



CHRISTIAN WHEELER
ENGINEERING

REPORT OF GEOTECHNICAL INVESTIGATION

MULTI-FAMILY RESIDENTIAL PROJECT

**137 W. VALLEY PARKWAY
ESCONDIDO, CALIFORNIA**

PREPARED FOR

**KINGSBARN REALITY CAPITAL
1645 VILLAGE CENTER CIRCLE, SUITE 200
LAS VEGAS, NEVADA 89134**

PREPARED BY

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January 8, 2025

Kingsbarn Reality Capital
1645 Village Center Circle, Suite 200
Las Vegas, Nevada 89134
Attention: John Stack

CWE 2230256.01

**Subject: Report of Geotechnical Investigation
Proposed Multi-Family Residential Project
137 W. Valley Parkway, Escondido, California**

Ladies and Gentlemen:

In accordance with our Proposal dated December 9, 2024, we have completed a geotechnical investigation for the subject project. We are presenting herein our findings and recommendations.

In general, we found the subject property suitable for the proposed construction, provided the recommendations provided herein are followed. Based on the results of our investigation, we expect that the soil to support the building will consist of competent older alluvium. Specific design criteria for the proposed structure are provided in the attached report.

If you 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,

CHRISTIAN WHEELER ENGINEERING



Shawn Caya, R.G.E. #2748

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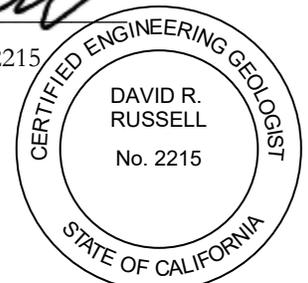


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REPORT OF GEOTECHNICAL INVESTIGATION

RESIDENTIAL MULTI-FAMILY PROJECT

137 W. VALLEY PARKWAY

ESCONDIDO, CALIFORNIA

INTRODUCTION AND PROJECT DESCRIPTION

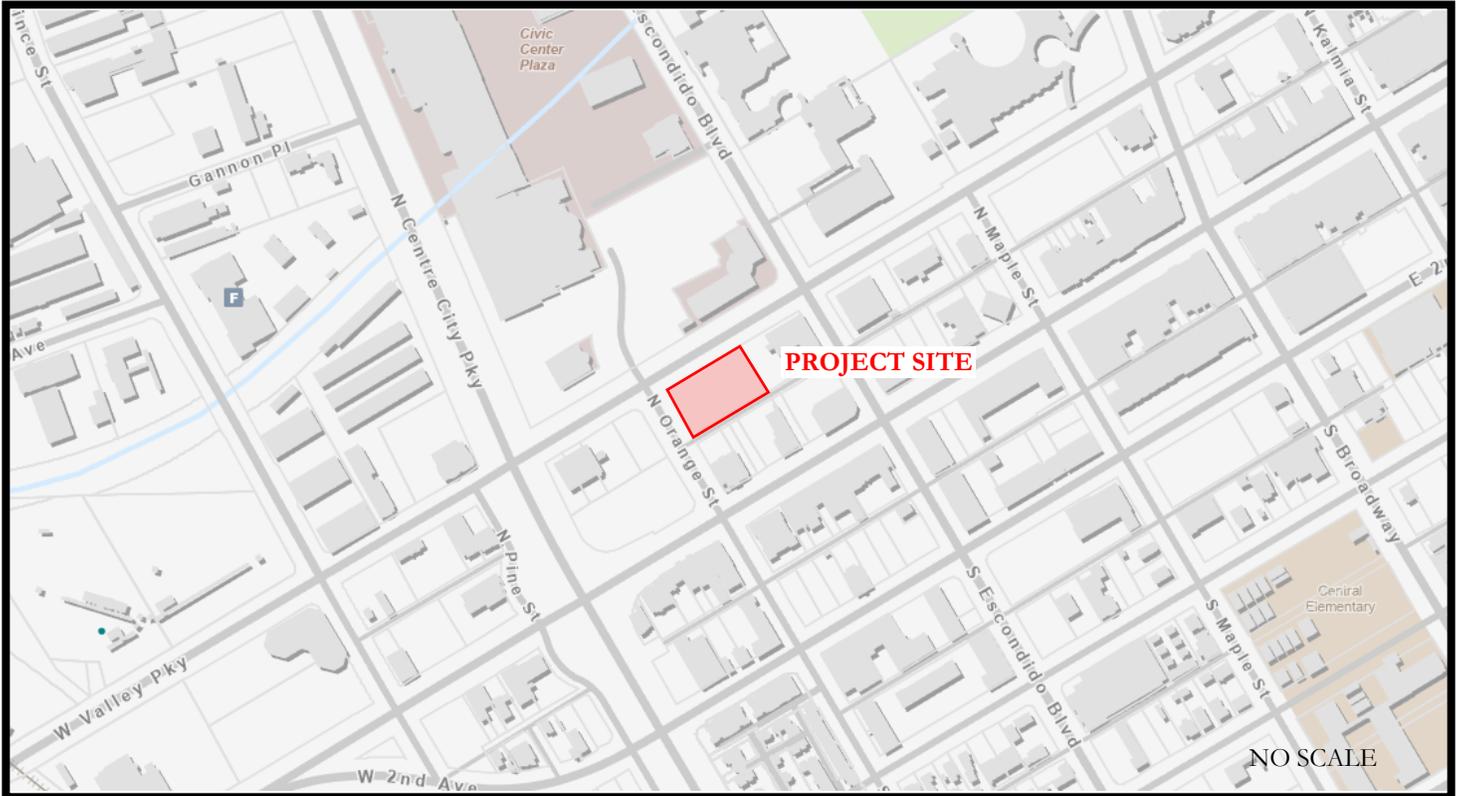
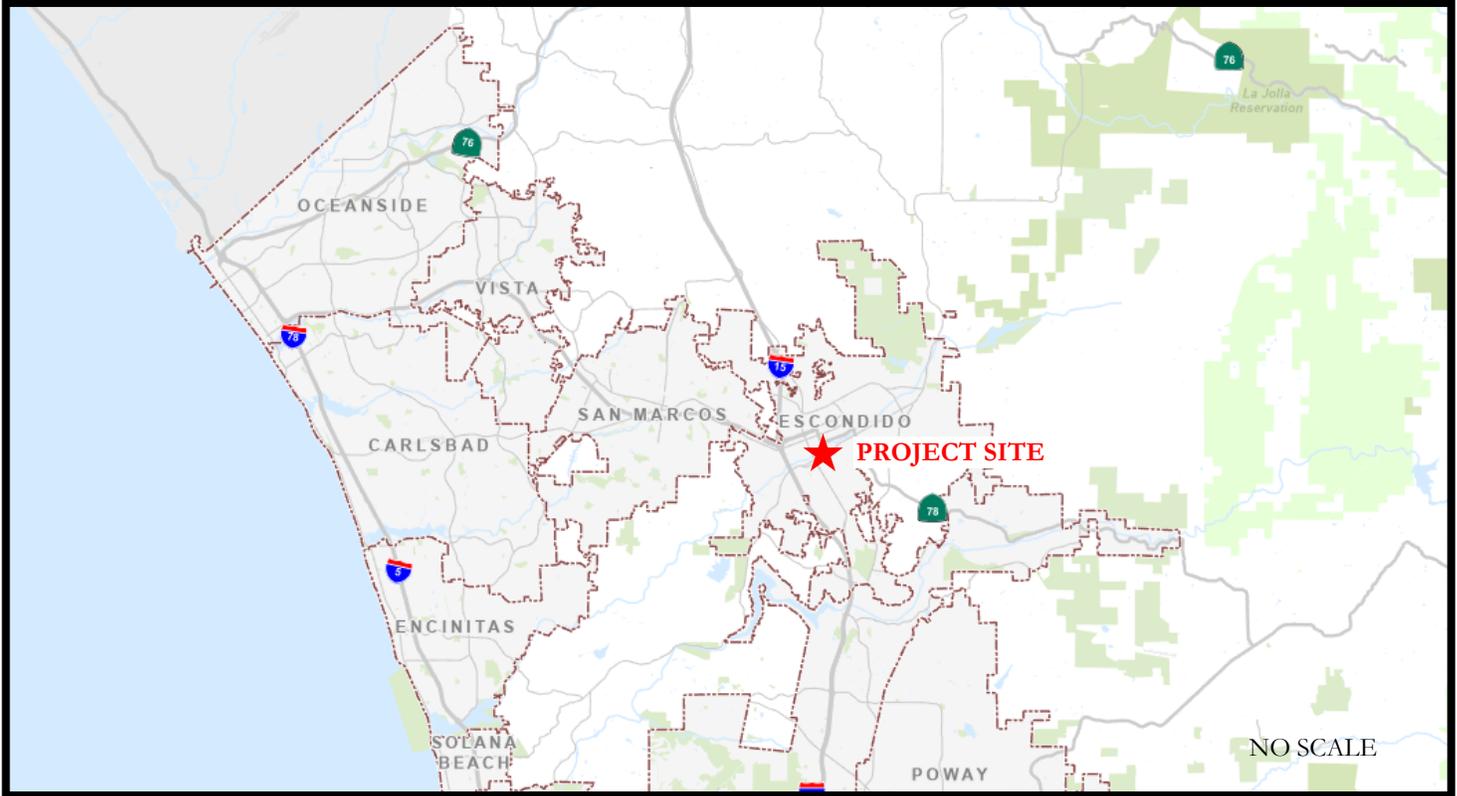
This report presents the results of a geotechnical investigation performed for a proposed residential development to be constructed at 137 W. Valley Parkway, in the city of Escondido, California. Figure Number 1, on the following page, presents a vicinity map showing the location of the project.

