C. W. La Monte Company Inc.

Soil and Foundation Engineers

REPORT OF GEOTECHNICAL INVESTIGATION
AND PRELIMINARY INFILTRATION STUDY
Proposed Commercial Development
Jefferson Road Between Olive Vista Drive and Campo Road
Jamul, California

JOB No. 18-6954

April 5, 2018

Prepared for:

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April 5, 2018 Job No. 18 6954

TO: Steve Powell
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SUBJECT: **REPORT OF GEOTECHNICAL INVESTIGATION AND PRELIMINARY INFILTRATION STUDY**
Proposed Commercial Development
Jefferson Road between Olive Vista Drive and Campo Road
Jamul, California

In accordance with your request, we have performed a geotechnical and infiltration study investigation for the proposed commercial development. We are presenting herein our findings and recommendations. In general, we found the property suitable for the proposed project provided that the recommendations contained herein are adhered to. The site is underlain with competent formational soils with associated surficial fill/residual soils. These loose surface soils will require removal and/or recompaction during future grading operations, if not removed by site grading. Dense soil conditions will likely be encountered during grading operations.

If you should have any questions after reviewing this report, please do not hesitate to contact our office. This opportunity to be of professional service is sincerely appreciated.

Respectfully submitted,
C.W. La Monte Company Inc.

Clifford W. La Monte

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TABLE OF CONTENTS

TABLES

FIGURES

PLATES

APPENDICES

REPORT OF LIMITED GEOTECHNICAL INVESTIGATION
AND PRELIMINARY INFILTRATION STUDY
Proposed Commercial Development
Jefferson Road Between Olive Vista Drive and Campo Road
Jamul, California

PROJECT DESCRIPTION

The following report presents the results of a geotechnical investigation performed for the proposed commercial development. The project site and area of study is an irregular -shaped, parcel of land that is located on the western side of Jefferson Street 350 feet north of the intersection with Campo Road in Jamul San Diego County, California. The project site is an undeveloped property with an assigned APN No. 596-071-60-00. Figures Number 1a and 1b (below and following page) provide a vicinity map showing the approximate location of the property and boundary layout.

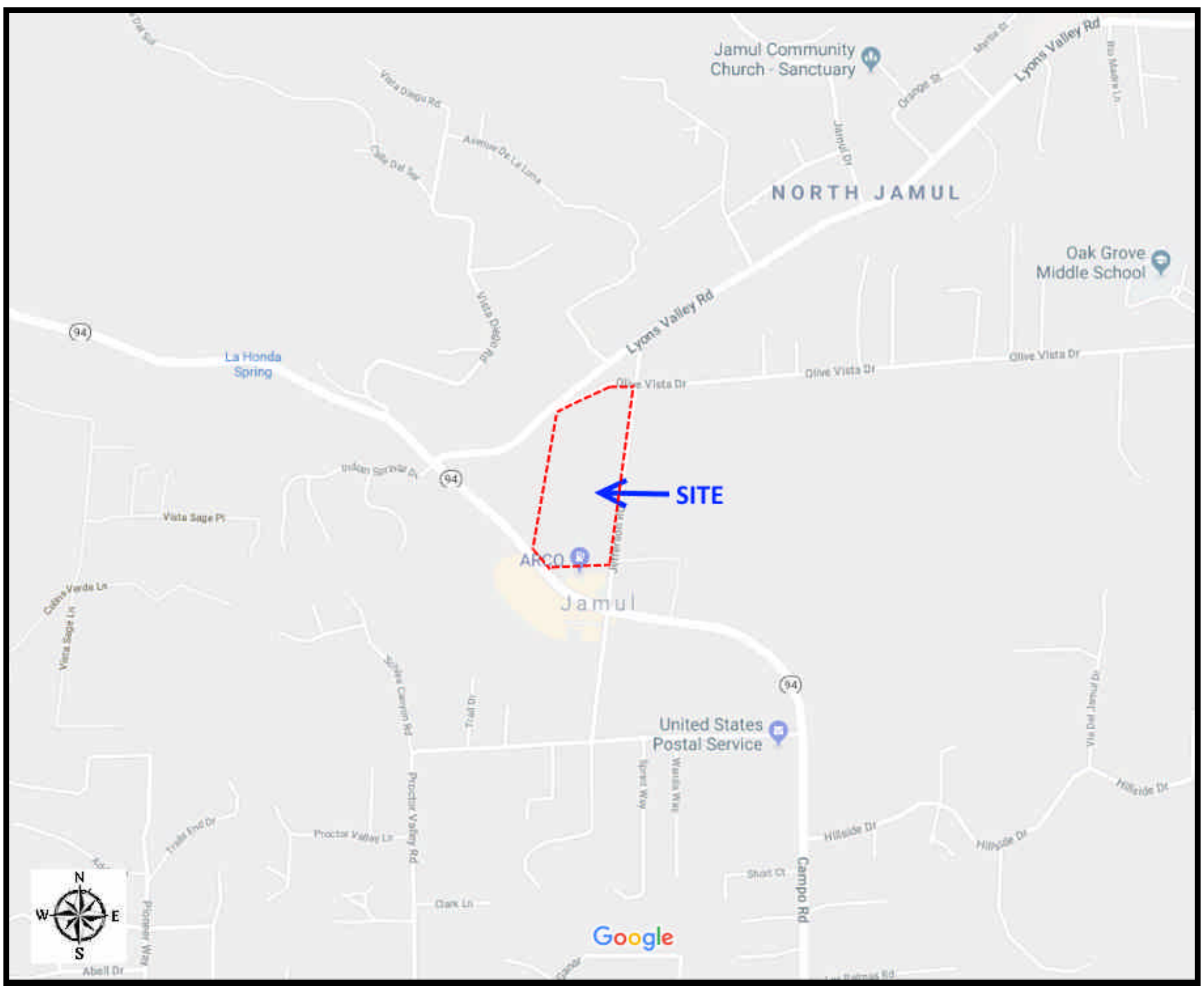


Figure 1a Vicinity Map

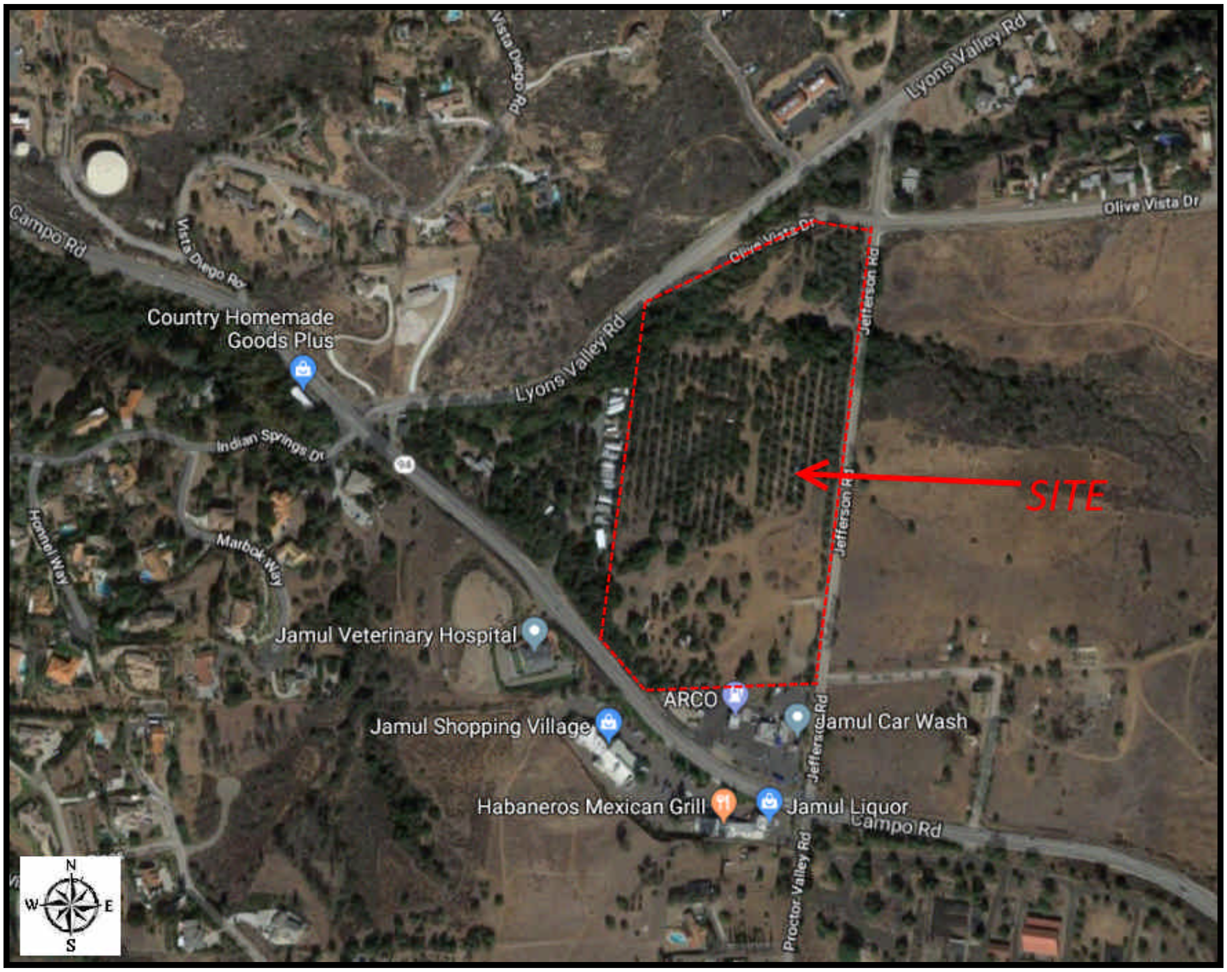


Figure 1b Vicinity Map/Aerial Photograph

The proposed improvements include an 18,800 square foot retail building, a 61,155 square foot self storage facility, asphalted drive and parking areas, stormdrain retention systems, landscape area and a trash enclosure. Proposed grading to construct the building pads will consist of removal of the existing unsuitable soils and replacement with compacted fill. Imported fill soils may be required to raise building pad grades to a suitable elevation. Figure 2 below presents the area of study included in this report.

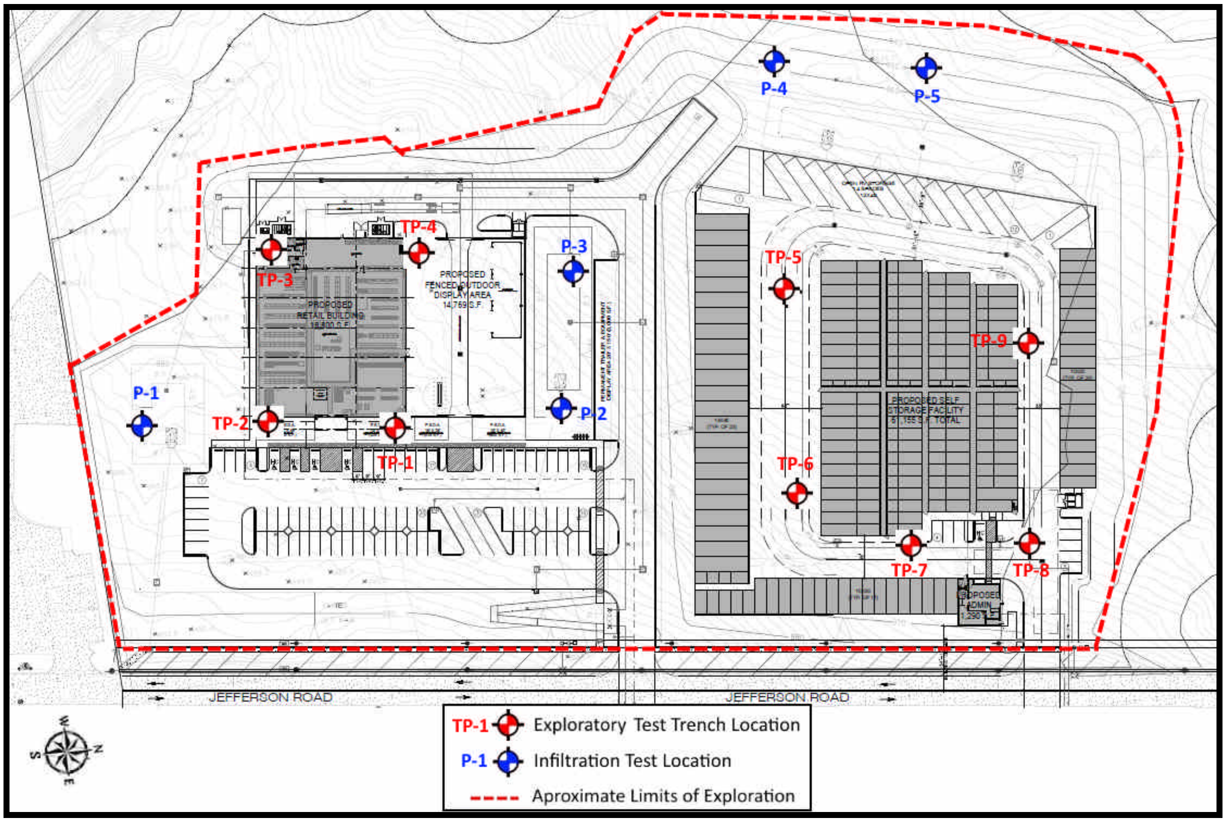


Figure 2 Plot Plan and Area of Exploration

To aid in the preparation of this report, we were provided with an Overall Site Plan, by Empire Design Group, printed October 16, 2017. These plans were used as the basis for the preparation our Plot Plan (Figure No. 2 above).

