Prior to placing steel, the excavation of the pool/spa must be inspected and approved by the Geotechnical Engineer or their field representative. We further recommend that your Structural Engineer review the steel once it is in place and document in writing such review along with recommendations to continue or correct a deficiency. Deputy inspection of the gunite is also recommended.

6. OBSERVATIONS AND TESTING

Prior to the start of site preparation and/or construction, *we recommend that a meeting be held with the Contractor to discuss the project.* We recommend that AGS be retained to perform the following tasks prior to and/or during construction. Please *advise* AGS a minimum 24 hours *prior* to any required site visit. *All approved plans, permits, and geotechnical reports must be at the jobsite and be made available during inspections.*

a. *Review* grading, foundation, and drainage plans to *verify* that the recommendations contained in this report have been properly interpreted and are incorporated into the project specifications. *If we are not accorded the opportunity to review these documents, we can take no responsibility for misinterpretation of our conclusions and recommendations.*

b. *Observe and advise* during all grading activities, including site preparation, foundation and retaining wall excavation, and placement of fill, to *confirm* that suitable fill soils are placed upon competent material and to allow design changes if subsurface conditions differ from those anticipated *prior* to the start of construction.

c. *Observe* the installation of all drainage devices.

d. *Test* all fill placed for engineering purposes to *confirm* that suitable fill materials are used and properly compacted.

7. LIMITS AND LIABILITY

All building sites are subject to elements of risk that cannot be wholly identified and/or entirely eliminated. Building sites are subject to many detrimental geotechnical hazards, including but *not* limited to the effects of water infiltration, erosion, concentrated drainage, total settlement, differential settlement, expansive soil movement, seismic shaking, fault rupture, landsliding, and slope creep. The risks from these hazards can be reduced by employing subsurface exploration, laboratory testing, analyses, and experienced geotechnical judgment. Many geotechnical hazards, however, are highly dependent on the property owner properly maintaining the site, drainage facilities, and slope and by correcting any deficiencies found during occupancy of the property in a timely manner. Even with a thorough subsurface exploration and testing program, significant variability between test locations and between sample intervals may exist. Ultimately, geotechnical recommendations are based on the experience and judgment of the geotechnical professionals in evaluating the available data from site observations, subsurface exploration, and laboratory tests. Latent defects can be concealed by earth materials, deposition, geologic history, and existing improvements. If such defects are present, they are beyond the evaluation of the geotechnical professionals. No warranty, expressed or implied, is made or intended in connection with this report, by furnishing of this report, or by any other oral or written statement. Owners and developers are responsible for retaining appropriate design professionals and qualified contractors in developing their property and for properly maintaining the property. Retaining the services of a geotechnical consultant should *not* be construed to relieve the Owner, Developer, or Contractors of their responsibilities or liabilities.

The analysis and recommendations submitted in this report are based in part on our subsurface exploration, laboratory testing, site observations, and provided data on geology and the proposed site development. Our descriptions and the boring logs may show distinctions between fill and native soils, between native (e.g., alluvium, colluvium, slopewash) and bedrock formation, and between soil type (e.g., sands and silty sands). Such distinctions were based on geologic information, grading plans when available, intermittent recovered soil/bedrock samples, and judgment. Delineations between these categories of materials may not be perfect and may be subject to change as more information becomes available. For example, judgments may be clouded when recovered samples are intermittent and small in comparison to the volume of soil under study, and macrostructure that would aid the identification process are not as apparent as they would be when the borehole is geologically downhole logged by entering the excavation. When the age of the fill is old, the difference between the structure of the fill and native materials may be less pronounced, or the degree of bedrock formation weathering sometimes makes it difficult to distinguish between overlying alluvium, colluvium, or slopewash and weathered bedrock formational material. In general, our recommendations are based more on the properties of the materials than on the category of the material type such as fill, alluvium, colluvium, slopewash, or bedrock formation. Furthermore, the actual stratigraphy may be more variable than shown on the logs.

Although this report may comment or discuss construction techniques or procedures for the design engineer's guidance, this report should *not* be interpreted to prescribe or dictate construction procedures or to relieve the contractor in any way of their responsibility for the construction.

Please be aware that the contract fee for our services to prepare this report does not include additional work that may be required, such as grading observation and testing, footing observations, plan review, or responses to governmental (regulatory) plan reviews associated with you obtaining a building permit. Where additional services are requested or required, you will be billed for any equipment costs and on an hourly basis for consultation or analysis.

The Geotechnical Engineer's actual scope of work during construction is very limited and does *not* assume the day-to-day physical direction of the work, minute examination of the elements, or responsibility for the safety of the contractor's workers. Our scope of services during construction consists of taking soil tests and making visual observations, sometimes on only an intermittent basis, relating to earthwork or foundation excavations for the project. We do *not* guarantee the contractor's performance, but rather look for general conformance to the intent of the plans and geotechnical report. Any discrepancy noted by us regarding earthwork or foundations will be referred to the Owner, project Engineer, Architect, or Contractor for action.

This report is issued with the understanding that it is the responsibility of the Owner, or of their representative, to ensure that the information and recommendations contained herein are called to the attention of the Architect and Engineers for the project and incorporated into the plan and that the necessary steps are taken to see that the Contractor carry out such recommendations in the field. Advanced Geotechnical Services, Inc., (AGS) has prepared this report for the exclusive use of the Client and authorized agents, and this report should *not* be considered transferable. We do recommend, however, that the report be given to future property Owners for the sole purpose of disclosing the report findings.

Findings of this report are valid as of the date of issuance. Changes in conditions of a property may occur with the passage of time whether attributable to natural processes or works of man on this or adjacent properties. Furthermore, changes in applicable or appropriate standards occur due, for example, to legislation and broadening of knowledge. Accordingly, findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, *this report is subject to our review and remains valid for a maximum period of one year*, unless we issue a written opinion of its continued applicability thereafter.

In the event that any changes in the nature and design (including structural loadings different from those anticipated), or other improvements are planned, the conclusions and recommendations contained in this report

shall *not* be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

This report may be subject to review by controlling agencies, and any modifications they deem necessary should be made a part thereof, subject to our technical acceptance of such modifications. All submissions of this report should be in its entirety. Under no circumstances should this report be summarized and synthesized to be quoted out of context for any purpose.

Test findings and statements of professional opinion do *not* constitute a guarantee or warranty, and *no* warranties, either expressed or implied, are made as to the professional advice provided under the terms of this agreement. We have strived, however, to provide our services in accordance with generally accepted geotechnical engineering practices in this community at the time of this report.

Appendix A

Field Exploration and Boring Logs

Appendix A
Field Exploration and Boring Logs

The field exploration included a site reconnaissance and subsurface exploration. During the site reconnaissance, the surface site conditions were noted, and the approximate locations of any exploration points were determined. The following descriptions of exploration methods are generic and may include methods not used on this project. Reference to the boring logs can be made to determine which methods are applicable to this project, and any differences between what is described below and actually occurred is described on the boring logs or in the main body of the report.

The test borings were advanced by either hand digging, digging with a backhoe, or drilling. In the case of drilling, a truck-mounted rotary drilling rig with a hollow-stem auger or bucket was used to advance the borings. When we expect to encounter shallow groundwater, a wet rotary drilling operation is usually used. The method actually used is noted on the boring logs. For geologic studies when the need for visual examination of the bedding and other stratigraphic features is needed along with engineering data, the larger bucket augers are used to allow a geologist to enter the excavation for visually logging the hole. When geologically logging borings and trenches, the sides are scraped prior to logging. A prefix B is used to designate a boring made with a drilling rig. When hand dug, the boring numbers have a prefix HB. When a backhoe was used, prefixes TP (test pit) or T (trench) are used. The difference between a trench and test pit being the length of the exploration; a trench being a long narrow exploration, most commonly used for fault studies. In each case, the soils were logged by technical personnel from our office and visually classified in the field in general accordance with the Unified Soil Classification system. The field descriptions have been modified as appropriate to reflect laboratory results when preparing the final boring logs.

Relatively undisturbed samples of the subsurface materials were obtained at appropriate intervals in the borings using a steel drive sampler (2.5-inches inside diameter, 3-inches outside diameter) lined with brass, one-inch-high sample rings with a diameter of 2.4 inches. This is referred to as a modified California sampler. The boring may be advanced by drilling with a hollow-stem auger or with a wet rotary operation. If below the groundwater, the hollow-stem is filled with water or drilling mud to counteract the fluid pressure of the groundwater. The sampler was usually driven into the bottom of the borehole with successive drops of a 140-pound safety hammer connected to the sampler with either A or AW rod and falling 30 inches. An automatic hammer is usually used when drilling with a CME dill rig, and a Safe-T-Driver is used when drilling with a Mobile drill rig. When above the groundwater level, a downhole Safe-T-Driver is usually used. Studies have shown that hammer efficiencies of the automatic hammer is over 90% while that of the Safe-T-Driver is about 70%, based on impact velocities. When a bucket auger is used to advance the boring, the driving weights change with depth, depending on the weight characteristics of the telescoping kelley bar, but the height of fall is usually 18 inches. Sampler driving resistance, expressed as blows per 6 inches of penetration, is presented on the boring logs at the respective sampling depths. When the borings or trenches are excavated with a backhoe, the sampler is pushed into the soil with the force of the backhoe. A hand sampler is used when the borings or trenches are advanced by hand digging or in some cases when a backhoe is used to make the excavation. This hand sampler is similar to the conventional California sampler, but lighter weight. An approximately 8-pound hammer falling about 18 inches is used to drive the hand sampler about 6 inches into the bottom of the exploration. The type of sampler used is noted on the boring logs. In some cases the hammer weight and falling distance deviate from those given above. The actual conditions are shown on the boring logs and supersede the conditions given above.

Ring samples were retained in close-fitting, moisture tight containers for transport to our laboratory for testing. Bulk samples, which were collected from cuttings, were placed in bags and transported to our laboratory for testing.

When noted on the boring logs, standard penetration test (SPT) samples were obtained using either a 20-inch or a 32-inch long split-barrel sampler with a 2-inch outside diameter and a 1.375-inch inside diameter when liners are

used (1.5-inch inside diameter without liners). Unless noted otherwise, liners are used. This sampler is driven into the soil with successive drops of a 140-pound, safety hammer falling 30 inches. The blows are recorded for each 6 inches of penetration for a total penetration of 18 or 24 inches. The sum of the number of blows for the last 12 inches of an 18-inch penetration or the middle 12 inches of a 24-inch penetration is referred to as the *N* value.

Elevations of the ground surface, if shown on the logs, were determined at the boring locations using a topographic map or determined by using a temporary bench mark shown on the *Site Plan,* (Plate 1).

Logs, which are presented on Plates at the end of this Appendix, include a description and classification of each stratum, sample locations, blow counts, groundwater conditions encountered during drilling, results from selected types of laboratory tests, and drilling information. Keys to *Soil and Bedrock Symbols and Terms* are included on Plate A-1 and Plate A-2.

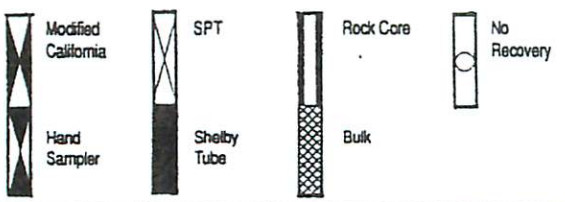
Each boring or trench, unless noted otherwise, was backfilled with cuttings at the completion of the logging and sampling. The backfill, however, may settle with time, and it is the responsibility of our client to ensure that such settlement does *not* become a liability.

Major Divisions			USCS Group Symbols	Typical Names
Coarse-Grained Soils (More than half of material is larger than No. 200 sieve)	Gravels (More than half of coarse fraction is larger than No. 4 sieve)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
		Gravels with fines (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand, clay mixtures
	Sands (More than half of coarse fraction is smaller than No. 4 sieve)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sand, little or no fines
			SP	Poorly graded sands, gravelly sands little or no fines
		Sands and fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
Fine-Grained Soils (More than half of material is smaller than No. 200 sieve)	Silts and Clays Liquid Limit < 50		ML	Silts and very fine sands, rock-flour, silty or clayey fine sands, or clayey silts with slight plasticity
			CL	Inorganic clays of low or medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays Liquid Limit > 50		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
	Highly Organic Soils		OH	Organic clays of medium to high plasticity, organic silts
			Pt	Peat and other highly organic soils

Legend of Laboratory Tests

G - Grain Size	C - Consolidation	PP - Pocket Penetrometer
A - Atterberg Limits	DS - Direct Shear	CH - Chemical
P - Compaction	U - Unconfined	
S - Swell/Expansion	T - Triaxial	

Sampler Type



Terms used in this report for describing soils according to their texture or grain size distributions are generally in accordance with the Unified Soil Classification System.

Terms Describing Density and Consistency

Coarse Grained soils (major portion retained on No. 200 sieve) include (1) clean gravels, (2) silty or clayey gravels, and (3) silty, clayey, or gravelly sands. Relative density is related to SPT blow count corrected for overburden pressure or drive energy.

Density		SPT *N* Value Blows/Ft	Relative Density %
Very Loose	vl	0 to 4	0 to 15
Loose	l	4 to 10	15 to 35
Medium Dense	md	10 to 30	35 to 65
Dense	d	30 to 50	65 to 85
Very Dense	vd	> 50	85 to 100

Fine Grained soils (major portions passing No. 200 sieve) inlcude (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shear strength as indicated by penetrometer readings, direct shear, or SPT blow count.

Consistency	Shear Strength, ksf	SPT *N* Value
Very Soft	< 0.25	0 to 2
Soft	0.25 to 0.50	2 to 4
Firm	0.50 to 1.00	4 to 8
Stiff	1.00 to 2.00	8 to 16
Very Stiff	2.00 to 4.00	16 to 32
Hard	> 4.00	> 32

Terms Characterizing Soil Structure

Slickensided	Having inclined planes of weakness that are slick and glossy in appearance.
Fissured	Containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
Laminated	Composed of thin layers of varying color and texture.
Interbedded	Composed of alternate layers of different soil types.
Calcareous	Containing appreciable quantities of calcium carbonate.
Well Graded	Having wide range in grain sizes and substantial amounts of intermediate particle sizes.
Poorly Graded	Predominately one grain size, or having a range of grain sizes with some intermediate sizes missing.
Porous	Having visibly apparent void spaces through which water, air, or light may pass.

Soil Moisture

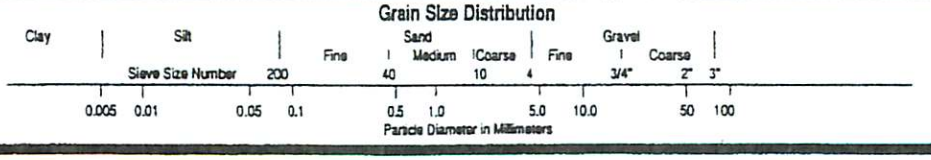
From low to high, the moisture content is indicated by:

Dry	D
Slightly Moist	Sl M
Moist (near optimum for compaction)	M
Very Moist	V M
Wet	W

Size Proportions

Designation	Percent by Weight
Trace	< 5
Few	5 to 10
Little	15 to 25
Some	30 to 45

Grain Size Distribution



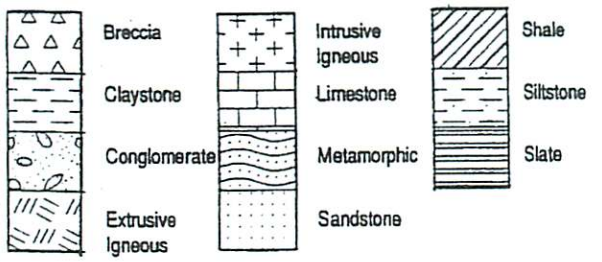
Degree of Weathering
Diagnostic Feature

Descriptive Term	Discoloration Extent	Fracture Condition	Surface Characteristics	Original Texture	Grain Boundary Condition
Unweathered	None	Closed or discolored	Unchanged	Preserved	Tight
Slightly Weathered	Less 20% of fracture spacing on both sides of fracture	Discolored, may contain thin filling	Partial discoloration	Preserved	Tight
Moderately Weathered	Greater than 20% of fracture spacing on both sides of fracture	Discolored, may contain thick filling, cemented rock	Partial to complete discoloration, not friable except poorly cemented rocks	Preserved	Partial Opening
Highly Weathered	Throughout		Friable and possibly pitted	Mainly Preserved	Partial Separation
Completely Weathered	Throughout		Resembles a soil	Partly Preserved	Complete Separation

Discontinuity Spacing

Description for Structural Feature: Bedding, Foliation, or Flow Banding	Spacing		Description for Joints, Faults, or Other Fractures
Very Thickly (Bedded, Foliated, or Banded)	More than 2 m	More than 6 ft	Very Widely (Fractured or Jointed)
Thickly	60 cm to 2 m	2 to 6 ft	Widely
Moderately	20 to 60 cm	8 to 24 in.	Medium
Thinly	60 to 200 mm	2.5 to 8 in.	Closely
Very Thinly	20 to 60 mm	0.75 to 2.5 in.	Very Closely
Description for Microstructural Features: Bedding, Foliation, or Cleavage			
Intensely (Laminated, Foliated, or Cleaved)	6 to 20 mm	0.25 to 0.75 in.	Extremely Close
Very Intensely	< 6 mm	< 0.25 in.	

Graphic Symbols - Bedrock



Rock Hardness

Classification	Field Test
Very Weak	Can be dug by hand and crushed with fingers.
Weak	Friable, can be gouged deeply with a knife and will crumble readily under light hammer blows.
Moderately Strong	Can be peeled with a knife. Material crumbles under firm blows with the sharp end of a geologic pick.
Strong	Cannot be scaped or peeled with a knife point. Hand held specimen breaks with firm blows of the pick.
Very Strong	Difficult to scratch with knife point. Cannot break hand held specimen.

Separation of Fracture Walls

Description	Separation of Walls, mm
Closed	0
Very Narrow	0 to 0.1
Narrow	0.1 to 1.0
Wide	1.0 to 5.0
Very Wide	> 5.0

Fracture Filling

Description	Definition
Clean	No fracture filling material
Stained	Discoloration of rock only. No recognizable filling material.
Filled	Fracture filled with recognizable filling material.

Surface Roughness

Description	Classification
Smooth	Appears smooth and is essentially smooth to the touch. May be slickensided.
Slightly Rough	Asperities on the fracture surfaces are visible and can be distinctly felt.
Medium Rough	Asperites are clearly visible and fracture surface feels abrasive to the touch.
Rough	Large angular asperites can be seen. Some ridge and high-side angle steps evident.
Very Rough	Near vertical steps and ridges occur on the fracture surface.

Where slickensides are observed, the direction of the slickensides should be recorded after the standard discontinuity surface description.

advanced geotechnical services, inc.

Boring Log B-12

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/11/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **853.5** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
0				**0 - 5.5' Quaternary Alluvium (Qal)** Dark brown CLAY with sand; very stiff; moist; minor gravel.					
	⋈	3 5 6				85.7	21.7		
				Grayish brown clayey SAND; medium dense; wet; subangular volcanic rock fragments					
5	⋈	7				86.9	31.7		
		5 8		**5.5 - 8' Bedrock - Topanga Formation (Tt)** Olive to yellowish brown interbedded clayey SILTSTONE and silty SANDSTONE; medium strong; moist; sandstone fine-grained; common gypsum and carbonate stringers.		87.0	28.7		
	⋈	4 9 16				95.1	23.4		
				Total Depth = 8' No Groundwater No Caving					
10									
15									
20									
25									

Plate A- 3

advanced geotechnical services, inc.

