
Limited Geologic and Soils Engineering Investigation



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LIMITED GEOLOGIC AND SOILS
ENGINEERING INVESTIGATION

Proposed Office Buildings

Lot A & B NW Corner of Cross Creek Road and Civic Center Way

Malibu, California

for

Goldman Firth Architects

Ron Goldman

24955 Pacific Coast Highway, Suite A202

Malibu, CA 90265

Project 1680

June 21, 1999

LIMITED GEOLOGIC AND SOILS ENGINEERING INVESTIGATION

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INTRODUCTION

This report presents the results of a Limited Geologic and Soils Engineering Investigation on the subject property. The purpose of this investigation has been to ascertain the subsurface conditions pertaining to the proposed project. Review of the project included reconnaissance mapping, description of earth materials, determination of geologic structure, obtaining representative earth samples, performing laboratory testing, engineering analyses and preparation of this report. Results of the project include findings, conclusions and appropriate recommendations covering the proposed project.

SCOPE

The scope of this investigation includes the following:

- Review of preliminary plans by Goldman-Firth.
- Review of fourteen backhoe explorations and eight borings. Explorations were backfilled with the excavated materials.
- Preparation of the enclosed Geologic Map (see Appendix I).
- Sampling of representative earth materials, laboratory testing and analyses (see Appendix II).
- Review of reference materials and available public reports at the City of Malibu (see Appendix V).
- Presentation of findings, conclusions and recommendations for the proposed project.

Dulin & Boynton prepared the topographic base map utilized in this investigation. It consists of one sheet drawn to a scale of one-inch equals thirty feet and dated April 7, 1999.

The scope of this investigation is limited to the project area explored as depicted on the Geologic Map. This report is not a comprehensive evaluation of the entire property. This report has not been prepared for use by other parties or for other purposes, and may not contain sufficient information for other than the intended use. Prior to use by others, GeoConcepts, Inc. should be consulted to determine if additional work is required. If construction is delayed more than one year, this office should be contacted to verify current site conditions and prepare an update report.

PROPOSED DEVELOPMENT

It is our understanding that the proposed development will consist of four, two story office buildings. Grading will consist of conventional cut and fill methods. It is proposed to raise the building pads above the flood level, about one to three feet. Final building and grading plans have not been prepared and await the conclusions and recommendations of this investigation.

SITE DESCRIPTION

GeoConcepts, Inc.

Location and Description

Access to the property is via Cross Creek Road from Civic Center Way (see Location Map). The site consists of a relatively level site that generally slopes to the south. Maximum relief on site is about five feet. The site was vacant and generally unimproved. Vegetation consisted of dense native grasses, shrubs and trees. Details of the topography are depicted on the Location Map and Geologic Map in Appendix I.

Drainage

Surface water at the site consists of direct precipitation onto the property and runoff from surrounding properties to the north. Much of this water drains as sheet flow to the south.

Groundwater

No active surface groundwater seeps or springs were observed on the subject site. The subsurface exploration encountered groundwater at depths of (9-10) feet. Seasonal fluctuations of groundwater levels may occur by varying amounts of rainfall, irrigation and recharge.

SUMMARY OF FINDINGS

Previous Works

No geology and/or geotechnical reports were found on file at the City of Los Angeles covering the subject site. GeoSoils, Inc. prepared several reports for the adjacent site to the west. In addition, Leighton and Associates, Inc. prepared a report covering the Civic Center area dated March 18, 1994. Aerial photographs dated 1952 indicated that the site was farmed.

Stratigraphy

The site is underlain by non-marine sediments of Quaternary time, which are covered by Holocene earth materials. The earth materials encountered on the subject property are briefly described below. Approximate depths and more detailed descriptions are given in the enclosed Exploration Logs (see Appendix II).

Fill (Af)

Previous grading has resulted in fill placement for the existing parking lot on a small portion of the subject site. Fill materials were presumably placed during pad grading for the parking area. Fill was encountered in four of the test pits ranging from (2) to (2.5) feet in thickness. A near

horizontal contact between the fill and the underlying alluvium was exposed within the exploratory test pits. Fill consists of pebbly silty sand, coarse to medium grain.

Native Soil (Qs)

Native soil consists of sandy silt to silty sand, medium brown. The soil was derived from weathered bedrock materials that have accumulated on natural descending slopes. Soil varies between (1) and (4) feet in thickness.

Older Quaternary Alluvium (Qoal)

Older Alluvial deposits under lie the site. The Older Alluvium is weathered bedrock material that has eroded from natural ascending slopes and accumulated in generally flat lying areas. Older Alluvium primarily consists of interlayered loose to dense, fine to coarse sands, gravels and firm to stiff sandy silt. These deposits were encountered within all of the exploratory test pits and borings ranging to over (61) feet in thickness.

Seismicity

The property is not located within an Earthquake Fault Zone. No known active fault exists beneath the proposed project. There are several active and/or potentially active faults that could possibly affect the site within Los Angeles County. However, all of Southern California is in a seismically active region. Neither the time, location, magnitude of fault movement nor earthquake can be accurately predicted.

The main trace of the Malibu Coast fault is mapped along the south and southeastern portions of the property near Cross Creek and along Civic Center Way, (Campbell 1996). The main trace of the Malibu Coast fault is mapped along the southern portion of the site near Civic Center Way, (Dibblee 1993). As of June 1995, two portions of the Malibu Coast fault zone were reclassified as an active fault. The Malibu Coast fault consists of several subparallel strands in a zone as wide as 0.5 km, with a length of at least 17 miles. It strikes east west and dips (45) to (80) degrees to the north.

During an earthquake there are generally three primary geologic hazards, such as ground rupture, liquefaction and ground motion, that can adversely affect property and structures.

Ground rupture is the result of movement from an active fault. No evidence of faulting was exhibited within the seismic trenches on the subject site. Therefore, no known active fault is located within the limits of the proposed dwelling.

The most comprehensive liquefaction study conducted in Los Angeles County indicated sediments deposited within the past 1000 years as the most susceptible, (Tinsley, 1985). Liquefaction is the process by which water-saturated sediment loses its strength and fails during

strong ground shaking, generally associated with moderate to great earthquakes. In the Los Angeles area, seismic shaking has occurred everywhere. Therefore, improvements founded in loose beach sands have a potential to liquefy due to high water levels and youthful, cohesionless sands.

Liquefaction during seismic shaking can result in severe disruption of near-surface structural and foundation distress. Structures founded in susceptible earth materials may settle several feet below grade while buried tanks or buoyant structures may rise to the surface. Especially at risk to liquefaction are improvements such as walkways, driveways, retaining walls and utility lines founded into saturated, loose, and uniformed grain size deposits.

Ground motion caused by an earthquake is likely to occur at the site during the lifetime of the development due to the proximity of several active and potentially active faults. A computer program for the deterministic prediction of peak horizontal acceleration from digitized California faults was utilized and is provided in the Appendix. The Santa Monica thrust fault and Malibu Coast fault has the potential to produce the largest Maximum Credible Peak and Repeatable Acceleration on the subject property. The duration of the Malibu Coast fault is estimated at (11) seconds assuming fault end nucleation and unidirectional rupture propagation, (Bolt, 1981). Generally, on a regional scale, quantitative predictions of ground motion values are linked to peak acceleration and repeatable acceleration, which is a response to earthquake magnitudes relative to the fault distance from the subject property.

This seismic evaluation is designed to provide the client with current, rational and believable seismic data that could affect the property during the lifetime of the proposed improvements. The minimum design acceleration for a project is listed in the Unified Building Code. It is recommended that the structural design of the proposed dwelling be based on current design acceleration practices of similar projects in the area.

Liquefaction

Liquefaction is the process by which sediments below the water table temporarily loses strength and behaves as a viscous liquid rather than a solid. Sediments most susceptible to liquefaction are sandy soils. Liquefaction can occur during moderate to great earthquakes. In the Los Angeles area, seismic shaking has occurred everywhere. Structures supported in susceptible earth materials may settle several feet below grade while buried tanks or buoyant structures may rise to the surface.

Based upon the subsurface exploration and laboratory testing the loose alluvial sands are potentially liquefiable. The potentially liquefiable sands were identified as depths ranging from eight to thirty feet.

Mitigation of localized problems including bearing failure and settlements may be accomplished by supporting the proposed structures on foundations deriving support from the alluvial soils below the potentially liquefiable soils. Alternatively, removal or treatment of the liquefiable material may be performed to densify the sands to reduce the liquefaction potential.

CONCLUSIONS

1. Based on the results of this investigation and a thorough review of the proposed development, as discussed, the site is suitable for the intended use providing the following recommendations are incorporated into the design and subsequent construction of the project. Also, the development must be performed in an acceptable manner conforming to building code requirements of the controlling governing agency.
2. The Malibu fault was mapped near the southern portion of the subject site, near and essentially parallel to Civic Center Way. This fault location was mapped by others based on photo-lineament analysis. GeoSoils, Inc. indicated that electric cone penetrometer soundings to a depth of (60) feet provide lateral consistency across the suspected area of faulting. Floodplain deposits were collected at depths of (19-19.5) and (25-26.6), which yield carbon-14 dates of 6500 and 7850 BP, respectively. This investigation by GeoSoils, Inc. on the adjacent (18.4) acres parcel to the west concluded that the Malibu fault is not correctly located or that the portion of the fault which underlies the site is pre-Holocene. Evidence of faulting was not observed within the GeoConcepts, Inc. seismic trenching performed on the subject site nor was it viewed on aerial photographs, (1952). Based on the all the available information herein and referenced, it is thought that the Malibu fault is not correctly located or it is deeper than the (60) feet and older than Holocene.
3. Analysis indicates that the loose alluvial sands have a potential for liquefaction. The analysis indicates liquefaction potential varying from eight to thirty feet.
4. Based upon field observations, laboratory testing and analysis, the alluvium found in the borings below thirty feet should possess sufficient strength to support the structures.

RECOMMENDATIONS

Specific

Option 1:

The proposed structures may be supported on friction piles extending through the potentially liquefiable sands. The friction piles may be designed as outlined in the Foundations section below.

Buried utilities and parking areas would still be affected by liquefaction. Appropriate measures such as flexible connections resistant to earthquake damage and shutoff valves should be considered.

Option 2:

The liquefaction hazard may be mitigated by in place treatment of the liquefiable sands to reduce the liquefaction potential. In place densification of the material may be accomplished with Vibro Compaction or Stone Column densification. Shallow foundations may be utilized provided that the liquefaction potential is reduced to an acceptable level. Additional testing following the treatment will verify the results of the densification.

General

1. All leach lines shall be field inspected and approved. The leach lines should be placed into the Older Alluvium in conformance with the controlling governing agency.
2. The site shall be maintained by the property owner as outlined in the Drainage and Maintenance section below.

Drainage and Maintenance

The site shall be maintained as outlined in the General Specifications in Appendix IV below.

Grading and Earthwork

Proposed grading will consist of raising the pad elevation about three feet. All grading shall be carried forth as outlined in the GRADING SPECIFICATIONS section in Appendix IV.

Foundations

Option 1:

The minimum friction pile diameter is (24) inches. Friction piles should extend into the non-liquefiable alluvium a minimum of (10) feet, which is found at a depth of thirty feet. The friction piles may be proportioned using skin friction value of (500) pounds per square foot. All friction piles should be designed to resist a creep force of 1000 pounds per lineal foot for each foot of shaft exposed to the liquefiable sands above thirty feet.

Lateral loads may be resisted by friction at the base of the conventional foundations and by passive resistance within the compacted fill. A coefficient of friction of (0.4) may be used between the foundations and the alluvium. The passive resistance may be assumed to act as a fluid with a density of (500) pounds per cubic foot. A maximum passive earth pressure of (2000)

pounds per square foot may be assumed. For isolated poles, the allowable passive earth pressure may be doubled.

Option 2:

The minimum continuous footing size is (12) inches wide and (24) inches deep into the compacted fill, measured from the lowest adjacent grade. Continuous footings may be proportioned, using a bearing value of (1500) pounds per square foot. Column footings placed into the compacted fill may be proportioned, using a bearing value of (2000) pounds per square foot, and should be a minimum of (2) feet in width and (24) inches deep, below the lowest adjacent grade.

The bearing values given above are net bearing values; the weight of concrete below grade may be neglected. These bearing values may be increased by one-third (1/3) for temporary loads, such as, wind and seismic forces.

All footing excavation depths will be measured from the lowest adjacent grade of recommended bearing material. Footing depths will not be measured from any proposed elevations or grades. Any foundation excavations that are not the recommended depth into the recommended bearing materials will not be acceptable to this office.

Lateral loads may be resisted by friction at the base of the conventional foundations and by passive resistance within the compacted fill. A coefficient of friction of (0.4) may be used between the foundations and the alluvium. The passive resistance may be assumed to act as a fluid with a density of (300) pounds per cubic foot. A maximum passive earth pressure of (2000) pounds per square foot may be assumed. For isolated poles, the allowable passive earth pressure may be doubled.

Settlement

Settlement of continuous footings is anticipated to be on the order of (1/4) inches. Isolated footings should have a settlement of (1/2) inches. Differential settlement between the two foundation unit types is not expected to exceed (1/4) inches.

Slabs on Grade

Option 1:

The proposed slabs on grade for structures should be supported by the foundation system.

Option 2:

Slabs on grade should be reinforced with minimum #3 reinforcing bars, placed at (18) inches on center each way. Floor slabs underlain by (4) inches of crusher-run base, compacted into place by mechanical means may be supported directly on compacted fill.

A polyethylene plastic vapor barrier should protect floors that may be affected by moisture. This barrier should be covered with a one inch (1") layer of sand to prevent punctures in the vapor barrier and to aid in the cure of the concrete.

Footing trench spoils should either be removed from the slab areas or compacted into place by mechanical means and tested for compaction.

Sewage

A private sewage disposal system utilizing septic tank and leach lines is geologically feasible within the older alluvium. The leach field should be placed into the older alluvium in conformance with the controlling governing agency.

The percolation testing for leaching trench type of effluent disposal field was performed within twelve test pits. The presoak percolation testing began on March 5, 1999. The test pits were refilled on March, 5, 1999 for the test period. The final water level was recorded on March 5, 1999, completing the test period. The results of the testing are attached. The percolation rate ranged from 0.24 to 0.45 square feet per gallon.

REVIEWS

Plan Review and Plan Notes

The final grading, building, and/or structural plans shall be reviewed and approved by the consultants to ensure that all recommendations are incorporated into the design or shown as notes on the plan.

The final plans should reflect the following:

1. The Geologic and Soils Engineering Investigation by GeoConcepts, Inc. is a part of the plans.
2. Plans must be reviewed and signed by the soils engineer and geologist.
3. All grading must be reviewed by the project soils engineer and geologist.
4. All foundations shall be reviewed by the project soils engineer and/or geologist.

5. All leach lines shall be field reviewed and approved.

Construction Review

Reviews will be required to verify all work. It is required that all footing excavations, seepage pits, and grading be reviewed by this office. This office should be notified at least **two working days** in advance of any field reviews so that staff personnel may be made available.

LIMITATIONS

General

Findings, conclusions and recommendations contained in this report are based upon the surface mapping, subsurface exploration, data analyses, and specific information as described and past experience. Earth materials and conditions immediately adjacent to, or beneath those observed may have different characteristics, such as, earth type, physical properties and strength. Therefore, no representations are made as to the nature, quality, or extent of latent earth materials. Site conditions can and do change from those that were first envisioned. During construction, if subsurface conditions differ from those encountered in the described exploration, this office should be advised immediately so that appropriate action can be taken.

Findings, conclusions and recommendations presented herein are based on experience and background. Therefore, findings, conclusions and recommendations are professional opinions and are not meant to indicate a control of nature.

This report may not be copied. If you wish additional copies, you may order them from this office.

111 Statement

It is the finding of this corporation, based upon the subsurface data, that the proposed project will be safe from landslide, settlement or slippage and will not adversely affect adjacent property, provided this corporation's recommendations and those of the Los Angeles County Code are followed and maintained.

CONSTRUCTION NOTICE

Construction can be difficult. Recommendations contained herein are based upon surface reconnaissance and subsurface explorations deemed suitable by your consultants.

It is this Corporation's aim to advise you through this report of the general site conditions, suitability for construction, and overall stability. It must be understood that the opinions are

based upon testing, analysis, and interpretation thereof.

Quantities for foundation concrete and steel may be estimated, based on the findings given in this report. However, you must be aware that depths and magnitudes will most likely vary between the explorations given in the report.

We appreciate the opportunity of serving you on this project. If you have any questions concerning this report, please contact the undersigned.

Respectfully submitted,
GEOCONCEPTS, INC.

Scott J. Walter
Project Engineer
GE 2476

Robert L. Sousa
Project Geologist
CEG 1315

RLS/SJW: ram-1680-1

Distribution: (9) Addressee

APPENDIX I

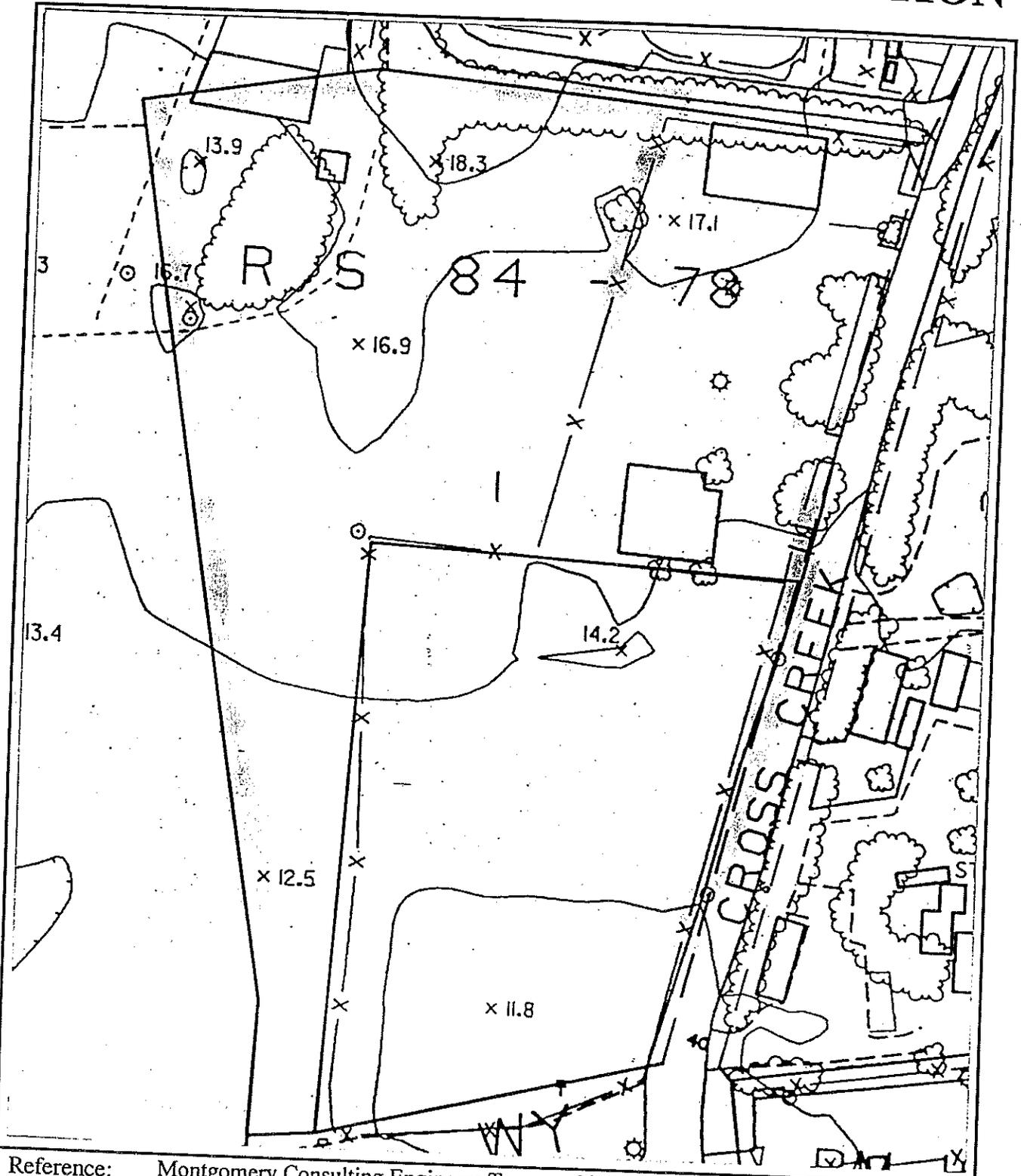
SITE INFORMATION

Location Map

Geologic Map

Field Exploration
Exploration Logs 1 through 14
Borings 1 through 8

LOCATION



Reference: Montgomery Consulting Engineers Topographic Maps No. 110-217-32

Project No.: 1680

Scale: 1" = 100'

Project Address: 3705 Cross Creek Road
23401 Civic Center Way
Malibu, California

Field Exploration

A field exploration of the site was conducted in March and April, 1999. The soils and geologic conditions were mapped by a representative of this office (refer to Exploration Logs). Subsurface exploration was performed by a conventional backhoe and hollow stem drill rig excavating into the underlying earth materials. Explorations were excavated to a maximum depth of (61) feet. The Geologic Map in Appendix I depicts locations of the subsurface explorations.

Representative, undisturbed and bulk samples of the earth materials were obtained. Undisturbed samples were obtained within the explorations through the use of a thin-walled steel hand-held sampler with successive blows of a 140 pound drop hammer dropped thirty inches (30"). Ring samples obtained were collected using a California Sampler with 2.5" brass rings. The soil is retained in the brass rings of two and one-half inches (2½") in diameter and one inch (1") in height. The sample is transported in moisture tight containers. The remaining sampling was performed using the Standard Penetration Testing (SPT) per ASTM 1586. The SPT blow counts were utilized in the liquefaction analysis

EXPLORATION: TP 1

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

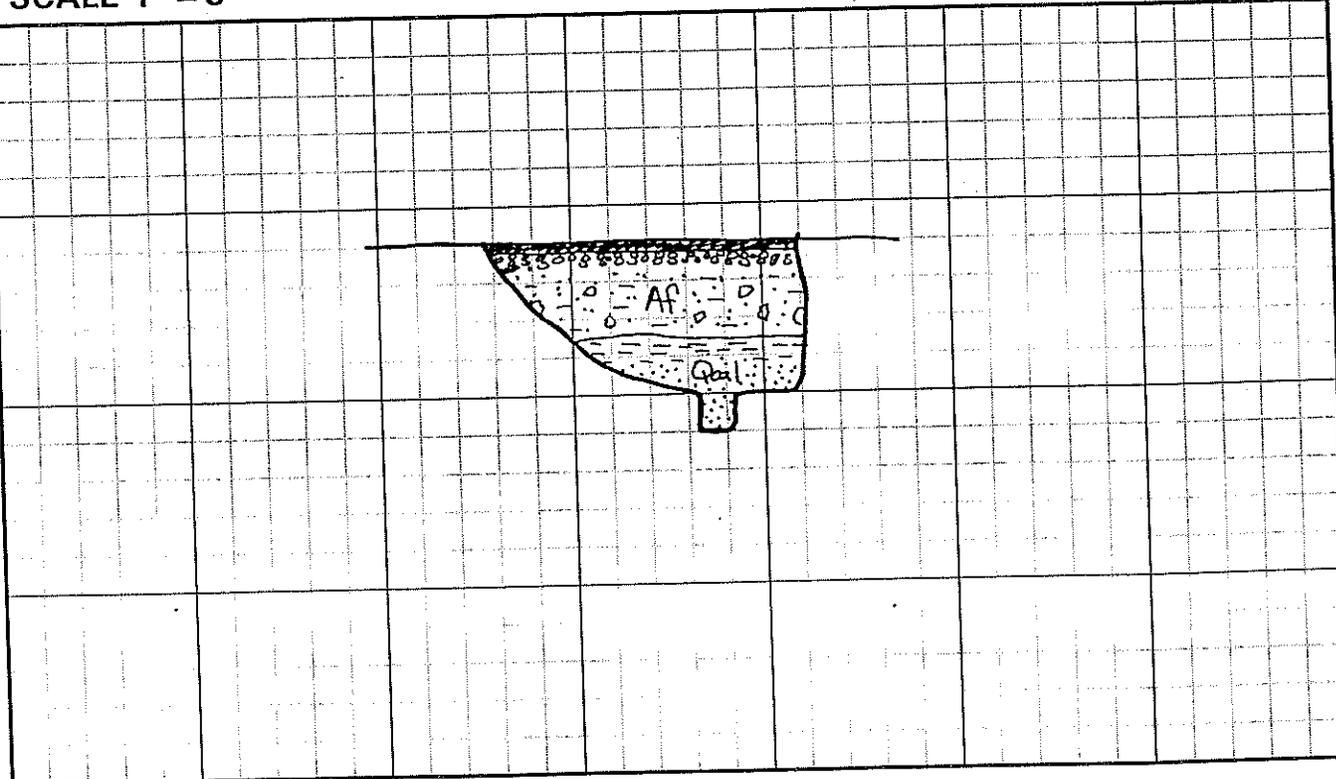
DATE: March 5, 1998

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
	<p>0.0 - 4.0" Asphalt</p> <p>4.0" - 6.0" Gravel</p> <p>6.0" - 2.5' FILL; Af, pebbly silty sand, coarse to medium grained, slightly moist, firm, pebbles up to 4" in diameter, average 2", brick fragments.</p> <p>2.5' - 4.0' OLDER ALLUVIUM; Qoal, sandy silt, buff, slightly moist, firm.</p> <p>@3.0' sand, fine- to medium-grained, slightly moist, moderately loose, light-gray, very few pebbles.</p>
<p>fp - foliation s - shear j - joint b - bedding</p>	<p>_____</p> <p>Total Depth 4.0 Feet, Bearing 276 Degrees, no groundwater, no caving.</p>

SCALE 1" = 5'

GENERALIZED PROFILE



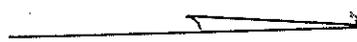
EXPLORATION: TP 2

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

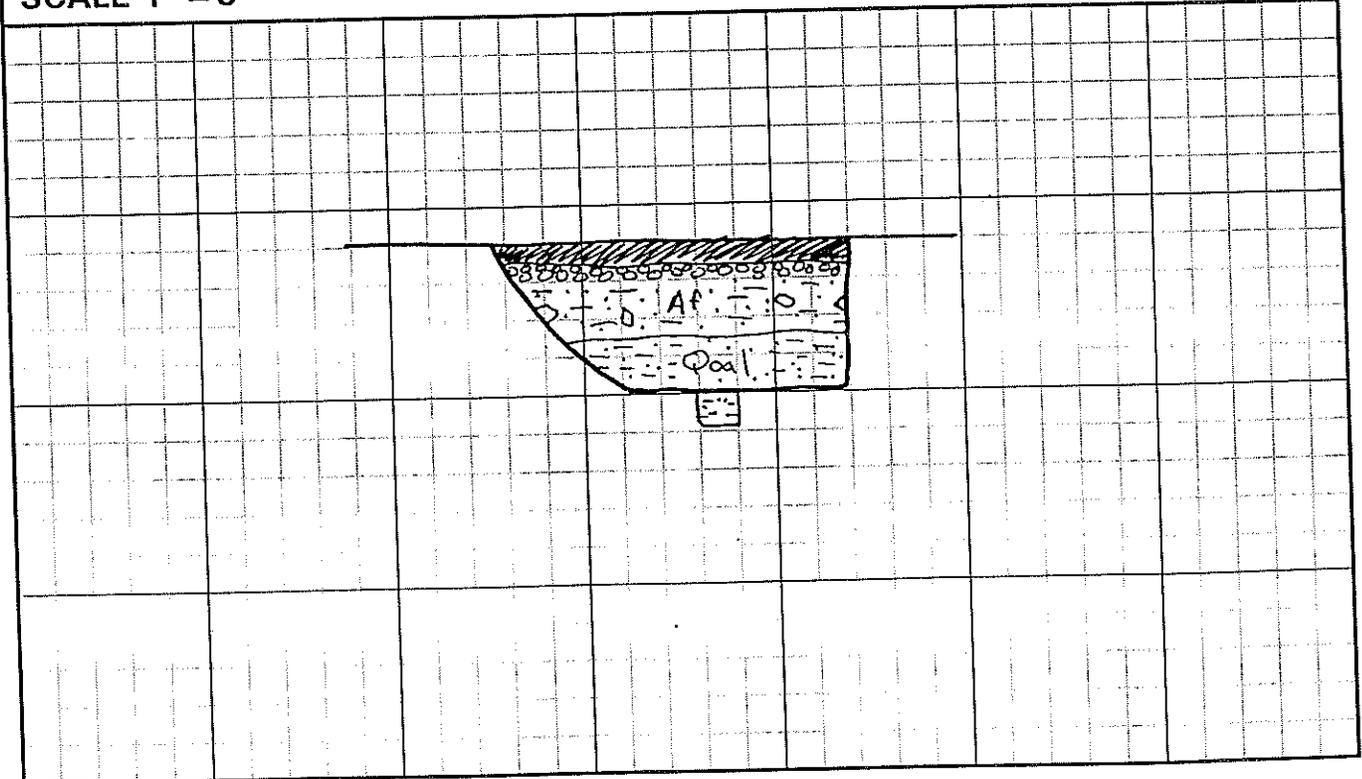
DATE: March 5, 1998

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
	0.0 - 6.0" Asphalt
	6.0" - 8.0" Gravel
	8.0" - 2.5' FILL; Af, pebbly silty sand, coarse to medium grained, slightly moist, firm, pebbles up to 4" in diameter, average 2", brick fragments.
	2.5' - 4.0' OLDER ALLUVIUM; Qoal, sandy silt, buff, slightly moist, firm.
<p>fp - foliation s - shear j - joint b - bedding</p>	 <p>Total Depth 4.0 Feet, Bearing 275 Degrees, no groundwater, no caving.</p>

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 3

PROJECT: 3705 Cross Creek Road

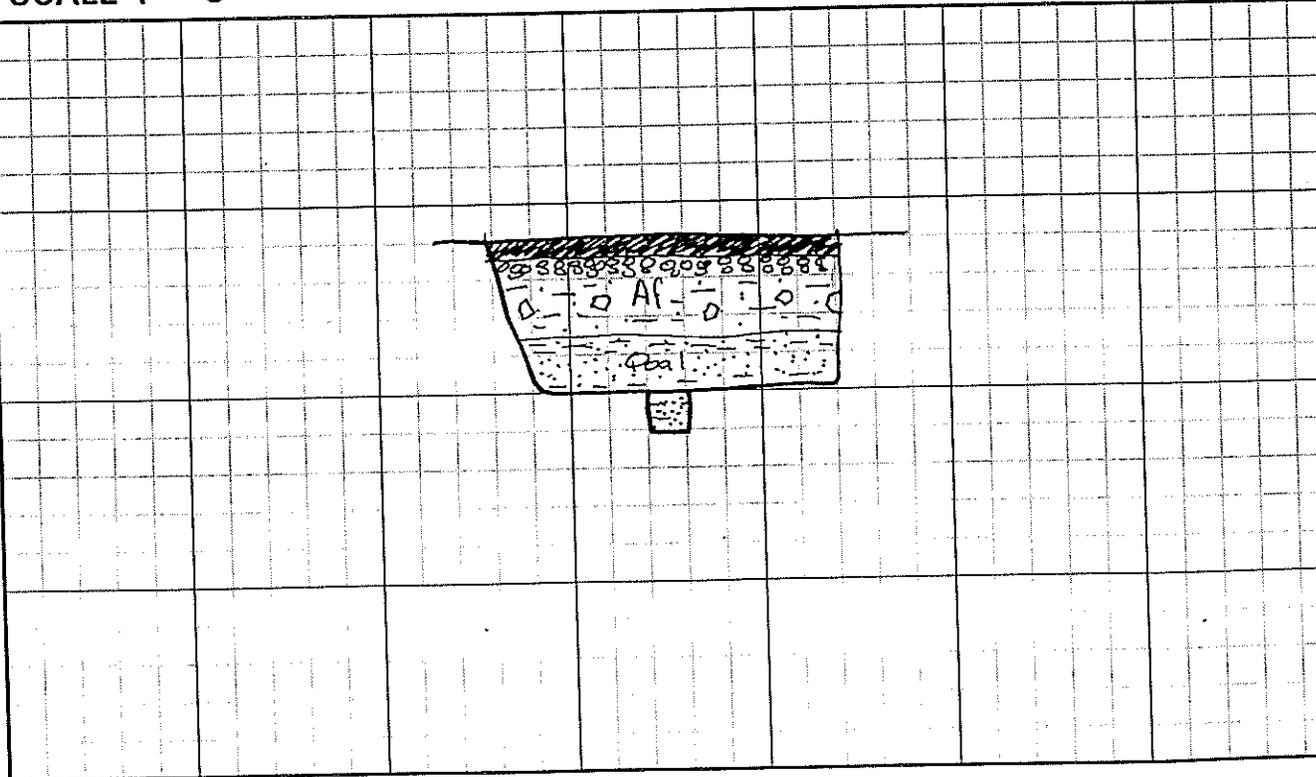
PROJECT NO.: 1680

DATE: March 5, 1998

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
	<p>0.0 - 6.0" Asphalt</p> <p>6.0" - 1.0' Gravel</p> <p>1.0' - 2.5' FILL; Af, pebbly silty sand, coarse to medium grained, slightly moist, firm, pebbles up to 4" in diameter, average 2", brick fragments, boulder up to 1.0'.</p> <p>2.5' - 4.0' OLDER ALLUVIUM; Qoal, sandy silt, buff to brown, slightly moist, firm, increase in sand with depth.</p> <p style="padding-left: 40px;">@3.0' sand, fine- to medium-grained, slightly moist, moderately loose, light-gray, very few pebbles.</p>
<p>fp - foliation s - shear j - joint b - bedding</p>	<p>—————→</p> <p>Total Depth 4.0 Feet, Bearing 274 Degrees; no groundwater, no caving.</p>