This report has been prepared for the exclusive use of the stated client and his or her design consultants for specific application to the project described herein. Should the project be changed in any way, the modified plans should be submitted to C.W. La Monte Company, Inc. for review to determine their conformance with our recommendations and to determine if any additional subsurface investigation, laboratory testing and/or recommendations are necessary. Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, expressed or implied.

SCOPE OF WORK

The scope of this investigation was limited to: surface reconnaissance, research of readily available geotechnical literature pertinent to the site; subsurface exploration, engineering and geologic analysis of the field data and preparation of this report. More specifically, the intent of this investigation was to:

- Review of available geotechnical and geologic reports and maps pertinent to the subject site.

- Identify the subsurface conditions of the site to the depths influenced by the proposed grading and construction.

- Based on empirical evaluation and our experience with similar sites in the area, identify the engineering properties of the various strata that may influence the proposed construction, including the allowable soil bearing pressures, expansive characteristics and settlement potential.

- Describe the general geology of the site including possible geologic factors that could have an effect on the site development.

- Provide a site soil classification and mapped spectral acceleration parameters.

- Address potential construction difficulties that may be encountered due to soil conditions, groundwater and provide recommendations concerning these problems.

- Develop soil engineering criteria for site grading.

- Recommend an appropriate foundation system for the type of structures anticipated and develop soil engineering design criteria for the recommended foundation designs.

- Conduct percolation-infiltration testing at the locations of the proposed stormwater BMP's.

- Present our opinions in this written report, which includes in addition to our findings and recommendations, a site plan showing the location of our subsurface explorations, logs of the test trenches and a summary of our laboratory test results.

We did not evaluate the site for hazardous materials contamination. Further, we did not perform laboratory tests to evaluate the chemical characteristics of the on-site soils in regard to their potentially corrosive impact to on-grade concrete and below grade improvements.

FINDINGS

SITE DESCRIPTION

The project site and area of study is an irregular -shaped, parcel of land that is located on the western side of Jefferson Street 350 feet north of the intersection with Campo Road in the community of Jamul, San Diego County, California. Figure Number 1 (page 1) provides a vicinity map showing the approximate location of the property and boundary layout.

Topographically the area of study generally slopes down to the northwest with elevations ranging from +932 to +990 feet msl.

FIELD SUBSURFACE EXPLORATION

A total of nine (9) exploratory borings were excavated at the site using a backhoe with a 24-inch bucket. The excavations were placed specifically in areas where representative soil conditions were expected and/or in the general vicinity of the proposed building structures. CWL directed the excavation of five (5) percolation test borings. These percolation test borings were located in the general vicinity of the proposed BMP's. The excavations were visually inspected and logged by our field geologist, and samples were taken of the predominant soils throughout the field operation. The predominant soils have been classified in conformance with the Unified Soil Classification System. The general location of the engineering excavations (B-1 through B-9); and percolation test excavations (referenced herein as 'P-1' through 'P-5'); is shown on Figure 3 (page 3 above). Logs of the excavations are provided in Plate Nos. 2A through 2E (attached).

Engineering Excavations: As noted previously, CWL directed the excavation of nine exploratory borings. The excavations were performed with a backhoe with a 24-inch bucket to refusal, ranging in depth 2.5 feet to 6 feet. The soils classifications listed in the excavation logs are a result of visual classification of soil with field moisture content. The classifications were assigned in accordance with ASTM D-2488: "Description of Soils (Visual-Manual Method)" and all applicable field soil-identification procedures described therein.

Percolation Excavations and Testing: CWL directed the excavation of five (5) percolation tests borings, located in the general vicinity of the proposed BMP's. The location of these percolation-infiltration test borings (referenced herein as 'P-1' through "P-5) is shown on Figure 3 (page 3 above).

The percolation-infiltration excavations were also performed with a with a backhoe with a 24-inch bucket and with a hand auger and extended to refusal at approximate depths ranging from 2.75 feet to 3.5 feet below the existing grade elevations (P-1 through P-5). The final depths were determined by the ability to continue excavating into the very dense weathered bedrock and to where it was considered representative of the infiltration soils and practical refusal to excavate. Field infiltration testing was performed in accordance with Appendix D of The County of San Diego BMP Design Manual by the Borehole Percolation Test Method (D.3.3.2).

Field measurements were taken to confirm that the borings were excavated to approximately 6-inches in diameter. The boreholes were logged by a CWL geologist, who observed and recorded exposed soil cuttings and the excavation conditions. Logs of the percolation test borings are provided in Plate Nos. 3A through 3C (attached).

Once the test excavations were constructed, the borings were converted to percolation wells

The percolation test holes were pre-soaked before testing and immediately prior to testing. The pre-soak process consisted of filling the hole twice with water before testing or overnight as recommended in the *County of San Diego Best Management Practice Design Manual (BMP Manual, 2016).*

After presoaking overnight, consecutive measurements indicated that less than 6 inches of water percolated in 30 minutes in all the test percolation borings. Water levels were recorded every 30 minutes keeping a constant head.

Upon completion of all work, each percolation boring was backfilled with soil cuttings and patched to match the existing surfacing.

DESCRIPTION OF SUBSURFACE SOIL AND GEOLOGIC CONDITIONS

The site is located in the Foothills Physiographic Province of San Diego County. The source rock for the soils in this province varies from granite to gabbro and generally consists of tonalite, granodiorite, and gabbro. These rocks tend to weather to disintegrated boulders to a considerable depth. Soil types associated with this bouldery topography are the Bonsall, Fallbrook and Vista soils. The gabbro deposits occur as "island" deposits in the Foothills and in the Mountains. Soils that develop in this material have a surface layer of fine sandy loam, are shallow to moderately deep and contain angular stone fragments. Metasedimentary and metavolcanic rocks occurring in the Foothills area are hard and unweathered. The soils derived from these rocks are moderately deep to very shallow and contain numerous rock fragments. Young and old granitic alluvium in the Foothills is derived predominately from granitic rocks and consists of gravelly sandy loam to fine sandy loam and is fairly we1l sorted. The alluvium occurs in broad basins, on alluvial fans, and in narrow drainage ways.

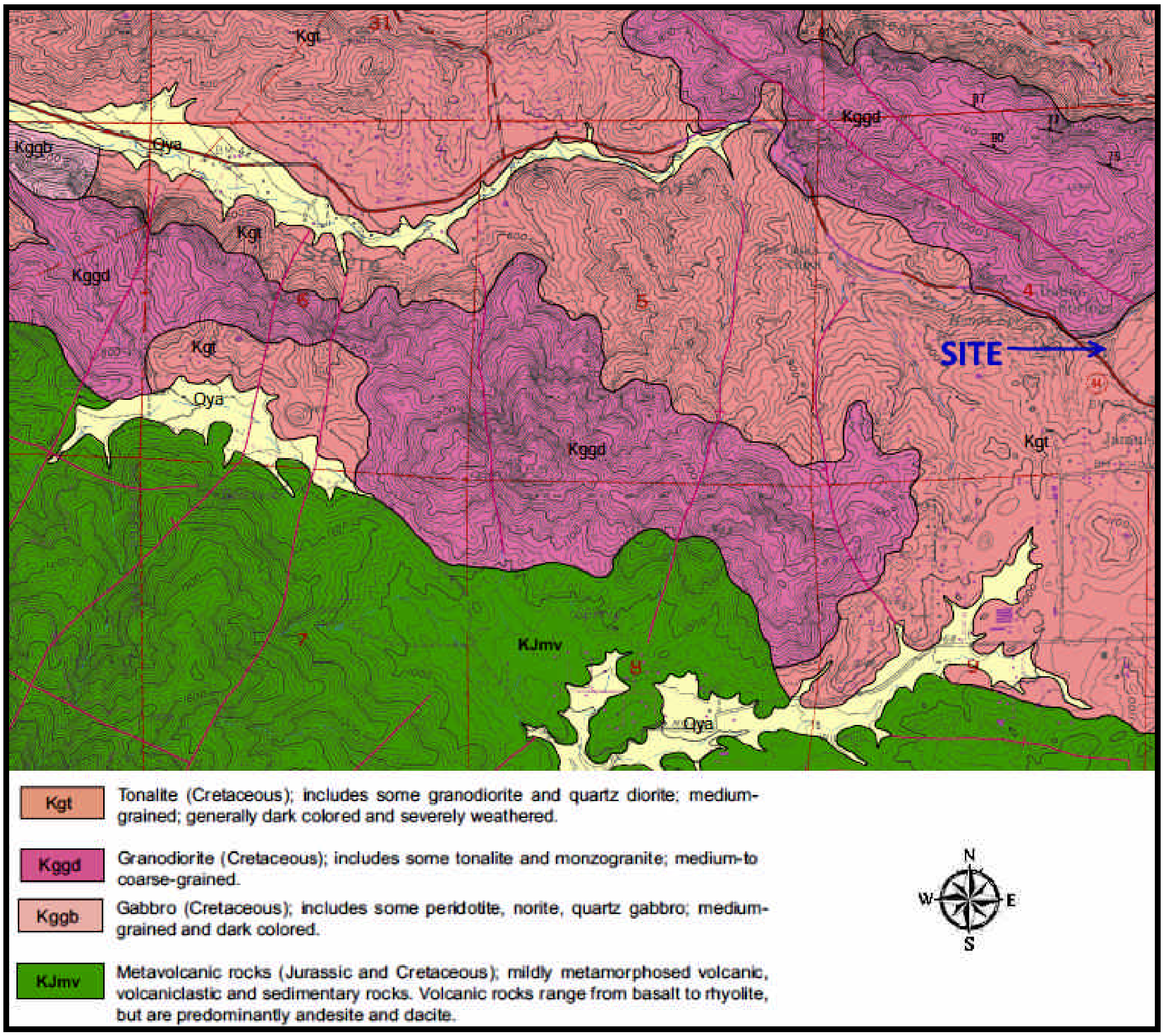


Figure No. 3 Geologic Map

Modified from: Geologic Map of the Jamul Mountains 7.5' Quadrangle San Diego County, California, (2002) Review of the available references (USGS, 2002) indicates that the subject site is underlain by Cretaceous Tonalite (Kgt), which includes some granodiorite and quartz diorite. Typical, over burden deposits consist of topsoil and residual soil/subsoil. These soil types are described individually below in order of increasing age. Refer the attached Test Excavation Logs, Plate No's 2A through 2E (attached) for a more detailed description of subsurface conditions. A Plot Plan and boring Location Map is presented as Figure No 2 (on Page 3 of this report) with the test excavation locations. An excerpt from a regional geologic map is included below as Figure No. 3 (above). Based on our visual and textural classification plus our past experience with similar soils in the vicinity of the subject site, the materials described above are anticipated to possess a "moderate" expansion potential as determined by ASTM D4829.

