RMA GeoScience
Every Project Matters | www.rmageoscience.com

June 10, 2016

Moorpark Property 67, LLC
26500 W Agoura Rd. #652
Calabasas, CA 91302

Attention: Mr. James Rasmussen

Subject: Geotechnical Investigation
Tract 5847
Moorpark, CA

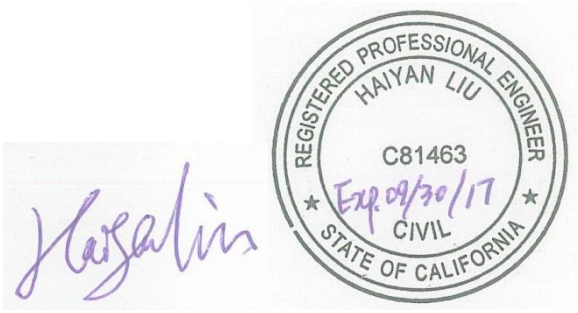
Dear Mr. Rasmussen:

In accordance with your request, a geotechnical investigation has been completed for the above-referenced project. The report addresses both engineering geologic and geotechnical conditions. The results of the investigation are presented in the accompanying report, which includes a description of site conditions, results of our field exploration and laboratory testing, conclusions, and recommendations.

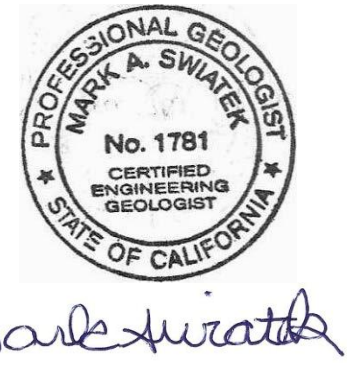
We appreciate this opportunity to be of continued service to you. If you have any questions regarding this report, please do not hesitate to contact us at your convenience.

Respectfully submitted,

RMA GeoScience



Haiyan Liu, PE
Project Engineer
C81463



Mark Swiatek, PG | CEG
Engineering Geologist
CEG 1781

Alison Stonehouse
Staff Geologist

RMA GeoScience
Every Project Matters | www.rmageoscience.com

GEOTECHNICAL INVESTIGATION
FOR
TRACT 5847
MOORPARK, CA

for

Moorpark Property 67, LLC
26500 W Agoura Rd. #652
Calabasas, CA 91302

June 10, 2016

16-G63-0

RMA GeoScience
Every Project Matters | www.rmageoscience.com

TABLE OF CONTENTS

RMA GeoScience
Every Project Matters | www.rmageoscience.com

TABLE OF CONTENTS
(Continued)

RMA GeoScience
Every Project Matters | www.rmageoscience.com

1.00 INTRODUCTION

1.01 Purpose

A geotechnical investigation has been completed for a proposed master planned community known as North Hills in the City of Moorpark and County of Ventura, California. The purpose of the investigation is to present geotechnical and geological information relative to planned grading and development of Tract 5847.

1.02 Scope of the Investigation

The general scope of this investigation included the following:

- Review of published and unpublished geologic, seismic, groundwater and geotechnical literature
- Examination of aerial photographs
- Contacting of underground service alert to locate onsite utility lines
- Logging, sampling and backfilling of 6 exploratory borings; 4 drilled with a bucket auger drill rig and 2 with a hollow stem auger drill rig
- Laboratory testing of representative soil samples
- Geotechnical evaluation of the compiled data
- Preparation of this report presenting our findings, conclusions and recommendations

Our scope of work did not include a preliminary site assessment for the potential of hazardous materials onsite

1.03 Site Location and Description

The site consists of approximately 68 acres of land located in the City of Moorpark, California. The property is bound to the north by existing ranch-style residences, to the east by Gabbert Road, to the south by undeveloped land, and to the west by a Ventura County Flood Control District (VCFCD) debris basin (Figure 1). The approximate geographic position of the center of the site is 34.2886° latitude and -118.9060° longitude.

The majority of the property consists of rolling hills, valleys, and incised drainages with the exception of the southwest corner which is relatively flat. Elevations range from approximately 1,500 to 1,640 feet above sea level. At the time of our field work, majority of the site was covered in grasses, brush, cacti, and sporadic trees.

Existing improvements on the site consist of a concrete road winding west from Gabbert Road to the center portion of the site where there are several smaller concrete roads and concrete pads. There are currently an abandoned swimming pool, a shed and a tennis court on the concrete pads in the central portion of the site. There is also an occupied residence near the east entrance at Gabbert Road. The concrete pads are level; indicating previous grading work was done on the site. There are also high voltage electrical transmission lines on the eastern portion of the site running in a north-south direction.

1.04 Current and Past Land Usage

Aerial photographs and historic topographic maps show that the site was completely undeveloped until sometime around

1947, at which time the flatter southwest portion of the site appears to have been an orchard. In 1967 the orchards are still there and the VCFCD debris basin is in place. By 1978 the residence located in the northeast corner of the site just east of Gabbert Road at the main entrance is in place, and the orchards on the southwest portion of the site appear to have been removed or abandoned. Between 1980 and 1994 the concrete roads and pads were put in place. By 2002 the residences to the north of the site had been constructed and the area that used to have the orchards had been covered by native vegetation.

Currently the site is vacant with the exception of the occupied residence in the northeast corner near Gabbert Road.

1.05 Planned Usage

It is our understanding that the proposed development will consist of a residential master planned community that will included multiple housing types, community facilities, and infrastructure improvements (Figure 3).

Our investigation was performed prior to the preparation of foundation plans. To aid in preparation of this report, we utilized the following assumptions:

- Maximum foundation loads of 3 kips per linear foot for continuous footings and 60 kips for isolated spread footings
- Cuts and fills will be less than 65 feet

1.06 Investigation Methods and Limitations

Our investigation consisted of office research, field exploration, laboratory testing, review of the compiled data, and preparation of this report. It has been performed in a manner consistent with generally accepted engineering and geologic principles and practices, and has incorporated applicable requirements of California Buildings Code. Definitions of technical terms and symbols used in this report include those of the ASTM International, the California Building Code, and commonly used geologic nomenclature.

Technical supporting data are presented in the attached appendices. Appendix A presents a description of the methods and equipment used in performing the field exploration and logs of our subsurface exploration. Appendix B presents a description of our laboratory testing and the test results. Standard Grading Specifications and references are presented in Appendix C. Liquefaction and stability analyses are presented in Appendices D and E, respectively. References are presented in Appendix F.

2.00 FINDINGS

2.01 Geologic Setting

The site is located in the Simi Hills, part of the Transverse Ranges. The rocks in the region consist of marine and non-marine sedimentary rocks deposited beginning 75 million years ago (Squires, 1997). The site is underlain by the Plio-Pleistocene aged Saugus Formation (TQs). The upper part of the Saugus Formation, deposited approximately 1.5 to 1 million years ago, was deposited by the rivers crossing the delta and consists of "light gray to brown gravel composed of pebbles and small cobbles mostly of white to light gray granitic rocks, and a few of gneiss, metavolcanic rocks, quartzite, very few anorthosite, gabbro, and basaltic to andesitic volcanic rocks (Tertiary) and of dark reddish sandstone in coarse sandy matrix, crudely bedded; includes minor sand and clay, locally weathers to fray and brown pebbly soil" (Dibblee, 1992). The structure of the Saugus Formation beneath the site generally consists of flat lying to shallow dipping beds.

2.02 Earth Materials

Our field investigation encountered 4 geologic units: artificial fill, alluvium, and Saugus Formation bedrock. These units are described individually below and where encountered during our subsurface investigation on the accompanying boring logs (Appendix A).

- Artificial Fill (af)

  Artificial fills have been placed within the site to create the existing concrete roads and pads. These fills appear to have been derived from onsite soils composed of silty sands and sandy silts. We found no information regarding the placement and compaction of these fills.

- Alluvium (Map Symbol Qal)

  Alluvial deposits occur in valley areas and tributary drainage courses within the site as well as the southwest portion where borings B4-B6 were drilled. These deposits are typically composed of brown sandy silts, silty sands, and gravelly sand. At the time of our study, the deposits typically ranged from dry to slightly moist and were found to typically range from loose to medium dense.

- Saugus Formation Bedrock (Map Symbol TQs)

  The Saugus Formation locally underlies the site. It ranges from gravelly sand to sandy silt with minor clay in various layers. At the time of our study the deposits ranged from dry to slightly moist and ranged from loose to dense.

A site Geologic Map showing the distribution of the above geologic units and the locations of our borings is presented as Plate 1. Logs of the borings and trenches are presented in Appendix A.

2.03 Expansive Soils

Expansion index tests were performed on selected soil samples by the test methods outlined in ASTM D4829. The selected soil samples were obtained from encountered clayey soils and represented the worst scenario of the on-site soil profile. The test results indicate that these soils have a medium expansion potential. Results of expansion tests are presented in Appendix B. Visual observations of the earth materials suggest majority of the onsite soils will have a very low to low EI.

Since expansion testing was performed on only a small portion of the soils within the site and since site grading will redistribute soils, additional testing of the expansive properties of soils should be performed during future geotechnical investigations of the property and near the completion of rough grading in each development area.

2.04 Surface and Groundwater Conditions

Springs and standing water were not present at the time of our study. Seepage was observed in B1 at approximately 45' in depth where a clay-rich layer was acting locally as an aquatard causing a minimal seepage within the boring. Below this layer was dry caving sand, and no evidence of an aquatard was seen in any of the other borings that we drilled which leads us to believe that this aquatard is not continuous across the site and only local to the area around B1.

Groundwater was not encountered during our subsurface exploration to the maximum depth explored of 75'. According to the California Department of Water Resources State Groundwater Elevation Monitoring System, the depth to ground water in the vicinity of the site has ranged from approximately 330 to 395 feet below the ground surface. Data from

nearby wells is summarized below:

Well No.	Approximate Distance from Site	Highest Groundwater Level (ft)	Lowest Groundwater Level (ft)	Dates of Reported Groundwater Measurements
02N19W06F001S	0.34 miles to the west	330.8	392.4	1974-1977
02N19W06E001S	0.64 miles to the west	359.6	394.6	1968-1974

It is possible that shallower perched groundwater may occur seasonally along or near drainage courses.

2.05 Faults

The site is not located within the boundaries of an Earthquake Fault Zone for fault-rupture hazards as defined by the Alquist-Priolo Earthquake Fault Zoning Act (Figure 4). The nearest Earthquake Fault Zone is located more than 2.5 miles to the southeast along the San Gorgonio Pass fault. No evidence of faulting was observed during our investigation.

2.06 Historic Seismicity

Three historic strong earthquakes have been epicentered within about 20 miles of the site. The most recent of these events was the 6.7 magnitude Northridge Earthquake in 1994 which was 21.6 miles from the site. The largest magnitude quake within 100 miles of the site was a 7.7 magnitude quake in 1852 and was approximately 38 miles away.

Strong earthquakes that have occurred within the region in historic time and their approximate epicentral distances are summarized in Table 2.

2.07 Flooding Potential

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) 06111C0817E and 06111C0816E (effective dates January 20, 2010) the entirety of the site is within Zone X which is defined as areas determined to be outside the 0.2% annual chance floodplain (Figure 5).

The design civil engineer should consider nearby flood zones as well as other surface runoff originating from both within and outside of the site in design of the project.

2.08 Landslides and Erosion

The site is not located in a seismic hazard zone of required investigation for earthquake-induced landslides. No large landslides were encountered during our field investigation and none were apparent on aerial photographs. The majority of the site is generally not susceptible to landsliding due its low gradient. Soils along and adjacent to some drainage course have been eroded by water and there have been some failures of channel banks. However, these areas are restricted to the immediate channel areas.

2.09 Regional Land Subsidence

Ground subsidence is a gradual settling or sinking of the ground surface that is typically associated with oil, gas or groundwater extraction. No known records of subsidence were found and no evidence of subsidence was observed on the site. There are no oil or gas fields within or near the site. Consequently, regional land subsidence due to extraction of oil or gas is not a hazard at the site. Alluvial sediments beneath could be susceptible to land subsidence if proper groundwater management practices are not followed.

2.10 Mineral Resources

No mines or mineral resources are shown to be present within the site on a map showing the locations of mines and mineral resources in Ventura County (Bowers, 1988). The general plan maps and regional geologic maps do not identify any mineral resources within the site.

2.11 Slope Stability

Global stability was evaluated for both of these conditions using the XSTABL computer program originally developed by Purdue University. Hundreds of random circular failure surfaces that satisfy user-designed constraints are generated, analyzed and sorted by factor of safety (FOS).

Direct shear testing was performed six (6) samples including in-situ conditions on native soils, remodeled conditions on artificial fill and bedrock. Among the six soil samples, two of them were selected from the caving layers encountered during our exploration in B1 at 49' and B3 at 12'. Observation and testing results confirm there are local beds present with low cohesion. After reviewing all direct shear testing results, we used the following conservative parameters for slope stability analysis:

- Cohesion = 220 psf
- Friction = 33 degree
- Unit Weight = 105 pcf

Surficial (infinite slope) stability was evaluated using an Excel spreadsheet developed internally by RMA. The surficial stability analyses were performed on artificial fill and bedrock for a 4 foot saturated thickness on a 2H:1V slope. Seismic analyses were not performed for the surficial condition. The shear strength parameters utilized in the stability analysis and results of surficial stability analysis are presented in the following table.

Shear Strength Parameters								FOS from Surficial Stability Analysis
Sampling Location	Material	Unit Weight (pcf)	Cohesion (psf)		Friction Angle (degree)		Remarks	
			Peak	Residual	Peak	Residual		
B1@35 feet	Sandstone	105	390	220	37	33	Undisturbed sample	1.8
B1@50 feet	Sandstone	101	550	240	38	34	Undisturbed sample	2.0
B2@30 feet	Claystone	116	490	360	22	20	Undisturbed sample	2.2
B3@60 feet	Sandstone	97	320	270	35	32	Undisturbed sample	2.1
B1@49 feet	Sandstone (Caving)	127	240	120	36	34	Remodeled Sample	1.3
B3@12 feet	Sandstone (Caving)	122	310	80	33	31	Remodeled Sample	1.0

Our slope stability analysis results are presented in Appendix E.

2.12 Liquefaction Screening Evaluation Results

Liquefaction describes a phenomenon where cyclic stresses, which are produced by earthquake-induced ground motions, create excess pore pressures in cohesionless soils. As a result, the soils may acquire a high degree of mobility, which can lead to lateral spreading, consolidation and settlement of loose sediments, ground oscillation, flow failure, loss of bearing strength, ground fissuring, sand boils, and other damaging deformations. This phenomenon occurs only below the water table, but after liquefaction has developed, it can propagate upward into overlying, non-saturated soil as excess pore water escapes. Descriptions of each of the phenomena associated with liquefaction are described below:

Lateral Spreading: Lateral spreading is the lateral movement of stiff, surficial blocks of sediments as a result of a subsurface layer liquefying. The lateral movements can cause ground fissures or extensional, open cracks at the surface as the blocks move toward a slope face, such as a stream bank or in the direction of a gentle slope. When the shaking stops, these isolated blocks of sediments come to rest in a place different from their original location and may be tilted.

Ground Oscillation: Ground oscillation occurs when liquefaction occurs at depth but the slopes are too gentle to permit lateral displacement. In this case, individual blocks may separate and oscillate on a liquefied layer. Sand boils and fissures are often associated with this phenomenon.

Flow Failure: A more catastrophic mode of ground failure than either lateral spreading or ground oscillation, involves large masses of liquefied sediment or blocks of intact material riding on a liquefied layer moving at high speeds over large distances. Generally flow failures are associated with ground slopes steeper than those associated with either lateral spreading or ground oscillation.

Bearing Strength Loss: Bearing strength decreases with a decrease in effective stress. Loss of bearing strength occurs when the effective stresses are reduced due to the cyclic loading caused by an earthquake. Even if the soil does not liquefy, the bearing of the soil may be reduced below its value either prior to or after the earthquake. If the bearing strength is sufficiently reduced, structures supported on the sediments can settle, tilt, or even float upward in the case of lightly loaded structures such as gas pipelines.

Ground Fissuring and Sand Boils: Ground fissuring and sand boils are surface manifestations associated with liquefaction and lateral spreading, ground oscillation, and flow failure. As apparent from the above descriptions, the likelihood of ground fissures developing is high when lateral spreading, ground oscillations, and flow failure occur. Sand boils occur when the high pore water pressures are relieved by drainage to the surface along weak spots that may have been created by fissuring. As the water flows to the surface, it can carry sediments, and if the pore water pressures are high enough create a gusher (sand boils) at the point of exit.

Research has shown that saturated, loose sands with a silt content less than about 25 percent are most susceptible to liquefaction, whereas other soil types are generally considered to have a low susceptibility. According to the California Geological Survey (CGS) Special Publication SP-117A (2008), "Guidelines for Evaluating and Mitigating Seismic Hazards in California," any materials with a PI > 12 and moisture content < 85% of the liquid limit were considered not subject to liquefaction. Liquefaction susceptibility is related to numerous factors, and the following conditions must exist for liquefaction to occur:

- Sediments must be relatively young in age and must not have developed large amounts of cementation
- Sediments must consist mainly of cohesionless sands and silts
- The sediment must not have a high relative density
- Free groundwater must exist in the sediment; and

- The site must be exposed to seismic events of a magnitude large enough to induce straining of soil particles

Based on our field investigations, high groundwater was 16 feet below the existing grade. No historic high groundwater data was accessible within a reasonable vicinity of the site. Therefore, RMA GeoScience considered the potential for groundwater to be at 10 feet below existing grade in the liquefaction screening evaluation. The soil strata encountered in both borings was used in our liquefaction screening evaluation.

The analysis was performed using LiquefyPro Version 5 (2015 edition) for groundwater conditions: at a depth of 15 feet. The analysis also took into account that two-third of the (PGA_M) is 0.71g and the Modal Magnitude (M_M) for the design level earthquake is 6.86 (based on the PSH Deaggregation tool on the USGS website). A summary of the input data and the results of this liquefaction analysis are provided in Appendix C of this report. Based on this analysis, there appears to be a very low risk of liquefaction occurring at the project site during a design level earthquake (Factor-of-Safety against liquefaction is greater than 1.1).

It should be noted that the California Geological Survey has not yet prepared a Seismic Hazard Zone Map of potential liquefaction hazards for the quadrangle in which the site is located. In addition, there are no liquefaction hazard zones near the site according to any publicly available records. Because there are no mapped liquefaction hazard zones near the site, a map depicting such a zone relative to the site has not been prepared.

2.13 Settlement Due to Seismic Shaking

The potential for seismically-induced settlement was evaluated for the site by using LiquefyPro Version 5 and Later, which was created by CivilTech Software. LiquefyPro is software that evaluates liquefaction potential and calculates the settlement of soil deposits due to seismic loads. The program is based on the most recent publications of NCEER Workshop and SP117 Implementation. Standard Penetration Tests (SPT) were used as input data to run LiquefyPro.

The seismically induced settlement is 1.75 inches when running LiquefyPro on SPT data from boring B-5 to a depth of 50 feet.

A detailed description of the seismically-induced settlement methodology is discussed in Appendix D.

2.14 Total and Differential Settlement

The above seismically induced settlement amount should be combined with the anticipated amount of static settlement in order to obtain an estimate of the amount of differential settlement that may affect the site. The maximum total static settlement of the proposed conventional footings is not expected to exceed ½ inch under the recommended bearing pressure. Therefore, the anticipated total settlement (static and seismic) is expected to be less than 2¼ inches. A differential settlement of approximately 1 inch in a 40 feet span is estimated for design of the proposed structures.

3.00 CONCLUSIONS AND RECOMMENDATIONS

3.01 General Conclusion

Based on specific data and information contained in this report, our understanding of the project and our general experience in engineering geology and geotechnical engineering, it is our professional judgment that the proposed development is geologically and geotechnically feasible. This is provided that the recommendations presented below are

fully implemented during design, grading and construction.

3.02 General Earthwork and Grading

All grading should be performed in accordance with the General Earthwork and Grading Specifications outlined in Appendix C, unless specifically revised or amended below. Recommendations contained in Appendix C are general specifications for typical grading projects and may not be entirely applicable to this project.

It is also recommended that all earthwork and grading be performed in accordance with Appendix J of the 2013 California Building Code and all applicable governmental agency requirements. In the event of conflicts between this report and Appendix J, this report shall govern.

3.03 Earthwork Shrinkage and Subsidence

Shrinkage is the decrease in volume of soil upon removal and recompaction expressed as a percentage of the original in-place volume. Subsidence occurs as natural ground is densified to receive fill. These factors account for changes in earth volumes that will occur during grading.

Alluvium and existing fills are expected to have fairly high shrinkage, perhaps on the order of 10 to 20 percent. Because of its granular nature, the shrinkage of wash deposits is expected to be less. Based on our experience in similar wash deposits on other sites, shrinkage of wash deposits is expected to be on the order of 5 to 10 percent. Older alluvial soils are fairly dense, thus its shrinkage is expected to be less than alluvium, approximately 5 to 10 percent for surficial older alluvium and 0 to 5 percent for deeper older alluvium. Grading is currently not proposed within bedrock, thus its shrinkage potential is not applicable to the currently proposed project. Excavations in bedrock could result in bulking.

Since alluvial soils that will need to be densified have low in situ densities, subsidence could be on the order of 0.2 feet. Existing fill soils will need to be entirely removed to competent native soils and thus subsidence of fills is not applicable. It is expected that older alluvial soils that will be exposed at the base of removals will be dense, thus a subsidence value of 0.1 foot may be considered in planning. Wash deposits are expected to have a similar subsidence value. Subsidence in areas underlain by bedrock will be nil.

The above estimates of shrinkage and subsidence are based on a small sample size when the size of the property is considered. Shrinkage and subsidence potential should be studied in greater detail to refine these estimates. For initial planning purposes prior to additional testing, use of multiple shrinkage and subsidence scenarios should be considered.

The degree to which fill soils are compacted and variations in the insitu density of existing soils will influence earth volume changes. Consequently, some adjustments in grades near the completion of grading could be required to balance the earthwork.

3.04 Removals and Overexcavation

All vegetation, trash and debris should be cleared from the grading area and removed from the site. Prior to placement of compacted fills, all non-engineered fills and loose, porous, or compressible soils will need to be removed down to competent ground. Depths of removals will be dependent upon the nature of the underlying soils and proposed land use. In general, it is anticipated that the following removals will be need for areas to receive fill or support structures:

- Artificial fills (Map Symbol af): Complete removal of artificial fills to competent natural ground is anticipated.

- Alluvium (Map Symbol Qal): The in situ density of alluvial soils within the site varies laterally and with depth. It is anticipated that removals of alluvium will typically need to extend to bedrock or a minimum depth of 10

feet in alluvium. Alluvial removals will need to be evaluated in greater detail when grading plans are developed. The estimated removal depths are indicated on Plate 3.

- Bedrock (Map Symbol TQs): Bedrock is the recommended bearing material in the majority of the fill areas on site.

More detail evaluation of removals should be developed once grading plans are available. At that time overexcavation recommendations should also be developed. Typically, footing areas that are not in deep fill areas are undercut, moistened, and compacted to a minimum of 90% relative compaction to a depth equal to the width of the footing below the bottom of the footing or to a depth of 3 feet below the bottom of the footing, whichever is less. Footing areas are typically defined as extending from the edge of the footing for a distance of 5 feet. Floor slabs, concrete flatwork and paved areas are typically underlain by a minimum of 12 inches of soil compacted to a minimum of 90% relative compaction. Removal and overexcavation depths will need to be confirmed or adjusted, if necessary, at the time of grading.

3.05 Rippability and Rock Disposal

Our exploratory trenches and borings indicate that soils within the site will be rippable with conventional heavy duty grading equipment and that it is unlikely that oversized materials will be encountered within the onsite soils.

The rippability of the bedrock knob in the southeast portion of the site was not specifically analyzed because no development in that area is currently proposed. Based on our visual field observations and experience with similar bedrock materials in southern California, we expect that heavy ripping and possibly blasting will be necessary to make significant cuts in the bedrock and that such excavations will likely generate oversized materials. Our general guidelines for rock disposal are presented in Appendix C. Implementation of our guidelines will require continuous testing and observation by a member of our staff. Oversized materials should not be placed within 10 feet of finish grade without the prior approval of the geotechnical consultant. Additional investigation of bedrock rippability can be performed, if requested.

3.06 Subdrains

Groundwater was not encountered during the course of our subsurface investigation. Water well data indicates that the depth to groundwater in the region is in excess of 200 feet. Conceptual development plans indicate that several drainage courses within the site will likely be filled. However, since it is anticipated that the permeability of native soils will be greater than soils would likely be placed within filled drainage courses, installation of canyon subdrains may not be necessary. The potential need for installation of canyon subdrains will need to be further evaluated once detailed development and grading plans have been prepared, however preliminary subdrain locations are shown in Plate 3.

3.07 Fill and Cut Slopes

For preliminary planning purposes we recommend that cut and fill slopes be inclined no steeper than 2 horizontal to 1 vertical. Our calculations demonstrate that cut and fill slopes will be stable to the maximum heights of the planned cut and fills. Observations and testing confirm that local layers not expected to be greater than five feet in vertical thickness will be exposed in the planned cut with low cohesion. We recommend placement of a geotextile fabric to promote plant growth and enhance the surficial stability of the layers with low cohesion.

3.08 Wind and Water Erosion

Wind erosion does not pose a threat to development within the site. No known wind hazards were encountered in our investigation and research.

Drainage courses within the site have eroded channels. These channels and their banks will be subject to future erosion during periods of high runoff. Mitigation of channel erosion and protection of adjoining areas to be developed will need to be addressed in planning, design and construction.

3.09 Faulting

Regional maps show no faults within the site and no evidence of faulting, recent or otherwise, was observed during our investigation.

Other faults within the region are potential sources for future earthquakes, but they do not represent a future surface fault rupture hazards within the property because they do not pass through the site.

3.10 Seismic Design Parameters

Seismic design parameters have been developed in accordance with the 2013 California Building Code (CBC) using the online U.S. Geological Survey Java Ground Motion Parameter Calculator (ASCE 7-10 Standard) and a site location based on latitude and longitude. The calculator generates probabilistic and deterministic maximum considered earthquake spectral parameters represented by a 5-percent damped acceleration response spectrum having a 2-percent probability of exceedance in 50 years. The deterministic response accelerations are calculated as 150 percent of the largest median 5-percent damped spectral response acceleration computed on active faults within a region, where the deterministic values govern. The calculator does not, however, produce separate probabilistic and deterministic results. The parameters generated for the subject site are presented below:

2013 California Building Code (CBC) Seismic Parameters

Parameter	Value
Site Location	Latitude = 34.2866 degrees Longitude = -118.9084 degrees
Site Class	Site Class = D Soil Profile Name = Stiff soil profile
Mapped Spectral Accelerations (Site Class B)	S_s (0.2- second period) = 2.750g S_1 (1-second period) = 0.943g
Site Coefficients (Site Class D)	F_a = 1.0 F_v = 1.5
Maximum Considered Earthquake Spectral Accelerations (Site Class D)	S_{MS} (0.2- second period) = 2.750g S_{M1} (1-second period) = 1.414g
Design Earthquake Spectral Accelerations (Site Class D)	S_{DS} (0.2- second period) = 1833g S_{D1} (1-second period) = 0.943g

The above table shows that the mapped spectral response acceleration parameter for a 1-second period (S_1) is greater than 0.75g. Therefore, for Occupancy Category II the Seismic Design Category is E (CBC Table 1604.5 and Section 1613.5.6). Consequently, as required for Seismic Design Categories C through F by CBC Section 1803.5.11, slope instability, liquefaction, total and differential settlement and surface displacement due to faulting or seismically induced flooding have been evaluated.

Peak earthquake ground acceleration adjusted for site class effects (PGA_M) has been determine in accordance with ASCE 7-10 Section 11.8.3 as follows: $PGA_M = F_{PGA} \times PGA = 1.0 \times 1.06 = 1.06g$.

3.11 Liquefaction and Secondary Earthquake Hazards

Potential secondary seismic hazards that can affect land development projects include liquefaction, tsunamis, seiches, seismically induced settlement, seismically induced flooding and seismically induced landsliding.

Liquefaction

Liquefaction is a phenomenon where earthquake- induced ground vibrations increase the pore pressure in saturated, granular soils until it is equal to the confining, overburden pressure. When this occurs, the soil can completely loose its shear strength and enter a liquefied state. The possibility of liquefaction is dependent upon grain size, relative density, confining pressure, saturation of the soils, and intensity and duration of ground shaking. In order for liquefaction to occur, three criteria must be met: underlying loose, coarse-grained (sandy) soils, a groundwater depth of less than about 50 feet, and a potential for seismic shaking from nearby large-magnitude earthquake.

The California Geological Survey has prepared a Seismic Hazard Zone Map for the Moorpark Quadrangle and the southwestern portion of the site is mapped as having liquefaction potential. A liquefaction analysis is presented in Appendix D.

Tsunamis and Seiches

Tsunamis are sea waves that are generated in response to large-magnitude earthquakes. When these waves reach shorelines, they sometimes produce coastal flooding. Seiches are the oscillation of large bodies of standing water, such as lakes, that can occur in response to ground shaking. Tsunamis and seiches do not pose hazards due to the inland location of the site and lack of nearby bodies of standing water.

Seismically Induced Settlement

Seismically induced settlement occurs most frequently in areas underlain by loose, granular sediments. Damage as a result of seismically induced settlement is most dramatic when differential settlement occurs in areas with large variations in the thickness of underlying sediments. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement. Since it is anticipated that loose soils underlying the site is being removed and replaced with compacted fill, the potential for significant seismically induced settlement appears unlikely. A Settlement Analysis is presented in Appendix D.

Seismically Induced Flooding

The site is not located directly down-stream from any major reservoirs. Consequently seismically induced flooding at the site is unlikely. There is an offsite water storage tank located on the south side of Westward Way east of Sunset Avenue that could pose a localized flooding hazard should the tank or its connecting pipes fail during an earthquake.

Seismically Induced Landsliding

The California Geological Survey has prepared a Seismic Hazard Zone Map for the Moorpark Quadrangle and landslides are not a recognized hazard anywhere within the site.

3.12 Foundations

For preliminary design purposes, isolated spread footings and/or continuous wall footings are recommended to support of residential structures, retaining walls and other lightly loaded structures associated with residential development. If the recommendations in the section on grading are followed and footings are established in firm native soils or

compacted fill materials, preliminary design of footings may use the following allowable soil bearing values:

- Continuous Wall Footings:

  Footings having a minimum width of 12 inches and a minimum depth of 12 inches below the lowest adjacent grade have allowable bearing capacity of 1,500 pounds per square foot (psf). This value may be increased by 20% for each additional foot of width and/or depth to a maximum value of 3,500 psf.

- Isolated Spread Footings:

  Footings having a minimum width of 12 inches and a minimum depth of 18 inches below the lowest adjacent grade have allowable bearing capacity of 2,500 psf. This value may be increased by 20% for each additional foot of width or depth to a maximum value of 3,500 psf.

- Retaining Wall Footings:

  Footings for retaining walls should be founded a minimum depth of 12 inches and have a minimum width of 12 inches. Footings may be designed using the allowable bearing capacity and lateral resistance values recommended for building footings. However, when calculating passive resistance, the upper 6 inches of the footings should be ignored in areas where the footings will not be covered with concrete flatwork. This value may also be increased by 20% for each additional foot of width or depth to a maximum value of 3,500 psf. Reinforcement should be provided for structural considerations as determined by the design engineer.

The above bearing capacities represent an allowable net increase in soil pressure over existing soil pressure and may be increased by one-third for short-term wind or seismic loads. The maximum expected settlement of footings designed with the recommended allowable bearing capacity is expected to be on the order of ½ inch with differential settlement on the order of ¼ inch.

Preliminary testing indicates that soils within the site have a very low expansion potential. Therefore, reinforcement of footings for expansive soil is not required. However, in view of the seismic setting, a nominal reinforcement consisting of one #4 bar placed within 3 inches of the top of footings and another placed within 3 inches of the bottom of footings is recommended. The structural engineer may require heavier reinforcement.

Due to the preliminary nature of the expansion tests performed for this study, we recommend additional testing be performed when detailed development have been prepared and near the completion of rough grading to verify the preliminary expansion test results and recommended foundation design criteria.

3.13 Foundation Setbacks from Slopes

Setbacks for footings adjacent to slopes should conform to the requirements of the California Building Code. Specifically, footings should maintain a horizontal distance or setback between any adjacent slope face and the bottom outer edge of the footing.

For slopes descending away from the foundation, the horizontal distance may be calculated by using h/3, where h is the height of the slope. The horizontal setback should not be less than 5 feet, nor need not be greater than 40 feet per the California Building Code. Where structures encroach within the zone of h/3 from the top of the slope the setback may be maintained by deepening the foundations. Flatwork and utilities within the zone of h/3 from the top of slope may be subject to lateral distortion caused by gradual downslope creep. Walls, fences and landscaping improvements constructed at the top of descending slopes should be designed with consideration of the potential for gradual downslope creep.

For ascending slopes, the horizontal setback required may be calculated by using h/2 where h is the height of the slope.

The horizontal setback need not be greater than 15 feet per the California Building Code.

3.14 Slabs on Grade

Testing performed during this investigation indicates that soils on the site have a very low expansion potential. Therefore it is anticipated that reinforcement of slabs on grade to resist forces of expansive soils will not be required. Floor slabs should have a nominal thickness of at least 4 inches and should be are divided into squares or rectangles using weakened plane joints, each with maximum dimensions not exceeding 25 feet. If weakened plane joints are not planned, then the slabs shall be reinforced with at least 6x6-10/10 welded wire fabric placed at mid-height of the slab.

A moisture vapor retarder/barrier is recommended beneath all slabs-on-grade that will be covered by moisture-sensitive flooring materials such as vinyl, linoleum, wood, carpet, rubber, rubber-backed carpet, tile, impermeable floor coatings, adhesives, or where moisture-sensitive equipment, products, or environments will exist. Design and construction of the vapor retarder or barrier should conform to Section 1805 of the 2010 California Building Code (CBC) and pertinent sections of American Concrete Institute (ACI) guidance documents 302.1R-04, 302.2R-06 and 360R-10.

The moisture vapor retarder/barrier should consist of a minimum 10 mils thick polyethylene with a maximum perm rating of 0.3 in accordance with ASTM E 1745. Seams in the moisture vapor retarder/barrier should be overlapped no less than 6 inches or in accordance with the manufacturer's recommendations. Joints and penetrations should be sealed with the manufacturer's recommended adhesives, pressure-sensitive tape, or both. The contractor must avoid damaging or puncturing the vapor retarder/barrier and repair any punctures with additional polyethylene properly lapped and sealed.

ACI guidelines allow for the placement of moisture vapor retarder/barriers either directly beneath floor slabs or below an intermediate granular soil layer.

Placing the moisture retarder/barrier directly beneath the floor slab will provide improved curing of the slab bottom and will eliminate potential problems caused by water being trapped in a granular fill layer. Concrete slabs poured directly on a vapor retarder/barrier can experience shrinkage cracking and curling due to differential rates of curing through the thickness of the slab. Therefore, for concrete placed directly on the vapor retarded, a maximum water cement ratio of 0.45 and the use of water-reducing admixtures to increase workability and decrease bleeding will likely be required.

If granular soil is placed over the vapor retarder/barrier, the layer should be at least 2 inches thick in accordance with traditional practice in southern California. The granular layer should be uniformly compacted and trimmed to provide the full design thickness of the proposed slab, and should not be left exposed to rain or other sources of water such as wet-grinding, power washing, pipe leaks or other processes, and should be dry at the time of concrete placement. Granular fill layers that become saturated should be removed and replaced prior to concrete placement.

An additional layer of sand may be placed beneath the vapor retarder/barrier at the developer's discretion to minimize the potential of the retarder/barrier being punctured by underlying soils.

Slab on grade design recommendations should be further evaluated once grading and foundation plans are prepared and near the completion of rough grading.

3.15 Miscellaneous Concrete Flatwork

For preliminary design purposes, miscellaneous concrete flatwork and walkways may be designed with a minimum thickness of 4 inches. Large slabs should be reinforced with a minimum of 6x6-10/10 welded wire mesh placed at

mid-height in the slab. Control joints should be constructed to create squares or rectangles with a maximum spacing of 15 feet.

Walkways may be constructed without reinforcement. Walkways should be separated from foundations with a thick expansion joint filler. Control joints should be constructed into non-reinforced walkways at a maximum of 5 feet spacing.

The subgrade soils beneath all miscellaneous concrete flatwork should be compacted to a minimum of 90 percent relative compaction for a minimum depth of 12 inches. The geotechnical engineer should monitor the compaction of the subgrade soils and perform testing to verify that proper compaction has been obtained.

3.16 Footing Excavation and Slab Preparations

All footing excavations should be observed by the geotechnical consultant to verify that they have been excavated into competent soils. The foundation excavations should be observed prior to the placement of forms, reinforcement steel, or concrete. These excavations should be evenly trimmed and level. Prior to concrete placement, any loose or soft soils should be removed. Excavated soils should not be placed on slab or footing areas unless properly compacted.

Prior to the placement of the moisture barrier, the subgrade soils underlying the slab should be observed by the geotechnical consultant to verify that all under-slab utility trenches have been properly backfilled and compacted, that no loose or soft soils are present, and that the slab subgrade has been properly compacted to a minimum of 90 percent relative compaction within the upper 12 inches.

Footings may experience and overall loss in bearing capacity or an increased potential to settle where located in close proximity to existing or future utility trenches. Furthermore, stresses imposed by the footings on the utility lines may cause cracking, collapse and/or a loss of serviceability. To reduce this risk, footings should extend below a 1:1 plane projected upward from the closest bottom of the trench.

Subgrade soils in area of slabs on grade and walkways should near their optimum moisture content prior to the placement of concrete. The geotechnical consultant should verify that the appropriate moisture content has been achieved a maximum of 24 hours prior to the placement of concrete or moisture barriers.

3.17 Lateral Load Resistance

Lateral loads may be resisted by soil friction and the passive resistance of the soil. The following parameters are recommended.

- Passive Earth Pressure = 375 pcf (equivalent fluid weight)
- Coefficient of Friction (soil to footing) = 0.35
- Retaining structures should be designed to resist the following lateral active earth pressures:

Surface Slope of Retained Materials (Horizontal:Vertical)	Equivalent Fluid Weight (pcf)
Level	38
5:1	40
4:1	45

3:1	52
2:1	56

These active earth pressures are only applicable if the retained earth is allowed to strain sufficiently to achieve the active state. The required minimum horizontal strain to achieve the active state is approximately 0.0025H. Retaining structures should be designed to resist an at-rest lateral earth pressure if this horizontal strain cannot be achieved.

- At-rest Lateral Earth Pressure = 59 pcf (equivalent fluid weight)

The Mononobe-Okabe method is commonly utilized for determining seismically induced active and passive lateral earth pressures and is based on the limit equilibrium Coulomb theory for static stress conditions. This method entails three fundamental assumptions (e.g., Seed and Whitman, 1970): Wall movement is sufficient to ensure either active or passive conditions, the driving soil wedge inducing the lateral earth pressures is formed by a planar failure surface starting at the heel of the wall and extending to the free surface of the backfill, and the driving soil wedge and the retaining structure act as rigid bodies, and therefore, experiences uniform accelerations throughout the respective bodies (U.S. Army Corps of Engineers, 2003, Engineering and Design - Stability Analysis of Concrete Structures).

- Seismic Lateral Earth Pressure = 23 pcf (equivalent fluid weight)

The seismic lateral earth pressure given above is an inverted triangle, and the resultant of this pressure is an increment of force which should be applied to the back of the wall in the upper 1/3 of the wall height and also applied as a reduction of force to the front of the wall in the upper 1/3 of the footing depth.