SCALE 1" = 5' **GENERALIZED PROFILE**



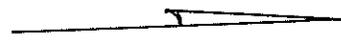
EXPLORATION: TP 4

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

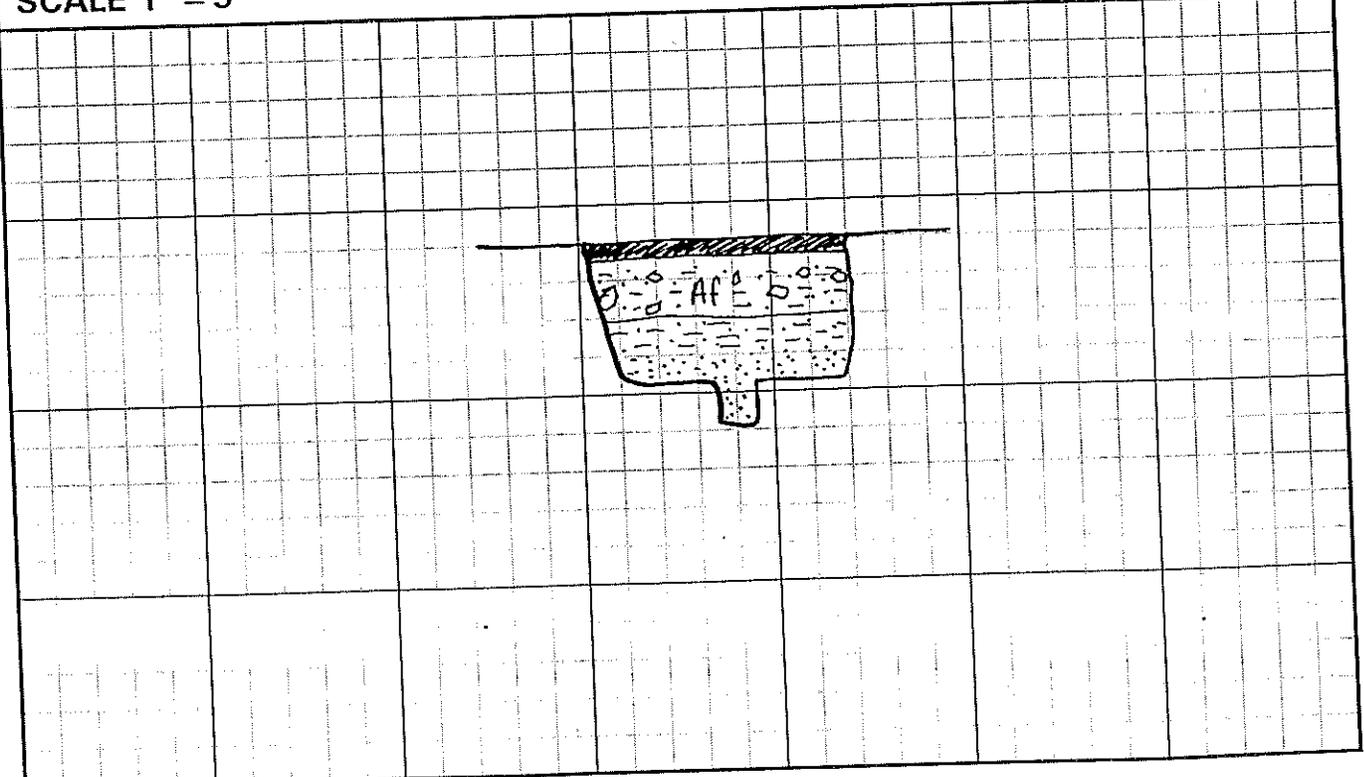
DATE: March 5, 1998

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
	0.0 - 5.0" Asphalt 5.0" - 1.0' Gravel 1.0' - 2.0' FILL ; Af, pebbly silty sand, coarse to medium grained, slightly moist, firm, pebbles up to 4" in diameter, average 2", brick fragments. 2.0' - 4.0' OLDER ALLUVIUM ; Qoal, sandy silt, buff, slightly moist, firm, increase in sand with depth @3.0' sand, fine- to medium-grained, slightly moist, moderately loose, brownish-gray, very few pebbles.
fp - foliation s - shear j - joint b - bedding	 Total Depth 4.0 Feet, Bearing 273 Degrees, no groundwater, no caving.

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 5

PROJECT: 3705 Cross Creek Road

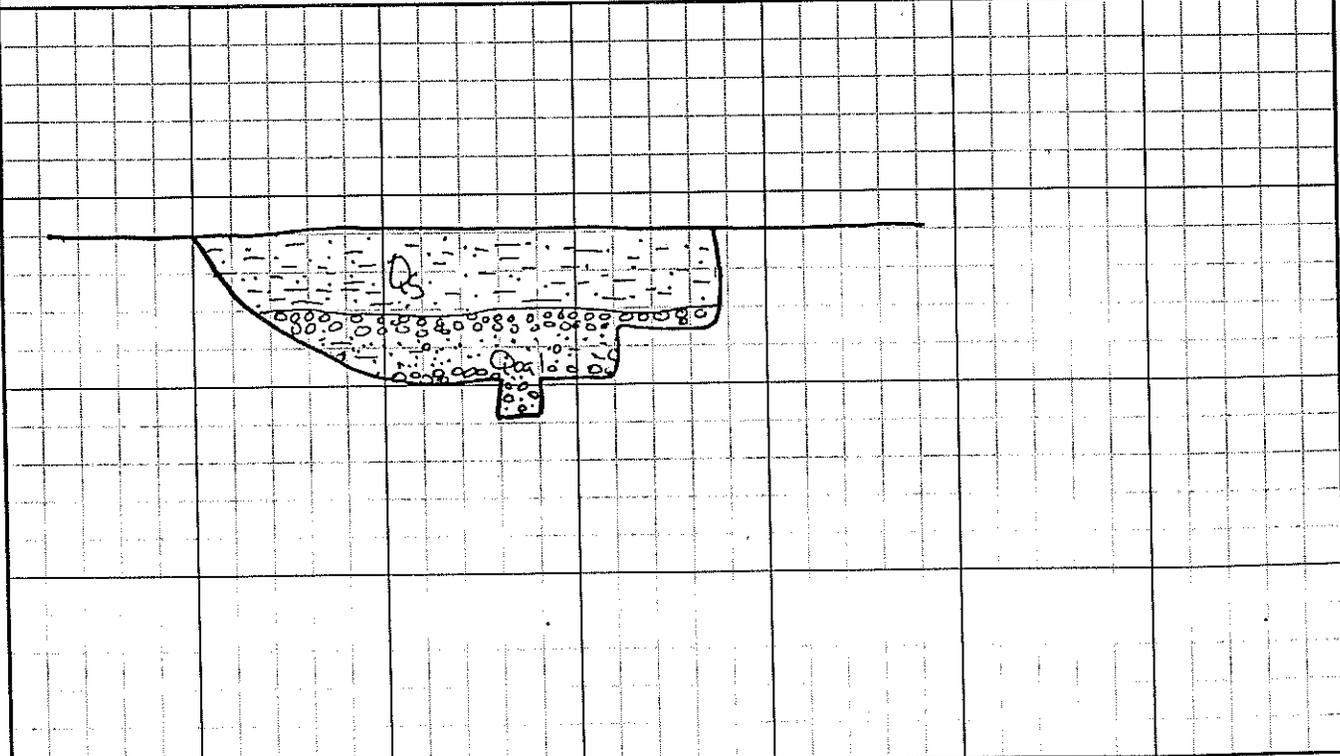
PROJECT NO.: 1680

DATE: March 5, 1998

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
<p>fp - foliation s - shear j - joint b - bedding</p>	<p>0.0 - 2.0' SOIL; Qs, sandy silt, medium-brown, slightly moist, moderately firm.</p> <p>2.0 - 4.5' OLDER ALLUVIUM; Qoa1, pebbly sand, light-gray, pebbles up to 6", average 3" in diameter, subrounded, slightly moist, moderately loose.</p> <p style="padding-left: 40px;">@2.5' silty sand, light-gray to buff, slightly moist, moderately firm.</p> <p style="padding-left: 40px;">@3.5' pebbly sand, light-gray, pebbles up to 1.0', subrounded, slightly moist, moderately loose.</p> <p style="text-align: center;">Total Depth 4.5 Feet, no groundwater, no caving.</p>

SCALE 1" = 5' **GENERALIZED PROFILE**



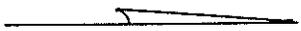
EXPLORATION: TP 6

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

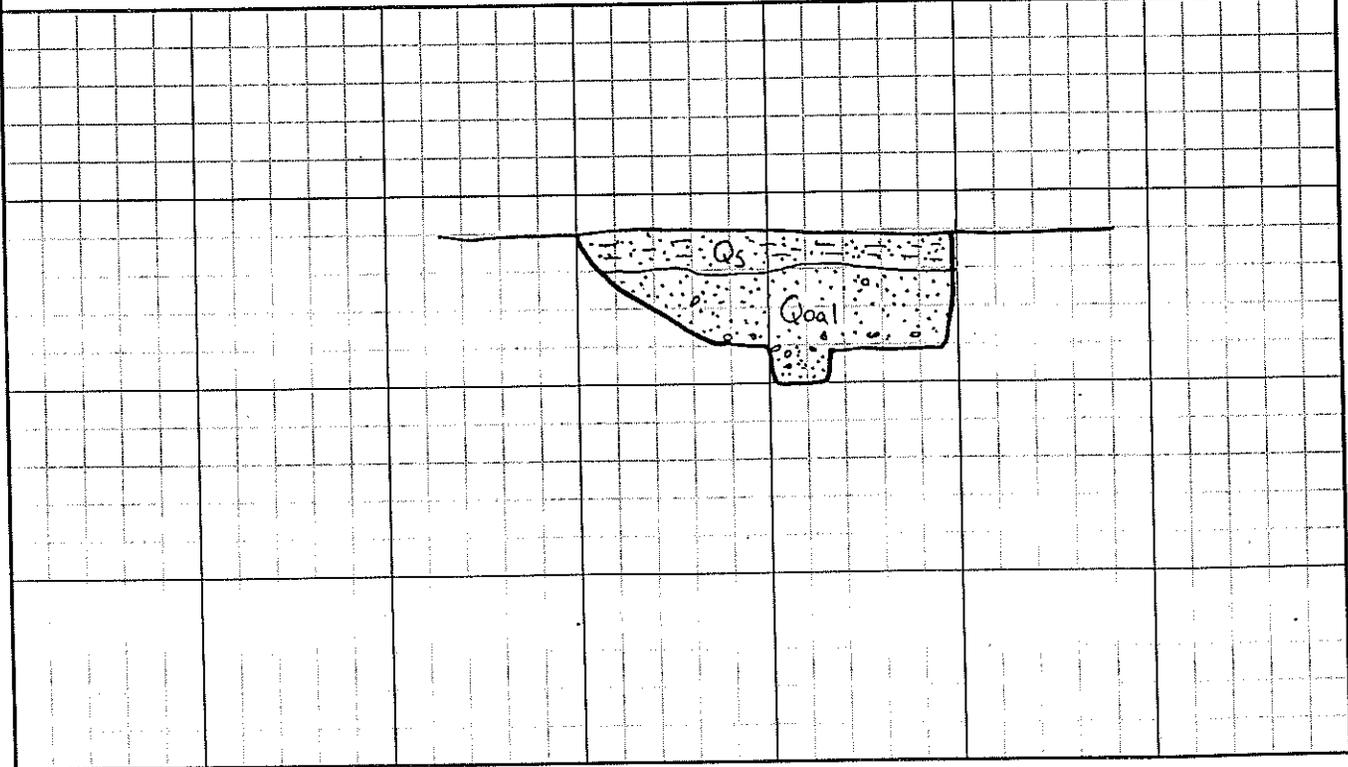
DATE: March 5, 1998

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
<p>0.0 - 1.0' SOIL; Q_s, silty sand, medium-brown, slightly moist, firm to moderately loose, few roots.</p> <p>1.0 - 3.0' OLDER ALLUVIUM; Q_{oa1}, sand, buff to tan, slightly moist, fine- to medium-grained, massive, moderately loose, few pebbles in lower 0.5'.</p>	<p>fp - foliation s - shear j - joint b - bedding</p> <p style="text-align: center;">  Total Depth 3.0 Feet, Bearing 287 Degrees, no groundwater, no caving. </p>

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 7

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

DATE: March 5, 1998

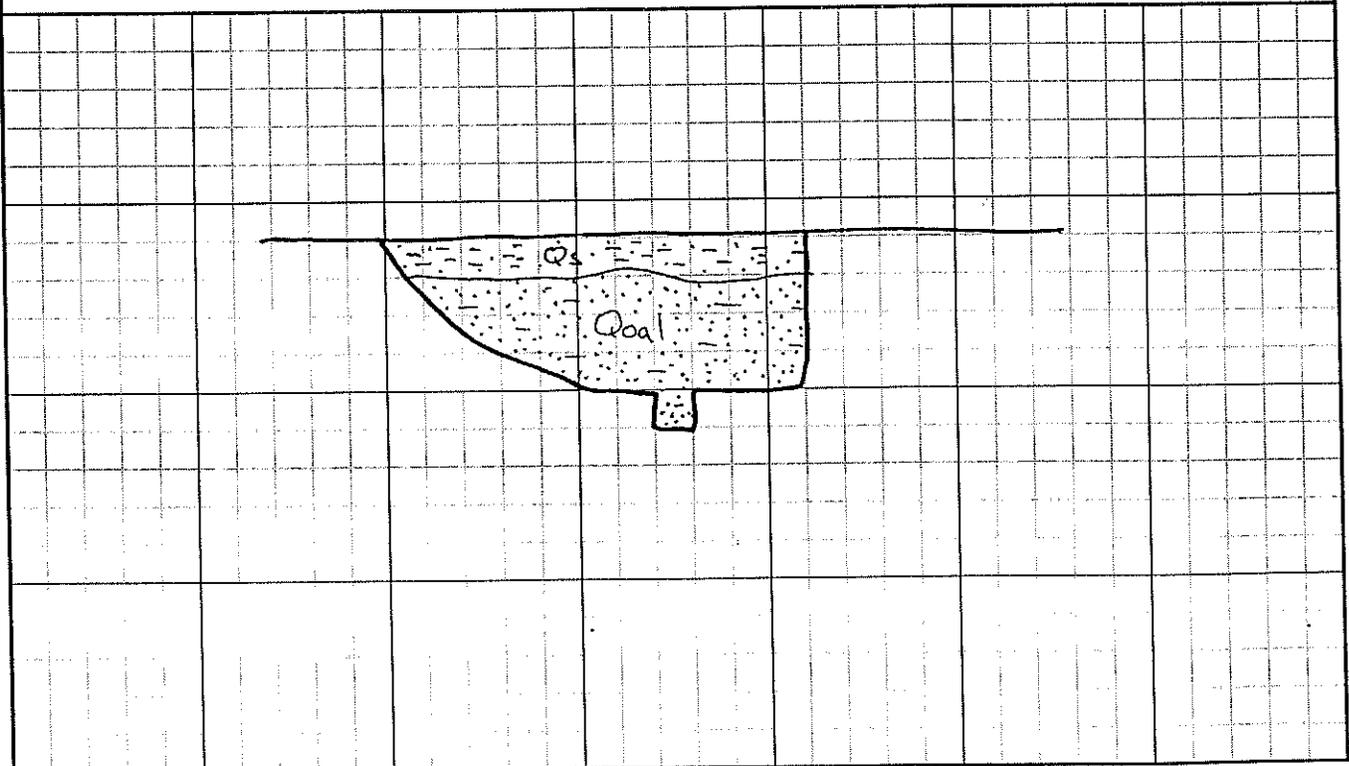
LOGGED BY: JSM

ATTITUDE	DESCRIPTION
<p>0.0 - 1.0' SOIL; Qs, silty sand, dark- to medium-brown, slightly moist, firm, roots, slightly porous.</p> <p>1.0 - 5.0' OLDER ALLUVIUM; Qoal, sand and silty sand, buff to tan, slightly moist, fine- to medium-grained, interbedded silt and sands, moderately loose.</p>	<p>Total Depth 5.0 Feet, Bearing 190 Degrees, no groundwater, no caving.</p>

fp - foliation
s - shear
j - joint
b - bedding

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 8

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

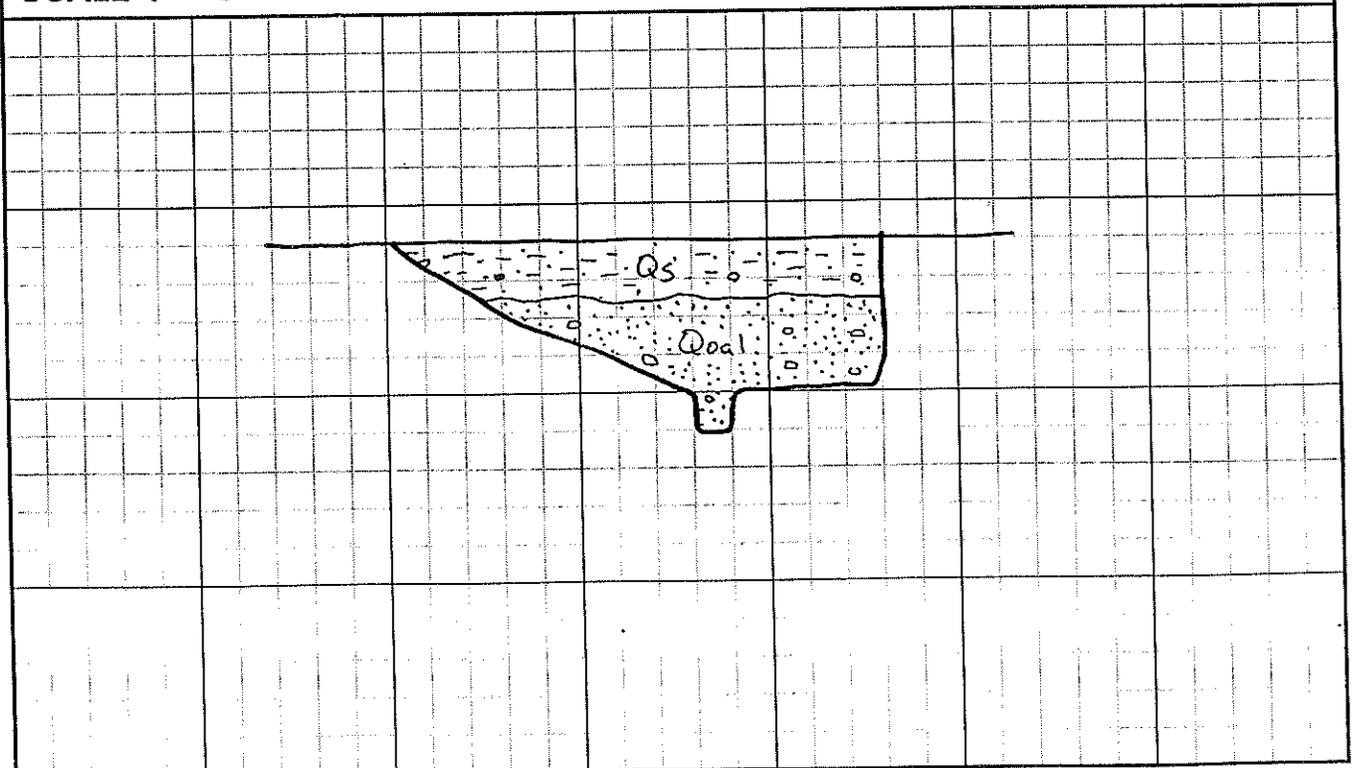
DATE: March 5, 1998

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
<p>1.0 - 1.5' SOIL; Qs, silty sand, dark- to medium-brown, slightly moist, firm, roots and rootlets, slightly porous, occasional pebbles.</p> <p>1.5 - 5.0' OLDER ALLUVIUM; Qoal, sand, medium- to coarse grained, light-gray, slightly moist, locally laminated, moderately loose, abundant pebbles up to 3", average 1".</p>	<p>fp - foliation s - shear j - joint b - bedding</p> <p style="text-align: center;">  Total Depth 5.0 Feet, Bearing 266 Degrees, no groundwater, no caving. </p>

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 9

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

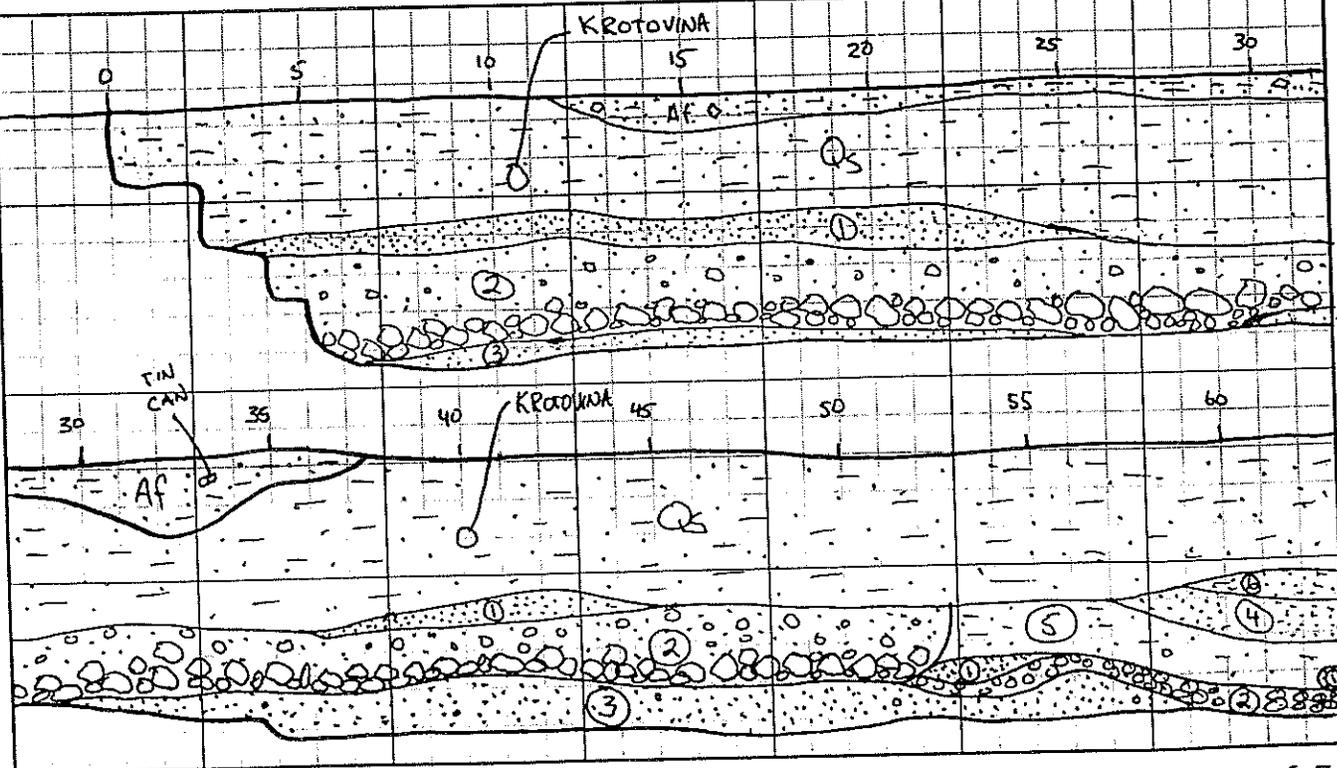
DATE: March 8, 1999

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
<p>fp - foliation s - shear j - joint b - bedding</p>	<p>FILL; Af, silty sand, fine-grained, medium-brown, dense, slightly moist, few pebbles.</p> <p>DISTURBED SOIL; Qs, silty sand, fine-grained, medium-brown, dense, slightly moist, few pebbles, very porous, many roots and rootlets, local sand concretions, increase in grain size with depth.</p> <p>OLDER ALLUVIUM; Qoal</p> <p>Unit 1: sand, yellowish-brown, fine-grained, slightly moist, moderately loose to moderately dense, slightly porous.</p> <p>Unit 2: pebbly sand, coarse-grained, light-gray, slightly moist, matrix supported, abundant pebbles up to 1', average 4", few boulders up to 2', moderately dense, increase in pebbles with depth.</p> <p>Unit 3: sand, medium- to coarse-grained, light-gray, slightly moist, dense, very few pebbles, well-laminated.</p> <p>Unit 4: sand, light-gray, fine- to medium-grained, well-laminated, slightly moist, moderately dense.</p> <p>Unit 5: sandy silt, medium-brown, slightly moist, dense, shell fragments common, few pebbles.</p> <p>Unit 6: silty sand, fine-grained, medium-brown, slightly moist, moderately dense, porous.</p> <div style="text-align: center; margin-top: 10px;"> <p>14°</p> </div>

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 9

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

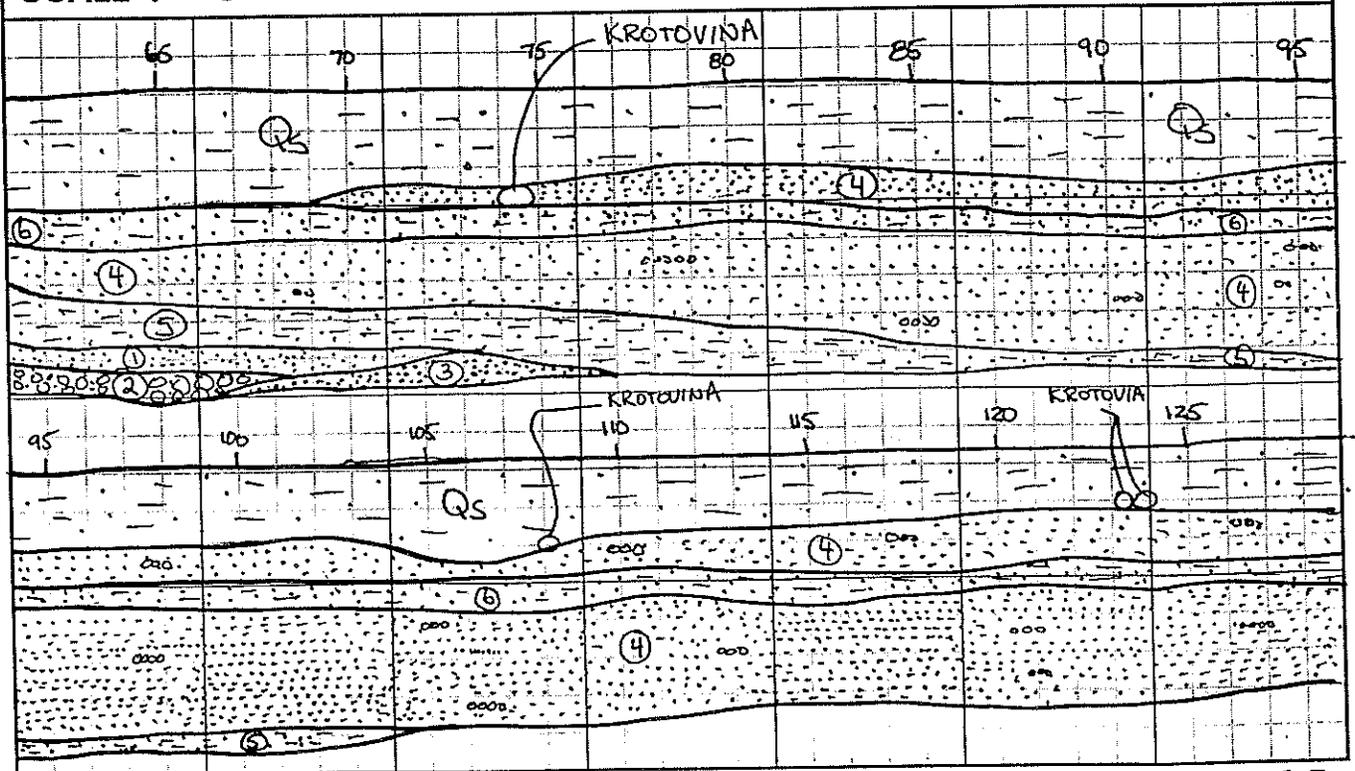
DATE: March 8, 1999

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
fp - foliation s - shear j - joint b - bedding	<p>FILL; Af, silty sand, fine-grained, medium-brown, dense, slightly moist, few pebbles.</p> <p>DISTURBED SOIL; Qs, silty sand, fine-grained, medium-brown, dense, slightly moist, few pebbles, very porous, many roots and rootlets, local sand concretions, increase in grain size with depth.</p> <p>OLDER ALLUVIUM; Qoal</p> <p>Unit 1: sand, yellowish-brown, fine-grained, slightly moist, moderately loose to moderately dense, slightly porous.</p> <p>Unit 2: pebbly sand, coarse-grained, light-gray, slightly moist, matrix supported, abundant pebbles up to 1', average 4", few boulders up to 2', moderately dense, increase in pebbles with depth.</p> <p>Unit 3: sand, medium- to coarse-grained, light-gray, slightly moist, dense, very few pebbles, well-laminated.</p> <p>Unit 4: sand, light-gray, fine- to medium-grained, well-laminated, slightly moist, moderately dense.</p> <p>Unit 5: sandy silt, medium-brown, slightly moist, dense, shell fragments common, few pebbles.</p> <p>Unit 6: silty sand, fine-grained, medium-brown, slightly moist, moderately dense, porous.</p>