Boring Log B-13

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/11/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **852.0** ft Depth to Water **9.0** ft After _____ hrs on _____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0 - 3" Concrete					
		3 5 7		**3" - 12' Artificial Fill (af)** Very dark grayish brown clayey SAND; hard and moist; moist; minor gravels; mild petroleum odor.		94.6	19.2	35.9	E.I. = 38
5		4 4 4				90.2	22.0		
		4 7 14		Dark gray to bluish gray clayey and silty SAND with gravel; dense and slightly moist; fine to coarse grains; isolated pockets of sandy clay; becomes wet and coarser grained @ 9'.		115.6	12.4		
				▼ Sand grades coarser grained.					
10		11 12 29				116.8	14.5		
		6 23 26		**12 - 15' Quaternary Alluvium - Stream Deposits (Qal)** Gray to dark-gray, fine to coarse grained, poorly graded SAND; locally gravelly; dense and saturated; subangular grains.		127.4	15.9		
15		10 11 16		**15 - 18.5' Bedrock - Topanga Formation (Tt)** Reddish and olive brown to dark gray clayey SILTSTONE to silty CLAYSTONE; medium strong and moist; thin, well-defined bedded.		96.1	21.7		
		18 27 40				112.5	16.8		
				Total Depth = 18.5' Groundwater @ 9' Caving of Hole to 8'					
20									
25									

Plate A- 4

advanced geotechnical services, inc.

Boring Log B-14

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/12/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **849.0** ft Depth to Water **6.0** ft After _____ hrs on _____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0 - 2" ASPHALT					
				2" - 7" CONCRETE					
		2 3 3		**7" - 6' Artificial Fill (af)** Very dark grayish brown clayey SAND; loose; moist; fine- to coarse-grained; mild petroleum odor.		98.3	20.2		
5		3 7 14		Gray silty SAND; medium dense; moist; fine- to medium-grained; local subangular gravel. ▼		102.4	17.4		
		2 3 5		**6 - 8.25' Quaternary Alluvium - Stream Deposits (Qal)** Grayish olive brown SAND with gravel; medium dense; moist to wet; medium- to coarse-grained; strong petroleum odor and visible petroleum products in sample.		98.7	17.2		
				8.25 - 11' Bedrock - Topanga Formation (Tt) Olive yellowish brown silty CLAYSTONE to clayey SILTSTONE; medium strong; very moist; thin-bedded.		86.7	34.7		
10		4 6 11				84.6	35.0		
				Total Depth = 11' Groundwater @ ~6' Caving of Hole to 6'					
15									
20									
25									

Plate A- 5

advanced geotechnical services, inc.

Boring Log B-20

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/23/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **872.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0' - 5" Asphalt					
				5" - 8" Base					
				8" - 2' Artificial Fill (af) Yellowish brown silty SAND; medium dense; moist; fine- to medium-grained.					
		4 9 18		**2' - 6' Bedrock-Topanga Formation (Tt)** Dark yellowish brown clayey SILTSTONE; medium strong; moist; thin-bedded.		93.5	26.6		
5		9 12 19				96.7	24.1		
				Total Depth = 6' No Groundwater No Caving					
10									
15									
20									
25									

Plate A- 6

advanced geotechnical services, inc.

Boring Log B-21

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/23/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **873.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0' - 5" Asphalt					
				5" - 8" Base					
				8" - 15' Artificial Fill (af) Mottled yellowish brown, dark gray, and olive sandy silty CLAY; very stiff; moist to very moist; subangular to subrounded rock fragments.					
		4 7 10				102.3	17.5		
5		5 5 6				84.7 83.6	27.5 31.7		
10		4 7 8		Very dark gray sandy CLAY; very stiff; very moist; minor gravels.		82.5	29.6		
15		7 13 14		**15' - 18.5' Bedrock - Topanga Formation (Tt)** Dark yellowish brown, olive and gray silty CLAYSTONE to clayey SILTSTONE; medium strong; moist; thin interbeds of fine-grained sandstone; carbonate mineralization along bedding planes.		95.9	25.0		
		5 10 15				91.7 87.4	28.4 31.1		
				Total Depth = 18.5' No Groundwater No Caving					
20									
25									

Plate A- 7

advanced geotechnical services, inc.

Boring Log B-22

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/23/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **875.0** ft Depth to Water _____ ft After _____ hrs on _____ Logged By **NA**

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.					
				0' - 5" Asphalt					
				5" - 12" Base					
				12" - 17' Artificial Fill (af)					
		8		Yellowish to olive brown clayey to silty SAND with gravel; dense;					
		12		moist; fine- to coarse-grained; isolated pieces of asphalt; local pockets of		89.8	21.5		
		13		sandy clay with gravel.					
5		10							
		11				114.8	11.1		
		11							
				Light olive brown CLAY with SAND; very stiff; very moist; isolated cobble-sized clasts.					
10		8							
		11				95.0	18.5	76.0	
		12				89.4	26.3		
						87.7	25.5		
				Yellowish brown clayey SAND to sandy CLAY; medium dense; very moist; fine- to coarse-grained; local gravel.					
15		5							
		6				86.1	29.5		
		10							
				17' - 21' Bedrock - Topanga Formation (Tt)					
				Dark brown clayey SILTSTONE; medium strong; moist; thin bedded;					
				fissile; minor carbonate mineralization along bedding.					
20		12							
		21				98.4	20.2	82.9	
		29				87.2	30.2		
						90.2	26.6		
				Total Depth = 21'					
				No Groundwater					
				No Caving					
25									

Plate A- 8

advanced geotechnical services, inc.

Boring Log B-32

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/24/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **857.0** ft Depth to Water _____ ft After _____ hrs on _____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0' - 5.5' Artificial Fill (af) Yellowish brown clayey SAND; medium dense; moist; locally mottled; angular siltstone fragments;.					
	⋈	6 9 12				78.4	17.2		
5	⋈	7 9 20		**5.5' - 7.5' Native Topsoil** Very dark grayish brown sandy CLAY; very stiff; moist; fine- to coarse-grained; isolated carbonate.		99.7 95.2	12.2 16.5	65.3	
				7.5' - 11' Quaternary Alluvium (Qal) Olive brown clayey SAND; medium dense; moist; fine- to coarse-grained; local gravel.					
10	⋈	6 7 9				101.9	16.1		
				Total Depth = 11' No Groundwater No Caving					
15									
20									
25									

Plate A- 9

advanced geotechnical services, inc.

Boring Log B-36

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/24/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **860.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0' - 11' Quaternary Alluvium (Qal) Dark yellow brown sandy CLAY with gravel; hard; damp; fine to coarse sand grains; local thin carbonate stringers; locally slightly porous with isolated rootlets.					
		12 17 10				103.4	14.0		
5		14 21 22				96.9	12.2		
				@ 8' Grades to fine to medium grained yellowish brown silty SAND; dense; damp; local coarse sand and gravel.					
10		13 14 32				104.2 102.6	9.2 12.9	24.3	
				Total Depth = 11' No Groundwater No Caving					
15									
20									
25									

Plate A- 10

advanced geotechnical services, inc.

Boring Log B-37

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/25/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **880.0** ft Depth to Water _____ ft After _____ hrs on _____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
0				**0' - 3" Asphalt**					
				3" - 5" Base					
				5" - 3.5' Artificial Fill (af)					
				Dark brown and mottled olive and gray CLAY with sand and gravel; very stiff; moist; common claystone and siltstone rock fragments.					
	⊠	5 7 12				101.1	15.4		
				3.5' - 6' Bedrock - Topanga Formation (Tt)					
5				Light olive, yellowish and gray brown silty CLAYSTONE; medium strong; moist; moderately defined bedding; moderately weathered.					
	⊠	11 14 24				100.4	15.8		
				Total Depth = 6' No Groundwater No Caving					
10									
15									
20									
25									

Plate A- 11

advanced geotechnical services, inc.

Boring Log B-38

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/25/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **851.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0' - 4" Concrete					
				4" - 7' Artificial Fill (af) Brown clayey and silty SAND with gravel; medium dense; slightly moist; fine to coarse grains.					
		7 9 8				100.6	10.6		
5									
		7 8 11		Gravelly and moist; medium to coarse sand grains with local pockets of clay; isolated thin rootlets.		104.9	9.4		
				7' - 11' Bedrock - Topanga Formation (Tt) Dark olive brown and dark gray clayey SILTSTONE and SHALE; thin, well developed bedding; gypsum mineralization along bedding.					
10		12 20 32				104.8	17.5		
				Total Depth = 11' No Groundwater No Caving					
15									
20									
25									

Plate A- 12

advanced geotechnical services, inc.

Boring Log B-39

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/25/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **849.5** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0' - 1" Asphalt					
				1" - 5" Concrete					
				5" - 8' Artificial Fill (af) Dark olive brown clayey SAND; medium dense; moist; common gravel; fine- to coarse-grained; local cobbles.					
		8 12 11				102.4	17.4		E.I. = 137
5		19 41 50					9.5		
				8' - 11' Bedrock - Topanga Formation (Tt) Dark olive brown to grayish brown clayey SILTSTONE; medium strong; moist; local gypsum mineralization; thin-bedded.					
10		27 31 50				100.0	19.5		
				Total Depth = 11' No Groundwater No Caving					
15									
20									
25									

Plate A- 13

advanced geotechnical services, inc.

Boring Log B-40

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/25/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **849.5** ft Depth to Water **8.0** ft After _____ hrs on _____ Logged By **NA**

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.					
				0' - 4" Concrete					
				4" - 10.5' Artificial Fill (af)					
				Dark brown to dark grayish brown clayey silty SAND with gravel; dense; moist.					
	⋈	13 22 14				96.2	17.3		E.I. = 137
5	⋈	4 3 3		Very dark gray to bluish gray clayey SAND with gravel; loose to medium dense; very moist; fine- to coarse-grained; strong petroleum odor in samples and cuttings.		97.3	19.7		
				▼					
10	○	11 14 12		Abundant cobbles.					
				Total Depth = 10.5' Groundwater @ 8' No Caving Petroleum odor to 5'					
15									
20									
25									

Plate A- 14

advanced geotechnical services, inc.

Boring Log B-41

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/25/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **850.5** ft Depth to Water _____ ft After _____ hrs on _____ Logged By **NA**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0' - 6" Concrete					
				6" - 9' Quaternary Alluvium (Qal) Dark brown sandy CLAY; very stiff; moist; sand fraction fine-to coarse-grained; porous; common rootlets.					
		11 14 23				91.4	12.5		
5		50/3"		Dark grayish-brown, silty sandy GRAVEL; dense; moist.					
				9' - 10.5' Weathered Bedrock - Conejo Volcanics (Tcv) Dark olive brown BASALT; medium strong to strong; moist; slightly vesicular; moderately to highly weathered.					
10		35 50/5"				109.2	14.8		
				Total Depth = 10.5' No Groundwater No Caving					
15									
20									
25									

Plate A- 15

advanced geotechnical services, inc.

Boring Log B-42

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/26/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **858.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.					
				0' - 2" Concrete					
				2" - 6" Asphalt					
				6" - 1' Artificial Fill (af) Very dark gray to black sandy CLAY; moist; petroleum odor.					
		8 12 17		**1' - 10' Quaternary Alluvium (Qal)** Moderate brown to moderate yellowish brown sandy CLAY; stiff; moist.		97.1	18.4		
5		6 11 17		@ 6' Cobbles/boulders.		97.9	18.5		
10		22 25 37		**10 - 11' Weathered Bedrock - Conejo Volcanics (Tcv)** @ 10 ' Weathered volcanic breccia; mottled pale red, green, olive; very hard; damp.		120.5	8.1		
				Total Depth = 11' No Groundwater No Caving Mild petroleum odor in upper 1'					
15									
20									
25									

Plate A- 16

advanced geotechnical services, inc.

Boring Log B-43

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/26/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **853.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0' - 3" Concrete					
				3" - 10" Asphalt					
				10" - 4' Quaternary Alluvium (Qal) Yellowish brown SAND; medium dense; moist; fine- to medium-grained; poorly cemented.					
		6				97.3	16.8		
		16		Dark brown CLAY; stiff; moist.					
		20		Dark brown clayey gravel; dense; moist.					
				4' - 6' Weathered Bedrock - Conejo Volcanics (Tcv) Olive brown BASALT; strong; slightly moist.					
5		32				102.9	6.7	26.7	
		35				114.2	12.3		
		50							
				Total Depth = 6' No Groundwater No Caving					
10									
15									
20									
25									

advanced geotechnical services, inc.

Boring Log B-44

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/26/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **854.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.					
				0' - 3" Concrete					
				3" - 5' Artificial Fill (af)					
				Medium yellowish brown to dark brwon clayey SAND to sandy CLAY; stiff; moist; fine to medium grained; minor gravel.					
	⊠	9 10 12		@ 2' Dark yellow brown sandy CLAY to clayey SAND; stiff; damp.		99.4	17.4		
5	⊠	11 14 24		**5' - 10' Quaternary Alluvium (Qal)**		116.7	8.7		
				Gravelly SAND with clay; dense; damp; rounded clasts of volcanic rocks in a matrix of medium grained clayey SAND.					
				@ 5.5' Very difficult drilling on rocks.					
10	⊠	32 50/5"		**10' - 11' Weathered Bedrock - Conejo Volcanics (Tcv)**		110.6 101.3	8.9 8.7	7.4	
				Dark yellowish-orange to dark olive-brown BASALT; hard; damp; upper portion fo sample is rounded volcanic rock fragments.					
				Total Depth = 11' No Groundwater No Caving					
15									
20									
25									

Plate A- 18

advanced geotechnical services, inc.

Boring Log B-45

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/26/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **851.5** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0' - 4" Concrete					
				4" - 7' Artificial Fill (af) Very dark gray silty CLAY; with minor gravel; firm; moist; mild organic odor.					
		22 33 21		@ 2' Large clast of volcanic rock; clay grades to very dark brown.		101.5	15.3		
5		9 6 19		@ 5' Possible weathered basalt in sampler tip.		103.9	18.1		
				7' - 10' Bedrock - Conejo Volcanics (Tcv) Dark yellowish-orange to dark olive BASALT; moderately hard to hard; damp; fine to medium grained; moderately vesicular.					
10		50/5"				100.9 102.6	10.2 10.5	44.1	
				Total Depth = 10.4' No Groundwater No Caving					
15									
20									
25									

Plate A- 19

advanced geotechnical services, inc.

Boring Log B-46

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/26/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **851.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.					
				0" - 3" Concrete					
				3" - 15' Artificial Fill (af)					
				Moderate yellow brown, olive and dark gray sandy CLAY; firm; moist; sand fraction primarily fine to medium grained with few pebbles.					
		7 9 9				97.3	22.4		
5		8 7 10				95.6 89.4	15.3 20.4	33.9	
10		5 7 10				92.6	24.6		
				15' - 20' Weathered Bedrock - Topanga Formation (Tt)					
15		3 4 6		Moderate yellow-brown and pale olive clayey SILTSTONE; very soft; moist; mottled.		73.9	44.3		
20		8 12 17		@ 20' Very dark-brown SILTSTONE; weak to moderately hard; damp to moist; thinly-bedded with sulfur staining along bedding surfaces.		80.3	37.2		
				Total Depth = 21' No Groundwater No Caving					
25									

Plate A- 20

advanced geotechnical services, inc.

Boring Log B-50

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/27/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **855.5** ft Depth to Water _____ ft After _____ hrs on _____ Logged By **CS**

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.					
				0 - 4" Concrete					
				4" - 15' Quaternary Alluvium (Qal)					
				Dark yellowish brown silty CLAY; very stiff; very moist.					
		7 11 16				94.0	23.4		
5		10 14 40		Rock in sampler tip.		106.3	17.6		
				Grades to clayey SAND.					
				Minor gravel.					
10		22 50/5"		Dark yellowish brown gravelly SAND; very dense; wet; medium- to coarse-grained; rounded clasts of volcanic rock and angular fragments of shale.		93.2 100.1	12.3 13.2		
15		21 50/5"		**15' - 15.9' Bedrock - Topanga Formation (Tt)**		84.9	31.6		
				Gray SILTSTONE; hard; wet.					
				Total Depth = 15.9' No Groundwater No Caving					
20									
25									

Plate A- 21

advanced geotechnical services, inc.

Boring Log B-51

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/27/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **864.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.					
				0" - 4" Concrete					
				4" - 10' Artificial Fill (af)					
				Moderate yellowish brown silty CLAY with gravel; stiff; moist; angular fragments of brown siltstone in matrix of soft silty CLAY.					
	⧓	10 10 14				81.3	33.0		
5	⧓	8 16 20		@5' Less gravel; color changes to mottled brownish-yellow, dark yellowish-brown and pale yellow.		94.3	25.9		
10	⧓	10 14 21		**10' - 16' Bedrock - Topanga Formation (Tt)**		96.6	22.8		
				Moderate yellow-brown and olive gray clayey SILTSTONE; thinly bedded; bedding dips at moderate to steep angles.					
15	⧓	20 30 45				103.0	20.7		
				Total Depth = 16' No Groundwater No Caving					
20									
25									

Plate A- 22

advanced geotechnical services, inc.

Boring Log B-52

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/27/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **874.5** ft Depth to Water _____ ft After _____ hrs on _____ Logged By **CS**

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.					
				0" - 3" Concrete					
				3" - 15' Artificial Fill (af) Dark yellowish brown CLAY; firm to stiff; moist; mottling of dark yellow orange, moderate yellow-brown and olive gray.					
		7 11 13				94.4	24.8		
5		5 9 12		@5' Sample appears to be all slough.		80.6	29.3		
10		8 14 16		@ 10' No Recovery.					
15		14 24 30		**15' - 16' Bedrock - Topanga Formation (Tt)** Moderate olive gray with mottling of dark yellowish brown SILTSTONE; thinly-bedded; dips at moderate to steep angles; carbonate along bedding surfaces.		95.7	25.4		
				Total Depth = 16' No Groundwater No Caving					
20									
25									

Plate A- 23

advanced geotechnical services, inc.

Boring Log B-53

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **10/27/00**

Comment **CME-75 with Automatic Hammer**

Drilling Company/Driller **JET Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **871.5** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.					
				0 - 3" Concrete					
				3" - 10' Artificial Fill (af)					
				Moderate yellowish brown CLAY; firm to stiff; moist; local gravel.					
				@ 1.5' Hard drilling on volcanic clast.					
	⋈	7 9 12				90.6	25.9		
5	⋈	8 18 20				91.3	30.2		
				10' - 16' Weathered Bedrock - Topanga Formation (Tt)					
10	⋈	14 22 32		Moderate yellow brown and olive gray clayey SILTSTONE; moderately hard; thin-bedded; beds steeply dipping.		95.7	25.2		
15	⋈	25 33 50				92.4	26.1		
				Total Depth = 16' No Groundwater No Caving					
20									
25									

Plate A- 24

advanced geotechnical services, inc.

Boring Log B-54

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **12/14/00**

Comment

Drilling Company/Driller **Discovery Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **855.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0" - 3" Concrete					
		7 7 9		**3" - 4' Artificial Fill (af)** Mottled light yellowish brown and olive brown sandy CLAY; firm to stiff; moist.		97.3	17.6		
		4 4 6		**4' - 11.5' Quaternary Alluvium (Qal)** Dark brown silty CLAY; stiff; very moist; local lenses of gravel. Minor gravel		71.4	32.9		
5		5 8 12				98.8	23.3		
		28 50/4"		Volcanic clasts in sampler tip.		89.4	21.6		
10		22 30 48		Large, rounded volcanic rock in sampler tip.					
				Total Depth = 11.5' No Groundwater No Cavung					
15									
20									
25									

Plate A- 25

advanced geotechnical services, inc.

Boring Log B-55

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **12/14/00**

Comment

Drilling Company/Driller **Discovery Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **850.5** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Description	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
			0" - 3" Concrete					
			3" - 10' Artificial Fill (af) Dark brown sandy clay; firm; moist; sand fraction very fine-grained.					
		7 8 10			110.6	18.1		
		4 6 11	Yellowish brown silty SAND; moist; dense; fine- to medium-grained; minor gravel.		103.9	16.2		
5								
		16 50/5.5"	Grades to yellowish brown gravelly SAND; moist; dense.		114.5	13.3		
			No sample attempted due to very rocky drilling.					
			Visible moisture on sampler.					
10		12 18 19	**10' - 16.5' Bedrock - Topanga Formation (Tt)** Dark olive to reddish yellow, clayey SILTSTONE; moderately strong; moist; thin-bedded; bedding dips ~45 degrees.		105.7	19.0		
15		40 50/5"			118.9	12.9		
			Total Depth = 16.5' Minor Seepage at 10' No Caving					
20								
25								

Plate A- 26

advanced geotechnical services, inc.