Topsoil: The subject site is mantled with a thin veneer of topsoil; this material was noted to consist of fine clayey sand to sandy clay. This material was observed to be generally firm to stiff and moist damp to dry and have a medium dense consistency. This topsoil was observed to extend to up to approximately 12 inches in thickness.

Residual Soil/Subsoil: Underlying the surficial topsoil materials described above, we encountered residual soils. These soils were noted to extend to depths of about 2 to 4.5 ft. The encountered natural soils were noted to generally consist of brown to dark brown; sandy clay to silty clay with sand. This material was observed to be very moist and very stiff to hard and contain gypsum fragments.

Weathered Granitic Bedrock (Kgt): Underlying the residual soil/subsoil, we encountered very dense weathered granitic rock, consisting of olive gray and brown (mottled) sandy silty clay.

GROUNDWATER

Groundwater was not encountered in our test explorations and is expected to be deeper than 50 feet from existing elevations.

It should also be recognized that minor groundwater seepage problems might occur after development of a site even where none were present before development. These are usually minor phenomena and are often the result of an alteration in drainage patterns and/or an increase in irrigation water. Based on the permeability characteristics of the soil and the anticipated usage and development, it is our opinion that any seepage problems, which may occur, will be minor in extent. It is further our opinion that these problems can be most effectively corrected on an individual basis if and when they occur.

FAULTING AND SEISMICITY

No faults are known to traverse the site, thus it is not considered susceptible to surface rupture as a result of on-site faulting. The probability of soil cracking caused by shaking from close or distant fault sources is also considered to be low. It should be noted that much of Southern California, including the San Diego County area is characterized by a series of Quaternary-age fault zones, which typically consist of several individual, en echelon faults that generally strike in a northerly to north-westerly direction. Some of these fault zones (and the individual faults within the zones) are classified as active while others are classified as only potentially active, according to the criteria of the California Division of Mines and Geology (currently California Geological Survey). Active fault zones are those that have shown conclusive evidence of faulting during the Holocene Epoch (the most recent 11,000 years), while potentially active fault zones have demonstrated movement during the Pleistocene Epoch (11,000 to 2 million years before the present) but no movement during Holocene time. An excerpt from the *2010 Fault Activity Map of California, Geologic Data Map No. 6*, is attached as Plate No. 4, showing the recency of faulting in the region.

Current geologic literature indicates that the Newport-Inglewood-Rose Canyon Fault Zone is the nearest known active fault. The closest fault strand to the site is the Silver Strand section located approximately 16 miles west of the site. Other active faults close to the site are the Coronado Bank Fault Zone with the fault strands located at approximately 28 miles to the west of the site and the San Diego Trough Fault Zone located at approximately 39 miles to the west of the site.

The Elsinore and San Jacinto Fault Zones are located about 25 and 45 miles (respectively) northeast of the site. The City of San Diego Seismic Safety Element estimates the maximum probable earthquake for both the San Jacinto and the Elsinore fault zones is between M 6.9 and 7.3, with a repeat interval of approximately 100 years. The maximum credible earthquake for both fault zones is estimated at M 7.6. Other active fault zones in the region that could possibly affect the site include the Coronado Bank, San Diego Trough and San Clemente Fault Zones to the southwest, and the Earthquake Valley Fault and San Andreas Fault Zones to the northeast. However, a Maximum Magnitude Earthquake on the Rose Canyon Fault Zone is anticipated to generate ground accelerations on the site, greater than any of these other nearby fault

According to the 2008 *National Seismic Hazard Maps - Fault Parameters* (USGS website), the Maximum Magnitude earthquake on the Rose Canyon Fault Zone is 6.9 (Ellsworth) or 6.7 (Hanks) with a slip rate of 1 to 5 mm/year. The Rose Canyon Fault

Zone is currently classified as a Type "B" fault (*California Probabilistic Seismic Hazard Maps,* June 2003.

According to the *Official Map of Alquist-Priolo Earthquake Fault Zones of California,* by the California Division of Mines and Geology (currently California Geological Survey) (CDMG, 1991) the site **IS NOT** located an Alquist-Priolo Earthquake Fault Zone map.

SEISMIC DESIGN PARAMETERS

To determine the site seismic parameters, we utilized the ground motion maps provided in the 2016 California Building Code (CBC, 2016). C.W LaMonte utilized the seismic design criteria provided in the CBC 2016. Table 6.1 provides the seismic design parameters assuming the new structures are designed in accordance with seismic design requirements of 2015 NEHRP Provisions.

The analysis included the following input parameters:

Design Code Reference Document: 2015 NEHRP
Site Soil Classification: Site Class C
Risk Category: I or II or III
Site Coordinates: 32.7197^{0} °N, 116.8766°W

The values generated by the *Design Map Report* are provided in the following table:

TABLE I
Site Coefficients and Spectral Response Acceleration Parameters

S_S	S_1	F_a	F_v	S_{MS}	S_{M1}	S_{DS}	S_{D1}	PGA
0.718 g	0.266 g	1.213	1.500	0.871 g	0.399 g	0.580 g	0.266 g	0.370

Application to the criteria in Table I for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if ever seismic shaking occurs. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

GEOLOGIC HAZARDS

General

No geologic hazards of sufficient magnitude to preclude development of the site as we presently contemplate it are known to exist. In our professional opinion and to the best of our knowledge, the site is suitable for the proposed development.

Ground Shaking

A likely geologic hazard to affect the site is ground shaking as a result of movement along one of the major active fault zones mentioned above. Probable ground shaking levels at the site could range from slight to severe, depending on such factors as the magnitude of the seismic event and the distance to the epicenter. It is likely that the site will experience the effects of at least one moderate to large earthquake during the life of the proposed structure. Construction in accordance with the minimum requirements of the California Building Code, the Structural Engineers Association of California lateral force design requirements, and local governing agencies should minimize potential damage due to seismic activity.

Landslide Potential and Slope Stability

A detailed, deterministic slope stability analysis was not included within our scope of services. However, the proposed development area of site is generally flat and underlain by very shallow very dense material. Furthermore, the proposed grading is not planned to create significant slopes at the site.

Due to the sites moderate topography and underlying stable bedrock, deep-seating landsliding does not present a significant hazard.

Liquefaction

Liquefaction of soils can be caused by strong vibratory motion in response to earthquakes. Both research and historical data indicate that loose mostly fine sands or predominantly granular soils are susceptible to liquefaction, while the stability of rock is not as adversely affected by vibratory motion. Liquefaction is generally known to occur primarily in cohesionless silt, sand, and fine grained gravel deposits of Holocene to late Pleistocene age in areas where the groundwater is shallower than about 50 feet (DMG Special Publication 117). Is also a function of relative density, soil type and probable intensity and duration of ground shaking. Based on the results of our field investigation, the subject site is underlain by shallow very dense formational material. As such the potential for liquefaction at the site is non-existent.

Flooding

According to the maps prepared by the Federal Emergency Management Agency the site is located in Zone X-Area of Minimal Flood Hazard.

Tsunamis and Seiches

Tsunamis are large sea waves produced by submarine earthquakes or volcanic eruptions. Based on the project's inland and elevated location, the site is considered to possess a very low risk potential from tsunamis. Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays or reservoirs. The site is considered to have a very low risk potential for damage caused by seiches.

CONCLUSIONS

In general, we found the subject property suitable for the proposed construction, provided the recommendations provided herein are followed. The most significant findings and geotechnical conditions that will influence site development are summarized below. Detailed recommendations for precede this section of the report.

- The building sites are overlain with topsoil and residual soil overlying dense, bedrock material. The encountered topsoil and residual soil were noted to extend to approximately 4.5 feet in depth. These surficial materials are considered unsuitable in their present condition to support structural fill and/or settlement sensitive improvements. As such, all topsoil and residual soil materials not removed by planned site grading will need to be removed from areas to support fills and/or settlement sensitive improvements and, where necessary to achieve planned site grades, be replaced as properly compacted fill.

- The site is underlain at relatively shallow depths by very dense bedrock material. Though variable throughout the site, this material generally consists of olive gray and brown (mottled) sandy silty clay. Our site investigation indicates that the bedrock material underlying the site is generally very dense very shallow, and may require large equipment in good condition.

- Generally, the soils underlying the site are considered to possess a **medium** expansive potential as determined by ASTM D4829. Although we encountered some areas with a residual soil consisting of silty clay, this material should be removed from the building pad areas and replaced with sandy material with an expansion index of less than 50.

- No significant cut –fill transitions are anticipated by proposed grading.

RECOMMENDATIONS

EARTH WORK AND GRADING

Specification Guidelines

All grading should conform to the guidelines presented in this report and the 2016 California Building Code, the minimum requirements of the County of San Diego, and the Standard Grading and Construction Specifications, Appendix "A", attached hereto, except where specifically superseded in the text of this report. Prior to grading, a representative of C.W. La Monte Company Inc. should be present at the preconstruction meeting to provide additional grading guidelines, if necessary, and to review the earthwork schedule.

Observation and testing by the soil engineer is essential during the grading operations. This allows the soil engineer to confirm the conditions anticipated by our investigation, to allow adjustments in design criteria to reflect the actual field conditions exposed, and to determine that the grading proceeds in general accordance with the recommendations contained herein

Fill Suitability

On-site excavated materials may be used as compacted fill material or backfill provided that clayey soils are removed from the building pads and structural improvements on site and they are screened of rocks larger than 6-inch diameter. At least two working days notice of a potential import source should be given to the Geotechnical Consultant so that appropriate testing can be accomplished. The type of material considered most desirable for import is a non-detrimentally expansive granular material with some silt or clay binder.

Site Preparation

Site preparation should begin with the removal of all vegetation and other deleterious materials from the portion of lot that will be graded and that will receive improvements. This should include all root balls from the trees and shrubs removed and all significant root material. The resulting materials should be disposed of off-site.

After clearing and grubbing, site preparation should continue with the removal all existing loose topsoil, residual soil, slope wash, colluvium and undocumented fill (if encountered) from areas that will be graded or that will support settlement-sensitive improvements. As the project is presently planned, fills and unsuitable material removals are, generally, expected to be 2 to 5 feet from existing ground elevation. Please note the estimated removal depths may be deeper in localized areas. The loose soil shall be removed to expose dense natural bedrock ground as determined by our field representative during grading.

Prior to placing any fill soils or constructing any new improvements in areas that have been cleaned out to receive fill, the exposed soils should be scarified to a depth of approximately 6 to 12 inches, be moisture conditioned, and compacted to at least 90 percent relative compaction.

Compaction and Method of Filling

Any structural fill placed at the site should be compacted to a relative compaction of at least 90 percent of its maximum dry density as determined by ASTM Laboratory Test D1557 guidelines. Fills should be placed at or slightly above optimum moisture content, in lifts six (6) to eight (8) inches thick, with each lift compacted by mechanical means. Fills should consist of approved earth material, free of trash or debris, roots, vegetation, or other materials determined to be unsuitable by our soil technicians or project geologist. All material should be free of rocks or lumps of soil in excess of twelve inches in maximum width. However, in the upper two feet of pad grade, no rocks or lumps of soil in excess of six inches should be allowed.

Utility trench backfill within five feet of the proposed structure and beneath all pavements and concrete flatwork should be compacted to a minimum of 90 percent of its maximum dry density. The upper one-foot of pavement subgrade and base material should be compacted to at least 95 percent relative density. All grading and fill placement should be performed in accordance with the local Grading Ordinance, the California Building Code, and the Recommended Grading Specifications and Special Provisions attached hereto as Appendix A.