3.18 Drainage and Moisture Proofing

Surface drainage should be directed away from proposed structures and into suitable drainage devices. Neither excess irrigation nor rainwater should be allowed to collect or pond against building foundations or within low-lying or level areas. Surface waters should be diverted away from the tops of slopes and prevented from draining over the top of slopes and down the slope face.

Walls and portions thereof that retain soil and enclose interior spaces and floors below grade should be waterproofed and dampproofed in accordance with CBC Section 1805.

Retaining structures should be drained to prevent the accumulation of subsurface water behind the walls. Backdrains should be installed behind all retaining walls exceeding 3 feet in height. A typical detail for retaining wall back drains is presented in Appendix C. All backdrains should be outlet to suitable drainage devices. Retaining wall less than 3 feet in height should be provided with backdrains or weep holes. Dampproofing and/or waterproofing should also be provided on all retaining walls.

3.19 Cement Type and Corrosion Potential

Initial soluble sulfate tests indicate that concrete at the subject site will have a negligible exposure to water-soluble sulfate in the soil. Our preliminary recommendations for concrete exposed to sulfate-containing soils are presented in the table below.

Recommendations for Concrete Exposed to Sulfate-Containing Soils

Sulfate Exposure	Water Soluble Sulfate (SO_4) in Soil (% by Weight)	Sulfate (SO_4) in Water (ppm)	Cement Type (ASTM C150)	Maximum Water-Cement Ratio (by Weight)	Minimum Compressive Strength (psi)
Negligible	0.00 - 0.10	0-150	--	--	2,500
Moderate	0.10 - 0.20	150-1,500	II	0.50	4,000
Severe	0.20 - 2.00	1,500-10,000	V	0.45	4,500
Very Severe	Over 2.00	Over 10,000	V plus pozzolan or slag	0.45	4,500

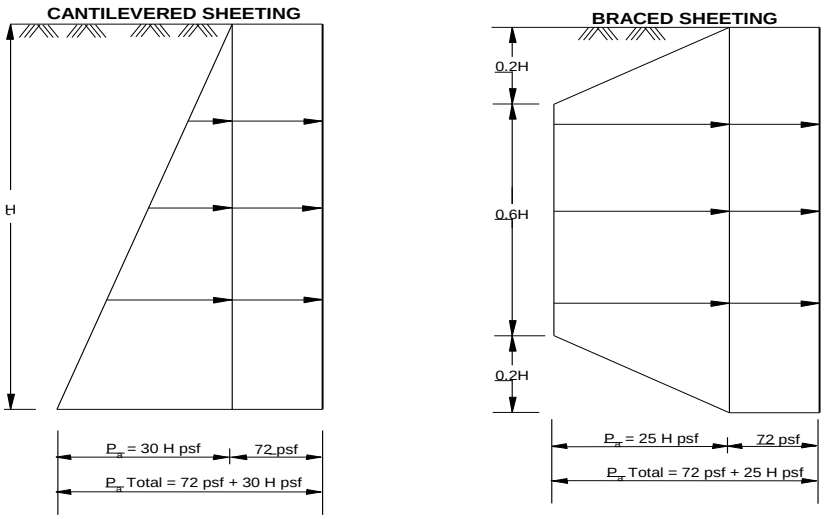
Use of alternate combinations of cementitious materials may be permitted if the combinations meet design recommendations contained in American Concrete Institute guideline ACI 318-11.

The soils were also tested for soil reactivity (pH) and electrical resistivity (ohm-cm). The preliminary test results indicate that the on-site soils have a soil reactivity ranging from 7.5 to 7.7 and an electrical resistivity ranging from 9287 to 11907 ohm-cm. A neutral or non-corrosive soil has a value ranging from 5.5 to 8.4. Generally, soils that could be considered moderately corrosive to ferrous metals have resistivityvalues of about 3,000 ohm-cm to 10,000 ohm-cm. Soils with resistivity values less than 3,000 ohm-cm can be considered corrosive and soils with resistivity values less than 1,000 ohm-cm can be considered extremely corrosive.

Based on these test results, it appears that soils underlying the site have a moderately corrosion potential. However, due to the preliminary nature of the testing performed, it is recommended that additional testing be performed as specific development plans are developed and that specific design recommendations be developed at that time.

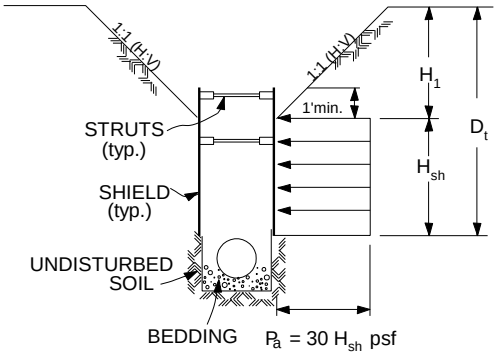
3.20 Temporary Slopes

Excavation of utility trenches will require either temporary sloped excavations or shoring. Temporary excavations in existing alluvial soils may be safely made at an inclination of 1:1 or flatter. If vertical sidewalls are required in excavations greater than 5 feet in depth, the use of cantilevered or braced shoring is recommended. Excavations less than 5 feet in depth may be constructed with vertical sidewalls without shoring or shielding. Our recommendations for lateral earth pressures to be used in the design of cantilevered and/or braced shoring are presented below. These values incorporate a uniform lateral pressure of 72 psf to provide for the normal construction loads imposed by vehicles, equipment, materials, and workmen on the surface adjacent to the trench excavation. However, if vehicles, equipment, materials, etc., are kept a minimum distance equal to the height of the excavation away from the edge of the excavation, this surcharge load need not be applied.



SHORING DESIGN: LATERAL SHORING PRESSURES

Design of the shield struts should be based on a value of 0.65 times the indicated pressure, Pa, for the approximate trench depth. The wales and sheeting can be designed for a value of 2/3 the design strut value.



HEIGHT OF SHIELD, H_{sh} = DEPTH OF TRENCH, D_t , MINUS DEPTH OF SLOPE, H_1

TYPICAL SHORING
DETAIL

Placement of the shield may be made after the excavation is completed or driven down as the material is excavated from inside of the shield. If placed after the excavation, some overexcavation may be required to allow for the shield width and advancement of the shield. The shield may be placed at either the top or the bottom of the pipe zone. Due to the anticipated thinness of the shield walls, removal of the shield after construction should have negligible effects on the load factor of pipes. Shields may be successively placed with conventional trenching equipment.

Vehicles, equipment, materials, etc. should be set back away from the edge of temporary excavations a minimum distance of 15 feet from the top edge of the excavation. Surface waters should be diverted away from temporary excavations and prevented from draining over the top of the excavation and down the slope face. During periods of heavy rain, the slope face should be protected with sandbags to prevent drainage over the edge of the slope, and a visqueen liner placed on the slope face to prevent erosion of the slope face.

Periodic observations of the excavations should be made by the geotechnical consultant to verify that the soil conditions have not varied from those anticipated and to monitor the overall condition of the temporary excavations over time. If at any time during construction conditions are encountered which differ from those anticipated, the geotechnical consultant should be contacted and allowed to analyze the field conditions prior to commencing work within the excavation.

Cal/OSHA construction safety orders should be observed during all underground work.

3.21 Utility Trench Backfill

Alluvial and older alluvial soils on the site will not be suitable for use as pipe bedding for buried utilities. All pipes should be bedded in a sand, gravel or crushed aggregate imported material complying with the requirements of the Standard Specifications for Public Works Construction Section 306-1.2.1. Crushed rock products that do not contain appreciable fines should not be utilized as pipe bedding and/or backfill. Bedding materials should be densified to at least 90% relative compaction (ASTM D1557) by mechanical methods. The geotechnical consultant should review and approve of proposed bedding materials prior to use.

The on-site soils are expected to be suitable as trench backfill provided they are screened of organic matter and cobbles over 6 inches in diameter. Backfill may include rocks up to 12 inches when the trench width is greater than 3 feet. Trench backfill should be densified to at least 90% relative compaction (ASTM D1557).

All utility trench backfill within street right of way, utility easements, under or adjacent to sidewalks, driveways, or building pads should be observed and tested by the geotechnical consultant to verify proper compaction. Trenches excavated adjacent to foundations should not extend within the footing influence zone defined as the area within a line projected at a 1:1 drawn from the bottom edge of the footing. Trenches crossing perpendicular to foundations should be excavated and backfilled prior to the construction of the foundations. The excavations should be backfilled in the presence of the geotechnical engineer and tested to verify adequate compaction beneath the proposed footing.

Cal/OSHA construction safety orders should be observed during all underground work.

3.22 Pavement Sections

The roadways of the subject project will be designed by County of Los Angeles. R-value tests were not performed on our soil samples. However, based on our experiences on similar materials, we estimate the R-values of the on-site soils would be higher than 30. Thus, an R-value of 30 was used to calculate preliminary pavement sections. Structural sections were designed using the procedures outlined in Chapter 630 of the California Highway Design Manual (Caltrans, 2012). This procedure uses the principle that the pavement structural section must be of adequate thickness to distribute the load from the design traffic index (TI) to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-value).

Calculated pavement sections are presented in the table below.

Structural Pavement Sections

	Major Collectors	Minor Collectors	Local Streets
Traffic Index	7	6	5
Calculated Pavement Section	4”AC/10”AB	4”AC/7”AB	3”AC/6”AB

AC = Asphaltic concrete
AB = Class II aggregate base

It is anticipated that Portland Cement Concrete (PCC) pavements for areas which are not subject to traffic loads will need to be a minimum thickness of 4 inches thick and may be placed on compacted soils. Where there will be traffic loads it is anticipated that PCC pavement will need to be a minimum thickness of 6 inches of Portland cement concrete and will need to rest on 4 inches of crushed aggregate base.

Prior to paving, the subgrade soils should be scarified and the moisture adjusted to within 2% of the optimum moisture content. The subgrade soils should be compacted to a minimum of 90% relative compaction where base is used and 95% relative compaction where base is not used. All aggregate base courses should be compacted to a minimum of 95% relative compaction.

The above pavement sections have been provided for preliminary planning purposes. Additional testing and analyses of pavement sections will need to be performed when detailed development or grading plans have been developed and near the completion of rough grading of individual development areas.

3.23 Plan Review

Once grading and foundation plans are prepared for the subject property, this office should review the plans from a geotechnical viewpoint. More detail geotechnical investigations and/or analyses will need to be performed at that time.

3.24 Geotechnical Observation and Testing During Rough Grading

The geotechnical engineer should be contacted to provide observation and testing during the following stages of grading:

- During the clearing and grubbing of the site
- During the demolition of any existing structures, buried utilities or other existing improvements
- During excavation and overexcavation of compressible soils
- During all phases of grading including ground preparation and filling operations
- When any unusual conditions are encountered during grading

A final geotechnical report summarizing conditions encountered during grading should be submitted upon completion of the rough grading operations.

3.25 Post-Grading Geotechnical Observation and Testing

After the completion of grading the geotechnical engineer should be contacted to provide additional observation and testing during the following construction activities:

- During trenching and backfilling operations of buried improvements and utilities to verify proper backfill and compaction of the utility trenches
- After excavation and prior to placement of reinforcing steel or concrete within footing trenches to verify that footings are properly founded in competent materials
- During fine or precise grading involving the placement of any fills underlying driveways, sidewalks, walkways, or other miscellaneous concrete flatwork to verify proper placement, mixing and compaction of fills
- When any unusual conditions are encountered during construction

4.00 CLOSURE

The findings, conclusions and recommendations in this report were prepared in accordance with generally accepted engineering and geologic principles and practices. No other warranty, either expressed or implied, is made. This report has been prepared for Moorpark Property 67, LLC to be used solely for design purposes. Anyone using this report for any other purpose must draw their own conclusions regarding required construction procedures and subsurface conditions.

The geotechnical and geologic consultant should be retained during the earthwork and foundation phases of construction to monitor compliance with the design concepts and recommendations and to provide additional recommendations as needed. Should subsurface conditions be encountered during construction that are different from those described in this report, this office should be notified immediately so that our recommendations may be re-evaluated.

RMA GeoScience
Every Project Matters | www.rmageoscience.com

FIGURES AND TABLES

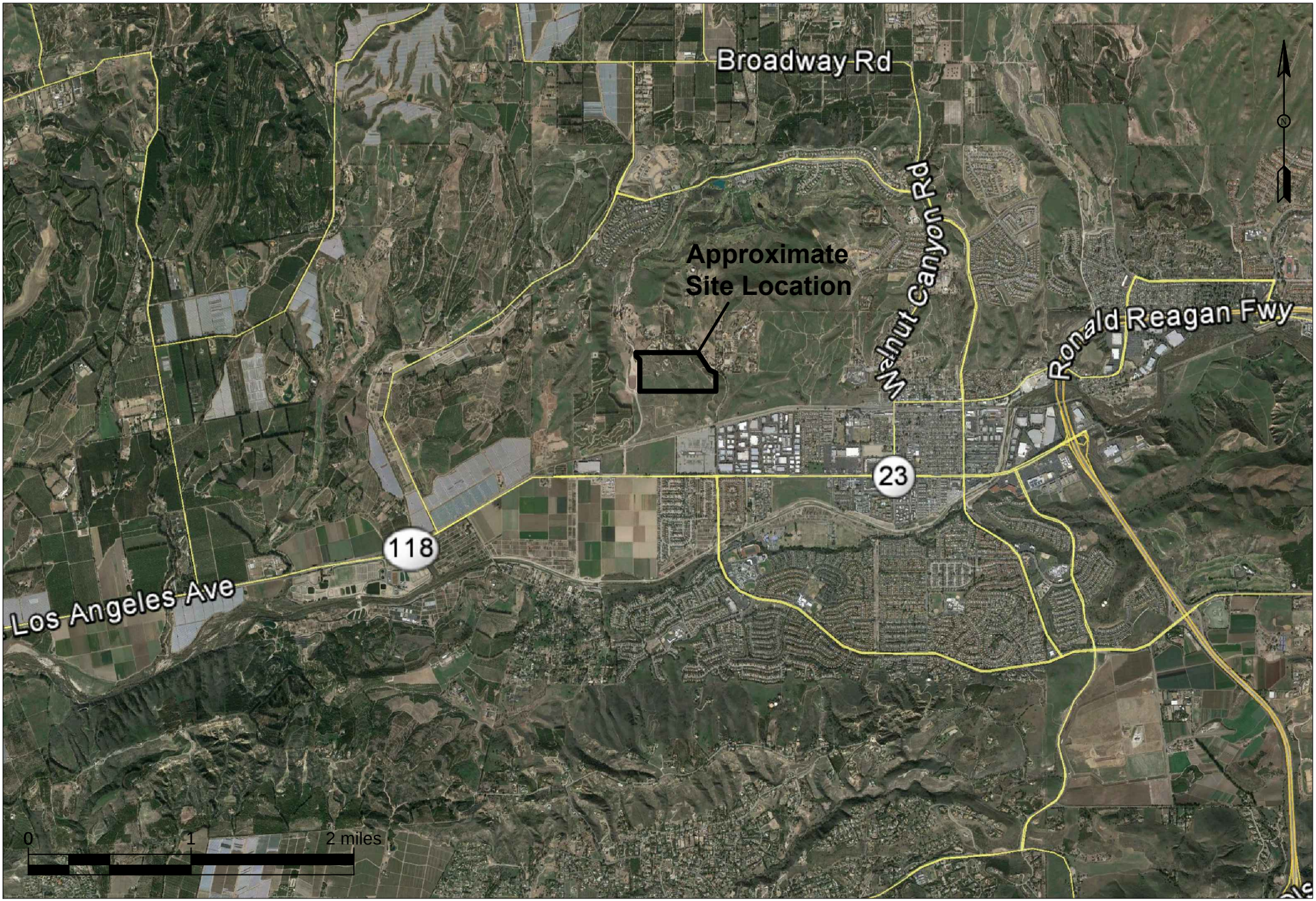


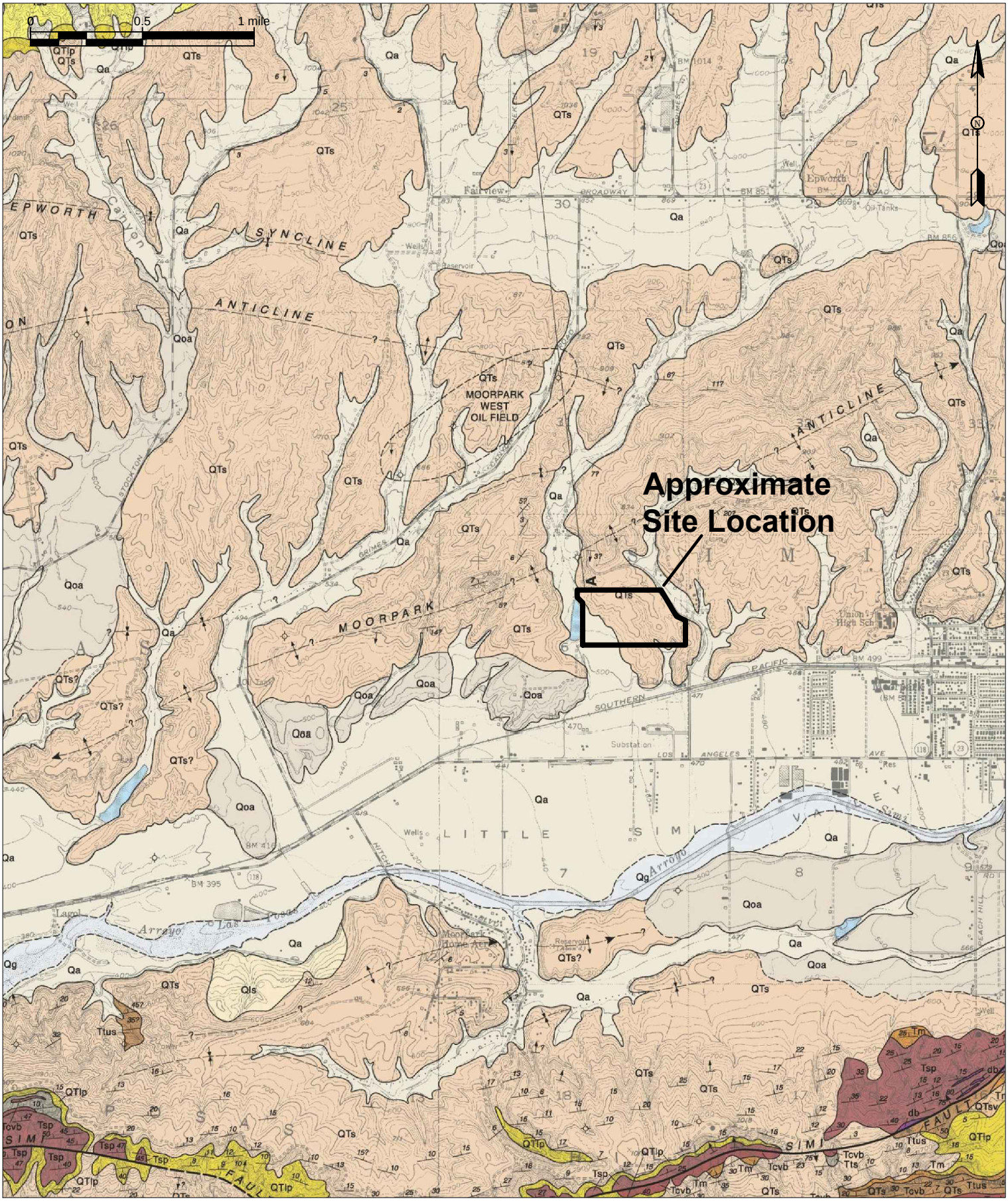
Figure 1

Site Vicinity Map

North Hills, Moorpark, CA

RMA GeoScience

RMA Job No:	16-G63-0
Date:	June 10, 2016
Prepared By:	AMS



Source: USGS Open-File Report 03-293 Preliminary Geologic Map of the San Bernardino 30' X 60' Quadrangle, California Version 1.0
Compiled By Douglas M. Morton & Fred K. Miller, 2003. Contour Interval: 50 meters

Figure 2a

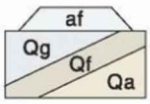
Regional Geology Map

North Hills, Moorpark, CA

RMA Job No:	16-G63-0
Date:	June 10, 2016
Prepared By:	AMS

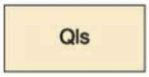
RMA GeoScience

LEGEND



SURFICIAL SEDIMENTS
Unconsolidated alluvial deposits; generally undissected

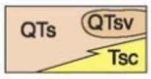
af *Artificiall fill*
Qg *Gravel and sand of major stream channels*
Qf *Alluvial fan boulder-cobble gravel*
Qa *Alluvium: silt, sand and gravel of valley and floodplain areas*



LANDSLIDE DEBRIS
Qls *In northeastern area debris derived mostly from Monterey shale (**Tm**)*

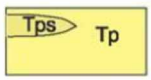
OLDER SURFICIAL SEDIMENTS
Dissected, weakly consolidated alluvial deposits
Qoa *Older alluvial gravel, and silt/clay; composed largely of detritus derived from formations within quadrangle*

— *UNCONFORMITY* —



SAUGUS FORMATION
(Of Hershey 1902; Kew 1924; Weber et al. 1973; Jakes 1979; Yeats 1967, 1987)
Nonmarine fluviatile, weakly consolidated; Pleistocene and Pliocene(?) ages
QTs *Light gray to brown gravel composed of pebbles and small cobbles mostly of white to light gray granitic rocks, and few of gneiss, metavolcanic rocks, quartzite, very few anorthosite, gabbro, and basaltic to andesitic volcanic rocks (Tertiary) and of dark reddish sandstone in coarse sandy matrix; crudely bedded; includes minor sand and clay, locally weathers to gray to brown pebbly soil*
Tsc *Similar to **QTs**, but gray-white, mostly pebbly sand, somewhat more consolidated, sorted and bedded, prominently cross-bedded; forms steep bluffs where eroded in Grimes Canyon; contains rare thin lenses of sandstone with shell fragments; intertongues westward*
QTsv *Southeast corner of quadrangle only: crudely bedded to massive brown breccia-conglomerate composed of andesitic-basaltic, angular to subrounded detritus of Conejo Volcanics, and a few clasts of Monterey Shale locally*

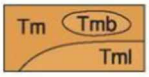
LAS POSAS SAND
(Of Pressler 1929; included in Saugus Formation by Kew 1924, Weber et al. 1973, Jakes 1929; similar to and probably in part equivalent to Santa Barbara Formation in that area, and to San Pedro Formation of San Pedro area)
Shallow marine regressive; probably early Pleistocene age*
(* Erroneously referred to Pliocene age in Dibblee and Ehrenspeck 1990)
QTlp *Weakly indurated light gray to yellow tan, friable, fine to medium grained sand, commonly with molluscan shell fragments; in Las Posas Hills, contains thin lenses of calcareous fossilferous pebbly sandstone; unconformity at base in Las Posas Hills; grades upward and eastward into **QTs** and **QTsv**.*



PICO FORMATION
(Of Kew 1924; Weber et al. 1973. Yeats 1967, 1987)
Marine clastic; Pliocene and Pleistocene(?) ages
Tp *Gray, vaguely bedded claystone-siltstone, crumbly where weathered; includes some layers of gray fine grained sandstone; includes a thin bed of 3 to 6 inches (8 to 16cm) thick of coherent, fine grained white tuff (Bailey Tuff of Yeats 1987)*
Tps *Bedded, light gray, semi-friable, fine to medium grained sandstone, locally pebbly*

— *UNCONFORMITY* —

SISQUOC FORMATION
(Included in Modelo Formation by Kew 1924; Weber et al. 1973, Yeats 1987; same lithologic unit as Sisquoc Formation in northern Ventura basin)
Marine clastic and biogenic; late Miocene age
Tsq *Dark gray to brownish gray clay shale, weathers light gray; some layers contain large tan dolomitic concretions; includes some white-weathering, thin bedded diatomaceous semi-siliceous shale*



MONTEREY SHALE
(Modelo Formation of Kew 1924; Yeats 1987; same lithologic unit as Monterey Shale of northern Ventura basin)
Marine biogenic; middle and late Miocene age (Luisian and Mohnian Stages)
Tm *Upper part: white-weathering soft fissle to punky thin bedded semi-siliceous shale and interbeds of hard platy to brittle siliceous shale; includes thin calcareous strata in lower part*
Tmb *Burned siliceous shale; same as **Tm**, but shale once partly molten by underground fires causing shale layers to expand, partially melt and remobilize, and flow unevenly to frothy, finely pumiceous layers of varying bright colors, mostly red, tan, yellow-green, maroon, and black*
Tml *Lower part: soft, thin bedded clayey shale; includes some tan dolomitic concretions; probably middle Miocene age*

UPPER TOPANGA FORMATION
[Topanga Formation of Jakes 1979; may be equivalent to Detrital Sediments (Tls) of Lindero Canyon in Thousand Oaks quadrangle, and in Camarillo-Newbury Park quadrangles (Dibblee and Ehrenspeck 1990)]
Marine transgressive clastic; middle Miocene age
Ttus *Light gray to tan semi-friable sandstone in Las Posas Hills*

CONEJO VOLCANICS
Extrusive volcanic rocks; middle Miocene age
Tcvb *Basaltic flows and sills (?) within and below Topanga Sandstone (**Tts**) in Las Posas Hills; black, massive basalt, fine grained, moderately hard to somewhat incoherent where weathered*

TOPANGA SANDSTONE
(Vaqueros Formation of Kew 1924, Yeats 1987)
Marine transgressive clastic; mostly early and middle Miocene age
Tts *Light gray to tan, thick bedded semi-friable sandstone; in Oak Ridge area may be in part equivalent to Vaqueros Formation of northern Ventura basin, mostly early Miocene age (Zemorrian-Saucesian-Relizian Stages); in Las Posas Hills, gray to brown, bedded, probably middle Miocene age, with unconformity at base*

SESPE FORMATION
Nonmarine fluviatile; mostly Oligocene age
Tsp *Mostly thick bedded tan to greenish gray friable sandstone, locally pebbly, and thin interbeds of soft red, pink, and greenish gray claystone; deposited by streams*

Source: Geologic Map of the Moorpark Quadrangle, Ventura County, California, Thomas W. Dibblee, Jr., 1992. Dibblee Geology Center Map #DF-40. Contour Interval 20'.

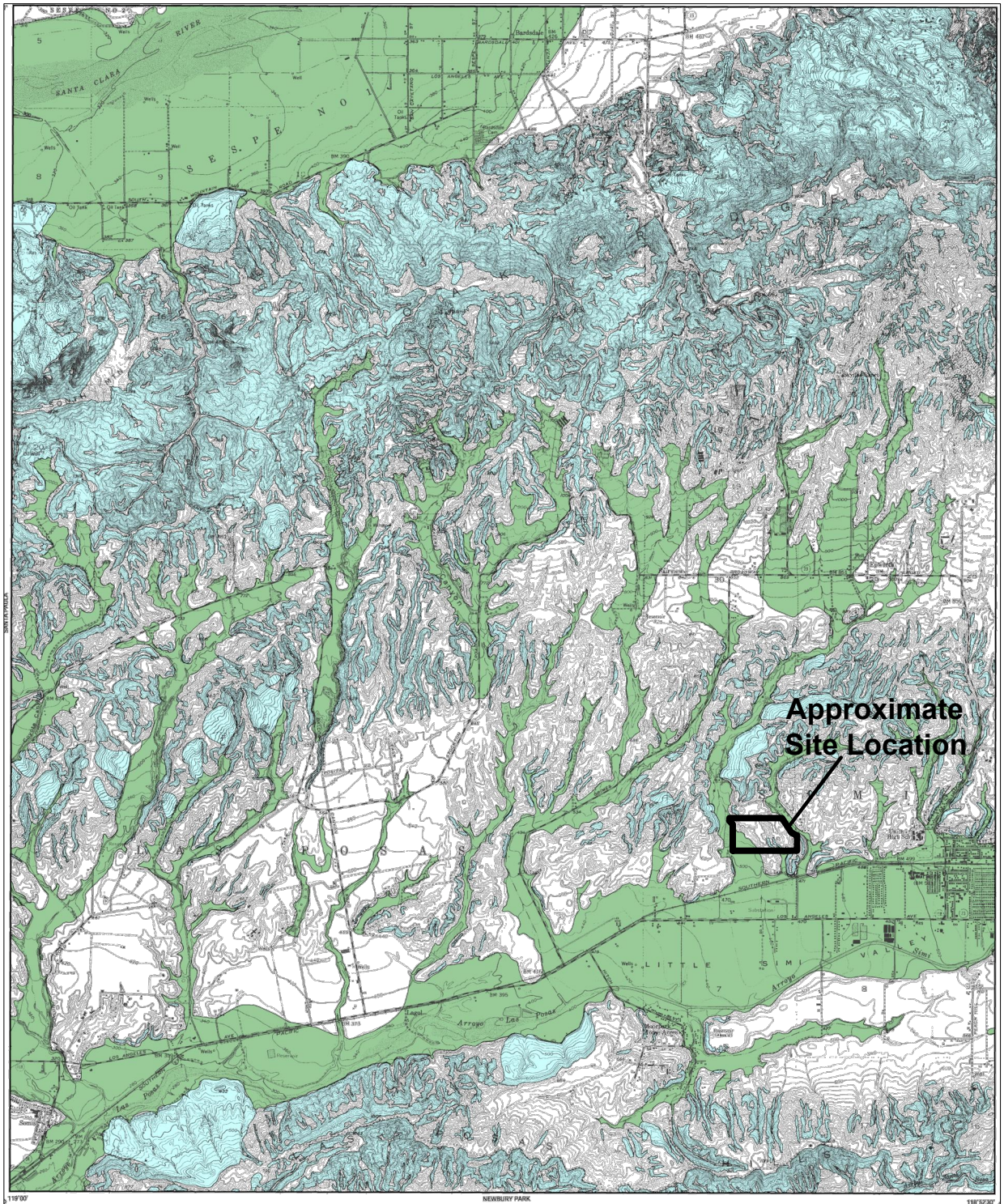
Figure 2b

RMA GeoScience

Regional Geology Map Legend

North Hills, Moorpark, CA

RMA Job No:	16-G63-0
Date:	June 10, 2016
Prepared By:	AMS



Base Map prepared by U.S. Geological Survey, 1951, photorevised

PURPOSE OF MAP

This map will assist cities and counties in fulfilling their responsibilities for protecting the public safety from the effects of earthquake-triggered ground failure as required by the Seismic Hazards Mapping Act (Public Resources Code Sections 2690-2699.6).

For information regarding the scope and recommended methods to be used in conducting the required site investigations, see DMG *Special Publication 117, Guidelines for Evaluating and Mitigating Seismic Hazards* in California.

For a general description of the Seismic Hazards Mapping Program, the Seismic Hazards Mapping Act and regulations, and related information, please refer to the draft User's Guide (see http://www.consrv.ca.gov/dmg/shezp/userguid/).

Production of this map was funded by the Federal Emergency Management Agency's Hazard Mitigation Program and the Department of Conservation in cooperation with the Governor's Office of Emergency Services.

IMPORTANT - PLEASE NOTE

1) This map may not show all areas that have the potential for liquefaction, landsliding, strong earthquake ground shaking or other earthquake and geologic hazards. Also, single earthquake capable of causing liquefaction or triggering landslide failure will not uniformly affect the entire area zoned.

2) Liquefaction zones may also contain areas susceptible to the effects of earthquake-induced landslides. This situation typically exists at or near the toe of existing landslides, downslope from rockfall or debris flow source areas, or adjacent to steep stream banks.

3) This map does not show Alquist-Priolo earthquake fault zones, if any, that may exist in this area. Please refer to the latest official map of earthquake fault zones for disclosures and other actions that are required by the Alquist-Priolo Earthquake Fault Zoning Act. For more information on this subject and an index to available maps, see DMG Special Publication 42.

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

STATE OF CALIFORNIA

SEISMIC HAZARD ZONES

Delineated in compliance with
Chapter 7.8, Division 2 of the California Public Resources
(Seismic Hazards Mapping Act)

MOORPARK QUADRANGLE

OFFICIAL MAP

Released:November 17, 2000

MAP EXPLANATION

Zones of Required Investigation:

Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslides

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

DATA AND METHODOLOGY USED TO DEVELOP THIS MAP ARE PRESENTED IN THE FOLLOWING:

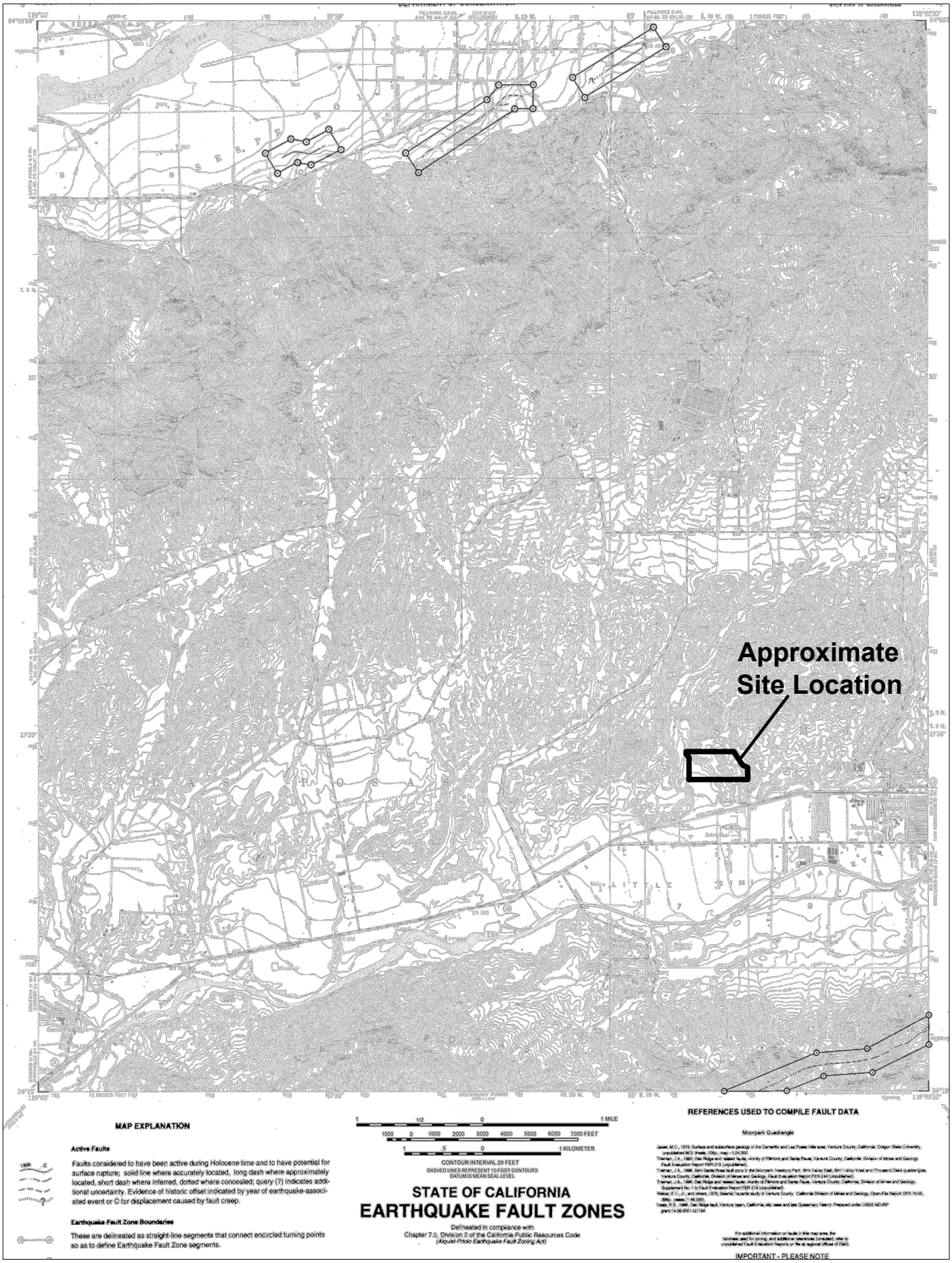
RMA GeoScience

Liquefaction Map

North Hills, Moorpark, CA

Figure 3

RMA Job No:	16-G63-0
Date:	June 10, 2016
Prepared By:	AMS

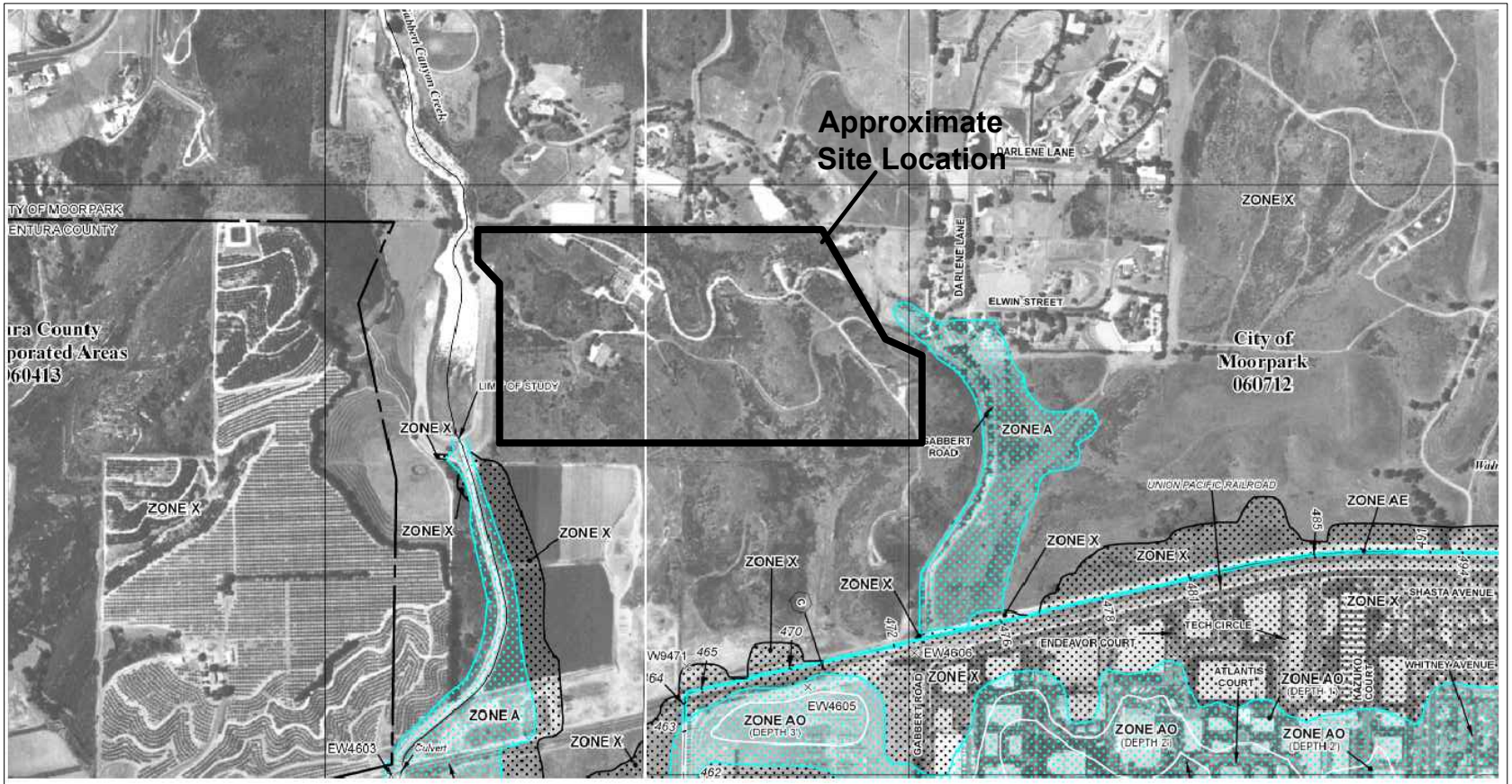


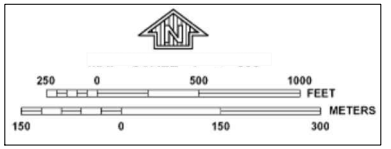
Earthquake Fault Zones Map

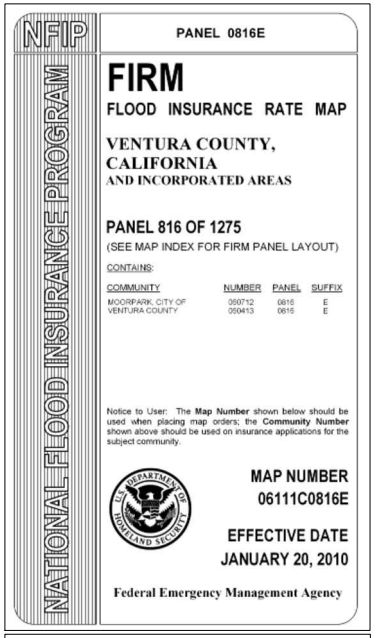
North Hills, Moorpark, CA

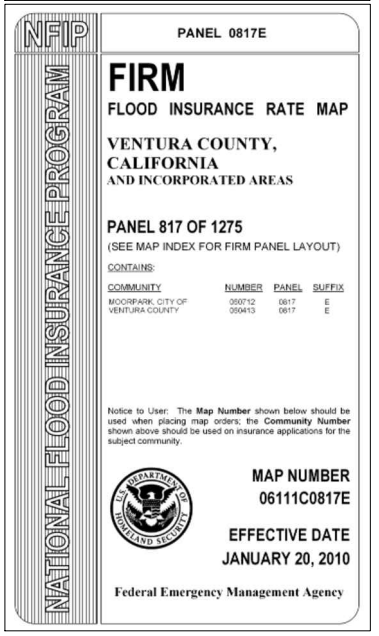
Figure 4

RMA Job No:	16-G63-0
Date:	June 10, 2016
Prepared By:	AMS









LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A — No Base Flood Elevations determined.
- ZONE AE — Base Flood Elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4376000 mN — 1000-meter Universal Transverse Mercator grid values, zone 11
- 600000 FT — 5000-foot grid ticks: California State Plane coordinate system, zone V (FIPSZONE 0405), Lambert Conformal Conic projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

Figure 5

FEMA Flood Insurance Rate Maps

North Hills, Moorpark, CA

RMA Job No:	16-G63-0
Date:	June 10, 2016
Prepared By:	AMS

RMA GeoScience

RMA GeoScience
Every Project Matters | www.rmageoscience.com

TABLE 1

HISTORIC STRONG EARTHQUAKES WITHIN 100 MILES OF SITE SINCE 1812

LATITUDE NORTH	LONGITUDE WEST	DATE OF EVENT	DEPTH (km)	QUAKE MAG.	SITE ACC. g	APPROX. DISTANCE mi(km)
34.3000	118.6000	04/04/1893	0.0	6.00	0.080	17.4(28.0)
34.0000	119.0000	09/24/1827	0.0	7.00	0.130	20.5(33.0)
34.2130	118.5370	1/17/1994	18.0	6.70	0.098	21.6(34.7)
34.4110	118.4010	2/9/1971	8.4	6.40	0.048	30.0(48.2)
34.8000	119.1000	09/05/1883	0.0	6.00	0.025	37.1(59.8)
34.8300	118.7500	11/27/1852	0.0	7.00	0.051	38.5(62.0)
34.9000	118.9000	10/23/1916	0.0	6.00	0.020	42.3(68.1)
34.1000	118.1000	07/11/1855	0.0	6.30	0.021	47.7(76.8)
35.0000	119.0000	7/21/1952	0.0	6.40	0.022	49.5(79.7)
35.0000	119.0170	7/21/1952	0.0	7.70	0.059	49.7(79.9)
34.3000	119.8000	6/29/1925	0.0	6.25	0.018	51.1(82.2)
34.2000	119.8000	12/21/1812	0.0	7.00	0.033	51.5(82.8)
33.6170	117.9670	3/11/1933	0.0	6.30	0.011	70.9(114.0)
34.3700	117.6500	12/08/1812	0.0	7.00	0.019	71.8(115.5)
34.3000	117.6000	07/30/1894	0.0	6.00	0.008	74.4(119.8)
35.3830	118.8500	7/29/1952	0.0	6.10	0.009	75.7(121.9)
35.3670	118.5830	7/23/1952	0.0	6.10	0.008	76.8(123.5)
34.3000	117.5000	07/22/1899	0.0	6.50	0.011	80.1(128.9)
34.0000	117.5000	12/16/1858	0.0	7.00	0.015	82.7(133.0)
35.3000	119.8000	01/09/1857	0.0	7.90	0.029	86.4(139.1)
34.6000	120.4000	8/1/1902	0.0	6.30	0.008	87.8(141.4)
34.6000	120.4000	7/28/1902	0.0	6.30	0.008	87.8(141.4)
33.7000	117.4000	5/15/1910	0.0	6.00	0.005	95.2(153.2)
34.0000	117.2500	7/23/1923	0.0	6.25	0.007	96.6(155.5)

RMA GeoScience
Every Project Matters | www.rmageoscience.com

APPENDIX A

FIELD INVESTIGATION

RMA GeoScience
Every Project Matters | www.rmageoscience.com

APPENDIX A

FIELD INVESTIGATION

A-1.00 FIELD EXPLORATION

A-1.01 Number of Borings

Our subsurface investigation consisted of 6 borings, 4 of which were done using a bucket auger and 2 of which were performed with a CME-75 drill rig equipped with 8-inch diameter hollow stem augers. All of the borings were logged and backfilled.