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 9

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

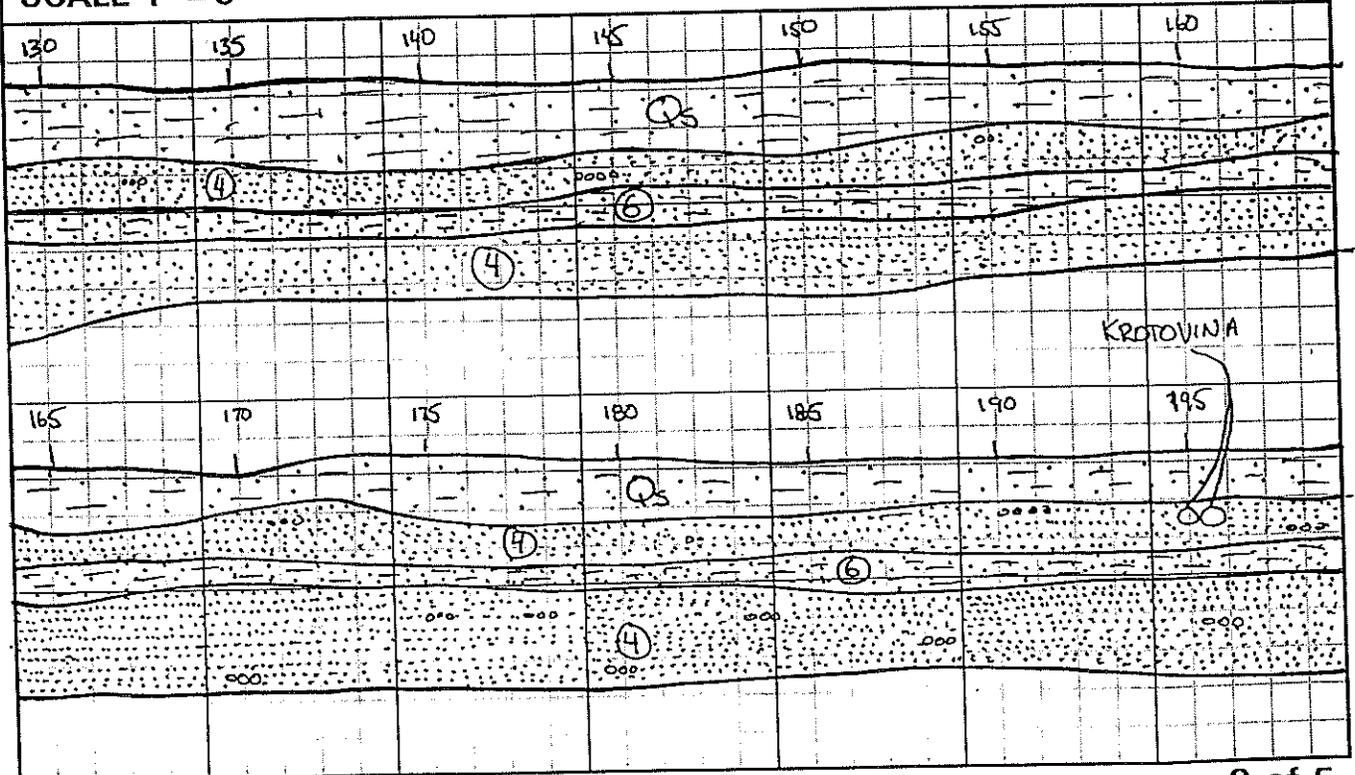
DATE: March 8, 1999

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
<p>fp - foliation s - shear j - joint b - bedding</p>	<p>FILL; Af, silty sand, fine-grained, medium-brown, dense, slightly moist, few pebbles.</p> <p>DISTURBED SOIL; Qs, silty sand, fine-grained, medium-brown, dense, slightly moist, few pebbles, very porous, many roots and rootlets, local sand concretions, increase in grain size with depth.</p> <p>OLDER ALLUVIUM; Qoal</p> <p>Unit 1: sand, yellowish-brown, fine-grained, slightly moist, moderately loose to moderately dense, slightly porous.</p> <p>Unit 2: pebbly sand, coarse-grained, light-gray, slightly moist, matrix supported, abundant pebbles up to 1', average 4", few boulders up to 2', moderately dense, increase in pebbles with depth.</p> <p>Unit 3: sand, medium- to coarse-grained, light-gray, slightly moist, dense, very few pebbles, well-laminated.</p> <p>Unit 4: sand, light-gray, fine- to medium-grained, well-laminated, slightly moist, moderately dense.</p> <p>Unit 5: sandy silt, medium-brown, slightly moist, dense, shell fragments common, few pebbles.</p> <p>Unit 6: silty sand, fine-grained, medium-brown, slightly moist, moderately dense, porous.</p>

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 9

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

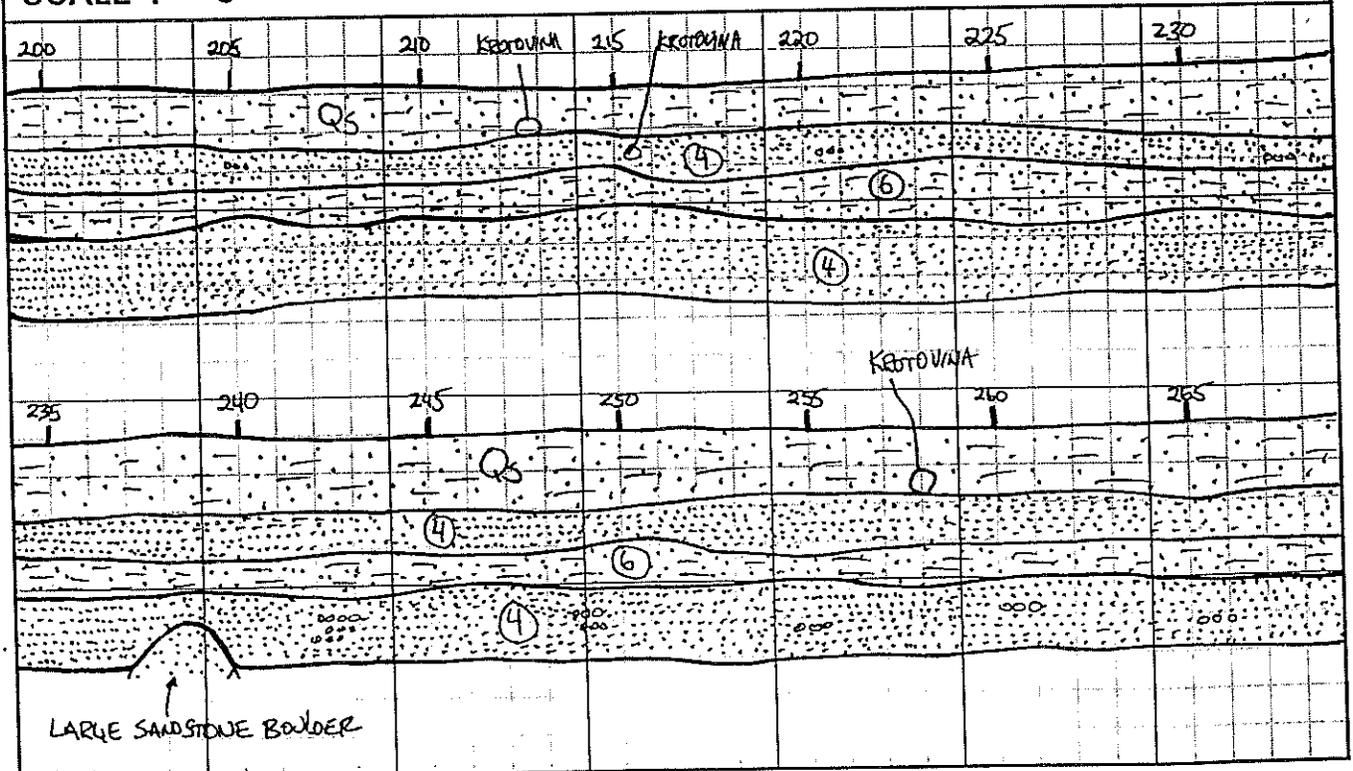
DATE: March 8, 1999

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
<p>fp - foliation s - shear j - joint b - bedding</p>	<p>FILL; Af, silty sand, fine-grained, medium-brown, dense, slightly moist, few pebbles.</p> <p>DISTURBED SOIL; Qs, silty sand, fine-grained, medium-brown, dense, slightly moist, few pebbles, very porous, many roots and rootlets, local sand concretions, increase in grain size with depth.</p> <p>OLDER ALLUVIUM; Qoal</p> <p>Unit 1: sand, yellowish-brown, fine-grained, slightly moist, moderately loose to moderately dense, slightly porous.</p> <p>Unit 2: pebbly sand, coarse-grained, light-gray, slightly moist, matrix supported, abundant pebbles up to 1', average 4", few boulders up to 2', moderately dense, increase in pebbles with depth.</p> <p>Unit 3: sand, medium- to coarse-grained, light-gray, slightly moist, dense, very few pebbles, well-laminated.</p> <p>Unit 4: sand, light-gray, fine- to medium-grained, well-laminated, slightly moist, moderately dense.</p> <p>Unit 5: sandy silt, medium-brown, slightly moist, dense, shell fragments common, few pebbles.</p> <p>Unit 6: silty sand, fine-grained, medium-brown, slightly moist, moderately dense, porous.</p>

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 9

PROJECT: 3705 Cross Creek Road

PROJECT NO.: 1680

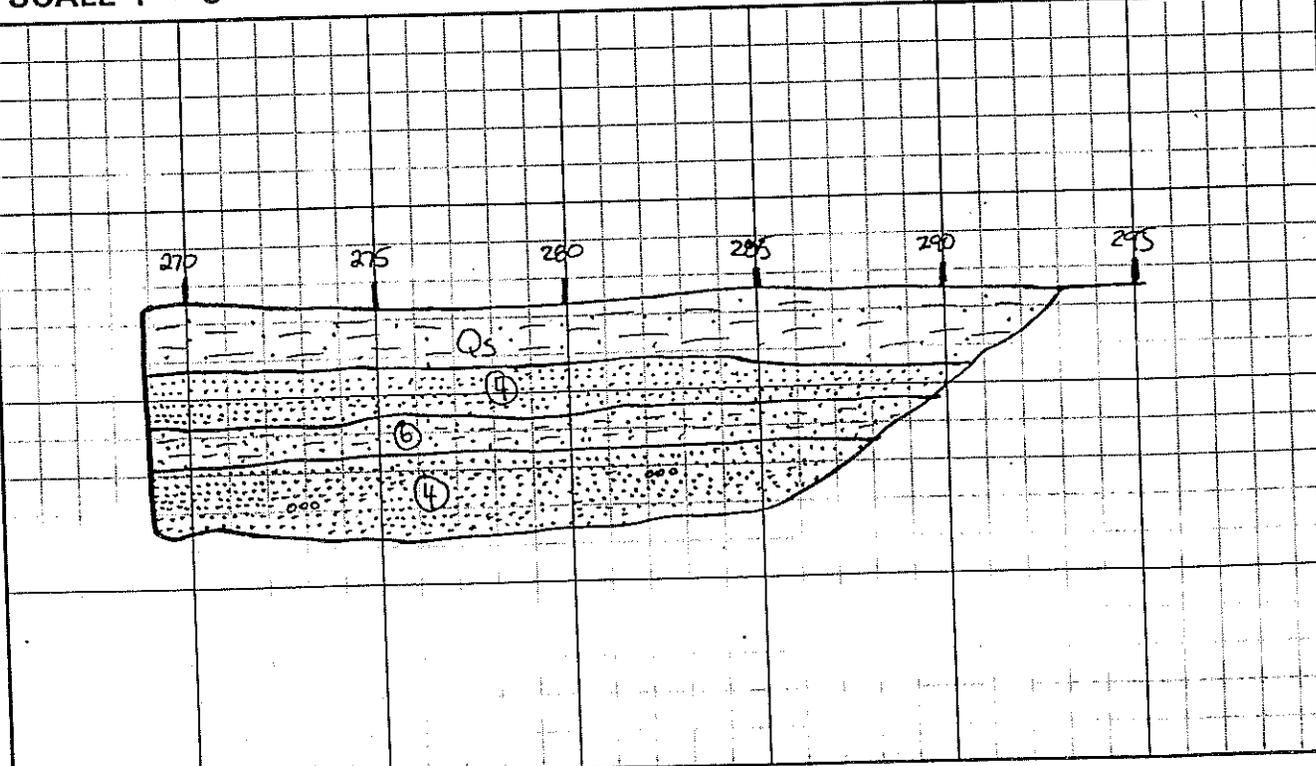
DATE: March 8, 1999

LOGGED BY: JSM

ATTITUDE	DESCRIPTION
<p>fp - foliation s - shear j - joint b - bedding</p>	<p>FILL; Af, silty sand, fine-grained, medium-brown, dense, slightly moist, few pebbles.</p> <p>DISTURBED SOIL; Qs, silty sand, fine-grained, medium-brown, dense, slightly moist, few pebbles, very porous, many roots and rootlets, local sand concretions, increase in grain size with depth.</p> <p>OLDER ALLUVIUM; Qoal</p> <p>Unit 1: sand, yellowish-brown, fine-grained, slightly moist, moderately loose to moderately dense, slightly porous.</p> <p>Unit 2: pebbly sand, coarse-grained, light-gray, slightly moist, matrix supported, abundant pebbles up to 1', average 4", few boulders up to 2', moderately dense, increase in pebbles with depth.</p> <p>Unit 3: sand, medium- to coarse-grained, light-gray, slightly moist, dense, very few pebbles, well-laminated.</p> <p>Unit 4: sand, light-gray, fine- to medium-grained, well-laminated, slightly moist, moderately dense.</p> <p>Unit 5: sandy silt, medium-brown, slightly moist, dense, shell fragments common, few pebbles.</p> <p>Unit 6: silty sand, fine-grained, medium-brown, slightly moist, moderately dense, porous.</p>

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 10

PROJECT: 23401 Civic Center Way

PROJECT NO.: 1680

DATE: March 5, 1999

LOGGED BY: JSM

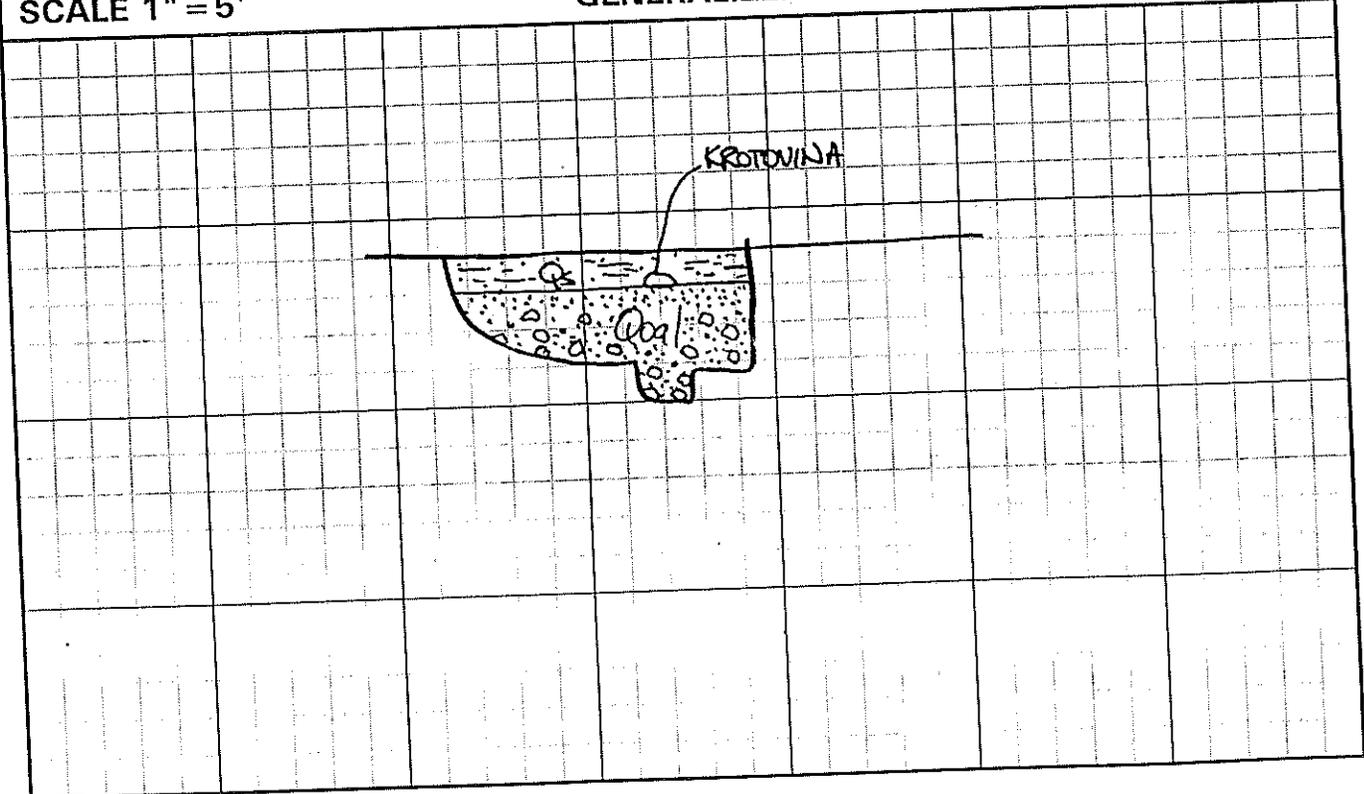
ATTITUDE	DESCRIPTION
<p>0.0 - 1.0' SOIL; Qs, silty sand, medium-brown, slightly moist, firm, few pebbles up to 1/4" in diameter, slightly porous.</p> <p>1.0 - 4.0' OLDER ALLUVIUM; Qoal, sand, fine- to medium-grained, buff- to light-gray, slightly moist, moderately loose.</p> <p>@1.5' pebbly sand, coarse-grained, light-gray, slightly moist, moderately loose, pebbles up to 3" in diameter, average 1.5", matrix supported.</p>	

fp - foliation
s - shear
j - joint
b - bedding

Total Depth 4.0, Bearing 96 Degrees, no groundwater, no caving.

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 11

PROJECT: : 23401 Civic Center Way

PROJECT NO.: 1680

DATE: March 5, 1999

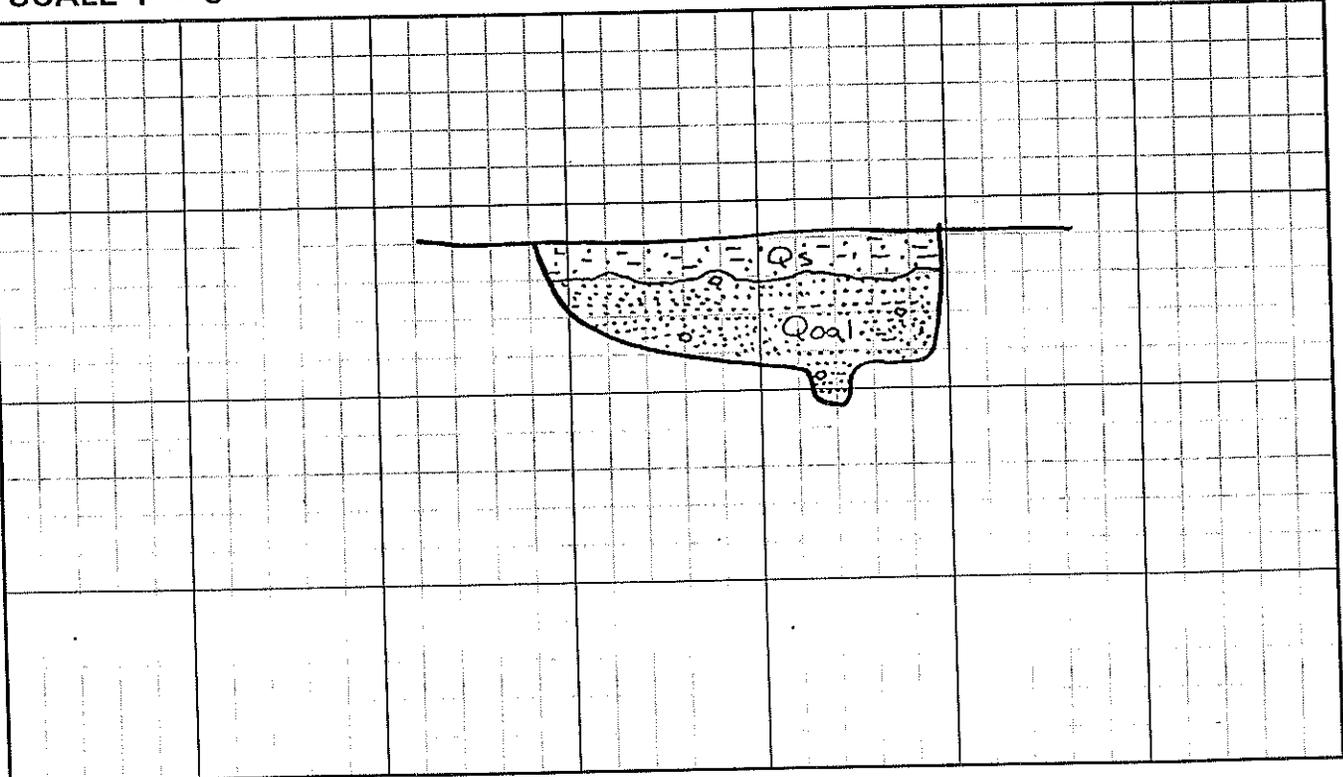
LOGGED BY: JSM

ATTITUDE	DESCRIPTION
<p>0.0 - 1.0' SOIL; Qs, silty sand, medium-brown, slightly moist, firm, few pebbles up to 2", average 1/2", porous, rootlets.</p> <p>1.0 - 4.5' OLDER ALLUVIUM; Qoal, sand, fine- to medium-grained, light-gray, slightly moist, moderately loose, well-laminated, very few pebbles up 1".</p>	<div style="text-align: center;">  </div> <p>Total Depth 4.5 Feet, Bearing 4 Degrees, no groundwater, no caving.</p>

fp - foliation
s - shear
j - joint
b - bedding

SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 12

PROJECT: 23401 Civic Center Way

PROJECT NO.: 1680

DATE: March 5, 1999

LOGGED BY: JSM

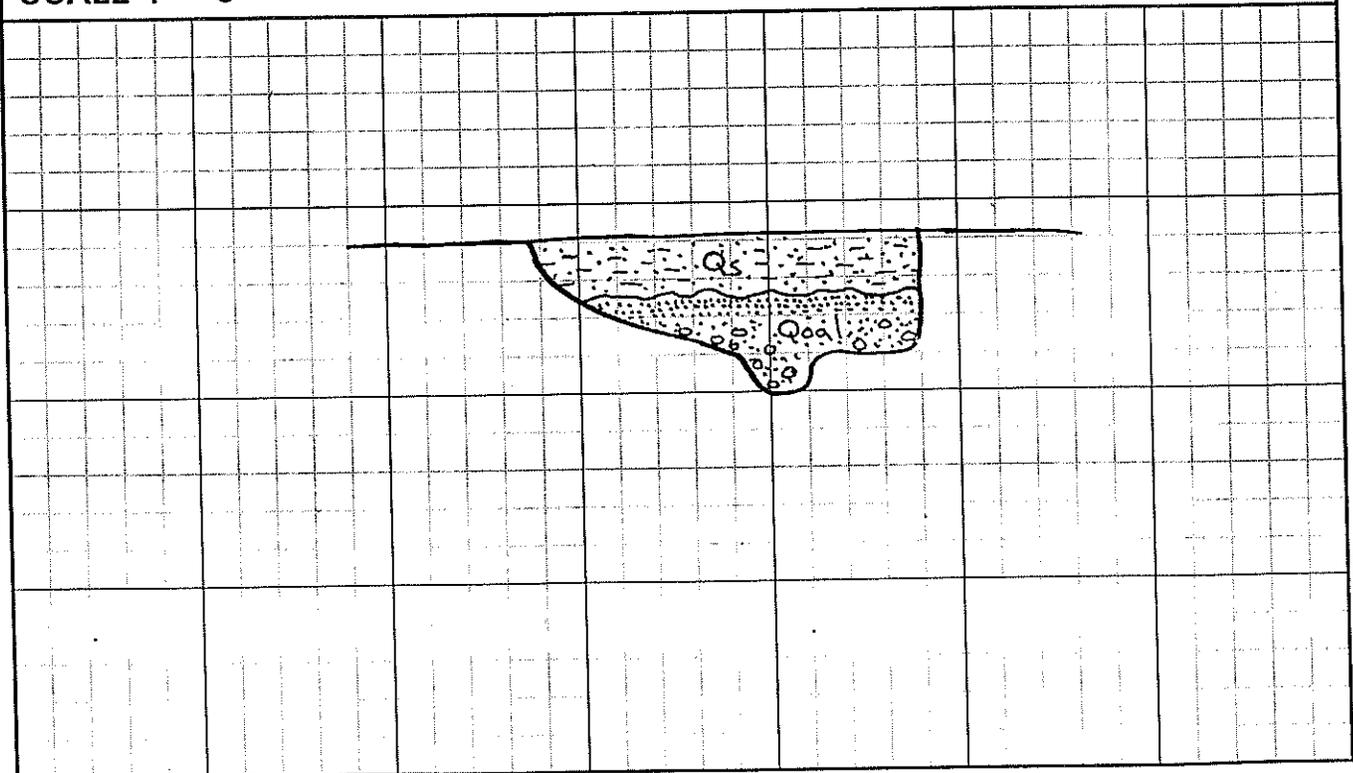
ATTITUDE	DESCRIPTION
<p>0.0 - 1.5' SOIL; Qs, silty sand, medium-brown, slightly moist, few pebbles, porous, rootlets, few roots.</p> <p>1.5 - 4.0 OLDER ALLUVIUM; Qoal, sand, light-gray, slightly moist, medium- to coarse-grained, increase in grain size with depth, upper 0.5' is well-laminated, below 0.5' is pebbly, pebbles up to 3", average 1", moderately loose.</p>	<p>Total Depth 4.0 Feet, Bearing 85 Degrees, no groundwater, no caving.</p>

fp - foliation
s - shear
j - joint
b - bedding



SCALE 1" = 5'

GENERALIZED PROFILE



EXPLORATION: TP 13

PROJECT: 23401 Civic Center Way

PROJECT NO.: 1680

DATE: March 5, 1999

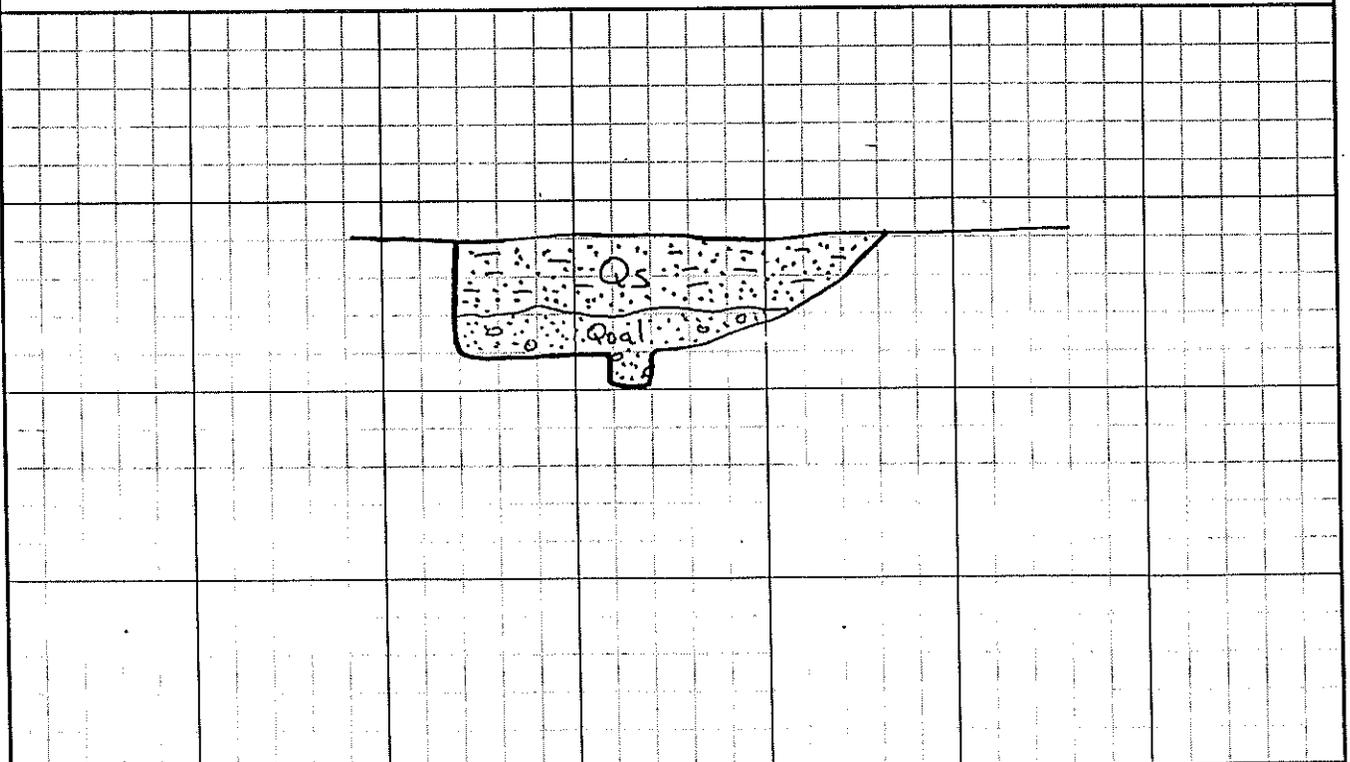
LOGGED BY: RLS

ATTITUDE	DESCRIPTION
<p>0.0 - 2.0' SOIL; Qs, silty sand, brown, moderately firm, slightly moist, upper 6" disturbed.</p> <p>2.0 - 4.0' OLDER ALLUVIUM; Qoal, sand, silty sand, and gravels, gray, loose, slightly moist, gravels up to 4".</p>	<div style="text-align: center;">  </div> <p>Total Depth 4.0 Feet, Bearing 265, no groundwater, no caving.</p>

fp - foliation
s - shear
j - joint
b - bedding

SCALE 1" = 5'

GENERALIZED PROFILE



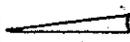
EXPLORATION: TP 14

PROJECT: 23401 Civic Center Way

PROJECT NO.: 1680

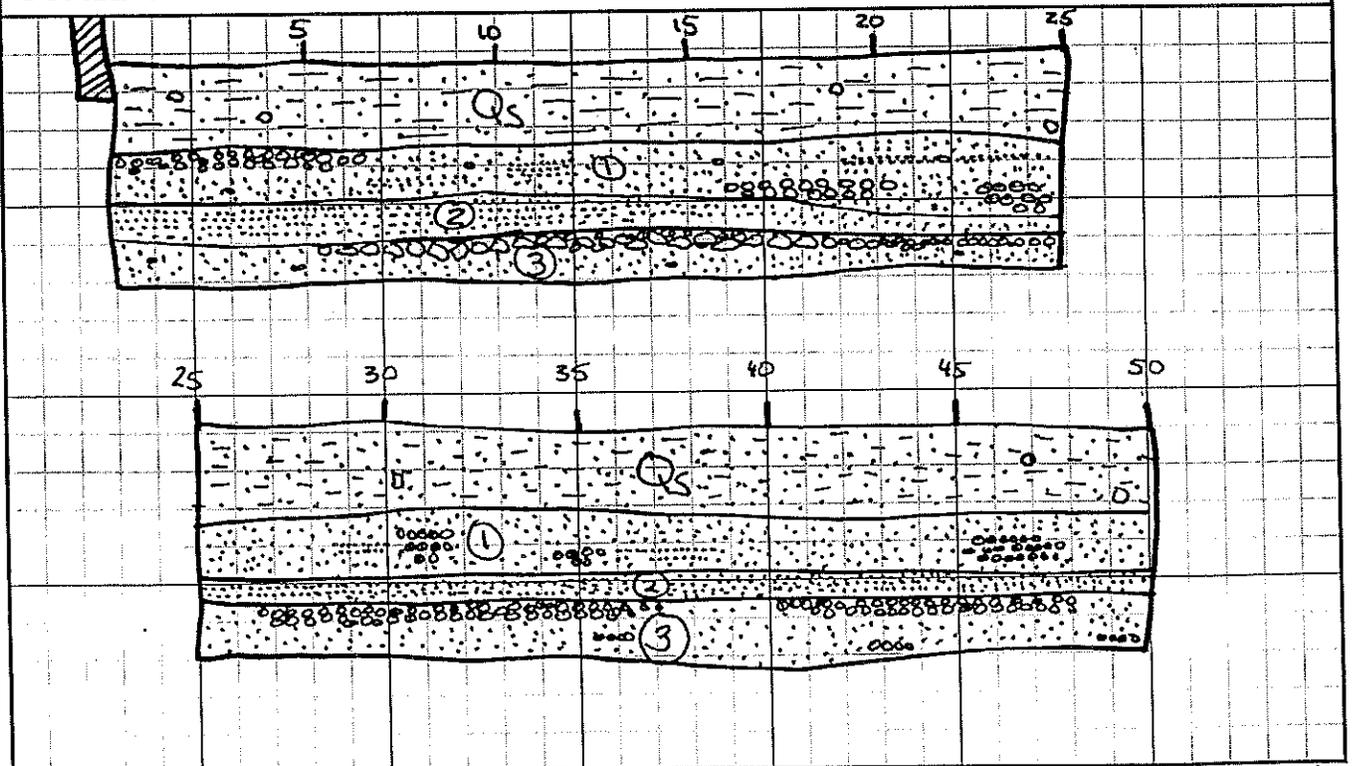
DATE: March 5, 1999

LOGGED BY: RLS

ATTITUDE	DESCRIPTION
<p>fp - foliation s - shear j - joint b - bedding</p>	<p>SOIL; Qs, silty sand, medium-brown, rootlets and roots, occasional rock fragments, occasional debris, silty moist.</p> <p>OLDER ALLUVIUM; Qoal</p> <p>Unit 1: sand, light-gray, poorly cemented to firm, minor caving, gravel layers 1/4" to 1.5", well stratified heavy mineral deposits, coarse sand and gravel lenses.</p> <p>Unit 2: sand, very fine-grained, tan, well-stratified, firm.</p> <p>Unit 3: sand, coarse-grained, gray, poorly cemented, well-stratified, moderately firm, loose.</p> <p>Unit 4: silty sand, tan, loose firm, 3-6" thick.</p> <p>Unit 5: sand, coarse-grained, decrease in gravels, gray.</p> <p style="text-align: center;">  Bearing 11 Degrees, no groundwater, no caving. </p>

