APPENDIX G

APPENDIX G-1

Whaler Associates:

- Letter - Geologic Investigation, February, 21, 1989
- Letter - Report for Inclusion in EIR, February 13, 1989
- Letter - Addendum Letter Report Geologic Investigation, June 29, 1989
- Letter – Geologic Investigation Opposite Lexington Quarry, April 11, 1989

Wahler Associates

Geotechnical and Water Resources Engineering

February 21, 1989
Project ZRL-101C

APPENDIX G-1

GEOLOGY REPORT

Lexington Quarry
701 Los Esteros Road
San Jose, California 95134

Attention: Mr. Paul Fisher

Subject: Geologic Investigation
Proposed Lexington Quarry Site

Dear Mr. Fisher:

We are transmitting herewith in a single binding, our three letter reports (listed below) on the geologic investigation of the proposed Lexington Quarry.

February 13, 1989 - Letter report for inclusion in EIR, Geotechnical and Geologic Concerns at Proposed Lexington Quarry Site.

June 29, 1988 - Addendum Letter Report, Geologic Investigation, Proposed Quarry Site, Opposite the Existing Lexington Quarry.

April 11, 1988 - Geologic Investigation, Proposed Quarry Site, Opposite the Existing Lexington Quarry.

The purpose of this compilation is for ease of reference during the review process. In accordance with your request, the name of the addressee has been changed from Zanker Road Landfill to Lexington Quarry to reflect the subject project site.

Very truly yours,

WAHLER ASSOCIATES

Antonio S. Buangan
Associate
CEG No. 824

ASB:LL

1023 Corporation Way. P.O. Box 10023. Palo Alto, California 94303 • Telephone Number (415) 968-6250 FAX: (415) 968-5365

Wahler Associates
Geotechnical and Water Resources Engineering

February 13, 1989
Project ZRL-101C

Lexington Quarry
701 Los Esteros Road
San Jose, California 95134

Attention: Mr. Paul Fisher

Subject: Letter Report for Inclusion in EIR
Geotechnical and Geologic Concerns
at Proposed Lexington Quarry Site

Dear Mr. Fisher:

This letter report reiterates our recommendations regarding the benched quarry configuration at the proposed site. The evaluation and supporting geologic data which were used to develop these conclusions are discussed herein. In addition, we have assessed the potential for mercury or asbestos occurrence at the quarry site. We trust the following discussions will adequately address the County's concerns and support your development of the EIR.

Bench Recommendations

Our initial geologic investigation report, dated April 11, 1988, contained recommendations for the excavation of a benched quarry. The purpose of this investigation was to provide geotechnical conclusions and recommendations for quarry development - a detailed evaluation of the project's economic viability, involving various layouts and quantity assessments, was beyond the scope of this work. Our original, recommended excavation scheme involved situating benches at maximum vertical intervals of 50 feet, with benches wide enough to accomodate excavation and maintenance equipment (our recommended slope and bench detail depicted 25-foot wide benches, although minimum width requirements would be determined by Zanker Road Landfill's (ZRL) civil engineer). Cut-slopes of 3/4-horizontal to 1-vertical (3/4H:1V)

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were recommended for the lower quarry faces, anticipated to be excavated in less-weathered and consequently more competent rock. Flatter slopes of 1H:1V were recommended for the upper faces, expected to be cut into somewhat more weathered rock. The maximum 50-foot face height recommendation was based on several factors, including our anticipation that the steeper (3/4H:1V) slopes and relatively narrow benches might be used in development, as well as the successful performance of faces with similar heights and slopes at the existing quarry.

Subsequent design layouts and quantity calculations produced by ZRL's engineer indicated that our recommended dimensions would not provide sufficient volume to allow project development. Consequently, ZRL requested that Wahler Associates assess alternative, greater slope heights and bench widths to optimize potential volume. Our addendum letter report, dated June 29, 1988, recommended excavation of maximum 100-foot high quarry faces at the flatter 1H:1V slope, and with minimum bench widths of 30 feet. The geologic and geometric factors which founded our recommendations were expressed in the addendum report, and are summarized again as follows:

- Franciscan Complex bedrock comprises the site, and almost exclusively consists of graywacke (minor interbeds of shale and chert occur locally). This rock is typically hard and strong.

- The bedrock structure, which would control cut-slope stability, appears to have a favorable configuration for site development. Bedding apparently dips gently into the slope, and the predominant joint sets are intersecting and moderately to closely spaced, which would tend to preclude any significant continuity of adversely oriented structures (i.e., localized bedding, joints or shears which dip out of the slope).

- o Bench widths of 30 feet, in conjunction with 100-foot high faces at 1H:1V slopes, will produce an overall effective slope comparable to that of the original ground profile. Consequently, the quarry development will not result in an overall, oversteepened slope relative to the existing slope.

- o The 30-foot wide benches will serve as catchment areas for fallen or slumped materials and will allow for working area to repair any breached portions of the bench resulting from localized slumps. Small localized slumps on excavated slopes are likely to occur on an intermittent basis, but are not expected to involve large volumes of material.

The following recommendations, presented in the original and addendum reports, are imperative for a successful quarry development.

- o A qualified engineering geologist or geotechnical engineer should review the final design plans to ensure that recommendations presented in our addendum report are incorporated into the quarry development.

- o Periodic site visits by a geologist or engineer, during excavation, are necessary to identify localized or previously unidentified conditions which might adversely affect quarry performance and require modification of the original scheme. Such conditions might include areas of sheared, soil-like bedrock which could require localized flattening to attain a stable, final slope.

Asbestos and Mercury Occurrence

The predominance of Franciscan Complex graywacke at the site suggests that the potential for asbestos or mercury occurrence is very unlikely. Within the Bay Area, serpentine is the typical natural source of asbestos, and silica-carbonate rock is the host material for mercury-bearing minerals. Although both serpentine and silica-carbonate rock are associated with the Franciscan Complex, neither rock type was encountered during our exploration of the proposed site. In addition, the Preliminary Geologic Map of the Los Gatos Quadrangle (Dibblee and Brabb, 1978) indicates that neither rock occurs within or near the immediate vicinity of the site. The nearest mapped outcrop of serpentine is shown approximately ½-mile south of the southeast corner of the proposed quarry.

Again, we hope that this response to the County's concerns will assist you in development of the EIR.

Very truly yours,

WAHLER ASSOCIATES

Rick Harlan

Rick Harlan
Senior Engineering Geologist

Antonio S. Buangan

Antonio S. Buangan
Associate Geologist
CEG No. 824, California

RH/ASB:5

cc: Ms. Maureen Phillips
David Powers & Associates

Wahler Associates

Geotechnical and Water Resources Engineering

June 29, 1988
Project ZRL-101B

Lexington Quarry
705 Los Esteros Road
San Jose, CA 95134

Attention: Mr. Paul Fisher

Subject: Addendum Letter Report
Geologic Investigation, Proposed Quarry Site
Opposite the Existing Lexington Quarry

Dear Mr. Fisher:

In accordance with your request, we have assessed alternative slope heights and bench widths for optimizing volume available at the Lexington quarry site. Our assessment is based on preparing several alternative excavation profiles and considerations of the geologic site conditions.

We have submitted our original recommendations for design in our geologic investigation report dated April 11, 1988. The purpose of this addendum letter is to provide documentation on recommended alternative slope height and bench width.

As discussed in our April 1988 report, the proposed quarry site is almost exclusively in graywacke sandstone of the Franciscan Formation. Bedding structure apparently dips gently into the slope. Detailed discussions of the site geologic conditions are presented in our April 1988 report. Based on our assessment of alternative slope heights and bench widths, we recommend that the final cut-slope should not be steeper than 1 horizontal to 1 vertical (1H:1V). Small localized slumps on excavated slopes, resulting from isolated adversely oriented joints or fractures are likely to occur on an intermittent basis, although they are not likely to involve significant volumes of material. The vertical height of the quarry faces should not exceed 100 feet and benches should have minimum widths of 30 feet to accommodate excavation and maintenance equipment, but more importantly, to provide for catchment area for slumped material and provide for working area in the event of partial loss (breaching) of the bench as a result of slumping. A bench width of 30 feet in conjunction with 100 feet high quarry faces at 1H:1V slopes will produce an overall effective slope comparable to that of the original ground profile. Recommendations for drainage control are included in our April 1988 report.

We recommend that a qualified engineering geologist or geotechnical engineer review the final design plans to ensure that recommendations presented herein are incorporated into the quarry development. In addition, periodic site visits by a geologist or engineer, during excavation, are recommended to identify localized or previously unidentified conditions which might adversely affect quarry performance and require modification of the original quarry scheme.

Very truly yours,

WAHLER ASSOCIATES

Antonio S. Buangan

Antonio S. Buangan
Principal
CEG 824, California

ASB:L2

Wahler Associates
Geotechnical and Water Resources Engineering

April 11, 1988
Project ZRL-101A

Lexington Quarry
705 Los Esteros Road
San Jose, California 95134

Attention: Mr. Paul Fisher

Subject: Geologic Investigation
Proposed Quarry Site,
Opposite the Existing
Lexington Quarry

Gentlemen:

This letter report presents the results of our geologic investigation of the proposed quarry site on the canyon slope opposite the existing Lexington Quarry, located approximately 1-1/2 miles south of Los Gatos, in Santa Clara County, California. Conclusions regarding site conditions, as well as recommendations for design, are included and should partially fulfill County requirements for a use permit application.

Detailed geologic mapping of the proposed site was performed on March 22 and 23, 1988, at a scale of 1"=100'. The map base was provided by the project civil engineer, Louis M. Bini Associates, Inc. Inspection of aerial photographs contributed to a preliminary site evaluation. In addition, three seismic refraction surveys were performed on March 23, 1988 to determine seismic velocities of subsurface materials within the site. A Bison Model 1570C Signal Enhancement Seismograph with a single geophone was used; a 10-pound sledge striking a metal plate provided the energy input. The locations of the seismic lines are depicted on the Site Geologic Map, Figure 2. A list of references for geologic literature used in the evaluation is included at the end of this report, following Figure 6.

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Telex Number 4998623

REGIONAL GEOLOGIC AND SEISMIC SETTING

The Lexington Quarry is situated within relatively rugged terrain dominated by Franciscan Complex bedrock (Figure 1). This area is located in a seismically active region which has been subjected to several strong earthquakes in recent history. Recorded earthquakes have occurred throughout the San Francisco Bay Area since the early 1800's, with the majority of these events having epicenters along the San Andreas, Hayward, and Calaveras fault zones. The San Andreas fault is located approximately 2.5 miles southwest of the site, and is the most likely source of future strong ground motions at the quarry. Although located further from the site, major earthquakes along the Hayward and Calaveras faults could also subject the quarry to strong shaking (these faults are located approximately 14 and 16 miles northeast of the quarry, respectively).

An approximately located and queried trace of the Limekiln fault has been mapped immediately southeast of the site, trending northwest along the floor of Limekiln Canyon (Dibblee and Brabb, 1978). However, this trace is considered inactive and is not located within an Alquist-Priolo special studies zone (CDMG, 1985).

SITE GEOLOGY

The Franciscan bedrock within the quarry area is comprised almost exclusively of graywacke (sandstone). Where exposed along quarry cuts and in outcrops within the well-incised ravine located toward the northeast edge of the site (Figure 2), the graywacke is typically moderate gray, fresh to slightly weathered, moderately to closely fractured (i.e., fracture spacings ranging from 1.0' to 0.1'), hard and strong. The fractures are distributed along numerous intersecting joint sets which tend to form an "interlocking" joint system. Although several joint sets dip outward (i.e., west to north) from the northwest-facing slope of the proposed quarry, other steeply dipping to vertical joint sets intersect these features and, consequently, appear to preclude any significant continuity of adversely oriented structures. The graywacke contains minor interbeds of dark gray, moderately hard and fissile shale, which typically range in thickness from several inches to about 1-foot. Several thin beds of very hard, green chert were also encountered within the graywacke. Bedding attitudes, measured at contacts of the graywacke and shale, indicate that the bedrock dips gently into the slope (i.e., generally south to southeastward) and is therefore favorable in terms of slope stability. Both joint and bedding attitudes are depicted, where measured, on the Site Geologic Map (Figure 2).

A narrow (roughly 8-inch wide) zone of sheared graywacke, crushed to a clayey, gravelly soil, was encountered within an existing cut near the toe of the proposed quarry slope. Such shear zones are typical of the Franciscan Complex and will probably be exposed on a minor, local basis during quarry excavation.

Two small areas of landsliding were encountered during exploration and are shown on Figure 2. Minor seepage was observed emanating from a small outcrop of severely weathered shale, within the slide area located near the southwest edge of the site. A slick, out-slope dipping (joint) surface was measured at this location and, along with the seepage, might have contributed to an unstable slope condition. Both slides appear to have incorporated only shallow, surficial materials consisting of soil and loose rock debris (i.e., colluvial deposits) and are confined to small, localized areas. Several minor slumps have occurred along cut-faces of the existing quarry and may be the result of localized, adversely oriented structures such as jointing. However, as previously discussed, the intersecting joint pattern and favorable bedding which are characteristic of the site should preclude any large-scale slope failures.

The results of the seismic refraction surveys, as well as observations of the upper cut-slopes of the existing quarry across the canyon, indicate that moderately weathered graywacke extends to depths of at least 30 feet below the ground surface at higher elevations. Low seismic velocity materials characteristic of moderately to severely weathered bedrock were encountered to the maximum exploration depths of approximately 30 feet at seismic lines SL-2 and SL-3, located along the middle to upper slopes of the proposed quarry (Figure 2). Exposures of fresh to slightly weathered graywacke predominate within quarry cuts at the lower elevations along both sides of the canyon floor, indicating that more competent, fresh graywacke occurs at shallower depths within the lower slopes. Seismic line SL-1, located along the lower to middle, northwest-facing slope of the proposed quarry, encountered a relatively higher velocity layer (indicative of somewhat less weathered rock) at a depth ranging from about 10 to 30 feet below the ground surface. Thin topsoil and colluvial deposits overlie the bedrock to depths ranging from less than 1-foot to about 6 feet, as indicated by the seismic surveys and numerous cut exposures. The seismic refraction profile sheets are included, immediately following the text.

RECOMMENDATIONS

Based upon the site geologic conditions, a benched quarry scheme, similar to that utilized at the original quarry, is recommended for development of the new site. Recommended schemes are depicted on Figures 5 and 6.

Final cut-slopes within less weathered and, consequently, more competent graywacke should not be steeper than 3/4 horizontal to 1 vertical (3/4 H:1 V). The distribution of the less weathered material along the existing quarry face indicates that these steeper cuts can be excavated within the lower portion (i.e., roughly the lowest several hundred vertical feet) of the slope above the canyon floor. Permanent cut-slopes for the more weathered material should not be steeper than 1 H:1 V. These flatter cuts will probably be required for the majority of the upper slope above roughly Elevation 1,100. Small, localized slumps on excavated slopes, resulting from isolated, adversely-oriented joints or fractures, are likely to occur on an intermittent basis, although they are not likely to involve significant volumes of material. As mentioned previously, such failures can be seen along cut-faces of the existing quarry across the canyon. The vertical height of quarry faces should not exceed 50 feet, and benches should be wide enough to accommodate equipment for excavation and maintenance.

In order to prevent excessive erosion of quarry slopes, the bench surfaces should be sloped in (2 percent minimum), toward the quarry face and into a drainage ditch (shown as "bench interceptor ditch" on Figures 5 and 6) at the face toe. The longitudinal slope of the benches and attendant interceptor ditches should be at least 2 percent, preferably sloped from the southwest edge of the quarry toward the quarry's northeast edge. A side collector ditch will channel runoff, collected from the interceptor ditches, to a stilling basin at the bottom of the canyon. The side collector ditch may require lining or energy dissipators to mitigate erosion, particularly within the more weathered graywacke at higher elevations. The stilling basin should accumulate the majority of eroded soil and rock debris, thus preventing the development of excessive downstream siltation (periodic removal of accumulated debris may be required to maintain the basin). Rock riprap should be placed at the toe of the side collector ditch to dissipate the energy of runoff and preclude concentrated erosion at the canyon floor. An additional interceptor ditch should be constructed along the upper margin of the quarry (i.e., immediately above the "daylight line") to drain runoff from natural slopes above the quarry. This ditch will probably require lining for erosion protection, as it will probably be excavated within easily erodible, colluvial soils or severely weathered bedrock. This scheme, as depicted in plan view on Figure 6, confines runoff to the area within the quarry boundary. An alternate drainage scheme, such as sloping the benches from a mid-point toward each end of the quarry, would probably entail directing a portion of the runoff toward, and outside, the southwest quarry boundary (i.e., into Limekiln Canyon).

LIMITATIONS

The conclusions and recommendations presented herein were developed by Wahler Associates in accordance with generally accepted geologic and geotechnical engineering practices and principles. They were based upon data obtained during the field exploration (mapping and seismic refraction survey) at the locations shown on Figure 2. If development of the new quarry utilizes any method or scheme not recommended in this report, Wahler Associates will hold no responsibility relating to performance of the developed quarry unless project changes are reviewed by Wahler Associates, and the conclusions and recommendations of this report are modified and approved in writing.

We recommend that a qualified engineering geologist or geotechnical engineer review the final design plans to ensure that recommendations presented herein are incorporated into the quarry development.

Very truly yours,

WAHLER ASSOCIATES

Rick Harlan
Staff Geologist

Antonio S. Buangan
Principal
CEG No. 824, California

RH:ASB:m

REFERENCES

California Division of Mines and Geology; (1985), Fault Rupture Hazard Zones in California, Special Publication 42.

Dibblee, T.W., and Brabb, E.E.; (1978), Preliminary Geologic Map of the Los Gatos Quadrangle, Santa Clara County, California, U.S. Geological Survey Open-File Report 78-453.

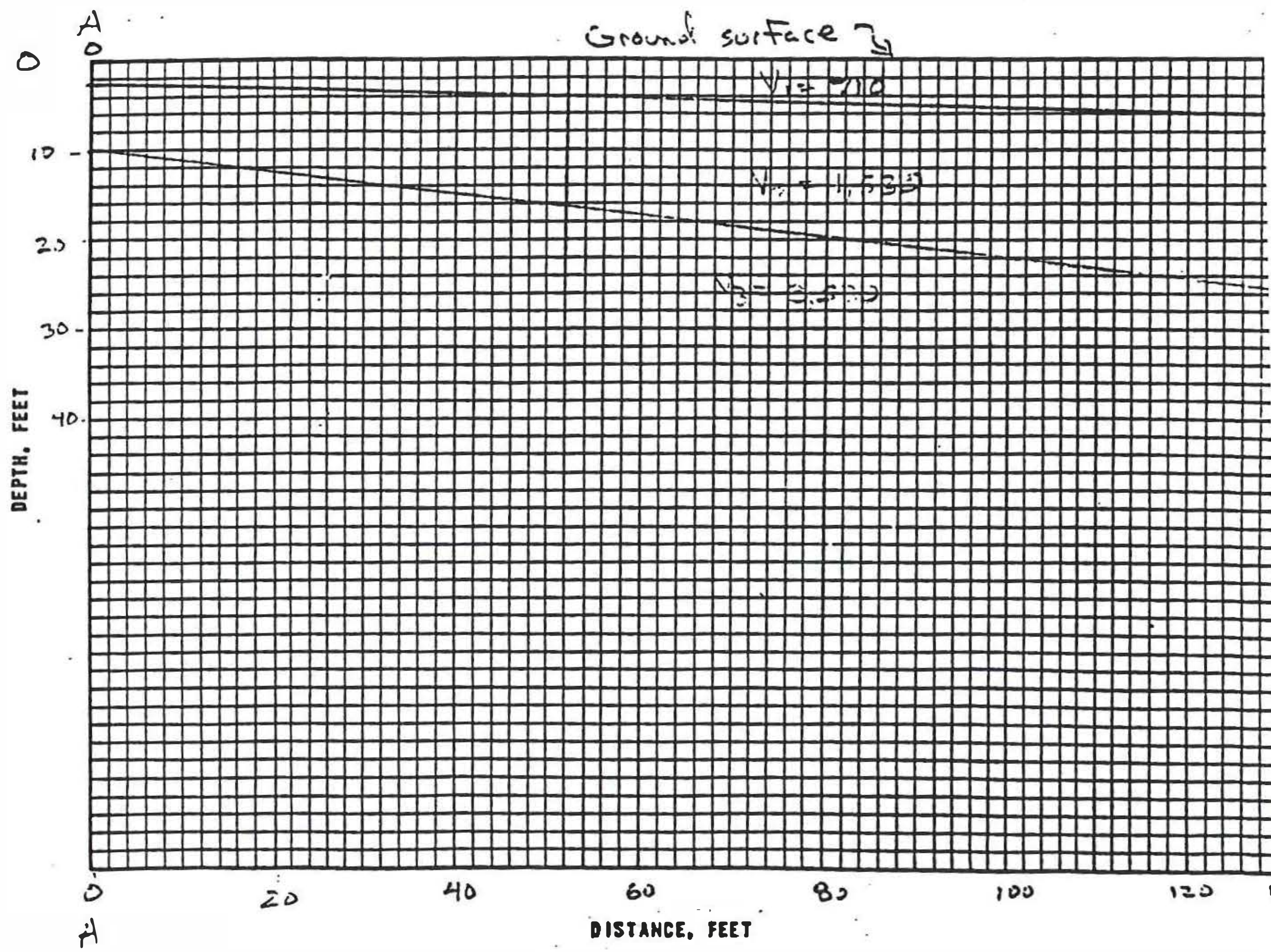
Rogers, T.H., and Williams, J.W.; (1974), Potential Seismic Hazards in Santa Clara County, California, California Division of Mines and Geology, Special Report 107.

LOCATION lower mid slope NW Face LINE NO. SL-1

LINE BEARING (A TO B) N 40°E PERFORMED BY RH / ASB

LINE LENGTH 130' DATE 3/24/88

V_1	AVERAGE VELOCITY LAYER 1	710
W_2	DIP ANGLE LAYER 2	-6.39
V_2	AVERAGE VELOCITY LAYER 2	1,530
HA_1	FIRST LAYER THICKNESS AT A	2.5
HB_1	FIRST LAYER THICKNESS AT B	6.0
W_3	DIP ANGLE LAYER 3	-1.14
V_3	AVERAGE VELOCITY LAYER 3	3,530
HA_2	SECOND LAYER THICKNESS AT A	7.5
HB_2	SECOND LAYER THICKNESS AT B	19.4



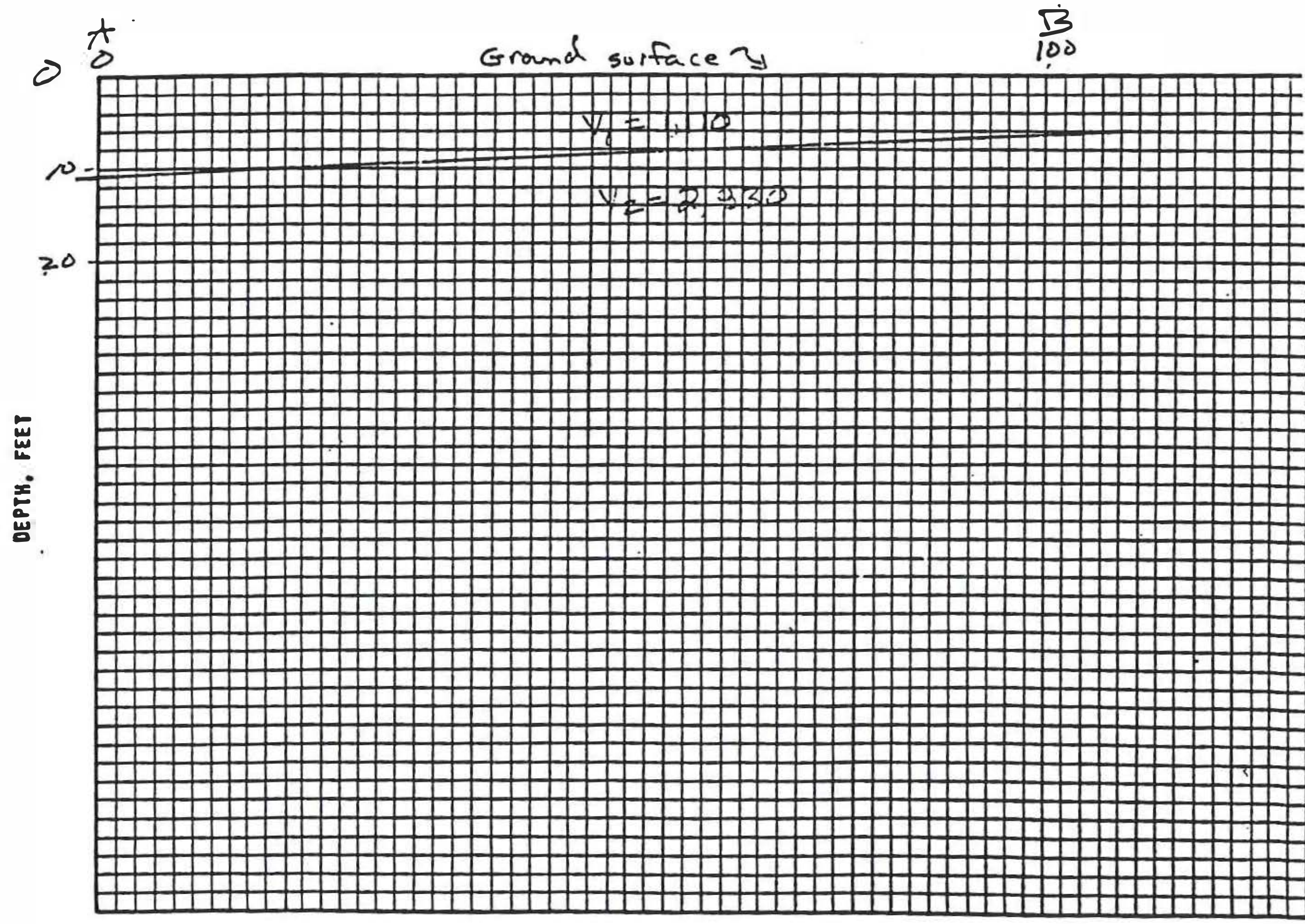
Wahler Associates 9/85

LOCATION mid slope so. Face LINE NO. SL-2

LINE BEARING (A TO B) S45°E PERFORMED BY RH/ASE

LINE LENGTH 100' DATE 3/24/89

V_1	AVERAGE VELOCITY LAYER 1	1,110
W_2	DIP ANGLE LAYER 2	1.64
V_2	AVERAGE VELOCITY LAYER 2	2,830
HA_1	FIRST LAYER THICKNESS AT A	10.40
HB_1	FIRST LAYER THICKNESS AT B	6.20
W_3	DIP ANGLE LAYER 3	
V_3	AVERAGE VELOCITY LAYER 3	
HA_2	SECOND LAYER THICKNESS AT A	
HB_2	SECOND LAYER THICKNESS AT B	