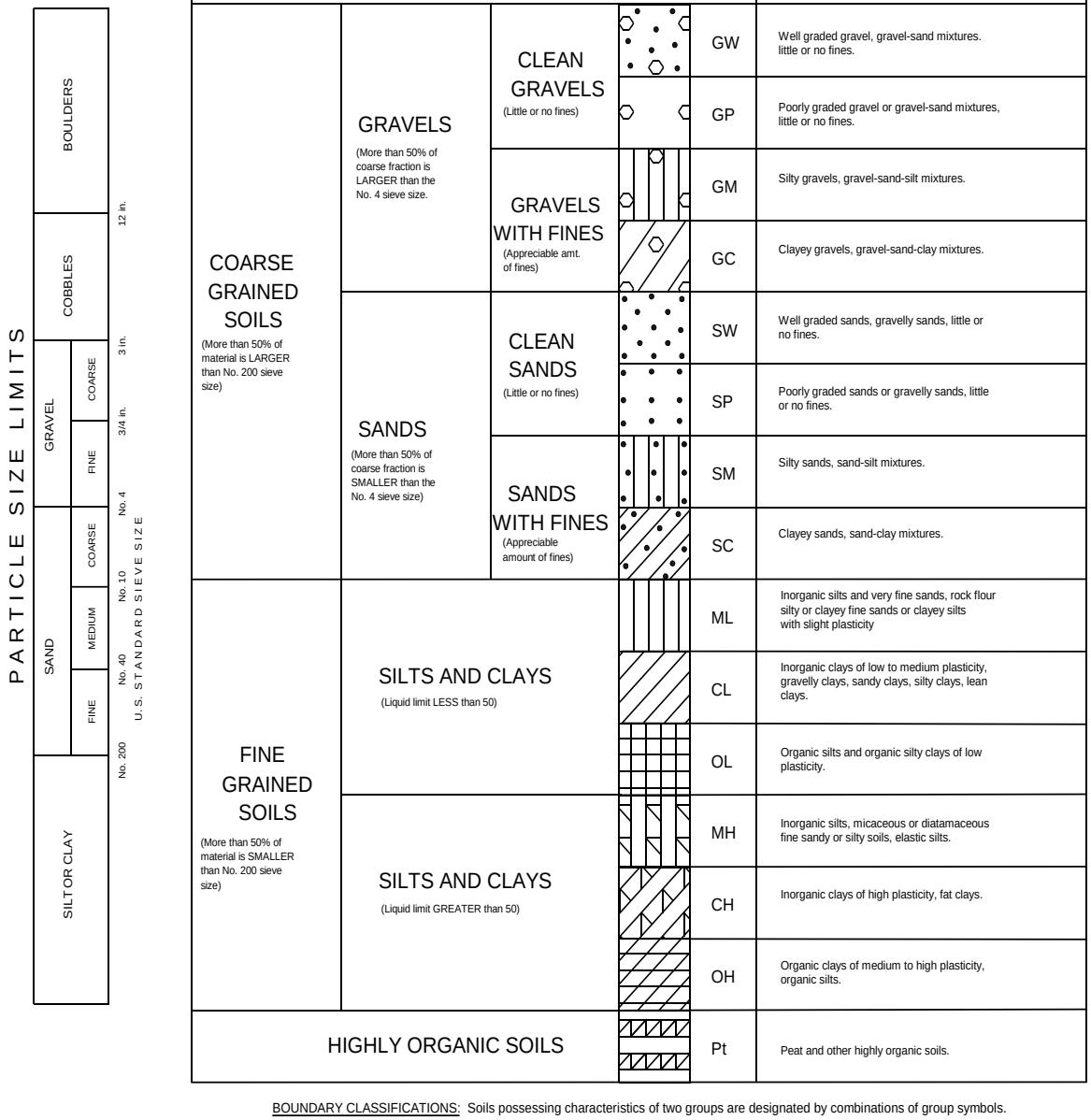
A-1.02 Location of Borings

A Site Geologic Map showing the approximate locations of the borings is presented as Plate 1.

A-1.03 Boring and Trench Logging

Logs of borings and trenches were prepared by one of our staff and are attached in this appendix. The logs contain factual information and interpretation of subsurface conditions between samples. The strata indicated on these logs represent the approximate boundary between earth units and the transition may be gradual. The logs show subsurface conditions at the dates and locations indicated, and may not be representative of subsurface conditions at other locations and times.

Identification of the soils encountered during the subsurface exploration was made using the field identification procedure of the Unified Soils Classification System (ASTM D2488). A legend indicating the symbols and definitions used in this classification system and a legend defining the terms used in describing the relative compaction, consistency or firmness of the soil are attached in this appendix. Bag samples of the major earth units were obtained for laboratory inspection and testing, and the in-place density of the various strata encountered in the exploration was determined



BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

UNIFIED SOIL CLASSIFICATION SYSTEM

RMA GeoScience
Every Project Matters | www.rmageoscience.com

I. SOIL STRENGTH/DENSITY

BASED ON STANDARD PENETRATION TESTS

Compactness of sand		Consistency of clay	
Penetration Resistance N (blows/Ft)	Compactness	Penetration Resistance N (blows/ft)	Consistency
0-4	Very Loose	<2	Very Soft
4-10	Loose	2-4	Soft
10-30	Medium Dense	4-8	Medium Stiff
30-50	Dense	8-15	Stiff
>50	Very Dense	15-30	Very Stiff
		>30	Hard

N = Number of blows of 140 lb. weight falling 30 in. to drive 2-in OD sampler 1 ft.

BASED ON RELATIVE COMPACTION

Compactness of sand		Consistency of clay	
% Compaction	Compactness	% Compaction	Consistency
<75	Loose	<80	Soft
75-83	Medium Dense	80-85	Medium Stiff
83-90	Dense	85-90	Stiff
>90	Very Dense	>90	Very Stiff

II. SOIL MOISTURE

Moisture of sands		Moisture of clays	
% Moisture	Description	% Moisture	Description
<5%	Dry	<12%	Dry
5-12%	Moist	12-20%	Moist
>12%	Very Moist	>20%	Very Moist, wet

SOIL DESCRIPTION LEGEND

RMA GeoScience

9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 1

Client: Moorpark Property 67, LLC
Project Name: North Hills Moorpark
Project Number 16-G63-0
Project Location: Moorpark, California
Date Started: 5/6/2016 Completed: 5/6/2016
Ground Elevation: 609' Boring Diameter: 36"
Excavation Method: Bucket Auger
Ground Water Levels: n/a
Drilling Contractor: Dave's Drilling
Notes: The Blow Count from Bucket Auger Kelly Bars
Logged By: ams Checked By: HL

Depth (ft)	Drive Sample	Blow Count (12")	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
										Top Soil: Light brown Sandy SILT, sporadic subrounded to subangular gravel less than 3" in diameter, dry			ML
5		7		1.7	117	119				5': TQs - Light orangey brown fine to coarse Sandy SILTSTONE with sporadic subrounded to subangular gravel less than 3" in diameter, medium dense, dry			ML
										9': N67E / 4NW			
10		8		1.6	117	118				10': TQs - Light to medium orangey brown Silty fine to coarse SANDSTONE with sporadic subrounded to subangular gravel less than 3" in diameter, medium dense, dry			SM
15		10		3	128	132				15': TQs - Reddish to orangey brown medium to coarse SANDSTONE with sporadic subrounded to angular gravel less than 4" in diameter, dense, slightly moist			SW
										17': N80E / 7S			
20		3		6.3	94	100				20': TQs - Medium yellow brown fine Sandy SILTSTONE, loose, slightly moist			ML
										22-25': Herringbone cross beds, otherwise bedding is flat			
25		7		3.4	103	106				25': TQs - Medium yellow brown fine Sandy SILTSTONE, mesium dense, slightly moist, laminated beds			ML
30		8		2	134	136				30': TQs - Medium yellow brown fine to coarse SANDSTONE with silt and rounded to subangular gravel less than 1" in diameter, medium dense, slightly moist			SW
										32': N60E / 6NW Herringbone cross beds			

Material Description

Thin Wall Tube | 2.5" Ring Sample | Bulk Sample | Standard Split Spoon Sample | Static Water Table

RMA GeoScience
9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 1

Client: Moorpark Property 67, LLC
Project Name: North Hills Moorpark
Project Number 16-G63-0
Project Location: Moorpark, California
Date Started: 5/6/2016 Completed: 5/6/2016
Ground Elevation: 609' Boring Diameter: 36"
Excavation Method: Bucket Auger
Ground Water Levels: n/a
Drilling Contractor: Dave's Drilling
Notes: The Blow Count from Bucket Auger Kelly Bars
Logged By: ams Checked By:

Depth (ft)	Drive Sample	Blow Count (12")	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
35	☒	12	▨	2.4	118	121				35': TQs - Dark yellow brown Silty fine to coarse SANDSTONE with subrounded to subangular gravel less than 3" in diameter, slightly moist, flat bedding			SW
40	☒	10	▨	6.5	109	116				40': TQs - Medium reddish brown fine to coarse grained SANDSTONE, moist			SW
										44': Sharp planar contact with medium brown CLAYSTONE layer approximately 5' thick, seepage in top of layer, overall layer is dipping approximately 5° into the slope			
45	☒	10-10"	▨	8	107	116				45': TQs - Medium brown Clayey SILTSTONE with minor fine sand especially in tip, slightly moist			ML
										49': Grades over 6 inches into very clean medium to coarse grained SANDSTONE, moderate caving			
50	☒	5-8"	▨	2.6	102	105				50': TQs - Tan fine to medium grained SANDSTONE with minor coarse grained sand, slightly moist, herringbone crossbeds, slight caving			SP
55	☒	12-10"	▨	2.9	131	135				55': TQs - Tan fine to coarse grained SANDSTONE with sporadic subrounded to subangular gravel less than 1" in diameter, slightly moist, flat laminated bedding			SW
60	☒	15	▨	1.1	108	110				60': TQs - Tan fine to coarse grained SANDSTONE with sporadic subrounded to subangular gravel less than 1" in diameter, slightly moist			SW
										64': Crossbeds			
65	☒	15-7"	▨	4.9	107	112				65': TQs - Tan fine to coarse grained SANDSTONE with subrounded to angular gravel less than 4" in diameter, minor silt, slightly moist, flat bedding			SW

Material Description: ■ Thin Wall Tube; ☒ 2.5" Ring Sample; ▨ Bulk Sample; ◫ Standard Split Spoon Sample; ▽ Static Water Table

RMA GeoScience
9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 1

Client: Moorpark Property 67, LLC
Project Name: North Hills Moorpark
Project Number 16-G63-0
Project Location: Moorpark, California
Date Started: 5/6/2016 Completed: 5/6/2016
Ground Elevation: 609' Boring Diameter: 36"
Excavation Method: Bucket Auger
Ground Water Levels: n/a
Drilling Contractor: Dave's Drilling
Notes: The Blow Count from Bucket Auger Kelly Bars
Logged By: ams Checked By:

Depth (ft)	Drive Sample	Blow Count (12")	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
70	☒	15-8"	▨	7.2	112	120				70': TQs - Medium brown fine to coarse grained SANDSTONE with subrounded to subangular gravel less than 2" in diameter, minor clay and silt, very sporadic dark brown clay nodules less than 1.5" in diameter, slightly moist, minor caving			SW
75	☒	15-10"	▨	4.9	118	124				75': TQs - Tan fine to coarse grained SANDSTONE with minor silt and sporadic rounded to subangular gravel less than 2.5" in diameter, slightly moist			SM / SW
80													
85													
90													
95													
100													

Material Description

■ Thin Wall Tube ☒ 2.5" Ring Sample ▨ Bulk Sample ◫ Standard Split Spoon Sample ▽ Static Water Table

Total Depth: 75'
Caving: 49'
Groundwater: None Encountered
Backfilled: Cuttings

RMA GeoScience

9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 2

Client: Moorpark Property 67, LLC

Project Name: North Hills Moorpark

Project Number 16-G63-0

Project Location: Moorpark, California

Date Started: 5/6/2016 Completed: 5/6/2016

Ground Elevation: 627' Boring Diameter: 36"

Excavation Method: Bucket Auger

Ground Water Levels: n/a

Drilling Contractor: Dave's Drilling

Notes: The Blow Count from Bucket Auger Kelly Bars

Logged By: ams Checked By: HL

Depth (ft)	Drive Sample	Blow Count (12")	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
										Top Soil: Medium brown gravelly fine to coarse Sandy SILT, dry			SW / SM
5										6': 8" thick clean coarse SANDSTONE layer, bedding is flat			
10		6		3.8	125	130				10': TQs - Reddish brown Silty fine to coarse SANDSTONE with minor clay and sporadic gravel less than 2" in diameter, medium dense, slightly moist, bedding is flat			SM
15													
20		6		6.7	116	124				20': TQs - Reddish brown gravelly coarse SANDSTONE, subangular to rounded crystalline gravel less than 4" in diameter, medium dense, minor clay, moist, bedding is flat			SW
										22.5': N45E / 6SE			
25													
30		2		36	86	117				30': TQs - Medium orangey brown Silty CLAYSTONE with minor fine to coarse sand and small gravel, less than 5" in diameter, soft, moist, bedding is flat			CL

Material Description: Thin Wall Tube; 2.5" Ring Sample; Bulk Sample; Standard Split Spoon Sample; Static Water Table

Total Depth: 30'

Caving: No

Groundwater: None Encountered

Backfilled: Cuttings

RMA GeoScience
9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 3

Client: Moorpark Property 67, LLC
Project Name: North Hills Moorpark
Project Number 16-G63-0
Project Location: Moorpark, California
Date Started: 5/6/2016 Completed: 5/6/2016
Ground Elevation: 580' Boring Diameter: 36"
Excavation Method: Bucket Auger
Ground Water Levels: n/a
Drilling Contractor: Dave's Drilling
Notes: The Blow Count from Bucket Auger Kelly Bars
Logged By: ams Checked By: HL

Depth (ft)	Drive Sample	Blow Count (12")	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
										Top Soil: Brown fine to coarse grained Sandy SILT with subangular to sunrounded gravel less than 4" in diameter, dry			ML
5										5.5': Laminated bedding			
										8': N25E / 10 NW (cross beds)			
10		5		1.2	107	108				10': TQs - Medium tan brown fine to coarse SANDSTONE with subandular to subrounded gravel less than 3" in diameter, minor silt, medium dense, dry, approximately 3-4' wide of caving in a layer approximately 5' tall			SW
										12.5': N-S / 8W			
15													
20		10		6.4	128	137				20': TQs - Medium tan brown fine to coarse grained SANDSTONE, with subangular to subrounded gravel less than 3" in diameter, minor silt, dense, dry, bedding is flat			SW
25													
30		6		8.5	109	119				30': TQs - Light orangey brown fine to coarse SANDSTONE with clay, sporadic rounded to subangular gravel less than 1.5" in diameter, minor silt, medium dense, slightly moist, bedding is flat			SC

Material Description: Thin Wall Tube; 2.5" Ring Sample; Bulk Sample; Standard Split Spoon Sample; Static Water Table

RMA GeoScience
9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 3

Client: Moorpark Property 67, LLC
Project Name: North Hills Moorpark
Project Number 16-G63-0
Project Location: Moorpark, California
Date Started: 5/6/2016 Completed: 5/6/2016
Ground Elevation: 580' Boring Diameter: 36"
Excavation Method: Bucket Auger
Ground Water Levels: n/a
Drilling Contractor: Dave's Drilling
Notes: The Blow Count from Bucket Auger Kelly Bars
Logged By: ams Checked By:

Depth (ft)	Drive Sample	Blow Count (12")	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
35										34.5': Herringbone cross beds 37': Herringbone cross beds			
40	☒	10	⧄	3	105	108				40': TQs - Light orangey brown fine to coase SANDSTONE with silt and subangular to sunrounded gravel less than 2" in diameter, minor clay, dense, slightly moist, bedding is flat 42': Cross bedding			SM / SW
45													
50	☒	7	⧄	7	107	114				47': Cross Bedding 50': TQs - Light orangey brown fine to coarse SANDSTONE with minor clay, silt, and angular to subangular gravel less than 1" in diameter, medium dense, slightly moist, bedding is flat			SM
55										53': Clast supported CONGLOMERATE with coarse grained sandy matrix, caving approximately 4' wide and 5' thick, bedding is flat			
60	☒	15	⧄	2.3	108	110				60': TQs - Light orangey brown fine to medium SANDSTONE with coarse sand, silt, and sporadic rounded to subangular gravel less than 1" in diameter, dense, dry, bedding is flat			SM / SW
65													

Material Description

Thin Wall Tube ☒ 2.5" Ring Sample
⧄ Bulk Sample ◫ Standard Split Spoon Sample ▽ Static Water Table

RMA GeoScience
9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 3

Client: Moorpark Property 67, LLC
Project Name: North Hills Moorpark
Project Number 16-G63-0
Project Location: Moorpark, California
Date Started: 5/6/2016 Completed: 5/6/2016
Ground Elevation: 580' Boring Diameter: 36"
Excavation Method: Bucket Auger
Ground Water Levels: n/a
Drilling Contractor: Dave's Drilling
Notes: The Blow Count from Bucket Auger Kelly Bars
Logged By: ams Checked By:

Depth (ft)	Drive Sample	Blow Count (12")	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
70	☒	15	▨	11	121	134				70': TQs - Orangey brown fine to medium Sandy CLAYSTONE with silt, coarse sand, and rounded to subangular gravel less than 1.5" in diameter, very stiff, slightly moist			SC / CL
75													
80													
85													
90													
95													
100													

Material Description: ■ Thin Wall Tube; ☒ 2.5" Ring Sample; ▨ Bulk Sample; ◫ Standard Split Spoon Sample; ▽ Static Water Table

Total Depth: 70'
Caving:
Groundwater: None Encountered
Backfilled: Cuttings

RMA GeoScience

9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 4

Client: Moorpark Property 67, LLC

Project Name: North Hills Moorpark

Project Number 16-G63-0

Project Location: Moorpark, California

Date Started: 5/6/2016 Completed: 5/6/2016

Ground Elevation: 522' Boring Diameter: 36"

Excavation Method: Bucket Auger

Ground Water Levels: n/a

Drilling Contractor: Dave's Drilling

Notes: The Blow Count from Bucket Auger Kelly Bars

Logged By: ams Checked By: HL

Depth (ft)	Drive Sample	Blow Count (12")	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
										Top Soil: Medium brown Sandy SILT with subangular to subrounded gravel less than 3" in diameter, dry			
10	☒	1	▨	9	106	116				10': Qal - Light to medium brown SILT with minor clay and fine to coarse sand, loose, slightly moist, bedding is flat			ML
										18': Flat laminated bedding			
20	☒	5		1.6	106	108				20': Qal - Light brown SILT with minor clay, sand, and sporadic rounded to subangular gravel less than 3" in diameter, medium dense, slightly moist, bedding is flat			ML
30	☒	8	▨	8	106	115				30': Qal - Medium reddish brown Clayey SILT with minor fine to medium sand, medium dense, slightly moist, bedding is flat			ML

Material Description

Thin Wall Tube ☒ 2.5" Ring Sample ▨ Bulk Sample ◫ Standard Split Spoon Sample ▽ Static Water Table

RMA GeoScience
9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 4

Client: Moorpark Property 67, LLC
Project Name: North Hills Moorpark
Project Number 16-G63-0
Project Location: Moorpark, California
Date Started: 5/6/2016 Completed: 5/6/2016
Ground Elevation: 522' Boring Diameter: 36"
Excavation Method: Bucket Auger
Ground Water Levels: n/a
Drilling Contractor: Dave's Drilling
Notes: The Blow Count from Bucket Auger Kelly Bars
Logged By: ams Checked By:

Depth (ft)	Drive Sample	Blow Count (12")	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
35													
40	☒	10	▨	2	101	103				40': Qal - Light reddish brown Silty fine to medium grained SAND with minor coarse sand, clay, and sporadic rounded to subangular gravel less than 2" in diameter, dense, slightly moist, bedding is flat			SM
45													
50	☒	4	▨	11	109	121				50': Qal - Light reddish brown Clayey SILT with minor fine sand, medium dense, slightly moist, bedding is flat			ML
55													
60										Total Depth: 50' Caving: No Groundwater: None Encountered Backfilled: Cuttings			
65													

Material Description

☒ Thin Wall Tube ☒ 2.5" Ring Sample
▨ Bulk Sample ◫ Standard Split Spoon Sample ▽ Static Water Table

RMA GeoScience

9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 5

Client: Moorpark Property 67, LLC

Project Name: North Hills Moorpark

Project Number 16-G63-0

Project Location: Moorpark, California

Date Started: 5/6/2016 Completed: 5/6/2016

Ground Elevation: 516' Boring Diameter: 8"

Excavation Method: Hollow Stem Auger

Ground Water Levels: n/a

Drilling Contractor: Choice Drilling

Notes:

Logged By: ams Checked By:

Depth (ft)	Drive Sample	Blow Count (N Value)	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
										Top Soil: Brown Sandy SILT, dry			ML
		9/10/11								2.5': Qal - Brown fine to coarse Sandy SILT with angular to subrounded pebbles less than 1" in diameter, medium dense, dry			ML
5		10/17/20		4.3	116	121				5': Qal - Brown Sandy SILT with angular to subrounded pebbles less than 1" in diameter, mild porosity, caliche visible in rings, medium dense, dry			ML
		5/6/7								7.5': Qal - Brown Silty SAND with subangular to rounded pebbles less than 1" in diameter, minor clay, medium dense, slightly moist	48	0.1	SM
10		7/12/18		11	107	119				10': Qal - Brown fine to medium Sandy SILT with clay, caliche, medium dense, slightly moist			ML
		7/8/10								12.5': Qal - Light to med brown fine to coarse Silty SAND with silt and angular to subrounded pebbles less than 1" in diameter, medium dense, clay in tip, slightly moist	12		SW / SM
15		5/7/10		7.2	116	124				15': Qal - Medium brown fine Sandy SILT with clay and sporadic coarse sand, loose, slightly moist			ML
		7/8/10								17.5': Qal - Light yellow brown Silty fine to coarse SAND, medium dense, slightly moist			SM
20		20/50-6		3.2	108	112				20': Qal - Yellow brown Silty fine to medium SAND, very dense, slightly moist			SM
		4/5/7								22.5': Qal - Medium yellow brown fine Silty SAND, medium dense, slightly moist	32		SM
25		5/10/20		5	115	121				25': Qal - Medium yellow brown fine Sandy SILT with minor clay and coarse SAND, medium dense, slightly moist			ML
		4/6/7								27.5': Qal - Medium yellow brown fine Silty SAND with minor clay, medium dense, slightly moist	40	0.1	SM
30		10/17/20		13	106	120				30': Qal - Tip is medium yellow brown fine to medium SAND with minor coarse sand and clay, slightly moist, medium dense. Sample is medium reddish brown Silty CLAY with white mottling, medium dense, slightly moist			SM
		4/5/7								32.5': Qal - Medium reddish brown Clayey SAND, white varigation, stiff, slightly moist	45		SC

Material Description

Thin Wall Tube | 2.5" Ring Sample | Bulk Sample | Standard Split Spoon Sample | Static Water Table

RMA GeoScience
9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 5

Client: Moorpark Property 67, LLC
Project Name: North Hills Moorpark
Project Number 16-G63-0
Project Location: Moorpark, California
Date Started: 5/6/2016 Completed: 5/6/2016
Ground Elevation: 516' Boring Diameter: 8"
Excavation Method: Hollow Stem Auger
Ground Water Levels: n/a
Drilling Contractor: Choice Drilling
Notes:
Logged By: ams Checked By:

Depth (ft)	Drive Sample	Blow Count (N Value)	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
35	☒	15/18/25		2	118	121				35': Qal - Dark yellow brown fine Sandy SILT with minor clay, medium dense, slightly moist			ML
	▯	12/18/20								37.5': Qal - Medium yellow brown Silty fine to coarse SAND with rounded to subangular gravel less than 1.5" in diameter, minor clay in top of sample, dense, slightly moist	4		SM
40	☒	32/50-4		2	123	126				40': Qal - Medium yellow brown rounded to sub rounded Gravely medium to coarse SAND, very dense, slightly moist			SW
	▯	11/12/14								42.5': Qal - Dark yellow brown angular to subrounded Gravely SAND, medium dense, slightly moist			SW
45	☒	29/20/19		6.3	117	124				45': Qal - Medium orangey brown rounded to subangular Gravely SAND with silt and minor clay, medium dense, slightly moist			SW
	▯	7/8/14								47.5': Qal - Medium reddish brown Clayey SAND, medium dense, moist	32		ML
50	☒	18/30/50-6		5	122	128				50': Qal - Tip is orangey brown fine Sandy SILT with clay, coarse sand, and sporadic rounded to subangular pebbles less than 1" in diameter, dense, moist. Sample is brown fine Sandy SILT with clay, dense, moist			ML
55													
60										Total Depth: 50' Caving: No Groundwater: None Encountered Backfilled: Grout			
65													

Material Description

▬ Thin Wall Tube ☒ 2.5" Ring Sample ▨ Bulk Sample ▯▯ Standard Split Spoon Sample ▽ Static Water Table

RMA GeoScience

9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 6

Client: Moorpark Property 67, LLC

Project Name: North Hills Moorpark

Project Number: 16-G63-0

Project Location: Moorpark, California

Date Started: 5/6/2016 Completed: 5/6/2016

Ground Elevation: 540' Boring Diameter: 8"

Excavation Method: Hollow Stem Auger

Ground Water Levels: n/a

Drilling Contractor: Choice Drilling

Notes:

Logged By: ams Checked By: HL

Depth (ft)	Drive Sample	Blow Count (N Value)	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
										Top Soil: Brown Silty fine to coarse SAND, dry			SM
		15/18/40		7.1	122	131				2.5': Qal - Light brown Silty fine to medium SAND with coarse sand and rounded to subrounded pebbles less than 0.75" in diameter, dense, slightly moist			SM
5		8/12/16								5': Qal - Medium brown Silty fine to coarse SAND with rounded to subangular pebbles less than 0.75" in diameter, medium dense, slightly moist	12		SM
		10/12/15		3.1	111	114				7.5': Qal - Brown Silty fine to coarse SAND with rounded to subrounded gravel less than 1" in diameter, minor clay in tip, medium dense, slightly moist			SM
10		5/8/9								10': Qal - (Rock in tip) Brown fine to coarse Silty SAND, medium dense, slightly moist	34	0.2	SM
		18/10/14		6.2	120	127				12.5': Qal - Brown Clayey fine to medium Sandy SILT, medium dense, slightly moist			SM
15		4/6/7								15': Qal - (Rock in tip) Medium to dark brown Silty fine to medium SAND with sporadic fine gravel, medium dense, slightly moist	18	0.5	SM
		6/12/15		7	116	124				17.5': Qal - Orangey brown to dark brown fine Silty SAND with clay, medium dense, slightly moist			SM
20		6/6/7								20': Qal - Tip is dark orange Clayey fine Silty SAND, medium dense, slightly moist. Sample is Silty fine to coarse SAND with minor clay, medium dense, slightly moist	16		SM
		12/30/50-5"		6.4	108	115				22.5': TQs - Light orangey brown Silty fine grained SANDSTONE, dense, slightly moist			SM
25		15/40/50-5"								25': TQs - Light orangey brown Silty fine grained SANDSTONE (coarser in bottom of sample), dense, slightly moist			SM
		50-5"		7.4	108	116				27.5': TQs - Tan to orange, Clayey Silty Gravely fine to coarse grained SANDSTONE, clasts are rounded to subangular and less than 4" in diameter, dense, slightly moist			SM / SW
30		28/50-6"								30': TQs - Tip is orangley brown Silty fine grained SANDSTONE, dense, moist. Sample is subangular to subrounded Gravely medium to coarse SAND, dense, slightly moist	10		SM
		30/50-4"		28	97	124				32.5': TQs - Tip is orangey brown Silty fine grained SANDSTONE with minor clay, dense, slightly moist. Sample is brown Silty CLAY to Clayey SILT, dense, slightly moist			SM / ML/ CL

Material Description: Thin Wall Tube; 2.5" Ring Sample; Bulk Sample; Standard Split Spoon Sample; Static Water Table

RMA GeoScience
9854 Glenoaks Blvd., Sun Valley, CA 91352

BORING NUMBER 6

Client: Moorpark Property 67, LLC
Project Name: North Hills Moorpark
Project Number 16-G63-0
Project Location: Moorpark, California
Date Started: 5/6/2016 Completed: 5/6/2016
Ground Elevation: 540' Boring Diameter: 8"
Excavation Method: Hollow Stem Auger
Ground Water Levels: n/a
Drilling Contractor: Choice Drilling
Notes:
Logged By: ams Checked By:

Depth (ft)	Drive Sample	Blow Count (N Value)	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	Wet Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Material Description	<#200	D_{50}	USCS Classification
35		6/12/18								35': TQs - Reddish brown Silty fine grained SANDSTONE to Clayey SILTSTONE, dense, slightly moist			SM
		28/50-5"		19.1	111	133				37.5': TQs - Brown Sandy CLAYSTONE, very stiff, slightly moist			CL
40		8/16/18								40': TQs - Dark orangey brown Clayey fine grained SANDSTONE, dense, slightly moist	27		SC
		15/27/40		25	102	127				42.5': TQs - Orangey brown fine Sandy Clayey SILTSTONE, dense, slightly moist			ML
45		7/8/10								45': TQs - Dark orangey brown Silty CLAYSTONE, very stiff, slightly moist			CL
		20/50-6"		13	114	129				47.5': TQs - Medium to dark orangey brown Clayey SILT,STONE dense, slightly moist			ML
50		11/12/15								50': TQs - Medium orangey brown fine Clayey SANDSTONE, medium dense, slightly moist	26		ML
55													
60										Total Depth: 50' Caving: No Groundwater: Not Encountered Backfilled: Grout			
65													

Thin Wall Tube | 2.5" Ring Sample | Bulk Sample | Standard Split Spoon Sample | Static Water Table

RMA GeoScience
Every Project Matters | www.rmageoscience.com

APPENDIX B

LABORATORY TESTS

RMA GeoScience
Every Project Matters | www.rmageoscience.com

APPENDIX B
LABORATORY TESTS

B-1.00 LABORATORY TESTS

B-1.01 Maximum Density

Maximum density - optimum moisture relationships for the major soil types encountered during the field exploration were performed in the laboratory using the standard procedures of ASTM D1557.

B-1.02 Soluble Sulfates

Testing was performed on representative samples encountered during the investigation and the tests were performed by using California Test Method 417.

B-1.03 Soil Reactivity (pH) and Electrical Conductivity (Ec)

Representative soil samples were tested for soil reactivity (pH) and electrical conductivity (Ec) using California Test Method 643. The pH measurement determines the degree of acidity or alkalinity in the soils. The Ec is a measure of the electrical resistivity and is expressed as the reciprocal of the resistivity.

B-1.04 Particle Size Analysis

Particle size analysis was performed on representative samples of the major soils types in accordance to the standard test methods of the ASTM D422.

B-1.05 Direct Shear

Direct shear tests were performed on representative samples using the standard test method of ASTM D3080 (consolidated and drained). Tests were performed on undisturbed and remolded samples. Remolded samples were tested at approximately 90 percent relative compaction.

Shear tests were performed on a direct shear machine of the strain-controlled type. To simulate possible adverse field conditions, the samples were saturated prior to shearing. Several samples were sheared at varying normal loads and the results plotted to establish the angle of the internal friction and cohesion of the tested samples.

B-1.06 Moisture Determination

Moisture content of the soil samples was performed in accordance to standard method for determination of water content of soil by drying oven, ASTM D2216. The mass of material remaining after oven drying is used as the mass of the solid particles.

B-1.07 Density of Split-Barrel Samples

The densities of soil samples obtained by using a split-barrel sampler were determined in accordance to standard method of ASTM D1586.

B-1.08 Expansion Tests

Expansion index tests were performed on representative samples of the major soil types encountered by the test methods outlined in ASTM D4829.

B-1.09 Test Results

Test results for all laboratory tests performed on the subject project are presented in this appendix.