Select Grading

The residual soil mantling the site have been determined to possess a moderate expansive potential. In order to use conventional spread foundations and on-grade floor slabs, the expansive portions of the residual soils that are to be used as fill material should be mixed with other on-site or select import soils to produce a non-detrimental expansive mixture of soil. The upper 2 to 4 feet of existing subgrade may need to be processed in order to provide appropriate subgrade conditions. Non-detrimental expansive soils are defined herein as soils with an expansion index less than 50. Samples of the mixed fill material placed at the foundation level should be tested to verify that a non-detrimental expansive mix has been achieved. Where the mixture of soil does not produce a non-detrimental expansive fill material, special consideration for heaving soil may need to be incorporated into the foundation design.

Excavation Characteristics

The on-site material is likely to be excavated with moderate to difficult effort using large excavating equipment. Localized large, cobble size rock could be encountered during excavating operations. We anticipate planned site excavations will generate some oversize rock debris (rock material over 12 inches in width is considered to be oversize). Oversized rock should be disposed off-site or used as landscape features without any special preparation.

Surface Drainage

Per Section 1804 of the California Building Code, in general, the ground immediately adjacent to foundations shall be sloped away from the building at a slope of not less than one unit vertical in 20 units horizontal (5-percent slope) for a minimum distance of 10 feet measured perpendicular to the face of the wall. If physical obstructions or lot lines prohibit 10 feet of horizontal distance, a 5-percent slope shall be provided to an approved alternative method of diverting water away from the foundation. Swales used for this purpose shall be sloped a minimum of 2 percent where located within 10 feet of the building foundation. Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2 percent away from the building.

Exceptions are allowed where climatic or soil conditions warrant, the slope of the ground away from the building foundation shall be permitted to be reduced to not less than one unit vertical in 48 units horizontal (2-percent slope). The procedure used to establish the final ground level adjacent to the foundation shall account for additional settlement of the backfill.

Erosion Control

In addition, appropriate erosion-control measures shall be taken at all times during construction to prevent surface runoff waters from entering footing excavations, ponding on finished building pad or pavement areas, or running uncontrolled over the tops of newly-constructed cut or fill slopes. Appropriate Best Management Practice (BMP) erosion control devices should be provided in accordance with local and federal governing agencies.

Grading Plans Review

The finalized, grading plans should be submitted to this office for review to ascertain that the recommendations provided in this report have been followed and that the assumptions utilized in its preparation are still valid. Additional or amended recommendations may be issued based on this review.

FOUNDATIONS

General

Based on the findings of our investigation, it is our opinion the proposed structures may be supported by conventional continuous and isolated spread footings. The on-site materials generally possess a low expansive potential, although as noted previously, localized areas containing expansive clays were encountered within the proposed building pads. As such we recommend that these clayey soils where encountered be removed and replaced with granular low expansion soils. Consideration for heaving soils is included in our recommendations.

Dimensions and Embedment

Conventional shallow foundations may be utilized in the support of the proposed structures when founded on firm natural ground or properly compacted fill soils. Foundations should be constructed in accordance with the recommendations of the project structural engineer. The table provided below is suggests minimum foundation dimensions:

TABLE II
Foundation Embedment

Number of Floors Supported by The Foundation	Width of Footing (Inches)	Embedment Depth Below Undisturbed Ground Surface * (Inches)
1	12	12
2	15	18
3	18	24

* Assumes non-expansive as-built subgrade conditions

Isolated pad footings should have a minimum width of 24 inches.

Soil Bearing Value

A bearing capacity of **2000 psf** may be assumed for footings when founded a minimum of 12 inches into firm natural ground or properly compacted fill. Bearing capacity may be increased by one-third, when considering wind and/or seismic loading.

Lateral Load Resistance

Lateral loads against foundations may be resisted by friction between the bottom of the footing and the supporting soil, and by the passive pressure against the footing. The coefficient of friction between concrete and soil may be considered to be 0.35. The passive resistance may be considered to be equal to an equivalent fluid weight of 325 pounds per cubic foot. This assumes the footings are poured tight against undisturbed soil. If a combination of the passive pressure and friction is used, the friction value should be reduced by one-third.

Foundation Reinforcement

Reinforcement requirements for foundations should be provided by a structural engineer. However, based on the existing soil conditions and provided the transition building pads are undercut as recommended above, we recommend that the <u>minimum</u> reinforcing for continuous footings consist of at least two No. 5 bars, one bar positioned three inches above the bottom of the footing and one No. 5 bar positioned approximately three inches below the top of the footing.

Anticipated Settlements

Based on our experience with the soil types on the subject site, the soils should experience settlement in the magnitude of less than 0.5 inches under proposed structural loads.

It should be recognized that minor hairline cracks normally occur in concrete slabs and foundations due to shrinkage during curing and/or redistribution of stresses and some cracks may be anticipated. Such cracks are not necessarily an indication of excessive vertical movements.

Foundation Plans Review

The finalized, foundation plans should be submitted to this office for review to ascertain that the recommendations provided in this report have been followed and that the assumptions utilized in its preparation are still valid. Additional or amended recommendations may be issued based on this review.

CONCRETE SLABS-ON-GRADE

Interior Floor Slabs

The minimum floor slab thickness should be four (4) inches. The floor slabs should be reinforced with at least No. 3 bars placed at 18 inches on center each way. Slab reinforcing should be supported by concrete chairs and be positioned at mid-height in the floor slab. This recommendation does not supersede the section required for structural considerations.

Exterior Concrete Flatwork

On-grade exterior concrete slabs for walks and patios should have a thickness of four (4) inches and should be reinforced with at least No. 3 reinforcing bars placed at 24 inches on center each way. Exterior slab reinforcement should be placed approximately at mid-height of the slab. Reinforcement and control joints should be constructed in exterior concrete flatwork to reduce the potential for cracking and movement. Joints should be placed in exterior concrete flatwork to help control the location of shrinkage cracks. Spacing of control joints should be in accordance with the American Concrete Institute specifications. Where slabs abut foundations they should be doweled into the footings.

SLAB MOISTURE BARRIERS

A moisture barrier system is recommended beneath any new interior slab-on-grade floors with moisture sensitive floor coverings or coatings to help reduce the upward migration of moisture vapor from the underlying subgrade soil. A properly selected and installed vapor retarder is essential for long-term moisture resistance and can minimize the potential for flooring problems related to excessive moisture.

Interior floor slabs should be underlain by a 2-inch layer of clean sand underlain by a minimum 10-mil thick moisture retarder product over a two-inch thick layer of clean sand (Please note, additional moisture reduction and/or prevention measures may be needed, depending on the performance requirements for future floor covering products). The moisture retarder product used should meet or exceed the performance standards dictated by ASTM E 1745 Class A material and be properly installed in accordance with ACI publication 302 (*Guide to Concrete Floor and Slab Construction*) and ASTM E1643 (*Standard Practice for Installation of Water Vapor Retarder Used in Contact with Earth or Granular Fill Under Concrete Slabs)*. Ultimately, the design of the moisture retarder system and recommendations for concrete placement and curing are purview of the structural engineer, in consideration of the project requirements provided by the project architect and developer.

The above described section is considered a moisture retarder and does not necessarily provide a waterproof floor system. If full waterproofing is desired, an appropriate moisture waterproofing product should be selected and incorporated into the overall waterproofing system.

Moisture Retarders and Installation

Vapor retarder joints must have at least 6-inch-wide overlaps and be sealed with mastic or the manufacturer's recommended tape or compound. No heavy equipment, stakes or other puncturing instruments should be used on top of the liner before or during concrete placement. In actual practice, stakes are often driven through the retarder material, equipment is dragged or rolled across the retarder, overlapping or jointing is not properly implemented, etc. All these construction deficiencies reduce the retarders' effectiveness. It is the responsibility of the contractor to ensure that the moisture retarder is properly placed in accordance with the project plans and specifications and that the moisture retarder material is free of tears and punctures and is properly sealed prior to the placement of concrete.

Interior Slab Curing Time

Following placement of concrete floor slabs, sufficient drying time must be allowed prior to placement of floor coverings. Premature placement of floor coverings may result in degradation of adhesive materials and loosening of the finish floor materials. Prior to installation, standardized testing (calcium chloride test and/or relative humidity) should be performed to determine if the slab moisture emissions are within the limits recommended by the manufacturer of the specified floor-covering product.

DESIGN PARAMETERS FOR EARTH RETAINING STRUCTURES

Parameters for masonry retaining walls are provided as follows (if needed).

Soil Bearing Value

Conventional spread footings with the above minimum dimensions may be designed for an allowable soil bearing pressure of 2,000 pounds per square foot for foundation bearing in compacted fill. Foundations bearing in very dense formation "bedrock" may utilize 3000 psf.

Passive Pressure

The passive pressure for the prevailing soil conditions may be considered to be 325 pounds per square foot per foot of depth. This pressure may be increased one-third for seismic loading. The coefficient of friction for concrete to soil may be assumed to be 0.35 for the resistance to lateral movement. When combining frictional and passive resistance, the friction value should be reduced by one-third.

Active Pressure for Retaining Walls

Lateral pressures acting against masonry and cast-in-place concrete retaining walls can be calculated using soil equivalent fluid weight. The equivalent fluid weight value used for design depends on allowable wall movement. Walls that are free to rotate at least 0.5 percent of the wall height can be designed for the active equivalent fluid weight. Retaining walls that are restrained at the top (such as basement walls), or are sensitive to movement and tilting should be designed for the at-rest equivalent fluid weight.

Values given in the table below are in terms of equivalent fluid weight and assume a triangular distribution. The provided equivalent fluid weight values assume that imported or onsite granular soils will be used as backfill. Clayey soil should not be used as backfill.

Table III
Equivalent Fluid Weights (efw) For Calculating Lateral Earth Pressures
(Using "Select" Onsite Backfill)

Condition: Level Backfill	
Active	40 pcf
At-Rest	80 pcf

Retaining Wall Foundations

Retaining wall foundations shall be designed by the structural engineer based on the appropriate parameters provided in this report.

All foundation excavations should be observed by the Geotechnical Consultant prior to placing the wall base course. All footing excavations should be excavated neat and level with level steps excavated for sloping terrain. Where applicable, we recommendation all footings penetrate any loose surficial topsoils and be founded in competent natural ground or documented (compacted) fill. In areas of remedial grading the foundation may be founded in recompacted, controlled fill material at design depths.

Waterproofing and Drainage

In general, retaining walls should be provided with a drainage system adequate to prevent the buildup of hydrostatic forces and be waterproofed as specified by the project architect. Also refer to American Concrete Institute ACI 515.R (A Guide to the Use of Waterproofing, Damp Proofing, Protective and Decorative Barriers Systems for Concrete).

Positive drainage for retaining walls should consist of a vertical layer of permeable material positioned between the retaining wall and the soil backfill. Such permeable material may be composed of a composite drainage geosynthetic or a natural permeable material such as crushed rock or clean sand at least 12 inches thick and capped with at least 12 inches of backfill soil. The gravel should be wrapped in a geosynthetic filter fabric. Provisions should be made for the discharge of any accumulated groundwater. The selected drainage system should be provided with a perforated collection and discharge pipe placed along the bottom of the permeable material near the base of the wall. The drain pipe should discharge to a suitable drainage facility. If lateral space (due to property line constraints) is insufficient to allow installation of the gravel-wrapped "burrito" drain, a geocomposite system may be used in lieu of the typical gravel and pipe subdrain system. TenCate's MiraDrain (and similar products) provide a "low-profile" drainage system that requires minimal lateral clearance for installation. MiraDRAIN and similar products may also be incorporated into a waterproofing system and provide a slab drainage system (Please note that supplemental manufacturer's details will be required to provide a waterproofed system), for suggested retaining wall drainage details.

Backfill

All backfill soils should be compacted to at least 90% relative compaction. Imported or on-site sands, gravels, silty sand (SM) and clayey sand (SC) materials are suitable for retaining wall backfill. The wall should not be backfilled until the masonry has reached an adequate strength. Soil with an expansion index (EI) of greater than 50 should not be used as backfill material behind retaining walls, which includes the predominant on-site material.