Boring Log B-56

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **12/14/00**

Comment

Drilling Company/Driller **Discovery Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **850.5** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Description	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
			0" - 5" Concrete					
			5" - 10' Quaternary Alluvium (Qal) Yellowish brown gravelly SAND; moist; dense; medium-grained.					
		8 21 26	Dark brown silty CLAY; firm to stiff; moist; minor sand fraction.		102.7	17.1		
5		3 3 6	Color grades to yellowish brown; greater sand fraction.		94.2	20.4		
		15 50/4"	Difficult drilling due to gravel lenses. Rounded clasts of volcanic rock in drill cuttings.		101.9	17.8		
		32 50/4"	Yellowish brown sandy CLAY; stiff to very stiff; moist; 10 to 20% rounded volcanic clasts.		121.8	12.4		
10		9 15 26	**10' - 16.5' Bedrock - Topanga Formation (Tt)** Yellowish brown to pale greenish gray clayey SILTSTONE and SANDSTONE; thin-bedded; beds dip 45 to 55 degrees.		100.1	21.2		
15		16 30 50/4"	Color grades to dark-gray and bluish-gray.		110.6	14.6		
			Total Depth = 16.5' No Groundwater No Caving					
20								
25								

advanced geotechnical services, inc.

Boring Log B-57

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **12/14/00**

Comment

Drilling Company/Driller **Discovery Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **852.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0" - 3" Concrete					
				3" - 11' Quaternary Alluvium (Qal) Dark brown silty CLAY; firm; moist.					
		9 12 15				97.7	21.7		
5		4 5 6		Color grades to yellowish brown.		94.6	22.9		
		9 18 30		Yellowish brown SAND; dense; moist; rounded volcanic clasts.		103.5	17.3		
		12 18 27							
10		19 37 48					28.0		
				11' - 15.5' Bedrock - Topanga Formation (Tt) Medium- to dark-grey and bluish-grey SANDSTONE and CLAYSTONE; laminated; beds dip ~50 - 55 degrees.					
15		30 50/2"				110.3	15.4		
				Total Depth = 15.5' No Groundwater No Caving					
20									
25									

Plate A- 28

advanced geotechnical services, inc.

Boring Log B-58

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **12/14/00**

Comment

Drilling Company/Driller **Discovery Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **852.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0" - 3" Concrete					
				3" - 10' Quaternary Alluvium (Qal)					
				Very dark gray to black silty CLAY; firm; moist; strong organic odor.					
		5 10 12				99.5	18.3		
		5 9 12		Grayish brown to dark yellowish brown silty to clayey SAND; medium dense to dense; slightly moist; fine-grained.		96.3	19.2		
5		13 15 24		Grades to yellowish brown SAND; dense; moist to wet; fine- to medium-grained; little gravel.		107.2	10.3		
		7 10 17				90.4	31.4		
				Minor seepage.					
10		12 15 27		**10' - 16' Bedrock - Topanga Formation (Tt)** Dark brown to pale bluish gray SANDSTONE and SILTSTONE; strong; moist; laminated; beds steeply dipping.		99.6	29.1		
15		33 50/6"				107.3	18.0		
				Total Depth = 16' No Groundwater No Caving					
20									
25									

Plate A- 29

advanced geotechnical services, inc.

Boring Log B-59

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **12/14/00**

Comment

Drilling Company/Driller **Discovery Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **850.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0" - 4" Concrete					
				4" - 11' Quaternary Alluvium (Qal) Dark brown sandy CLAY; soft to firm; moist.					
		5 6 8				100.0	17.9		
		6 12 16		Yellowish brown, silty to clayey SAND; dense; moist to very moist; fine-grained; pervasive carbonate stringers.		100.9	18.6		
5		8 10 16		Grades medium- to coarse-grained; local gravel.		116.6	17.1		
		10 15 30				111.8	18.9		
10		50 48		Minor seepage. Rock in sampler tip.					
				Total Depth = 11' Minor Seepage @ 10'					
15									
20									
25									

advanced geotechnical services, inc.

Boring Log B-60

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **12/14/00**

Comment

Drilling Company/Driller **Discovery Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **853.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0" - 2' Artificial Fill (af) Yellowish brown silty to clayey SAND; medium dense; moist; fine- to medium-grained.					
				2' - 10' Quaternary Alluvium (Qal) Yellowish brown to dark brown, silty SAND; moist; fine-grained.					
5				Difficult drilling due to gravel.					
10		6 12 16		**10' - 21' Bedrock - Topanga Formation (Tt)** Reddish yellow SILTSTONE; medium strong; moist; grades to dark brown and gray with depth.		93.4	24.5		
15		19 50/6"							
20						109.1	15.1		
				Total Depth = 21' No Groundwater No Caving					
25									

Plate A- 31

advanced geotechnical services, inc.

Boring Log B-61

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **12/14/00**

Comment

Drilling Company/Driller **Discovery Drilling** Equipment **Hollow Stem Auger**

Driving Weight (lbs) **140** Average Drop (in.) **30** Hole Diameter (in.) **6**

Elevation **860.0** ft Depth to Water ____ ft After ____ hrs on ____ Logged By **CS**

Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Description	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
			0" - 2" Asphalt					
			2" - 10' Quaternary Alluvium (Qal) Dark brown CLAY; very stiff; moist; local lenses of gravel.					
		9 18 37			94.5	23.5		
		11 32 26	Rock in sampler tip.		88.6	23.5		
5			Color grades to dark yellowish brown.					
		12 26 30	Dark yellow brown sandy CLAY to clayey SAND; stiff; moist; sand fraction fine-grained.		103.8	18.5		
		9 15 21			99.0	22.5		
10		8 10 15	Yellowish brown SAND; dense; moist; fine- to medium-grained; 5 - 10% pebble-sized gravel clasts.		99.2	11.2		
			Total Depth = 10.5' No Groundwater No Caving					
15								
20								
25								

advanced geotechnical

s e r v i c e s, i n c.

advanced geotechnical services, inc.

Boring/Test Pit Log TP-6

Sheet 1 of 1

Project **Selleck Development Group** Client No. **2738** Date Drilled **5/9/00**

Comment **Agoura Road, Agoura Hills**

Drilling Company/Driller **Platt Construction** Equipment **Backhoe**

Driving Weight (lbs) **Push** Average Drop (in.) **Backhoe Sampler** Hole Diameter (in.) **24"**

Elevation **865.0** ft Depth to Water _____ ft After _____ hrs on _____ Logged By **CS/NA**

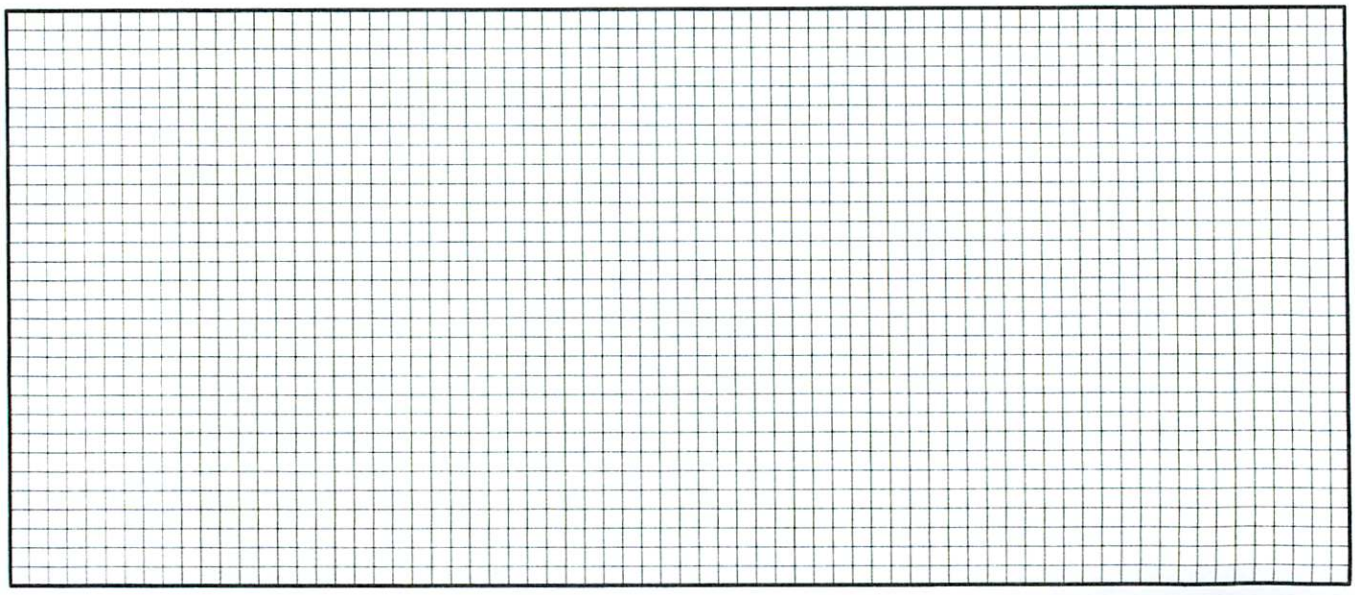
Description of Material

This log, which is part of the report prepared by Advanced Geotechnical Services, Inc. for the named project, should be read together with that report for complete interpretation. This summary applies only at this boring location and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth, ft	Sample	Blows/6"	Graphic Symbol	Description of Material	Attitudes	Dry Unit Weight, pcf	Moisture Content, %	-#200, %	Other Tests
				0' - 14.5' Quaternary Alluvium (Qal) Dark brown silty CLAY; fine grained sand fraction; local gravel-sized rounded volcanic clasts; slightly moist; very stiff; upper 6" - 10" disturbed.		98.6	18.0		
5				@ 3.5' Dark brown silty sandy CLAY; very fine to fine-grained; slightly porous; very stiff; slightly moist; roothairs very common; grades less silt and clay with depth; silty SAND below 7.5'.		97.6 106.7	20.5 19.0		
						96.9	16.1		
10				@ 10' Yellowish brown sandy GRAVEL; pebble to cobble-sized; rounded clasts of primarily volcanic rock in a matrix of medium to coarse-grained sand; poorly cemented; damp to moist.					
15				Total Depth = 14.5' No Groundwater No Caving					

Trench Description

Depth, ft
1" = 5'



Appendix B

Laboratory Testing

Appendix B
Laboratory Testing

A laboratory test program is designed for each project to evaluate the physical and mechanical properties of the soil and bedrock materials encountered at the site during our field exploration program. Laboratory tests were conducted on representative samples for the purpose of classification and determining their properties for use in analyses and evaluations. The most common laboratory tests include moisture-density, Atterberg limits, grain-size analyses (sieve and hydrometer analyses), sand equivalent, direct shear, consolidation, compaction, expansion index, and *R*-values. The following descriptions of test methods are generic and may include methods not used on this project. Reference to the boring logs and test results on Plates attached to this appendix will show which tests were performed for this project. Laboratory testing is performed in general accordance with the most recent ASTM (2007) test designations available at the time of testing.

Classification Tests

Classification testing is performed to identify differences in material behavior and to correlate the results with shear strength and volume change characteristics of the materials. Classification testing includes unit weight (e.g., dry density), moisture content, Atterberg limits, grain size analyses (sieve and hydrometer), and sand equivalent.

Moisture-Density Test

Site soils were classified in the laboratory in accordance with the Unified Soil Classification System. Moisture contents are performed in general accordance with ASTM Test Designation D2216 and unit weights were determined in general accordance with ASTM Test Designation D2937. Field moisture contents and dry unit weights were determined for the ring samples obtained in the field. Field moisture contents and dry unit weights are shown on the boring logs in Appendix A.

Sieve Analysis

Sieve analysis tests were conducted on the on-site soils in general accordance with sieve analysis test procedure from ASTM Test Designation D422. This method covers the quantitative determination of the distribution of particle sizes in soils. If this test was performed, the results are presented on Plates attached to this appendix.

Hydrometer Test

Hydrometer tests were performed in general accordance with ASTM Test Designation D422. If this test was performed, the results are presented on Plates attached to this appendix. Samples with obviously little course material and a high percentage of fines were prepared with a wet method (ASTM Test Designation D2217) rather than air-drying the sample and pulverizing with a mortar and pedestal.

Shear Tests

Direct shear tests were performed in general accordance with ASTM D3080 to determine the shear strength parameters of undisturbed on-site soils or remolded soil specimens. The samples are usually tested in an artificially saturated condition. This is accomplished by soaking the specimens in a confined container for a period of one or 2 days, depending on the permeability of the material. The specimen, 1-inch-high and 2.4-inch-diameter, is placed in the shear device, and a vertical stress is applied to the specimen. The specimen is allowed to reach an equilibrium state (swell or consolidate). The specimen is then sheared under a constant rate of deformation. The rate of deformation for a slow test, sufficiently slow to presumably allow drainage, is selected from computed or measured consolidation rates to simulate full drainage (full dissipation of any tendency for pore water pressure changes) during shear. A rate of displacement of 0.005 inches per minute was used for the most tests. The process usually is repeated for 3 specimens, each under different vertical stresses. The results from the 3 tests are plotted on a diagram of shear stress and normal (vertical) stress at failure, and linear approximations are drawn of the failure curves to determine the angle of internal friction and cohesion. The first moisture content

shown on the graphs (associated with peak values) is for either the in-situ condition or the remolded condition, and the second moisture content (associated with ultimate value) is for the soaked condition.

Consolidation Test

Consolidation tests were performed in general accordance with ASTM D2435 and D5333 on selected samples to evaluate the load-deformation characteristics of the earth soils. The tests were performed primarily on material that would be most susceptible to consolidation under anticipated foundation loading. The soil specimen, contained in a 2.4-inch-diameter, 1.0-inch-high sampling ring, is placed in a loading frame under a seating pressure of 0.1 ksf. Vertical loads are applied to the samples in several geometric increments, and the resulting deformations were recorded at selected time intervals. When the pressure reaches a preselected effective overburden pressure (often 2 ksf) and the specimen has consolidated under that pressure, the laboratory technician adds water to the test cell and records the vertical movement. After the specimen reaches equilibrium with the addition of water, the technician continues the loading process, usually up to a pressure of about 8 ksf. The specimen is then unloaded in increments, and the test is dismantled. The results of the test are presented in terms of percent volume change versus applied vertical stress. If this test was performed, the results are presented on Plates attached to this appendix.

Compaction Test

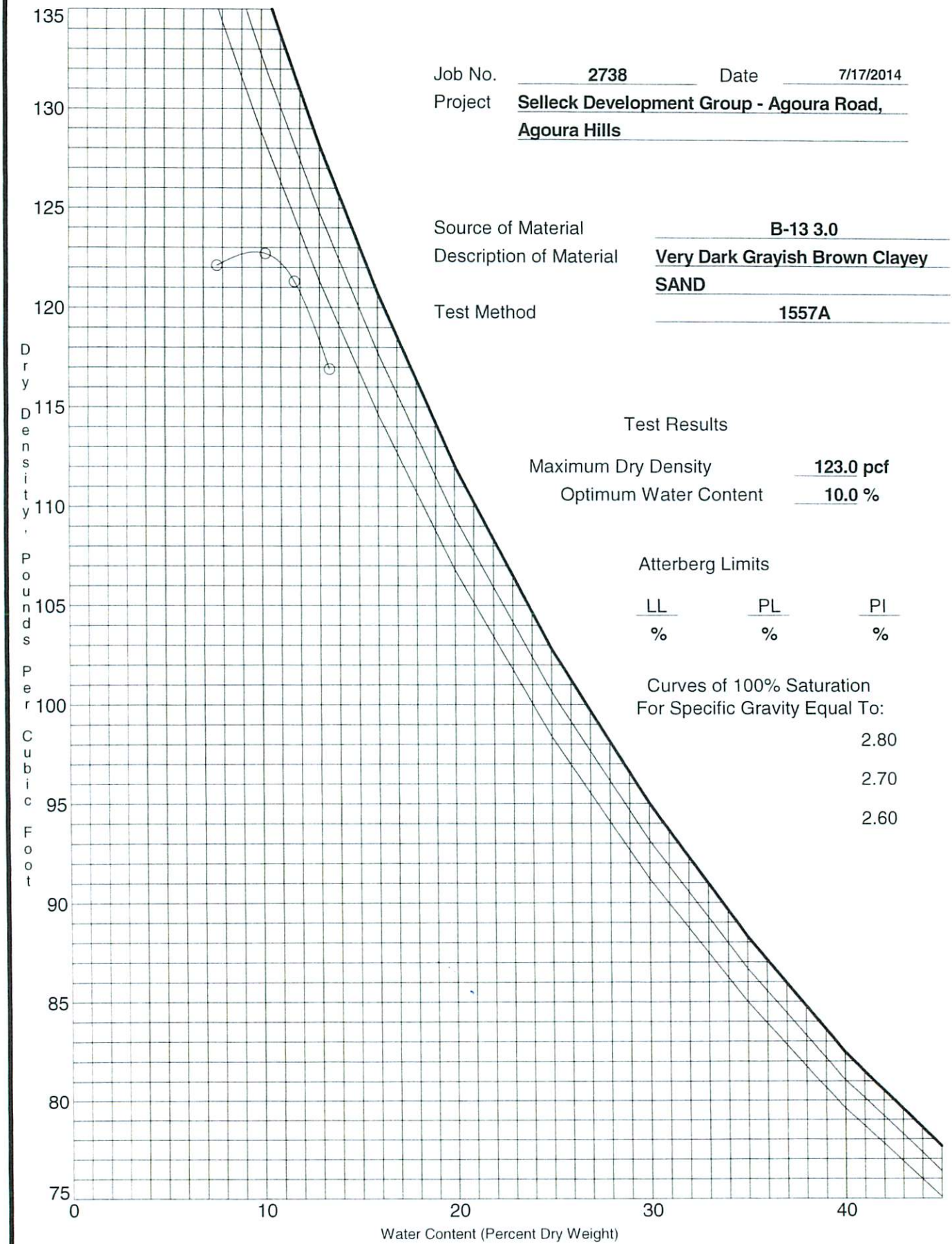
Compaction tests provide information on the relationship between moisture content and dry density of the soil compacted in a given manner. The maximum density is obtained for a given compaction effort at an optimum moisture content. Specifications for earthwork are in terms of the unit weight (or dry density) expressed as a percentage of the maximum density, and the moisture content compared to the optimum moisture content. Compaction tests were performed in general accordance with ASTM Test Designation D1557 to determine the maximum dry densities and optimum moisture contents of the on-site soils. If this test was performed, the results are presented on Plates attached to this appendix.

Expansion Index Test

The expansion index test provides an assessment of the potential for expansion or heave that could be detrimental to foundation or slab performance. Expansion Index tests are performed on shallow on-site soils in general accordance with expansion test procedures in ASTM D4829. In this test, a specimen is compacted at a degree of saturation between 45% and 55% in a 4.01-inch-diameter, 1.0-inch-high ring. The specimen is subjected to a seating pressure of 144 psf, water is added to the test cell, and swell is monitored until the expansion stops. The volume of swell is converted to an expansion index. Any test results are summarized on the boring logs in Appendix A.

Sample Remolding

In some cases remolded samples are used when performing direct shear tests and consolidation tests. Samples are remolded to a specified moisture and density by compacting the soil in a 2.42-inch-diameter sample ring. The specified moisture content is either at optimum or a few percentage points above optimum. The specified dry density is usually at a relative compaction of 90%. The required moisture is added to and mixed with dry soil, providing a homogeneous mixture. A 2.42-inch-diameter ring is placed in a 6-inch-diameter compaction mold, and soil is placed in the mold to above the ring. The soil is then compacted with a 5.5-pound hammer with a free-fall drop of 12 inches. The sample is trimmed, and the dry density is determined. If the dry density deviates more than about one pound per cubic foot from the specified dry density, the process is repeated with the number of blows altered to better achieve the specified dry density.