MAXIMUM DENSITY - OPTIMUM MOISTURE

(Test Method: ASTM D1557)

Sample Location	Optimum Moisture (Percent)	Maximum Density (lbs/ft^3)
B-1 @15 ft	10.4	126.7
B-1 @20 ft	12.9	123.8
B-1 @50 ft	12.8	119.8
B-2 @30 ft	16.9	110.5

SOLUBLE SULFATES

(Test Method: California Test Method 417 & California Test Method 422)

Sample Number	Soluble Sulfate (ppm)	Chloride Content (ppm)
B-3 @ 10 ft	47	37
B-4 @ 0-3 ft	42	37

SOIL REACTIVITY (pH) AND ELECTRICAL CONDUCTIVITY

(Test Method: California Test Method 643)

Sample Number	pH	Resistivity (Ohm-cm)
B-3 @ 10 ft	7.5	11907
B-4 @ 0-3 ft	7.7	9287

EXPANSION INDEX*

(Test Method: ASTM D4829)

Sample Number	Material Type	Expansion Index	Expansion Potential
B-1 @ 45 ft	Sandy Clay (CL)	58	Moderate
B-2 @ 30 ft	Sandy Clay (CL)	82	Moderate

RMA GeoScience
Every Project Matters | www.rmageoscience.com

PARTICLE SIZE ANALYSIS

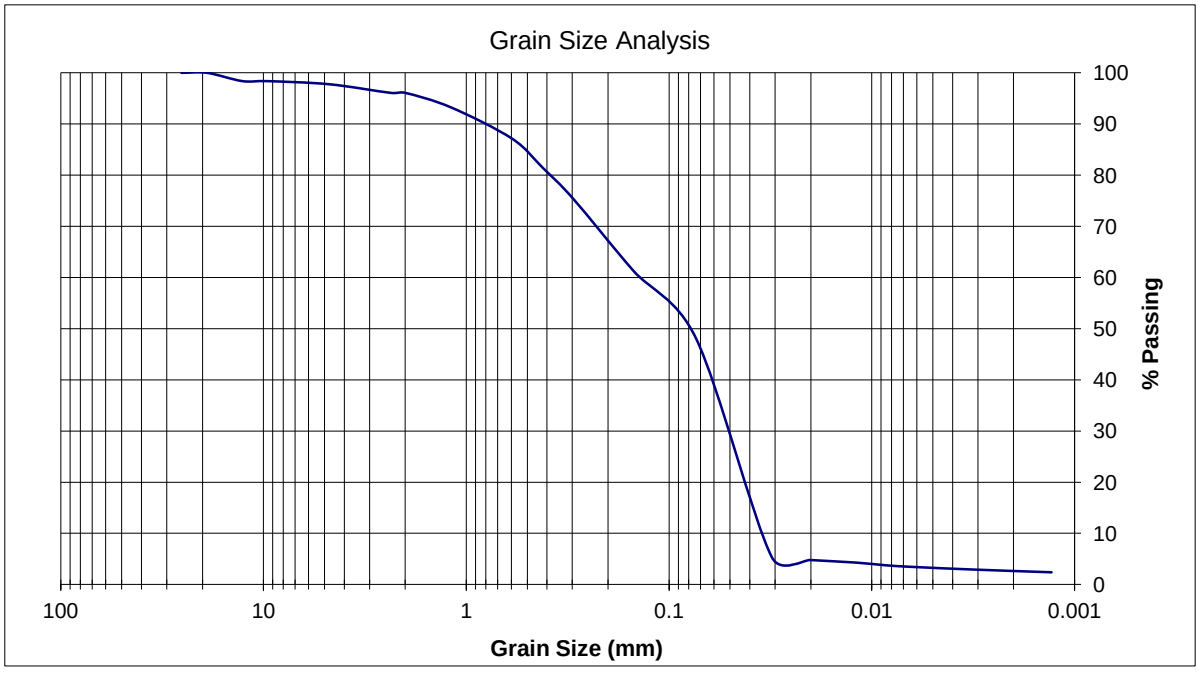
ASTM D422

Project ID: 16-G63-0/01
Sample ID: 16-197M
Location: B5
Depth: 7.5'
Soil Description: Medium brown silty sand

Fraction A Dry Net Weight (gms): 479.7

Fraction A: Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
1"	0	479.7	100
3/4"	0	479.7	100
1/2"	7.8	471.9	98
3/8"	7.8	471.9	98
#4	10.7	469.0	98
#8	18.8	460.9	96
#10	18.8	460.9	96
#16	32.4	447.3	93
#30	61.7	418.0	87
#40	89	390.7	81
#50	118	361.7	75
#100	185.6	294.1	61
#200	248.9	230.8	48

Hydrometer Portion: Particle Diameter (mm)	% Soil in Suspension
0.031	5.3
0.020	4.8
0.012	4.3
0.009	3.8
0.006	3.4
0.003	2.9
0.001	2.4



RMA GeoScience
Every Project Matters | www.rmageoscience.com

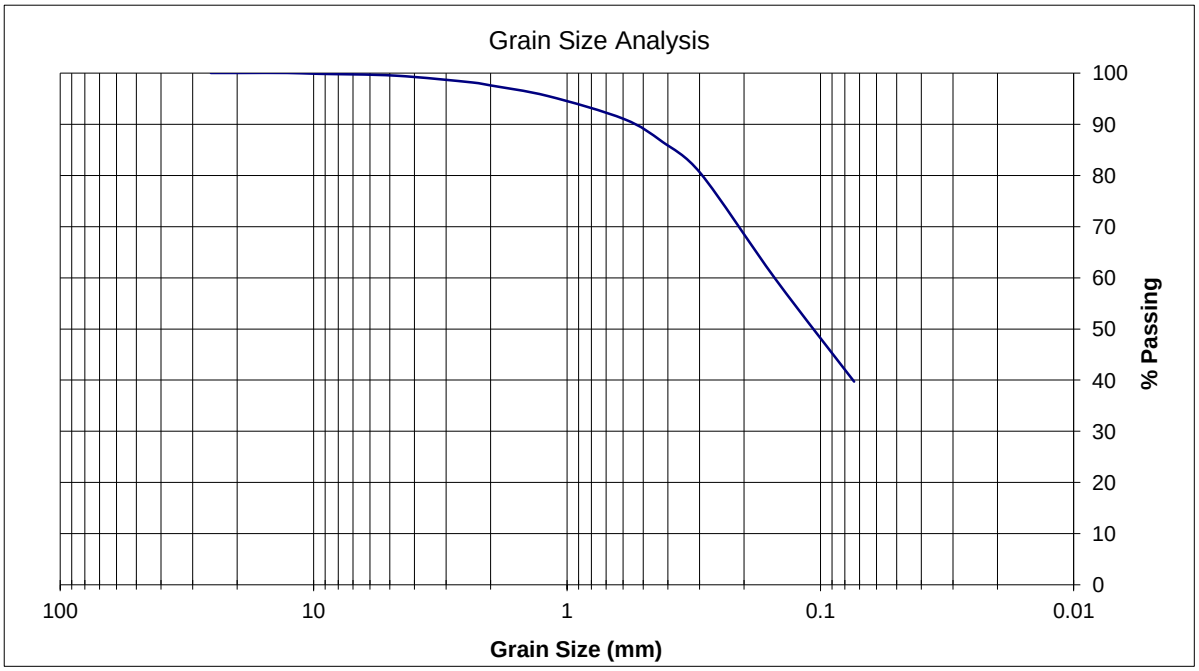
PARTICLE SIZE ANALYSIS

ASTM D422

Project ID: 16-G63-0/01
Sample ID: 16-201
Location: B5
Depth: 27.5'
Soil Description: Medium brown clayey sand

Fraction A Dry Net Weight (gms): 741.5

Fraction A: Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
1"	0	741.5	100
3/4"	0	741.5	100
1/2"	0	741.5	100
3/8"	1.3	740.2	100
#4	3.9	737.6	99
#8	13.8	727.7	98
#10	18.1	723.4	98
#16	33.4	708.1	95
#30	66.8	674.7	91
#40	99.8	641.7	87
#50	145.3	596.2	80
#100	299.3	442.2	60
#200	446.8	294.7	40



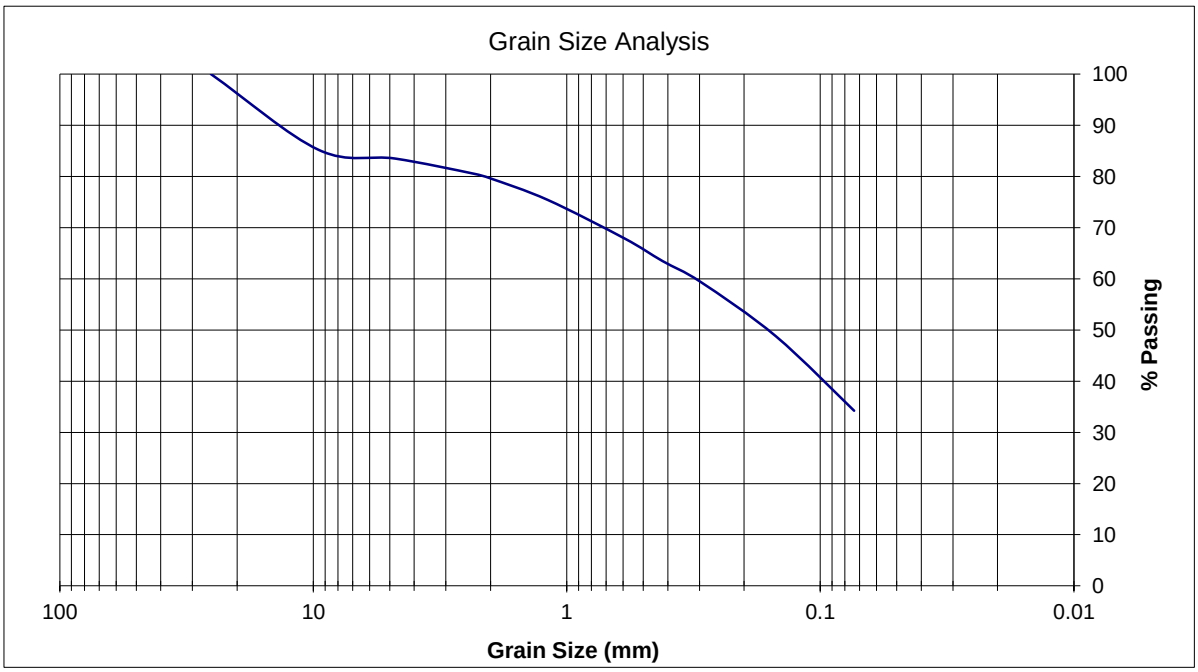
RMA GeoScience
Every Project Matters | www.rmageoscience.com

PARTICLE SIZE ANALYSIS
ASTM D422

Project ID: 16-G63-0/01
Sample ID: 16-217
Location: B6
Depth: 10'
Soil Description: Silty Sand

Fraction A Dry Net Weight (gms): 314.2

Fraction A: Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
1"	0	314.2	100
3/4"	46.6	267.6	85
1/2"	46.6	267.6	85
3/8"	46.6	267.6	85
#4	51.9	262.3	83
#8	61	253.2	81
#10	64.1	250.1	80
#16	77.3	236.9	75
#30	100.8	213.4	68
#40	114.8	199.4	63
#50	127.6	186.6	59
#100	161	153.2	49
#200	206.7	107.5	34



RMA GeoScience
Every Project Matters | www.rmageoscience.com

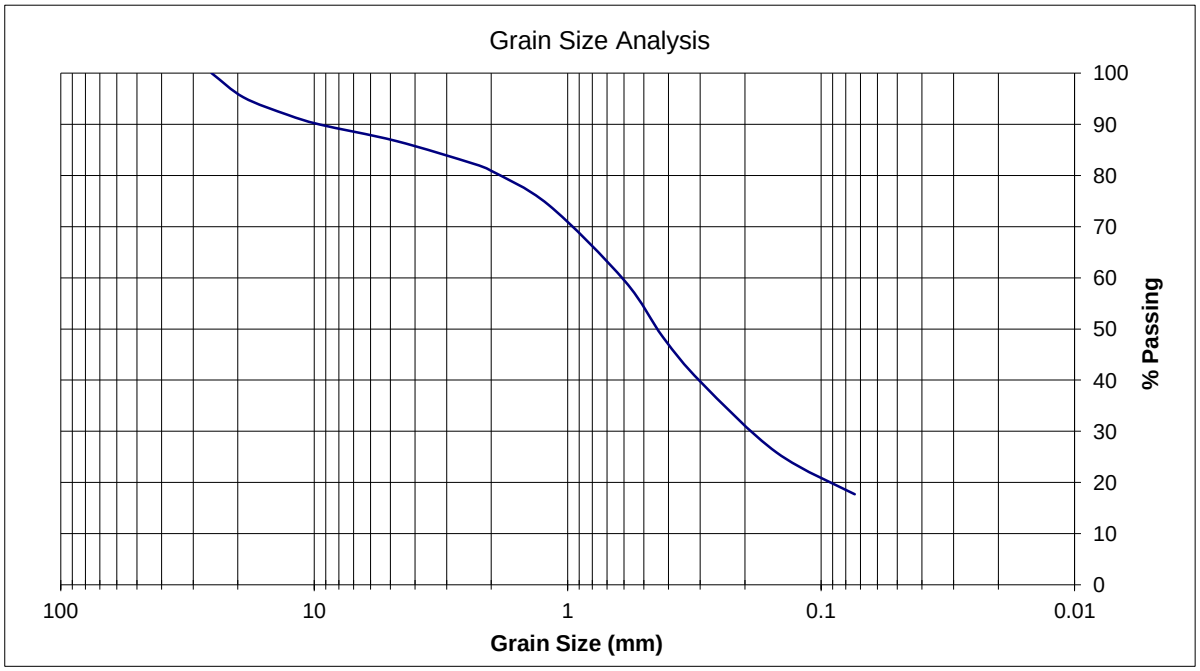
PARTICLE SIZE ANALYSIS

ASTM D422

Project ID: 16-G63-0/01
Sample ID: 16-218
Location: B6
Depth: 15'
Soil Description: Silty Sand

Fraction A Dry Net Weight (gms): 353

Fraction A: Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
1"	0	353.0	100
3/4"	16.7	336.3	95
1/2"	28.8	324.2	92
3/8"	35.4	317.6	90
#4	46.8	306.2	87
#8	62.4	290.6	82
#10	67.4	285.6	81
#16	90.8	262.2	74
#30	143.3	209.7	59
#40	182.2	170.8	48
#50	213.3	139.7	40
#100	261.6	91.4	26
#200	290.4	62.6	18



RMA GeoScience
Every Project Matters | www.rmageoscience.com

DIRECT SHEAR TEST
ASTM D3080

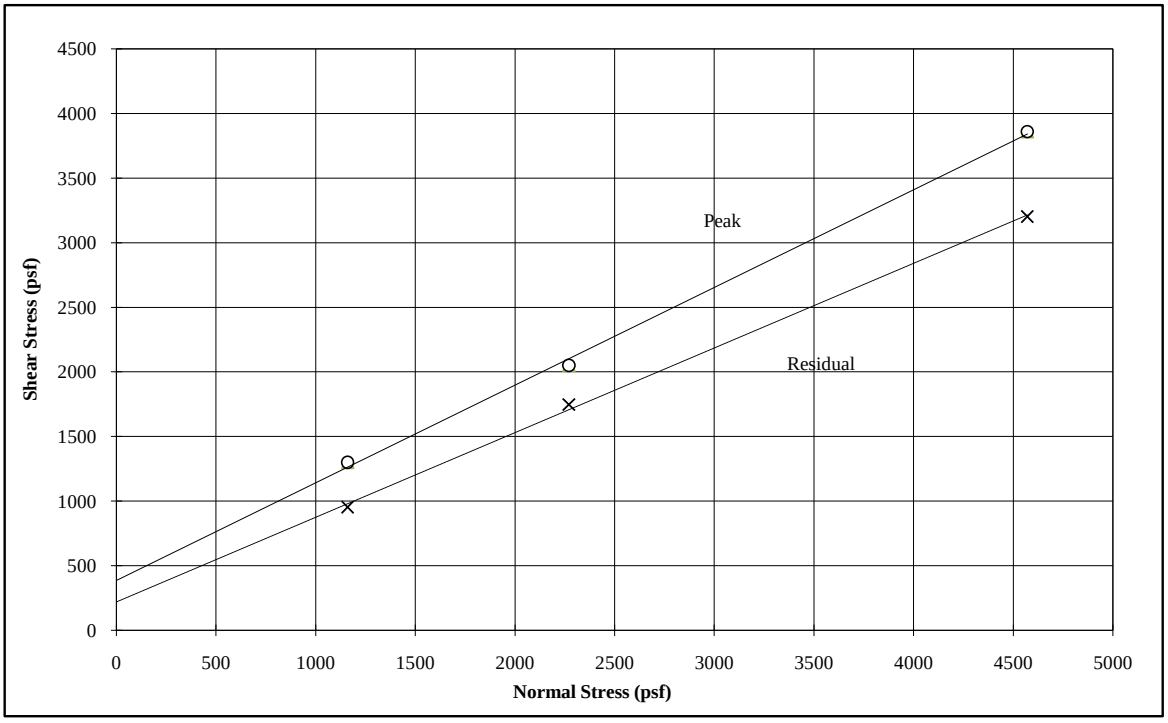
Project ID: 16-G63-0
Sample ID: 16-152
Location: B1
Depth: 35'
Soil Description: Sandstone

Remolded or Undisturbed: Undisturbed
Maximum Dry Density (pcf) = N/A
Optimum Moisture Content (%) = N/A
Initial Dry Density (pcf) = 102.1
Relative Compaction (%) = N/A
Initial Moisture Content (%) = 2.4
Final Moisture Content (%) = 17.6

Diameter (in)	2.41
Area of sample (in^2)	4.56
Load Ring Constant (lb/in)	4010

Load Applied (g)	Normal Pressure (psf)	Peak		Residual	
		Dial Reading	Shear Resist (psf)	Dial Reading	Shear Resist (psf)
16615	1160	0.0102	1300	0.0075	954
32600	2270	0.0162	2050	0.0138	1747
65681	4570	0.0305	3860	0.0253	3203

	Peak	Residual
Cohesion (psf) =	390	220
Friction Angle (deg) =	37	33



RMA GeoScience
Every Project Matters | www.rmageoscience.com

DIRECT SHEAR TEST
ASTM D3080

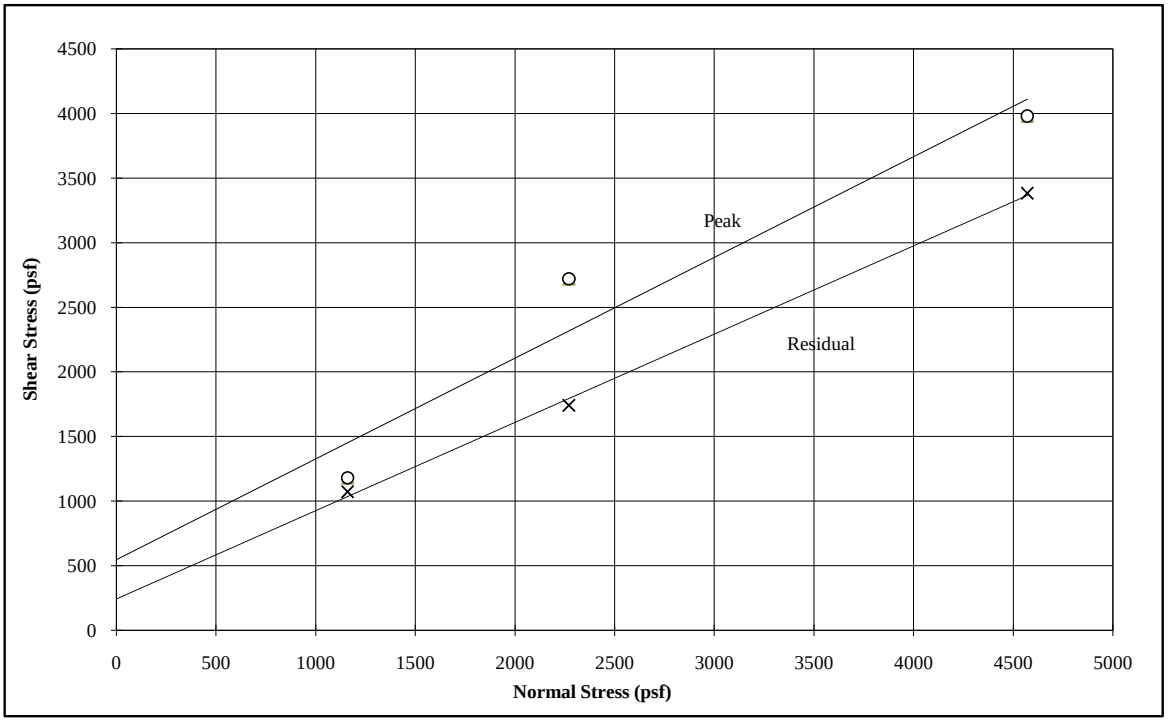
Project ID: 16-G63-0
Sample ID: 16-155
Location: B1
Depth: 50'
Soil Description: Sandstone

Remolded or Undisturbed: Undisturbed
Maximum Dry Density (pcf) = N/A
Optimum Moisture Content (%) = N/A
Initial Dry Density (pcf) = 98.1
Relative Compaction (%) = N/A
Initial Moisture Content (%) = 2.6
Final Moisture Content (%) = 13.9

Diameter (in)	2.41
Area of sample (in^2)	4.56
Load Ring Constant (lb/in)	4010

Load Applied (g)	Normal Pressure (psf)	Peak		Residual	
		Dial Reading	Shear Resist (psf)	Dial Reading	Shear Resist (psf)
16615	1160	0.0094	1180	0.0085	1072
32600	2270	0.0215	2720	0.0138	1741
65681	4570	0.0315	3980	0.0267	3384

	Peak	Residual
Cohesion (psf) =	550	240
Friction Angle (deg) =	38	34



RMA GeoScience
Every Project Matters | www.rmageoscience.com

DIRECT SHEAR TEST
ASTM D3080

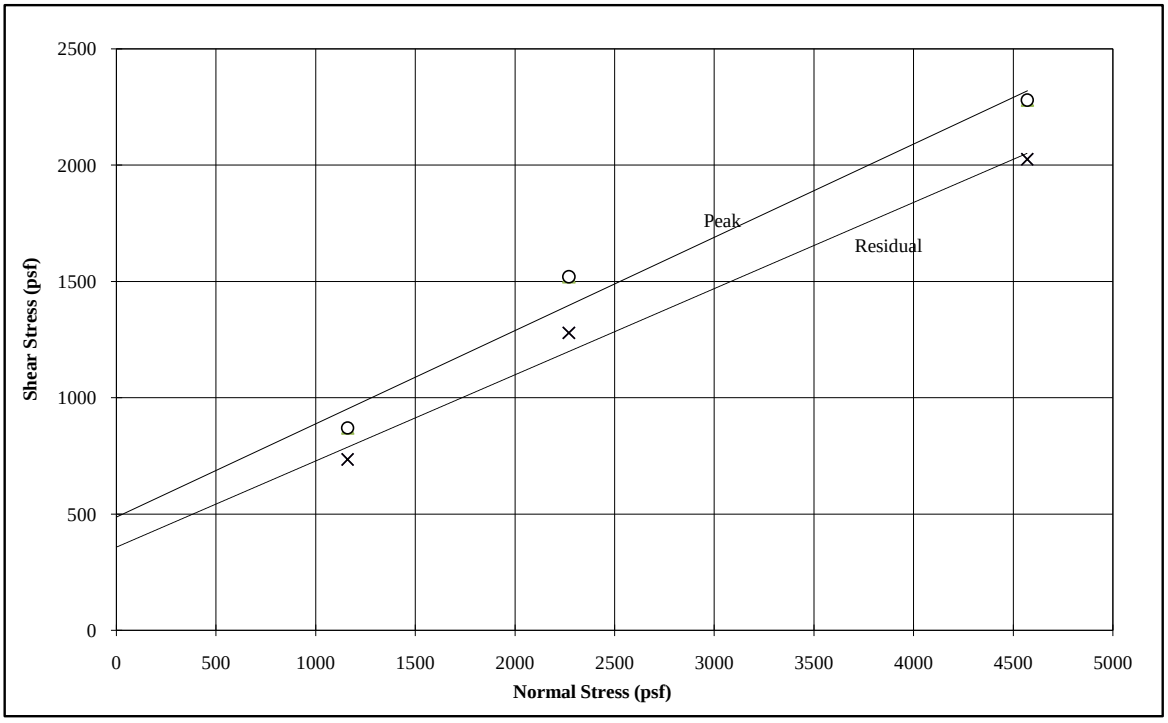
Project ID: 16-G63-0
Sample ID: 16-167
Location: B2
Depth: 30'
Soil Description: Claystone

Remolded or Undisturbed: Undisturbed
Maximum Dry Density (pcf) = N/A
Optimum Moisture Content (%) = N/A
Initial Dry Density (pcf) = 85.5
Relative Compaction (%) = N/A
Initial Moisture Content (%) = 36.0
Final Moisture Content (%) = 39.2

Diameter (in)	2.41
Area of sample (in^2)	4.56
Load Ring Constant (lb/in)	4010

Load Applied (g)	Normal Pressure (psf)	Peak		Residual	
		Dial Reading	Shear Resist (psf)	Dial Reading	Shear Resist (psf)
16615	1160	0.0069	870	0.0058	734
32600	2270	0.0120	1520	0.0101	1279
65681	4570	0.0180	2280	0.0160	2025

	Peak	Residual
Cohesion (psf) =	490	360
Friction Angle (deg) =	22	20



RMA GeoScience
Every Project Matters | www.rmageoscience.com

DIRECT SHEAR TEST
ASTM D3080

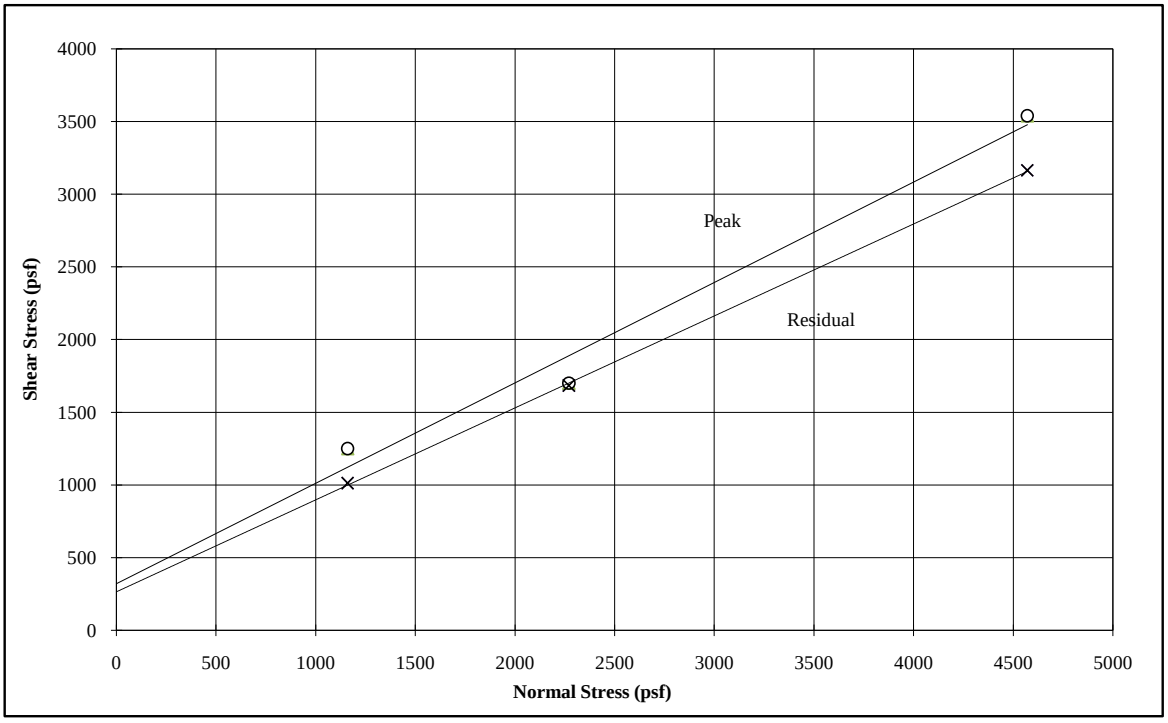
Project ID: 16-G63-0
Sample ID: 116-181
Location: B3
Depth: 60'
Soil Description: Sandstone

Remolded or Undisturbed: Undisturbed
Maximum Dry Density (pcf) = N/A
Optimum Moisture Content (%) = N/A
Initial Dry Density (pcf) = 97.4
Relative Compaction (%) = N/A
Initial Moisture Content (%) = 2.3
Final Moisture Content (%) = 15.4

Diameter (in)	2.41
Area of sample (in^2)	4.56
Load Ring Constant (lb/in)	4010

Load Applied (g)	Normal Pressure (psf)	Peak		Residual	
		Dial Reading	Shear Resist (psf)	Dial Reading	Shear Resist (psf)
16615	1160	0.0099	1250	0.0080	1013
32600	2270	0.0134	1700	0.0133	1684
65681	4570	0.0280	3540	0.0250	3165

	Peak	Residual
Cohesion (psf) =	320	270
Friction Angle (deg) =	35	32



RMA GeoScience
Every Project Matters | www.rmageoscience.com

DIRECT SHEAR TEST
ASTM D3080

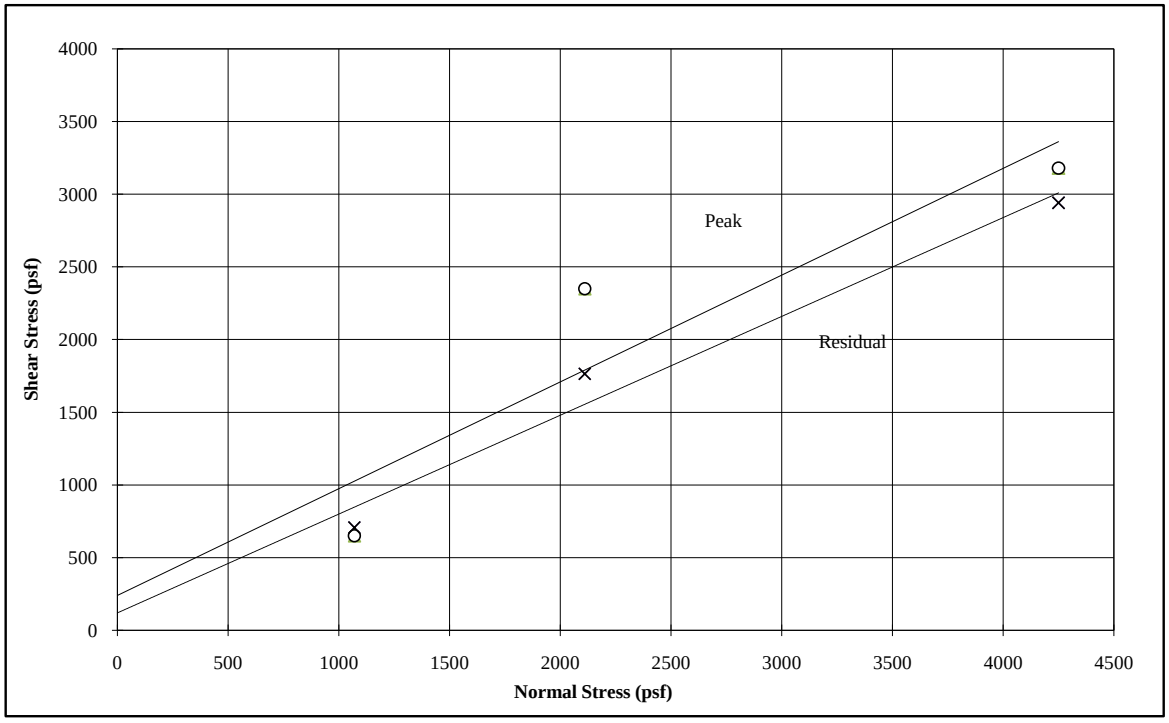
Project ID: 16-G63-0
Sample ID: 16-162
Location: B1
Depth: 49'
Soil Description: SandStone (caving)

Remolded or Undisturbed: Remolded
Maximum Dry Density (pcf) = 123.8
Optimum Moisture Content (%) = 12.9
Initial Dry Density (pcf) = 112.0
Relative Compaction (%) = 90%
Initial Moisture Content (%) = 13.3
Final Moisture Content (%) = 18.9

Diameter (in)	2.5
Area of sample (in^2)	4.91
Load Ring Constant (lb/in)	4010

Load Applied (g)	Normal Pressure (psf)	Peak		Residual	
		Dial Reading	Shear Resist (psf)	Dial Reading	Shear Resist (psf)
16615	1070	0.0055	650	0.0060	706
32600	2110	0.0200	2350	0.0150	1765
65681	4250	0.0270	3180	0.0250	2941

	Peak	Residual
Cohesion (psf) =	240	120
Friction Angle (deg) =	36	34



RMA GeoScience
Every Project Matters | www.rmageoscience.com

DIRECT SHEAR TEST
ASTM D3080

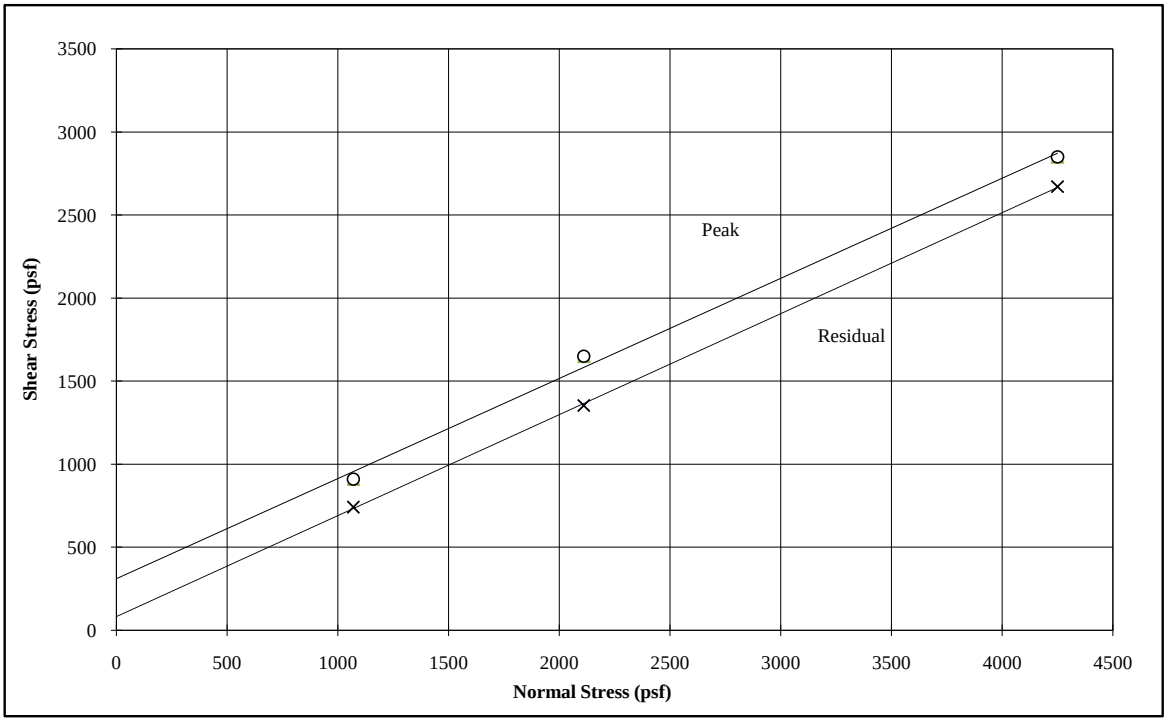
Project ID: 16-G63-0
Sample ID: 16-193
Location: B3
Depth: 12'
Soil Description: Sandstone (caving)

Remolded or Undisturbed: Remolded
Maximum Dry Density (pcf) = 110.5
Optimum Moisture Content (%) = 16.9
Initial Dry Density (pcf) = 106.0
Relative Compaction (%) = 96%
Initial Moisture Content (%) = 15.2
Final Moisture Content (%) = 19.6

Diameter (in)	2.5
Area of sample (in^2)	4.91
Load Ring Constant (lb/in)	4010

Load Applied (g)	Normal Pressure (psf)	Peak		Residual	
		Dial Reading	Shear Resist (psf)	Dial Reading	Shear Resist (psf)
16615	1070	0.0077	910	0.0063	741
32600	2110	0.0140	1650	0.0115	1353
65681	4250	0.0242	2850	0.0227	2670

	Peak	Residual
Cohesion (psf) =	310	80
Friction Angle (deg) =	31	31



RMA GeoScience
Every Project Matters | www.rmageoscience.com

APPENDIX C

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

RMA GeoScience
Every Project Matters | www.rmageoscience.com

APPENDIX C

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

C-1.00 GENERAL DESCRIPTION

C-1.01 Introduction

These specifications present our general recommendations for earthwork and grading as shown on the approved grading plans for the subject project. These specifications shall cover all clearing and grubbing, removal of existing structures, preparation of land to be filled, filling of the land, spreading, compaction and control of the fill, and all subsidiary work necessary to complete the grading of the filled areas to conform with the lines, grades and slopes as shown on the approved plans.

The recommendations contained in the geotechnical report of which these general specifications are a part of shall supersede the provisions contained hereinafter in case of conflict.

C-1.02 Laboratory Standard and Field Test Methods

The laboratory standard used to establish the maximum density and optimum moisture shall be ASTM D1557.

The insitu density of earth materials (field compaction tests) shall be determined by the sand cone method (ASTM D1556), direct transmission nuclear method (ASTM D2922) or other test methods as considered appropriate by the geotechnical consultant.

Relative compaction is defined, for purposes of these specifications, as the ratio of the in-place density to the maximum density as determined in the previously mentioned laboratory standard.

C-2.00 CLEARING

C-2.01 Surface Clearing

All structures marked for removal, timber, logs, trees, brush and other rubbish shall be removed and disposed of off the site. Any trees to be removed shall be pulled in such a manner so as to remove as much of the root system as possible.

C-2.02 Subsurface Removals

A thorough search should be made for possible underground storage tanks and/or septic tanks and cesspools. If found, tanks should be removed and cesspools pumped dry.

Any concrete irrigation lines shall be crushed in place and all metal underground lines shall be removed from the site.

C-2.03 Backfill of Cavities

All cavities created or exposed during clearing and grubbing operations or by previous use of the site shall be cleared of deleterious material and backfilled with native soils or other materials approved by the soil engineer. Said backfill shall be compacted to a minimum of 90% relative compaction.

C-3.00 ORIGINAL GROUND PREPARATION

C-3.01 Stripping of Vegetation

After the site has been properly cleared, all vegetation and topsoil containing the root systems of former vegetation shall be stripped from areas to be graded. Materials removed in this stripping process may be used as fill in areas designated by the soil engineer, provided the vegetation is mixed with a sufficient amount of soil to assure that no appreciable settlement or other detriment will occur due to decaying of the organic matter. Soil materials containing more than 3% organics shall not be used as structural fill.

C-3.02 Removals of Non-Engineered Fills

Any non-engineered fills encountered during grading shall be completely removed and the underlying ground shall be prepared in accordance to the recommendations for original ground preparation contained in this section. After cleansing of any organic matter the fill material may be used for engineered fill.

C-3.03 Overexcavation of Fill Areas

The existing ground in all areas determined to be satisfactory for the support of fills shall be scarified to a minimum depth of 6 inches. Scarification shall continue until the soils are broken down and free from lumps or clods and until the scarified zone is uniform. The moisture content of the scarified zone shall be adjusted to within 2% of optimum moisture. The scarified zone shall then be uniformly compacted to 90% relative compaction.

Where fill material is to be placed on ground with slopes steeper than 5:1 (H:V) the sloping ground shall be benched. The lowermost bench shall be a minimum of 15 feet wide, shall be a minimum of 2 feet deep, and shall expose firm material as determined by the geotechnical consultant. Other benches shall be excavated to firm material as determined by the geotechnical consultant and shall have a minimum width of 4 feet.

Existing ground that is determined to be unsatisfactory for the support of fills shall be overexcavated in accordance to the recommendations contained in the geotechnical report of which these general specifications are a part.

C-4.00 FILL MATERIALS

C-4.01 General

Materials for the fill shall be free from vegetable matter and other deleterious substances, shall not contain rocks or lumps of a greater dimension than is recommended by the geotechnical consultant, and shall be approved by the geotechnical consultant. Soils of poor gradation, expansion, or strength properties shall be placed in areas designated by the geotechnical consultant or shall be mixed with other soils providing satisfactory fill material.

C-4.02 Oversize Material

Oversize material, rock or other irreducible material with a maximum dimension greater than 12 inches shall not be placed in fills, unless the location, materials, and disposal methods are specifically approved by the geotechnical consultant. Oversize material shall be placed in such a manner that nesting of oversize material does not occur and in such a manner that the oversize material is completely surrounded by fill material compacted to a minimum of 90% relative compaction. Oversize material shall not be placed within 10 feet of finished grade without the approval of the geotechnical consultant.

C-4.03 Import

Material imported to the site shall conform to the requirements of Section 4.01 of these specifications. Potential import material shall be approved by the geotechnical consultant prior to importation to the subject site.

C-5.00 PLACING AND SPREADING OF FILL

C-5.01 Fill Lifts

The selected fill material shall be placed in nearly horizontal layers which when compacted will not exceed approximately 6 inches in thickness. Thicker lifts may be placed if testing indicates the compaction procedures are such that the required compaction is being achieved and the geotechnical consultant approves their use.
Each layer shall be spread evenly and shall be thoroughly blade mixed during the spreading to insure uniformity of material in each layer.

C-5.02 Fill Moisture

When the moisture content of the fill material is below that recommended by the soils engineer, water shall then be added until he moisture content is as specified to assure thorough bonding during the compacting process.

When the moisture content of the fill material is above that recommended by the soils engineer, the fill material shall be aerated by blading or other satisfactory methods until the moisture content is as specified.

