# VOLUME TECHNICAL APPENDICES

## DRAFT ENVIRONMENTAL IMPACT REPORT

TR 060922 CUP No. 04-075 Oak Tree Permit No. 04-075



# Skyline Ranch Project



County Project No. 04-075 State Clearinghouse No. 2004101090

County of Los Angeles
Department of Regional Planning
Impact Analysis Section
320 West Temple Street
Los Angeles, California 90012-3225

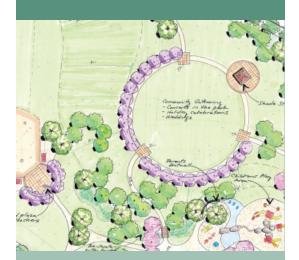
**JULY 2009** 

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**JULY 2009** 

Prepared by:
PCR Services Corporation
233 Wilshire Boulevard
Santa Monica, California 90401
TEL 310.451.4488
FAX 310.451.5279



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# Los Angeles County Department of Regional Planning

Planning for the Challenges Ahead



James E. Hartl, AICP Director of Planning

# NOTICE OF PREPARATION AND SCOPING MEETING

"The Skyline Ranch Project"

County Project No. 04-075
Tentative Tract Map No. 060922
Oak Tree Permit, Conditional Use Permit, Development Agreement

The County of Los Angeles will be the lead agency and will prepare an Environmental Impact Report (EIR) for the project identified above. In compliance with Section 15082 of the CEQA Guidelines, the County of Los Angeles is sending this Notice of Preparation to responsible agencies, interested parties and federal agencies which may be involved in approving or permitting the project, and to trustee agencies responsible for natural resources affected by the project. Within 30 days after receiving the Notice of Preparation, each agency shall provide the County of Los Angeles with specific details about the scope and content of the environmental information to be contained in the EIR related to that agency's area of statutory responsibility. In addition to the project actions cited above, permission will be sought for offsite grading on federally owned land managed by the Bureau of Land Management (BLM). Should such offsite grading be determined to be a project subject to the National Environmental Policy Act (NEPA), clearance of that aspect of this project will probably be undertaken separately through an Environmental Assessment (EA) or a joint EIR/EA.

The purpose of this Notice of Preparation is to solicit the views of your agency as to the scope and content of the environmental information germane to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR prepared by our agency when considering your permit or other approval for the project.

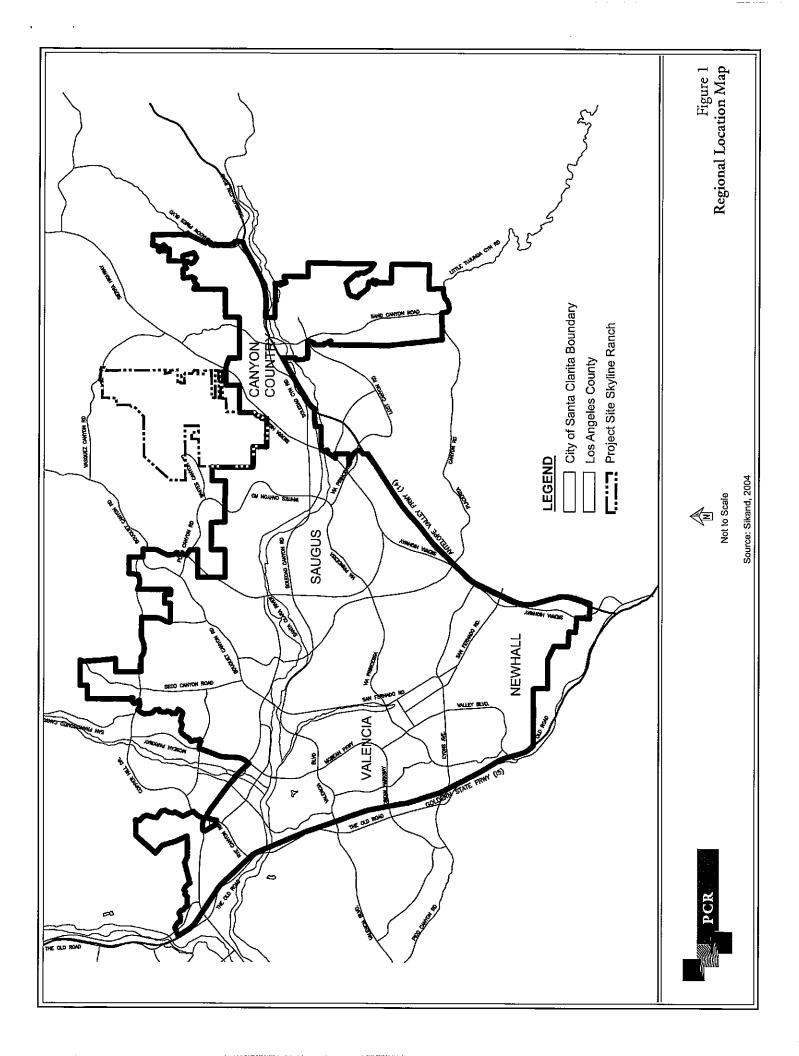
#### PROJECT LOCATION

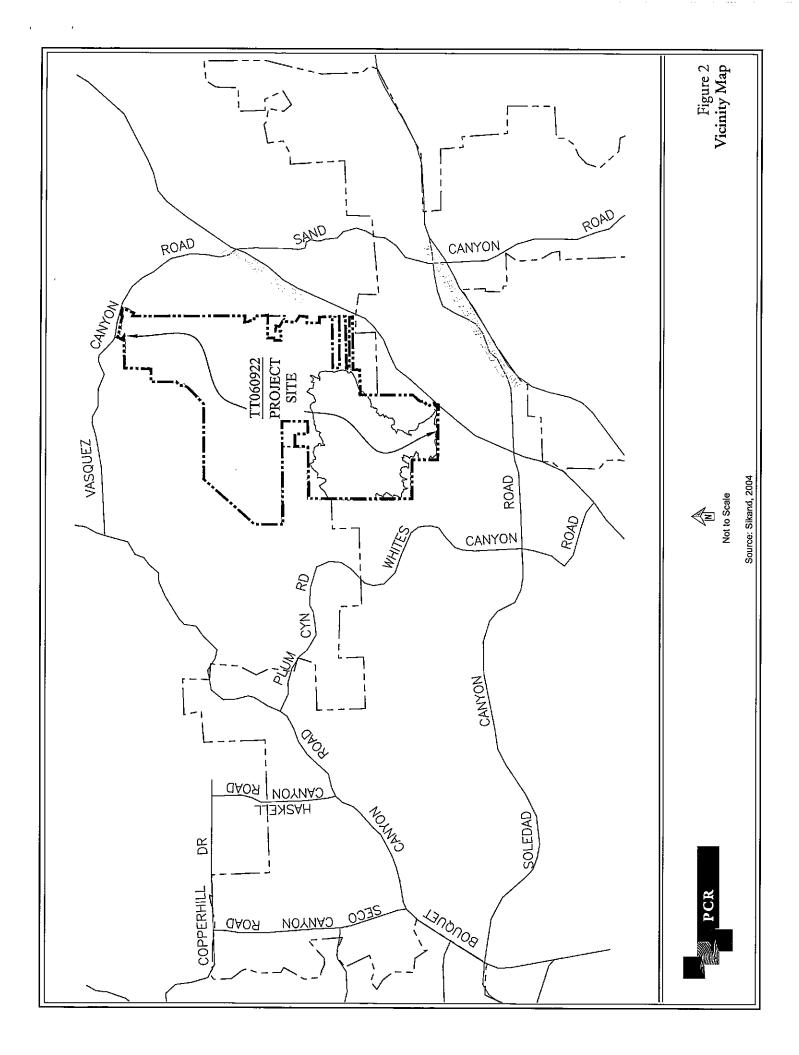
As shown in Figure 1, the 2,196-acre Skyline Ranch site is located in the Santa Clarita Valley west and north of Highway 14 (Antelope Valley Freeway) and north of the City of Santa Clarita in unincorporated Los Angeles County. The project site includes various parcels west of Mint Canyon between the Santa Clara River and Vasquez Canyon. As illustrated in Figure 2, the site is roughly defined by Sierra Highway (Mint Canyon) on the east and southeast, residential communities on the south and southwest, Plum Canyon Road on the west, Bouquet Canyon Road to the northwest, and Vasquez Canyon Road to the northeast.

ORIGINAL FILED

OCT 2 2 2004

LOS ANGELES, COUNTY CLERK





#### **EXISTING LAND USE AND ZONING DESIGNATIONS**

As shown in Figure 3, the Santa Clarita Valley Area Plan Land Use Policy Map designates the project site as U1 (Urban 1.1 to 3.3 dwelling unit [du]/ acre), U2 (Urban 3.4 to 6.6 du/acre), U3 (Urban 6.7 to 15 du/acre), N (Non-Urban 0.5 to 1.0 du/acre), W (Floodplain), and HM (Hillside Management).

As shown in Figure 4, the County of Los Angeles Zoning Code designates the project site for agricultural uses, including A-2-1 (Heavy Agricultural), and A-1-1 and A-1-10,000 (Light Agricultural).

#### PROJECT DESCRIPTION

#### Land Use

The project applicant proposes to develop approximately 592 acres of the site with 1,325 single-family residential lots with pads ranging in size from 4,830 to 7,350 square feet along with a 10-acre school site and approximately 10 acres of public park land. Development is proposed for the southern portion of the property where slopes of 25 percent or less are located. The northern 1,604 acres of the site would remain preserved as open space and managed by an as yet to be determined entity. A copy of the map is included as Figure 5.

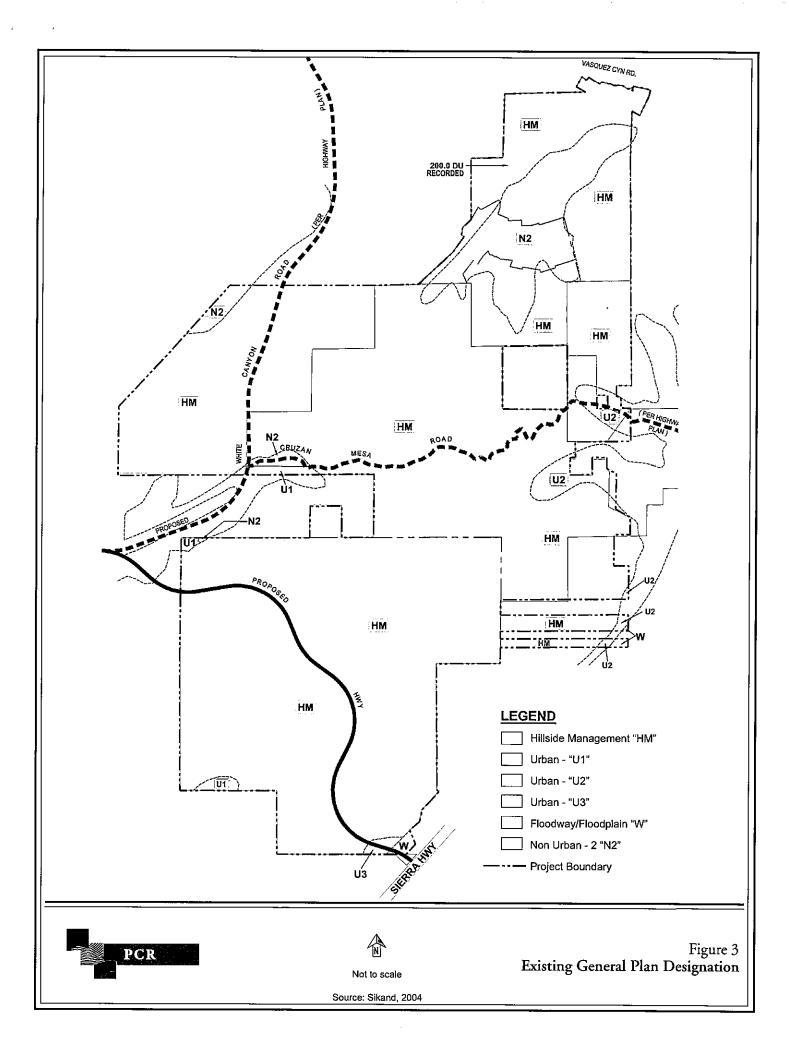
#### Grading

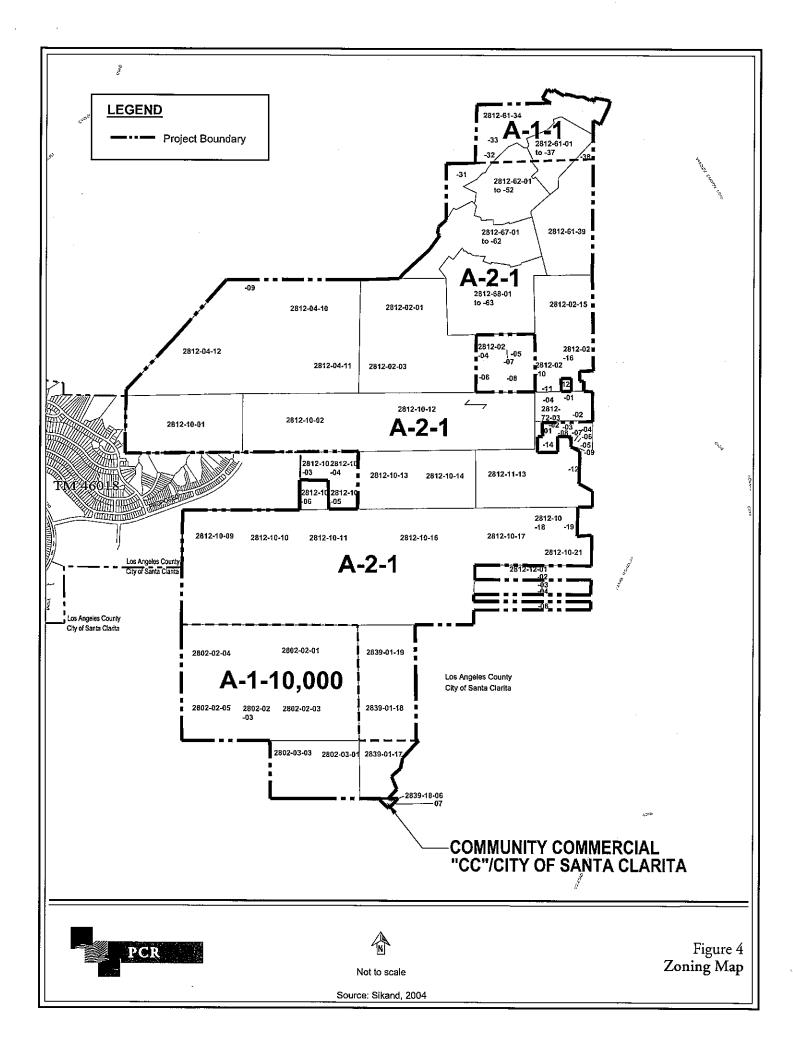
Grading and associated earthwork would require the movement of approximately 20 million cubic yards of earth (cut/fill) that would occur exclusively on the southern 592 acres of the 2,196-acre site and immediately adjacent properties to the southeast and west for project access. Approximately 32 percent of the grading would be associated with a proposed off- and on-site public street improvement to extend Whites Canyon Road to the project site. Within the 592 acre portion of the property, mass grading would take place to provide for major roads and infrastructure, establish drainage patterns and for creation of building pads for the various land uses within the project.

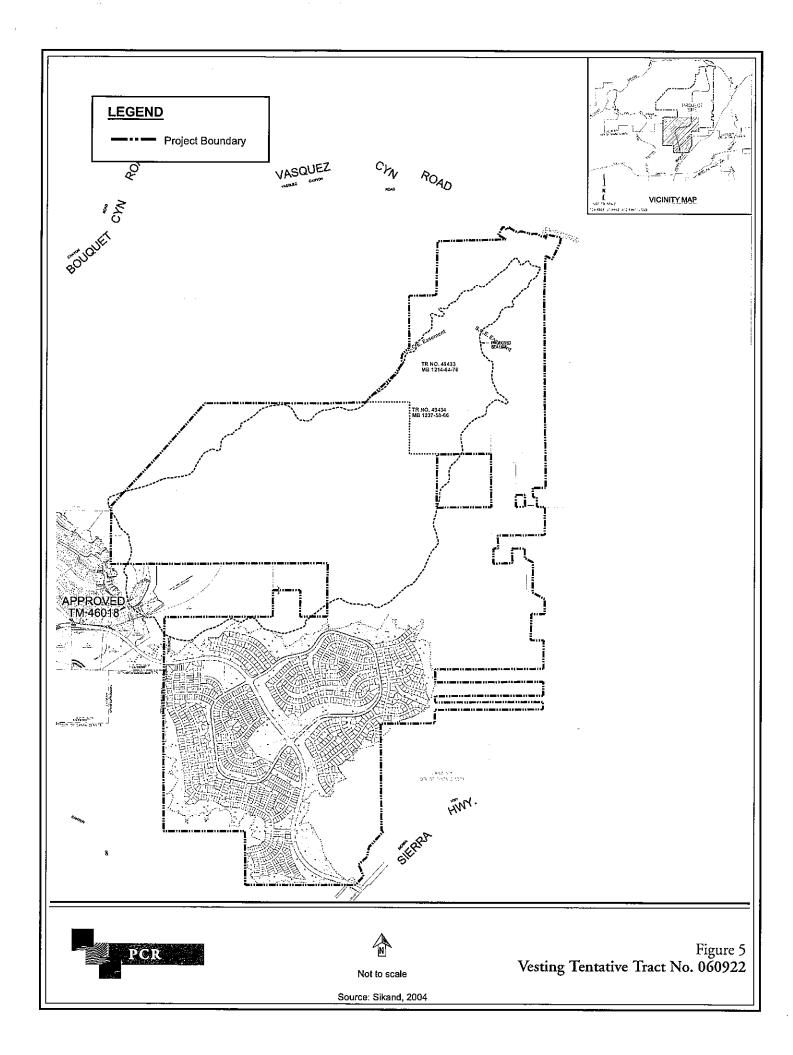
The overall grading and earthwork proposal includes approximately 10.54 acres off-site associated with the extension of Whites Canyon Road to Plum Canyon Road. For approximately 1.42 acres of this off-site area, permission will be sought to undertake grading on land owned by the Federal government. Approximately 65,000 cubic yards of fill would be placed on this property with a maximum fill depth of 100 feet.

#### Infrastructure

The project will construct a network of collector roads to provide local access to land uses associated with the proposed project. Primary access to the tract is provided by the off-site extension of Whites Canyon Road from Plum Canyon on the west (through Tract Map No. 46018), through the project site as Skyline Ranch Road, ultimately connecting to Sierra Highway in the southeast. This roadway is planned for two travel lanes in each direction separated by a center median and containing landscaped parkways of variable width within a 100-foot right-of-way. Local roadways would extend off Whites Canyon Road within a 50-foot right of way. All roadways within the project site will be constructed to urban standards as defined by the County of Los Angeles Department of Public Works.







A system of landscaped trails and walkways, called paseos, is proposed to provide a safe and attractive means of pedestrian access from residential neighborhoods to the elementary school and park sites. The paseos would adjoin Skyline Ranch Road and certain residential collector streets, and would be separated from vehicular traffic.

On-site surface run-off would be intercepted by curb, debris, and/or desilting inlets and conveyed to a network of storm drains that lead to a series of treatment structures including water quality basins prior to discharge into the existing storm drain network serving nearby developed uses.

Wastewater would be collected and conveyed by a gravity flow network of pipes placed beneath on-site roadways. The sewer collector lines serving the site will connect to a sewer trunk main that extends along Sierra Highway.

The site is currently located in an area served by both the Santa Clarita Water Division (SCWD) and the Newhall County Water District. However, detachment from the Newhall County Water District is proposed as part of the project since the SCWD has existing distribution infrastructure in place that can more feasibly serve the project. In order to provide sufficient amounts of water and adequate water pressure to the project, a series of water storage reservoirs are proposed within two on-site water zones. Potable water would be conveyed to on-site uses via a network of 6" to 12" pipes that are located primarily beneath the planned roadway alignments.

#### DISCRETIONARY ACTIONS REQUESTED

Actions from the County of Los Angeles Department of Regional Planning needed to develop the property as proposed include: 1) Vesting Tentative Tract Map No. 060922; 2) Conditional Use Permit (04-075) for a Residential Planned Development, development in a Hillside Management Area, and for the movement of more than 100,000 cubic yards of earth; 3) Oak Tree Permit (04-075) for removal of one oak tree; and 4) a Development Agreement (04-075) with the County of Los Angeles. Among actions being sought from other agencies, detachment from the Newhall County Water District and annexation to the SCWD is proposed.

#### ENVIRONMENTAL SETTING/POTENTIAL ENVIRONMENTAL ISSUES

Topography consists of modest- to steep-sloped ridgelines and canyons. The site drains to the west and southwest into the Santa Clara River basin. The terrain is generally rugged, but has few exposed rock outcroppings. South of Plum Canyon, the terrain rises gently from southwest to northeast where it joins the pass at the headwaters of Plum Canyon. North of Plum Canyon is a series of side canyons and associated slopes and ridges. These ridges slope southwestward from Cruzan Mesa and northward into Vasquez and Bouquet Canyons farther to the north.

The site has no active land uses other than on Cruzan Mesa. The northern portion of Cruzan Mesa is currently being leased by SLS Film Works as an outdoor movie location. Portions of Cruzan Mesa have been used for cattle grazing and are the site of a sizable vernal pool. Land ownership of the entire Skyline Ranch site is in private holdings. Recorded Tract Map No. 44967 of 200 lots on 360 acres is included within the northern boundary of this project.

The Skyline Ranch site supports seven vegetation communities as classified by Holland (1986): non-native grassland, coastal sage scrub, chaparral, coastal sage—chaparral scrub, holly-leaved cherry scrub, vernal pool, sycamore riparian woodland, and highly disturbed areas, with minor elements of other plant communities present. The dominant communities on the site are coastal

sage scrub and coastal sage—chaparral scrub, with the former best represented on south-facing slopes and ridgelines and the latter mostly on north-facing slopes. True chaparral with scrub oaks is restricted primarily to shaded north-facing slopes in the northern portion of the project site. Non-native grassland predominates on mesas, ridgelines, and gentler south-facing slopes, but as with chaparral, in many areas it is transitional with coastal sage scrub and clearly represents an early stage of sage scrub following past soil disturbance.

Wildlife diversity on the site is moderate, commensurate with the rather homogeneous nature of the sage scrub and grassland-covered slopes and ridges that comprise most of the site. The highest diversity occurs in Plum Canyon and an unnamed canyon to the southwest, which have the best developed plant community structure and greatest diversity of habitat types. Cruzan Mesa, the northern portion of the 1,604 acres of the project site proposed to remain preserved as open space, has seasonal pools and extensive grassland, offers additional habitat for a different array of species, and the long escarpment along the northern end of this area provides nesting habitat for several species of raptors. The pools also offer resting and foraging habitat for a number of migratory waterfowl and shorebirds in the spring and early summer. Biological survey data from 2002 and 2003 confirmed the presence of four plant species and twelve wildlife species that are recognized as regionally or locally "sensitive", but are not federally or Statelisted.

The Los Angeles County Department of Regional Planning prepared an Initial Study for the Skyline Ranch project and determined that a project EIR is required. A copy of the Initial Study is included as an attachment to this NOP.

The attached Initial Study was prepared pursuant to CEQA Guidelines §15063 and provides a preliminary analysis of the potential environmental effects to be analyzed in the Project EIR. The Initial Study provides a description of the project, including the location; a description of the environmental setting; and an identification of the project's potential environmental effects relative to hazards (geotechnical, flood, fire and noise); resources (water quality, air quality, biota, cultural resources and visual resources/aesthetics), services (traffic/access, sewage disposal, education, fire/sheriff and utilities) and other potential impact categories (general, environmental safety/hazardous materials, land use, population/housing/employment and mandatory findings of significance).

Based on the preliminary analysis, the Initial Study determined that the project may have potentially significant effects relative to the various impact categories, including: hazards (geotechnical, flood, fire and noise), resources (water quality, air quality, biota, cultural resources, and visual resources/aesthetics), services (traffic/access, sewage disposal, education, fire/sheriff and utilities) and other (general, environmental safety/hazardous materials, land use and recreation).

#### SCOPING MEETING

To assist in local participation, a Scoping Meeting will be held to present the proposed project and to solicit suggestions from the public and responsible agencies on the content of the Draft EIR. This meeting will be held in the Canyon Country Joanne Darcy Library located at 18536 Soledad Canyon Road, Santa Clarita, CA 91351 on November 10<sup>th</sup>, 2004 from 6:00 p.m. to 8:00 p.m.

#### NOTICE OF PREPARATION REVIEW AND COMMENTS

The review period for the Notice of Preparation will be from October 25 to November 24, 2004. Copies of the NOP are available for review at Canyon Country Library located at 18536 Soledad Canyon Road, Santa Clarita, CA 91351; Valencia County Library at 23743 West Valencia Boulevard, Santa Clarita, CA 91355; Newhall County Library at 22704 West 9th Street, Santa Clarita, CA 91321; as well as at the Department of Regional Planning, at the address below, and its website <a href="http://planning.co.la.ca.us/drp\_agnd.html">http://planning.co.la.ca.us/drp\_agnd.html</a> Tentative Tract Map No. 060922. Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but not later than November 30, 2004. Please direct all written comments to the following address. In your written response, please include the name of a contact person in your agency.

Dr. Hsiao-ching Chen, AICP Los Angeles County Regional Planning Department Impact Analysis Section 320 West Temple Street, Room 1348 Los Angeles, CA 90012 Tel (213) 974-6461 Fax (213) 626-0434

## NOTICE OF CORRECTION

# ADDITIONAL PROJECT INFORMATION TO BE INCLUDED IN THE NOTICE OF PREPARATION

The "Skyline Ranch" Project

County Project No. 04-075
Oak Tree Permit, Conditional Use Permit, Development Agreement
Tentative Tract Map No. 060922

The Notice of Preparation (NOP) distributed on October 25, 2004 regarding the above-referenced project failed to include a copy of the Initial Study prepared by the County of Los Angeles Department of Regional Planning. We apologize for this oversight. A copy of the Initial Study is attached for your review.

Please direct any questions concerning this matter or the project to:

Dr. Hsiao-ching Chen, AICP
Impact Analysis Section
Los Angeles County, Department of Regional Planning
320 W. Temple Street, Room 1348
Los Angeles, CA 90012
Telephone: (213) 974-6461
Fax: (213) 626-0434

## STAFF USE ONLY

PROJECT NUMBER: <u>04-075</u>

CASES:

TR 060922

CP, ZC, PA



## \*\*\*\* INITIAL STUDY \* \* \* \*

# COUNTY OF LOS ANGELES DEPARTMENT OF REGIONAL PLANNING

#### **GENERAL INFORMATION**

I.A. Map Date: <u>March 8, 2004</u>	Staff Member: <u>Hsiao-ching Chen</u>
Thomas Guide: <u>4551 H,J-1; 4461 H,J1-6; 4462 A 1-7</u>	7, B1-6 USGS Quad: Mint Canyon
Location: West of Mint Canyon and Sierra Highway b	between the Santa Clara River and Vasquez Canyon
Road, Canyon Country	
Description of Project: This application is a request	for a Tentative Tract Map and a Conditional Use
Permit for hillside development to subdivide into 1,343	3 single-family lots, a 10-acre school site, 9 acres of
park lands, and an open space area of 1,604 acres. App	proximately 306 acres of the site contains previously
approved and recorded tract maps (i.e., Tracts 49433,	49434, 44967). Requests for ZC, PA, and OTP are
uncertain and to be determined by staff.	
Gross Area: 2,196 acres	
Environmental Setting: The project site is located in	n the upper Santa Clarita Valley north and west of
Highway 14 and north of the City of Santa Clarita in the	e unincorporated Los Angeles County. Plum Canyon
is the major drainage on-site and runs east-west, ultim	nately draining into Bouquet Canyon west of the site.
Topography consists of modest to steep ridgelines and of	canyons covered with low scrub and grasslands with
scattered trees and tall scrub in the larger canyons. No	orthern portion of the site is currently being leased as
an outdoor movie set on the previously recorded tracts of	area and another portion site has been used for cattle
grazing. Surrounding land uses include existing, appro-	ved, and proposed residential communities and vacant
<u>land.</u>	
Zoning: <u>A-2-1, A-1-1, A-1-10,000</u>	
General Plan: Non-urban	

Community/Area Wide Plan: <u>U1, U2, U3, N, W, HM (SCVAP)</u>

## Major projects in area:

Project Number	Description & Status
CP 03-074 85-628/TR46018 04-124/ TR060999 04-102/ TR46018 00-187/TR 52763	Condominium (12/2003 approved) (TN) 1309 lots on 603 AC (1/31/89 partially recorded) 45 SF and 1 Open Space (pending) 4 SF, 5MF, 1 Fire Station, 1 Park, 3 Open Space (Revised Map-pending) 11 SF and 1 Open Space (pending)
86-441/ TR44967	(TN) 202 SF, 4 OS, 2 PF LOTS ON 360 AC (recorded 5/12/99)

NOTE: For EIRs, above projects are not sufficient for cumulative analysis.

## **REVIEWING AGENCIES**

Responsible Agencies	Special Reviewing Agencies	Regional Significance
None	None	□ None
Regional Water Quality Control Board	Santa Monica Mountains Conservancy	SCAG Criteria
	☐ National Parks	<ul><li>☑ Air Quality</li><li>☑ Water Resources</li></ul>
Lahontan Region	☐ National Forest	Water Resources
☐ CA Dept of Health Services	☐ Edwards Air Force Base	County Poviowing Agonolog
Army Corps of Engineers	Resource Conservation District of the Santa Monica	County Reviewing Agencies  Subdivision Committee
☐ CA Integ. Waste Mgt Board	Mtns.	DPW: <u>Traffic &amp; Lighting; Env</u>
⊠ <u>Caltrans</u>	∆ir Resources Board	Programs; Land Dev, Geo & Materials, Waterworks
Trustee Agencies	∑ AQMD, SCAG, DTSC	Watershed Mgt,
None	☐ City of Santa Clarita	Health Services: <u>Env</u> <u>Protection, Solid Waste Mg</u>
State Fish and Game	₩ S Hart USD, Saugus SD	<u>Programs</u>
State Parks	Sulphur Springs Union SD	Sanitation Districts
	Newhall County Water Dist.	🔀 Fire, Sheriff, Library
		Parks & Recreation
	SC Valley Historical Society	

			ANALYSIS SUMMARY (See individual pages for details)					
<b>IMPACT AN</b>	<u>ALYSIS MATRIX</u>		No Additional Analysis					
					Addendum EIR/ND			
						Subsequent/Supplemental EIR		
CATEGORY	FACTOR	Pg				Potential Concern		
HAZARDS	1. Geotechnical	5			図	Seismic hazard, landslide, substantial grading		
	2. Flood	6			図	Plum Canyon		
	3. Fire	7	回		M	Fire Zone 4, Water supply for fire fighting purposes		
	4. Noise	8			X	Construction noise on surrounding residential uses		
RESOURCES	1. Water Quality				図	NPDES compliance		
	2. Air Quality	10			図	Project exceeds regional threshold		
	3. Biota	11			図	vernal pools, coastal sage scrub, sycamore riparian habitat		
	4. Cultural Resources	12			M	Oak, drainage course, undisturbed land		
	5. Mineral Resources	13	$\boxtimes$					
	6. Agriculture Resources	14	$\boxtimes$					
	7. Visual Qualities	15			M	Landform alteration		
SERVICES	1. Traffic/Access	16			$\boxtimes$	Project exceeds CMP thresholds		
	2. Sewage Disposal	17			Image: Control of the	No existing services available		
	3. Education	18			M	Existing district/school exceeds current capacity		
	4. Fire/Sheriff				$\boxtimes$	Nearest fire/sheriff unable to respond in time		
	5. Utilities				$\boxtimes$	All utility supplies including water		
OTHER	1. General	21			$\boxtimes$	Water supply, solid waste facility near capacity		
	2. Environmental Safety	22			$\boxtimes$	Phase I Env Assessment is required		
	3. Land Use	23			$\boxtimes$	Plan Amendment, Zone Change, Hillside development		
	4. Pop./Hous./Emp./Rec.	24			M	Increased demand for recreational facility		
	Mandatory Findings	25			$\boxtimes$	Biota, Traffic, Water Quality, Air Quality		
As require the enviro	nmental review procedure as p lopment Policy Map Designation es  No Is the project locate Monica Mountains of	enera prescr on: <u>No</u> d in th or Sar	il Pla ibec o <u>n-u</u> ne A nta (	rba Ante Clar	sta n hi lope ita \	e Valley, East San Gabriel Valley, Malibu/Santa Valley planning area?		
	an urban expansion	desi	gnat	ion	?	cated within, or proposes a plan amendment to, project is subject to a County DMS analysis.		
	k if DMS printout generated (a	ttache	ed)	Dat	e of	printout: <u>4/28/04</u>		
	k if DMS overview worksheet or staff reports shall utilize the most cu							

## **Environmental Finding:** FINAL DETERMINATION: On the basis of this Initial Study, the Department of Regional Planning finds that this project qualifies for the following environmental document: NEGATIVE DECLARATION, inasmuch as the proposed project will not have a significant effect on the environment. An Initial Study was prepared on this project in compliance with the State CEQA Guidelines and the environmental reporting procedures of the County of Los Angeles. It was determined that this project will not exceed the established threshold criteria for any environmental/service factor and, as a result, will not have a significant effect on the physical environment. MITIGATED NEGATIVE DECLARATION, inasmuch as the changes required for the project will reduce impacts to insignificant levels (see attached discussion and/or conditions). An Initial Study was prepared on this project in compliance with the State CEQA Guidelines and the environmental reporting procedures of the County of Los Angeles. It was originally determined that the proposed project may exceed established threshold criteria. The applicant has agreed to modification of the project so that it can now be determined that the project will not have a significant effect on the physical environment. The modification to mitigate this impact(s) is identified on the Project Changes/Conditions Form included as part of this Initial Study. ENVIRONMENTAL IMPACT REPORT\*, inasmuch as there is substantial evidence that the project may have a significant impact due to factors listed above as "significant." On the basis of substantial evidence in the light of the whole record, there are substantial changes in project as well as with respect to the circumstances under which the project is undertaken. A Subsequent EIR is to be prepared pursuant to CEQA Guidelines Section 15162. Reviewed by: Hsiao-ching Chen Date: Approved by: Daryl Koutnik This proposed project is exempt from Fish and Game CEQA filling fees. There is no substantial

\*NOTE: Findings for Environmental Impact Reports will be prepared as a separate document following the public hearing on the project.

upon which the wildlife depends. (Fish & Game Code 753.5).

