ENGINEERING GEOLOGY REPORT

A.P.N. 155-170-043 and 044
586 Toro Canyon Park Road
Santa Barbara County, California

Prepared by:
CFS GEOTECHNICAL CONSULTANTS

May 29, 2003

Project No. 021203
May 29, 2003

Shoto Land Development
586 Toro Canyon Park Road
Carpinteria, California 93436

Attention: Mr. Gregg Henrikson

Subject: **Engineering Geology Report**
Proposed Land Division, A.P.N. 155-170-43, 044
586 Toro Canyon Park Road
Santa Barbara County, California

Dear Mr. Henrikson:

CFS Geotechnical Consultants (CFS) is pleased to submit this Engineering Geology Report for the planned Land Division, A.P.N. 155-170-43, 044, 586 Toro Canyon Park Road, Santa Barbara County, California. The purpose of this report is to provide an engineering geology assessment with respect to the planned land division. We have also evaluated geologic hazards that could potentially impact the project. On the basis of our work performed, it is our opinion that the parcels are suitable for the residential development as planned. This report was prepared in accordance with the scope of services presented in our proposal dated December 10, 2002, and authorized on December 11, 2002.

We appreciate the opportunity to provide our services on this project. Please contact the undersigned if you have questions regarding this report, or require additional information.

Sincerely,
CFS GEOTECHNICAL CONSULTANTS, INC.
A CALIFORNIA CORPORATION

Roger C. Slayman, C.E.G. 1920
Principal Engineering Geologist

Copies: 3 – Addressee

Table of Contents

List of Figures

1. SITE AND PROJECT DESCRIPTION

The property is identified as 586 Toro Canyon Park Road, in the Toro Canyon area of Santa Barbara County, California. The location of the site relative to nearby streets and geographic landmarks is shown on Figure 1, Vicinity Map. The project consists of two parcels totaling approximately 147 acres (APN 155-170-043 is 27 acres, and APN 155-170-044 is 120 acres). The parcels are located along the west side of Santa Monica Creek, which flows southerly to the Pacific Ocean within the western portion of Carpinteria.

1.1 SITE DESCRIPTION

The terrain in the site vicinity consists of southerly and southeasterly-descending ridgelines and intervening drainages. An existing single-family residence occupies APN 155-170-043. The existing residence is accessed by a driveway leading from Toro Canyon Park Road located at the northwest corner of the parcel. Review of the topographic plans indicate that the elevations on the parcels range from a high of about 1,250 feet, mean sea level (msl) along the northern side of APN 155-170-043, to a low of about 600 feet, msl at the southeast corner of APN 155-170-044. Existing site vegetation consists of scattered oak trees, shrubs and grasses.

1.2 PROJECT DESCRIPTION

Review of plans prepared by K. B. Foster Civil Engineering (2002) indicate that the project will consist of a land division creating four new parcels from the existing two parcels. APN 155-170-043 which contains the existing residence will have a lot line adjustment to reduce the acreage from 26.98 acres to 26.97 acres (Parcel 1), and APN 155-170-043 will be divided into three, 40-acre parcels (Parcels 2, 3, and 4). Parcels 2, 3, and 4 will be developed with new single-family residences, and appurtenant landscape improvements. The residences will be served by private, on-site septic systems. Building envelopes have been proposed for the Parcels 2, 3, and 4. The new residences will be accessed by driveways following the approximate alignment of existing, unimproved dirt roads. At the time of this report preparation, two alignments are being considered for access to Parcel 3, with one alignment (lower road) leading through Parcel 4, and one alignment leading through Parcel 2 (upper road).

2. WORK PERFORMED

2.1 PURPOSE

The purpose of this report is to provide geologic opinions and recommendations regarding the suitability of development of three residential building sites on Parcels 2, 3, and 4. The main geologic considerations that we evaluated for the project are characterization of the subsurface materials, slope stability and landsliding, and erosion control of the exposed slopes surrounding the building pads.

2.2 SCOPE

To evaluate the geologic considerations for the project, we have performed the following scope of work:

- Performing a site visit to observe the general site conditions, and coordinating the field exploration program;
- Performing field exploration consisting of logging eleven test pits, two large-diameter borings, and mapping exposed geologic features;
- Preparing this report summarizing the data obtained for the site, and our conclusions and recommendations regarding;
  - Geologic and seismic setting;
  - Soil and groundwater conditions encountered;
  - Slope stability;
  - Potential for the sites to be impacted by liquefaction;
  - Surface and subsurface drainage; and
  - Erosion control and slope stabilization.

2.3 FIELD EXPLORATION

A Jon Deere 310E rubber-tired backhoe equipped with a 24-inch wide bucket was used to excavate eleven test pits at the site, and a Low Drill track mounted drill rig was used to excavate the exploratory boring. A field geologist from CFS logged the trenches and borings, and recorded geologic structure. The exploratory boring was subsequently reamed and completed as a dry well on Parcel 3. The geologic structure and a description of the subsurface conditions encountered are presented on the logs of the trenches and boring in Appendix A.

2.4 GENERAL CONDITIONS

CFS Geotechnical Consultants prepared the conclusions, recommendations, and professional opinions of this report in accordance with the generally accepted geological principles and practices at this time and location. This warranty is in lieu of all other warranties, either expressed or implied. This report was prepared for the exclusive use of Shoto Land Development and their authorized agents only. It is not intended to address issues or conditions pertinent to other parties, projects or for other uses. The report and the drawings contained herein are not intended to act as construction drawings or specifications. Explorations and services have not been requested nor performed to assess the presence or absence of hazardous or toxic materials.

Our characterization of the subsurface conditions is based on explorations performed at specific locations, and the interpolation and extrapolation of data between points of exploration and testing. The boundaries and extent of the subsurface conditions described are approximate, and transitions can be gradual. The subsurface soil and groundwater conditions will vary

between points of exploration and observation, may change with time, and should be reviewed based on the conditions revealed by construction.

3. SITE CONDITIONS

3.1 GEOLOGIC SETTING

The site is located on the southern flank of the Santa Ynez Mountain Range. The Santa Ynez Range is a predominantly east-west trending mountain block within the western Transverse Ranges of California. The range extends continuously from Point Arguello eastward for 75 miles into Ventura County. The Santa Ynez Mountains and adjacent lowlands are composed almost entirely of sedimentary rocks ranging in age from late Jurassic to Recent. The subsurface conditions at the site generally consist of a shallow thickness of surficial soils, fill derived from the grading of the existing access roads, landslide debris, alluvium, and Sespe Formation sedimentary rocks. The surficial soils generally consist of residual soils that have formed as result of in-place weathering of the underlying bedrock, and colluvium that generally consists of eroded soils and materials that have been transported downslope to their present location. For purposes of our evaluation, the residual soils are not differentiated from the colluvium.

The bedrock strata in the site vicinity consist of moderate, north dipping units of the Sespe Formation. The Sespe Formation is Oligocene age, and consists of non-marine sandstone, siltstone and claystone. The regional geology in the vicinity of the site is depicted on Figure 2, Regional Geologic Map.

3.2 SUBSURFACE CONDITIONS

The building areas and adjacent slopes are generally underlain by a shallow thickness of colluvium overlying sandstone, siltstone, and claystone units of the Sespe Formation. A summary of the geologic units encountered in our explorations is provided below. Logs of the explorations are presented in Appendix A. The locations of the explorations are shown on the Geologic Map, Figure 4.

Colluvium (Qcol). Colluvium was observed blanketing areas of the natural slopes at the site. The thickness and areal extent of the colluvium is variable, and the colluvium is absent at some locations. The colluvium consists of soft to firm sandy clay to silt clay with sandstone, siltstone and shale detritus derived from the weathering and downslope movement of the underlying Sespe Formation. On the basis of trench excavations, the thickness of the colluvium is estimated to be 2 to 4 feet typically. With the exception of the eastern edge of the Building envelope on Parcel 3, the colluvium was underlain by Sespe Formation bedrock.