SCALE 1" = 5'

GENERALIZED PROFILE



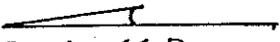
EXPLORATION: TP 14

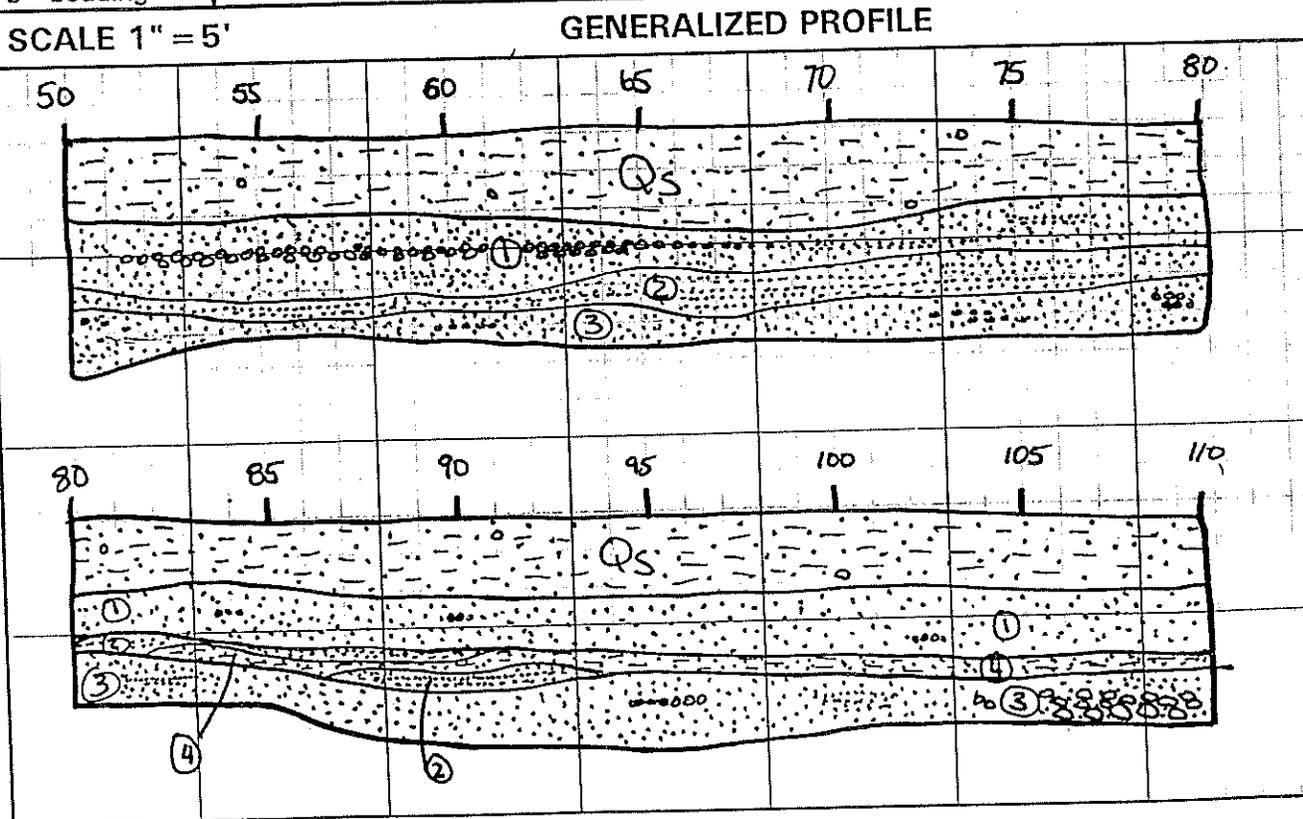
PROJECT: 23401 Civic Center Way

PROJECT NO.: 1680

DATE: March 5, 1999

LOGGED BY: RLS

ATTITUDE	DESCRIPTION
	<p>SOIL; Qs, silty sand, medium-brown, rootlets and roots, occasional rock fragments, occasional debris, silty moist.</p> <p>OLDER ALLUVIUM; Qoal</p> <p>Unit 1: sand, light-gray, poorly cemented to firm, minor caving, gravel layers 1/4" to 1.5", well stratified heavy mineral deposits, coarse sand and gravel lenses.</p> <p>Unit 2: sand, very fine-grained, tan, well-stratified, firm.</p> <p>Unit 3: sand, coarse-grained, gray, poorly cemented, well-stratified, moderately firm, loose.</p> <p>Unit 4: silty sand, tan, loose firm, 3-6" thick.</p> <p>Unit 5: sand, coarse-grained, decrease in gravels, gray.</p>
<p>fp - foliation s - shear j - joint b - bedding</p>	<p style="text-align: center;">  Bearing 11 Degrees, no groundwater, no caving. </p>



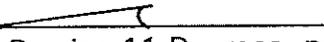
EXPLORATION: TP 14

PROJECT: 23401 Civic Center Way

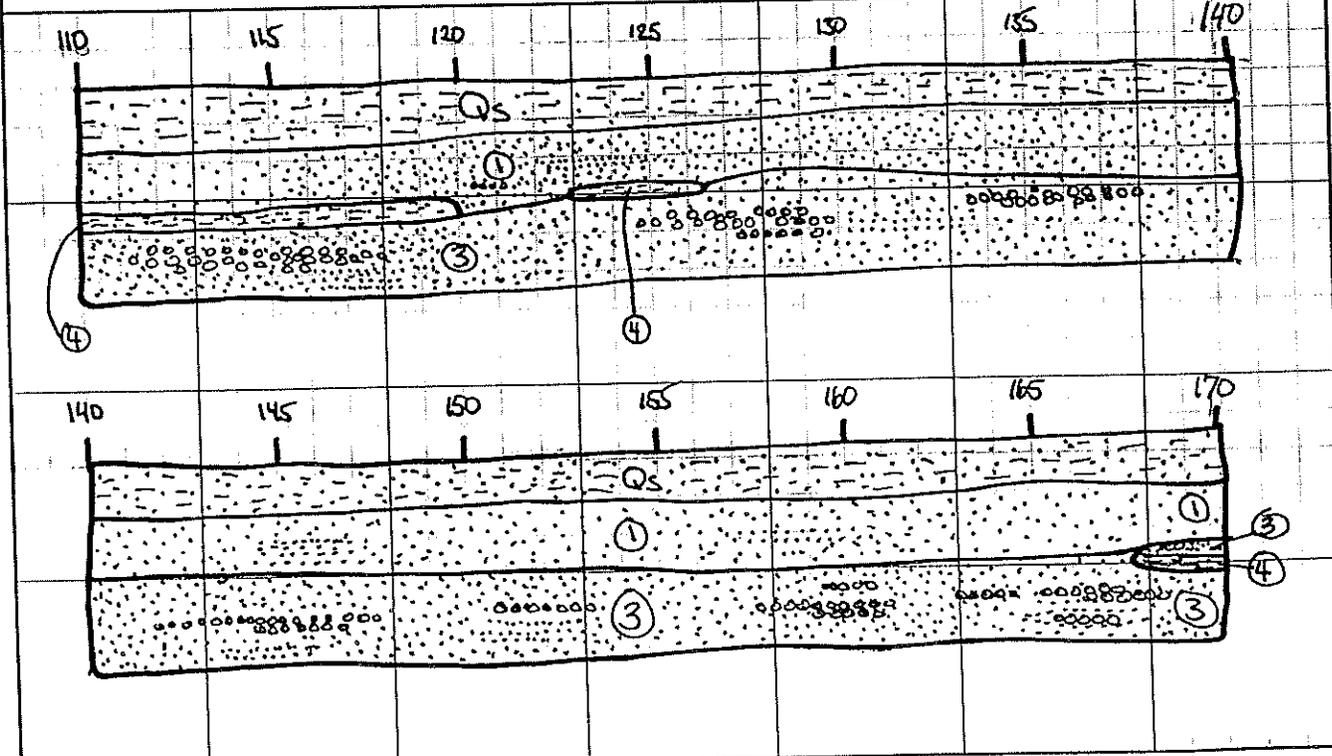
PROJECT NO.: 1680

DATE: March 5, 1999

LOGGED BY: RLS

ATTITUDE	DESCRIPTION
	<p>SOIL; Qs, silty sand, medium-brown, rootlets and roots, occasional rock fragments, occasional debris, silty moist.</p> <p>OLDER ALLUVIUM; Qoal</p> <p>Unit 1: sand, light-gray, poorly cemented to firm, minor caving, gravel layers 1/4" to 1.5", well stratified heavy mineral deposits, coarse sand and gravel lenses.</p> <p>Unit 2: sand, very fine-grained, tan, well-stratified, firm.</p> <p>Unit 3: sand, coarse-grained, gray, poorly cemented, well-stratified, moderately firm, loose.</p> <p>Unit 4: silty sand, tan, loose firm, 3-6" thick.</p> <p>Unit 5: sand, coarse-grained, decrease in gravels, gray.</p>
<p>fp - foliation s - shear j - joint b - bedding</p>	<p style="text-align: center;">  Bearing 11 Degrees, no groundwater, no caving. </p>

SCALE 1" = 5' **GENERALIZED PROFILE**



EXPLORATION: TP 14

PROJECT: 23401 Civic Center Way

PROJECT NO.: 1680

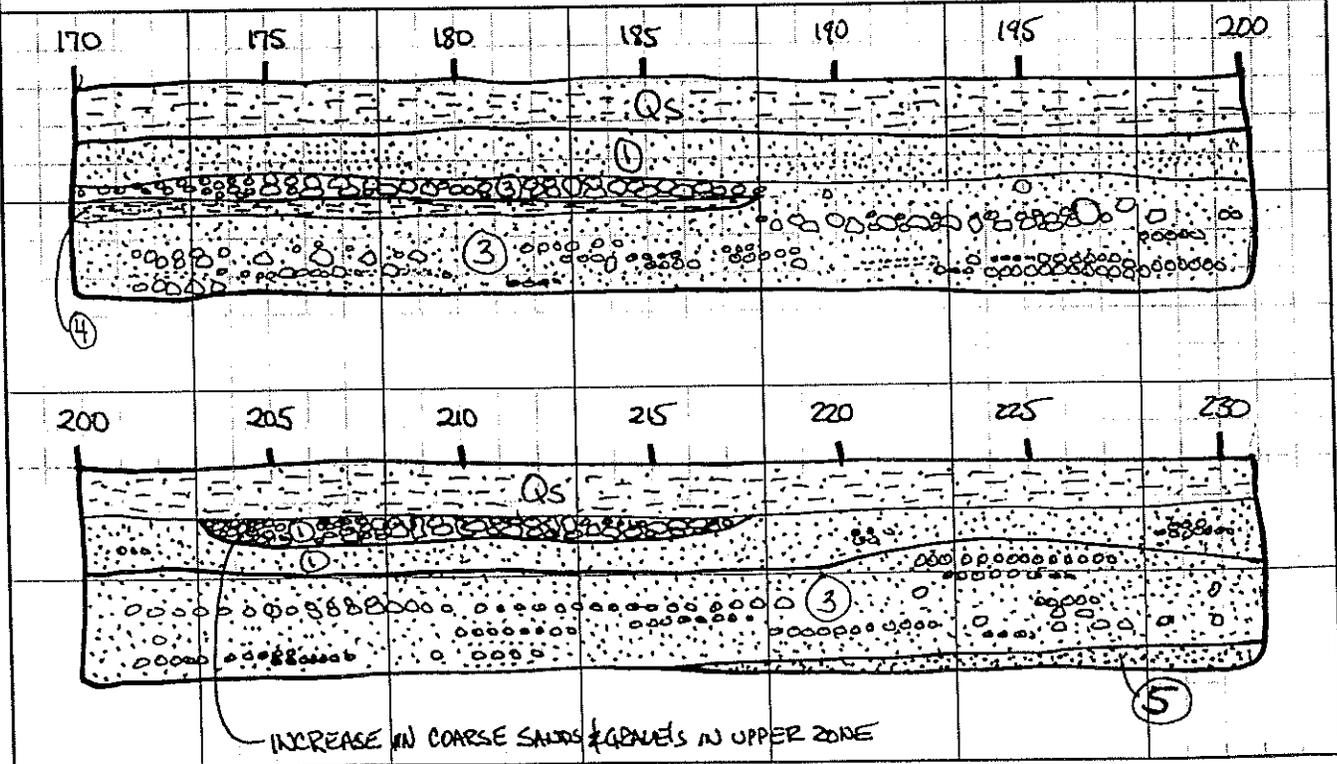
DATE: March 5, 1999

LOGGED BY: RLS

ATTITUDE	DESCRIPTION
	<p>SOIL; Qs, silty sand, medium-brown, rootlets and roots, occasional rock fragments, occasional debris, silty moist.</p> <p>OLDER ALLUVIUM; Q_{ol}</p> <p>Unit 1: sand, light-gray, poorly cemented to firm, minor caving, gravel layers 1/4" to 1.5", well stratified heavy mineral deposits, coarse sand and gravel lenses.</p> <p>Unit 2: sand, very fine-grained, tan, well-stratified, firm.</p> <p>Unit 3: sand, coarse-grained, gray, poorly cemented, well-stratified, moderately firm, loose.</p> <p>Unit 4: silty sand, tan, loose firm, 3-6" thick.</p> <p>Unit 5: sand, coarse-grained, decrease in gravels, gray.</p>
<p>fp - foliation s - shear j - joint b - bedding</p>	<p style="text-align: center;">  Bearing 11 Degrees, no groundwater, no caving. </p>

SCALE 1" = 5'

GENERALIZED PROFILE



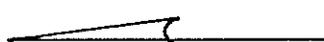
EXPLORATION: TP 14

PROJECT: 23401 Civic Center Way

PROJECT NO.: 1680

DATE: March 5, 1999

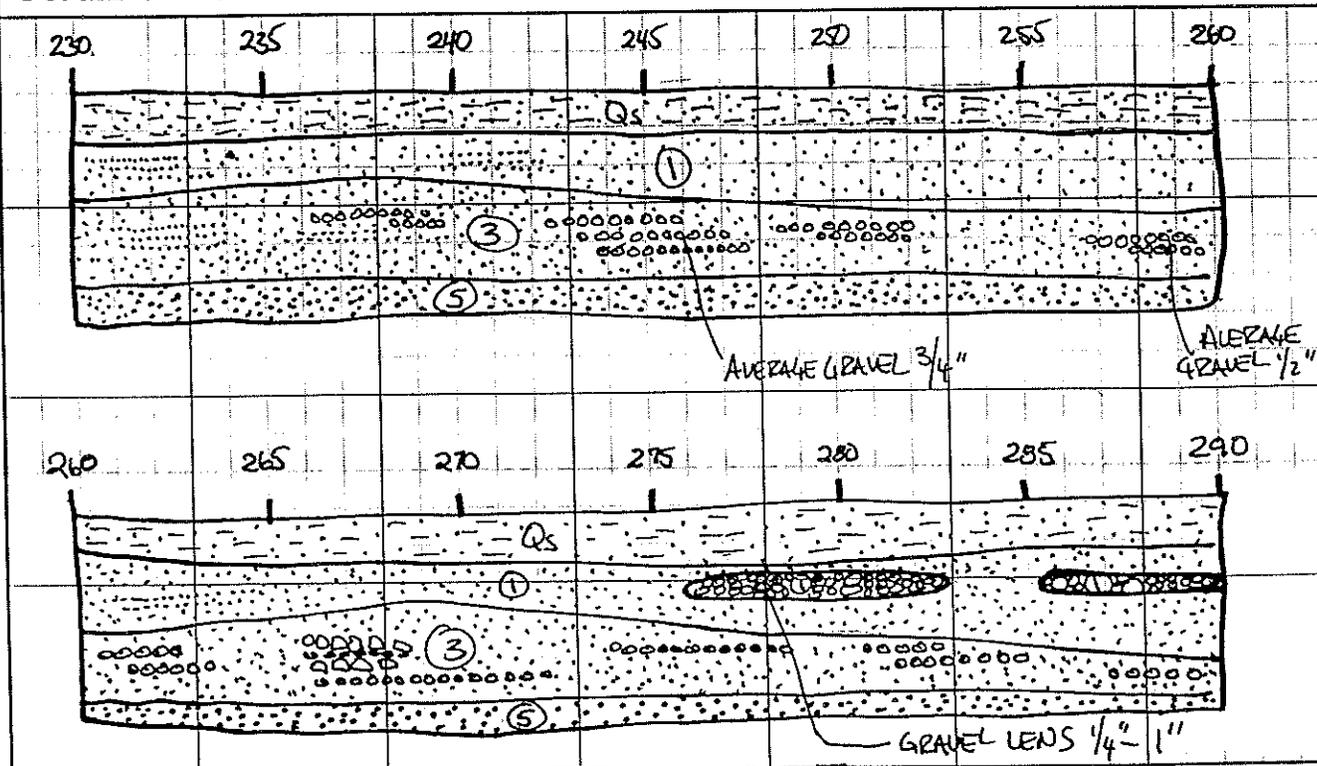
LOGGED BY: RLS

ATTITUDE	DESCRIPTION
	<p>SOIL; Qs, silty sand, medium-brown, rootlets and roots, occasional rock fragments, occasional debris, silty moist.</p> <p>OLDER ALLUVIUM; Qoal</p> <p>Unit 1: sand, light-gray, poorly cemented to firm, minor caving, gravel layers 1/4" to 1.5", well stratified heavy mineral deposits, coarse sand and gravel lenses.</p> <p>Unit 2: sand, very fine-grained, tan, well-stratified, firm.</p> <p>Unit 3: sand, coarse-grained, gray, poorly cemented, well-stratified, moderately firm, loose.</p> <p>Unit 4: silty sand, tan, loose firm, 3-6" thick.</p> <p>Unit 5: sand, coarse-grained, decrease in gravels, gray.</p> <p style="text-align: center;">  Bearing 11 Degrees, no groundwater, no caving. </p>

fp - foliation
 s - shear
 j - joint
 b - bedding.

SCALE 1" = 5'

GENERALIZED PROFILE



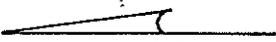
EXPLORATION: TP 14

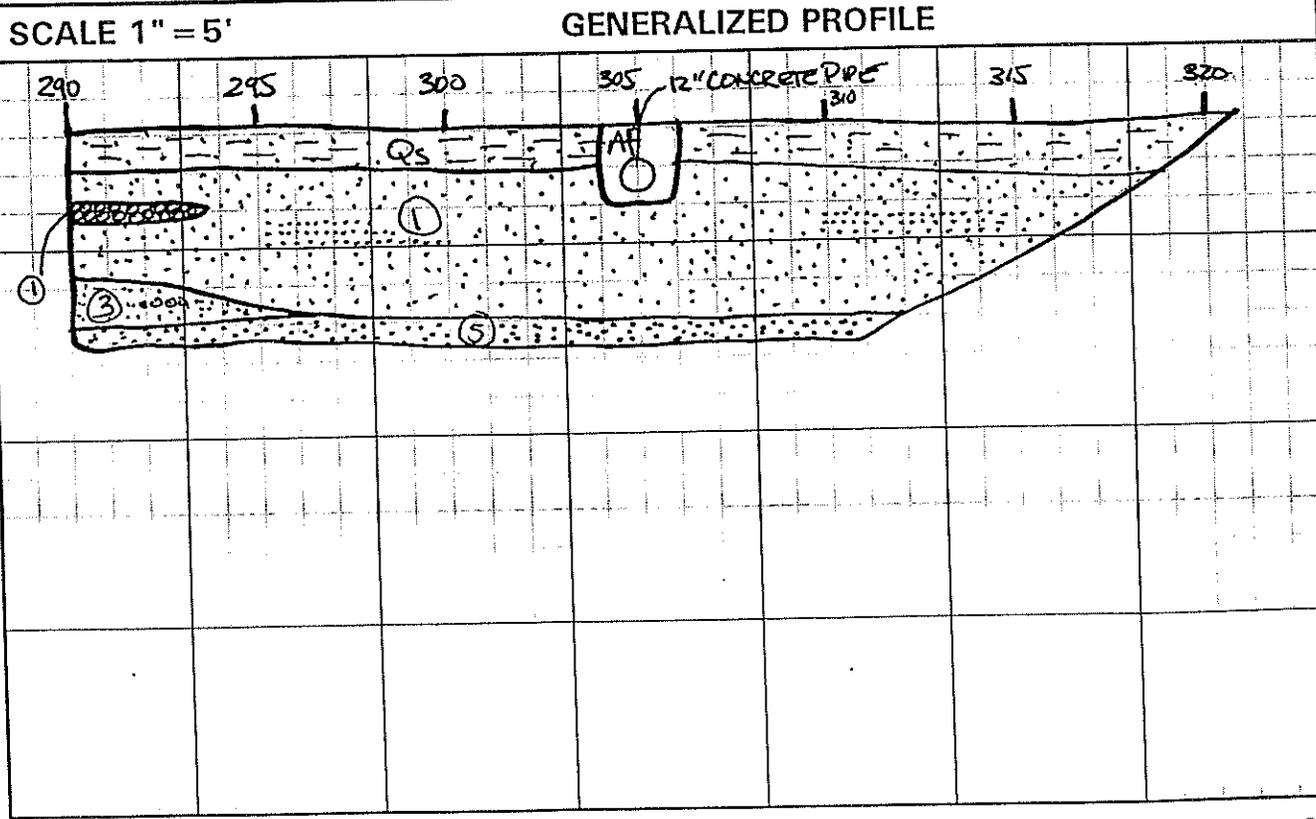
PROJECT: 23401 Civic Center Way

PROJECT NO.: 1680

DATE: March 5, 1999

LOGGED BY: RLS

ATTITUDE	DESCRIPTION
	<p>SOIL; Qs, silty sand, medium-brown, rootlets and roots, occasional rock fragments, occasional debris, silty moist.</p> <p>OLDER ALLUVIUM; Qoal</p> <p>Unit 1: sand, light-gray, poorly cemented to firm, minor caving, gravel layers 1/4" to 1.5", well stratified heavy mineral deposits, coarse sand and gravel lenses.</p> <p>Unit 2: sand, very fine-grained, tan, well-stratified, firm.</p> <p>Unit 3: sand, coarse-grained, gray, poorly cemented, well-stratified, moderately firm, loose.</p> <p>Unit 4: silty sand, tan, loose firm, 3-6" thick.</p> <p>Unit 5: sand, coarse-grained, decrease in gravels, gray.</p> <p>fp - foliation s - shear j - joint b - bedding</p> <p style="text-align: center;">  Bearing 11 Degrees, no groundwater, no caving. </p>



BORING: B 1

ADDRESS: 3705 Cross Creek Road

PROJECT NO.: 1680

DATE LOGGED: March 5, 1999

LOGGED BY: SW

ATTITUDES	WATER CONTENT, %	UNIT DRY WEIGHT, PCF	BLOWS/FOOT	SAMPLES	DEPTH, FT	GRAPHIC LOG	DESCRIPTION
b - bedding j - joint s - shear f - fault							
							<p>0.0 - 51.5' OLDER ALLUVIUM; Qoal</p> <p>@ 5.0' sand, medium-brown, slightly moist, fine to medium-grained, loose to medium dense</p> <p>@ 10.0' Water - sand, medium-grained, saturated, few gravels. @ 12.5' sand, medium-grained, few gravels, moderately sorted, loose</p> <p>@ 18.5' increase in gravels. @ 20.0' sand, coarse-grained, medium-brown, few pebbles, poorly sorted, medium dense @ 22.0' increase in gravels. @ 23.0' moderate decrease in grain size.</p> <p>@ 25.0, sandy silt, dark gray, moist, fine-grained, very stiff</p> <p>@ 30.0' sandy silt, medium to fine-grained, dark brownish-gray, poorly sorted, very stiff @ 32.5' increase in silt</p> <p>@ 37.0' sandy silt, very fine-grained, gray, moist, stiff.</p> <p>@ 40.0' sandy silt, fine-grained, gray, slightly moist, moderately firm, very stiff</p> <p>@ 43.5' sandy silt, fine-grained, dark-gray, moist, caliche stringers, stiff</p> <p>@ 47.5' minor increase in grain size.</p>
							<p>Total Depth 51.5' 8" Hollow Stem Auger Water at 10.0'</p>

BORING: B 2

ADDRESS: 3705 Cross Creek Road

PROJECT NO.: 1680

DATE LOGGED: March 5, 1999

LOGGED BY: JSM

ATTITUDES	WATER CONTENT, %	UNIT DRY WEIGHT, PCF	BLOWS/FOOT SAMPLES	DEPTH, FT	GRAPHIC LOG	DESCRIPTION
b - bedding j - joint s - shear f - fault						
				5	11	0.0 - 51.5' OLDER ALLUVIUM; Qoal @ 5.0' silty sand, fine-grained, medium-brown, slightly moist, moderately porous, few roots, moderately firm, medium dense
				10	25	@ 10.0' Water - sand, coarse-grained, few pebbles, dense, saturated, poorly sorted, medium dense
				15	11	@ 15.0' sandy silt, fine-grained, gray, moist, moderately firm, well-laminated, stiff
	30	94		20	13	@ 20.0' sandy silt, greenish-gray, fine-grained, moderately firm, slight odor from sample, stiff
				25	14	@ 25.0' sandy silt, fine-grained, greenish-gray, moderate odor from sample, stiff
	30	93		30	16	@ 27.5' sand, reddish-brown, moist, fine to medium-grained, very dense.
				35	6	@ 35.0' increase in grained size moderately sorted.
				40	24	@ 40.0' sand, coarse-grained, pebbles up to 3", rock in tip of sample, moist, dense.
				45	61	@ 45.0' sand, moderate to coarse-grained, brownish-gray, moist pebbles, dense
				50	41	@ 50.0' sand, medium to coarse-grained, brownish-gray, poorly sorted, dense
				55	59	Total Depth 51.5' 6" Hollow Stem Auger Water at 10.0'
	14	122		100	100	
				102	103	

BORING: B 3

ADDRESS: 3705 Cross Creek Road

PROJECT NO.: 1680

DATE LOGGED: March 8, 1999

LOGGED BY: SW

ATTITUDES	WATER CONTENT, %	UNIT DRY WEIGHT, PCF	BLOWS/FOOT	SAMPLES	DEPTH, FT	GRAPHIC LOG	DESCRIPTION
b - bedding j - joint s - shear f - fault							
							<p>0.0 - 51.0' OLDER ALLUVIUM; Qoal</p> <p>@ 5.0' sand, medium to coarse-grained, brownish-gray, pebbles, poorly-sorted, medium dense</p> <p>@ 10.0' Water - sand, coarse-grained, few pebbles, medium dense</p> <p>@ 15.0' sand, coarse-grained, grayish-brown, pebbles up to 2" long, moist, medium dense</p> <p>@ 17.0' no recovery in sample.</p> <p>@ 20.0' sand, medium-grained, dark gray, moist, moderately sorted, dense</p> <p>@ 25.0' sand, coarse grained, few pieces of wood in sample, medium dense</p> <p>@ 30.0' sand, medium-grained, dark gray, moist, medium sorted, medium dense</p> <p>@ 35.0' sand, medium to coarse grained, dense, many pebbles, poorly sorted, moist, dense</p> <p>@ 40.0' gravelly, refusal, 18 blows with no penetration.</p> <p>@ 45.0' gravelly, refusal, 25 blows for 1".</p>
	19	103	62	90	50		Total Depth 51.0'. 6" Hollow Stem Auger Water at 10.0'

BORING: B 4

ADDRESS: 3705 Cross Creek Road

PROJECT NO.: 1680

DATE LOGGED: March 8, 1999

LOGGED BY: SW

ATTITUDES	WATER CONTENT, %	UNIT DRY WEIGHT, PCF	BLOWS/FOOT SAMPLES	DEPTH, FT	GRAPHIC LOG	DESCRIPTION
b - bedding j - joint s - shear f - fault						
				5	6	0.0 - 51.5' OLDER ALLUVIUM; Qoal @ 5.0' silty sand, brown, moist, loose to moderately dense, moderately porous, slightly moist, loose
				10	8	@ 10.0' Water - sand, medium to coarse grained, brown, moderately sorted, saturated, loose
				15	21	@ 15.0' sandy silt, fine-grained, greenish-gray, moist, firm, stiff
	29	95		20	20	@ 17.0' sandy silt, gray, fine-grained. @ 20.0' sandy silt, fine-grained, greenish-gray, moist moderately firm, stiff
				25	12	@ 25.0' sandy silt, fine-grained, greenish-gray, moist, stiff
				30	28	@ 30.0' sand, medium-grained, gray, moist, medium dense
				35	46	@ 35.0' sand, medium to coarse-grained, few pebbles, poorly sorted, dense
	9	127		50	50	@ 37.0' sand, coarse-grained, few gravels. @ 40.0' sand, coarse grained, pebbles are poorly sorted, dense
				45	80	@ 45.0' sand, coarse-grained, gravels, dense, poorly sorted.
				50	60	@ 50.0' sand, coarse-grained, dense, brownish gray, pebbles, poorly sorted.
				55		Total Depth 51.5' 6" Hollow Stem Auger Water at 10.0'

BORING: B 5

ADDRESS: 3705 Cross Creek Road

PROJECT NO.: 1680

DATE LOGGED: March 8, 1999

LOGGED BY: SW

ATTITUDES	WATER CONTENT, %	UNIT DRY WEIGHT, PCF	BLOWS/FOOT	SAMPLES	DEPTH, FT	GRAPHIC LOG	DESCRIPTION
b - bedding j - joint s - shear f - fault							
							0.0 - 51.5' OLDER ALLUVIUM; Qoal
			50	X	5		
			73	X	10		@10.0' Water - sand, coarse-grained, gravelly, rock in sample tip.
			11	X	15		@15.0' sandy silt, grayish-brown, fine-grained, stiff
			24	X	20		@20.0' sandy silt, brown, very moist, fine-grained, stiff
			23	X	25		@25.0' sand, brownish-tan, minor silt, dense
			31	X	30		@30.0' sand, medium-grained, brown, dense
			38	X	35		@35.0' sand, medium- to coarse-grained, with minor gravels, dense
			8	X	40		@40.0' sandy silt, dark-brown, fine-grained, moist, firm
			13	X	45		@ 45.0' silty sand, greenish-gray, moist, fine-grained, firm, stiff
			13	X	50		
					55		Total Depth 51.5' 6" Hollow Stem Auger Water at 10.0'

BORING: B 7

ADDRESS: 3705 Cross Creek Road

PROJECT NO.: 1680

DATE LOGGED: April 30, 1999

LOGGED BY: SW

ATTITUDES	WATER CONTENT, %	UNIT DRY WEIGHT, PCF	BLOWS/FOOT SAMPLES	DEPTH, FT	GRAPHIC LOG	DESCRIPTION
b - bedding j - joint s - shear f - fault						
			6	5	0-5'	OLDER ALLUVIUM; Coal, Silty sand, light brown, medium grain, slightly moist
			28	10	5-10'	@5' Sand, medium to coarse grain, golden brown, slightly moist, loose @8.5' water Sand, medium to coarse grain, very moist, brown, medium dense
			39	15	10-15'	@20' Sand, coarse grain with few gravels, brown, very moist, dense gravelly to 17'
			11	20	15-20'	@20' Silty sand, fine grained, dark brown, moist, medium dense
			11	25	20-25'	@25' Sand, medium grained, brown, very moist, medium dense
			13	30	25-30'	@30' Sandy silt, brown to grey, very moist, stiff
			38	35	30-35'	Sand, fine to medium grain, dense, dense
			42	40	35-40'	Sand, medium grain, brown, dense
				45	40-45'	@44' gravels
				50	45-50'	Total depth 50', water at 9', 6" hollow stem auger
				55	50-55'	

BORING: B 8

ADDRESS: 3705 Cross Creek Road

PROJECT NO.: 1680

DATE LOGGED: April 30, 1999

LOGGED BY: SW

ATTITUDES	WATER CONTENT, %	UNIT DRY WEIGHT, PCF	BLOWS/FOOT	SAMPLES	DEPTH, FT	GRAPHIC LOG	DESCRIPTION
b - bedding j - joint s - shear f - fault							
					5	0-5'	OLDER ALLUVIUM; Coal, Sand, fine to medium grain, brown, moist @5' Sand, medium grain, brown, slightly moist, medium dense @7' gravelly @9' @10' Sand, coarse grain with gravels, very moist, medium dense @13' gravelly @15' Sand, coarse grain, brown, saturated, medium dense @17' gravelly @20' no recovery
					10	5-10'	
					15	10-15'	
					20	15-20'	
					25	20-25'	@25' Silt, grey, firm moist, firm to stiff
					30	25-30'	@30' Sandy silt, grey, stiff, very moist
					35	30-35'	@35' Sandy silt, stiff, very moist
					40	35-40'	@40' Sand, medium to coarse grain, very moist, dense
					45	40-45'	wash up in auger, no sample/recovery Total depth 45', water at 9', 6" hollow stem auger
					50	45-50'	
					55	50-55'	

BORING: B 6

ADDRESS: 3705 Cross Creek Road

PROJECT NO.: 1680

DATE LOGGED: April 30, 1999

LOGGED BY: SW

ATTITUDES <small>b - bedding j - joint s - shear f - fault</small>	WATER CONTENT, %	UNIT DRY WEIGHT, PCF	BLOWS/FOOT SAMPLES	DEPTH, FT	GRAPHIC LOG	DESCRIPTION	
			8	5		0-61.5' OLDER ALLUVIUM; Qoa1 Silty sand, fine to medium grain, dark brown, slightly moist @5' medium grain sand, brown, slightly moist, loose @9' water @10' medium to coarse sand, very moist, brown, few gravels abundant gravels @12' sand, coarse grain with few gravels, medium dense	
			9	10			
			20	15			
			8	20			@20' Sandy silt, brown, very moist, firm to stiff
			11	25			@25' Sandy silt, brown, very moist, stiff
			5	30			@30' Silt, dark grey, very moist, firm
			6	35			Sandy silt, grey, very moist, firm
			10	40			@40' sandy silt, brown, very moist, stiff
			9	45			@45' Sandy silt, brown, moist, firm to stiff
			7	50			
			13	55			
			21	60			
				65			Total depth 61.5', Water at 9', 6" hollow stem auger.