C-5.03 Fill Compaction

After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted to not less than 90% relative compaction. Compaction shall be by sheepsfoot rollers, multiple-wheel pneumatic tired rollers, or other types approved by the soil engineer.

Rolling shall be accomplished while the fill material is at the specified moisture content. Rolling of each layer shall be continuous over its entire area and the roller shall make sufficient trips to insure that the desired density has been obtained.

C-5.04 Fill Slopes

Fill slopes shall be compacted by means of sheepsfoot rollers or other suitable equipment. Compacting of the slopes may be done progressively in increments of 3 to 4 feet in fill height. At the completion of grading, the slope face shall be compacted to a minimum of 90% relative compaction. This may require track rolling or rolling with a grid roller attached to a tractor mounted side-boom.

Slopes may be over filled and cut back in such a manner that the exposed slope faces are compacted to a minimum of 90% relative compaction.

The fill operation shall be continued in six inch (6") compacted layers, or as specified above, until the fill has been brought to the finished slopes and grades as shown on the accepted plans.

C-5.05 Compaction Testing

Field density tests shall be made by the geotechnical consultant of the compaction of each layer of fill. Density tests shall be made at locations selected by the geotechnical consultant.

Frequency of field density tests shall be not less than one test for each 2.0 feet of fill height and at least every one thousand cubic yards of fill. Where fill slopes exceed four feet in height their finished faces shall be tested at a frequency of one test for each 1000 square feet of slope face.

Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Density reading shall be taken in the compacted material below the disturbed surface. When these readings indicate that the density of any layer of fill or portion thereof is below the required density, the particular layer or portion shall be reworked until the required density has been obtained.

C-6.00 SUBDRAINS

C-6.01 Subdrain Material

Subdrains shall be constructed of a minimum 4-inch diameter pipe encased in a suitable filter material. The subdrain pipe shall be Schedule 40 Acrylonitrile Butadiene Styrene (ABS) or Schedule 40 Polyvinyl Chloride Plastic (PVC) pipe or approved equivalent. Subdrain pipe shall be installed with perforations down. Filter material shall consist of 3/4" to 1 1/2" clean gravel wrapped in an envelope of filter fabric consisting of Mirafi 140N or approved equivalent.

C-6.02 Subdrain Installation

Subdrain systems, if required, shall be installed in approved ground to conform the approximate alignment and details shown on the plans or herein. The subdrain locations shall not be changed or modified without the approval of the geotechnical consultant. The geotechnical consultant may recommend and direct changes in the subdrain line, grade or material upon approval by the design civil engineer and the appropriate governmental agencies.

C-7.00 EXCAVATIONS

C-7.01 General

Excavations and cut slopes shall be examined by the geotechnical consultant. If determined necessary by the geotechnical consultant, further excavation or overexcavation and refilling of overexcavated areas shall be performed, and/or remedial grading of cut slopes shall be performed.

C-7.02 Fill-Over-Cut Slopes

Where fill-over-cut slopes are to be graded the cut portion of the slope shall be made and approved by the geotechnical consultant prior to placement of materials for construction of the fill portion of the slope.

C-8.00 TRENCH BACKFILL

C-.01 General

Trench backfill within street right of ways shall be compacted to 90% relative compaction as determined by the ASTM D1557 test method. Backfill may be jetted as a means of initial compaction; however, mechanical compaction will be required to obtain the required percentage of relative compaction. If trenches are jetted, there must be a suitable delay for drainage of excess water before mechanical compaction is applied.

C-9.00 SEASONAL LIMITS

C-9.01 General

No fill material shall be placed, spread or rolled while it is frozen or thawing or during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not be resumed until field tests by the soils engineer indicate that the moisture content and density of the fill are as previously specified.

C-10.00 SUPERVISION

C-10.01 Prior to Grading

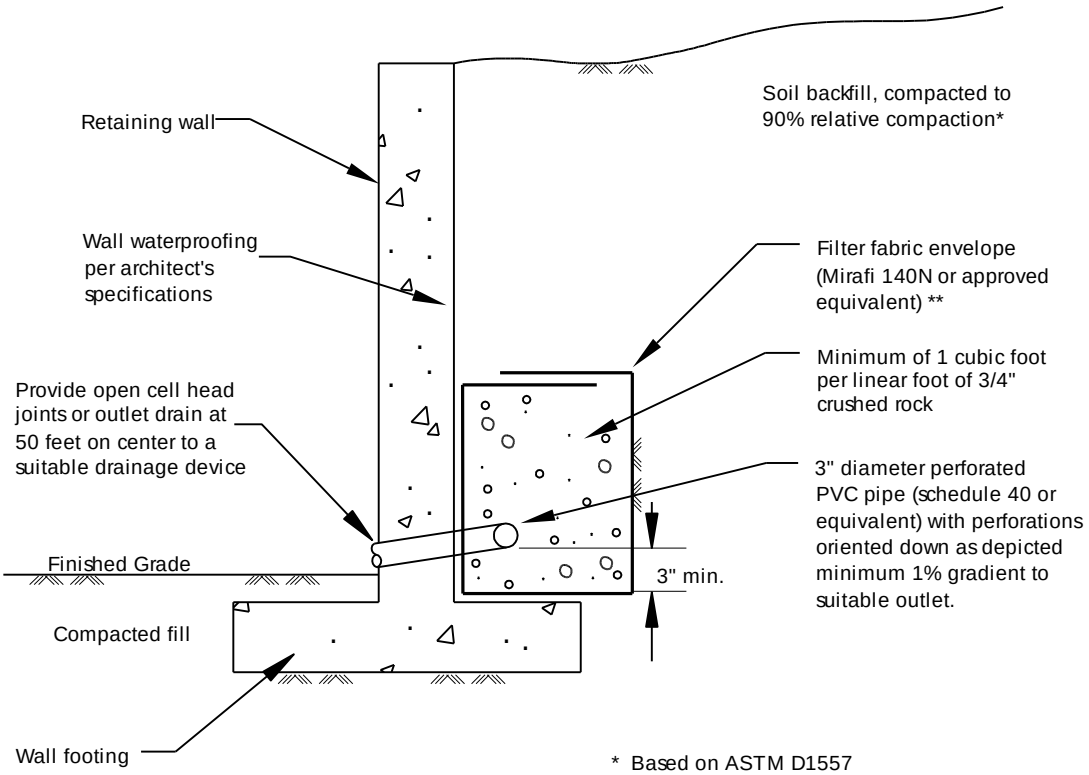
The site shall be observed by the geotechnical consultant upon completion of clearing and grubbing, prior to the preparation of any original ground for preparation of fill.

The supervisor of the grading contractor and the field representative of the geotechnical consultant shall have a meeting and discuss the geotechnical aspects of the earthwork prior to commencement of grading.

C-10.02 During Grading

Site preparation of all areas to receive fill shall be tested and approved by the geotechnical consultant prior to the placement of any fill.

The geotechnical consultant or his representative shall observe the fill and compaction operations so that he can provide an opinion regarding the conformance of the work to the recommendations contained in this report.



* Based on ASTM D1557

** If class 2 permeable material (See gradation to left) is used in place of 3/4" - 1 1/2" gravel. Filter fabric may be deleted. Class 2 permeable material compacted to 90% relative compaction. *

SPECIFICATIONS FOR CLASS 2 PERMEABLE MATERIAL (CAL TRANS SPECIFICATIONS)

Sieve Size	% Passing
1"	100
3/4"	90-100
3/8"	40-100
No.4	25-40
No.8	18-33
No.30	5-15
No.50	0-7
No.200	0-3

RETAINING WALL DRAINAGE DETAIL

RMA GeoScience
Every Project Matters | www.rmageoscience.com

APPENDIX D

SEISMIC SETTLEMENT ANALYSIS
RESULTS FROM RUNNING LIQUEFYPRO

LIQUEFACTION ANALYSIS_SPT B5 INPUT GRAPHICS
LIQUEFACTION ANALYSIS_SPT B5 OUTPUT GRAPHICS
LIQUEFACTION ANALYSIS_ SPT B5 INPUT & OUTPUT DATA

Seismically-induced settlement in unsaturated (dry) and saturated soils generally occur due to the dissipation of pore pressure in a liquefiable soil layer. As previously defined, liquefaction occurs when cyclic stresses, which are produced by earthquake-induced ground motions, create excess pore pressures in predominately cohesionless soils. The controlling factors affecting settlement in saturated sands consist of the pore pressure drainage path, magnitude and duration of the seismic event, cyclic stresses, maximum shear strains, and the SPT (N1)60 value of the soil layers. Seismically-induced settlement in partially saturated or dry sands is controlled predominately by the magnitude and duration of the seismic event, cyclic strains, and the SPT (N1)60 value of the soil layers.

The potential for seismically-induced settlement is greatest in loose granular soils (i.e., sands, silty sands, sandy silts), whereas cohesive soils (i.e., clays and silts) are generally not prone to this kind of settlement. It should be realized that granular soils are susceptible to settlement during a seismic event whether the soils liquefy or not. Soils underlying the site generally consist of alternating layers of sandy soils with silt, clay and gravel components.

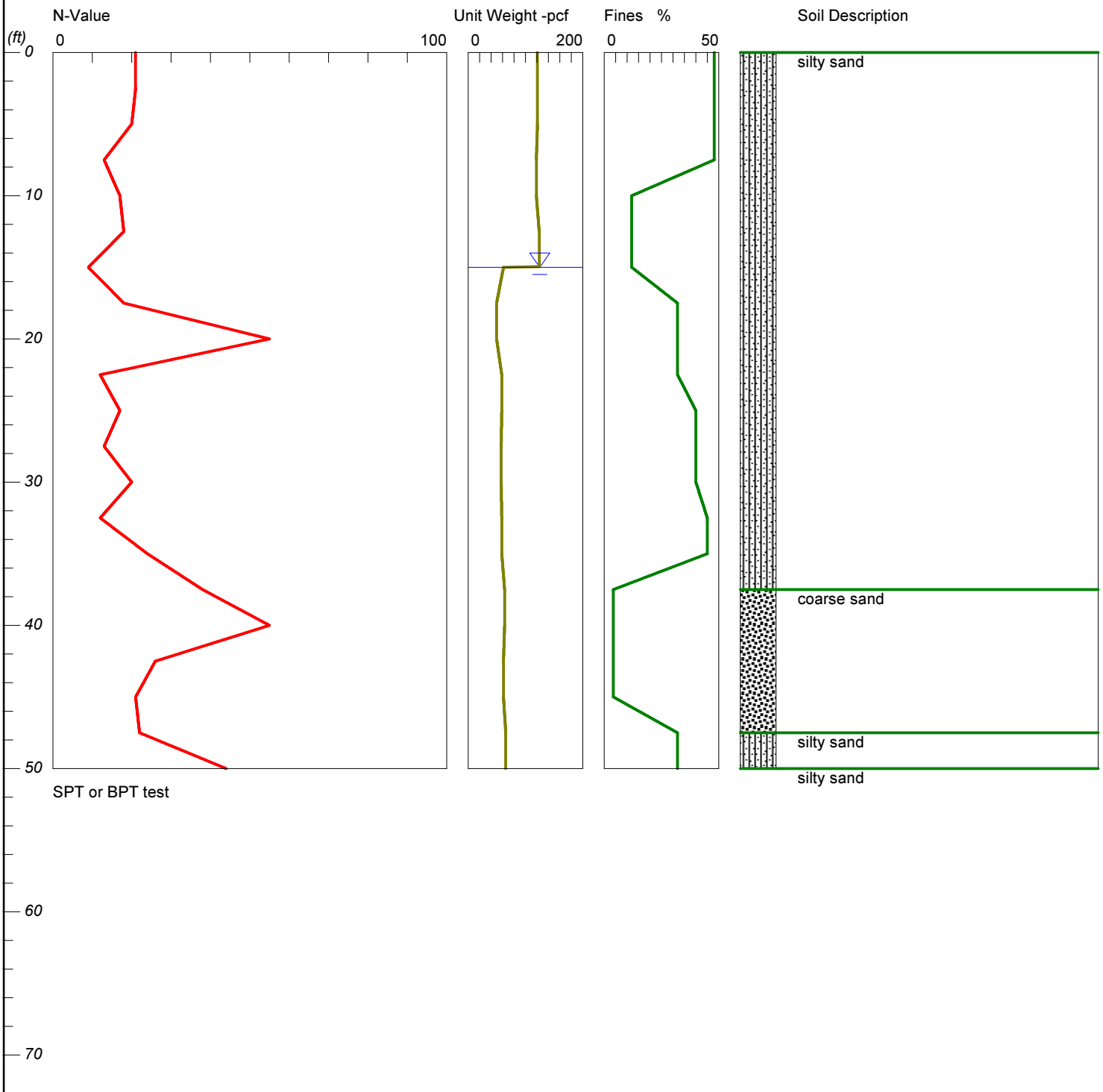
The potential for seismically-induced settlement was evaluated for the site by using LiquefyPro Version 5 and Later, which was created by CivilTech Software. The input data and output results are presented as follows.

LIQUEFACTION ANALYSIS

16-G63-0, Settlement

Hole No.=B-5 Water Depth=15 ft Surface Elev.=511

Magnitude=6.86
Acceleration=0.71g

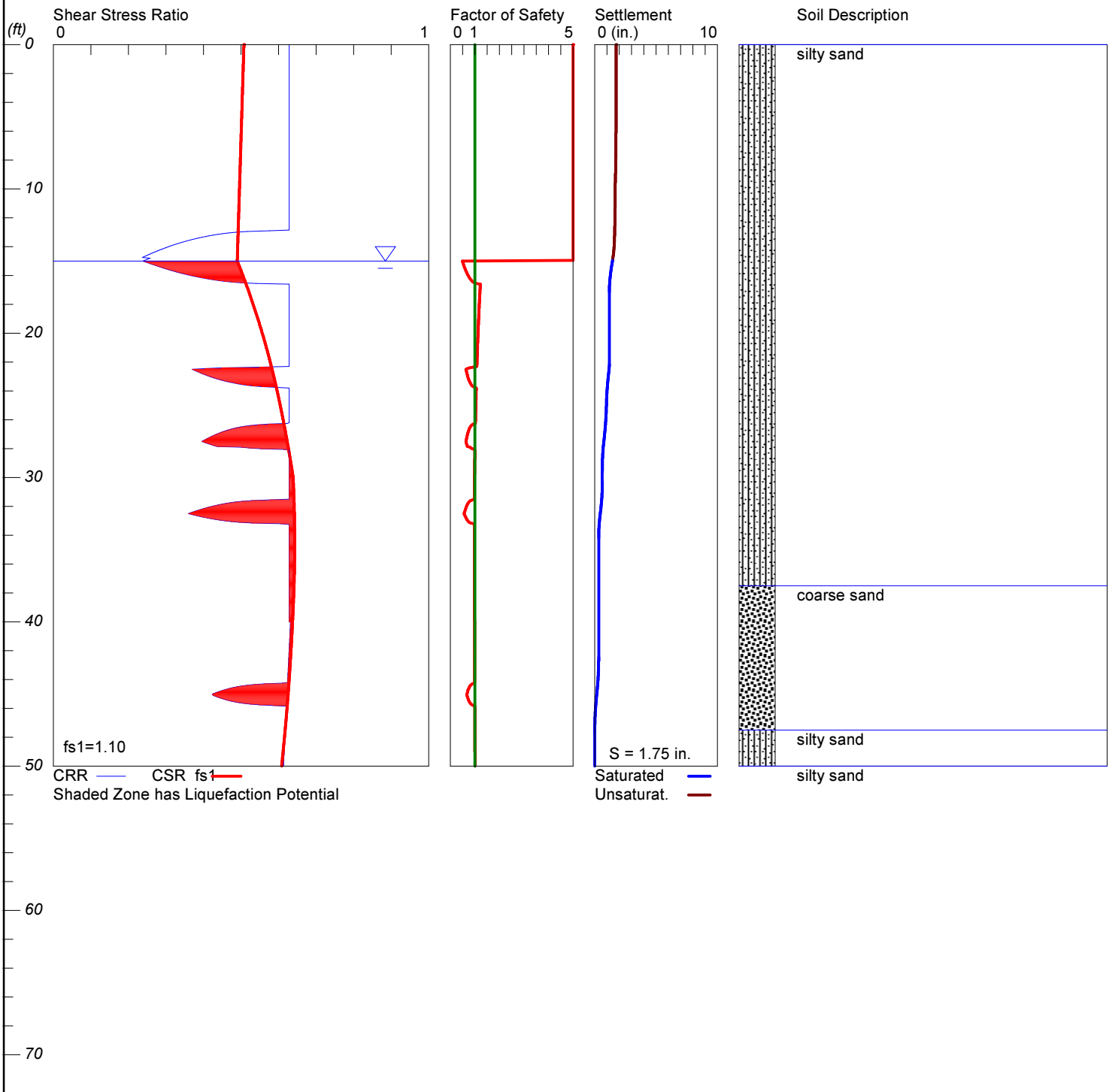


LIQUEFACTION ANALYSIS

16-G63-0, Settlement

Hole No.=B-5 Water Depth=15 ft Surface Elev.=511

Magnitude=6.86
Acceleration=0.71g



****

LIQUEFACTION ANALYSIS SUMMARY

****

Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to , 6/7/2016 10:33:24 AM

Input File Name: C:\Users\geo-science\Documents\16-G63-0_B5.liq
Title: 16-G63-0, Settlement
Subtitle: Tract 5847_MoorPark

Surface Elev.=511
Hole No.=B-5
Depth of Hole= 50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 15.00 ft
Max. Acceleration= 0.71 g
Earthquake Magnitude= 6.86

Input Data:
Surface Elev.=511
Hole No.=B-5
Depth of Hole=50.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 15.00 ft
Max. Acceleration=0.71 g
Earthquake Magnitude=6.86
No-Liquefiable Soils: Based on Analysis

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu, M-correction
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1.15
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1.1
   Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.00	21.00	121.00	48.00
2.50	21.00	121.00	48.00
5.00	20.00	121.00	48.00
7.50	13.00	119.00	48.00
10.00	17.00	119.00	12.00
12.50	18.00	124.00	12.00
15.00	9.00	124.00	12.00
17.50	18.00	112.00	32.00
20.00	55.00	112.00	32.00
22.50	12.00	121.00	32.00
25.00	17.00	121.00	40.00
27.50	13.00	120.00	40.00
30.00	20.00	120.00	40.00
32.50	12.00	121.00	45.00
35.00	24.00	121.00	45.00
37.50	38.00	126.00	4.00
40.00	55.00	126.00	4.00
42.50	26.00	124.00	4.00
45.00	21.00	124.00	4.00
47.50	22.00	128.00	32.00
50.00	44.00	128.00	32.00

Output Results:

Settlement of Saturated Sands=1.44 in.
Settlement of Unsaturated Sands=0.30 in.
Total Settlement of Saturated and Unsaturated Sands=1.75 in.
Differential Settlement=0.874 to 1.153 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	0.63	0.51	5.00	1.44	0.30	1.75
0.05	0.63	0.51	5.00	1.44	0.30	1.75
0.10	0.63	0.51	5.00	1.44	0.30	1.75
0.15	0.63	0.51	5.00	1.44	0.30	1.75
0.20	0.63	0.51	5.00	1.44	0.30	1.75
0.25	0.63	0.51	5.00	1.44	0.30	1.75
0.30	0.63	0.51	5.00	1.44	0.30	1.75
0.35	0.63	0.51	5.00	1.44	0.30	1.75
0.40	0.63	0.51	5.00	1.44	0.30	1.75
0.45	0.63	0.51	5.00	1.44	0.30	1.75
0.50	0.63	0.51	5.00	1.44	0.30	1.75
0.55	0.63	0.51	5.00	1.44	0.30	1.75

0.60	0.63	0.51	5.00	1.44	0.30	1.75
0.65	0.63	0.51	5.00	1.44	0.30	1.75
0.70	0.63	0.51	5.00	1.44	0.30	1.75
0.75	0.63	0.51	5.00	1.44	0.30	1.75
0.80	0.63	0.51	5.00	1.44	0.30	1.75
0.85	0.63	0.51	5.00	1.44	0.30	1.75
0.90	0.63	0.51	5.00	1.44	0.30	1.75
0.95	0.63	0.51	5.00	1.44	0.30	1.75
1.00	0.63	0.51	5.00	1.44	0.30	1.75
1.05	0.63	0.51	5.00	1.44	0.30	1.75
1.10	0.63	0.51	5.00	1.44	0.30	1.75
1.15	0.63	0.51	5.00	1.44	0.30	1.75
1.20	0.63	0.51	5.00	1.44	0.30	1.75
1.25	0.63	0.51	5.00	1.44	0.30	1.75
1.30	0.63	0.51	5.00	1.44	0.30	1.75
1.35	0.63	0.51	5.00	1.44	0.30	1.75
1.40	0.63	0.51	5.00	1.44	0.30	1.75
1.45	0.63	0.51	5.00	1.44	0.30	1.75
1.50	0.63	0.51	5.00	1.44	0.30	1.75
1.55	0.63	0.51	5.00	1.44	0.30	1.75
1.60	0.63	0.51	5.00	1.44	0.30	1.75
1.65	0.63	0.51	5.00	1.44	0.30	1.75
1.70	0.63	0.51	5.00	1.44	0.30	1.75
1.75	0.63	0.51	5.00	1.44	0.30	1.75
1.80	0.63	0.51	5.00	1.44	0.30	1.75
1.85	0.63	0.51	5.00	1.44	0.30	1.75
1.90	0.63	0.51	5.00	1.44	0.30	1.75
1.95	0.63	0.51	5.00	1.44	0.30	1.75
2.00	0.63	0.51	5.00	1.44	0.30	1.75
2.05	0.63	0.51	5.00	1.44	0.30	1.75
2.10	0.63	0.51	5.00	1.44	0.30	1.75
2.15	0.63	0.51	5.00	1.44	0.30	1.75
2.20	0.63	0.51	5.00	1.44	0.30	1.74
2.25	0.63	0.50	5.00	1.44	0.30	1.74
2.30	0.63	0.50	5.00	1.44	0.30	1.74
2.35	0.63	0.50	5.00	1.44	0.30	1.74
2.40	0.63	0.50	5.00	1.44	0.30	1.74
2.45	0.63	0.50	5.00	1.44	0.30	1.74
2.50	0.63	0.50	5.00	1.44	0.30	1.74
2.55	0.63	0.50	5.00	1.44	0.30	1.74
2.60	0.63	0.50	5.00	1.44	0.30	1.74
2.65	0.63	0.50	5.00	1.44	0.30	1.74
2.70	0.63	0.50	5.00	1.44	0.30	1.74
2.75	0.63	0.50	5.00	1.44	0.30	1.74
2.80	0.63	0.50	5.00	1.44	0.30	1.74
2.85	0.63	0.50	5.00	1.44	0.30	1.74
2.90	0.63	0.50	5.00	1.44	0.30	1.74
2.95	0.63	0.50	5.00	1.44	0.30	1.74

3.00	0.63	0.50	5.00	1.44	0.30	1.74
3.05	0.63	0.50	5.00	1.44	0.30	1.74
3.10	0.63	0.50	5.00	1.44	0.30	1.74
3.15	0.63	0.50	5.00	1.44	0.30	1.74
3.20	0.63	0.50	5.00	1.44	0.30	1.74
3.25	0.63	0.50	5.00	1.44	0.30	1.74
3.30	0.63	0.50	5.00	1.44	0.30	1.74
3.35	0.63	0.50	5.00	1.44	0.30	1.74
3.40	0.63	0.50	5.00	1.44	0.30	1.74
3.45	0.63	0.50	5.00	1.44	0.30	1.74
3.50	0.63	0.50	5.00	1.44	0.30	1.74
3.55	0.63	0.50	5.00	1.44	0.30	1.74
3.60	0.63	0.50	5.00	1.44	0.30	1.74
3.65	0.63	0.50	5.00	1.44	0.30	1.74
3.70	0.63	0.50	5.00	1.44	0.30	1.74
3.75	0.63	0.50	5.00	1.44	0.30	1.74
3.80	0.63	0.50	5.00	1.44	0.30	1.74
3.85	0.63	0.50	5.00	1.44	0.30	1.74
3.90	0.63	0.50	5.00	1.44	0.30	1.74
3.95	0.63	0.50	5.00	1.44	0.30	1.74
4.00	0.63	0.50	5.00	1.44	0.30	1.74
4.05	0.63	0.50	5.00	1.44	0.30	1.74
4.10	0.63	0.50	5.00	1.44	0.30	1.74
4.15	0.63	0.50	5.00	1.44	0.30	1.74
4.20	0.63	0.50	5.00	1.44	0.30	1.74
4.25	0.63	0.50	5.00	1.44	0.30	1.74
4.30	0.63	0.50	5.00	1.44	0.30	1.74
4.35	0.63	0.50	5.00	1.44	0.30	1.74
4.40	0.63	0.50	5.00	1.44	0.30	1.74
4.45	0.63	0.50	5.00	1.44	0.30	1.74
4.50	0.63	0.50	5.00	1.44	0.30	1.74
4.55	0.63	0.50	5.00	1.44	0.30	1.74
4.60	0.63	0.50	5.00	1.44	0.30	1.74
4.65	0.63	0.50	5.00	1.44	0.30	1.74
4.70	0.63	0.50	5.00	1.44	0.30	1.74
4.75	0.63	0.50	5.00	1.44	0.30	1.74
4.80	0.63	0.50	5.00	1.44	0.30	1.74
4.85	0.63	0.50	5.00	1.44	0.30	1.74
4.90	0.63	0.50	5.00	1.44	0.30	1.74
4.95	0.63	0.50	5.00	1.44	0.30	1.74
5.00	0.63	0.50	5.00	1.44	0.30	1.74
5.05	0.63	0.50	5.00	1.44	0.30	1.74
5.10	0.63	0.50	5.00	1.44	0.30	1.74
5.15	0.63	0.50	5.00	1.44	0.30	1.74
5.20	0.63	0.50	5.00	1.44	0.30	1.74
5.25	0.63	0.50	5.00	1.44	0.29	1.74
5.30	0.63	0.50	5.00	1.44	0.29	1.74
5.35	0.63	0.50	5.00	1.44	0.29	1.74

5.40	0.63	0.50	5.00	1.44	0.29	1.74
5.45	0.63	0.50	5.00	1.44	0.29	1.74
5.50	0.63	0.50	5.00	1.44	0.29	1.74
5.55	0.63	0.50	5.00	1.44	0.29	1.74
5.60	0.63	0.50	5.00	1.44	0.29	1.74
5.65	0.63	0.50	5.00	1.44	0.29	1.74
5.70	0.63	0.50	5.00	1.44	0.29	1.74
5.75	0.63	0.50	5.00	1.44	0.29	1.74
5.80	0.63	0.50	5.00	1.44	0.29	1.74
5.85	0.63	0.50	5.00	1.44	0.29	1.74
5.90	0.63	0.50	5.00	1.44	0.29	1.74
5.95	0.63	0.50	5.00	1.44	0.29	1.74
6.00	0.63	0.50	5.00	1.44	0.29	1.74
6.05	0.63	0.50	5.00	1.44	0.29	1.74
6.10	0.63	0.50	5.00	1.44	0.29	1.74
6.15	0.63	0.50	5.00	1.44	0.29	1.74
6.20	0.63	0.50	5.00	1.44	0.29	1.73
6.25	0.63	0.50	5.00	1.44	0.29	1.73
6.30	0.63	0.50	5.00	1.44	0.29	1.73
6.35	0.63	0.50	5.00	1.44	0.29	1.73
6.40	0.63	0.50	5.00	1.44	0.29	1.73
6.45	0.63	0.50	5.00	1.44	0.29	1.73
6.50	0.63	0.50	5.00	1.44	0.29	1.73
6.55	0.63	0.50	5.00	1.44	0.29	1.73
6.60	0.63	0.50	5.00	1.44	0.29	1.73
6.65	0.63	0.50	5.00	1.44	0.29	1.73
6.70	0.63	0.50	5.00	1.44	0.29	1.73
6.75	0.63	0.50	5.00	1.44	0.29	1.73
6.80	0.63	0.50	5.00	1.44	0.29	1.73
6.85	0.63	0.50	5.00	1.44	0.29	1.73
6.90	0.63	0.50	5.00	1.44	0.29	1.73
6.95	0.63	0.50	5.00	1.44	0.29	1.73
7.00	0.63	0.50	5.00	1.44	0.29	1.73
7.05	0.63	0.50	5.00	1.44	0.29	1.73
7.10	0.63	0.50	5.00	1.44	0.29	1.73
7.15	0.63	0.50	5.00	1.44	0.29	1.73
7.20	0.63	0.50	5.00	1.44	0.29	1.73
7.25	0.63	0.50	5.00	1.44	0.28	1.73
7.30	0.63	0.50	5.00	1.44	0.28	1.73
7.35	0.63	0.50	5.00	1.44	0.28	1.73
7.40	0.63	0.50	5.00	1.44	0.28	1.73
7.45	0.63	0.50	5.00	1.44	0.28	1.73
7.50	0.63	0.50	5.00	1.44	0.28	1.72
7.55	0.63	0.50	5.00	1.44	0.28	1.72
7.60	0.63	0.50	5.00	1.44	0.28	1.72
7.65	0.63	0.50	5.00	1.44	0.28	1.72
7.70	0.63	0.50	5.00	1.44	0.28	1.72
7.75	0.63	0.50	5.00	1.44	0.28	1.72

7.80	0.63	0.50	5.00	1.44	0.28	1.72
7.85	0.63	0.50	5.00	1.44	0.27	1.72
7.90	0.63	0.50	5.00	1.44	0.27	1.72
7.95	0.63	0.50	5.00	1.44	0.27	1.72
8.00	0.63	0.50	5.00	1.44	0.27	1.71
8.05	0.63	0.50	5.00	1.44	0.27	1.71
8.10	0.63	0.50	5.00	1.44	0.27	1.71
8.15	0.63	0.50	5.00	1.44	0.27	1.71
8.20	0.63	0.50	5.00	1.44	0.27	1.71
8.25	0.63	0.50	5.00	1.44	0.26	1.71
8.30	0.63	0.50	5.00	1.44	0.26	1.71
8.35	0.63	0.50	5.00	1.44	0.26	1.71
8.40	0.63	0.50	5.00	1.44	0.26	1.71
8.45	0.63	0.50	5.00	1.44	0.26	1.70
8.50	0.63	0.50	5.00	1.44	0.26	1.70
8.55	0.63	0.50	5.00	1.44	0.26	1.70
8.60	0.63	0.50	5.00	1.44	0.26	1.70
8.65	0.63	0.50	5.00	1.44	0.26	1.70
8.70	0.63	0.50	5.00	1.44	0.26	1.70
8.75	0.63	0.50	5.00	1.44	0.26	1.70
8.80	0.63	0.50	5.00	1.44	0.26	1.70
8.85	0.63	0.50	5.00	1.44	0.25	1.70
8.90	0.63	0.50	5.00	1.44	0.25	1.70
8.95	0.63	0.50	5.00	1.44	0.25	1.69
9.00	0.63	0.50	5.00	1.44	0.25	1.69
9.05	0.63	0.50	5.00	1.44	0.25	1.69
9.10	0.63	0.50	5.00	1.44	0.25	1.69
9.15	0.63	0.50	5.00	1.44	0.25	1.69
9.20	0.63	0.50	5.00	1.44	0.24	1.69
9.25	0.63	0.50	5.00	1.44	0.24	1.69
9.30	0.63	0.50	5.00	1.44	0.24	1.68
9.35	0.63	0.50	5.00	1.44	0.24	1.68
9.40	0.63	0.50	5.00	1.44	0.24	1.68
9.45	0.63	0.50	5.00	1.44	0.24	1.68
9.50	0.63	0.50	5.00	1.44	0.23	1.68
9.55	0.63	0.50	5.00	1.44	0.23	1.68
9.60	0.63	0.50	5.00	1.44	0.23	1.68
9.65	0.63	0.50	5.00	1.44	0.23	1.68
9.70	0.63	0.50	5.00	1.44	0.23	1.68
9.75	0.63	0.50	5.00	1.44	0.23	1.67
9.80	0.63	0.50	5.00	1.44	0.23	1.67
9.85	0.63	0.50	5.00	1.44	0.23	1.67
9.90	0.63	0.50	5.00	1.44	0.23	1.67
9.95	0.63	0.50	5.00	1.44	0.23	1.67
10.00	0.63	0.50	5.00	1.44	0.23	1.67
10.05	0.63	0.50	5.00	1.44	0.23	1.67
10.10	0.63	0.50	5.00	1.44	0.23	1.67
10.15	0.63	0.50	5.00	1.44	0.23	1.67

10.20	0.63	0.50	5.00	1.44	0.23	1.67
10.25	0.63	0.50	5.00	1.44	0.23	1.67
10.30	0.63	0.50	5.00	1.44	0.23	1.67
10.35	0.63	0.50	5.00	1.44	0.23	1.67
10.40	0.63	0.50	5.00	1.44	0.23	1.67
10.45	0.63	0.50	5.00	1.44	0.22	1.67
10.50	0.63	0.50	5.00	1.44	0.22	1.67
10.55	0.63	0.50	5.00	1.44	0.22	1.67
10.60	0.63	0.50	5.00	1.44	0.22	1.67
10.65	0.63	0.50	5.00	1.44	0.22	1.67
10.70	0.63	0.49	5.00	1.44	0.22	1.66
10.75	0.63	0.49	5.00	1.44	0.22	1.66
10.80	0.63	0.49	5.00	1.44	0.22	1.66
10.85	0.63	0.49	5.00	1.44	0.22	1.66
10.90	0.63	0.49	5.00	1.44	0.22	1.66
10.95	0.63	0.49	5.00	1.44	0.22	1.66
11.00	0.63	0.49	5.00	1.44	0.22	1.66
11.05	0.63	0.49	5.00	1.44	0.22	1.66
11.10	0.63	0.49	5.00	1.44	0.22	1.66
11.15	0.63	0.49	5.00	1.44	0.22	1.66
11.20	0.63	0.49	5.00	1.44	0.22	1.66
11.25	0.63	0.49	5.00	1.44	0.21	1.66
11.30	0.63	0.49	5.00	1.44	0.21	1.66
11.35	0.63	0.49	5.00	1.44	0.21	1.66
11.40	0.63	0.49	5.00	1.44	0.21	1.66
11.45	0.63	0.49	5.00	1.44	0.21	1.66
11.50	0.63	0.49	5.00	1.44	0.21	1.65
11.55	0.63	0.49	5.00	1.44	0.21	1.65
11.60	0.63	0.49	5.00	1.44	0.21	1.65
11.65	0.63	0.49	5.00	1.44	0.21	1.65
11.70	0.63	0.49	5.00	1.44	0.21	1.65
11.75	0.63	0.49	5.00	1.44	0.21	1.65
11.80	0.63	0.49	5.00	1.44	0.21	1.65
11.85	0.63	0.49	5.00	1.44	0.21	1.65
11.90	0.63	0.49	5.00	1.44	0.21	1.65
11.95	0.63	0.49	5.00	1.44	0.20	1.65
12.00	0.63	0.49	5.00	1.44	0.20	1.65
12.05	0.63	0.49	5.00	1.44	0.20	1.65
12.10	0.63	0.49	5.00	1.44	0.20	1.65
12.15	0.63	0.49	5.00	1.44	0.20	1.64
12.20	0.63	0.49	5.00	1.44	0.20	1.64
12.25	0.63	0.49	5.00	1.44	0.20	1.64
12.30	0.63	0.49	5.00	1.44	0.20	1.64
12.35	0.63	0.49	5.00	1.44	0.20	1.64
12.40	0.63	0.49	5.00	1.44	0.20	1.64
12.45	0.63	0.49	5.00	1.44	0.20	1.64
12.50	0.63	0.49	5.00	1.44	0.20	1.64
12.55	0.63	0.49	5.00	1.44	0.19	1.64

12.60	0.63	0.49	5.00	1.44	0.19	1.64
12.65	0.63	0.49	5.00	1.44	0.19	1.64
12.70	0.63	0.49	5.00	1.44	0.19	1.63
12.75	0.63	0.49	5.00	1.44	0.19	1.63
12.80	0.63	0.49	5.00	1.44	0.19	1.63
12.85	0.63	0.49	5.00	1.44	0.19	1.63
12.90	0.58	0.49	5.00	1.44	0.19	1.63
12.95	0.52	0.49	5.00	1.44	0.19	1.63
13.00	0.49	0.49	5.00	1.44	0.18	1.63
13.05	0.47	0.49	5.00	1.44	0.18	1.63
13.10	0.45	0.49	5.00	1.44	0.18	1.62
13.15	0.44	0.49	5.00	1.44	0.18	1.62
13.20	0.43	0.49	5.00	1.44	0.18	1.62
13.25	0.41	0.49	5.00	1.44	0.18	1.62
13.30	0.40	0.49	5.00	1.44	0.17	1.62
13.35	0.40	0.49	5.00	1.44	0.17	1.62
13.40	0.39	0.49	5.00	1.44	0.17	1.61
13.45	0.38	0.49	5.00	1.44	0.17	1.61
13.50	0.37	0.49	5.00	1.44	0.17	1.61
13.55	0.36	0.49	5.00	1.44	0.16	1.61
13.60	0.36	0.49	5.00	1.44	0.16	1.60
13.65	0.35	0.49	5.00	1.44	0.16	1.60
13.70	0.34	0.49	5.00	1.44	0.16	1.60
13.75	0.34	0.49	5.00	1.44	0.15	1.60
13.80	0.33	0.49	5.00	1.44	0.15	1.59
13.85	0.32	0.49	5.00	1.44	0.15	1.59
13.90	0.32	0.49	5.00	1.44	0.14	1.59
13.95	0.31	0.49	5.00	1.44	0.14	1.58
14.00	0.31	0.49	5.00	1.44	0.14	1.58
14.05	0.30	0.49	5.00	1.44	0.13	1.58
14.10	0.30	0.49	5.00	1.44	0.13	1.57
14.15	0.29	0.49	5.00	1.44	0.12	1.57
14.20	0.29	0.49	5.00	1.44	0.12	1.56
14.25	0.28	0.49	5.00	1.44	0.12	1.56
14.30	0.28	0.49	5.00	1.44	0.11	1.55
14.35	0.27	0.49	5.00	1.44	0.10	1.55
14.40	0.27	0.49	5.00	1.44	0.10	1.54
14.45	0.26	0.49	5.00	1.44	0.09	1.54
14.50	0.26	0.49	5.00	1.44	0.09	1.53
14.55	0.25	0.49	5.00	1.44	0.08	1.52
14.60	0.25	0.49	5.00	1.44	0.07	1.51
14.65	0.25	0.49	5.00	1.44	0.06	1.51
14.70	0.24	0.49	5.00	1.44	0.05	1.50
14.75	0.24	0.49	5.00	1.44	0.04	1.49
14.80	0.26	0.49	5.00	1.44	0.03	1.48
14.85	0.25	0.49	5.00	1.44	0.03	1.47
14.90	0.25	0.49	5.00	1.44	0.02	1.46
14.95	0.24	0.49	5.00	1.44	0.01	1.45