Job No. **2738** Date **7/17/2014**

Project **Selleck Development Group - Agoura Road, Agoura Hills**

Source of Material **B-13 3.0**

Description of Material **Very Dark Grayish Brown Clayey SAND**

Test Method **1557A**

Test Results

Maximum Dry Density **123.0 pcf**

Optimum Water Content **10.0 %**

Atterberg Limits

LL	PL	PI
%	%	%

Curves of 100% Saturation For Specific Gravity Equal To:

2.80

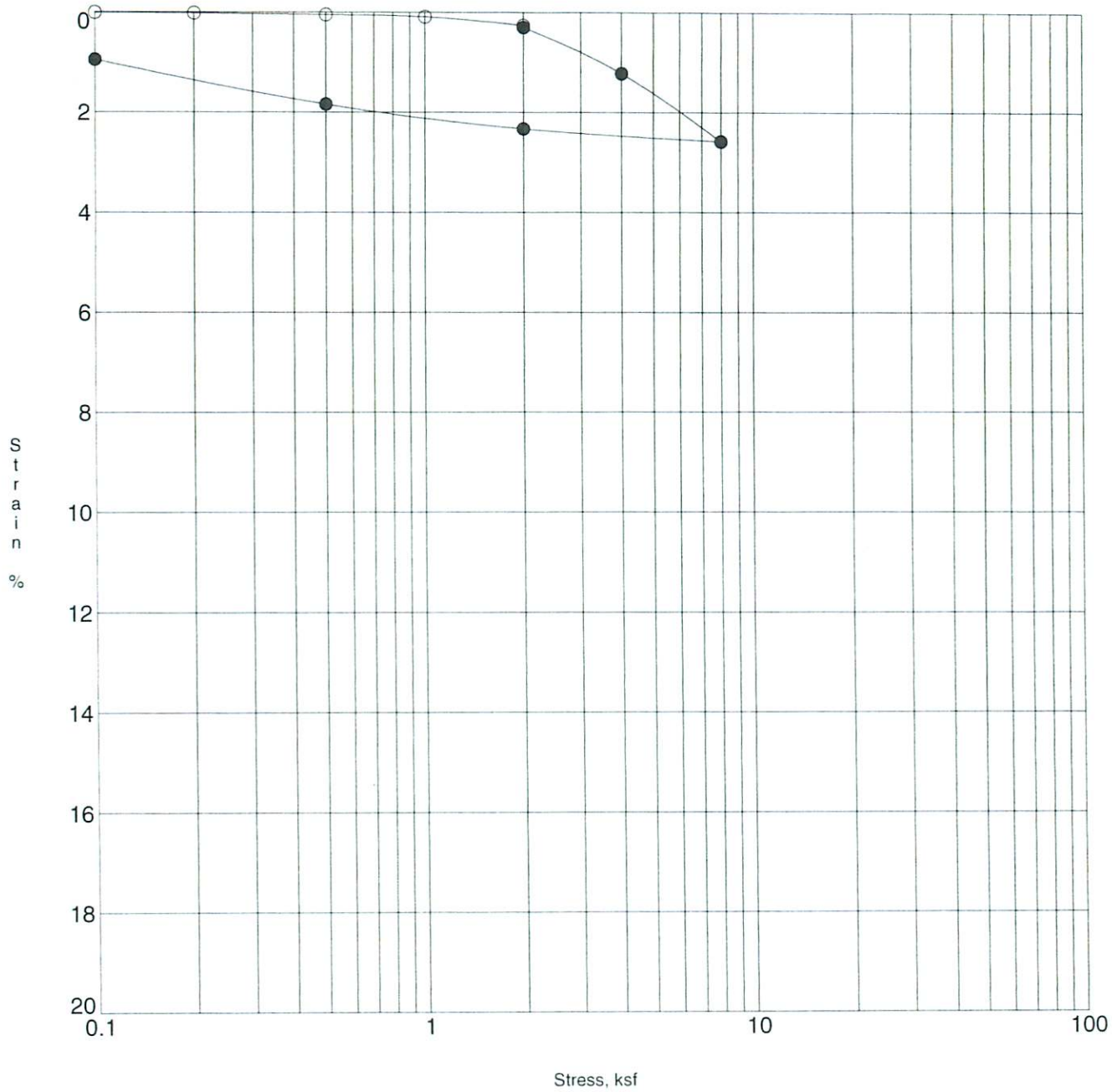
2.70

2.60

Moisture-Density Relationship

Advanced Geotechnical Services, Inc.

Plate B- 3



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

	Specimen Identification		Classification	DD	MC%
○	B-13	3.0	Very Dark Grayish Brown Clayey SAND	112.5	10.3
●	B-13	3.0	(Remolded)	113.6	16.2

Project: Selleck Development Group - Agoura Road, Agoura Hills

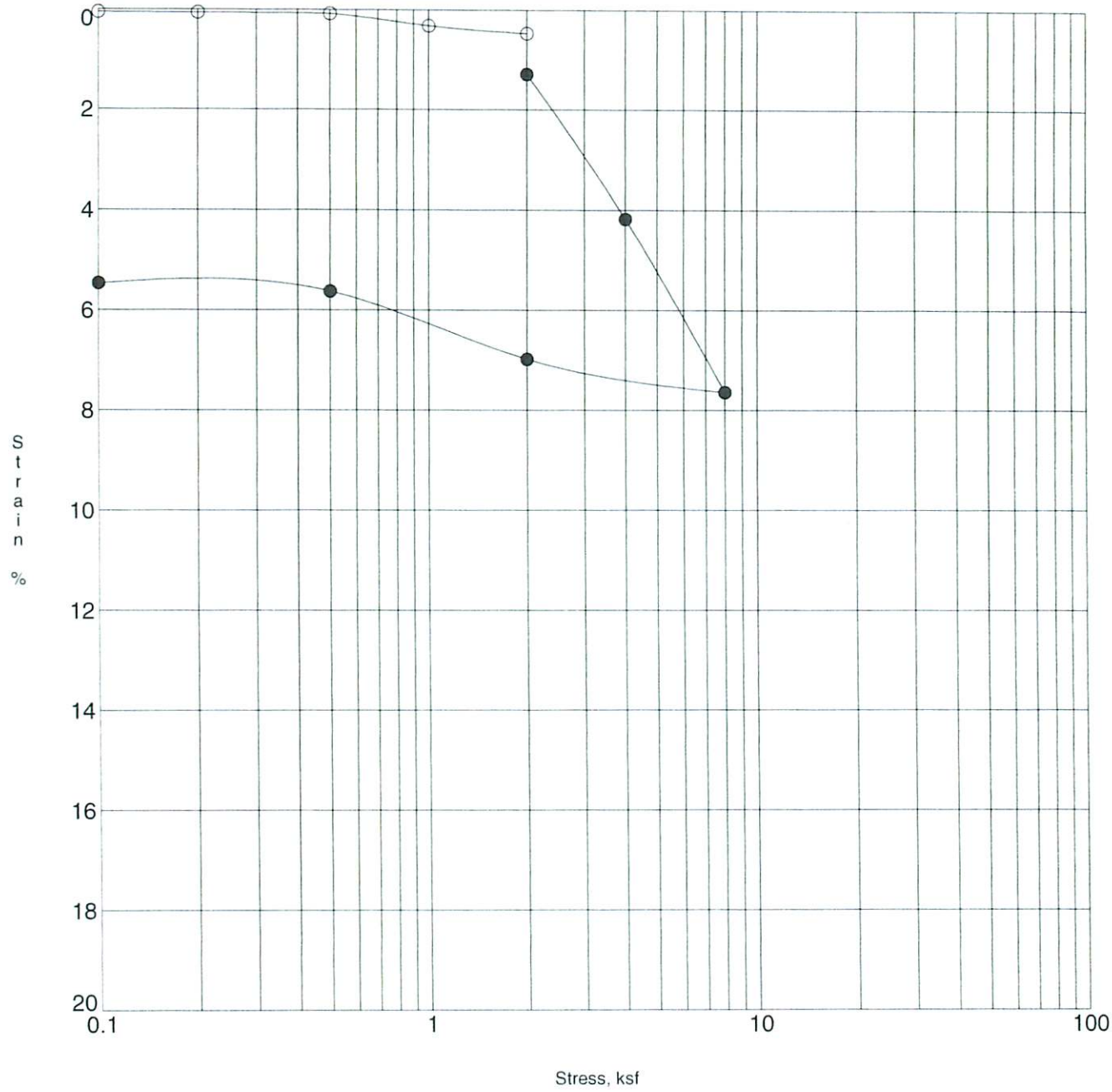
Client No.: 2738

Date: 7/17/14

Consolidation Test

Advanced Geotechnical Services, Inc.

Plate B- 4



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

Specimen Identification			Classification	DD	MC%
○	B-22	10.5	Light Olive Brown CLAY with Sand	87.7	25.5
●	B-22	10.5		92.8	28.3

Project: Selleck Development Group - Agoura Road, Agoura Hills

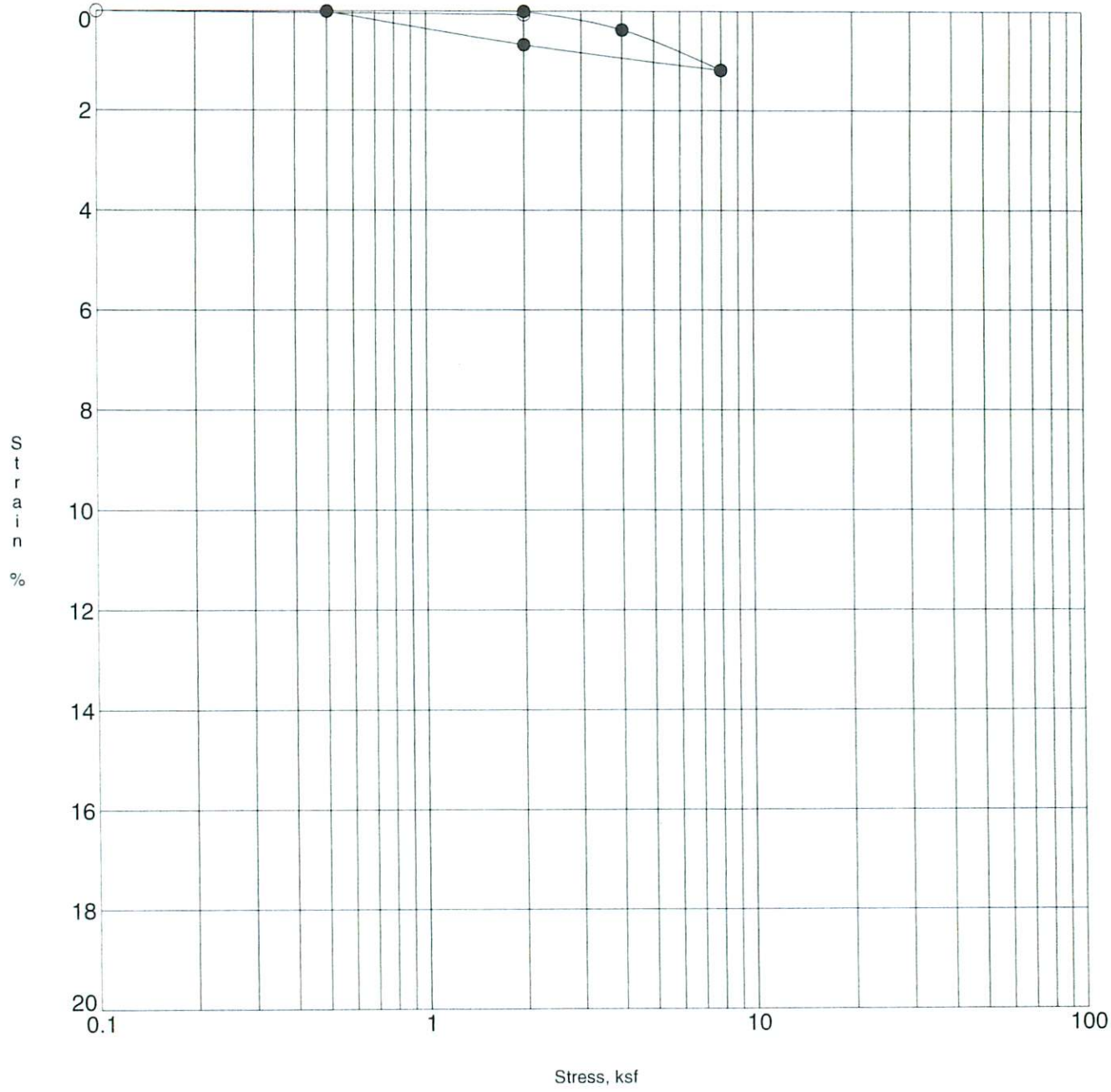
Client No.: 2738

Date: 7/17/14

Consolidation Test

Advanced Geotechnical Services, Inc.

Plate B- 5



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

Specimen Identification			Classification	DD	MC%
○	B-22	20.5	Dark Brown CLAY with Sand	90.2	26.6
●	B-22	20.5	Topanga Formation	90.2	29.4

Project: Selleck Development Group - Agoura Road, Agoura Hills

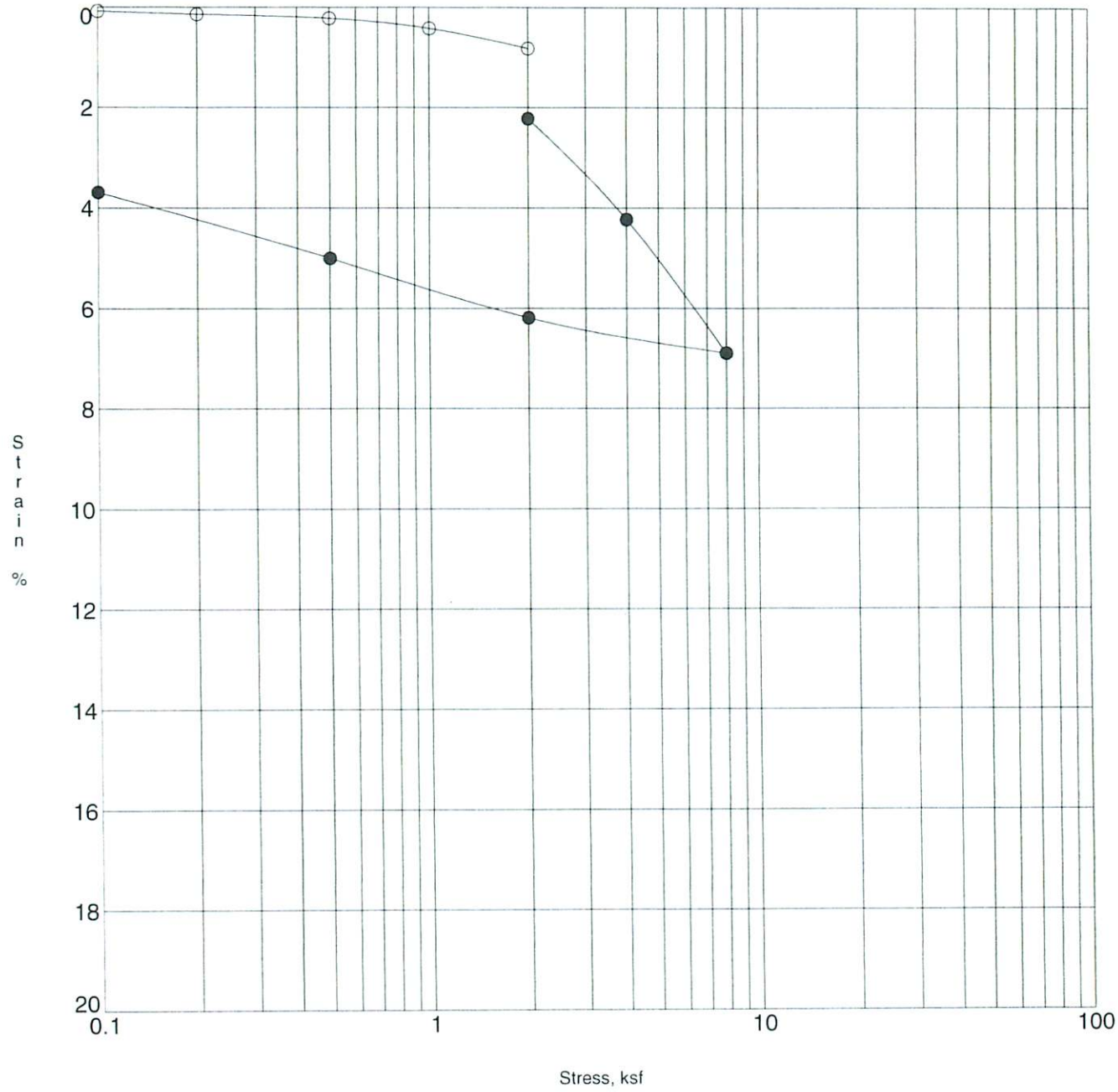
Client No.: 2738

Date: 7/17/14

Consolidation Test

Advanced Geotechnical Services, Inc.

Plate B- 6



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

	Specimen Identification		Classification	DD	MC%
○	B-32	5.3	Very Dark Grayish Brown Sandy CLAY	95.2	16.5
●	B-32	5.3		98.8	23.5

Project: Selleck Development Group - Agoura Road, Agoura Hills

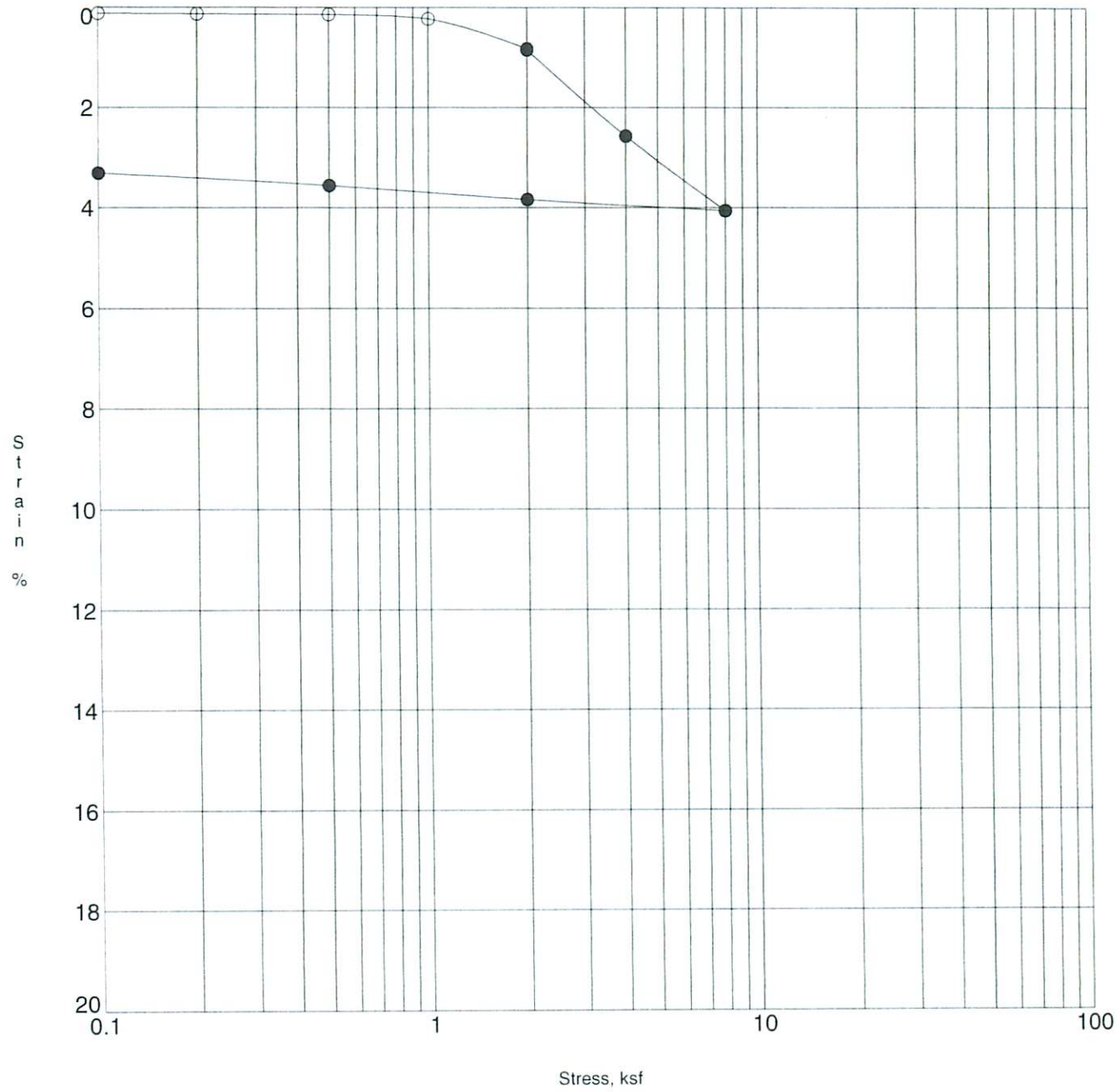
Client No.: 2738

Date: 7/17/14

Consolidation Test

Advanced Geotechnical Services, Inc.