Landslide Deposits (Qls/Qlsa). Landslide deposits are mapped along the west margin of Parcel 1 (California Division of Mines and Geology, 2000). This landslide is characterized as dormant to young with no signs of recent movement. Material interpreted to be older landslide deposits were encountered in exploratory trenches 2 and 8. These deposits were composed of

soft to firm, fat (high plasticity) clay. Numerous slickensided surfaces were observed within the clay at a depth of about 12 feet in trench T-2. Sespe Formation was not encountered to the maximum depth explored in Trench T-2, but was encountered at a depth of about 10 feet in Trench T-8. Site observations and aerial photo review (see references for aerial photos reviewed) did not indicate any discernable surface features that would indicate that the landslide has had any recent movement. An alternative interpretation of the deposits could be colluvial and residual soils disturbed from past grading within the building envelope area of Parcel 3. Review of circa 1967 aerial photos and site observations indicate that the slope within the building envelope has had drainage benches graded possibly for agricultural purposes. The approximate limits of the landslides are shown on Figure 3, Landslide Map, and Figure 4, Geologic Map.

Sespe Formation (Tsp). Sespe Formation was encountered below the colluvium and landslide deposits in our explorations, and is exposed at the ground surface at many locations over the site. The Sespe Formation is the parent rock from which the overlying colluvium is derived. Sespe Formation was encountered to the maximum depth in our trenches and boring. The Sespe Formation generally consists of massive to thickly bedded, sandstone, siltstone and claystone. The sandstone ranged from well cemented to friable. The siltstone and claystone are commonly intensely to moderately fractured, and moderately cemented.

The fracture patterns in the Sespe Formation are random with groupings oriented N35E to N60W. The inclinations of the fractures range from near horizontal to vertical. Bedding planes within the Sespe Formation strike between EW to N80W and dipping 18 to 32 degrees to the north.

3.3 GROUNDWATER CONDITIONS

Groundwater was not encountered in the trenches or borings excavated at the site. The presence and variation in the perched groundwater conditions in the area is a function of changes in precipitation, runoff, permeability of the overlying surficial deposits, and other factors.

3.4 FAULTING

3.4.1 Regional Fault Setting

Regional compressive forces acting on the Montecito/Santa Barbara coastal area have resulted in the formation of prominent east-west trending folds and faults. Gurrola (1998, 1999) terms the region the Santa Barbara Fold Belt (SBFB). The SBFB includes the on- and off-shore terrain between the Santa Ynez Fault, along the northern margin of the Santa Ynez Mountains, and the Santa Cruz Island Fault that is located in the Santa Barbara Channel and passes approximately midway through Santa Cruz Island.

The SBFB is characterized by active folding and faulting. Faults are present with predominantly three orientations and types of movement: 1) west striking reverse faults (e.g. Arroyo Parida and Santa Ynez faults), 2) northwest striking reverse faults and, 3) northeast

striking strike-slip faults. All of the faults and bedrock formations described above are postulated by Namson and Davis (1992) to be underlain by a deep, low angle, north dipping ramp of a detachment fault ("blind thrust fault") at 10 to 12 kilometers in depth.

The closest significant fault to the parcels is the Mission Ridge-Arroyo Parida fault. Other significant regional faults in the project area include the Red Mountain, offshore North Channel Slope, Santa Cruz Island, Santa Rosa Island, Hosgri, Anacapa-Dume, More Ranch/Mission Ridge/Arroyo Parida, Channel Islands, and the Montalvo trend of the Oak Ridge Fault. The North Channel Slope is characterized to be a blind thrust fault that underlies the entire south coast of the Santa Barbara/Montecito area. The San Andreas Fault is mapped near the northeast corner of Santa Barbara County, approximately 58 miles north of the project area. The San Andreas, and some of the faults within the Santa Barbara Channel, are considered to be associated with significant historical earthquakes.

Site Faulting. No surface faults are mapped trending through the project site. The closest mapped fault trace to the site is the Arroyo Parida fault, mapped trending east/west just south of the site (see Figure 2). The Arroyo Parida fault is classified as active (movement within last 11,000 years) by the County of Santa Barbara (1972).

3.4.2 Seismicity

A deterministic evaluation of peak ground acceleration for the site was completed using the computer program EQFAULT (Blake 2000) and the CDMG (1996) southern California fault database. EQFAULT provides deterministic site parameters based on digitized fault data. The fault search found 23 active and potentially active mapped faults within a 62-mile (100 km) radius of the site. Summarized below are the results for eleven faults that were considered to be the most capable of producing high ground motion at the site. The peak ground accelerations shown in the table were estimated using the attenuation relationship proposed by Boore et al. (1997). Analyses completed using this relationship assume randomly oriented components of peak acceleration as well as a site class "A" designation. A site class "A" designation (equivalent to UBC Soil Profile Type S_B) indicates that material in the upper 30 meters (100 feet) of the site has an average shear wave velocity between 760 and 1500 meters per second (rock).

Results of the Deterministic Seismic Hazard Analysis

Fault	Distance from Site miles/(km)	Maximum Moment Magnitude (M_w)	Fault Length (km)	Slip Rate (mm/yr)	Peak Ground Acceleration Mean (g)
Red Mountain	0 (0)	6.8	39	2 ± 1	0.51
M. Ridge – Arroyo Parida	0.1 (0.2)	6.7	65	0.4 ± 0.2	0.49
Santa Ynez (east)	2.4 (3)	7.0	68	2 ± 1	0.40
Ventura/Pitas Point	6 (10)	6.8	41	1 ± 0.5	0.29
North Channel Slope	7 (11)	7.1	60	2.0 ± 2.0	0.27
Channel Island Thrust	11 (18)	7.4	65	1.5 ± 1	0.27
Los Alamos/Baseline	5.2 (8)	6.9	28	0.7 ± 0.7	0.25
Montalvo/Oak Ridge Trend	7 (11)	6.6	37	1 ± 1	0.25
Santa Ynez (west)	7 (11)	6.9	65	2 ± 1	0.24
Anacapa/Dume	19 (30)	7.3	75	3 ± 2	0.18
San Andreas (1857 rupture)	35 (56)	7.8	345	34 ± 5	0.12

Note: "Distance from site" refers to the horizontal distance of the fault rupture plane projected to the ground surface, and not necessarily the surface trace of the fault. All acceleration values are in units of g (9.81 m/s^2 or 32 ft/s^2). 1 kilometer (km) = approximately 0.6 miles.

3.5 HISTORICAL EARTHQUAKES

The site is within a seismically active region of southern California that has experienced ground motion in response to earthquakes in the historical past. The closest faults with reported historic seismic activity are associated with offshore faults within the Santa Barbara Channel. Earthquakes that have occurred in the Santa Barbara Channel include a M7.0 in 1812, M6.25 in 1883, M6.3 in 1925, M5.9 in 1941, and M5.1 in 1978. The Santa Barbara earthquake of 1925 damaged most of the buildings within a 36-block area of downtown Santa Barbara and resulted in 13 deaths. The 1941 earthquake resulted in several broken water mains and relatively minor structural damage. The 1978 earthquake resulted in a train derailment near Goleta and relatively minor structural damage. The project area has also been subjected to strong ground motion from the 1812, 1857, 1906, 1934, 1952, and 1966 earthquakes along the San Andreas fault.

4. GEOLOGIC HAZARDS

The following summarizes our assessment of geologic hazards that could potentially impact the site. Our assessment was performed in general accordance with the guidelines contained in California Division of Mines and Geology (1997) Note 48 and Special Publication 117.

4.1 SURFACE FAULT RUPTURE

Fault rupture is the displacement of the ground surface created by movement along a fault plane during an earthquake. The site is not within a State of California Fault Hazards Zone. As discussed previously, the closest known active or potentially active is the Mission Ridge-Arroyo Parida fault located just south of the parcels. The numerous on- and offshore faults in the area are an indication of the geologic complexity of the project area. Based on the location of mapped faults in relation to the subject property, it is our opinion that the site has a "low" potential to experience surface fault rupture in association with an earthquake on one of the mapped faults.