DISTANCE, FEET

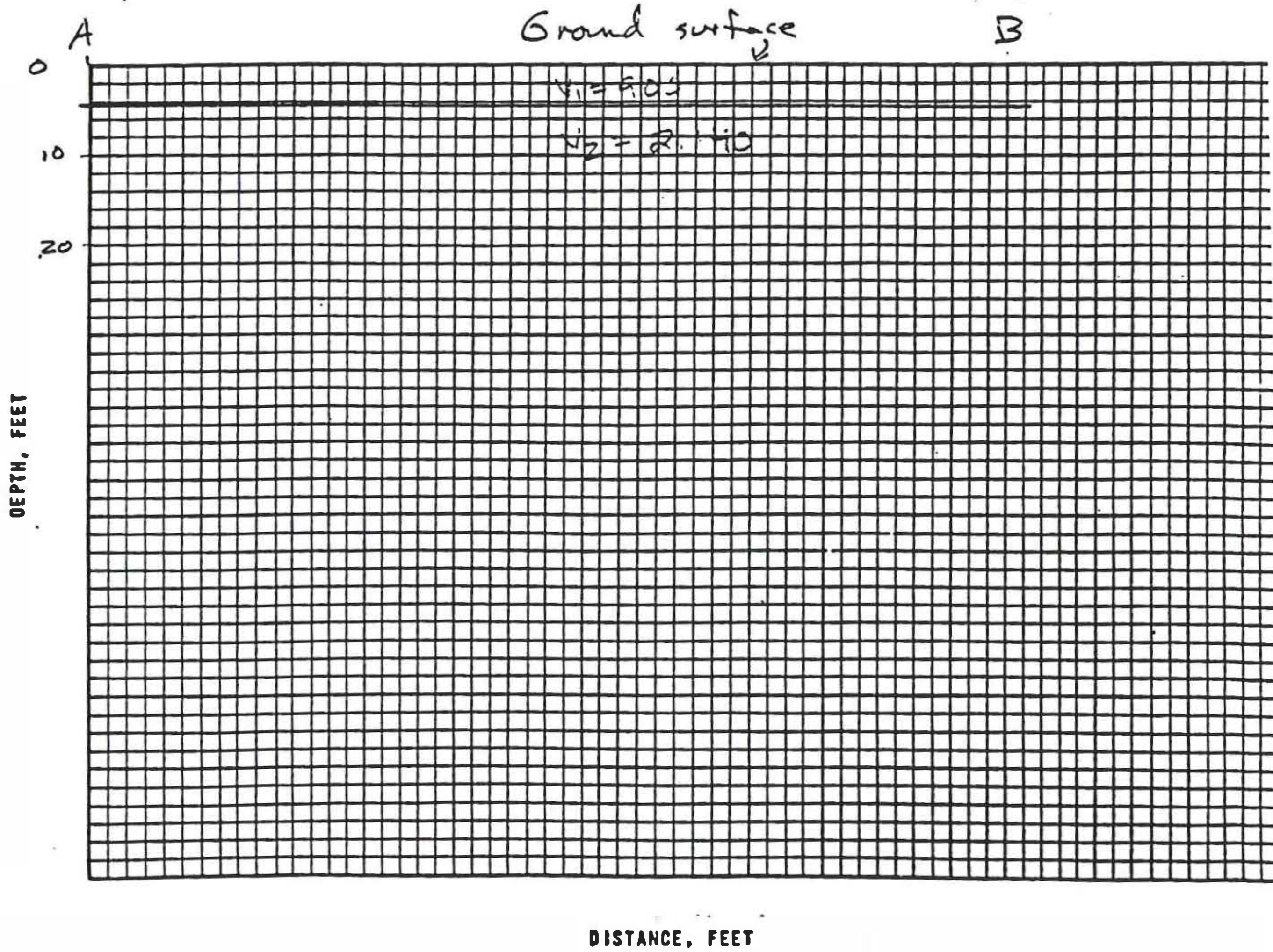
Wahler Associates 9/85

LOCATION Upper slope, NW face — LINE NO. SL-3

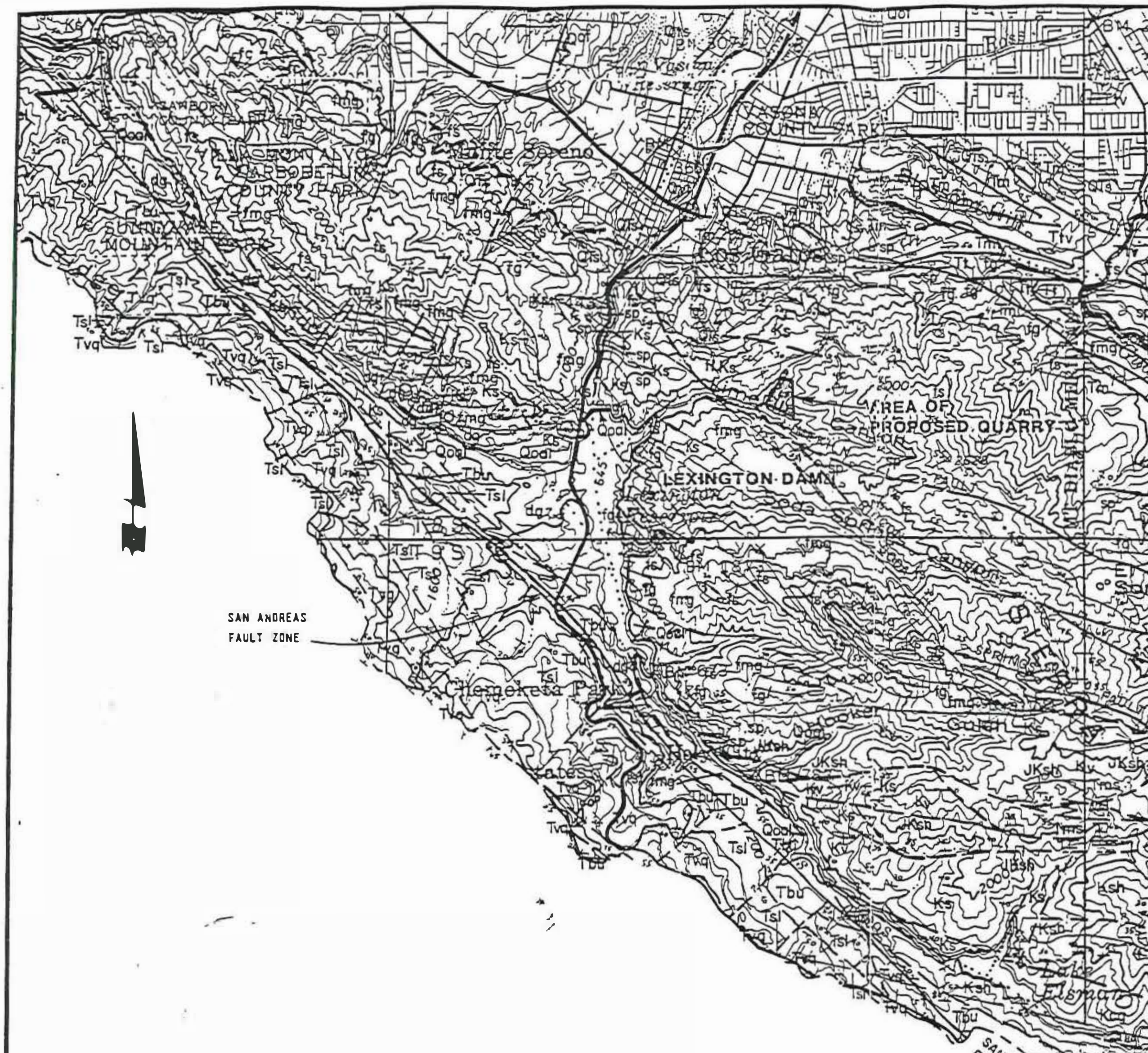
LINE BEARING (A TO B) S 63°E — PERFORMED BY RH/ASB

LINE LENGTH 100' — DATE 3/24/88

V_1	AVERAGE VELOCITY LAYER 1	900
W_2	DIP ANGLE LAYER 2	-0.25
V_2	AVERAGE VELOCITY LAYER 2	2,140
HA_1	FIRST LAYER THICKNESS AT A	4.1
HB_1	FIRST LAYER THICKNESS AT B	4.2
W_3	DIP ANGLE LAYER 3	
V_3	AVERAGE VELOCITY LAYER 3	
HA_2	SECOND LAYER THICKNESS AT A	
HB_2	SECOND LAYER THICKNESS AT B	



Wahler Associates 9/85



EXPLANATION

GEOLOGIC UNITS

QUATERNARY

Qyf	Young alluvial fan
Qof	Older alluvial fan
Qoal	Older stream alluvium
QTs	Non marine sedimentary rocks (Includes Santa Clara and Packwood Formation)

TERTIARY

Ttv	Volcanic rock
Tm	Monterey Formation: siliceous shale, chert, mudstone
Tvq	Vaqueros Formation: sandstone
Tbu	Butano Formation: sandstone
Tsl	San Lorenzo Formation: mudstone shale
Tt	Temblor Formation: sandstone, conglomerate

CRETACEOUS

Ks	Hard sandstone, shale
Ksh	Hard sandstone, shale

FRANCISCAN COMPLEX

fs	Sandstone, shale
fmg	Melange
fg	Greenstone
fc	Chert
sp	Serpentine

SYMBOLS

Fault solid where well located dashed where approximately located dotted where concealed queried where inferred. Barbs indicate thrust fault (barbs on upper plate)

Lithologic contact - solid where well located, dashed where approximately located dotted where concealed, queried where inferred

Contact between the Franciscan melange and the other Franciscan units. Solid where well located dashed where approximately located. Dotted where concealed, queried where inferred.

25 Strike and dip of bedding, number indicates the degree of dip

Anticline

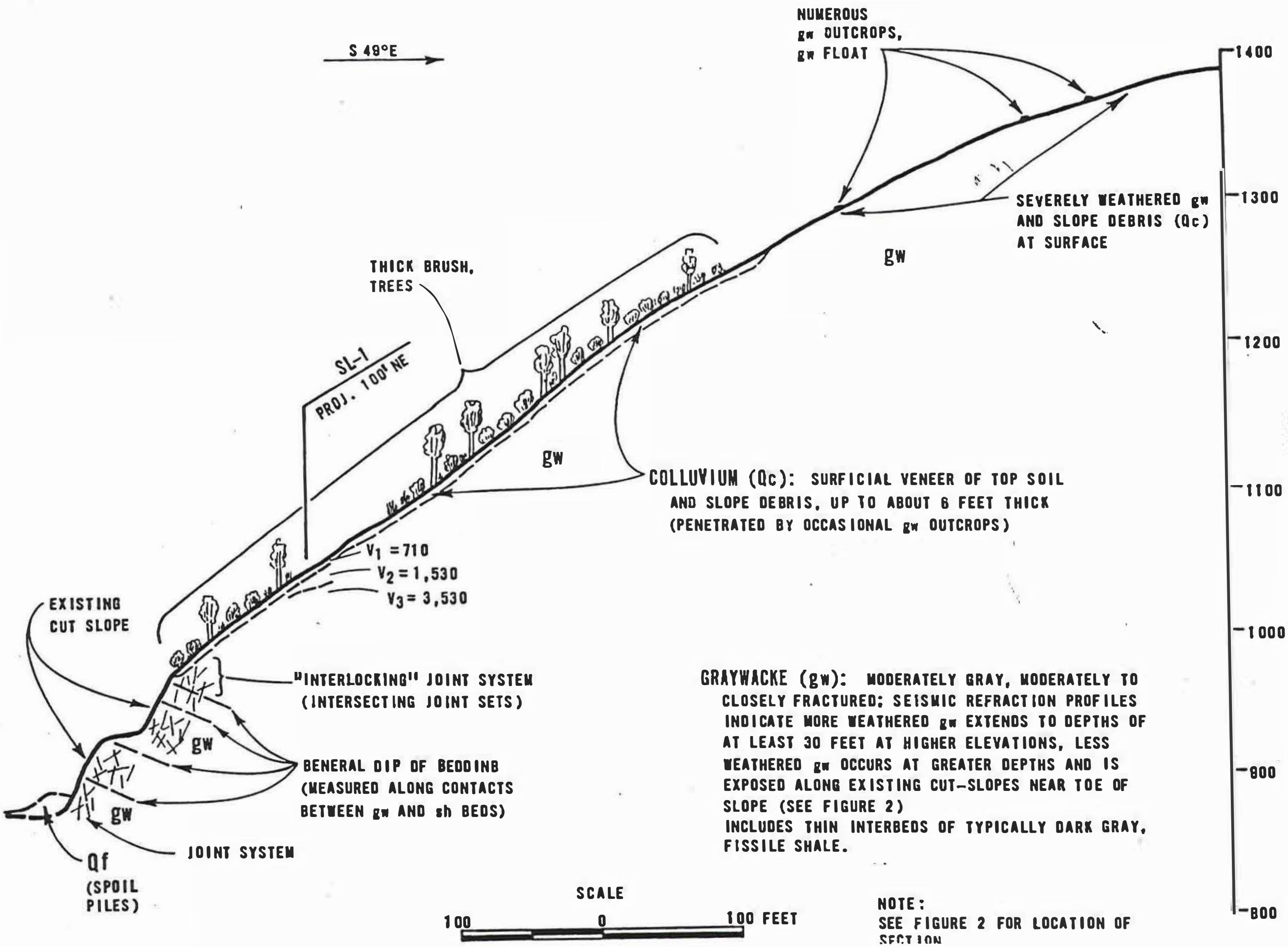
Syncline

Lineament from aerial photographs

Source. Rogers & Williams, 1974

3000 0 3000 FEET
SCALE: 1:62,500

Wahler Associates	PROPOSED QUARRY SITE, OPPOSITE EXISTING LEXINGTON QUARRY	REGIONAL GEOLOGY		
	PALO ALTO • CALIFORNIA	PROJECT NO.	DATE	FIGURE NO.
		ZRL-1G1A	APRIL 1988	1



NOTE:
SEE FIGURE 2 FOR LOCATION OF SECTION

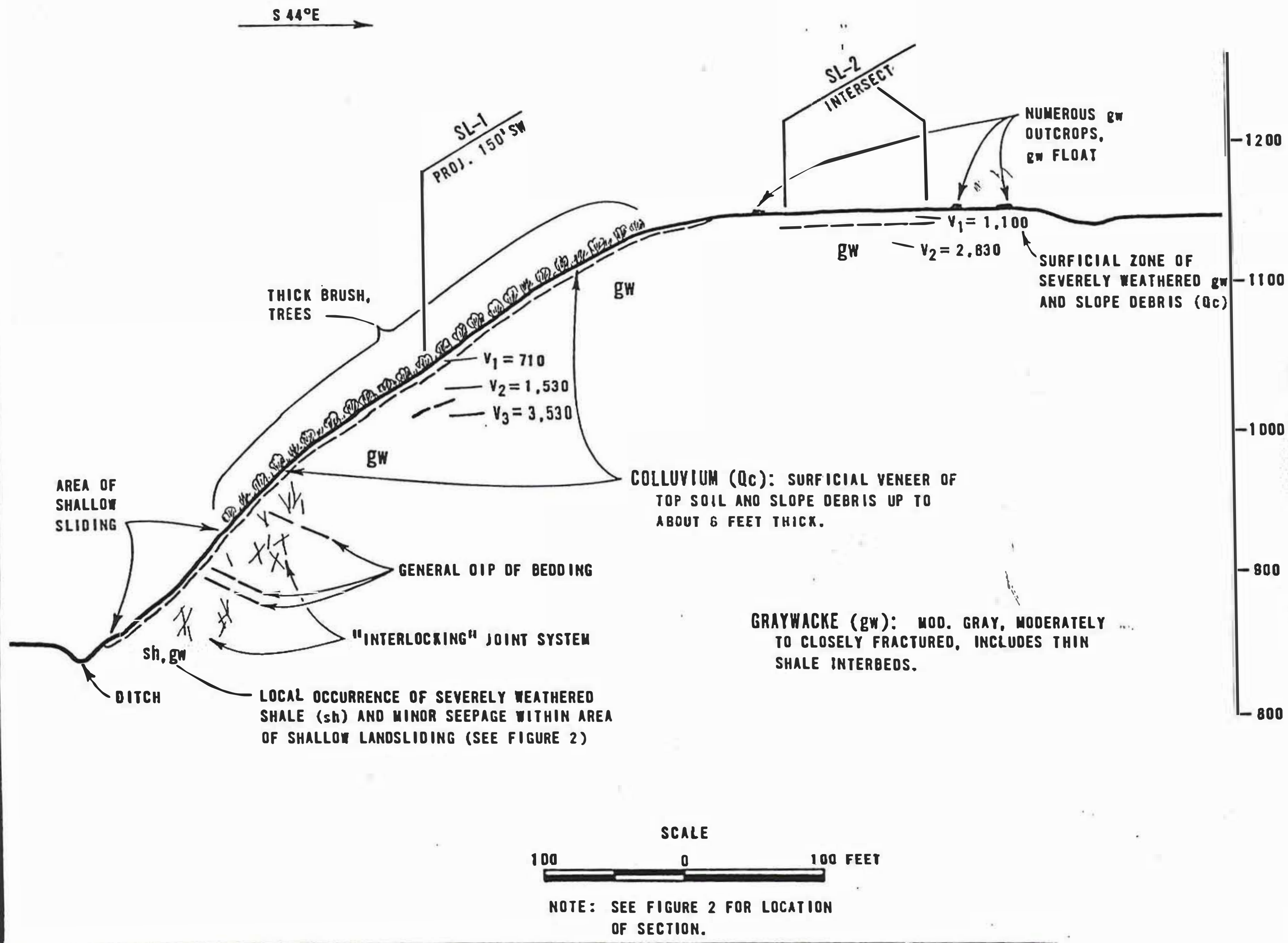
Wahler Associates

PROPOSED QUARRY SITE, OPPOSITE EXISTING LEXINGTON QUARRY

PALO ALTO • CALIFORNIA

SECTION A-A

PROJECT NO.	DATE	FIGURE NO.
ZRL-101A	APRRIL 1988	3



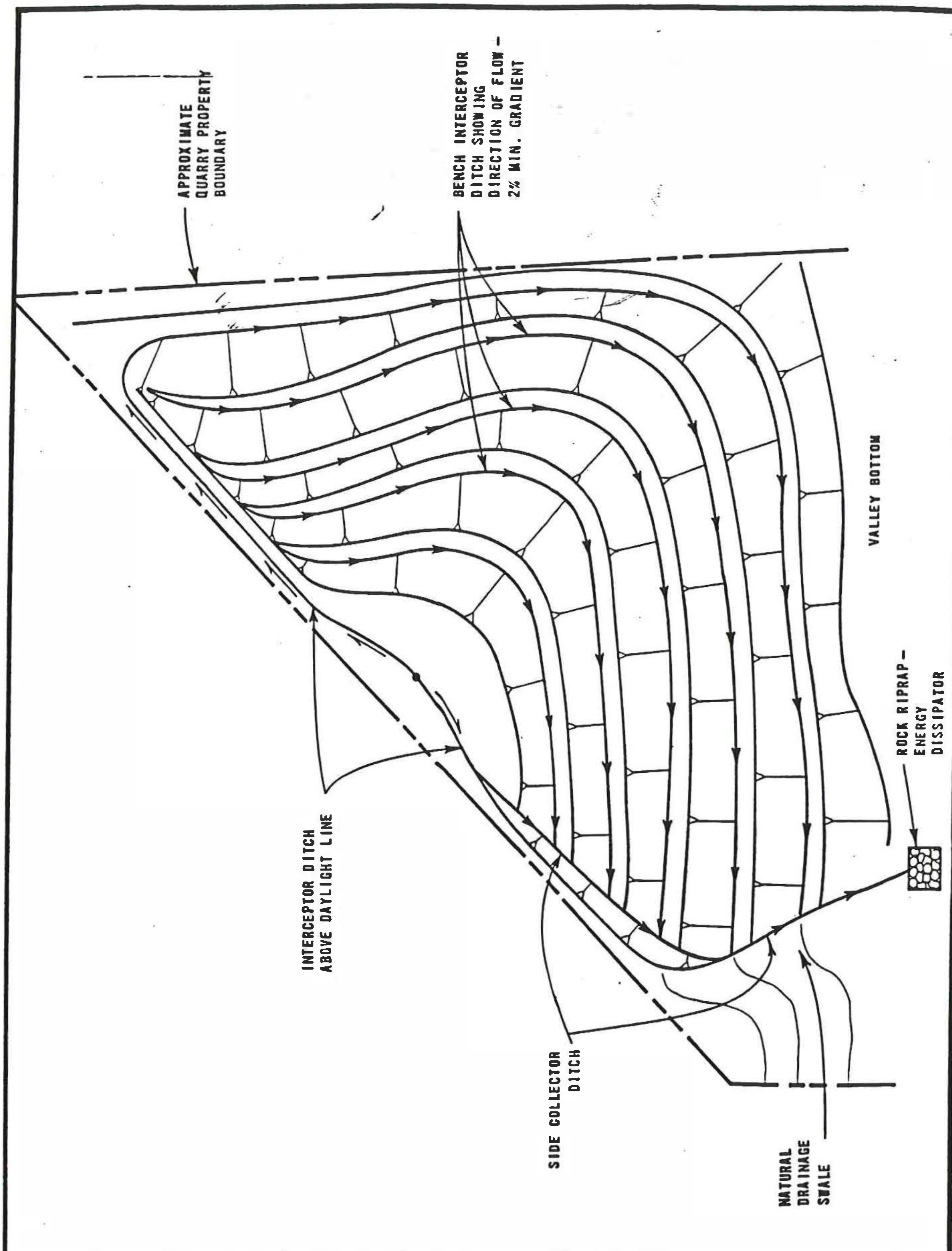
Wahler Associates

PROPOSED QUARRY SITE, OPPOSITE EXISTING LEXINGTON QUARRY

PALO ALTO • CALIFORNIA

SECTION B-B

PROJECT NO.	DATE	FIGURE NO.
ZRL-101A	APRIL 1988	4



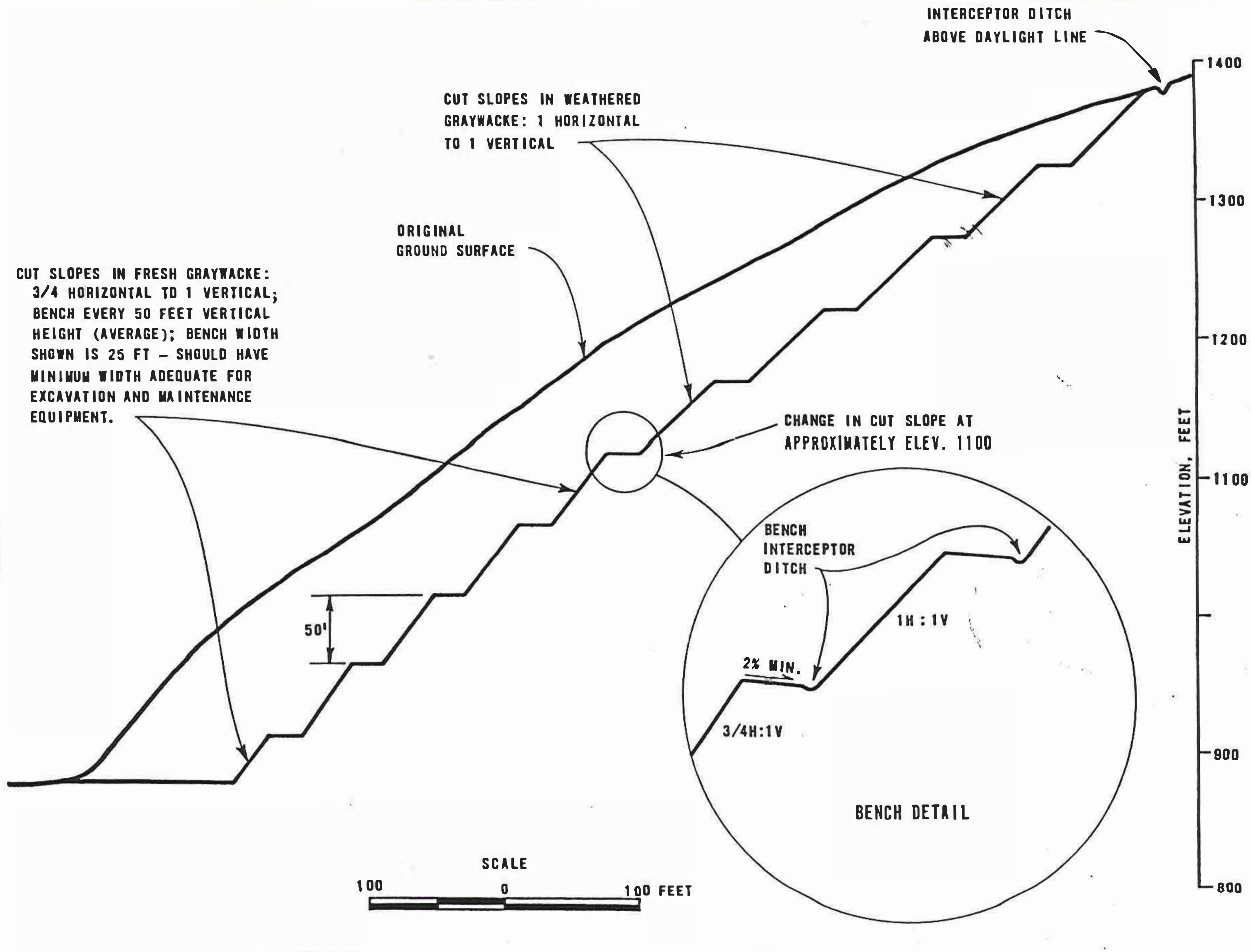
Wahler Associates

PROPOSED QUARRY SITE,
OPPOSITE EXISTING LEXINGTON QUARRY

PALO ALTO • CALIFORNIA

SCHEMATIC DIAGRAM
QUARRY PLAN

PROJECT NO.	DATE	FIGURE NO.
ZRL-101A	APRIL 1988	6



Woodward-Clyde
Associates

PROPOSED QUARRY SITE,
OPPOSITE EXISTING LEXINGTON QUARRY

PALO ALTO • CALIFORNIA

RECOMMENDED SLOPE AND BENCH DETAIL

PROJECT NO.	DATE	FIGURE NO.
ZRL-101A	APRIL 1988	5

APPENDIX G-2

Cleary Consultants, Inc.