To assist in the preparation of this report, our firm has been given conceptual site plans prepared by Steinberg Hart, dated April 1, 2024. The Proposed Site Plan was used as the base for our Geotechnical Map, which is included herewith as Plate Number 1. We have also reviewed our report titled *Report of Preliminary Geotechnical Investigation, Proposed Mixed-Use Development, 173 W. Valley Parkway, Escondido, California, dated June 17, 2017*, which was prepared for a previous project at the same site. The boring logs and laboratory test results from that report have been used as the basis for this report and are presented in Appendixes A and B, respectively.

We understand that it is proposed to develop the site with a new multi-family residential project. The project will consist of podium-style construction with one level of at-grade parking and four levels of residential space above. We anticipate that the building will be of masonry and/or cast-in-place concrete construction in the lower portion and wood-frame above. The structure is expected to be supported by a shallow foundation system with an on-grade concrete slab at the lowest level. Grading will be limited to cuts and fills less than a couple of feet from the existing grades.

This report has been prepared for the exclusive use of Kingsbarn Reality Capital and its consultants for specific application to the project described herein. Should the project be modified, the conclusions and recommendations presented in this report should be reviewed by Christian Wheeler Engineering for conformance with our recommendations and to determine whether any additional subsurface investigation, laboratory testing and/or recommendations are necessary. Our professional services have been performed,

SITE VICINITY



PROPOSED MULTI-FAMILY RESIDENTIAL PROJECT
137 W. VALLEY PARKWAY, ESCONDIDO, CALIFORNIA

DATE: JANUARY 2025

REPORT NO.: 2230256.01

BY: SCC

FIGURE NO.: 1



CHRISTIAN WHEELER
ENGINEERING

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.

PROJECT SCOPE

Our geotechnical investigation consisted of surface reconnaissance, review of our previous subsurface explorations and laboratory testing, analysis of the previous field and laboratory data, and review of relevant geologic literature. More specifically, our intent was to provide the services listed below.

- Evaluate, by laboratory tests and our experience with similar soil types, the engineering properties of the various soil strata that may influence the proposed construction, including bearing capacities, expansive characteristics and settlement potential.
- Describe the general geology at the site, including possible geologic hazards that could have an effect on the proposed construction, and provide the seismic design parameters in accordance with the 2022 edition of the California Building Code.
- Address potential construction difficulties that may be encountered due to soil conditions, groundwater or geologic hazards, and provide geotechnical recommendations to deal with these difficulties.
- Provide site preparation and grading recommendations for the anticipated work.
- Provide foundation recommendations for the type of construction anticipated and develop soil engineering design criteria for the recommended foundation designs.
- Prepare this report, which includes, in addition to our conclusions and recommendations, a plot plan showing the areal extent of the geological units and the locations of our exploratory borings, exploration logs, and a summary of the laboratory test results.

FINDINGS

SITE DESCRIPTION

The subject site is a rectangular-shaped lot that is located southeast of the intersection of Valley Parkway and Maple Street, in the city of Escondido, California. The property is roughly 1.04 acres and currently supports an asphalt-paved parking lot with some landscape planters. Based on our cursory review of historical aerial photographs, it appears that the site previously supported two commercial structures with associated parking lots. Topographically, the site is generally flat-lying with a rough elevation of 652 feet (Google Earth).

GENERAL GEOLOGY AND SUBSURFACE CONDITIONS

GEOLOGIC SETTING AND SOIL DESCRIPTION: The subject site is located within the Foothills Physiographic Province of San Diego County. Based on our subsurface explorations and analysis of readily available, pertinent geologic literature, the areas of the site investigated were found to be underlain by older alluvium and weathered granitics. Each of these units is discussed below in order of increasing age:

OLDER ALLUVIUM (Qoal): Quaternary-age older alluvium was encountered in each of our exploratory borings and is expected to underlie the entire site. Within our borings, the older alluvium layer extended to depths ranging from approximately 13 to 18 feet below the existing site grades. The encountered alluvial soils generally consist of interbedded layers of reddish-brown, clayey sand (SC) and silty sand (SM), and light brown, poorly-graded sand with silt (SP-SM) and poorly-graded sand (SP). Lenses of gravel were also encountered. The alluvium is typically medium dense to very dense in consistency and moist. A relatively thin zone of wet to saturated material was noted at the contact with the underlying bedrock material. These deposits were judged to have a low expansion index ($EI < 50$).

WEATHERED GRANITICS (Kgr): Weathered granitic bedrock was encountered below the alluvium in each of our 4 exploratory borings at depths ranging from approximately 13 to 18 feet below the existing grades. Within our borings, this material consisted of light grayish-brown, damp, very dense, well-graded sand (SW). These deposits were judged to have a low expansion index ($EI < 50$).

GROUNDWATER: Groundwater was not encountered in our borings; however, a thin zone of perched water was noted at the contact between the older alluvium and the underlying bedrock. It should be noted that variations in subsurface water (including perched water zones and seepage) may result from fluctuations in the ground surface topography, subsurface stratification, precipitation, irrigation, and other factors that may not have been evident at the time of the investigation. 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. It is further our opinion that these problems can be most effectively corrected on an individual basis if and when they occur.

TECTONIC SETTING: No active or potentially active faults are known to traverse the subject site. However, 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 that consist of several individual, en echelon faults that generally strike in a northerly to northwesterly direction. Some of these fault zones (and the individual faults within the zone) are classified as “active” according to the criteria of the California Division of Mines and Geology. Active fault zones are those that have shown conclusive evidence of faulting during the Holocene Epoch (the most recent 11,000 years). The Division of Mines and Geology used the term “potentially active” on Earthquake Fault Zone maps until 1988 to refer to all Quaternary-age (last 1.6 million years) faults for the purpose of evaluation for possible zonation in accordance with the Alquist-Priolo Earthquake Fault Zoning Act and identified all Quaternary-age faults as “potentially active” except for certain faults that were presumed to be inactive based on direct geologic evidence of inactivity during all of Holocene time or longer. Some faults considered to be “potentially active” would be considered to be “active” but lack specific criteria used by the State Geologist, such as *sufficiently active* and *well-defined*. Faults older than Quaternary-age are not specifically defined in Special Publication 42, Fault Rupture Hazard Zones in California, published by the California Division of Mines and Geology. However, it is generally accepted that faults showing no movement during the Quaternary period may be considered to be “inactive”.

TABLE I: PROXIMAL FAULT ZONES

Fault Zone	Distance
Elsinore	15 mi
Rose Canyon- Newport-Inglewood	16 mi
Coronado Bank	29 mi
Palos Verdes	36 mi
San Jacinto	39 mi
San Diego Trough	41 mi
San Clemente	65 mi
San Andreas	67 mi

The active Elsinore Fault Zone is located approximately 15 miles northeast of the subject site. Other active fault zones in the region that could possibly affect the site include the Rose Canyon-Newport-Inglewood, Coronado Bank, San Diego trough and San Clemente Fault Zones to the southwest, the Palos Verdes Fault Zone to the northwest, and the San Jacinto and San Andreas Fault Zones to the northeast.

GEOLOGIC HAZARDS

SEISMIC HAZARD: 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 in the “Tectonic Setting” section of this report. Seismic design parameters were determined in accordance with Chapter 16 of the 2022 *California Building Code (CBC)* and the applicable sections of *ASCE/SEI 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures*.

For the subject site, estimated blow counts within the underlying older alluvium and granitics indicate that the upper 100 feet of geologic subgrade can be characterized as Soil Site Class C.

