ENGINEERING GEOLOGIC EXPLORATION UPDATE

Emergency Slope Remediation

Lot 7, Tract 26458

3929 Malibu Vista Drive

Malibu, Los Angeles County, California

for

Ms. Natasha Roit and Ms. Rickley

SG 7430-W **February 10, 2016**

SCHICK GEOTECHNICAL, INC.
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ENGINEERING GEOLOGICY EXPLORATION UPDATE

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3929 Malibu Vista Drive

Malibu, Los Angeles County, California

INTRODUCTION

The following report summarizes the findings of our geologic engineering exploration update performed on a portion of the site. The purpose of this report is to evaluate the nature, distribution, engineering properties, and geologic structure of the earth materials underlying the site with respect to future emergency slope remediation.

Intent

It is the intent of this report to aid in the design and completion of the proposed project. Implementation of the "Conclusions and Recommendations" section of this report is intended to reduce certain risks associated with construction projects. The professional opinions and geotechnical advice contained in this report are subject to the general conditions described in the "Notice" section of this report.

EXPLORATION

The scope of this exploration is based on the preliminary plot plan. It is limited to the area of the

proposed emergency slope remediation, as shown on the enclosed Geologic Map and Cross Section. Office tasks included review of the referenced records and the preparation of this report. Procedures and results of the referenced laboratory testing are presented in Appendix I, which contains a discussion of the testing procedures and results. Surface geologic conditions are shown on the enclosed Geologic Map. Subsurface distribution of the earth materials, and the proposed project are shown on Section A.

PROPOSED PROJECT

Recent survey readings indicate that the site is experiencing movement, therefore, it is proposed to construct an emergency row of soldier piles to enhance the existing stability of the level pad and residence. The swimming pool will be designed to act as a grade beam between the soldier piles and further enhance the stability of the level pad and existing residence. The pool footprint located at the top of the slope will prevent infiltration of site irrigation and rainfall in the underlying fill and soil.

RESEARCH

Research at the Department of Building and Safety was performed in preparation of this report. The following is a summary of information on file:

"Final Compaction Report for Tract 26458," prepared by the Donald R. Warren Company, dated February 6, 1962;

"Geologic report for a deck located at 3925 Malibu Vista Drive," prepared by Mountain Geology, Inc., dated October 2, 1987;

Letter prepared by E. D. Michael, Consulting Geologist, dated February 24, 1993;

"Geotechnical Investigation of Cut Slope Stability, Station No. 214, 18541 Pacific Coast Highway,

Malibu, California," prepared by Leighton and Associates, Inc., dated July 6, 1993;

"Memorandum, Estimate on a Tieback Restraint System, prepared by CalTrans, dated October 25, 1996. "Ultimate factor of safety will be increased from the presently assumed value of 1.00 to approximately 1.19 (2 tier tieback) and 1.24 (3 tier tieback) through the wall toe (attachment A-% to A-11).";

Preliminary Geologic Report for 3929 Malibu Vista Drive, prepared by E. D. Michael, dated December 15, 1996;

"Memorandum, Office of Structural Foundations / Roadway South, "Horizontal Drains", prepared by CalTrans, dated August 12, 1997;

"Active Landslide, Pacific Coast Highway at Topanga Canyon Boulevard," prepared by the County of Los Angeles, dated October 30, 1997;

"Tieback wall at PCH & Topanga Canyon Blvd.," prepared by the State of California, dated April 10, 1998. "*We strongly recommend that the proposed soldier pile-tieback wall project be considered a high priority within the District's projects and expedite its design and construction for this year*.";

"Active Landslide, Pacific Coast Highway & Topanga Canyon Boulevard," prepared by the State of California Department of Transportation, dated April 14, 1998;

"Geotechnical Investigation for Proposed Replacement Residence, Lot 6, Tract 26458," prepared by Hakimian Engineering, dated May 14, 1998. Report concluded that the factors of safety are adequate for the construction of a pile-supported residence;

"Foundation Recommendations & Wall Design," prepared by the State of California, dated September 14, 1998;

"Tieback wall at PCH & Topanga Canyon Blvd.," prepared by the State of California, dated October 6, 1998;

"Slope Review - PCH KP 65.3," prepared by the State of California, dated January 13, 1999. Due to additional bulging at the toe of the slope, "*We strongly recommend that the previously proposed soldier pile tie-back wall project be considered a high priority within the District's projects and expedite its design and construction for this year*.";

Letter to Ella Khierkhahi of Lockwood-Singh & Associates, prepared by the State of California, dated February 17, 1999;

Letter to Christopher Harris from Orlance Lee (Caltrans), prepared by the State of California, dated March 1, 1999;

"Project Plans for Construction on State Highway in Los Angeles County Near Malibu, Route 1/27 Junction, KP 65.3, PM 40.8, Contract No. 07-181804, prepared by CalTrans, dated March 3, 1999;

Work Plan for Installing and Monitoring Inclinometers and Perform Geologic Review for State Route 1, Topanga Canyon Landslide," prepared by URS Greiner Woodward Clyde, dated July 16, 1999;

"Geotechnical Data report prepared for 3929 Malibu Vista Drive," by URS Greiner Woodward Clyde, dated May 15, 2000;

"Geotechnical Engineering and Geologic Investigation and Report for Existing One-Story Addition, at 3925 Malibu Vista Drive, Los Angeles County, California," prepared by Ralph Stone and Company, Inc., dated September 7, 2007;

Soils Engineering Review Sheet, County of Los Angeles, B.P. P.C. No. 61100057, dated November 29, 2007;

Geologic Review Sheet, County of Los Angeles, B.P. P.C. No. 61100057, dated December 24, 2007;

"Addendum No. 1. Response to County Geologic and Soils Engineering Review Sheets to Geotechnical Engineering and Geologic Investigation and Report for Existing One-Story Addition, at 3925 Malibu Vista Drive, Los Angeles County, California," prepared by Ralph Stone and Company, Inc., dated March 28, 2008.

Work performed by CalTrans included installation of a system of tie-backs with walers and 270-foot long horizontal drains at the toe of the offsite cut slope. The tie-backs/walers and dewatering horizontal drains increased the pre-existing factor of safety, however, did not achieve a 1.5 factor of safety.

SITE DESCRIPTION

The subject property consists of a partially graded lot located west of the southwestern portion of Malibu Vista Drive, in the Coastline area of Malibu, Los Angeles County, California. The site is presently occupied by a single family residence with an attached two-car garage. Past grading associated with construction of the level pad consisted of placing fill as a part of the original tract development. The rear yard slope descends below the level pad and residence at approximately a 1.5 gradient to the gently sloping rear vacant lot. Below the lot, the cut slope descends at

approximately a 1:1gradient to Pacific Coast Highway. The cut slope was provided with 4 paved drainage terraces. Vegetation on the site consists of domestic trees, shrubs, and groundcover. Drainage from the rear portion of the site flows down the contours over the rear yard slope. Seeps, springs, and groundwater were not encountered during our exploration.

EARTH MATERIALS

Fill

The compacted fill on the level pad was placed in 1961 and 1962 as a part of grading performed for Tract 26458, under the observation of the Donald R. Warren Company. The fill consists of sandy silt and silty sand with clay binder which is medium brown, loose and contains occasional rocks and roots.

Alluvial Terrace

The alluvial terrace encountered in the test pits consists of sandy silt and silty sand with clay binder which is medium reddish brown, slightly porous, dense, and contains rounded pebbles and cobbles. The contact between the alluvial terrace and underlying bedrock reportedly consists of an 'abrasion platform" encountered by HE at elevation 180 and 185, resulting in a thickness of 0 to 44 feet thick.

Bedrock

Bedrock encountered by the referenced RTF&A exploration was described as interbedded Chico Martinez sandstone, siltstone, siliceous siltstone, shale, and claystone. The rock was described as weathered and oxidized to 30 to 43 feet (Hakimian encountered bedrock at 43 to 44 feet at 3925 Malibu Vista). The bedding planes reportedly mapped below the slide generally strike northwest and

dip north approximately 50 degrees. The orientation of the bedding planes within the competent bedrock are favorably oriented.

Landslide

The historic landslide located at the toe of the slope below 3925 and 3929 Malibu Vista Drive initially experienced periodic shallow slides. Slope movement eventually encroached from the Station property at the toe of the cut slope eastward to the adjoining residential properties. The slope reportedly experienced additional movement on July 21, 1971 after the 1971 San Fernando earthquake, causing "slope cracking." Following the 1971 movement, additional movement reportedly occurred in early 1980 following the heavy winter rains of 1977-78. Slide removal was performed in 1980 under the supervision of Robert Stone & Associates for the owner of the gas station. The referenced Leighton report states, "No significant slide movement or further headward encroachment in the upper area, however, appears to have occurred since about 1985." CalTrans performed stabilization in 2000, consisting of a waler/tieback retaining system near the toe of the slope. The waler/tieback wall consists of 560 linear feet with concrete lagging in seven levels. The reported design resulted in an increase in the factor of safety from the pre-existing 1.0 to the current 1.16 - 1.40.

SEISMIC CONDITIONS

The Southern California region is located within a tectonically active portion of the earth's crust which has produced both small and sizeable earthquakes throughout recorded history and before. As the earth's crust continuously adjusts itself, stresses and strains are built up along discontinuities, referred to as faults. Faults can be generally classified as active, potentially active, or inactive.

Faults are considered active if they have produced seismic activity within the past 11,000 years. Faults are considered potentially active if there has been seismic activity along the fault between 11,000 and 1,000,000 years. Inactive faults have not produced any seismic activity within the past 1,000,000 years. In an effort to better inform the public regarding seismic risk, the State of California passed the Alquist-Priolo Special Studies Act in 1972 following the 1971 San Fernando Earthquake. Active faults within the state were identified and zones were established limiting construction within the zones. Following the damaging 1989 Loma Prieta Earthquake, the state enacted the Seismic Hazard Mapping Act (SHMA) in 1990. The Department of Conservation was empowered to prepare a set of maps designating areas within Los Angeles and a portion of Ventura Counties which are susceptible to seismic slope instability and liquefaction. Recently, real estate disclosure laws have been modified to require disclosure if a property is affected by the Alquist-Priolo Earthquake Fault Zoning Act and the Seismic Hazard Mapping Act. As of March 1, 1998, either the Local Option Real Estate Transfer disclosure Statement or The Natural Hazard Disclosure Statement is required for disclosures. The subject property is not located within any special studies zone (Alquist-Priolo Act, 1972) and no known active fault crosses the site. Active and potentially active faults in the vicinity of the subject property are listed in the following Table I. Following the 1994 Northridge Earthquake, the Department of Conservation, Division of Mines and Geology established areas which are considered to be susceptible to seismically-induced slope failure and liquefaction. These seismic safety zones were published as a series of maps, initially released in 1996. Strong ground motion associated with large earthquakes can cause slopes to become unstable and experience slumping, landsliding and/or block failure.

The following table lists known active faults within the southern California area which could

theoretically produce a sizable earthquake during the expected occupancy period of the property. UBC categories have been established for active faults in accordance with Table 16-U in the 1997 UBC. Faults within category A exhibit magnitudes greater than or equal to 7.0 and slip rates greater than or equal to 5mm/year and have a high rate of seismic activity. Category B faults exhibit magnitudes up to magnitude 7.0, but with slip rates less than 5mm/year.

The following fault distances were obtained using GPS Visualizer and EQFault.

(Latitude 34.0411; / Longitude -118.5774)

Fault	**UBC Category**	**Distance from Site** (miles)	**Maximum Credible Earthquake** (Richter Magnitude)*	**Risk of Earthquake during Occupancy**
San Andreas	A	43.2	8.0	moderate
Newport-Inglewood	B	11.9	6.9	low to moderate
Malibu	B	1.9	6.7	low
Hollywood	B	10.3	6.7	low
Raymond	B	21.3	6.5	low to moderate
Sierra Madre	B	20.8	6.7	moderate
Santa Susana	B	19.8	6.6	low to moderate
Compton Thrust	B	14.9	6.3	low to moderate
Simi-Santa Rosa	B	22.1	6.7	low
Verdugo	B	19.4	6.7	low
Elysian Park Thrust	B	21.0	6.7	moderate
Palos Verdes	B	5.3	7.1	low
Oak Ridge	B	24.2	6.9	low
Satna Monica	B	2.2	6.8	low
Unknown fault	?	?	?	moderate

Table I - Active Faults within the Los Angeles - Ventura County area

* Data obtained from Los Angeles County Seismic Safety Element, 1990; Annual Technical Report, July 1994, Southern California Earthquake Center; Seismic Hazards Study of Ventura County, 1975; and ICBO publication, Maps of Known Active Fault Near-Source Zones, California Division of Mines and Geology, 1998.

HISTORIC EARTHQUAKES

1971 San Fernando Earthquake

On February 9, 1971 a Richter Magnitude 6.4 earthquake occurred along a frontal fault system of the San Gabriel Mountains. In general, one-story buildings performed substantially better than two-story buildings and much better than combination one and two-story buildings. There was no noticeable difference between the performance of concrete-slab floors and wood-joist floors. Considerable damage was experienced by unreinforced masonry structures. Local characteristics of the underlying soils played a significant role in structural performance during the earthquake.

1994 Northridge Earthquake

The subject property is located approximately 15.0 miles southeast of the epicenter of the January 17, 1994 Northridge earthquake which measured 6.7 on the Richter magnitude scale. The subject property experienced strong ground shaking during the earthquake, however no secondary effects caused by the earthquake, such as liquefaction, seismically-induced landsliding or differential settlement were observed at the site.