4.2 GROUND MOTION

The site is located in a seismically active region of southern California. The project is close to mapped active and potentially active faults. Strong ground motion has likely affected the site in the historical past, such as from the 1925 Santa Barbara earthquake, and 1927 offshore Lompoc earthquake, and is likely to again in the future.

Based on the CDMG (1996) fault database for southern California, the maximum moment magnitude for the Red Mountain fault is M6.8. Using the Boore et al. (1997) attenuation relationship, we estimate that a M6.8 earthquake on the Red Mountain fault could generate peak ground accelerations of 0.51g at the site. Due to statistical variation in the methods used to estimate strong ground motion, we expect that peak ground accelerations approaching 1g could occur during an earthquake on either the Red Mountain or Arroyo Parida faults.

4.3 LIQUEFACTION

Liquefaction is defined as the loss of soil strength due to an increase in soil porewater pressures that results from seismic ground shaking. In order for liquefaction to occur, three geotechnical conditions generally occur: 1) groundwater is present within the potentially liquefiable material; 2) the soil is granular and meets a specific range of grain sizes; and 3) the soil is in a loose state of low relative density. If those conditions are present and strong ground motion occurs, portions of the soil column could liquefy, depending upon the intensity and duration of the strong ground motion.

Tertiary-age, sedimentary rocks underlie the site. Groundwater was not encountered in our explorations. It is therefore our opinion that the soil and rocks encountered are not susceptible to liquefaction.

4.4 SEISMICALLY INDUCED SETTLEMENT

Seismically induced settlement can occur in loose to medium dense soils. The site is underlain at by sedimentary rocks. Surficial soils should be removed and be replaced with compacted fill within the improvement areas. It is therefore our opinion that there is a low potential for seismically induced settlement to impact the site improvements.

4.5 GROUND LURCHING

Ground lurching occurs as the ground is accelerated during a seismic event. As evidenced by the Loma Prieta, Landers, and recent Northridge earthquakes, the effects of ground lurching can damage structures and buried pipelines. Ground lurching occurs due to detachment of underlying stratigraphic units, allowing near-surface soil to move differentially from underlying soil. It is our opinion that there is a potential for ground lurching to affect the site, particularly within near surface soils adjacent to steep slopes.

4.6 LANDSLIDING

With the exception of the older slide mass encountered at the eastern margin of the Parcel 3 building envelope, and the mapped landslide along the west side of Parcel 1, evidence of large-scale or deep-seated landsliding was not observed during our field explorations, or data, aerial photo and literature review. The bedding within the Sespe Formation is inclined to the north at 15 to 35 degrees. A majority of the larger slopes on at the site are east and southeast facing. Surficial erosion and slumping has occurred on the slopes below the access roads. The erosion and slumping has generally occurred because of uncontrolled run-off onto these slopes. Recommendations to reduce the potential for erosion and slumping are provided in the following section.

Although the surface topography is relatively gentle to moderate, and there is no evidence of recent movement, we recommend that a fifty foot structural setback be provided from the landslide mapped on Parcel 3

5. CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations presented in this report are based on our understanding of the project as presently planned; review of the referenced reports, plans and published information; geologic analyses, and assessment of geologic hazards. The residence and access road design should be based on a design –level geotechnical investigation.

5.1 SUMMARY OF GEOLOGIC HAZARDS

The main geologic hazards that are likely to impact the site are seismic shaking in response to nearby or regional earthquakes, erosion and slope instability.

5.2 SEISMIC CONSIDERATIONS

The site is within Seismic Zone 4 based on the 1997 Uniform Building Code and the 1998 California Building Code. We expect that the predominant seismic source for the site is a M6.8 on the Red Mountain fault, a M6.7 on the Arroyo Parida fault, or a M7.1 earthquake on the North Channel Slope fault, a blind thrust fault that is interpreted to underlie the Santa Barbara region. These faults are Seismic Source Type B based on the fault conditions discussed in Section 3.4. We recommend that the residences be designed for the seismic code requirements in effect at the time of the project design.

5.3 GRADING CONSIDERATIONS

The parcels are considered geologically suitable for the proposed site development. The site preparation, grading and foundation design should be based on a design-level investigation. On the basis of the sloping nature of the building areas and the loose colluvial soils, it is our preliminary opinion that the structure foundations will likely need to be either deepened and embedded into competent Sespe Formations material, or bear on a mat of compacted fill.

Finished cut and fill slopes should be designed using a slope inclination of 2h:1v or flatter for slopes up to 20 feet high, measure toe to crest. If the slope height exceeds 20 feet, the geotechnical engineer should review the proposed grading, and provide additional recommendations for the design of the slope, if needed.

5.4 ACCESS ROAD

Two general alignments are being considered for the access road to Parcel 3. These alignments are shown on Figure 4. The alignments were evaluated in the order of their geotechnical suitability, and were ranked whether the sites have a low, moderate, or high potential to be impacted by specific geologic and physical constraints (for example, slope gradient and extent of required grading, and landslides). The ranking is based on the following:

Low. The alignment is in moderate terrain, and is not known to be in an area of mapped landslides or faults. Site preparation, grading and foundation support for the improvements should be able to be obtained using conventional construction techniques, such as relatively shallow cuts and fill.

Moderate. The alignment is in moderate to steep terrain, and although not sited on, may be near or in an area susceptible to slope instability or landsliding. The site can likely be developed using conventional construction techniques, but may require more grading and special consideration of the terrain.

High. The site is in steep terrain,. These conditions may require significant mitigation (such as, deep soil removals, deep foundations, or retaining walls).

Site access and the geotechnical complexity of the alignment was also ranked as good, fair, or poor based on a general assessment of whether the construction of an access road appears to be straight forward, will require special considerations to address terrain or landslides, or if there are multiple adverse geotechnical conditions that would require mitigation.

The following provides a ranking of the alignment areas in there order of preference based on the preliminary geologic evaluation.

Summary of Access Road Conditions

Location	Seismicity and Strong Ground Motion	Landslides and Slope Instability	Erosion	Steepness	Expansive Soils	Ease of Grading	Overall Rating and Comments
Lower Access Road Alignment	M	M	M	L-M	M	Moderate	Moderate. Road gradient is less than upper access road; however; more drainage crossings and grading required due to longer alignment.
Upper Access Road Alignment	M	M	M	M-H	M	Fair	Moderate. Less grading required; however; steeper grades required along south portion of Parcel 2.

5.5 EROSION CONTROL AND SLOPE DRAINAGE

Drainage should be provided such that surface water does not run over slopes or pond on pavements, slabs, or adjacent to foundations. Downspouts should be provided to collect roof drainage and direct the water to drainage pipes or area away from the building. The top of slopes should be graded to direct drainage away from the slopes, or be provided with dikes and ditches that will direct surface water to controlled drainage structures. Concentrated flows and runoff should not be permitted to discharge onto slopes. Down drains, solid pipes, or lined ditches should be provided to carry water to the base of the slope. Energy dissipation and erosion control devises should be provided at the outlet of drainage pipes and in areas of concentrated flow and runoff to reduce the potential for erosion.

Ongoing slope maintenance will be needed to keep drainage conduits and ditches clear of debris, and to assist in establishing vegetation on the slope. Eroded areas and gullies are likely to occur while vegetation is being established and during periods of precipitation, and should be repaired as they occur to reduce the potential for further erosion and instability of the slope.