TABLE III: CBC 2022/ASCE 7-16 – SEISMIC DESIGN PARAMETERS

CBC – Chapter 16 Section	Seismic Design Parameter	Recommended Value
Section 1613.2.2	Soil Site Class	C
Figure 1613.2.1 (1)	MCE_R Acceleration for Short Periods (0.2 sec), S_s	0.898 g
Figure 1613.2.1 (2)	MCE_R Acceleration for 1.0 Sec Periods (1.0 sec), S_1	0.328 g
Table 1613.2.3 (1)	Site Coefficient, F_a	1.200
Table 1613.3.3 (2)	Site Coefficient, F_v	1.500
Section 1613.2.3	$S_{MS} = MCE_R$ Spectral Response at 0.2 sec. = $(S_s)(F_a)$	1.078 g
Section 1613.2.3	$S_{M1} = MCE_R$ Spectral Response at 1.0 sec. = $(S_1)(F_v)$	0.493 g
Section 1613.2.4	$S_{DS} =$ Design Spectral Response at 0.2 sec. = $2/3(S_{MS})$	0.719 g
Section 1613.2.4	$S_{D1} =$ Design Spectral Response at 1.0 sec. = $2/3(S_{M1})$	0.328 g
Section 1613.2.5	Seismic Design Category	D
ASCE 7-16 Fig. 22-14	Mapped Long-Period Transition Period, T_L	8 sec
Section 1803.2.12	PGA_M per Section 11.8.3 of ASCE 7	0.47 g

LANDSLIDE POTENTIAL AND SLOPE STABILITY: As part of this investigation we reviewed the publication, “Landslide Hazards in the Northern Part of the San Diego Metropolitan Area” by Tan, 1995. This reference is a comprehensive study that classifies San Diego County into areas of relative landslide susceptibility. According to this publication, the site is located in Relative Landslide Susceptibility Area 2. Area 2 is considered to be “marginally susceptible” to landsliding. Based on our findings, it is our professional opinion that the potential for slope failures within the site is very low.

LIQUEFACTION: The near-surface soils encountered at the site are not considered susceptible to liquefaction due to such factors as depth to the groundwater table, soil density and grain-size distribution.

FLOODING: As delineated on Flood Insurance Rate Map (FIRM) 06073C1077G prepared by the Federal Emergency Management Agency, the site is located within Zone X, which has a 0.2% annual chance to be affected by a flood hazard.

TSUNAMIS: Tsunamis are great sea waves produced by submarine earthquakes or volcanic eruptions. Due to the site’s elevation and location, the risk of the site being affected by a tsunami is considered low.

SEICHES: Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays or reservoirs. Due to the site’s location, it should not be affected by seiches.

CONCLUSIONS

In general, we found that the subject site is suitable to support the proposed residential project provided the recommendations presented herein are followed. We have found that the site is underlain a shallow depths by relatively competent older alluvium that is suitable to support shallow foundations. Soil design values for such conditions are presented in the *Foundations* section of this report. Existing soils that will support slab-on-grade will require scarification, moisture conditioning, and compaction prior to slab construction.

RECOMMENDATIONS

GRADING AND EARTHWORK

GENERAL: All grading should conform to the guidelines presented in Appendix J of the California Building Code and the minimum requirements of the City of Escondido except where specifically superseded in the text of this report. Prior to grading, a representative of Christian Wheeler Engineering should be present at the pre-construction meeting to provide additional grading guidelines, if necessary, and to review the earthwork schedule.

OBSERVATION OF GRADING: Continuous observation by the Geotechnical Consultant is essential during the grading operation to confirm conditions anticipated by our investigation, to allow adjustments in design criteria to reflect actual field conditions exposed, and to determine that the grading proceeds in general accordance with the recommendations contained herein.

CLEARING AND GRUBBING: Site preparation should begin with demolition and removal of the existing improvements and the stripping and removal of vegetation, construction debris and other deleterious materials from the site. This should include all significant root material. The resulting materials should be disposed of off-site in a legal dumpsite.

REMEDIAL GRADING: Prior to constructing any new improvements, including the proposed slab-on-grade, the exposed soils should be scarified to a depth of 12 inches, moisture conditioned, and compacted to at least 90 percent relative compaction. Prior to compaction, the exposed soil should be observed by a representative of Christian Wheeler Engineering. Depending on the conditions encountered, deeper removals may be recommended by our field personnel.

DEWATERING: Based on the expected construction and the above recommendations, we expect that the excavations for the proposed structures will be above the local water table; however, the excavations may encounter perched groundwater and/or very wet to saturated soils. In this case, it will likely be necessary to perform localized dewatering during construction to remove water from the excavation.

COMPACTION AND METHOD OF FILLING: All structural fill and backfill material placed at the site, except as noted below, should be compacted to a relative compaction of at least 90 percent of maximum dry density as determined by ASTM Laboratory Test D1557. Fills should be placed at or slightly above optimum moisture content, in lifts six to eight 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. Fill material should be free of rocks or lumps of soil in excess of twelve inches in maximum dimension; however, this should be reduced to six inches within four feet of finish grade.

All utility trench backfill should be compacted to a minimum of 90 percent of its maximum dry density. The upper twelve inches of subgrade beneath paved areas should be compacted to 95 percent of the materials maximum dry density. This compaction should be obtained by the paving contractor just prior to placing the aggregate base material and should not be part of the mass grading requirements or operation.

IMPORTED FILL MATERIAL: Soils to be imported to the site should be evaluated and approved by the Geotechnical Consultant prior to being imported. At least five 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 granular material containing some silt or clay binder, which has an Expansion Index of less than 50. Less than 25 percent of the material should be larger than the Standard #4 sieve, and less than 25 percent finer than the Standard # 200 sieve. Soils not meeting these criteria should not be used for structural fill or backfill.

TEMPORARY CUT SLOPES: The contractor is solely responsible for designing and constructing stable, temporary excavations and will need to shore, slope, or bench the sides of trench excavations as required to maintain the stability of the excavation sides. The contractor's "competent person", as defined in the OSHA Construction Standards for Excavations, 29 CFR, Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety process. We anticipate that the existing on-site soils will consist of Type C material. Our firm should be contacted to observe all temporary cut slopes during grading to ascertain that no unforeseen adverse conditions exist. No surcharge loads such as foundation loads, or soil or equipment st

ockpiles, vehicles, etc. should be allowed within a distance from the top of temporary slopes equal to half the slope height.

SURFACE DRAINAGE: The ground around the proposed structures should be graded so that surface water flows rapidly away from the structures without ponding. In general, we recommend that the ground adjacent to structure slope away at a gradient of at least two percent. Densely vegetated areas where runoff can be impaired should have a minimum gradient of five percent within the first five feet from the structure. It is our opinion that the project site is not suitable for storm water infiltration/percolation BMPs. We recommend any planned pervious pavements, bio retention areas, or bio swales be lined in such a manner as to prevent the storm water from infiltrating into the underlying soils and should be connected via pipes to the storm drain system.

GRADING PLAN REVIEW: The final grading plans should be submitted to this office for review in order to ascertain that the recommendations of this report have been implemented, and that no additional recommendations are needed due to changes in the anticipated development plans.

FOUNDATIONS

GENERAL: We expect that the proposed podium-style building will be supported by conventional spread footings. The following design recommendations are considered the minimum based on anticipated soil conditions and are not intended to be lieu of structural considerations. All foundations should be designed by a qualified structural engineer.

DIMENSIONS: New continuous and individual pad footings should have a minimum embedment of 24 inches below finish grade. Continuous footings should have a minimum width of 18 inches and pad footings should have a minimum width of 24 inches.

ALLOWABLE BEARING PRESSURE: Footings with the minimum dimensions noted above may be designed based on the values presented in Table III. Foundations should be designed to support imposed vertical and lateral loads without exceeding the strength of the soil and to support sustained loads without exceeding the settlement criteria noted below. Vertical loads include combinations of dead (D) and live (L) loads while lateral loads are those combinations that also include transient wind (W) or seismic forces (E). Imposed loads should be determined using combinations in accordance with the applicable building code. Sustained loads include the dead load and the portion of live load that is considered to be permanent or of long-term duration such that it contributes to settlement. For typical buildings, the sustained load is commonly taken as the dead load plus 50 percent of the live load.

TABLE III: ALLOWABLE BEARING PRESSURE

Controlling Soil Criteria	ASD Load Combinations	Allowable Bearing Pressure	Minimum Factor of Safety
Strength – vertical loads	Dead, Live	10,000 psf ¹	3
Strength – vertical plus lateral loads	Dead, Live, Seismic	8,000 psf ¹	3
Settlement – sustained load	Dead, (½) Live	4,000 psf ²	2

1. The allowable bearing pressure for soil strength can be increased by 500 psf and 300 psf for each additional foot of depth and width, respectively.
2. The allowable bearing pressure for soil settlement should be decreased by 250 psf for each additional foot of width.

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 350 pounds per cubic foot. These values are based on the assumption that 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.

SETTLEMENT CHARACTERISTICS: The anticipated total and differential foundation settlement for the static condition is expected to be less than 1 inch and ¾ inch in 40 feet, respectively, provided the recommendations presented in this report are followed. It should be recognized that minor cracks normally occur in concrete slabs and foundations due to shrinkage during curing or redistribution of stresses, therefore some cracks should be anticipated. Such cracks are not necessarily an indication of excessive vertical movements.

EXPANSIVE CHARACTERISTICS: The foundation soils are expected to have a “low” expansion index. The site preparation and foundation recommendations reflect this condition.