FUTURE SEISMICITY

All of southern California is subject to periodic ground shaking from earthquake activity. Sites and

structures can experience significant damage during strong seismic shaking. Foundation conditions and the seismic/structural design of the structure greatly affect how the structures will perform during earthquake loading. Significant damage can occur to the site and structures during a strong seismic event. Strong ground shaking can also cause movement of the earth materials on the site which may not be predictable. The principal seismic hazard to the site from a geologic standpoint is strong ground shaking.

Seismic Design

The seismic factors listed in the following table can be used in the structural design. The seismic factors were determined based on the findings of the field exploration and in accordance with 2013 California Building Code and 2014 City of Los Angeles Building Code.

Seismic Factors	Value	Reference
Site Class	D	Chapter 20 of ASCE 7
Mapped Spectral Response Acceleration at 0.2 second Period (Ss)	2.260g	Figure 1613.3.1(1)/ CBC
Mapped Spectral Response Acceleration at 1.0 second Period (S_1)	0.834g	Figure 1613.3.1(2)/ CBC
Site Coefficient Fa	1.0	Table 1613.3.3(1)/CBC
Site Coefficient Fv	1.3	Table 1613.3.3(2)/CBC
Maximum Considered Earthquake Spectral Response Acceleration at 0.2 second Period (Sms)	2.260g	Equation 16-37/CBC
Maximum Considered Earthquake Spectral Response Acceleration at 1.0 second Period (Sm_1)	1.252g	Equation 16-38/CBC
Design Spectral Response Acceleration at 0.2 second Period (Sds)	1.506g	Equation 16-39/CBC
Design Spectral Response Acceleration at 1.0 second Period (Sd_1)	0.834g	Equation 16-40/CBC
Seismic Design Category	D	Chapter 20 of ASCE 7

SLOPE STABILITY

The enclosed stability calculations indicate that the descending slope has a factor of safety of 1.16 to 1.4. The factor of safety will remain less than a 1.5, however, the proposed row of soldier piles will locally inprove the factor of safety for the level pad and residence. It is not feasible to increase the factor of safety for the subject property to a 1.5 without the involvement of the adjoining properties.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the research it is the opinion of SGI that construction of the emergency soldier piles (with a swimming pool) is feasible from an engineering geologic standpoint provided the advice and recommendations contained in this report are included in the plans and are properly implemented during construction.

The recommended bearing material for the row of soldier piles is the competent bedrock, encountered at approximately 30 to 43 feet below existing grade. The existing tiebacks with walers and horizontal drains which were constructed by Caltrans at the lower portion of the descending cut slope have increased the factor of safety, however, the slope does not have a 1.5 factor of safety. This report should be recorded with the Los Angeles County Recorder's office.

111 Statement

Providing the recommendations contained in this report are properly implemented, the proposed construction will not adversely affect any of the adjoining properties.

Soldier Piles

The proposed swimming pool shall be supported on a series of soldier piles placed below the "1.25 Factor of Safety Line" shown on Geologic Cross Section B-B'. The minimum soldier pile diameter is thirty six inches (36"). All soldier piles should extend below the "1.25 Factor of Safety Line" a minimum of twenty feet (20'). The vertical capacity of the soldier piles will be based upon a skin friction value of seven hundred pounds per square foot (700 psf) per foot of shaft extending below the "1.25 Factor of Safety Line". All soldier piles should be tied together in both directions with grade beams. Soldier piles shall be designed to resist a lateral force of seventy one and two tenths pounds per lineal foot (71.2plf) for each foot of shaft above the "1.25 Factor of Safety Line per foot of width between each pile. All soldier piles shall be placed under the continuous review of the project Geotechnical Engineer.

Lateral Load Design-Friction Piles

Lateral loads may be resisted by passive resistance within the bedrock located below the "1.25 Factor of Safety Line". The passive resistance may be assumed to act as a fluid with a density of seven hundred pounds per cubic foot (700 pcf). The maximum earth pressure that may be used is eight thousand pounds per square foot (8000psf). Pile foundations are considered isolated when separated by a distance equal to three pile diameters. The allowable passive earth pressure, in this case, can be doubled. If the pool support system will consist of grade beams and piles the piles and grade beams may be designed as moment resisting frames which will reduce the bending moment within the piles.

SWIMMING POOL AND SPA

The proposed swimming pool and spa may be constructed using a free-standing shell design. The pool and spa must derive support entirely from the competent bedrock which will require soldier piles. The pool walls should be designed for an inward pressure of 60 pounds per cubic foot. The pool may be supported by the recommended row of soldier piles.

Foundation Setback

The Building Code requires that foundations be a sufficient depth to provide a horizontal setback from the descending slope. The required setback is 1/3 the height of the slope with a minimum of five feet and a maximum of 40 feet from the base of the foundation to the slope face.

Excavation Characteristics

The test pits did not encounter hard to excavate materials, however, hard to excavate areas may be encountered and require coring or jackhammers.

Foundation Settlement

Settlement of the proposed foundation system is expected to occur on initial application of loading. A settlement of ¼ to ½-inch may be anticipated, however the differential settlement should not exceed ¼-inch.

DRAINAGE

Pad and roof drainage must be collected and transferred to the street in non-erosive drainage devices. Drainage must not be allowed to pond on the pad or against any foundation. Drainage must be

prevented from flowing over any slope in a concentrated form.

PLAN REVIEW

Formal plans ready for submittal to the Building Department must be reviewed by SGI. Any change in scope of the project may require additional work.

SITE OBSERVATION

It is required that all foundation excavations and the pool excavation be observed by the geologist prior to placing forms, concrete, or steel. Should the observations reveal any unforeseen hazard, the geologist will provide additional recommendations.

CONSTRUCTION SITE MAINTENANCE

It is the responsibility of the contractor to maintain a safe construction site per OSHA requirements.

Please call this office with any questions. This report and the exploration are subject to the following NOTICE. Please read the Notice carefully, as it limits our liability.

NOTICE

In the event of any changes in the design or location of any structure, as outlined in this report, the conclusions and recommendations contained herein may not be considered valid unless the changes are reviewed by us and the conclusions and recommendations are modified or reaffirmed after such review.

The subsurface conditions, excavation characteristics, and geologic structure described herein and shown on the enclosed cross section have been projected from excavations on the site as indicated and should in no way be construed to reflect any variations that may occur between these excavations or that may result from changes in subsurface conditions.

Fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, irrigation, and other factors not evident at the time of the measurements reported herein.

Fluctuations also may occur across the site. High groundwater levels can be extremely hazardous. Saturation of earth materials can cause subsidence or slippage of the site.

If conditions encountered during construction appear to differ from those disclosed herein, notify us immediately so we may consider the need for modifications. Compliance with the design concepts, specifications or recommendations during construction requires the review of the engineering geologist engineer during the course of construction.

THE EXPLORATION WAS PERFORMED ONLY ON A PORTION OF THE SITE, AND CANNOT BE CONSIDERED AS INDICATIVE OF THE PORTIONS OF THE SITE NOT EXPLORED.

This report is issued and made for the sole use and benefit of the client, is not transferable and is as of the exploration date. Any liability in connection herewith shall not exceed the fee for the exploration. No warranty, expressed or implied, is made or intended in connection with the above exploration or by the furnishing of this report or by any other oral or written statement.

THIS REPORT WAS PREPARED ON THE BASIS OF THE PRELIMINARY DEVELOPMENT PLAN FURNISHED. FINAL PLANS SHOULD BE REVIEWED BY THIS OFFICE AS ADDITIONAL GEOTECHNICAL WORK MAY BE REQUIRED.

Schick Geotechnical, Inc. has reviewed, concurs with, and accepts responsibility for the enclosed laboratory testing and slope stability analyses.

Respectfully submitted,

WAYNE SCHICK
C.E.G. 1300

Gary C. Masterman
R.G.E. 567

Enc:

Appendix I - Laboratory Testing from referenced reports
Slope Stability Analyses - from referenced reports
Pocket: Geologic Map and Section A

xc: (4) Addressee

10954 Santa Monica Blvd.
Los Angeles, CA 90025
(800) 813-9613
(310) 478-1501

RALPH STONE & COMPANY, INC.

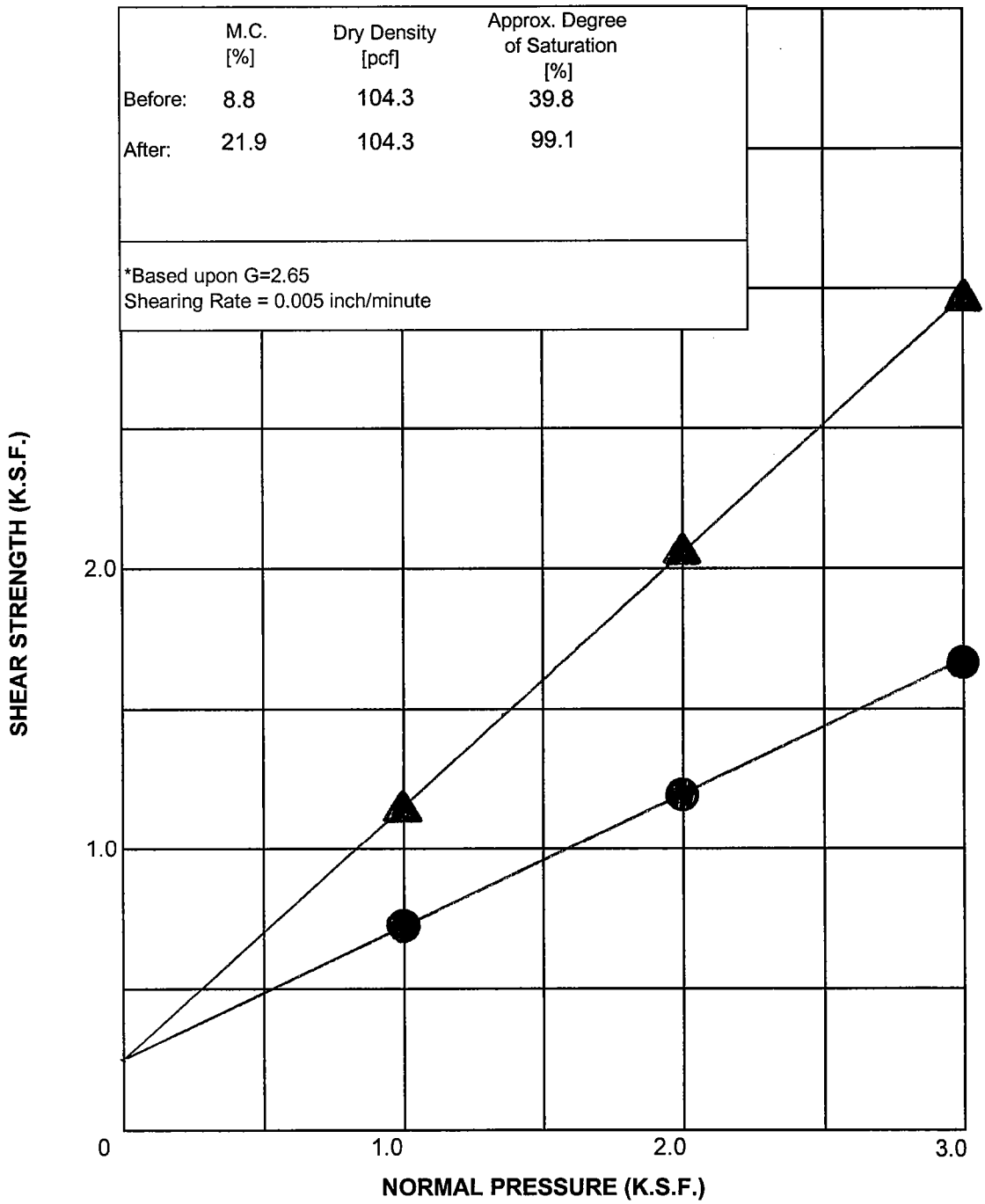
Geotechnical Engineers

DIRECT SHEAR

SYMBOL	SAMPLE TYPE	LOCATION	DEPTH (feet)	ϕ (degrees)	C (P.S.F.)
	Artificial Fill: silty sand w/ gravel	B-1	4.5		
▲	saturated, ultimate			42°	250
●	saturated, residual			25°	250

	M.C. [%]	Dry Density [pcf]	Approx. Degree of Saturation [%]
Before:	8.8	104.3	39.8
After:	21.9	104.3	99.1