Determination appealed--see attached sheet.

evidence that the proposed project will have potential for an adverse effect on wildlife or the habitat

### **HAZARDS - 1. Geotechnical**

SE			ACTS	
a.	Yes	No I	Maybe	Is the project site located in an active or potentially active fault zone, Seismic Hazards Zone, or Alquist-Priolo Earthquake Fault Zone? <u>Portion of the site is close to Mint Canyon Fault (LA Co Safety Element Plate 1)</u> ; <u>Earthquake-induced landslides and liquefaction areas (Seismic Hazard Zones Map Mint Canyon Quad.</u> )
b.	$\boxtimes$			Is the project site located in an area containing a major landslide(s)?
				Earthquake-induced landslides (Seismic Hazard Zones Map Mint Canyon Quad.)
C.	$\boxtimes$			Is the project site located in an area having high slope instability?
				Grading and construction within hillside area.
d.	$\boxtimes$			Is the project site subject to high subsidence, high groundwater level, liquefaction, or hydrocompaction?
				Liquefaction areas (Seismic Hazard Zones Map Mint Canyon Quad.)
e.				Is the proposed project considered a sensitive use (school, hospital, public assembly site) located in close proximity to a significant geotechnical hazard?
				Project contains a propsoed school site.
f.				Will the project entail substantial grading and/or alteration of topography including slopes of more than 25%?
				Substantial grading in hillside area
g.		$\boxtimes$		Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?
h.				Other factors?
ST	AND	ARD (	CODE	REQUIREMENTS
	Build	ing O	rdinand	ce No. 2225 C Sections 308B, 309, 310 and 311 and Chapters 29 and 70.
$\boxtimes$	MITI	GATIC	ON ME	ASURES /  OTHER CONSIDERATIONS
	Lot S	Size		☐ Project Design ☐ Approval of Geotechnical Report by DPW
		USIO		to information, could the project have a significant insulatively distributely an accordance to
				ve information, could the project have a significant impact (individually or cumulatively) on, or <b>technical</b> factors?
$\boxtimes$	Pote	ntially	signifi	cant

## HAZARDS - 2. Flood

SE	TTING	3/IMP	ACTS	
a.	Yes ⊠	No N	∕/aybe □	Is a major drainage course, as identified on USGS quad sheets by a dashed line, located on the project site?
				Plum Canyon
b.				Is the project site located within or does it contain a floodway, floodplain, or designated flood hazard zone?
				Plum Canyon
C.			$\boxtimes$	Is the project site located in or subject to high mudflow conditions?
				Construction on hillside area
d.			$\boxtimes$	Could the project contribute or be subject to high erosion and debris deposition from run off?
				Construction on hillside area
e.	$\boxtimes$			Would the project substantially alter the existing drainage pattern of the site or area?
				Topography to be significantly altered although not directly in main Plum Canyon
f.				Other factors (e.g., dam failure)?
ST	ANDA	ARD C	ODE I	REQUIREMENTS
		_		ee No. 2225 C Section 308A Cordinance No. 12,114 (Floodways) age Concept by DPW
$\boxtimes$	MITIC	ATIO	N ME	ASURES /  OTHER CONSIDERATIONS
	Lot S	ize		Project Design
CC	NCL	JSION	J	
				re information, could the project have a significant impact (individually or cumulatively) on, <b>bod (hydrological)</b> factors?
$\boxtimes$	Poter	ntially	signific	ant Less than significant with project mitigation Less than significant/No impact

## HAZARDS - 3. Fire

SETTING/IMPACTS						
	Yes	No N	/laybe	Letter music et site le cete din a Vene High Fire Howard Soverity Zone (Fire Zone 4)?		
a.				Is the project site located in a Very High Fire Hazard Severity Zone (Fire Zone 4)?		
				Fire Zone 4 (LA County Safety Element Plate 7)		
b.				Is the project site in a high fire hazard area and served by inadequate access due to lengths, widths, surface materials, turnarounds or grade?		
C.		$\boxtimes$		Does the project site have more than 75 dwelling units on a single access in a high fire hazard area?		
d.			$\boxtimes$	Is the project site located in an area having inadequate water and pressure to meet fire flow standards? <i>No water currently available</i>		
e.				Is the project site located in close proximity to potential dangerous fire hazard conditions/uses (such as refineries, flammables, explosives manufacturing)?		
f.		$\boxtimes$		Does the proposed use constitute a potentially dangerous fire hazard?		
g.				Other factors?		
ST	AND	ARD C	ODE	REQUIREMENTS		
$\boxtimes$	Wate	r Ordi	nance	No. 7834 ⊠ Fire Ordinance No. 2947 ⊠ Fire Regulation No. 8		
$\boxtimes$	Fuel	Modif	icatior	n/Landscape Plan		
$\boxtimes$	MITIC	SATIO	N ME	ASURES /  OTHER CONSIDERATIONS		
	Proje	ct Des	sign	Compatible Use		
Co	nside		e abov	ve information, could the project have a significant impact (individually or cumulatively) y <b>fire hazard</b> factors?		
$\boxtimes$	Poter	ntially	signific	cant		

## HAZARDS - 4. Noise

SE	TTING	3/IMP	ACTS	
a.	Yes	No N ⊠	∕laybe □	Is the project site located near a high noise source (airports, railroads, freeways, industry)?
b.	$\boxtimes$			Is the proposed use considered sensitive (school, hospital, senior citizen facility) or are there other sensitive uses in close proximity?
				Project contains a propsoed school site.
C.				Could the project substantially increase ambient noise levels including those associated with special equipment (such as amplified sound systems) or parking areas associated with the project?
				Site is currently undeveloped
d.				Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels without the project? <u>During project preparation and construction, truck trips may travel through existing residential communities or affect exisiting surrounding residential uses.</u>
e.				Other factors?
ST	AND	ARD (	ODE	REQUIREMENTS
$\boxtimes$	Nois	e Ordi	nance	No. 11,778
$\boxtimes$	MITI	GATIC	ON ME	ASURES /  OTHER CONSIDERATIONS
	Lot S	Size		Project Design Compatible Use
***************************************				
		.USIO		
Co on	nside , or b	ering the	ne abo ersely i	ve information, could the project have a significant impact (individually or cumulatively) mpacted by <b>noise</b> ?
$\boxtimes$	Pote	ntially	signifi	cant

## **RESOURCES - 1. Water Quality**

SE			PACTS	
a.	Yes	No ⊠	Maybe	Is the project site located in an area having known water quality problems and proposing the use of individual water wells?
b.		$\boxtimes$		Will the proposed project require the use of a private sewage disposal system?
				If the answer is yes, is the project site located in an area having known septic tank limitations due to high groundwater or other geotechnical limitations <i>or</i> is the project proposing on-site systems located in close proximity to a drainage course?
C.				Could the project's associated construction activities significantly impact the quality of groundwater and/or storm water runoff to the storm water conveyance system and/or receiving water bodies?
				NPDES compliance required.
d.				Could the project's post-development activities potentially degrade the quality of storm water runoff and/or could post-development non-storm water discharges contribute potential pollutants to the storm water conveyance system and/or receiving bodies?
				NPDES compliance required.
e.	ā			Other factors?
ST	ANDA	ARD (	CODE	REQUIREMENTS
	Indus	trial V	Vaste I	Permit
	Plum	bina (	Code C	ordinance No. 2269 NPDES Permit Compliance (DPW)
				ASURES /  OTHER CONSIDERATIONS
	Lot S			☐ Project Design
CC	NCL	JSIOI	N	
				ve information, could the project have a significant impact (individually or cumulatively) y, water quality problems?
$\boxtimes$	Poter	ntially	signific	ant

## **RESOURCES - 2. Air Quality**

3E	202000000							
a.	Yes ⊠	No M		Will the proposed project exceed the State's criteria for regional significance (generally (a) 500 dwelling units for residential uses or (b) 40 gross acres, 650,000 square feet of floor area or 1,000 employees for nonresidential uses)?				
				Project contains 1,341 units of single family units and one school site.				
b.	$\boxtimes$			Is the proposal considered a sensitive use (schools, hospitals, parks) and located near a freeway or heavy industrial use?				
				Project contains a proposed school site.				
C.				Will the project increase local emissions to a significant extent due to increased traffic congestion or use of a parking structure, or exceed AQMD thresholds of potential significance?				
				Project is likely to exceed AQMD thresholds of significance due to its large size.				
d.				Will the project generate or is the site in close proximity to sources which create obnoxious odors, dust, and/or hazardous emissions?				
e.			$\boxtimes$	Would the project conflict with or obstruct implementation of the applicable air quality plan?				
				Project is a non-attainment area.				
f.			$\boxtimes$	Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?				
				Construction activities could exceed Nox threshold.				
g.				Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? <u>ROG, NOx, PM10</u>				
h.	$\boxtimes$			Other factors: Site is located within a non-attainment air quality district.				
ST	ANDA	ARD C	ODE	REQUIREMENTS				
	Healt	h and	Safet	y Code Section 40506				
$\boxtimes$	MITIC	ATIO	N ME	ASURES /  OTHER CONSIDERATIONS				
	☐ Project Design							
CC	NCL	JSION	Į					
				ve information, could the project have a significant impact (individually or cumulatively) on, ir quality?				
$\square$	Poter	ntially s	sianifi	eant				

## **RESOURCES - 3. Biota**

## SETTING/IMPACTS Yes No Mavbe Is the project site located within a Significant Ecological Area (SEA), SEA Buffer, or M coastal Sensitive Environmental Resource (ESHA, etc.), or is the site relatively undisturbed and natural? Portion of the site is within the proposed Crezan Mesa SEA; Site is relatively undisturbed Will grading, fire clearance, or flood related improvements remove substantial natural M habitat areas? Site is relatively undisturbed Is a major drainage course, as identified on USGS quad sheets by a blue, dashed M line, located on the project site? Plum Canyon and its unnamed tributary drainage. Does the project site contain a major riparian or other sensitive habitat (e.g., coastal $\boxtimes$ sage scrub, oak woodland, sycamore riparian woodland, wetland, etc.)? Cruzan Mesa and Plum Canyon vernal pools, coastal sage scrub, holly-leaved cherry scrub, sycamore riparian woodland, chaparral Does the project site contain oak or other unique native trees (specify kinds of trees)? M e. Site contains one mature coast live oak (Ouercus agrifolia) tree and Sycamore Is the project site habitat for any known sensitive species (federal or state listed f. M endangered, etc.)? California Orcutt, spreading navarretia, slender mariposa lily, Peirson's Morning-glory, Palmer's Grappling Hook, California gnatcatcher, white-tailed kite, nothern harrier, golden eagle, prairie falcon, ashy rufous-crowned sparrow, Bell's sage sparrow, widespread Pacific treefrog, western spadefoot, coast horned lizard, vernal pool fairy shrimp, coastal whiptail, and southern rattlesnake. Other factors (e.g., wildlife corridor, adjacent open space linkage)? q. **⋈** MITIGATION MEASURES / ☐ OTHER CONSIDERATIONS ○ Oak Tree Permit Project Design Lot Size Biological Resources Constraints dated March 2004 by Natural Resource Consultant on file. CONCLUSION Considering the above information, could the project have a significant impact (individually or cumulatively) on biotic resources? Less than significant with project mitigation Less than significant/No impact Notentially significant

## RESOURCES - 4. Archaeological / Historical / Paleontological

## **SETTING/IMPACTS**

a.			<b>L</b> I	Is the project site in or near an area containing known archaeological resources or containing features (drainage course, spring, knoll, rock outcroppings, or oak trees) which indicate potential archaeological sensitivity?
				Plum Canyon, one oak tree
b.		$\boxtimes$		Does the project site contain rock formations indicating potential paleontological resources?
c.		$\boxtimes$		Does the project site contain known historic structures or sites?
				Site is currently vacant
d.		$\boxtimes$		Would the project cause a substantial adverse change in the significance of a historical or archaeological resource as defined in 15064.5?
e.		$\boxtimes$		Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?
f.				Other factors?
$\boxtimes$	MITI	GATI	ON ME	ASURES /  OTHER CONSIDERATIONS
	Lot S	Size		☐ Project Design ☐ Phase I Archaeology Report
C	ONCL	USIC	ON	
				ve information, could the project leave a significant impact (individually or cumulatively) historical, or paleontological resources?
$\boxtimes$	Pote	ntiall	y signifi	cant

## **RESOURCES - 5.Mineral Resources**

SETTIN Yes a.		PACTS Maybe	Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?
b. 🗀	$\boxtimes$		Would the project result in the loss of availability of a locally important mineral resource discovery site delineated on a local general plan, specific plan or other land use plan?
с. 🔲			Other factors?
MIT	IGATIO	ON ME	ASURES /  OTHER CONSIDERATIONS
Lot	Size		☐ Project Design
***************************************			
CONC	LUSIC	N	
Consid on <b>min</b>			ve information, could the project leave a significant impact (individually or cumulatively) es?
☐ Pot	entially	/ signifi	cant

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## **RESOURCES - 6. Agriculture Resources**

SE	TTIN	G/IMP	ACTS	
a.	Yes	No ∣	Maybe	Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?
				Per Los Angeles County Important Farmland 2002 map
b.				Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?
C.				Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?
d.				Other factors?
	MITI	GATIO	ON ME	ASURES /  OTHER CONSIDERATIONS
	Lot S	Size		☐ Project Design
		.USIO		ve information, could the project leave a significant impact (individually or cumulatively)
			e reso	
	Pote	ntially	' signifi	cant

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## **RESOURCES - 7. Visual Qualities**

SE	TTING	G/IMP	ACTS	
a.	Yes	No I	Maybe ⊠	Is the project site substantially visible from or will it obstruct views along a scenic highway (as shown on the Scenic Highway Element), or is it located within a scenic corridor or will it otherwise impact the viewshed?  Soledad Canyon Road is Santa Clarita is a secondary scenic highway.
b.			$\boxtimes$	Is the project substantially visible from or will it obstruct views from a regional riding or hiking trail? <u>Mint Canyon and Bouquet Canyon Trails are in the close area (per LA County Trail System Map)</u>
C.		$\boxtimes$		Is the project site located in an undeveloped or undisturbed area, which contains unique aesthetic features?
d.				Is the proposed use out-of-character in comparison to adjacent uses because of height, bulk, or other features?
e.		$\boxtimes$		Is the project likely to create substantial sun shadow, light or glare problems?
f.				Other factors (e.g., grading or land form alteration):
$\boxtimes$	MITIC	SATIO	ON ME	ASURES /  OTHER CONSIDERATIONS
	Lot S			☐ Project Design ☐ Visual Report ☐ Compatible Use
Со	nside	_		ve information, could the project have a significant impact (individually or cumulatively)
$\boxtimes$	Poter	ntially	signific	cant

## SERVICES - 1. Traffic/Access

SE	TTING	3/IMP/		
a.	Yes ⊠	No N	∕laybe □	Does the project contain 25 dwelling units, or more and is it located in an area with known congestion problems (roadway or intersections)? <u>Project is proposing 1,341 SF</u> units and 1 school site; many intersections in Santa Clarita near capacity.
b.				Will the project result in any hazardous traffic conditions?
C.				Will the project result in parking problems with a subsequent impact on traffic conditions?
d.				Will inadequate access during an emergency (other than fire hazards) result in problems for emergency vehicles or residents/employees in the area?
e.				Will the congestion management program (CMP) Transportation Impact Analysis thresholds of 50 peak hour vehicles added by project traffic to a CMP highway system intersection or 150 peak hour trips added by project traffic to a mainline freeway link be exceeded?
				Project exceeds CMP threshold for single family residential projects.
f.		$\boxtimes$		Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?
g.				Other factors?
		GATIC ect Des		ASURES / ☐ OTHER CONSIDERATIONS  ☐ Traffic Report ☐ Consultation with Traffic & Lighting Division
		USIO		
Co on	nside the p	ring th hysica	e abo ıl envir	ve information, could the project have a significant impact (individually or cumulatively) conment due to <b>traffic/access</b> factors?
$\boxtimes$	Pote	ntially	signifi	cant

## SERVICES - 2. Sewage Disposal

SE			ACIS	
а.	Yes ⊠	No	Maybe	If served by a community sewage system, could the project create capacity problems at the treatment plant? <u>Per application, the project will be annexed to the LA County Sanitation District No. 26, within which the current demand exceeds design capacity.</u>
b.	$\boxtimes$			Could the project create capacity problems in the sewer lines serving the project site? <u>Community sewage system for the site currently unavailable. Project will require existing sewer lines to be extended.</u>
c.				Other factors?
				REQUIREMENTS
Ш	Sanit	tary S	ewers a	and Industrial Waste Ordinance No. 6130
	Plum	bing	Code C	Ordinance No. 2269
	MITI	GATIO	ON ME	ASURES /  OTHER CONSIDERATIONS
CC	NCL	USIO	N	
Co on	nside the p	ering t hysic	he abo al envir	ve information, could the project have a significant impact (individually or cumulatively) ronment due to <b>sewage disposal</b> facilities?
$\boxtimes$	Pote	ntially	⁄ signifi	cant

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## SERVICES - 3. Education

SE	SETTING/IMPACTS						
a.	Yes ⊠	No N	Maybe □	Could the project create capacity problems at the district level?			
				Sulphur Springs, Saugus, and William S. Hart School Districts are currently over capacity.			
b.				Could the project create capacity problems at individual schools which will serve the project site? <i>Individual schools within the above three school districts are currently operating over capacity.</i>			
C.	$\boxtimes$			Could the project create student transportation problems?			
				Students may be transferred to other schools not in the immediate vicinity.			
d.				Could the project create substantial library impacts due to increased population and demand? Project will increase demand for library services by 8,287 volumes and 1,612 square feet to a total of 129,600 volumes and 25,207 square feet respectively, compared to current supply of 66,790 volumes and 5,050 square feet. Project will result in significant impacts on project level as well as on a cumulative basis.			
e.				Other factors?			
		<b>SATIO</b> Dedica		ASURES / OTHER CONSIDERATIONS  Solvernment Code Section 65995  Library Facilities Mitigation Fee			
	Site [		ition				
CO	Site E	Dedical USION	tion  l				

## SERVICES - 4. Fire/Sheriff Services

SE	TTING	G/IMP	ACTS	
_	Yes	No I	Maybe	Could the project create staffing or response time problems at the fire station or
a.				sheriff's substation serving the project site? <u>The nearest fire station Fire Engine 107 is located at 18239 Soledad Canyon Road, Canyon County, which is approximately 4.5 miles from site; Project site is within the service area of the Santa Clarita Sheriff Station, which is located approximately 10.3 miles from the site at 23740 West Magic Mountain Parkway in Valencia.</u>
b.		$\boxtimes$		Are there any special fire or law enforcement problems associated with the project or the general area?  Site is currently undeveloped.
C.				Other factors?
			tion Fe	ASURES / OTHER CONSIDERATIONS es
CC	ONCL	USIO	N	
				re information, could the project have a significant impact (individually or cumulatively)  f services?
	Pote	ntially	signific	cant Less than significant with project mitigation Less than significant/No impact

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## SERVICES - <u>5. Utilities/Other Services</u>

SE	TTING		ACTS				
a.	Yes	No I	Maybe ⊠	Is the project site in an area known to have an inadequate public water supply to meet domestic needs or to have an inadequate ground water supply and proposes water wells?			
				Dispute in known available water supplies			
b.		$\boxtimes$		Is the project site in an area known to have an inadequate water supply and/or pressure to meet fire fighting needs?			
C.		$\boxtimes$		Could the project create problems with providing utility services, such as electricity, gas, or propane?			
d.	$\boxtimes$			Are there any other known service problem areas (e.g., solid waste)?			
				Countywide solid waste facilities are reaching capacity.			
e.				Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services or facilities (e.g., fire protection, police protection, schools, parks, roads)?			
f.	$\boxtimes$			Other factors? <u>Project is required to perform a mandatory water assessment.</u>			
ST	ANDA	ARD (	CODE	REQUIREMENTS			
	Plum	bing (	Code C	Ordinance No. 2269			
	MITIC	SATIO	ON ME	ASURES /  OTHER CONSIDERATIONS			
	Lot S	ize		☐ Project Design			
	CONCLUSION						
				ve information, could the project have a significant impact (individually or cumulatively) ervices?			
$\boxtimes$	Poter	ntially	signific	cant			

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## OTHER FACTORS - 1. General

SE	SETTING/IMPACTS						
a.			Maybe	Will the project result in an inefficient use of energy resources?			
b.			$\boxtimes$	Will the project result in a major change in the patterns, scale, or character of the general area or community?			
				Site is currently undeveloped.			
C.		$\boxtimes$		Will the project result in a significant reduction in the amount of agricultural land?			
d.				Other factors?			
	<ul> <li>State Administrative Code, Title 24, Part 5, T-20 (Energy Conservation)</li> <li>■ MITIGATION MEASURES / ■ OTHER CONSIDERATIONS</li> <li>■ Lot size ■ Project Design ■ Compatible Use</li> <li>To be discussed in conjunction with "Land Use," "Visual," and other factors.</li> </ul>						
Co	CONCLUSION  Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to any of the above factors?						
$\boxtimes$	☑ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact						

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## OTHER FACTORS - 2. Environmental Safety

SE'	SETTING/IMPACTS						
a.	Yes	No I ⊠	Maybe	Are any hazardous materials used, transported, produced, handled, or stored on-site?			
b.		$\boxtimes$		Are any pressurized tanks to be used or any hazardous wastes stored on-site?			
C.			$\boxtimes$	Are any residential units, schools, or hospitals located within 500 feet and potentially adversely affected?			
				Project is proposing a school on-site			
d.				Have there been previous uses which indicate residual soil toxicity of the site?			
e.		$\boxtimes$		Would the project create a significant hazard to the public or the environment involving the accidental release of hazardous materials into the environment?			
f.		$\boxtimes$		Would the project emit hazardous emissions or handle hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			
g.		$\boxtimes$		Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or environment?			
h.		$\boxtimes$		Would the project result in a safety hazard for people in a project area located within an airport land use plan, within two miles of a public or public use airport, or within the vicinity of a private airstrip?			
۱.		$\boxtimes$		Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			
j.				Other factors?			
П	MITIC	ATIC	ON ME	ASURES /  OTHER CONSIDERATIONS			
$\boxtimes$							
CC	NCL	JSIO	N				
Co	nside	rina th	ne abov	ve information, could the project have a significant impact relative to <b>public safety</b> ?			
لاے	Potentially significant Less than significant with project mitigation Less than significant/No impact						

## OTHER FACTORS - 3. Land Use

SE	TTING	G/IMP	ACTS					
a.	Yes ⊠	No M	Maybe	Can the project be found to be inconsistent with the plan designation(s) of the subject property?				
				Project may require a Plan Amendment				
b.	$\boxtimes$			Can the project be found to be inconsistent with the zoning designation of the subject property?				
				Project may require a Zone Change.				
C.				Can the project be found to be inconsistent with the following applicable land use criteria:				
	$\boxtimes$			Hillside Management Criteria?				
			$\boxtimes$	SEA Conformance Criteria? <u>Site is within the proposed Cruzan Mesa SEA.</u>				
				Other?				
d.		$\boxtimes$		Would the project physically divide an established community?				
e.				Other factors? One of the two project main access connects to a road extending from west of a pending Tract Map (Project No. 04-102/TR 46018-Revsied) not yet approved and recorded. This uncertainty leads to possible design alteration until TR 46018 is approved and recorded.				
				ASURES /  OTHER CONSIDERATIONS unalysis.				
		USIOI						
				ve information, could the project have a significant impact (individually or cumulatively) on ment due to <b>land use</b> factors?				
$\boxtimes$	Pote							

## OTHER FACTORS - 4. Population/Housing/Employment/Recreation

SE	TTING	G/IMP	ACTS	
a.	Yes	No N ⊠	/laybe	Could the project cumulatively exceed official regional or local population projections?
b.			$\boxtimes$	Could the project induce substantial direct or indirect growth in an area (e.g., through projects in an undeveloped area or extension of major infrastructure)?
				Site is currently undeveloped.
c.		$\boxtimes$		Could the project displace existing housing, especially affordable housing?
d.		$\boxtimes$		Could the project result in a substantial job/housing imbalance or substantial increase in Vehicle Miles Traveled (VMT)?
e.	$\boxtimes$			Could the project require new or expanded recreational facilities for future residents?
				Demand for recreation facilities from future residents
f.		$\boxtimes$		Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?
g.				Other factors?
	MITIC	GATIC	ON ME	ASURES /  OTHER CONSIDERATIONS
Со	nside	<b>USIOI</b> ering th	ie abov	ve information, could the project have a significant impact (individually or cumulatively) on
				ment due to <b>population, housing, employment</b> , or <b>recreational</b> factors?  cant

## MANDATORY FINDINGS OF SIGNIFICANCE

Based on this Initial Study, the following findings are made: No Maybe Yes Does the project have the potential to substantially degrade the quality of the X a. environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory? Biota Does the project have possible environmental effects which are individually limited but X cumulatively considerable? "Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. Traffic, education, air quality, sewer treatment Will the environmental effects of the project cause substantial adverse effects on human M beings, either directly or indirectly? Air quality, water quality CONCLUSION Considering the above information, could the project have a significant impact (individually or cumulatively) on the environment? Less than significant with project mitigation Less than significant/No impact □ Potentially significant

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# URBAN SERVICES ANALYSIS

# SEWER TREATMENT CAPACITY ANALYSIS (MILLION GALLONS PER DAY)

CASE NO: TR060922

PROJECT NO. 04-075

4/28/2004

POTENTIAL	SIGNIFICANT IMPACT	YES
	SUPPLY SIG	19.10
	TOTAL	25.03
	PROJECT	0.35
	PENDING	3.01
	APPROVED PENDING	3.21
	RECORDED	3.42
EXISTING	DEMAND	15.04
	SEWER AGENCY	S.D. NO. 26 & 32

## PLANNED EXPANSION

POTENTIAL	SIGNIFICANT	IMPACT	NO	NO
	COMPLETION	EXPECTED	2002	2010
		TOTAL CAPACITY	28.10	34.10
	SEWER AGENCY	S.D. NO. 26 & 32	FIRST STAGE	PRACTICAL SITE CAPACITY:

## CRITERIA

				COMMERCIAL INDUSTRIA	INDUSTRIAL
DEMAND FACTORS (GAL/DAY): SF MF MH (PER ACRE) (PER ACRE)	SF	MF	MH	(PER ACRE)	(PER ACRE)
S.D. NO. 26 & 32	260	195	156	1,440	2,009

## URBAN SERVICES ANALYSIS

# LIBRARY CAPACITY ANALYSIS

4/28/2004 DEMAND TR060922 PROJECT NO 04-075 CASE NO.

POTENITAL	SIGNIFICANT IMPACT		YES	YES		YES	YES
	SIGNIFICAN SUPPLY IMPACT		06,790	5,050		348,467	67,777
	TOTAL		129,600	25,207		551,316	107,231
	PROJECT		8,287	1,612		8,287	1,612
TIAL	PENDING		15,098	2,937		65,659	12,187
POTENTIAL	APPROVED PENDING		28,236	5,492		76,886	14,954
	RECORDED		13,571	2,640		82,886	16,121
	EXISTING DEMAND		64,408	12,527		320,598	62,356
	LIBRARY	CANYON COUNTRY	VOLUMES	SPACE (SQ FT)	-AREA CLUSTER-*	VOLUMES	SPACE (SQ FT)

 $<sup>\</sup>ast$  AREA CLUSTER IS THE GROUP OF LIBRARIES SERVING THE ENTIRE COMMUNITY.

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7	0.389
VOLUMES PER CAPITA:	SQUARE FOOT PER CAPITA:

Wednesday, April 28, 2004

Page 1 of 1

## URBAN SERVICES ANALYSIS

## SCHOOL CAPACITY ANALYSIS

4/28/2004

TR060922

CASE NO.

PROJECT NO. 04-075

## STUDENT EVALUATION

SCHOOL DISTRICT	ENROLLMENT PENDING	PENDING	APPROVED	RECORDED	PROJECT	TOTAL	TOTAL CAPACITY	STUDENT OVERLOAD	POTENTIAL SIGNIFICANT IMPACT
SULPHUR SPRINGS	4,662	985	801	802	534	7,385	4,975	2,410	YES
WM.S. HART JR HI	5,217	541	852	793	134	7,537	5,174	2,363	YES
WM.S. HART SR HI	9,903	1,468	1,778	1,973	252	15,374	9,512	5,862	YES

## URBAN SERVICES ANALYSIS SCHOOL CAPACITY ANALYSIS

4/28/2004

TR060922

CASE NO.