15.00	0.24	0.49	0.49*	1.44	0.00	1.44
15.05	0.24	0.49	0.50*	1.43	0.00	1.43
15.10	0.25	0.49	0.51*	1.42	0.00	1.42
15.15	0.25	0.49	0.52*	1.41	0.00	1.41
15.20	0.26	0.49	0.53*	1.40	0.00	1.40
15.25	0.27	0.49	0.54*	1.39	0.00	1.39
15.30	0.27	0.49	0.55*	1.39	0.00	1.39
15.35	0.28	0.50	0.56*	1.38	0.00	1.38
15.40	0.28	0.50	0.57*	1.37	0.00	1.37
15.45	0.29	0.50	0.58*	1.36	0.00	1.36
15.50	0.30	0.50	0.59*	1.35	0.00	1.35
15.55	0.30	0.50	0.60*	1.34	0.00	1.34
15.60	0.31	0.50	0.62*	1.33	0.00	1.33
15.65	0.31	0.50	0.63*	1.33	0.00	1.33
15.70	0.32	0.50	0.64*	1.32	0.00	1.32
15.75	0.33	0.50	0.65*	1.31	0.00	1.31
15.80	0.33	0.50	0.67*	1.30	0.00	1.30
15.85	0.34	0.50	0.68*	1.30	0.00	1.30
15.90	0.35	0.50	0.70*	1.29	0.00	1.29
15.95	0.36	0.50	0.71*	1.28	0.00	1.28
16.00	0.37	0.50	0.73*	1.28	0.00	1.28
16.05	0.37	0.51	0.74*	1.27	0.00	1.27
16.10	0.38	0.51	0.76*	1.26	0.00	1.26
16.15	0.39	0.51	0.78*	1.26	0.00	1.26
16.20	0.40	0.51	0.80*	1.25	0.00	1.25
16.25	0.42	0.51	0.82*	1.24	0.00	1.24
16.30	0.43	0.51	0.84*	1.24	0.00	1.24
16.35	0.44	0.51	0.86*	1.23	0.00	1.23
16.40	0.46	0.51	0.89*	1.23	0.00	1.23
16.45	0.47	0.51	0.93*	1.22	0.00	1.22
16.50	0.50	0.51	0.97*	1.22	0.00	1.22
16.55	0.54	0.51	1.05	1.21	0.00	1.21
16.60	0.63	0.51	1.22	1.21	0.00	1.21
16.65	0.63	0.51	1.22	1.21	0.00	1.21
16.70	0.63	0.51	1.22	1.20	0.00	1.20
16.75	0.63	0.52	1.22	1.20	0.00	1.20
16.80	0.63	0.52	1.22	1.20	0.00	1.20
16.85	0.63	0.52	1.21	1.20	0.00	1.20
16.90	0.63	0.52	1.21	1.20	0.00	1.20
16.95	0.63	0.52	1.21	1.20	0.00	1.20
17.00	0.63	0.52	1.21	1.19	0.00	1.19
17.05	0.63	0.52	1.21	1.19	0.00	1.19
17.10	0.63	0.52	1.21	1.19	0.00	1.19
17.15	0.63	0.52	1.21	1.19	0.00	1.19
17.20	0.63	0.52	1.20	1.19	0.00	1.19
17.25	0.63	0.52	1.20	1.19	0.00	1.19
17.30	0.63	0.52	1.20	1.19	0.00	1.19
17.35	0.63	0.52	1.20	1.19	0.00	1.19

17.40	0.63	0.52	1.20	1.19	0.00	1.19
17.45	0.63	0.53	1.20	1.19	0.00	1.19
17.50	0.63	0.53	1.19	1.19	0.00	1.19
17.55	0.63	0.53	1.19	1.19	0.00	1.19
17.60	0.63	0.53	1.19	1.19	0.00	1.19
17.65	0.63	0.53	1.19	1.19	0.00	1.19
17.70	0.63	0.53	1.19	1.19	0.00	1.19
17.75	0.63	0.53	1.19	1.19	0.00	1.19
17.80	0.63	0.53	1.19	1.19	0.00	1.19
17.85	0.63	0.53	1.18	1.19	0.00	1.19
17.90	0.63	0.53	1.18	1.19	0.00	1.19
17.95	0.63	0.53	1.18	1.19	0.00	1.19
18.00	0.63	0.53	1.18	1.19	0.00	1.19
18.05	0.63	0.53	1.18	1.19	0.00	1.19
18.10	0.63	0.53	1.18	1.19	0.00	1.19
18.15	0.63	0.53	1.18	1.19	0.00	1.19
18.20	0.63	0.53	1.17	1.19	0.00	1.19
18.25	0.63	0.54	1.17	1.19	0.00	1.19
18.30	0.63	0.54	1.17	1.19	0.00	1.19
18.35	0.63	0.54	1.17	1.19	0.00	1.19
18.40	0.63	0.54	1.17	1.19	0.00	1.19
18.45	0.63	0.54	1.17	1.19	0.00	1.19
18.50	0.63	0.54	1.17	1.19	0.00	1.19
18.55	0.63	0.54	1.16	1.19	0.00	1.19
18.60	0.63	0.54	1.16	1.19	0.00	1.19
18.65	0.63	0.54	1.16	1.19	0.00	1.19
18.70	0.63	0.54	1.16	1.19	0.00	1.19
18.75	0.63	0.54	1.16	1.19	0.00	1.19
18.80	0.63	0.54	1.16	1.19	0.00	1.19
18.85	0.63	0.54	1.16	1.19	0.00	1.19
18.90	0.63	0.54	1.16	1.19	0.00	1.19
18.95	0.63	0.54	1.15	1.19	0.00	1.19
19.00	0.63	0.54	1.15	1.19	0.00	1.19
19.05	0.63	0.55	1.15	1.19	0.00	1.19
19.10	0.63	0.55	1.15	1.19	0.00	1.19
19.15	0.63	0.55	1.15	1.19	0.00	1.19
19.20	0.63	0.55	1.15	1.19	0.00	1.19
19.25	0.63	0.55	1.15	1.19	0.00	1.19
19.30	0.63	0.55	1.15	1.19	0.00	1.19
19.35	0.63	0.55	1.14	1.19	0.00	1.19
19.40	0.63	0.55	1.14	1.19	0.00	1.19
19.45	0.63	0.55	1.14	1.19	0.00	1.19
19.50	0.63	0.55	1.14	1.19	0.00	1.19
19.55	0.63	0.55	1.14	1.19	0.00	1.19
19.60	0.63	0.55	1.14	1.19	0.00	1.19
19.65	0.63	0.55	1.14	1.19	0.00	1.19
19.70	0.63	0.55	1.14	1.19	0.00	1.19
19.75	0.63	0.55	1.13	1.19	0.00	1.19

19.80	0.63	0.55	1.13	1.19	0.00	1.19
19.85	0.63	0.55	1.13	1.19	0.00	1.19
19.90	0.63	0.56	1.13	1.19	0.00	1.19
19.95	0.63	0.56	1.13	1.19	0.00	1.19
20.00	0.63	0.56	1.13	1.19	0.00	1.19
20.05	0.63	0.56	1.13	1.19	0.00	1.19
20.10	0.63	0.56	1.13	1.19	0.00	1.19
20.15	0.63	0.56	1.12	1.19	0.00	1.19
20.20	0.63	0.56	1.12	1.19	0.00	1.19
20.25	0.63	0.56	1.12	1.19	0.00	1.19
20.30	0.63	0.56	1.12	1.19	0.00	1.19
20.35	0.63	0.56	1.12	1.19	0.00	1.19
20.40	0.63	0.56	1.12	1.19	0.00	1.19
20.45	0.63	0.56	1.12	1.19	0.00	1.19
20.50	0.63	0.56	1.12	1.19	0.00	1.19
20.55	0.63	0.56	1.12	1.19	0.00	1.19
20.60	0.63	0.56	1.11	1.19	0.00	1.19
20.65	0.63	0.56	1.11	1.19	0.00	1.19
20.70	0.63	0.56	1.11	1.19	0.00	1.19
20.75	0.63	0.56	1.11	1.19	0.00	1.19
20.80	0.63	0.57	1.11	1.19	0.00	1.19
20.85	0.63	0.57	1.11	1.19	0.00	1.19
20.90	0.63	0.57	1.11	1.19	0.00	1.19
20.95	0.63	0.57	1.11	1.19	0.00	1.19
21.00	0.63	0.57	1.11	1.19	0.00	1.19
21.05	0.63	0.57	1.11	1.19	0.00	1.19
21.10	0.63	0.57	1.10	1.19	0.00	1.19
21.15	0.63	0.57	1.10	1.19	0.00	1.19
21.20	0.63	0.57	1.10	1.19	0.00	1.19
21.25	0.63	0.57	1.10	1.19	0.00	1.19
21.30	0.63	0.57	1.10	1.19	0.00	1.19
21.35	0.63	0.57	1.10	1.19	0.00	1.19
21.40	0.63	0.57	1.10	1.19	0.00	1.19
21.45	0.63	0.57	1.10	1.19	0.00	1.19
21.50	0.63	0.57	1.10	1.19	0.00	1.19
21.55	0.63	0.57	1.10	1.19	0.00	1.19
21.60	0.63	0.57	1.09	1.19	0.00	1.19
21.65	0.63	0.57	1.09	1.19	0.00	1.19
21.70	0.63	0.57	1.09	1.19	0.00	1.19
21.75	0.63	0.58	1.09	1.19	0.00	1.19
21.80	0.63	0.58	1.09	1.19	0.00	1.19
21.85	0.63	0.58	1.09	1.19	0.00	1.19
21.90	0.63	0.58	1.09	1.19	0.00	1.19
21.95	0.63	0.58	1.09	1.19	0.00	1.19
22.00	0.63	0.58	1.09	1.19	0.00	1.19
22.05	0.63	0.58	1.09	1.19	0.00	1.19
22.10	0.63	0.58	1.08	1.19	0.00	1.19
22.15	0.63	0.58	1.08	1.19	0.00	1.19

22.20	0.63	0.58	1.08	1.19	0.00	1.19
22.25	0.63	0.58	1.08	1.19	0.00	1.19
22.30	0.63	0.58	1.08	1.19	0.00	1.19
22.35	0.55	0.58	0.95*	1.19	0.00	1.19
22.40	0.45	0.58	0.77*	1.18	0.00	1.18
22.45	0.40	0.58	0.69*	1.18	0.00	1.18
22.50	0.37	0.58	0.63*	1.17	0.00	1.17
22.55	0.37	0.58	0.64*	1.16	0.00	1.16
22.60	0.38	0.58	0.65*	1.16	0.00	1.16
22.65	0.38	0.58	0.66*	1.15	0.00	1.15
22.70	0.39	0.58	0.66*	1.14	0.00	1.14
22.75	0.39	0.59	0.67*	1.14	0.00	1.14
22.80	0.40	0.59	0.68*	1.13	0.00	1.13
22.85	0.40	0.59	0.68*	1.12	0.00	1.12
22.90	0.41	0.59	0.69*	1.12	0.00	1.12
22.95	0.41	0.59	0.70*	1.11	0.00	1.11
23.00	0.42	0.59	0.71*	1.10	0.00	1.10
23.05	0.42	0.59	0.72*	1.10	0.00	1.10
23.10	0.43	0.59	0.73*	1.09	0.00	1.09
23.15	0.43	0.59	0.74*	1.09	0.00	1.09
23.20	0.44	0.59	0.75*	1.08	0.00	1.08
23.25	0.45	0.59	0.76*	1.08	0.00	1.08
23.30	0.45	0.59	0.77*	1.07	0.00	1.07
23.35	0.46	0.59	0.78*	1.06	0.00	1.06
23.40	0.47	0.59	0.80*	1.06	0.00	1.06
23.45	0.48	0.59	0.81*	1.05	0.00	1.05
23.50	0.49	0.59	0.83*	1.05	0.00	1.05
23.55	0.50	0.59	0.85*	1.04	0.00	1.04
23.60	0.51	0.59	0.87*	1.04	0.00	1.04
23.65	0.53	0.59	0.90*	1.03	0.00	1.03
23.70	0.55	0.59	0.93*	1.03	0.00	1.03
23.75	0.59	0.59	1.00*	1.03	0.00	1.03
23.80	0.63	0.59	1.06	1.02	0.00	1.02
23.85	0.63	0.59	1.06	1.02	0.00	1.02
23.90	0.63	0.60	1.06	1.01	0.00	1.01
23.95	0.63	0.60	1.05	1.01	0.00	1.01
24.00	0.63	0.60	1.05	1.00	0.00	1.00
24.05	0.63	0.60	1.05	1.00	0.00	1.00
24.10	0.63	0.60	1.05	1.00	0.00	1.00
24.15	0.63	0.60	1.05	0.99	0.00	0.99
24.20	0.63	0.60	1.05	0.99	0.00	0.99
24.25	0.63	0.60	1.05	0.99	0.00	0.99
24.30	0.63	0.60	1.05	0.98	0.00	0.98
24.35	0.63	0.60	1.05	0.98	0.00	0.98
24.40	0.63	0.60	1.05	0.98	0.00	0.98
24.45	0.63	0.60	1.05	0.97	0.00	0.97
24.50	0.63	0.60	1.05	0.97	0.00	0.97
24.55	0.63	0.60	1.05	0.97	0.00	0.97

24.60	0.63	0.60	1.04	0.97	0.00	0.97
24.65	0.63	0.60	1.04	0.96	0.00	0.96
24.70	0.63	0.60	1.04	0.96	0.00	0.96
24.75	0.63	0.60	1.04	0.96	0.00	0.96
24.80	0.63	0.60	1.04	0.96	0.00	0.96
24.85	0.63	0.60	1.04	0.96	0.00	0.96
24.90	0.63	0.60	1.04	0.96	0.00	0.96
24.95	0.63	0.60	1.04	0.95	0.00	0.95
25.00	0.63	0.60	1.04	0.95	0.00	0.95
25.05	0.63	0.60	1.04	0.95	0.00	0.95
25.10	0.63	0.61	1.04	0.95	0.00	0.95
25.15	0.63	0.61	1.04	0.95	0.00	0.95
25.20	0.63	0.61	1.04	0.95	0.00	0.95
25.25	0.63	0.61	1.04	0.95	0.00	0.95
25.30	0.63	0.61	1.04	0.94	0.00	0.94
25.35	0.63	0.61	1.03	0.94	0.00	0.94
25.40	0.63	0.61	1.03	0.94	0.00	0.94
25.45	0.63	0.61	1.03	0.94	0.00	0.94
25.50	0.63	0.61	1.03	0.94	0.00	0.94
25.55	0.63	0.61	1.03	0.93	0.00	0.93
25.60	0.63	0.61	1.03	0.93	0.00	0.93
25.65	0.63	0.61	1.03	0.93	0.00	0.93
25.70	0.63	0.61	1.03	0.92	0.00	0.92
25.75	0.63	0.61	1.03	0.92	0.00	0.92
25.80	0.63	0.61	1.03	0.92	0.00	0.92
25.85	0.63	0.61	1.03	0.91	0.00	0.91
25.90	0.63	0.61	1.03	0.91	0.00	0.91
25.95	0.63	0.61	1.03	0.91	0.00	0.91
26.00	0.63	0.61	1.03	0.90	0.00	0.90
26.05	0.63	0.61	1.03	0.90	0.00	0.90
26.10	0.63	0.61	1.02	0.90	0.00	0.90
26.15	0.63	0.61	1.02	0.89	0.00	0.89
26.20	0.63	0.61	1.02	0.89	0.00	0.89
26.25	0.62	0.61	1.01	0.88	0.00	0.88
26.30	0.57	0.61	0.93*	0.88	0.00	0.88
26.35	0.54	0.61	0.88*	0.87	0.00	0.87
26.40	0.52	0.62	0.85*	0.87	0.00	0.87
26.45	0.51	0.62	0.83*	0.86	0.00	0.86
26.50	0.50	0.62	0.81*	0.86	0.00	0.86
26.55	0.49	0.62	0.79*	0.85	0.00	0.85
26.60	0.48	0.62	0.78*	0.85	0.00	0.85
26.65	0.47	0.62	0.77*	0.84	0.00	0.84
26.70	0.47	0.62	0.76*	0.84	0.00	0.84
26.75	0.46	0.62	0.74*	0.83	0.00	0.83
26.80	0.45	0.62	0.73*	0.83	0.00	0.83
26.85	0.45	0.62	0.73*	0.82	0.00	0.82
26.90	0.44	0.62	0.72*	0.82	0.00	0.82
26.95	0.44	0.62	0.71*	0.81	0.00	0.81

27.00	0.43	0.62	0.70*	0.81	0.00	0.81
27.05	0.43	0.62	0.69*	0.80	0.00	0.80
27.10	0.43	0.62	0.69*	0.79	0.00	0.79
27.15	0.42	0.62	0.68*	0.79	0.00	0.79
27.20	0.42	0.62	0.67*	0.78	0.00	0.78
27.25	0.41	0.62	0.67*	0.78	0.00	0.78
27.30	0.41	0.62	0.66*	0.77	0.00	0.77
27.35	0.41	0.62	0.65*	0.76	0.00	0.76
27.40	0.40	0.62	0.65*	0.76	0.00	0.76
27.45	0.40	0.62	0.64*	0.75	0.00	0.75
27.50	0.40	0.62	0.63*	0.74	0.00	0.74
27.55	0.40	0.62	0.64*	0.74	0.00	0.74
27.60	0.41	0.62	0.65*	0.73	0.00	0.73
27.65	0.41	0.62	0.66*	0.73	0.00	0.73
27.70	0.42	0.62	0.67*	0.72	0.00	0.72
27.75	0.42	0.62	0.68*	0.71	0.00	0.71
27.80	0.43	0.63	0.69*	0.71	0.00	0.71
27.85	0.44	0.63	0.70*	0.70	0.00	0.70
27.90	0.50	0.63	0.80*	0.69	0.00	0.69
27.95	0.52	0.63	0.83*	0.69	0.00	0.69
28.00	0.55	0.63	0.88*	0.69	0.00	0.69
28.05	0.61	0.63	0.98*	0.68	0.00	0.68
28.10	0.63	0.63	1.00	0.68	0.00	0.68
28.15	0.63	0.63	1.00	0.67	0.00	0.67
28.20	0.63	0.63	1.00	0.67	0.00	0.67
28.25	0.63	0.63	1.00	0.66	0.00	0.66
28.30	0.63	0.63	1.00*	0.66	0.00	0.66
28.35	0.63	0.63	1.00*	0.66	0.00	0.66
28.40	0.63	0.63	1.00*	0.65	0.00	0.65
28.45	0.63	0.63	1.00*	0.65	0.00	0.65
28.50	0.63	0.63	1.00*	0.65	0.00	0.65
28.55	0.63	0.63	1.00*	0.64	0.00	0.64
28.60	0.63	0.63	1.00*	0.64	0.00	0.64
28.65	0.63	0.63	1.00*	0.64	0.00	0.64
28.70	0.63	0.63	1.00*	0.64	0.00	0.64
28.75	0.63	0.63	0.99*	0.63	0.00	0.63
28.80	0.63	0.63	0.99*	0.63	0.00	0.63
28.85	0.63	0.63	0.99*	0.63	0.00	0.63
28.90	0.63	0.63	0.99*	0.63	0.00	0.63
28.95	0.63	0.63	0.99*	0.63	0.00	0.63
29.00	0.63	0.63	0.99*	0.63	0.00	0.63
29.05	0.63	0.63	0.99*	0.63	0.00	0.63
29.10	0.63	0.63	0.99*	0.62	0.00	0.62
29.15	0.63	0.63	0.99*	0.62	0.00	0.62
29.20	0.63	0.63	0.99*	0.62	0.00	0.62
29.25	0.63	0.63	0.99*	0.62	0.00	0.62
29.30	0.63	0.63	0.99*	0.62	0.00	0.62
29.35	0.63	0.63	0.99*	0.62	0.00	0.62

29.40	0.63	0.64	0.99*	0.62	0.00	0.62
29.45	0.63	0.64	0.99*	0.62	0.00	0.62
29.50	0.63	0.64	0.99*	0.62	0.00	0.62
29.55	0.63	0.64	0.99*	0.62	0.00	0.62
29.60	0.63	0.64	0.99*	0.62	0.00	0.62
29.65	0.63	0.64	0.99*	0.62	0.00	0.62
29.70	0.63	0.64	0.99*	0.62	0.00	0.62
29.75	0.63	0.64	0.99*	0.62	0.00	0.62
29.80	0.63	0.64	0.98*	0.62	0.00	0.62
29.85	0.63	0.64	0.98*	0.62	0.00	0.62
29.90	0.63	0.64	0.98*	0.62	0.00	0.62
29.95	0.63	0.64	0.98*	0.62	0.00	0.62
30.00	0.63	0.64	0.98*	0.62	0.00	0.62
30.05	0.63	0.64	0.98*	0.62	0.00	0.62
30.10	0.63	0.64	0.98*	0.62	0.00	0.62
30.15	0.63	0.64	0.98*	0.62	0.00	0.62
30.20	0.63	0.64	0.98*	0.62	0.00	0.62
30.25	0.63	0.64	0.98*	0.62	0.00	0.62
30.30	0.63	0.64	0.98*	0.62	0.00	0.62
30.35	0.63	0.64	0.98*	0.62	0.00	0.62
30.40	0.63	0.64	0.98*	0.61	0.00	0.61
30.45	0.63	0.64	0.98*	0.61	0.00	0.61
30.50	0.63	0.64	0.98*	0.61	0.00	0.61
30.55	0.63	0.64	0.98*	0.61	0.00	0.61
30.60	0.63	0.64	0.98*	0.61	0.00	0.61
30.65	0.63	0.64	0.98*	0.61	0.00	0.61
30.70	0.63	0.64	0.98*	0.61	0.00	0.61
30.75	0.63	0.64	0.98*	0.61	0.00	0.61
30.80	0.63	0.64	0.98*	0.61	0.00	0.61
30.85	0.63	0.64	0.98*	0.61	0.00	0.61
30.90	0.63	0.64	0.98*	0.61	0.00	0.61
30.95	0.63	0.64	0.98*	0.60	0.00	0.60
31.00	0.63	0.64	0.98*	0.60	0.00	0.60
31.05	0.63	0.64	0.98*	0.60	0.00	0.60
31.10	0.63	0.64	0.98*	0.60	0.00	0.60
31.15	0.63	0.64	0.98*	0.60	0.00	0.60
31.20	0.63	0.64	0.98*	0.59	0.00	0.59
31.25	0.63	0.64	0.98*	0.59	0.00	0.59
31.30	0.63	0.64	0.98*	0.59	0.00	0.59
31.35	0.63	0.64	0.98*	0.58	0.00	0.58
31.40	0.63	0.64	0.98*	0.58	0.00	0.58
31.45	0.63	0.64	0.98*	0.57	0.00	0.57
31.50	0.63	0.64	0.98*	0.57	0.00	0.57
31.55	0.58	0.64	0.90*	0.57	0.00	0.57
31.60	0.53	0.64	0.82*	0.56	0.00	0.56
31.65	0.50	0.64	0.78*	0.56	0.00	0.56
31.70	0.48	0.64	0.75*	0.55	0.00	0.55
31.75	0.47	0.64	0.73*	0.55	0.00	0.55

31.80	0.46	0.64	0.71*	0.54	0.00	0.54
31.85	0.45	0.64	0.70*	0.54	0.00	0.54
31.90	0.44	0.64	0.68*	0.53	0.00	0.53
31.95	0.43	0.64	0.67*	0.52	0.00	0.52
32.00	0.42	0.64	0.66*	0.52	0.00	0.52
32.05	0.41	0.64	0.65*	0.51	0.00	0.51
32.10	0.41	0.64	0.63*	0.51	0.00	0.51
32.15	0.40	0.64	0.62*	0.50	0.00	0.50
32.20	0.39	0.64	0.61*	0.49	0.00	0.49
32.25	0.39	0.64	0.60*	0.49	0.00	0.49
32.30	0.38	0.64	0.59*	0.48	0.00	0.48
32.35	0.38	0.64	0.59*	0.47	0.00	0.47
32.40	0.37	0.64	0.58*	0.47	0.00	0.47
32.45	0.36	0.64	0.57*	0.46	0.00	0.46
32.50	0.36	0.64	0.56*	0.45	0.00	0.45
32.55	0.37	0.64	0.57*	0.45	0.00	0.45
32.60	0.37	0.64	0.58*	0.44	0.00	0.44
32.65	0.38	0.64	0.60*	0.43	0.00	0.43
32.70	0.39	0.64	0.61*	0.43	0.00	0.43
32.75	0.40	0.64	0.62*	0.42	0.00	0.42
32.80	0.41	0.64	0.64*	0.41	0.00	0.41
32.85	0.42	0.64	0.65*	0.41	0.00	0.41
32.90	0.43	0.64	0.67*	0.40	0.00	0.40
32.95	0.44	0.64	0.69*	0.39	0.00	0.39
33.00	0.46	0.64	0.71*	0.39	0.00	0.39
33.05	0.47	0.64	0.74*	0.38	0.00	0.38
33.10	0.49	0.64	0.77*	0.38	0.00	0.38
33.15	0.53	0.64	0.82*	0.37	0.00	0.37
33.20	0.61	0.64	0.94*	0.37	0.00	0.37
33.25	0.63	0.64	0.98*	0.36	0.00	0.36
33.30	0.63	0.64	0.98*	0.36	0.00	0.36
33.35	0.63	0.64	0.98*	0.36	0.00	0.36
33.40	0.63	0.64	0.98*	0.35	0.00	0.35
33.45	0.63	0.64	0.98*	0.35	0.00	0.35
33.50	0.63	0.64	0.98*	0.35	0.00	0.35
33.55	0.63	0.64	0.98*	0.34	0.00	0.34
33.60	0.63	0.64	0.98*	0.34	0.00	0.34
33.65	0.63	0.64	0.98*	0.34	0.00	0.34
33.70	0.63	0.64	0.98*	0.34	0.00	0.34
33.75	0.63	0.64	0.98*	0.34	0.00	0.34
33.80	0.63	0.64	0.98*	0.33	0.00	0.33
33.85	0.63	0.64	0.98*	0.33	0.00	0.33
33.90	0.63	0.64	0.98*	0.33	0.00	0.33
33.95	0.63	0.64	0.98*	0.33	0.00	0.33
34.00	0.63	0.64	0.98*	0.33	0.00	0.33
34.05	0.63	0.64	0.98*	0.33	0.00	0.33
34.10	0.63	0.64	0.98*	0.33	0.00	0.33
34.15	0.63	0.64	0.98*	0.33	0.00	0.33

34.20	0.63	0.64	0.98*	0.33	0.00	0.33
34.25	0.63	0.64	0.98*	0.33	0.00	0.33
34.30	0.63	0.64	0.98*	0.33	0.00	0.33
34.35	0.63	0.64	0.98*	0.33	0.00	0.33
34.40	0.63	0.64	0.98*	0.33	0.00	0.33
34.45	0.63	0.64	0.98*	0.33	0.00	0.33
34.50	0.63	0.64	0.98*	0.33	0.00	0.33
34.55	0.63	0.64	0.98*	0.33	0.00	0.33
34.60	0.63	0.64	0.98*	0.33	0.00	0.33
34.65	0.63	0.64	0.98*	0.33	0.00	0.33
34.70	0.63	0.64	0.98*	0.33	0.00	0.33
34.75	0.63	0.64	0.98*	0.33	0.00	0.33
34.80	0.63	0.64	0.98*	0.33	0.00	0.33
34.85	0.63	0.64	0.98*	0.33	0.00	0.33
34.90	0.63	0.64	0.98*	0.33	0.00	0.33
34.95	0.63	0.64	0.98*	0.33	0.00	0.33
35.00	0.63	0.64	0.98*	0.33	0.00	0.33
35.05	0.63	0.64	0.98*	0.33	0.00	0.33
35.10	0.63	0.64	0.98*	0.33	0.00	0.33
35.15	0.63	0.64	0.98*	0.33	0.00	0.33
35.20	0.63	0.64	0.98*	0.33	0.00	0.33
35.25	0.63	0.64	0.98*	0.33	0.00	0.33
35.30	0.63	0.64	0.98*	0.33	0.00	0.33
35.35	0.63	0.64	0.98*	0.33	0.00	0.33
35.40	0.63	0.64	0.98*	0.33	0.00	0.33
35.45	0.63	0.64	0.98*	0.33	0.00	0.33
35.50	0.63	0.64	0.98*	0.33	0.00	0.33
35.55	0.63	0.64	0.98*	0.33	0.00	0.33
35.60	0.63	0.64	0.98*	0.33	0.00	0.33
35.65	0.63	0.64	0.98*	0.33	0.00	0.33
35.70	0.63	0.64	0.98*	0.33	0.00	0.33
35.75	0.63	0.64	0.98*	0.33	0.00	0.33
35.80	0.63	0.64	0.98*	0.33	0.00	0.33
35.85	0.63	0.64	0.98*	0.33	0.00	0.33
35.90	0.63	0.64	0.98*	0.33	0.00	0.33
35.95	0.63	0.64	0.98*	0.33	0.00	0.33
36.00	0.63	0.64	0.98*	0.33	0.00	0.33
36.05	0.63	0.64	0.98*	0.33	0.00	0.33
36.10	0.63	0.64	0.98*	0.33	0.00	0.33
36.15	0.63	0.64	0.98*	0.33	0.00	0.33
36.20	0.63	0.64	0.98*	0.33	0.00	0.33
36.25	0.63	0.64	0.98*	0.33	0.00	0.33
36.30	0.63	0.64	0.98*	0.33	0.00	0.33
36.35	0.63	0.64	0.98*	0.33	0.00	0.33
36.40	0.63	0.64	0.98*	0.33	0.00	0.33
36.45	0.63	0.64	0.98*	0.33	0.00	0.33
36.50	0.63	0.64	0.98*	0.33	0.00	0.33
36.55	0.63	0.64	0.98*	0.33	0.00	0.33

36.60	0.63	0.64	0.98*	0.33	0.00	0.33
36.65	0.63	0.64	0.98*	0.33	0.00	0.33
36.70	0.63	0.64	0.98*	0.33	0.00	0.33
36.75	0.63	0.64	0.98*	0.33	0.00	0.33
36.80	0.63	0.64	0.98*	0.33	0.00	0.33
36.85	0.63	0.64	0.98*	0.33	0.00	0.33
36.90	0.63	0.64	0.98*	0.33	0.00	0.33
36.95	0.63	0.64	0.98*	0.33	0.00	0.33
37.00	0.63	0.64	0.98*	0.33	0.00	0.33
37.05	0.63	0.64	0.98*	0.33	0.00	0.33
37.10	0.63	0.64	0.98*	0.33	0.00	0.33
37.15	0.63	0.64	0.98*	0.33	0.00	0.33
37.20	0.63	0.64	0.98*	0.33	0.00	0.33
37.25	0.63	0.64	0.98*	0.33	0.00	0.33
37.30	0.63	0.64	0.98*	0.33	0.00	0.33
37.35	0.63	0.64	0.98*	0.33	0.00	0.33
37.40	0.63	0.64	0.98*	0.33	0.00	0.33
37.45	0.63	0.64	0.98*	0.33	0.00	0.33
37.50	0.63	0.64	0.98*	0.33	0.00	0.33
37.55	0.63	0.64	0.98*	0.33	0.00	0.33
37.60	0.63	0.64	0.98*	0.33	0.00	0.33
37.65	0.63	0.64	0.98*	0.33	0.00	0.33
37.70	0.63	0.64	0.98*	0.33	0.00	0.33
37.75	0.63	0.64	0.98*	0.33	0.00	0.33
37.80	0.63	0.64	0.98*	0.33	0.00	0.33
37.85	0.63	0.64	0.98*	0.33	0.00	0.33
37.90	0.63	0.64	0.98*	0.33	0.00	0.33
37.95	0.63	0.64	0.98*	0.33	0.00	0.33
38.00	0.63	0.64	0.98*	0.33	0.00	0.33
38.05	0.63	0.64	0.98*	0.33	0.00	0.33
38.10	0.63	0.64	0.98*	0.33	0.00	0.33
38.15	0.63	0.64	0.98*	0.33	0.00	0.33
38.20	0.63	0.64	0.98*	0.33	0.00	0.33
38.25	0.63	0.64	0.98*	0.33	0.00	0.33
38.30	0.63	0.64	0.98*	0.33	0.00	0.33
38.35	0.63	0.64	0.98*	0.33	0.00	0.33
38.40	0.63	0.64	0.98*	0.33	0.00	0.33
38.45	0.63	0.64	0.98*	0.33	0.00	0.33
38.50	0.63	0.64	0.98*	0.33	0.00	0.33
38.55	0.63	0.64	0.98*	0.33	0.00	0.33
38.60	0.63	0.64	0.98*	0.33	0.00	0.33
38.65	0.63	0.64	0.98*	0.33	0.00	0.33
38.70	0.63	0.64	0.98*	0.33	0.00	0.33
38.75	0.63	0.64	0.98*	0.33	0.00	0.33
38.80	0.63	0.64	0.98*	0.33	0.00	0.33
38.85	0.63	0.64	0.98*	0.33	0.00	0.33
38.90	0.63	0.64	0.98*	0.33	0.00	0.33
38.95	0.63	0.64	0.98*	0.33	0.00	0.33

39.00	0.63	0.64	0.98*	0.33	0.00	0.33
39.05	0.63	0.64	0.98*	0.33	0.00	0.33
39.10	0.63	0.64	0.98*	0.33	0.00	0.33
39.15	0.63	0.64	0.98*	0.33	0.00	0.33
39.20	0.63	0.64	0.98*	0.33	0.00	0.33
39.25	0.63	0.64	0.98*	0.33	0.00	0.33
39.30	0.63	0.64	0.98*	0.33	0.00	0.33
39.35	0.63	0.64	0.98*	0.33	0.00	0.33
39.40	0.63	0.64	0.98*	0.33	0.00	0.33
39.45	0.63	0.64	0.98*	0.33	0.00	0.33
39.50	0.63	0.64	0.98*	0.33	0.00	0.33
39.55	0.63	0.64	0.98*	0.33	0.00	0.33
39.60	0.63	0.64	0.98*	0.33	0.00	0.33
39.65	0.63	0.64	0.98*	0.33	0.00	0.33
39.70	0.63	0.64	0.98*	0.33	0.00	0.33
39.75	0.63	0.64	0.98*	0.33	0.00	0.33
39.80	0.63	0.64	0.98*	0.33	0.00	0.33
39.85	0.63	0.64	0.99*	0.33	0.00	0.33
39.90	0.63	0.64	0.99*	0.33	0.00	0.33
39.95	0.63	0.64	0.99*	0.33	0.00	0.33
40.00	0.63	0.64	0.99*	0.33	0.00	0.33
40.05	0.63	0.64	0.99*	0.33	0.00	0.33
40.10	0.63	0.64	0.99*	0.33	0.00	0.33
40.15	0.63	0.64	0.99*	0.33	0.00	0.33
40.20	0.63	0.64	0.99*	0.33	0.00	0.33
40.25	0.63	0.64	0.99*	0.33	0.00	0.33
40.30	0.63	0.64	0.99*	0.33	0.00	0.33
40.35	0.63	0.64	0.99*	0.33	0.00	0.33
40.40	0.63	0.64	0.99*	0.33	0.00	0.33
40.45	0.63	0.64	0.99*	0.33	0.00	0.33
40.50	0.63	0.64	0.99*	0.33	0.00	0.33
40.55	0.63	0.64	0.99*	0.33	0.00	0.33
40.60	0.63	0.64	0.99*	0.33	0.00	0.33
40.65	0.63	0.64	0.99*	0.33	0.00	0.33
40.70	0.63	0.64	0.99*	0.33	0.00	0.33
40.75	0.63	0.64	0.99*	0.33	0.00	0.33
40.80	0.63	0.64	0.99*	0.33	0.00	0.33
40.85	0.63	0.64	0.99*	0.33	0.00	0.33
40.90	0.63	0.64	0.99*	0.33	0.00	0.33
40.95	0.63	0.64	0.99*	0.33	0.00	0.33
41.00	0.63	0.64	0.99*	0.33	0.00	0.33
41.05	0.63	0.64	0.99*	0.33	0.00	0.33
41.10	0.63	0.64	0.99*	0.33	0.00	0.33
41.15	0.63	0.63	0.99*	0.33	0.00	0.33
41.20	0.63	0.63	0.99*	0.33	0.00	0.33
41.25	0.63	0.63	0.99*	0.33	0.00	0.33
41.30	0.63	0.63	0.99*	0.33	0.00	0.33
41.35	0.63	0.63	0.99*	0.33	0.00	0.33

41.40	0.63	0.63	0.99*	0.33	0.00	0.33
41.45	0.63	0.63	0.99*	0.33	0.00	0.33
41.50	0.63	0.63	0.99*	0.33	0.00	0.33
41.55	0.63	0.63	0.99*	0.33	0.00	0.33
41.60	0.63	0.63	0.99*	0.33	0.00	0.33
41.65	0.63	0.63	0.99*	0.33	0.00	0.33
41.70	0.63	0.63	0.99*	0.33	0.00	0.33
41.75	0.63	0.63	0.99*	0.33	0.00	0.33
41.80	0.63	0.63	0.99*	0.33	0.00	0.33
41.85	0.63	0.63	0.99*	0.33	0.00	0.33
41.90	0.63	0.63	0.99*	0.33	0.00	0.33
41.95	0.63	0.63	0.99*	0.33	0.00	0.33
42.00	0.63	0.63	0.99*	0.33	0.00	0.33
42.05	0.63	0.63	0.99*	0.33	0.00	0.33
42.10	0.63	0.63	0.99*	0.33	0.00	0.33
42.15	0.63	0.63	0.99*	0.33	0.00	0.33
42.20	0.63	0.63	0.99*	0.33	0.00	0.33
42.25	0.63	0.63	0.99*	0.33	0.00	0.33
42.30	0.63	0.63	0.99*	0.33	0.00	0.33
42.35	0.63	0.63	0.99*	0.33	0.00	0.33
42.40	0.63	0.63	0.99*	0.33	0.00	0.33
42.45	0.63	0.63	0.99*	0.33	0.00	0.33
42.50	0.63	0.63	0.99*	0.33	0.00	0.33
42.55	0.63	0.63	0.99*	0.33	0.00	0.33
42.60	0.63	0.63	0.99*	0.33	0.00	0.33
42.65	0.63	0.63	0.99*	0.32	0.00	0.32
42.70	0.63	0.63	0.99*	0.32	0.00	0.32
42.75	0.63	0.63	0.99*	0.32	0.00	0.32
42.80	0.63	0.63	0.99*	0.32	0.00	0.32
42.85	0.63	0.63	0.99*	0.32	0.00	0.32
42.90	0.63	0.63	0.99*	0.32	0.00	0.32
42.95	0.63	0.63	0.99*	0.32	0.00	0.32
43.00	0.63	0.63	0.99*	0.32	0.00	0.32
43.05	0.63	0.63	0.99*	0.32	0.00	0.32
43.10	0.63	0.63	0.99*	0.32	0.00	0.32
43.15	0.63	0.63	0.99*	0.31	0.00	0.31
43.20	0.63	0.63	0.99*	0.31	0.00	0.31
43.25	0.63	0.63	0.99*	0.31	0.00	0.31
43.30	0.63	0.63	0.99*	0.31	0.00	0.31
43.35	0.63	0.63	0.99*	0.31	0.00	0.31
43.40	0.63	0.63	0.99*	0.31	0.00	0.31
43.45	0.63	0.63	0.99*	0.30	0.00	0.30
43.50	0.63	0.63	0.99*	0.30	0.00	0.30
43.55	0.63	0.63	0.99*	0.30	0.00	0.30
43.60	0.63	0.63	0.99*	0.30	0.00	0.30
43.65	0.63	0.63	0.99*	0.29	0.00	0.29
43.70	0.62	0.63	0.99*	0.29	0.00	0.29
43.75	0.62	0.63	0.99*	0.29	0.00	0.29