*Based upon G=2.65
Shearing Rate = 0.005 inch/minute



FILE NO.: 6272

CLIENT: Goodfriend

PLATE: 5a

10954 Santa Monica Blvd.
Los Angeles, CA 90025
(800) 813-9613
(310) 478-1501

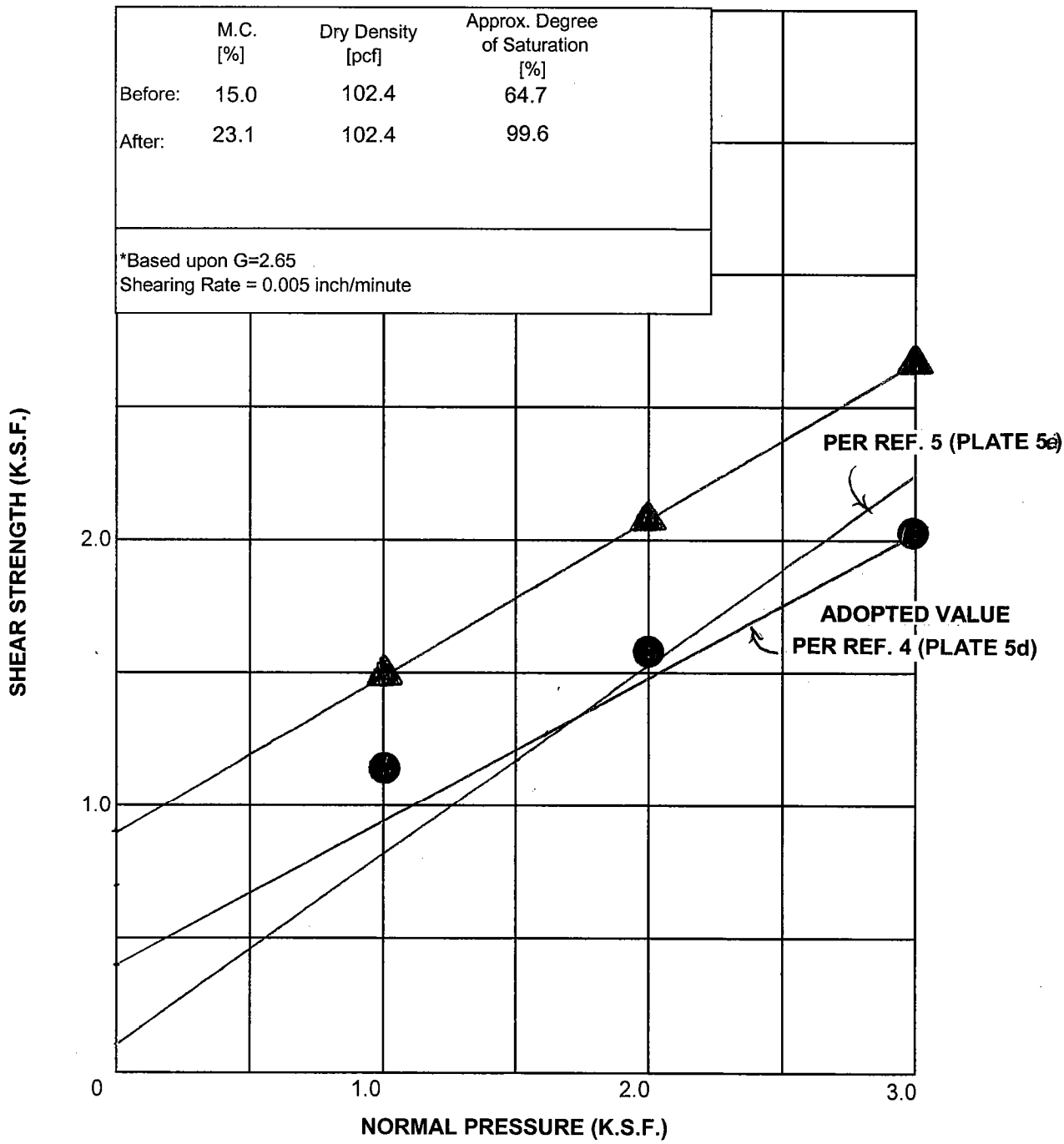
RALPH STONE & COMPANY, INC.
Geotechnical Engineers

DIRECT SHEAR

SYMBOL	SAMPLE TYPE	LOCATION	DEPTH (feet)	ϕ (degrees)	C (P.S.F.)
	Terrace Deposits: silty sand w/ gravel	B-1	9.5		
	saturated, ultimate			30°	900
	saturated, residual			29°	400

	M.C. [%]	Dry Density [pcf]	Approx. Degree of Saturation [%]
Before:	15.0	102.4	64.7
After:	23.1	102.4	99.6

*Based upon G=2.65
Shearing Rate = 0.005 inch/minute



FILE NO.: 6272

CLIENT: Goodfriend

PLATE: 5b

10954 Santa Monica Blvd.
Los Angeles, CA 90025
(800) 813-9613
(310) 478-1501

RALPH STONE & COMPANY, INC.
Geotechnical Engineers

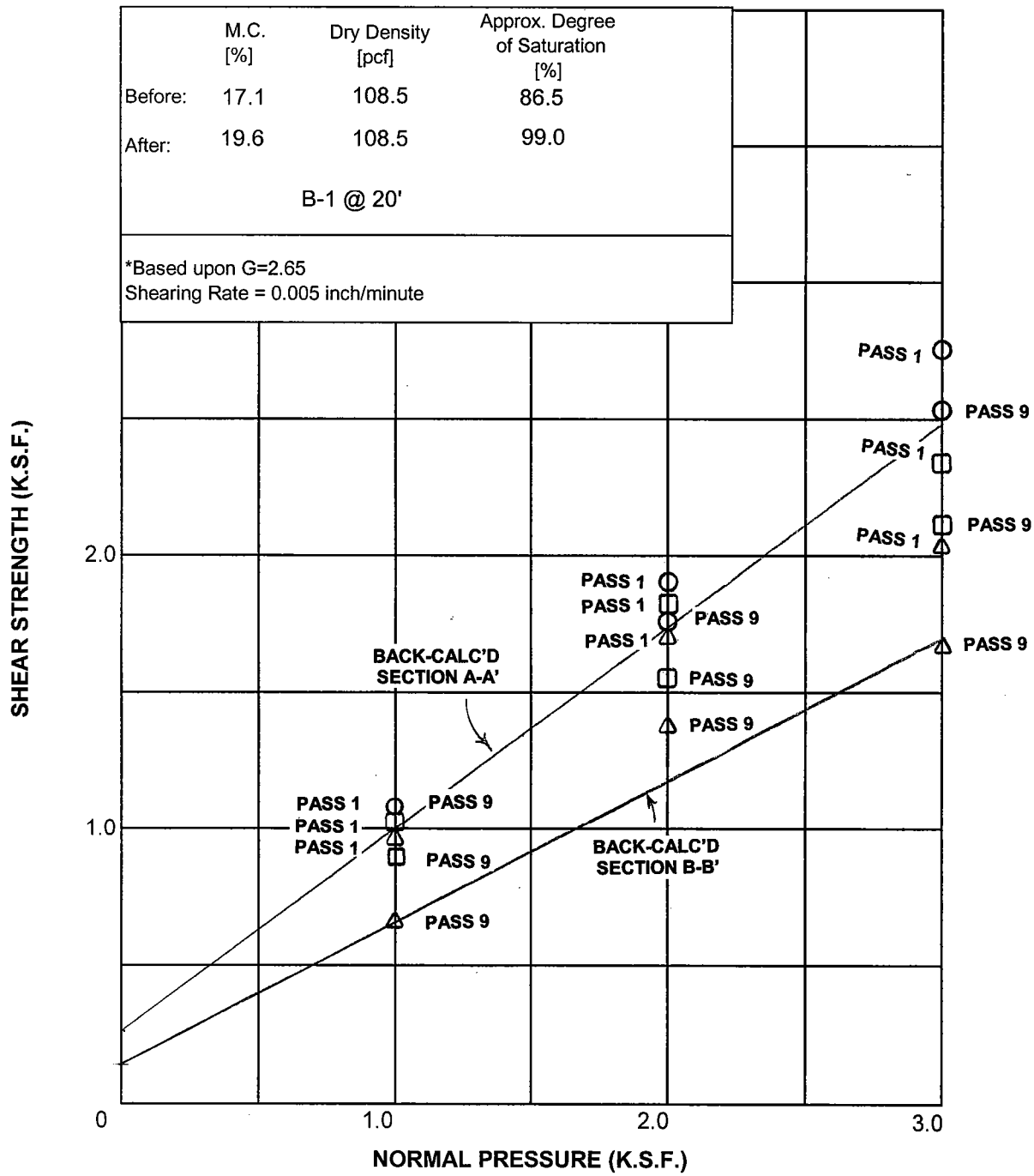
DIRECT SHEAR

SYMBOL	SAMPLE TYPE	LOCATION	DEPTH (feet)	ϕ (degrees)	C (P.S.F.)
○ △ □	Bedrock: sandstone	B-1	20, 40, 60		
	saturated, residual, Section A-A'			36°	260
	saturated, residual, Section B-B'			27°	135

	M.C. [%]	Dry Density [pcf]	Approx. Degree of Saturation [%]
Before:	17.1	108.5	86.5
After:	19.6	108.5	99.0

B-1 @ 20'

*Based upon G=2.65
Shearing Rate = 0.005 inch/minute

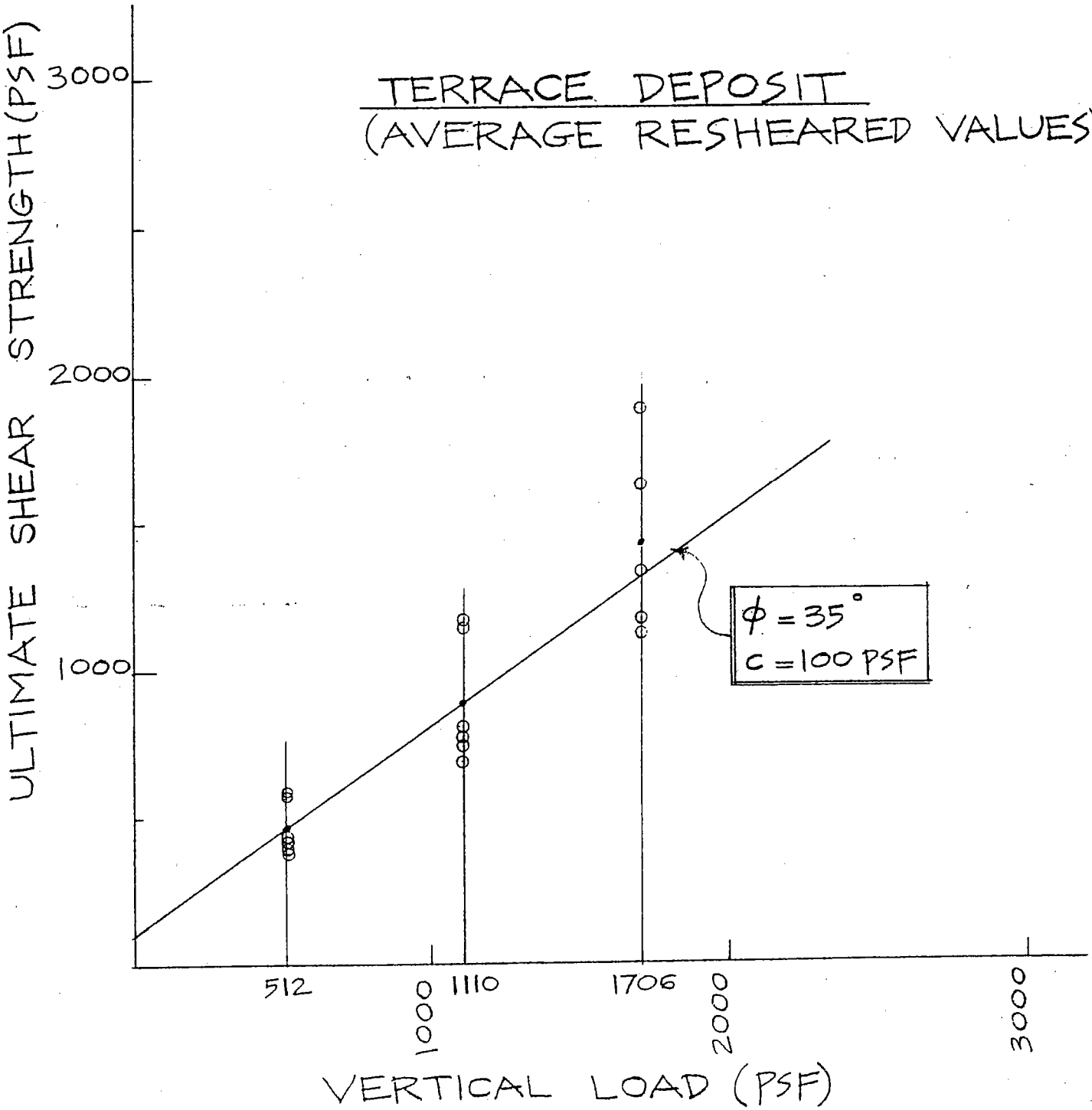


FILE NO.: 6272

CLIENT: Goodfriend

PLATE: 5c

TERRACE DEPOSIT
(AVERAGE RESHEARED VALUES)



HAKIMIAN ENGINEERING, INC.

