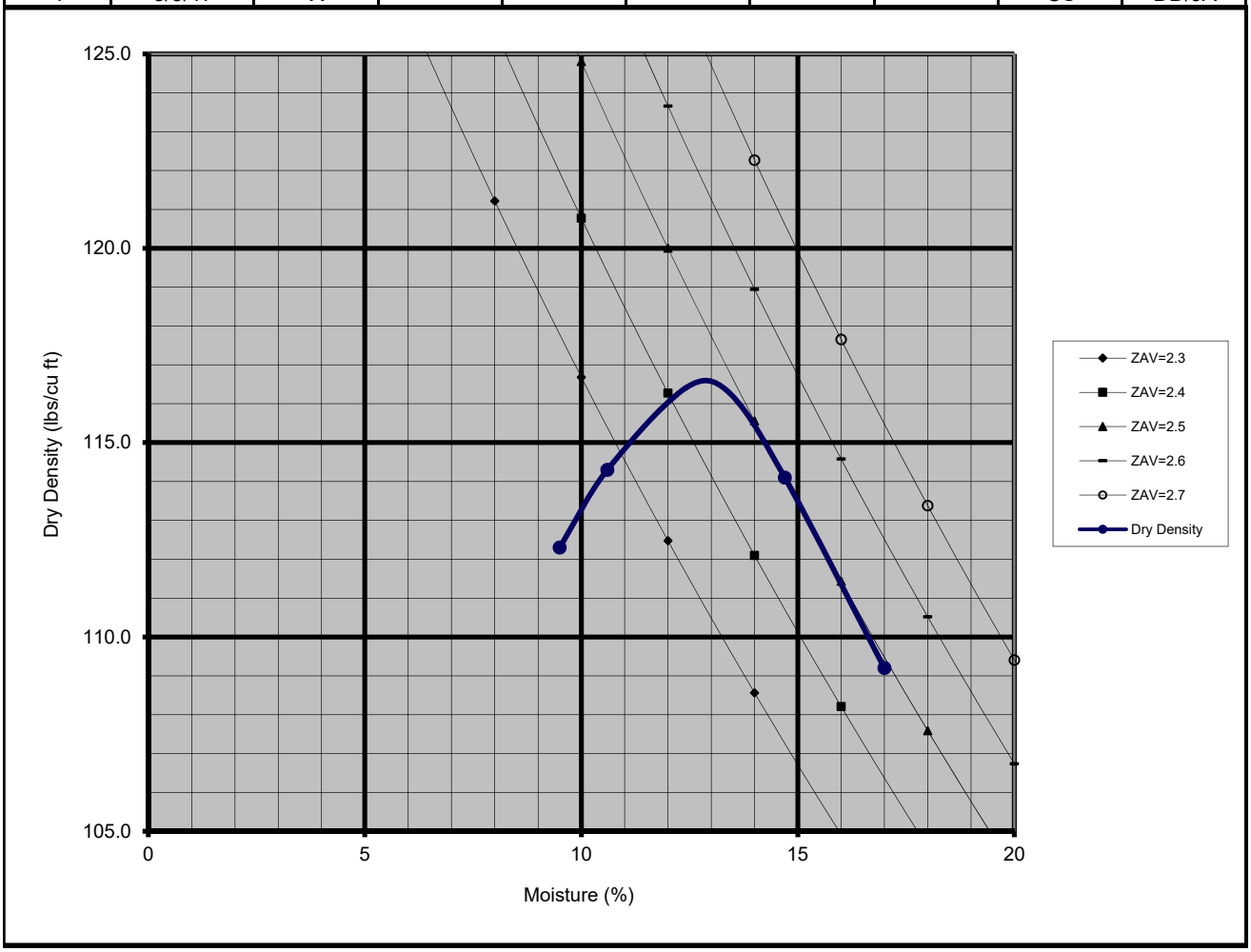
Caltrans Lab #214 AMRL Lab #2460 CCRL Lab #2081 DSA LEA Lab #189

MAXIMUM DENSITY-MOISTURE CURVE (PROCTOR)