- Geologic Mapping and Slope Stability Analysis Report, July 27, 2006

APPENDIX G-2

GEOLOGIC MAPPING AND
SLOPE STABILITY ANALYSES REPORT
LEXINGTON QUARRY
SANTA CLARA COUNTY, CALIFORNIA

for

Richard O. DeAtley
West Coast Aggregates, Inc.
P.O. Box 1061
Tracy, CA 95378

by

Cleary Consultants, Inc.
900 N. San Antonio Road
Los Altos, California 94022

July 2006

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

J. Michael Cleary, CEG, GE
Christophe A. Ciechanowski, GE
Grant F. Foster, GE

July 27, 2006
Project No. 898.2A
Ser. 9868

West Coast Aggregates, Inc.
Attn: Richard O. DeAtley
P.O. Box 1061
Tracy, CA 95378

RE: GEOLOGIC MAPPING AND SLOPE STABILITY ANALYSES STUDY FOR EAST AND WEST QUARRY SLOPES
LEXINGTON QUARRY
SANTA CLARA COUNTY, CALIFORNIA

Dear Mr. De Atley:

As authorized, we have performed a geologic mapping and slope stability study for the east and west quarry slopes at the Lexington Quarry in Santa Clara County, California. The accompanying report presents the results of our geologic field work, subsurface investigation, laboratory testing, and engineering analyses. The scope of these services is intended to address the requirements of the State of California Office of Mine Reclamation as described in the 2005 SMARA Mine Inspection report for Lexington Quarry dated July 12, 2005. The site and subsurface conditions are discussed and our findings regarding the site geologic conditions, stability of the existing and proposed future mining slopes and recommendations for mitigation of localized slope failures are presented.

We refer you to the text of the report for details of our findings, analyses and recommendations. If you have any questions concerning the report, please call.

Very truly yours,

CLEARY CONSULTANTS, INC.

REGISTERED PROFESSIONAL ENGINEER
GRANT FOSTER
No. 2662
EXP. 6-30-07
GEOTECHNICAL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
J. M. CLEARY
No. 222
EXP. 9-30-07
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Grant Foster
Geotechnical Engineer 2662

J. Michael Cleary
Engineering Geologist 352
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GF/JMC:cm

Copies: Addressee (3)
Santa Clara County (3) Attn: Rob Eastwood
Matteoni, O'Laughlin and Hechtman (1) Attn: Bart Hechtman
LSA Associates (1) Attn: Mac Carpenter
Ruth & Going, Inc. (1) Attn: Mike Sheehy
Schaaf & Wheeler (1) Attn: Jim Schaaf

REGISTERED GEOLOGIST
J. M. CLEARY
No. 352
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA
GP 11/30/07

TABLE OF CONTENTS

TABLES

DRAWINGS

INTRODUCTION

This report presents the results of our geologic mapping and geotechnical investigation study regarding the stability of the east and west quarry slopes at Lexington Quarry in Santa Clara County, California. The location of Lexington Quarry is shown on Drawing 1, Site Vicinity and Local Geologic Map.

The mining of the west face of the quarry, which has a maximum height of approximately 470 feet, was completed about 11 years ago. The cutslopes were constructed with a total of eight inward sloping, 25 foot wide benches at 50 foot vertical intervals inclined at approximately 1:1 (horizontal to vertical) except for the two lowermost slope intervals which were constructed as steep as 3/4:1. The benches are "crowned" for drainage at roughly the one-third point from the north end with bench runoff laterally toward both ends.

A 160 to 180 foot high oversteepened (up to 160 percent) cutslope, which was constructed without benches, is located several hundred feet south of the west quarry face near the entrance to Lexington Quarry and directly above Sediment Basin #2. The several hundred foot long slope will be reconfigured based on additional design analyses by LSA Associates Inc.

The east quarry face (active mining area) has a maximum height of approximately 500 feet above the existing quarry floor elevation. At the present time, materials are being mined between the fourth and fifth benches; the design for the east face incorporates 30 foot wide benches at 100 foot vertical intervals with 1:1 slopes between benches. (The most recent topographic mapping available for this portion of the quarry is based on an aerial survey flown June 17, 2002.) The east face benches and slopes have been covered with one to two feet of clay and silt quarry replanting material which we understand will be used for revegetation purposes. The proposed east quarry slope expansion area is located southwest of the active mining area.

The purpose of our study was to analyze the stability of the existing and proposed quarry slopes as required by the 2005 SMARA report for the quarry. The east quarry slope plans used for this report were prepared by Ruth and Going, Inc., dated January 14, 2004; the proposed quarry excavation grades and contours shown on Sheet 4 of these plans were used in our slope stability analyses.

SCOPE OF WORK

As discussed in our proposal agreement dated February 27, 2006, the scope of services for this investigation has included detailed geologic mapping of the east and west quarry slopes; review of aerial photos, prior geological reports for the quarry, and other available information; a subsurface exploration consisting of five exploratory borings and nine seismic refraction survey lines (performed by Norcal Geophysical Consultants); laboratory testing; slope stability analyses of the existing and proposed east and west quarry slopes to determine the overall factor of safety for the existing slopes for both static and seismic conditions; stereo net analyses and evaluation of the potential for shallow planar and wedge failures; discussion of the conditions encountered with recommendations for repairing or mitigating localized slope failures as required by the State of California and Santa Clara County; and preparation of this report.

Geologic mapping of the quarry slopes was performed by Michelle Richardson, Michael Cleary, CEG, GE and Louis Richardson, CEG, who also prepared a draft of the geology section. The slope stability analyses and report draft preparation were carried out by

Grant Foster, GE. Overall supervision and review of the findings, conclusions and recommendations presented in the report were the responsibility of Michael Cleary.

This report has been prepared for the specific use of West Coast Aggregates, Inc. in accordance with generally accepted geotechnical engineering principles and practices. No other warranty, either expressed or implied, is made. In the event that any substantial changes in the nature, design, or locations of the planned quarry mining operations should occur, the conclusions and recommendations of this report will not be considered valid unless such changes are reviewed and the conclusions of this report modified or verified in writing by Cleary Consultants, Inc. Any use or reliance of this report or the information contained herein by a third party will be at such party's sole risk.

It should also be recognized that the passage of time may result in significant changes in technology, building codes, the state of practice, economic conditions or site variations that could render this report inaccurate. Accordingly, neither West Coast Aggregates, Inc., nor any other party, should rely on the information, conclusions or recommendations contained in this report after three years from its date of issuance without the express written consent of Cleary Consultants, Inc.

METHOD OF INVESTIGATION

Available geologic literature for the quarry, including our previous geologic reports (2001, 2002, 2005), the earlier geologic reports by Wahler Associates (1988, 1989), available topographic maps, and aerial photographs for the period of 1971-2005 were reviewed to determine the progression of the mining operations and geologic conditions at the quarry.

Based on our literature review and initial site reconnaissance, a subsurface investigation program was developed to obtain additional information necessary for the preparation of Subsurface Profiles A-A' through E-E' for use in slope stability analyses of the east and west quarry slopes. The program was performed in two phases; the drilling of exploratory borings and the performing of seismic refraction lines in the study areas. Detailed geologic mapping of the east and west slope was conducted during April and May, 2005 to determine the bedrock conditions and map local slope failures. Due to the extended rainy season experienced this past spring, the start of our field work was delayed until April 17, 2006.

A total of five exploratory borings were drilled on April 25 and 26, 2006, to a maximum depth of 45 feet using a track-mounted hollow stem auger drill rig. Seismic Refraction Lines 1 through 9, ranging from 185 to 480 feet in length, were performed by Norcal Geophysical Consultants on April 20 through April 24, and May 25, 2006. The exploratory boring and seismic refraction line locations are shown on Drawing 2, Site Geologic Map.

A key describing the soil classification system and soil consistency terms used in this report is presented on Drawing 6 and the soil sampling procedures are described in Drawing 7. Logs of the borings are presented on Drawings 9 through 19.

The borings and seismic refraction lines were located in the field by pacing and interpolation of the features shown on the topographic map provided to us. These locations should be considered accurate only to the degree implied by the methods used.

Samples of the material obtained from the borings were returned to our laboratory for classification and testing. The results of moisture content, dry density and percent finer than No. 200 sieve testing are shown on the boring logs. Drawings 20 through 25 present the results of triaxial compression and direct shear testing (by Cooper Testing Laboratory) on relatively undisturbed rock samples obtained from the exploratory borings. The laboratory testing procedures followed during this investigation are summarized on Drawing 8.

A list of references consulted during this investigation is included at the end of the text.

LOCAL GEOLOGY AND SEISMICITY

Lexington Quarry is situated in rugged terrain on the eastern flank of the central Santa Cruz Mountains about three-quarters of a mile east of St. Joseph's Hill near the northwestern end of Sierra Azul Ridge. The quarry site is located within a local, steep-sided, southwesterly draining valley just above its confluence with Limekiln Canyon, a tributary drainage to Los Gatos Creek at Lexington Reservoir. The reservoir occupies a broad valley about 1.5 miles west of the quarry, just above the town of Los Gatos.

The geology of the site region is a complexly faulted and folded terrain. Local bedrock is primarily composed of massive blocks and wedges of clastic sedimentary rock types within the New Almaden Block, a fault-bounded structural component of the Franciscan Complex that extends northward through the Lexington Reservoir area. The main, active trace of the Santa Cruz Mountains segment of the San Andreas fault is manifested as a broad fault zone passing about 2.5 miles southwest of Lexington Quarry. It follows upper Los Gatos Creek to the south and traces northwesterly along the eastern flank of the Santa Cruz mountains.

North of the quarry area, a network of range front thrust faults meanders through the northeastern edge of the Santa Cruz Mountains. Although they are unlikely sources of independent earthquake activity, large earthquakes on the San Andreas fault are known to have triggered slip on segments of these faults, usually thrusting older Franciscan rocks over younger geologic units to the east. Included among these range front faults are the Shannon fault zone, about 1.5 miles north of Lexington Quarry, and the Berrocal fault zone one-half mile northwest of the quarry. The east-west trending Lime Kiln fault zone, which follows Limekiln Canyon just south of the quarry, is not considered active. Disaggregation of the probabilistic seismic hazard model used by the State of California for earthquake hazard evaluations of ground failure potential in this area indicates that the controlling earthquake for site seismic analyses would be a magnitude 7.9 (Mw) earthquake generated by the San Andreas fault.

BEDROCK TYPE AND SLOPE CONDITIONS

The quarry occupies both sides of a southwesterly-trending valley that is subsequent to the north side of Limekiln Canyon. Based on our visual examination of the overall quarry slopes and our reconnaissance of benches and other accessible areas, Lexington Quarry is within a large body of Cretaceous-age sedimentary bedrock of the Franciscan Complex. At this locality, the rock is primarily composed of sandstone and finer grained sedimentary rocks such as shale and siltstone that have been subjected to some degree of metamorphism. These sediments are exposed throughout the quarry area and are presently being processed for crushed rock and aggregate.

Although there are some isolated slivers and discontinuous beds of shale or argillite (weakly metamorphosed shale), bedrock (see photo, Drawing 32) throughout the quarry is almost exclusively a thick section of Franciscan metasandstone (called graywacke). Infrequent narrow, steep shears containing greenish antigorite mineralization and intermittent grayish gouge were observed.

Due to intense regional folding and the rock's disturbance and partial metamorphism during a much earlier period of tectonic subduction, the graywacke is complexly fractured and jointed in multiple directions with most fractures abutted by mechanical interfaces, such as joints, stratigraphic horizons and shears. The density and persistence of the fractures that were observed on the excavated faces was, for the most part, in proportion with the spacing of those interfaces. Fracture spacing commonly varies from a few inches to 3 feet with limited areas of wider spacing, seldom greater than 6 to 10 feet. Fractures and joints are usually tight and the surfaces are rough and uneven. Although bedding measurements are, to some extent, problematic due to the folded, fractured nature of the rock, the orientations of bedding and/or weak foliation of the metasediments seem to strike predominantly to the northeast with relatively steep dip attitudes of northerly to southerly inclinations.

Evidence of weathering and rock decomposition is apparent in the form of brownish oxidation and discoloration throughout the upper portions and outside edges of the quarry slopes on either side of the valley. With the exception of the most severely weathered areas adjacent to the upper "daylight" lines of the excavated quarry slopes - and within local shear zones - infilling of fractures due to in-place decomposition of rock or soil transport is generally insignificant. The majorities of the interior sections of the cut face exposures are less – or slightly – altered with only slight discoloration and little staining. Fresh, bluish-gray, unaltered sandstone has been exposed by excavations in the lowest cut faces at the northern end of the quarry.

SITE CONDITIONS

A. Surface

1. Western Face

The western face of Lexington Quarry has not been quarried for rock for at least the past eleven years. During that time, weathering of the cut slopes has been manifested in the form of gradual deterioration, small rockfalls and raveling. This debris has been contained by the eight, 25-foot wide, inward sloping benches. Erosion by precipitation and runoff appears to be minor due to the erosion-resistant nature of the greywacke rock and insignificant soil cover throughout the excavated area.

The most typical type of slope failure and degradation is in the form of raveling in closely fractured zones and areas of small, shallow, planar slides where the rock fails and slips downslope on local discontinuities that dip with, or slightly out of the slope (see photo, Drawing 33). The rock generally breaks into small pieces of scree that migrate down the slopes, forming local accumulations of talus along the inside edges of most of the benches. Other less common failures are scattered across the western quarry face. For the most part, these are older, somewhat small wedge-type failures that have developed along the intersection line of two or more joints or discontinuities that daylight on the slope. Some have migrated upward, involving the outer edge of the bench above them. Most appear to have occurred during or shortly after excavation of the quarry faces. The slope failures described above generally do not extend upward or downward beyond a single bench and section of intervening slope. The failures observed on the slopes appear to be controlled by the rock jointing and infrequent localized shears; bedding generally projects into the slope and has little effect on the rock mass stability.

The eight benches on the west face have been planted and support a varied growth of grasses, shrubs and small trees.

The results of the field mapping are presented on Drawing 2, Site Geologic Map.

2. Southwestern Extension

The southwestern side of the entrance to the quarry is the southern shoulder of the easterly-facing valley wall that has been cut back to the north. This steep, mountainside spur, composed of weathered graywacke sandstone, is at the juncture of the Limekiln Creek Valley just west of the quarry scale station, and above a series of sediment basins. Considerable rockfall activity from the oversteepened, highly fractured and weathered upper portion of the slope has formed substantial accumulations of talus that fan out along the lower flanks, adjacent to the sediment basins.

Much of the face of this steeply-sloping shoulder at the southwestern extension of the quarry is unstable and inaccessible. Adjacent to the north edge of this area, at the southern edge of the quarried slope, is a relatively large, planar surface of fresh rock that is inclined with the slope, dipping about 45 degrees in a southwesterly direction. The planar surface projects into the aforementioned shoulder and would most likely represent the controlling bedrock discontinuity from the standpoint of slope stability. It appears that this "planar feature" may have occurred during a period of previous cutting at the current floor level which resulted in a steep temporary slope condition.

3. <u>Eastern Face</u>

The eastern, westerly-facing side of the quarry is presently being excavated downward and expanded. Four benches have been completed above the lowest quarry face and excavation is more than half way down to the fifth bench. The cut faces adjacent to the top two benches expose closely spaced joints, fractures and local shears in highly weathered graywacke. A broad, gentle syncline with bedding that dips gently out of the slope is vaguely visible above the uppermost bench.

Local slope failures have occurred along the inner edge of the upper bench, portions of which are oversteepened, and a broad failure roughly 100 feet across exists above the central portion of the second bench, extending about halfway up the slope. These failures are a combination of wedge and planar failures that have developed along adverse, steeply dipping fractures on oversteepened cut slopes. Areas of downward transient percolating seepage on the faces of this side of the quarry suggest that water in fractures, possibly concentrated in the axis of the gentle syncline, may be a contributing factor.

Below the upper two benches, large areas of the slopes are masked by the quarried clay and silt spoils and rocky debris from upslope areas and benches (see photo, Drawing 34). Portions of the surficial materials have slumped, or eroded, onto the lower two benches, resulting in reversed drainage toward the outer edge of the bench (see photo, Drawing 35). At some locations, planting trenches have been cut into the bench (17 feet at Exploratory Boring 4) and filled in with fines from the quarry operations.

Planar or wedge rock failures were generally absent below the upper two benches.

B. Subsurface

Exploratory Borings 1 and 2, drilled at the top rim of the west quarry slope, encountered medium dense to very dense greywacke sandstone to the maximum depth explored of 45.0 feet.

Exploratory Boring 3, drilled part way down the "nose" of the southwest extension area at approximately Elevation 1075 feet, encountered approximately six and one-half feet of medium dense, gravelly silty sand fill material (from the road pioneering), which was underlain by six feet of loose to medium dense gravelly silty sand, which was further underlain by medium dense to very dense greywacke sandstone to the maximum depth explored, 44.0 feet.

Exploratory Boring 4, drilled on the uppermost bench of the east (active) quarry face, encountered approximately 17 feet of "man made" soft to stiff silty to sandy clay and clayey silt fill, which was underlain by very dense greywacke sandstone to the maximum depth explored (drilling refusal), 22.0 feet.

Exploratory Boring 5, drilled on the edge of the haul road overlooking the southeast expansion area, encountered medium dense to very dense greywacke sandstone to the maximum depth explored (drilling refusal), 24.0 feet.

The drilling rates, generally averaged over five foot intervals, recorded during drilling are indicated on the boring logs.

A total of nine seismic refraction lines were conducted by Norcal Geophysical Consultants for this study to obtain information on the depth and degree of rock weathering. Line 1 was extended an additional 120 feet in each direction and is noted as Line 1A in the Norcal report. Lines 1/1A, 2 and 9, located along the upper rim, Bench 3 and Bench 4 on the west quarry face, respectively, indicated compressional velocities of 1,000 to 6,500 feet/second (typical of highly to moderately weathered bedrock) to depths ranging from 50 feet to 140 feet. Line 3, located on the "nose" of the southeast quarry face, and Line 4, located in the southeast quarry expansion area, indicated velocities of 1,000 to 5,000 feet/second (typical of highly weathered bedrock). Line 5, located on the uppermost bench of the east (active) quarry slope, indicated velocities of 1,000 to 5,000 feet/second. Line 6, located on the lowest (Bench 4) of the east quarry slope, indicated compressional velocities of 1,000 to 8,000 feet/second (typical of highly to moderately weathered bedrock). Lines 7 and 8, located on the west and east sides of the quarry floor, respectively, indicated compressional velocities of 2,000 to 14,000 feet/second (upper range typical of slightly weathered to fresh bedrock). The report prepared by Norcal Geophysical Consultants is attached to this report as Appendix B.

The locations of the exploratory borings and seismic lines conducted for this study are shown on Drawing 2, Site Geologic Map. The attached boring logs, seismic refraction line profiles, and related information depict subsurface conditions only at the specific locations shown on Drawing 2 and on the particular dates the field work was performed. Subsurface conditions at other locations may differ from conditions occurring at these locations. Also, the passage of time may result in a change of subsurface conditions at these locations due to environmental changes.

C. Groundwater Seepage

Our site reconnaissance was performed in the latter part of April and in May, 2006, after a continuous period of near-record amounts of rain in March and April. Nevertheless, with the exception of a small, seeping spring observed within a drainage swale at the extreme northern end of the property, the easterly-facing slopes across the western side of the quarry were dry.

Slow seepage was, however, noted to be emerging at the time of our field mapping from relatively horizontal rock discontinuities across a section of the lower, west-facing, quarried slopes on the eastern side of the quarry, as indicated on Drawing 2, causing local ponding of water along the fourth bench from the top. A small, flowing spring was also observed to be emerging from a vertical fracture at the southern end of the uppermost bench. It is our observation that the seeps observed on the east slope are confined to the fractures and shears within the rock and do not represent a true groundwater table, or phreatic surface, within the graywacke sandstone.

During a visit on July 14, 2006, the seeps noted earlier in the year on the lower, west facing slope on the east side of the quarry were no longer present.

STEREONET PLOTS

The orientations of the bedrock discontinuities, i.e. joints, bedding, shears and contacts, mapped on the west and east quarry faces, were evaluated for trends in the data which could influence slope stability. The discontinuity strike and dip attitudes were analyzed stereographically using Version 1.2 of the Stereo Stat computer program. Briefly, the analysis of bedrock discontinuities by the stereo net process allows the discontinuity plane in three dimensions to be viewed in two dimensions by projection of its great circle onto the lower hemisphere of a reference globe sliced through at the equator. The equal area net (Schmidt method) of projection is used by the program. The poles, or points perpendicular to the discontinuity planes which project onto the opposite/lower quadrant, and dip (dip vectors on the great circle perpendicular to the poles) were plotted to evaluate the data trends. The pole concentrations were contoured for analysis of any major trends in the orientations of the joints, beds, shears or contacts.

As discussed earlier, the greywacke sandstone is complexly fractured and jointing orientations were determined in the field mapping to trend in multiple directions. This was confirmed by the plots of the jointing poles for both the west and east quarry faces (Drawings 26 and 29) which do not indicate a strong alignment of joint sets but rather a general northeasterly strike trend with predominantly steep dips toward the northwest and southeast. Bedding measurements in the greywacke, which were primarily observed on thin infrequent shale interbeds, are also predominantly steeply dipping and northeast trending. Bedrock shears were observed infrequently within the greywacke, primarily on the west face; shear orientations mapped in the field had a random strike and predominantly steep dip.

Drawings 27 and 30 present stereonet plots of the discontinuity dip vectors and the slope aspects (great circles) for the west face and east face, respectively. A 35 degree friction angle for the rock facture surfaces, considered representative of the greywacke sandstone discontinuities, is shown on the plots. For static instability of a planar surface, discontinuities, is shown on the plots. For static instability of a planar surface, discontinuities must be flatter, i.e., lie outside the great circle defined by the quarry face such that a dipslope condition exists; and must lie within the friction circle , i.e., dip more steeply than the friction circle. From the plots on Drawings 27 and 30, it can be seen that the "instability region" defined by the 45 degree mining slope and the 35 degree friction angle is relatively small, limiting the potential for deep seated planar failure; and that there are a relatively low percentage of joints and shears which lie within this zone.

Drawings 28 and 31 provide stereographic net plots of the discontinuity intersections (principally joints) associated with the west and east sides of the quarry; these intersections define "wedge type" failures where they daylight on the slopes. Similar to the planar analysis, the "instability region" for the 45 degree mining slope lies within the shaded area indicated on the drawings. The population of unfavorable joint intersections in this area is small in comparison with the total population of joint intersection points, consistent with the infrequent wedge failures present on the east and west quarry faces.

The aerial photography which we reviewed suggests that the planar and wedge instabilities observed on the 1:1 (and steeper) slopes most likely have occurred shortly after excavation of the slopes were completed. In our opinion, these failures do not affect the overall, or global, stability of the east and west quarry slopes. The primary concern with these types of failures is diversion of drainage onto the slope and immediately downslope bench such that the downslope potential for erosion is increased; measures to mitigate this concern are discussed in the conclusions and recommendations section of this report.

The proposed future mining slopes south of the current mining area, and the planned regrading of the oversteepened southwesterly extension opposite the scale home are expected to be generally stable with respect to shallow planar and wedge type failures based on the planned maximum slope gradients of 1:1 and the pattern of predominantly steep slope discontinuities mapped throughout the quarry.