13003 LADANA COURT
SANTA FE SPRINGS, CA 90670
(562) 946-7783

MR. & MRS. GOODFRIEND
3925 MALIBU VISTA DR.
MALIBU, CA

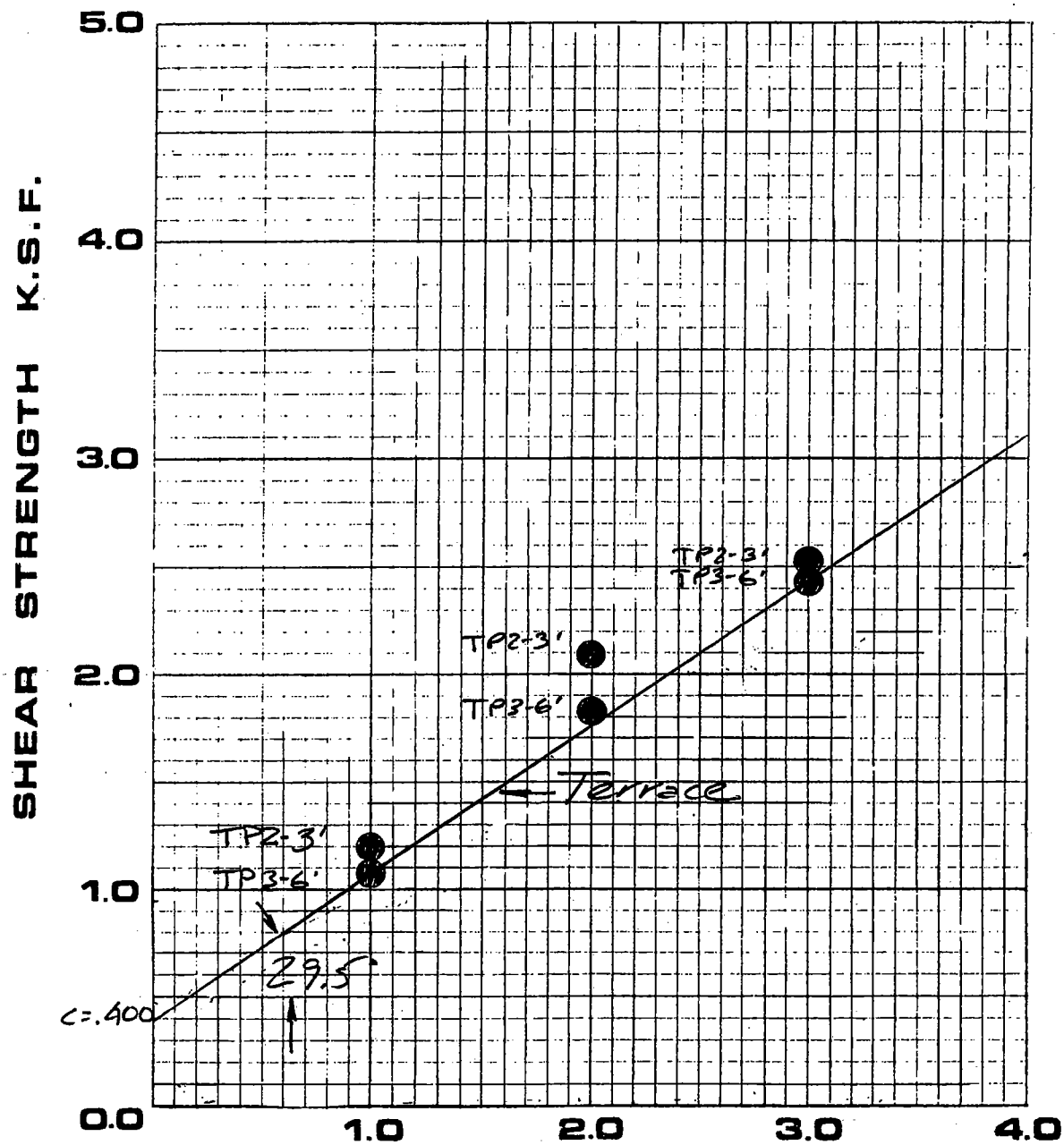
DATE	JOB NO.	PLATE
5-8-98	GT 94-0913A	XVII

PLATE: 5d

PROJECT GOODFRIEND JOB NO JH1984

SAMPLE AS NOTED DATE 10/87

SHEAR TEST DIAGRAM



O DIRECT SHEAR AT FIELD MOISTURE
● DIRECT SHEAR, SATURATED
U UNCONFINED COMPRESSION TEST

PLATE: 5e

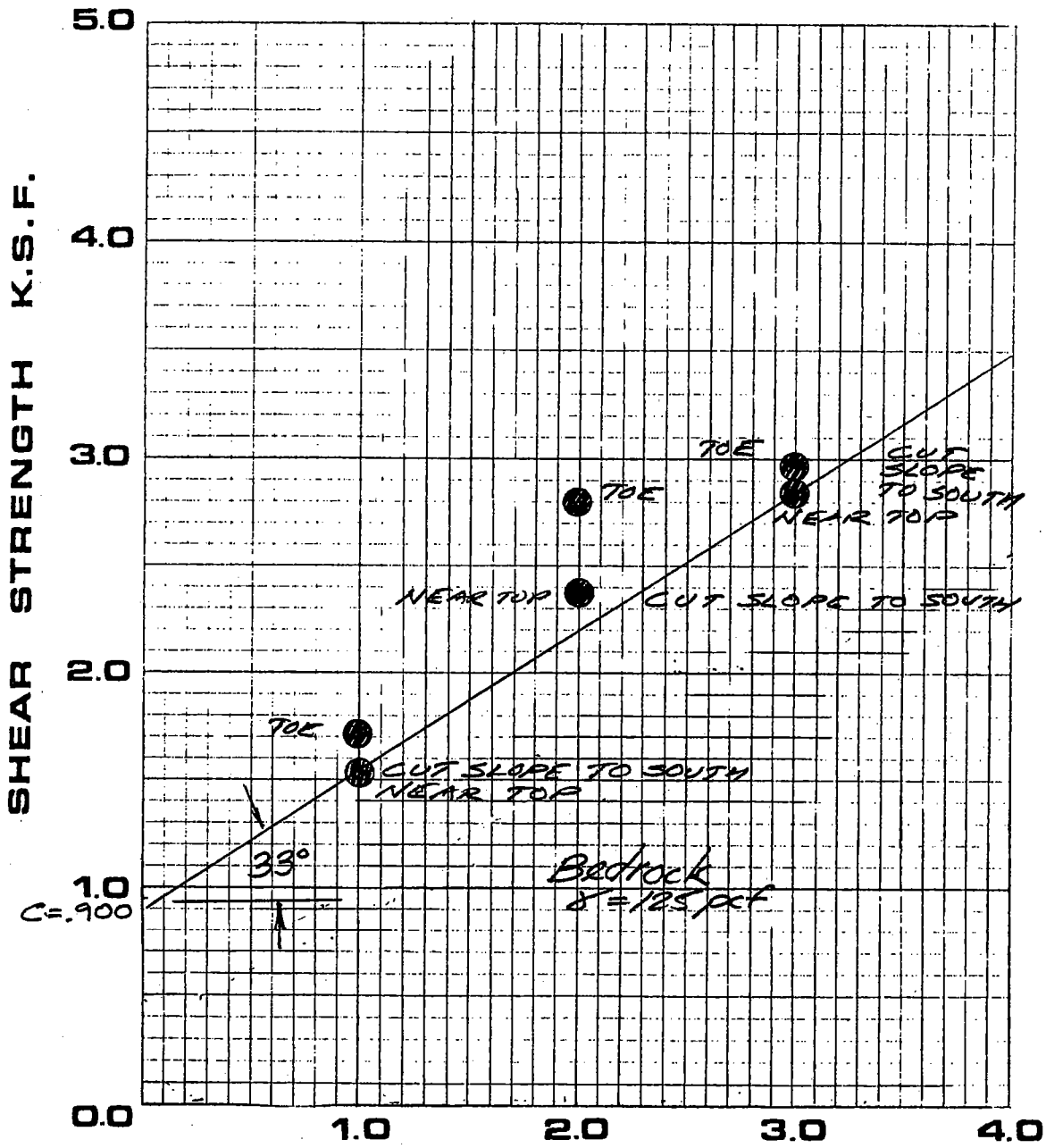
West Coast Soils

PLATE B

PROJECT GOODFRIEND JOB NO JH1984

SAMPLE AS NOTED DATE 10/87

SHEAR TEST DIAGRAM



NORMAL PRESSURE K.S.F.

O DIRECT SHEAR AT FIELD MOISTURE
● DIRECT SHEAR, SATURATED
U UNCONFINED COMPRESSION TEST

PLATE: 5f

West Coast Soils

PLATE B-2

EXPANSION INDEX SOIL TESTS WERE
PERFORMED IN ACCORDANCE WITH ASTM D4829

THE TEST RESULTS ARE AS FOLLOWS:

SAMPLE TYPE	SOIL TYPE	LOCATION	EXPANSION INDEX	EXPANSION POTENTIAL
Fill	Silty Sand	B-1 0-5'	0	Very Low

EXPANSION INDEX	EXPANSION POTENTIAL
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

Table 18-I-B-Classification of Expansive Soil
(Source: California Building Code)

EXPANSION INDEX DATA

CLIENT: Goodfriend	SITE LOCATION	
FILE: 6272	3925 Malibu Vista Drive Los Angeles County, California	PLATE: 6

RALPH STONE AND COMPANY, INC.
10954 Santa Monica Blvd.
Los Angeles CA 90025
(310)478-1501
Fax(310)478-7359

CHLORIDE/SULFATE/RESISTIVITY/pH TEST RESULTS

Test	Sample Location	Sample Depth	Soil Type	Chloride (ppm)	Sulfate (ppm)	Resistivity (ohm-cm)	pH
#1	B-1	0-5'	Artificial Fill	42	134	2240	6.8
#2	B-1	5-10'	Terrace Deposits	35	200	2080	7.2
#3	B-1	35'	Bedrock	18	32	2760	8.4

DEFINITION:

Test	Value	Action (for concrete)	Source
Chloride	≥10,000 ppm	Mitigation Required	LA County Dept. of Public Works
	<10,000 ppm	Mitigation Usually Not Required	
Sulfates	>2000 ppm,(soil)	Mitigation Required	LA County Dept. of Public Works
	>1000 ppm in ground water	Mitigation Required	
pH	<4	Mitigation Required	LA County Dept. of Public Works
	≥4	Mitigation Usually Not Required	

RESISTIVITY

Soil Resistivity, Ohm-cm	Corrosivity Category (for metal)
0-1,000	Severly Corrosive
1,000-2000	Corrosive
2,000-10,000	Moderately Corrosive
Over 10,000	Mildly Corrosive

*Source: LA County Dept. of Public Works

CLIENT: Goodfriend	SAMPLED BY: AN	TEST BY: SCHIFF ASSOCIATES
FILE: 6272		Plate: 7a

Table 1 - Laboratory Tests on Soil Samples

Ralph Stone and Co., Inc
Goodfriend, Los Angeles, CA
Your #6272, SA #07-0532LAB
12-Apr-07

Sample ID			B-1 0'-5' Fill	B-1 5'-10' Terrace	B-1 35' Bedrock
Resistivity		**Units**			
as-received		ohm-cm	68,000	60,000	29,600
minimum		ohm-cm	2,240	2,080	2,760
pH			6.8	7.2	8.4
Electrical Conductivity		mS/cm	0.17	0.22	0.14
Chemical Analyses					
Cations					
calcium	Ca^{2+}	mg/kg	23	68	23
magnesium	Mg^{2+}	mg/kg	16	24	12
sodium	Na^{1+}	mg/kg	116	134	119
potassium	K^{1+}	mg/kg	8.2	7.1	12
Anions					
carbonate	CO_3^{2-}	mg/kg	ND	ND	30
bicarbonate	HCO_3^{1-}	mg/kg	88	122	159
flouride	F^{1-}	mg/kg	1.0	0.9	7.2
chloride	Cl^{1-}	mg/kg	42	35	18
sulfate	SO_4^{2-}	mg/kg	134	200	32
phosphate	PO_4^{3-}	mg/kg	1.1	2.6	ND
Other Tests					
ammonium	NH_4^{1+}	mg/kg	1.0	2.4	0.9
nitrate	NO_3^{1-}	mg/kg	1.6	0.5	ND
sulfide	S^{2-}	qual	na	na	na
Redox		mV	na	na	na

Minimum resistivity per CTM 643

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

431 West Baseline Road · Claremont, CA 91711
Phone: 909.626.0967 · Fax: 909.626.3316

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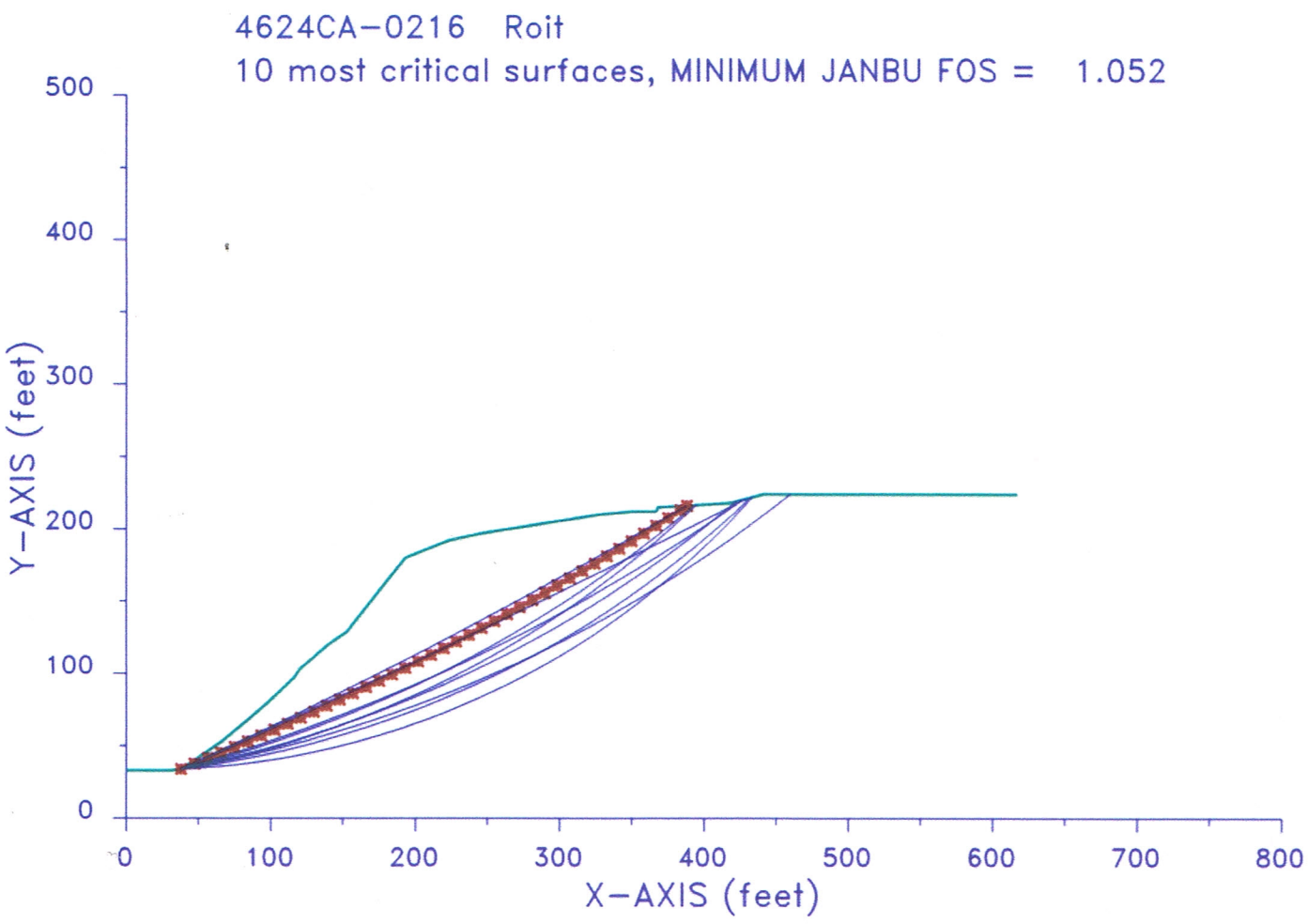