PROJECT NO. 04-075

## STUDENT EVALUATION

SCHOOL DISTRICT	ENROLLMENT PENDING	PENDING	APPROVED	RECORDED 1 421	PROJECT TOTAL	TOTAL	CAPACITY	STUDENT OVERLOAD 5 791	SIGNIFICANT IMPACT YES
SAUGUS UNION WM.S. HART JR HI WM.S. HART SR HI	8,979 5,217 9,903	541 1,468	852 1,778	793	134 252	7,537	5,174	5,862	YES

SI	ION				OTENTIAL DRY NORMAL SIGNIFICANT SOJECT TOTAL SUPPLY SUPPLY IMPACT	1,059.39 15,466.47	,059.39 84,379.44 90,600 96,000 NO	UPPLY	YEAR	2005 90,600 96,000 NO	2006 90,600 96,000 NO	2007 90,600 96,000 NO	2008 90,600 96,000 NO	COMMERCIAL INDUSTRIAL	(PER ACRE) (PER ACRE)	2.77 3.14
S ANALYSI Y ANALYS 4	ES ANALYS TY ANALYS 004 TY EVALUA' (YEAR)	\T	PENDING PROJECT	3,556.13 1,	6,585.35 1,059.39	DE FUTURE S						$\overline{\mathbf{A}}$	MH	0.31		
URBAN SERVICES ANALYSIS WATER CAPACITY ANALYSIS 4/28/2004 WATER AVAILABILITY EVALUATION (ACRE-FEET/YEAR) DEMAND		POTENTIAL	i	33.18	5,521.85	A VALLEY WII						CRITERIA	MF	0.22		
URBAN	WATERA	)			RECORDED APPROVED	1,469.77	6,862.85	SANTA CLARITA VALLEY WIDE FUTURE SUPPLY							(): SF	0.79
				nnematophopytytytissanamanamanamathtvi	EXISTING DEMAND	9,348	64,350	SA							DEMAND FACTORS (AF/YR):	LL WD
PROJECT NO. 04-075 CASE NO. TR060922					WATER COMPANY	NEWHALL WD	SC VALLEY WIDE								DEMAN	NEWHALL WD

Dry Supply - Ranges from 90,600 to 147,500 acre-feet-per year.

Note:

Conjunctive-use and groundwater banking supplies are not included in table.

Normal Supply - Ranges from 96,000 to 151,900 acre-feet-per year.

## URBAN SERVICES ANALYSIS FIRE PROTECTION ANALYSIS

4/28/2004

PROJECT NO. 04-075 CASE NO. TR060922

## RESPONSE DISTANCE EVALUATION (MILES)

## MAXIMUM DISTANCE CRITERIA

		Commercial	Approximate	Potential Significant
Lot Type	Residential	<u>Industrial</u>	Distance	Impact
SINGLE FAMILY	6		4.4	No

## THE SIGNAL NEWSPAPER 24000 Creekside Rd Valencia CA 91355

## **Proof of Publication**

(2015.5 C.C.P)

## STATE OF CALIFORNIA, COUNTY OF LOS ANGELES

I am a citizen of the United States, and a resident of the county aforesaid; I am over the age of eighteen years; and I am not a party to or interested in the notice published. I am the chief legal advertising clerk of the publisher of the

### SIGNAL NEWSPAPER

a newspaper of general circulation, printed and published Daily in the City of Santa Clarita County of Los Angeles, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Los Angeles, State of California,

under the date of March 25, 1988

Case Number NVC15880, that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

All in the year 20 b4

I certify (or declare) under penalty of perjury that the foregoing is true and correct

Dated at Valencia, California, this

Paste Clipping



Los Angeles County Department of Regional Planning Notice of Preparation and Scoping Meeting Notification



Date:

October 22, 2004

Project:

:The "Skyline Ranch" Project, County Project Ne 04-045; Tentative Tract Map No 060922

Project: The "Skyline Ranch" Broiest, County Broied No 04315. Rentative Tract Map No 060922

Applicant: Bardee Homes

| Fig. | F

yet to be determined entity

A Notice of Preparation (NOP) for the EIR is being distributed. The review period for the NOP is from October 25 to November 24, 2004. Copies of the NOP are available for review at Carryon Country Library located at 18536 Sole-dad Carryon Road. Santa Clarita. CA 91351, Valencia Country Library at 23749 Vyest/Valencia, Boulevard, Santa Clarita. CA 91355, Newhall Country Library at 22704 West 9th Street, Santa Clarita, GA.91321, as well as at the Department of Regional Planning at the address below, and its website http://planning.co.la.ca.us/drp..agnd.html Tentative Tract Map No. 060922. Due to the time limits manidated by State law your response must be sent at the earliest possible date, but not later than November 30, 2004 at 5:00 p.m. Send written responses to Di. Histo-ching Chen, AICP Country of Los Angeles Department of Regional Planning, Impact Arialysis Section, 320 West Temple Street, Los Angeles CA 900 12-3225, Telephone: (213) 974-6461, Fax (213) 626-0434 Planning of the Carryon Road Planning of the Draft EIR. This meeting will be held in the Carryon Country Joanne Darcy Library located at 18536 Soledad Carryon Road Santa Clarita, CA 9131351 on November 10th, 2004 from 6:00 p.m. to 8:00 p.m.

Published in the Signal 11/01, 11/02, 11/3, 2004



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## COUNTY OF LOS ANGELES SKYLINE RANCH PROJECT DRAFT EIR SCOPING MEETING SUMMARY

**Date:** November 10, 2004 **Time:** 6:00 P.M. – 8:00 P.M.

Place: Canyon Country Joanne Darcy Library, 18536 Soledad Canyon Road, Santa Clarita

**Subject:** Skyline Ranch Project Draft EIR

Participating Staff: Hsiao-ching Chen County of Los Angeles Regional Planning

Daryl Koutnik County of Los Angeles Regional Planning

Joel Miller Psomas (Facilitator)

**CEQA Consultant:** Stephanie Eyestone-Jones PCR Services Corporation (CEQA Consultant)

Jay Ziff PCR Services Corporation (CEQA Consultant)

Meeting Overview: The main purpose of the scoping meeting was to present an introduction to the

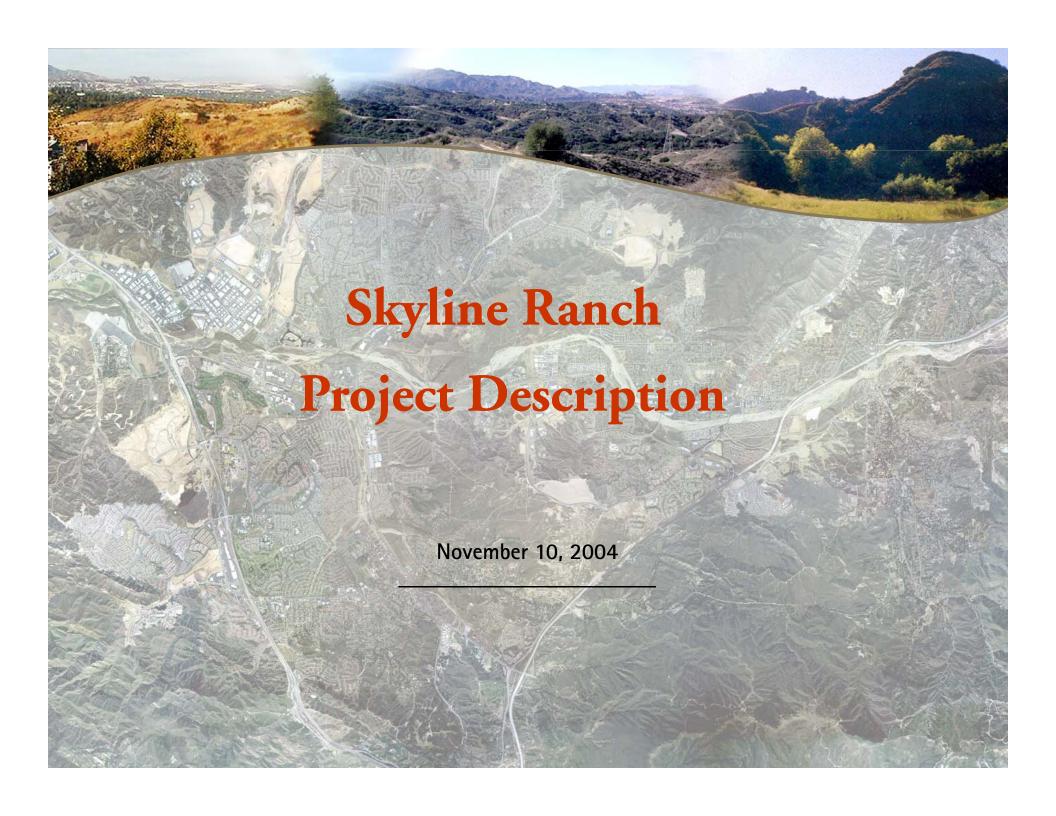
Environmental Impact Report (EIR) process, establish base facts about the proposed project, and solicit input on the range of issues to be analyzed in the EIR. Attendees were greeted by County staff, signed-in, and were given informational materials including an agenda and a printout of the slide (Power Point) presentation to be discussed during the meeting. The presentation included an explanation of the meeting agenda and format, an overview of the CEQA process, a summary of the proposed project and its basic components, and a summary of the Initial Study. The presentation was followed by a facilitated public input session, where individuals had an opportunity to state their concerns or questions regarding the information contained

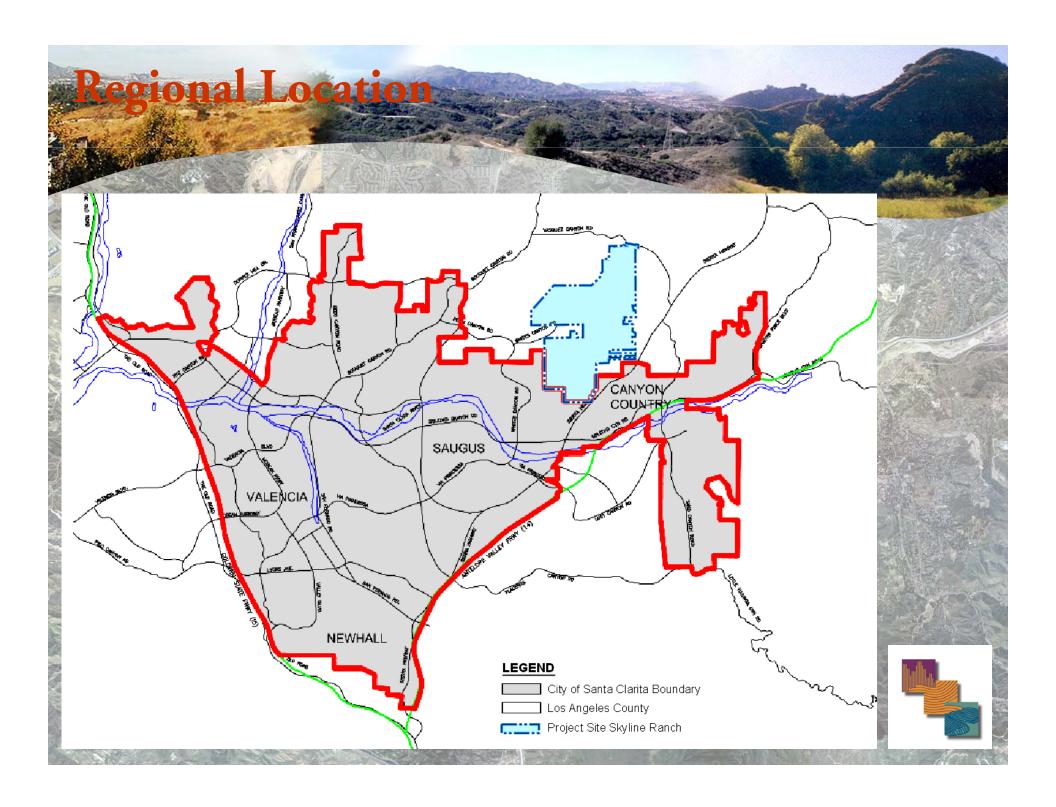
in the Initial Study.

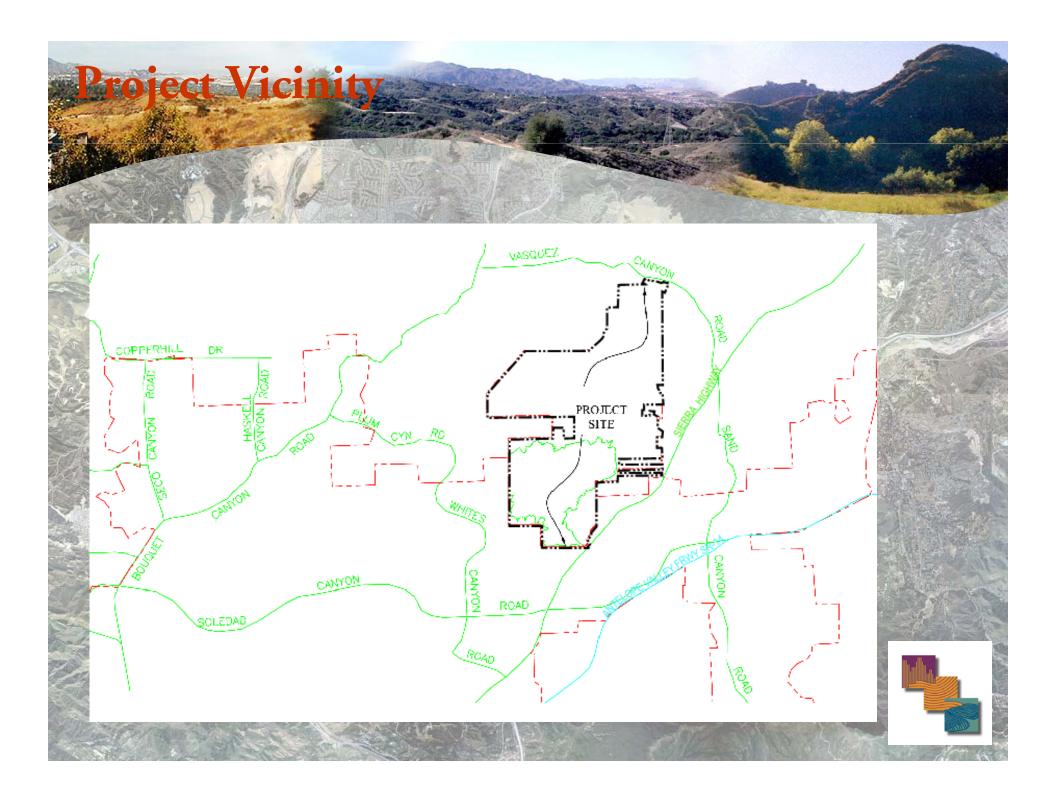
The following presents a general summary of meeting comments based on notes taken by the facilitator and the CEQA consultant.

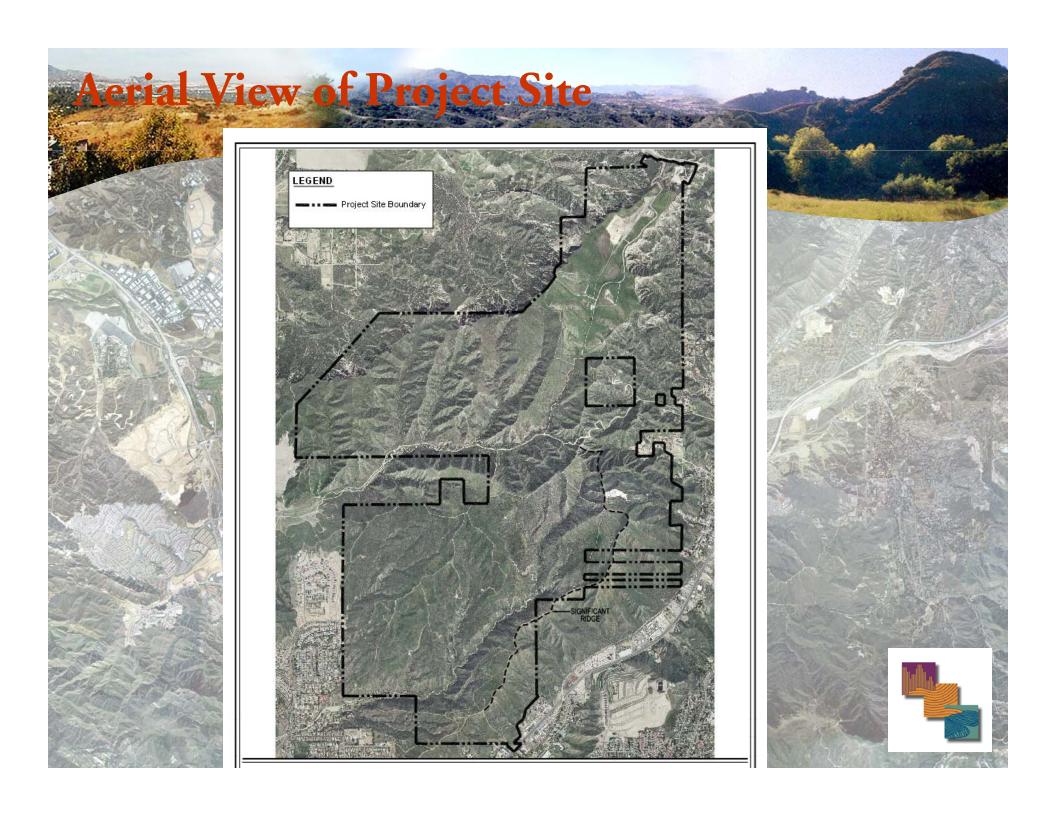
COMMENTOR	SUMMARY OF COMMENTS		
Kai Luoma, City of Santa Clarita	Growth inducing impacts resulting from infrastructure extensions		
	Project may need to be revised; it's dependent on the approval of another project. If that project is not approved, what is the impact on access?		
Bill Wittenberg	Skyline Ranch Road is a single means of access		
	<ul> <li>Fire and emergency access issue</li> </ul>		
	<ul> <li>No site for a fire station; impacts on the Fire Department</li> </ul>		
	<ul> <li>There is currently no water to the site</li> </ul>		
	Does the school district have funds to build the school that is necessary? Will it be operational before occupany?		
	<ul> <li>Use of Soledad Canyon Road</li> </ul>		
Sgt. Hernandez, CHP	■ 15 percent increase in traffic collisions since 2001		
	<ul> <li>No personnel increase in over 20 years; need more officers to patrol highways</li> </ul>		
	<ul> <li>CHP has requested 20 new officers but there is no funding</li> </ul>		
	<ul> <li>CHP wants to be involved in the school's design and proper access (ingress/egress) for the school</li> </ul>		

COMMENTOR	SUMMARY OF COMMENTS		
Bill Wittenberg	<ul> <li>CHP responsibilities are increasing but staffing is not</li> </ul>		
	<ul> <li>Staff are needed (Sheriff and CHP) for unincorporated areas</li> </ul>		
	<ul> <li>Lack of service by Sheriff's Department</li> </ul>		
	<ul> <li>Project will add to existing burden on crime prevention and traffic and the safety of existing residents – biggest issue</li> </ul>		
	<ul> <li>Traffic-related safety should be discussed</li> </ul>		
Roger Peterson	<ul> <li>Concerned about whether project will connect to Vasquez Canyon Road (Mystery Mesa)</li> </ul>		
	<ul> <li>Will Pardee develop this area? If so, then too much traffic (and hazards) on Vasquez Canyon Road</li> </ul>		
	<ul> <li>Traffic from the movie industry should be looked at</li> </ul>		
Nina Woodbury	■ Impact on Vasquez Canyon Road		
	<ul> <li>Concern regarding filming traffic</li> </ul>		
	<ul> <li>Concern regarding sewers and water</li> </ul>		
	<ul> <li>Cross Valley Connector will only add to traffic congestion</li> </ul>		
	<ul> <li>All housing tracts make traffic terrible</li> </ul>		
Bill Wittenberg	• What are the benefits of the project?		
	• Will the community park just be graded or will it be improved? What are the amenities?		
	Will the traffic study go beyond the tract?		





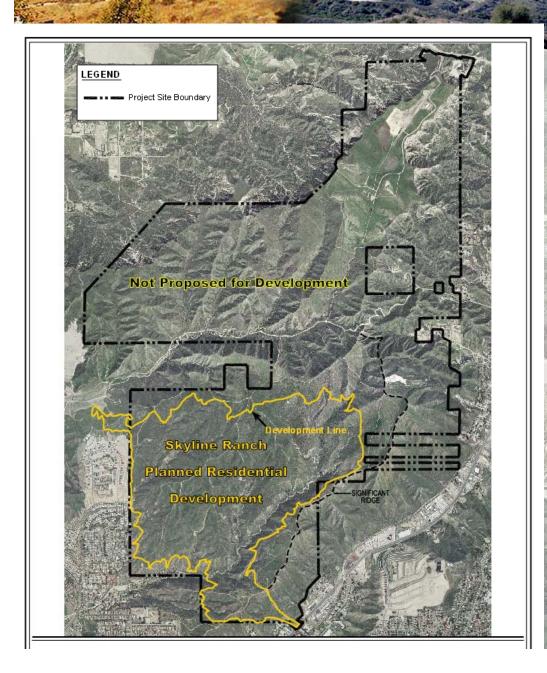






- → Size: 2,196 acres
- → Moderate to Steep Slopes, Ridges and Canyons
- → Dominant Plant Communities Coastal Sage Scrub, Coastal Sage-Chaparral Scrub
- Proposed Cruzan Mesa Vernal Pools SEA
- Previous Uses: Grazing, Landing Strip
- ◆ Active Land Uses: Limited, with the exception of an Outdoor Movie Location
- → Land Use Designations: U1 (Urban 1.1to 3.3 du/acre); U2 (Urban 3.4 to 6.6 du/acre); U3 (6.7 to 15 du/acre); N (Non Urban 0.5 to 1.0 du/acre); HM (Hillside Management), W (flood plain)
- → Zoning Designations: A-2-1 (Heavy Agricultural) and A-1-1 and A-1-10,000 (Light Agricultural)





Northern Area:
 No Development 1,604 acres
 (73% of site)

→ Southern Area: Development of 592 acres (27% of site)





- Approximately 1,246 single-family residential lots
- → 10 acre public school site (K-6)
- → 10 acre public community park, a private neighborhood park, and private pocket parks
- → Whites Canyon Road Extension (Skyline Ranch Road)
- Grading: on 27 % of site, concentrated in areas of 25 % or less slopes, substantial cut and fill for infrastructure and development areas
- → Landscape Design: transitional perimeter plantings with native and drought tolerant plants, enhanced pedestrian circulation, landscape theme for development area



## Skyline Ranch Community Design Concept COMMUNITY ENTRY WEIGHBOPHOOD COMMUNITY PARK-BITTRY WIEW/ROCKET PARK SKYLINE PANISH ROAD ZIANES W/MEDIAN POTEITIAL PEDESTRIAN OVERPASS SCHOOL **POLIVIDABOUT** NEW/PLOKET PARK SYNUME PANICH ROAD 4 LANES WIMEDIAN COMMUNITY







# Sign-In Form Public Scoping Meeting The "Skyline Ranch" Project County Project No. 04-075



November 10, 2004

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Name Rek Willshad	Organization (if applicable)  P.A.M.I.N.C. COMMISSIONER  Ord. OF SANTA CLARITA	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
ROGER PETERSON		30815 SWAPISE 41 US RO	661714-9032	
Name		Street Address/City/State/ZIP	Phone Number	Check if wish to speak
4NOREN HERNANDEZ SENGERANT	CACIFORNIA PATROL	38648 THE OLD ROAD	0661	
			Account of the contract of the	
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
Le mons	The Signal	24000 Creeksde Kd.	(661) 259-1234	
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## Sign-In Form Public Scoping Meeting The "Skyline Ranch" Project County Project No. 04-075



# •

		November 10, 2004		
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
DENNIS ROLFE	SANTA C'CAN TA WATE	P.O. BOX 903 S.C. CA.	66,2592737	
	The state of the s			
Name   Bill Wittenberg	Organization (if applicable)	Street Address/City/State/ZIP  2 @ SQL N	Phone Number	Check if wish to speak
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Name Kai Luoma	Organization (if applicable)  CTY of Senter Clounty	Street Address/City/State/ZIP	Phone Number (56) 255-4350	Check if wish to speak
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			A CONTRACTOR OF THE PROPERTY O	



## Sign-In Form Public Scoping Meeting The "Skyline Ranch" Project County Project No. 04-075



		November 10, 2004		
Name NINA Woodbury	Organization (if applicable)	Street Address/City/State/ZIP 308/5 Sun Risk Hills Rd	Phone Number (661)296 6463	Check if wish to speak
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
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#### STATE OF CALIFORNIA

#### Governor's Office of Planning and Research State Clearinghouse and Planning Unit



Jan Boel Acting Director

#### **Notice of Preparation**

October 22, 2004

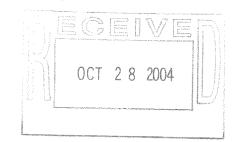
To:

Reviewing Agencies

Re:

Skyline Ranch Project, Project No. 03-075, Tract Map No. 060922

SCH# 2004101090



Attached for your review and comment is the Notice of Preparation (NOP) for the Skyline Ranch Project, Project No. 03-075, Tract Map No. 060922 draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Hsiao-ching Chen Los Angeles County Department of Regional Planning 320 W. Temple Street Los Angeles, CA 90012

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan

Associate Planner, State Clearinghouse

Attachments cc: Lead Agency

#### **Document Details Report** State Clearinghouse Data Base

SCH# 2004101090

Skyline Ranch Project, Project No. 03-075, Tract Map No. 060922 Project Title

Los Angeles County Department of Regional Planning Lead Agency

> NOP Notice of Preparation Type

The project applicant proposes to develop approximately 592 acres of the site with 1,325 single-family Description

residential lots ranging in size from 4,830 to 7,350 square feet along with a 10-acre school site and 10 acres of parks. Development is proposed for the southern portion of the property with slopes of 25 percent or less. The northern 1,604 acres of the site would remain preserved as open space and

managed by an as yet to be determined entity.

#### **Lead Agency Contact**

Hsiao-ching Chen Name

Los Angeles County Department of Regional Planning Agency

(213) 974-6461 Phone

email

320 W. Temple Street Address

> City Los Angeles

Zip 90012 State CA

Fax

#### Project Location

Los Angeles County

> Santa Clarita City

Region

Sierra Highway, Plum Canyon Road **Cross Streets** 

2839-0-17 to 19, 2802-02-1, 3 to 8, 10 to 12, 15, 2812-3-45, 4, 27, 2, 2802-03-1, 5, 2812-4-11 Parcel No.

Township

Range 15W

3,9,10 Section

SBB&M Base

#### Proximity to:

Highways

**Airports** None

Metrolink Railways

Santa Clara River, Mint Canyon Waterways

Canyon HS, Sierra Vista JH, L.H. Cox Elem. Schools

Vacant (occasional filming use) / A-2-1, A-1-1, A-1-10,000 / Non-urban Land Use

#### Project Issues

Aesthetic/Visual; Air Quality; Archaeologic-Historic; Drainage/Absorption; Flood Plain/Flooding; Forest

Land/Fire Hazard; Geologic/Seismic; Noise; Population/Housing Balance; Public Services;

Recreation/Parks; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid

Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Growth Inducing; Landuse; Cumulative Effects; Other Issues

#### Reviewing Agencies

Resources Agency; Department of Forestry and Fire Protection; Department of Parks and Recreation;

Department of Water Resources; Native American Heritage Commission; Office of Emergency

Services; Department of Health Services; Department of Fish and Game, Region 5; California Highway Patrol; Department of Housing and Community Development; Public Utilities Commission; Caltrans,

District 7; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 4

Date Received

10/22/2004

Start of Review 10/22/2004

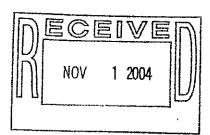
End of Review 11/22/2004

Note: Blanks in data fields result from insufficient information provided by lead agency.

D 10 10 10 10 10 10 10 10 10 10 10 10 10	Regional Water Quality Control  Board (RWQCB)  RWQCB 1  Cathleen Hudson North Coast Region (1)  RWQCB 2  Environmental Document Coordinator San Francisco Bay Region (2)  RWQCB 3  Central Coast Region (3)  RWQCB 4  Jonathan Bishop Los Angeles Region (4)  RWQCB 5  Central Valley Region (5)  Fresno Branch Office  RWQCB 6  Lahondan Region (6)  RWQCB 6  Lahondan Region (6)  RWQCB 7  Colorado River Basin Region (7)  RWQCB 7  Colorado River Basin Region (7)  RWQCB 8  Santa Ana Region (9)  RWQCB 9  San Diego Region (9)
sches sch#	Dept. of Transportation 8 John Pagano District 8 Gayle Rosander District 9 Tom Dumas District 10 Tom Dumas District 10 Dept. of Transportation 10 Tom Dumas District 11 Dept. of Transportation 11 Manio Orso District 11 Dept. of Transportation 12 Bob Joseph District 11 Dept. of Transportation 12 Bob Joseph District 12 Airport Projects 1 Jim Lemer Jim Lemer Jim Larnsportation Projects Mike Tolistrup Mike Tolistrup  California Integrated Waste Management Board Sue O'Leary State Water Resources Control Board Jim Hockenberry Division of Financial Assistance State Water Resources Control Board State Water Resources Control Cediffication of Water Rights  Dept. of Toxic Substances Control CEDA Tracking Center
County: Los Angel	Ren Lewis State Lands Commission Jean Sarino Tahoe Regional Planning Agency (TRPA) Cherry Jacques Sandy Hesnard Caltrans - Division of Aeronautics Sandy Hesnard Caltrans - Planning Terri Pencovic Dept. of Transportation 3 Jeff Pulverman District 3 Dept. of Transportation 5 David Murray District 4 Dept. of Transportation 6 Marc Birnbaum District 6 Marc Birnbaum District 6 Cheryl J. Powell District 7
	Robert Floerke Robert Floerke Region 3 Robert Floerke Region 3 Dept. of Fish & Game 4 William Laudemilk Region 4 Region 5 Dept. of Fish & Game 5 Don Chadwick Region 5, Habitat Conservation Program Dept. of Fish & Game 6 Gabrina Gatchel Region 6, Habitat Conservation Program Dept. of Fish & Game 6 I/M Tammy Allen Region 6, Inyo/Mono, Habitat Conservation Program Dept. of Fish & Game M George Isaac Marine Region Other Departments Region Dept. of General Services Steve Shaffer Dept. of Health Services Robert Sleppy Environmental Services Section George Isaac Marine Region Other Departments Conservation Program Dept. of Health/Drinking Water Dept. of Health/Drinking Water Dept. of Health/Drinking Water Dept. of Health/Drinking Water Office of Emergency Services John Rowden, Manager Governor's Office of Planning & Research State Clearinghouse State Clearinghouse Comm. Debbie Treadway
NOP Distribution List	Resources Agency Nadell Gayou Nadell Gayou Suzi Betzler California Coastal Commission Elizabeth A. Fuchs Colorado River Board Gerald R. Zimmerman Dept. of Conservation Roseanne Taylor Commission Environmental Office Protection Allen Robertson Office of Historic Preservation Hans Kreutzberg Dept of Parks & Recreation B. Noah Tilghman Hans Kreutzberg Dept of Parks & Recreation B. Noah Tilghman Fectamation Board DeeDee Jones Section  Reclamation Board DeeDe Jones Santa Monica Mountains Conservancy Paul Edelman Steve McAdam Steve McAda

21865 Copley Drive, Diamond Bar, CA 91765-41 (909) 396-2000 • www.aqmd.gov

October 28, 2004



Dr. Hsiao-ching Chen, AICP Los Angeles County Regional Planning Dept. Impact Analysis Section 320 West Temple Street, Room 1348 Los Angeles, CA 90012

Dear Dr. Chen:

#### Notice of Preparation of a Draft Environmental Impact Report for The Skyline Ranch Project

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the Draft Environmental Impact Report (EIR). Please send the SCAQMD a copy of the Draft EIR upon its completion.

#### Air Quality Analysis

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2002 Model. This model is available on the CARB Website at: www.arb.ca.gov.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips

should be included in the analysis. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

**Mitigation Measures** 

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

#### **Data Sources**

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. Please call Charles Blankson, Ph.D., Air Quality Specialist, CEQA Section, at (909) 396-3304 if you have any questions regarding this letter.

Sincerely,

Steve Smith, Ph.D.