FOUNDATION PLAN REVIEW: The final foundation plan and accompanying details and notes should be submitted to this office for review. The intent of our review will be to verify that the plans used for construction reflect the minimum dimensioning and reinforcing criteria presented in this section and that no additional criteria are required due to changes in the foundation type or layout. It is not our intent to review structural plans, notes, details, or calculations to verify that the design engineer has correctly applied the geotechnical design values. It is the responsibility of the design engineer to properly design/specify the foundations and other structural elements based on the requirements of the structure and considering the information presented in this report.

FOUNDATION EXCAVATION OBSERVATION: All foundation excavations should be observed by the Geotechnical Consultant prior to placing reinforcing steel or formwork in order to determine if the foundation recommendations presented herein are followed. All footing excavations should be excavated neat, level, and square. All loose or unsuitable material should be removed prior to the placement of concrete.

CORROSIVITY

The water soluble sulfate content was determined for a representative soil sample from the site in accordance with California Test Method 417. The result, which is presented in Appendix B, indicates that the on-site soils are, in general, negligibly corrosive to concrete.

It should be understood Christian Wheeler Engineering does not practice corrosion engineering. If such an analysis is considered necessary, we recommend that the client retain an engineering firm that specializes in this field to consult with them on this matter. The results of our tests should only be used as a guideline to determine if additional testing and analysis is necessary.

ON-GRADE SLABS

GENERAL: It is our understanding that the lowest level will have a concrete slab-on-grade. The following recommendations are considered the minimum slab requirements based on the soil conditions and are not intended to be in lieu of structural considerations.

INTERIOR SLAB: We recommend that the parking slab-on-grade be at least 6 inches thick and the non-parking slab-on-grade be at least 5 inches thick. The slabs should be reinforced with at least No. 3 bars spaced at 18 inches on center each way. The reinforcing bars should extend at least six inches into the foundations and should be supported by chairs and be positioned in the center of the slab. The owner and the project structural engineer should determine if the on-grade slabs need to be designed for special loading conditions. For such cases, a subgrade modulus of 150 pounds per cubic inch can be assumed for the subgrade provided it is prepared as recommended in this report. The allowable bearing load for the subgrade is 2,000 pounds per square foot.

UNDER-SLAB VAPOR RETARDERS: Where floor coverings are installed, steps should be taken to minimize the transmission of moisture vapor from the subsoil through the interior slabs where it can potentially damage the interior floor coverings. We recommend that the owner/contractor follow national standards for the installation of vapor retarders below interior slabs as presented in currently published standards including AC

I 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."

LIMITATIONS

REVIEW, OBSERVATION AND TESTING

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 the California Building Code.

It is recommended that Christian Wheeler Engineering be retained to provide continuous soil engineering services during the earthwork 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.

UNIFORMITY OF CONDITIONS

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.

CHANGE IN SCOPE

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. This should be verified in writing or modified by a written addendum.

TIME LIMITATIONS

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 be 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.

PROFESSIONAL STANDARD

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 test pits, surveys, and explorations are made, and that our data, interpretations, and recommendations be 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.

CLIENT'S RESPONSIBILITY

It is the client's responsibility, or its 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.

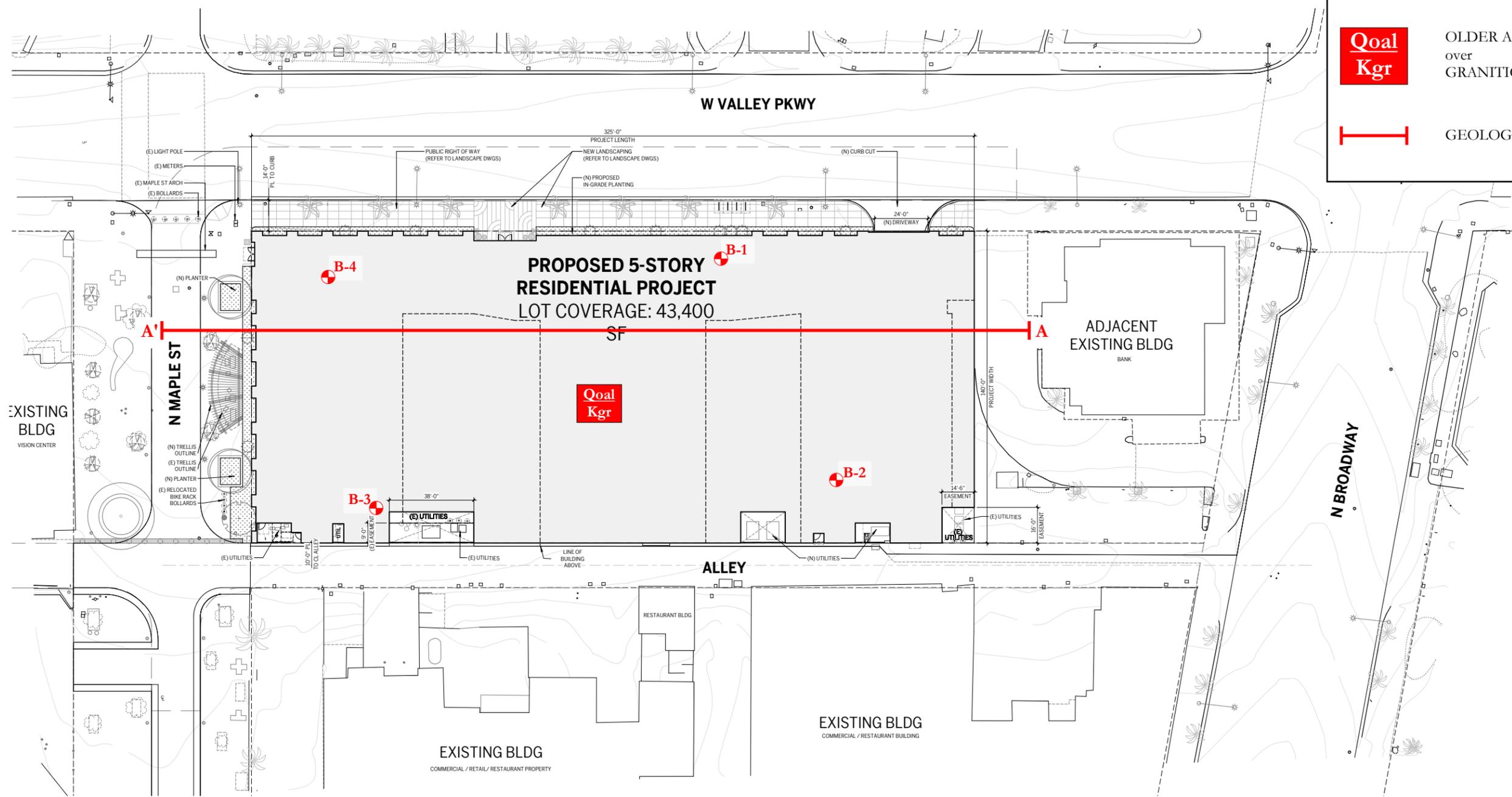
FIELD EXPLORATIONS

Four subsurface explorations were made during a previous investigation at the locations indicated on the Site Plan included herewith as Plate Number 1 on March 2, 2017. These explorations consisted of four small-diameter, hollow-stem borings drilled with a truck-mounted drill rig. The fieldwork was conducted under the observation and direction of our engineering geology personnel.

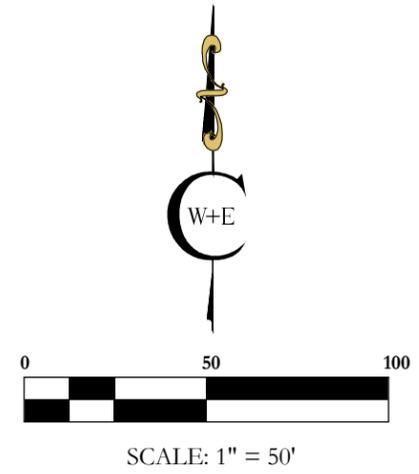
The borings were carefully logged when made. The boring logs are presented in the attached Appendix A. The soils are described in accordance with the Unified Soils Classification. In addition, a verbal textural description, the wet color, the apparent moisture and the density or consistency are provided. The density of granular soils is given as either very loose, loose, medium dense, dense or very dense. The consistency of silts or clays is given as either very soft, soft, medium stiff, stiff, very stiff, or hard. Undisturbed samples of typical and representative soils were obtained and returned to the laboratory for testing. The undisturbed samples were obtained by driving a 2 3/8-inch inside diameter split-tube sampler ahead of the auger using a 140-pound weight free-falling a distance of 30 inches. The number of blows required to drive the sampler each foot was recorded and this value is presented on the attached boring logs as "Penetration Resistance." Bulk samples of disturbed soil were also collected in bags from the auger cuttings during the advancement of the borings and transported to the laboratory for testing.

LABORATORY TESTING

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. A brief description of the tests performed and the subsequent results are presented in Appendix B.