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*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
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Problem Description : 4624CA-0216 Roit

SEGMENT BOUNDARY COORDINATES

---

21 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	33.0	31.0	33.0	1
2	31.0	33.0	38.0	34.0	1
3	38.0	34.0	47.0	40.0	1
4	47.0	40.0	66.0	53.0	1
5	66.0	53.0	83.0	67.0	1
6	83.0	67.0	97.0	79.0	1
7	97.0	79.0	116.0	97.0	1
8	116.0	97.0	120.0	103.0	1
9	120.0	103.0	140.0	120.0	1
10	140.0	120.0	153.0	129.0	1
11	153.0	129.0	193.0	180.0	1
12	193.0	180.0	223.0	192.0	1
13	223.0	192.0	246.0	197.0	1
14	246.0	197.0	327.0	210.0	1
15	327.0	210.0	349.0	212.0	1
16	349.0	212.0	367.0	212.0	1
17	367.0	212.0	368.0	215.0	1
18	368.0	215.0	418.0	218.0	1
19	418.0	218.0	441.0	224.0	1
20	441.0	224.0	521.0	224.0	1

21	521.0	224.0	617.0	224.0	1

ISOTROPIC Soil Parameters
---

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Water Constant (psf)	Surface No.
1	130.0	130.0	135.0	27.00	.000	.0	0
2	130.0	130.0	260.0	36.00	.000	.0	0

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

20 trial surfaces will be generated and analyzed.

20 Surfaces initiate from each of 1 points equally spaced along the ground surface between x = 38.0 ft
and x = 38.0 ft

Each surface terminates between x = 380.0 ft
and x = 600.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = 34.0 ft

10.0 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 JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 41 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.27	37.74
3	56.53	41.53
4	65.76	45.36
5	74.98	49.24
6	84.18	53.17
7	93.36	57.14
8	102.51	61.16
9	111.65	65.22
10	120.77	69.33
11	129.86	73.49
12	138.94	77.69
13	147.99	81.93
14	157.02	86.22
15	166.04	90.56
16	175.03	94.94
17	183.99	99.36
18	192.94	103.83
19	201.86	108.35
20	210.76	112.91
21	219.64	117.51
22	228.49	122.16
23	237.32	126.85
24	246.13	131.59
25	254.91	136.37
26	263.67	141.19
27	272.41	146.06
28	281.12	150.97
29	289.81	155.93
30	298.47	160.93
31	307.10	165.97
32	315.71	171.05
33	324.30	176.18

34	332.86	181.35
35	341.39	186.56
36	349.90	191.82
37	358.38	197.12
38	366.84	202.46
39	375.26	207.84
40	383.67	213.26
41	388.18	216.21

** Corrected JANBU FOS = 1.052 ** (Fo factor = 1.012)

Failure surface No. 2 specified by 41 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.08	38.19
3	56.15	42.40
4	65.21	46.63
5	74.26	50.89
6	83.30	55.17
7	92.32	59.47
8	101.34	63.80
9	110.35	68.14
10	119.34	72.51
11	128.33	76.90
12	137.30	81.32
13	146.26	85.75
14	155.21	90.21
15	164.15	94.69
16	173.08	99.20
17	182.00	103.72
18	190.90	108.27
19	199.80	112.84
20	208.68	117.43
21	217.56	122.04
22	226.42	126.68
23	235.26	131.34
24	244.10	136.02
25	252.93	140.72
26	261.74	145.44
27	270.54	150.19
28	279.33	154.96
29	288.11	159.75
30	296.88	164.56
31	305.63	169.39
32	314.37	174.25
33	323.10	179.13
34	331.82	184.03
35	340.53	188.95
36	349.22	193.89
37	357.90	198.85

38	366.57	203.84
39	375.23	208.85
40	383.87	213.88
41	387.82	216.19

** Corrected JANBU FOS = 1.052 ** (Fo factor = 1.006)

Failure surface No. 3 specified by 42 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.69	36.48
3	57.35	39.07
4	66.98	41.77
5	76.57	44.57
6	86.14	47.49
7	95.67	50.52
8	105.17	53.65
9	114.62	56.90
10	124.05	60.25
11	133.43	63.71
12	142.77	67.27
13	152.07	70.94
14	161.33	74.72
15	170.55	78.60
16	179.72	82.59
17	188.84	86.68
18	197.92	90.88
19	206.95	95.18
20	215.93	99.58
21	224.86	104.08
22	233.73	108.69
23	242.56	113.40
24	251.32	118.20
25	260.04	123.11
26	268.69	128.12
27	277.29	133.22
28	285.83	138.42
29	294.31	143.72
30	302.73	149.12
31	311.09	154.61
32	319.38	160.20
33	327.61	165.88
34	335.78	171.65
35	343.88	177.52
36	351.91	183.48
37	359.87	189.53
38	367.76	195.67
39	375.58	201.90
40	383.33	208.22
41	391.01	214.63

42	393.22	216.51

** Corrected JANBU FOS = 1.078 ** (Fo factor = 1.027)

Failure surface No. 4 specified by 42 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.82	35.91
3	57.60	37.96
4	67.36	40.15
5	77.09	42.47
6	86.78	44.94
7	96.43	47.54
8	106.05	50.28
9	115.63	53.15
10	125.17	56.16
11	134.66	59.30
12	144.11	62.58
13	153.51	66.00
14	162.86	69.54
15	172.16	73.22
16	181.40	77.03
17	190.59	80.97
18	199.73	85.04
19	208.80	89.24
20	217.82	93.57
21	226.77	98.02
22	235.66	102.61
23	244.48	107.32
24	253.23	112.15
25	261.92	117.10
26	270.53	122.18
27	279.07	127.38
28	287.54	132.71
29	295.93	138.15
30	304.24	143.71
31	312.48	149.38
32	320.63	155.18
33	328.69	161.09
34	336.68	167.11
35	344.57	173.24
36	352.38	179.49
37	360.10	185.85
38	367.73	192.31
39	375.27	198.89
40	382.71	205.57
41	390.06	212.35
42	394.52	216.59

** Corrected JANBU FOS = 1.094 ** (Fo factor = 1.033)

Failure surface No. 5 specified by 45 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.13	38.07
3	56.26	42.15
4	65.39	46.25
5	74.50	50.35
6	83.62	54.47
7	92.73	58.60
8	101.83	62.74
9	110.93	66.89
10	120.02	71.05
11	129.11	75.22
12	138.19	79.41
13	147.27	83.61
14	156.34	87.81
15	165.40	92.03
16	174.46	96.27
17	183.52	100.51
18	192.57	104.76
19	201.61	109.03
20	210.65	113.30
21	219.69	117.59
22	228.72	121.89
23	237.74	126.20
24	246.76	130.52
25	255.77	134.85
26	264.78	139.20
27	273.78	143.55
28	282.78	147.92
29	291.77	152.30
30	300.75	156.69
31	309.73	161.09
32	318.70	165.50
33	327.67	169.93
34	336.64	174.36
35	345.59	178.81
36	354.55	183.26
37	363.49	187.73
38	372.43	192.21
39	381.37	196.70
40	390.30	201.20
41	399.22	205.72
42	408.14	210.24
43	417.05	214.78
44	425.96	219.32
45	428.95	220.86

** Corrected JANBU FOS = 1.140 ** (Fo factor = 1.003)

Failure surface No. 6 specified by 45 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.60	36.79
3	57.18	39.65
4	66.74	42.59
5	76.28	45.60
6	85.79	48.68
7	95.28	51.84
8	104.74	55.07
9	114.18	58.38
10	123.59	61.76
11	132.98	65.21
12	142.34	68.74
13	151.67	72.33
14	160.97	76.00
15	170.24	79.74
16	179.49	83.56
17	188.70	87.44
18	197.89	91.40
19	207.04	95.43
20	216.16	99.52
21	225.25	103.69
22	234.31	107.93
23	243.33	112.24
24	252.32	116.62
25	261.28	121.07
26	270.20	125.59
27	279.08	130.18
28	287.93	134.84
29	296.74	139.56
30	305.52	144.36
31	314.26	149.22
32	322.96	154.15
33	331.62	159.14
34	340.25	164.21
35	348.83	169.34
36	357.37	174.53
37	365.88	179.80
38	374.34	185.13
39	382.76	190.52
40	391.14	195.98
41	399.47	201.50
42	407.76	207.09
43	416.01	212.75
44	424.22	218.46
45	426.80	220.30

** Corrected JANBU FOS = 1.151 ** (Fo factor = 1.020)

Failure surface No. 7 specified by 45 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.79	36.04
3	57.55	38.20
4	67.29	40.47
5	77.01	42.85
6	86.69	45.34
7	96.35	47.94
8	105.97	50.66
9	115.56	53.49
10	125.12	56.42
11	134.64	59.47
12	144.13	62.63
13	153.58	65.90
14	163.00	69.27
15	172.37	72.76
16	181.70	76.35
17	190.99	80.05
18	200.24	83.86
19	209.44	87.77
20	218.60	91.79
21	227.71	95.92
22	236.77	100.15
23	245.78	104.48
24	254.74	108.92
25	263.65	113.47
26	272.50	118.11
27	281.31	122.86
28	290.05	127.71
29	298.74	132.66
30	307.37	137.70
31	315.95	142.85
32	324.46	148.10
33	332.91	153.45
34	341.30	158.89
35	349.62	164.43
36	357.89	170.06
37	366.08	175.79
38	374.21	181.62
39	382.27	187.54
40	390.26	193.55
41	398.18	199.65
42	406.03	205.85
43	413.81	212.13
44	421.52	218.50
45	422.22	219.10

** Corrected JANBU FOS = 1.160 ** (Fo factor = 1.029)

Failure surface No. 8 specified by 46 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.91	35.33
3	57.80	36.79
4	67.67	38.41
5	77.52	40.16
6	87.34	42.05
7	97.13	44.08
8	106.89	46.26
9	116.62	48.57
10	126.31	51.02
11	135.97	53.62
12	145.59	56.35
13	155.17	59.22
14	164.71	62.22
15	174.20	65.36
16	183.65	68.64
17	193.05	72.05
18	202.40	75.60
19	211.70	79.28
20	220.94	83.10
21	230.13	87.05
22	239.26	91.12
23	248.33	95.33
24	257.34	99.67
25	266.29	104.14
26	275.17	108.73
27	283.98	113.46
28	292.73	118.31
29	301.40	123.28
30	310.01	128.38
31	318.54	133.60
32	326.99	138.94
33	335.36	144.40
34	343.66	149.99
35	351.88	155.69
36	360.01	161.51
37	368.06	167.44
38	376.02	173.49
39	383.90	179.65
40	391.68	185.93
41	399.38	192.32
42	406.98	198.81
43	414.49	205.42
44	421.90	212.13
45	429.21	218.95
46	432.05	221.66

** Corrected JANBU FOS = 1.202 ** (Fo factor = 1.036)

Failure surface No. 9 specified by 46 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.99	34.53
3	57.96	35.23
4	67.92	36.12
5	77.87	37.17
6	87.79	38.41
7	97.69	39.82
8	107.56	41.41
9	117.41	43.17
10	127.22	45.11
11	136.99	47.22
12	146.73	49.51
13	156.42	51.97
14	166.07	54.60
15	175.67	57.40
16	185.21	60.37
17	194.71	63.51
18	204.14	66.82
19	213.52	70.30
20	222.83	73.94
21	232.08	77.75
22	241.26	81.72
23	250.36	85.85
24	259.39	90.15
25	268.35	94.60
26	277.22	99.22
27	286.01	103.99
28	294.71	108.91
29	303.32	113.99
30	311.85	119.23
31	320.27	124.61
32	328.60	130.14
33	336.84	135.82
34	344.96	141.64
35	352.99	147.61
36	360.90	153.72
37	368.71	159.97
38	376.41	166.36
39	383.98	172.88
40	391.45	179.54
41	398.79	186.33
42	406.01	193.25
43	413.11	200.29
44	420.08	207.46
45	426.92	214.75
46	433.52	222.05