LABORATORY PROCEDURES

Laboratory testing was performed on samples obtained as outlined in Appendix I. All samples were sent to the laboratory for examination, testing, and classification, using the Unified Soil Classification System and group symbol.

Moisture and Density Tests

The dry unit weight and moisture content of the undisturbed samples were determined. The results are tabulated in the Laboratory Recapitulation - Table 1.

Grain Size Analysis

Sieve

A group of sieves is assembled with a solid collecting pan at the bottom. The sample is placed in top sieve. The assembly is placed in the sieve shaker. Upon completion of the sieving operation the weight of the material retained on each is determined.

Hydrometer

The sample is thoroughly mixed with sodium hexametaphosphate solution. The mixed solution is transferred to the sedimentation cylinder. The hydrometer reading is recorded at specified time intervals.

Shear Tests

Direct single-shear tests were performed with a direct shear machine. The desired normal load is applied to the specimen and allowed to come to equilibrium. The rate of deflection on the sample is approximately 0.01 inches per minute. The samples are tested at higher and/or lower normal loads in order to determine the angle of internal friction and the cohesion. The results are plotted on the Shear Test Diagrams and the results tabulated in the Laboratory Recapitulation - Table I.

APPENDIX II

LABORATORY TESTING

Laboratory Procedures

Laboratory Recapitulation

Figures S.1 through S.3
Figures SV.1 through SV.4

LABORATORY RECAPITULATION
PROJECT: 3705 Cross Creek Road
PROJECT NO.: 1680

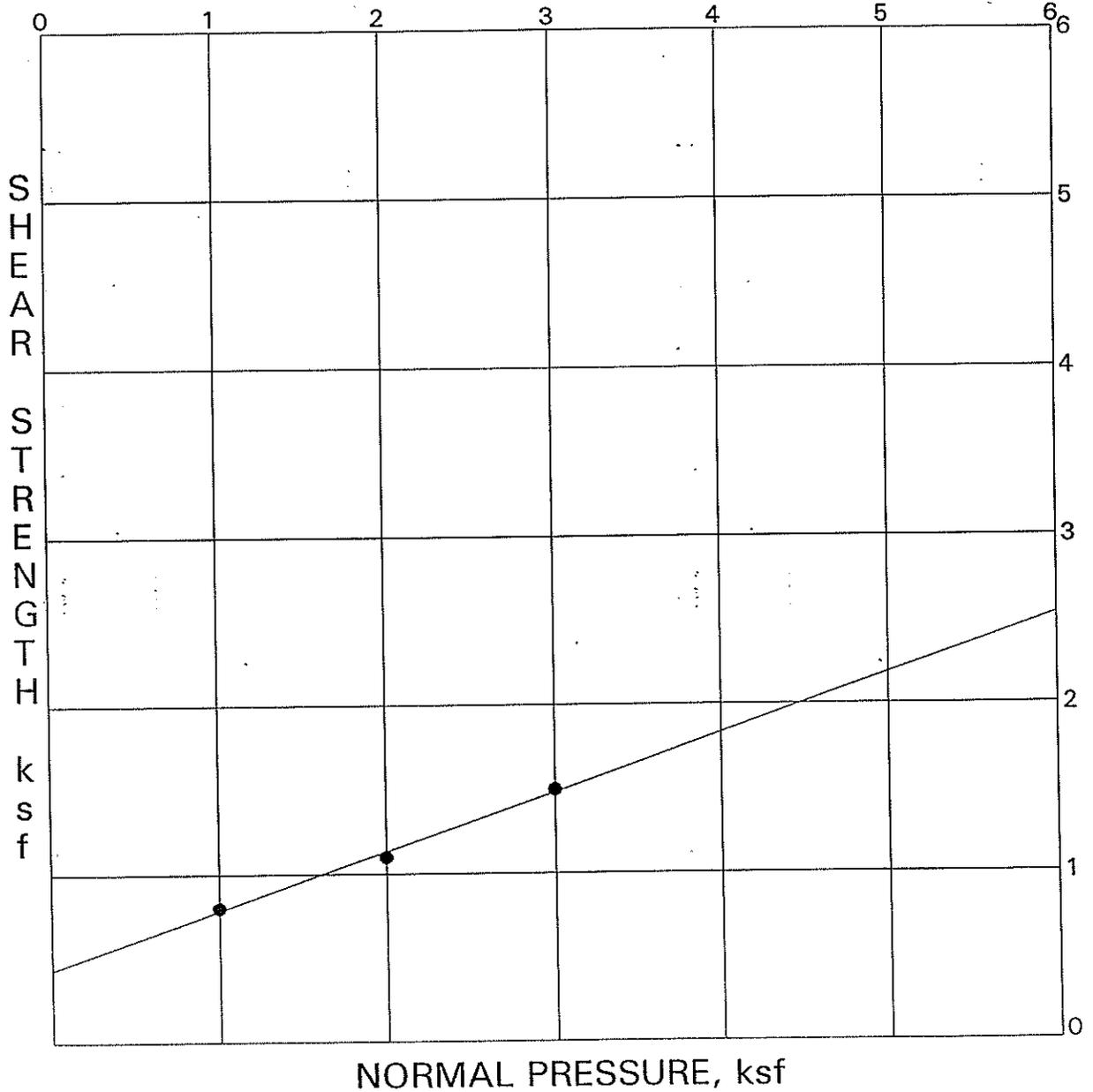
Explor -ation	Depth (ft)	Mat'l	Dry Dens. In Situ (P.C.F.)	Moisture Content (%)	Cohesion (K.S.F)	Friction Angle (degree)
B 2	17.5	ML	93.5	30.2		
B 2	23.3	ML	92.8	30.4	0.425	19.0
B 2	27.5	SP	101.6	24.5		
B 2	40.0	SP	121.8	14.4	0.150	35.0
B 3	32.5	SP	103.0	18.6	0.200	31.0
B 4	17.0	ML	95.3	28.6		
B 4	37.0	SP	127.3	9.5		

PROJECT: 1680

PROJECT LOCATION: 3705 Cross Creek Road

SAMPLE LOCATION: B 2 @ 23.3

DESCRIPTION:



Test Results

Moisture Content (%) Insitu: 30.4 Saturated: 38.3	Density (pcf) Dry Density: 92.8	Ultimate Strength Phi (deg): 19.0 Cohesion (ksf): 0.425
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SHEAR TEST DIAGRAM

GeoConcepts, Inc.

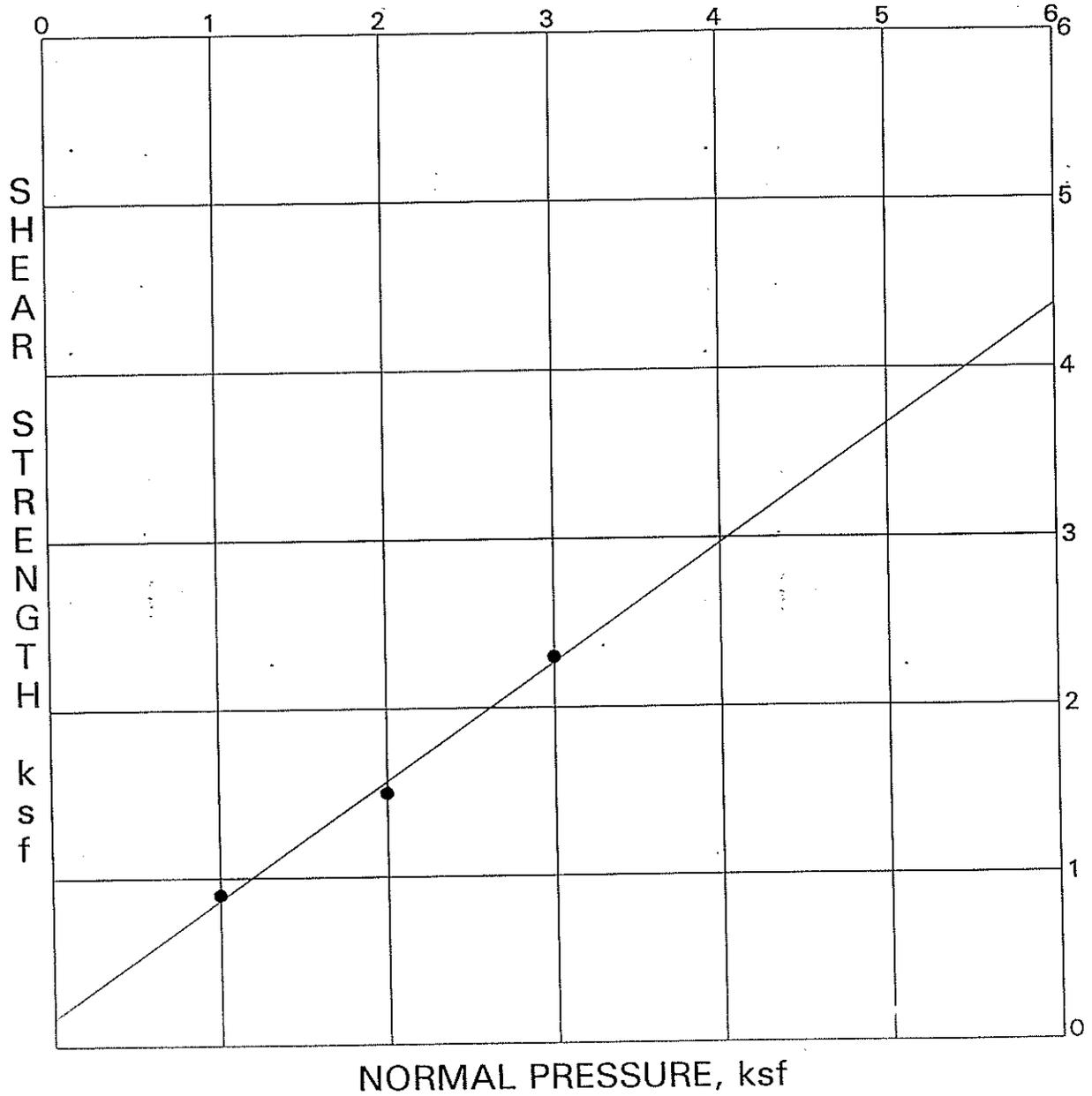
14424 Friar Street, Van Nuys

PROJECT: 1680

PROJECT LOCATION: 3705 Cross Creek Road

SAMPLE LOCATION: B 2 @ 40.0

DESCRIPTION:



Test Results

Moisture Content (%) Insitu: 14.4 Saturated: 24.0	Density (pcf) Dry Density: 121.8	Ultimate Strength Phi (deg): 35.0 Cohesion (ksf): 0.150
--	--	--

SHEAR TEST DIAGRAM

GeoConcepts, Inc.

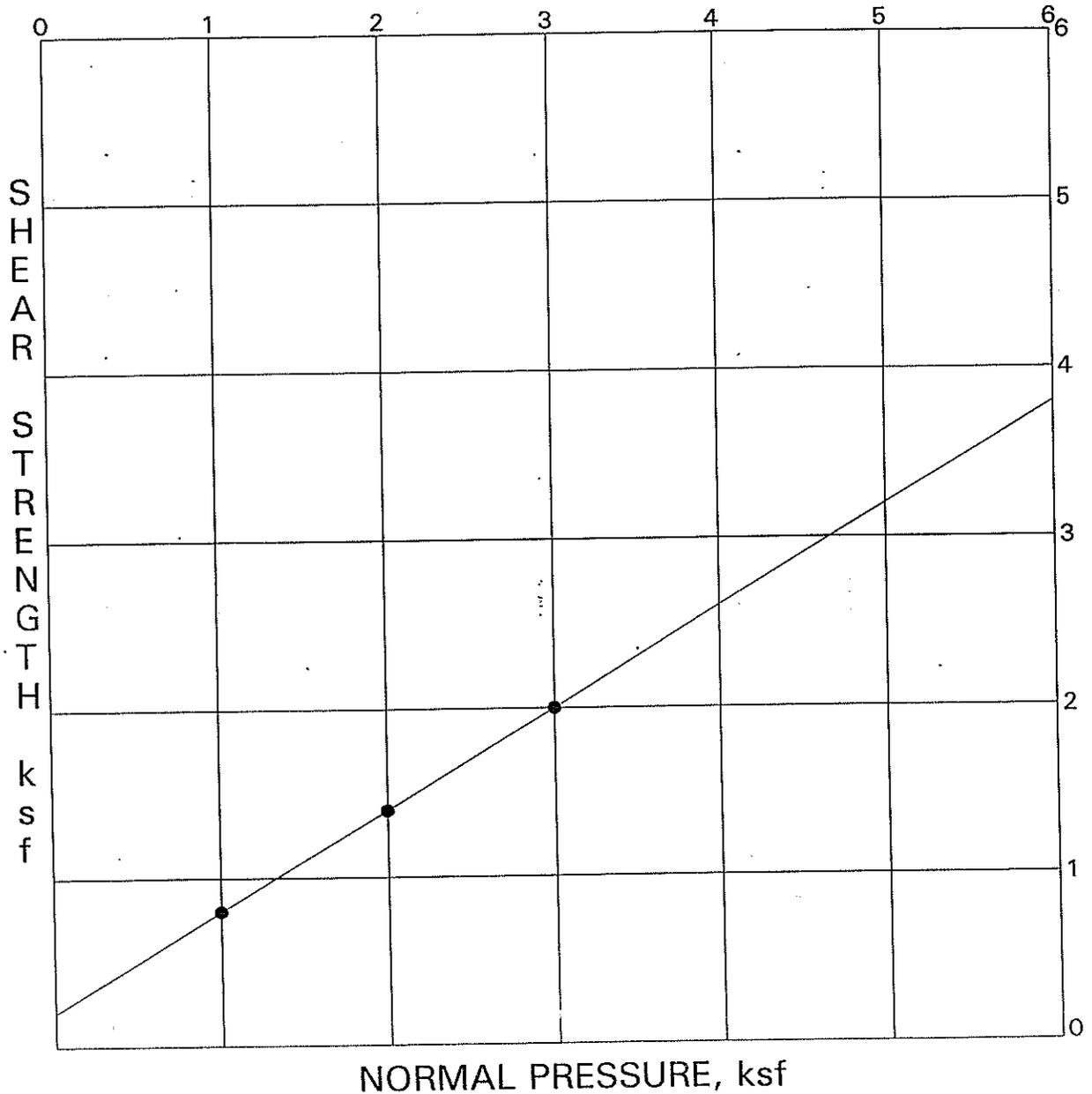
14424 Friar Street, Van Nuys

PROJECT: 1680

PROJECT LOCATION: 3705 Cross Creek Road

SAMPLE LOCATION: B 3 @ 32.5

DESCRIPTION:



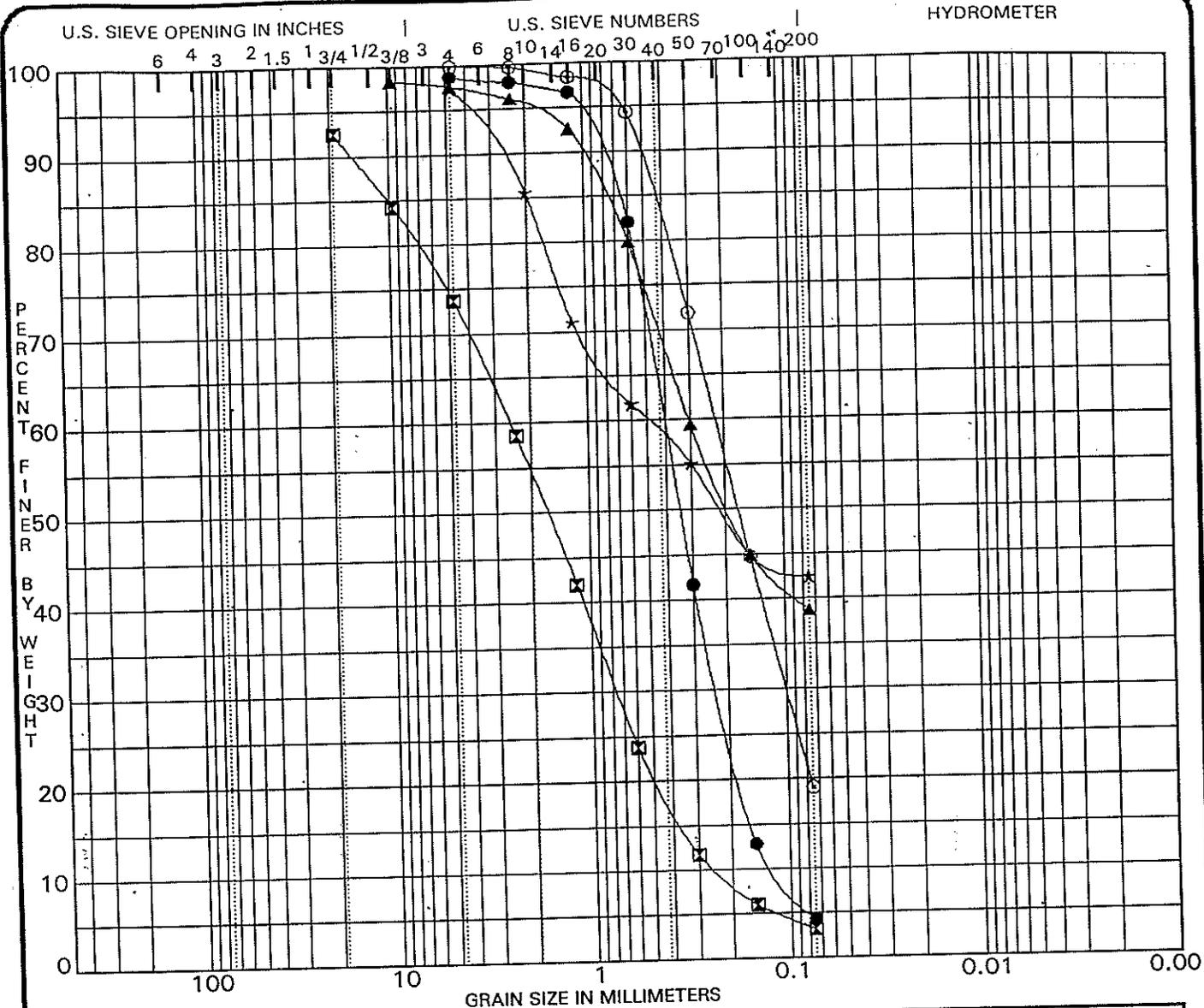
Test Results

Moisture Content (%)	Density (pcf)	Ultimate Strength
Insitu: 18.6	Dry Density: 103.0	Phi (deg): 31.0
Saturated: 23.6		Cohesion (ksf): 0.200

SHEAR TEST DIAGRAM

GeoConcepts, Inc.

14424 Friar Street, Van Nuys



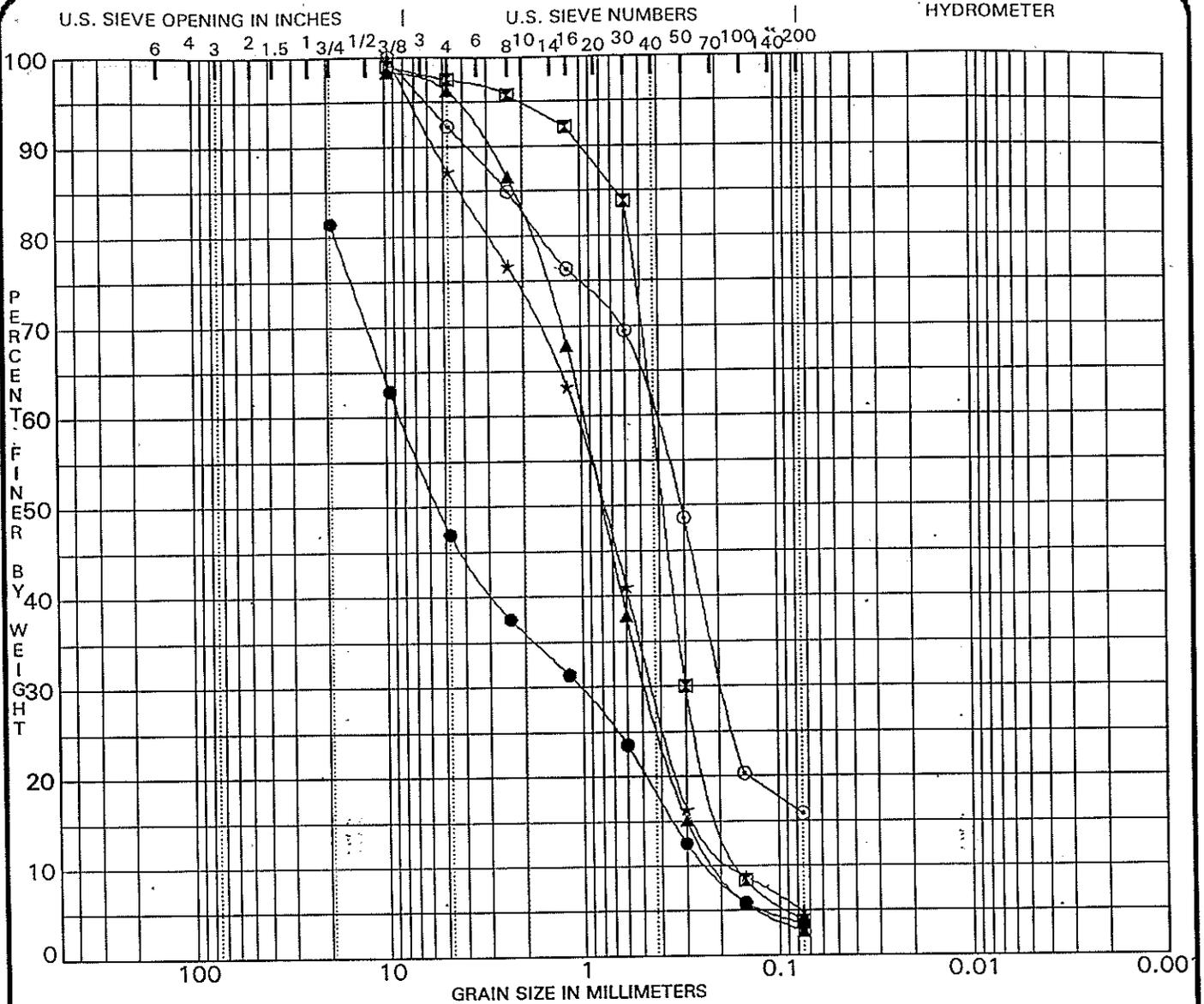
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification				MC%	LL	PL	PI	Cc	Cu
● B 1 5.0									1.05	3.4
☒ B 1 20.0									0.93	10.3
▲ B 1 30.0										
* B 1 32.5										
⊙ B 2 5.0										
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● B 1 5.0		0.41	0.227	0.1194		94.4	4.3			
☒ B 1 20.0		2.52	0.756	0.2440		70.4	3.2			
▲ B 1 30.0		0.31				58.9	38.7			
* B 1 32.5		0.50				54.9	42.4			
⊙ B 2 5.0		0.22	0.101			80.9	19.0			

PROJECT Civic Center & Cross Creek Lot A - 3705
Cross Creek Road

GRADATION CURVES

GeoConcepts, Inc.
14424 Friar Street, Van Nuys



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

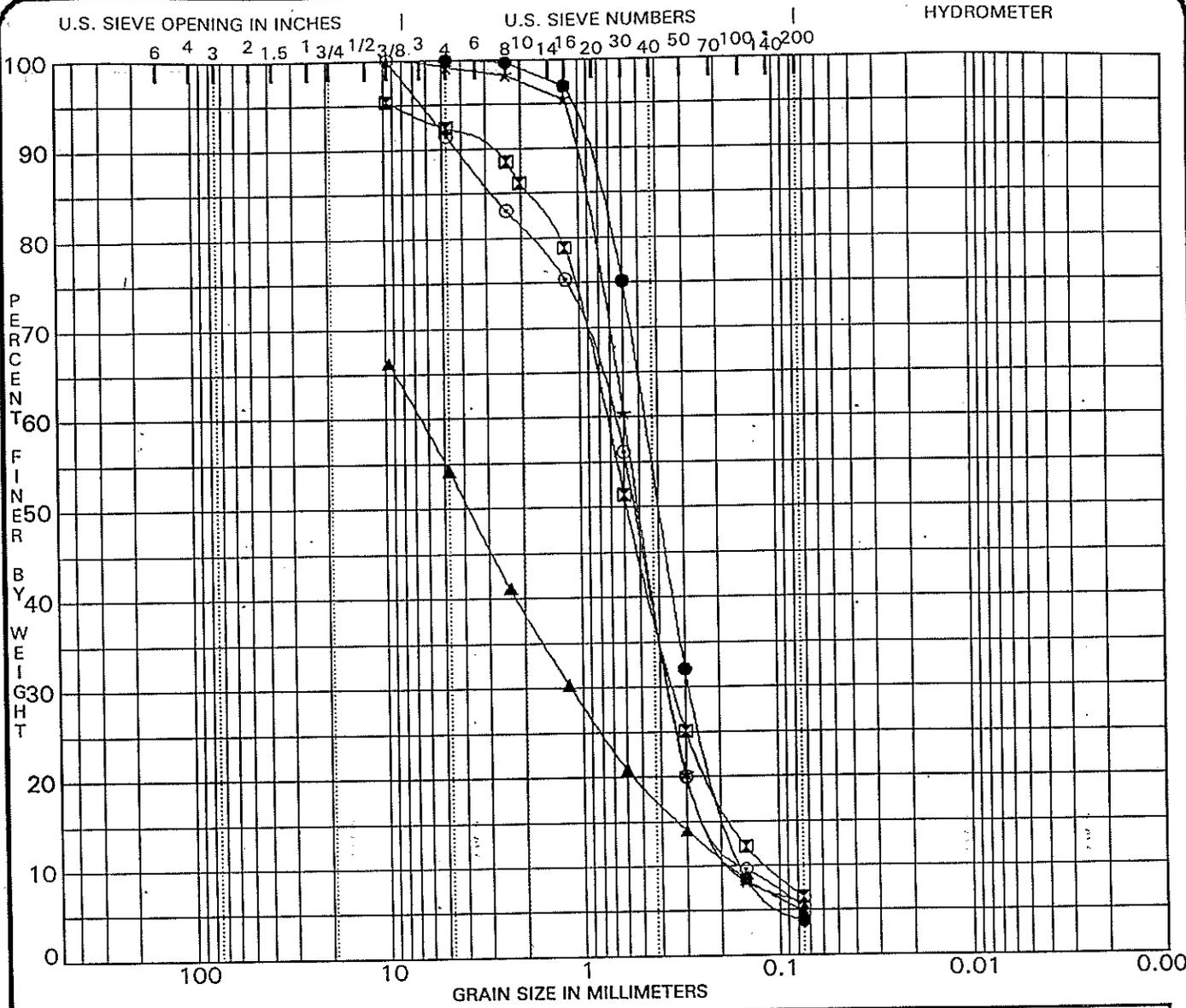
Specimen Identification	Classification					MC%	LL	PL	PI	Cc	Cu
● B 2 10.0										0.57	36.4
☒ B 2 30.0										1.29	2.8
▲ B 2 50.0										1.10	4.8
* B 3 10.0										1.08	6.4
⊙ B 3 35.0											

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B 2 10.0		8.41	1.054	0.2307		43.4		3.5
☒ B 2 30.0		0.44	0.300	0.1579		93.6		3.9
▲ B 2 50.0		0.99	0.473	0.2051		93.5		2.7
* B 3 10.0	9.50	1.07	0.441	0.1676	12.9	82.2		4.9
⊙ B 3 35.0	9.50	0.44	0.190		7.8	76.4		15.8

PROJECT Civic Center & Cross Creek Lot A - 3705
Cross Creek Road

GRADATION CURVES

GeoConcepts, Inc.
 14424 Friar Street, Van Nuys



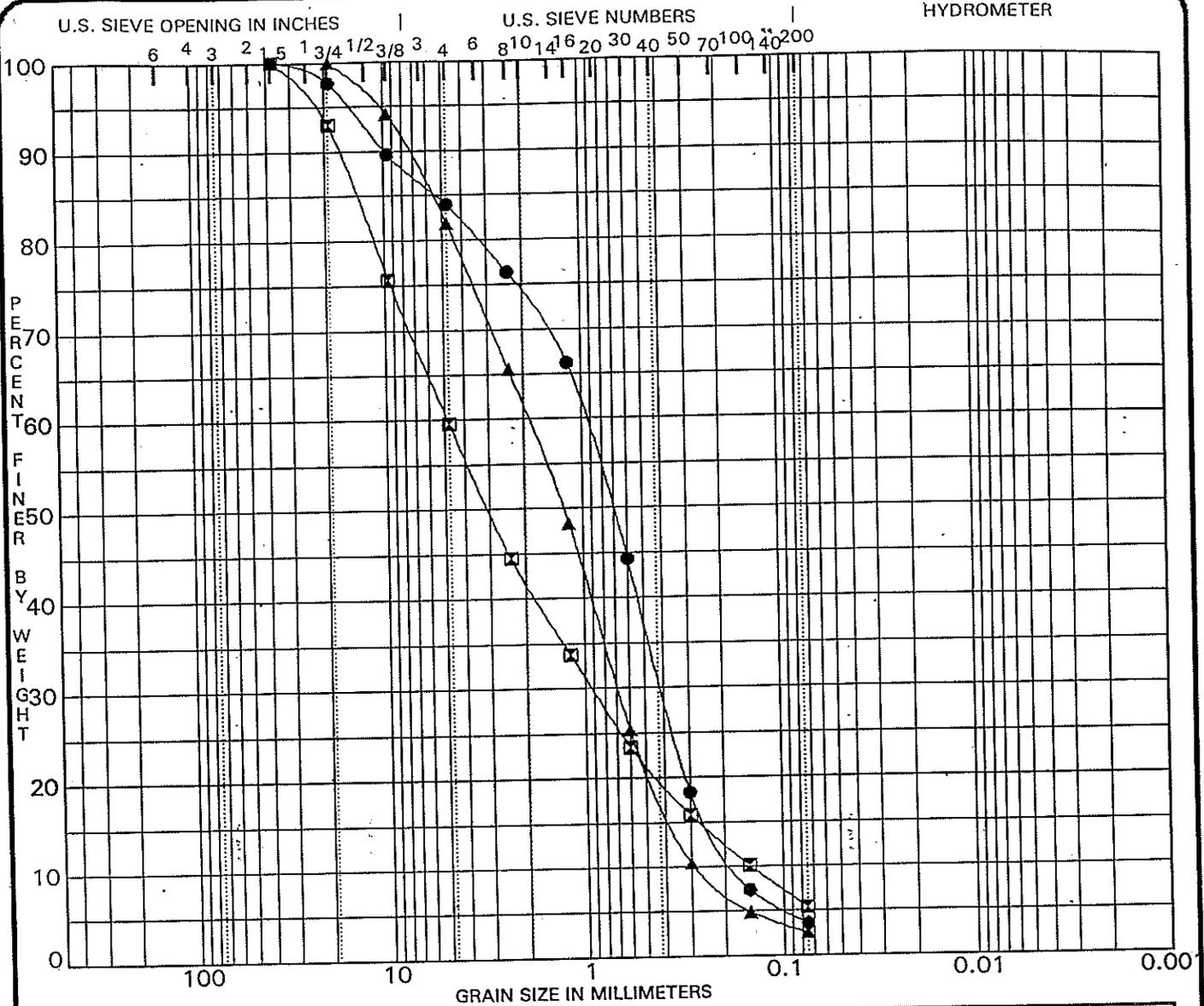
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification		MC%	LL	PL	PI	Cc	Cu
● B 4 10.0							1.09	3.0
⊠ B 4 35.0							1.37	6.5
▲ B 4 40.0							1.11	36.6
* B 5 30.0							1.27	3.6
⊙ B 5 35.0							1.25	4.5

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B 4 10.0	4.75	0.47	0.283	0.1564	0.0	96.1	3.9	
⊠ B 4 35.0		0.74	0.342	0.1148		85.8	6.5	
▲ B 4 40.0		6.64	1.155	0.1812		49.3	4.9	
* B 5 30.0	9.50	0.60	0.355	0.1663	0.8	93.3	5.9	
⊙ B 5 35.0	9.50	0.69	0.364	0.1541	8.6	86.1	5.3	

PROJECT Civic Center & Cross Creek Lot A - 3705
Cross Creek Road

GRADATION CURVES
GeoConcepts, Inc.
14424 Friar Street, Van Nuys



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Cc	Cu
● B 6 10.0										0.97	5.5
⊠ B 7 15.0										1.19	32.8
▲ B 8 15.0										0.88	6.6

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B 6 10.0	37.50	0.97	0.410	0.1770	16.1	80.3	3.6	
⊠ B 7 15.0	37.50	4.85	0.926	0.1478	40.5	54.1	5.4	
▲ B 8 15.0	19.00	1.89	0.689	0.2853	18.2	79.3	2.5	

PROJECT Civic Center & Cross Creek Lot A - 3705
Cross Creek Road

GRADATION CURVES
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APPENDIX III

ENGINEERING ANALYSIS

Bearing

Lateral

Seismic Evaluation

Liquefaction

Percolation Testing

Skin Friction Analysis

$$Q_{ult} = (K_{hc} * \tan(d) * P_o + C_a) * C * Z$$

Soil Parameters		Pile Dimensions	
phi =	31	Diameter D=	2
cohesion =	150	Adhesion Coef =	1
gamma =	115	Circum (C) =	6.28
		depth of overburden =	30
K _{hc} =	0.61		
d = 0.75 * phi =	23.25	Factor of Safety =	2
		Calculated Skin	
Pile Embedment into		Friction (psf)	
Recommended Material		with FS=2	
5		602.4	
7		632.6	
9		662.7	
11		692.8	

Skin Friction Analysis

$$Q_{ult} = (K_{hc} * \tan(d) * P_o + C_a) * C * Z$$

Soil Parameters		Pile Dimensions	
phi =	19	Diameter D=	2
cohesion =	425	Adhesion Coef =	1
gamma =	115	Circum (C) =	6.28
		depth of overburden =	30
K _{hc} =	0.61		
d = 0.75 * phi =	14.25	Factor of Safety =	2
		Calculated Skin	
Pile Embedment into		Friction (psf)	
Recommended Material		with FS=2	
5		524.3	
7		542.1	
9		559.9	
11		577.7	

LATERAL DESIGN
 SLOPING SURFACE

INPUT:

Depth of Embedment, (D):	1.5						ft.
Soil Phi, (phi):	19						deg.
Soil Cohesion, (c):	425						psf
Soil Density, (g):	115						pcf.
Slope Angle, (B):	0						deg.
Safety Factor Applied:	2.0						FS
Passive Wedge Angles (A):	30	35	40	45	50		deg.