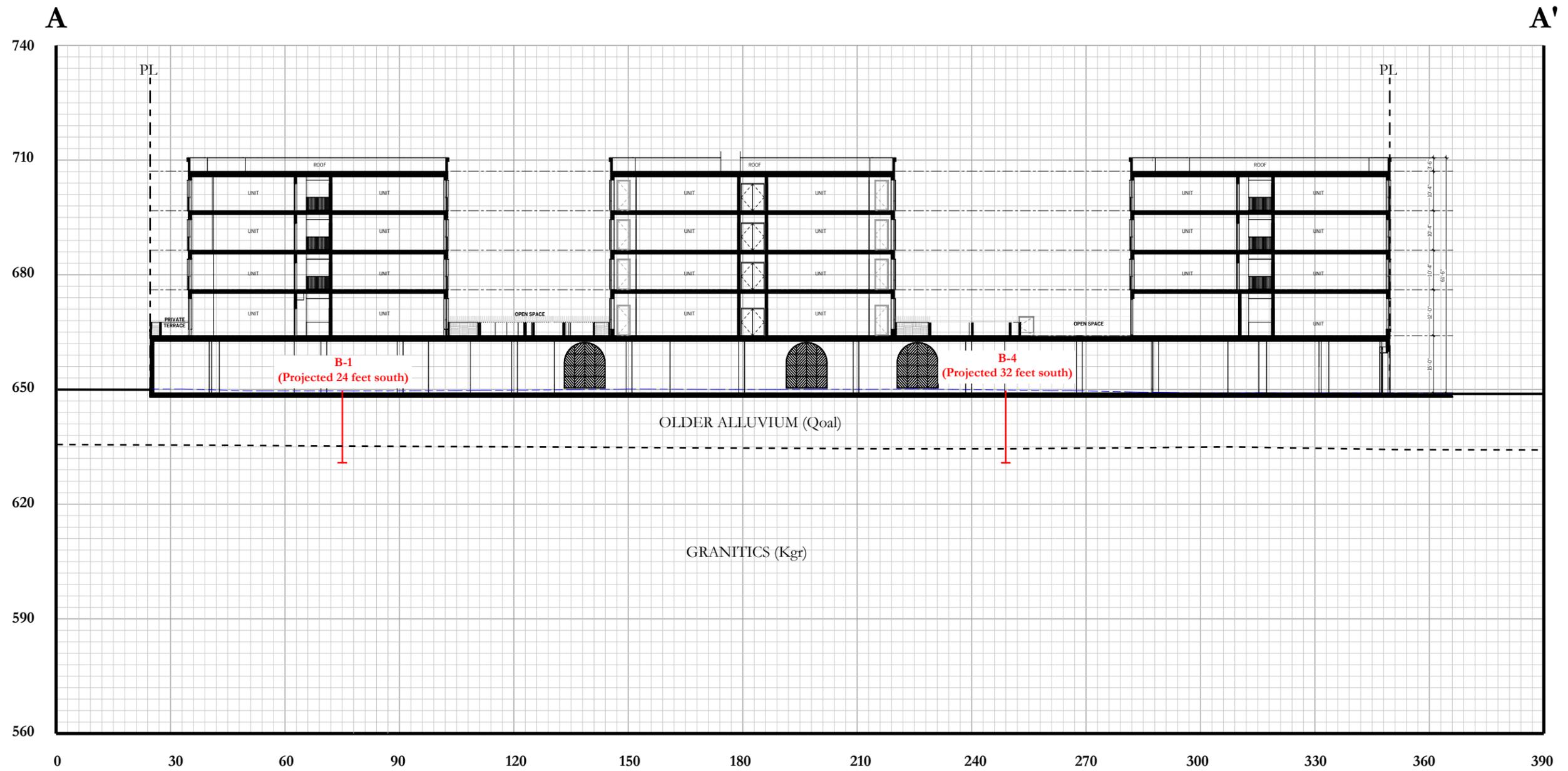
CWE LEGEND	
 B-4	APPROXIMATE BORING LOCATION
	OLDER ALLUVIUM over GRANITICS
	GEOLOGIC CROSS-SECTION



SITE PLAN AND GEOTECHNICAL MAP

PROPOSED MULTI-FAMILY RESIDENTIAL PROJECT 173 W. VALLEY PARKWAY, ESCONDIDO, CALIFORNIA	
DATE: JANUARY 2025	REPORT NO.: 2230256.01
BY: SCC	PLATE NO.: 1





GEOLOGIC CROSS-SECTION A-A'

PROPOSED MULTI-FAMILY RESIDENTIAL PROJECT
 173 W. VALLEY PARKWAY, ESCONDIDO, CALIFORNIA

DATE: JANUARY 2025

REPORT NO.: 2230256.01

BY: SCC

PLATE NO.: 2



Appendix A

Boring Logs

LOG OF TEST BORING B-1

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk
SPT	Standard Penetration Test	DR	Drive Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential	SD	Sample Density

Date Logged: 3/2/17 Equipment: Mobil B-61
 Logged By: DJF Auger Type: 8 inch Hollow Stem
 Existing Elevation: Drive Type: 140lbs/30 inches
 Proposed Elevation: Depth to Water: 13.5 feet

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0				3" AC over 6" Base.							
			SC/ CL	Older Alluvium (Qoal): Reddish-brown, moist, medium dense/stiff, very fine- to medium-grained, CLAYEY SAND/SANDY CLAY, upper 2 feet disturbed.							
5			SM	Reddish-brown, moist, medium dense, SILTY SAND.	33	Cal		13.2	119.1		DS
10			SP- SM	Light brown, very moist, medium dense, fine- to coarse-grained, POORLY GRADED SAND with silt.	26	Cal		19.5	108.6		SA SO4
				Perched groundwater at 13.5 feet.							
15			SW	Weathered Granitics (Kgr): Light grayish-brown, damp, very dense, fine- to coarse-grained, WELL-GRADED SAND.	68	Cal					
20				Boring terminated at 19.5 feet. Perched groundwater at 13.5 feet.	50/3"	Cal					

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

PROPOSED MULTI-FAMILY RESIDENTIAL PROJECT 137 W. VALLEY PARKWAY ESCONDIDO, CALIFORNIA

DATE: JANUARY 2025 JOB NO.: 2230256.01
 BY: SD APPENDIX: A-1



CHRISTIAN WHEELER
ENGINEERING

LOG OF TEST BORING B-2

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk
SPT	Standard Penetration Test	DR	Drive Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential	SD	Sample Density

Date Logged: 3/2/17 Equipment: Mobil B-61
 Logged By: DJF Auger Type: 8 inch Hollow Stem
 Existing Elevation: Drive Type: 140lbs/30 inches
 Proposed Elevation: Depth to Water: 13 feet

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0				3" AC over 6" Base.							
			SC	Older Alluvium (Qoal): Reddish-brown, moist, dense, fine- to coarse-grained, CLAYEY SAND, micaceous, upper 12 inches disturbed. Very dense. Light orangish-brown, very fine- to medium-grained. Increase in fine content at 2 feet.	50/4"	Cal					
5					75	Cal		19.0	106.3		
			SM	Light brown to reddish-brown, moist, very dense, very fine- to medium-grained, SILTY SAND with clay	62	Cal		12.2	119.5		SA SO4
				Perched groundwater at 13 feet.							
			SW	Weathered Granitics (Kgr): Light gray, moist, very dense, fine- to coarse-grained, WELL-GRADED SAND.	79	Cal					
15					80	Cal					
				Boring terminated at 18 feet. Perched groundwater at 13 feet.							
20											
25											
30											

Notes:

Symbol Legend	
	Groundwater Level During Drilling
	Groundwater Level After Drilling
	Apparent Seepage
*	No Sample Recovery
**	Non-Representative Blow Count (rocks present)

PROPOSED MULTI-FAMILY RESIDENTIAL PROJECT 137 W. VALLEY PARKWAY ESCONDIDO, CALIFORNIA

DATE: JANUARY 2025	JOB NO.: 2230256.01
BY: SD	APPENDIX: A-2



CHRISTIAN WHEELER
ENGINEERING

LOG OF TEST BORING B-3

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk
SPT	Standard Penetration Test	DR	Drive Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential	SD	Sample Density

Date Logged: 3/2/17 Equipment: Mobil B-61
 Logged By: DJF Auger Type: 8 inch Hollow Stem
 Existing Elevation: Drive Type: 140lbs/30 inches
 Proposed Elevation: Depth to Water: Unknown

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0				2" AC over 10" Base.							
			SM	Artificial Fill (Qaf): Reddish-brown, moist, medium dense, very fine- to medium-grained, SILTY SAND with trace AC and concrete debris.	25	Cal		8.7	125.2		
			SC	Older Alluvium (Qoal): Reddish-brown, moist, dense, very fine- to medium-grained, CLAYEY SAND.	38	Cal		14.5	115.8		
			SM	Reddish-brown, moist, medium dense, very fine- to medium-grained, SILTY SAND with clay, micaceous.	24	Cal		17.0	112.5		
				Brown to grayish-brown, mottled.	46	Cal		15.6	116.6		Con
			SM	Reddish-brown, moist, medium dense, very fine- to medium-grained, SILTY SAND with clay, micaceous.	28	Cal		19.5	108.7		Con
			SW	Weathered Granitics (Kgr): Light gray, moist, very dense, fine- to coarse-grained, WELL-GRADED SAND.	50/6"	Cal					
				Boring terminated at 19 feet. No groundwater or seepage encountered.							