** Corrected JANBU FOS = 1.235 ** (Fo factor = 1.043)

Failure surface No.10 specified by 48 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.84	35.79
3	57.66	37.69
4	67.46	39.68
5	77.23	41.79
6	86.98	44.00
7	96.71	46.31
8	106.42	48.72
9	116.10	51.24
10	125.75	53.86
11	135.37	56.58
12	144.96	59.41
13	154.52	62.34
14	164.05	65.37
15	173.55	68.50
16	183.01	71.73
17	192.44	75.06
18	201.84	78.49
19	211.19	82.02
20	220.51	85.65
21	229.79	89.38
22	239.03	93.21
23	248.22	97.14
24	257.38	101.16
25	266.49	105.28
26	275.55	109.50
27	284.58	113.82
28	293.55	118.23
29	302.48	122.73
30	311.36	127.33
31	320.19	132.03
32	328.97	136.81
33	337.69	141.70
34	346.37	146.67
35	354.99	151.73
36	363.56	156.89
37	372.07	162.14
38	380.53	167.48
39	388.93	172.91
40	397.27	178.42
41	405.55	184.03
42	413.77	189.72
43	421.93	195.50
44	430.03	201.37
45	438.06	207.33

46	446.03	213.36
47	453.94	219.49
48	459.64	224.00

** Corrected JANBU FOS = 1.251 ** (Fo factor = 1.029)

The following is a summary of the TEN most critical surfaces

Problem Description : 4624CA-0216 Roit

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.052	1.012	38.00	388.18	8.569E+05
2.	1.052	1.006	38.00	387.82	7.787E+05
3.	1.078	1.027	38.00	393.22	1.101E+06
4.	1.094	1.033	38.00	394.52	1.211E+06
5.	1.140	1.003	38.00	428.95	9.448E+05
6.	1.151	1.020	38.00	426.80	1.205E+06
7.	1.160	1.029	38.00	422.22	1.341E+06
8.	1.202	1.036	38.00	432.05	1.540E+06
9.	1.235	1.043	38.00	433.52	1.730E+06
10.	1.251	1.029	38.00	459.64	1.601E+06

* * * END OF FILE * * *

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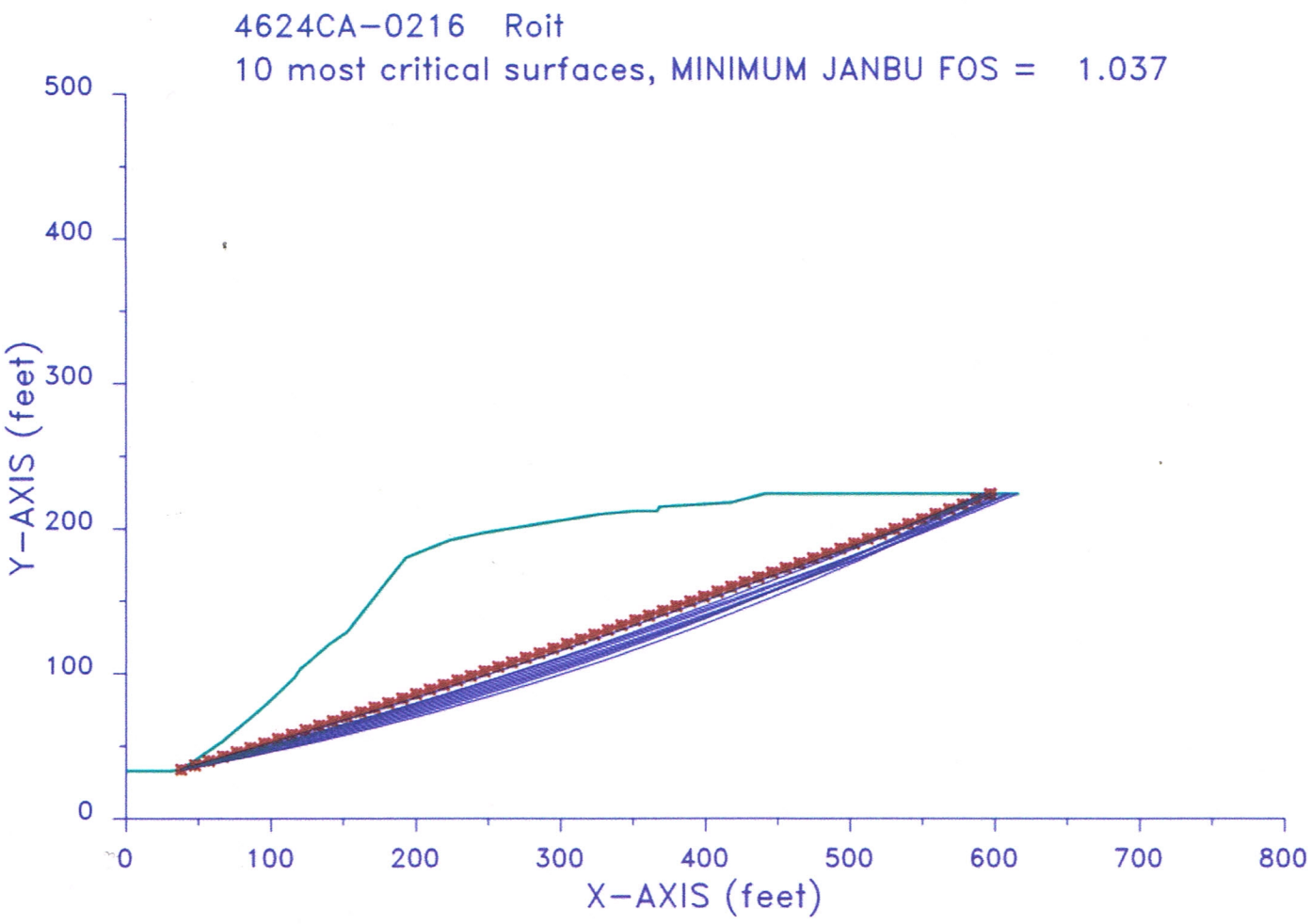

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*              X S T A B L              *
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*        Slope Stability Analysis       *
*               using the               *
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*  Ver. 5.209                96 - 1877  *
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Problem Description : 4624CA-0216 Roit

SEGMENT BOUNDARY COORDINATES

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21 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	33.0	31.0	33.0	1
2	31.0	33.0	38.0	34.0	1
3	38.0	34.0	47.0	40.0	1
4	47.0	40.0	66.0	53.0	1
5	66.0	53.0	83.0	67.0	1
6	83.0	67.0	97.0	79.0	1
7	97.0	79.0	116.0	97.0	1
8	116.0	97.0	120.0	103.0	1
9	120.0	103.0	140.0	120.0	1
10	140.0	120.0	153.0	129.0	1
11	153.0	129.0	193.0	180.0	1
12	193.0	180.0	223.0	192.0	1
13	223.0	192.0	246.0	197.0	1
14	246.0	197.0	327.0	210.0	1
15	327.0	210.0	349.0	212.0	1
16	349.0	212.0	367.0	212.0	1
17	367.0	212.0	368.0	215.0	1
18	368.0	215.0	418.0	218.0	1
19	418.0	218.0	441.0	224.0	1
20	441.0	224.0	521.0	224.0	1

21	521.0	224.0	650.0	224.0	1

ISOTROPIC Soil Parameters
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2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Water Constant (psf)	Surface No.
1	130.0	130.0	135.0	27.00	.000	.0	0
2	130.0	130.0	260.0	36.00	.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.

20 trial surfaces will be generated and analyzed.

20 Surfaces initiate from each of 1 points equally spaced along the ground surface between x = 38.0 ft
and x = 38.0 ft

Each surface terminates between x = 630.0 ft
and x = 650.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = 34.0 ft

10.0 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 JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 64 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.60	36.79
3	57.20	39.58
4	66.80	42.39
5	76.40	45.20
6	85.99	48.02
7	95.59	50.85
8	105.18	53.68
9	114.76	56.52
10	124.35	59.37
11	133.93	62.23
12	143.51	65.10
13	153.09	67.97
14	162.67	70.85
15	172.24	73.74
16	181.81	76.64
17	191.38	79.54
18	200.95	82.45
19	210.51	85.37
20	220.07	88.30
21	229.63	91.23
22	239.19	94.18
23	248.75	97.13
24	258.30	100.09
25	267.85	103.05

26	277.40	106.02
27	286.94	109.01
28	296.48	112.00
29	306.02	114.99
30	315.56	118.00
31	325.10	121.01
32	334.63	124.03
33	344.16	127.06
34	353.69	130.09
35	363.22	133.13
36	372.74	136.18
37	382.26	139.24
38	391.78	142.31
39	401.29	145.38
40	410.81	148.46
41	420.32	151.55
42	429.83	154.65
43	439.33	157.75
44	448.84	160.87
45	458.34	163.99
46	467.84	167.11
47	477.33	170.25
48	486.83	173.39
49	496.32	176.54
50	505.80	179.70
51	515.29	182.86
52	524.77	186.04
53	534.25	189.22
54	543.73	192.41
55	553.21	195.60
56	562.68	198.81
57	572.15	202.02
58	581.62	205.24
59	591.08	208.46
60	600.55	211.70
61	610.01	214.94
62	619.46	218.19
63	628.92	221.45
64	636.31	224.00

** Corrected JANBU FOS = 1.089 ** (Fo factor = 1.003)

Failure surface No. 2 specified by 64 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.69	36.48
3	57.37	38.97
4	67.05	41.49
5	76.72	44.02
6	86.39	46.58

7	96.06	49.15
8	105.71	51.74
9	115.37	54.35
10	125.02	56.97
11	134.66	59.62
12	144.30	62.28
13	153.93	64.97
14	163.56	67.67
15	173.18	70.39
16	182.80	73.13
17	192.41	75.88
18	202.02	78.66
19	211.62	81.45
20	221.22	84.26
21	230.81	87.10
22	240.40	89.95
23	249.98	92.81
24	259.55	95.70
25	269.12	98.60
26	278.68	101.53
27	288.24	104.47
28	297.79	107.43
29	307.34	110.41
30	316.88	113.40
31	326.41	116.42
32	335.94	119.45
33	345.47	122.50
34	354.98	125.57
35	364.49	128.66
36	374.00	131.77
37	383.50	134.89
38	392.99	138.04
39	402.48	141.20
40	411.96	144.38
41	421.43	147.58
42	430.90	150.79
43	440.37	154.03
44	449.82	157.28
45	459.27	160.55
46	468.71	163.84
47	478.15	167.15
48	487.58	170.47
49	497.01	173.82
50	506.43	177.18
51	515.84	180.56
52	525.24	183.95
53	534.64	187.37
54	544.03	190.80
55	553.42	194.26
56	562.80	197.73
57	572.17	201.22
58	581.53	204.72
59	590.89	208.25
60	600.24	211.79

61	609.59	215.35
62	618.93	218.93
63	628.26	222.52
64	632.06	224.00

** Corrected JANBU FOS = 1.093 ** (Fo factor = 1.007)

Failure surface No. 3 specified by 65 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.67	36.53
3	57.34	39.08
4	67.01	41.64
5	76.67	44.22
6	86.33	46.81
7	95.99	49.42
8	105.64	52.04
9	115.28	54.67
10	124.93	57.32
11	134.56	59.98
12	144.20	62.66
13	153.83	65.35
14	163.46	68.06
15	173.08	70.78
16	182.70	73.51
17	192.31	76.26
18	201.93	79.02
19	211.53	81.80
20	221.13	84.59
21	230.73	87.39
22	240.33	90.21
23	249.92	93.05
24	259.50	95.90
25	269.08	98.76
26	278.66	101.64
27	288.23	104.53
28	297.80	107.43
29	307.37	110.35
30	316.93	113.29
31	326.48	116.23
32	336.03	119.20
33	345.58	122.17
34	355.12	125.16
35	364.66	128.17
36	374.20	131.19
37	383.72	134.22
38	393.25	137.27
39	402.77	140.33
40	412.28	143.40
41	421.79	146.49

42	431.30	149.60
43	440.80	152.71
44	450.30	155.85
45	459.79	158.99
46	469.28	162.15
47	478.76	165.33
48	488.24	168.51
49	497.71	171.72
50	507.18	174.93
51	516.65	178.16
52	526.10	181.41
53	535.56	184.67
54	545.01	187.94
55	554.45	191.23
56	563.89	194.53
57	573.33	197.84
58	582.76	201.17
59	592.18	204.51
60	601.60	207.87
61	611.02	211.24
62	620.43	214.63
63	629.83	218.02
64	639.23	221.44
65	646.26	224.00

** Corrected JANBU FOS = 1.108 ** (Fo factor = 1.006)

Failure surface No. 4 specified by 65 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.70	36.41
3	57.40	38.85
4	67.10	41.30
5	76.79	43.77
6	86.47	46.26
7	96.16	48.76
8	105.83	51.29
9	115.50	53.83
10	125.17	56.39
11	134.83	58.98
12	144.49	61.57
13	154.14	64.19
14	163.78	66.83
15	173.42	69.48
16	183.06	72.16
17	192.69	74.85
18	202.32	77.56
19	211.94	80.28
20	221.55	83.03
21	231.16	85.80

22	240.77	88.58
23	250.37	91.38
24	259.96	94.20
25	269.55	97.04
26	279.14	99.89
27	288.71	102.77
28	298.29	105.66
29	307.85	108.57
30	317.41	111.50
31	326.97	114.45
32	336.52	117.42
33	346.06	120.40
34	355.60	123.40
35	365.14	126.42
36	374.66	129.46
37	384.18	132.52
38	393.70	135.59
39	403.21	138.69
40	412.71	141.80
41	422.21	144.93
42	431.70	148.08
43	441.19	151.24
44	450.67	154.43
45	460.14	157.63
46	469.61	160.85
47	479.07	164.09
48	488.52	167.34
49	497.97	170.62
50	507.41	173.91
51	516.85	177.22
52	526.28	180.55
53	535.70	183.90
54	545.12	187.26
55	554.53	190.64
56	563.94	194.04
57	573.33	197.46
58	582.72	200.90
59	592.11	204.35
60	601.49	207.82
61	610.86	211.31
62	620.22	214.82
63	629.58	218.35
64	638.93	221.89
65	644.46	224.00