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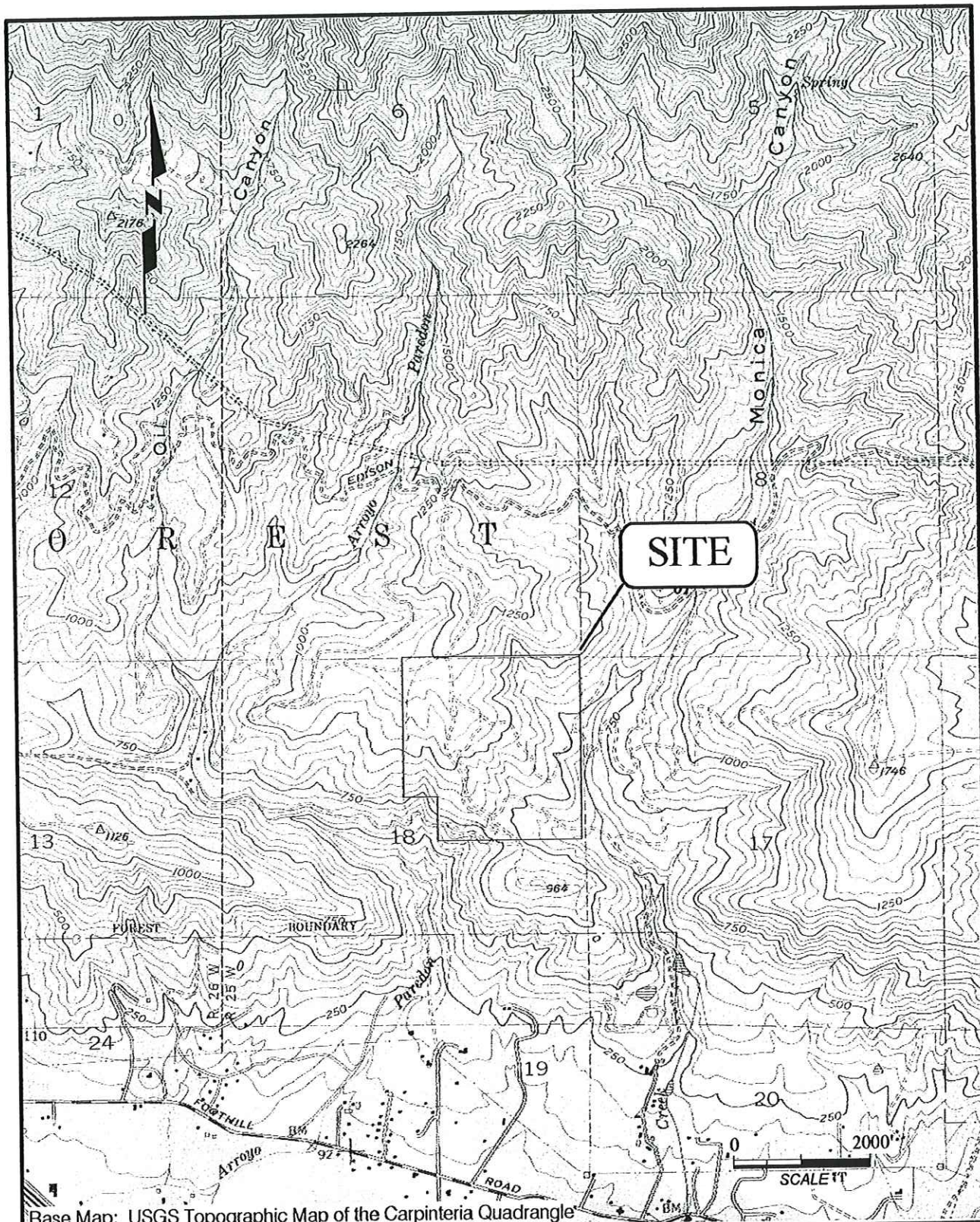


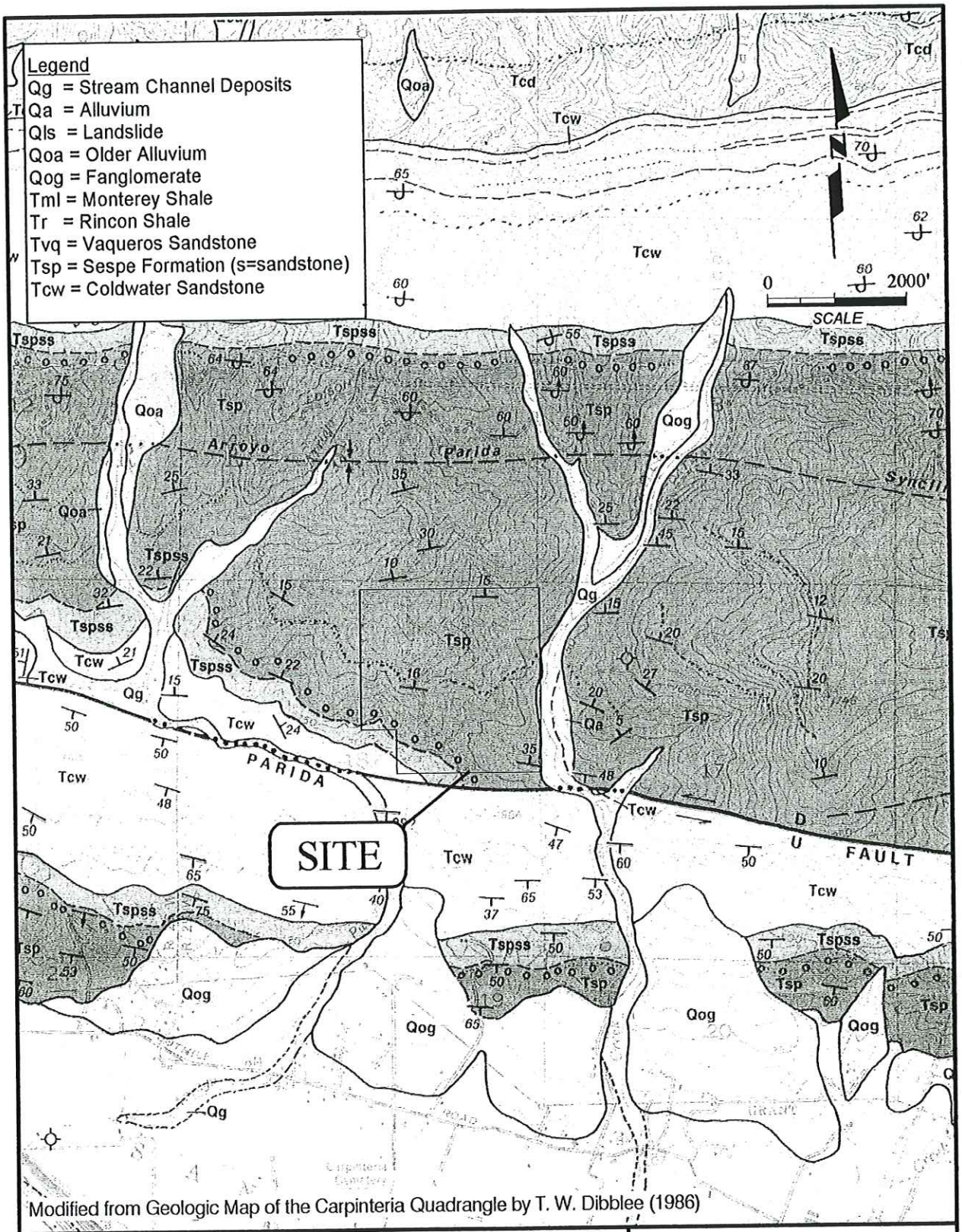
Base Map: USGS Topographic Map of the Carpinteria Quadrangle

CFS Geotechnical Consultants

VICINITY MAP

APN 155-170-043, 044
586 Toro Canyon Park Road
Santa Barbara County, California
Project No. 020103