Plate B- 7



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

Specimen Identification			Classification	DD	MC%
○	B-36	10.5	Dark Olive Brown Silty SAND	102.6	12.9
●	B-36	10.5		106.1	18.5

Project: Selleck Development Group - Agoura Road, Agoura Hills

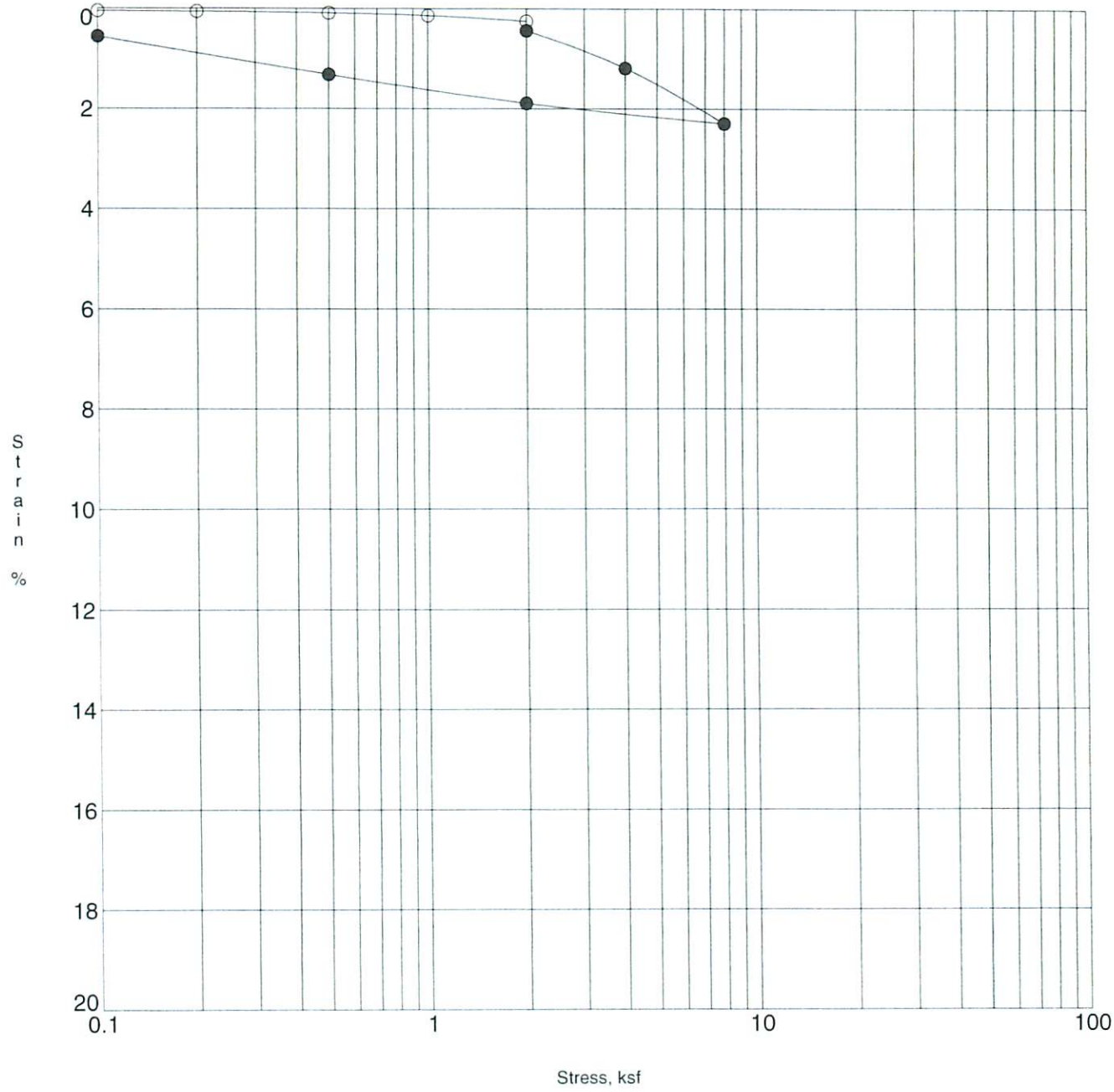
Client No.: 2738

Date: 7/17/14

Consolidation Test

Advanced Geotechnical Services, Inc.

Plate B- 8



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

Specimen Identification			Classification	DD	MC%
○	B-43	5.0	Olive Brown Silty SAND	114.2	12.3
●	B-43	5.0	Conejo Volcanics	114.8	17.4

Project: Selleck Development Group - Agoura Road, Agoura Hills

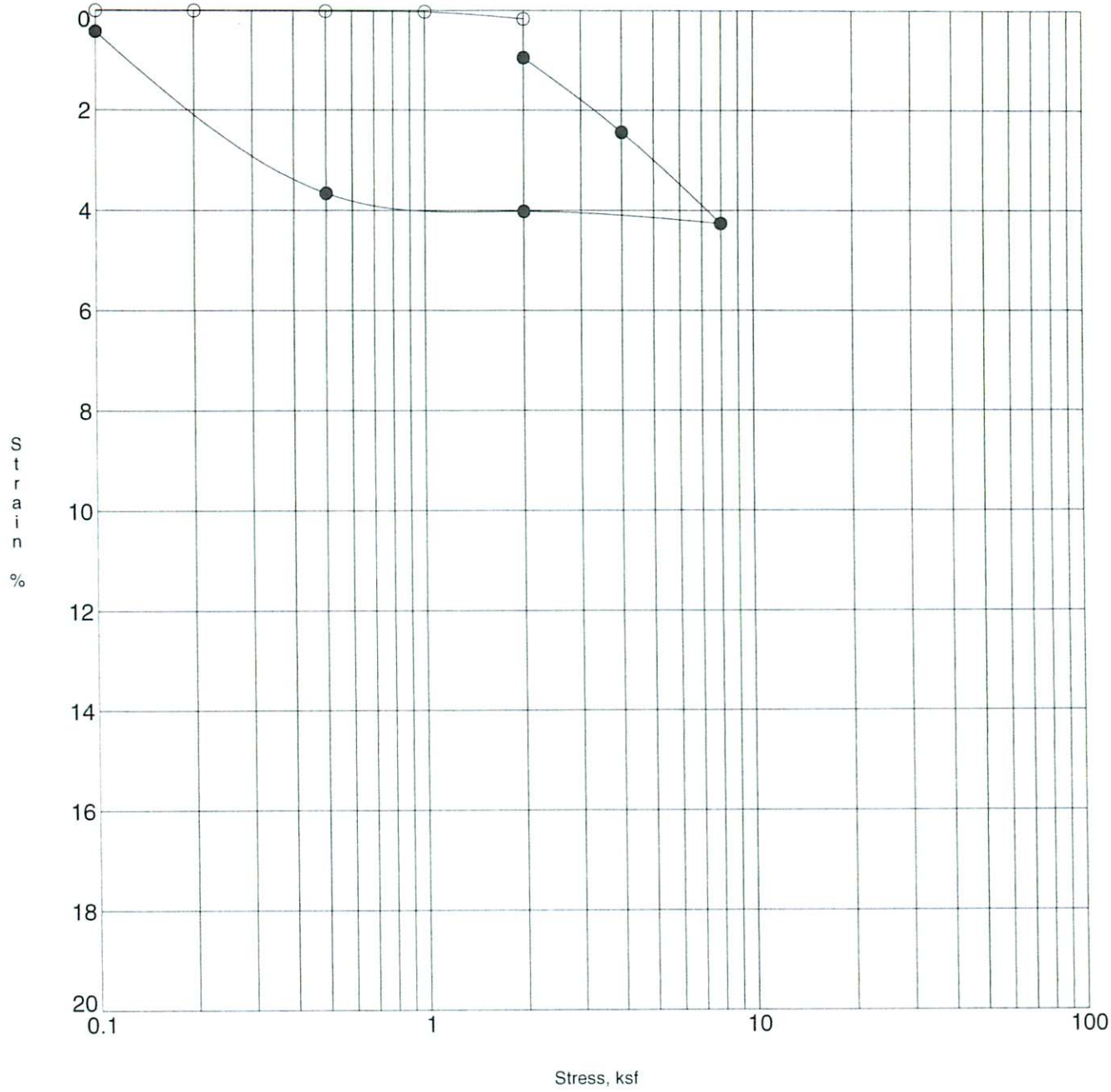
Client No.: 2738

Date: 7/17/14

Consolidation Test

Advanced Geotechnical Services, Inc.

Plate B- 9



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

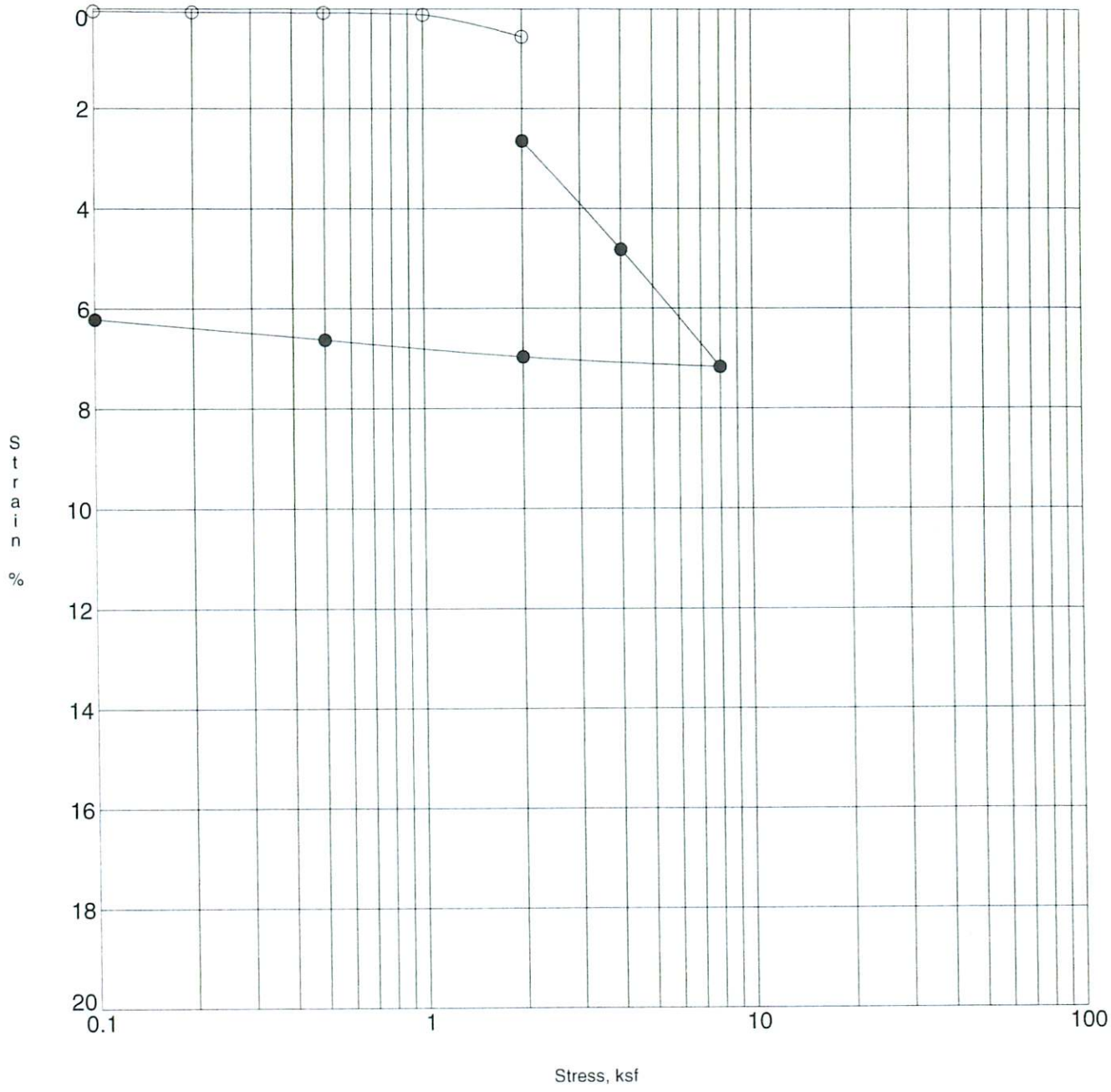
	Specimen Identification		Classification	DD	MC%
○	B-44	10.0	Dark Yellowish Brown GRAVEL with Silt and Sand	104.3	8.7
●	B-44	10.0	Conejo Volcanics	104.7	18.3

Project: **Selleck Development Group - Agoura Road, Agoura Hills**

Client No.: **2738**

Date: **7/17/14**

Consolidation Test



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

Specimen Identification			Classification	DD	MC%
○	B-45	10.0	Olive Brown Silty SAND	102.6	10.5
●	B-45	10.0	Conejo Volcanics	109.4	17.7

Project: Selleck Development Group - Agoura Road, Agoura Hills

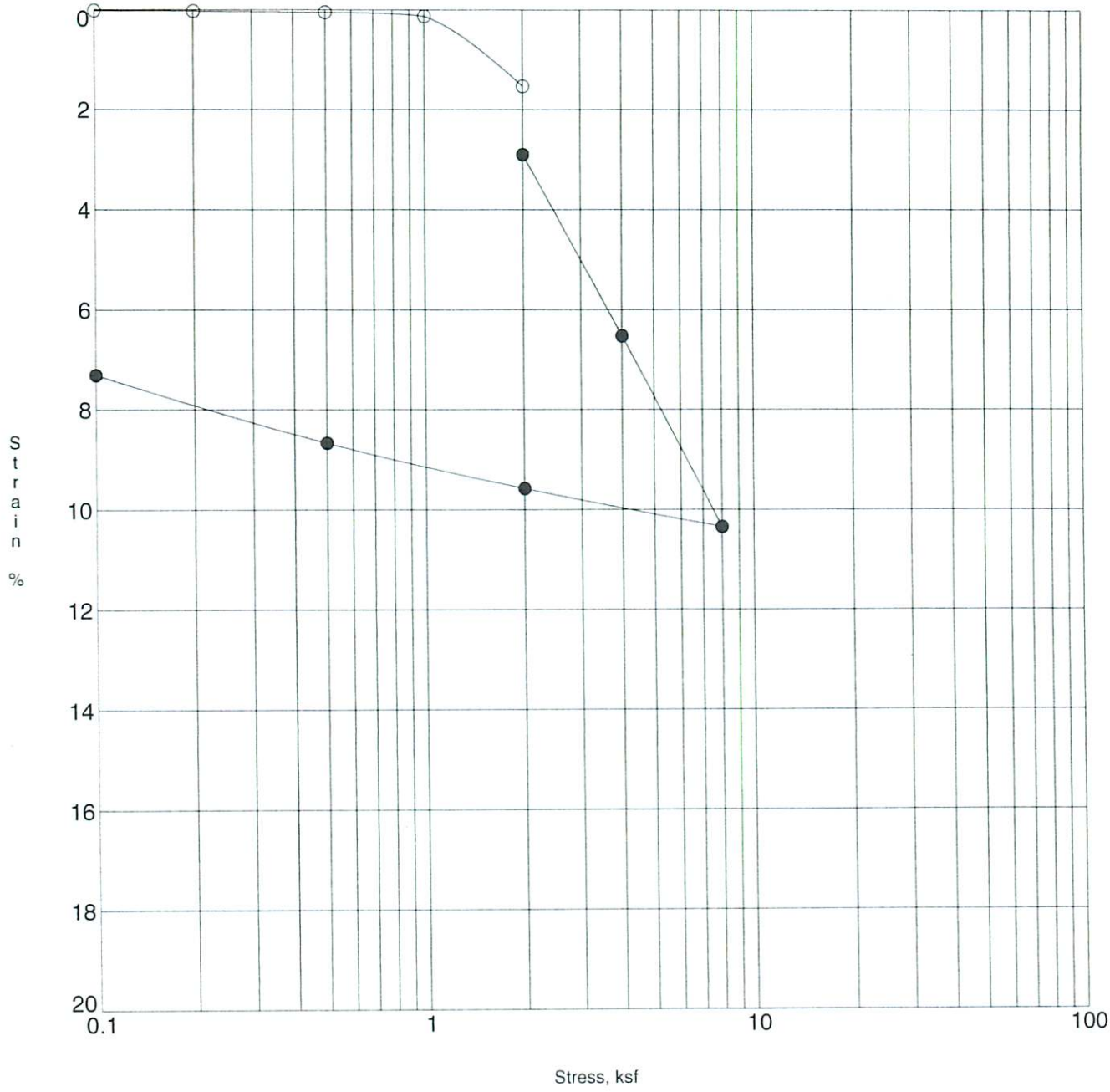
Client No.: 2738

Date: 7/17/14

Consolidation Test

Advanced Geotechnical Services, Inc.

Plate B- 11



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

Specimen Identification			Classification	DD	MC%
○	B-46	5.0	Very Dark Grayish Brown Clayey GRAVEL with Sand	89.4	20.4
●	B-46	5.0		96.4	24.1

Project: Selleck Development Group - Agoura Road, Agoura Hills

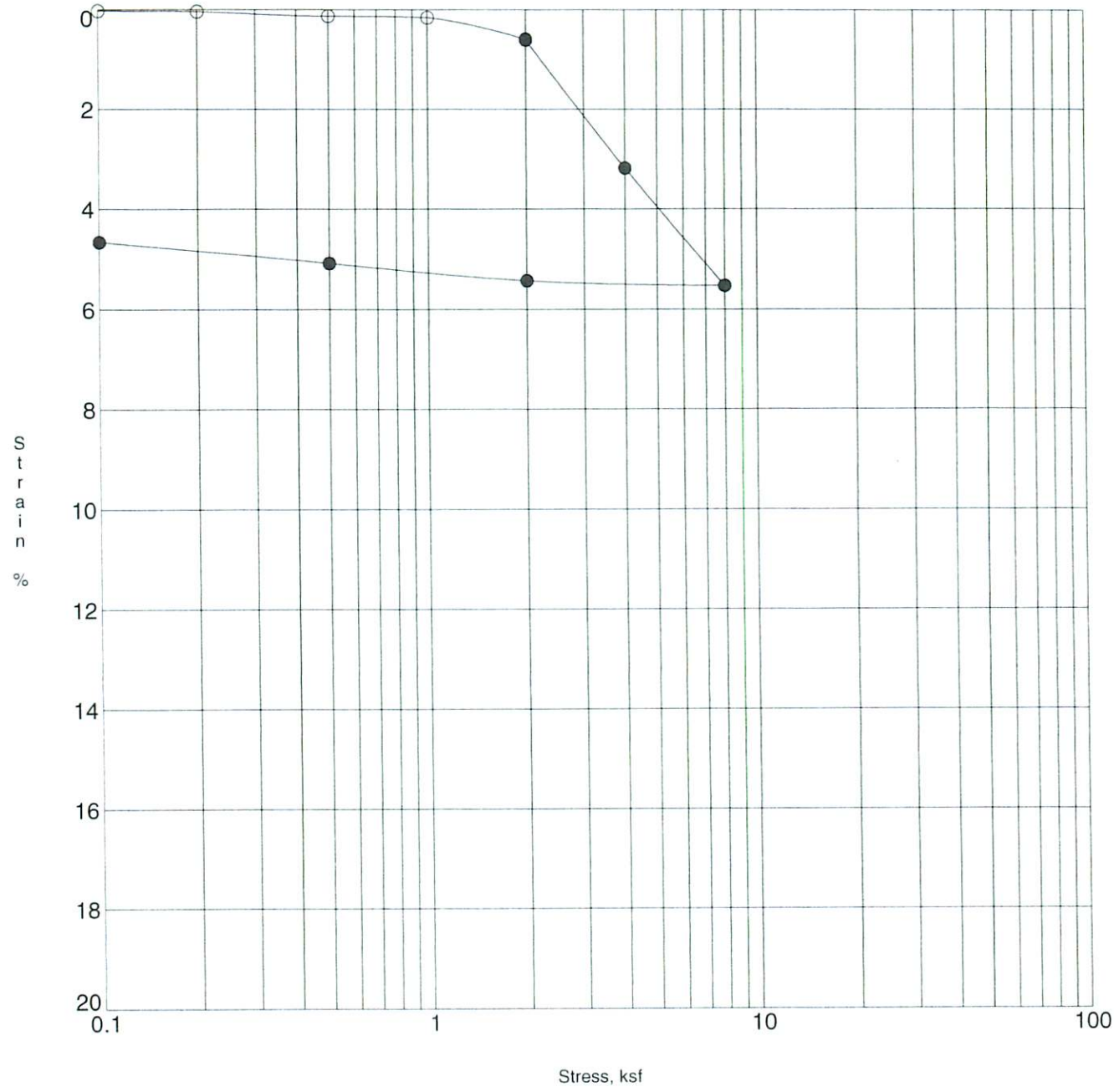
Client No.: 2738

Date: 7/17/14

Consolidation Test

Advanced Geotechnical Services, Inc.