Program Supervisor, CEQA Section

Planning, Rule Development and Area Sources

SS:CB:li

LAC041026-06LI Control Number





Sheriff's Bepartment Headquart<u>ers</u> 4700 Ramona Boulevard Monterey Park, California 91754-2169 (661) 255-1121

November 3, 2004

Dr. Hsiao-ching Chen, AICP Los Angeles County Regional Planning 320 W. Temple Street Los Angeles, California 90012-3225

Dear Dr. Chen:

## INITIAL STUDY TRACT NO. 060922, PROJECT NO. 04-075 SKYLINE RANCH PROJECT

The proposed Project consisting of 1,343 single family residential units, west of Mint Canyon and Sierra Highway between the Santa Clara River and Vasquez Canyon, is within the jurisdiction of the Los Angeles County Sheriff's Department, Santa Clarita Valley Station, 23740 Magic Mountain Parkway, Valencia, California. The station is located approximately 9-10 miles from the project site.

It is anticipated that the non-emergent response time to a request for service would be approximately 25-35 minutes. The priority response time would be approximately 8-11 minutes and the response time under emergent circumstances would be approximately 5-8 minutes. All response times are approximations, only, and would be dependent on both the deployment of area radio cars and traffic conditions.

This station serves an area of 656 square miles, which is made up of the City of Santa Clarita and unincorporated County area between the Los Angeles City Limits to the South, the Kern County Line to the North and involving all area between the Ventura County Line to the West and the township of Aqua Dulce to the East. The population served by our station is approximately 200,000 residents.

#### INITIAL STUDY PAGE 2 TRACT NO. 060922, PROJECT NO. 04-075, SKYLINE RANCH PROJECT

Our ideal officer to population ratio is one deputy per 1,000 residents and with our current staffing of 161 sworn deputies currently assigned, our ratio is less than ideal at one deputy per every 1,243 residents. Assuming a residential density of 3.01 persons per dwelling unit, this proposed project will generate a population increase of 4,042. Based on the above, this project would require four additional deputies to the station complement.

Our primary concern is our ability to provide an adequate level of protection and service to all areas we police. Due to the rapidly expanding population of the Santa Clarita Valley and its record-setting home building, it is difficult to project the impact of this project on law enforcement.

Adding this project and other projects in progress, either proposed, approved or committed, it is certain they will all significantly strain our resources to the breaking point. Additionally, the increase in required field personnel will necessitate a concomitant increase in support resources such as detectives, complaint desk officers, vehicles and portable radios. While not directly a builder's matter, our ability to provide a sufficient level of law enforcement services must be considered when applications for new projects such as these are considered.

While we do not oppose this project, we are seriously concerned about our ability to adequately police this area. Without a commitment from the Board of Supervisors to provide sufficient funding, we may face a situation where we cannot provide timely emergency services.

It is suggested, for the security and safety of the residents, that the following crime prevention measures be implemented during site and building layout design:

- Provide lighting in open areas and parking lots;
- Ensure the visibility of doors and windows from the street and between buildings;
- Provide adequate parking spaces in the parking lots to accommodate shoppers, employees and residents;
- Ensure that the required building address numbers are lighted and readily apparent from the street for emergency response agencies.

### INITIAL STUDY PAGE 3 TRACT NO. 060922, PROJECT NO. 04-075, SKYLINE RANCH PROJECT

Should you have further questions, please feel free to call me at (661) 255-1121 extension 5102, or Deputy Patrick Rissler at extension 5159.

Sincerely,

LEROY D. BACA, SHERIFF

Patti A. Minutello, Captain Santa Clarita Valley Station

cc: Mr. Gary T.K. Tse, Director Facilities Planning Bureau

PAM;par



THOMAS L. GARTHWAITE, M.D. DIRECTOR and CHIEF MEDICAL OFFICER

FRED LEAF CHIEF OPERATING OFFICER

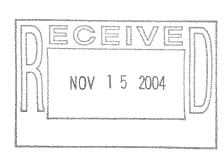
JONATHAN E. FIELDING, M.D., M.P.H. Director of Public Health and Health Officer

Environmental Health ARTURO AGUIRRE, Director

Bureau of Environmental Protection Mountain & Rural/Water, Sewage & Subdivision Program 5050 Commerce Drive, Baldwin Park, CA 91706-1423 TEL (626)430-5380 · FAX (626)813-3016 www.lapublichealth.org/eh/progs/envirp.htm

November 3, 2004

Hsiao-ching Chen, Impact Analysis Section, Department of Regional Planning 320 W. Temple St., Los Angeles, CA 90012





BOARD OF SUPERVISORS

Gloria Molina

Yvonne Brathwaite Burke Second District

Zev Yaroslavsky Third District

Don Knabe Fourth District

Michael D. Antonovich Fifth District

#### RE: Project No. 04-075/TR 060922; The Skyline Ranch Project, Canyon Country

This is in response to request for comments regarding Notice of Preparation of a Draft Environmental Impact Report for the above referenced development project that was forwarded to this Department.

Mountain & Rural/Water, Sewage & Subdivision program of Environmental Health has reviewed the information submitted and has no objection to the noted development with the understanding that adequate and sustainable potable water shall be supplied through an existing public water systems or an improvement district which will guarantee water connection and service to the entire project area. Furthermore waste water treatment for the entire project site shall be accommodated by public sewer and waste water treatment facilities of the Los Angeles County Sanitation District.

However, this preliminary review encompasses issues that pertain to this program; other potential environmental impacts associated with the development of this project should be addressed by their respective programs/units, e.g., acoustical impact review and analysis should be conducted by Environmental Hygiene Program of this Department.

We would like to receive and review future subsequent documents that will be prepared for this project.

If you have any questions or need additional information, please contact me at 626-430-5380.

Respectfully,

Patrick Nejadian, Program Director

Mountain & Rural/Water, Sewage & Subdivision Program



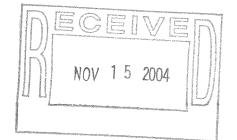
## COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400 Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998 Telephone: (562) 699-7411, FAX: (562) 699-5422 www.lacsd.ora

JAMES F. STAHL Chief Engineer and General Manager

November 9, 2004

File No: 26-00.04-00



Dr. Hsiao-ching Chen, AICP Impact Analysis Section Los Angeles County Department of Regional Planning 320 West Temple Street, Room 1348 Los Angeles, CA 90012

Dear Dr. Chen:

#### Skyline Ranch Project, County Project No. 04-075, Tract Map No. 060922

The County Sanitation Districts of Los Angeles County (Districts) received a Notice of Preparation of a Draft Environmental Impact Report for the subject project on October 25, 2004. We offer the following comments regarding sewerage service:

- 1. Most of the project area is outside the jurisdictional boundaries of the Districts and will require annexation into District No. 26 before sewerage service can be provided to the proposed development. For specific information regarding the annexation procedure and fees, please contact Ms. Margarita Cabrera at extension 2708. Copies of the Districts' Annexation Information and Processing Fees sheets are enclosed for your convenience.
- 2. Because of the project's location, the flow originating from the proposed project would have to be transported to the Districts' trunk sewer by local sewer(s) that are not maintained by the Districts. If no local sewer lines currently exist, it is the responsibility of the developer to convey any wastewater generated by the project to the nearest local sewer and/or Districts' trunk sewer. The nearest Districts' trunk sewer is the Soledad Canyon Trunk Sewer, Section 5, located in Soledad Canyon Road at Sierra Highway. This 18-inch diameter trunk sewer has a design capacity of 6.4 million gallons per day (mgd) and conveyed a peak flow of 4.5 mgd when last measured in 2003.
- 3. Due to the large amount of wastewater the future development would generate, the proposed project may have significant impacts on the Districts' sewerage system. Although a relief sewer is not scheduled for construction at this time, if additional flows are generated and the Districts' trunk sewer nears capacity, construction of a relief sewer will be scheduled, depending on the availability of relief project funding.
- 4. The Districts operate two water reclamation plants (WRPs), the Saugus WRP and the Valencia WRP, which provide wastewater treatment in the Santa Clarita Valley. These facilities are interconnected to form a regional treatment system known as the Santa Clarita Valley Joint Sewerage System (SCVJSS) that currently has a permitted treatment capacity of 19.1 mgd. A

9 mgd expansion of the Valencia WRP will be completed in 2004 and is expected to meet the Regional Growth Management Plan forecasted demand through 2010. The SCVJSS currently processes an average flow of 18.4 mgd.

- 5. The expected average wastewater flow from the project site is 386,500 gallons per day. A copy of the Districts' average wastewater generation factors is enclosed for your information.
- 6. The Districts are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting (directly or indirectly) to the Districts' Sewerage System or increasing the existing strength and/or quantity of wastewater attributable to a particular parcel or operation already connected. This connection fee is required to construct an incremental expansion of the Sewerage System to accommodate the proposed project, which will mitigate the impact of this project on the present Sewerage System. Payment of a connection fee will be required before a permit to connect to the sewer is issued. A copy of the Connection Fee Information Sheet is enclosed for your convenience. For more specific information regarding the connection fee application procedure and fees, please contact the Connection Fee Counter at extension 2727.
- 7. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the design capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into the Air Quality Management Plan, which is prepared by the South Coast Air Quality Management District in order to improve air quality in the South Coast Air Basin as mandated by the CAA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise you that the Districts intend to provide this service up to the levels that are legally permitted and to inform you of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 699-7411, extension 2717.

Very truly yours,

James F. Stahl

Ruth I. Frazen

Engineering Technician

auth d. Fracen

Planning & Property Management Section

RIF:rf Enclosures c: M. Cabrera

## INFORMATION SHEET FOR APPLICANTS REQUESTING ANNEXATION TO A COUNTY SANITATION DISTRICT OF LOS ANGELES COUNTY

### A. ELIGIBILITY CRITERIA FOR ANNEXATION TO A COUNTY SANITATION DISTRICT OF LOS ANGELES COUNTY

- 1. The property is contiguous to said County Sanitation District or, if not contiguous, may be drained by gravity to a trunk sewer of that District,
- 2. The property is not included in whole or in part in any other agency providing services similar to those of the said County Sanitation District, and
- 3. The property is to be benefited by its inclusion in the said County Sanitation District.

#### B. HOW DO I INITIATE THE ANNEXATION APPLICATION PROCESS?

1. WRITE TO: County Sanitation Districts of Los Angeles County

P.O. Box 4998, Whittier, CA 90607

Attn: Annexation Fee Program

The letter should contain the following information and support documentation about the property involved:

- a) Property location (street address, city, zip and Thomas Brothers map, page, grid)
- b) In case of a recorded single lot, include the County Assessor's map book-page-parcel map with the parcel highlighted.
- c) In case of a tract or parcel map, include a copy of the tentative or final map plus a closedsurvey engineering traverse around the boundary to be annexed to the centerline of any public street.

<u>CALL:</u> County Sanitation Districts of Los Angeles County (562) 699-7411, Extension 2708

7:00 a.m. through 4:30 p.m., Monday through Thursday

7:00 a.m. through 3:30 p.m., Fridays, except holidays

- 2. Districts' staff will calculate the acreage involved and will provide the applicant with a quote of annexation fees to be paid. At this time, the applicant will also be provided with a "Request for Annexation" form along with necessary instructions.
- 3. An annexation application file will be opened upon submittal by applicant of all the required documents (refer to Section C) along with a check for the annexation fee made payable to:

County Sanitation Districts of Los Angeles County

#### C. WHAT DOCUMENTS DO I NEED TO FILE?

- 1. "Request for Annexation" Form (4 pages): All applicants must complete, in detail, and return the Request for Annexation form signed by the legal owner whose name appears on the current Los Angeles County assessment roll. See C5) for assistance in completing page 4 of this form.
- 2. Los Angeles County Local Agency Formation Commission Party Disclosure Form: All applicants must complete and return the Party Disclosure Form pursuant to the Local Agency Formation Commission Party Disclosure Form Information Sheet.
- 3. Annexation Fee payment as stated in the quotation letter. Cash will not be accepted.

- 4. Copy of Grant Deed (Applicants must submit a copy of the Grant Deed which includes the legal description. Disregard this request if the proposed project is a tract/parcel map.)
- 5. California Environmental Quality Act (CEQA): All applications are subject to CEQA. If you are applying for a single-family home on septic tank, your project is exempt and the Notice of Exemption will be prepared by this office. As required by LAFCO, all other applicants must provide twenty six (26) copies of the Initial Study, Final Negative Declaration, Final Mitigated Negative Declaration, Notice of Determination, and Mitigation Monitoring and Reporting Program approved by a city or County Regional Planning Commission, or five (5) copies each of the Final Environmental Impact Report (EIR) and the Notice of Determination approved by a city or County Regional Planning Commission, whichever is applicable
- 6. Radius Map and Corresponding Mailing Labels for LAFCO: All developers are required to submit a radius map within a 300-foot radius of the exterior boundaries of the project area and each parcel of land lying entirely or partially within a 300-foot radius. A set of mailing labels of those landowners that are within a 300-foot radius of the exterior boundaries of the subject area is also required. Provide a list of the Assessor's parcel number, name, and address of each landowner.
- 7. **Please Note:** The annexation fees and application will not be accepted until *all* of the required items have been submitted.

#### D. HOW MUCH DO I HAVE TO PAY?

The annexation fee consists of three processing fees. The Annexation Processing Fees table is attached. The Sanitation Districts, as the lead agency for the annexation, will collect the processing fees at time of annexation application. The three processing fees are for: 1) County Sanitation Districts of Los Angeles County (CSD), 2) Local Agency Formation Commission (LAFCO), and 3) State Board of Equalization (SBE). The LAFCO and SBE processing fees are subject to change without notice. If their fees increase before your application is processed by this office for submittal to these agencies, then you will be notified and the additional monies must be paid before the annexation procedure can be finalized.

#### E. HOW LONG DOES IT TAKE TO PROCESS MY ANNEXATION APPLICATION?

If the project is a recorded single family lot, Districts' staff will begin processing the annexation application as soon as the required forms are submitted and the annexation fees paid. Upon payment of the annexation fees, for all Sanitation Districts except 26 & 32, the applicant may pay the connection fees and proceed with the project.

If the project is a tract or parcel map, Districts' staff will begin processing the annexation application as soon as the required forms, annexation fees and a copy of the recorded tract/parcel map blueline are submitted. Upon payment of annexation fees, the applicant may have the original sewer map signed off. Also, for all Sanitation Districts except 26 & 32, the applicant may pay the connection fees. The annexation procedure cannot be completed until after receipt, in this office, of the recorded tract/parcel blueline map.

#### F. WHERE CAN I GET ADDITIONAL INFORMATION?

For additional information, please call:

County Sanitation Districts of Los Angeles County (562) 699-7411, Extension 2708
7:00 a.m. through 4:30 p.m., Monday through Thursday 7:00 a.m. through 3:30 p.m., Fridays, except holidays

#### **ANNEXATION PROCESSING FEES FOR THE** COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

COUNTY SANITATION DISTRICTS' PROCESSING FEE	ACREAGE			FEE
	0.0	to	1.5	\$800
	>1.5 >5.0	to	5.0	\$1,075
	73.0	Over 20.0	20.0	\$215/Acre \$4,300 Plus \$35/Additional Acre And Every Fraction Thereo
LOCAL AGENCY FORMATION COMMISSION FILING FEE <sup>17</sup>		ACREAGE		FEE
ANNEXATIONS AND DETACHMENTS	0.0	to	1.0	\$2,500
	>1.0	to	5.0	\$3,000
	>5.0	to	10.0	\$3,500
	>10.0 >25.0	to	25.0	\$5,000
	>50.0	to to	50.0	\$6,000
*	>50.0 to 160.0 160.0			\$7,000
OTHER PROPOSALS	160.0+ Acres Special Reorganization			\$8,000
	Income	2	pecial Reorganization	\$10,000
	incorpo	pration/Disincorp	oration/Consolidation	\$7,500
			District Formation	\$7,500
	Dis	trict Dissolution/	Consolidation/Merger	\$5,000
		Establishment	of Subsidiary District	\$4,000
			Reorganizations	Basic Fee*+ 20%
	Amend Existing	Sphere of Influer	ice for an Annexation	\$500
	Amend Existin	g Sphere of Influ	ence for Action other	·
	than an An	nexation Existing Sphere	of Influence Without	20% of Basic Fee
	0.0	to	1.0	\$2.500
	>1.0	to	5.0	\$2,500 \$3,000
	>5.0	to	10.0	\$3,500
	>10.0	to	25.0	\$5,000
	>25.0	to 50.0		\$6,000
	>50.0 to 160.0		\$7,000	
	160.0+ Acres			\$7,000
	Reconsideration of LAFCO Determinations			50% of Basic Fee
'The "Basic Fee" is the filing fee charged	Special District Study			Actual Cost
for the underlying change of organization	Out-of-Agency Service Agreements			\$2,000
associated with the action indicated. If	Petition Verification			Actual Cost
nore than one change of organization is				
proposed, it is the higher fee.	Notice/Radius Map			Actual Cost
STATE BOARD OF	State Controller Review			\$2,000 + Actual Cost
EQUALIZATION <sup>2</sup> SINGLE AREA TRANSACTIONS	0.0	ACREAGE		FEE
	1.0	to to	1.0	\$300
	6.0	to	5.0 10.0	\$350 \$500
!		to	20.0	\$500 \$800
	· 11.0			
	21.0	to	50.0	\$1.200
	21.0 51.0		50.0 100.0	\$1,200 \$1,500
	21.0 51.0 101.0	to to to	100.0 500.0	\$1,500
	21.0 51.0 101.0 501.0	to to to to to	100.0 500.0 1,000.0	\$1,500 \$2,000 \$2,500
	21.0 51.0 101.0 501.0 1,001.0	to to to to to	100.0 500.0 1,000.0 2,000.0	\$1,500 \$2,000 \$2,500 \$3,000
OTHER PROPOSALS	21.0 51.0 101.0 501.0 1,001.0	to to to to to	100.0 500.0 1,000.0 2,000.0	\$1,500 \$2,000 \$2,500 \$3,000 \$3,500
OTHER PROPOSALS	21.0 51.0 101.0 501.0 1,001.0	to to to to to to co to co to to co to co to co 2,001.0 and Above	100.0 500.0 1,000.0 2,000.0 /e Deferral of Fees	\$1,500 \$2,000 \$2,500 \$3,000 \$3,500 \$35
OTHER PROPOSALS	21.0 51.0 101.0 501.0 1,001.0	to to to to to colored to Additional Co	100.0 500.0 1,000.0 2,000.0 /e  Deferral of Fees unty per Transaction	\$1,500 \$2,000 \$2,500 \$3,000 \$3,500 \$35 \$250
OTHER PROPOSALS	21.0 51.0 101.0 501.0 1,001.0	to to to to to consolidation	100.0 500.0 1,000.0 2,000.0 ve Deferral of Fees unty per Transaction per District or Zone	\$1,500 \$2,000 \$2,500 \$3,000 \$3,500 \$35 \$250 \$300
OTHER PROPOSALS	21.0 51.0 101.0 501.0 1,001.0	to to to to to 2,001.0 and Above  Additional Co Consolidation Entire	100.0 500.0 1,000.0 2,000.0 /e  Deferral of Fees unty per Transaction	\$1,500 \$2,000 \$2,500 \$3,000 \$3,500 \$35 \$250

<sup>&</sup>lt;sup>1</sup>/Most recent LAFCO fee increase effective June 1, 2003. <sup>2</sup>/Most recent SBE fee increase effective December 2, 1998.

TABLE 1

LOADINGS FOR EACH CLASS OF LAND USE

DESCRIPTION	UNIT OF MEASURE	FLOW (Gallons <u>Per Day)</u>	COD (Pounds <u>Per Day)</u>	SUSPENDED SOLIDS (Pounds <u>Per Day)</u>
RESIDENTIAL				
Single Family Home	Parcel	260	1.22	0.59
Duplex	Parcel	312	1.46	0.70
Triplex	Parcel	468	2.19	1.05
Fourplex	Parcel	624	2.92	1.40
Condominiums	Parcel	195	0.92	0.44
Single Family Home	Parcel	156	0.73	0.35
(reduced rate)				
Five Units or More	No. of Dwlg. Units	156	0.73	0.35
Mobile Home Parks	No. of Spaces	156	0.73	0.35
COMMERCIAL				
Hotel/Motel/Rooming House	Room	125	0.54	0.28
Store	$1000   \mathrm{ft}^2$	100	0.43	0.23
Supermarket	$1000 \text{ ft}^2$	150	2.00	1.00
Shopping Center	$1000   \mathrm{ft}^2$	325	3.00	1.17
Regional Mall	1000 ft <sup>2</sup>	150	2.10	0.77
Office Building	$1000  \mathrm{ft}^2$	200	0.86	0.45
Professional Building	$1000  \mathrm{ft}^2$	300	1.29	0.68
Restaurant	$1000   \mathrm{ft}^2$	1,000	16.68	5.00
Indoor Theatre	$1000   \mathrm{ft}^2$	125	0.54	0.28
Car Wash				
Tunnel - No Recycling	$1000  \mathrm{ft}^2$	3,700	15.86	8.33
Tunnel - Recycling	$1000  \mathrm{ft}^2$	2,700	11.74	6.16
Wand	$1000 \text{ ft}^2$	700	3.00	1.58
Financial Institution	$1000 \text{ ft}^2$	100	0.43	0.23
Service Shop	$1000 \text{ ft}^2$	100	0.43	0.23
Animal Kennels	$1000 \text{ ft}^2$	100	0.43	0.23
Service Station	$1000  \text{ft}^2$	100	0.43	0.23
Auto Sales/Repair	$1000  \text{ft}^2$	100	0.43	0.23
Wholesale Outlet	$1000 \text{ ft}^2$	100	0.43	0.23
Nursery/Greenhouse	$1000 \text{ ft}^2$	25	0.11	0.06
Manufacturing	$1000 \text{ ft}^2$	200	1.86	0.70
Dry Manufacturing	$1000 \text{ ft}^2$	25	0.23	0.09
Lumber Yard	$1000 \text{ ft}^2$	25	0.23	0.09
Warehousing	$1000 \text{ ft}^2$	25	0.23	0.09
Open Storage	$1000 \text{ ft}^2$	25	0.23	0.09
Drive-in Theatre	$1000   \mathrm{ft}^2$	20	0.09	0.05

TABLE 1
(continued)

LOADINGS FOR EACH CLASS OF LAND USE

DESCRIPTION	UNIT OF MEASURE	FLOW (Gallons <u>Per Day)</u>	COD (Pounds <u>Per Day)</u>	SUSPENDED SOLIDS (Pounds <u>Per Day)</u>
COMMERCIAL				
Night Club Bowling/Skating Club Auditorium, Amusement Golf Course, Camp, and Park (Structures and Improvements Recreational Vehicle Park Convalescent Home Laundry Mortuary/Cemetery Health Spa, Gymnasium With Showers Without Showers Convention Center, Fairground, Racetrack, Sports Stadium/Arena	1000 ft <sup>2</sup> No. of Spaces Bed 1000 ft <sup>2</sup> 1000 ft <sup>2</sup> Average Daily Attendance	350 150 125 350 100 55 125 3,825 100 600 300	1.50 1.76 0.54 1.50 0.43 0.34 0.54 16.40 1.33 2.58 1.29	0.79 0.55 0.27 0.79 0.23 0.14 0.28 8.61 0.67 1.35 0.68
INSTITUTIONAL				
College/University Private School Church	Student $1000 \text{ ft}^2$ $1000 \text{ ft}^2$	20 200 50	0.09 0.86 0.21	0.05 0.45 0.11

## INFORMATION SHEET FOR APPLICANTS PROPOSING TO CONNECT OR INCREASE THEIR DISCHARGE TO THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY SEWERAGE SYSTEM

#### THE PROGRAM

The County Sanitation Districts of Los Angeles County are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting to a Sanitation District's sewerage system. Your connection to a City or County sewer constitutes a connection to a Sanitation District's sewerage system as these sewers flow into a Sanitation District's system. The County Sanitation Districts of Los Angeles County provide for the conveyance, treatment, and disposal of your wastewater. PAYMENT OF A CONNECTION FEE TO THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY WILL BE REQUIRED BEFORE A CITY OR THE COUNTY WILL ISSUE YOU A PERMIT TO CONNECT TO THE SEWER.

#### I. WHO IS REQUIRED TO PAY A CONNECTION FEE?

- 1. Anyone connecting to the sewerage system for the first time for any structure located on a parcel(s) of land within a County Sanitation District of Los Angeles County.
- 2. Anyone increasing the quantity of wastewater discharged due to the construction of additional dwelling units on or a change in land usage of a parcel already connected to the sewerage system.
- 3. Anyone increasing the improvement square footage of a commercial or institutional parcel by more than 25 percent.
- 4. Anyone increasing the quantity and/or strength of wastewater from an industrial parcel.
- 5. If you qualify for an Ad Valorem Tax or Demolition Credit, connection fee will be adjusted accordingly.

#### II. HOW ARE THE CONNECTION FEES USED?

The connection fees are used to provide additional conveyance, treatment, and disposal facilities (capital facilities) which are made necessary by new users connecting to a Sanitation District's sewerage system or by existing users who significantly increase the quantity or strength of their wastewater discharge. The Connection Fee Program insures that all users pay their fair share for any necessary expansion of the system.

#### III. HOW MUCH IS MY CONNECTION FEE?

Your connection fee can be determined from the Connection Fee Schedule specific to the Sanitation District in which your parcel(s) to be connected is located. A Sanitation District boundary map is attached to each corresponding Sanitation District Connection Fee Schedule. Your City or County sewer permitting office has copies of the Connection Fee Schedule(s) and Sanitation District boundary map(s) for your parcel(s). If you require verification of the Sanitation District in which your parcel is located, please call the Sanitation Districts' information number listed under Item IX below.

#### IV. WHAT FORMS ARE REQUIRED\*?

The Connection Fee application package consists of the following:

- 1. Information Sheet for Applicants (this form)
- 2. Application for Sewer Connection

3. Connection Fee Schedule with Sanitation District Map (one schedule for each Sanitation District)

#### V. WHAT DO I NEED TO FILE?

- 1. Completed Application Form
- 2. A complete set of architectural blueprints (not required for connecting one single family home)
- 3. Fee Payment (checks payable to: County Sanitation Districts of Los Angeles County)
- 4. Industrial applicants must file additional forms and follow the procedures as outlined in the application instructions

#### VI. WHERE DO I SUBMIT THE FORMS?

Residential, Commercial, and Institutional applicants should submit the above listed materials either by mail or in person to:

County Sanitation Districts of Los Angeles County Connection Fee Program, Room 130 1955 Workman Mill Road Whittier, CA 90601

Industrial applicants should submit the appropriate materials directly to the City or County office which will issue the sewer connection permit.

#### VII. HOW LONG DOES IT TAKE TO PROCESS MY APPLICATION?

Applications submitted by mail are generally processed and mailed within three working days of receipt. Applications brought in person are processed on the same day provided the application, supporting materials, and fee is satisfactory. Processing of large and/or complex projects may take longer.

#### VIII. HOW DO I OBTAIN MY SEWER PERMIT TO CONNECT?

An approved Application for Sewer Connection will be returned to the applicant after all necessary documents for processing have been submitted. Present this approved-stamped copy to the City or County Office issuing sewer connection permits for your area at the time you apply for actual sewer hookup.

#### IX. HOW CAN I GET ADDITIONAL INFORMATION?

If you require assistance or need additional information, please call the County Sanitation Districts of Los Angeles County at (562) 699-7411, extension 2727.

#### X. WHAT ARE THE DISTRICTS' WORKING HOURS?

The Districts' offices are open between the hours of 7:00 a.m. and 4:00 p.m., Monday through Thursday, and between the hours of 7:00 a.m. and 3:00 p.m. on Friday, except holidays. When applying in person, applicants must be at the Connection Fee counter at least 30 minutes before closing time.

<sup>\*</sup>Additional forms are required for Industrial Dischargers.

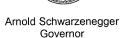




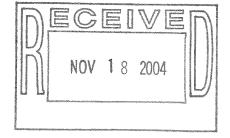
#### Department of Toxic Substances Control



1011 North Grandview Avenue Glendale, California 91201



November 16, 2004



Dr. Hsiao-ching Chen, AICP Los Angeles County Regional Planning Department Impact Analysis Section 320 West Temple Street, Room 1348 Los Angeles, California 90012

NOTICE OF PREPARATION DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE SKYLINE RANCH PROJECT, PROJECT NO. 03-075, TRACT NO. 060922, SCH NO. 2004101090

Dear Dr. Chen:

The Department of Toxic Substances Control (DTSC) has received your Notice of Preparation of a draft Environmental Impact Report (EIR) for the project mentioned above.

Based on the review of the document, DTSC comments are as follows:

- 1. The draft EIR needs to identify and determine whether current or historic uses at the Project site have resulted in any release of hazardous wastes/substances at the Project area.
- 2. The draft EIR needs to identify any known or potentially contaminated site within the Project area. For all identified sites, the draft EIR needs to evaluate whether conditions at the site pose a threat to human health or the environment.
- 3. The draft EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may require remediation, and which government agency will provide appropriate regulatory oversight.
- 4. If during construction of the project, soil contamination is suspected, construction in the area should stop, and appropriate health and safety procedures should be implemented. If it is determined that contaminated soils exists, the draft EIR should identify how any required investigation and/or remediation will be conducted, and which government agency will provide regulatory oversight.

Dr. Hsiao-ching Chen, AICP November 16, 2004 Page 2

DTSC provides guidance for Preliminary Endangerment Assessment preparation and cleanup oversight through the Voluntary Cleanup Program (VCP). For additional information on the VCP please visit DTSC's web site at www.dtsc.ca.gov. If you would like to meet and discuss this matter further, please contact Mr. Alberto Valmidiano, Project Manager, at (818) 551-2870 or me, at (818) 551-2857.

Sincerely,

Michel Iskarous Acting Unit Chief

Southern California Cleanup Operations Branch - Glendale Office

cc: Governor's Office of Planning and Research

State Clearinghouse

P.O. Box 3044

Sacramento, California 95812-3044

Mr. Guenther W. Moskat, Chief
Planning and Environmental Analysis Section
CEQA Tracking Center

Department of Toxic Substances Control

P.O. Box 806

Sacramento, California 95812-0806



#### DEPARTMENT OF FISH AND GAME

http://www.dfg.ca.gov 4949 Viewridge Avenue San Diego, CA 92123 (858) 467-4201



November 15, 2004

Ms. Hsiao-ching Chen Los Angeles County Department of Regional Planning 320 W. Temple Street Los Angeles, CA 90012

Notice of Preparation for an Environmental Impact Report for Skyline Ranch Project, Project # 03-075 SCH# 2004101090, Los Angeles County

#### Dear Ms Chen:

The Department of Fish and Game (Department) appreciates this opportunity to comment on the above-referenced project, relative to impacts to biological resources. The proposed project involves the development of 592 acres of the site with 1,325 single-family residences and a ten acre school. Approximately 1,604 acres of the site is proposed for protected open space. The project site supports habitat for listed species, species of Special Concern, seven vegetative communities and a large vernal pool at Cruzan Mesa (located within a Los Angeles County proposed Significant Ecological Area). Plum Canyon drainage and its tributary are also identified within the subject project site. The majority of the site is undeveloped and is located near the intersection of Sierra Highway and Plum Canyon Road near the City of Santa Clarita, Los Angeles County.

To enable Department staff to adequately review and comment on the proposed project we recommend the following information, where applicable, be included in the Draft Environmental Impact Report:

- A complete, recent assessment of flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats.
  - a. A thorough recent assessment of rare plants and rare natural communities, following the Department's Guidelines for Assessing Impacts to Rare Plants and Rare Natural Communities (Attachment 1).
  - b. A complete, recent assessment of sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use of the project area should also be addressed. Recent, focused, species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Department and U.S. Fish and Wildlife Service.