Figure 1



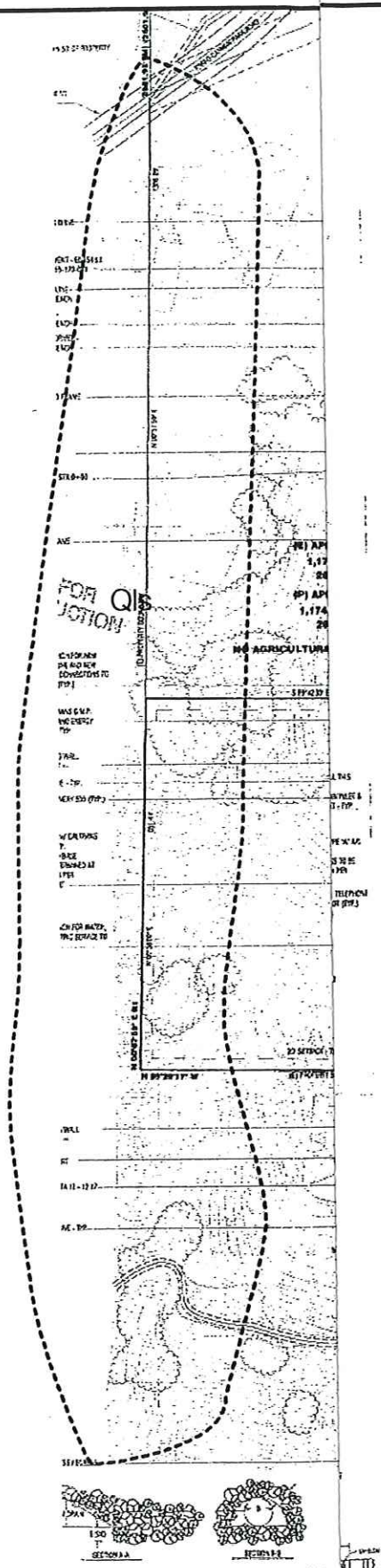
Modified from Geologic Map of the Carpinteria Quadrangle by T. W. Dibblee (1986)

CFS Geotechnical Consultants

REGIONAL GEOLOGIC MAP

APN 155-170-043, 044
586 Toro Canyon Park Road
Santa Barbara County, California
Project No. 021203

Figure 2



Legend
Qa = Alluvium
Qls/lsa = Landslide debris
Tsp = Sespe Formation
T-1 = Approximate location of exploratory trench
= Approximate location of exploratory boring
= Strike and dip of bedding
= Approximate geologic contact

N

0 300'
SCALE

Note: CFS has provided only geologic information to this p
prepared by K. B. Foster Civil Engineering. CFS has not re
of other information provided on these plans.

GEOLOGIC MAP

APN 155-170-043,044
586 Toro Canyon Park Road
Santa Barbara County, California
Project No. 021203

Approximate Scale: 1 in. = 300 ft. | Figure 4

CFS Geotechnical Consultants

Drilling Method: Solid Flight Auger
Driller: Terra Firma
Logged by: R. Slayman
Date: February 28, 2003

Completion Depth: 68 feet **Ground Elevation:** 742 feet, msl
Groundwater: Not encountered

Backfill Material: Cuttings from 58 to 68 ft., gravel from 20 58 ft., cement cap at 19 to 20 ft., and cuttings from 0 to 19 ft.

Depth (Meters)	Depth (Feet)	Drive Samples	Bulk Samples	Blowcount (blows/foot)	Sample	Geologic Unit	DESCRIPTION AND CLASSIFICATION	Total Unit Weight (pcf)	Moisture Content (%)	Other Tests
1	5					Qcol	Colluvium: Fat CLAY (CH), firm to stiff, dark red brown, moist, abundant rootlets to approx 3 feet			
2						Tsp	Sespe Formation: " Sandy SILT, (ML)", weathered siltstone, massive, maroon red to dark red, dry to slightly moist, grades to sandstone (silty SAND) at 12 feet, bedding: EW 32N			
3	10									
4										
5	15									
6	20					Tsp	Green sandstone bed at 22 feet, N80W, 18N, approx. 6 inches thick			
7	25						"Sandy SILT (ML)", weathered Siltstone, dark red brown, massive			
8										

CFS Geotechnical Consultants

BORING NO. 1

586 Toro Canyon Park Road
Santa Barbara County, California

Figure A-1

Drilling Method: Solid Flight Auger
Driller: Terra Firma
Logged by: R. Slayman
Date: February 28, 2003

Completion Depth: 68 feet **Ground Elevation:** 742 feet, msl
Groundwater: Not encountered
Backfill Material: Cuttings from 58 to 68 ft., gravel from 20 58 ft., cement cap at 19 to 20 ft., and cuttings from 0 to 19 ft.

Depth Meters	Depth Feet	Drive Samples	Bulk Samples	Blowcount (blows/foot)	Sample	Geologic Unit	DESCRIPTION AND CLASSIFICATION	Total Unit Weight (pcf)	Moisture Content (%)	Other Tests
9	30					Tsp	Sespe Formation: "Sandy SILT (ML)", Siltstone, dark red brown, hard to very hard, dry			
10	35					Tsp	Sespe Formation: "Silty SAND (SM)", sandstone, gray green, massive, moderately weathered, bedding at 36 feet: N82W, 22N			
11										
12	40						Friable to poorly cemented from 40 to 45 feet			
13	45									
14	50					Tsp	Sespe Formation: " Sandy SILT (ML)", sandy siltstone, dark red brown, massive, hard to very hard, dry, bedding at 49 feet: N84W, 24N			
15										
16	55									

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BORING NO. 1 Cont.

586 Toro Canyon Park Road
Santa Barbara County, California

Figure A-2

Drilling Method: Solid Flight Auger
Driller: Terra Firma
Logged by: R. Slayman
Date: February 28, 2003

Completion Depth: 68 feet **Ground Elevation:** 742 feet, msl
Groundwater: Not encountered
Backfill Material: Cuttings from 58 to 68 ft., gravel from 20 58 ft., cement cap at 19 to 20 ft., and cuttings from 0 to 19 ft.

Depth (Meters)	Depth (Feet)	Drive Samples	Bulk Samples	Blowcount (blows/foot)	Sample	Geologic Unit	DESCRIPTION AND CLASSIFICATION	Total Unit Weight (pcf)	Moisture Content (%)	Other Tests
17	60					Tsp	Sespe Formation: "Sandy SILT (ML)", Siltstone, gray to gray brown, hard to very hard, moderately weathered, friable, dry, with interbeds of sandstone.			
18										
19	65									
20							Boring terminated at 68 feet. No groundwater or seepage. Downhole logged to 57 feet.			
21	70									
22	75									
23										
24	80									

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BORING NO. 1 Cont.

586 Toro Canyon Park Road
Santa Barbara County, California

Figure A-3

CFS Geotechnical Consultants, Inc.

LOG OF TRENCH T-1

PROJECT NAME 836 Toro Canyon Park Road
JOB NO: 0201203
EQUIPMENT: John Deere 310E
LOGGED BY: R. Slayman

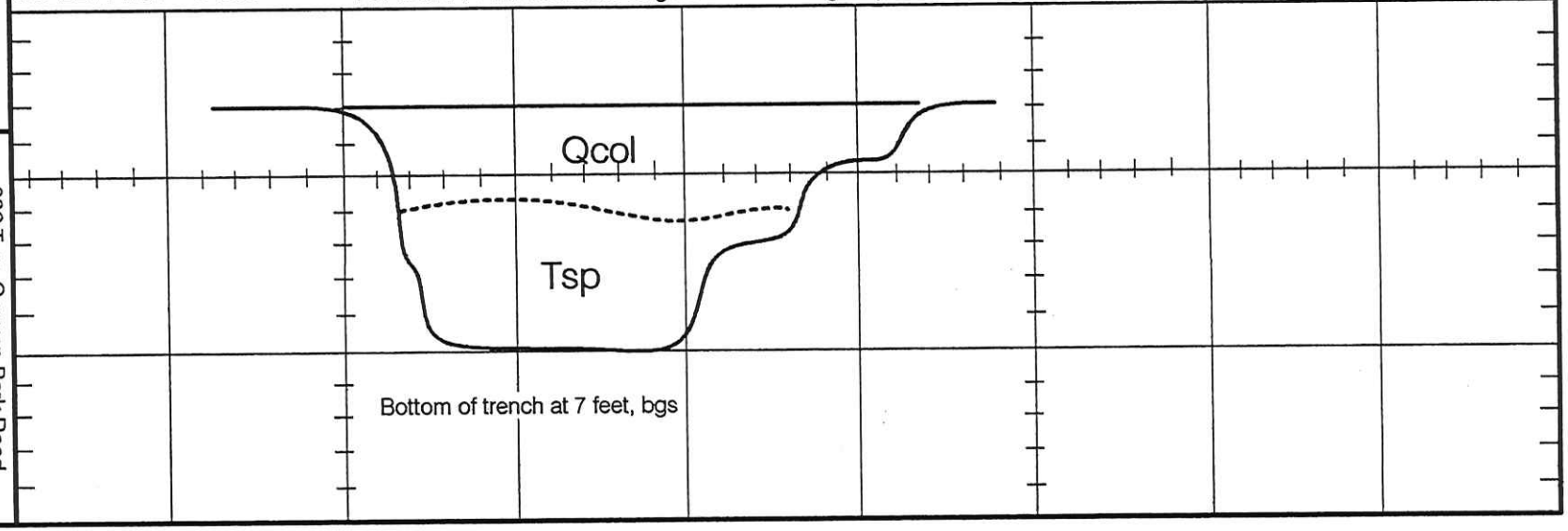
TRENCH NO: T-1
DATE: December 13, 2002
ELEVATION : 1080 feet, msl
LOCATION: Building Envelope, Parcel 2