Plate B- 12



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

Specimen Identification			Classification	DD	MC%
○	B-50	10.0	Dark Yellowish Brown SAND with Gravel	100.1	13.2
●	B-50	10.0		105.0	16.5

Project: Selleck Development Group - Agoura Road, Agoura Hills

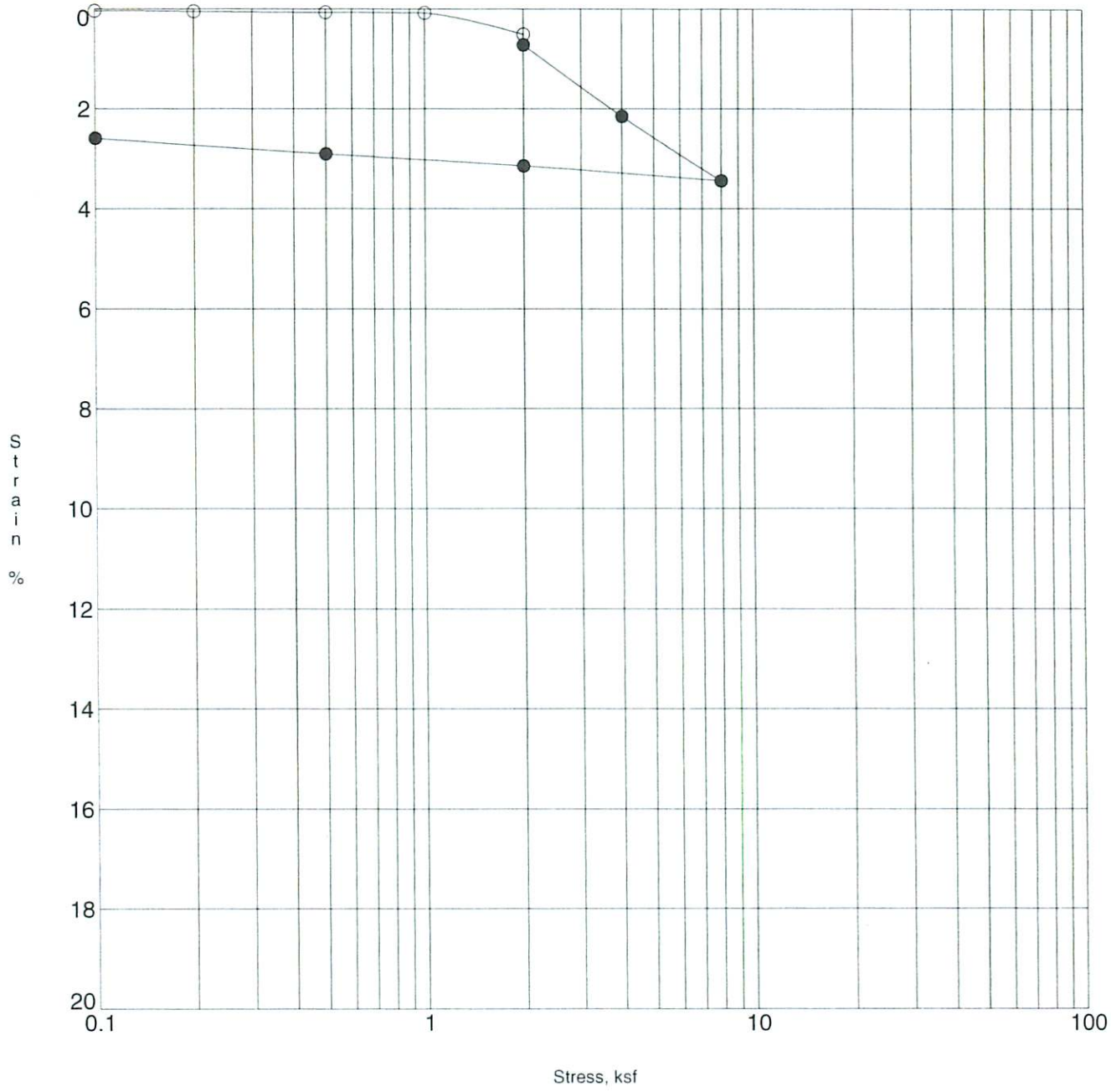
Client No.: 2738

Date: 7/17/14

Consolidation Test

Advanced Geotechnical Services, Inc.

Plate B- 13



Open Symbol At Field Moisture, Solid Symbol After Submersion in Water

	Specimen Identification		Classification	DD	MC%
○	B-61	10.0	Yellowish Brown Silty Clayey SAND	100.1	13.2
●	B-61	10.0		102.8	19.0

Project: Selleck Development Group - Agoura Road, Agoura Hills

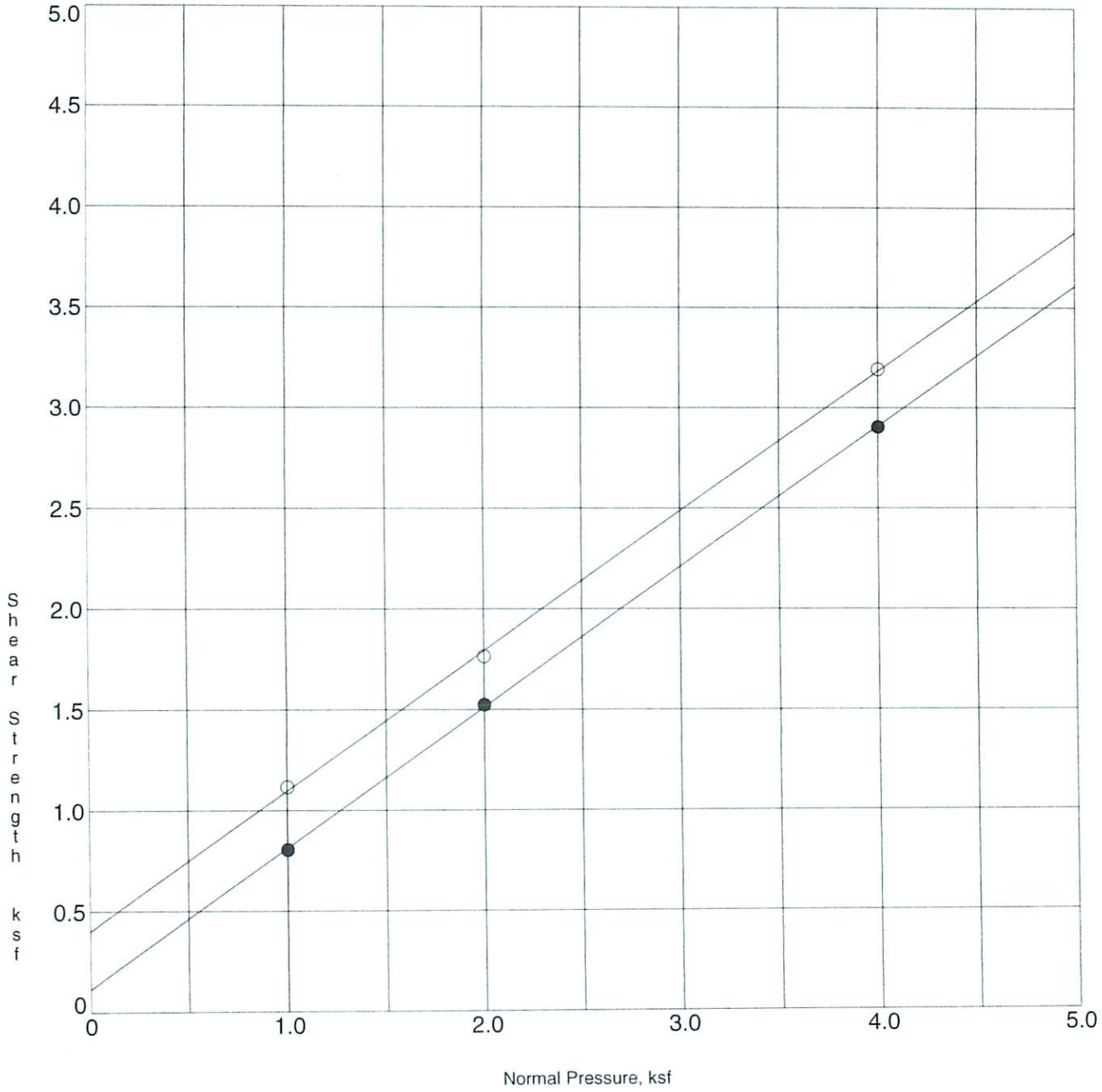
Client No.: 2738

Date: 7/17/14

Consolidation Test

Advanced Geotechnical Services, Inc.

Plate B- 14



○ - Peak Shear ● - Ultimate Shear △ - Residual Shear

	Specimen Identification		Classification	DD	MC%	c, ksf	phi
○	B-13	3.0	Very Dark Grayish Brown Clayey SAND	110.6	12.2	0.40	35
●	B-13	3.0	(Remolded)	110.6	17.2	0.11	35

Project: **Selleck Development Group - Agoura Road, Agoura Hills**

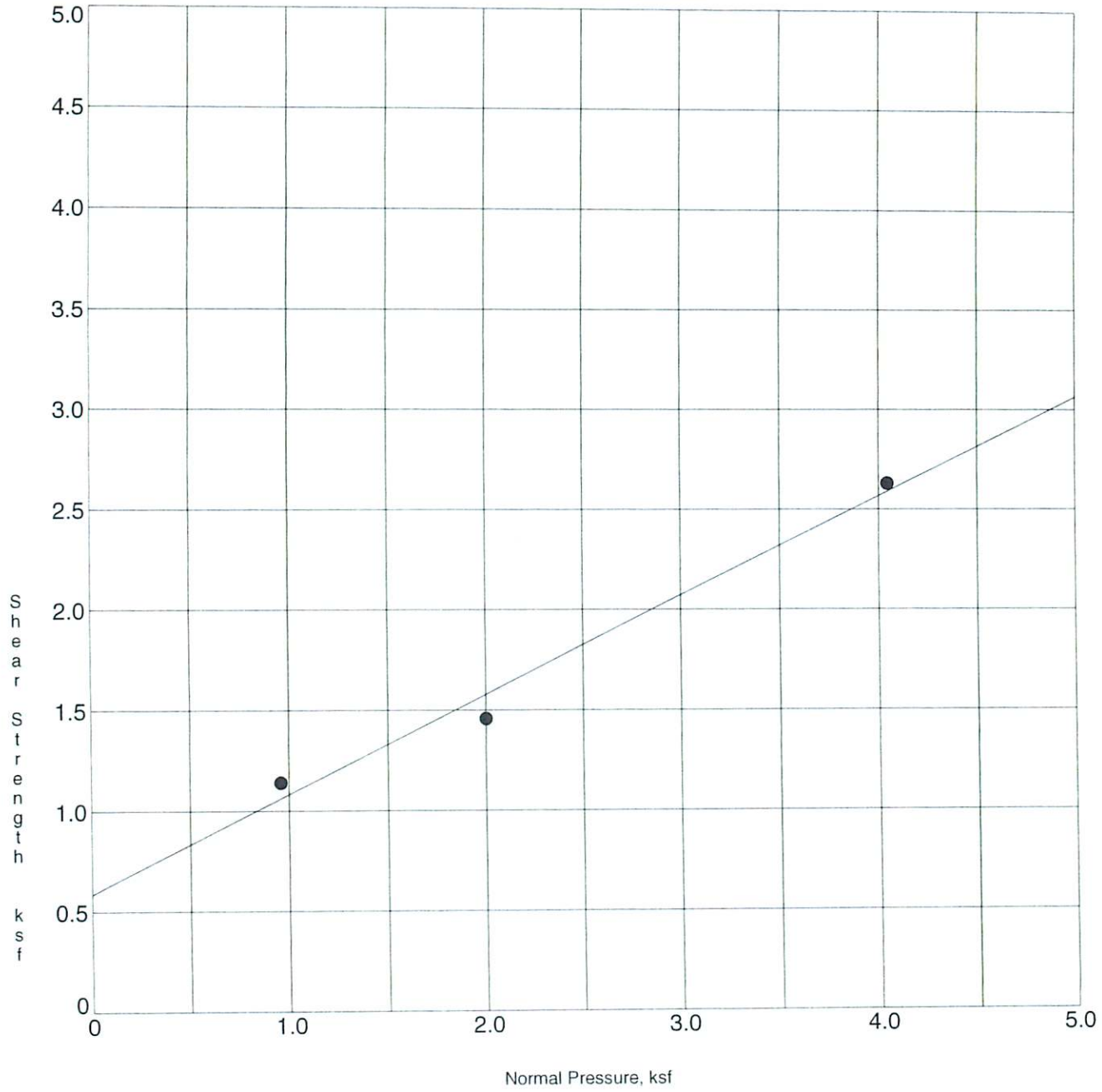
Client No. **2738**

Date **7/17/14**

Shear Test Diagram

Advanced Geotechnical Services, Inc.

Plate B- 15



○ - Peak Shear ● - Ultimate Shear △ - Residual Shear

	Specimen Identification		Classification	DD	MC%	c, ksf	phi
○	B-21	5.5	Dark Yellowish Brown Silty CLAY with Gravel	83.6	31.7	0.59	26
●	B-21	5.5	Artificial Fill	83.6	34.7	0.59	26

Project **Selleck Development Group - Agoura Road, Agoura Hills**

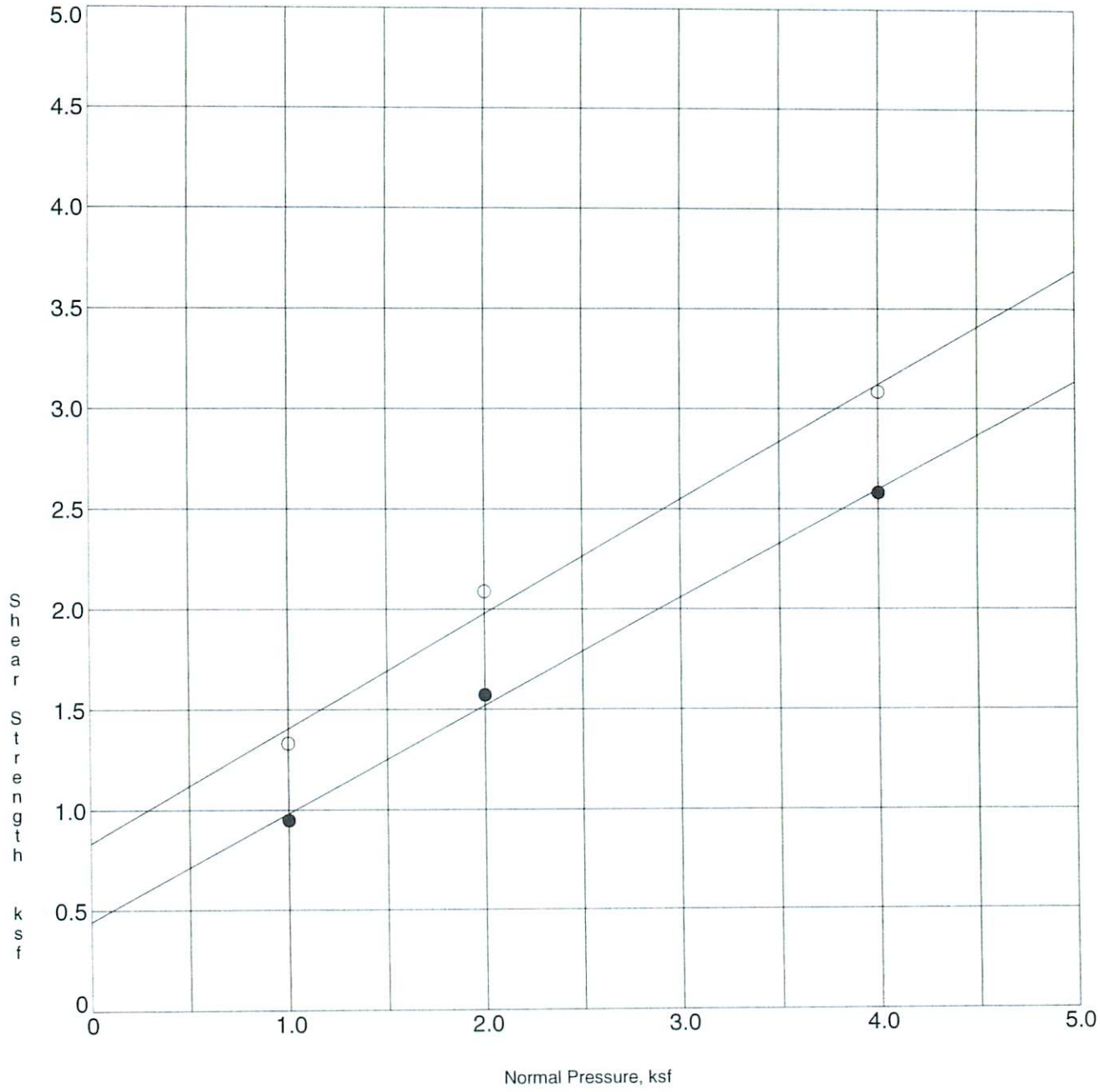
Client No. **2738**

Date **7/17/14**

Shear Test Diagram

Advanced Geotechnical Services, Inc.