- c. Rare, threatened, and endangered species to be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (see CEQA Guidelines, Section 15380).
- d. The Department's California Natural Diversity Data Base in Sacramento should be contacted at (916) 327-5960 to obtain current information on any previously reported sensitive species and habitats, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code. Also, any Significant Ecological Areas (SEAs) or Environmentally Sensitive Habitats (ESHs) or any areas that are considered sensitive by the local jurisdiction that are located in or adjacent to the project area must be addressed.
- A thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts. This discussion should focus on maximizing avoidance, and minimizing impacts.
  - a. CEQA Guidelines, Section 15125(a), direct that knowledge of the regional setting is critical to an assessment of environmental impacts and that special emphasis should be placed on resources that are rare or unique to the region.
  - b. Project impacts should also be analyzed relative to their effects on off-site habitats and populations. Specifically, this should include nearby public lands, open space, adjacent natural habitats, and riparian ecosystems. Impacts to and maintenance of wildlife corridor/movement areas, including access to undisturbed habitat in adjacent areas, should be fully evaluated and provided. The analysis should also include a discussion of the potential for impacts resulting from such effects as increased vehicle traffic and outdoor artificial lighting.
  - c. A cumulative effects analysis should be developed as described under CEQA Guidelines, Section 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.
  - d. Impacts to migratory wildlife affected by the project should be fully evaluated. This can include such elements as migratory butterfly roost sites and neo-tropical bird and waterfowl stop-over and staging sites. All migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13). Sections 3503, 3503.5 and 3513 of the California Fish and Game Code prohibit take of birds and their active nests, including raptors and other migratory nongame birds as listed under the MBTA.
  - e. Impacts to all habitats from City or County required Fuel Modification Zones (FMZ). Areas slated as mitigation for loss of habitat shall not occur within the FMZ.
  - f. Proposed project activities (including disturbances to vegetation) should take place outside of the breeding bird season (February 1- September 15) to avoid take (including disturbances which would cause abandonment of active nests containing eggs and/or young). If project activities cannot avoid the breeding bird season, nest surveys should be conducted and active nests should be avoided and provided with a minimum buffer as determined by a biological monitor (the Department recommends a minimum 500-foot buffer for all active raptor nests).
  - g. Night lighting, and reflective surfaces pose a hazard to resident and migrant birds

Ms. Hsiao-ching Chen November 15, 2004 Page 3

species. These impacts are often overlooked during project planning and design. The DEIR should discuss measures to avoid/minimize these additional project related threats to avian species.

- 3. A range of alternatives should be analyzed to ensure that alternatives to the proposed project are fully considered and evaluated. A range of alternatives which avoid or otherwise minimize impacts to sensitive biological resources including wetlands/riparian habitats, alluvial scrub, coastal sage scrub, native woodlands, etc. should be included. Specific alternative locations should also be evaluated in areas with lower resource sensitivity where appropriate.
  - a. Mitigation measures for project impacts to sensitive plants, animals, and habitats should emphasize evaluation and selection of alternatives which avoid or otherwise minimize project impacts. Compensation for unavoidable impacts through acquisition and protection of high quality habitat elsewhere should be addressed.
  - b. The Department considers Rare Natural Communities as threatened habitats having both regional and local significance. Thus, these communities should be fully avoided and otherwise protected from project-related impacts (Attachment 2).
  - c. The Department generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species. Department studies have shown that these efforts are experimental in nature and largely unsuccessful.
- 4. A California Endangered Species Act (CESA) Permit must be obtained, if the project has the potential to result in "take" of species of plants or animals listed under CESA, either during construction or over the life of the project. CESA Permits are issued to conserve, protect, enhance, and restore State-listed threatened or endangered species and their habitats. Early consultation is encouraged, as significant modification to the proposed project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, require that the Department issue a separate CEQA document for the issuance of a CESA permit unless the project CEQA document addresses all project impacts to listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of a CESA permit. For these reasons, the following information is requested:
  - a. Biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA Permit.
  - b. A Department-approved Mitigation Agreement and Mitigation Plan are required for plants listed as rare under the Native Plant Protection Act.
- 5. The Department opposes the elimination of watercourses and/or their channelization or conversion to subsurface drains. All wetlands and watercourses, whether intermittent, ephemeral, or perennial, must be retained and provided with substantial setbacks which preserve the riparian and aquatic habitat values and maintain their value to on-site and off-site wildlife populations.
  - a. The Department requires a Streambed Alteration Agreement (SAA), pursuant to Section 1600 et seq. of the Fish and Game Code, with the applicant prior to any direct or indirect impact to a lake or stream bed, bank or channel or associated riparian resources. The Department's issuance of a SAA may be a project that is subject to CEQA. To facilitate our issuance of the Agreement when CEQA applies, the

Ms. Hsiao-ching Chen November 15, 2004 Page 4

Department as a responsible agency under CEQA may consider the local jurisdiction's (lead agency) document for the project. To minimize additional requirements by the Department under CEQA the document should fully identify the potential impacts to the lake, stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the Agreement. Early consultation is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources.

The Department suggests a pre-project or early consultation planning meeting for all projects. To make an appointment, please call Scott Harris, Wildlife Biologist, at (626) 797-3170. Thank you for this opportunity to provide comment.

Sincerely,

C. F. Raysbrook Regional Manager

#### Attachments

cc:

Ms. Morgan Wehtje
Mr. Scott Harris
Ms. Betty Courtney
Department of Fish & Game
Mr. Scott Morgan
State Clearinghouse

HCP-Chron

Department of Fish and Game

SPH:sph

SOUTHERN CALIFORNIA



#### Main Office

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Orange County: Chris Norby, Orange County • Lou Bone, Tustin • Art Brown, Buena Park • Richard Chavez, Anaheim • Debbie Cook, Huntington Beach • Cathryn DeYoung, Laguna Niguel • Richard Dixon, Lake Forest • Alta Duke, La Palma • Bev Perry, Brea • Marilyn Poe, Los Alamitos • Tod Ridgeway, Newport Beach

Riverside County: Marion Ashley, Riverside County • Thomas Buckley, Lake Elsinore • Bonnie Flickinger, Moreno Valley • Ron Loveridge, Riverside • Greg Pettis, Cathedral City • Ron Roberts, Temecula

San Bernardino County: Paul Biane, San Bernardino County • Bill Alexander, Rancho Cucamonga • Edward Burgono, Town of Apple Valley • Lawrence Dale, Barstow • Lee Ann Garcia, Grand Terrace • Susan Longville, San Bernardino • Gary Ovitt, Ontario • Deborah Robertson, Rialto

Ventura County: Judy Mikels, Ventura County • Glen Becerra, Simi Valley • Carl Morehouse, San Buenaventura • Toni Young, Port Hueneme

Orange County Transportation Authority: Charles Smith, Orange County Riverside County Transportation Commission:

Robin Lowe, Hemet

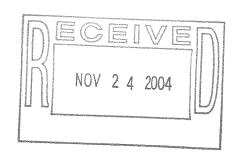
Ventura County Transportation Commission: Bill

550-0/07/04

Davis, Simi Valley
Printed on Recycled Paper

November 23, 2004

Dr. Hsiao-ching Chen, AICP Impact Analysis Section Los Angeles County Department of Regional Planning 320 W. Temple Street, Room 1348 Los Angeles, CA 90012



RE: Comments on the Notice of Preparation for a Draft Environmental Impact Report for the Skyline Ranch Project – SCAG No. 1 20040723

Dear Dr. Chen:

Thank you for submitting the Notice of Preparation for a Draft Environmental Impact Report for the Skyline Ranch Project to SCAG for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects, and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

We have reviewed the Notice of Preparation, and have determined that the proposed Project is regionally significant per California Environmental Quality Act (CEQA) Guidelines (Section 15206). The proposed Project considers the construction of more than 500 dwelling units. CEQA requires that EIRs discuss any inconsistencies between the proposed project and the applicable general plans and regional plans (Section 15125 [d]). If there are inconsistencies, an explanation and rationalization for such inconsistencies should be provided.

Policies of SCAG's Regional Comprehensive Plan and Guide and Regional Transportation Plan, which may be applicable to your project, are outlined in the attachment. We expect the Draft EIR to specifically cite the appropriate SCAG policies and address the manner in which the Project is consistent with applicable core policies or supportive of applicable ancillary policies. Please use our policy numbers to refer to them in your Draft EIR. Also, we would encourage you to use a side-by-side comparison of SCAG policies with a discussion of the consistency or support of the policy with the Proposed Project.

Please provide a minimum of 45 days for SCAG to review the Draft EIR when this document is available. If you have any questions regarding the attached comments, please contact me at (213) 236-1867. Thank you.

JEFFREY M. SMITH, AICP

Sincerely,

Senior Regional Planner Intergovernmental Review

# COMMENTS ON THE PROPOSAL TO DEVELOP A DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT FOR THE SKYLINE RANCH PROJECT SCAG NO. I 20040723

#### PROJECT DESCRIPTION

The proposed Project considers the development of 1,325 single-family residences on approximately 592 acres. The Project will also include a 10-acres school site and 10-acres for a public park. The proposed Project is part of a 2,196 acre project area that is located in the Santa Clarita Valley, west and north of Highway 14 (Antelope Valley Freeway) and north of the City of Santa Clarita in unincorporated Los Angeles County.

#### CONSISTENCY WITH REGIONAL COMPREHENSIVE PLAN AND GUIDE POLICIES

The **Growth Management Chapter (GMC)** of the Regional Comprehensive Plan and Guide (RCPG) contains the following policies that are particularly applicable and should be addressed in the Draft EIR for the Skyline Ranch Project.

3.01 The population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies, shall be used by SCAG in all phases of implementation and review.

#### Regional Growth Forecasts

The Draft EIR should reflect the most current SCAG forecasts which are the 2004 RTP (April 2004) Population, Household and Employment forecasts for the North Los Angeles County subregion and Unincorporated Los Angeles County. These forecasts are as follows:

NORTH LA SUBREGION	2000	2005	<u> 2010</u>	<u> 2015</u>	<u> 2020</u>	<u> 2025</u>
POPULATION	512.391	614,502	735,262	852,964	967,387	1,076,013
HOUSEHOLD	161.131	181.825	221,538	256,966	292,658	327,745
EMPLOYMENT	178,999	182,284	215,955	235,070	253,417	270,409

UNINCORP. LA Co.	2000	<u> 2005</u>	<u>2010</u>	<u> 2015</u>	<u> 2020</u>	2025
POPULATION	1.007.701	1,118,360	1,231,730	1,332,100	1,429,615	1,520,279
Household	2.81.124	301.345	337,539	371,349	405,520	439,160
EMPLOYMENT	256,474	260,627	303,110	314,852	326,028	336,182

3.03 The timing, financing, and location of public facilities, utility systems, and transportation systems shall be used by SCAG to implement the region's growth policies.

## GMC POLICIES RELATED TO THE RCPG GOAL TO IMPROVE THE REGIONAL STANDARD OF LIVING

The Growth Management goals to develop urban forms that enable individuals to spend less income on housing cost, that minimize public and private development costs, and that enable firms to be more competitive, strengthen the regional strategic goal to stimulate the regional economy. The evaluation of the proposed project in relation to the following policies would be intended to guide efforts toward achievement of such goals and does not infer regional interference with local land use powers.

- 3.05 Encourage patterns of urban development and land use, which reduce costs on infrastructure construction and make better use of existing facilities.
- 3.09 Support local jurisdictions' efforts to minimize the cost of infrastructure and public service delivery, and efforts to seek new sources of funding for development and the provision of services.
- 3.10 Support local jurisdictions' actions to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness.

## GMC POLICIES RELATED TO THE RCPG GOAL TO IMPROVE THE REGIONAL QUALITY OF LIFE

The Growth Management goals to attain mobility and clean air goals and to develop urban forms that enhance quality of life, that accommodate a diversity of life styles, that preserve open space and natural resources, and that are aesthetically pleasing and preserve the character of communities, enhance the regional strategic goal of maintaining the regional quality of life. The evaluation of the proposed project in relation to the following policies would be intended to provide direction for plan implementation, and does not allude to regional mandates.

- 3.12 Encourage existing or proposed local jurisdictions' programs aimed at designing land uses which encourage the use of transit and thus reduce the need for roadway expansion, reduce the number of auto trips and vehicle miles traveled, and create opportunities for residents to walk and bike.
- 3.14 Support local plans to increase density of future development located at strategic

November 23, 2004 Dr. Hsiao-ching Chen, AICP Page 4

- points along the regional commuter rail, transit systems, and activity centers.
- 3.17 Support and encourage settlement patterns, which contain a range of urban densities
- 3.18 Encourage planned development in locations least likely to cause environmental impact.
- 3.19 SCAG shall support policies and actions that preserve open space areas identified in local, state and federal plans.
- 3.20 Support the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals.
- 3.21 Encourage the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites.
- 3.22 Discourage development, or encourage the use of special design requirements, in areas with steep slopes, high fire, flood, and seismic hazards.
- 3.23 Encourage mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources, measures that would reduce exposure to seismic hazards, minimize earthquake damage, and to develop emergency response and recovery plans.

## GMC POLICIES RELATED TO THE RCPG GOAL TO PROVIDE SOCIAL, POLITICAL, AND CULTURAL EQUITY

The Growth Management Goal to develop urban forms that avoid economic and social polarization promotes the regional strategic goal of minimizing social and geographic disparities and of reaching equity among all segments of society. The evaluation of the proposed project in relation to the policy stated below is intended guide direction for the accomplishment of this goal, and does not infer regional mandates and interference with local land use powers.

- 3.24 Encourage efforts of local jurisdictions in the implementation of programs that increase the supply and quality of housing and provide affordable housing as evaluated in the Regional Housing Needs Assessment.
- 3.27 Support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social

services, recreational facilities, law enforcement, and fire protection.

# REGIONAL TRANSPORTATION PLAN

The 2004 Regional Transportation Plan (RTP) also has goals and policies that are pertinent to this proposed project. This RTP links the goal of sustaining mobility with the goals of fostering economic development, enhancing the environment, reducing energy consumption, promoting transportation-friendly development patterns, and encouraging fair and equitable access to residents affected by socio-economic, geographic and commercial limitations. The RTP continues to support all applicable federal and state laws in implementing the proposed project. Among the relevant goals and policies of the RTP are the following:

# Regional Transportation Plan Goals

- Maximize mobility and accessibility for all people and goods in the region.
- Ensure travel safety and reliability for all people and goods in the region.
- Preserve and ensure a sustainable regional transportation system.
- Maximize the productivity of our transportation system.
- Protect the environment, improve air quality and promote energy efficiency.
- Encourage land use and growth patterns that complement our transportation investments.

# Regional Transportation Plan Policies

 Transportation investments shall be based on SCAG's adopted Regional Performance Indicators.

Indicators.  Performance  Indicator	Performance <u>Measures</u>	<u>Definition</u>	Performance <u>Outcome</u>
Mobility	Average Daily Speed     Average Daily Delay	Speed-experienced by travelers regardless of mode. Delay-excess travel time resulting from the difference between a reference speed and actual speed. Total daily delay and daily delay per capita are indicators used.	10% Improvement 40% Improvement
Accessibility	<ul> <li>Percent PM peak work trips within 45 minutes of home</li> <li>Distribution of work trip travel times</li> </ul>		Auto 90% Transit 37%  Auto 8% Improvement Transit 8% Improvement
Reliability	Percent variation in travel time	Day-to-day change in travel times experienced by travelers. Variability results from accidents, weather, road closures, system problems and other non-recurrent conditions.	10% Improvement
Safety	Accident Rates	Measured in accidents per million	0.3% Improvement

		vehicle miles by mode.	
Performance Indicator	Performance <u>Measures</u>	<u>Definition</u>	Performance <u>Outcome</u>
Cost Effectiveness	<ul> <li>Benefit-to-Cost (B/C) Ratio</li> </ul>	Ratio of benefits of RTP investments to the associated investments costs.	\$3.08
Productivity	Percent capability     utilized during peak     conditions	<ul> <li>Transportation infrastructure capacity and services provided.</li> <li>Roadway Capacity - vehicles per hour per lane by type of facility.</li> <li>Transit Capacity - seating capacity utilized by mode.</li> </ul>	20% Improvement at known bottlenecks
Sustainability	Total cost per capita     to sustain current     system performance	Focus in on overall performance, including infrastructure condition Preservation measure is a subset of sustainability.	\$20 per capita, primarily in preservation costs
Preservation	<ul> <li>Maintenance cost per capita to preserve system at base year conditions</li> </ul>	Focus is on infrastructure condition. Sub-set of sustainability.	Maintain current conditions
Environmental	Emissions generated by travel	Measured/forecast emissions include CO, NOX, PM10, SOX and VOC. CO2 as secondary measure to reflect greenhouse emissions.	Meets conformity requirements
Environmental Justice	Expenditures by quintile and ethnicity	Proportionate share of expenditures in the 2004 RTP by each quintile.	No disproportionate impact to any group or quintile
	Benefit vs. burden by quintiles	Proportionate share of benefits to each quintile ethnicity.	
		Proportionate share of additional airport noise by ethnic group.	

- Ensuring safety, adequate maintenance, and efficiency of operations on the existing multi-modal transportation system will be RTP priorities and will be balanced against the need for system expansion investments.
- RTP land use and growth strategies that differ from currently expected trends will require a collaborative implementation program that identifies required actions and policies by all affected agencies and sub-regions.
- HOV gap closures that significantly increase transit and rideshare usage will be supported and encouraged, subject to Policy #1.

## AIR QUALITY CHAPTER CORE ACTIONS

The Air Quality Chapter core actions related to the proposed project includes:

- 5.07 Determine specific programs and associated actions needed (e.g., indirect source rules, enhanced use of telecommunications, provision of community based shuttle services, provision of demand management based programs, or vehicle-milestraveled/emission fees) so that options to command and control regulations can be assessed.
- 5.11 Through the environmental document review process, ensure that plans at all levels of government (regional, air basin, county, subregional and local) consider air quality, land use, transportation and economic relationships to ensure consistency and minimize conflicts.

# **OPEN SPACE CHAPTER ANCILLARY GOALS**

### Outdoor Recreation

- 9.01 Provide adequate land resources to meet the outdoor recreation needs of the present and future residents in the region and to promote tourism in the region.
- 9.02 Increase the accessibility to open space lands for outdoor recreation.
- 9.03 Promote self-sustaining regional recreation resources and facilities.

# Public Health and Safety

- 9.04 Maintain open space for adequate protection of lives and properties against natural and man-made hazards.
- 9.05 Minimize potentially hazardous developments in hillsides, canyons, areas susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipment.

# Resource Production

9.07 Maintain adequate viable resource production land, particularly lands devoted to commercial agriculture and mining operations.

November 23, 2004 Dr. Hsiao-ching Chen, AICP Page 8

#### Resource Protection

9.08 Develop well-managed viable ecosystems or known habitats of rare, threatened and endangered species, including wetlands.

# WATER QUALITY CHAPTER RECOMMENDATIONS AND POLICY OPTIONS

The **Water Quality Chapter** core recommendations and policy options relate to the two water quality goals: to restore and maintain the chemical, physical and biological integrity of the nation's water; and, to achieve and maintain water quality objectives that are necessary to protect all beneficial uses of all waters.

11.07 Encourage water reclamation throughout the region where it is cost-effective, feasible, and appropriate to reduce reliance on imported water and wastewater discharges. Current administrative impediments to increased use of wastewater should be addressed.

#### **GROWTH VISIONING**

The fundamental goal of the Growth Visioning effort is to make the SCAG region a better place to live, work and play for all residents regardless of race, ethnicity or income class. Thus, decisions regarding growth, transportation, land use, and economic development should be made to promote and **sustain** for future generations the region's **mobility**, **livability** and **prosperity**. The following "Regional Growth Principles" are proposed to provide a framework for local and regional decision making that improves the quality of life for all SCAG residents. Each principle is followed by a specific set of strategies intended to achieve this goal.

# Principle 1: Improve **mobility** for all residents

- Encourage transportation investments and land use decisions that are mutually supportive.
- Locate new housing near existing jobs and new jobs near existing housing.
- Encourage transit-oriented development.
- Promote a variety of travel choices

# Principle 2: Foster livability in all communities

- Promote infill development and redevelopment to revitalize existing communities.
- Promote developments, which provide a mix of uses.
- Promote "people scaled," walkable communities.
- Support the preservation of stable, single-family neighborhoods.

November 23, 2004 Dr. Hsiao-ching Chen, AICP Page 9

## Principle 3: Enable **prosperity** for all people

- Provide, in each community, a variety of housing types to meet the housing needs of all income levels.
- Support educational opportunities that promote balanced growth.
- Ensure environmental justice regardless of race, ethnicity or income class.
- Support local and state fiscal policies that encourage balanced growth
- Encourage civic engagement.

# Principle 4: Promote sustainability for future generations

- Preserve rural, agricultural, recreational and environmentally sensitive areas.
- Focus development in urban centers and existing cities.
- Develop strategies to accommodate growth that uses resources efficiently, eliminate pollution and significantly reduce waste.
- Utilize "green" development techniques.

### **CONCLUSIONS**

All feasible measures needed to mitigate any potentially negative regional impacts associated with the proposed project should be implemented and monitored, as required by CEQA.

## SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

#### **Roles and Authorities**

THE SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS (SCAG) is a *Joint Powers Agency* established under California Government Code Section 6502 et seq. Under federal and state law, SCAG is designated as a Council of Governments (COG), a Regional Transportation Planning Agency (RTPA), and a Metropolitan Planning Organization (MPO). SCAG's mandated roles and responsibilities include the following:

SCAG is designated by the federal government as the Region's *Metropolitan Planning Organization* and mandated to maintain a continuing, cooperative, and comprehensive transportation planning process resulting in a Regional Transportation Plan and a Regional Transportation Improvement Program pursuant to 23 U.S.C. '134, 49 U.S.C. '5301 et seq., 23 C.F.R. '450, and 49 C.F.R. '613. SCAG is also the designated *Regional Transportation Planning Agency*, and as such is responsible for both preparation of the Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP) under California Government Code Section 65080 and 65082 respectively.

SCAG is responsible for developing the demographic projections and the integrated land use, housing, employment, and transportation programs, measures, and strategies portions of the *South Coast Air Quality Management Plan*, pursuant to California Health and Safety Code Section 40460(b)-(c). SCAG is also designated under 42 U.S.C. '7504(a) as a *Co-Lead Agency* for air quality planning for the Central Coast and Southeast Desert Air Basin District.

SCAG is responsible under the Federal Clean Air Act for determining *Conformity* of Projects, Plans and Programs to the State Implementation Plan, pursuant to 42 U.S.C. '7506.

Pursuant to California Government Code Section 65089.2, SCAG is responsible for *reviewing all Congestion Management Plans (CMPs) for consistency with regional transportation plans* required by Section 65080 of the Government Code. SCAG must also evaluate the consistency and compatibility of such programs within the region.

SCAG is the authorized regional agency for *Inter-Governmental Review* of Programs proposed for federal financial assistance and direct development activities, pursuant to Presidential Executive Order 12,372 (replacing A-95 Review).

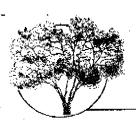
SCAG reviews, pursuant to Public Resources Code Sections 21083 and 21087, Environmental Impacts Reports of projects of regional significance for consistency with regional plans [California Environmental Quality Act Guidelines Sections 15206 and 15125(b)].

Pursuant to 33 U.S.C. '1288(a)(2) (Section 208 of the Federal Water Pollution Control Act), SCAG is the authorized *Areawide Waste Treatment Management Planning Agency*.

SCAG is responsible for preparation of the *Regional Housing Needs Assessment*, pursuant to California Government Code Section 65584(a).

SCAG is responsible (with the Association of Bay Area Governments, the Sacramento Area Council of Governments, and the Association of Monterey Bay Area Governments) for preparing the **Southern California Hazardous Waste Management Plan** pursuant to California Health and Safety Code Section 25135.3.

Revised July 2001



# COUNTY OF LOS ANGELES DEPARTMENT OF PARKS AND RECREATION



November 30, 2004

TO:

Ms. Hsiao-ching Chen

Department of Regional Planning

Impact Analysis Section

FROM:

Larry Hensley &

Planning Division Chief

SUBJECT:

NOTICE OF PREPARATION

"Skyline Ranch" Project

County Project No. 04-075/Tract Map No. 060922

The Department of Parks and Recreation has reviewed the Notice of Preparation for the preparation of an Environmental Impact Report for the proposed Skyline Ranch project. We concur with the finding that the proposed project could require new or expanded recreational facilities for future residents. Some of our specific concerns are as follows:

- Provide local parks for the enjoyment and leisure of the proposed development by meeting the standard established in the County's General Plan of four (4) acres per thousand population\*. The Department understands that local parkland has been designated for implementation in lots 1343 and 1344 per the March 9, 2004 map.
- Provide regional park facilities for the enjoyment of the residents in the larger Santa Clarita Valley area by meeting the standard of six (6) acres per thousand population\* as established in the County's General Plan. This could take several forms including but not to limited trails, trail heads, and additional facilities for the William S. Hart Regional Park or Vasquez Rocks Natural Area Park.
- The Mint Canyon Trail appears to be within the project boundary, however, that is still subject to field verification.
  - \* Population (approximately 4,250) based on the anticipated growth relating to the number of projected dwelling units within the development.

November 30, 2004 Ms. Hsiano-ching Chen Page 2

If you have any questions, please contact me at (213) 351-5098.

LH:bm(c:response-skylineranch)

c: Gil Lopez, Parks and Recreation
James Barber, Parks and Recreation
Joan Rupert, Parks and Recreation
Bryan Moscardini, Parks and Recreation

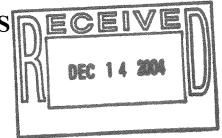


# COUNTY OF LOS ANGELES

#### **DEPARTMENT OF PUBLIC WORKS**

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE ALHAMBRA, CALIFORNIA 91803-1331 Telephone: (626) 458-5100 www.ladpw.org



ADDRESS ALL CORRESPONDENCE TO: P.O. BOX 1460 ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: LD-0

December 7, 2004

TO: Daryl Koutnik

Department of Regional Planning

Attention Hsiao-Ching Chen

FROM:

Dennis Hunter

Land Development Division

RESPONSE TO A NOTICE OF PREPARATION SKYLINE RANCH PROJECT PROJECT NO. 04-075/TRACT NO. 060922

We have reviewed the Notice of Preparation for the Skyline Ranch Project and offer the following comments for your consideration in preparing the Draft Environmental Impact Report (DEIR).

#### Geotechnical

The geotechnical report should include a topographic map identifying grading activities, geotechnical hazards, and a detailed discussion of any mitigation measures. A liquefaction analysis and seismic slope analyses are not warranted at this time. However, detailed liquefaction and seismic slope stability analyses, conforming to the requirements of the State of California Division of Mines and Geology "Special Publication 117," must be conducted at the tentative map and/or grading/building plan stages.

# **Drainage/Water Quality**

Our records indicate that a drainage concept was previously prepared for this project and we have since returned comments. Following submission, review, and approval of the revised drainage concept, the results of the final approved report should be included in the DEIR.

The DEIR should discuss the impacts of the encroachments on the floodplain/floodway near the Skyline Ranch Road and Sierra Highway intersection. Because this encroachment has the potential to raise the base flood elevations, the analysis needs to document the finished floor elevations of existing structures. The finished floor elevations of the existing structures must remain below the base flood elevations.

Daryl Koutnik December 7, 2004 Page 2

Also, the project includes the construction of debris basins. Periodic cleanouts of these facilities are necessary to maintain design capacity. Cleanout activities entail operation of equipment within the basin and truck traffic to haul the material away. The DEIR should discuss the periodic removal of vegetation as part of the sediment removal. If regulatory agencies determine these basins fall within their jurisdiction, maintenance plans and permits will be required prior to these facilities being accepted for public maintenance. The DEIR should also address the long-term sediment management impacts by determining the average annual sediment basin entrapment and where this material will be placed over the life of the project. This development may negatively impact the County's sediment management infrastructure.

#### Traffic/Access

The proposed project has the potential to significantly impact the County and County/City roadways and intersections in the area, as well as freeways under the jurisdiction of Caltrans. (Please see attached Caltran's letter dated July 20, 2004.) We would like the opportunity to review the related environmental document and traffic The County's methodology shall be used when studies upon their completion. evaluating the County and/or County/City roadways and intersections. The applicant must confer with Caltrans in order to select the methodology to use when determining the impact to the freeways. The traffic impact study shall also address the cumulative impacts generated by this and nearby developments by including the level of service analysis for the affected roadways and intersections. Upon identifying impact, the traffic study must identify feasible mitigation measures. A copy of the County's Traffic Impact Study Guidelines is attached. Please note that our guidelines reiterate the need of the developer to confer with Caltrans and/or affected cities during the preparation of the traffic study.

#### Sewage Disposal

A sewer area study shall be submitted to determine if the proposed and existing sewerage system servicing this project have adequate capacity to accept all tributary area sewer discharges. This tributary area shall include, but is not limited to, the proposed flows from the project site and tributary flows from adjacent areas and, if applicable, all other tributary areas beyond the project boundaries. The sewer area study shall be approved by Public Works and/or agencies having jurisdiction of the tributary area. If the system is found to have insufficient capacity, upgrade of the proposed and existing sewerage system is required to the satisfaction of all affected agencies. In addition, the sewer deficiencies shall be addressed in the DEIR.

Daryl Koutnik December 7, 2004 Page 3

Also, the Department's Consolidated Sewer Maintenance District maintains the local sanitary sewers within the unincorporated areas of the County. Therefore, the entire sewer system will be required to be annexed to the District. This will be in addition to the Las Virgenes Municipal Water District's requirements.

#### Solid Waste

The construction, demolition and/or predevelopment activities associated with the proposed project and the postdevelopment operation over the life of the proposed project will increase the generation of solid waste and may negatively impact the solid waste management infrastructure in the County. Therefore, the DEIR should identify what measures the project proponent plans to implement to mitigate the impact. Mitigation measures may include, but are not limited to, implementation of waste reduction and recycling programs to divert the solid waste, including construction and demolition waste and excavated material, from the landfills.

The DEIR should include/discuss standards to provide adequate recyclable storage areas for collection/storage of recyclable and green waste materials for this project's public facilities.

School districts are encouraged to take advantage of special County programs, available through Public Works, by calling (888) CLEAN LA or visiting www.888CleanLA.com.

The proposed project may generate hazardous waste and/or household hazardous waste, which could adversely impact existing hazardous waste management infrastructure. This issue should be addressed and mitigation measures provided. Mitigation measures may include, but are not limited to, providing new homeowners with educational materials on the proper management and disposal of household hazardous waste. The project proponent may contact Public Works for available educational materials by calling 1(888) CLEAN LA.

#### COMMENTS RELATED TO THE LAND USE PERMIT

The proposed realignment of Whites Canyon Road will require approval by the Board of Supervisors.

The Los Angeles County Building Code, Section 110.4 requires that buildings or structures adjacent to or within 200 feet (60.96 m) of active, abandoned or idle oil or gas well(s) be provided with methane gas protection systems. If the project site contains or

Daryl Koutnik December 7, 2004 Page 4

lies within 200 feet of active, abandoned, or idle oil or gas wells, this issue should be addressed and mitigation measures provided, and our Environmental Programs Division must be contacted for issuance of necessary permits.

Should any operation within the subject project include the construction, installation, modification, or removal of underground storage tanks, industrial waste treatment or disposal facilities, and/or stormwater treatment facilities, Public Works must be contacted for required approvals and operating permits.

The food service facility at the school, may be required to provide a grease treatment device and will be subject to review and approval by Public Works.

If you have any questions or require additional information, please contact Clarice Nash at (626) 458-5910.

CN:ca:jmw P:\CEQA\CLARIE\\skyline\_ranch.doc

Attach.

DEPARTMENT OF TRANSPORTATION

DISTRICT 7, REGIONAL PLANNING IGR/CEQA BRANCH 120 SO, SPRING ST. LOS ANGELES, CA 90012 PHONE (213) 897-6536 (213) 897-1337 FAX

E-Mail:NersesYerjanian@dot.ca.gov

7019 JT 22 N 5: 08 900 S. The LUTT AVE.



Mr. James Chon Department of Public Works Los Angeles County 900 S. Fremont Ave. P.O. Box 1460 Alhambra, CA. 91802-1460

IGR/CEOA# 040640NY TIS/ Skyline Ranch/1,350 Single Family Homes TT#060922 LA/14/35.71

July 20, 2004 Dear Mr. Chon:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Skyline Ranch/1,350 Single Family Residential Project.