Any potential import soil sites should be evaluated and approved by the Geotechnical Consultant prior to importation. At least two working days notice of a potential import source should be given to the Geotechnical Consultant so that appropriate testing can be accomplished. The proposed import should meet or exceed the above provided soil parameters and should consists of non-detrimentally expansive material.

Only manually operated compaction equipment should be used in the area adjacent to the wall. Heavy equipment should be maintained at least 3 feet from the backside of the wall so as not to exert any additional surcharge loads

PAVEMENT RECOMMENDATIONS

Asphalt Pavement Section

Final pavement design should be based upon sampling and testing of post graded conditions. For preliminary design and estimating purposes, the following pavement structural sections can be used for the range of likely Traffic Index wheel loads. The preliminary sections are based on an assumed R-Value of 20, which in our opinion is a conservative estimate for local material.

TABLE IV
Preliminary Pavement Design

R-Value*	Traffic Index	Asphaltic Concrete Thickness (Inches)	Aggregate Base Thickness (Inches)
20	4.5	4	6
	6	4	8
	7	5	10

* Estimated R-Value -testing required during site grading.

Site Preparation for Pavement Areas

The upper one (1) foot of pavement subgrade soils should be at or near optimum moisture content and should be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D1557. Aggregate base should be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D1557and should conform with the specifications listed in Section 26 of the *Standard Specifications for the State of California Department of Transportation* (Caltrans) or Section 200-2 of the *Standard Specifications for Public Works Construction* (Green Book). The asphalt concrete should conform to Section 26 of the Caltrans *Standard Specifications* or Section 203-6 of the Green Book.

LABORATORY TESTS AND SOIL INFORMATION

Based on the proposed grading, final finish grades and shallow depth to very dense formation materials, we only obtained bulk samples from the test excavations for expansion index. We recommend that samples be obtained of the materials being used as fill/backfill and samples of the near finish grade materials to determined the engineering and corrosivity properties. At that point CWL can provide supplemental engineering recommendations if warranted.

Classification: Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System.

Expansion Index: Expansion Index testing on a remolded sample was performed on a representative sample of the existing clayey subsoil. The test was performed on the portion of the sample passing the #4 standard sieve. The sample was brought to near optimum moisture content. The specimen was then compacted in a 4-inch-diameter mold in two equal layers by means of a tamper, then trimmed to a final height of 1 inch, and brought to a saturation of approximately 50 percent. The specimen was placed in a consolidometer with porous stones at the top and bottom; a total normal load of 12.63 pounds was placed (144.7 psf). The sample was saturated, and the change in vertical movement was recorded until the rate of expansion became nominal. The expansion index is reported below as the total vertical displacement.

TABLE V
Expansion Index Test

Sample Location:	**TP-1 + TP-2 @ 1-3 ft.**
Initial Moisture Content:	13.6%
Initial Dry Density:	97.6
Expansion Index:	71
CBC Classification:	Medium

STORMWATER INFILTRATION –RETENTION EVALUATION

Percolation testing for design of stormwater infiltration BMPs was completed after guidance contained in the *County of San Diego Best Management Practice Design Manual; Appendix C and D (BMP Manual, 2016).*

Based upon the indications of the field exploration and laboratory testing reported herein, CWL has evaluated the site as summarized below.

- Based on our review and site reconnaissance it appears that there is no visible evidence of areas of contaminated soil or contaminated groundwater known to be within the site or the immediate surroundings of the site.
- There are no 'brownfield' sites within 1,000 feet of the site.
- There are no slopes steeper than 25% within the site limits.
- There are no known water supply wells, permitted UST's (GeoTracker, 2016) or permitted graywater systems within 1,000 feet of locations contemplated for retention/biofiltration/BMPs.

Figure 4 (Below) depicts the location of the testing. This section provides the results of those testing and related recommendations for management of stormwater in conformance with the *County of San Diego Best Management Practice Design Manual (BMP Manual, 2016).*

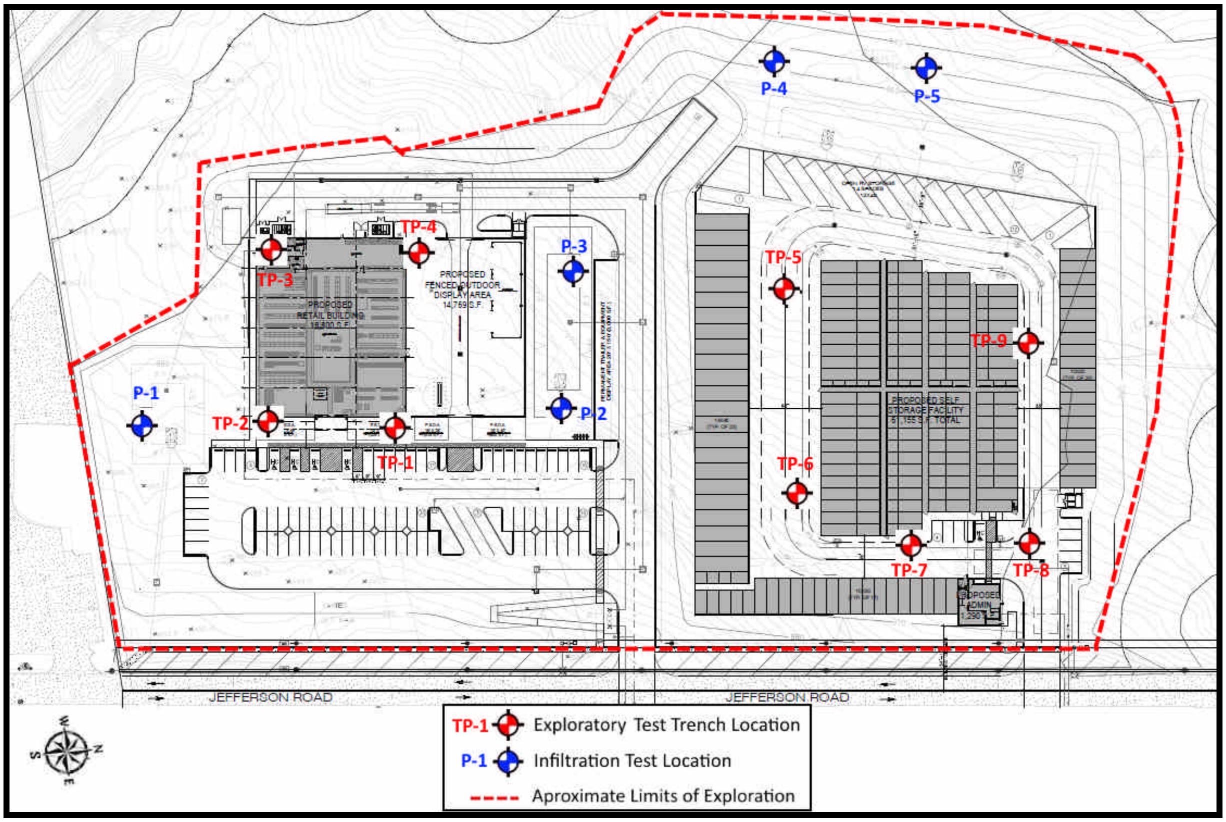


Figure 4 Percolation Test Locations

Field Subsurface Exploration

Five (5) percolation tests borings were excavated on the site in the general areas of the planned BMP's. The location of the percolation test borings (referenced herein as P-1 through P-5) is shown on Figure 4 (above). Logs of the percolation test borings are provided in Plate Nos. 3A through 3C (attached).

As is well-established by the *County of San Diego Best Management Practice Design Manual (BMP Manual, 2016)*, the feasibility of stormwater infiltration is principally dependent on geotechnical and hydrogeologic conditions at the project site. This section provides CWL's assessment of the feasibility for stormwater infiltration BMPs utilizing the information developed by the field exploration, as well as other elements of the site assessment.

BMP Soil and Geologic Conditions

The percolation tests excavations completed for this assessment disclose the sequence of artificial fill and Quaternary Young Alluvial Fan deposits described below.

Topsoil: The subject site is mantled with a thin veneer of topsoil; this material was noted to consist of fine clayey sand to sandy clay. This material was observed to be generally firm to stiff and moist damp to dry and have a medium dense consistency. This topsoil was observed to extend to up to approximately 12 inches in thickness.

Residual Soil/Subsoil: Underlying the surficial topsoil materials described above, we encountered residual soils. These soils were noted to extend to depths up to 4.5 ft. The encountered natural soils were noted to generally consist of brown to dark brown; sandy clay to silty clay with sand. This material was observed to be very moist and very stiff to hard and contain gypsum fragments.

Weathered Granitic Bedrock (Kgt): Underlying the residual soil/subsoil, we encountered very dense weathered granitic rock, consisting of olive gray and brown (mottled) sandy silty clay. These soils yielded very shallow refusal to excavate.

The United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS) provides soil data and information for the entire United States. Data available from the USDA NRCS include a description of the soils, their location on the landscape, and tables that show soil properties and limitations affecting various uses.

Review of USDA NRCS data indicates that the area of study is underlain mainly by soil unit "RaC2", Ramona sandy loam, with a 55.6 percent of the site and assigned a hydrologic soil group C. "RaD2" which is described as Ramona sandy loam as well, occupying 26.8 percent of the site and assigned a hydrologic soil group C. "FaC2" Fallbrook sandy loam with a 12 percent of the site and assigned a hydrologic soil group C. Two other minor components "CmrG" Cieneba very rocky coarse sandy loam with a 2.5 percent of the site and "PeD2" Pacentia sandy loam with a 3.1 percent of the site.

Soil Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Site Specific Percolation/Infiltration Testing:

The percolation-infiltration excavations were performed with a backhoe and extended approximately 18-inches with hand auger or to refusal at approximate depths ranging from of 2.75 feet and 3.5 feet below the existing grade elevations. The final depths were determined by the ability to continue excavating into the very dense; well cemented formational soils and to where it was considered representative of the infiltration soils and practical refusal to excavate. All percolation borings were extended into very dense well cemented formational materials consisting of a cobble-gravel conglomerate. Testing was performed in accordance with Appendix D of the *County of San Diego Best Management Practice Design Manual (BMP Manual, 2016)*, by the Borehole Percolation Test Method.

Appendix D of the BMP manual provides a description of the field work undertaken to complete the testing. Figure No. 4 (page 24), depicts the location of the testing. The following section provides the results of the testing and related recommendations for management of stormwater in conformance with the BMP Manual.

All percolation tests (P-1 through P-5) used the Borehole Percolation Test Method, penetrating the existing topsoil and residual soil and infiltrating into the bedrock. Testing locations are shown on Figure No. 4 (page 24).

The feasibility of stormwater infiltration is principally dependent on geologic and hydrogeologic conditions at the project site. This section provides CWL's assessment of the feasibility of stormwater infiltration BMPs utilizing the information developed by the field exploration, as well as other elements of the site assessment.

Table VI below provides a summary of the testing to determine the percolation rate. The percolation rate of a soil profile is not the same as its infiltration rate ('I'). Therefore, the measured/calculated field percolation rate was converted to an estimated infiltration rate utilizing the Porchet Method in accordance with guidance contained in the BMP Manual. Records related to the percolation testing (Worksheet C.4-1), are provided in Appendix C.

Results of percolation testing and infiltration rate are presented in the following table.

TABLE VI
Percolation-Infiltration Test Results

Test	Depth Of Test[1] (Feet)	Subsurface Unit Tested[2]	Infiltration Rate (in/hour)	Infiltration Rate (in/hour, F=2*)
P-1	3.25	Kgt	0.457	0.228
P-2	2.75	Kgt	0.114	0.057
P-3	3.40	Kgt	0.125	0.063
P-4	2.80	Kgt	0.032	0.016
P-5	3.40	Kgt	0.273	0.137

"F" Indicates Factor of Safety

Notes to Table 1:
1. Depth of test limited to (practical refusal depth)
2. 'Kgt' indicates the very dense, well cemented granitic bedrock.

Design Infiltration Rate

As may be seen by review of Table VI, the infiltration rates measured across the site were very minimal. Measured infiltration across the area were measured at I = 0.016 to 0.228 inches per hour (using a minimum factor of safety of 2).