SLOPE STABILITY ANALYSES

Slope stability analyses were performed using the six cross-sections (A-A' through E-E') located on the west and east sides of the quarry as shown on Drawing 2, Site Geologic Map, the GSTABL7 Computer program, and the following design parameters for the bedrock materials:

Table 1 - Bedrock Strength Parameters

	Highly Weathered Graywacke Sandstone	Moderately Weathered Graywacke Sandstone	Slightly Weathered to Fresh Graywacke Sandstone
φ, Degrees	30	35	39
Cohesion, psf	500	6000	8000
Soil weight moist, pcf	130	140	160
Soil weight saturated, pcf	140	145	160

The strength parameters for the highly weathered greywacke sandstone are based on the results of our subsurface investigation (SPT blow counts in the upper weathered bedrock zone) and laboratory testing of the materials obtained from the exploratory borings, which consisted of triaxial consolidated undrained (CU) tests and direct shear tests. The average phi angle indicated by laboratory testing on the highly weathered greywacke was approximately 30 degrees.

The triaxial and direct shear laboratory test results for cohesion (c = zero) do not appear to be representative of the bedrock at the quarry, and were therefore not used in our analyses. The cause of the inconsistent cohesion results is likely due to the fact that the liner samples of the highly weathered rock obtained from the borings were generally disturbed. Therefore, the cohesion value of the highly weathered greywacke (500 psf) was determined by performing a slope stability back calculation analysis (assuming a factor of safety of 1.0) along Section B-B' and Section E-E' where minor failures of the upper highly weathered greywacke sandstone were observed.

The strength parameters for the moderately weathered and fresh greywacke sandstone were determined by combining the results of the geologic reconnaissance and field mapping, seismic refraction surveys, and analyses using the Hoek-Brown strength criteria for fractured rock masses (Hoek and Brown, 1988) and the relationships between friction angles and cohesive strength mobilized at failure (Hoek and Bray, 1981). These published strength parameters and criteria (TRB Special Report 24, Landslide Investigation and Mitigation, Pages 384-388) are based on qualitative descriptions of the degree of rock weathering, rock hardness, joint spacing and dip relative to the slope, and rock disturbance. Hoek and Brown describe "fair quality rock mass" as having "several sets of moderately weathered joints spaced at one to three feet." "Good quality rock mass" is described as "fresh to slightly weathered rock, slightly disturbed with joints at one to three feet."

We categorize the moderately weathered greywacke zone within the Hoek-Brown classification of fair quality rock mass. The observed fracture planes within this zone are generally tight, uneven and angular, and little weathered. The slightly weathered to fresh greywacke sandstone falls within the good quality rock mass. These categories generally match the results of the seismic refraction survey where the zones of moderately weathered rock indicate compressional velocities of 5,000 to 10,000 ft/sec (marginally rippable), and the zones of slightly weathered to fresh rock indicate velocities as high as 14,000 ft/sec (non-rippable).

Cross sections through the existing and proposed quarry excavations were prepared at representative locations within the quarry property. Cross-Section A-A' is located in the area of the finished west quarry slopes. Cross-Sections B-B' and E-E' are located on the south end of the west quarry slope in the existing oversteepened area that is proposed to be regraded; the proposed cutslopes in this area were analyzed for acceptable factors of safety. Cross-Section C-C' is located on the east (current mining) side of the quarry. Cross-Section D-D' is located in the proposed expansion area south of the active mining area; the proposed cutslope was also analyzed in this area for acceptable factors of safety.

The subsurface profiles used for the cross-sections incorporate the findings of our geologic mapping, subsurface investigation and the results of the seismic refraction survey.

The following table summarizes the results of our slope stability analyses with resulting safety factors. A minimum static factor of safety of 1.5, and pseudo-static factor of safety of 1.15 using a seismic coefficient of 0.15g, is recommended by the California Division of Mines and Geology Special Publication 117, 1997, for permanent slopes:

Table 2 - Summary of Slope Stability Analyses for East and West Slopes

Cross-Section No. and Position within Quarry	Static F.S.	Pseudo-Static F.S. (0.15g)
Cross-Section A-A', Global Stability (Finished West Slope)	2.13	1.66
Cross-Section B-B', Global Stability (Existing Southwest Slope)	0.99*	0.80*
Cross-Section B-B', Global Stability (Proposed Southwest Slope Cut)	2.79	2.15
Cross-Section C-C', Global Stability (Active Mining Cut, East Slope)	1.90	1.50
Cross-Section D-D', Global Stability (Proposed Cut Expansion Area, East Slope)	1.93	1.51
Cross-Section E-E', Global Stability (Existing Southwest Slope)	0.98*	0.79*
Cross-Section E-E', Global Stability (Proposed Southwest Slope Cut)	1.38*	1.08*
Cross-Section E-E', Global Stability (Modified Proposed Southwest Slope Cut)	1.57	1.26

* Slopes not meeting the minimum factor of safety requirements.

A deep-seated, rotational failure mode was assumed and the Modified Bishop Circular Search Method was used in the slope stability analyses. Based on published information (California Division of Mines and Geology Special Publication 117, 1997; Seed, 1979), a pseudo-static seismic coefficient of 0.15g was used for earthquakes up to Magnitude 8.25 in the analyses.

The full height (global stability) of all sections was analyzed for the factors of safety. The corresponding slope stability plots are included in Appendix A.

Based on our analyses, the finished west quarry slopes meet the required minimum safety factors of 1.5 for static and 1.15 for pseudo-static conditions. The proposed cutslopes on the west and southwest oversteepened areas also meet the required factors of safety provided the upper portion of the proposed slope indicated on Cross-Section E-E' is revised to an approximately 1.2:1 to 1.5:1 intermediate slope configuration. The existing oversteepened slope opposite the scale house in the southwest corner of the quarry does not meet the minimum required factors of safety, and is to be regraded as discussed above.

The global stability of the east (active) mining slopes and the proposed cutslopes in the southeast expansion area meet the required minimum factors of safety.

The proposed future fillslope area (not shown on the site plan) proposed by LSA at the oversteepened base of the southwest quarry slope was also analyzed for its factor of safety. The fill is proposed to consist of on-site coarse granular material with approximately 2:1 intermediate slopes and 12-foot wide benches every 10 to 15 feet in the vertical elevation. Strength parameters for compacted rockfill material consisting of on-site greywacke sandstone were assumed to have a friction angle of 36 degrees with a cohesion of zero based on our review of typical compacted rock fill strength values (Design of Small Dams, 1965). A static factor of safety of 1.64 and a pseudo-static factor of safety of 1.15 was achieved for the above slope condition which had a total height of approximately 85 feet.

As requested by the County geologist, Mr. Jim Baker, the slopes were also analyzed using the pseudo-static screening analysis procedure outlined in Section 11.2 of DMG Special Publication 117. Based on this procedure, the slopes exceed the required minimum pseudo-static factor of safety of 1.0 using a calculated seismic coefficient of 0.37.

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to provide the geologic and geotechnical related information required by the State of California Office of Mine Reclamation, as noted in their 2005 Mine Inspection Report. Section 9.0 Issues of Concern/Recommendations of the report states that geologic mapping and a slope stability analyses is necessary for the west and east (active) quarry slopes for the "as-built" and future proposed mining slope configuration. Section 4.0 Observations states that for the slope west of Sediment Basin #2, "No analysis of the final stability of this slope has been done." The report also requires that recommendations be provided for the mitigation or repair of existing and future planar/wedge failures in these areas, which "render the approved bench drainage system ineffective."

Based on the results of our slope stability analyses, the finished "as-built" west quarry slopes, the east (active) mining slopes and the proposed cutslopes in the southeast expansion area demonstrate satisfactory slope stability i.e. they meet the required minimum safety factors of 1.5 for static and 1.15 for pseudo-static conditions. These findings are consistent with the overall stable conditions observed during our geologic field mapping of the final quarry slopes.

The existing cutslopes on the southwest oversteepened area do not meet the required minimum factors of safety in their present condition; however, the proposed reconfiguration of this area meets the required factors of safety provided the upper portion of the slope as indicated on Cross-Section E-E' is sloped back (reduced) to approximately 1.2:1 to 1.5:1. Planar "slab" failure along a 44 degree joint was observed in this local area of the slope which contributed to the instability; as noted earlier, this instability may have been caused by cutting in at the slope base to create additional level space. Future mining operations should proceed in a "top down" manner, starting at the top of the cutslope and continuing downward, such that temporary slope oversteepening is avoided.

The proposed future fillslope area proposed by LSA Associates at the base of the west quarry slopes meets the minimum factor of safety requirements. In order to accommodate the required regrading of this slope, acquisition of the small triangular-shaped portion of the adjoining property west of the quarry will be required. The current LSA Associates slope stabilization plans for this area (April 2006) have been utilized in our slope stability analyses.

The lower portion of the 80 to 150 foot high slope below the lowermost bench (#8) on the west side of the quarry, while excavated into slightly weathered to fresh dark gray to blue graywacke, is oversteepened as a result of cutting into the slope from the quarry base level. The LSA Associates grading plan proposes regrading of this area with rock fill material.

The results of our geologic mapping and stereonet plots indicate that jointing is the most common type of discontinuity in the bedrock at the quarry with planes dipping steeply on both sides of the quarry at predominantly greater than 50 degrees. Therefore, we have determined that adverse jointing is not a significant factor that would cause global instability of quarry slopes having a 1:1 slope configuration. Some of the local southeasterly facing joint planes have a shallow failure mechanism, such as the planar slipouts observed on the west quarry slopes which occurred relatively soon after the initial slope and bench excavations. These failures are generally limited to a single bench and were not observed to affect the adjacent intermediate slopes or benches (see photo, Drawing 33). Repairing these local failures is not feasible; however, we recommend that drainage paths be maintained around these areas to minimize erosion and concentrated flow (cascading effect) over the slopes to the lower benches. The talus that has accumulated at the base of the failure areas and along the backside of the benches on the west quarry slopes should also be removed to prevent the obstruction of the drainage system.

We also observed a build up of loose clayey sand material along the backside of the lower two benches on the east (active) slopes (see photo, Drawing 35), which is blocking the drainage path. The material, which we understand was placed for future revegetation purposes, will likely continue to erode downslope during the winter seasons and cause runoff to flow over the slopes to the lower benches. The loose soil should either be protected with jute netting and hydroseeded and irrigated early enough in the current dry season to establish growth, or the material should be removed to expose the underlying rock similar to the condition on the west quarry slopes.

****

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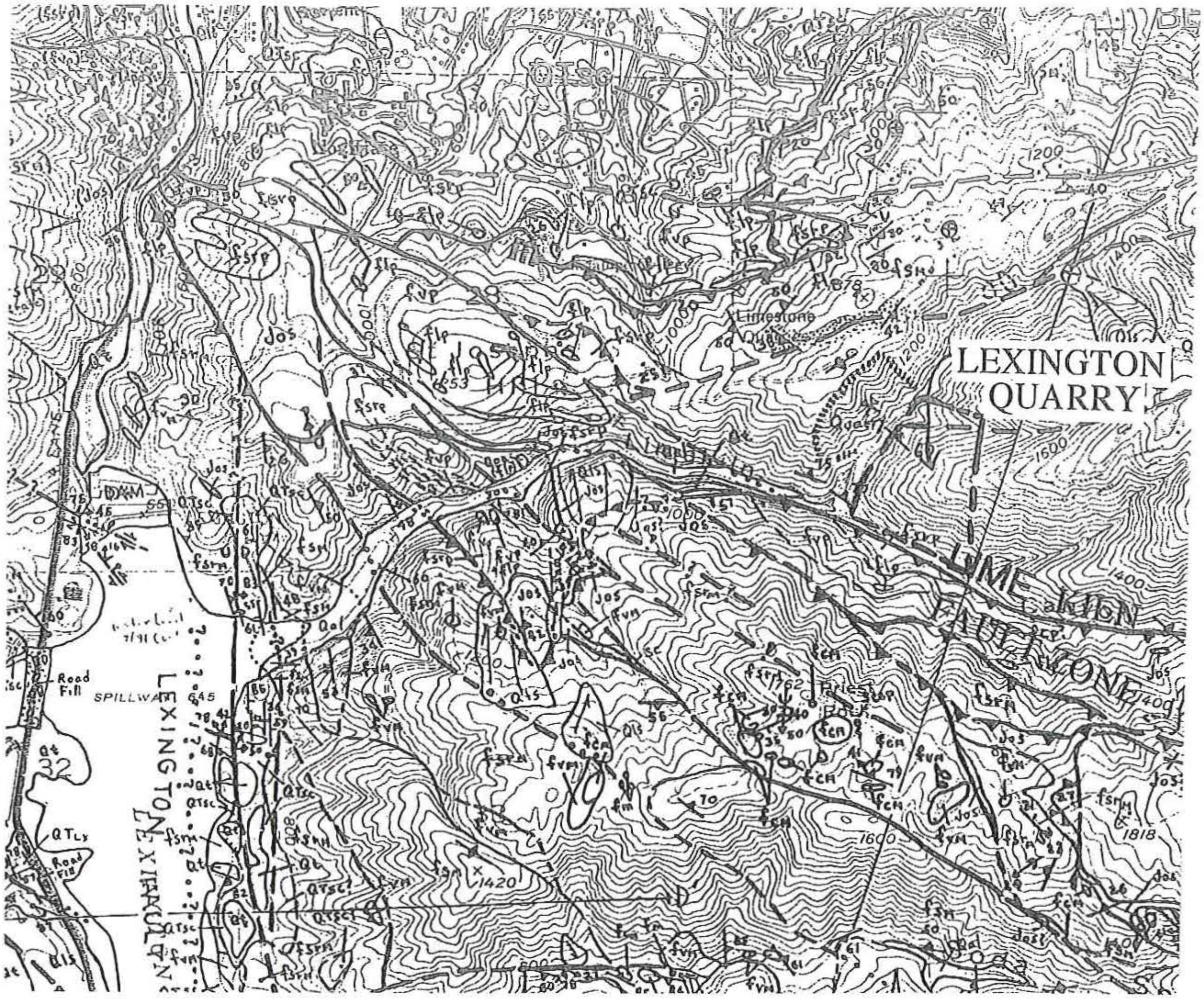


EXPLANATION

Qal	Alluvium	**fsm**	Franciscan Complex Metasandstone
Qt	Terrace Deposits	**fcm**	Franciscan Complex Radiolarian Chert
Qls	Landslide Deposits	**fvm**	Franciscan Complex Basalt
QTsc	Santa Clara Formation	**fsrm**	Franciscan Complex Melange
Jos	Serpentinite		Fault, dashed where inferred, dotted where concealed, barbs on upthrown plate
flp	Franciscan Complex Limestone		
fvp	Franciscan Complex Basalt		
fsrp	Franciscan Complex Melange	30	Bedding Strike and Dip

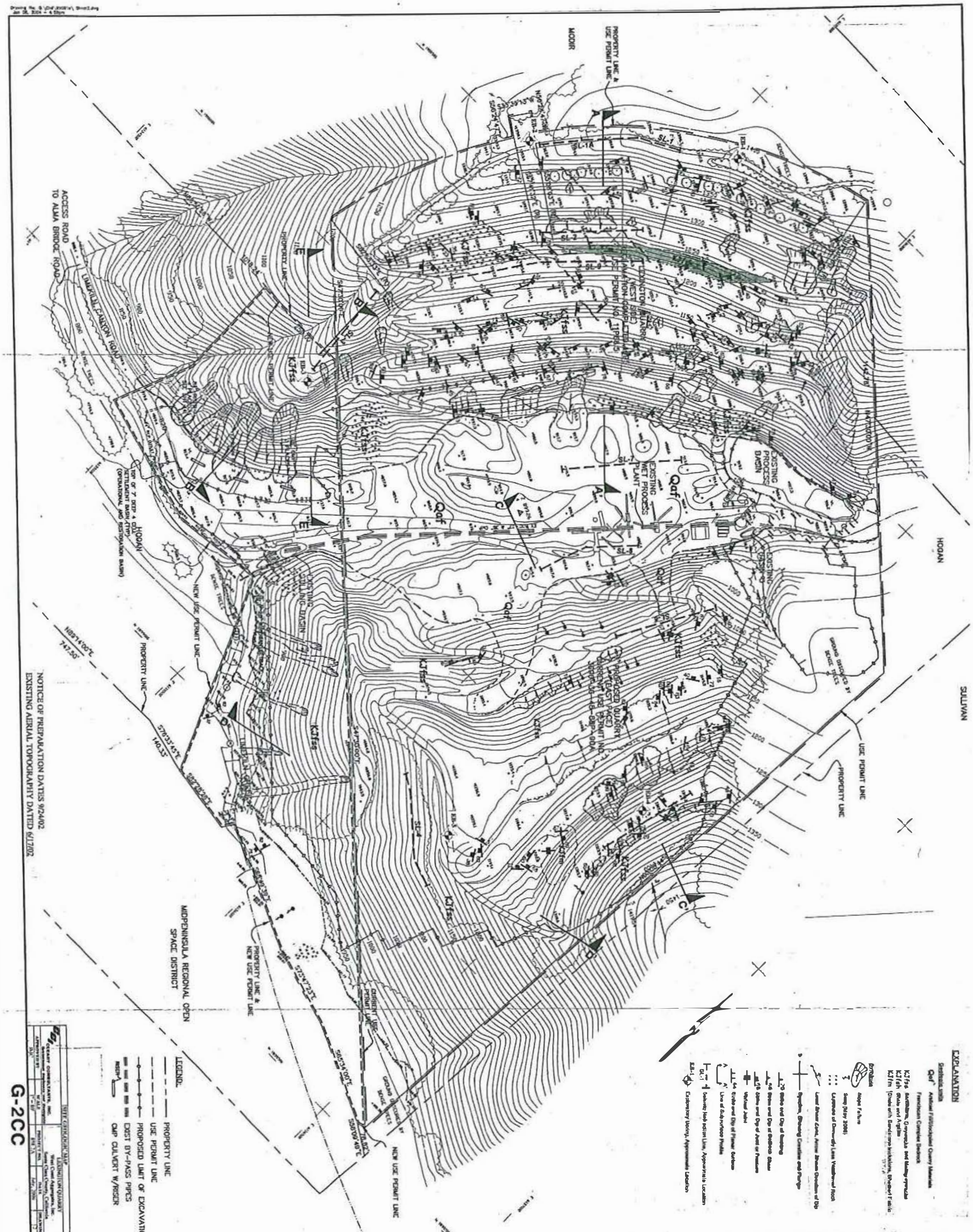
N

BASE: McLaughlin, 1991

SITE VICINITY AND LOCAL GEOLOGIC MAP

CLEARY CONSULTANTS, INC. *Geotechnical Engineers and Geologists*	LEXINGTON QUARRY West Coasts Aggregates, Inc. Santa Clara County, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 2000'	898.2A	July 2006	1



LEXINGTON QUARRY

QUARRY BOUNDARY – EXISTING CONDITIONS

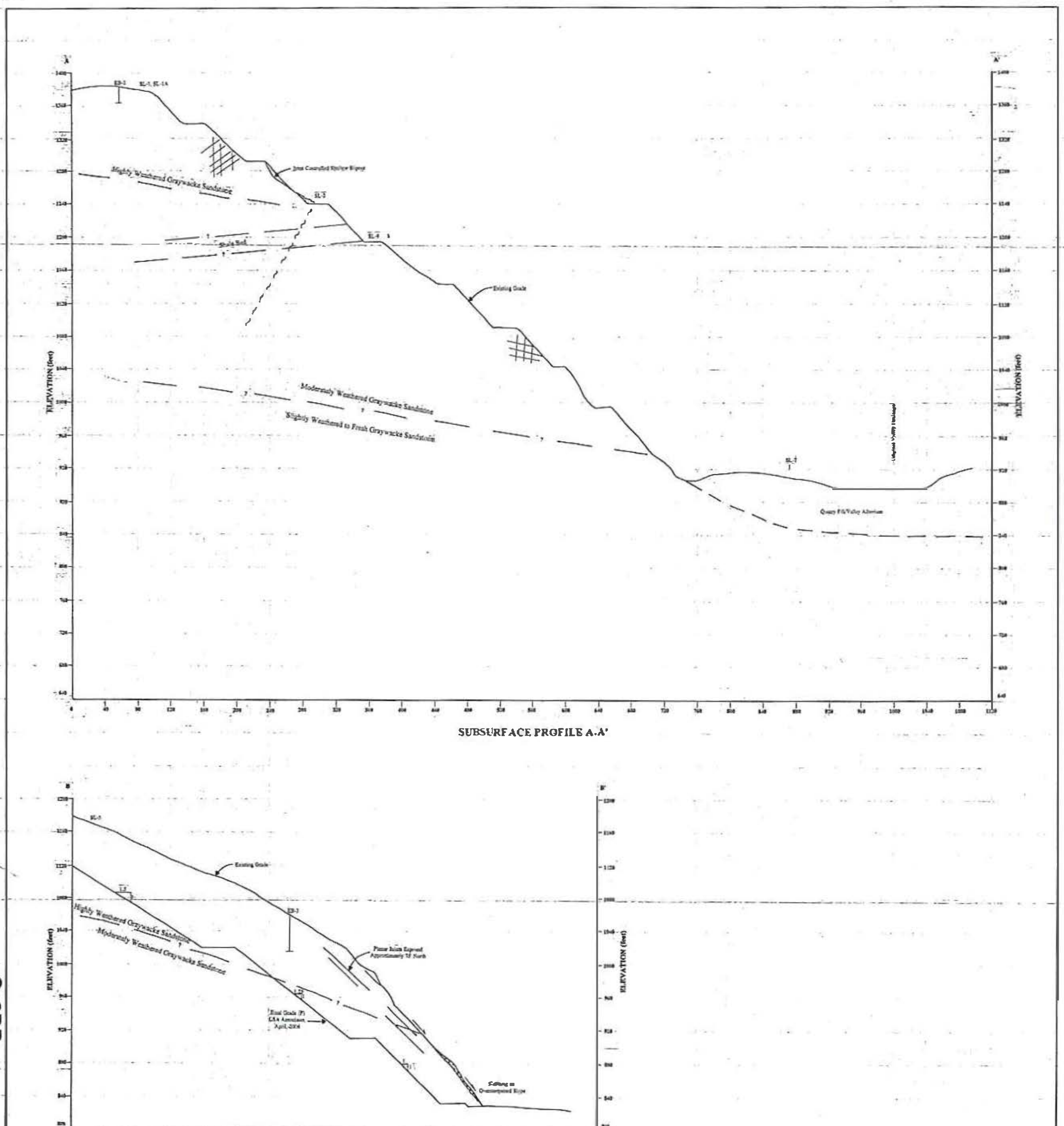
SANTA CLARA COUNTY — CALIFORNIA

R+G RUTH AND GOING, INC.
Civil Engineering Land Surveying

Scale 1"=80'
Date 01-14-04
Job No. 99061A
2 of 15 Sheets

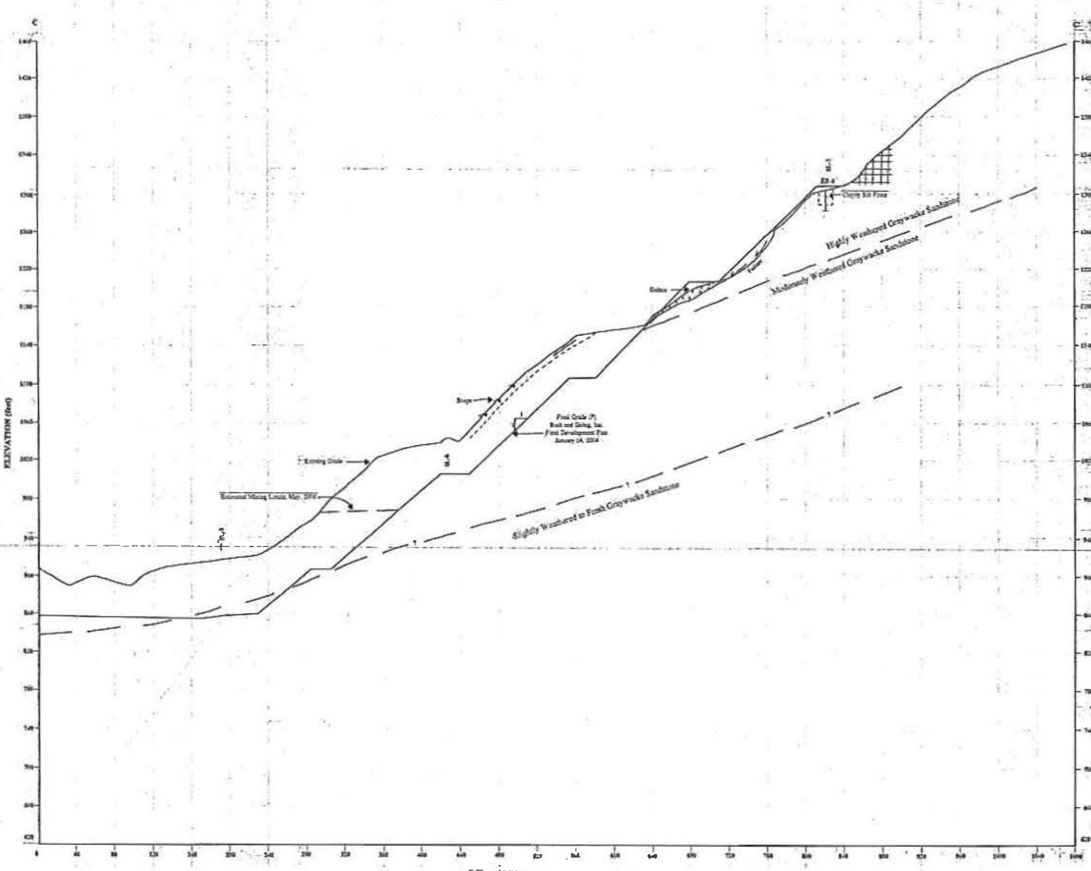
Description	Date
REVISIONS PER ADER	
REVISED PROP GRADING	
ADDED BOUNDARY CONDITIONS	