We have reviewed the project's traffic study that you provided. The Department as a responsible agency under CEQA has jurisdiction superceding that of MTA in identifying the freeway analysis needed for this project. Caltrans is responsible for obtaining measures that will off-set project vehicle trip generation that worsens Caltrans facilities and hence, it does not adhere to the CMP guide of 150 or more vehicle trips added before freeway analysis is needed. MTA's Congestion Management Program in acknowledging the Department's role, stipulates that Caltrans must be consulted to identify specific locations to be analyzed on the State Highway System.

Please reference the Department's Traffic Impact Study Guideline on the Internet at http://www.dot.ca.gov/hg/traffops/developserv/operationalsystems/reports/tisguide.pdf

We request that you apply the equitable share responsibility formula on page 2 of Appendix B (Methodology for Calculating Equitable Mitigation Measures) and set aside a portion of Transportation Impact Fees generated for the future State Highway 14 improvement projects. The County may need to recalculate or establish an additional fee for this purpose. If you have any questions regarding this response, please call the Project Engineer/Coordinator Mr. Yerjanian at (213) 897-6536 and refer to IGR/CEQA # 040640NY.

Cheryl J. Powell

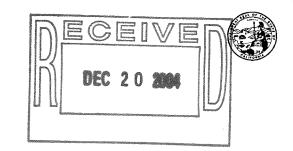
IGR/CEQA Branch Chief

Regional Transportation Planning

"Caltrans improves mobility across California"

# SANTA MONICA MOUNTAINS CONSERVANCY

RAMIREZ CANYON PARK 5750 RAMIREZ CANYON ROAD MALIBU, CALIFORNIA 90265 PHONE (310) 589-3200 FAX (310) 589-3207



December 6, 2004

Dr. Hsiao-ching Chen, AICP Los Angeles County Regional Planning Department Impact Analysis Section 320 West Temple Street, Room 1348 Los Angeles, California 90012

# Notice of Preparation of a Draft Environmental Impact Report Comments Skyline Ranch Project Tentative Tract Map No. 060922

Dear Dr. Chen:

The proposed project is located in the upper Santa Clara River watershed, which contains regionally significant ecological, recreational and visual resources. The project site includes the biologically sensitive and significant Cruzan Mesa. Located on the mesa is a vernal pool complex that supports numerous endangered and sensitive species. The vernal pool system is a sensitive, regional resource that must be protected.

## **Community Facilities District**

The land that is to become open space, as identified in the Notice of Preparation (NOP), is a regionally significant resource. Good stewardship must be provided for this open space. A resource management agency that can adequately protect the resources on the property is the only entity that the open space should be dedicated to. The Conservancy's joint powers entity, the Mountains Recreation and Conservation Authority (MRCA), is able to take title to the open space and manage it in a protective capacity.

In order to guarantee the safety of the public visiting the open space dedication and of the new adjoining homeowners, as well as the ecological integrity of the open space, another critical mitigation measure that must be included in the DEIR is a permanent funding mechanism to maintain the property. Dedication of land is only a complete mitigation measure if funding is provided. To our knowledge, a Community Facilities District (CFD) is the optimal method for such a funding source.

A minimum of \$35,000 per year with an inflation adjuster must be provided for maintenance of the open space. The open space recipient, such as the MRCA, would be the

Dr. Hsiao-ching Chen Skyline Ranch project (TTM 060922) NOP comments December 6, 2004 Page 2

beneficiary of the money generated by the CFD each year. The \$35,000 would fund two half-day visits to the site per week throughout the year. The money would also fund the maintenance of signage, trails, fencing, protection of the vernal pools, the cleanup of trash, and provide for public safety. The first increment of the CFD must be provided simultaneously with the transfer of the open space. If the resource management agency were to provide brushing on the project site as well, then \$40,000 per year must be provided by the CFD.

In addition to the money raised annually by the CFD, the resource management agency must be provided with a minimum of \$20,000 for initial site improvements. This money for initial site improvements must be provided simultaneously with the transfer of the open space. The improvements to the site would include gates, fencing, and signage.

#### **Mitigation Measures**

The DEIR must include two mitigation measures. The project site and in particular Cruzan Mesa, where the vernal pools are located, has been significantly degraded. This degradation was caused by continual discing of the land surrounding each vernal pool, as well as the filming and grazing activities allowed on the mesa. To mitigate these impacts, the DEIR must include the following measure. All filming and grazing uses not recommended by Los Angeles County biologists be removed from the project site, no more than 60 days after project approval.

To help educate the public about the significant biological resources found on Cruzan Mesa, the DEIR must include the following mitigation measure. The project applicant will provide one-time funding totaling \$25,000 to the open space recipient to prepare educational kiosks about the vernal pool ecosystem prior to map recordation or the issuance of grading permits.

#### **Restoration of the Vernal Pool Complex**

The biological integrity of the vernal pool ecosystem must be restored. As stated in the above section, the site has been significantly degraded by the uses in that area of the project site. To adequately restore the vernal pool system, a restoration plan must developed. This plan must be approved by Los Angeles County biologists prior to EIR certification. A minimum of \$500,000 must be provided to the resource management agency to administer the plan and restore the vernal pools. The restoration fund must be in an escrow account 30 days prior to map recordation or the issuance of a grading permit.

Dr. Hsiao-ching Chen Skyline Ranch project (TTM 060922) NOP comments December 6, 2004 Page 3

### **Growth Inducing Impacts**

Two inholdings are located in the eastern side of the project site. The DEIR must describe what type of access will be provided to these inholdings. All future environmental impacts must be described. One of the parcels is located within the Cruzan Mesa Significant Ecological Area. To remove any potential for growth inducing impacts, the applicant should buy out the inholdings and include them as part of the open space dedication.

#### Mint Canyon Creek

The Conservancy is pleased that the project footprint was completely moved off of the mesa. However, the majority of Mint Canyon Creek and its tributaries on the project site will be totally filled in. Mint Canyon Creek is a significant biological resource and must be protected. The footprint should be altered so that the creek is preserved.

The Conservancy appreciates the opportunity to comment. Please direct any questions or future documents to Paul Edelman of our staff at (310) 589-3200 ext. 128 and at the above Ramirez Canyon Park address.

Sincerely,

JEROME C. DANIEL

Chairperson

# COUNTY OF LOS ANGELES



#### FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE LOS ANGELES, CALIFORNIA 90063-3294

(323) 890-4330

P. MICHAEL FREEMAN FIRE CHIEF FORESTER & FIRE WARDEN

December 21, 2004

Mr. Daryl Koutnik
Impact Analysis Section
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Mr. Koutnik:

NOTICE OF PREPARATION/INITIAL STUDY OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED "SKYLINE RANCH" SUBDIVISION PROJECT, COUNTY PROJECT #04-075, TRACT MAP #060922, "SANTA CLARITA VALLEY" -- (EIR #2165/2004)

The Notice of Preparation/Initial Study of a Draft Environmental Impact Report (EIR) for the Skyline Ranch Project" has been reviewed by the Planning Division, Land Development Unit, and Forestry Division of the County of Los Angeles Fire Department. The following are their comments:

#### PLANNING DIVISION:

Enclosed please find our previous letter regarding this project. In addition to the two fire stations mentioned in that letter, a future station is planned in the vicinity of the intersection of Plum Canyon and Whites Canyon Roads. We reiterate that we would need a detailed, scaled map showing all existing and proposed roads in order to calculate response distances/times.

The DMS analysis concludes that the first-due response distance is adequate, based on the maximum distance criteria for rural density. Since the critical factor for fire containment is structure separation, the relevant density is the density within the developed area, after subtracting the open space. The actual density of this project is thus low-urban, approximately 2.25 dwelling units per acre of development.

The fire camps play a supportive role in wildland fire prevention and suppression. They are not staffed with firefighters and do not respond to incidents in developed areas. They should not be included in an EIR for a land development project.

There are no aid agreements with other fire protection agencies affecting this project.

The developer fee is due and payable at the time a building permit is issued. It is anticipated that the rate will be set at \$0.3877 per square foot as of December 1<sup>st</sup>, 2004. This figure is subject to periodic adjustment.

#### SERVING THE UNINCORPORATED AREAS OF LOS ANGELES COUNTY AND THE CITIES OF:

HAWTHORNE

4 044

Mr. Daryl Koutnik December 21, 2004 Page 2

#### LAND DEVELOPMENT UNIT:

The Fire Prevention Division, Land Development Unit has no additional comments regarding this project. The conditions that were detailed in the letter dated October 8, 2004, EIR #2088/2004 have not been changed at this time (see enclosed copy of letter).

Should any questions arise regarding subdivision, water systems, or access please contact Inspector Marvin Dorsey at (323) 890-4243.

#### FORESTRY DIVISION - OTHER ENVIRONMENTAL CONCERNS:

The statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources and the County Oak Tree Ordinance. Potential impacts in these areas should be addressed in the Final Environmental Impact Report.

This project will require an EIR fee deposit of \$1,000 payable to the Los Angeles County Fire Department at the time the DEIR is submitted for review (see enclosed).

If you have any additional questions, please contact this office at (323) 890-4330.

Very truly yours,

# DAVID R. LEININGER, CHIEF, FORESTRY DIVISION PREVENTION BUREAU

DRL:sc

#### Enclosures

c: Ms. Lisa Dittman -- Cox Castle Nicholson

be: Yocum-E/R
Div. III
EIR #2165/Pac.
Land Development
Planning
#219
(EIR #2165.B74)

NOTE: Ms. Lisa Dittman

Cox Castle Nicholson 2049 Century Park East, 28th Floor Los Angeles, CA 90067

#### (323) 890-4330

October 8, 2004

Mr. Ned Baldwin Impact Sciences 30343 Canwood Street, Suite 210 Agoura Hills, CA 91301

Dear Mr. Baldwin:

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE "SYLINE RANCH (TENTATIVE TRACT #060922) PROJECT" - "SANTA CLARITA" (EIR #2088/2004)

The Notice of Preparation of an Environmental Impact Report for the aforementioned proposed project has been reviewed by the Planning Division, Land Development Unit, and Forestry Division of the County of Los Angeles Fire Department. The following are their comments:

#### PLANNING DIVISION:

The subject development will receive fire protection and paramedic service from the County of Los Angeles Fire Department. Fire Station 107, located at 18239 W. Soledad Canyon Road, is the jurisdictional station for this property. A 3-person engine company and a 2-person paramedic squad are assigned to this station.

The second closest station will be the new Fire Station 104, scheduled to open October 15, 2004. This fire station will be temporarily located at 26622 Golden Valley Road, Santa Clarita 91350. It will house a 4-person quint (a combination engine/ladder truck apparatus)

We would need a detailed map showing the location of proposed land uses as well as existing and proposed roads in order to calculate response distances/times from these and other fire stations in the area.

The County of Los Angeles Consolidated Fire Protection District, also known as the County Fire Department, is not divided into distinct service areas. The entire District is a seamless whole for the purposes of dispatching emergency response units. The closest available units are dispatched as needed to an incident anywhere within its

Any new development will increase the service demand on existing resources. Although this development would be in proximity to an existing fire station, it would increase service demand on the fire protection resources in the general area. Additional manpower, equipment, and facilities are needed in the area now. Limited tax revenues have restricted the Fire Department's ability to meet new growth needs. While general plans have been developed or upgrading fire protection in this area, the Department will not be able to implement these plans without specific

provisions for the necessary manpower, equipment and facilities. Mitigation of this problem should be required prior to granting approval of this development. The Fire Department will work with the developer to establish appropriate mitigation arrangements for the proposed project.

The applicant shall participate in an appropriate financing mechanism, such as a developer fee or an in-kind consideration in lieu of developer fees, to provide funds for fire protection facilities which are required by new commercial, industrial or residential development in an amount proportionate to the demand created by this project. Currently, the developer fee is a set amount per square foot of building space, adjusted annually, and is due and payable at the time a building permit is issued. In the event that the developer fee is no longer in effect at the time of building permit issuance, alternative mitigation measures shall be required.

The environmental document should provide a breakdown of dwelling units by density and type e.g., single-family detached vs. multi-family.

Due to the fact that the information available on this project is limited at the present time, we are not able to respond fully as to how this project will affect our Department. We would like to reserve the right to respond further at a future date when additional information and suitable maps are available.

# LAND DEVELOPMENT UNIT/GENERAL REQUIREMENTS:

The proposed development may necessitate multiple ingress/egress access for the circulation of traffic, and emergency response issues. The Department may condition future development to provide additional means of access. The development of this project must comply with all applicable code and ordinance requirements for construction, access, water mains, fire flows and hydrants.

This property is located within the area described by the Forester and Fire Warden as a Fire Zone 4, Very High Fire Hazard Severity Zone (VHFHSZ). All applicable fire code and ordinance requirements for construction, access, water mains, fire hydrants, fire flows, brush clearance and fuel modification plans, must be met.

Specific fire and life safety requirements for the construction phase will be addressed at the building fire plan check. There may be additional fire and life safety requirements during this time. Every building constructed shall be accessible to Fire Department apparatus by way of access roadways, with an all-weather surface of not less than the prescribed width. The roadway shall be extended to within 150 feet of all portions of the exterior walls when measured by an unobstructed route around the exterior of the building.

Access roads shall be maintained with a minimum of ten (10) feet of brush clearance on each side. Fire access roads shall have an unobstructed vertical clearance clear-to-sky with the exception of protected tree species. Protected tree species overhanging fire access roads shall be maintained to provide a vertical clearance of 13 feet, 6 inches.

The maximum allowable grade shall not exceed 15% except where topography makes it impractical to keep within such grade; in such cases, an absolute maximum of 20% will be allowed for up to 150 feet in distance. The average maximum allowed grade including topographical difficulties shall be no more than 17%. Grade breaks shall not exceed 10% in ten (10) feet.

When involved with a subdivision in unincorporated areas within the County of Los Angeles Fire Department, requirements for access, fire flows and hydrants are addressed at the Los Angeles County Subdivision Committee meeting during the subdivision tentative map stage.

Fire sprinkler systems are required in some residential and most commercial occupancies. For those occupancies not requiring fire sprinkler systems, it is strongly suggested that fire sprinkler systems be installed. This will reduce potential fire and life losses. Systems are now technically and economically feasible for residential use.

## INSTITUTIONAL:

The development may require fire flows up to 8,000 gallons per minute at 20 pounds per square inch residual pressure for up to a four-hour duration as outlined in the 2002 County of Los Angeles Fire Code Appendix III-AA. Final fire flows will be based on the size of buildings, their relationship to other structures, property lines, and types of construction used.

Fire hydrant spacing shall be based on fire flow requirements as outlined in the 2002 County of Los Angeles Fire Code Appendix III-BB. Additional hydrants will be required if hydrant spacing exceeds specified distances.

Turning radii shall not be less than 32 feet. This measurement shall be determined at the centerline of the road. A Fire Department approved turning area shall be provided for all driveways exceeding 150 feet in length and at the end of all cul-de-sacs.

All on-site driveways/roadways shall provide a minimum unobstructed width of 28 feet, clear-to-sky. The on-site driveway is to be within 150 feet of all portions of the exterior walls of the first story of any building. The centerline of the access driveway shall be located parallel to, and within 30 feet of an exterior wall on one side of the proposed structure. Driveway width for Institutional developments shall be increased when any of the following conditions will exist:

- 1. Provide 34 feet in width when parallel parking is allowed on one side of the access roadway/driveway. Preference is that such parking is not adjacent to the structure.
- 2. Provide 42 feet in width when parallel parking is allowed on each side of the access roadway/driveway.
- 3. Any access way less than 34 feet in width shall be labeled "Fire Lane" on the final recording map, and final building plans.
- 4. For streets or driveways with parking restrictions: The entrance to the street/driveway and intermittent spacing distances of 150 feet shall be posted with Fire Department approved signs stating "NO PARKING FIRE LANE" in three-inch high letters. Driveway labeling is necessary to ensure access for Fire Department use.

# HIGH-DENSITY RESIDENTIAL:

The development may require fire flows up to 5,000 gallons per minute at 20 pounds per square inch residual pressure for up to a five-hour duration. Final fire flows will be based on the size of the buildings, their relationship to other structures, property lines, and types of construction used. Fire hydrant spacing shall be 300 feet and shall meet the following requirements:

1. No portion of lot frontage shall be more than 200 feet via vehicular access from a public fire hydrant.

- No portion of a building shall exceed 400 feet via vehicular access from a properly spaced fire 2. 3.
- When cul-de-sac depth exceeds 200 feet, hydrants will be required at the corner and mid-block. 4.
- Additional hydrants will be required if the hydrant spacing exceeds specified distances.

Turning radii shall not be less than 32 feet. This measurement shall be determined at the centerline of the road. A Fire Department approved turning area shall be provided for all driveways exceeding 150 feet in length and at the end of all cul-de-sacs. When serving land zoned for residential uses having a density of more than four (4) units

- A cul-de-sac shall be a minimum of 34 feet in width and shall not be more than 700 feet in length. 1.
- The length of the cul-de-sac may be increased to 1,000 feet if a minimum of 36 feet in width is
- A Fire Department approved turning area shall be provided at the end of a cul-de-sac. and the standard of the control of the standard of the standard of the standard of the standard of the standard

All on-site driveways shall provide a minimum unobstructed width of 28 feet, clear-to-sky. The 28 feet width does not allow for parking, and shall be designated as a "Fire Lane," and have appropriate signage. The centerline of the on-site driveway shall be located parallel to and within 30 feet of an exterior wall on one side of the proposed structure. The on-site driveway is to be within 150 feet of all portions of the exterior walls of the first story of any building. The 28 feet in width shall be increased to: 

- Provide 34 feet in width when parallel parking is allowed on one side of the access way. 1.
- Provide 36 feet in width when parallel parking is allowed on both sides of the access way.
- Any access way less than 34 feet in width shall be labeled "Fire Lane" on the final recording map, and final building plans.
- For streets or driveways with parking restrictions: The entrance to the street/driveway and 4. intermittent spacing distances of 150 feet shall be posted with Fire Department approved signs stating "NO PARKING - FIRE LANE" in three-inch high letters. Driveway labeling is ... necessary to ensure access for Fire Department use.

# SINGLE-FAMILY/TWO-FAMILY DWELLING UNITS:

Single-family detached homes shall require a minimum fire flow of 1,250 gallons per minute at 20 pounds per square inch residual pressure for a two-hour duration. Two-family dwelling units (duplexes) shall require a fire flow of 1,500 gallons per minute at 20 pounds per square inch residual pressure for a two-hour duration. When there are five (5) or more units taking access on a single driveway, the minimum fire flow shall be increased to 1,500 gallons per minute at 20 pounds per square inch residual pressure for a two-hour duration. Fire hydrant spacing shall be 600 feet and shall meet the following requirements:

- No portion of lot frontage shall be more than 450 feet via vehicular access from a public fire 1.
- No portion of a structure should be placed on a lot where it exceeds 750 feet via vehicular access from a properly spaced public fire hydrant.
- When cul-de-sac depth exceeds 450 feet on a residential street, hydrants shall be required at the corner and mid-block
- Additional hydrants will be required if hydrant spacing exceeds specified distances.

A Fire Department approved turning area shall be provided for all driveways exceeding 150 feet in length and at the end of all cul-de-sacs. Fire Department access shall provide a minimum unobstructed width of 23 feet, clear-to-sky and be within 150 feet of all portions of the exterior walls of the first story of any single unit. If exceeding 150 feet, provide 20 feet minimum paved width "Private Driveway/Fire Lane" clear-to-sky to within 150 feet of all portions of the exterior walls of the unit. Fire Lanes serving three (3) or more units shall be increased to 26 feet. Streets or driveways within the development shall be provided with the following:

- Provide 36 feet in width on all streets where parking is allowed on both sides.
- 2. Provide 34 feet in width on cul-de-sacs up to 700 feet in length. This allows parking on both sides of the street.
- Provide 36 feet in width on cul-de-sacs from 701 to 1,000 feet in length. This allows parking on both sides of the street.
- 4. For streets or driveways with parking restrictions: The entrance to the street/driveway and intermittent spacing distances of 150 feet shall be posted with Fire Department approved signs stating "NO PARKING FIRE LANE" in three-inch high letters. Driveway labeling is necessary to ensure access for Fire Department use.
- 5. Turning radii shall not be less than 32 feet. This measurement shall be determined at the centerline of the road.

# LIMITED ACCESS DEVICES (GATES, ETC.):

All access devices and gates for schools shall comply with California Code of Regulations, Title 19, Article 3.05 and Article 3.16. All access devices and gates for residential developments shall meet the following requirements:

- 1. Any single-gated opening used for ingress and egress shall be a minimum of 26 feet in width, clear-to-sky.
- 2. Any divided gate opening (when each gate is used for a single-direction of travel i.e., ingress or egress) shall be a minimum width of 20 feet clear-to-sky.
- 3. Gates and/or control devices shall be positioned a minimum of 50 feet from a public right-of-way, and shall be provided with a turnaround having a minimum of 32 feet of turning radius. If an intercom system is used, the 50 feet shall be measured from the right-of-way to the intercom control device.
- 4. All limited access devices shall be of a type approved by the Fire Department.
- 5. Gate plans shall be submitted to the Fire Department prior to installation. These plans shall show all locations, widths and details of the proposed gates.

# TRAFFIC CALMING MEASURES:

All proposals for traffic calming measures (speed humps/bumps/cushions, traffic circles, roundabouts, etc.) shall be submitted to the Fire Department for review prior to implementation. Should any questions arise regarding design and construction, and/or water and access, please contact Inspector Marvin Dorsey at (323) 890-4243.

## FORESTRY DIVISION:

The statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources, and the County Oak Tree Ordinance.

Oak trees are known to exist in the proposed project area. Further field studies should be conducted to determine

Under the Los Angeles County Oak Tree Ordinance, a permit is required to cut, destroy, remove, relocate, inflict damage or encroach into the protected zone of any tree of the Oak genus which is 25 inches or more in circumference (eight (8) inches in diameter), as measured 4 1/2 feet above mean natural grade. The applicant should incorporate innovative design to reduce or eliminate the impact to the Oak resources.

This property is located within the area described by the Forester and Fire Warden as a Very High Fire Hazard Severity Zone or Fire Zone 4. The development of this project must comply with all Very High Fire Hazard Severity Zone code and ordinance requirements for fuel modification.

As required by Section 1117.2.1 of the County of Los Angeles Fire Code, a fuel modification plan, a landscape plan, and an irrigation plan shall be submitted with any subdivision of land or prior to any new construction, remodeling, modification or reconstruction where such activities increase the square footage of the existing structure by at least 50% within a 12-month period and where said structure or subdivision is located within an area designated as a Very High Fire Hazard Severity Zone or within Fire Zone 4.

A fuel modification plan, a landscape plan, and an irrigation plan shall be developed and approved prior to construction. Said plans shall be reviewed and approved by the County of Los Angeles Fire Department, Forestry . Division. Specific questions regarding fuel modification requirements should be directed to the Fuel Modification

This project will require an EIR fee deposit of \$1,000 payable to the County of Los Angeles Fire Department at the time the DEIR is submitted for review. (See enclosed)

If you have any additional questions, please contact this office at (323) 890-4330.

Very truly yours,

DAVID R. LEININGÉR, CHIEF, FORESTRY DIVISION

PREVENTION BUREAU

DRL:sc

Enclosure

Yocum/ERU, Division III, EIR #2088/Pac., Chalton/Saugus, Land Development, Planning, #219 be: (EIR #2088.b70)



# LOS ANGELES COUNTY FIRE DEPARTMENT ENVIRONMENTAL REVIEW FEES & DEPOSITS

Effective September 11, 1991, whenever a review for impact on the fire prevention, natural resources, and/or fire resource allocation responsibilities of the Fire Department is required, as part of the environmental review process, the applicant shall pay a minimum deposit fee of \$1,000 from which actual costs shall be billed and deducted. Additional deposits may have to be made if actual review costs exceed 80% of deposited funds. A larger deposit may be made for more complex projects to ensure prompt continuation of environmental review efforts. All unused funds shall be refunded to the applicant.

All Environmental Review Deposits should be made payable and sent to:

County of Los Angeles Fire Department P.O. Box 910901 Commerce, CA 90091-0901 Attn: Financial Management Division

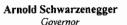
If you have any questions regarding the Environmental Review Fee or Deposit amount, please call the Forestry Division at (323) 890-4330.

If you have any questions regarding your Environmental Review Deposit status, please contact the Fiscal Services Division at (323) 838-2345.

# California Regional Water Quality Control Board







320 W. 4th Street, Suite 200, Los Angeles, California 90013 Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.swrcb.ca.gov/rwqcb4

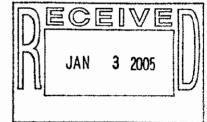
December 30, 2004

Terry Tamminen

Secretary for Environmental

Protection

Hsiao-ching Chen Los Angeles County Department of Regional Planning 320 W Temple St Los Angeles, CA 90012



Dear Hsiao-ching Chen,

Re: CEQA Documentation for Project in the Santa Clara Watershed

Skyline Ranch Project, Project No. 03-075, Tract Map No. 060922 SCH #2004101090

We appreciate the opportunity to comment on the CEQA documentation for the abovementioned project. For your information a list of permitting requirements and Regional Board Contacts is provided in Attachment A hereto.

The project site lies in the Santa Clara watershed that was listed as being impaired pursuant to Section 303 (d) of the Clean Water Act. Impairments listed in reaches downstream from the proposed project include nutrients and their effects, salts, coliform bacteria, and historic pesticides. The Los Angeles Regional Water Quality Control Board will be developing Total Maximum Daily Loads (TMDLs) for the watershed, but the proposed project is expected to proceed before applicable TMDLs are adopted. In the interim, the Regional Board must carefully evaluate the potential impacts of new projects that may discharge to impaired waterbodies.

Our review of your documentation shows that it does not include information on how this project will change the loading of these pollutants into the watershed. Please provide the following additional information for both the construction and operational phases of the project.

- For each constituent listed above, please provide an estimate of the concentration (ppb) and load (lbs/day) from non-point and point source discharges.
- Estimates of the amount of additional runoff generated by the project during wet and dry seasons.
- Estimate of the amount of increased or decreased percolation due to the project.

California Environmental Protection Agency

 Estimates of the net change in cubic feet per second of groundwater and surface water contributions under historic drought conditions (as compiled by local water purveyors, the Department of Water Resources, and others), and 10-year 50-year, and 100-year flood conditions.

The Upper Santa Clara River River has been subjected to significant urban development during the past 10 years. Unfortunately very little water quality data has been collected in this area, especially in comparison with data collected in the Lower Santa Clara River.

Additional water quality data are necessary to evaluate the cumulative impacts of past development and predict potential impacts of the subject project. Pollutants of concern include sediment, dissolved oxygen, pesticides, metals, and bioassessment.

If you have any questions please call me at (213) 576-6683.

Sincerely,

Elizabeth Erickson

Associate Geologist, TMDL Unit

un hule

Los Angeles Regional Water Quality Control Board

EE

Attachments (1)

cc:

State Clearinghouse

File

#### **ATTACHMENT A**

✓ If the proposed project will result in a discharge of dredge or fill into a surface water (including a dry streambed), and is subject to a federal license or permit, the project may require a Section 401 Water Quality Certification, or waiver of Waste Discharge Requirements. For further information, please contact:

Valerie Carillo, Nonpoint Source Unit at (213) 576-6759.

✓ If the project involves inland disposal of nonhazardous contaminated soils and materials, the proposed project may be subject to Waste Discharge Requirements. For further information, please contact:

Rodney Nelson, Landfills Unit, at (213) 620-6119

\*\*\*\*

✓ If the overall project area is larger than five acres, the proposed project may be subject to the State Board's General Construction Activity Storm Water Permit. For further information, please contact:

Tracy Woods, Statewide General Construction Activity Storm Water Permits at (213) 620-2095.

✓ If the project involves a facility that is proposing to discharge storm water associated with industrial activity (e.g., manufacturing, recycling and transportation facilities, etc.), the facility may be subject to the State Board's General Industrial Activities Storm Water Permit. For further information, please contact:

Kristie Chung, Statewide General Industrial Storm Water Permits at (213) 620-2283.

✓ If the proposed project involves requirements for new development and construction pertaining to municipal storm water programs, please contact:

Dan Radulescu, Municipal Storm Water Permits, Los Angeles County at (213) 620-2038; Jeff Mack, Municipal Storm Water Permits, Ventura County at (213) 620-2121.

✓ The proposed project also shall comply with the local regulations associated with the applicable Regional Board stormwater permit:

Los Angeles County and Co-permittees: NPDES No. CAS614001

Waste Discharge Requirements Order No. 96-054.

Long Beach County and Co-permittees:

NPDES CAS004003

Waste Discharge Requirements Order No. 99-060.

Ventura County and Co-permittees:

NPDES No. CAS004002

Waste Discharge Requirements Order No. 00-108.

\*\*\*\*\*\*

✓ If the proposed project involves any construction and/or groundwater dewatering to be discharged to surface waters, the project may be subject to NPDES/Waste Discharge Requirements. For further information, please contact:

Augustine Anijielo, General Permitting and Special Projects Unit at (213) 576-6657(All Region 4 Watersheds).

✓ If the proposed project involves any construction and/or groundwater dewatering to be discharged to land or groundwater, the project may be subject to Waste Discharge Requirements. For further information, please contact:

Kwang-il Lee, Non-Chapter 15 Unit, at (213) 620-2269 (All Region 4 Watersheds).

Revised: March 11, 2004



MARGARET DONNELLAN TODD COUNTY LIBRARIAN

February 25, 2005

TO:

Hsiao-ching Chen

Los Angeles County Department of Regional Planning

FROM:

Malou Rubio

Head, Staff Services

SUBJECT:

SKYLINE RANCH PROJECT

PROJECT No. 04-075, TENTATIVE TRACT MAP No. 060922

This is in response to your request for information regarding the Draft Environmental Impact Report for the Skyline Ranch project. The Skyline Ranch project is located in the County Library's Developer Fee Planning Area 1 and is within the Canyon Country Jo Anne Darcy Library (Canyon Country Library) service area. The Canyon Country Library is located at 18601 Soledad Canyon Road. It is a 12,864 sq. ft. facility and has a current collection of 109,796 books and other materials.

Demand for library services is typically determined based on the size of the resident population. Increase in population results in a need for additional facility space and library items. The Library Capacity section of the Urban Services Analysis uses 2 volumes (items) per capita and 0.389 sq. ft. of facility space per capita. The current Public Library service level guidelines are 2.0 items per capita for new libraries (opening day collection), 2.75 items per capita for community libraries (built-out collection), and 0.5 sq. ft. of facility space per capita.

Using an average persons per household of 3.09, the proposed Skyline Ranch project would result in an estimated population increase of 4,150 (1,343  $\times$  3.09). This projected population increase would generate a need for an additional 2,075 sq. ft. (4,150  $\times$  0.5) of facility space and 11,413 books and other materials (4,150  $\times$  2.75). Please revise the numbers in the EIR to reflect current service level guidelines.

The cumulative effect of new housing and infill development, such as the Skyline Ranch project, will have significant impact on the ability of the Canyon Country Library to serve existing and future population in the service area. This impact may be mitigated by payment of the County Library's developer fee. If the project is approved and built as described, it will result in a total of 1,343 dwelling units. The current County Library Developer Fee for Planning Area 1 is \$677 per dwelling unit. This would result in a total fee obligation of \$909,211 (1,343 x \$677) at the current rate. The County Library Developer Fee is subject to an annual CPI adjustment, and the actual amount of the fee will be that in effect at the time the building permits for the project are issued. Therefore, the total fee obligation for this project may be higher.

If you have any questions or require additional information, please contact Malaisha Hughes at (562) 940-8455.