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- No Sample Recovery
- Non-Representative Blow Count (rocks present)

PROPOSED MULTI-FAMILY RESIDENTIAL PROJECT 137 W. VALLEY PARKWAY ESCONDIDO, CALIFORNIA

DATE: JANUARY 2025

JOB NO.: 2230256.01

BY: SD

APPENDIX: A-3



CHRISTIAN WHEELER
ENGINEERING

LOG OF TEST BORING B-4

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk
SPT	Standard Penetration Test	DR	Drive Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential	SD	Sample Density

Date Logged: 3/2/17 Equipment: Mobil B-61
 Logged By: DJF Auger Type: 8 inch Hollow Stem
 Existing Elevation: Drive Type: 140lbs/30 inches
 Proposed Elevation: Depth to Water: 13 feet

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0				3" AC over 7" Base.							
			SM	Older Alluvium (Qoal): Reddish-brown, moist, medium dense, very fine- to medium-grained, SILTY SAND.	16	Cal		16.1	113.9		
			SC	Reddish-brown, moist, medium dense, very fine- to medium-grained, CLAYEY SAND.							
				Orangish-brown.	49	Cal		18.7	108.6		DS
				Mottled.							
				Perched groundwater at 13 feet.							
			SP	Light brown, saturated, medium dense, fine- to coarse-grained, POORLY-GRADED SAND with silt and gravels.	44	Cal					
			SW	Weathered Granitics (Kgr): Light gray, moist, very dense, fine- to coarse-grained, WELL-GRADED SAND.							
				Boring terminated at 19.5 feet. Perched groundwater at 13 feet.	50/4"	Cal					

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- No Sample Recovery
- Non-Representative Blow Count (rocks present)

PROPOSED MULTI-FAMILY RESIDENTIAL PROJECT 137 W. VALLEY PARKWAY ESCONDIDO, CALIFORNIA

DATE: JANUARY 2025

JOB NO.: 2230256.01

BY: SD

APPENDIX: A-4



CHRISTIAN WHEELER
ENGINEERING

Appendix B

Laboratory Test Results

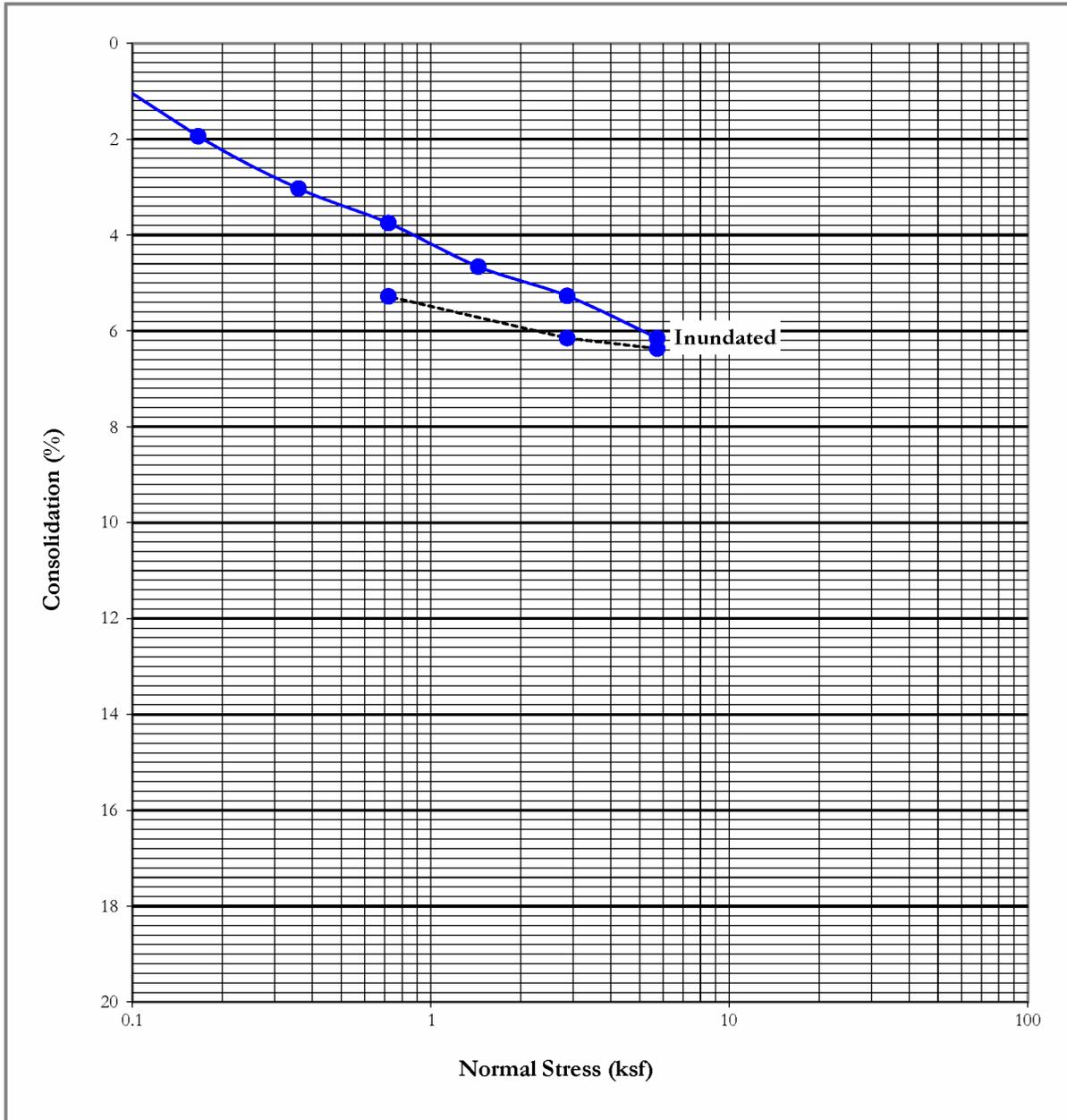
LABORATORY DESCRIPTION

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. Brief descriptions of the tests performed are presented below:

- a) **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System and are presented on the exploration logs in Appendix A.
- b) **MOISTURE-DENSITY:** In-place moisture contents and dry densities were determined for representative soil samples. This information was an aid to classification and permitted recognition of variations in material consistency with depth. The dry unit weight is determined in pounds per cubic foot, and the in-place moisture content is determined as a percentage of the soil's dry weight. The results of these tests are summarized in the exploration logs presented in Appendix A.
- c) **CONSOLIDATION TESTS:** One dimensional consolidation testing was performed in accordance with ASTM D2435. The specimen was placed in a consolidometer with porous stones at the top and bottom and loads were applied in a geometric progression. After vertical movement ceased with each load interval, the resulting deformation was recorded. The percent consolidation is reported as the ratio of vertical compression to the original sample height. The test sample was inundated at some point in the test cycle to determine its behavior under the anticipated loads as soil moisture increases.
- d) **DIRECT SHEAR:** Direct shear tests were performed to determine the failure envelope of selected soils based on yield shear strength. The shear box was designed to accommodate a sample having a diameter of 2.375 inches or 2.50 inches and a height of 1.0 inch. Samples were tested at different vertical loads and a saturated moisture content. The shear stress was applied at a constant rate of strain of approximately 0.05 inch per minute.
- e) **GRAIN SIZE DISTRIBUTION:** The grain size distributions of selected samples were determined in accordance with ASTM C136 and/or ASTM D422.
- f) **SOLUBLE SULFATE CONTENT:** The soluble sulfate content was determined for representative samples in accordance with California Test Methods 417.