Based on the requirements of the *City County of San Diego Best Management Practice Design Manual (BMP Manual, 2016)*, and the results of our infiltration, it appears that the site is not feasible for the implementation of a full or partial stormwater infiltration BMPs at the locations addressed by this report and alternate methods of retention and or biofiltration, or other approved system should be considered for the design of BMP's at the site.

LIMITATIONS

The recommendations presented in this report are contingent upon our review of final plans and specifications. Such plans and specifications should be made available to the Geotechnical Engineer and Engineering Geologist so that they may review and verify their compliance with this report and with Appendix A and the current California Building Code. It is recommended that C.W. La Monte Company Inc. be retained to provide soil-engineering services during the construction operations. This is to verify compliance with the design concepts, specifications or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

The recommendations and opinions expressed in this report reflect our best estimate of the project requirements based on an evaluation of the subsurface soil conditions encountered at the subsurface exploration locations and on the assumption that the soil conditions do not deviate appreciably from those encountered. It should be recognized that the performance of the foundations and/or cut and fill slopes may be influenced by undisclosed or unforeseen variations in the soil conditions that may occur in the intermediate and unexplored areas. Any unusual conditions not covered in this report that may be encountered during site development should be brought to the attention of the Geotechnical Engineer so that he may make modifications if necessary.

This office should be advised of any changes in the project scope or proposed site grading so that we may determine if the recommendations contained herein are appropriate. It should be verified in writing if the recommendations are found to be appropriate for the proposed changes or our recommendations should be modified by a written addendum.

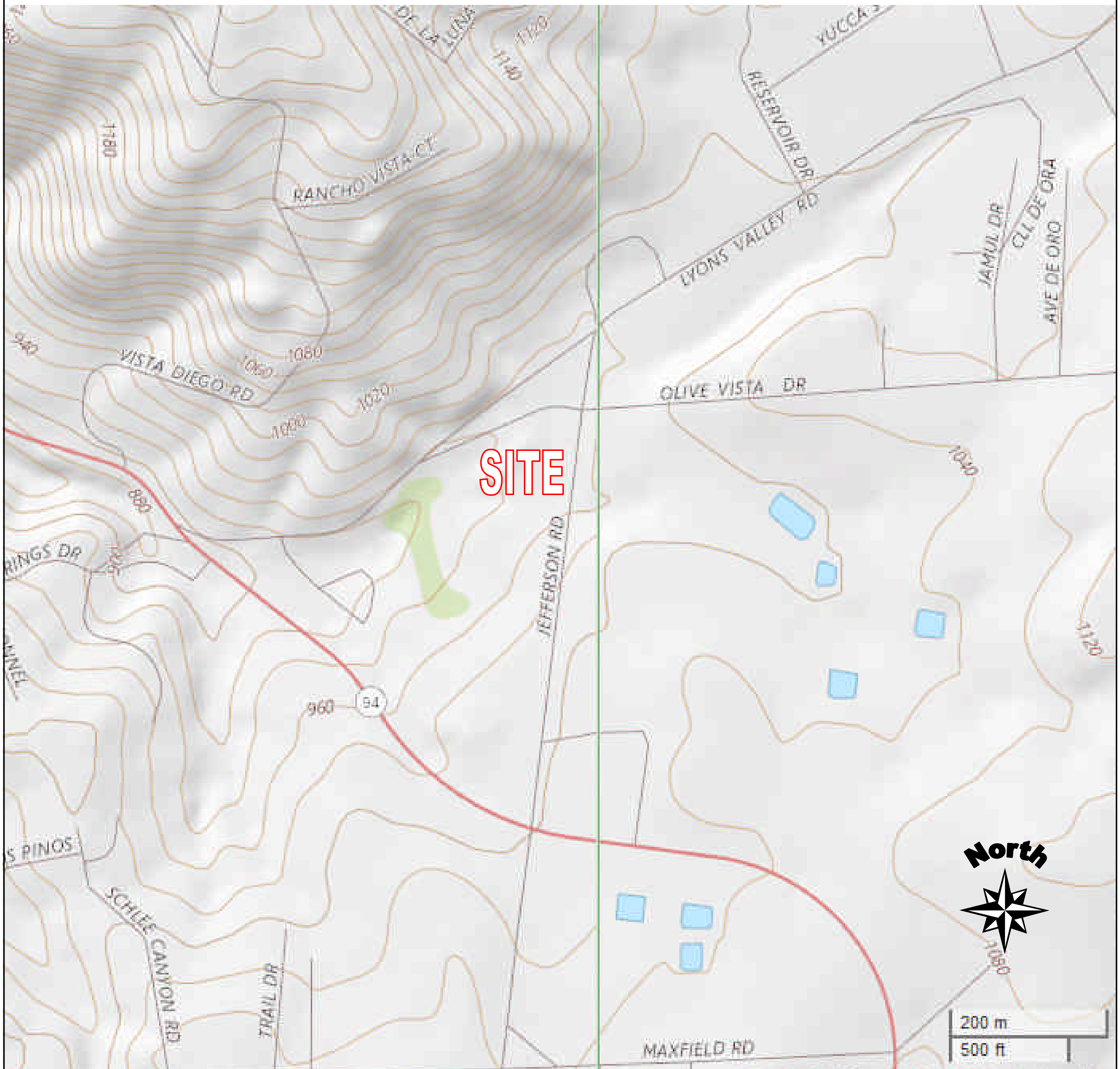
The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they are due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Government Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a period of two years without a review by us verifying the suitability of the conclusions and recommendations.

In the performance of our professional services, we comply with that level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions and in the same locality. The client recognizes that subsurface conditions may vary from those encountered at the locations where our borings, surveys, and explorations are made, and that our data, interpretations, and recommendations are based solely on the information obtained by us. We will be responsible for those data, interpretations, and recommendations, but shall not be responsible for the interpretations by others of the information developed. Our services consist of professional consultation and observation only, and no warranty of any kind whatsoever, express or implied, is made or intended in connection with the work performed or to be performed by us, or by our proposal for consulting or other services, or by our furnishing of oral or written reports or findings.

Our firm will not be responsible for the safety of personnel other than our own on the site; the safety of others is the responsibility of the Contractor. The Contractor should notify the Owner if he considers any of the recommended actions presented herein to be unsafe.

It is the responsibility of the stated client or their representatives to ensure that the information and recommendations contained herein are brought to the attention of the structural engineer and architect for the project and incorporated into the project's plans and specifications. It is further their responsibility to take the necessary measures to insure that the contractor and his subcontractors carry out such recommendations during construction. The firm of C.W. La Monte Co. Inc. shall not be held responsible for changes to the physical condition of the property, such as addition of fill soils or changing drainage patterns, which occur subsequent to the issuance of this report.

SITE LOCATION AND TOPOGRAPHIC MAP



Excerpt from USGS "The National Map"
Jamul and Jamul Mountain Quadrangles, 7.5-Minute Series

C.W. La Monte Company Inc.
Soil and Foundation Engineers

Plate No. 1

EXCAVATION LOG

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth:	NONE ENCOUNTERED	Boring No. TP-1

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0						**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1					1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Moist to Very Moist, Dark Brown.	SC CL
2							
3							
4					3.5 ft	**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray and Brown, Blocky, Gypsum Fragments.	CL
5							
6							
7						TOTAL DEPTH 3.5 FT. NO GROUNDWATER NO CAVING BACKFILLED 2/24/18	
8							
9							
10							
11							
12							
- -							
- -							

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth:	NONE ENCOUNTERED	Boring No. TP-2

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0						**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1					1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Very Moist, Dark Brown.	SC CL
2							
3					2.5 ft.	Becomes Very Stiff to Hard	
4					3.5 ft	**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray and Brown, Blocky, Gypsum Fragments.	CL
5							
6					4.0 ft.	Clayey Sand, Fine to Medium Grained, Very Dense, Very Moist, Red-Brown.	SC
7							
8						TOTAL DEPTH 4.5 FT. NO GROUNDWATER NO CAVING BACKFILLED 2/26/17	
9							
10							
11							
12							
- -							
- -							

Legend	
▼	Water Table
☒	Bulk Sample
◪	SPT Sample
■	Drive Sample
#	Disturbed Blowcount No.
*	Disturbed Sample
**	No Sample Recovery
———	Geologic Contact
- - - -	Soils Change

C. W. La Monte Company Inc.

JOB NAME:
Proposed Commercial Development

JOB ADDRESS:
Jefferson Rd. between Olive Vista Dr. and Campo Rd Jamul

PLATE NO. 2A

EXCAVATION LOG

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth: NONE ENCOUNTERED		Boring No. TP-3

DEPTH (FT.)	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0		**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1	1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff, Moist to Very Moist, Dark Brown.	SC CL
2	2.0 ft	**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray and Brown, Blocky, Gypsum Fragments.	SC
3	2.5 ft	Clayey Sand, Fine to Medium Grained, Very Dense, Very Moist, Red-Brown.	SC
		Refusal at 3.2 ft.	

TOTAL DEPTH 3.2 FT.
NO GROUNDWATER
NO CAVING
BACKFILLED 2/24/18

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth: NONE ENCOUNTERED		Boring No. TP-4

DEPTH (FT.)	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0		**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1	1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Very Moist, Dark Brown.	SC CL
2	2.0 ft.	**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray, Red-Brown and Brown, Gypsum Fragments.	CL
		Refusal at 2.5 ft.	

TOTAL DEPTH 2.5 FT.
NO GROUNDWATER
NO CAVING
BACKFILLED 2/26/17

Water Table
Bulk Sample
SPT Sample
Drive Sample
Disturbed Blowcount No.
* Disturbed Sample
** No Sample Recovery
Geologic Contact
Soils Change

C. W. La Monte Company Inc.

JOB NAME:
Proposed Commercial Development

JOB ADDRESS:
Jefferson Rd. between Olive Vista Dr. and Campo Rd Jamul

PLATE NO. 2B

EXCAVATION LOG

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth: NONE ENCOUNTERED		Boring No. TP-5

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0						**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1					1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff, Moist to Very Moist, Dark Brown.	SC CL
2					2.0 ft	**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray and Brown, Blocky, Gypsum Fragments.	SC
3							
4					2.5 ft	Clayey Sand, Fine to Medium Grained, Very Dense, Very Moist, Red-Brown.	SC
5						Refusal at 3.0 ft.	
6							
7						TOTAL DEPTH 3.0 FT. NO GROUNDWATER NO CAVING BACKFILLED 2/24/18	
8							
9							
10							
11							
12							

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth: NONE ENCOUNTERED		Boring No. TP-6

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0						**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1					0.5 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Very Moist, Dark Brown.	SC CL
2					1.5 ft	**Weathered Granitic Bedrock:** Silty Clay to Sandy Clay, Very Moist, Very Stiff to Hard Mottled Olive Gray, Red-Brown and Brown, Gypsum Fragments.	CL SC
3					2.5 ft		
4						Sandy Clay/Clayey Sand, Hard to Very Dense, Moist, Olive Gray	CL SC
5					3.0 ft	Sand, Very Dense, Moist, Olive Gray, Well Cemented, Refusal at 3.0 ft	SP
6							
7						TOTAL DEPTH 3.0 FT. NO GROUNDWATER NO CAVING BACKFILLED 2/26/17	
8							
9							
10							
11							
12							

Symbol	Legend
▼	Water Table
☒	Bulk Sample
◪	SPT Sample
■	Drive Sample
#	Disturbed Blowcount No.
*	Disturbed Sample
**	No Sample Recovery
———	Geologic Contact
– – – –	Soils Change

C. W. La Monte Company Inc.

JOB NAME: Proposed Commercial Development

JOB ADDRESS: Jefferson Rd. between Olive Vista Dr. and Campo Rd Jamul

PLATE NO. 2C

EXCAVATION LOG

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth:	NONE ENCOUNTERED	Boring No. **TP-7**