Revisions

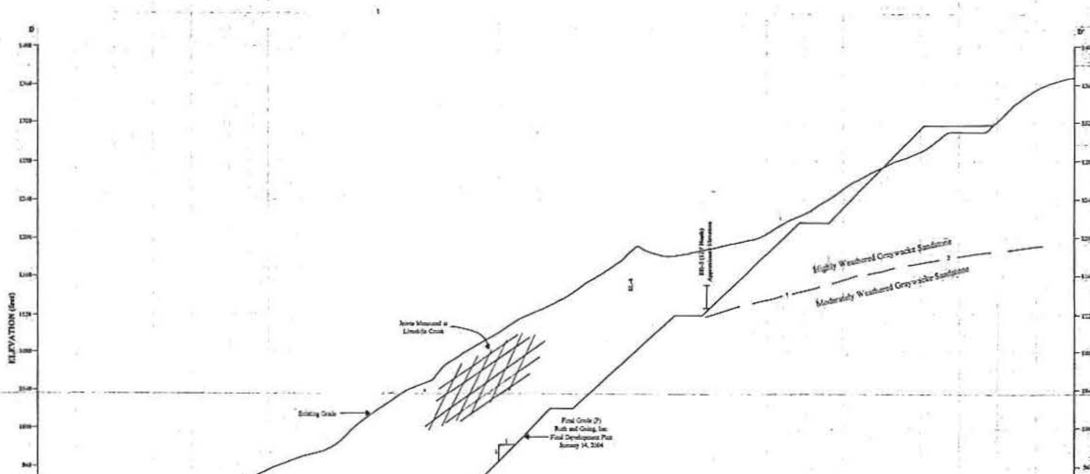


ELEVATION (feet)
Highly Weathered Graywacke Sandstone
Shale Bed
Existing Grade
Moderately Weathered Graywacke Sandstone
Slightly Weathered to Fresh Graywacke Sandstone
Quarry Fill/Valley Alluvium
SUBSURFACE PROFILE A-A'
Existing Grade
Highly Weathered Graywacke Sandstone
Moderately Weathered Graywacke Sandstone
SUBSURFACE PROFILE B-B'
SUBSURFACE PROFILES A-A' AND B-B'
CLEARY CONSULTANTS, INC.
LEXINGTON QUARRY
West Coast Aggregates, Inc.
Santa Clara County, California
APPROVED BY
SCALE
PROJECT NO.
DATE
DRAWING NO.
July 2006

G-2DD



SUBSURFACE PROFILE C-C'



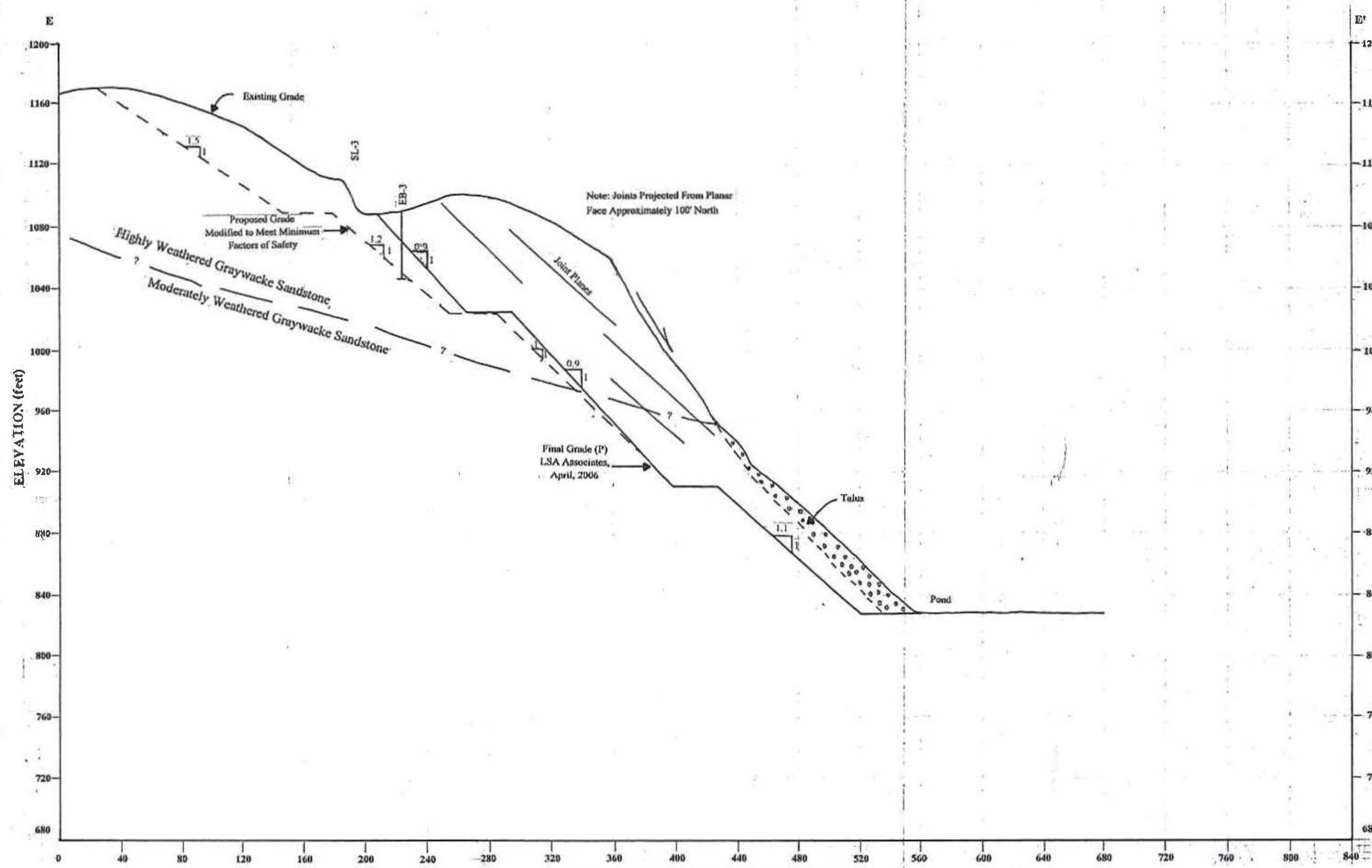
SUBSURFACE PROFILE D-D'

G-2EE

NOTE: The stratum lines are based upon our interpretation of the boring data, geophysical information and geologic mapping, and may not represent actual subsurface conditions.

Topography shown in this drawing based on existing aerial survey dated June 17, 2002, Ruth and Going, Inc., Sheet 2, Quarry Boundary - Existing Conditions, January 14, 2004.

SUBSURFACE PROFILES C-C' AND D-D'				
CLEARY CONSULTANTS, INC.		LEXINGTON QUARRY West Coast Aggregates, Inc. Santa Clara County, California		
APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 40'	[illegible]	[illegible]	4



SUBSURFACE PROFILE E-E'

NOTE: The stratum lines are based upon our interpolation of the boring data, geophysical information and geologic mapping, and may not represent actual subsurface conditions.

Topography shown on this drawing based on existing aerial survey dated June 17, 2002, Ruth and Going, Inc., Sheet 2, Quarry Boundary - Existing Conditions, January 14, 2004.

SUBSURFACE PROFILE E-E'				
CLEARY CONSULTANTS, INC. Geotechnical Engineers and Geologists		LEXINGTON QUARRY West Coast Aggregates, Inc. Santa Clara County, California		
APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 40'	898.2A	July, 2006	5

G-2FF

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISION
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines
			SC	Clayey sands, sand-clay mixtures, plastic fines
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey f ne sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

U.S. STANDARD SERIES SIEVE — CLEAR SQUARE SIEVE OPENINGS

	200	40	10	4	3/4"	3"	12"
SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

GRAIN SIZES

SANDS AND GRAVELS	BLOWS/FOOT✦
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

RELATIVE DENSITY

SILTS AND CLAYS	STRENGTH ☆	BLOWS/FOOT ✦
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER4	OVER 32

CONSISTENCY

✦ Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split barrel (ASTM D-1586).

☆ Unconfined compressive strength in tons/sq.ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

KEY TO EXPLORATORY BORING LOGS

LEXINGTON QUARRY
West Coasts Aggregates, Inc.
Santa Clara County, California

PROJECT NO.	DATE	DRAWING NO.
898.2A	July 2006	6

West Face Planar Slipout (Joint Controlled)

DRAWING NO. 33

East Face Hard Sandstone Exposed in Slope Exposure

DRAWING NO. 34

East Face Silt Buildup on Bench 3

DRAWING NO. 35

Appendix B
Norcal Geophysical Consultants Report,
Lexington Quarry, Seismic Lines 1-9

June 20, 2006

Cleary Consultants, Inc.
900 N. San Antonio Road
Los Altos, CA 94022

NORCAL Project: 06-139.08

Subject: Seismic Refraction Survey
Lexington Quarry
Los Gatos, California

Attention: Mr. Michael Cleary

Gentlemen:

This report presents the findings of a seismic refraction survey performed by NORCAL Geophysical Consultants at the subject facility. The seismic refraction survey is part of an on-going geotechnical investigation being performed by Cleary Consultants for Western Aggregate Company, operators of the quarry. The seismic refraction survey was conducted in two phases. The Phase 1 survey consisted of eight seismic lines and was conducted during the period of April 20 through April 24, 2006. The Phase 2 survey consisted of two additional seismic lines and was conducted on May 25, 2006. NORCAL personnel participating in the seismic refraction survey include Principal Geophysicist William E. Black, Senior Geophysicist Dr. Graham Brew, and Geophysical Technician Travis W. Black. Ms. Michelle Richardson of Cleary Consultants assisted with some of the field work and also provided background information and site logistical support.

SITE DESCRIPTION

Lexington Quarry is located at the southern limits of the city of Los Gatos in Santa Clara County, California. The quarry is accessed from California Highway 17 by Alma Bridge Road and Limekiln Canyon Road. The quarry can also be accessed from the top of the west face by Aztec Ridge Drive. The quarry is cut into two facing ridge lines that trend southwest to northeast. The southeast facing slope of the northernmost ridge is referred to as the west face. The northwest facing slope of the southernmost ridge is referred to as the east face. Both faces are very steep and have a series of horizontal benches cut across them. Access to the benches is provided by steep, winding dozer trails on the south side of both faces. Processing facilities consisting of rock crushers, conveyors, and storage bins are located on the floor of the canyon (base of quarry) between the two faces. The quarry rock consists primarily of sandstone with some shale. The terrain surrounding the quarry is very steep and covered by dense brush and trees. Surface elevations within the quarry range from about 900 to 1400-ft above mean sea level (msl).

OBJECTIVE

The objective of the seismic refraction surveys is to determine the seismic velocity of the subsurface to depths of 50- to 140-ft. This information can be used to estimate the depth and relative competence of the rock as well as its excavation characteristics.

METHODOLOGY

The seismic refraction (SR) method is used to determine the seismic velocity structure of the subsurface. Compressional (P) wave energy generated by an impulsive source at the surface propagates into the earth. The P-waves are refracted along interfaces representing an increase in velocity, and back to the surface where they are detected by collinear arrays of detectors (geophones). The detected signals are recorded on a multi-channel seismograph and are analyzed to determine the shot point to geophone travel times. These data can be used along with the corresponding shot point to geophone distances to determine the depth, thickness, and velocity of subsurface seismic layers.

DATA ACQUISITION

During Phase 1 of the survey we obtained seismic refraction data from eight seismic lines labeled Line 1 through Line 8, as depicted by the red lines shown on Plate 1. These lines varied in length from 250- to 300-ft and provided depths of investigation ranging from 40- to 80-ft. Following our submittal of the preliminary results of the Phase 1 survey, Cleary Consultants requested the addition of two more seismic lines (Phase 2). One of the Phase 2 lines was positioned to coincide with Line 1 (Phase 1) and, therefore, is labeled Line 1A. The other Phase 2 line was labeled Line 9. The Phase 2 seismic lines are represented by the blue lines shown on Plate 1. Both lines were 470-ft long and provided depths of penetration of approximately 100- to 140-ft.

Each seismic line consisted of five shot points and 24-geophones distributed in a collinear array. The geophones comprising the Phase 1 lines were distributed at 10- to 13-ft intervals and the geophones comprising the Phase 2 lines were distributed at 20-ft intervals. For both phases, the shot points were placed at the center and both ends of the geophone array, and half-way between the end and center shot points.

Where access allowed, we produced seismic compressional (P) wave energy at each shot point using a Digipulse AWD-100 accelerated weight drop. This device consists of a 100-lb cylindrical weight that impacts an aluminum strike plate placed on the ground surface. The weight is approximately 3" in diameter and 4-ft. long. It is contained in a metal framework mounted on the back of a 4 wheel drive, all-terrain vehicle. The framework confines the weight so that it can only move in the vertical direction. A large (4"-wide, ½"-thick) elastic band passes over the top of the cylinder. The tension on the band is varied using cylindrical ratchets mounted on either side of the metal framework. Removable safety shields cover the elastic band to prevent injury in case it breaks. A battery powered hydraulic ram mounted to the front of the framework lifts the weight against the tension of the elastic band. When the weight reaches a certain height (approximately 24"), it slips off the ram and accelerates downward impacting the strike plate. An accelerometer attached to the plate then transmits an electrical pulse through an insulated cable to the seismic recording system. When the system detects the electrical pulse it triggers a recording event. In areas with limited access, we substituted a 16-pound sledge hammer in place of the AWD-100. We detected the P-waves produced at each shot point using Mark Products geophones with a natural frequency of 10-Hz. The detected seismic signals were digitized and recorded using a Geometrics 24-channel Strataviewer seismograph. The data were recorded on an internal hard drive and also were printed out on paper strip charts (seismic records). Upon completing each seismic line we used a global positioning system (GPS) to determine the geographical coordinates of each shot point.

DATA ANALYSIS

We analyzed the seismic refraction data using the computer program ***Seisimager*** by Geometrics, Inc. This is an interactive program that we use to determine the shot point to geophone travel times, and to compute a 2D model based on those times. Once we had determined the travel times for a given line, we used the programs time-term algorithm to compute a preliminary 2D seismic model. We then used that model as input for the programs tomographic routine. Using this procedure, the program divided the starting model into a network of cells and assigned velocities to those cells based on the starting model. The program then traced the refracted seismic travel paths through those cells and computed the associated travel times. It then compared the computed travel times with the measured times and adjusted the velocities of the appropriate cells to improve the fit. We programmed the software to continue this procedure for twenty iterations. At the end of the twenty iterations the travel times associated with the computed model matched the observed travel times to an accuracy of one milli-second (mS) or better. Once a satisfactory model was computed, the software contoured the model velocities to produce seismic velocity vs. depth and distance cross-sections (profiles).

RESULTS

The results of the seismic refraction survey are illustrated by the seismic velocity profiles shown on Plates 2 through 10. On each profile the vertical axis represents elevation (above mean sea level) and the horizontal axis represents distance. The profiles depict the ground surface, the locations of the shot points, and color contours representing seismic velocity according to the color scale shown on the right hand side of each section.

The ten profiles shown on Plates 2, 2A, and 3 through 10 indicate seismic velocities ranging from 1,000- to 14,000-ft/sec. Since the rock in the survey area is relatively homogeneous and either exposed or very shallow, the variations in velocity can probably be attributed solely to variations in the degree of weathering and fracturing of the rock. Velocities ranging from 1,000- to about 5,000-ft/sec probably represents rock that is deeply weathered to decomposed and closely fractured. Locally, this velocity range may also include rock fill that may have been used in the construction of the benches. Velocities ranging from 5,000- to 10,000-ft/sec probably represent rock that is moderately weathered and fractured. Velocities in excess of 10,000-ft/sec indicate rock that is only slightly weathered. Seismic Lines 1, 1A, 2 – 5, and 9 all detected velocities ranging from 1,000- to 6,000-ft/sec. These velocities are consistent with rock that is deeply to moderately weathered. Furthermore, these lines are all located in the upper reaches of the quarry, at elevations of 1100-ft or higher. However, Lines 6 - 8, which are situated near the base of the quarry, detected velocities as high as 8,000- to 14,000-ft/sec. These velocities are consistent with rock that is moderately to slightly weathered.

DISCUSSION

The seismic refraction depth of investigation is directly proportional to the length of the seismic line. We conducted Line 1A at the same location as Line 1 and made it twice as long in order to increase the depth of investigation in that area. The same is true for Line 9, which is twice as long as, and in close proximity to, Line 2. In spite of having approximately twice the depth of investigation, Line 1A and Line 9 detected maximum velocities (5,000- to 6,000-ft/sec) that are only slightly higher than those detected by Line 1 and Line 2 (3,500- to 5,000-ft/sec). This indicates that the low velocities detected beneath Lines 1 through 5 are not the result of an insufficient depth of investigation. Instead, it indicates that relatively low velocities extend to depths of at least 100 to 120-ft beneath those lines.

EXCAVATION CHARACTERISTICS (RIPPABILITY)

Seismic velocity tables relating seismic velocity and excavation characteristics have been developed from field tests by others. These tables list the seismic velocity of various types of bedrock materials and their relative ease of excavation using different types of rippers. Caterpillar Tractor Company publishes a performance manual that lists ripper performance tables for the D8L, D9L, and D11L tractors. The following information was obtained from a performance tablet for a D9L Ripper:

• Rippable	Sedimentary	Less than 6,400 to 7,800 ft/s
	Igneous	Less than 6,700 to 7,600 ft/s
	Metamorphic	Less than 7,200 to 7,300 ft/s
• Marginally Rippable	Sedimentary	Between 6,400 to 9,700 ft/s
	Igneous	Between 6,700 to 8,600 ft/s
	Metamorphic	Between 7,200 to 9,200 ft/s
• Non-rippable	Sedimentary	Greater than 8,600 to 9,700 ft/s
	Igneous	Greater than 8,000 to 8,700 ft/s
	Metamorphic	Greater than 9,000 to 9,200 ft/s

This information should only be used as a general guide, however, as many other factors should also be considered. These factors include the rock jointing and fracture patterns, the experience of the equipment operator, and the equipment and excavation methods selected.

Since the quarry rock is sedimentary, it should be rippable at velocities less than 6,400-ft/sec, marginally rippable at velocities ranging from 6,400- to 8,600-ft/sec, and non-rippable at velocities in excess of 8,600-ft/sec. This being the case, non-rippable velocities were detected at depths of 25- to 60-ft beneath Line 7, and at depths 30- to 40-ft beneath Line 8. Marginally rippable velocities were resolved at depths of 15- to 30-ft beneath Line 6, at depths of 25- to 35-ft beneath Line 7, and at depths of 20- to 35-ft beneath Line 8. The velocities resolved by the remaining seismic lines (Line 1, 1A, 2 – 5, and 9) are all in the rippable range (<6,400-ft/sec).

STANDARD CARE AND WARRANTY

The scope of services for this project consisted of using the seismic refraction method to define subsurface seismic velocities and depths. The accuracy of our findings is subject to specific site conditions and limitations inherent to the seismic refraction technique. We performed our services in a manner consistent with the level of skill ordinarily exercised by members of the profession currently employing similar methods. No warranty, with respect to the performance of services or products delivered under this agreement, expressed or implied, is made by NORCAL.

We appreciate the opportunity to provide our services to Cleary Consultants, Inc. for this project. Should you require additional geophysical services or have questions regarding this survey, please do not hesitate to call.

Sincerely,

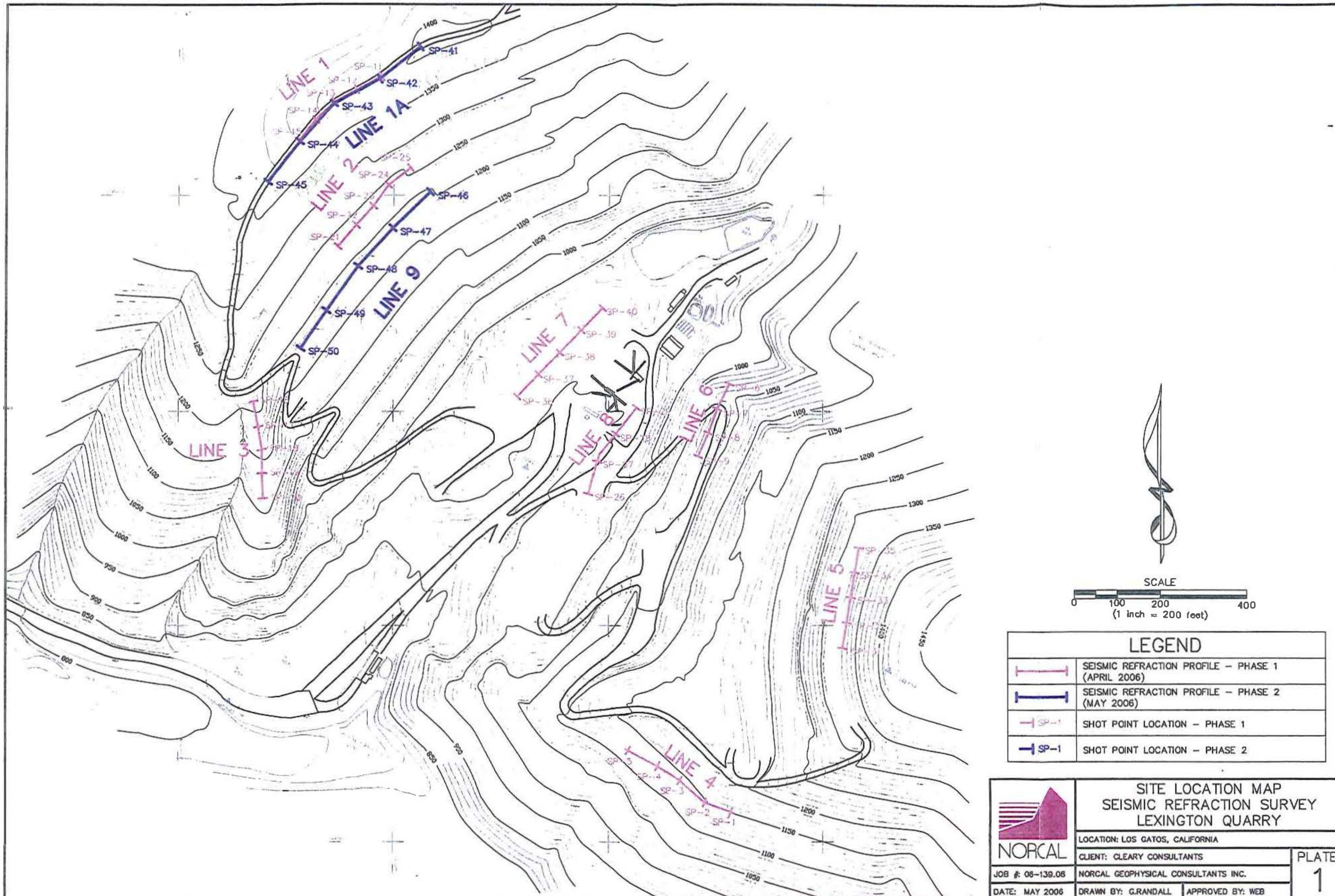
NORCAL Geophysical Consultants, Inc.

William E. Black
Geophysicist GP-843

REGISTERED GEOPHYSICIST
WILLIAM E. BLACK
7/31/06
NO. 843
STATE OF CALIFORNIA

WEB/tt

Enclosures: Plates 1 - 10



LEGEND

	SEISMIC REFRACTION PROFILE – PHASE 1 (APRIL 2006)
	SEISMIC REFRACTION PROFILE – PHASE 2 (MAY 2006)
SP-1	SHOT POINT LOCATION – PHASE 1
SP-1	SHOT POINT LOCATION – PHASE 2

SITE LOCATION MAP
SEISMIC REFRACTION SURVEY
LEXINGTON QUARRY

NORCAL

LOCATION: LOS GATOS, CALIFORNIA
CLIENT: CLEARY CONSULTANTS
JOB #: 06-139.06
NORCAL GEOPHYSICAL CONSULTANTS INC.
DATE: MAY 2006
DRAWN BY: G.RANDALL
APPROVED BY: WEB
PLATE 1

G-2QQ

APPENDIX G-3

Cleary Consultants, Inc.

- Response Letter and Review of Quarry Plan, May 27, 2008

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

J. Michael Cleary, CEG, GE
Christophe A. Ciechanowski, GE
Grant F. Foster, GE

May 27, 2008
Project No. 898.2A
Ser. 2201

Mr. Richard O. DeAtley, President
West Coast Aggregates, Inc.
P.O. Box 1061
Tracy, California 95378

RE: RESPONSE LETTER AND REVIEW OF QUARRY PLAN SHEET NO. 4, REVISIONS THROUGH MAY 19, 2008 (RUTH AND GOING, INC.) LEXINGTON QUARRY SANTA CLARA COUNTY, CALIFORNIA (REVISED)

Dear Mr. DeAtley:

Introduction

As requested, we have prepared this response to the County of Santa Clara e-mail transmittal of April 8, 2008 from Rob Eastwood to Bart Hechtman, Item 2 Geology/Cleary Plan Review Letter/Updates which references the Cotton Shires Associates, Inc. Peer Review Letter dated December 18, 2007. Our report titled "Geologic Mapping and Slope Stability Analyses Report for Lexington Quarry, Santa Clara County, California" was submitted July 29, 2006. This letter replaces our May 23, 2008 response letter which contained a typo on Page 3, 4th paragraph from the top.