** Corrected JANBU FOS = 1.110 ** (Fo factor = 1.007)

Failure surface No. 5 specified by 64 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00

2	47.82	35.91
3	57.62	37.86
4	67.43	39.84
5	77.22	41.86
6	87.00	43.92
7	96.78	46.02
8	106.55	48.15
9	116.31	50.33
10	126.07	52.53
11	135.81	54.78
12	145.55	57.06
13	155.27	59.38
14	164.99	61.74
15	174.70	64.13
16	184.40	66.56
17	194.09	69.03
18	203.77	71.54
19	213.45	74.08
20	223.11	76.66
21	232.76	79.27
22	242.40	81.92
23	252.03	84.61
24	261.65	87.34
25	271.27	90.10
26	280.87	92.90
27	290.46	95.73
28	300.03	98.61
29	309.60	101.51
30	319.16	104.46
31	328.70	107.44
32	338.24	110.46
33	347.76	113.51
34	357.27	116.60
35	366.77	119.73
36	376.26	122.89
37	385.73	126.09
38	395.19	129.33
39	404.64	132.60
40	414.08	135.90
41	423.50	139.25
42	432.92	142.63
43	442.31	146.04
44	451.70	149.49
45	461.07	152.98
46	470.43	156.50
47	479.78	160.06
48	489.11	163.65
49	498.43	167.28
50	507.73	170.94
51	517.02	174.64
52	526.30	178.38
53	535.56	182.15
54	544.81	185.96
55	554.04	189.80

56	563.26	193.67
57	572.46	197.58
58	581.65	201.53
59	590.83	205.51
60	599.98	209.53
61	609.13	213.58
62	618.25	217.67
63	627.36	221.79
64	632.21	224.00

** Corrected JANBU FOS = 1.111 ** (Fo factor = 1.014)

Failure surface No. 6 specified by 64 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.79	36.04
3	57.57	38.12
4	67.35	40.22
5	77.12	42.36
6	86.88	44.53
7	96.63	46.74
8	106.38	48.97
9	116.12	51.24
10	125.85	53.54
11	135.57	55.87
12	145.29	58.24
13	155.00	60.64
14	164.70	63.06
15	174.39	65.52
16	184.08	68.02
17	193.75	70.54
18	203.42	73.10
19	213.08	75.69
20	222.73	78.31
21	232.37	80.96
22	242.01	83.64
23	251.63	86.36
24	261.24	89.10
25	270.85	91.88
26	280.45	94.69
27	290.04	97.53
28	299.61	100.41
29	309.18	103.31
30	318.74	106.25
31	328.29	109.22
32	337.83	112.22
33	347.36	115.25
34	356.88	118.31
35	366.39	121.41
36	375.89	124.53

37	385.38	127.69
38	394.85	130.88
39	404.32	134.10
40	413.78	137.35
41	423.22	140.63
42	432.66	143.94
43	442.08	147.29
44	451.50	150.66
45	460.90	154.07
46	470.29	157.51
47	479.67	160.98
48	489.04	164.47
49	498.39	168.01
50	507.74	171.57
51	517.07	175.16
52	526.39	178.78
53	535.70	182.43
54	545.00	186.12
55	554.28	189.83
56	563.55	193.58
57	572.81	197.35
58	582.06	201.16
59	591.29	205.00
60	600.52	208.86
61	609.73	212.76
62	618.92	216.69
63	628.10	220.65
64	635.81	224.00

** Corrected JANBU FOS = 1.111 ** (Fo factor = 1.012)

Failure surface No. 7 specified by 66 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.70	36.43
3	57.40	38.87
4	67.09	41.34
5	76.78	43.82
6	86.46	46.31
7	96.14	48.83
8	105.81	51.36
9	115.48	53.91
10	125.15	56.47
11	134.81	59.06
12	144.46	61.66
13	154.12	64.27
14	163.76	66.91
15	173.41	69.56
16	183.04	72.23
17	192.68	74.91

18	202.30	77.61
19	211.93	80.33
20	221.55	83.07
21	231.16	85.82
22	240.77	88.59
23	250.37	91.38
24	259.97	94.18
25	269.56	97.00
26	279.15	99.84
27	288.74	102.70
28	298.32	105.57
29	307.89	108.46
30	317.46	111.36
31	327.02	114.29
32	336.58	117.23
33	346.13	120.18
34	355.68	123.16
35	365.22	126.15
36	374.76	129.16
37	384.29	132.18
38	393.82	135.22
39	403.34	138.28
40	412.85	141.35
41	422.36	144.45
42	431.87	147.55
43	441.37	150.68
44	450.86	153.82
45	460.35	156.98
46	469.83	160.16
47	479.31	163.35
48	488.78	166.56
49	498.24	169.79
50	507.70	173.03
51	517.16	176.29
52	526.60	179.56
53	536.05	182.86
54	545.48	186.17
55	554.91	189.49
56	564.34	192.84
57	573.76	196.20
58	583.17	199.57
59	592.58	202.97
60	601.98	206.38
61	611.37	209.80
62	620.76	213.24
63	630.14	216.70
64	639.52	220.18
65	648.89	223.67
66	649.76	224.00

** Corrected JANBU FOS = 1.116 ** (Fo factor = 1.007)

Failure surface No. 8 specified by 65 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.76	36.20
3	57.51	38.42
4	67.25	40.67
5	76.99	42.94
6	86.72	45.24
7	96.45	47.56
8	106.17	49.91
9	115.88	52.29
10	125.59	54.69
11	135.29	57.11
12	144.99	59.56
13	154.67	62.04
14	164.36	64.54
15	174.03	67.06
16	183.70	69.61
17	193.36	72.19
18	203.02	74.79
19	212.67	77.42
20	222.31	80.07
21	231.95	82.74
22	241.57	85.45
23	251.20	88.17
24	260.81	90.92
25	270.42	93.70
26	280.02	96.50
27	289.61	99.33
28	299.19	102.18
29	308.77	105.06
30	318.34	107.96
31	327.90	110.88
32	337.46	113.83
33	347.00	116.81
34	356.54	119.81
35	366.07	122.83
36	375.60	125.88
37	385.11	128.96
38	394.62	132.06
39	404.12	135.18
40	413.61	138.33
41	423.10	141.51
42	432.57	144.70
43	442.04	147.93
44	451.49	151.17
45	460.94	154.45
46	470.38	157.74
47	479.82	161.06
48	489.24	164.41
49	498.66	167.78
50	508.06	171.18

51	517.46	174.59
52	526.85	178.04
53	536.23	181.51
54	545.60	185.00
55	554.96	188.52
56	564.31	192.06
57	573.65	195.62
58	582.99	199.21
59	592.31	202.83
60	601.63	206.46
61	610.93	210.13
62	620.23	213.81
63	629.51	217.52
64	638.79	221.26
65	645.55	224.00

** Corrected JANBU FOS = 1.118 ** (Fo factor = 1.010)

Failure surface No. 9 specified by 66 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.73	36.33
3	57.45	38.68
4	67.16	41.04
5	76.87	43.43
6	86.58	45.84
7	96.28	48.27
8	105.97	50.72
9	115.66	53.19
10	125.35	55.68
11	135.03	58.19
12	144.70	60.72
13	154.37	63.27
14	164.04	65.84
15	173.69	68.43
16	183.35	71.05
17	192.99	73.68
18	202.64	76.33
19	212.27	79.00
20	221.90	81.69
21	231.53	84.41
22	241.15	87.14
23	250.76	89.89
24	260.37	92.67
25	269.97	95.46
26	279.57	98.27
27	289.16	101.11
28	298.74	103.96
29	308.32	106.83
30	317.89	109.73

31	327.46	112.64
32	337.02	115.57
33	346.57	118.53
34	356.12	121.50
35	365.66	124.49
36	375.20	127.51
37	384.73	130.54
38	394.25	133.60
39	403.76	136.67
40	413.27	139.76
41	422.78	142.88
42	432.27	146.01
43	441.76	149.16
44	451.25	152.34
45	460.72	155.53
46	470.19	158.74
47	479.66	161.97
48	489.11	165.23
49	498.56	168.50
50	508.00	171.79
51	517.44	175.10
52	526.87	178.43
53	536.29	181.78
54	545.70	185.16
55	555.11	188.55
56	564.51	191.96
57	573.91	195.39
58	583.29	198.84
59	592.67	202.31
60	602.04	205.80
61	611.41	209.30
62	620.76	212.83
63	630.11	216.38
64	639.45	219.95
65	648.79	223.53
66	649.99	224.00

** Corrected JANBU FOS = 1.119 ** (Fo factor = 1.008)

Failure surface No.10 specified by 65 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	38.00	34.00
2	47.84	35.79
3	57.67	37.62
4	67.49	39.49
5	77.31	41.40
6	87.12	43.35
7	96.92	45.34
8	106.71	47.37
9	116.49	49.44

10	126.27	51.54
11	136.04	53.69
12	145.79	55.88
13	155.54	58.10
14	165.28	60.37
15	175.01	62.68
16	184.73	65.02
17	194.45	67.40
18	204.15	69.83
19	213.84	72.29
20	223.52	74.79
21	233.19	77.33
22	242.86	79.91
23	252.51	82.53
24	262.15	85.19
25	271.78	87.88
26	281.39	90.62
27	291.00	93.39
28	300.60	96.21
29	310.18	99.06
30	319.76	101.95
31	329.32	104.88
32	338.87	107.85
33	348.40	110.86
34	357.93	113.90
35	367.44	116.99
36	376.94	120.11
37	386.43	123.27
38	395.90	126.47
39	405.36	129.71
40	414.81	132.98
41	424.25	136.30
42	433.67	139.65
43	443.08	143.04
44	452.47	146.47
45	461.85	149.93
46	471.22	153.44
47	480.57	156.98
48	489.91	160.56
49	499.23	164.18
50	508.54	167.83
51	517.83	171.52
52	527.11	175.25
53	536.37	179.02
54	545.62	182.83
55	554.85	186.67
56	564.07	190.55
57	573.27	194.47
58	582.45	198.42
59	591.62	202.41
60	600.77	206.44
61	609.91	210.51
62	619.03	214.61
63	628.13	218.75

64	637.22	222.93
65	639.53	224.00

** Corrected JANBU FOS = 1.124 ** (Fo factor = 1.015)

The following is a summary of the TEN most critical surfaces

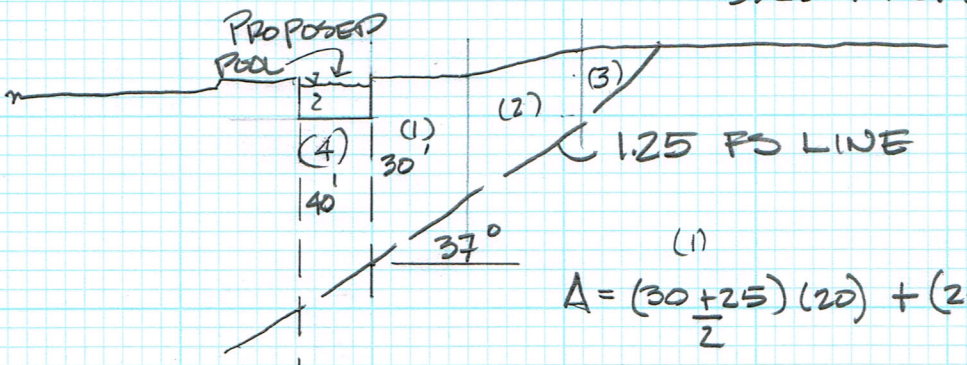
Problem Description : 4624CA-0216 Roit

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.089	1.003	38.00	636.31	2.174E+06
2.	1.093	1.007	38.00	632.06	2.285E+06
3.	1.108	1.006	38.00	646.26	2.332E+06
4.	1.110	1.007	38.00	644.46	2.376E+06
5.	1.111	1.014	38.00	632.21	2.525E+06
6.	1.111	1.012	38.00	635.81	2.490E+06
7.	1.116	1.007	38.00	649.76	2.396E+06
8.	1.118	1.010	38.00	645.55	2.477E+06
9.	1.119	1.008	38.00	649.99	2.443E+06
10.	1.124	1.015	38.00	639.53	2.620E+06

* * * END OF FILE * * *

LATERAL LOAD ON POOL PILES

3929 MALIBU VISTA DR



$\gamma = 130$ PCF
$C = 135$ PSF
$\phi = 27°$

REF: STONE 9/7/07

REF: SECTION B-B'

$$A = \frac{(30+25)}{2}(20) + \frac{(25+15)}{2}(23) + \tfrac{1}{2}(15)(15)$$

$$= 550 + 460 + 112.5 = 1122.5^{\#}$$

$W = 145.9^{K}$ (1) TO (3)

$D = W \sin 37 = 87.8^{K}$

$N = W \cos 37 = 116.5^{K}$

$R = 0.135(76) + 116.5 \tan 27° = 69.6^{K}$

$T = 1.25(D) - R = 40.15$

$T\cos\theta = 32.1^{K}$

$$EFP = \frac{2T}{H^2} = \frac{2000(32.1)}{30^2} = \underline{71.2} \text{ PCF/FT OF WIDTH}$$

(4)

$A = \frac{1}{2}(30+40)(15) = 525^{\#}$

$W = \gamma A = 68.2^{K}$

$D = W \sin 37 = 41.0^{K}$

$N = W \cos 37 = 54.5^{K}$

$R = 0.135(18) + 54.5 \tan 27 = 30.2^{K}$

$FS = 41.0/30.2 = \underline{1.35}$

PORTION OF TOPOGRAPHIC MAP #110-192-12 STATE OF CALIF. DIV. OF HIGHWAYS DATED MAY 25, 1971 ~1"=40'

TOPANGA CANYON BLVD.