DEPTH (FT.)	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0–1.5		**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1.5–3.0	1.5 ft.	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Moist to Very Moist, Dark Brown.	SC CL
3.0–5.0	3.0 ft	Silty Clay, Very Stiff, Moist to Very Moist, Olive Brown.	
5.0–6.0	5.0 ft	**Weathered Granitic Bedrock:** Clayey Sand, Very Moist, Very Stiff Mottled Olive Gray and Brown, Blocky, Gypsum Fragments.	SC
6.0–	6.0 ft.	Silty Sand to Sand, Very Dense, Moist Olive Gray Refusal at 6.5 ft.	SM SP

TOTAL DEPTH 6.0 FT.
NO GROUNDWATER
NO CAVING
BACKFILLED 2/26/18

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth:	NONE ENCOUNTERED	Boring No. **TP-8**

DEPTH (FT.)	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0–0.5		**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
0.5–3.0	0.5 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Very Moist, Dark Brown.	SC CL
3.0–	3.0 ft	**Weathered Granitic Bedrock:** Silty Clay to Sandy Clay, Very Moist, Very Stiff to Hard Mottled Olive Gray, Red-Brown and Brown, Gypsum Fragments. Refusal at 3.5 ft	CL SC

TOTAL DEPTH 3.5 FT.
NO GROUNDWATER
NO CAVING
BACKFILLED 2/26/17

Legend:
- ▼ Water Table
- ⊠ Bulk Sample
- ◩ SPT Sample
- ■ Drive Sample
- # Disturbed Blowcount No.
- * Disturbed Sample
- ** No Sample Recovery
- ——— Geologic Contact
- - - - - Soils Change

C. W. La Monte Company Inc.

JOB NAME: Proposed Commercial Development

JOB ADDRESS: Jefferson Rd. between Olive Vista Dr. and Campo Rd. Jamul

PLATE NO. 2D

EXCAVATION LOG

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth: NONE ENCOUNTERED		Boring No. TP-9

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0						**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1					1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Moist to Very Moist, Dark Brown.	SC CL
2						**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray and Brown, Blocky, Gypsum Fragments. Refusal at 2.5 ft.	CL
3							
4							
5							
6							
7						TOTAL DEPTH 2.5 FT. NO GROUNDWATER NO CAVING BACKFILLED 2/26/18	
8							
9							
10							
11							
12							
- -							
- -							

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By:	Date
Elevation Existing Elevation	Groundwater Depth: NONE ENCOUNTERED		Boring No.

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
- -							
- -							

▼ Water Table
☒ Bulk Sample
◪ SPT Sample
■ Drive Sample
Disturbed Blowcount No.
* Disturbed Sample
** No Sample Recovery
——— Geologic Contact
- - - - Soils Change

C. W. La Monte Company Inc.

JOB NAME:
Proposed Commercial Development

JOB ADDRESS:
Jefferson Rd. between Olive Vista Dr. and Campo Rd Jamul

PLATE NO. 2E

EXCAVATION LOG

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth: NONE ENCOUNTERED		Boring No. P-1

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0						**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1					1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Moist to Very Moist, Dark Brown.	SC CL
3					3.25 ft	**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray and Brown, Blocky, Gypsum Fragments. Refusal at 3.5 ft.	CL

TOTAL DEPTH 3.25 FT.
NO GROUNDWATER
NO CAVING
BACKFILLED 2/24/18

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth: NONE ENCOUNTERED		Boring No. P-2

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0						**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1					1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Very Moist, Dark Brown.	SC CL
2					2.0 ft	**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray and Brown, Blocky, Gypsum Fragments. Refusal at 2.75 ft	CL

TOTAL DEPTH 2.75 FT.
NO GROUNDWATER
NO CAVING
BACKFILLED 2/26/17

Water Table
Bulk Sample
SPT Sample
Drive Sample
\# Disturbed Blowcount No.
* Disturbed Sample
** No Sample Recovery
Geologic Contact
Soils Change

C. W. La Monte Company Inc.

JOB NAME: Proposed Commercial Development

JOB ADDRESS: Jefferson Rd. between Olive Vista Dr. and Campo Rd Jamul

PLATE NO. 3A

EXCAVATION LOG

Equipment: Backhoe/ hand tool	Dimension and Type of Excavation: 24-inch Test Trench/6-inch hand auger	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth:	NONE ENCOUNTERED	Boring No. P-3

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0						**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1					1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Moist to Very Moist, Dark Brown.	SC CL
3					3.0 ft	**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray and Brown, Blocky, Gypsum Fragments. Refusal at 3.4 ft.	CL
5–12						TOTAL DEPTH 3.4 FT. NO GROUNDWATER NO CAVING BACKFILLED 2/26/18	

Equipment: Backhoe/ hand tool	Dimension and Type of Excavation: 24-inch Test Trench/6-inch hand	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth:	NONE ENCOUNTERED	Boring No. P-4

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0						**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1					1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Very Moist, Dark Brown.	SC CL
2					2.0 ft	**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray and Brown, Blocky, Gypsum Fragments. Refusal at 2.8 ft	CL
4–12						TOTAL DEPTH 2.8 FT. NO GROUNDWATER NO CAVING BACKFILLED 2/26/17	

Symbol	Legend
▼	Water Table
☒	Bulk Sample
◪	SPT Sample
■	Drive Sample
#	Disturbed Blowcount No.
*	Disturbed Sample
**	No Sample Recovery
——	Geologic Contact
- - - -	Soils Change

C. W. La Monte Company Inc.

JOB NAME:
Proposed Commercial Development

JOB ADDRESS:
Jefferson Rd. between Olive Vista Dr. and Campo Rd Jamul

PLATE NO. 3B

EXCAVATION LOG

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date 2/22/2018
Elevation Existing Elevation	Groundwater Depth: NONE ENCOUNTERED		Boring No. P-5

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0						**Topsoil:** Clayey Sand/Sandy Clay, Fine Grained, Firm to Stiff, Moist, Brown.	SC CL
1					1.0 ft	**Residual Soil/Subsoil:** Sandy Clay/Silty Clay, Very Stiff to Hard, Moist to Very Moist, Dark Brown.	SC CL
2							
3					3.0 ft	**Weathered Granitic Bedrock:** Silty Clay, Very Moist, Hard, Mottled Olive Gray and Brown, Blocky, Gypsum Fragments. Refusal at 3.4 ft.	CL
4							
5							
6							
7						TOTAL DEPTH 3.4 FT. NO GROUNDWATER NO CAVING BACKFILLED 2/24/18	
8							
9							
10							
11							
12							
-							
-							

Equipment: Backhoe	Dimension and Type of Excavation: 24-inch Test Trench	Logged By: HE	Date
Elevation Existing Elevation	Groundwater Depth: NONE ENCOUNTERED		Boring No.

DEPTH (FT.)	SYMBOL	BAG SAMPLE	SAMPLE	BLOW COUNTS / FT.	CHANGE DEPTH (@)	FIELD SOIL DESCRIPTION AND CLASSIFICATION Description and Remarks (Grain Size, Density, Moisture, Color)	U.S.C.S.
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
-							
-							

Water Table
Bulk Sample
SPT Sample
Drive Sample
\# Disturbed Blowcount No.
* Disturbed Sample
** No Sample Recovery
Geologic Contact
Soils Change

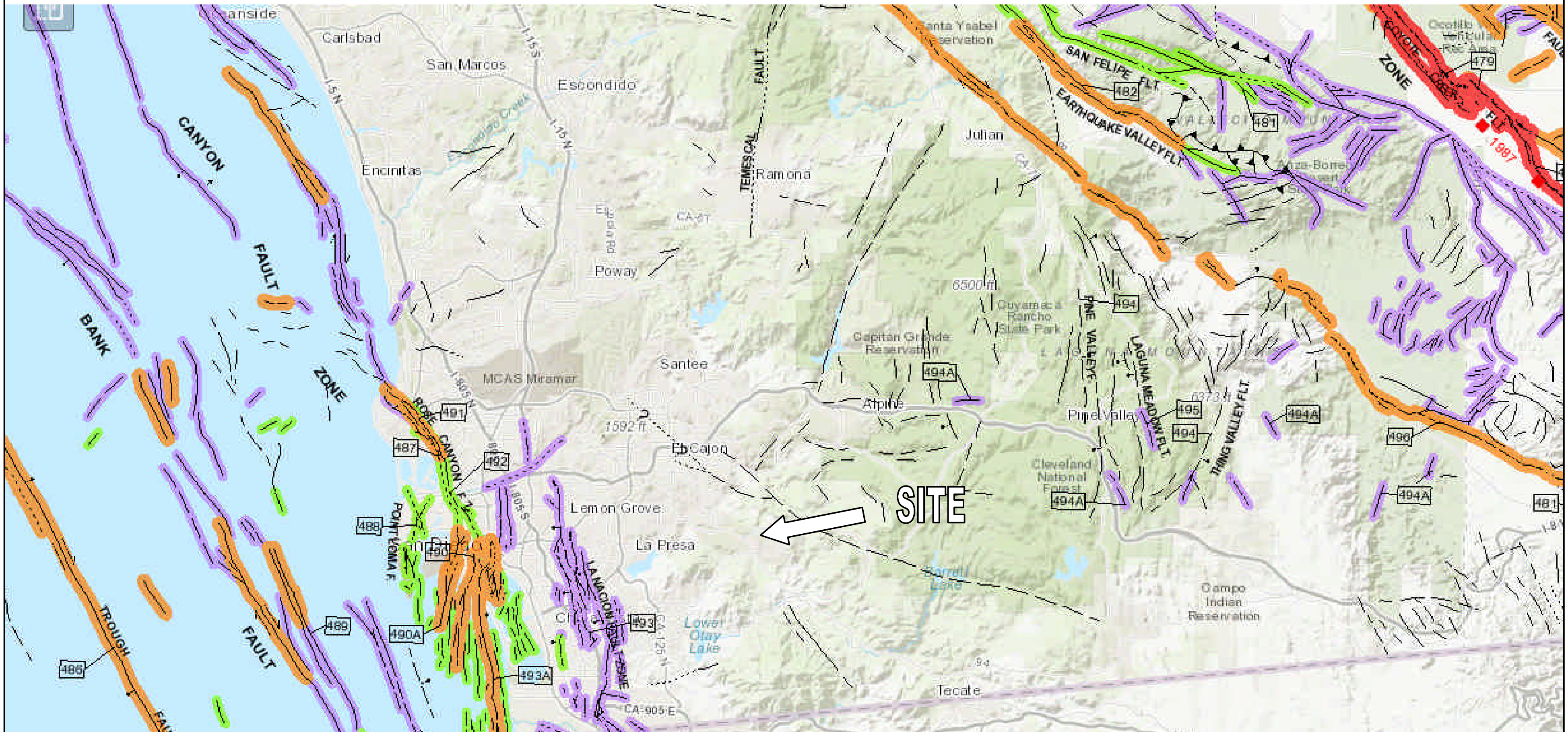
C. W. La Monte Company Inc.

JOB NAME:
Proposed Commercial Development

JOB ADDRESS:
Jefferson Rd. between Olive Vista Dr. and Campo Rd Jamul

PLATE NO. 3C

PLATE NO. 4 - Excerpt from: 2010 Fault Activity Map of California, Geologic Data Map



SUMMARY EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain.

FAULT CLASSIFICATION COLOR CODE (Indicating Recency of Movement)

- Historic Fault (last 200 years)
- Holocene fault (during past 11,700 years) without historic record.
- Quaternary fault (age undifferentiated)
- Late Quaternary fault (during past 700,000 years).
- Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement.

Appendix “A”

STANDARD GRADING AND CONSTRUCTION SPECIFICATIONS

Appendix "A"

STANDARD GRADING AND CONSTRUCTION SPECIFICATIONS

These specifications present the usual and minimum requirements for projects on which C.W. La Monte Company is the geotechnical consultant. No deviation from these specifications will be allowed, except where specifically superseded in the preliminary geology and soils report or in other written communication signed by the Soils Engineer or Engineering Geologist of record.