As a basis for this response, we made several visits to Lexington Quarry in May, 2008 to observe the conditions of the slopes and benches on both sides of the quarry, and reviewed correspondences relating to the County's response and information in our files for this project.

Geology/Cleary Plan Review Letter/Updates

The County has requested additional geological and geotechnical information regarding the long term stability of the finished quarry slopes and potential for rockfall, placement of loose fill on the east quarry slopes and consistency of the Reclamation Plan (Ruth & Going Sheet 4, Revised May 19, 2008) with our geotechnical report. These items are listed below and are followed by a discussion/response regarding our recent observations of the condition of the quarry slopes and our re-evaluation of the long term slope stability at the site.

Item 2a:

The County's April 8, 2008 transmittal requests an evaluation of potential rock fall and local long term stability for both the reclaimed slopes on the west quarry face and the more recently mined slopes on the east face where mining operations are continuing. The west face has eight (8) 25 foot wide benches every 50 feet vertical with approximately 1:1 slopes between benches, the exception being the slope below Bench 8 at the bottom which is as steep as ¾:1. The east face has five (5) 30 foot wide benches every 100 feet vertical with approximately 1:1 slopes between benches; the lower most (5^{th} Bench) is at approximately the same elevation as the current aggregate processing plant at the base of the hill.

Our reconnaissance of the west quarry face indicates the roughly half dozen slipouts which we mapped during our 2006 study on the slopes between Benches 1 and 7 are not significantly changed and have not resulted in blockage of the next lower bench with debris. These features are older and somewhat stabilized as evidenced by the start of grass and shrub growth. At one location, at the north end on Bench 7, debris from a shallow planar failure on the slope above is within three feet of the outer edge; however this blockage of the bench is at the "hinge point" for drainage and does not affect surface water flow. Fan-shaped debris from the other isolated, local failures on Benches 3 and 7 cover less of the overall bench width, where the remaining benches are approximately 10 to 12 feet wide, and runoff has not been impeded so as to cause water flow over the top of the outer edge of the benches. The underlying basal rock surfaces immediately above the talus piles appear stable and we don't anticipate that significant additional material will be generated. We did not observe evidence (erosion or rilling) that drainage throughout the west face along the benches was being blocked by talus; the talus material is the size of small angular cobbles and water is likely flowing through the material.

The lowermost oversteepened cutslope below Bench 8 on the west face is failing more extensively than the upslope cuts which were excavated to the recommended slope gradient of 1:1. Roughly six slope failures have occurred on this slope over the width of the west face. This cutslope will be buttressed as indicated on Sheet 4 (Ruth & Going). Our analyses indicate the future buttress fill will achieve a stable final slope condition, as discussed in our July 29, 2006 report (Page 18).

Bench 1 and Bench 2 on the east face have been vegetated with oak trees, pine trees and shrubs and appear to have reverse slope as recommended. A recent shallow rock fall was observed above Bench 2, however, the material, which ranged in size from two to 12 inches, is contained in an aréa within five feet of the back side of the bench. Bench 3 and Bench 4 are mantled with silt fines; we understand these materials may be as thick as three to four feet; at the time of our visit these two benches had not yet been sloped back into the hill. Bench 5, at the existing plant grade, is cut down into hard blue-gray sandstone.

The east and west quarry slopes appear to be performing satisfactorily based on our site reconnaissance and historical review of aerial photographs. The isolated shallow planar/wedge type slipouts are limited to portions of the slopes between the benches, which are effectively containing the talus and preventing a rockfall condition such that material would roll continuously down to the lower slopes or benches. The slipouts are also well defined, do not appear to be increasing in size, and the talus at the base of the slipouts is sloped at a relatively stable angle of repose. We believe that removing the talus on the west benches below the slipouts would create local instability on the slope as the rock material is buttressing the slope in the current configuration.

Item 2b:

The placement of loose fill over the slopes on the east face was stopped last year. Based on Bart Hechtman's letter to the County dated May 5, 2008, the Reclamation Plan will require quarterly removal of the fines material that has slid down the slopes onto the benches, as needed, from April to October and monthly removal November through March during operation of the quarry, and continuing for five years after shutdown on a reduced basis. Over an estimated 12 year remaining operation period, we believe that the loose soils will have been removed or stabilized with vegetation.

The benches on the east face effectively act as a catchment to contain the local "debris flow" failures within the silt fines which were placed on the slopes directly above Benches 2, 3, and 4.

Item 2c:

Sheet 4 (Ruth & Going) has been modified subsequent to Cotton Shires December 18, 2007 letter in order to meet the slope recommendations in our geotechnical report for the west face above Basin 2. The slope above the El. 1025 bench was flattened to 1.25:1 (horizontal:vertical) and the slope above the El. 1070 bench was flattened to 1.5:1 (horizontal:vertical); the revised slope was re-checked using the GSTABL slope stability computer program to confirm that the required static and pseudo-static factors of safety were achieved.

The buttress fill planned on the bottom of the west face below Bench 8 was also extended to the north approximately 150 feet to stabilize the slipout above the existing stilling basin. The portion of the buttress fill and regrading area shown with slopes near 1:1 are in cut areas of hard sandstone. Fill areas will have overall slopes of 2:1 (horizontal:vertical).

Based on our review of the above plan, and the findings of our May 2008 site reconnaissance and additional slope stability analyses, it is our opinion that the plan properly incorporates the recommendations presented in our report.

Conclusions

Based on our re-evaluation of the overall performance of the east and west quarry slopes, we conclude that the final slope inclinations indicated on the latest revisions to Sheet 4 (Ruth & Going) will provide satisfactory long term stability. The small slope failures observed on Benches 3, 6 and 7 on the west face have stabilized and are contained on the next lowest bench; associated talus does not appear to be blocking water flow and we do not recommend removing the material which is acting as a small buttress in these areas. The potential for rockfall at the elevation of the quarry floor is very low to nil in our opinion as the benches above are preventing the material from tumbling down any further than the next lowest bench. The future buttress fill on the west face will also act as a catchment area should any material fall down the slopes beyond Bench 8; and Sediment Basin 2 will act to contain any debris which originates on the 1:1, 100 foot high interval of future cutslope above the pond.

This letter has been prepared for the specific use of West Coast Aggregates, Inc. in accordance with generally accepted geotechnical engineering principles and practices. No other warranty, either expressed or implied, is made.

We have enjoyed the opportunity of performing this review and ask that you call if you have any questions regarding this letter.

Yours very truly,

CLEARY CONSULTANTS, INC.

Grant Foster
Geotechnical Engineer 2662

REGISTERED PROFESSIONAL ENGINEER
GRANT FOSTER
No. 2662
EXP. 6/30/08
GEOTECHNICAL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
J. M. CLEARY
No. 222
EXP. 9-30-09
GEOTECHNICAL
STATE OF CALIFORNIA

J. Michael Cleary
Geotechnical Engineer 222

GF/JMC:cm

Copies: Addressee (2)
Ruth and Going, Inc. (2) Attn: Mike Sheehy
LSA Associates (1) Attn: Mignone Wood
Matteoni O'Laughlin and Hechtman (1) Attn: Bart Hechtman
County of Santa Clara Planning Department (2) Attn: Rob Eastwood

APPENDIX G-4

Cleary Consultants, Inc.

- Letter - Use Permit EIR Geotechnical Issues, January 12, 2009
- Supplemental Submittal: Use Permit EIR Geotechnical Issues, February 13, 2009

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

J. Michael Cleary, CEG, GE
Christophe A. Ciechanowski, GE
Grant F. Foster, GE

January 12, 2009
Project No. 898.2A
Ser. 2444

Mr. Richard O. DeAtley, President
West Coast Aggregates, Inc.
P.O. Box 1061
Tracy, California 95378

**RE: USE PERMIT EIR GEOTECHNICAL ISSUES
LEXINGTON QUARRY
SANTA CLARA COUNTY, CALIFORNIA**

Dear Mr. DeAtley:

The purpose of this letter is to summarize and discuss the current Use Permit EIR geotechnical issues that were discussed during our January 7 meeting with Jim Baker, Santa Clara County Geologist, and Rob Eastwood, Santa Clara County Planner. These are issues that are still outstanding, based on the County perspective, from the previous reviews by Cotton Shires, and Jim wants to "close the loops" from their reviews.

We made several visits to Lexington Quarry in October and December, 2008 to observe the current conditions of the slopes and benches on both sides of the quarry as part of our work to address the following issues:

Slope Redesign/Regrading above Sediment Basin #2 – Ruth and Going prepared a new plan and cross-section based on Cotton Shires contention that uniform 1.4:1 slopes at 100-foot intervals with 20-foot wide benches could be used in this area. The plan shows that there is not room for 1.4:1 slopes; instead 1.25:1 slopes can be fit onto the slope using 20-foot benches. The plan can be provided to the County upon request.

We expressed the opinion that 30-foot benches are preferable given the 100 foot bench interval. It is also our opinion that the steeper 1.25:1 slopes would not be as stable in the more weathered rock zones (indicated from seismic lines and borings) as the 1.5:1 slope design that was previously recommended for this section of the slope in our 2006 slope stability analysis report. It is our opinion that the original slope design (May 2008) with 30-foot wide benches is more appropriate for this area and this slope configuration has been analyzed for satisfactory slope stability.

Jim Baker indicated, based on a review of the plans (Sheet 4 of 15) for this area, that the south end of the upper three benches in the regraded area would likely require down drains to prevent runoff from sheet flow down the 80 to 100 foot high slope. Ruth and Going has added three catch basins and "on slope" down drains in this area between Elevation 1229 to Elevation 1334, as indicated in the attached updated drawing of this portion of the quarry. This change will be included in the final plan set.

West slope Talus Accumulation – Talus has accumulated in isolated areas on at the back side of Benches 3, 7 and 8, and there is concern that drainage will be blocked and water will pond on the benches. The talus is very coarse and it is our opinion that drainage will flow through, and not around, the talus piles during heavy storms, and that it is preferable to leave the piles in place as they are providing a more stable configuration for the slope and bench above the pile. We propose to photo document the condition of the talus piles and surrounding vegetation before and after the rainy season for any significant changes in the drainage and look for evidence (silt buildup, bench overtopping, erosion, vegetation disturbance, soil displacement) of blockage.

West slope Buttress Fill – New cross-sections through the buttress fill have been prepared by Ruth & Going (Sheet 14 of 15, Details P, Q and R) to confirm that fills are 2:1 as recommended in our report.

Buttress Fill Material Specifications: Engineered fill for the buttress should be predominantly granular with a plasticity index of 12 or less, and should be compacted to at least 95 percent relative compaction, as determined by ASTM Test Designation D1557. Fill material should not contain rocks or lumps greater than six inches in greatest dimension with not more than 15 percent larger than 2.5 inches. The material should not have more than 30 percent passing the No. 200 sieve.

Fill material should be spread and compacted in lifts not exceeding 12 inches in uncompacted thickness. The moisture content of on-site soils utilized as fill should be adjusted to at least their laboratory established optimum moisture content prior to compaction. Compaction should be performed using heavy compaction equipment such as a self-propelled vibratory sheepsfoot compactor.

The grading operations should be observed and tested by our representative for conformance with our recommendations. This work includes site preparation, selection of satisfactory fill materials, and placement and compaction of the fill. Sufficient notification prior to commencement of earthwork operations is essential to make certain that the work will be properly observed and tested.

East Slope Oversteepened Toe Areas – As requested, we have performed a numerical slope stability analysis to determine if the stability of the intermediate slopes has been impacted by oversteepened cuts that exist locally at the base of some of the slopes. The oversteepened cuts on Bench 1 range in height from seven to 14 feet. The oversteepened cuts on the lower Benches 2, 3, 4 range in height from three to seven feet high, and on Benches 3 and 4 the upper portion of the dozer cut is in the fines layer placed over the slopes for revegetation purposes. We understand the dozer cut was made during the removal of fines from the backside of the bench. The relief of these oversteepened toe cuts is not great enough, and is too variable, to be accurately indicated on the Final Development Plan (Sheet 4 of 15). However, the relief can be seen in the slope stability profiles attached to this letter, which were conservatively plotted using field observation and the Development Plan to represent the worst case conditions (i.e. maximum heights) of the oversteepened areas.

A total of three different profiles consisting of an individual bench and the above intermediate slope, selected to represent the oversteepened toe conditions on Benches 1 through 4, were analyzed as follows: Bench 1, intermediate slope above the water tank and the intermediate slope in an area with a 14 foot high near vertical cut (worst case); Bench 3, intermediate slope in an area with a five foot high near vertical dozer cut (created from dozer removal of fines accumulation). The locations of the profiles are indicated on the attached plan.

We reviewed the available geophysical data and rock conditions for the east slope and utilized conservative strength values for the greywacke sandstone slopes (phi angle = 30 degrees, cohesion = 1500 psf). A cohesion value of 500 psf was used for the slope above the water tank on the north end of Bench 1 due to the locally observed higher degree of weathering.

The results of our analyses indicate that the stability of the existing intermediate slopes, specifically in oversteepened toe cut areas, exceeds the minimum required factors of safety of 1.5 for static and 1.15 for pseudostatic conditions as recommended by the California Division of Mines and Geology Special Publication 117, 1997, for permanent slopes. The pseudostatic screening analysis procedure outlined in Section 11.2 of the Recommended Procedures for Implementation of DMG Special Publication 117 for Analyzing and Mitigating Landslides was also performed; based on this procedure, the slopes exceed the minimum pseudostatic factor of safety of 1.0 using a calculated seismic coefficient of 0.37. The slope stability analyses included in our July 27, 2006 Slope Stability Analysis Report also indicated that the existing (full height) east quarry slope exceeds the minimum required global factors of safety.

We observed that adverse jointing is not a factor that would cause instability of the intermediate slopes. However, we did find two areas with potentially unstable material which we recommend be removed/modified as follows: Bench 1, intermediate slope above the water tank has a layer (two to three feet thick) of hanging overburden soil over hard rock which should be thinned out or knocked down; Bench 2, south end, has a five foot high reverse slope cut, which should be cut back to correct the reverse slope condition. Alternatively, large rock (18-inch minimum diameter rip rap) can be placed at the base of the slope to replace the vertical cut material.

East Slope Fines Layer- The placement of loose fill over the slopes on the east face was stopped in 2007. The Reclamation Plan will require quarterly removal of the fines material that has slid down the slopes onto the benches, as needed, from April to October and monthly removal November through March during operation of the quarry, and continuing for five years after shutdown on a reduced basis. Based on Bart Hechtman's letter to the County dated December 1, 2008, the fines remaining on the slopes at the end of the reclamation period will be addressed as follows: "During the last year of the five year reclamation/monitoring period, the Operator shall either (a) remove from the intervening slopes all topsoil placed on those slopes by the Operator or (b) obtain from a State licensed geotechnical engineer a report, in form and content satisfactory to the County Geologist, analyzing the stability of all remaining soil on the intervening slopes which was placed there by the Operator, with recommendations for any actions which should be taken regarding the soil remaining on the intervening slopes, and the Operator shall, after approval by the County, implement the approved recommendations."

The benches on the east face will effectively act as a catchment to contain the local "debris flow" failures within the silt fines which were placed on the slopes directly above Benches 2, 3, and 4. Over the estimated 12 year remaining operation period, and the succeeding five year reclamation period, we believe it is likely that most of the loose soils will have been removed by the operator or stabilized with vegetation.

Conclusions

Based on our re-evaluation of the slope design/regrading above Basin #2, we conclude that the original slope inclinations with 30 foot benches indicated on the latest revisions to Sheet 4 (Ruth & Going) will provide satisfactory long term stability.

The talus piles on the west slopes do not appear to be blocking water flow and we do not recommend removing the material which is acting to locally buttress the slope above in these areas. We propose to photo document these areas to demonstrate that the piles are not adversely affecting drainage.

Our site reconnaissance and slope stability analyses indicate that the existing oversteepened cuts located at the toe of portions of the east face intermediate slopes have not significantly affected the stability of the slopes and that the slopes meet the minimum required factors of safety.

This letter has been prepared for the specific use of West Coast Aggregates, Inc. in accordance with generally accepted geotechnical engineering principles and practices. No other warranty, either expressed or implied, is made.

Please call if you have any questions regarding this letter.

Yours very truly,

CLEARY CONSULTANTS, INC.

Grant Foster
Geotechnical Engineer 2662

REGISTERED PROFESSIONAL ENGINEER GRANT FOSTER No. 2662 EXP. 6-30-09 GEOTECHNICAL STATE OF CALIFORNIA

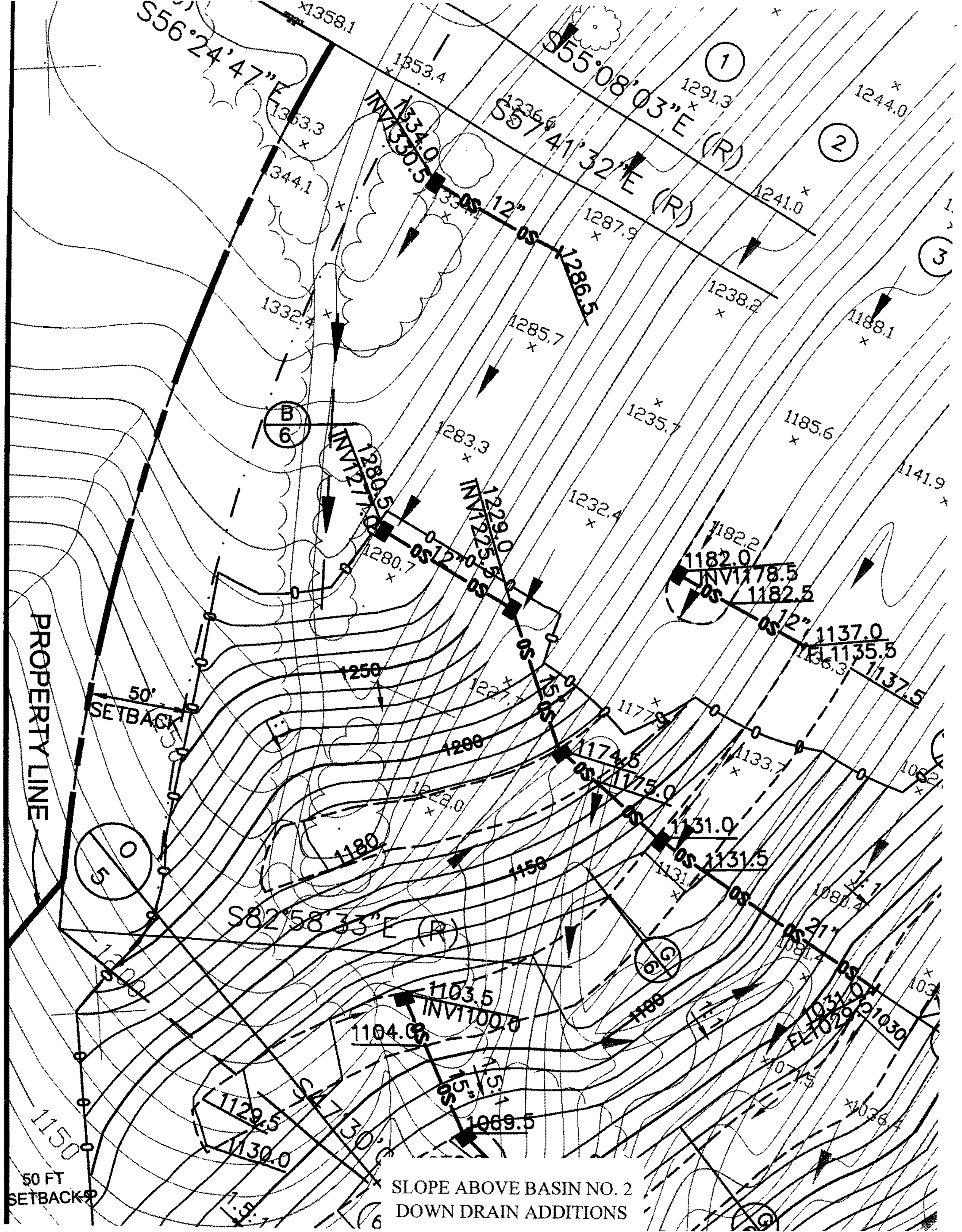
J. Michael Cleary
Engineering Geologist 352
Geotechnical Engineer 222

REGISTERED PROFESSIONAL ENGINEER J.M. CLEARY No. 222 EXP. 9-30-09 GEOTECHNICAL STATE OF CALIFORNIA

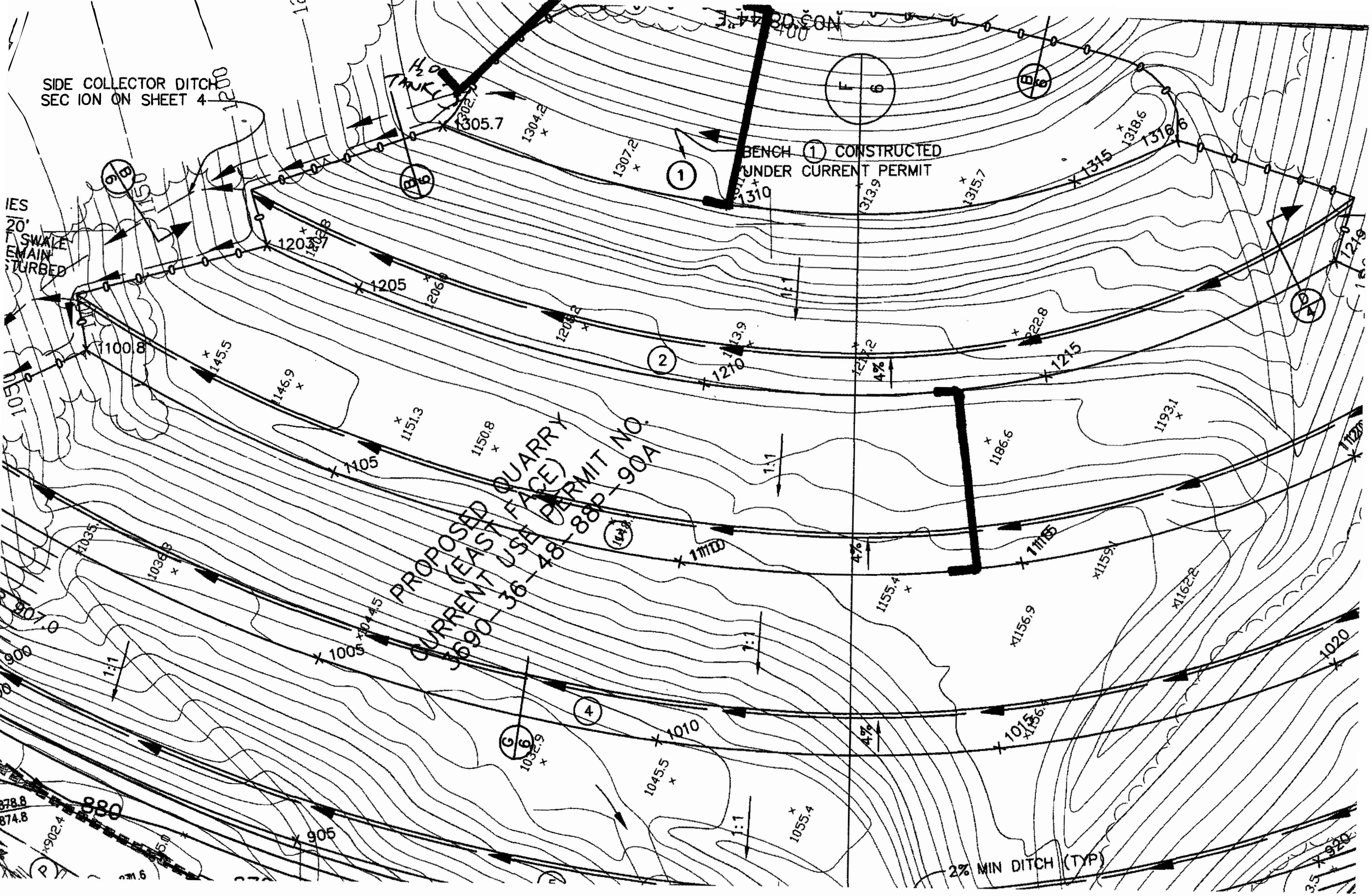
REGISTERED GEOLOGIST J. M. CLEARY No. 352 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

GF/JMC:cm
Copies: Addressee (2)
Ruth and Going, Inc. (1) Attn: Mike Sheehy
LSA Associates (1) Attn: Mignone Wood
Matteoni O'Laughlin and Hechtman (1) Attn: Bart Hechtman
County of Santa Clara Planning Department (2) Attn: Rob Eastwood
Jim Baker (1) County Geologist

Attachments: Slope above Basin #2, Downdrain Additions
Slope Stability Profile Locations – East Slope Cuts
Slope Stability Plots – East Slope Cuts



SLOPE ABOVE BASIN NO. 2
DOWN DRAIN ADDITIONS



EAST SLOPE STABILITY ANALYSIS LOCATIONS

(Profiles Modified to Reflect Current or Planned Final Slope Conditions)