EQUATIONS:

Angle1 = 90-A =	60	55	50	45	40		deg.
Angle2 = 90-B =	90	90	90	90	90		deg.
Angle3 = A+B =	30	35	40	45	50		deg.
L = D*Sin(Angle2)/Sin(Angle3) =	3	3	2	2	2		ft.
Ar = h*L*0.5 =	2	2	1	1	1		ft^2
h = D*sin(angle1) =	1	1	1	1	1		ft.
W = Ar*g =	224	185	154	129	109		lbs.
phim = Atan(tan(phi)/FS) =	10	10	10	10	10		deg.
cm = c/FS =	213	213	213	213	213		pcf.
Wx = sin(90-phim)*(cmL)/sin(A+phim) =	982	778	640	544	475		lbs.

PASSIVE PRESSURE

Pp = (tan(A+phim))*(W+Wx) =	1004	955	939	953	1001		lbs.
-----------------------------	------	-----	-----	-----	------	--	------

LATERAL DESIGN
 SLOPING SURFACE

INPUT:

Depth of Embedment, (D):	1.5						ft.
Soil Phi, (phi):	31						deg.
Soil Cohesion, (c):	150						psf
Soil Density, (g):	115						pcf.
Slope Angle, (B):	0						deg.
Safety Factor Applied:	2.0						FS
Passive Wedge Angles (A):	30	35	40	45	50		deg.

EQUATIONS:

Angle1 = 90-A =	60	55	50	45	40		deg.
Angle2 = 90-B =	90	90	90	90	90		deg.
Angle3 = A+B =	30	35	40	45	50		deg.
$L = D \cdot \sin(\text{Angle2}) / \sin(\text{Angle3}) =$	3	3	2	2	2		ft.
$Ar = h \cdot L \cdot 0.5 =$	2	2	1	1	1		ft ²
$h = D \cdot \sin(\text{angle1}) =$	1	1	1	1	1		ft.
$W = Ar \cdot g =$	224	185	154	129	109		lbs.
$\text{phim} = \text{Atan}(\tan(\text{phi}) / \text{FS}) =$	17	17	17	17	17		deg.
$\text{cm} = c / \text{FS} =$	75	75	75	75	75		pcf.
$Wx = \sin(90 - \text{phim}) \cdot (\text{cm} \cdot L) / \sin(A + \text{phim}) =$	296	239	200	173	153		lbs.