MR:MH:mh

U:\STAFFSERVICES\DEVELOPER FEE\EIR\Skyline Ranch-2.doc

c: David Flint, Assistant Director, Finance and Planning, Public Library

Serving the unincorporated areas of Los Angeles County and the cities of: Agoura Hills \* Artesia \* Avaion \* Baldwin Park \* Bell \* Bell Gardens \* Bellflower \* Bradbury \* Carson \* Claremont \* Compton \* Cudahy \* Culver City \* Diamond Bar \* Duarte \* El Monte \* Gardena \* Hawaiian Gardens \* Hawthorne \* Hermosa Beach \* Hidden Hills \* Huntington Park \* La Canada Flintridge \* La Habra Heights \* Lakewood \* La Mirada \* Lancaster \* La Puente \* La Verne \* Lawndale \* Lomita \* Lynwood \* Malibu \* Manhattan Beach \* Maywood \* Montebello \* Norwalk \* Paramount \* Pico Rivera \* Rosemead \* San Dimas \* San Fernando \* San Gabriel \* Santa Clarita \* South El Monte \* South Gate \* Temple City \* Walnut \* West Covina \* West Hollywood \* Westlake Village

Appendix B:	Geotechnical Reports
	_

Sheet 1 of 1

#### County of Los Angeles Department of Public Works GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION GEOLOGIC REVIEW SHEET

900 So. Fremont Ave., Alhambra, CA 91803 TEL. (626) 458-4925

DISTRIBUTION
1 Geologist
Solls Engineer
1 GMED File
1 Pubdivicion

TENTA	ATIVE T	RACT MAP 60922 TENTATIVE MAP DATED 12/27/04 (Revised)		
		Pardee Homes LOCATION Senta Clarita		
ENGIN	JEER S	kand		
GEOLO	OGIST &	SOILS ENGINEER Geoleus - Weetlake Village REPORT DATE 1/3/05, 8/23/04, 3/6/04		
[X]	TENTA MAP,	ATIVE MAP FEASIBILITY IS RECOMMENDED FOR APPROVAL, PRIOR TO FILING THE FINAL LAND DIVISION THE FOLLOWING CONDITIONS MUST BE FULFILLED:		
	ĺΧĴ	The final map must be approved by the Geology and Soils Sections to assure that all geotechnical (geology and soils) factors have been properly evaluated.		
[X] A grading plan must be geotechnically approved by the Geology and Solls Sections. This grading plan to based on a detailed engineering geology report and/or soils engineering report and show all recommer submitted by them. It must also agree with the tentative map and conditions as approved by the F Commission. If the subdivision is to be recorded prior to the completion and acceptance of grading, or geologic bonds will be required.				
	[X]	All geologic hazards associated with this proposed development must be eliminated, or		
		delineate restricted use areas, approved by the consultant geologist and/or soils engineer, to the satisfaction of the Geology and Soils Sections, and dedicate to the County the right to prohibit the erection of buildings or other structures within the restricted use areas.		
	[]	A statement entitled: "Geotechnical Note(s), Potential Building Site: For grading and corrective work requirements for access and building areas for Lot(s) No(s) refer to the Soils Report(s) by, dated		
	M	The Soils Engineering review dated 2/22/05 is attached.		
[X]		ATIVE MAP IS APPROVED FOR FEASIBILITY. THE FOLLOWING INFORMATION IS APPLICABLE TO THIS ION OF LAND:		
٠	[]	This project may not qualify for a waiver of final map under section 21.48.140 of the Los Angeles County Title 21 Subdivision Code.		
	[1	The subdivider is advised that approval of this division of land is contingent upon the installation and use of a sewer system.		
	[]	A geology and/or soits engineering report may be required prior to approval of building or grading plans.		
	[X]	Geotechnical Recordation Map verification deposit estimate 6 hours.		
[ ] Groundwater is less than 10 feet from the ground surface on lots				
Prepa	red by	Reviewed by Date		

## COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION

#### SOILS ENGINEERING REVIEW SHEET

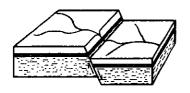
	iress: ephone: c	(626) 4	Fremont Ave., Alhambra, CA 91803 58-4925 58-4913	District Office Job Number Sheet 1 of 2	8.2 LX001129 & GMTR	
Rev	view No. 2				RIBUTION:	
Tentative Tract Map Location Developer/Owner Engineer/Architect Soils Engineer Geologist		Ier	60922 Santa Clarita Pardee Homes Sikand Geolabs - Westlake Village Same as above		Orainage Brading Beo/Soils Central File District Engineer Beologist Solls Engineer Engineer/Architect	
Ret	ilew of:					
			Map Dated By Regional Planning <u>12/27/04</u> cologic Report Dated <u>1/3/05, 8/23/04, 3/06/04</u>		*	
Pro	vious review	v sheet d	ated <u>1/19/05</u>			
AC.	TION:					
Ter	ntative Map (	[easib[]ity	is recommended for approval.			
RE	MARKS:					
1.	<ol> <li>Provide a soils engineering report at the grading plan stage. The report must comply with the provisions of "Manual for Preparation of Geotechnical Reports" prepared by County of Los Angeles, Department of Public Works. The Manual is available on the Internet at the following address: <a href="http://ladow.org/construction/manual.pdf">http://ladow.org/construction/manual.pdf</a></li> </ol>					
2.	Submit two	sets of	grading plans to the Solls Section for vertication of compliance with Cou	nty codes and p	olicies.	
		-		•		
A. B.	THE ON-S	ITE SOIL ITE SOIL GRADIN	CHECKER/BUILDING AND SAFETY ENGINEER: S ARE SEVERELY CORROSIVE TO FERROUS METALS. S HAVE A MEDIUM EXPANSION POTENTIAL. G IS RECOMMENED FOR THE REMOVAL TARB RECOMPACTION OF PROFESSIONAL MORISE COMPACTION OF MAIN MORISE COMPACTION OF MAIN MORISE COMPACTION OF EXP. 8/30/05	F <b>LANDSLIDES</b>	QLS-9A, QLS-10, QLS-	
HA.	riewed by		Washida Marisaku		Date 2/23/05	

<u>NOTICE</u>: Public safety, relative to geotechnical subsurface exploration, shall be provided in accordance with current codes for excavations, inclusive of the Los Angeles County Code, Chapter 11.45, and the State of California, Title 8, Construction Safety Orders. P:Yosh\80922Ten\70

# Geotechnical Investigation of Vesting Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

W.O. 8838

March 6, 2004



R & R Services

Corporation

GEOLABS-WESTLAKE VILLAGE

Foundation and Soils Engineering, Geology

31119 Via Colinas, Suite 502 • Westlake Village, CA 91362

Voice: (818) 889-2562 (805) 495-2197

Fax: (818) 889-2995 (805) 379-2603

March 6, 2004

W.O. 8838

Pardee Homes 1320 Flynn Road, Suite 100 Camarillo, California

Attention:

Mr. Wade Lewis

SUBJECT:

Geotechnical Investigation of Vesting Tentative Tract No. 060922,

Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

Gentlemen;

We present herein our findings from our geotechnical investigation of Vesting Tentative Tract No. 060922, Skyline Ranch in the Whites Canyon area of the Santa Clarita Valley. The purpose of our investigation was to identify the major geologic and geotechnical elements of the site which might impact the proposed development.

The scope of work included the following: review of aerial photographs and published geological maps covering the site, review of consultant's reports for adjacent properties which were readily available to our office, geologic mapping of the site, the recent drilling and sampling of twenty-two large-diameter bucket-auger borings, advancement of five continuously-cored borings within areas of deep cut and conglomerate-rich bedrock formations, excavation and logging of sixteen exploratory test pits, laboratory testing of selected samples, soils engineering analyses, and preparation of this report. In addition, subsurface data from our previous geotechnical investigations of the Monarch Hills property (Geolabs-Westlake Village, 1997) and our due diligence study of the Skyline Ranch property (GWV, 2002) are included herein.

#### **SITE LOCATION**

The subject property is located in northern Santa Clarita Valley, west of Sierra Highway and southeast of the Plum Canyon residential development. The site is best accessed from its westerly boundary, via basins at the terminus of Canyon Crest Drive or Falcon Crest Court within the Tr. 46626 (recently constructed by Richmond American Homes). Both points of entry provide access to a dirt access road which climbs a north-trending ridgeline. This access road eventually heads in a northeasterly direction and climbs along the east-west trending ridgeline which separates the Plum Canyon drainage to the north with that of Whites Canyon (and the proposed development footprint) to the south.

The current City of Santa Clarita boundary traverses the westerly and southerly boundary of the site. Tract No. 46626 (directly to the west) was recently developed by Richmond American Homes). The Plum Canyon Development of S&S Construction is located to the northwest.

Evidence of prior use of the site is minimal. Small residential structures were present in the southwest corner of the site (in the Sherburne parcel) but have since been demolished. We surmise that these structures were serviced by on-site sewage disposal systems comprised of either leach fields or seepage pits. No evidence of either feature was observed in our site visit to this locality. Review of the references available to our office do not indicate the presence of any oil wells on the site. However, two drilling pads were observed in the vicinity of Cross Section G-G'. We believe this to be the locations of either geotechnical, water, or oil well exploratory borings.

#### **SITE TOPOGRAPHY**

The enclosed Geologic Map was prepared at a scale of 1"=200' utilizing the Tentative Tract Map and topography prepared by Sikand Engineering (see Plate 1.2). A Geologic Map without the proposed development enclosed as Plate 1.4 for easier review of the topography, geologic conditions,

and exploratory findings.

The subject property is dominated by a broad east-west trending ridge located between Plum Canyon to the north and Whites Canon to the south. The northerly tract line traverses the numerous rounded peaks and saddles of this ridgeline. The northerly flank of this ridge is moderately to steeply incised, with slopes averaging 250 feet in height from the ridgetop to Plum Canyon below.

The southerly flank of the ridge is notably more subdued, with numerous southerly to southwesterly draining canyons, typically paralleling the rounded ridgespurs. The higher portions of these ridgespurs which exhibit the subdued, rounded topographic expression appear to represent an older erosional surface. Examples of similar ancient land forms are have been noted in the immediate vicinity and include Mystery (Cruzan) Mesa to the northeast. These ancient land form surfaces may correlate to broad, elevated erosional surfaces along the west-side of Bouquet Canyon (located west of Mystery Mesa) and the subject property.

The lower portions of the site, such as the canyon bottoms along the Whites Canyon drainage exhibit steeper, more rugged terrain indicative of recent and active erosional processes (stream rejuvenation). Total relief from the major ridgeline to the lower reaches of Whites Canyon is on the order of 650 feet.

Geologic influences on topography are evident in some portions of the site in the form of strike ridges (ridgelines conforming to the strike of hard, resistant beds), topographic reversals associated with landsliding, and geologic contacts.

#### PROPOSED GRADING

The 1"=200' scale Tentative Tract Map prepared by Sikand Engineering proposed the development of the site for 1340± single family residences, associated streets, three park sites, and two water reservoir pads (at elevations 2,215 and 1,927 feet). The proposed Whites Canyon

Highway will provide access to the site, in addition to connecting Sierra Highway to Plum Canyon Road. Whites Canyon Highway will consist of four lanes with a center greenbelt/meridian, and enhanced intersections.

Fill slopes are proposed around the westerly and southerly portions of the site, while the major perimeter cut slopes would be constructed along the easterly and northerly ridgelines. The upper reaches of Whites Canyon shall be filled, enhancing the site stability.

Fill slopes are planned at gradients of 2:1 or flatter, to a maximum height of 200 feet (See Cross Section S-S'). The maximum depth of fill is anticipated to be on the order of 140 feet following alluvial removals within Whites Canyon.

Cut slopes are also planned at a gradient of 2:1 or flatter to maximum height of 210 feet (see Cross Section P-P'). The maximum depth of planned cut approaches 200 feet as illustrated in Cross Section P-P'.

#### PREVIOUS EXPLORATION AND STUDIES

Previous exploration was performed by our office in 1995 in the southeasterly portion of the site. A total of twelve bucket-auger borings (see Plates B1(1995) through B12(1995) were drilled, along with the excavation and logging of twenty-three test pits (see Plates T1-T23).

The adjacent Tr. 46626 was investigated by Pacific Soils Eng. and Geosoils. Pertinent data (boring B-115 and in-grading attitudes) from their reports are included on the Geologic Map. Data from the Plum Canyon development in the northwesterly portion of the site is somewhat sparse since that development is primarily north and west of Plum Canyon Road.

#### EARTH MATERIALS

Through the course of our investigation, the following earth materials have been mapped at the subject site:

#### **Engineered Fill**

Engineered fill placed for Tr. 46626 and under the observation of Geosoils, Inc. is located west of Skyline Ranch. Engineered fill placed for a buttress fill/landslide removal may extend onsite within northerly trending ridgeline which separates the Skyline Ranch from Tr. 46626.

#### **Artificial Fill**

Localized undocumented fills were observed in association with existing dozer roads, and abandoned house site in the southwest corner of the site. Field observations indicate that these soils are typically less than five feet in thickness. Similarly, minor dozer road fill and pads constructed by our office for this investigation are similarly thin. Such materials will require removal in conjunction with the grading of the site.

#### **Alluvial Deposits**

These soils have been mapped within the major of canyon bottoms which traverse the site. In general, these materials consist of interbedded sand, gravel, cobbles, and boulders with only sparse to minor silt and clay content. A notable concentration of oversize boulders were noted within the vast majority of canyons (ranging from 12" to 6 feet in diameter). These boulders are typically subangular to subrounded, crystalline, and very hard (granitic or gneissic composition).

Based on field observations and exploratory test pits, we anticipate these soils to be unconsolidated and thus require removal and recompaction within areas to receive engineered fill. We anticipate the oversize rock to create some difficult excavation conditions.

The depth of these materials within the smaller southerly-draining canyon was found to be relatively thin (less than 10 feet). Bedrock outcroppings were observed along many of the canyon bottoms. However, we anticipate canyon cleanouts to be relatively steep and narrow ("V-shaped") with buried canyon walls continuing at gradients similar to (2:1 to 1:1) the exposed canyon slopes.

Exploration within canyon bottoms was somewhat difficult in light of the abundance of large boulders.

Within Whites Canyon, the alluvial deposits are very coarse-grained, consisting of gravels, cobbles, and boulders within a poorly sorted sand matrix. Deposits may also be clast-supported (i.e. boulders and cobbles in contact with one another). Due to environmental concerns and difficult access conditions, exploration with Whites Canyon was not feasible at the time of our site investigation. Access to the canyon bottom would have required extensive dozer work which was determined inappropriate at this time by the project environmental consultant. The depth of these alluvial soils is anticipated approach or exceed 40 feet.

#### Colluvial/Slopewash Deposits

Colluvial and slopewash deposits have been observed within the smaller tributary canyons. Due to the localized nature of these materials, we have not mapped them at the scale of 1"=200'. These soils are generally located in the subdued topography and are generated from the weathering of the underlying formations as well as from down-slope creep processes. Findings from our exploratory test pits indicate that these materials are typically less than 5 feet in thickness and consist of gravelly to cobble-rich silty and clayey sands in a dry and slightly loose to slightly dense condition. These materials are not considered suitable to remain in areas to receive fills and are recommended for removal during the grading of the site.

#### Landslide Debris

Numerous landslides have been identified on the site on the basis of field observations, aerial photo review, and topographic expression. These materials will require complete removal due to their potential compressibility, hydroconsolidation, and/or to provide satisfactory slope stability conditions.

The largest landslides observed appear to have failed in the direction of the prevailing dip of the Saugus Formation. Such landslides were likely triggered by the undermining of westerly-facing natural slopes within canyons.

Additional discussion with respect to landsliding and slope stability is provided later in this report.

#### **Terrace Deposits**

Terrace deposits have been mapped adjacent to Whites Canyon, locally capping the relatively flatter portions of the higher terrain. Based on the test pits excavated on the Monarch Hills property, these remnant deposits generally consist of reddish brown clayey sand to silty sand with occasional lenses of gravels and cobbles. Their depths typically range from ten to fifteen feet. The vast majority of these materials shall be removed by the planned cut.

#### Saugus Formation

The majority of the site is underlain by the Quaternary-age Saugus Formation, which is comprised of poorly lithified, nonmarine sandstone and conglomerate. The lowermost 20 to 50 feet of this formation typically consists of a massively-bedded cobble to boulder conglomerate which is exposed along White Canyon and in its tributary canyons. Some regional geologic maps have differentiated this lithologic section from the overlying section which contains less conglomerate.

Lesser sandy siltstone and red sandy claystone (possibly paleosols) have been observed in outcrop and borings in the westerly portion of the site which corresponds to the upper (younger) portion of the formation. These units appear poorly to massively bedded and in a dense condition. The red clayey beds encountered in this formation typically require removal and recompaction where exposed at grade due to their expansion potential. These beds also strongly influence the site stability on account of their lower shear strength.

#### **Mint Canyon Formation**

The Miocene-age Mint Canyon Formation exposed on the project site is primarily comprised of nonmarine sandstone and conglomerate with poor to moderate cementation. The conglomerate units are typically massively bedded but occasionally well-defined bedding can be observed within the finer-grained sandstone sections.

The upper portion of this formation consists of a white, light grey, or greenish grey conglomerate which is commonly discernible from the overlying light orangish brown to tan Saugus Formation basal conglomerate. In addition, the conglomerates and sandstones of the Mint Canyon Formation typically exhibit better sorting and less silt and clay content that those of the Saugus Formation. Fine grained siltstone and claystone within the Mint Canyon Formation are relatively rare on the subject tract. Unoxidized materials were not encountered in our deep borings.

#### **GEOLOGIC STRUCTURE**

Regional geologic maps of the Mint Canyon Quadrangle (Dibblee, 1996 and Yerkes, 1996) indicate that bedding of both the Saugus and Mint Canyon formations dip gently to the west and southwest. Data obtained during the course of our investigation agree with this generalization of the geologic structure.

The Saugus Fm.-Mint Canyon Fm. contact observed within numerous canyon bottoms and sides indicates an overall shallow westerly to southwesterly dip for the formational contact. Internal bedding of the Saugus Formation yields dip directions ranging from due south to due west, with dip angles typically between 0 (horizontal bedding) to 10 degrees. Variations in dip direction and inclination are attributed to localized structural variations, cross-bedding, and channelization within the formation. The basal portion of the Saugus Formation is typically comprised of a massively-bedded cobble to boulder conglomerate, particularly in the easterly portion of the site. Overall, the

Saugus Formation exhibits a slight fining of lithologies moving east to west across the site, which corresponds with increasing exposure of higher stratigraphic horizons of the formation.

The Mint Canyon Formation, in general, yields slightly steeper dips on average (typically between 10 and 25 degrees), with prevailing westerly dip directions.

A broad westerly-plunging syncline has been mapped across the site by Dibblee (1996). Data obtained by our investigation confirms the westerly-dipping structure but does not conform well to this feature interpreted by Dibblee (1996).

#### **LANDSLIDING AND SLOPE STABILITY**

As part of our investigation, numerous regional maps were reviewed for the determination of previously mapped landslides. One of these maps, presented in the Seismic Evaluation Report of the Mint Canyon 7.5-Minute Quadrangle (CDMG, 1998) indicated the presence of large-scale landsliding within the westerly half of the subject property. This map is reproduced herein as Plate 1.4. Such large-scale landsliding has been documented in the immediate vicinity of Santa Clarita (Plum Canyon and Shangri-La landslide complexes). Review of 1 inch = 2000 feet scale topographic maps and aerial photographs render some topographic expressions and geomorphic features suggestive of such a large-scale landslide(s). In addition, the direction of landsliding (to southwest) conforms with much of the prevailing dip direction of the Saugus Formation. A primary objective of our drilling B1 through B8 in 2002 was to determine the presence or absence of such large-scale landslides which might complicate the development of the site.

#### **Aerial Photo Review**

Aerial photographs were obtained and reviewed in order to discern the extent of landsliding on the site. Numerous small to moderate size landslides were identified on the aerial photographs and similarly supported by field observations and their geomorphic expression in the 1"=200' scale

topographic map. The majority of these landslides appear to have failed in the direction of the prevailing dip of the Saugus Formation. Such landslides were likely triggered by the undermining of westerly-facing natural slopes within canyons which led to daylighted bedding conditions. Due to the generally shallow dips, some of the landslides may have failed in a rotational fashion, as large-scale slumps. The scarps of the larger landslides are commonly healed and appear to have been infilled with slopewash, but topographic breaks or benches at the heads of the landslides remain discernible.

The 1"=2000' scale topography of the westerly and southwesterly portion of the site displays numerous saddles, locally irregular drainages alignments, and large-scale hummocky-like topography. Explanation of such features are commonly attributed to large-scale landsliding or alternatively, a combination of small-scale landslides and geomorphic expression of the underlying geologic structure.

#### Review of Regional Maps and Geologic Mapping

Regional Geologic Maps with coverage of the site were reviewed as part of our landslide investigation. Only the Seismic Evaluation Report of the Mint Canyon 7.5-Minute Quadrangle (CDMG, 1998) contains the postulated large-scale landslide. Maps prepared by Dibblee (1996), and Yerkes (1996), and Larson (1990) do not display such large-scale landsliding. Rather, they indicate smaller landslides.

These later three referenced geologic maps present the geologic contact between the Saugus Formation and underlying Mint Canyon Formation along numerous canyon walls of the site. This contact was similarly observed and mapped by our office during the course of our fieldwork. No indication of displacement by a large-scale landslide (of the contact or internally bedding of each formation) was observed.

#### **Subsurface Borings**

Six large diameter bucket-auger borings were drilled in 2002 in order to further our understanding of the site conditions. Minor dozer work was performed to improve existing dirt roads and to create level drilling pads. Borings were located within areas of suspicious topography in relation to the early hypothesis of large-scale landsliding. In addition, care was exercised to locate borings along canyon sides or bottoms to minimize the depth of drilling to penetrate any deep-seated slideplane. These borings were downhole-logged by our geologist (or by BIPS camera logging) for observation of the stratigraphy and geologic structure.

As described in the attached boring logs, drilling conditions were very difficult on account of the abundance of conglomerate beds requiring coring. In particular, conglomerate beds of the Mint Canyon Formation were difficult to penetrate on account of the large crystalline boulders and cobbles, and the localized cementation of the matrix in the conglomerates. Refusal was encountered in all of the bucket-auger borings prior to the intended depth of exploration. In the case of Boring 3, over 30 hours of coring was performed to advance the hole from 40 to 70 feet in depth.

Boring data from Borings 2 and 3 provided additional control on the Saugus-Mint Canyon Fm. contact, supporting the southwesterly dip indicated from field mapping and regional geologic maps. Furthermore, these borings were located in an area of suspected large-scale landsliding. No evidence of landsliding was observed in the borings; bedrock units were observed to be notably hard, very dense, and undisturbed. No fine-grained lithologies (siltstone or claystone) were observed.

Evidence of landsliding such as disaggregated bedrock, extensive weathering or fracturing, or slideplanes, were not observed within any of these bucket-auger borings.

#### Continuous-Core Borings and BIPS Logging

Due to the difficulty encountered in the advancement of the bucket-auger borings and the limited depth capability of the downhole-logging, a second episode of exploration was performed in 2002 with a Boyles-37 four-wheel drive HQ-HX coring rig. Upon completion of these borings (Borings 7 and 8), the BIPS system (Borehole Image Processing System) was utilized to log the interior of the boring for the recordation of geologic data such as strike and dip of bedding, joints, and shears, and lithology. This data complements the rock cores recovered, and provides a means of structural data acquisition as well as documenting zones where core recovery is poor.

Raw data in the form of a VHS format videotape of the boring was processed by Layne-Christiensen Drilling Company for determination of the structural data. As indicated in the enclosed boring logs and JPG files for B7 and B8 (See CD1), the materials encountered were entirely coarse-grained (sandstone and conglomerate). Structural data interpreted by Layne Christiansen is provided after each boring log. Strike orientation was corrected by our office from magnetic north to true north (14 degree declination correction). The features from which these attitudes were obtained were then reviewed to determine if they consisted of bedding planes, fractures, shears, or faults. Numerous attitudes were based on the tops or bottoms of cobbles or boulders and thus not considered representative of bedding. Ultimately, the data plotted and added to the boring logs (Plates B7 & B8) include that structural data which was considered most representative of bedding and fracture planes observed in the log images. This process was also performed for the more recently drilled B17, B18, and B20 which were logged by a downhole camera.

These deep borings provided the following critical pieces of data: (1) the lack of deep-seated landsliding via direct observation of the lack of landslide planes, (2) the lack of any landslide-related

disturbance such as open fractures or disaggregated bedrock, and (3) confirmation of the lack of fine-grained beds within the southerly portion of the site which might impact the stability of the site with respect to the Whites Canyon drainage, and (4) additional control on the Saugus Fm./Mint Canyon Fm. geologic contact.

#### Mitigation of Small and Moderate-Level Landslides

A total of 25 landslides have been identified within VITM 060922 and four additional landslides have been mapped by Leighton (1999) in the vicinity of Whites Canyon Highway connection to Plum Canyon (Leighton Qls-9, Qls-9a, Qls-10, and Qls-10a). A brief description and discussion for these features are provided herein, along with their proposed mitigation measures (as warranted).

#### Landslide L1

Landslide L1 consists of a rotational failure within the Saugus Formation. A basin was constructed down-canyon as part of its mitigation with respect to Tr. 46626. Since the proposed Whites Canyon Hwy. alignment traverses this feature, it will require removal and recompaction in its entirety. The sloping portion above Whites Canyon Hwy (and outside of the planned graded slope) should be rebuilt at 2:1 or flatter.

#### Landslide L2

This landslide has a relatively well defined headscarp and bench at its head, while its lower surface has experienced variable incision. Boring 26 encountered a reddish brown clay at 31 feet in depth which has been interpreted as the basal landslide plane. This landslide failed in a southeasterly direction, opposite to the direction of the prevailing structure. However, southeasterly dips were recorded at depth within B26, indicating that the mode of failure was translational. Most

of this landslide shall be removed by the planned cut. Remaining portions should be removed to competent bedrock.

#### Landslides L3, L4, L5, L6

These small landslides exhibit numerous features suggestive of recent failure such as tension cracks, poorly vegetated scarps, and obstructed drainages along their toes. These landslides should be removed and recompacted in their entirety during the grading of the site.

#### Landslides L7 and L8

These landslides failed in a northwesterly-direction into a steeply-incised canyon. Boring 27 encountered a landslide plane at 21.5 feet, with a southwesterly dip, indicating that their failure was in part translational. The majority of these landslides are to be removed by the planned cut; remaining portions should be removed and recompacted to competent bedrock.

#### Landslide L9

This landslide is located at the far northerly portion of the site (outside of the development footprint) and fails to the northwest across the tract boundary. Review of aerial photographs and the topography exhibit a broad, flat head area and steeply-incised canyon along its toe. The portion of L9 within the subject tract shall require placement in a Restricted Use Area.

#### Landslide L10, L11, L12, L13, and L14

These landslides have been mapped on the basis of mild topographic and field expression, and our review of available aerial photography. The prevailing westerly dip of the Saugus Formation further supports their presence. The planned grading calls for the vast majority of these features to be removed by the planned cut. Remaining portions should be removed to competent bedrock and replaced with engineered fill. Further exploration at the 1"=40' scale grading plan stage of these features is warranted to conclusively determine their presence.

#### Landslides L15, L16, and L20

These small landslides fail into canyons along their toes. They should be removed and recompacted to competent bedrock during the grading of the site.

#### Landslides L17 and L23

These features consist of relatively thin failures within the southeasterly canyon wall of Whites Canyon. They should be removed and recompacted to competent bedrock during the grading of the site. The planned development calls for deep engineered fill at their locations.

#### Landslides L18 and L19

Landslides L18 and L19 consist of thin deposits of slopewash which have accumulated on the flank of the steep westerly canyon wall of Whites Canyon. They have been mapped as landslides on account of their current surficial instability. These features shall be mitigated through removal and recompaction to competent bedrock.

#### Landslides L21 and L22

These two queried landslides are located outside of the limits of proposed development. Field observations of the morphology of this north-facing slope is obscured by dense vegetation. However, aerial photographs and the topography is suggestive of thin slumping, likely within the outer slopewash and weathered bedrock materials within the oversteepened natural slope. Slope stability analyses along R-R' assume the absence (i.e. failure) of L22 to establish a preliminary slope setback of 50 feet. Landslides L22 and the portion of L21 within the tract boundary should be placed in Restricted Use Areas.

#### Landslide L24 and L25

Portions of these small landslides that are not removed by the planned cut should be removed and recompacted to bedrock.

#### Offsite Landslides at Whites Canyon Highway and Plum Canyon Road

Four landslides have been identified by Leighton (1999) near the proposed connection of Whites Canyon Highway to Plum Canyon Road. Of these four, we anticipate Qls-10a to require complete removal and recompaction. Landslide Qls-10 will likely require partial removal and recompaction. Landslides Qls-9 and Qls-9a do not impact the road alignment on account of their distant location.

#### **GROUNDWATER**

Groundwater seepage within the hillside terrain was notably absent within the numerous bucket-auger borings. One exception was Boring 4, located within a small canyon tributary in the southerly portion of the site. This groundwater occurrence consisted of slow but steady seepage from sandstone and conglomeratic bedrock, at elevation 1655' (below the elevation of the canyon axis).

Within the deeper cored borings, groundwater was artificially elevated at the conclusion of drilling on account of the use of drilling mud. Hence, determination of the naturally occurring groundwater required selected borings to remain open until static groundwater conditions were established.

Groundwater was recorded at a depth of 169.5 feet in Boring 7 (approx. elev. 1790'), roughly 10.5 feet above the boring bottom.

Within Boring 8, groundwater remained at a depth of 120 feet (approx. elev.1434') roughly 3 weeks after its drilling. This elevation corresponds to the elevation of Whites Canyon stream bed to the south.

Within B17 and B18, the water levels dropped to the bottom of the cored boring within the weeks following their drilling. B22 experienced a similar rapid drop following after its completion. Hence, we do not consider groundwater present to the depths of exploration at those locations.

In summary, groundwater within the hillside terrain is at such depth that it is not anticipated to impact the proposed development.

#### Canyon Areas

Exploration within the floor of Whites Canyon and other major canyons on the site was impeded by environmental and property line constraints. We anticipate groundwater to be present in an unconfined condition within the deeper alluvial deposits of Whites Canyon. Further explanation in these areas is warranted at the 1"=40' scale grading plan stage or as soon as environmental issues allow the necessary dozer work in these areas.

#### LIQUEFACTION AND RELATED SEISMIC HAZARDS

Portions of Whites Canyon and a tributary canyon which extends on-site have been delineated as Seismic Hazard Zones where liquefaction hazards may exist according to the Official Map of Seismic Hazards for the Mint Canyon Quadrangle. These canyons contain very coarse-grained alluvial deposits in a generally matrix-supported condition. We anticipate groundwater to be present at depth, near the alluvial-bedrock contact. Mitigation of the liquefaction hazards for such materials is most commonly addressed by the removal and recompaction of the alluvial materials. We anticipate this to be necessary where the proposed development traverses these canyons. Consideration of the removal and recompaction of these deposits, and the notable depth of planned fill (over 50 feet in most cases), renders the potential for liquefaction to occur at the site as very low and not a constraint to the development.

Exploration with Whites Canyon should be performed to determine depths of removal upon notice from the project environmental consultant that necessary dozer work (to obtain access from hillside terrain) is permissible.

#### **Dry Seismic Settlement**

During seismic groundshaking, seismically induced settlement can occur. The estimation of the potential seismic settlement is divided into two separate causative mechanisms. The settlement of coarse grained soils above the groundwater table is assumed to be related primarily to groundshaking adjusting the coarse grained soils into a tighter packing configuration. The seismic settlement below the groundwater is assumed to be related to pore pressure changes during liquefaction. Since surficial materials of low relative density (such as alluvial, colluvial, landslide debris, and terrace deposits) are anticipated to be removed during the grading of the site, the potential for dry seismic settlement to impact the site is considered very low.