Lexington Quarry East Slope Bench 1 above H2O Tank

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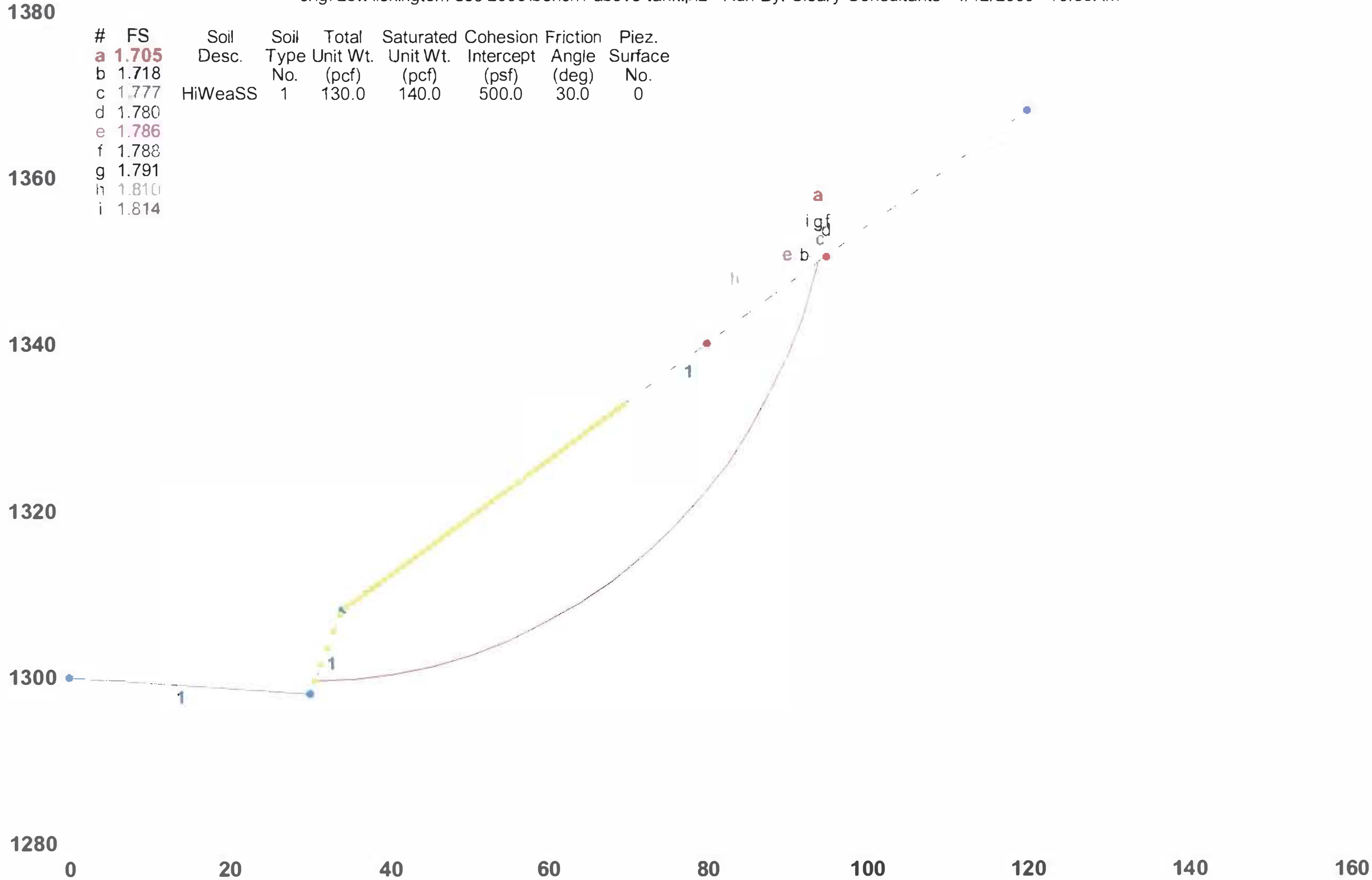

GSTABL7 v.2 FSmin=1.705

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

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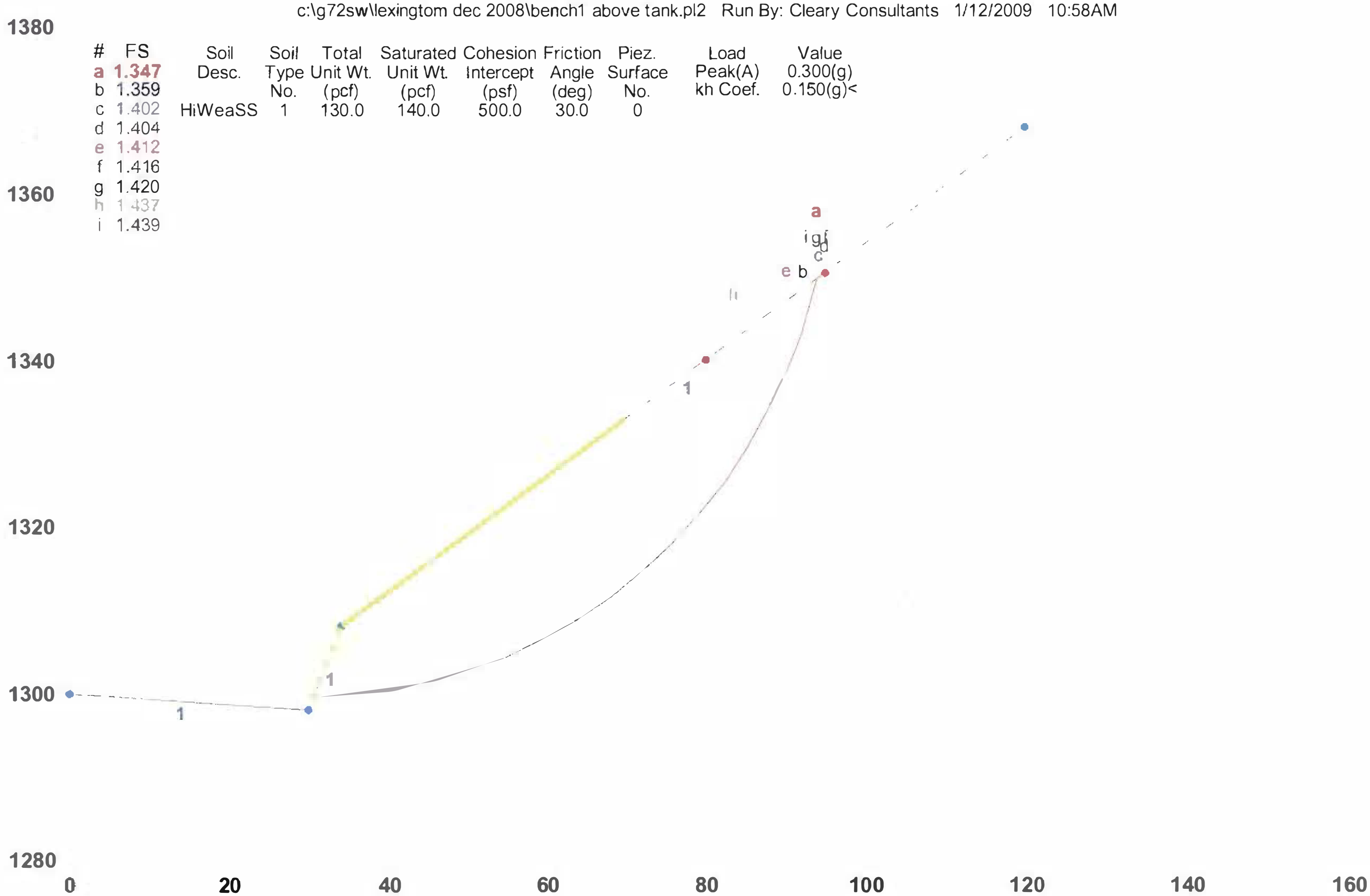

#	FS
a	1.347
b	1.359
c	1.402
d	1.404
e	1.412
f	1.416
g	1.420
h	1.437
i	1.439

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
HiWeaSS	1	130.0	140.0	500.0	30.0	0

Load	Value
Peak(A)	0.300(g)
kh Coef.	0.150(g)<

GSTABL7 v.2 FSmin=1.347

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

Lexington Quarry East Slope Bench 1 above H2O Tank

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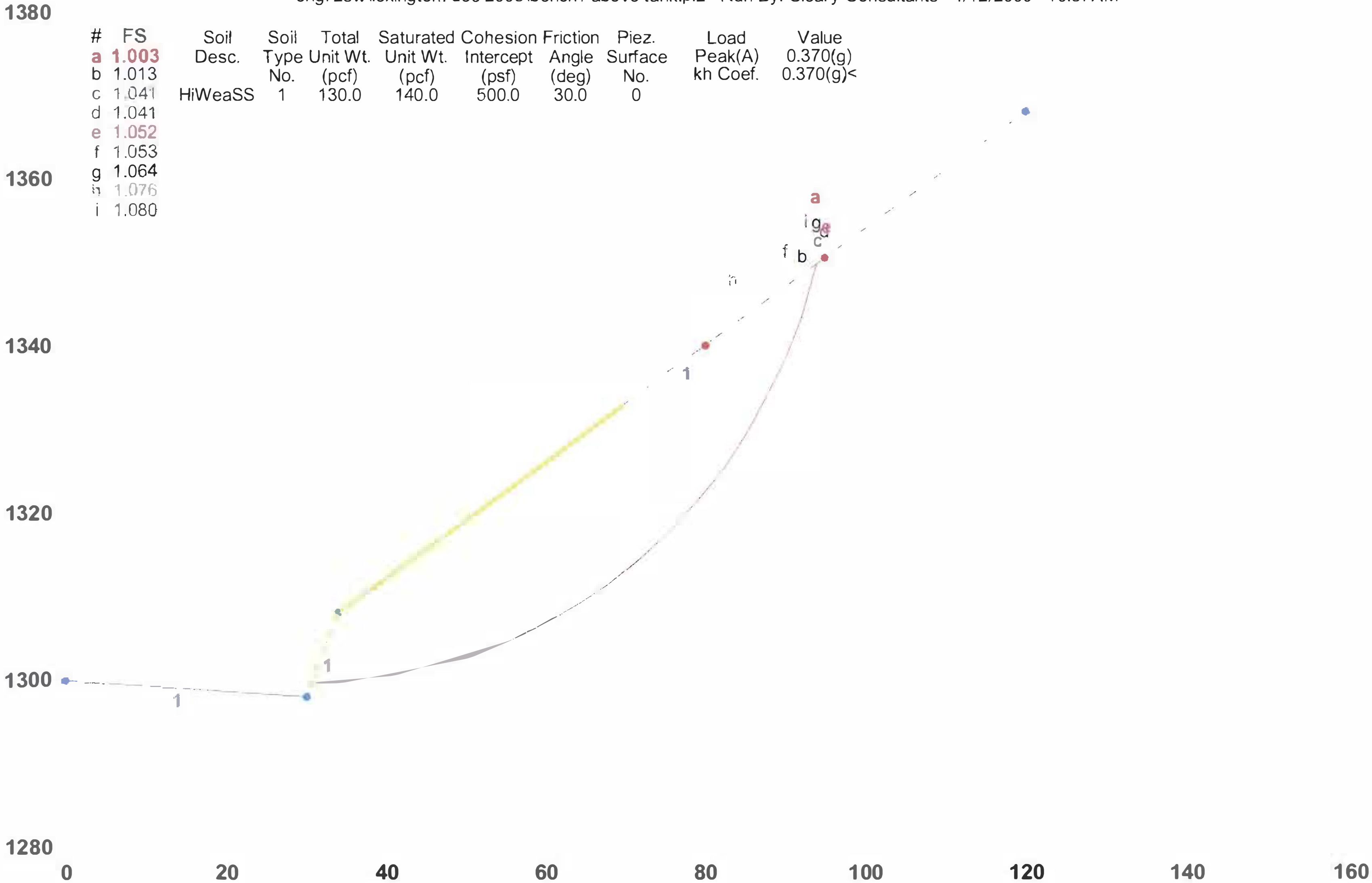

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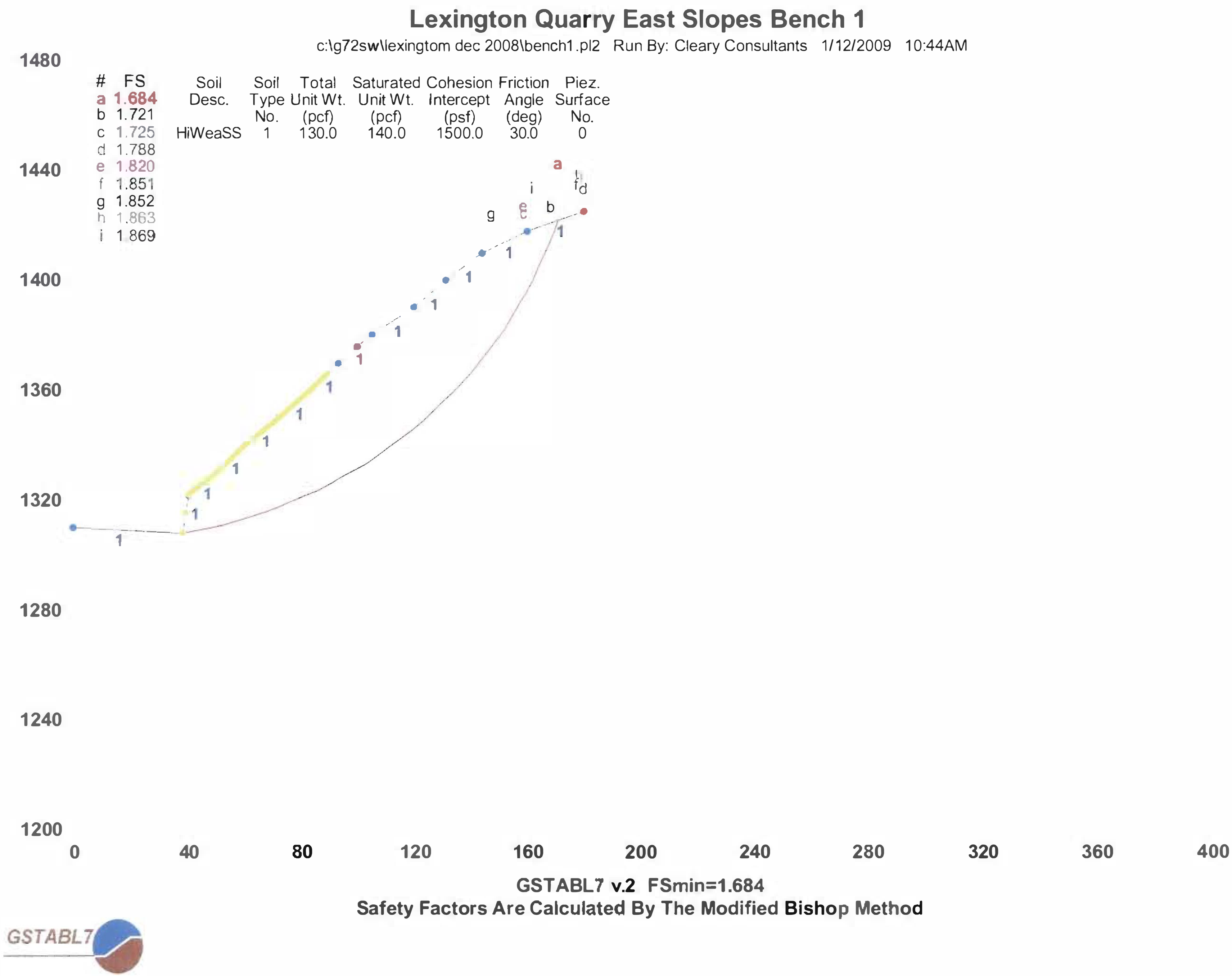
Safety Factors Are Calculated By The Modified Bishop Method



Lexington Quarry East Slopes Bench 1
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FS
a 1.684
b 1.721
c 1.725
d 1.788
e 1.820
f 1.851
g 1.852
h 1.863
i 1.869
Soil Desc.
Soil Type No.
Total Unit Wt. (pcf)
Saturated Unit Wt. (pcf)
Cohesion Intercept (psf)
Friction Angle (deg)
Piez. Surface No.
HiWeaSS 1 130.0 140.0 1500.0 30.0 0
1480
1440
1400
1360
1320
1280
1240
1200
0 40 80 120 160 200 240 280 320 360 400
GSTABL7 v.2 FSmin=1.684
Safety Factors Are Calculated By The Modified Bishop Method
GSTABL7

Lexington Quarry East Slopes Bench 1

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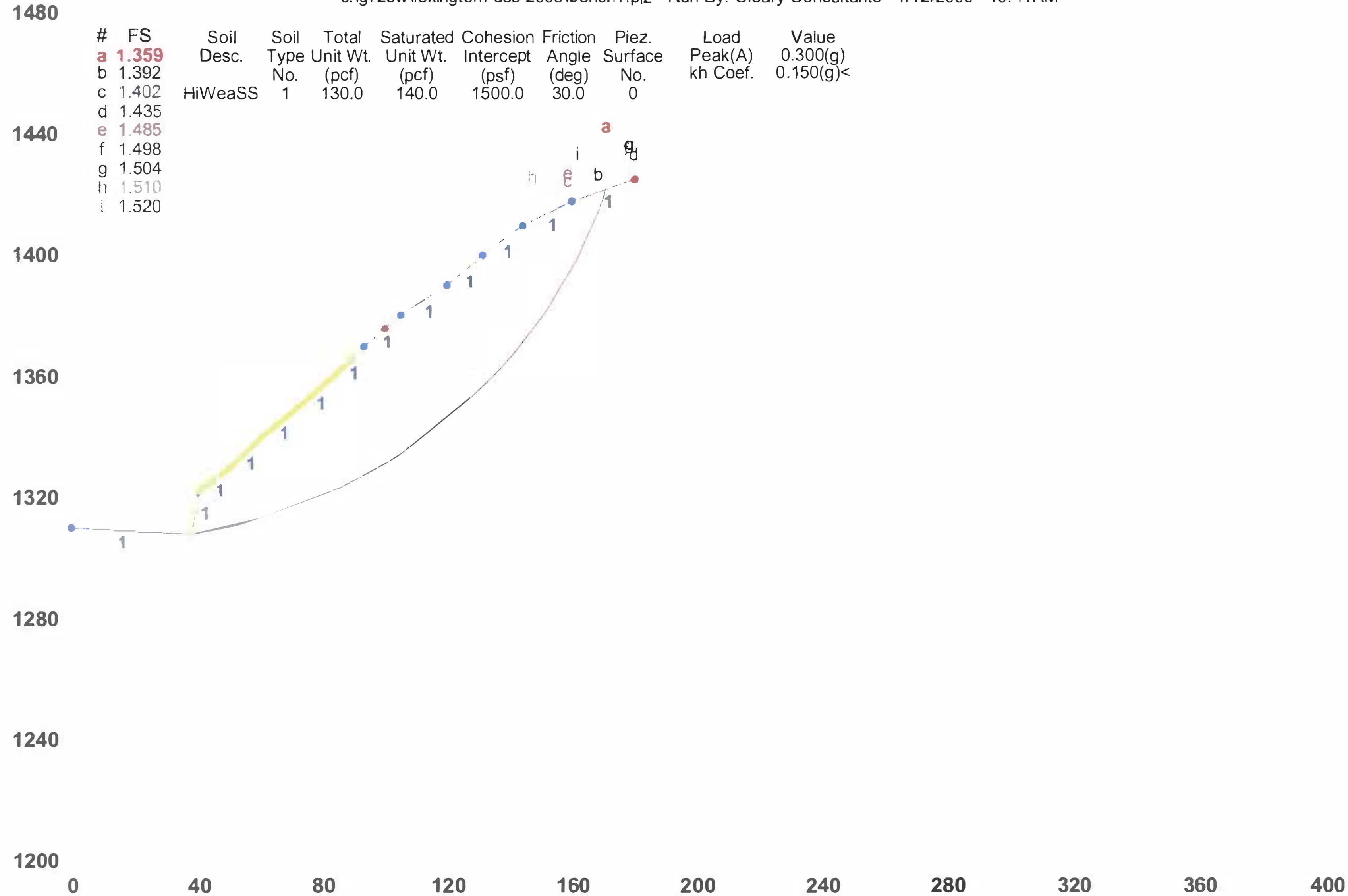

GSTABL7 v.2 FSmin=1.359

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

Lexington Quarry East Slopes Bench 1

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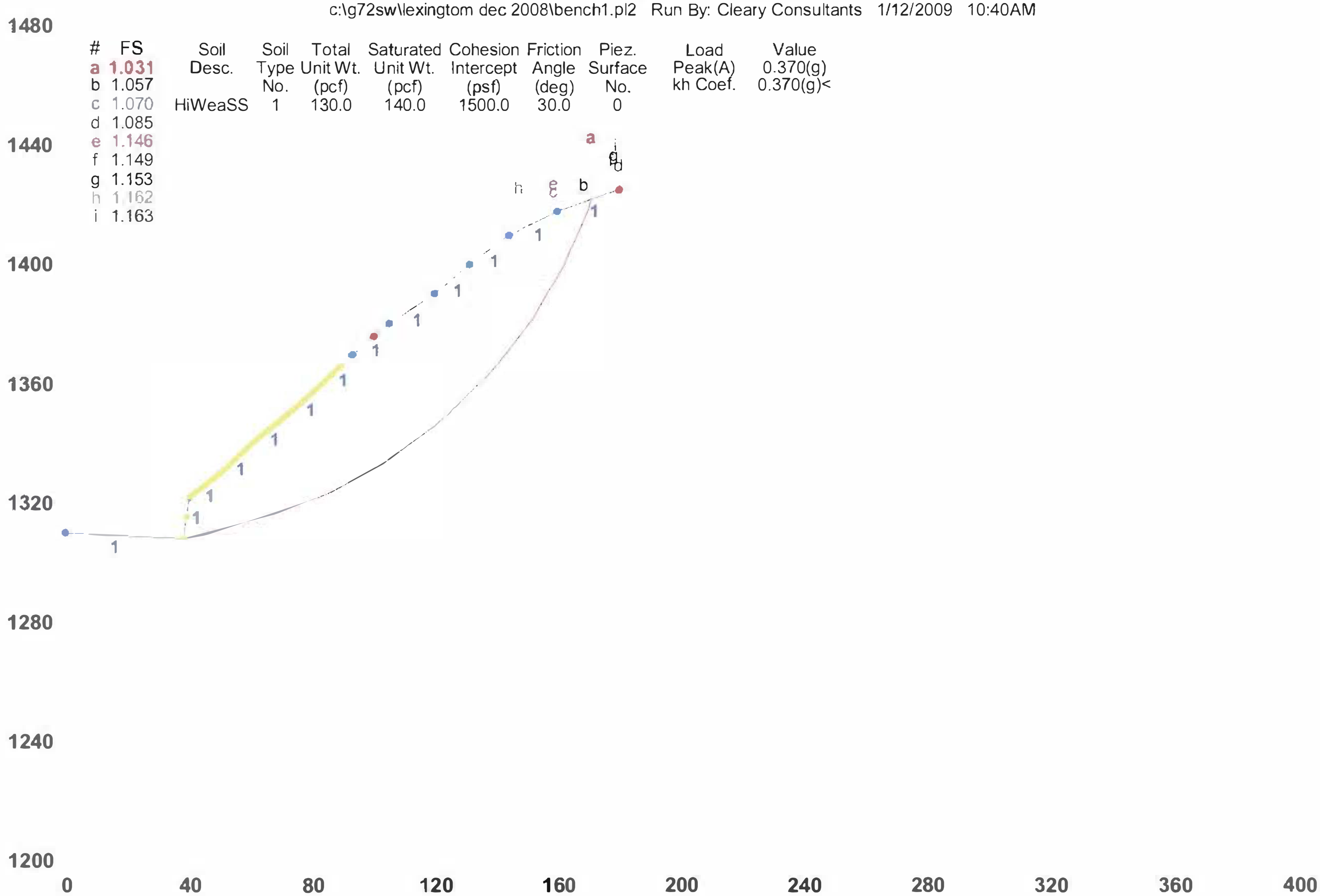