PASSIVE PRESSURE

$Pp = (\tan(A + \text{phim})) \cdot (W + Wx) =$	552	537	540	562	608		lbs.
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*****  
*                                     *  
*           E Q F A U L T           *  
*                                     *  
*           Ver. 2.20               *  
*                                     *  
*                                     *  
*****
```

(Estimation of Peak Horizontal Acceleration
From Digitized California Faults)

SEARCH PERFORMED FOR: Ron Goldman

JOB NUMBER: 1680

JOB NAME: Cross Creek

SITE COORDINATES:

LATITUDE: 34.0377 N

LONGITUDE: 118.6857 W

SEARCH RADIUS: 50 mi

ATTENUATION RELATION: 19) Idriss (1994) Horiz. - Soft Soil

UNCERTAINTY (M=Mean, S=Mean+1-Sigma): M

SCOND: 0

COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED: CALIFLT.DAT

SOURCE OF DEPTH VALUES (A=Attenuation File, F=Fault Data File): A

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT			MAX. PROBABLE EVENT		
		MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
ANACAPA	8 (13)	7.00	0.459	X	5.70	0.255	IX
ARROYO PARIDA - MORE RANCH	38 (60)	7.40	0.281	IX	5.10	0.066	VI
CATALINA ESCARPMENT	31 (50)	7.00	0.210	VIII	6.10	0.129	VIII
CHANNEL IS. THRUST (EAST)	23 (37)	7.20	0.491	X	6.00	0.267	IX
CLAMSHELL-SAWPIT	40 (64)	6.60	0.181	VIII	4.90	0.054	VI
CLEARWATER	39 (63)	7.00	0.226	IX	3.90	0.021	IV
ELYSIAN PARK SEISMIC ZONE	21 (35)	7.10	0.324	IX	5.80	0.166	VIII
FRAZIER MOUNTAIN	49 (78)	6.50	0.147	VIII	3.40	0.009	III
HOLSER	27 (43)	6.60	0.230	IX	4.90	0.077	VII
MALIBU COAST	1 (1)	7.50	0.697	XI	6.50	0.585	X
MID-CHANNEL	34 (54)	7.50	0.309	IX	5.70	0.112	VII
MONTALVO THRUST	36 (57)	6.00	0.196	VIII	5.80	0.172	VIII
NEWPORT-INGLEWOOD (NORTH)	15 (24)	6.70	0.267	IX	4.20	0.059	VI
NEWPORT-INGLEWOOD-OFFSHORE	33 (53)	7.10	0.213	VIII	5.90	0.106	VII
NORTHRIDGE HILLS	17 (27)	6.50	0.283	IX	5.50	0.162	VIII
OAK RIDGE (Eastern Blind)	22 (35)	7.00	0.465	X	5.50	0.206	VIII
OAK RIDGE (Offshore)	30 (49)	7.00	0.261	IX	5.60	0.115	VII
OAK RIDGE (Western Onshore)	25 (40)	7.00	0.289	IX	6.30	0.206	VIII
PALOS VERDES HILLS	20 (32)	7.20	0.287	IX	6.20	0.185	VIII
PINE MOUNTAIN	40 (64)	7.00	0.224	IX	4.50	0.038	V
PITAS POINT THRUST	37 (59)	6.00	0.191	VIII	4.60	0.067	VI
RAYMOND	26 (42)	7.50	0.346	IX	4.90	0.078	VII

 DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT			MAX. PROBABLE EVENT		
		MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
RED MOUNTAIN	41 (65)	7.10	0.233	IX	5.40	0.078	VII
SAN ANDREAS (Mojave)	46 (74)	8.00	0.271	IX	7.40	0.208	VIII
SAN CAYETANO (East)	26 (42)	6.90	0.269	IX	6.30	0.199	VIII
SAN CAYETANO (West)	31 (50)	7.00	0.256	IX	6.10	0.157	VIII
SAN CLEMENTE - SAN ISIDRO	39 (62)	8.00	0.291	IX	6.50	0.142	VIII
SAN GABRIEL	27 (43)	7.40	0.271	IX	5.60	0.103	VII
SAN JOSE	49 (79)	6.70	0.137	VIII	5.00	0.039	V
SANTA CRUZ ISLAND	43 (69)	7.40	0.264	IX	5.40	0.075	VII
SANTA MONICA - HOLLYWOOD	1 (2)	7.00	0.616	X	5.80	0.325	IX
SANTA MONICA MTNS. THRUST	3 (4)	7.20	0.893	XI	6.30	0.727	XI
SANTA SUSANA	20 (32)	6.90	0.310	IX	6.30	0.237	IX
SANTA YNEZ (East)	39 (63)	7.50	0.235	IX	5.50	0.071	VI
SIERRA MADRE-SAN FERNANDO	22 (36)	7.30	0.343	IX	6.30	0.220	IX
SIMI - SANTA ROSA	17 (28)	7.10	0.356	IX	5.40	0.149	VIII
VENTURA - PITAS POINT	33 (54)	7.30	0.285	IX	5.70	0.113	VII
VERDUGO	21 (34)	6.70	0.275	IX	5.20	0.115	VII
WHITTIER - NORTH ELSINORE	28 (45)	7.10	0.233	IX	6.00	0.127	VIII
WILSHIRE ARCH	19 (30)	5.70	0.257	IX	5.00	0.166	VIII

-END OF SEARCH- 40 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE MALIBU COAST FAULT IS CLOSEST TO THE SITE.
 IT IS ABOUT 0.5 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.893 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.727 g

File Name: 16801.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1) 60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
1	0.25	0.015	0.015	10	0.02	*	*	*	*	*	**
1	0.75	0.045	0.045	10	0.02	*	*	*	*	*	**
1	1.25	0.075	0.075	10	0.02	*	*	*	*	*	**
1	1.75	0.105	0.105	10	0.02	*	*	*	*	*	**
1	2.25	0.135	0.135	10	0.02	*	*	*	*	*	**
1	2.75	0.165	0.165	10	0.02	*	*	*	*	*	**
1	3.25	0.195	0.195	10	0.02	*	*	*	*	*	**
1	3.75	0.225	0.225	10	0.02	*	*	*	*	*	**
1	4.25	0.255	0.255	10	0.02	*	*	*	*	*	**
1	4.75	0.285	0.285	10	0.02	*	*	*	*	*	**
1	5.25	0.315	0.315	10	0.02	*	*	*	*	*	**
1	5.75	0.345	0.345	10	0.02	*	*	*	*	*	**
1	6.25	0.375	0.375	10	0.02	*	*	*	*	*	**
1	6.75	0.405	0.405	10	0.02	*	*	*	*	*	**
1	7.25	0.435	0.435	10	0.02	*	*	*	*	*	**
2	7.75	0.465	0.465	13	0.02	*	*	*	*	*	**
2	8.25	0.495	0.487	13	0.02	1.549	17.4	0.189	0.971	0.464	0.52
2	8.75	0.525	0.502	13	0.02	1.549	17.4	0.189	0.968	0.473	0.51
2	9.25	0.555	0.516	13	0.02	1.549	17.4	0.189	0.964	0.481	0.50
2	9.75	0.585	0.530	13	0.02	1.549	17.4	0.189	0.961	0.489	0.49
2	10.25	0.615	0.545	13	0.02	1.549	17.4	0.189	0.958	0.497	0.49
2	10.75	0.645	0.559	13	0.02	1.549	17.4	0.189	0.955	0.504	0.48
3	11.25	0.675	0.574	10	0.02	1.286	12.3	0.135	0.952	0.510	0.34
3	11.75	0.705	0.588	10	0.02	1.286	12.3	0.135	0.948	0.516	0.33
3	12.25	0.735	0.602	10	0.02	1.286	12.3	0.135	0.945	0.522	0.33
3	12.75	0.765	0.617	10	0.02	1.286	12.3	0.135	0.942	0.528	0.33
3	13.25	0.795	0.631	10	0.02	1.286	12.3	0.135	0.939	0.533	0.32
3	13.75	0.825	0.646	10	0.02	1.286	12.3	0.135	0.936	0.538	0.32
3	14.25	0.855	0.660	10	0.02	1.286	12.3	0.135	0.932	0.543	0.32
3	14.75	0.885	0.674	10	0.02	1.286	12.3	0.135	0.929	0.547	0.31
4	15.25	0.915	0.689	3	0.01	1.231	3.7	0.059	0.926	0.551	0.14
4	15.75	0.945	0.703	3	0.01	1.231	3.7	0.059	0.923	0.555	0.14
4	16.25	0.975	0.718	3	0.01	1.231	3.7	0.059	0.920	0.559	0.13
4	16.75	1.005	0.732	3	0.01	1.231	3.7	0.059	0.916	0.563	0.13
5	17.25	1.035	0.746	12	0.02	1.183	14.7	0.160	0.913	0.566	0.36
5	17.75	1.065	0.761	12	0.02	1.183	14.7	0.160	0.910	0.569	0.36
5	18.25	1.095	0.775	12	0.02	1.183	14.7	0.160	0.907	0.572	0.36
5	18.75	1.125	0.790	12	0.02	1.183	14.7	0.160	0.904	0.575	0.36
5	19.25	1.155	0.804	12	0.02	1.183	14.7	0.160	0.900	0.577	0.36
5	19.75	1.185	0.818	12	0.02	1.183	14.7	0.160	0.897	0.580	0.35
6	20.25	1.215	0.833	14	0.02	1.120	16.9	0.189	0.894	0.582	0.42
6	20.75	1.245	0.847	14	0.02	1.120	16.9	0.189	0.891	0.584	0.41
6	21.25	1.275	0.862	14	0.02	1.120	16.9	0.189	0.888	0.586	0.41

NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

PAGE 2

File Name: 16801.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA NL_60	C N	CORR. (NL) 60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
6	21.75	1.305	0.876	14	0.02	1.120	16.9	0.189	0.884	0.588	0.41
7	22.25	1.335	0.890	32	0.05	1.066	38.0	Infin	0.881	0.589	NonLiq
7	22.75	1.365	0.905	32	0.05	1.066	38.0	Infin	0.878	0.591	NonLiq
7	23.25	1.395	0.919	32	0.05	1.066	38.0	Infin	0.875	0.592	NonLiq
7	23.75	1.425	0.934	32	0.05	1.066	38.0	Infin	0.872	0.594	NonLiq
7	24.25	1.455	0.948	32	0.05	1.066	38.0	Infin	0.868	0.595	NonLiq
7	24.75	1.485	0.962	32	0.05	1.066	38.0	Infin	0.865	0.596	NonLiq
8	25.25	1.515	0.977	18	~	~	~	~	~	~	~
8	25.75	1.545	0.991	18	~	~	~	~	~	~	~
8	26.25	1.575	1.006	18	~	~	~	~	~	~	~
8	26.75	1.605	1.020	18	~	~	~	~	~	~	~
9	27.25	1.635	1.034	20	~	~	~	~	~	~	~
9	27.75	1.665	1.049	20	~	~	~	~	~	~	~
9	28.25	1.695	1.063	20	~	~	~	~	~	~	~
9	28.75	1.725	1.078	20	~	~	~	~	~	~	~
9	29.25	1.755	1.092	20	~	~	~	~	~	~	~
9	29.75	1.785	1.106	20	~	~	~	~	~	~	~
10	30.25	1.815	1.121	17	~	~	~	~	~	~	~
10	30.75	1.845	1.135	17	~	~	~	~	~	~	~
10	31.25	1.875	1.150	17	~	~	~	~	~	~	~
10	31.75	1.905	1.164	17	~	~	~	~	~	~	~
11	32.25	1.935	1.178	9	~	~	~	~	~	~	~
11	32.75	1.965	1.193	9	~	~	~	~	~	~	~
11	33.25	1.995	1.207	9	~	~	~	~	~	~	~
11	33.75	2.025	1.222	9	~	~	~	~	~	~	~
11	34.25	2.055	1.236	9	~	~	~	~	~	~	~
11	34.75	2.085	1.250	9	~	~	~	~	~	~	~
12	35.25	2.115	1.265	12	~	~	~	~	~	~	~
12	35.75	2.145	1.279	12	~	~	~	~	~	~	~
12	36.25	2.175	1.294	12	~	~	~	~	~	~	~
12	36.75	2.205	1.308	12	~	~	~	~	~	~	~
13	37.25	2.235	1.322	11	~	~	~	~	~	~	~
13	37.75	2.265	1.337	11	~	~	~	~	~	~	~
13	38.25	2.295	1.351	11	~	~	~	~	~	~	~
13	38.75	2.325	1.366	11	~	~	~	~	~	~	~
13	39.25	2.355	1.380	11	~	~	~	~	~	~	~
13	39.75	2.385	1.394	11	~	~	~	~	~	~	~
14	40.25	2.415	1.409	47	~	~	~	~	~	~	~
14	40.75	2.445	1.423	47	~	~	~	~	~	~	~
14	41.25	2.475	1.438	47	~	~	~	~	~	~	~
14	41.75	2.505	1.452	47	~	~	~	~	~	~	~
15	42.25	2.535	1.466	13	~	~	~	~	~	~	~
15	42.75	2.565	1.481	13	~	~	~	~	~	~	~
15	43.25	2.595	1.495	13	~	~	~	~	~	~	~

File Name: 16801.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA NL_60	C N	CORR. (NL) 60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
15	43.75	2.625	1.510	13	~	~	~	~	~	~	~~
15	44.25	2.655	1.524	13	~	~	~	~	~	~	~~
15	44.75	2.685	1.538	13	~	~	~	~	~	~	~~
16	45.25	2.715	1.553	17	~	~	~	~	~	~	~~
16	45.75	2.745	1.567	17	~	~	~	~	~	~	~~
16	46.25	2.775	1.582	17	~	~	~	~	~	~	~~
16	46.75	2.805	1.596	17	~	~	~	~	~	~	~~
17	47.25	2.835	1.610	14	~	~	~	~	~	~	~~
17	47.75	2.865	1.625	14	~	~	~	~	~	~	~~
17	48.25	2.895	1.639	14	~	~	~	~	~	~	~~
17	48.75	2.925	1.654	14	~	~	~	~	~	~	~~
17	49.25	2.955	1.668	14	~	~	~	~	~	~	~~
17	49.75	2.985	1.682	14	~	~	~	~	~	~	~~
18	50.25	3.015	1.697	14	~	~	~	~	~	~	~~
18	50.75	3.045	1.711	14	~	~	~	~	~	~	~~
18	51.25	3.075	1.726	14	~	~	~	~	~	~	~~
18	51.75	3.105	1.740	14	~	~	~	~	~	~	~~
18	52.25	3.135	1.754	14	~	~	~	~	~	~	~~
18	52.75	3.165	1.769	14	~	~	~	~	~	~	~~
18	53.25	3.195	1.783	14	~	~	~	~	~	~	~~
18	53.75	3.225	1.798	14	~	~	~	~	~	~	~~
18	54.25	3.255	1.812	14	~	~	~	~	~	~	~~
18	54.75	3.285	1.826	14	~	~	~	~	~	~	~~

File Name: 16802.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1) 60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
1	0.25	0.015	0.015	11	4.58	*	*	*	*	*	**
1	0.75	0.045	0.045	11	4.58	*	*	*	*	*	**
1	1.25	0.075	0.075	11	4.58	*	*	*	*	*	**
1	1.75	0.105	0.105	11	4.58	*	*	*	*	*	**
1	2.25	0.135	0.135	11	4.58	*	*	*	*	*	**
1	2.75	0.165	0.165	11	4.58	*	*	*	*	*	**
1	3.25	0.195	0.195	11	4.58	*	*	*	*	*	**
1	3.75	0.225	0.225	11	4.58	*	*	*	*	*	**
1	4.25	0.255	0.255	11	4.58	*	*	*	*	*	**
1	4.75	0.285	0.285	11	4.58	*	*	*	*	*	**
1	5.25	0.315	0.315	11	4.58	*	*	*	*	*	**
1	5.75	0.345	0.345	11	4.58	*	*	*	*	*	**
1	6.25	0.375	0.375	11	4.58	*	*	*	*	*	**
1	6.75	0.405	0.405	11	4.58	*	*	*	*	*	**
2	7.25	0.435	0.435	25	0.04	*	*	*	*	*	**
2	7.75	0.465	0.465	25	0.04	*	*	*	*	*	**
2	8.25	0.495	0.487	25	0.04	1.384	27.8	0.344	0.971	0.464	0.95
2	8.75	0.525	0.502	25	0.04	1.384	27.8	0.344	0.968	0.473	0.93
2	9.25	0.555	0.516	25	0.04	1.384	27.8	0.344	0.964	0.481	0.92
2	9.75	0.585	0.530	25	0.04	1.384	27.8	0.344	0.961	0.489	0.90
2	10.25	0.615	0.545	25	0.04	1.384	27.8	0.344	0.958	0.497	0.89
2	10.75	0.645	0.559	25	0.04	1.384	27.8	0.344	0.955	0.504	0.87
2	11.25	0.675	0.574	25	0.04	1.384	27.8	0.344	0.952	0.510	0.86
2	11.75	0.705	0.588	25	0.04	1.384	27.8	0.344	0.948	0.516	0.85
2	12.25	0.735	0.602	25	0.04	1.384	27.8	0.344	0.945	0.522	0.84
2	12.75	0.765	0.617	25	0.04	1.384	27.8	0.344	0.942	0.528	0.83
3	13.25	0.795	0.631	11	~	~	~	~	~	~	~
3	13.75	0.825	0.646	11	~	~	~	~	~	~	~
3	14.25	0.855	0.660	11	~	~	~	~	~	~	~
3	14.75	0.885	0.674	11	~	~	~	~	~	~	~
3	15.25	0.915	0.689	11	~	~	~	~	~	~	~
3	15.75	0.945	0.703	11	~	~	~	~	~	~	~
3	16.25	0.975	0.718	11	~	~	~	~	~	~	~
3	16.75	1.005	0.732	11	~	~	~	~	~	~	~
4	17.25	1.035	0.746	14	~	~	~	~	~	~	~
4	17.75	1.065	0.761	14	~	~	~	~	~	~	~
4	18.25	1.095	0.775	14	~	~	~	~	~	~	~
4	18.75	1.125	0.790	14	~	~	~	~	~	~	~
4	19.25	1.155	0.804	14	~	~	~	~	~	~	~
4	19.75	1.185	0.818	14	~	~	~	~	~	~	~
4	20.25	1.215	0.833	14	~	~	~	~	~	~	~
4	20.75	1.245	0.847	14	~	~	~	~	~	~	~
4	21.25	1.275	0.862	14	~	~	~	~	~	~	~

NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

PAGE 2

File Name: 16802.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
4	21.75	1.305	0.876	14	~	~	~	~	~	~	~~
5	22.25	1.335	0.890	6	~	~	~	~	~	~	~~
5	22.75	1.365	0.905	6	~	~	~	~	~	~	~~
5	23.25	1.395	0.919	6	~	~	~	~	~	~	~~
5	23.75	1.425	0.934	6	~	~	~	~	~	~	~~
5	24.25	1.455	0.948	6	~	~	~	~	~	~	~~
5	24.75	1.485	0.962	6	~	~	~	~	~	~	~~
5	25.25	1.515	0.977	6	~	~	~	~	~	~	~~
5	25.75	1.545	0.991	6	~	~	~	~	~	~	~~
6	26.25	1.575	1.006	42	0.05	0.965	42.6	Infin	0.856	0.599	NonLiq
6	26.75	1.605	1.020	42	0.05	0.965	42.6	Infin	0.853	0.599	NonLiq
6	27.25	1.635	1.034	42	0.05	0.965	42.6	Infin	0.850	0.600	NonLiq
6	27.75	1.665	1.049	42	0.05	0.965	42.6	Infin	0.846	0.601	NonLiq
6	28.25	1.695	1.063	42	0.05	0.965	42.6	Infin	0.843	0.601	NonLiq
6	28.75	1.725	1.078	42	0.05	0.965	42.6	Infin	0.840	0.601	NonLiq
6	29.25	1.755	1.092	42	0.05	0.965	42.6	Infin	0.837	0.602	NonLiq
6	29.75	1.785	1.106	42	0.05	0.965	42.6	Infin	0.834	0.602	NonLiq
6	30.25	1.815	1.121	42	0.05	0.965	42.6	Infin	0.831	0.602	NonLiq
6	30.75	1.845	1.135	42	0.05	0.965	42.6	Infin	0.828	0.602	NonLiq
6	31.25	1.875	1.150	42	0.05	0.965	42.6	Infin	0.824	0.602	NonLiq
6	31.75	1.905	1.164	42	0.05	0.965	42.6	Infin	0.821	0.602	NonLiq
7	32.25	1.935	1.178	59	0.07	0.909	56.4	Infin	0.818	0.602	NonLiq
7	32.75	1.965	1.193	59	0.07	0.909	56.4	Infin	0.815	0.602	NonLiq
7	33.25	1.995	1.207	59	0.07	0.909	56.4	Infin	0.812	0.602	NonLiq
7	33.75	2.025	1.222	59	0.07	0.909	56.4	Infin	0.809	0.601	NonLiq
7	34.25	2.055	1.236	59	0.07	0.909	56.4	Infin	0.806	0.601	NonLiq
7	34.75	2.085	1.250	59	0.07	0.909	56.4	Infin	0.803	0.601	NonLiq
7	35.25	2.115	1.265	59	0.07	0.909	56.4	Infin	0.799	0.600	NonLiq
7	35.75	2.145	1.279	59	0.07	0.909	56.4	Infin	0.796	0.600	NonLiq
7	36.25	2.175	1.294	59	0.07	0.909	56.4	Infin	0.793	0.599	NonLiq
7	36.75	2.205	1.308	59	0.07	0.909	56.4	Infin	0.790	0.599	NonLiq
8	37.25	2.235	1.322	100	0.11	0.861	90.5	Infin	0.787	0.598	NonLiq
8	37.75	2.265	1.337	100	0.11	0.861	90.5	Infin	0.784	0.597	NonLiq
8	38.25	2.295	1.351	100	0.11	0.861	90.5	Infin	0.781	0.597	NonLiq
8	38.75	2.325	1.366	100	0.11	0.861	90.5	Infin	0.778	0.596	NonLiq
8	39.25	2.355	1.380	100	0.11	0.861	90.5	Infin	0.775	0.595	NonLiq
8	39.75	2.385	1.394	100	0.11	0.861	90.5	Infin	0.772	0.594	NonLiq
8	40.25	2.415	1.409	100	0.11	0.861	90.5	Infin	0.769	0.593	NonLiq
8	40.75	2.445	1.423	100	0.11	0.861	90.5	Infin	0.766	0.592	NonLiq
8	41.25	2.475	1.438	100	0.11	0.861	90.5	Infin	0.763	0.592	NonLiq
8	41.75	2.505	1.452	100	0.11	0.861	90.5	Infin	0.760	0.591	NonLiq
9	42.25	2.535	1.466	100	0.10	0.820	86.2	Infin	0.757	0.590	NonLiq
9	42.75	2.565	1.481	100	0.10	0.820	86.2	Infin	0.754	0.589	NonLiq
9	43.25	2.595	1.495	100	0.10	0.820	86.2	Infin	0.751	0.588	NonLiq

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LIQUEFACTION ANALYSIS SUMMARY

PAGE 3

File Name: 16802.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
9	43.75	2.625	1.510	100	0.10	0.820	86.2	Infin	0.748	0.586	NonLiq
9	44.25	2.655	1.524	100	0.10	0.820	86.2	Infin	0.745	0.585	NonLiq
9	44.75	2.685	1.538	100	0.10	0.820	86.2	Infin	0.742	0.584	NonLiq
9	45.25	2.715	1.553	100	0.10	0.820	86.2	Infin	0.739	0.583	NonLiq
9	45.75	2.745	1.567	100	0.10	0.820	86.2	Infin	0.736	0.582	NonLiq
9	46.25	2.775	1.582	100	0.10	0.820	86.2	Infin	0.733	0.581	NonLiq
9	46.75	2.805	1.596	100	0.10	0.820	86.2	Infin	0.730	0.579	NonLiq
10	47.25	2.835	1.610	100	0.10	0.784	82.5	Infin	0.727	0.578	NonLiq
10	47.75	2.865	1.625	100	0.10	0.784	82.5	Infin	0.724	0.577	NonLiq
10	48.25	2.895	1.639	100	0.10	0.784	82.5	Infin	0.721	0.576	NonLiq
10	48.75	2.925	1.654	100	0.10	0.784	82.5	Infin	0.718	0.574	NonLiq
10	49.25	2.955	1.668	100	0.10	0.784	82.5	Infin	0.715	0.573	NonLiq
10	49.75	2.985	1.682	100	0.10	0.784	82.5	Infin	0.712	0.572	NonLiq
10	50.25	3.015	1.697	100	0.10	0.784	82.5	Infin	0.709	0.570	NonLiq
10	50.75	3.045	1.711	100	0.10	0.784	82.5	Infin	0.706	0.569	NonLiq
10	51.25	3.075	1.726	100	0.10	0.784	82.5	Infin	0.703	0.567	NonLiq
10	51.75	3.105	1.740	100	0.10	0.784	82.5	Infin	0.700	0.566	NonLiq

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LIQUEFACTION ANALYSIS SUMMARY

PAGE 1

File Name: 16803.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1) 60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
1	0.25	0.015	0.015	14	0.03	*	*	*	*	*	**
1	0.75	0.045	0.045	14	0.03	*	*	*	*	*	**
1	1.25	0.075	0.075	14	0.03	*	*	*	*	*	**
1	1.75	0.105	0.105	14	0.03	*	*	*	*	*	**
1	2.25	0.135	0.135	14	0.03	*	*	*	*	*	**
1	2.75	0.165	0.165	14	0.03	*	*	*	*	*	**
1	3.25	0.195	0.195	14	0.03	*	*	*	*	*	**
1	3.75	0.225	0.225	14	0.03	*	*	*	*	*	**
1	4.25	0.255	0.255	14	0.03	*	*	*	*	*	**
1	4.75	0.285	0.285	14	0.03	*	*	*	*	*	**
1	5.25	0.315	0.315	14	0.03	*	*	*	*	*	**
1	5.75	0.345	0.345	14	0.03	*	*	*	*	*	**
1	6.25	0.375	0.375	14	0.03	*	*	*	*	*	**
1	6.75	0.405	0.405	14	0.03	*	*	*	*	*	**
2	7.25	0.435	0.435	13	0.02	*	*	*	*	*	**
2	7.75	0.465	0.465	13	0.02	*	*	*	*	*	**
2	8.25	0.495	0.487	13	0.02	1.384	14.5	0.158	0.971	0.464	0.44
2	8.75	0.525	0.502	13	0.02	1.384	14.5	0.158	0.968	0.473	0.43
2	9.25	0.555	0.516	13	0.02	1.384	14.5	0.158	0.964	0.481	0.42
2	9.75	0.585	0.530	13	0.02	1.384	14.5	0.158	0.961	0.489	0.41
2	10.25	0.615	0.545	13	0.02	1.384	14.5	0.158	0.958	0.497	0.41
2	10.75	0.645	0.559	13	0.02	1.384	14.5	0.158	0.955	0.504	0.40
2	11.25	0.675	0.574	13	0.02	1.384	14.5	0.158	0.952	0.510	0.40
2	11.75	0.705	0.588	13	0.02	1.384	14.5	0.158	0.948	0.516	0.39
3	12.25	0.735	0.602	22	0.03	1.231	24.7	0.281	0.945	0.522	0.69
3	12.75	0.765	0.617	22	0.03	1.231	24.7	0.281	0.942	0.528	0.68
3	13.25	0.795	0.631	22	0.03	1.231	24.7	0.281	0.939	0.533	0.67
3	13.75	0.825	0.646	22	0.03	1.231	24.7	0.281	0.936	0.538	0.67
3	14.25	0.855	0.660	22	0.03	1.231	24.7	0.281	0.932	0.543	0.66
3	14.75	0.885	0.674	22	0.03	1.231	24.7	0.281	0.929	0.547	0.66
3	15.25	0.915	0.689	22	0.03	1.231	24.7	0.281	0.926	0.551	0.65
3	15.75	0.945	0.703	22	0.03	1.231	24.7	0.281	0.923	0.555	0.65
3	16.25	0.975	0.718	22	0.03	1.231	24.7	0.281	0.920	0.559	0.64
3	16.75	1.005	0.732	22	0.03	1.231	24.7	0.281	0.916	0.563	0.64
4	17.25	1.035	0.746	30	0.04	1.120	33.1	Infin	0.913	0.566	NonLiq
4	17.75	1.065	0.761	30	0.04	1.120	33.1	Infin	0.910	0.569	NonLiq
4	18.25	1.095	0.775	30	0.04	1.120	33.1	Infin	0.907	0.572	NonLiq
4	18.75	1.125	0.790	30	0.04	1.120	33.1	Infin	0.904	0.575	NonLiq
4	19.25	1.155	0.804	30	0.04	1.120	33.1	Infin	0.900	0.577	NonLiq
4	19.75	1.185	0.818	30	0.04	1.120	33.1	Infin	0.897	0.580	NonLiq
4	20.25	1.215	0.833	30	0.04	1.120	33.1	Infin	0.894	0.582	NonLiq
4	20.75	1.245	0.847	30	0.04	1.120	33.1	Infin	0.891	0.584	NonLiq
4	21.25	1.275	0.862	30	0.04	1.120	33.1	Infin	0.888	0.586	NonLiq

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LIQUEFACTION ANALYSIS SUMMARY

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File Name: 16803.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
4	21.75	1.305	0.876	30	0.04	1.120	33.1	Infin	0.884	0.588	NonLiq
5	22.25	1.335	0.890	25	0.03	1.034	26.8	0.321	0.881	0.589	0.70
5	22.75	1.365	0.905	25	0.03	1.034	26.8	0.321	0.878	0.591	0.70
5	23.25	1.395	0.919	25	0.03	1.034	26.8	0.321	0.875	0.592	0.69
5	23.75	1.425	0.934	25	0.03	1.034	26.8	0.321	0.872	0.594	0.69
5	24.25	1.455	0.948	25	0.03	1.034	26.8	0.321	0.868	0.595	0.69
5	24.75	1.485	0.962	25	0.03	1.034	26.8	0.321	0.865	0.596	0.69
5	25.25	1.515	0.977	25	0.03	1.034	26.8	0.321	0.862	0.597	0.69
5	25.75	1.545	0.991	25	0.03	1.034	26.8	0.321	0.859	0.598	0.69
5	26.25	1.575	1.006	25	0.03	1.034	26.8	0.321	0.856	0.599	0.69
5	26.75	1.605	1.020	25	0.03	1.034	26.8	0.321	0.853	0.599	0.69
6	27.25	1.635	1.034	24	0.03	0.965	24.4	0.271	0.850	0.600	0.58
6	27.75	1.665	1.049	24	0.03	0.965	24.4	0.271	0.846	0.601	0.58
6	28.25	1.695	1.063	24	0.03	0.965	24.4	0.271	0.843	0.601	0.58
6	28.75	1.725	1.078	24	0.03	0.965	24.4	0.271	0.840	0.601	0.58
6	29.25	1.755	1.092	24	0.03	0.965	24.4	0.271	0.837	0.602	0.58
6	29.75	1.785	1.106	24	0.03	0.965	24.4	0.271	0.834	0.602	0.58
6	30.25	1.815	1.121	24	0.03	0.965	24.4	0.271	0.831	0.602	0.58
6	30.75	1.845	1.135	24	0.03	0.965	24.4	0.271	0.828	0.602	0.58
6	31.25	1.875	1.150	24	0.03	0.965	24.4	0.271	0.824	0.602	0.58
6	31.75	1.905	1.164	24	0.03	0.965	24.4	0.271	0.821	0.602	0.58
7	32.25	1.935	1.178	62	0.07	0.909	59.2	Infin	0.818	0.602	NonLiq
7	32.75	1.965	1.193	62	0.07	0.909	59.2	Infin	0.815	0.602	NonLiq
7	33.25	1.995	1.207	62	0.07	0.909	59.2	Infin	0.812	0.602	NonLiq
7	33.75	2.025	1.222	62	0.07	0.909	59.2	Infin	0.809	0.601	NonLiq
7	34.25	2.055	1.236	62	0.07	0.909	59.2	Infin	0.806	0.601	NonLiq
7	34.75	2.085	1.250	62	0.07	0.909	59.2	Infin	0.803	0.601	NonLiq
7	35.25	2.115	1.265	62	0.07	0.909	59.2	Infin	0.799	0.600	NonLiq
7	35.75	2.145	1.279	62	0.07	0.909	59.2	Infin	0.796	0.600	NonLiq
7	36.25	2.175	1.294	62	0.07	0.909	59.2	Infin	0.793	0.599	NonLiq
7	36.75	2.205	1.308	62	0.07	0.909	59.2	Infin	0.790	0.599	NonLiq
8	37.25	2.235	1.322	90	0.09	0.784	74.2	Infin	0.787	0.598	NonLiq
8	37.75	2.265	1.337	90	0.09	0.784	74.2	Infin	0.784	0.597	NonLiq
8	38.25	2.295	1.351	90	0.09	0.784	74.2	Infin	0.781	0.597	NonLiq
8	38.75	2.325	1.366	90	0.09	0.784	74.2	Infin	0.778	0.596	NonLiq
8	39.25	2.355	1.380	90	0.09	0.784	74.2	Infin	0.775	0.595	NonLiq
8	39.75	2.385	1.394	90	0.09	0.784	74.2	Infin	0.772	0.594	NonLiq
8	40.25	2.415	1.409	90	0.09	0.784	74.2	Infin	0.769	0.593	NonLiq
8	40.75	2.445	1.423	90	0.09	0.784	74.2	Infin	0.766	0.592	NonLiq
8	41.25	2.475	1.438	90	0.09	0.784	74.2	Infin	0.763	0.592	NonLiq
8	41.75	2.505	1.452	90	0.09	0.784	74.2	Infin	0.760	0.591	NonLiq
8	42.25	2.535	1.466	90	0.09	0.784	74.2	Infin	0.757	0.590	NonLiq
8	42.75	2.565	1.481	90	0.09	0.784	74.2	Infin	0.754	0.589	NonLiq
8	43.25	2.595	1.495	90	0.09	0.784	74.2	Infin	0.751	0.588	NonLiq

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LIQUEFACTION ANALYSIS SUMMARY

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File Name: 16803.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
8	43.75	2.625	1.510	90	0.09	0.784	74.2	Infin	0.748	0.586	NonLiq
8	44.25	2.655	1.524	90	0.09	0.784	74.2	Infin	0.745	0.585	NonLiq
8	44.75	2.685	1.538	90	0.09	0.784	74.2	Infin	0.742	0.584	NonLiq
8	45.25	2.715	1.553	90	0.09	0.784	74.2	Infin	0.739	0.583	NonLiq
8	45.75	2.745	1.567	90	0.09	0.784	74.2	Infin	0.736	0.582	NonLiq
8	46.25	2.775	1.582	90	0.09	0.784	74.2	Infin	0.733	0.581	NonLiq
8	46.75	2.805	1.596	90	0.09	0.784	74.2	Infin	0.730	0.579	NonLiq
8	47.25	2.835	1.610	90	0.09	0.784	74.2	Infin	0.727	0.578	NonLiq
8	47.75	2.865	1.625	90	0.09	0.784	74.2	Infin	0.724	0.577	NonLiq
8	48.25	2.895	1.639	90	0.09	0.784	74.2	Infin	0.721	0.576	NonLiq
8	48.75	2.925	1.654	90	0.09	0.784	74.2	Infin	0.718	0.574	NonLiq
8	49.25	2.955	1.668	90	0.09	0.784	74.2	Infin	0.715	0.573	NonLiq
8	49.75	2.985	1.682	90	0.09	0.784	74.2	Infin	0.712	0.572	NonLiq
8	50.25	3.015	1.697	90	0.09	0.784	74.2	Infin	0.709	0.570	NonLiq
8	50.75	3.045	1.711	90	0.09	0.784	74.2	Infin	0.706	0.569	NonLiq
8	51.25	3.075	1.726	90	0.09	0.784	74.2	Infin	0.703	0.567	NonLiq
8	51.75	3.105	1.740	90	0.09	0.784	74.2	Infin	0.700	0.566	NonLiq
8	52.25	3.135	1.754	90	0.09	0.784	74.2	Infin	0.697	0.565	NonLiq
8	52.75	3.165	1.769	90	0.09	0.784	74.2	Infin	0.694	0.563	NonLiq
8	53.25	3.195	1.783	90	0.09	0.784	74.2	Infin	0.691	0.562	NonLiq
8	53.75	3.225	1.798	90	0.09	0.784	74.2	Infin	0.689	0.560	NonLiq
8	54.25	3.255	1.812	90	0.09	0.784	74.2	Infin	0.686	0.559	NonLiq
8	54.75	3.285	1.826	90	0.09	0.784	74.2	Infin	0.683	0.557	NonLiq

File Name: 16804.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1) 60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
1	0.25	0.015	0.015	6	0.01	*	*	*	*	*	**
1	0.75	0.045	0.045	6	0.01	*	*	*	*	*	**
1	1.25	0.075	0.075	6	0.01	*	*	*	*	*	**
1	1.75	0.105	0.105	6	0.01	*	*	*	*	*	**
1	2.25	0.135	0.135	6	0.01	*	*	*	*	*	**
1	2.75	0.165	0.165	6	0.01	*	*	*	*	*	**
1	3.25	0.195	0.195	6	0.01	*	*	*	*	*	**
1	3.75	0.225	0.225	6	0.01	*	*	*	*	*	**
1	4.25	0.255	0.255	6	0.01	*	*	*	*	*	**
1	4.75	0.285	0.285	6	0.01	*	*	*	*	*	**
1	5.25	0.315	0.315	6	0.01	*	*	*	*	*	**
1	5.75	0.345	0.345	6	0.01	*	*	*	*	*	**
1	6.25	0.375	0.375	6	0.01	*	*	*	*	*	**
1	6.75	0.405	0.405	6	0.01	*	*	*	*	*	**
2	7.25	0.435	0.435	8	0.01	*	*	*	*	*	**
2	7.75	0.465	0.465	8	0.01	*	*	*	*	*	**
2	8.25	0.495	0.487	8	0.01	1.384	8.9	0.098	0.971	0.464	0.27
2	8.75	0.525	0.502	8	0.01	1.384	8.9	0.098	0.968	0.473	0.27
2	9.25	0.555	0.516	8	0.01	1.384	8.9	0.098	0.964	0.481	0.26
2	9.75	0.585	0.530	8	0.01	1.384	8.9	0.098	0.961	0.489	0.26
2	10.25	0.615	0.545	8	0.01	1.384	8.9	0.098	0.958	0.497	0.25
2	10.75	0.645	0.559	8	0.01	1.384	8.9	0.098	0.955	0.504	0.25
2	11.25	0.675	0.574	8	0.01	1.384	8.9	0.098	0.952	0.510	0.25
2	11.75	0.705	0.588	8	0.01	1.384	8.9	0.098	0.948	0.516	0.24
3	12.25	0.735	0.602	21	0.03	1.231	23.6	0.264	0.945	0.522	0.65
3	12.75	0.765	0.617	21	0.03	1.231	23.6	0.264	0.942	0.528	0.64
3	13.25	0.795	0.631	21	0.03	1.231	23.6	0.264	0.939	0.533	0.63
3	13.75	0.825	0.646	21	0.03	1.231	23.6	0.264	0.936	0.538	0.63
3	14.25	0.855	0.660	21	0.03	1.231	23.6	0.264	0.932	0.543	0.62
3	14.75	0.885	0.674	21	0.03	1.231	23.6	0.264	0.929	0.547	0.62
3	15.25	0.915	0.689	21	0.03	1.231	23.6	0.264	0.926	0.551	0.61
3	15.75	0.945	0.703	21	0.03	1.231	23.6	0.264	0.923	0.555	0.61
3	16.25	0.975	0.718	21	0.03	1.231	23.6	0.264	0.920	0.559	0.60
3	16.75	1.005	0.732	21	0.03	1.231	23.6	0.264	0.916	0.563	0.60
4	17.25	1.035	0.746	13	~	~	~	~	~	~	~~
4	17.75	1.065	0.761	13	~	~	~	~	~	~	~~
4	18.25	1.095	0.775	13	~	~	~	~	~	~	~~
4	18.75	1.125	0.790	13	~	~	~	~	~	~	~~
4	19.25	1.155	0.804	13	~	~	~	~	~	~	~~
4	19.75	1.185	0.818	13	~	~	~	~	~	~	~~
4	20.25	1.215	0.833	13	~	~	~	~	~	~	~~
4	20.75	1.245	0.847	13	~	~	~	~	~	~	~~
4	21.25	1.275	0.862	13	~	~	~	~	~	~	~~

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LIQUEFACTION ANALYSIS SUMMARY

PAGE 2

File Name: 16804.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
4	21.75	1.305	0.876	13	~	~	~	~	~	~	~~
5	22.25	1.335	0.890	12	~	~	~	~	~	~	~~
5	22.75	1.365	0.905	12	~	~	~	~	~	~	~~
5	23.25	1.395	0.919	12	~	~	~	~	~	~	~~
5	23.75	1.425	0.934	12	~	~	~	~	~	~	~~
5	24.25	1.455	0.948	12	~	~	~	~	~	~	~~
5	24.75	1.485	0.962	12	~	~	~	~	~	~	~~
5	25.25	1.515	0.977	12	~	~	~	~	~	~	~~
5	25.75	1.545	0.991	12	~	~	~	~	~	~	~~
5	26.25	1.575	1.006	12	~	~	~	~	~	~	~~
5	26.75	1.605	1.020	12	~	~	~	~	~	~	~~
6	27.25	1.635	1.034	28	~	~	~	~	~	~	~~
6	27.75	1.665	1.049	28	~	~	~	~	~	~	~~
6	28.25	1.695	1.063	28	~	~	~	~	~	~	~~
6	28.75	1.725	1.078	28	~	~	~	~	~	~	~~
6	29.25	1.755	1.092	28	~	~	~	~	~	~	~~
6	29.75	1.785	1.106	28	~	~	~	~	~	~	~~
7	30.25	1.815	1.121	46	0.05	0.909	43.9	Infin	0.831	0.602	NonLiq
7	30.75	1.845	1.135	46	0.05	0.909	43.9	Infin	0.828	0.602	NonLiq
7	31.25	1.875	1.150	46	0.05	0.909	43.9	Infin	0.824	0.602	NonLiq
7	31.75	1.905	1.164	46	0.05	0.909	43.9	Infin	0.821	0.602	NonLiq
7	32.25	1.935	1.178	46	0.05	0.909	43.9	Infin	0.818	0.602	NonLiq
7	32.75	1.965	1.193	46	0.05	0.909	43.9	Infin	0.815	0.602	NonLiq
7	33.25	1.995	1.207	46	0.05	0.909	43.9	Infin	0.812	0.602	NonLiq
7	33.75	2.025	1.222	46	0.05	0.909	43.9	Infin	0.809	0.601	NonLiq
7	34.25	2.055	1.236	46	0.05	0.909	43.9	Infin	0.806	0.601	NonLiq
7	34.75	2.085	1.250	46	0.05	0.909	43.9	Infin	0.803	0.601	NonLiq
7	35.25	2.115	1.265	46	0.05	0.909	43.9	Infin	0.799	0.600	NonLiq
7	35.75	2.145	1.279	46	0.05	0.909	43.9	Infin	0.796	0.600	NonLiq
7	36.25	2.175	1.294	46	0.05	0.909	43.9	Infin	0.793	0.599	NonLiq
7	36.75	2.205	1.308	46	0.05	0.909	43.9	Infin	0.790	0.599	NonLiq
8	37.25	2.235	1.322	40	0.05	0.861	36.2	Infin	0.787	0.598	NonLiq
8	37.75	2.265	1.337	40	0.05	0.861	36.2	Infin	0.784	0.597	NonLiq
8	38.25	2.295	1.351	40	0.05	0.861	36.2	Infin	0.781	0.597	NonLiq
8	38.75	2.325	1.366	40	0.05	0.861	36.2	Infin	0.778	0.596	NonLiq
8	39.25	2.355	1.380	40	0.05	0.861	36.2	Infin	0.775	0.595	NonLiq
8	39.75	2.385	1.394	40	0.05	0.861	36.2	Infin	0.772	0.594	NonLiq
8	40.25	2.415	1.409	40	0.05	0.861	36.2	Infin	0.769	0.593	NonLiq
8	40.75	2.445	1.423	40	0.05	0.861	36.2	Infin	0.766	0.592	NonLiq
8	41.25	2.475	1.438	40	0.05	0.861	36.2	Infin	0.763	0.592	NonLiq
8	41.75	2.505	1.452	40	0.05	0.861	36.2	Infin	0.760	0.591	NonLiq
9	42.25	2.535	1.466	80	0.08	0.820	69.0	Infin	0.757	0.590	NonLiq
9	42.75	2.565	1.481	80	0.08	0.820	69.0	Infin	0.754	0.589	NonLiq
9	43.25	2.595	1.495	80	0.08	0.820	69.0	Infin	0.751	0.588	NonLiq

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LIQUEFACTION ANALYSIS SUMMARY

PAGE 3

File Name: 16804.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
9	43.75	2.625	1.510	80	0.08	0.820	69.0	Infin	0.748	0.586	NonLiq