43.80	0.62	0.63	0.99*	0.28	0.00	0.28
43.85	0.62	0.63	0.99*	0.28	0.00	0.28
43.90	0.62	0.63	0.99*	0.28	0.00	0.28
43.95	0.62	0.63	0.99*	0.27	0.00	0.27
44.00	0.62	0.63	0.99*	0.27	0.00	0.27
44.05	0.62	0.63	0.99*	0.27	0.00	0.27
44.10	0.62	0.63	0.99*	0.26	0.00	0.26
44.15	0.62	0.63	0.99*	0.26	0.00	0.26
44.20	0.62	0.63	0.99*	0.25	0.00	0.25
44.25	0.61	0.63	0.97*	0.25	0.00	0.25
44.30	0.56	0.63	0.89*	0.24	0.00	0.24
44.35	0.53	0.63	0.85*	0.24	0.00	0.24
44.40	0.51	0.63	0.82*	0.23	0.00	0.23
44.45	0.50	0.63	0.80*	0.23	0.00	0.23
44.50	0.49	0.63	0.78*	0.23	0.00	0.23
44.55	0.48	0.63	0.77*	0.22	0.00	0.22
44.60	0.47	0.63	0.75*	0.22	0.00	0.22
44.65	0.46	0.63	0.74*	0.21	0.00	0.21
44.70	0.46	0.63	0.73*	0.20	0.00	0.20
44.75	0.45	0.63	0.72*	0.20	0.00	0.20
44.80	0.44	0.63	0.71*	0.19	0.00	0.19
44.85	0.44	0.63	0.70*	0.19	0.00	0.19
44.90	0.43	0.63	0.69*	0.18	0.00	0.18
44.95	0.43	0.63	0.69*	0.18	0.00	0.18
45.00	0.42	0.63	0.68*	0.17	0.00	0.17
45.05	0.42	0.63	0.68*	0.16	0.00	0.16
45.10	0.43	0.63	0.68*	0.16	0.00	0.16
45.15	0.43	0.63	0.69*	0.15	0.00	0.15
45.20	0.44	0.62	0.70*	0.15	0.00	0.15
45.25	0.44	0.62	0.71*	0.14	0.00	0.14
45.30	0.45	0.62	0.72*	0.14	0.00	0.14
45.35	0.45	0.62	0.73*	0.13	0.00	0.13
45.40	0.46	0.62	0.74*	0.12	0.00	0.12
45.45	0.47	0.62	0.75*	0.12	0.00	0.12
45.50	0.47	0.62	0.76*	0.11	0.00	0.11
45.55	0.48	0.62	0.78*	0.11	0.00	0.11
45.60	0.49	0.62	0.79*	0.10	0.00	0.10
45.65	0.51	0.62	0.81*	0.10	0.00	0.10
45.70	0.52	0.62	0.84*	0.09	0.00	0.09
45.75	0.55	0.62	0.88*	0.09	0.00	0.09
45.80	0.59	0.62	0.94*	0.08	0.00	0.08
45.85	0.62	0.62	1.00*	0.08	0.00	0.08
45.90	0.62	0.62	1.00*	0.08	0.00	0.08
45.95	0.62	0.62	1.00*	0.07	0.00	0.07
46.00	0.62	0.62	1.00*	0.07	0.00	0.07
46.05	0.62	0.62	1.00*	0.06	0.00	0.06
46.10	0.62	0.62	1.00*	0.06	0.00	0.06
46.15	0.62	0.62	1.00*	0.06	0.00	0.06

46.20	0.62	0.62	1.00*	0.05	0.00	0.05
46.25	0.62	0.62	1.00*	0.05	0.00	0.05
46.30	0.62	0.62	1.00*	0.05	0.00	0.05
46.35	0.62	0.62	1.00*	0.04	0.00	0.04
46.40	0.62	0.62	1.00*	0.04	0.00	0.04
46.45	0.62	0.62	1.00*	0.04	0.00	0.04
46.50	0.62	0.62	1.00*	0.03	0.00	0.03
46.55	0.62	0.62	1.00*	0.03	0.00	0.03
46.60	0.62	0.62	1.00*	0.03	0.00	0.03
46.65	0.62	0.62	1.00*	0.02	0.00	0.02
46.70	0.62	0.62	1.00*	0.02	0.00	0.02
46.75	0.62	0.62	1.00*	0.02	0.00	0.02
46.80	0.62	0.62	1.00*	0.02	0.00	0.02
46.85	0.62	0.62	1.00*	0.02	0.00	0.02
46.90	0.62	0.62	1.00*	0.02	0.00	0.02
46.95	0.62	0.62	1.00*	0.01	0.00	0.01
47.00	0.62	0.62	1.00*	0.01	0.00	0.01
47.05	0.62	0.62	1.00*	0.01	0.00	0.01
47.10	0.62	0.62	1.00*	0.01	0.00	0.01
47.15	0.62	0.62	1.00*	0.01	0.00	0.01
47.20	0.62	0.62	1.00*	0.01	0.00	0.01
47.25	0.62	0.62	1.00*	0.01	0.00	0.01
47.30	0.62	0.62	1.00	0.01	0.00	0.01
47.35	0.62	0.62	1.00	0.01	0.00	0.01
47.40	0.62	0.62	1.00	0.00	0.00	0.00
47.45	0.62	0.62	1.00	0.00	0.00	0.00
47.50	0.62	0.62	1.00	0.00	0.00	0.00
47.55	0.62	0.62	1.00	0.00	0.00	0.00
47.60	0.62	0.62	1.00	0.00	0.00	0.00
47.65	0.62	0.62	1.00	0.00	0.00	0.00
47.70	0.62	0.62	1.00	0.00	0.00	0.00
47.75	0.62	0.62	1.00	0.00	0.00	0.00
47.80	0.62	0.62	1.00	0.00	0.00	0.00
47.85	0.62	0.62	1.00	0.00	0.00	0.00
47.90	0.62	0.62	1.00	0.00	0.00	0.00
47.95	0.62	0.62	1.00	0.00	0.00	0.00
48.00	0.62	0.62	1.00	0.00	0.00	0.00
48.05	0.62	0.62	1.00	0.00	0.00	0.00
48.10	0.62	0.62	1.00	0.00	0.00	0.00
48.15	0.62	0.62	1.00	0.00	0.00	0.00
48.20	0.62	0.61	1.00	0.00	0.00	0.00
48.25	0.62	0.61	1.00	0.00	0.00	0.00
48.30	0.62	0.61	1.00	0.00	0.00	0.00
48.35	0.62	0.61	1.00	0.00	0.00	0.00
48.40	0.62	0.61	1.00	0.00	0.00	0.00
48.45	0.62	0.61	1.00	0.00	0.00	0.00
48.50	0.62	0.61	1.00	0.00	0.00	0.00
48.55	0.62	0.61	1.00	0.00	0.00	0.00

48.60	0.62	0.61	1.00	0.00	0.00	0.00
48.65	0.62	0.61	1.00	0.00	0.00	0.00
48.70	0.62	0.61	1.00	0.00	0.00	0.00
48.75	0.62	0.61	1.00	0.00	0.00	0.00
48.80	0.62	0.61	1.00	0.00	0.00	0.00
48.85	0.62	0.61	1.00	0.00	0.00	0.00
48.90	0.62	0.61	1.00	0.00	0.00	0.00
48.95	0.62	0.61	1.00	0.00	0.00	0.00
49.00	0.61	0.61	1.00	0.00	0.00	0.00
49.05	0.61	0.61	1.00	0.00	0.00	0.00
49.10	0.61	0.61	1.01	0.00	0.00	0.00
49.15	0.61	0.61	1.01	0.00	0.00	0.00
49.20	0.61	0.61	1.01	0.00	0.00	0.00
49.25	0.61	0.61	1.01	0.00	0.00	0.00
49.30	0.61	0.61	1.01	0.00	0.00	0.00
49.35	0.61	0.61	1.01	0.00	0.00	0.00
49.40	0.61	0.61	1.01	0.00	0.00	0.00
49.45	0.61	0.61	1.01	0.00	0.00	0.00
49.50	0.61	0.61	1.01	0.00	0.00	0.00
49.55	0.61	0.61	1.01	0.00	0.00	0.00
49.60	0.61	0.61	1.01	0.00	0.00	0.00
49.65	0.61	0.61	1.01	0.00	0.00	0.00
49.70	0.61	0.61	1.01	0.00	0.00	0.00
49.75	0.61	0.61	1.01	0.00	0.00	0.00
49.80	0.61	0.61	1.01	0.00	0.00	0.00
49.85	0.61	0.61	1.01	0.00	0.00	0.00
49.90	0.61	0.61	1.01	0.00	0.00	0.00
49.95	0.61	0.61	1.01	0.00	0.00	0.00
50.00	0.61	0.61	1.01	0.00	0.00	0.00

---

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

---

1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands
S_all Total Settlement from Saturated and Unsaturated Sands
NoLiq No-Liquefy Soils

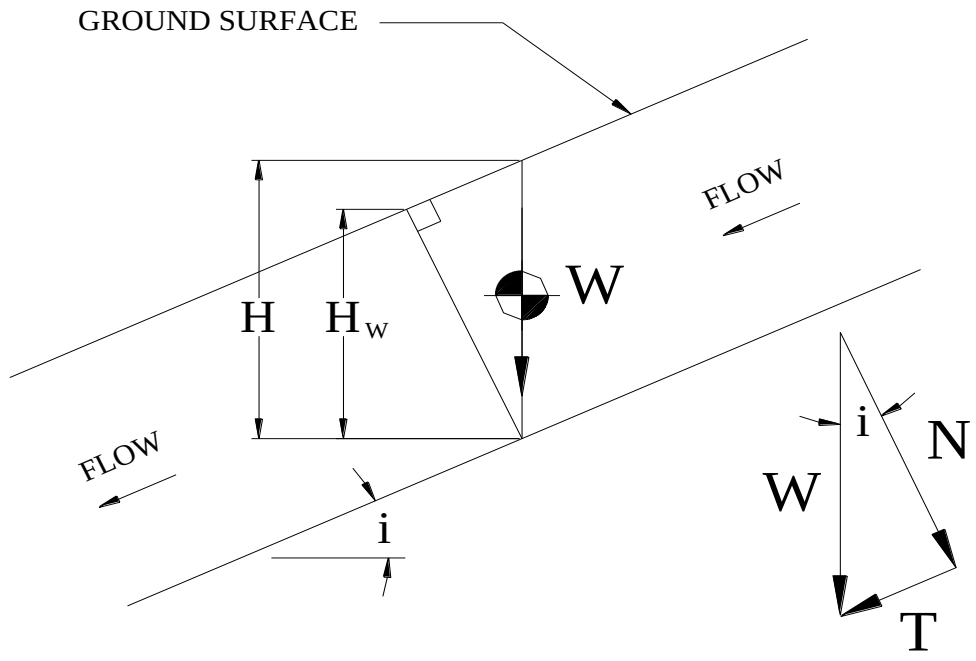
APPENDIX E

STABILITY ANALYSIS

SURFICIAL STABILITY ANALYSIS RESULTS
GLOBAL STABILITY ANALYSIS

SURFICIAL STABILITY OF SATURATED SLOPE - B1@35'

(INFINITE SLOPE ANALYSIS)



INPUT PARAMETERS

Saturated Thickness, H (ft) =	4
Slope Angle, *i* (deg) =	26.6
Cohesion, c (psf) =	220
Friction Angle, ϕ (deg) =	33
Saturated Unit Weight, γ (pcf) =	110

STABILITY CALCULATION PARAMETERS

Tangential (Driving) Force: $T = \gamma H \sin i \cos i$

Effective Normal Force: $N' = \gamma' H \cos^2 i$

Resisting Shear Force = $\tau = N' \tan\phi + c$

$\tau = \gamma' H \cos^2 i \tan\phi + c$

FACTOR OF SAFETY

$$\text{Factor of Safety} = \frac{\text{Resisting Force}}{\text{Driving Force}} = \frac{\tau}{T} = \frac{\gamma' H \cos^2 i \tan\phi + c}{\gamma H \sin i \cos i}$$

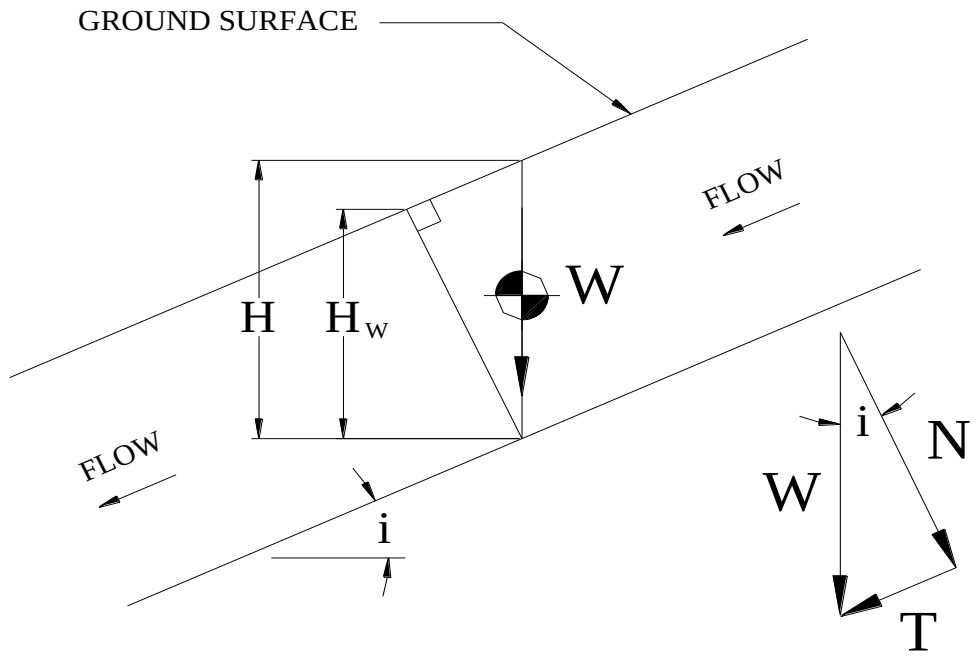
$$\textbf{Factor of Safety} = \frac{\textbf{319}}{\textbf{176}} = \textbf{1.8}$$

RMA GeoScience

Tract 5847
Moorpark, CA
June, 2016

SURFICIAL STABILITY OF SATURATED SLOPE - B1@50'

(INFINITE SLOPE ANALYSIS)



INPUT PARAMETERS

Saturated Thickness, H (ft) =	4
Slope Angle, *i* (deg) =	26.6
Cohesion, c (psf) =	240
Friction Angle, ϕ (deg) =	34
Saturated Unit Weight, γ (pcf) =	105

STABILITY CALCULATION PARAMETERS

Tangential (Driving) Force: $T = \gamma H \sin i \cos i$

Effective Normal Force: $N' = \gamma' H \cos^2 i$

Resisting Shear Force = $\tau = N' \tan\phi + c$

$\tau = \gamma' H \cos^2 i \tan\phi + c$

FACTOR OF SAFETY

$$\text{Factor of Safety} = \frac{\text{Resisting Force}}{\text{Driving Force}} = \frac{\tau}{T} = \frac{\gamma' H \cos^2 i \tan\phi + c}{\gamma H \sin i \cos i}$$

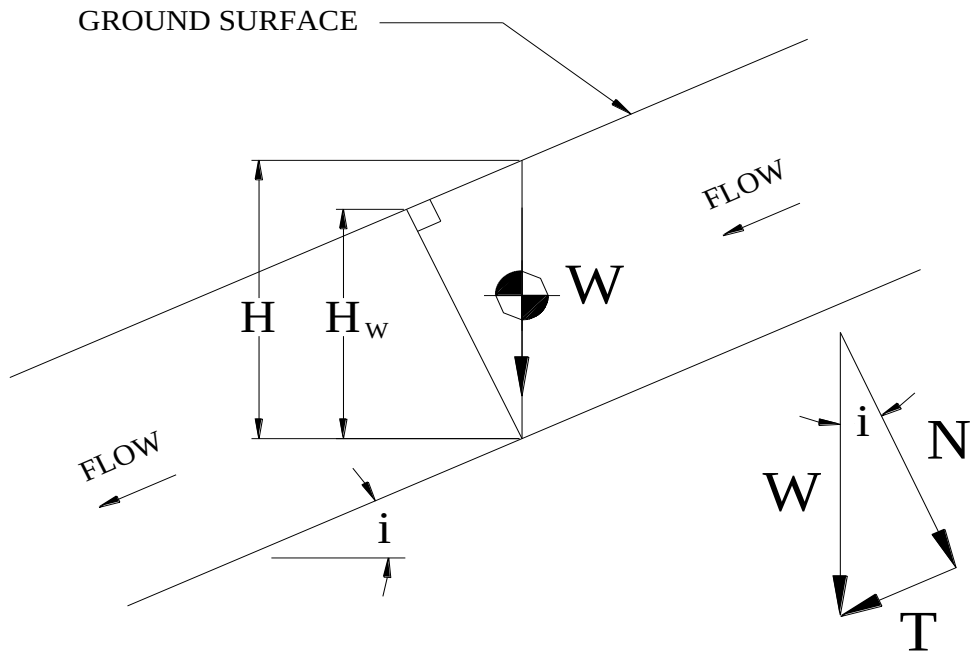
$$\textbf{Factor of Safety} = \frac{\textbf{332}}{\textbf{168}} = \textbf{2.0}$$

RMA GeoScience

Tract 5847
Moorpark, CA
June, 2016

SURFICIAL STABILITY OF SATURATED SLOPE - B2@30'

(INFINITE SLOPE ANALYSIS)



INPUT PARAMETERS

Saturated Thickness, H (ft) =	4
Slope Angle, *i* (deg) =	26.6
Cohesion, c (psf) =	360
Friction Angle, ϕ (deg) =	20
Saturated Unit Weight, γ (pcf) =	120

STABILITY CALCULATION PARAMETERS

Tangential (Driving) Force: $T = \gamma H \sin i \cos i$

Effective Normal Force: $N' = \gamma' H \cos^2 i$

Resisting Shear Force = $\tau = N' \tan\phi + c$

$\tau = \gamma' H \cos^2 i \tan\phi + c$

FACTOR OF SAFETY

$$\text{Factor of Safety} = \frac{\text{Resisting Force}}{\text{Driving Force}} = \frac{\tau}{T} = \frac{\gamma' H \cos^2 i \tan\phi + c}{\gamma H \sin i \cos i}$$

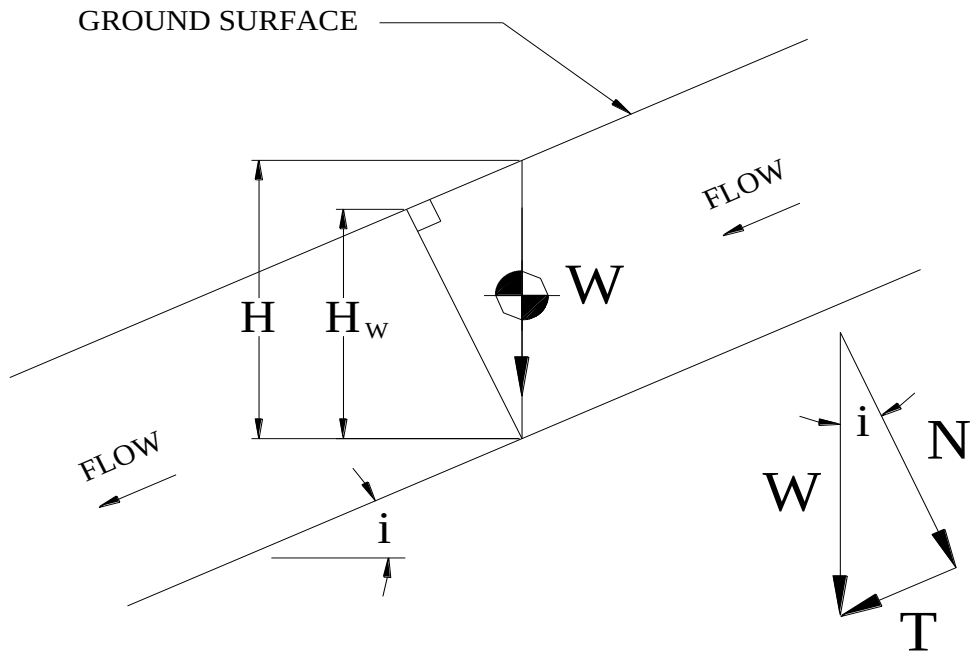
$$\textbf{Factor of Safety} = \frac{\textbf{427}}{\textbf{192}} = \textbf{2.2}$$

RMA GeoScience

Tract 5847
Moorpark, CA
June, 2016

SURFICIAL STABILITY OF SATURATED SLOPE - B3@60'

(INFINITE SLOPE ANALYSIS)



INPUT PARAMETERS

Saturated Thickness, H (ft) =	4
Slope Angle, *i* (deg) =	26.6
Cohesion, c (psf) =	270
Friction Angle, ϕ (deg) =	32
Saturated Unit Weight, γ (pcf) =	104

STABILITY CALCULATION PARAMETERS

Tangential (Driving) Force: $T = \gamma H \sin i \cos i$

Effective Normal Force: $N' = \gamma' H \cos^2 i$

Resisting Shear Force = $\tau = N' \tan\phi + c$

$\tau = \gamma' H \cos^2 i \tan\phi + c$

FACTOR OF SAFETY

$$\text{Factor of Safety} = \frac{\text{Resisting Force}}{\text{Driving Force}} = \frac{\tau}{T} = \frac{\gamma' H \cos^2 i \tan\phi + c}{\gamma H \sin i \cos i}$$

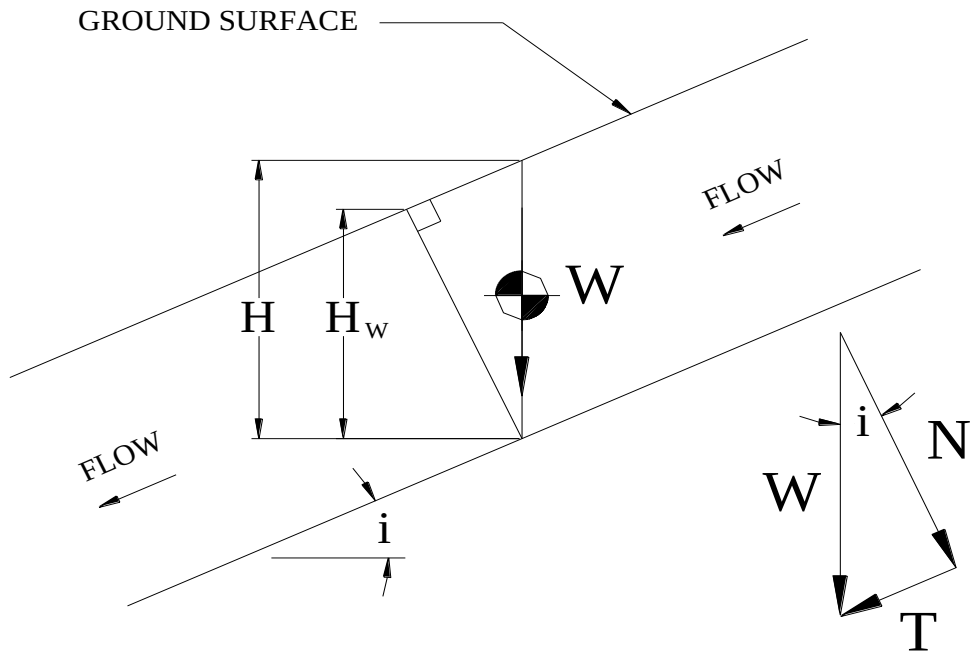
$$\textbf{Factor of Safety} = \frac{\textbf{353}}{\textbf{167}} = \textbf{2.1}$$

RMA GeoScience

Tract 5847
Moorpark, CA
June, 2016

SURFICIAL STABILITY OF SATURATED SLOPE - B1@49'

(INFINITE SLOPE ANALYSIS)



INPUT PARAMETERS

Saturated Thickness, H (ft) =	4
Slope Angle, *i* (deg) =	26.6
Cohesion, c (psf) =	120
Friction Angle, ϕ (deg) =	34
Saturated Unit Weight, γ (pcf) =	133

STABILITY CALCULATION PARAMETERS

Tangential (Driving) Force: $T = \gamma H \sin i \cos i$

Effective Normal Force: $N' = \gamma' H \cos^2 i$

Resisting Shear Force = $\tau = N' \tan\phi + c$

$\tau = \gamma' H \cos^2 i \tan\phi + c$

FACTOR OF SAFETY

$$\text{Factor of Safety} = \frac{\text{Resisting Force}}{\text{Driving Force}} = \frac{\tau}{T} = \frac{\gamma' H \cos^2 i \tan\phi + c}{\gamma H \sin i \cos i}$$

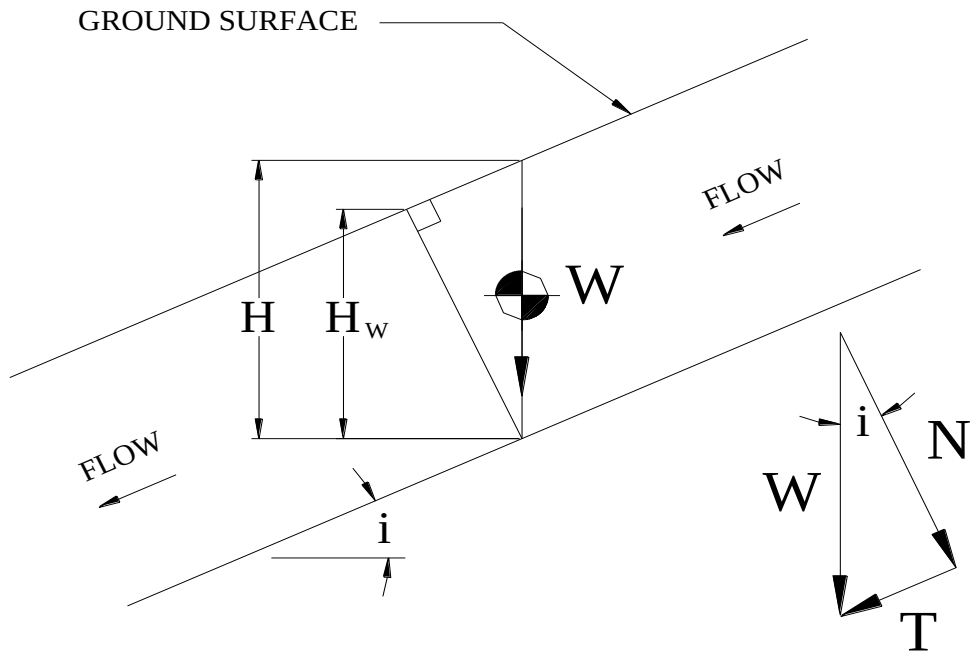
$$\textbf{Factor of Safety} = \frac{\textbf{272}}{\textbf{213}} = \textbf{1.3}$$

RMA GeoScience

Tract 5847
Moorpark, CA
June, 2016

SURFICIAL STABILITY OF SATURATED SLOPE - B3@12'

(INFINITE SLOPE ANALYSIS)



INPUT PARAMETERS

Saturated Thickness, H (ft) =	4
Slope Angle, *i* (deg) =	26.6
Cohesion, c (psf) =	80
Friction Angle, ϕ (deg) =	31
Saturated Unit Weight, γ (pcf) =	128

STABILITY CALCULATION PARAMETERS

Tangential (Driving) Force: $T = \gamma H \sin i \cos i$

Effective Normal Force: $N' = \gamma' H \cos^2 i$

Resisting Shear Force = $\tau = N' \tan\phi + c$

$\tau = \gamma' H \cos^2 i \tan\phi + c$

FACTOR OF SAFETY

$$\text{Factor of Safety} = \frac{\text{Resisting Force}}{\text{Driving Force}} = \frac{\tau}{T} = \frac{\gamma' H \cos^2 i \tan\phi + c}{\gamma H \sin i \cos i}$$

$$\textbf{Factor of Safety} = \frac{\textbf{206}}{\textbf{205}} = \textbf{1.0}$$

RMA GeoScience

Tract 5847
Moorpark, CA
June, 2016

XSTABL File: 16G63-1 6-23-16 12:08

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*                using the              *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 - 2013      *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.209                 96 - 2086 *
*****************************************
```

Problem Description : Circular Section 1

SEGMENT BOUNDARY COORDINATES

---

4 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1571.0	115.0	1545.0	1
2	115.0	1545.0	920.0	1541.0	1
3	920.0	1541.0	978.0	1511.0	1
4	978.0	1511.0	1130.0	1507.0	1

ISOTROPIC Soil Parameters

---

1 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Water Constant (psf)	Surface No.

1 110.0 120.0 200.0 33.00 .000 .0
0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

400 trial surfaces will be generated and analyzed.

20 Surfaces initiate from each of 20 points equally spaced along the ground surface between x = 978.0 ft
and x = 978.0 ft

Each surface terminates between x = 900.0 ft
and x = 920.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

4.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 20 coordinate points

Point	x-surf	y-surf

No.	(ft)	(ft)
1	978.00	1511.00
2	974.01	1510.74
3	970.01	1510.71
4	966.01	1510.91
5	962.04	1511.33
6	958.09	1511.97
7	954.18	1512.84
8	950.33	1513.92
9	946.55	1515.22
10	942.84	1516.73
11	939.23	1518.44
12	935.72	1520.36
13	932.32	1522.47
14	929.05	1524.77
15	925.91	1527.25
16	922.92	1529.91
17	920.08	1532.72
18	917.40	1535.70
19	914.90	1538.81
20	913.31	1541.03

**** Simplified BISHOP FOS = 2.117 ****

The following is a summary of the TEN most critical surfaces

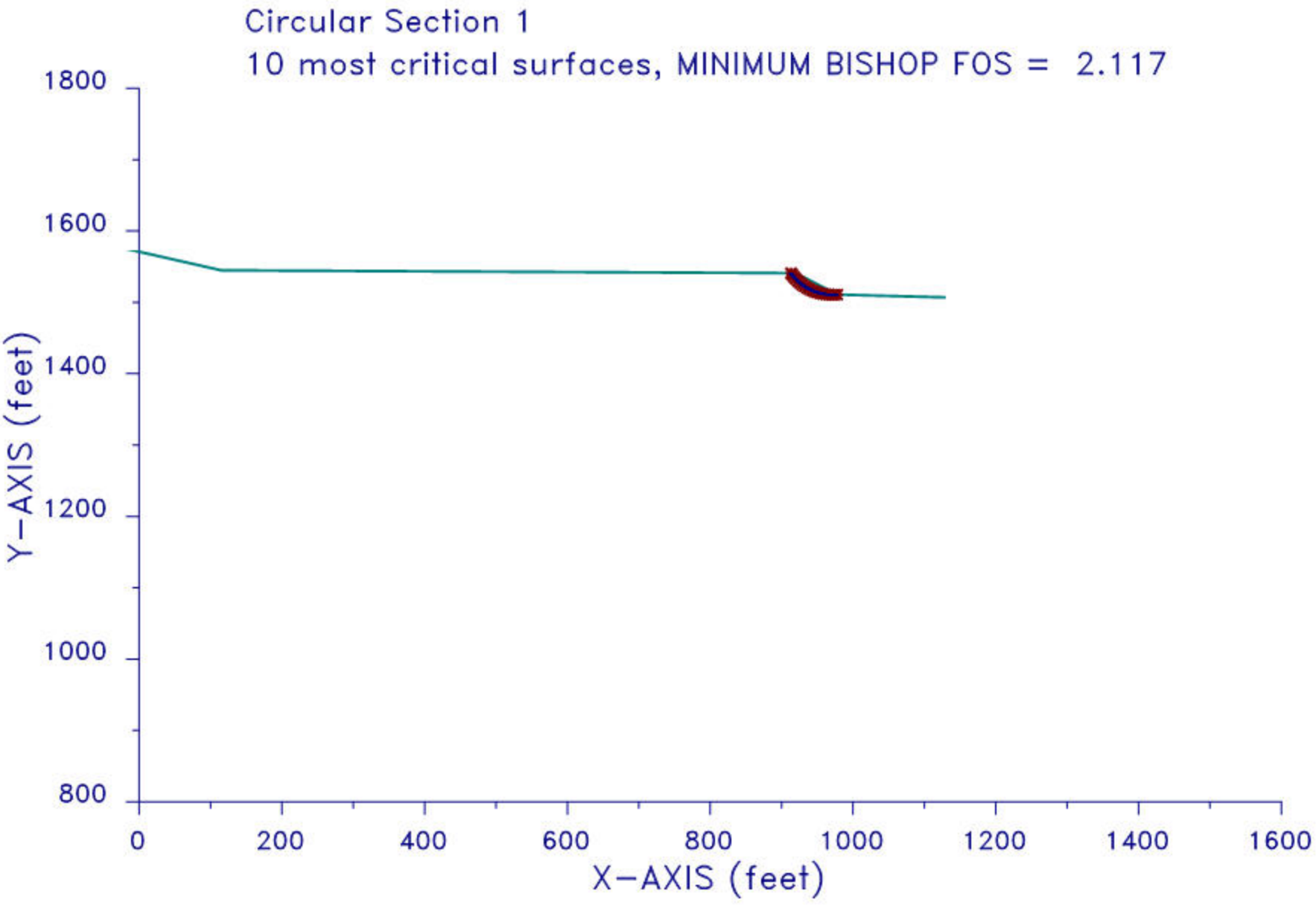
Problem Description : Circular Section 1

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	2.117	971.47	1581.88	71.18	978.00	913.31	3.767E+06
2.	2.119	971.75	1579.51	68.79	978.00	915.04	3.445E+06
3.	2.120	971.55	1578.13	67.44	978.00	915.44	3.355E+06
4.	2.121	974.81	1586.84	75.91	978.00	914.34	3.625E+06
5.	2.121	974.21	1584.29	73.39	978.00	914.96	3.481E+06
6.	2.122	975.29	1590.02	79.07	978.00	913.24	3.868E+06

7.	2.127	971.86	1588.00	77.24	978.00	910.81	4.334E+06
8.	2.127	970.99	1585.34	74.67	978.00	910.93	4.255E+06
9.	2.130	969.19	1580.24	69.80	978.00	911.42	4.097E+06
10.	2.132	968.17	1576.38	66.12	978.00	912.35	3.892E+06

* * * END OF FILE * * *

16G63-1 6-23-16 12:08



XSTABL File: 16G63-1S 6-23-16 12:09

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*                using the              *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 - 2013      *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.209                 96 - 2086 *
*****************************************
```

Problem Description : Seismic Section 1

SEGMENT BOUNDARY COORDINATES

---

4 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1571.0	115.0	1545.0	1
2	115.0	1545.0	920.0	1541.0	1
3	920.0	1541.0	978.0	1511.0	1
4	978.0	1511.0	1130.0	1507.0	1

ISOTROPIC Soil Parameters

---

1 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Water Constant (psf)	Surface No.

1 110.0 120.0 200.0 33.00 .000 .0
0

A horizontal earthquake loading coefficient
of .150 has been assigned

A vertical earthquake loading coefficient
of .000 has been assigned

A critical failure surface searching method, using a random
technique for generating CIRCULAR surfaces has been specified.

400 trial surfaces will be generated and analyzed.