Plate B- 16



○ - Peak Shear ● - Ultimate Shear △ - Residual Shear

	Specimen Identification		Classification	DD	MC%	c, ksf	phi
○	B-21	18.0	Dark Yellowish Brown Silty Sandy CLAY	87.4	31.1	0.83	30
●	B-21	18.0	Topanga Formation	87.4	33.3	0.44	28

Project: Selleck Development Group - Agoura Road, Agoura Hills

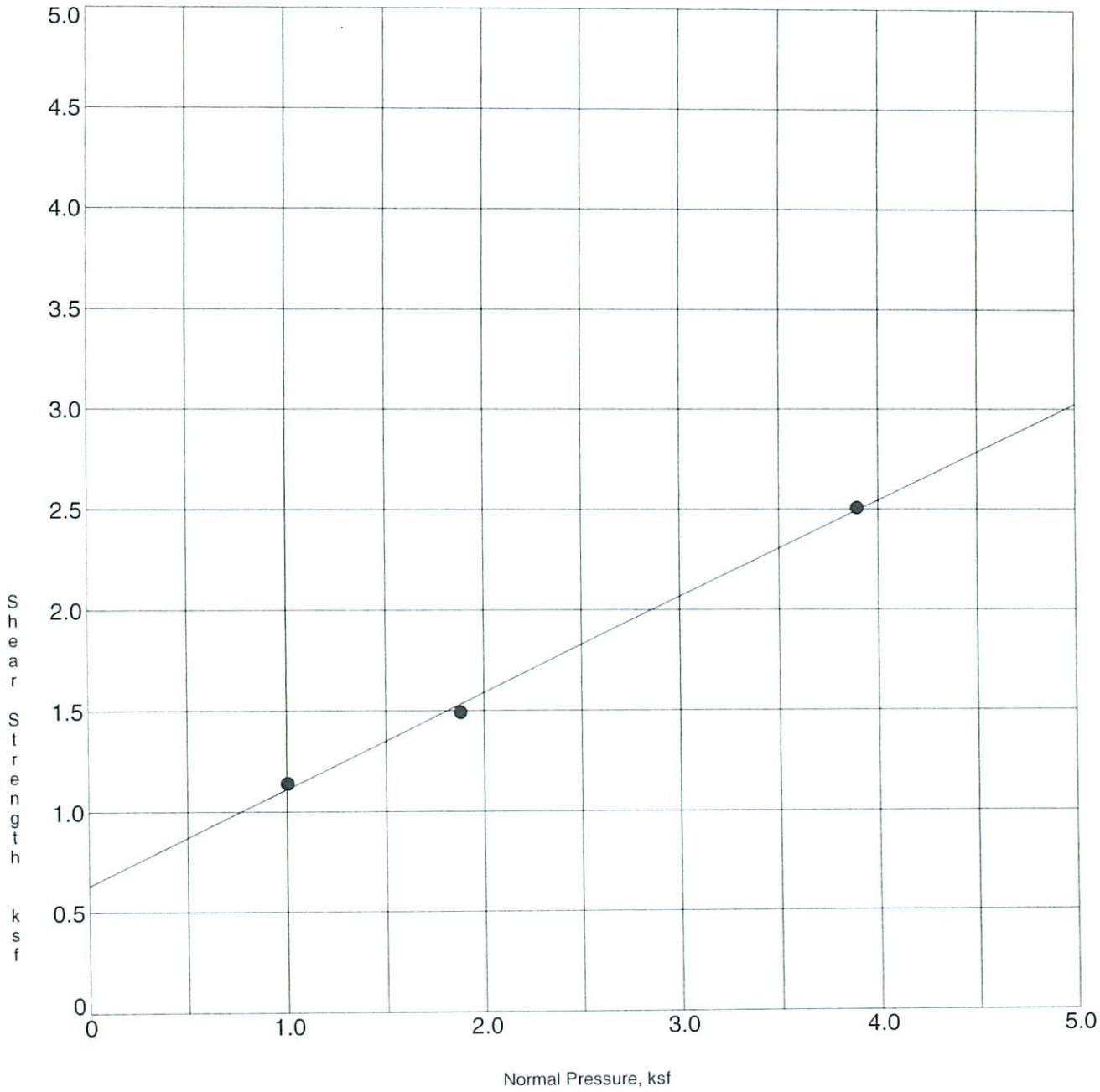
Client No. 2738

Date 7/17/14

Shear Test Diagram

Advanced Geotechnical Services, Inc.

Plate B- 17



○ - Peak Shear ● - Ultimate Shear △ - Residual Shear

	Specimen Identification		Classification	DD	MC%	c, ksf	phi
○	B-22	10.5	Light Olive Brown CLAY with Sand	89.4	26.3	0.63	26
●	B-22	10.5	Artificial Fill	89.4	30.0	0.63	26

Project **Selleck Development Group - Agoura Road, Agoura Hills**

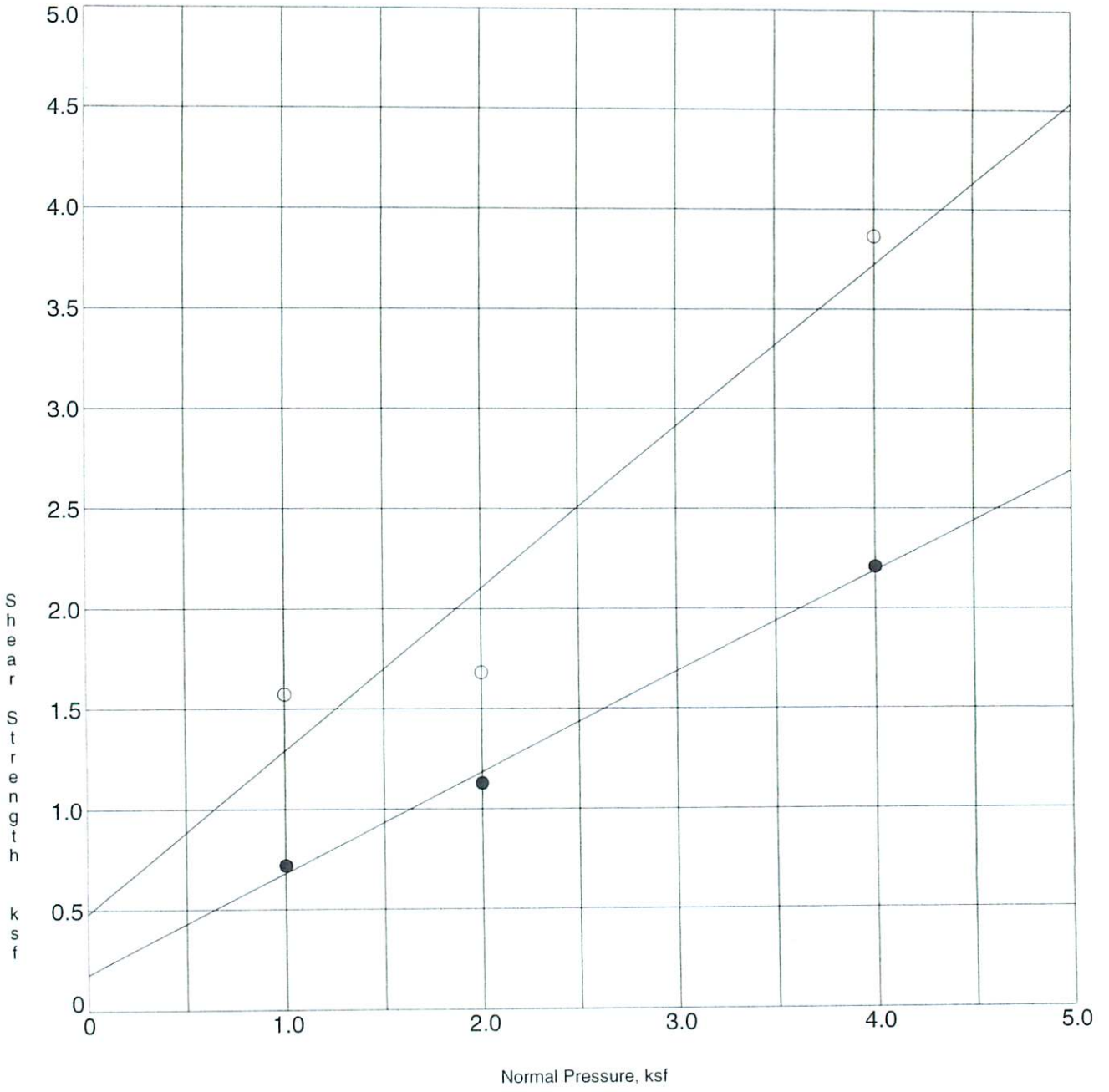
Client No. **2738**

Date **7/17/14**

Shear Test Diagram

Advanced Geotechnical Services, Inc.

Plate B- 18



○ - Peak Shear ● - Ultimate Shear △ - Residual Shear

	Specimen Identification		Classification	DD	MC%	c, ksf	phi
○	B-22	20.5	Dark Brown CLAY with Sand	87.2	30.2	0.48	39
●	B-22	20.5	Topanga Formation	87.2	30.4	0.18	27

Project: Selleck Development Group - Agoura Road, Agoura Hills

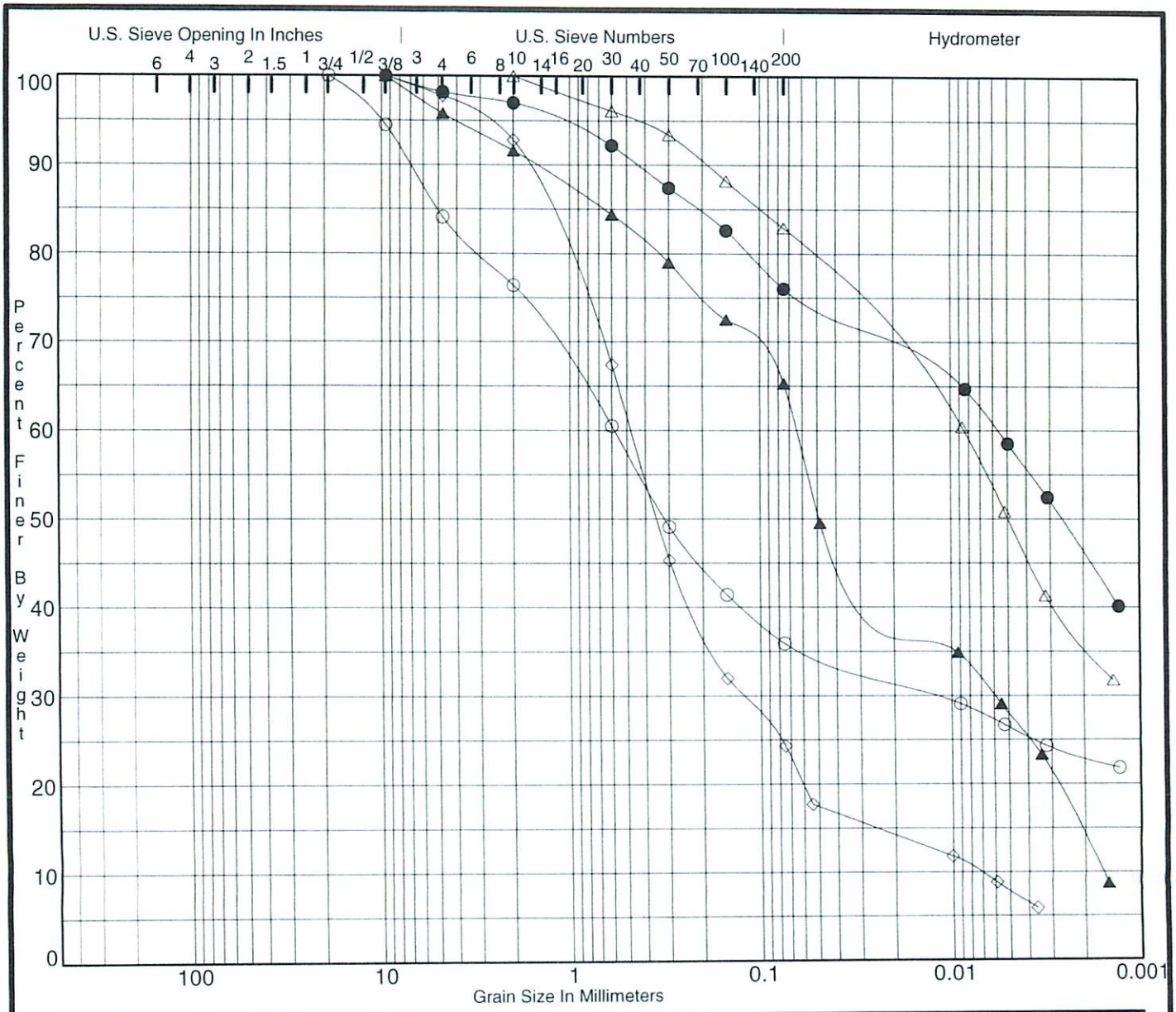
Client No. 2738

Date 7/17/14

Shear Test Diagram

Advanced Geotechnical Services, Inc.

Plate B- 19



Cobbles	Gravel		Sand			Silt Or Clay
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
○	B-13	3.0	Very Dark Grayish Brown Clayey SAND						
●	B-22	10.5	Light Olive Brown CLAY with Sand						
△	B-22	20.5	Dark Brown CLAY with Sand						
▲	B-32	5.3	Very Dark Grayish Brown Sandy CLAY					0.34	40.2
◇	B-36	10.5	Dark Olive Brown Silty SAND					4.51	65.0

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
○	B-13	3.0	19.00	0.58	0.012		15.9	48.2	9.5	26.4
●	B-22	10.5	9.50	0.01			1.8	22.2	17.5	58.5
△	B-22	20.5	2.00	0.01			0.0	17.1	32.9	50.0
▲	B-32	5.3	9.50	0.06	0.006	0.0016	4.2	30.5	37.3	28.0
◇	B-36	10.5	9.50	0.48	0.125	0.0073	2.2	73.5	16.5	7.8

Project: **Selleck Development Group - Agoura Road, Agoura Hills**

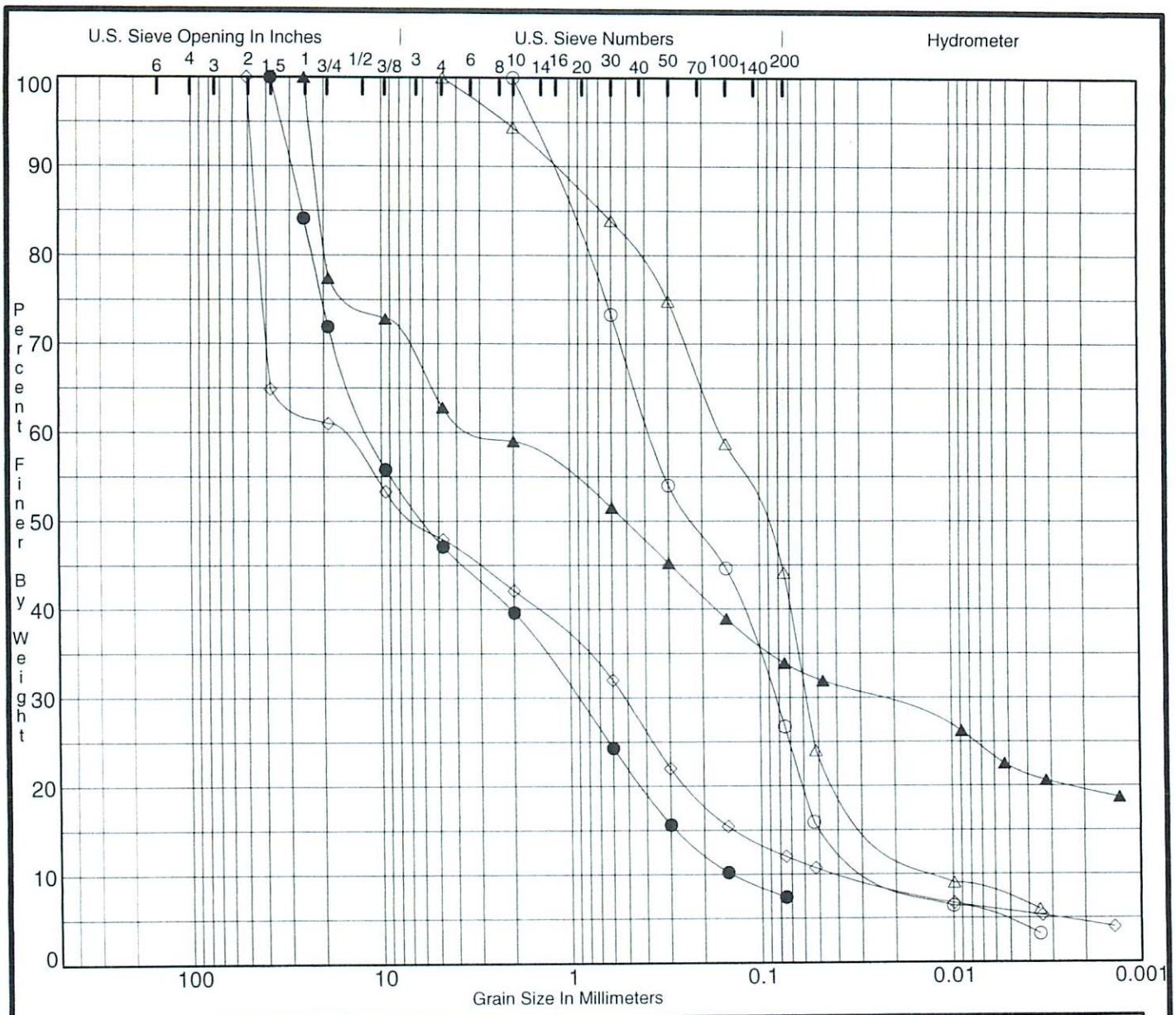
Client No.: **2738**

Date: **7/17/14**

Gradation Curves

Advanced Geotechnical Services, Inc.

Plate B- 20



Cobbles	Gravel		Sand			Silt Or Clay
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
○	B-43	5.0	Olive Brown Silty SAND					1.03	19.7
●	B-44	10.0	Dark Yellowish Brown GRAVEL with Silt and Sand					0.54	79.7
△	B-45	10.0	Olive Brown Silty SAND					1.91	14.3
▲	B-46	5.0	Very Dark Grayish Brown Clayey GRAVEL with Sand						
◇	B-58	6.0	Yellowish Brown GRAVEL with Silt and Sand					0.40	442.2

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
○	B-43	5.0	2.00	0.37	0.085	0.0189	0.0	73.3	22.4	4.3
●	B-44	10.0	38.10	11.38	0.940	0.1428	52.9	39.7	7.4	
△	B-45	10.0	4.75	0.16	0.058	0.0111	0.0	55.9	37.1	7.0
▲	B-46	5.0	25.40	2.51	0.027		37.2	28.9	11.6	22.3
◇	B-58	6.0	50.80	17.36	0.522	0.0393	52.1	35.9	6.2	5.8

Project: **Selleck Development Group - Agoura Road, Agoura Hills**

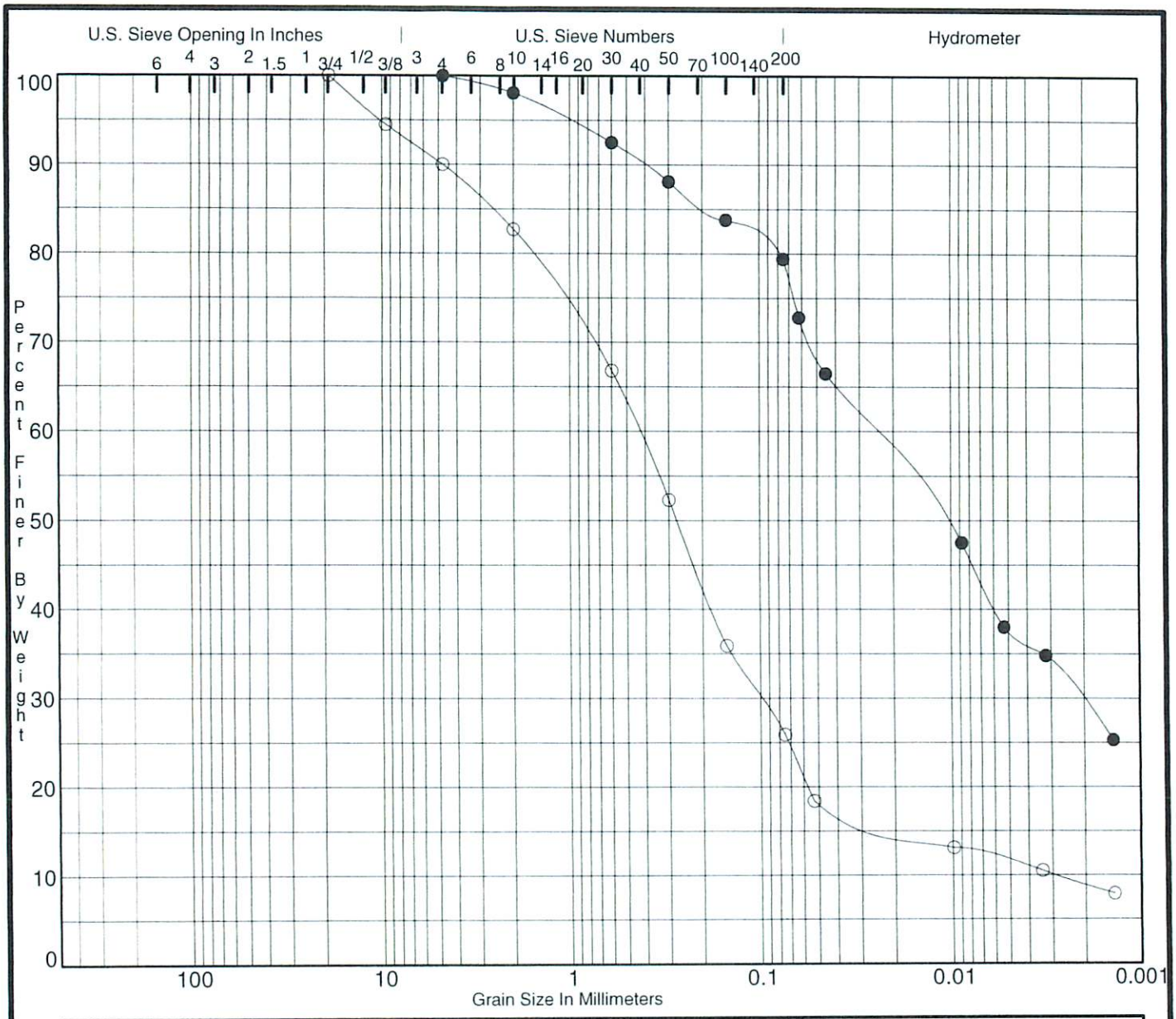
Client No.: **2738**

Date: **7/17/14**

Gradation Curves

Advanced Geotechnical Services, Inc.