9	44.25	2.655	1.524	80	0.08	0.820	69.0	Infin	0.745	0.585	NonLiq
9	44.75	2.685	1.538	80	0.08	0.820	69.0	Infin	0.742	0.584	NonLiq
9	45.25	2.715	1.553	80	0.08	0.820	69.0	Infin	0.739	0.583	NonLiq
9	45.75	2.745	1.567	80	0.08	0.820	69.0	Infin	0.736	0.582	NonLiq
9	46.25	2.775	1.582	80	0.08	0.820	69.0	Infin	0.733	0.581	NonLiq
9	46.75	2.805	1.596	80	0.08	0.820	69.0	Infin	0.730	0.579	NonLiq
10	47.25	2.835	1.610	60	0.06	0.784	49.5	Infin	0.727	0.578	NonLiq
10	47.75	2.865	1.625	60	0.06	0.784	49.5	Infin	0.724	0.577	NonLiq
10	48.25	2.895	1.639	60	0.06	0.784	49.5	Infin	0.721	0.576	NonLiq
10	48.75	2.925	1.654	60	0.06	0.784	49.5	Infin	0.718	0.574	NonLiq
10	49.25	2.955	1.668	60	0.06	0.784	49.5	Infin	0.715	0.573	NonLiq
10	49.75	2.985	1.682	60	0.06	0.784	49.5	Infin	0.712	0.572	NonLiq
10	50.25	3.015	1.697	60	0.06	0.784	49.5	Infin	0.709	0.570	NonLiq
10	50.75	3.045	1.711	60	0.06	0.784	49.5	Infin	0.706	0.569	NonLiq
10	51.25	3.075	1.726	60	0.06	0.784	49.5	Infin	0.703	0.567	NonLiq
10	51.75	3.105	1.740	60	0.06	0.784	49.5	Infin	0.700	0.566	NonLiq
10	52.25	3.135	1.754	60	0.06	0.784	49.5	Infin	0.697	0.565	NonLiq
10	52.75	3.165	1.769	60	0.06	0.784	49.5	Infin	0.694	0.563	NonLiq
10	53.25	3.195	1.783	60	0.06	0.784	49.5	Infin	0.691	0.562	NonLiq
10	53.75	3.225	1.798	60	0.06	0.784	49.5	Infin	0.689	0.560	NonLiq
10	54.25	3.255	1.812	60	0.06	0.784	49.5	Infin	0.686	0.559	NonLiq
10	54.75	3.285	1.826	60	0.06	0.784	49.5	Infin	0.683	0.557	NonLiq

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LIQUEFACTION ANALYSIS SUMMARY

PAGE 1

File Name: 16805.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
1	0.25	0.015	0.015	50	0.37	*	*	*	*	*	**
1	0.75	0.045	0.045	50	0.37	*	*	*	*	*	**
1	1.25	0.075	0.075	50	0.37	*	*	*	*	*	**
1	1.75	0.105	0.105	50	0.37	*	*	*	*	*	**
1	2.25	0.135	0.135	50	0.37	*	*	*	*	*	**
1	2.75	0.165	0.165	50	0.37	*	*	*	*	*	**
1	3.25	0.195	0.195	50	0.37	*	*	*	*	*	**
1	3.75	0.225	0.225	50	0.37	*	*	*	*	*	**
1	4.25	0.255	0.255	50	0.37	*	*	*	*	*	**
1	4.75	0.285	0.285	50	0.37	*	*	*	*	*	**
1	5.25	0.315	0.315	50	0.37	*	*	*	*	*	**
1	5.75	0.345	0.345	50	0.37	*	*	*	*	*	**
1	6.25	0.375	0.375	50	0.37	*	*	*	*	*	**
1	6.75	0.405	0.405	50	0.37	*	*	*	*	*	**
2	7.25	0.435	0.435	73	0.41	*	*	*	*	*	**
2	7.75	0.465	0.465	73	0.41	*	*	*	*	*	**
2	8.25	0.495	0.487	73	0.41	1.384	81.5	Infin	0.971	0.464	NonLiq
2	8.75	0.525	0.502	73	0.41	1.384	81.5	Infin	0.968	0.473	NonLiq
2	9.25	0.555	0.516	73	0.41	1.384	81.5	Infin	0.964	0.481	NonLiq
2	9.75	0.585	0.530	73	0.41	1.384	81.5	Infin	0.961	0.489	NonLiq
2	10.25	0.615	0.545	73	0.41	1.384	81.5	Infin	0.958	0.497	NonLiq
2	10.75	0.645	0.559	73	0.41	1.384	81.5	Infin	0.955	0.504	NonLiq
3	11.25	0.675	0.574	11	~	~	~	~	~	~	~~
3	11.75	0.705	0.588	11	~	~	~	~	~	~	~~
3	12.25	0.735	0.602	11	~	~	~	~	~	~	~~
3	12.75	0.765	0.617	11	~	~	~	~	~	~	~~
3	13.25	0.795	0.631	11	~	~	~	~	~	~	~~
3	13.75	0.825	0.646	11	~	~	~	~	~	~	~~
3	14.25	0.855	0.660	11	~	~	~	~	~	~	~~
3	14.75	0.885	0.674	11	~	~	~	~	~	~	~~
3	15.25	0.915	0.689	11	~	~	~	~	~	~	~~
3	15.75	0.945	0.703	11	~	~	~	~	~	~	~~
3	16.25	0.975	0.718	11	~	~	~	~	~	~	~~
3	16.75	1.005	0.732	11	~	~	~	~	~	~	~~
4	17.25	1.035	0.746	24	~	~	~	~	~	~	~~
4	17.75	1.065	0.761	24	~	~	~	~	~	~	~~
4	18.25	1.095	0.775	24	~	~	~	~	~	~	~~
4	18.75	1.125	0.790	24	~	~	~	~	~	~	~~
4	19.25	1.155	0.804	24	~	~	~	~	~	~	~~
4	19.75	1.185	0.818	24	~	~	~	~	~	~	~~
4	20.25	1.215	0.833	24	~	~	~	~	~	~	~~
4	20.75	1.245	0.847	24	~	~	~	~	~	~	~~
4	21.25	1.275	0.862	24	~	~	~	~	~	~	~~

File Name: 16805.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA NL_60	C N	CORR. (NL) 60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
4	21.75	1.305	0.876	24	~	~	~	~	~	~	~~
4	22.25	1.335	0.890	24	~	~	~	~	~	~	~~
4	22.75	1.365	0.905	24	~	~	~	~	~	~	~~
4	23.25	1.395	0.919	24	~	~	~	~	~	~	~~
4	23.75	1.425	0.934	24	~	~	~	~	~	~	~~
4	24.25	1.455	0.948	24	~	~	~	~	~	~	~~
4	24.75	1.485	0.962	24	~	~	~	~	~	~	~~
5	25.25	1.515	0.977	23	0.15	1.034	24.8	0.283	0.862	0.597	0.61
5	25.75	1.545	0.991	23	0.15	1.034	24.8	0.283	0.859	0.598	0.61
5	26.25	1.575	1.006	23	0.15	1.034	24.8	0.283	0.856	0.599	0.61
5	26.75	1.605	1.020	23	0.15	1.034	24.8	0.283	0.853	0.599	0.60
6	27.25	1.635	1.034	31	0.18	0.965	31.6	Infin	0.850	0.600	NonLiq
6	27.75	1.665	1.049	31	0.18	0.965	31.6	Infin	0.846	0.601	NonLiq
6	28.25	1.695	1.063	31	0.18	0.965	31.6	Infin	0.843	0.601	NonLiq
6	28.75	1.725	1.078	31	0.18	0.965	31.6	Infin	0.840	0.601	NonLiq
6	29.25	1.755	1.092	31	0.18	0.965	31.6	Infin	0.837	0.602	NonLiq
6	29.75	1.785	1.106	31	0.18	0.965	31.6	Infin	0.834	0.602	NonLiq
6	30.25	1.815	1.121	31	0.18	0.965	31.6	Infin	0.831	0.602	NonLiq
6	30.75	1.845	1.135	31	0.18	0.965	31.6	Infin	0.828	0.602	NonLiq
6	31.25	1.875	1.150	31	0.18	0.965	31.6	Infin	0.824	0.602	NonLiq
6	31.75	1.905	1.164	31	0.18	0.965	31.6	Infin	0.821	0.602	NonLiq
7	32.25	1.935	1.178	38	0.20	0.909	36.5	Infin	0.818	0.602	NonLiq
7	32.75	1.965	1.193	38	0.20	0.909	36.5	Infin	0.815	0.602	NonLiq
7	33.25	1.995	1.207	38	0.20	0.909	36.5	Infin	0.812	0.602	NonLiq
7	33.75	2.025	1.222	38	0.20	0.909	36.5	Infin	0.809	0.601	NonLiq
7	34.25	2.055	1.236	38	0.20	0.909	36.5	Infin	0.806	0.601	NonLiq
7	34.75	2.085	1.250	38	0.20	0.909	36.5	Infin	0.803	0.601	NonLiq
7	35.25	2.115	1.265	38	0.20	0.909	36.5	Infin	0.799	0.600	NonLiq
7	35.75	2.145	1.279	38	0.20	0.909	36.5	Infin	0.796	0.600	NonLiq
7	36.25	2.175	1.294	38	0.20	0.909	36.5	Infin	0.793	0.599	NonLiq
7	36.75	2.205	1.308	38	0.20	0.909	36.5	Infin	0.790	0.599	NonLiq
7	37.25	2.235	1.322	38	0.20	0.909	36.5	Infin	0.787	0.598	NonLiq
7	37.75	2.265	1.337	38	0.20	0.909	36.5	Infin	0.784	0.597	NonLiq
7	38.25	2.295	1.351	38	0.20	0.909	36.5	Infin	0.781	0.597	NonLiq
7	38.75	2.325	1.366	38	0.20	0.909	36.5	Infin	0.778	0.596	NonLiq
7	39.25	2.355	1.380	38	0.20	0.909	36.5	Infin	0.775	0.595	NonLiq
7	39.75	2.385	1.394	38	0.20	0.909	36.5	Infin	0.772	0.594	NonLiq
8	40.25	2.415	1.409	8	~	~	~	~	~	~	~~
8	40.75	2.445	1.423	8	~	~	~	~	~	~	~~
8	41.25	2.475	1.438	8	~	~	~	~	~	~	~~
8	41.75	2.505	1.452	8	~	~	~	~	~	~	~~
9	42.25	2.535	1.466	13	~	~	~	~	~	~	~~
9	42.75	2.565	1.481	13	~	~	~	~	~	~	~~
9	43.25	2.595	1.495	13	~	~	~	~	~	~	~~

File Name: 16805.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA NL_60	C N	CORR. (NL) 60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
9	43.75	2.625	1.510	13	~	~	~	~	~	~	~~
9	44.25	2.655	1.524	13	~	~	~	~	~	~	~~
9	44.75	2.685	1.538	13	~	~	~	~	~	~	~~
9	45.25	2.715	1.553	13	~	~	~	~	~	~	~~
9	45.75	2.745	1.567	13	~	~	~	~	~	~	~~
9	46.25	2.775	1.582	13	~	~	~	~	~	~	~~
9	46.75	2.805	1.596	13	~	~	~	~	~	~	~~
10	47.25	2.835	1.610	13	~	~	~	~	~	~	~~
10	47.75	2.865	1.625	13	~	~	~	~	~	~	~~
10	48.25	2.895	1.639	13	~	~	~	~	~	~	~~
10	48.75	2.925	1.654	13	~	~	~	~	~	~	~~
10	49.25	2.955	1.668	13	~	~	~	~	~	~	~~
10	49.75	2.985	1.682	13	~	~	~	~	~	~	~~
10	50.25	3.015	1.697	13	~	~	~	~	~	~	~~
10	50.75	3.045	1.711	13	~	~	~	~	~	~	~~
10	51.25	3.075	1.726	13	~	~	~	~	~	~	~~
10	51.75	3.105	1.740	13	~	~	~	~	~	~	~~

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LIQUEFACTION ANALYSIS SUMMARY

PAGE 1

File Name: 16806.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1) 60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
1	0.25	0.015	0.015	8	0.02	*	*	*	*	*	**
1	0.75	0.045	0.045	8	0.02	*	*	*	*	*	**
1	1.25	0.075	0.075	8	0.02	*	*	*	*	*	**
1	1.75	0.105	0.105	8	0.02	*	*	*	*	*	**
1	2.25	0.135	0.135	8	0.02	*	*	*	*	*	**
1	2.75	0.165	0.165	8	0.02	*	*	*	*	*	**
1	3.25	0.195	0.195	8	0.02	*	*	*	*	*	**
1	3.75	0.225	0.225	8	0.02	*	*	*	*	*	**
1	4.25	0.255	0.255	8	0.02	*	*	*	*	*	**
1	4.75	0.285	0.285	8	0.02	*	*	*	*	*	**
1	5.25	0.315	0.315	8	0.02	*	*	*	*	*	**
1	5.75	0.345	0.345	8	0.02	*	*	*	*	*	**
1	6.25	0.375	0.375	8	0.02	*	*	*	*	*	**
1	6.75	0.405	0.405	8	0.02	*	*	*	*	*	**
2	7.25	0.435	0.435	9	0.01	*	*	*	*	*	**
2	7.75	0.465	0.465	9	0.01	*	*	*	*	*	**
2	8.25	0.495	0.487	9	0.01	1.384	10.0	0.110	0.971	0.464	0.30
2	8.75	0.525	0.502	9	0.01	1.384	10.0	0.110	0.968	0.473	0.30
2	9.25	0.555	0.516	9	0.01	1.384	10.0	0.110	0.964	0.481	0.29
2	9.75	0.585	0.530	9	0.01	1.384	10.0	0.110	0.961	0.489	0.29
2	10.25	0.615	0.545	9	0.01	1.384	10.0	0.110	0.958	0.497	0.28
2	10.75	0.645	0.559	9	0.01	1.384	10.0	0.110	0.955	0.504	0.28
2	11.25	0.675	0.574	9	0.01	1.384	10.0	0.110	0.952	0.510	0.28
2	11.75	0.705	0.588	9	0.01	1.384	10.0	0.110	0.948	0.516	0.27
3	12.25	0.735	0.602	20	0.03	1.231	22.5	0.248	0.945	0.522	0.61
3	12.75	0.765	0.617	20	0.03	1.231	22.5	0.248	0.942	0.528	0.60
3	13.25	0.795	0.631	20	0.03	1.231	22.5	0.248	0.939	0.533	0.60
3	13.75	0.825	0.646	20	0.03	1.231	22.5	0.248	0.936	0.538	0.59
3	14.25	0.855	0.660	20	0.03	1.231	22.5	0.248	0.932	0.543	0.59
3	14.75	0.885	0.674	20	0.03	1.231	22.5	0.248	0.929	0.547	0.58
3	15.25	0.915	0.689	20	0.03	1.231	22.5	0.248	0.926	0.551	0.58
3	15.75	0.945	0.703	20	0.03	1.231	22.5	0.248	0.923	0.555	0.57
3	16.25	0.975	0.718	20	0.03	1.231	22.5	0.248	0.920	0.559	0.57
3	16.75	1.005	0.732	20	0.03	1.231	22.5	0.248	0.916	0.563	0.56
3	17.25	1.035	0.746	20	0.03	1.231	22.5	0.248	0.913	0.566	0.56
3	17.75	1.065	0.761	20	0.03	1.231	22.5	0.248	0.910	0.569	0.56
3	18.25	1.095	0.775	20	0.03	1.231	22.5	0.248	0.907	0.572	0.56
3	18.75	1.125	0.790	20	0.03	1.231	22.5	0.248	0.904	0.575	0.55
3	19.25	1.155	0.804	20	0.03	1.231	22.5	0.248	0.900	0.577	0.55
3	19.75	1.185	0.818	20	0.03	1.231	22.5	0.248	0.897	0.580	0.55
4	20.25	1.215	0.833	8	~	~	~	~	~	~	~~
4	20.75	1.245	0.847	8	~	~	~	~	~	~	~~
4	21.25	1.275	0.862	8	~	~	~	~	~	~	~~

NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

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File Name: 16806.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
4	21.75	1.305	0.876	8	~	~	~	~	~	~	~~
5	22.25	1.335	0.890	11	~	~	~	~	~	~	~~
5	22.75	1.365	0.905	11	~	~	~	~	~	~	~~
5	23.25	1.395	0.919	11	~	~	~	~	~	~	~~
5	23.75	1.425	0.934	11	~	~	~	~	~	~	~~
5	24.25	1.455	0.948	11	~	~	~	~	~	~	~~
5	24.75	1.485	0.962	11	~	~	~	~	~	~	~~
5	25.25	1.515	0.977	11	~	~	~	~	~	~	~~
5	25.75	1.545	0.991	11	~	~	~	~	~	~	~~
5	26.25	1.575	1.006	11	~	~	~	~	~	~	~~
5	26.75	1.605	1.020	11	~	~	~	~	~	~	~~
6	27.25	1.635	1.034	5	~	~	~	~	~	~	~~
6	27.75	1.665	1.049	5	~	~	~	~	~	~	~~
6	28.25	1.695	1.063	5	~	~	~	~	~	~	~~
6	28.75	1.725	1.078	5	~	~	~	~	~	~	~~
6	29.25	1.755	1.092	5	~	~	~	~	~	~	~~
6	29.75	1.785	1.106	5	~	~	~	~	~	~	~~
6	30.25	1.815	1.121	5	~	~	~	~	~	~	~~
6	30.75	1.845	1.135	5	~	~	~	~	~	~	~~
6	31.25	1.875	1.150	5	~	~	~	~	~	~	~~
6	31.75	1.905	1.164	5	~	~	~	~	~	~	~~
7	32.25	1.935	1.178	6	~	~	~	~	~	~	~~
7	32.75	1.965	1.193	6	~	~	~	~	~	~	~~
7	33.25	1.995	1.207	6	~	~	~	~	~	~	~~
7	33.75	2.025	1.222	6	~	~	~	~	~	~	~~
7	34.25	2.055	1.236	6	~	~	~	~	~	~	~~
7	34.75	2.085	1.250	6	~	~	~	~	~	~	~~
7	35.25	2.115	1.265	6	~	~	~	~	~	~	~~
7	35.75	2.145	1.279	6	~	~	~	~	~	~	~~
7	36.25	2.175	1.294	6	~	~	~	~	~	~	~~
7	36.75	2.205	1.308	6	~	~	~	~	~	~	~~
8	37.25	2.235	1.322	10	~	~	~	~	~	~	~~
8	37.75	2.265	1.337	10	~	~	~	~	~	~	~~
8	38.25	2.295	1.351	10	~	~	~	~	~	~	~~
8	38.75	2.325	1.366	10	~	~	~	~	~	~	~~
8	39.25	2.355	1.380	10	~	~	~	~	~	~	~~
8	39.75	2.385	1.394	10	~	~	~	~	~	~	~~
8	40.25	2.415	1.409	10	~	~	~	~	~	~	~~
8	40.75	2.445	1.423	10	~	~	~	~	~	~	~~
8	41.25	2.475	1.438	10	~	~	~	~	~	~	~~
8	41.75	2.505	1.452	10	~	~	~	~	~	~	~~
9	42.25	2.535	1.466	9	~	~	~	~	~	~	~~
9	42.75	2.565	1.481	9	~	~	~	~	~	~	~~
9	43.25	2.595	1.495	9	~	~	~	~	~	~	~~

NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

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File Name: 16806.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
9	43.75	2.625	1.510	9	~	~	~	~	~	~	~~
9	44.25	2.655	1.524	9	~	~	~	~	~	~	~~
9	44.75	2.685	1.538	9	~	~	~	~	~	~	~~
9	45.25	2.715	1.553	9	~	~	~	~	~	~	~~
9	45.75	2.745	1.567	9	~	~	~	~	~	~	~~
9	46.25	2.775	1.582	9	~	~	~	~	~	~	~~
9	46.75	2.805	1.596	9	~	~	~	~	~	~	~~
10	47.25	2.835	1.610	7	~	~	~	~	~	~	~~
10	47.75	2.865	1.625	7	~	~	~	~	~	~	~~
10	48.25	2.895	1.639	7	~	~	~	~	~	~	~~
10	48.75	2.925	1.654	7	~	~	~	~	~	~	~~
10	49.25	2.955	1.668	7	~	~	~	~	~	~	~~
10	49.75	2.985	1.682	7	~	~	~	~	~	~	~~
10	50.25	3.015	1.697	7	~	~	~	~	~	~	~~
10	50.75	3.045	1.711	7	~	~	~	~	~	~	~~
10	51.25	3.075	1.726	7	~	~	~	~	~	~	~~
10	51.75	3.105	1.740	7	~	~	~	~	~	~	~~
11	52.25	3.135	1.754	13	~	~	~	~	~	~	~~
11	52.75	3.165	1.769	13	~	~	~	~	~	~	~~
11	53.25	3.195	1.783	13	~	~	~	~	~	~	~~
11	53.75	3.225	1.798	13	~	~	~	~	~	~	~~
11	54.25	3.255	1.812	13	~	~	~	~	~	~	~~
11	54.75	3.285	1.826	13	~	~	~	~	~	~	~~
11	55.25	3.315	1.841	13	~	~	~	~	~	~	~~
11	55.75	3.345	1.855	13	~	~	~	~	~	~	~~
11	56.25	3.375	1.870	13	~	~	~	~	~	~	~~
11	56.75	3.405	1.884	13	~	~	~	~	~	~	~~
12	57.25	3.435	1.898	21	~	~	~	~	~	~	~~
12	57.75	3.465	1.913	21	~	~	~	~	~	~	~~
12	58.25	3.495	1.927	21	~	~	~	~	~	~	~~
12	58.75	3.525	1.942	21	~	~	~	~	~	~	~~
12	59.25	3.555	1.956	21	~	~	~	~	~	~	~~
12	59.75	3.585	1.970	21	~	~	~	~	~	~	~~
12	60.25	3.615	1.985	21	~	~	~	~	~	~	~~
12	60.75	3.645	1.999	21	~	~	~	~	~	~	~~
12	61.25	3.675	2.014	21	~	~	~	~	~	~	~~
12	61.75	3.705	2.028	21	~	~	~	~	~	~	~~

File Name: 16807.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1) 60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
1	0.25	0.015	0.015	6	0.07	*	*	*	*	*	**
1	0.75	0.045	0.045	6	0.07	*	*	*	*	*	**
1	1.25	0.075	0.075	6	0.07	*	*	*	*	*	**
1	1.75	0.105	0.105	6	0.07	*	*	*	*	*	**
1	2.25	0.135	0.135	6	0.07	*	*	*	*	*	**
1	2.75	0.165	0.165	6	0.07	*	*	*	*	*	**
1	3.25	0.195	0.195	6	0.07	*	*	*	*	*	**
1	3.75	0.225	0.225	6	0.07	*	*	*	*	*	**
1	4.25	0.255	0.255	6	0.07	*	*	*	*	*	**
1	4.75	0.285	0.285	6	0.07	*	*	*	*	*	**
1	5.25	0.315	0.315	6	0.07	*	*	*	*	*	**
1	5.75	0.345	0.345	6	0.07	*	*	*	*	*	**
1	6.25	0.375	0.375	6	0.07	*	*	*	*	*	**
1	6.75	0.405	0.405	6	0.07	*	*	*	*	*	**
2	7.25	0.435	0.435	28	0.18	*	*	*	*	*	**
2	7.75	0.465	0.465	28	0.18	*	*	*	*	*	**
2	8.25	0.495	0.487	28	0.18	1.384	31.3	Infin	0.971	0.464	NonLiq
2	8.75	0.525	0.502	28	0.18	1.384	31.3	Infin	0.968	0.473	NonLiq
2	9.25	0.555	0.516	28	0.18	1.384	31.3	Infin	0.964	0.481	NonLiq
2	9.75	0.585	0.530	28	0.18	1.384	31.3	Infin	0.961	0.489	NonLiq
2	10.25	0.615	0.545	28	0.18	1.384	31.3	Infin	0.958	0.497	NonLiq
2	10.75	0.645	0.559	28	0.18	1.384	31.3	Infin	0.955	0.504	NonLiq
2	11.25	0.675	0.574	28	0.18	1.384	31.3	Infin	0.952	0.510	NonLiq
2	11.75	0.705	0.588	28	0.18	1.384	31.3	Infin	0.948	0.516	NonLiq
3	12.25	0.735	0.602	39	0.24	1.231	44.0	Infin	0.945	0.522	NonLiq
3	12.75	0.765	0.617	39	0.24	1.231	44.0	Infin	0.942	0.528	NonLiq
3	13.25	0.795	0.631	39	0.24	1.231	44.0	Infin	0.939	0.533	NonLiq
3	13.75	0.825	0.646	39	0.24	1.231	44.0	Infin	0.936	0.538	NonLiq
3	14.25	0.855	0.660	39	0.24	1.231	44.0	Infin	0.932	0.543	NonLiq
3	14.75	0.885	0.674	39	0.24	1.231	44.0	Infin	0.929	0.547	NonLiq
3	15.25	0.915	0.689	39	0.24	1.231	44.0	Infin	0.926	0.551	NonLiq
3	15.75	0.945	0.703	39	0.24	1.231	44.0	Infin	0.923	0.555	NonLiq
3	16.25	0.975	0.718	39	0.24	1.231	44.0	Infin	0.920	0.559	NonLiq
3	16.75	1.005	0.732	39	0.24	1.231	44.0	Infin	0.916	0.563	NonLiq
4	17.25	1.035	0.746	11	0.09	1.120	12.2	0.137	0.913	0.566	0.31
4	17.75	1.065	0.761	11	0.09	1.120	12.2	0.137	0.910	0.569	0.31
4	18.25	1.095	0.775	11	0.09	1.120	12.2	0.137	0.907	0.572	0.31
4	18.75	1.125	0.790	11	0.09	1.120	12.2	0.137	0.904	0.575	0.30
4	19.25	1.155	0.804	11	0.09	1.120	12.2	0.137	0.900	0.577	0.30
4	19.75	1.185	0.818	11	0.09	1.120	12.2	0.137	0.897	0.580	0.30
4	20.25	1.215	0.833	11	0.09	1.120	12.2	0.137	0.894	0.582	0.30
4	20.75	1.245	0.847	11	0.09	1.120	12.2	0.137	0.891	0.584	0.30
4	21.25	1.275	0.862	11	0.09	1.120	12.2	0.137	0.888	0.586	0.30

NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

PAGE 2

File Name: 16807.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA Nl_60	C N	CORR. (Nl)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
4	21.75	1.305	0.876	11	0.09	1.120	12.2	0.137	0.884	0.588	0.30
5	22.25	1.335	0.890	11	0.08	1.034	11.9	0.130	0.881	0.589	0.28
5	22.75	1.365	0.905	11	0.08	1.034	11.9	0.130	0.878	0.591	0.28
5	23.25	1.395	0.919	11	0.08	1.034	11.9	0.130	0.875	0.592	0.28
5	23.75	1.425	0.934	11	0.08	1.034	11.9	0.130	0.872	0.594	0.28
5	24.25	1.455	0.948	11	0.08	1.034	11.9	0.130	0.868	0.595	0.28
5	24.75	1.485	0.962	11	0.08	1.034	11.9	0.130	0.865	0.596	0.28
5	25.25	1.515	0.977	11	0.08	1.034	11.9	0.130	0.862	0.597	0.28
5	25.75	1.545	0.991	11	0.08	1.034	11.9	0.130	0.859	0.598	0.28
5	26.25	1.575	1.006	11	0.08	1.034	11.9	0.130	0.856	0.599	0.28
5	26.75	1.605	1.020	11	0.08	1.034	11.9	0.130	0.853	0.599	0.28
5	27.25	1.635	1.034	11	0.08	1.034	11.9	0.130	0.850	0.600	0.28
5	27.75	1.665	1.049	11	0.08	1.034	11.9	0.130	0.846	0.601	0.28
5	28.25	1.695	1.063	11	0.08	1.034	11.9	0.130	0.843	0.601	0.28
5	28.75	1.725	1.078	11	0.08	1.034	11.9	0.130	0.840	0.601	0.28
6	29.25	1.755	1.092	13	~	~	~	~	~	~	~~
6	29.75	1.785	1.106	13	~	~	~	~	~	~	~~
6	30.25	1.815	1.121	13	~	~	~	~	~	~	~~
6	30.75	1.845	1.135	13	~	~	~	~	~	~	~~
6	31.25	1.875	1.150	13	~	~	~	~	~	~	~~
6	31.75	1.905	1.164	13	~	~	~	~	~	~	~~
6	32.25	1.935	1.178	13	~	~	~	~	~	~	~~
6	32.75	1.965	1.193	13	~	~	~	~	~	~	~~
6	33.25	1.995	1.207	13	~	~	~	~	~	~	~~
6	33.75	2.025	1.222	13	~	~	~	~	~	~	~~
7	34.25	2.055	1.236	38	0.20	0.909	36.5	Infin	0.806	0.601	NonLiq
7	34.75	2.085	1.250	38	0.20	0.909	36.5	Infin	0.803	0.601	NonLiq
7	35.25	2.115	1.265	38	0.20	0.909	36.5	Infin	0.799	0.600	NonLiq
7	35.75	2.145	1.279	38	0.20	0.909	36.5	Infin	0.796	0.600	NonLiq
7	36.25	2.175	1.294	38	0.20	0.909	36.5	Infin	0.793	0.599	NonLiq
7	36.75	2.205	1.308	38	0.20	0.909	36.5	Infin	0.790	0.599	NonLiq
8	37.25	2.235	1.322	42	0.21	0.861	38.2	Infin	0.787	0.598	NonLiq
8	37.75	2.265	1.337	42	0.21	0.861	38.2	Infin	0.784	0.597	NonLiq
8	38.25	2.295	1.351	42	0.21	0.861	38.2	Infin	0.781	0.597	NonLiq
8	38.75	2.325	1.366	42	0.21	0.861	38.2	Infin	0.778	0.596	NonLiq
8	39.25	2.355	1.380	42	0.21	0.861	38.2	Infin	0.775	0.595	NonLiq
8	39.75	2.385	1.394	42	0.21	0.861	38.2	Infin	0.772	0.594	NonLiq
8	40.25	2.415	1.409	42	0.21	0.861	38.2	Infin	0.769	0.593	NonLiq
8	40.75	2.445	1.423	42	0.21	0.861	38.2	Infin	0.766	0.592	NonLiq
8	41.25	2.475	1.438	42	0.21	0.861	38.2	Infin	0.763	0.592	NonLiq
8	41.75	2.505	1.452	42	0.21	0.861	38.2	Infin	0.760	0.591	NonLiq
8	42.25	2.535	1.466	42	0.21	0.861	38.2	Infin	0.757	0.590	NonLiq
8	42.75	2.565	1.481	42	0.21	0.861	38.2	Infin	0.754	0.589	NonLiq
8	43.25	2.595	1.495	42	0.21	0.861	38.2	Infin	0.751	0.588	NonLiq

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LIQUEFACTION ANALYSIS SUMMARY

PAGE 3

File Name: 16807.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
8	43.75	2.625	1.510	42	0.21	0.861	38.2	Infin	0.748	0.586	NonLiq
8	44.25	2.655	1.524	42	0.21	0.861	38.2	Infin	0.745	0.585	NonLiq
8	44.75	2.685	1.538	42	0.21	0.861	38.2	Infin	0.742	0.584	NonLiq
8	45.25	2.715	1.553	42	0.21	0.861	38.2	Infin	0.739	0.583	NonLiq
8	45.75	2.745	1.567	42	0.21	0.861	38.2	Infin	0.736	0.582	NonLiq
8	46.25	2.775	1.582	42	0.21	0.861	38.2	Infin	0.733	0.581	NonLiq
8	46.75	2.805	1.596	42	0.21	0.861	38.2	Infin	0.730	0.579	NonLiq
8	47.25	2.835	1.610	42	0.21	0.861	38.2	Infin	0.727	0.578	NonLiq
8	47.75	2.865	1.625	42	0.21	0.861	38.2	Infin	0.724	0.577	NonLiq
8	48.25	2.895	1.639	42	0.21	0.861	38.2	Infin	0.721	0.576	NonLiq
8	48.75	2.925	1.654	42	0.21	0.861	38.2	Infin	0.718	0.574	NonLiq
8	49.25	2.955	1.668	42	0.21	0.861	38.2	Infin	0.715	0.573	NonLiq
8	49.75	2.985	1.682	42	0.21	0.861	38.2	Infin	0.712	0.572	NonLiq

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LIQUEFACTION ANALYSIS SUMMARY

PAGE 1

File Name: 16808.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
1	0.25	0.015	0.015	13	0.02	*	*	*	*	*	**
1	0.75	0.045	0.045	13	0.02	*	*	*	*	*	**
1	1.25	0.075	0.075	13	0.02	*	*	*	*	*	**
1	1.75	0.105	0.105	13	0.02	*	*	*	*	*	**
1	2.25	0.135	0.135	13	0.02	*	*	*	*	*	**
1	2.75	0.165	0.165	13	0.02	*	*	*	*	*	**
1	3.25	0.195	0.195	13	0.02	*	*	*	*	*	**
1	3.75	0.225	0.225	13	0.02	*	*	*	*	*	**
1	4.25	0.255	0.255	13	0.02	*	*	*	*	*	**
1	4.75	0.285	0.285	13	0.02	*	*	*	*	*	**
1	5.25	0.315	0.315	13	0.02	*	*	*	*	*	**
1	5.75	0.345	0.345	13	0.02	*	*	*	*	*	**
1	6.25	0.375	0.375	13	0.02	*	*	*	*	*	**
1	6.75	0.405	0.405	13	0.02	*	*	*	*	*	**
2	7.25	0.435	0.435	18	0.03	*	*	*	*	*	**
2	7.75	0.465	0.465	18	0.03	*	*	*	*	*	**
2	8.25	0.495	0.487	18	0.03	1.384	20.0	0.218	0.971	0.464	0.60
2	8.75	0.525	0.502	18	0.03	1.384	20.0	0.218	0.968	0.473	0.59
2	9.25	0.555	0.516	18	0.03	1.384	20.0	0.218	0.964	0.481	0.58
2	9.75	0.585	0.530	18	0.03	1.384	20.0	0.218	0.961	0.489	0.57
2	10.25	0.615	0.545	18	0.03	1.384	20.0	0.218	0.958	0.497	0.56
2	10.75	0.645	0.559	18	0.03	1.384	20.0	0.218	0.955	0.504	0.55
2	11.25	0.675	0.574	18	0.03	1.384	20.0	0.218	0.952	0.510	0.55
2	11.75	0.705	0.588	18	0.03	1.384	20.0	0.218	0.948	0.516	0.54
3	12.25	0.735	0.602	12	0.02	1.231	13.5	0.147	0.945	0.522	0.36
3	12.75	0.765	0.617	12	0.02	1.231	13.5	0.147	0.942	0.528	0.36
3	13.25	0.795	0.631	12	0.02	1.231	13.5	0.147	0.939	0.533	0.35
3	13.75	0.825	0.646	12	0.02	1.231	13.5	0.147	0.936	0.538	0.35
3	14.25	0.855	0.660	12	0.02	1.231	13.5	0.147	0.932	0.543	0.35
3	14.75	0.885	0.674	12	0.02	1.231	13.5	0.147	0.929	0.547	0.34
3	15.25	0.915	0.689	12	0.02	1.231	13.5	0.147	0.926	0.551	0.34
3	15.75	0.945	0.703	12	0.02	1.231	13.5	0.147	0.923	0.555	0.34
3	16.25	0.975	0.718	12	0.02	1.231	13.5	0.147	0.920	0.559	0.34
3	16.75	1.005	0.732	12	0.02	1.231	13.5	0.147	0.916	0.563	0.33
4	17.25	1.035	0.746	39	0.05	1.120	43.0	Infin	0.913	0.566	NonLiq
4	17.75	1.065	0.761	39	0.05	1.120	43.0	Infin	0.910	0.569	NonLiq
4	18.25	1.095	0.775	39	0.05	1.120	43.0	Infin	0.907	0.572	NonLiq
4	18.75	1.125	0.790	39	0.05	1.120	43.0	Infin	0.904	0.575	NonLiq
4	19.25	1.155	0.804	39	0.05	1.120	43.0	Infin	0.900	0.577	NonLiq
4	19.75	1.185	0.818	39	0.05	1.120	43.0	Infin	0.897	0.580	NonLiq
4	20.25	1.215	0.833	39	0.05	1.120	43.0	Infin	0.894	0.582	NonLiq
4	20.75	1.245	0.847	39	0.05	1.120	43.0	Infin	0.891	0.584	NonLiq
4	21.25	1.275	0.862	39	0.05	1.120	43.0	Infin	0.888	0.586	NonLiq

NCEER [1997] Method

LIQUEFACTION ANALYSIS SUMMARY

PAGE 2

File Name: 16808.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
4	21.75	1.305	0.876	39	0.05	1.120	43.0	Infin	0.884	0.588	NonLiq
4	22.25	1.335	0.890	39	0.05	1.120	43.0	Infin	0.881	0.589	NonLiq
4	22.75	1.365	0.905	39	0.05	1.120	43.0	Infin	0.878	0.591	NonLiq
4	23.25	1.395	0.919	39	0.05	1.120	43.0	Infin	0.875	0.592	NonLiq
4	23.75	1.425	0.934	39	0.05	1.120	43.0	Infin	0.872	0.594	NonLiq
5	24.25	1.455	0.948	8	~	~	~	~	~	~	~
5	24.75	1.485	0.962	8	~	~	~	~	~	~	~
5	25.25	1.515	0.977	8	~	~	~	~	~	~	~
5	25.75	1.545	0.991	8	~	~	~	~	~	~	~
5	26.25	1.575	1.006	8	~	~	~	~	~	~	~
5	26.75	1.605	1.020	8	~	~	~	~	~	~	~
6	27.25	1.635	1.034	17	~	~	~	~	~	~	~
6	27.75	1.665	1.049	17	~	~	~	~	~	~	~
6	28.25	1.695	1.063	17	~	~	~	~	~	~	~
6	28.75	1.725	1.078	17	~	~	~	~	~	~	~
6	29.25	1.755	1.092	17	~	~	~	~	~	~	~
6	29.75	1.785	1.106	17	~	~	~	~	~	~	~
6	30.25	1.815	1.121	17	~	~	~	~	~	~	~
6	30.75	1.845	1.135	17	~	~	~	~	~	~	~
6	31.25	1.875	1.150	17	~	~	~	~	~	~	~
6	31.75	1.905	1.164	17	~	~	~	~	~	~	~
7	32.25	1.935	1.178	18	~	~	~	~	~	~	~
7	32.75	1.965	1.193	18	~	~	~	~	~	~	~
7	33.25	1.995	1.207	18	~	~	~	~	~	~	~
7	33.75	2.025	1.222	18	~	~	~	~	~	~	~
7	34.25	2.055	1.236	18	~	~	~	~	~	~	~
7	34.75	2.085	1.250	18	~	~	~	~	~	~	~
7	35.25	2.115	1.265	18	~	~	~	~	~	~	~
7	35.75	2.145	1.279	18	~	~	~	~	~	~	~
7	36.25	2.175	1.294	18	~	~	~	~	~	~	~
7	36.75	2.205	1.308	18	~	~	~	~	~	~	~
7	37.25	2.235	1.322	18	~	~	~	~	~	~	~
7	37.75	2.265	1.337	18	~	~	~	~	~	~	~
7	38.25	2.295	1.351	18	~	~	~	~	~	~	~
7	38.75	2.325	1.366	18	~	~	~	~	~	~	~
8	39.25	2.355	1.380	42	0.05	0.861	38.0	Infin	0.775	0.595	NonLiq
8	39.75	2.385	1.394	42	0.05	0.861	38.0	Infin	0.772	0.594	NonLiq
8	40.25	2.415	1.409	42	0.05	0.861	38.0	Infin	0.769	0.593	NonLiq
8	40.75	2.445	1.423	42	0.05	0.861	38.0	Infin	0.766	0.592	NonLiq
8	41.25	2.475	1.438	42	0.05	0.861	38.0	Infin	0.763	0.592	NonLiq
8	41.75	2.505	1.452	42	0.05	0.861	38.0	Infin	0.760	0.591	NonLiq
8	42.25	2.535	1.466	42	0.05	0.861	38.0	Infin	0.757	0.590	NonLiq
8	42.75	2.565	1.481	42	0.05	0.861	38.0	Infin	0.754	0.589	NonLiq
8	43.25	2.595	1.495	42	0.05	0.861	38.0	Infin	0.751	0.588	NonLiq

 NCEER [1997] Method

 LIQUEFACTION ANALYSIS SUMMARY

PAGE 3

File Name: 16808.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
8	43.75	2.625	1.510	42	0.05	0.861	38.0	Infin	0.748	0.586	NonLiq
8	44.25	2.655	1.524	42	0.05	0.861	38.0	Infin	0.745	0.585	NonLiq
8	44.75	2.685	1.538	42	0.05	0.861	38.0	Infin	0.742	0.584	NonLiq
8	45.25	2.715	1.553	42	0.05	0.861	38.0	Infin	0.739	0.583	NonLiq
8	45.75	2.745	1.567	42	0.05	0.861	38.0	Infin	0.736	0.582	NonLiq
8	46.25	2.775	1.582	42	0.05	0.861	38.0	Infin	0.733	0.581	NonLiq
8	46.75	2.805	1.596	42	0.05	0.861	38.0	Infin	0.730	0.579	NonLiq
8	47.25	2.835	1.610	42	0.05	0.861	38.0	Infin	0.727	0.578	NonLiq
8	47.75	2.865	1.625	42	0.05	0.861	38.0	Infin	0.724	0.577	NonLiq
8	48.25	2.895	1.639	42	0.05	0.861	38.0	Infin	0.721	0.576	NonLiq
8	48.75	2.925	1.654	42	0.05	0.861	38.0	Infin	0.718	0.574	NonLiq
8	49.25	2.955	1.668	42	0.05	0.861	38.0	Infin	0.715	0.573	NonLiq
8	49.75	2.985	1.682	42	0.05	0.861	38.0	Infin	0.712	0.572	NonLiq

PERCOLATION TEST DATA

Presoak Date: 3/5/99

Time of Day: 8:00

Test Date: 3/5/99

Time of Day: 10:00

Test Pit No.	Min./in. 5" to 6"	Rate Sf/Gal.	Test Material	Tested Depth
1	2		Sand	4.5'
2	2		Sand	5'
3	4		Sandy Silt	5'
4	3		Sandy Silty	5'
5	3		Pebbly Sand	5.5'
6	7		Sand	4'
7	3		Sand	5'
8	3		Sand	5'
10	1		Pebbly Sand	4'
11	1		Sand	4.5'
12	1		Sand	4'
13	1		Sand	4'

Calculations:

Test Pit No. Used: 6

Ryon Formula: Rate Sf/Gal = $A = \frac{T + 6.24}{29}$ Drain Field: $\frac{C}{2} \times A = \text{Sf}$

Drain Field: $\frac{7 + 6.24}{29} \times = 0.45$

Require Area:

percol.doc

SPECIFICATIONS

Drainage and Maintenance

Maintenance of property must be performed to avoid serious damage and/or instability to improvements. Most hillside problems are associated with or triggered by water. Therefore, a comprehensive drainage system should be designed and incorporated into the final plans. In addition, pad areas should be maintained and planted in a way that will allow this drainage system to function as intended. The following are specific drainage, maintenance, and landscaping recommendations.

Pad Drainage

Positive pad drainage should be incorporated into the final plans. All drainage from the roof and pad should be directed so that water does not pond adjacent to the foundations or flow toward them. All drainage from the site should be collected and directed via non-erosive devices to a location approved by the building official. Planters placed adjacent to the structures should be designed to drain away from the structure. Area drains, subdrains, weep holes, roof gutters and downspouts should be inspected periodically to ensure that they are not clogged with debris or damaged. If blockage or damage is evident, have it corrected.

Landscaping (Planting)

All slopes should be maintained with a dense growth of plants, ground-covering vegetation, shrubs and trees that possess dense, deep root structures and require a minimum of irrigation. Plants surrounding the development should be of a variety that requires a minimum of watering. It is recommended that a landscape architect be consulted regarding planting adjacent to improvements. It will be the responsibility of the property owner to maintain the planting. Alterations of planting schemes should be reviewed by the landscape architect.

Irrigation

An adequate irrigation system is required to sustain landscaping. Over-watering resulting in runoff and/or ground saturation must be avoided. Irrigation systems must be adjusted to account for natural rainfall conditions. Any leaks or defective sprinklers must be repaired immediately. To mitigate erosion and saturation, automatic sprinkling systems must be adjusted for rainy seasons. A landscape architect should be consulted to determine the best times for landscape watering and the maximum amount of water usage.

APPENDIX V

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