Project Name								Project No.	
Lot 32 Lakeside Drive, Bridgeport, California								3.31411	
Client								Deliver Date	
Wabinski								4/27/2017	
Source								Sampled By	Delivered By
Test Pit 1 at 1.0 to 2.0 feet deep								JA	JA
Proctor No	Test Date	Native	Belt Cut	Screen	Chute	Stockpile	Truck	Tested By	Reviewed By
1	5/3/17	X						CS	DD/JA



Laboratory Data:

Test #	Soil & Mold (lb)	Mold (lb)	Soil (lb)	Wet Density (pcf)	Percent Moisture	Dry Density (pcf)	Mold Volume (cf)	Max. Dry Density (pcf)	Optimum Moisture (%)
1	13.774	9.692	4.082	123.0	9.5	112.3	0.03319	116.5	13.0
2	13.888	9.692	4.196	126.4	10.6	114.3			
3	14.040	9.692	4.348	131.0	14.8	114.1		Rock	
4	13.934	9.692	4.242	127.8	17.0	109.2		Corr. (pcf)	
5								n/a	

Note: ZAV=Zero Air Voids per Specific Gravity of Soil Solids

Thomas A Platz, PE C41039

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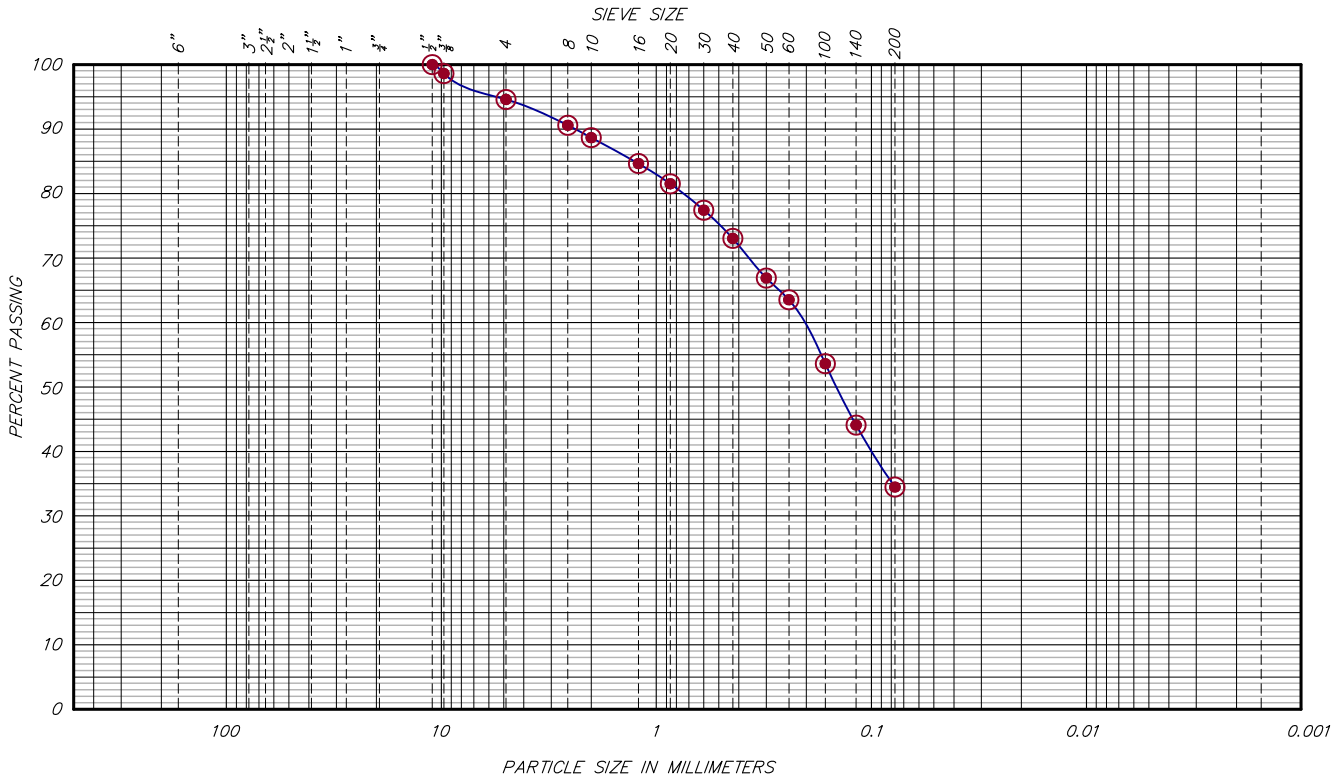
PARTICLE SIZE DISTRIBUTION REPORT