DESCRIPTION		ENGINEERING PROPERTIES: CLASSIFICATION U.S.C.S.	Pocket Penetrometer (tsf)	MOISTURE (%)	DENSITY (PCF)
Qcol: Colluvium -	Sandy CLAY, firm to stiff, red brown, moist.	CL	1.0 at 1 ft.		
Tsp: Sespe Formation -	"Silty SAND", moderately weathered sandstone, hard, massive, moderately to well cemented	SM	4.5 at 2 ft.		

SCALE: 1 inch = 5 feet

TOPOGRAPHY: Moderate to gentle east-facing slope

TRENCH ORIENTATION: N20E



836 Toro Canyon Park Road
APN 155-170-43, 44
Santa Barbara County, California

Figure A-4

CFS Geotechnical Consultants, Inc.

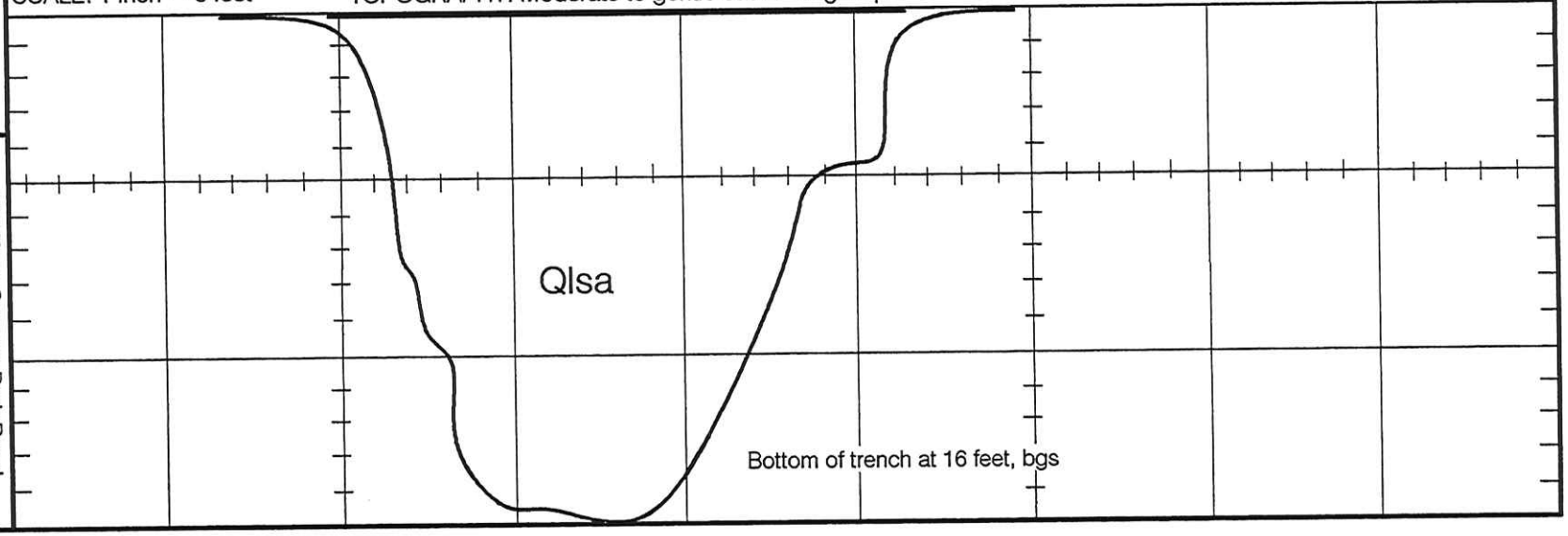
LOG OF TRENCH T-2

PROJECT NAME 836 Toro Canyon Park Road
JOB NO: 0201203
EQUIPMENT: John Deere 310E
LOGGED BY: R. Slayman

TRENCH NO: T-2
DATE: December 13, 2002
ELEVATION: 742 feet, msl
LOCATION: East of Building Envelope, Parcel 3

DESCRIPTION	ENGINEERING PROPERTIES			
	CLASSIFICATION U.S.C.S.	Pocket Penetrometer (tsf)	MOISTURE (%)	DENSITY (PCF)
Qlsa - Older Landslide Debris - Fat CLAY to fat CLAY with sand, firm to stiff, red brown, moist, abundant slickensides and gouge at 12 feet.	CH			

SCALE: 1 inch = 5 feet
TOPOGRAPHY: Moderate to gentle east-facing slope
TRENCH ORIENTATION: N20E



836 Toro Canyon Park Road
APN 155-170-43, 44
Santa Barbara County, California

Figure A-5

CFS Geotechnical Consultants, Inc.

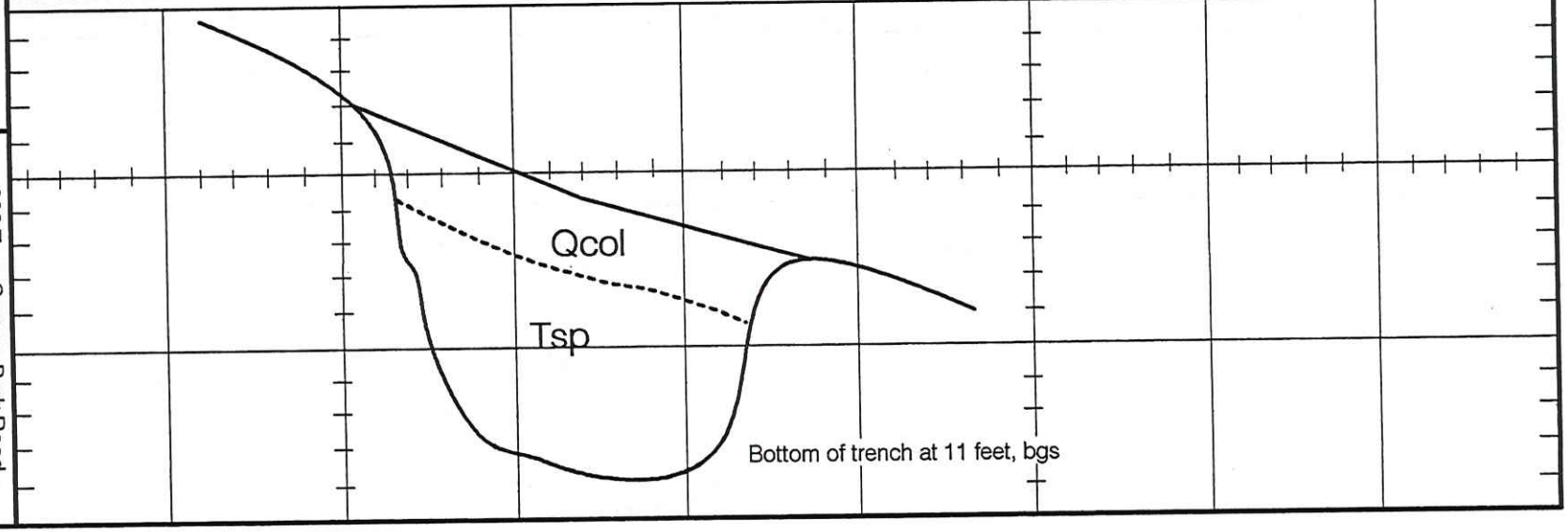
LOG OF TRENCH T-3

PROJECT NAME 836 Toro Canyon Park Road
JOB NO: 0201203
EQUIPMENT: John Deere 310E
LOGGED BY: R. Slayman

TRENCH NO: T-3
DATE: December 13, 2002
ELEVATION :774 feet, msl
LOCATION: Building Envelope, Parcel 3

DESCRIPTION		ENGINEERING PROPERTIES: CLASSIFICATION U.S.C.S.	Pocket Penetrometer (tsf)	MOISTURE (%)	DENSITY (PCF)
Qcol: Colluvium -	Silty CLAY, soft to firm, medium red brown, moist.	CL			
Tsp: Sespe Formation -	"Sandy SILT", moderately weathered siltstone, hard, massive to thickly bedded, green sandstone bed at 4 feet: N85E, 15N	ML			

SCALE: 1 inch = 5 feet
TOPOGRAPHY: Moderate east-facing slope
TRENCH ORIENTATION: N70W



836 Toro Canyon Park Road
APN 155-170-43, 44
Santa Barbara County, California

Figure A-6

CFS Geotechnical Consultants, Inc.