Plate B- 21



Cobbles	Gravel		Sand			Silt Or Clay
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
○	B-61	10.0	Yellowish Brown Silty Clayey SAND					7.99	151.2
●	TP-6	2.5	Light Olive Brown CLAY with Sand						

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
○	B-61	10.0	19.00	0.43	0.100	0.0029	10.0	64.1	14.5	11.4
●	TP-6	2.5	4.75	0.03	0.002		0.0	20.6	41.8	37.6

Project: **Selleck Development Group - Agoura Road, Agoura Hills**

Client No.: **2738**

Date: **7/17/14**

Gradation Curves

Advanced Geotechnical Services, Inc.

Plate B- 22

PAT-CHEM LABORATORIES
11990 Discovery Ct. • Moorpark, CA 93021 • Ph. (805) 532-0012 • Fax (805) 532-0016

Customer: **AGS**
5251 Verdugo Way Suite L
Camarillo CA, 93012

Attention: Omar Contreras
Report Date: 16-Jul-14 13:44
Subject: Soil Samples
Project/P.O.#: Selleck

PARAMETER	METHOD	QC BATCH	REPORTING LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
Selleck TP-1 @ 0-4' (Sample I.D.# : 1407206-01) Collected: 15-Jul-14 By OC						
pH	EPA 9045B	AG41602	0.1	16-Jul-14 (PL)	8.6 pH Units	pH
Specific Conductance (EC)	CT 424	AG41603	0.1	16-Jul-14 (PL)	45.5 umhos/cm	
Chloride	CT 422	AG41601	5.0	16-Jul-14 (PL)	29.7 mg/kg	
Sulfate as SO4	CT 417	AG41601	5.0	16-Jul-14 (PL)	72.5 mg/kg	

Notes and Definitions

pH	The temperature in Celsius was 23.1 when the pH was recorded
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis

Respectfully Submitted,

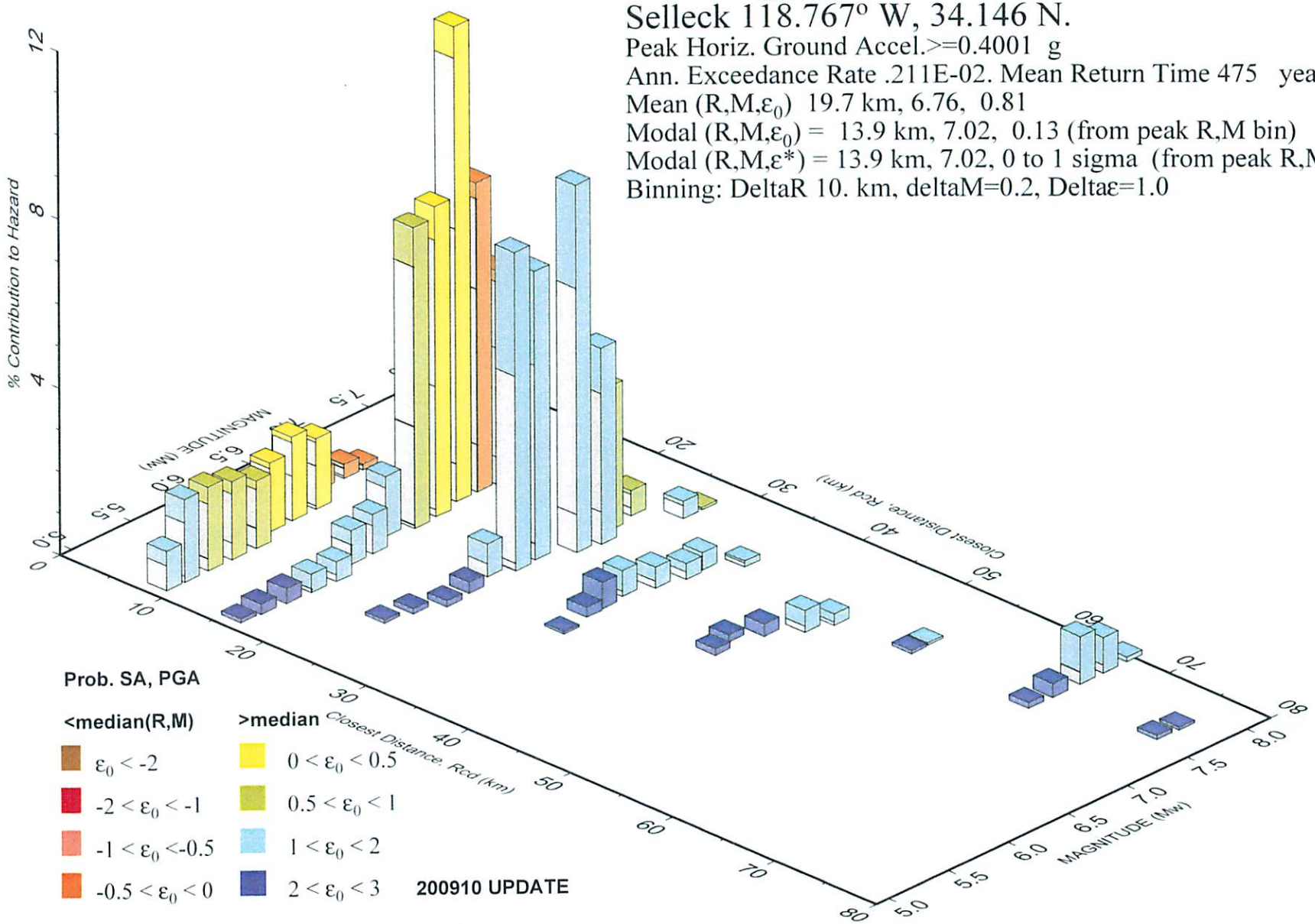
Steve Jefferson 7/16/2014
Laboratory Director

Appendix C

Seismicity Study

PSH Deaggregation on NEHRP C soil
Selleck 118.767° W, 34.146 N.

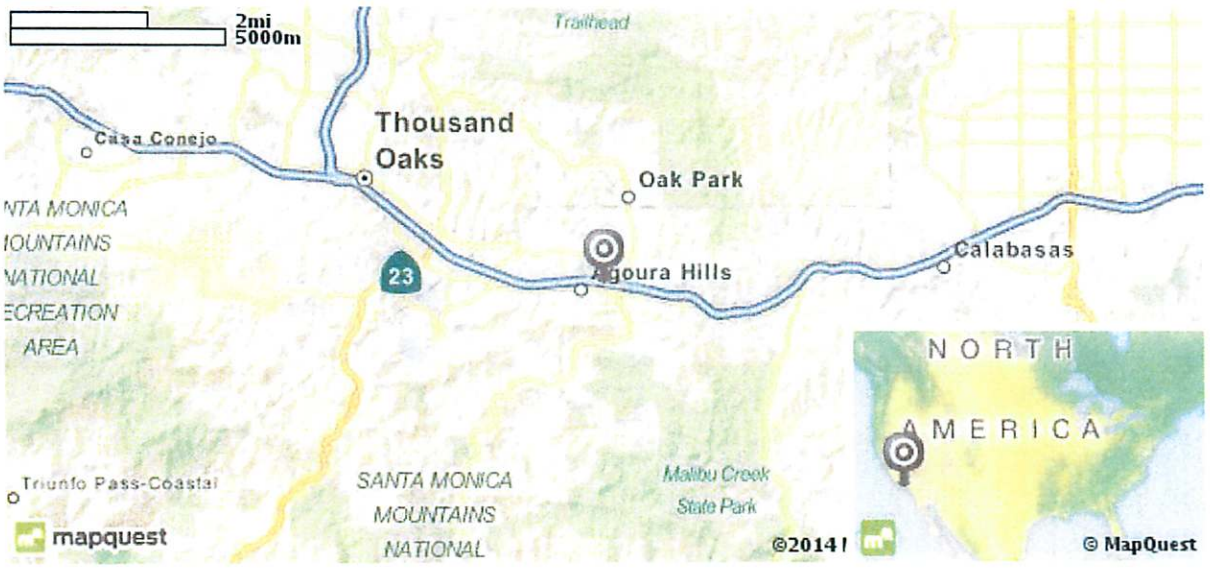
Peak Horiz. Ground Accel.>=0.4001 g
Ann. Exceedance Rate .211E-02. Mean Return Time 475 years
Mean (R,M,ε_0) 19.7 km, 6.76, 0.81
Modal (R,M,ε_0) = 13.9 km, 7.02, 0.13 (from peak R,M bin)
Modal (R,M,ε*) = 13.9 km, 7.02, 0 to 1 sigma (from peak R,M,ε bin)
Binning: DeltaR 10. km, deltaM=0.2, Deltaε=1.0



USGS Design Maps Summary Report

User-Specified Input

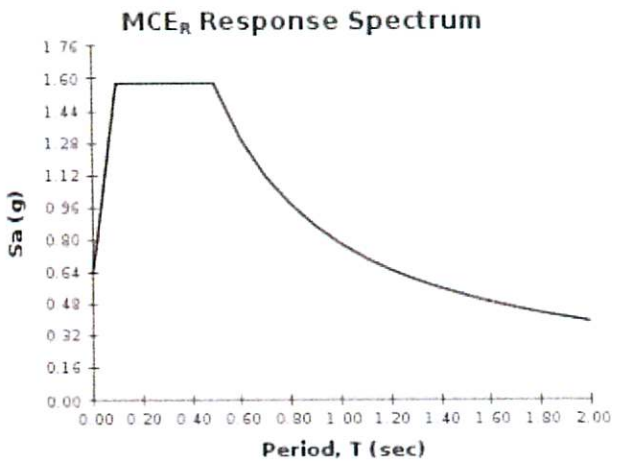
Report Title	Selleck Thu May 29, 2014 17:49:12 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	34.14607°N, 118.7669°W
Site Soil Classification	Site Class C – "Very Dense Soil and Soft Rock"
Risk Category	I/II/III

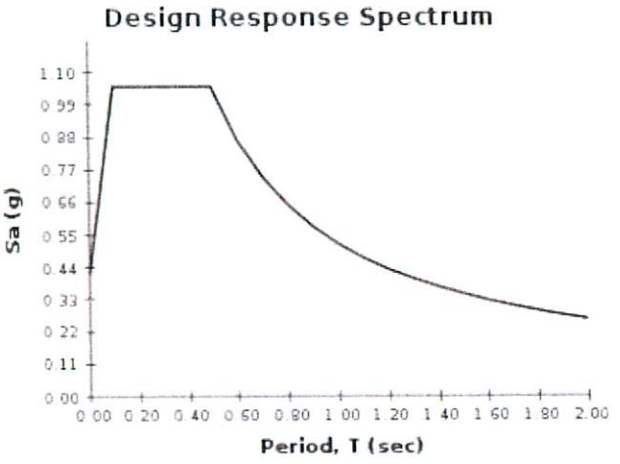


USGS-Provided Output

S_S =	1.575 g	S_{MS} =	1.575 g	S_{DS} =	1.050 g
S_1 =	0.600 g	S_{M1} =	0.780 g	S_{D1} =	0.520 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





For PGA$_M$, T$_L$, C$_{RS}$, and C$_{R1}$ values, please view the detailed report.

USGS Design Maps Detailed Report

ASCE 7-10 Standard (34.14607°N, 118.7669°W)

Site Class C – "Very Dense Soil and Soft Rock", Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1]	S_S = 1.575 g
From Figure 22-2 [2]	S_1 = 0.600 g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class C, based on the site soil properties in accordance with Chapter 20.

Table 20.3-1 Site Classification

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index PI > 20, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4-1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \le 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \ge 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_S

For Site Class = C and S_S = 1.575 g, F_a = 1.000

Table 11.4-2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1-s Period				
	$S_1 \le 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \ge 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_1

For Site Class = C and S_1 = 0.600 g, F_v = 1.300

Equation (11.4-1): $S_{MS} = F_a S_S = 1.000 \times 1.575 = 1.575$ g

Equation (11.4-2): $S_{M1} = F_v S_1 = 1.300 \times 0.600 = 0.780$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

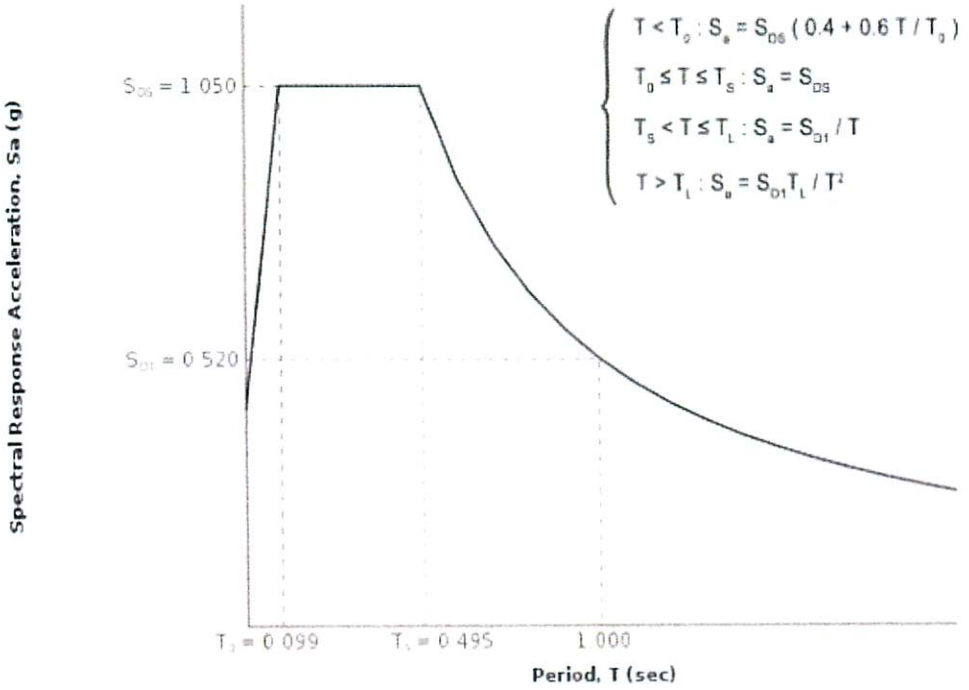
Equation (11.4-3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 1.575 = 1.050$ g

Equation (11.4-4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.780 = 0.520$ g

Section 11.4.5 — Design Response Spectrum

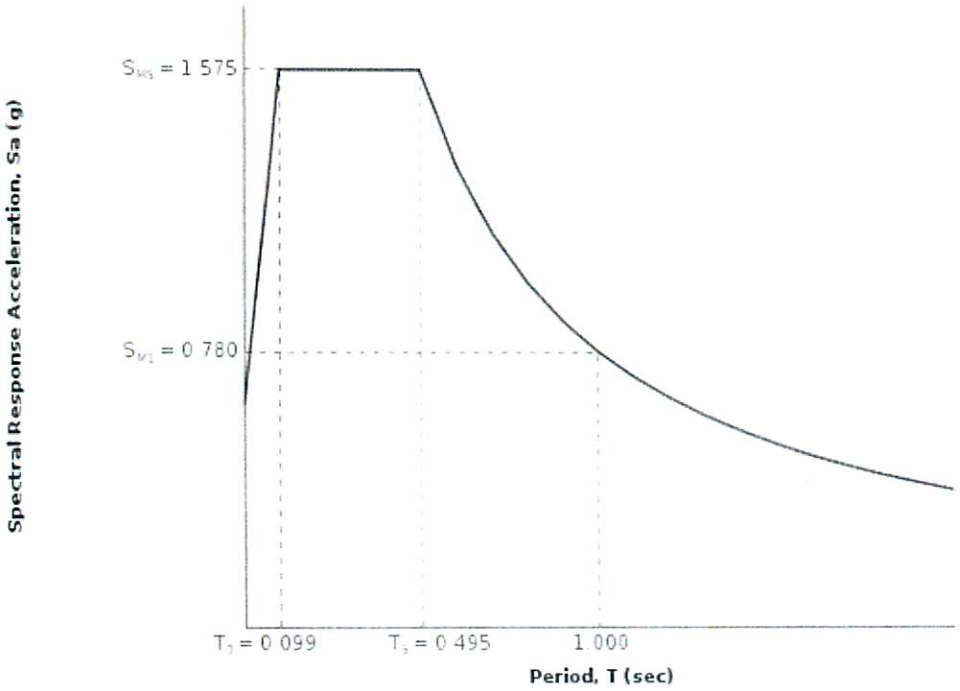
From Figure 22-12 [3] $T_L = 8$ seconds

Figure 11.4-1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.584

Equation (11.8-1): $PGA_M = F_{PGA}PGA = 1.000 \times 0.584 = 0.584$ g

Table 11.8-1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of PGA

For Site Class = C and PGA = 0.584 g, F_{PGA} = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 1.015

From Figure 22-18 [6] C_{R1} = 1.032

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 1.050 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.520 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

Appendix D

References

Appendix D
References

The following list includes the citations of references referred to in this report.

Advanced Geotechnical Services, Inc. (2001), **Geotechnical Engineering Study, Proposed Home Depot and Restaurant pad, Ladyface Village Phase I, Agoura Road West of Kanan, Agoura Hills, California**, Client Number 2738, Report Number 4613 Revised, dated September 18, 2001.

American Society for Testing and Materials (2013), **ASTM Standards**, Section 4: Construction, Volume 04.08 Soil and Rock (I): D 420 – D 5611, West Conshohocken, PA.

Bozorgnia, Y., Campbell, K. W., and Niazi, M. (1999), *Vertical Ground Motion: Characteristics, Relationship with Horizontal Component, and Building Code Implications*, **Proceedings of the SMIP99 Seminar of Strong Motion Data**, Oakland California, September 15, 1999, pp. 23 - 49.

California Division of Mines and Geology (CDMG, 2008), **Guidelines for Evaluating and Mitigating Seismic Hazards in California**, Special Publication 117A, Division of Mines and Geology.

California Division of Mines and Geology (CDMG 2000), **Seismic Hazard Evaluation of the Thousand Oaks 7.5-Minute Quadrangle, Ventura and Los Angeles Counties, California**, Seismic Hazard Zone Report 042.

California Division of Mines and Geology (CDMG 2000), **State of California Seismic Hazard Zones Map, Thousand Oaks Quadrangle**, Released: November 17, 2000.

Department of the NAVY, NAVFAC Design Manual 7.02, (1986), **Foundations and Earth Structures**, Naval Facilities Engineering Command, September.

Dibblee, T. W., (1993), **Geologic Map of the Thousand Oaks Quadrangle, Ventura and Los Angeles Counties, California**, Dibblee Foundation Map DF-49.

Google (2014), Google Earth Interactive web program
http://www.google.com/earth/

International Conference of Building Officials and California Building Standards Commission (2013), **2013 California Building Code**.

Southern California Earthquake Center (1999), **Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California**, Martin, G. R. and Lew, M. Co-Chairs and Editors, University of Southern California, March 1999.

Tokimatsu, K. and Seed, H. B. (1987), *Evaluation of Settlements in Sands Due to Earthquake Shaking*, **Journal Geotechnical Engineering**, ASCE, Vol. 113, No. 8, pp. 861-878.

United States Geological Survey, (2008), "2008 Interactive Deaggregations" computer program
http://geohazards.usgs.gov/deaggint/2008

United States Geological Survey, (2014), **Seismic Design Maps** web program, last modified March 10, 2014
http://earthquake.usgs.gov/designmaps/us/application.php