N

GT 94-0913A
PLATE IV

APPROX. LOCATION OF SEEPS

APPROX. LOCATION OF EXISTING WALL AND TIEBACKS BY CALTRANS

APPROX. LOCATION OF SURFICIAL FAILURES

APPROX. FAULT TRACE PER DIBBLEE (REF. 1)

SCARPS

EXISTING ONE-STORY ADDITION

PARCEL #2

PARCEL #1

SITE

PROPOSED POOL/ DECK

OUR SITE

EXISTING FAILURE

PACIFIC COAST HIGHWAY

MALIBU VISTA DR.

Asph.

Asph Shldr.

Conc.

Pool

Berm

Pipe

A

A'

B

B'

C

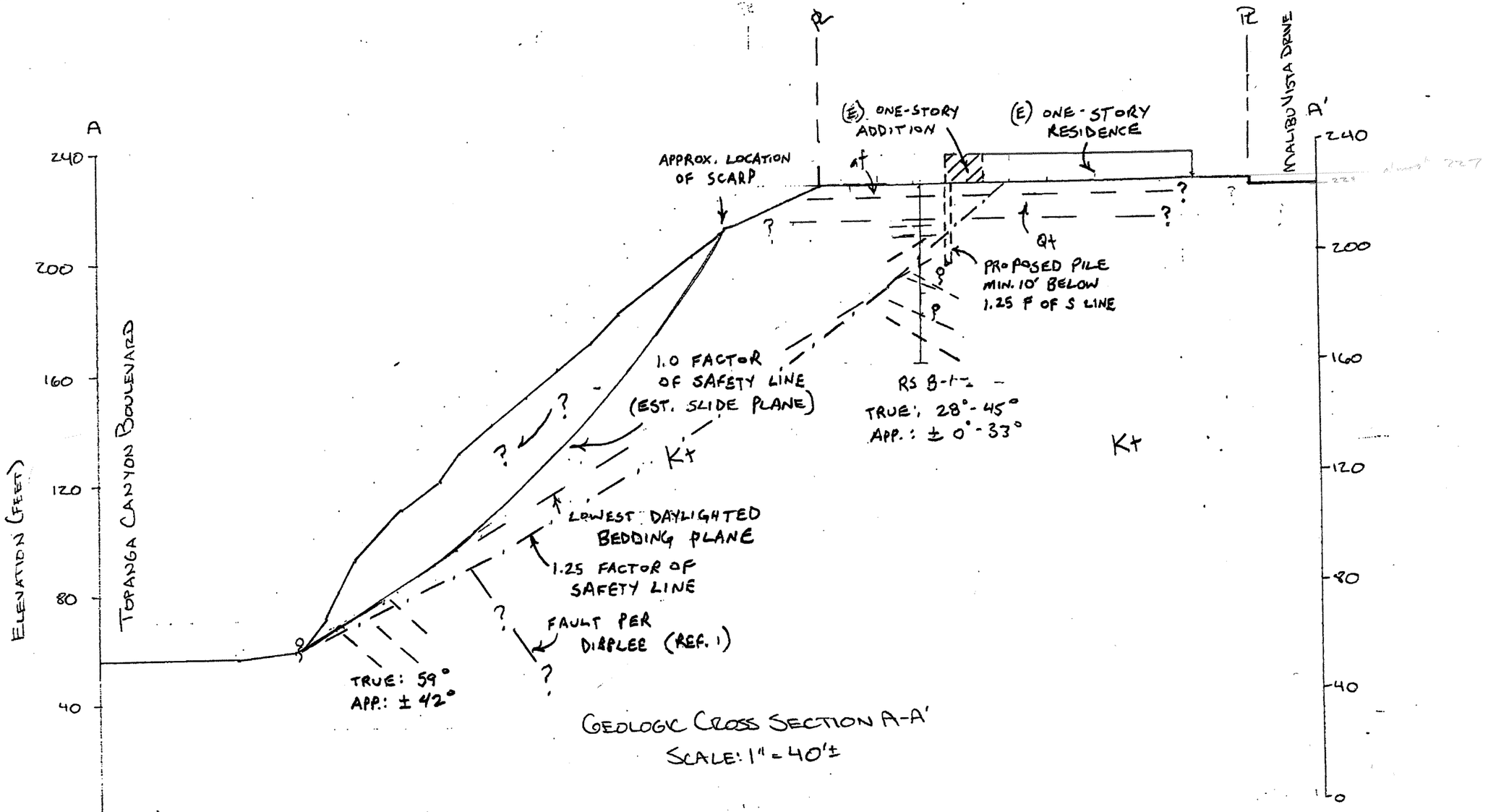
C'

RALPH STONE AND COMPANY, INC.
CONSULTING ENGINEERS
10954 Santa Monica Blvd.
Los Angeles, CA 90025
(310) 478-1501

VICINITY GEOLOGIC MAP

CLIENT: GOODFRIEND
FILE: 6272
DATE: 9/07

PLATE: 2a



GEOLOGIC CROSS SECTION A-A'
SCALE: 1" = 40'±

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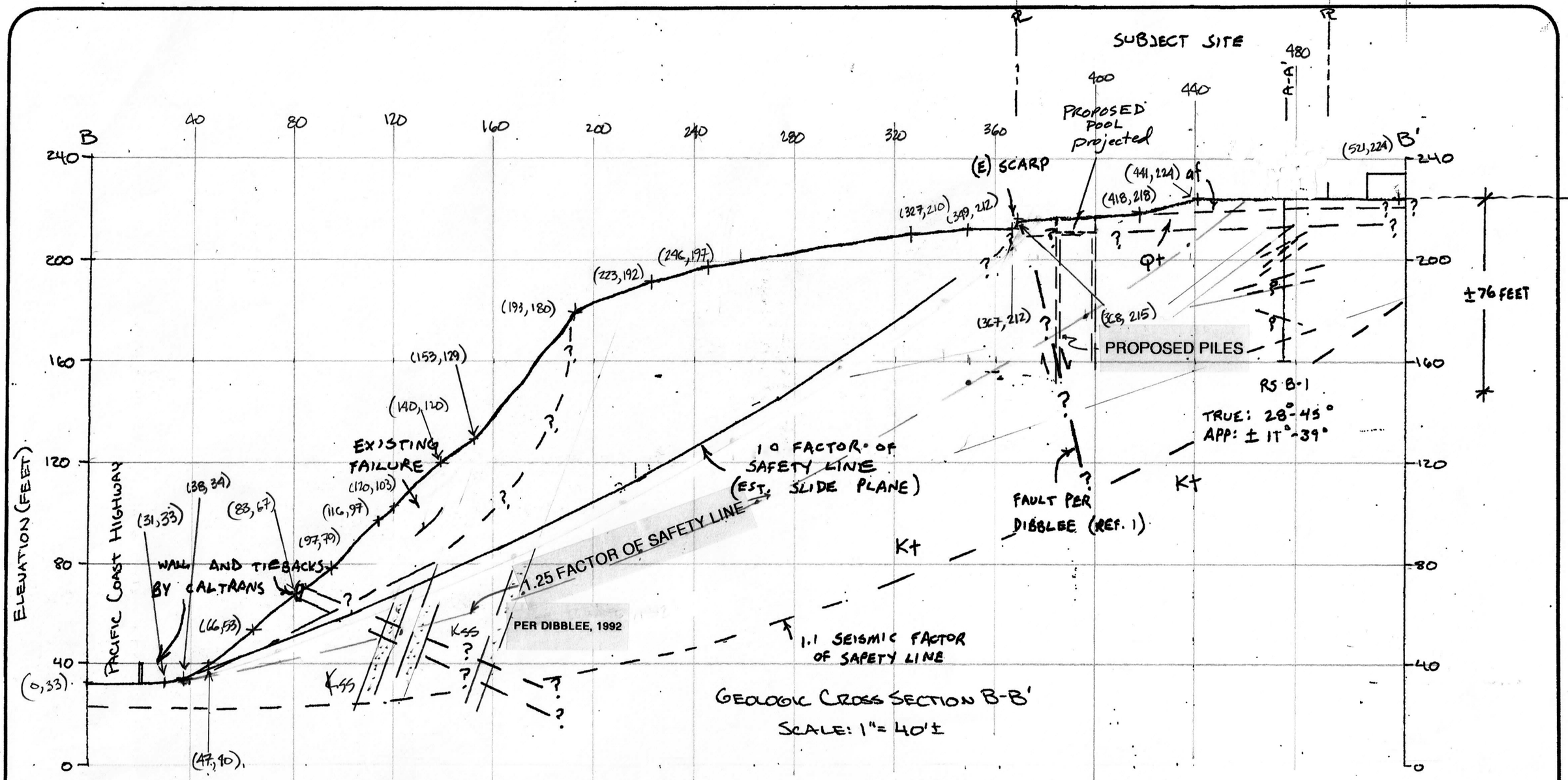
478-1501
879-1115

3925 MALIBU VISTA DRIVE
MALIBU, CA 90265

GEOLOGIC CROSS SECTION A-A'

DR AN/RC	JOB 6272	DWG NO PLATE: 3a	REV
CH AN	SCALE 1"=40'		
APP DG/JR	DATE 9/07		



GEOLOGIC CROSS SECTION B-B'
SCALE: 1"= 40'±

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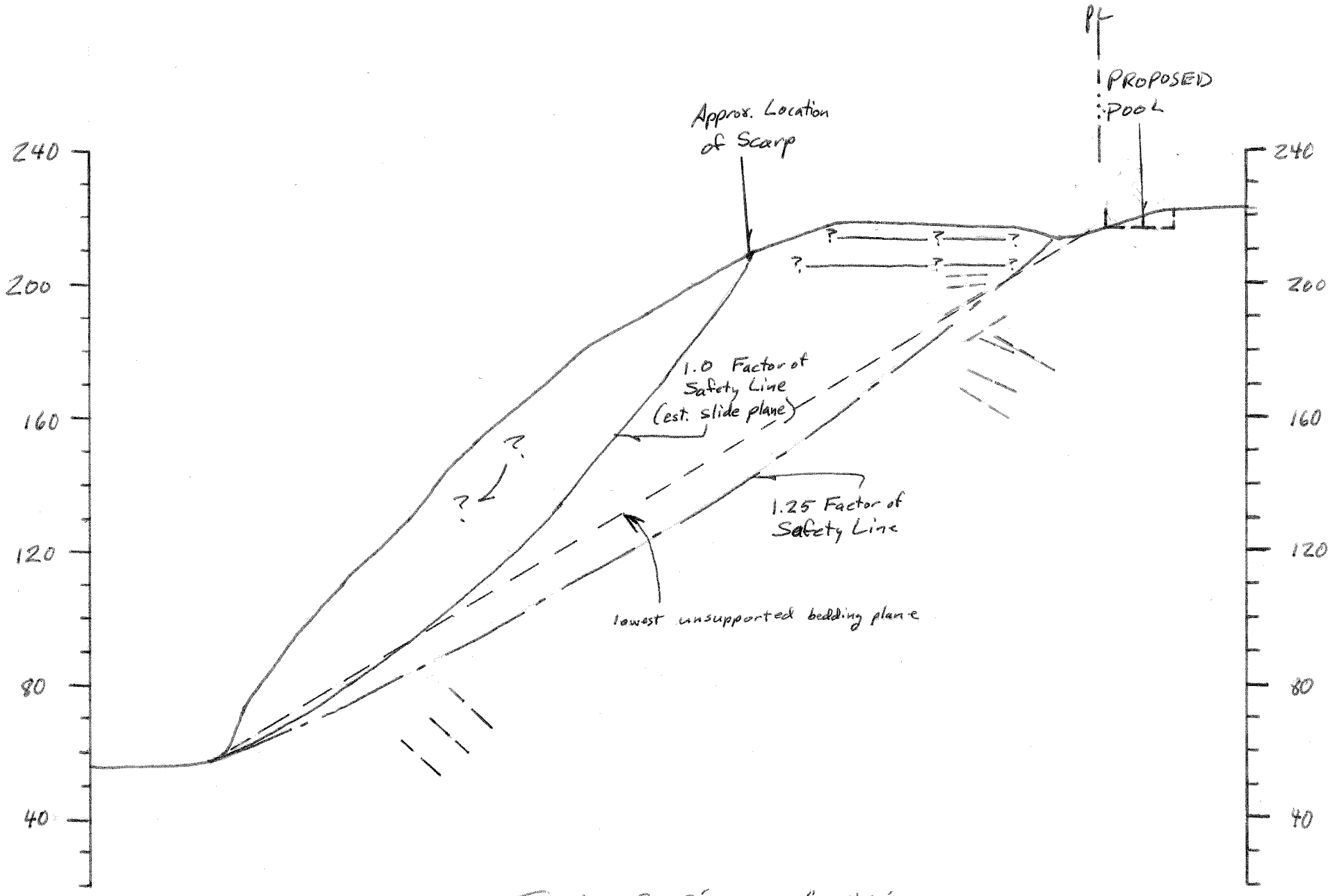
478-1501
879-1115

3925 MALIBU VISTA DRIVE
MALIBU, CA 90265

GEOLOGIC CROSS SECTION B-B'

DR RC/AN	JOB 6272	DWG NO PLATE: 3b	REV
CH AN	SCALE 1"=40'		
APP DG/JR	DATE 9/07		



Section C-C' 1" = 40'