 CHRISTIAN WHEELER ENGINEERING	LABORATORY TEST RESULTS	PROJECT NO. 2230256
	PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT 137 W. VALLEY PARKWAY, ESCONDIDO, CA	DATE Jan-25
		FIGURE B-2

CONSOLIDATION (ASTM D2435)



Sample No	Initial Moisture Content	Initial Dry Density	Final Moisture Content
B-3 @ 13'	15.6%	116.6 pcf	15.9%



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LABORATORY TEST RESULTS

PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
137 W. VALLEY PARKWAY, ESCONDIDO, CA

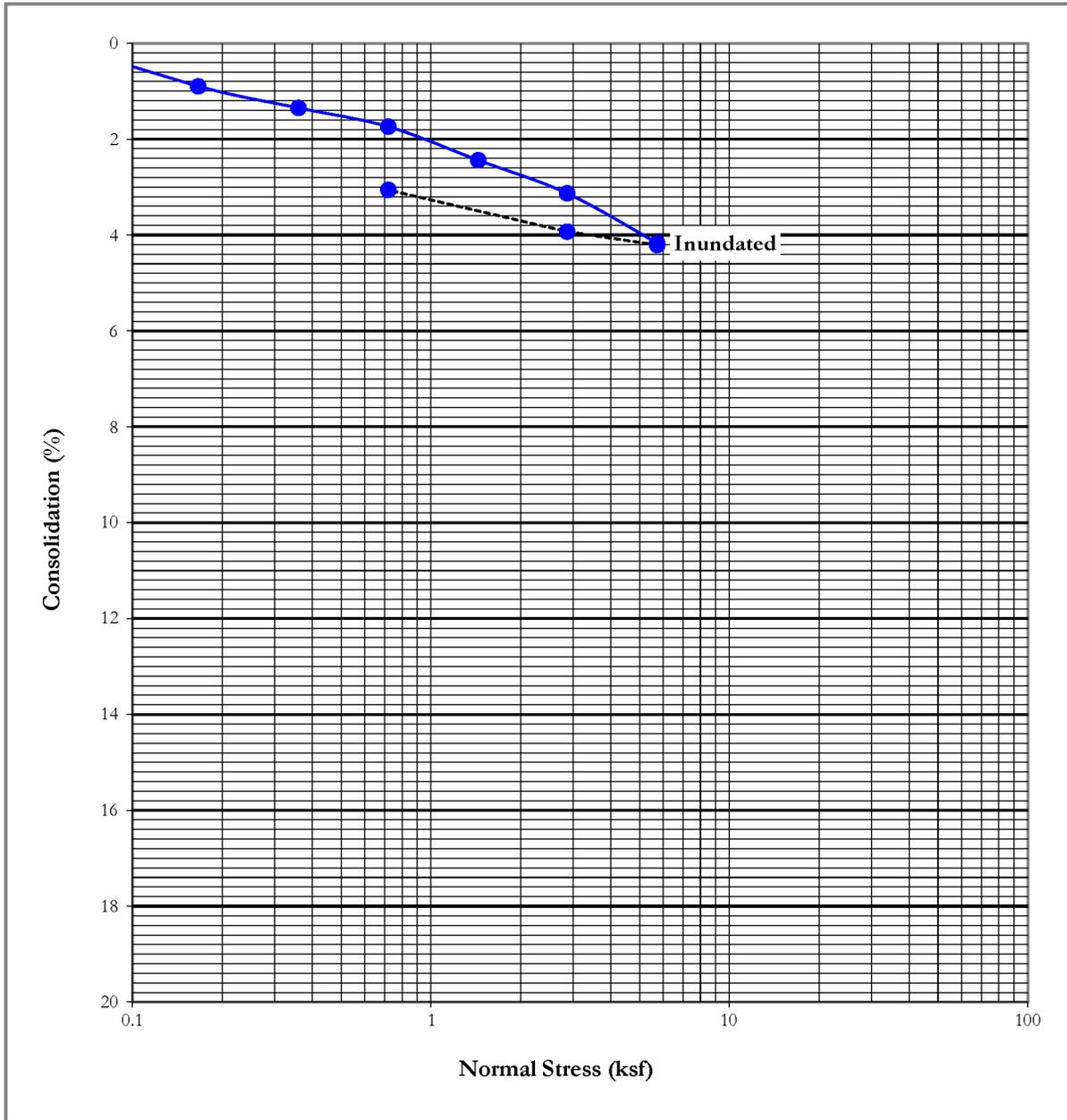
PROJECT NO. 2230256

DATE Jan-25

FIGURE

B-3

CONSOLIDATION (ASTM D2435)



Sample No	Initial Moisture Content	Initial Dry Density	Final Moisture Content
B-3 @ 16½'	19.5%	108.7 pcf	19.2%



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ENGINEERING

LABORATORY TEST RESULTS

PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
137 W. VALLEY PARKWAY, ESCONDIDO, CA

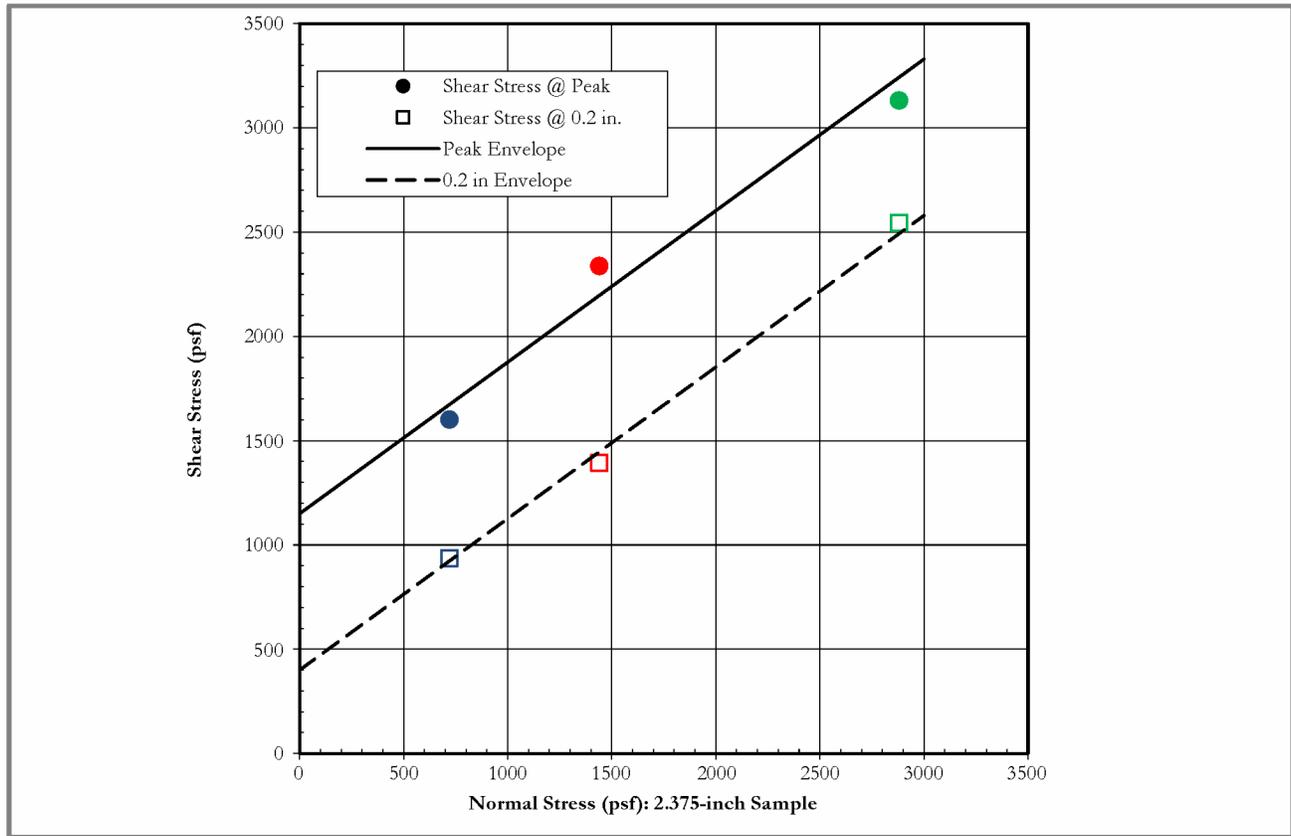
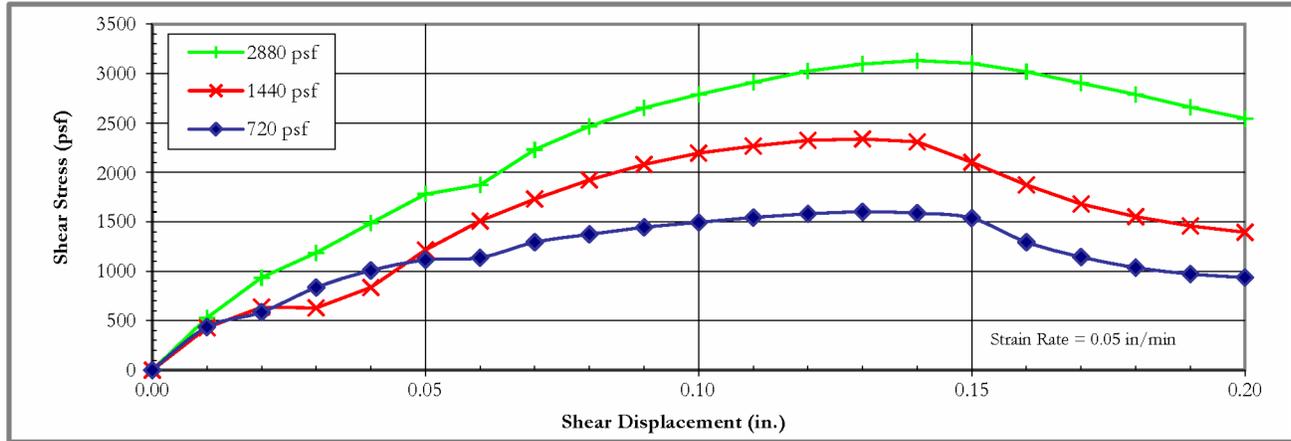
PROJECT NO. 2230256