GENERAL

A. The Soils Engineer and Engineering Geologist is the Owner's or Builders' representative on the Project. For the purpose of these specifications, participation by the Soils Engineer includes that observation performed by any person or persons employed by, and responsible to, the licensed Civil Engineer signing the soils reports.

B. All clearing, site preparation, or earthwork performed on the project shall be conducted by the Contractor under the supervision of the Soils Engineer.

C. It is the Contractor's responsibility to prepare the ground surface to receive the fills to the satisfaction of the Soils Engineer and to place, spread, mix, water, and compact the fill in accordance with the specifications of the Soils Engineer. The Contractor shall also remove all material considered unsatisfactory by the Soils Engineer.

D. It is also the Contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment will be shut down to permit completion of compaction. Sufficient watering apparatus will also be provided by the Contractor, with due consideration for the fill material, rate of placement, and time of year.

E. A final report shall be issued by the Soils Engineer attesting to the Contractor's conformance with these specifications.

SITE PREPARATION

A. All vegetation and deleterious material shall be disposed of off site. This removal shall be concluded prior to placing fill.

B. Soil, alluvium, or bedrock materials determined by the Soils Engineer, as being unsuitable for placement in compacted fills shall be removed from the site. The Soils Engineer must approve any material incorporated as a part of a compacted fill.

C. After the ground surface to receive fill has been cleared, it shall be scarified, disced, or bladed by the Contractor until it is uniform and free from ruts, hollows, hummocks, or other uneven features which may prevent uniform compaction.

   The scarified ground surface shall then be brought to optimum moisture, mixed as required, and compacted as specified. If the scarified zone is greater than 12 inches in depth, the excess shall be removed and placed in lifts restricted to 6 inches.

   Prior to placing fill, the ground surface to receive fill shall be inspected, tested as necessary, and approved by the Soils Engineer.

D. Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipe lines, or others are to be removed or treated in a manner prescribed by the Soils Engineer and /or governing agency.

E. In order to provide uniform bearing conditions in cut-fill transition lots and where cut lots are partially in soil, colluvium, or un-weathered bedrock materials, the bedrock portion of the lot extending a minimum of 3 feet outside of building lines shall be over excavated a minimum of 3 feet and replaced with compacted fill.

COMPACTED FILLS

A. Any material imported or excavated on the property may be utilized in the fill, provided each material has been determined to be suitable by the Soils Engineer. Roots, tree branches, and other matter missed during clearing shall be removed from the fill as directed by the Soils Engineer.

B. Rock fragments less than 6 inches in diameter may be utilized in the fill, provided:

1. They are not placed in concentrated pockets.
2. There is a sufficient percentage of fine-grained material to surround the rocks.
3. The Soils Engineer shall supervise the distribution of rocks.

C. Rocks greater than 6 inches in diameter shall be taken off site, or placed in accordance with the recommendations of the Soils Engineer in areas designated as suitable for rock disposal.

D. Material that is spongy, subject to decay or otherwise considered unsuitable should not be used in the compacted fill.

E. Representative samples of material to be utilized as compacted fill shall be analyzed by the laboratory of the Soils Engineer to determine their physical properties. If any material other than that previously tested is encountered during grading, the appropriate analysis of this material shall be conducted by the Soils Engineer as soon as possible.

F. Material used in the compaction process shall be evenly spread, watered processed, and compacted in thin lifts not to exceed 6 inches in thickness to obtain a uniformly dense layer. The fill shall be placed and compacted on a horizontal plane, unless otherwise approved by the Soils Engineer.

G. If the moisture content or relative density varies from that required by the Soils Engineer, the Contractor should re-work the fill until the Soils Engineer approves it.

H. Each layer shall be compacted to 90 percent of the maximum density in compliance with the testing method specified by the controlling governmental agency. (In general, ASTM D-1557-91, the five-layer method will be used.)

If compaction to a lesser percentage is authorized by the controlling governmental agency because of a specific land use or expansive soils condition, the area to receive fill compacted to less than 90 percent shall either be delineated on the grading plan or appropriate reference made to the area in the soils report.

H. All fills shall be keyed and benched through all topsoil, colluvium, alluvium or creep material, into sound bedrock or firm material except where the slope receiving fill exceeds a ratio of five horizontal to one vertical, in accordance with the recommendations of the Soils Engineer.

I. The key for hillside fills should be a minimum of 15 feet in width and within bedrock or similar materials, unless otherwise specified in the soil report.

K. Subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency, or with the recommendations of the Soils Engineer or Engineering Geologist.

L. The contractor will be required to obtain a minimum relative compaction of 90 percent out to the finish slope face of fill slopes, buttresses, and stabilization fills. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment, or by any other procedure which produces the required compaction.

M. All fill slopes should be planted or protected from erosion or by other methods specified in the soils report.

N. Fill-over-cut slopes shall be properly keyed through topsoil, colluvium or creep material into rock or firm materials, and the transition shall be stripped of all soil prior to placing fill.

CUT SLOPES

A. The Engineering Geologist shall inspect all cut slopes at vertical intervals not exceeding 10 feet.

B. If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints or fault planes are encountered during grading, these conditions shall be analyzed by the Engineering Geologist and Soils Engineer, and recommendations shall be made to treat these problems.

C. Cut slopes that face in the same direction as the prevailing drainage shall be protected from slope wash by a non-erodible interceptor swale placed at the top of the slope.

Unless otherwise specified in the soils and geological report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies.

Drainage terraces shall be constructed in compliance with the ordinances of controlling governmental agencies, or with the recommendations of the Soils Engineer or Engineering Geologist.

GRADING CONTROL

A. Observation of the fill placement shall be provided by the Soils Engineer during the progress of grading.

B. In general, density tests should be made at intervals not exceeding 2 feet of fill height or every 500 cubic yards of fill placement. This criteria will vary, depending on soil conditions and the size of the job. In any event, an adequate number of field density tests shall be made to verily that the required compaction is being achieved.

C. Density tests may also be conducted on the surface material to receive fills as determined by the Soils Engineer.

D. All clean-outs, processed ground to receive fill, key excavations, subdrains, and rock disposals must be inspected and approved by the Soils Engineer or Engineering Geologist prior to placing any fill. It shall be the Contractor's responsibility to notify the Soils Engineer when such areas are ready for inspection.

CONSTRUCTION CONSIDERATIONS

A. The Contractor shall provide necessary erosion control measures, during grading and prior to the completion and construction of permanent drainage controls.

B. Upon completion of grading and termination of inspections by the Soils Engineer, no further filling or excavating, including that necessary for footings, foundations, large tree wells, retaining walls, or other features shall be performed without the approval of the Soils Engineer or Engineering Geologist.

C. Care shall be taken by the Contractor during final grading to preserve any berms, drainage terraces, interceptor swales, or other devices of permanent nature on or adjacent to the property.

D. In the event that temporary ramps or pads are constructed of uncontrolled fill soils during a future grading operation, the location and extent of the loose fill soils shall be noted by the on-site representative of a qualified soil engineering firm. These materials shall be removed and properly recompacted prior to completion of grading operations.

E. Where not superseded by specific recommendations presented in this report, trenches, excavations, and temporary slopes at the subject site shall be constructed in accordance with section 1541 of Title 8, Construction Safety Orders, issued by OSHA.

APPENDIX " B"
UNIFIED SOIL CLASSIFICATION CHART

SOI L DESC RI PTI ON

I . COARSE GRAINED: More than half of material is larger than No. 200 sieve size.

GRAVELS: More than half of coarse fraction is larger than No. 4 sieve size but smaller than 3".

	GROUP SYMBOL	TYPICAL NAMES
CLEAN GRAVELS	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
	GP	Poorly graded gravels, gravel sand mixtures, little or no fines
GRAVELS WITH FINES	GM	Silty gravels, poorly graded gravel- sand-silt mixtures
(Appreciable amount of fines)	GC	Clayey gravels, poorly graded gravel sand, clay mixtures.

SANDS: More than half of coarse fraction is smaller than No. 4 sieve size

CLEAN SANDS	SW	Well graded sand, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
SANDS WITH FINES	SM	Silty sands, poorly graded sand and silty mixtures.
(Appreciable amount of fines	SC	Clayey sands, poorly graded sand and clay **mixtures**

II. FINE GRAINED: More than half of material is smaller than No. 200 sieve size

SILTS AND CLAYS	ML	Inorganic silts and very fine sands, rock flour, sandy silt - or clayey-silt with slight plasticity.
Liquid Limit Less than 50	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	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silt
Liquid Limit greater than 50	CH	Inorganic clays of high plasticity, fat clays.
	OH	Organic clays of medium to high plasticity.
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils.

APPENDIX C

Form I-8 (Worksheet C4-1: Categorization of Infiltration Feasibility Condition

(from BMP Design Manual Appendix C)

Categorization of Infiltration Feasibility Condition			Worksheet C.4-1
Part 1 - Full Infiltration Feasibility Screening Criteria Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X
Provide basis: *The measured infiltration rates of the existing soils based on the on-site infiltration study was calculated; after applying a minimum factor of safety of 2.0 to be LESS than 0.05 inches per hour for all tested locations (P-1 =0.23 inches per hour; P-2 = .06 inches per hour; P-3 = 0.06 inches per hour; P-4 = 0.02 inches per hour and P-5 = 0.14 inches per hour). The results indicate that for the tested locations full infiltration **is not feasible**. Based on the site geologic conditions it is CWLamonte's opinion that the infiltration results obtained are typical for the entire site.* Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
2	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X
Provide basis: *CWLamonte did not encounter areas with infiltration rates greater than 0.5 inches per hour. Based on the findings, site conditions and on-site testing of the underlying soils, infiltration rate is less than 0.5 inches per hour. As such, infiltration rates greater than 0.5 inches per hour cannot be allowed.* Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: *CWLamonte did not address water contamination.* Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: *CWLamonte did not address potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters.* Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X
Provide basis: *The measured infiltration rats of the existing soils based on the on-site infiltration study was calculated after applying a minimum factor of safety of 2.0 to range from 0.02 to 0.23 for locations P-1 through P-5, indicating that at these locations* ***partial infiltration is not feasible****.* Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X
Provide basis: *Although increased risks to geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) are not factors at the site CWLamonte did not encounter areas with infiltration rates that are feasible for partial infiltration.* Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: *CWLamonte did not address water contamination.* Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: *CWLamonte did not address potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters.* Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration. If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings

Table C.5-1: Feasibility Screening Exhibits

Figures	Layer	Intent/Rationale	Data Sources
C.1 Soils	Hydrologic Soil Group – A, B, C, D	Hydrologic Soil Group will aid in determining areas of potential infiltration	NRCS Web Soil Survey http://websoilsurvey.sc.egov.usda.gov/
	Hydric Soils	Hydric soils will indicate layers of intermittent saturation that may function like a D soil and should be avoided for infiltration	USDA Web Soil Survey. Hydric soils, (ratings of 100) were classified as hydric. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm
C.2: Slopes and Geologic Hazards	Slopes >25%	BMPs are hard to construct on slopes >25% and can potentially cause slope instability	SanGIS http://www.sangis.org/
	Liquefaction Potential	BMPs (particularly infiltration BMPs) must not be sited in areas with high potential for liquefaction or landslides to minimize earthquake/landslide risks	SanGIS http://www.sangis.org/
	Landslide Potential		SanGIS Geologic Hazards layer. Subset of polygons with hazard codes related to landslides was selected. This data is limited to the City of San Diego Boundary. http://www.sangis.org/
C.3: Groundwater Table Elevations	Groundwater Depths	Infiltration BMPs will need to be sited in areas with adequate distance (>10 ft) from the groundwater table	GeoTracker. Data downloaded for San Diego county from 2014 and 2013. In cases where there were multiple measurements made at the same well, the average was taken over that year. http://geotracker.waterboards.ca.gov/data_download_by_county.asp
C.4: Contaminated Sites	Contaminated soils and/or groundwater sites	Infiltration must limited in areas of contaminated soil/groundwater	GeoTracker. Data downloaded for San Diego county and limited to active cleanup sites http://geotracker.waterboards.ca.gov/