PER ASTM TEST METHODS D2487 & D6913



% >3"	% GRAVEL		% SAND			% FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	5.4	5.9	15.7	38.6	34.4	n/a

SIEVE SIZE	PERCENT RETAINED	PERCENT PASSING	SPECIFIED PERCENT	PASS? (Yes or No)
3"				
2-1/2"				
2"				
1-1/2"				
1"				
3/4"				
1/2"	0	100		
3/8"	1.4	98.6		
No. 4	5.4	94.6		
No. 8	9.5	90.5		
No. 10	11.3	88.7		
No. 16	15.3	84.7		
No. 20	18.5	81.5		
No. 30	22.6	77.4		
No. 40	27.0	73.0		
No. 50	33.1	66.9		
No. 60	36.5	63.5		
No. 100	46.4	53.6		
No. 140	56.0	44.0		
No. 200	65.6	34.4		

SOIL DESCRIPTION

Silty SAND

ATTERBERG LIMITS

PL = 0 LL = 0 PI = NP

COEFFICIENTS

D_{85} = n/a D_{60} = 0.120 D_{50} = n/a

D_{30} = n/a D_{15} = n/a D_{10} = n/a

C_U = n/a C_C = n/a

CLASSIFICATION

USCS = SM AASHTO = n/a

REMARKS

Specific Gravity (per ASTM D854) = n/a

SIERRA GEOTECHNICAL SERVICES, INC.

ENVIRONMENTAL GEOTECHNICAL GEOLOGY GROUNDWATER MINING MATERIALS
873 NORTH MAIN STREET, SUITE 150, BISHOP, CALIFORNIA 93514
549 OLD MAMMOTH ROAD, SUTIE 222, MAMMOTH LAKES, CALIFORNIA 93546
www.sgsi.us

PROJECT:	CLIENT:		
Lot 32 Lakeside Dr Bridgeport	Wabinski		
SAMPLE DEPTH: TP-1 at 1.0-2.0'	MATERIAL: Native		
SAMPLE DATE: 4/27/17	SAMPLED BY: DD	DELIVERED BY: DD	
JOB NO.: 3.31411	TESTED BY: CS	REVIEWED BY: DD/JA	

APPENDIX C

EARTHWORK AND GRADING

These earthwork and grading specifications are for the grading and earthwork shown on the approved grading or construction plan(s) and/or indicated in the geotechnical report(s). Earthwork and grading should be conducted in accordance with applicable grading ordinances, the current California Building Code, and the recommendations of this report. The following recommendations are provided regarding specific aspects of the proposed earthwork construction. These recommendations should be considered subject to revision based on field conditions observed by the geotechnical consultant during grading.

Geotechnical Consultant of Record

Prior to commencement of work, the owner shall employ the Geotechnical Consultant of Record. The Geotechnical Consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of grading or construction.

During grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include natural ground, after it has been cleared for receiving fill but before it has been placed, bottoms of all "remedial removal areas, all key bottoms, and benches made on sloping ground to receive fill.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to determine the attained level of compaction. The Geotechnical Consultant shall provide the test results to the owner and the contractor on a routine and frequent basis.

The Earthwork Contractor

The Earthwork Contractor shall be solely responsible for performing the grading in accordance with the plans and specifications. The Earthwork Contractor shall review and accept the plans, geotechnical report(s) and these Specifications prior to the commencement of grading. The Earthwork Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultant unsatisfactory conditions, such as unstable soil, improper moisture condition, inadequate compaction, adverse weather, etc… are resulting in a quality of work less than required in these Specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified.

Site Preparation

General: Site preparation includes removal of deleterious materials, unsuitable materials, and existing improvements from areas where new improvements or new fills are planned. Deleterious materials, which include vegetation, trash, and debris, should be removed from the site and legally disposed of off-site. Unsuitable materials include loose or disturbed soils, undocumented fills, contaminated soils, or other unsuitable materials. The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1-percent of organic materials (by volume). Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant etc…) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fine and/or imprisonment and shall not be allowed.