20 Surfaces initiate from each of 20 points equally spaced
along the ground surface between x = 978.0 ft
and x = 978.0 ft

Each surface terminates between x = 900.0 ft
and x = 920.0 ft

Unless further limitations were imposed, the minimum elevation
at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

4.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined
within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
is specified by 21 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	978.00	1511.00
2	974.01	1510.78
3	970.01	1510.78
4	966.01	1510.98
5	962.03	1511.39
6	958.08	1512.00
7	954.16	1512.82
8	950.30	1513.85
9	946.49	1515.07
10	942.75	1516.49
11	939.09	1518.11
12	935.52	1519.91
13	932.05	1521.89
14	928.68	1524.06
15	925.44	1526.40
16	922.32	1528.90
17	919.33	1531.56
18	916.49	1534.38
19	913.80	1537.33
20	911.26	1540.43
21	910.81	1541.05

**** Simplified BISHOP FOS = 1.555 ****

The following is a summary of the TEN most critical surfaces

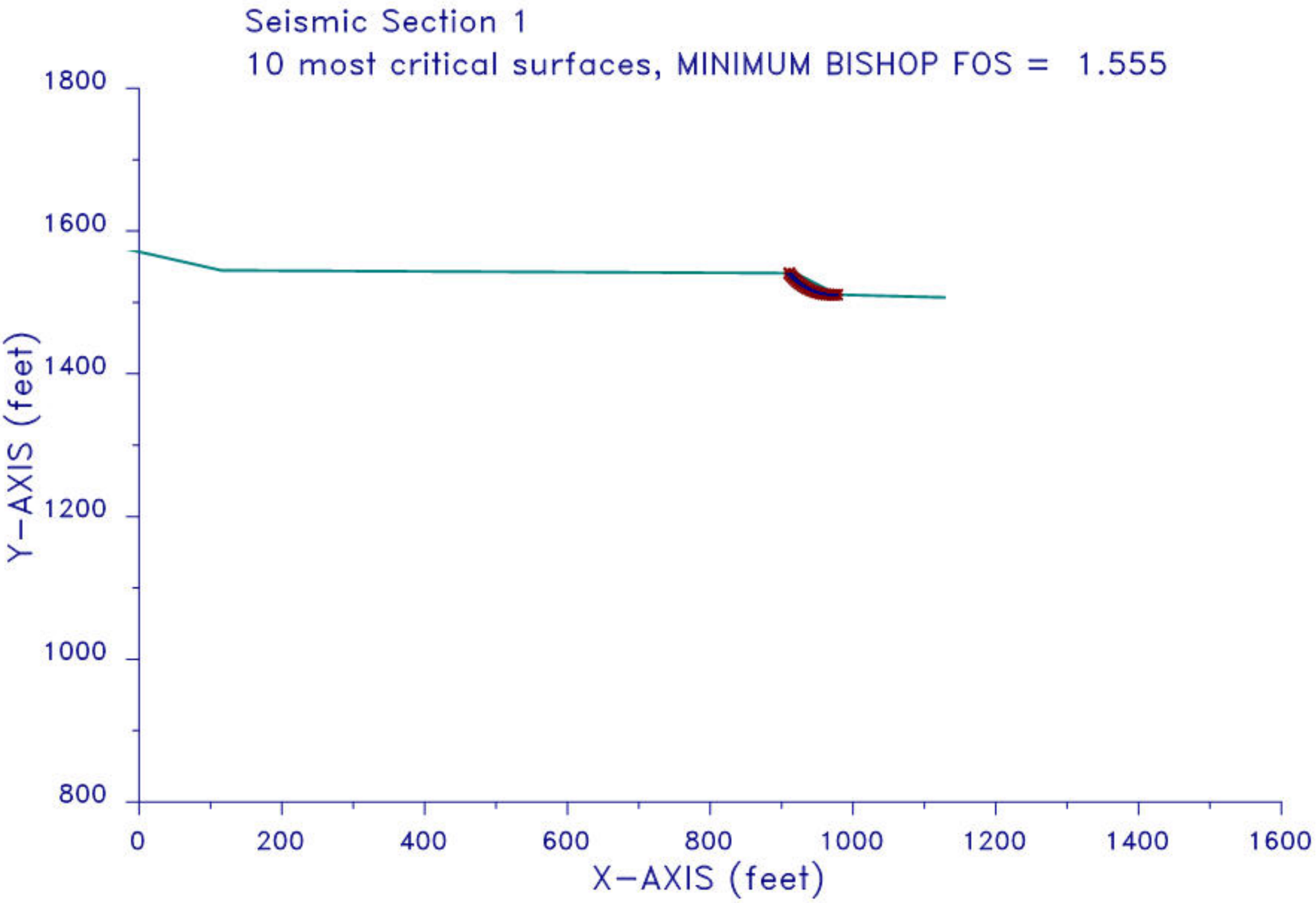
Problem Description : Seismic Section 1

FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)

1.	1.555	971.86	1588.00	77.24	978.00	910.81	4.151E+06
2.	1.556	970.99	1585.34	74.67	978.00	910.93	4.076E+06
3.	1.558	971.47	1581.88	71.18	978.00	913.31	3.607E+06
4.	1.559	976.80	1599.60	88.60	978.00	910.29	4.406E+06
5.	1.559	975.29	1590.02	79.07	978.00	913.24	3.702E+06
6.	1.561	969.19	1580.24	69.80	978.00	911.42	3.926E+06
7.	1.563	974.81	1586.84	75.91	978.00	914.34	3.469E+06
8.	1.564	971.75	1579.51	68.79	978.00	915.04	3.298E+06
9.	1.564	975.53	1603.81	92.85	978.00	907.12	5.146E+06
10.	1.564	973.67	1600.17	89.28	978.00	906.75	5.148E+06

* * * END OF FILE * * *

16G63-1S 6-23-16 12:09



XSTABL File: 16G63-2 6-22-16 8:43

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*                using the              *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 - 2013      *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.209                 96 - 2086 *
*****************************************
```

Problem Description : Circular Section 2

SEGMENT BOUNDARY COORDINATES

---

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1566.0	113.0	1566.0	1
2	113.0	1566.0	125.0	1568.0	1
3	125.0	1568.0	141.0	1570.0	1
4	141.0	1570.0	203.0	1590.0	1
5	203.0	1590.0	276.0	1625.0	1
6	276.0	1625.0	314.0	1630.0	1
7	314.0	1630.0	342.0	1630.0	1
8	342.0	1630.0	347.0	1633.0	1
9	347.0	1633.0	500.0	1633.0	1

ISOTROPIC Soil Parameters

---

1 Soil unit(s) specified

Soil	Unit Weight	Cohesion	Friction	Pore Pressure Water

Unit No.	Moist (pcf)	Sat. (pcf)	Intercept (psf)	Angle (deg)	Parameter Ru	Constant (psf)	Surface No.
1	100.0	120.0	200.0	33.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

400 trial surfaces will be generated and analyzed.

20 Surfaces initiate from each of 20 points equally spaced along the ground surface between x = 125.0 ft
and x = 125.0 ft

Each surface terminates between x = 350.0 ft
and x = 450.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

7.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
is specified by 36 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	125.00	1568.00
2	132.00	1567.99
3	139.00	1568.09
4	146.00	1568.32
5	152.99	1568.66
6	159.97	1569.12
7	166.95	1569.70
8	173.91	1570.40
9	180.87	1571.22
10	187.80	1572.15
11	194.72	1573.20
12	201.62	1574.37
13	208.51	1575.66
14	215.36	1577.06
15	222.20	1578.58
16	229.00	1580.21
17	235.78	1581.96
18	242.53	1583.83
19	249.24	1585.81
20	255.92	1587.90
21	262.57	1590.11
22	269.17	1592.42
23	275.74	1594.85
24	282.26	1597.39
25	288.74	1600.05
26	295.17	1602.81
27	301.55	1605.68
28	307.89	1608.65
29	314.17	1611.74
30	320.40	1614.93
31	326.58	1618.22
32	332.70	1621.62
33	338.76	1625.13
34	344.76	1628.73
35	350.70	1632.44
36	351.56	1633.00

**** Simplified BISHOP FOS = 2.528 ****

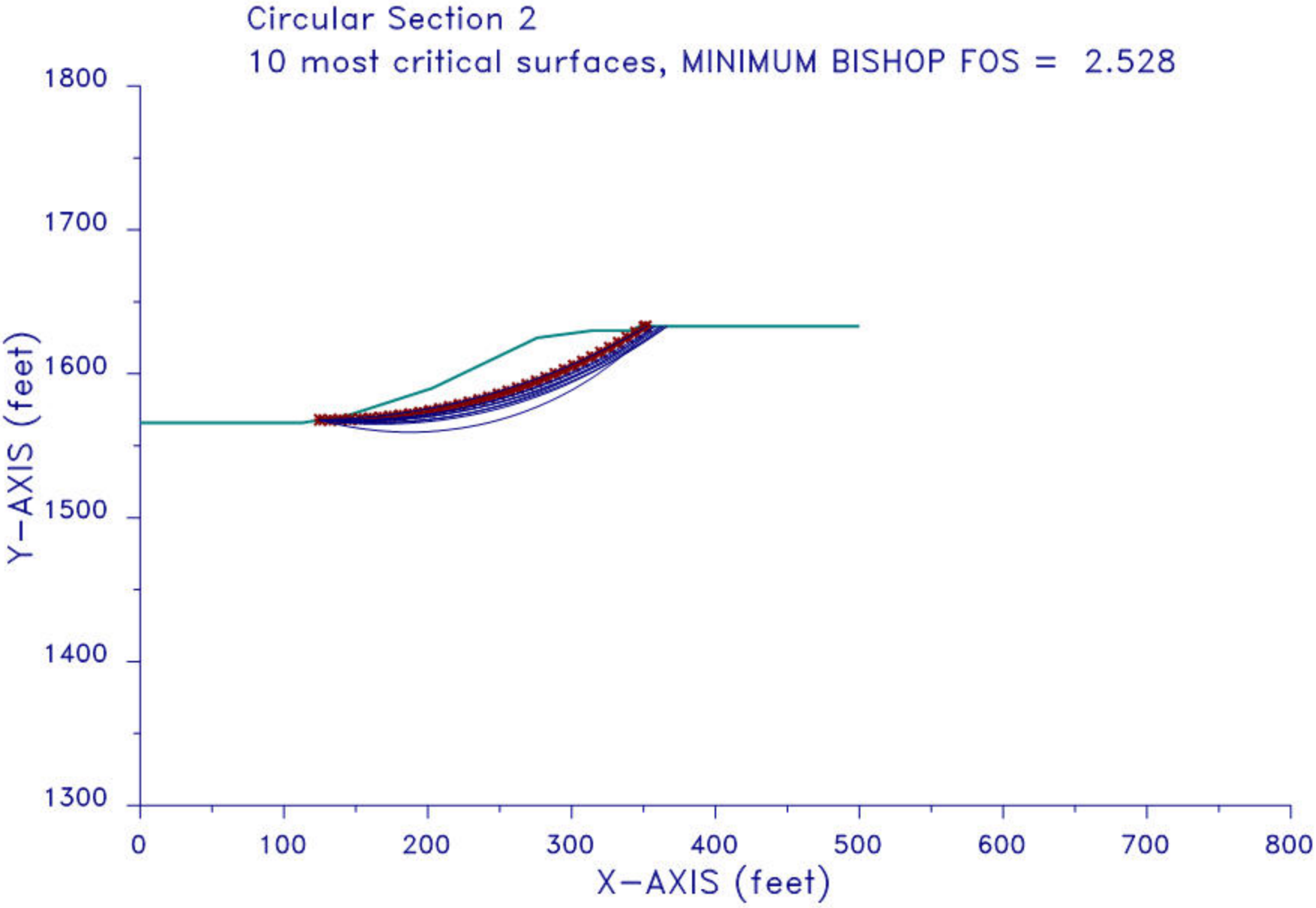
The following is a summary of the TEN most critical surfaces

Problem Description : Circular Section 2

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	2.528	129.28	1980.52	412.54	125.00	351.56	1.127E+08
2.	2.538	162.41	1883.15	317.36	125.00	357.70	1.153E+08
3.	2.553	143.10	1953.02	385.45	125.00	357.83	1.217E+08
4.	2.560	115.18	2031.11	463.22	125.00	352.06	1.182E+08
5.	2.581	142.69	1965.29	397.68	125.00	361.21	1.292E+08
6.	2.587	150.57	1942.52	375.40	125.00	362.97	1.302E+08
7.	2.588	167.42	1883.26	318.10	125.00	363.78	1.261E+08
8.	2.589	187.31	1791.31	231.84	125.00	356.69	1.092E+08
9.	2.609	161.23	1914.52	348.41	125.00	366.38	1.338E+08
10.	2.611	151.30	1949.27	382.17	125.00	365.84	1.363E+08

* * * END OF FILE * * *

16G63-2 6-22-16 8:43



XSTABL File: 16G63-2S 6-22-16 8:48

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*                using the              *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 - 2013      *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.209                 96 - 2086 *
*****************************************
```

Problem Description : Seismic Section 2

SEGMENT BOUNDARY COORDINATES

---

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1566.0	113.0	1566.0	1
2	113.0	1566.0	125.0	1568.0	1
3	125.0	1568.0	141.0	1570.0	1
4	141.0	1570.0	203.0	1590.0	1
5	203.0	1590.0	276.0	1625.0	1
6	276.0	1625.0	314.0	1630.0	1
7	314.0	1630.0	342.0	1630.0	1
8	342.0	1630.0	347.0	1633.0	1
9	347.0	1633.0	500.0	1633.0	1

ISOTROPIC Soil Parameters

---

1 Soil unit(s) specified

Soil	Unit Weight	Cohesion	Friction	Pore Pressure Water

Unit No.	Moist (pcf)	Sat. (pcf)	Intercept (psf)	Angle (deg)	Parameter Ru	Constant (psf)	Surface No.
1	100.0	120.0	200.0	33.00	.000	.0	0

A horizontal earthquake loading coefficient
of .150 has been assigned

A vertical earthquake loading coefficient
of .000 has been assigned

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

400 trial surfaces will be generated and analyzed.

20 Surfaces initiate from each of 20 points equally spaced along the ground surface between x = 125.0 ft
and x = 125.0 ft

Each surface terminates between x = 350.0 ft
and x = 450.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

7.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
is specified by 37 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	125.00	1568.00
2	131.96	1567.25
3	138.93	1566.66
4	145.92	1566.22
5	152.91	1565.93
6	159.91	1565.80
7	166.91	1565.82
8	173.91	1565.99
9	180.90	1566.33
10	187.89	1566.81
11	194.86	1567.45
12	201.81	1568.24
13	208.75	1569.19
14	215.66	1570.28
15	222.55	1571.53
16	229.41	1572.94
17	236.23	1574.49
18	243.02	1576.19
19	249.77	1578.04
20	256.48	1580.05
21	263.14	1582.19
22	269.76	1584.49
23	276.32	1586.93
24	282.82	1589.51
25	289.27	1592.24
26	295.66	1595.11
27	301.98	1598.12
28	308.23	1601.26
29	314.41	1604.55
30	320.52	1607.97
31	326.55	1611.52
32	332.50	1615.21
33	338.37	1619.02
34	344.15	1622.97
35	349.85	1627.04
36	355.45	1631.23
37	357.70	1633.00

**** Simplified BISHOP FOS = 1.666 ****

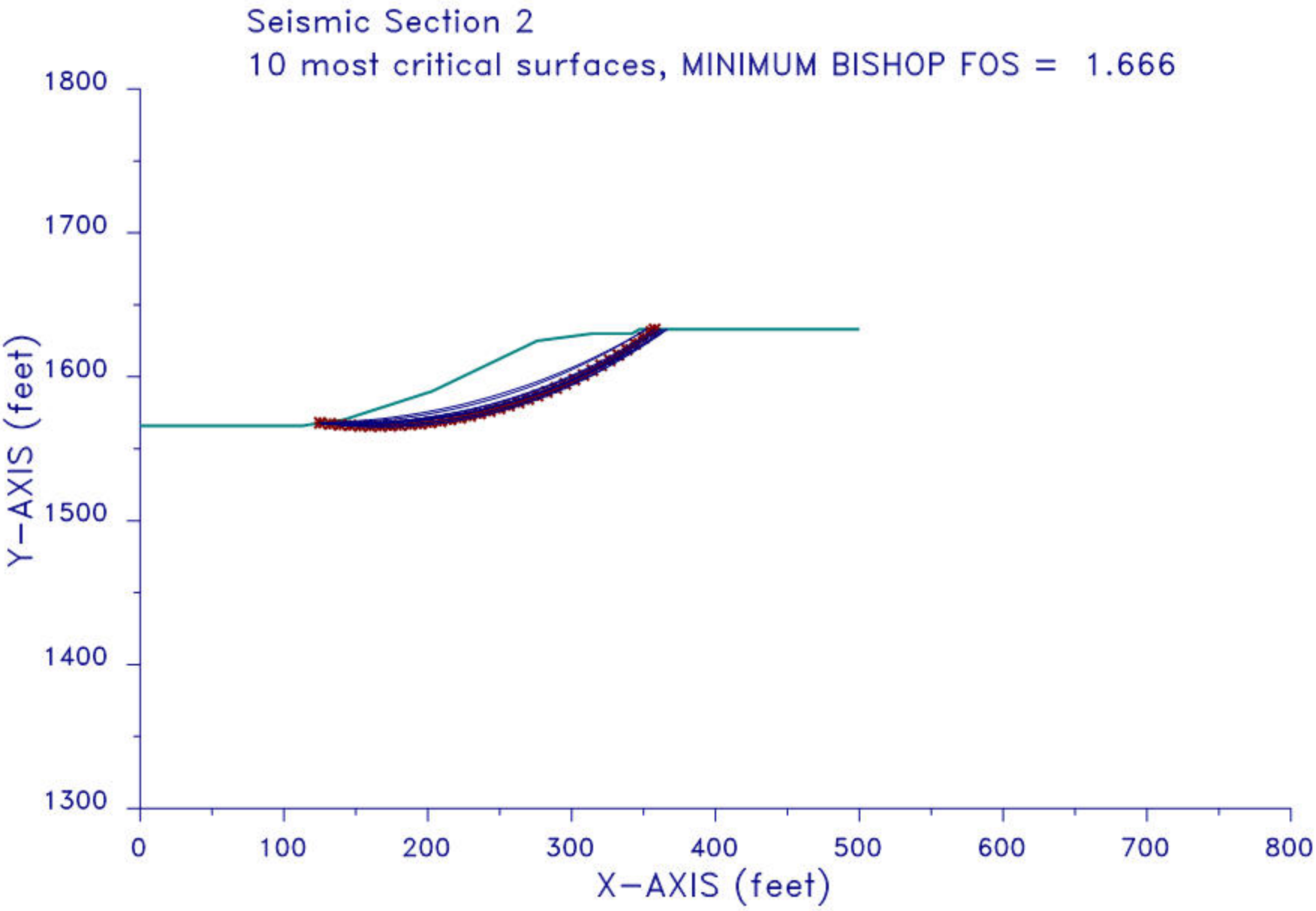
The following is a summary of the TEN most critical surfaces

Problem Description : Seismic Section 2

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.666	162.41	1883.15	317.36	125.00	357.70	1.112E+08
2.	1.667	129.28	1980.52	412.54	125.00	351.56	1.085E+08
3.	1.672	143.10	1953.02	385.45	125.00	357.83	1.173E+08
4.	1.683	142.69	1965.29	397.68	125.00	361.21	1.246E+08
5.	1.684	150.57	1942.52	375.40	125.00	362.97	1.255E+08
6.	1.686	115.18	2031.11	463.22	125.00	352.06	1.139E+08
7.	1.687	167.42	1883.26	318.10	125.00	363.78	1.217E+08
8.	1.693	151.30	1949.27	382.17	125.00	365.84	1.316E+08
9.	1.694	161.23	1914.52	348.41	125.00	366.38	1.291E+08
10.	1.696	149.00	1959.27	392.01	125.00	366.21	1.334E+08

* * * END OF FILE * * *

16G63-2S 6-22-16 8:48



XSTABL File: 16G63-3 6-22-16 8:46

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*                using the              *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 - 2013      *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.209                 96 - 2086 *
*****************************************
```

Problem Description : Circular Section 3

SEGMENT BOUNDARY COORDINATES

---

8 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1634.0	45.0	1634.0	1
2	45.0	1634.0	73.0	1632.0	1
3	73.0	1632.0	79.0	1634.0	1
4	79.0	1634.0	225.0	1634.0	1
5	225.0	1634.0	261.0	1615.0	1
6	261.0	1615.0	363.0	1615.0	1
7	363.0	1615.0	528.0	1552.0	1
8	528.0	1552.0	627.0	1552.0	1

ISOTROPIC Soil Parameters

---

1 Soil unit(s) specified

Soil Unit	Unit Weight Moist	Sat.	Cohesion Intercept	Friction Angle	Pore Pressure Parameter	Water Surface Constant

No.	(pcf)	(pcf)	(psf)	(deg)	Ru	(psf)	No.
1	110.0	120.0	200.0	33.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

400 trial surfaces will be generated and analyzed.

20 Surfaces initiate from each of 20 points equally spaced along the ground surface between x = 528.0 ft
and x = 528.0 ft

Each surface terminates between x = 79.0 ft
and x = 225.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

9.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface

is specified by 37 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	528.00	1552.00
2	519.00	1552.20
3	510.01	1552.53
4	501.02	1552.99
5	492.04	1553.57
6	483.07	1554.27
7	474.11	1555.11
8	465.16	1556.07
9	456.22	1557.15
10	447.30	1558.36
11	438.40	1559.70
12	429.52	1561.16
13	420.66	1562.74
14	411.83	1564.45
15	403.02	1566.29
16	394.23	1568.24
17	385.47	1570.32
18	376.75	1572.53
19	368.05	1574.85
20	359.39	1577.30
21	350.77	1579.87
22	342.18	1582.56
23	333.63	1585.37
24	325.12	1588.29
25	316.65	1591.34
26	308.23	1594.51
27	299.85	1597.80
28	291.52	1601.20
29	283.23	1604.72
30	275.00	1608.36
31	266.82	1612.11
32	258.69	1615.97
33	250.62	1619.95
34	242.60	1624.04
35	234.65	1628.25
36	226.75	1632.57
37	224.21	1634.00

**** Simplified BISHOP FOS = 3.113 ****

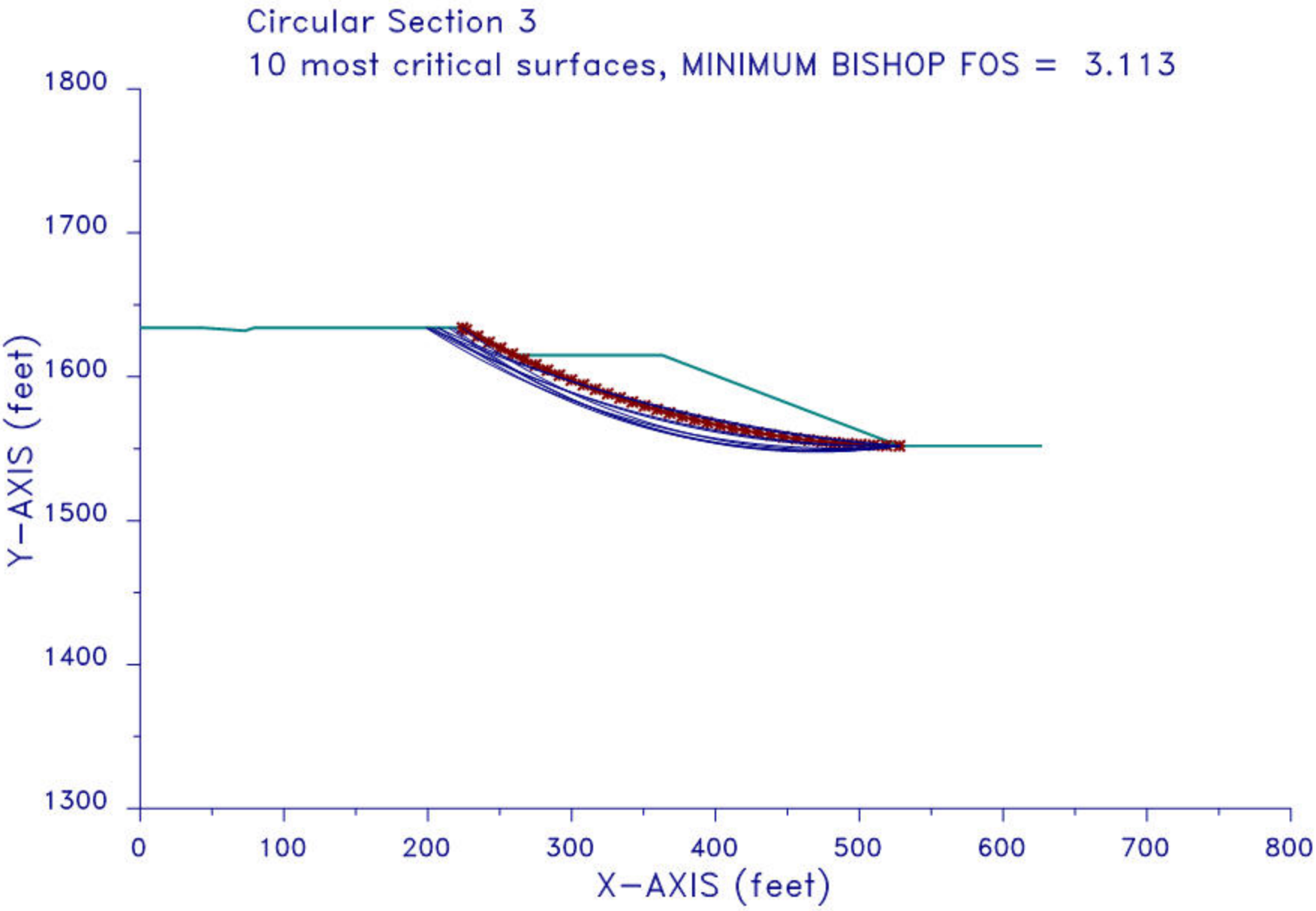
The following is a summary of the TEN most critical surfaces

Problem Description : Circular Section 3

	FOS (BISHOP)	Circle Center x-coord (ft)	y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	3.113	537.91	2192.77	640.85	528.00	224.21	3.075E+08
2.	3.150	479.07	1974.55	425.38	528.00	224.12	2.735E+08
3.	3.154	587.73	2456.42	906.39	528.00	206.70	4.357E+08
4.	3.156	510.38	2166.65	614.90	528.00	203.26	3.825E+08
5.	3.166	519.45	2215.50	663.55	528.00	199.83	4.076E+08
6.	3.170	472.39	1978.69	430.30	528.00	214.92	3.045E+08
7.	3.174	469.83	1960.14	412.26	528.00	217.78	2.925E+08
8.	3.185	471.20	1995.65	447.27	528.00	207.99	3.307E+08
9.	3.186	615.38	2598.92	1050.56	528.00	199.90	5.052E+08
10.	3.189	485.50	2082.64	532.34	528.00	199.00	3.803E+08

* * * END OF FILE * * *

16G63-3 6-22-16 8:46



XSTABL File: 16G63-3S 6-22-16 8:51

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*                using the              *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 - 2013      *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.209                 96 - 2086 *
*****************************************
```

Problem Description : Seismic Section 3

SEGMENT BOUNDARY COORDINATES

---

8 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1634.0	45.0	1634.0	1
2	45.0	1634.0	73.0	1632.0	1
3	73.0	1632.0	79.0	1634.0	1
4	79.0	1634.0	225.0	1634.0	1
5	225.0	1634.0	261.0	1615.0	1
6	261.0	1615.0	363.0	1615.0	1
7	363.0	1615.0	528.0	1552.0	1
8	528.0	1552.0	627.0	1552.0	1

ISOTROPIC Soil Parameters

---

1 Soil unit(s) specified

Soil Unit	Unit Weight Moist	Unit Weight Sat.	Cohesion Intercept	Friction Angle	Pore Pressure Parameter	Water Surface Constant

No.	(pcf)	(pcf)	(psf)	(deg)	Ru	(psf)	No.
1	110.0	120.0	200.0	33.00	.000	.0	0

A horizontal earthquake loading coefficient
of .150 has been assigned

A vertical earthquake loading coefficient
of .000 has been assigned

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

400 trial surfaces will be generated and analyzed.

20 Surfaces initiate from each of 20 points equally spaced along the ground surface between x = 528.0 ft
and x = 528.0 ft

Each surface terminates between x = 79.0 ft
and x = 225.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

9.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
is specified by 37 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	528.00	1552.00
2	519.00	1552.20
3	510.01	1552.53
4	501.02	1552.99
5	492.04	1553.57
6	483.07	1554.27
7	474.11	1555.11
8	465.16	1556.07
9	456.22	1557.15
10	447.30	1558.36
11	438.40	1559.70
12	429.52	1561.16
13	420.66	1562.74
14	411.83	1564.45
15	403.02	1566.29
16	394.23	1568.24
17	385.47	1570.32
18	376.75	1572.53
19	368.05	1574.85
20	359.39	1577.30
21	350.77	1579.87
22	342.18	1582.56
23	333.63	1585.37
24	325.12	1588.29
25	316.65	1591.34
26	308.23	1594.51
27	299.85	1597.80
28	291.52	1601.20
29	283.23	1604.72
30	275.00	1608.36
31	266.82	1612.11
32	258.69	1615.97
33	250.62	1619.95
34	242.60	1624.04
35	234.65	1628.25
36	226.75	1632.57
37	224.21	1634.00

**** Simplified BISHOP FOS = 1.880 ****

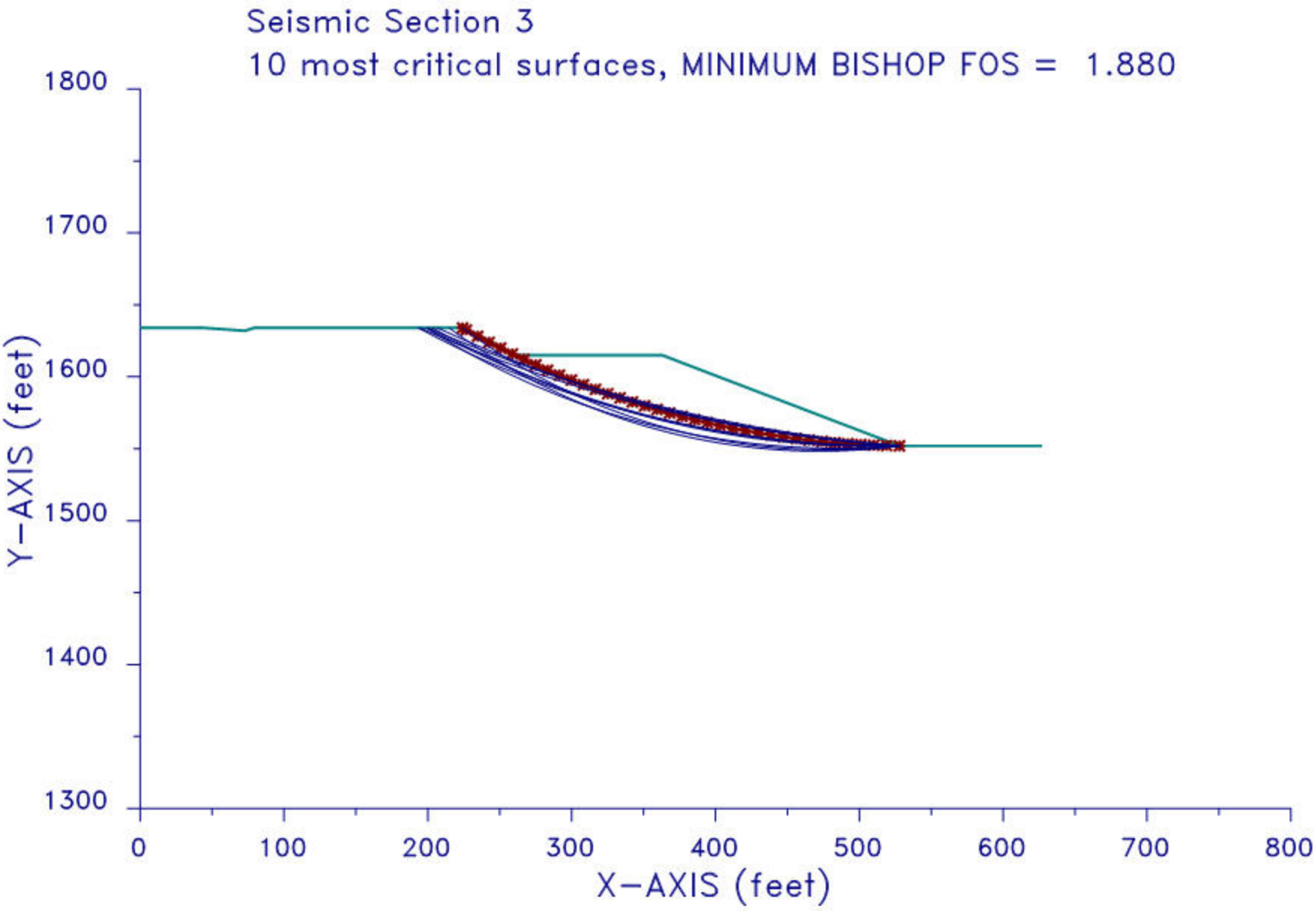
The following is a summary of the TEN most critical surfaces

Problem Description : Seismic Section 3

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.880	537.91	2192.77	640.85	528.00	224.21	2.980E+08
2.	1.885	510.38	2166.65	614.90	528.00	203.26	3.710E+08
3.	1.888	519.45	2215.50	663.55	528.00	199.83	3.953E+08
4.	1.893	587.73	2456.42	906.39	528.00	206.70	4.223E+08
5.	1.895	521.20	2247.50	695.53	528.00	193.44	4.293E+08
6.	1.897	479.07	1974.55	425.38	528.00	224.12	2.654E+08
7.	1.899	485.50	2082.64	532.34	528.00	199.00	3.691E+08
8.	1.903	472.39	1978.69	430.30	528.00	214.92	2.956E+08
9.	1.905	595.31	2544.58	994.86	528.00	194.55	5.025E+08
10.	1.905	615.38	2598.92	1050.56	528.00	199.90	4.899E+08

* * * END OF FILE * * *

16G63-3S 6-22-16 8:51



APPENDIX F

REFERENCES

RMA GeoScience
Every Project Matters | www.rmageoscience.com

APPENDIX F

REFERENCES

1. Squires, R.L. (1997), Geologic profile of Simi Valley. In: Havens, P. and B. Appleton (eds.) Simi Valley - A Journey Through Time. Simi Valley Historical Society and Museum. Pp. 293-301

2. Dibblee, Thomas W. (1992), Geologic Map of the Moorpark Quadrangle, Ventura County, California. Dibblee Geology Center Map #DF-40.

3. Bowers, Stephen (1888), Ventura County, California: California Mining Bureau. Report 8: 679-690.

4. Historical Aerials.com copyright 2009-2016 Nationwide Environmental Title Research, LLC. NETR online, Aerial photographs: 1947, 1967, 1969, 1978, 1980, 1994, 2002, 2005, 2009, 2010, 2012.

5. Historical Aerials.com copyright 2009-2016 Nationwide Environmental Title Research, LLC. NETR online, Historic Topos: 1903, 1909, 1912, 1925, 1927, 1937, 1944, 1952, 1963, 1968, 1970, 1978, 1979.

6. California Division of Mines and Geology, Earthquake Fault Zone Map, Moorpark Quadrangle, Effective date May 1, 1999.

7. California Division of Mines and Geology, Seismic Hazard Zones Map, Moorpark Quadrangle, Effective date November 17, 2000.

8. Federal Emergency Management Agency, 2010, Flood Insurance Rate Maps (FIRM) 06111C0816E and 06111C0817E, effective dates January 20, 2010.
9. California Building Standards Commission, 2013 California Building Code.

10. Google Earth, Aerial Photographs, 1989-2015.

11. California Geologic Survey, Special Publication 117 Guidelines for Evaluating and Mitigating Seismic Hazards in California, 2008.

12. State of California, Department of Conservation, http://www.conservation.ca.gov/cgs/Pages/Index.aspx

13. U.S. Geological Survey, U.S. Seismic Design Maps, htpp://earthquake.usgs.gov/research/hazmaps/design.

RMA GeoScience
Every Project Matters | www.rmageoscience.com

PLATES

ALT. "E"

SUMMARY		
	LOTS	GROSS AREA (AC)
ESTATE LOTS (5 AC MIN.)	5	27.37
SINGLE FAMILY RESIDENCE (6,000 SF MIN.) W/STREETS AND SLOPES	133	30.74
RECREATIONAL LOT W/SLOPES	1	3.17
OFFSITE STREETS / SLOPES		6.68
TOTAL		67.96

SCALE: 1"=200'

0 250' 500'

TRACT 5147

LOT 6 LOT 7 LOT 8 LOT 9 LOT 10

Geologic Map

North Hills - Moorpark, CA

RMA GeoScience

Plate 1

RMA Job No:	16-G63-0
Date:	June 2016
Prepared By:	AMS

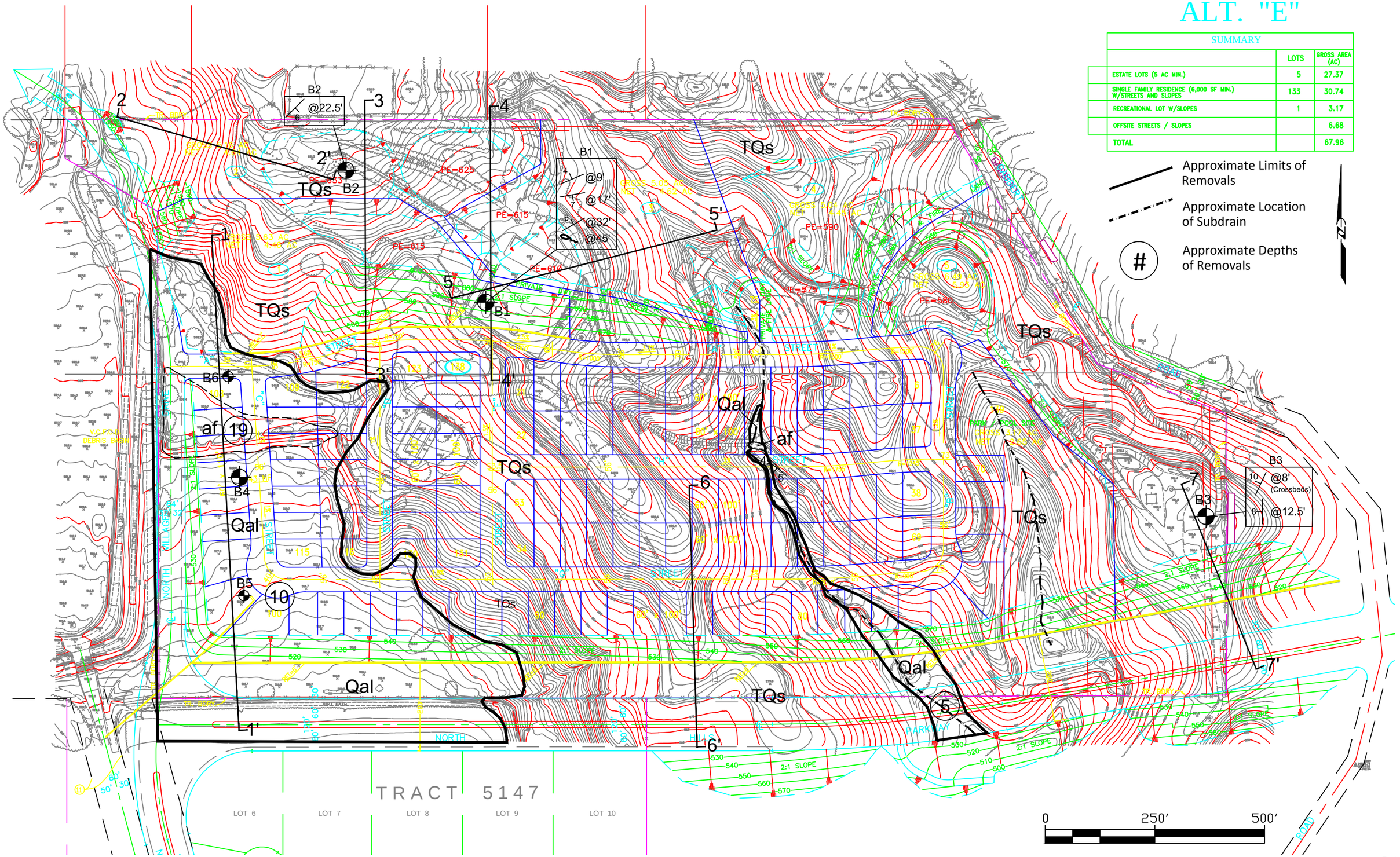
ALT. "E"

SUMMARY		
	LOTS	GROSS AREA (AC)
ESTATE LOTS (5 AC MIN.)	5	27.37
SINGLE FAMILY RESIDENCE (6,000 SF MIN.) W/STREETS AND SLOPES	133	30.74
RECREATIONAL LOT W/SLOPES	1	3.17
OFFSITE STREETS / SLOPES		6.68
TOTAL		67.96

Approximate Limits of Removals

Approximate Location of Subdrain

(#) Approximate Depths of Removals



Limits of Removals & Subdrains

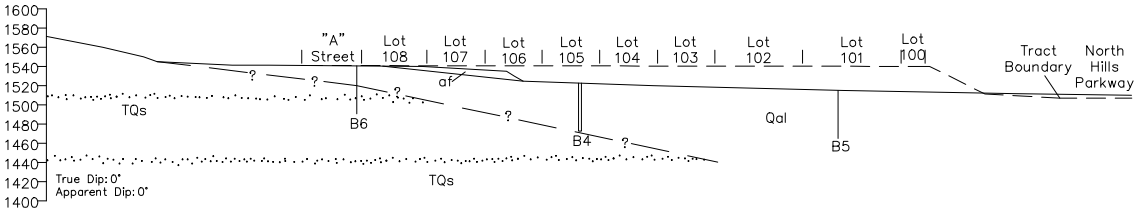
North Hills - Moorpark, CA

RMA GeoScience

Plate 3

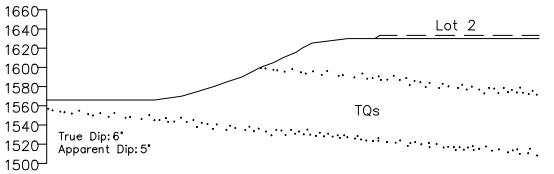
RMA Job No:	16-G63-0
Date:	June 2016
Prepared By:	AMS

1



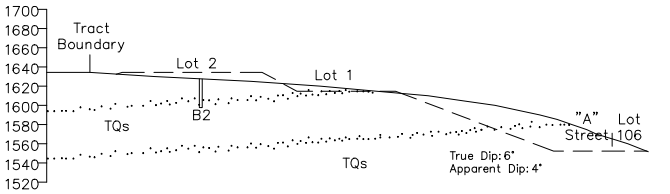
1'

2



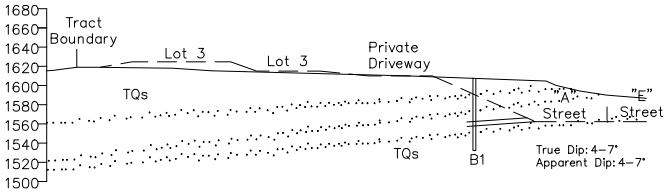
2'

3



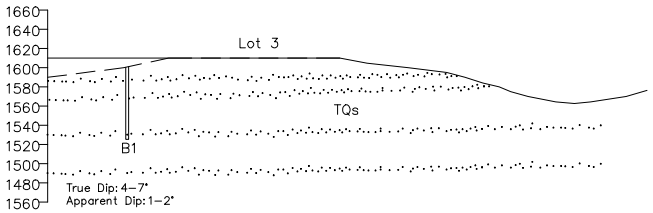
3'

4



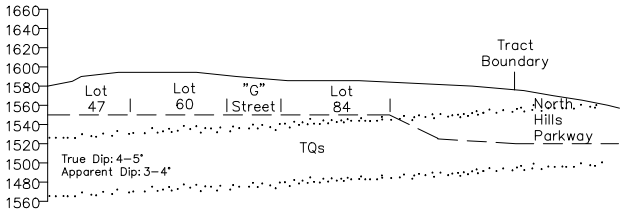
4'

5



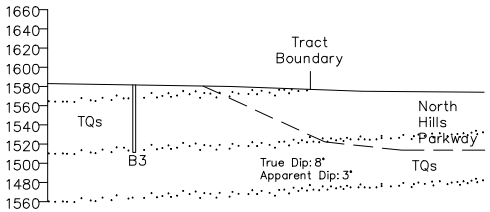
5'

6



6'

7



7'

SCALE: 1"=200'

RMA GeoScience

Geologic Cross Sections

North Hills - Moorpark, CA

Plate 2

RMA Job No:	16-G63-0
Date:	June 2016
Prepared By:	AMS