GSTABL7 v.2 FSmin=1.031

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

Lexington Quarry East Slopes Bench 3

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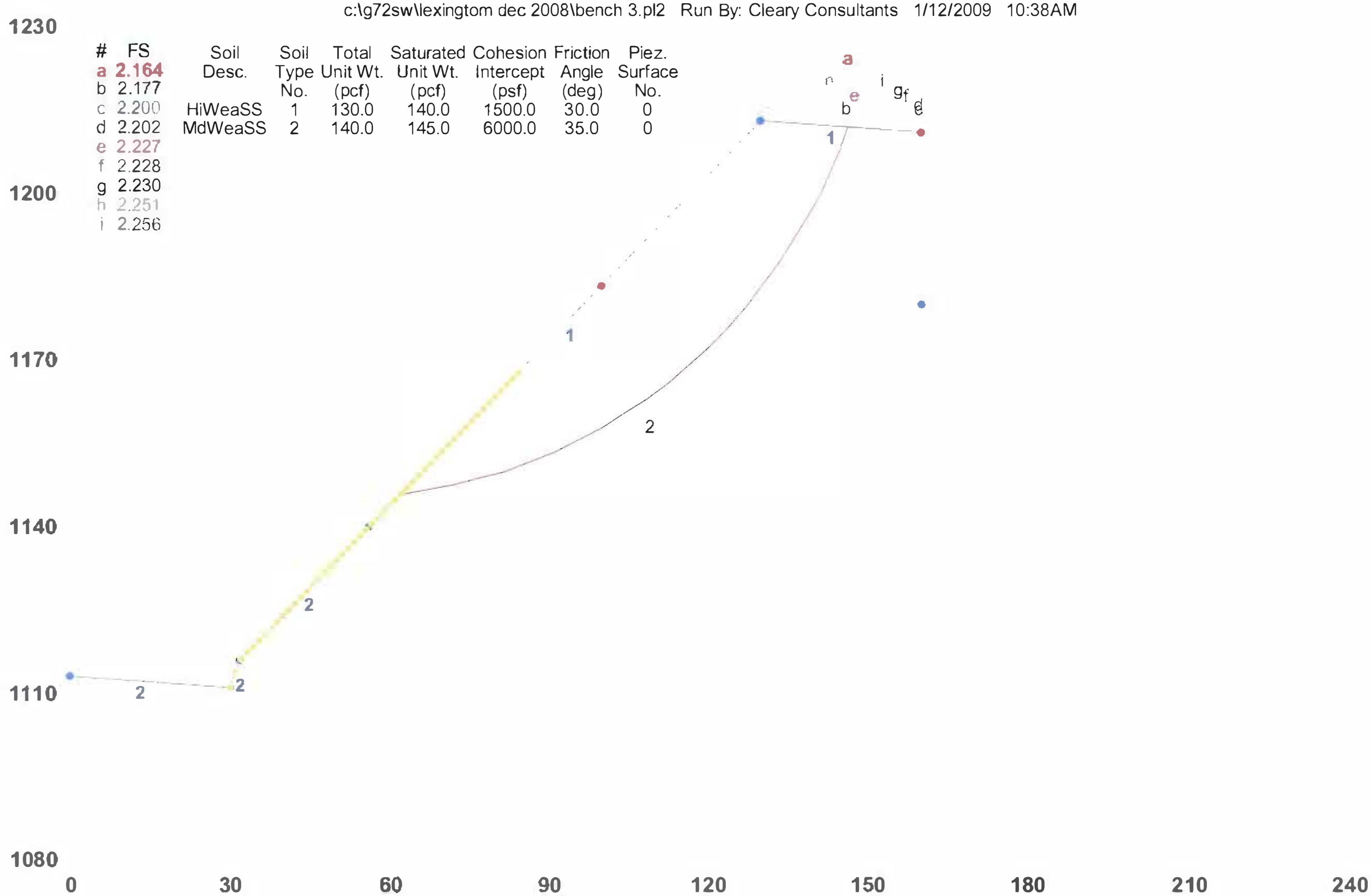

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
HiWeaSS	1	130.0	140.0	1500.0	30.0	0
MdWeaSS	2	140.0	145.0	6000.0	35.0	0

GSTABL7 v.2 FSmin=2.164

Safety Factors Are Calculated By The Modified Bishop Method

Lexington Quarry East Slopes Bench 3

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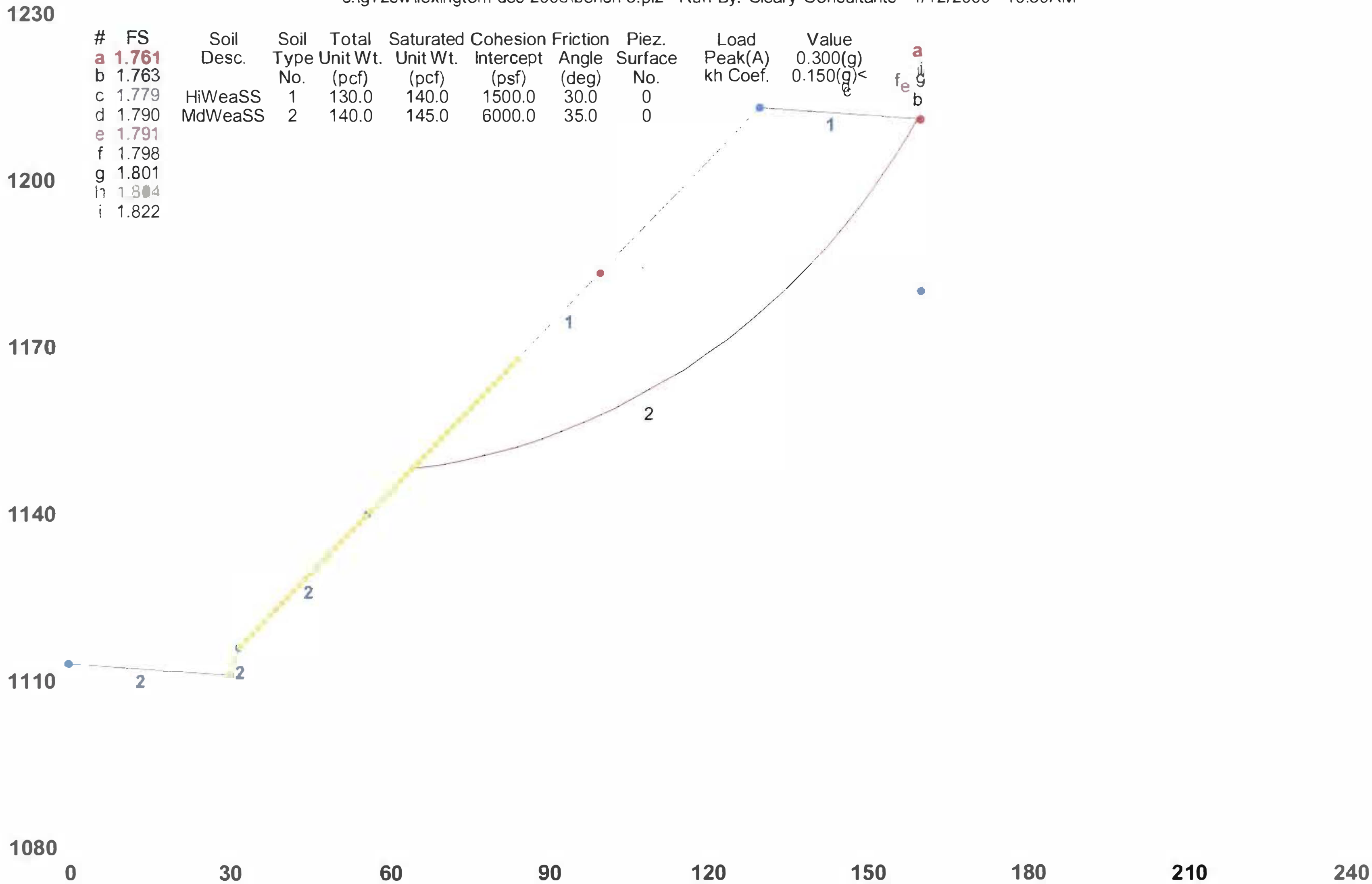

GSTABL7 v.2 FSmin=1.761

Safety Factors Are Calculated By The Modified Bishop Method

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

J. Michael Cleary, CEG, GE
Christophe A. Ciechanowski, GE
Grant F. Foster, GE

February 13, 2009
Project No. 898.2A
Ser. 2476

Mr. Richard O. DeAtley, President
West Coast Aggregates, Inc.
P.O. Box 1061
Tracy, California 95378

**RE: SUPPLEMENTAL SUBMITTAL REQUESTED BY SANTA CLARA COUNTY
USE PERMIT EIR GEOTECHNICAL REVIEW ISSUES
LEXINGTON QUARRY
SANTA CLARA COUNTY, CALIFORNIA**

Dear Mr. DeAtley:

As requested by Rob Eastwood (January 26 email) regarding the County review of our EIR response letter dated January 12, we are providing additional information for the EIR geologic review. The County specifically asked for "a plan showing which approach will be taken to address the reverse cut (overhang) on the south end of Bench #2 of the east face." Further information regarding the extent and thickness of the fines on the lower slopes of the east face was also requested; however, physically mapping the depth of the fines on the 1:1 slopes is not feasible, and we have therefore estimated the quantity of the fines that are presently on the slopes. Copies of the Quarry Plans prepared by Ruth and Going for the alternative slope redesign above Basin #2 and the West Slope Buttress Fill were also requested, and are attached to this letter.

1. **Talus on Benches** – We visited the site on February 10, 2009, following a series of recent rain storms to observe and photo document the conditions of the benches at the talus piles on Benches 7 and 8 of the west slope. We did not see any evidence that the talus piles were blocking drainage or causing local ponding of water and overtopping of the benches. The talus pile on Bench 7, which we understand is more of a concern to the County due to the narrow bench width in front of the pile (about three feet), is located at a bench "hinge point". Flow direction is to the north on the north side of the pile, and to the south on the south side of the pile. Photos taken from the same perspectives in May 2008, show unchanged conditions at the talus pile locations with no observed erosion, bench

disturbance or gullying. Based on our photo documentation and site observations, it is our opinion that the talus piles do not present any adverse affect on the drainage or performance of the benches.

Regarding the issue of fines washing into the talus, see Bart Hechtman's recent letter to the County.

2. **Alternative Slope Design Above Basin #2** - Attached are Ruth & Going's plan and cross-section for the alternative slope design that we recommended in our previous letter dated January 22, 2009 above Basin #2.

3. **Reverse Cut (Overhang) South End of Bench #2** – The south end of Bench #2 on the east slope has a reverse slope cut which varies in height from about three to eight feet. We understand that the quarry operator plans to replace the overcut material at the toe of the slope in this area with large-sized rock (12-inch to 18-inch minimum diameter). We recommend that the material be placed tightly at the toe of the slope at a 1:1 (horizontal:vertical) as indicated in the attached Drawing 1, Rip Rap Repair Detail at Oversteepened Toe Cut.

4. **East Slope Fines Layer**- The layer of fines placed on the intermediate slopes below Benches 1, 2, 3 and 4 is presently estimated to be approximately 18 to 24 inches thick (12 inches below Bench 4) based on site observation from walking the benches. The fines layer is not of uniform thickness over the slopes, however, and the bedrock underlying the fines layer is exposed over the north end of the slopes and in erosion gullies and areas of planar downslope fines migration. As a means of estimating the rough quantity of fines remaining on the slope, we have compared the areas of fines washout to the total slope areas initially covered with fines using wide angle/composite photographs of the slope intervals below Benches 1 through 4. Based on this analysis, we estimate that there are approximately 13,500 cubic yards of fines material remaining on the lower four slopes of the east face. Regarding the status of the haul road and impacts to landscaping associated with removing the fines, see Bart Hechtman's recent letter to the County.

5. **West Slope Buttress Fill** – Cross-sections included on Sheet 14 of the revised Ruth and Going plans appear to accurately represent the recommended buttress fill slopes. Ruth and Going has also added our material specifications to Sheet 14 of the revised plans, which are delivered to the county with this letter.

This letter has been prepared for the specific use of West Coast Aggregates, Inc. in accordance with generally accepted geotechnical engineering principles and practices. No other warranty, either expressed or implied, is made.

Please call if you have any questions regarding this letter.

Yours very truly,

CLEARY CONSULTANTS, INC.

Grant Foster
Geotechnical Engineer 2662

J. Michael Cleary
Engineering Geologist 352
Geotechnical Engineer 222

GF/JMC:cm

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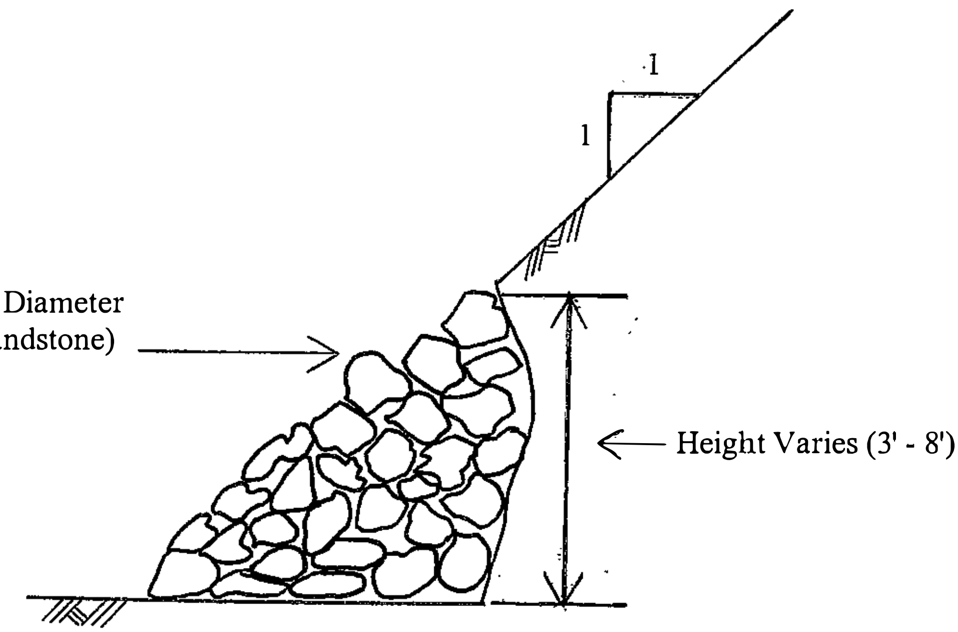
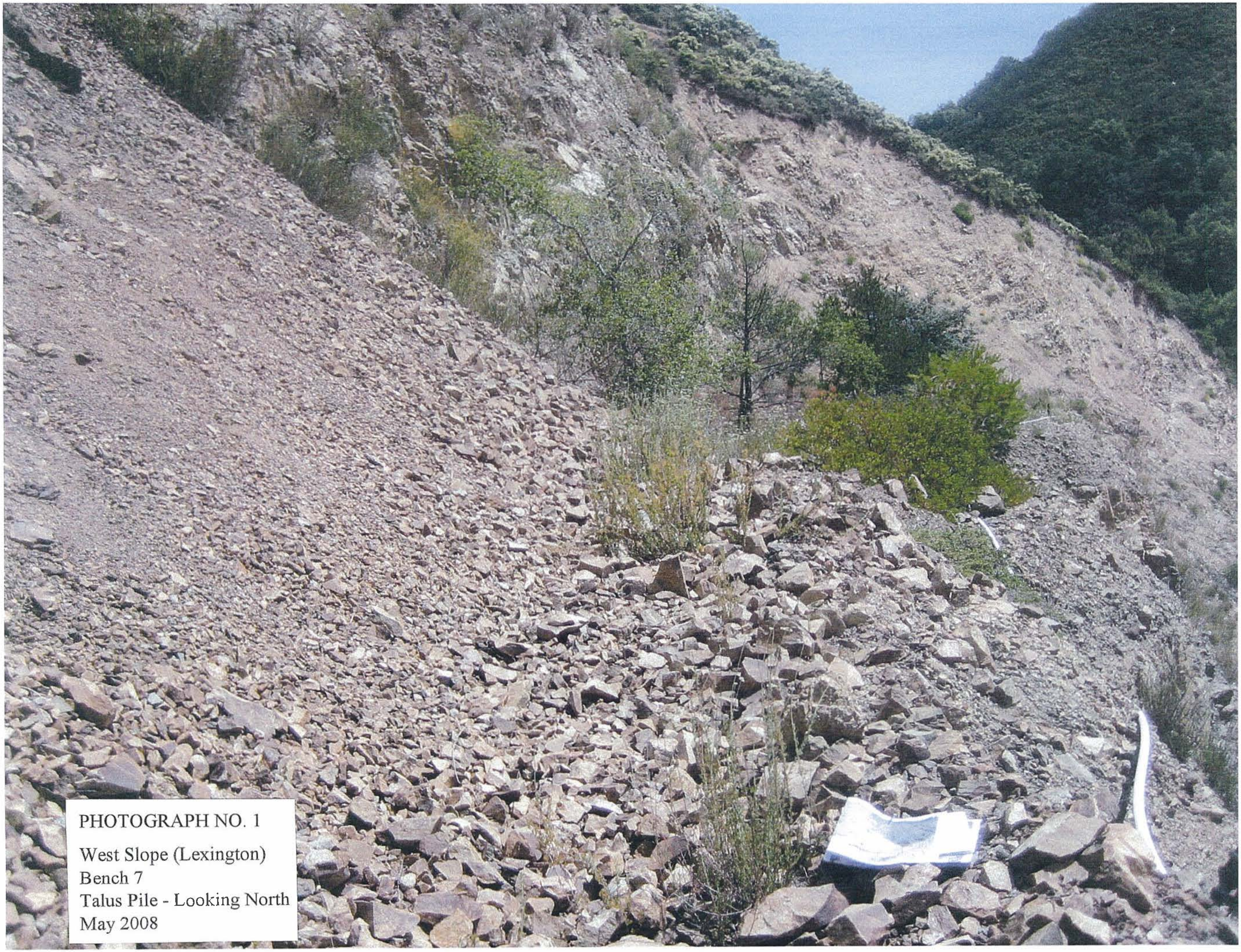
LSA Associates (1) Attn: Mignone Wood
Matteoni O'Laughlin and Hechtman (1) Attn: Bart Hechtman
County of Santa Clara Planning Department (2) Attn: Rob Eastwood
Jim Baker (1) County Geologist (Including photo documentation of the talus pile on Bench 7, west slope)

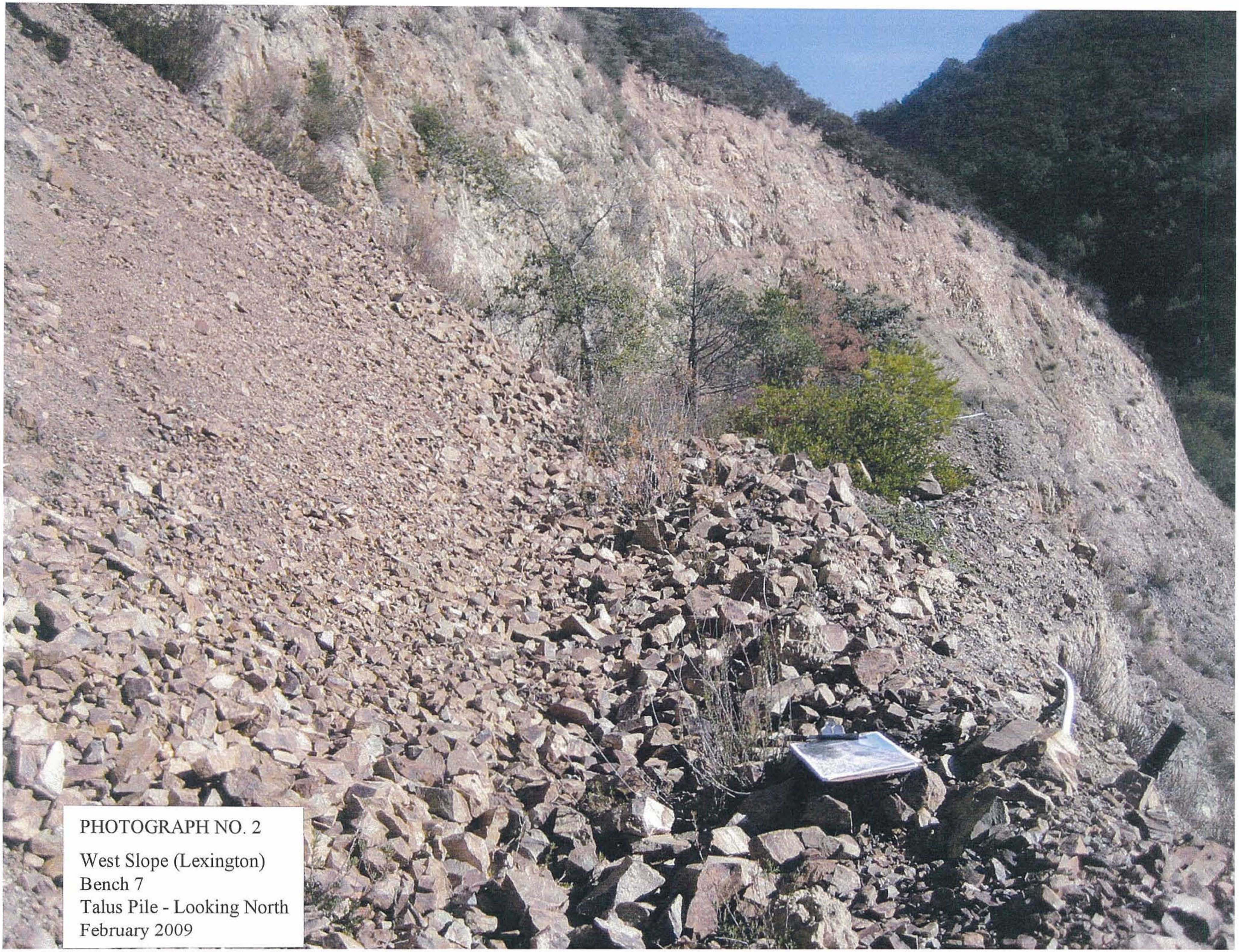
Attachments: Drawing 1 – Rip Rap Repair at Oversteepened Toe Cut (Bench 2)
Ruth and Going Sheets 1 and 2, Alternate West Slope Grading (above Basin #2) dated October 1, 2008 (Delivered to Santa Clara County)
Ruth and Going Revised Plan Set for Lexington Quarry dated February 13, 2009 (15 Sheets, Delivered to Santa Clara County)



RIP RAP REPAIR DETAIL AT OVERSTEEPENED TOE CUT				
CLEARY CONSULTANTS, INC. *Geotechnical Engineers and Geologists*		EAST SLOPE, BENCH 2 Lexington Quarry Santa Clara County, California		
APPROVED BY	**SCALE**	**PROJECT NO.**	**DATE**	**DRAWING NO.**
GF	Not To Scale	898.2A	February 2009	1

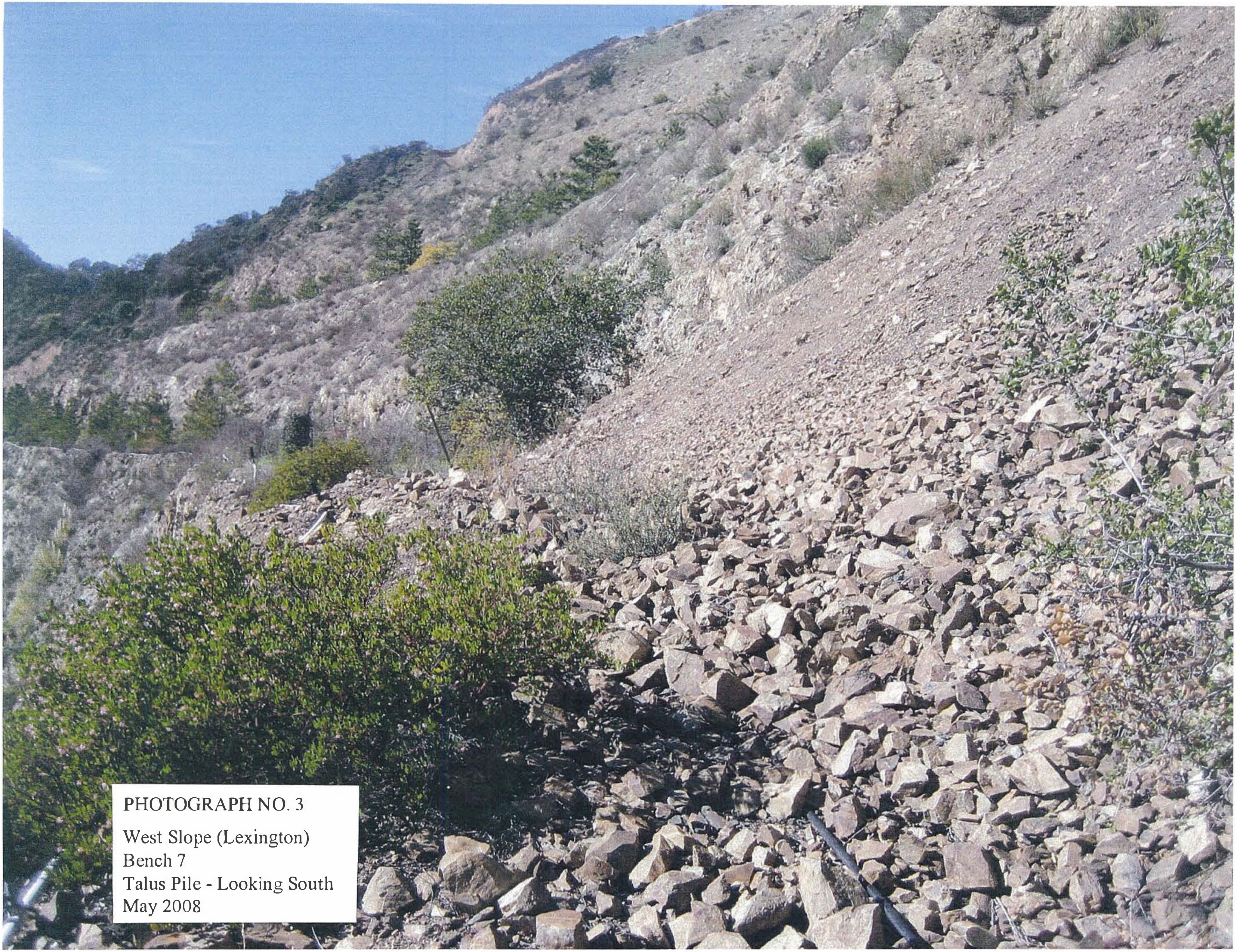


PHOTOGRAPH NO. 1
West Slope (Lexington)
Bench 7
Talus Pile - Looking North
May 2008



PHOTOGRAPH NO. 2

West Slope (Lexington)
Bench 7
Talus Pile - Looking North
February 2009



PHOTOGRAPH NO. 3

West Slope (Lexington)
Bench 7
Talus Pile - Looking South
May 2008

PHOTOGRAPH NO. 4

West Slope (Lexington)
Bench 7
Talus Pile - Looking South
February 2009