Any existing subsurface utilities that are to be abandoned should be removed and the trenches backfilled and compacted. If necessary, abandoned pipelines may be filled with grout or slurry cement as recommended by, and under the observation of, the Geotechnical Consultant.

Excavation

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured, or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.

All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

Fill Compaction

The onsite soils are suitable for placement as compacted fill provided the organics, oversized rock (greater than 6-inches in diameter) and deleterious materials are removed. Rocks greater than 6-inches and less than 2-feet in diameter can be placed in the bottom of deeper fills or approved areas provided they are selectively placed in such a manner that no large voids are created. All rocks shall be placed a minimum of 4-feet below finish grade elevation unless used for landscaping purposes. Any import soils shall be tested for suitability in advance by the project Geotechnical Engineer.

After making the recommended removals prior to fill placement, the exposed ground surface should be scarified to a depth of approximately 12-inches, moisture conditioned as necessary, and compacted to at least 95-percent of the maximum dry density obtained using ASTM D1557-as a guideline. Surfaces on which fill is to be placed which are steeper than 5:1 (Horizontal to vertical) should be benched so that the fill placement occurs on relatively level ground.

For the parking areas and other improvements a one-foot removal is recommended depending on site conditions (i.e. depth of root zone, and depth of disturbance which may have locally deeper removal depths). The removal bottom should be observed (tested as needed) by the geotechnical consultant prior to placing fill soils. The upper 12-inches of subgrade material along with the Class II Aggregate Base and the Asphaltic concrete shall be compacted to a minimum of 95-percent of the materials maximum dry density as determined by ASTM D1557. The subgrade and aggregate base shall be moisture-conditioned and compacted to 95-percent of the material's maximum dry density as determined by ASTM D-1557 to a depth of 12-inches.

All fill and backfill to be placed in association with the proposed construction should be accomplished slightly over optimum moisture content using equipment that is capable of producing a uniformly compacted product throughout the entire fill lift. Fill materials at less than optimum moisture should have water added and the fill mixed to result in material that is uniformly above optimum moisture content. Fill materials that are too wet can be aerated by blading or other satisfactory methods until the moisture content is as required. The wet soils may be mixed with drier materials in order to achieve an acceptable moisture content.

The fill and backfill should be placed in horizontal lifts at a thickness appropriate for equipment spreading, mixing, and compacting the material, but generally should not exceed eight inches in thickness.

No fill soils shall be placed during unfavorable weather conditions. When work is interrupted by rains or snow, fill operations shall not be resumed until the field tests by the geotechnical engineer indicate that the moisture content and density of the fill are as previously specified.

Slopes

All slopes shall be compacted in a single continuous operation upon completion of grading by means of sheepsfoot or other suitable equipment, or all loose soils remaining on the slopes shall be trimmed back until a firm compacted surface is exposed. Slope compaction tests shall be made within one foot of slope surface.

Cut and fill slopes shall be a maximum of 2:1 (horizontal to vertical) unless approved by the Geotechnical Consultant.

Planting and irrigation of cut and fill slopes and/or installation of erosion control and drainage devices should be completed due to the erosion potential of the soil.

Temporary Excavations

Temporary excavation shall be made no steeper than 1:1 (horizontal to vertical). The recommended slope for temporary excavations does not preclude local raveling and sloughing. Where wet soils are exposed, flatter excavation of slopes and dewatering may be necessary. In areas of insufficient space for slope cuts, or where soils with little or no binder are encountered, shoring shall be used.

All large rocks exposed above temporary cuts shall be removed prior to foundation excavation. In addition any rocks exposed during development from raveling and sloughing should be removed immediately.

All excavations should comply with the requirements of the California Construction and General Industry Safety Orders and the Occupational Safety and Health Act and other public agencies having jurisdiction.

Utility Trench Backfill

All utility trenches in structural areas shall be compacted to a minimum of 95-percent per ASTM D1557. All trenches in non-structural areas shall be compacted to a minimum of 85-percent per ASTM D1557.

All material used for utility trench backfill shall be approved by the Geotechnical Engineer prior to placement. All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1-foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum of 95-percent of maximum from 1-foot above the top of the conduit to the surface.

Lift thickness of utility trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

Regulations of the governing agency may supersede the above, and all trench excavations should conform to all applicable safety codes. The Contractor shall follow all OSHA and Cal/OSHA requirements for safety of trench excavations.