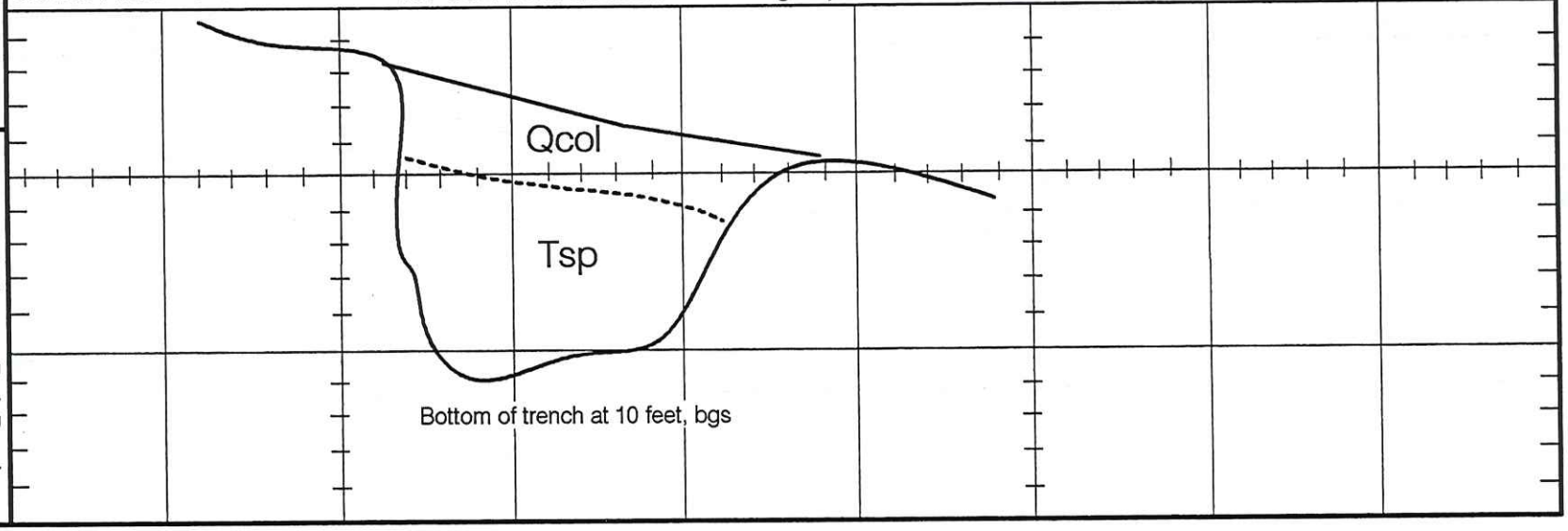
LOG OF TRENCH T-5

PROJECT NAME 836 Toro Canyon Park Road
JOB NO: 0201203
EQUIPMENT: John Deere 310E
LOGGED BY: R. Slayman

TRENCH NO: T-5
DATE: December 13, 2002
ELEVATION : 750 feet, msl
LOCATION: Building Envelope, Parcel 3

DESCRIPTION		ENGINEERING PROPERTIES: CLASSIFICATION U.S.C.S.	Pocket Penetrometer (tsf)	MOISTURE (%)	DENSITY (PCF)
Qcol: Colluvium -	Silty CLAY, soft to firm, dark red brown, moist.	CL			
Tsp: Sespe Formation -	"Sandy SILT", moderately weathered siltstone, hard, massive, blocky, highly fracture, with fractures with average spacing of approximately 3/4 to 1 1/2 inches, medium red brown	ML			

SCALE: 1 inch = 5 feet
TOPOGRAPHY: Moderate east-facing slope
TRENCH ORIENTATION: N84W



836 Toro Canyon Park Road
APN 155-170-43, 44
Santa Barbara County, California

Figure A-8

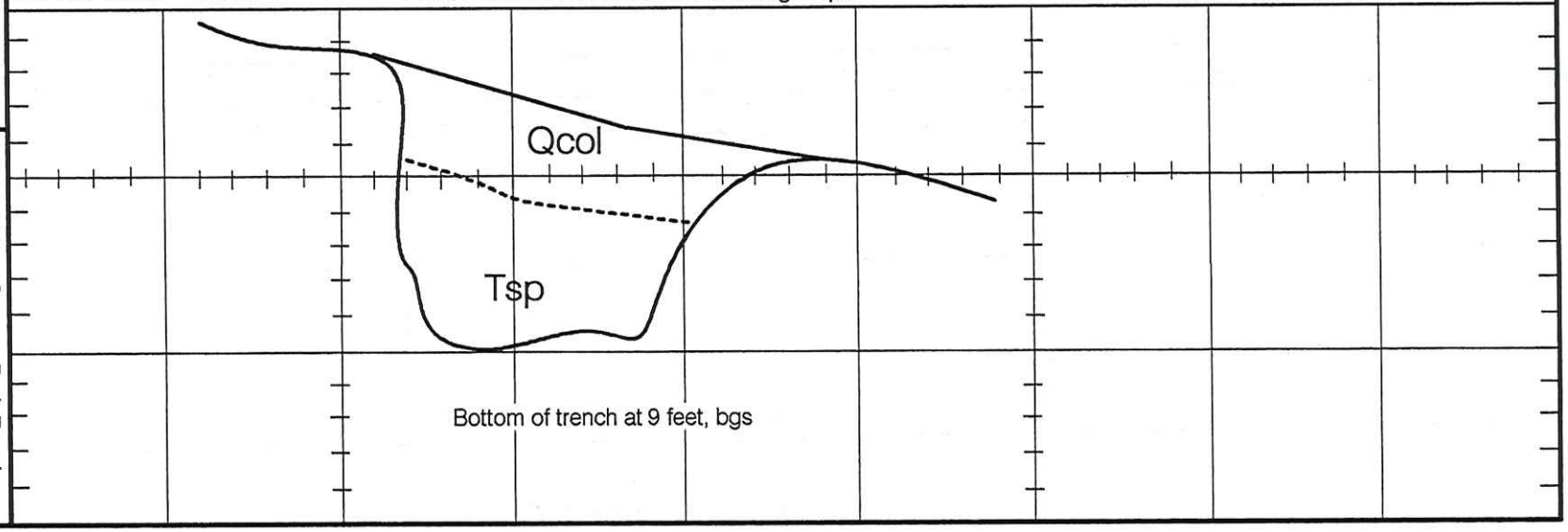
CFS Geotechnical Consultants, Inc.