DATE Jan-25

FIGURE

B-4

DIRECT SHEAR TEST (ASTM D3080)



Sample No. **B-1 @ 5'**

Sample Type: Undisturbed (Ring)

Normal Stress (psf)	720	1440	2880
Peak Shear Stress (psf)	1602	2338	3132
Shear Stress at 0.2 in (psf)	937	1394	2545
Initial Dry Density (pcf)	119.1	119.1	119.4
Initial Moisture Content (%)	13.2	13.2	13.1

	Peak	at 0.2 in Displacement
Friction Angle, ϕ (deg):	36	36
Cohesion Intercept, c (psf):	1150	400



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LABORATORY TEST RESULTS

PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
137 W. VALLEY PARKWAY, ESCONDIDO, CA

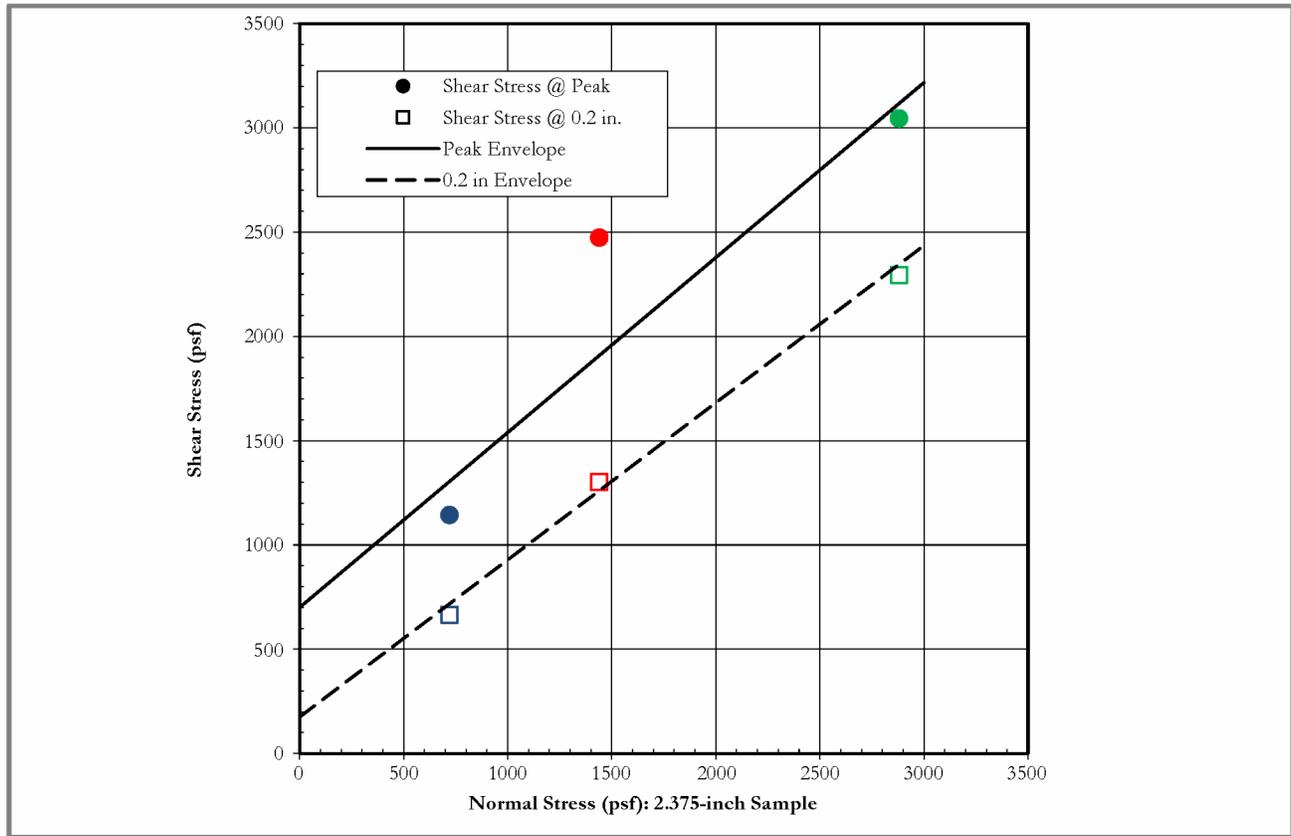
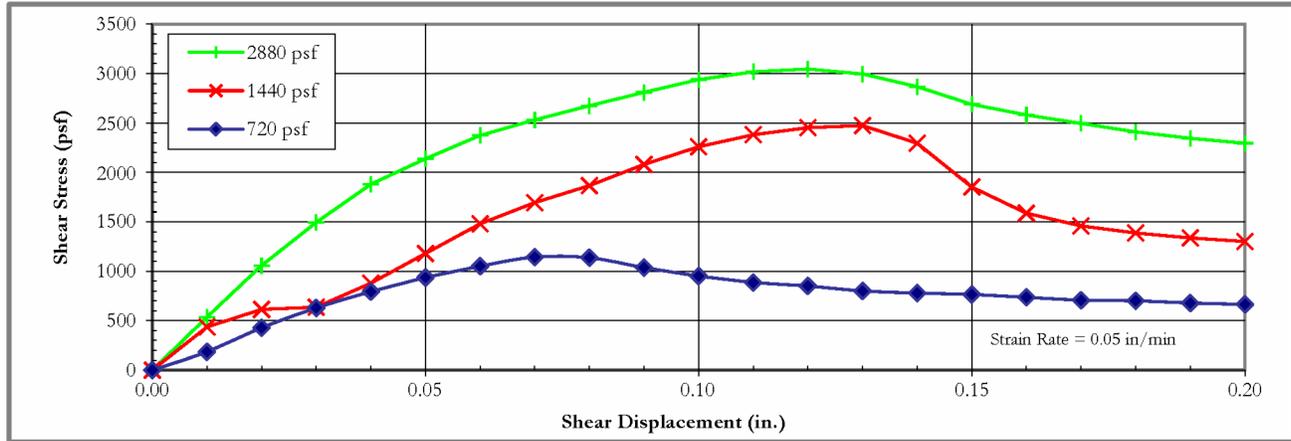
PROJECT NO. 2230256

DATE Jan-25

FIGURE

B-5

DIRECT SHEAR TEST (ASTM D3080)



Sample No. **B-4 @ 5'**

Sample Type: Undisturbed (Ring)

Normal Stress (psf)	720	1440	2880
Peak Shear Stress (psf)	1144	2474	3046
Shear Stress at 0.2 in (psf)	665	1301	2295
Initial Dry Density (pcf)	108.5	108.6	106.7
Initial Moisture Content (%)	16.5	18.7	20

	Peak	at 0.2 in Displacement
Friction Angle, ϕ (deg):	40	37
Cohesion Intercept, c (psf):	700	175



LABORATORY TEST RESULTS

PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
137 W. VALLEY PARKWAY, ESCONDIDO, CA

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FIGURE

B-6

CORROSIVITY TESTS

Sample No.	CALTEST 417	CALTEST 643		CALTEST 422
	Sulfate Content (% SO ₄)	pH	Resistivity (ohm-cm)	Chloride Content (ppm)
B-1 @ 8'-13'	0.008	--	--	--
B-2 @ 8'-13'	0.008	--	--	--



CHRISTIAN WHEELER
ENGINEERING

LABORATORY TEST RESULTS

PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
137 W. VALLEY PARKWAY, ESCONDIDO, CA

PROJECT NO. 2230256

DATE Jan-25

FIGURE

B-8

Appendix C

References

REFERENCES

Bryant, W. A. (compiler), 2005, Digital Database of Quaternary and Younger Faults from the Fault Activity Map of California, version 2.0: California Geological Survey Web Page,
http://www.consrv.ca.gov/CGS/information/publications/QuaternaryFaults_ver2.htm

Federal Emergency Management Agency, 2012, San Diego County, California and Incorporated Areas Flood Insurance Rate Map, Panel 1077 of 2375, Map Number 06073C1077G.

Historic Aerials, NETR Online, historicaerials.com

Jennings, C.W. and Bryant, W. A., 2010, Fault Activity Map, California Geological Survey, Geologic Data Map No. 6, <http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html>

Kennedy, Michael P. and Tan, Siang S., 2007, Geologic Map of the Oceanside 30'x60' Quadrangle, California, California Geologic Survey, Map No. 2.

Tan, S.S., 1995, Landslide Hazards in the Northern Part of the San Diego Metropolitan Area, San Diego County, California, California Division of Mines and Geology Open-File Report 95-04.

U.S. Geological Survey, U.S. Seismic Design Maps Web Application,
<http://geohazards.usgs.gov/designmaps/us/application.php>

U.S. Geological Survey, Quaternary Faults in Google Earth,
<http://earthquake.usgs.gov/hazards/qfaults/google.php>