LOG OF TRENCH T-7

PROJECT NAME 836 Toro Canyon Park Road
TRENCH NO: T-7
JOB NO: 0201203
DATE: December 14, 2002
EQUIPMENT: John Deere 310E
ELEVATION : 755 feet, msl
LOGGED BY: R. Slayman
LOCATION: Building Envelope, Parcel 3

DESCRIPTION		ENGINEERING PROPERTIES: CLASSIFICATION U.S.C.S.	Pocket Penetrometer (tsf)	MOISTURE (%)	DENSITY (PCF)
Qcol: Colluvium -	Fat CLAY, firm to stiff, dark red brown, moist.	CH			
Tsp: Sespe Formation -	"Silty CLAY", moderately weathered claystone, hard, massive, blocky, highly fractured, medium red brown.	CL/ML			

SCALE: 1 inch = 5 feet
TOPOGRAPHY: Moderate east-facing slope
TRENCH ORIENTATION: N80W



836 Toro Canyon Park Road
APN 155-170-43, 44
Santa Barbara County, California

Figure A-10

CFS Geotechnical Consultants, Inc.

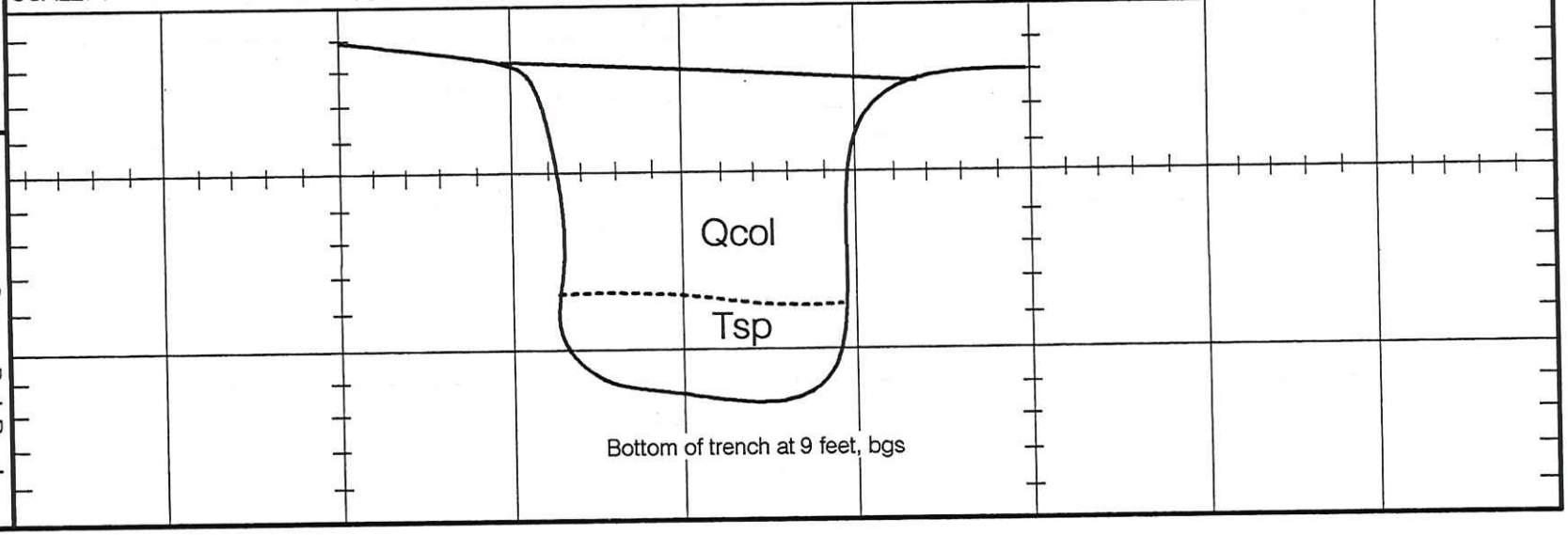
LOG OF TRENCH T-9

PROJECT NAME 836 Toro Canyon Park Road
JOB NO: 0201203
EQUIPMENT: John Deere 310E
LOGGED BY: R. Slayman

TRENCH NO: T-9
DATE: December 14, 2002
ELEVATION : 760 feet, msl
LOCATION: South of Building Envelope, Parcel 3

DESCRIPTION		ENGINEERING PROPERTIES: CLASSIFICATION U.S.C.S.	Pocket Penetrometer (tsf)	MOISTURE (%)	DENSITY (PCF)
Qcol: Colluvium -	Fat CLAY, firm to stiff, dark red brown, moist.	CH			
Tsp: Sespe Formation -	"Silty SAND", moderately weathered sandstone, hard, massive, medium tan brown.	SM			

SCALE: 1 inch = 5 feet
TOPOGRAPHY: Level area east of lower access road
TRENCH ORIENTATION: N80W



836 Toro Canyon Park Road
APN 155-170-43, 44
Santa Barbara County, California

Figure A-12

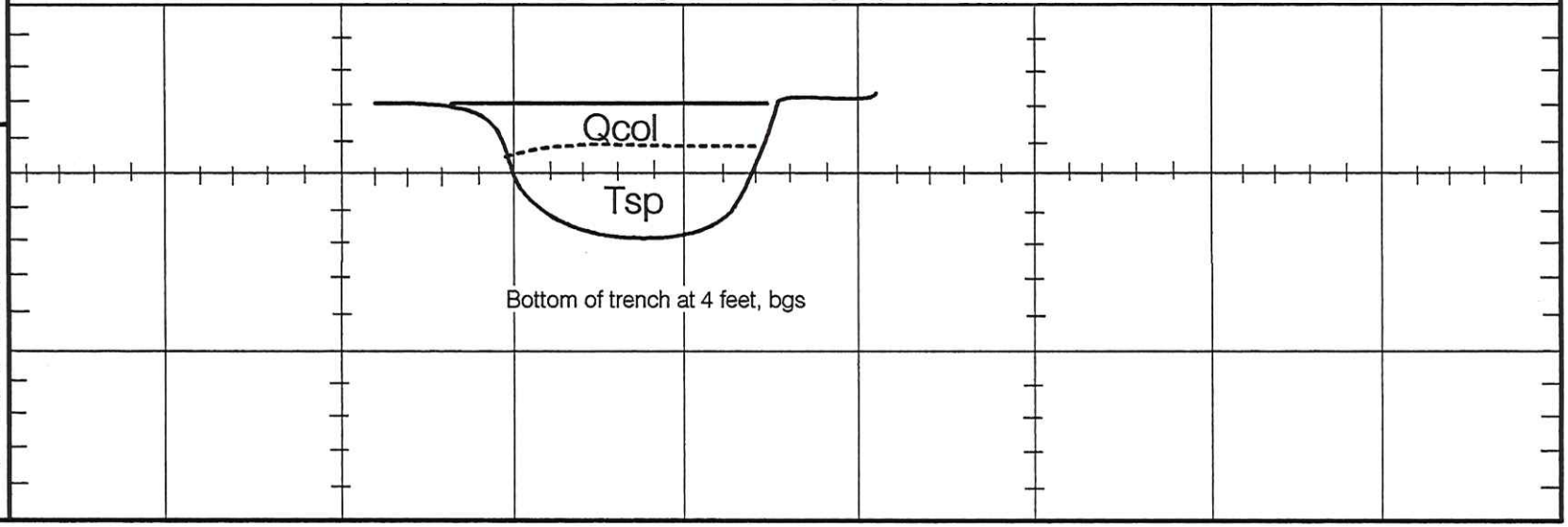
CFS Geotechnical Consultants, Inc.

LOG OF TRENCH T-11

PROJECT NAME 836 Toro Canyon Park Road
TRENCH NO: T-11
JOB NO: 0201203
DATE: December 13, 2002
EQUIPMENT: John Deere 310E
ELEVATION : 1,060 feet, msl
LOGGED BY: R. Slayman
LOCATION: Building Envelope, Parcel 2

DESCRIPTION		ENGINEERING PROPERTIES: CLASSIFICATION U.S.C.S.	Pocket Penetrometer (tsf)	MOISTURE (%)	DENSITY (PCF)
Qcol: Colluvium -	Sandy CLAY, firm to stiff, red brown, moist.	CL			
Tsp: Sespe Formation -	"Silty SAND", moderately weathered sandstone, hard, massive, moderately to well cemented	SM			

SCALE: 1 inch = 5 feet
TOPOGRAPHY: Moderate to gentle east-facing slope
TRENCH ORIENTATION: N20E



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Santa Barbara County, California

Figure A-14