#### **Tsunamis and Seiches**

Review of the site's location in elevated terrain, the potential for tsunamis and seiches to impact the site is considered negligible.

#### **HYDROCONSOLIDATION POTENTIAL**

Hydroconsolidation is a condition where dry or moist soils undergo settlement upon being wetted. In many cases no additional surcharge load is necessary to trigger the hydroconsolidation.

The potential for hydroconsolidation has been evaluated based upon the results of consolidation tests performed on samples taken from the excavated borings, and from our observations of the density of the materials encountered. Consolidation testing performed on bedrock formations indicate that they are not susceptible to hydroconsolidation on account of their high density and lithified state. The very minor collapse (typically <0.5%) observed in such tests is attributed to sampling and handling disturbance.

Consolidation testing from samples of alluvium on the Sierra Highway portion of the site indicate that alluvial soils are susceptible to hydroconsolidation and should be removed in areas of

proposed improvements. Sampling of the alluvial deposits in the remaining portions of the site was impeded by: (1) the notable coarseness of the deposits (cobble and boulder-rich) and (2) impeded access for exploratory excavation due to environmental concerns. Based on our experience, we anticipate alluvial deposits in the tributary drainages to be relatively thin and requiring removal and recompaction. Within Whites Canyon, alluvial deposits are notably coarse, consisting essentially of lag deposits of cobbles and boulders with a poorly-sorted sand matrix. Due to the notable depth of planned fill, these materials should be removed and replaced within engineered fill, thus mitigating their potential for hydroconsolidation.

Consolidation testing and subsurface observations of terrace deposits, colluvium, and slopewash on the site indicate that these materials have a potential for hydroconsolidation. These materials should be removed and recompacted to bedrock within areas of planned development. Much of these materials will be removed by the planned cuts.

#### FAULTING AND SEISMICITY

The subject site contains no known active or potentially active faults, nor is it within an Alquist-Priolo Fault Rupture Hazard Zone. Therefore, the potential for ground rupture is considered to be very low. However, the property is situated within the seismically active Southern California region and ground shaking is likely to occur due to earthquakes caused by movement along nearby faults.

One method of seismic design is to utilize the Static Force procedure (structures less than five stories) presented in the Uniform Building Code (UBC), which can be used to estimate base shear/on-site acceleration based upon site location, occupancy classifications, and the planned structural system. The program UBCSEIS (Blake) was utilized to determine appropriate design parameters (See Appendix A).

For the 1997 UBC this site has a Seismic Zone Factor, Z of 0.4 (Tbl 16-I), the Soil Profile Type is considered  $S_D$  (Tbl 16-J) on account of the numerous deep fills anticipated. The Seismic Source Type is considered B (Tbl 16-U), and the Near Source Factors are estimated as  $N_a$  of 1.0 and  $N_v$  of 1.2 (Tbl 16-S & 16-T). The nearest Type B fault is the Sierra Madre (San Fernando) fault, located approximately 6.2 kilometers to the south. The San Gabriel fault, another Type B fault, is located approximately 6.8 kilometers from the site. The nearest Type A fault is the San Andreas fault, located roughly 23 kilometers away.

Another method of seismic design is to assess the potential on-site ground acceleration based upon a site's proximity to specific, known faults. This relies upon prediction of a maximum earthquake for each fault considered, relationships which characterize the diminution of ground response with distance from the causative event, and relationships which assess impact of site-characteristics upon ground response. One commonly used method of estimating possible on-site accelerations is the probabilistic seismic hazard analysis.

#### Probabilistic Analysis - Simplified Prescribed Parameter Value

We have employed the Simplified Prescribed Parameter Value Method for the estimation of peak ground acceleration during a design level seismic event (10% probability of occurrence in 50 years, per 1997 UBC). Figures presented in the Seismic Hazard Evaluation Report of the Mint Canyon 7.5' Quadrangle were reviewed for the selection of peak ground acceleration and magnitude. Based on the referenced document, a peak ground acceleration of 0.58g is anticipated the subject property (for a soft rock condition), with a predominant earthquake magnitude of M=6.6, for a design level event. Copies of Figures 1.2 and 1.3 from the Seismic Hazard Evaluation Report are provided in Appendix A.

#### Seismic Discussion

The methodology in the Uniform Building Code intends to protect and preserve life and limb. It has, apparently, been successful in that regard. On that basis, we recommend minimum structural design be in compliance with the seismic design provisions of the UBC. Design per the UBC (and hence adoption of the philosophy that life and limb need be protected) is commensurate with the local building ordinance. Being that higher standards of design (i.e. that intend to minimize property damage in the case of a much less likely event) have not been adopted by the governing agency (which is responsible for setting such standards), use of a higher acceleration (than provided by the UBC) is discretionary.

#### LABORATORY TESTING

Undisturbed and bulk samples of soil and rock materials encountered at the site were collected during the course of our field work. Selected laboratory tests completed on the retrieved samples are described below:

#### **Moisture-Density**

The field moisture content and dry unit weight were determined for each undisturbed sample.

Dry unit weight is expressed in pounds per cubic foot and the moisture content represents a percentage of the dry unit weight. This test data is presented on the boring logs.

#### Shear Test

Shear tests were performed in a Direct Shear Machine of the strain control type. The rate of deformation is approximately 0.01 inches per minute. Selected samples, as noted in the shear test diagram, were sheared at reduced rates of deformation. Shearing occurred under a variety of confining loads in order to determine the Coulomb shear strength parameters. The test was performed on undisturbed and remolded (@ 90% relative compaction) samples in an artificially

saturated condition. The test results are presented in Appendix B.

#### **Consolidation Test**

Settlement predictions of the soil's behavior under load are made on the basis of consolidation tests. A one inch high sample is loaded in a geometric progression and the resulting deformation is recorded at selected time intervals. Porous stones are placed in contact with the sample (top and bottom) to permit addition and release of pore fluid. The sample is inundated at a selected load (typically near overburden pressure) during the progression. Results are plotted on the enclosed Consolidation-Pressure Curves included in Appendix C.

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#### **Compaction and Expansion Tests**

To determine the compaction characteristics of the onsite materials, compaction tests are performed in accordance with ASTM D 1557-00. The maximum dry density is reported in pounds per cubic foot and the optimum moisture content as a percentage of the maximum dry density. Expansion index tests were performed in accordance with the criteria in U.B.C. 18-2. The results of these tests are included in Table I.

**Table I - Laboratory Test Data** 

		Maximum Dry	Optimum Moisture	
_		Density	Content	Expansion
<u>Sample</u>	Description	PCF_	%	<u>Index</u>
B2@11-15'	Tan silty SAND (Saugus Fm.)	134	8	6
B3@5'	Tan clayey silty SAND (Saugus Fm.)	127	9	0
B3@38'	Lt. gray silty SAND w/ grave. (Mint Cyn.Fm.	) 132	10	0
B9@15'	Lt. brown sandy SILT	124	11	19
B10@20'	Tan clayey med-cs SAND w/ gravel	137	7	4
B16@60'	Dark red sandy CLAY (TQs)			56
B19@15'	Tan silty f-cs SAND w/ gravel	128	10	10
B1(1995)@15	5' Gray silty SAND w/ gravel	133	7	
B1(1995)@35	5' Lt gray silty med-cs SAND	131	9	
B1(1995)@72	2' Lt. gray clayey silty SAND	125	10	
B11(1995)@4	10' Lt. gray clayey SAND	130	10	
T3@1.5'	Brown clayey silty f-med. SAND	126	9.5	-

#### **Atterburg Limits and Sieve Analyses**

Selected fine-grained samples were subject to particle-size analyses, hydrometer analyses, and Atterburg Limit testing. The results of this testing is presented in the following table.

Sample	Liquid Limit	Plastic Limit	Plasticity Index	% Clay (passing 0.005 mm sieve)
B5@12' (TQs)	36.9%	18.9%	18	19%
B5@72' (Tmc)	40%	20.7%	20	9%
B13@27' (Tmc)	38.4%	17.4%	21	25%
B16@60' (TQs)	42.7%	15.9%	27	
B16@63' (TQs)	57.5%	18.2%	40	M W 4-
B16@80' (TQs)	91.9%	32.2%	60	90%
B21 @ 49' (TQs)	57.9%	18.2%	40	50%
B23@70' (TQs)	84.3%	27.3%	57	86%
B25@53' (TQs)	46.7%	19.2%	28	12%

#### **CHEMICAL TESTING**

Selected samples were submitted to M.J. Schiff and Associates for chemical testing to evaluate their corrosion potential. Results presented in Appendix E are summarized herein.

#### **Sulfates**

Preliminary testing of samples obtained from our borings indicate the on-site soils have low levels (< 150 ppm) of sulfates which indicates a low corrosion potential for concrete. Near the completion of grading additional testing should be performed to verify the corrosion potential of the soils.

### TABLE 19-A-4 REQUIREMENTS FOR CONCRETE EXPOSED TO SULFATE-CONTAINING SOLUTIONS

SULFATE EXPOSURE	WATER-SOLUBLE SULFATE (SO <sub>4</sub> ) IN SOIL, % by weight	SULFATE (SO <sub>4</sub> ) IN WATER, ppm	CEMENT TYPE	Maximum Water- Cementitious Materials Ratio, by Weight, Normal- Weight Aggregate Concrete <sup>1</sup>	Minimum f' <sub>c</sub> Normal Weight and Lightweight Aggregate Concrete, psi <sup>1</sup> x 0.00689 for MPa
Negligible	0.00 - 0.10	0 - 150			
Moderate <sup>2</sup>	0.10 - 0.20	150 - 1,500	II, IP(MS), IS(MS)	0.50	4,000
Severe	0.20 - 2.00	1,500 - 10,000	V	0.45	4,500
Very severe	Over 2.00	Over 10,000	V plus pozzolan³	0.45	4,500

A lower water-cementitious materials ratio or higher strength may be required for low permeability or for protection against corrosion of embedded items or freezing and thawing (Table 19-A-2).

#### Chlorides

Test results indicate that chloride levels (40 to 210 ppm) are below levels of concern with respect to corrosion.

#### pH levels

Test results presented in Appendix E indicate the on-site soils are typically neutral to slightly basic (pH 7-8).

#### Soil Resistivity

Representative samples of the earth materials encountered at the site was tested for resistivity. Resistivity of soils is inversely proportional to corrosiveness. Thus, the analysis helps in determining whether the soils may have a deleterious affect on underground metallic structures. A generally accepted correlation between resistivity and soil corrosiveness toward metals is provided below:

Seawater

Pozzolan that has been determined by test or service record to improve sulfate resistance when used in concrete containing Type V cement.

Resistivity (Ohm-Centimeter)	Corrosiveness
< 1,000	Severely Corrosive
1,000 - 2,000	Corrosive
2,000 - 10,000	Increasingly Moderate
> 10,000	Increasingly Mild

#### **Laboratory Test Results**

Sample B2@10-15' B9@15' As-Received Resistivity
ohm-cm
930,000
7,400

Saturated Resistivity ohm-cm 1,700 690

Based on these test results, the on-site soils are considered corrosive to severely corrosive to ferrous metals when saturated. Appropriate mitigation measures should be obtained from an experienced corrosion engineer.

#### **SLOPE STABILITY**

Much of the sloping terrain on the site has been delineated within Seismic Hazard Zones with the potential for earthquake-induced landsliding. These zones typically include areas where landslides or adverse bedding conditions are readily evident.

Stability analyses of the planned and natural slopes were performed using the computer software entitled XSTABL which is based on the program PCSTABL5 developed at Purdue University. Program output includes a description of the problem, including soil boundaries, soil properties, earthquake loading, searching criteria, and the method of safety factor calculation. Information regarding the ten trial surfaces with the lowest computed factors of safety is also provided. Graphical depictions of the ten most critical failure surfaces and all failure surfaces considered are presented on the final two sheets of each analysis. Pseudostatic analyses (when bedding dips exceed 12°) utilize a pseudostatic coefficient of 0.15 in accordance with LACDPW

requirements.

#### **Across-Bedding Shear Strengths**

Direct shear testing of undisturbed samples of the materials encountered at the site were performed in order to develop representative "across-bedding" strengths. Composite plots of the shear strength tests data are presented on Plates STQs (Saugus Fm.), STmc (Mint Canyon Fm.), and Saf (eng. fill) of Appendix B.

#### **Along-Bedding Strengths**

In order to determine along-bedding strengths for the Saugus and Mint Canyon Formations, multi-cycle residual shear tests and correlations (per SCEC, 2002 and Stark and McCone, 2001) were performed on selected fine-grained samples. As noted in the boring logs, fine-grained lithologies are relatively infrequent in the Saugus Formation, and somewhat rare in the Mint Canyon Formation within the subject property. Graphs associated with the Stark and McCone (2001) correlations are presented on Plate SC1 of Appendix B. Liquid limit and % clay results were utilized to generate "ball-milled" liquid limits and "ball milled" clay fractions from which residual friction angles were estimated. Nonlinear shear strength envelopes were generated (see Plate SC2) and friction angles corresponding from the 3 to 10 kip normal pressure range (corresponding to typical slope geometries considered herein) are presented in the following table.

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Sample	"Ball-Milled" Liquid Limit	"Ball-Milled" Clay Fraction	Angle of Internal Friction per Stark & McCone (2001) Correlation
B5@12' (TQs)	47%	25%	20 deg.
B5@72' (Tmc)	51%	<15%	24 deg.
B13@27' (Tmc)	49%	37%	19 deg.
B16@80' (TQs)	138%	99%	7 deg.
B21@49' (TQs)	79%	58%	10 deg.
B23@70' (TQs)	125%	95%	7 deg.
B25@53' (TQs)	61%	25%	17 deg.

#### Along-Bedding Bedding Strength for Sheared TOs Clays

Review of the descriptions for the Saugus Formation clay samples indicate they all have reddish brown to dark red coloration, but vary in their residual strengths. Hence, sheared claystone beds of the Saugus Fm. can be grouped into two strength categories: (1) claystones (such as B5@12' and B25@53') with friction angles between 17 and 20 deg., and (2) weak claystones with notably low friction (phi = 7 deg.). We have utilized the lower strength for specific cases where such low friction angle sheared clays are documented.

#### Along Bedding Strength for Unsheared TOs Clays

Numerous claystones encountered in the Saugus Formation did not exhibit shearing and thus do not warrant use of the lowest residual friction angle. A shear strength of phi=17°, c=150 psf has been utilized to model such unsheared beds, and corresponds to the correlations obtained for the B5@12' and B25@53' samples.

#### Along Bedding Strength for Coarse-Grained Lithologies (Tmc and TQs)

The along bedding shear strength of phi=25°, c=100 psf was utilized to model slopes with daylighted bedding conditions that have boring data confirming the lack of fine-grained beds. This strength is considered representative of a through-going poorly cemented sandstone.

#### Along Bedding Strength for Tmc Sheared Clays

Correlations performed for Mint Canyon Formation claystones indicate that they have relatively high (19° to 24°) friction angles. Based on our experience with claystones of this formation from nearby sites, we have used a conservatively lower shear strength of phi=12°, c=150psf for sheared clays of the Mint Canyon Formation.

The following shear strengths were utilized in our analyses (unless specified otherwise in the

#### following paragraphs):

Material Type	Cohesion (psf)	Angle of Internal Friction (degrees)
Engineered Fill	200	34
Alluvium	0	30
Landslide Debris	200	30
Saugus Formation Across-Bedding Strength	225	40
Mint Canyon and Saugus Fm- Along Bedding Strength, Coarse-grained Lithologies	100	25
Saugus Formation Along Bedding, Fine-grained Lithologies, Unsheared	150	17.
Saugus Formation Along Bedding, Fine-grained Sheared Lithologies	150	7
Mint Canyon Formation Across-Bedding Strength.	200	40
Mint Canyon Formation Along Bedding, Fine- grained Sheared Lithologies	150	12

#### Cross Section B-B'

The 150 feet high, 2:1 cut slope illustrated in Cross Section B-B' is anticipated to encounter laterally-supported Saugus Fm. within its upper reaches, and potentially daylighted bedding near its toe (based on B25 and B26). An anisotropic strength range (17 to 22 degrees) was applied to the Saugus Formation from x=0' to x=560' to model this adverse bedding condition. An along-bedding strength of phi=5°, c=750 psf was used based on Plate S26.53m. A buttress key width of 210 feet, and depth of 5 feet, along with a 2:1 backcut were required to achieve satisfactory factors of safety with Spencer's Method.

#### Cross Section C-C'

This 130 feet high, 2:1 cut slope is anticipated to expose daylight bedding of the Saugus Formation. Data from B16 indicates that the majority of the Saugus Fm. consists of interbedded sandstone and conglomerate, with relatively shallow dips. However, a series of relatively thin red sheared clay beds were encountered. In particular, the clay at 80 feet was considered the most

critical, on account of its location, dip inclination, and low friction angle correlation. Analyses for a buttress design targeted this bed (for which a 21° dip was recorded) in order to demonstrate the feasibility of buttressing this slope, assuming this weak bed is continuous. This resulted in a key width of 150 feet and depth of five feet, along with a 2.75:1 backcut. Satisfactory factors of safety of 1.5 (static) and 1.12 (pseudostatic) were obtained with Spencer's Method.

A higher friction angle (10 deg.) was utilized in our backcut analyses for C-C'. A 2.75:1 backcut provides for a temporary factor of safety of 1.3.

We anticipate that additional exploration in this area will demonstrate a lack of continuity of these clay beds. In addition, multi-cycle residual shear strength testing on these materials may warrant an increase in along-bedding strength, and thus help reduce key width dimensions and steepen backcut angles.

#### Cross Section D-D'

Data from B17 indicates that coarse-grained lithologies are present to a depth of 95 feet within the Saugus Formation. Between 95 feet and 132 feet, isolated red claystone (some with sheared textures) were encountered. Dip inclination and directions were highly variable on account of the abundance of conglomerates.

The slope was modeled with two soil types for the Saugus Formation corresponding to the coarse-grained strata (0 to 95 feet) and the strata containing the clays (below 95 feet to 132 feet). Below 132 feet, entirely coarse-grained lithologies of the Mint Canyon Formation were encountered. The Saugus Formation was modeled with bedding inclinations of 4 to 8 degrees on the basis of the formation's regional dip and the more consistent bedding dips of B16 and B23 (to west and east). The Mint Canyon Formation was modeled with a dip of 15 to 20 degrees but does not contribute to critical geometries since its entirely coarse-grained strata is documented by B17.

A 180 feet wide, 5 feet deep key provides for a factor of safety of 1.6 for the most critical geometries which pass through the clay-bearing strata of the Saugus Formation. For the backcut analysis, the along bedding friction angle was modestly increased to 10° in light of the temporary condition. A temporary factor of safety of 1.26 was obtained for a 2.75:1 backcut.

#### Cross Section E-E'

Attitudes obtained from B23 indicate that bedding of the Saugus Formation is laterally supported with respect to the perimeter cut slope illustrated in Cross Section E-E'. This slope was analyzed with circular failures surfaces; static and pseudostatic factors of safety of 2.33 and 1.62 were obtained respectively.

#### Cross Sections G-G' and I-I'

Boring 18 was advanced 200 feet to determine the structure and stratigraphy underlying this 2:1 cut slope. The upper 119 feet consist of massively bedded conglomerate and sandstone. At a depth of 119.5 feet, a sheared mudstone was encountered. Attitudes below this depth rendered southerly dips, typically between 25 and 30 degrees. Sections G and I were evaluated considering the phi=12°, c=150 psf along-bedding strength below the 119.5 foot depth. A buttress key width of 80 feet and depth of 5 feet was found to provide adequate factors of safety for both sections (see Plates G and I of Appendix D).

#### Cross Section H-H'

Boring 22 indicates that this proposed cut slope is underlain by massively bedded sandstone and conglomerate. Attitudes obtained by the downhole camera reader generally flat apparent dips relative to the section. Since the prevailing structure of the Mint Canyon is known to dip to the west, we considered it prudent to model the slope with a dip of 5-12° and the coarse-grained along bedding strength. An 80 foot wide by 5 foot deep buttress provides a static factor of safety of 1.76. A 2:1

backcut yields a temporary factor of safety of 1.57.

#### **Cross Section K-K'**

In light of the forgoing discussion and analyses for Section H-H', the portion of slope illustrated in Section K-K' has been provided a W=60 feet, D=5 feet keyway.

#### Cross Section L-L'

The projection of Boring 24 indicates that this natural and planned cut slope is underlain by sandstone and conglomerate (devoid of fine-grained beds) of the Saugus and Mint Canyon Formations, with shallow westerly dips (based on dip inclinations from core samples, assuming adverse dip direction). A buttress fill width of 70 feet and depth of 5 feet provide for adequate factors of safety (see Plates L.1-L.5, Lp.1-Lp.5, and Lb.1-Lb.5) and also provides for re-facing of the slope to mitigate surficial issues with uncemented zones and cobbles. A 2.5:1 backcut provides a temporary factor of safety of 1.62.

#### Cross Section M-M'

Boring 10 and the project of Boring 24 indicate that the westerly facing cut and natural slope is underlain by coarse-grained lithologies of the Saugus and Mint Canyon Formations. These units dip shallowly to the west and have been modeled as 5 to 10 degrees for the Saugus Fm. and 10 to 15 degrees for the Mint Canyon Formation. Along-bedding values of phi = 25 deg. and C=100 psf were utilized on account of the lack of fine-grained lithologies in both formations.

A buttress key width of 60 feet and depth of 5 feet provide for factors of safety of 1.87 (static) and 1.25 (pseudostatic). A 1.9:1 backcut yields a temporary factor of safety of 1.45.

#### Cross Section N-N'

Data from B9 indicates that the Mint Canyon Formation dips very shallowly to the northwest, rendering very shallow to neutral apparent dips relative to the section. The Saugus Formation has

shallow westerly dips but lacks fine-grained beds and thus translational analyses are not warranted.

#### Cross Section O-O'

The proposed 2:1 cut slope at the southerly end of Section O-O' is anticipated to expose northwesterly-dipping Saugus Formation based on B10. Data from B10 and the numerous borings which penetrated the Saugus-Mint Canyon Formation contact have indicated a lack of sheared clays within the Saugus Formation in this portion of the site. Hence, the unsheared claystone strength of phi=17°, c=150 psf was utilized. An out-of-slope dip range of 5 to 9 degrees was considered and a buttress key width of 70 feet, and depth of 5 feet was required to demonstrate an adequate factor of safety for the static condition (see Plates O.1-O.5). The 1.5:1 backcut has a temporary factor of safety of 1.29.

#### Cross Section R-R' - Southerly Buttress

Similar conditions were modeled for this southerly Section of R-R' as for Section O-O'. A key width of 60 feet and depth of 5 feet provided for a static factor of safety of 1.87. The 1.75:1 backcut provides a temporary factor of safety of 1.42.

#### Cross Section P-P' - Stability Fills

Data from B6(1995) and B11(1995) indicate that the Saugus and Mint Canyon Formations to be exposed in the tall cuts associated with this section of Whites Canyon Hwy. contain friable, uncemented zones (prone to caving in borings) and large cobbles and boulders. While predominantly massively-bedded, both formations dip shallowly to the west and are thus laterally-supported with respect to this section. Due to the potential for poor surficial performance (erosion and rockfall), we recommend the stabilization of these tall cut slopes as illustrated in the section (upper and lower keyways, separated by a 20 foot wide bench).

Due to the height of the slope, rotational analyses were performed for the southwesterly-

facing slope. Factors of safety of 2.3 (static) and 1.56 (pseudostatic) were obtained.

#### Cross Section R-R' - Descending Natural Slope Setback

The westerly end of Cross Section R-R' illustrates a steep, descending natural slope condition. Bedding of both the Saugus and Mint Canyon Formations is anticipated to be laterally-supported based on the available subsurface data. A shallow landslide has been mapped within the lower portion of the slope and has been assumed absent in our rotational mode of failure slope stability evaluation.

Substandard factors of safety were obtained within the outer 50 feet of the proposed daylight cut lot illustrated in Cross Section R-R'. Accordingly, a preliminary slope setback line (50 feet from the top of slope) has been incorporated on the Remedial Grading Map (Plate 1.3). Further evaluation of the adjacent daylight cut lots should be performed at the grading plan stage to provide design-level slope setbacks.

#### Cross Section S-S'

This 2:1 fill slope was evaluated with rotational failures on account of its tall height. Factors of safety of 1.87 (static) and 1.29 (pseudostatic) were obtained.

#### Cross Section T-T'

This fill slope was also evaluated with rotational failure surfaces. Factors of safety of 1.9 (static) and 1.3 (pseudostatic) were obtained.

#### Cross Section V-V'

Attitudes obtained from B21 indicate that the southwesterly-facing portion of this cut slope shall expose daylighted bedding with dips of 7 to 12 degrees. The majority of the Saugus Formation encountered consisted of sandstone and conglomerate with isolated claystones which did not exhibit shearing. Boring 1 (nearby) encountered entirely coarse-grained materials and met with refusal. A

buttress key width of 130 feet and depth of 5 feet provide for a static factor of safety of 1.78. The 2.4:1 backcut provides a temporary factor of safety of 1.37.

# **Cross Section Y-Y'**

These cut slopes shall be subject to a daylighted bedding condition based on B5 and surrounding attitudes. No shearing was noted in fine-grained materials within B5 which projects into the section. A key width of 40 feet and depth of 5 feet, along with a 30' by 5' key for the ascending slope above "Main Street South" provide adequate factors of safety. A 2.6:1 backcut provides a temporary factor of safety of 1.75.

# Surficial Stability Analyses of 2:1 Cut and Fill Slopes

Surficial stability analyses have been performed for the Saugus Fm., Mint Canyon Fm., and engineered fill, assuming a 2:1 gradient and saturated thickness of 4 feet. The results of these analyses are presented on Plates A.1, A.2, and A.3 of Appendix D. Factors of safety in excess of 1.5 were obtained.

#### Surficial Stability of Natural Slopes

Geologic mapping of the site indicates that surficial instability of the natural slopes commonly occurs at gradients of 1.25:1 or steeper within thin, sandy surficials soil in the form of shallow isolated soil slips. The most common occurrences of such features are along the sides of steeply incised canyons such as Whites Canyon. These features will be removed by the proposed grading and removals.

Review of the Tentative Tract Map indicates that a few lots are exposed to ascending natural slope conditions. These areas are discussed in the following sections.

#### Easterly Daylight Fill of Whites Canyon

Several lots, a water tank site, and park site are located at the toe of a natural slope ranging

in height from 25 to 100 feet. Slope gradients of this slope are typically 2:1 or flatter. In order to protect these improvements from potential surficial instability, we recommend the incorporation of a 2:1 slope from the edge of these pads down to the daylight. This slope should be between 4 feet in height for the smaller sections of natural slope, and up to 7 feet in height for the taller sections. A paved swale should be provided along the toe/daylight to convey water and eroded materials to an appropriate inlets or small basins.

#### **Lots West of Section C-C'**

Three lots appear to be exposed to a tall ascending natural slope. As discussed above, a false slope should be provided along the edge of these pads down to the daylight in order to protect the lots from potential surficial instability. A paved swale should be provided to convey water and eroded material to an appropriate inlet or basin.

#### FINDINGS AND RECOMMENDATIONS

Based on our exploratory finding, analyses, we consider the proposed development of the Tentative Tract No. 060922 to be feasible with respect to geotechnical considerations. The following recommendations are presented for your consideration in the grading and development of the site.

#### Removals

The following materials are considered unsuitable for support of the proposed grading and building construction: existing fill soils, colluvial deposits and slopewash, alluvial deposits, landslide debris, and terrace deposits. These materials should be removed and recompacted in the grading of the site. The approximate limits and depths of removals are illustrated on the enclosed Plate 1.3.

Groundwater may be encountered during alluvial removals in the lower reaches of Whites Canyon within the southerly portion of the site. However, the notable amount of cobbles and boulders in these deposits should support grading equipment even when saturated. Dewatering may

be considered to facilitate removals in some cases.

#### **Subdrains**

Following canyon removals, subdrains should be installed in order to provide subsurface drainage along the fill-bedrock contact. Details regarding typical canyon bottom subdrain construction is illustrated in Plate GS1 of Appendix F. In the case of the Whites Canyon drainage and other subdrain runs exceeding 2000 feet, the double 8" pipe configuration of Plate GS1B should be utilized. Where removals extend below depths of viable outletting at the toe of a slope, a canyon-side subdrain should be installed in accordance with Plate GS1A. A cut-off wall should be installed (in accordance with Plate GS2) at least 20 feet before each outlet location, with solid pipe utilized between the wall and the outlet.

The approximate locations of proposed subdrains are provided on Plate 1.3. These locations should be revisited at the 40-scale grading plan stage. All subdrains and backdrains should be surveyed by the project civil engineering during the grading of the site and presented on an as-built map.

#### Oversize Materials and Rock Disposal

Exploratory logs and geologic mapping of the site indicate that a significant amount of oversize rock in the form of crystalline igneous and metamorphic cobbles and boulders are present on the site. These materials will be encountered in colluvial soils, alluvial soils, and conglomerate beds of both formations. We do not anticipate such rocks to break down under normal grading equipment or operations.

Such materials will create difficult excavation conditions both in canyon removals and in planned cuts. We anticipate much of these materials to require placement in canyons as windrows in accordance with traditional rock disposal methods and in accordance with Plate RD of Appendix

F. Additional handling should be anticipated as finish grade is approached to remove oversize rock from the engineered fill.

In addition to such rock disposal measures, we anticipate a significant amount of oversize rock to remain towards the later part of grading as material is generated from the conglomerate beds of the bedrock formations. The disposal of this material towards the later part of grading should be considered. Possible solutions include: crushing for use as base, exportation, use on site as rip-rap, or leaving a designated rock disposal canyon low towards the later portion of grading.

# **Rippability**

Based on our recovery and Rock Quality Designations from the cored borings, deep cuts within the Saugus and Mint Canyon Formations are not anticipated to require blasting. Several bucket-auger borings met refusal prior to their planned depth on account of hard, crystalline cobbles and boulders within the conglomerate beds. Such beds may be problematic but excavatable. Cementation within both bedrock formations was found to be poor to moderate, and not at levels anticipated to require blasting.

# Street or Lot Overexcavation for Trenching Considerations

Where encountered, conglomerate beds may create problematic trenching conditions for foundations, storm drains, and utilities. We suggest consideration of the overexcavation of such beds (where encountered during grading) to provide for more uniform and easier trenching conditions. Oversize rock from the excavated material would require separation prior to its reuse as engineered fill within the upper 10 feet of fill. The delineation of such areas would be best determined in-grading.

#### **Buttresses and Stability Fills**

Based on the data available to date, westerly-facing and some southwesterly-facing slopes

are scheduled for buttress or stability fills. Perimeter slopes were evaluated to demonstrate the feasibility of buttressing. Slopes within the interior of the site are obviously feasible to buttress since property lines do not constrain any backcuts. At the 1"=40' scale grading plan stage, interior slopes with daylighted bedding conditions should be analyzed for appropriate buttress design. At this time, we have assigned stability fill key dimensions for planning purposes.

Tall cut slopes in the southerly portion of the site are anticipated to expose friable, uncemented bedrock zones and large cobbles and boulders. We anticipate several of these slopes to require stabilization in order to mitigate the potential for raveling and dislocation of cobbles and boulders. Typical stability and buttress fill construction are provided in Plates GS4 and GS5 of Appendix F. All stability fills and buttresses should be provided with backdrains in accordance with Plate GS6.

Generalized stability fill key dimensions for the "re-facing" of planned cuts slopes for the reasons discussed above are provided in the following table.

Slope Height	Key Width (feet)	Key Depth (feet)
< 30'	20	5
< 45'	25	5
< 60'	30	5
< 75'	40	5
< 90'	50	5
< 105	60	5
< 130	70	5

#### **Expansive Soils and Expansive Bedrock**

The vast majority of soils encountered are anticipated to be within the very low (0-20) and low (21-50) expansion index ranges. Either conventional or post-tension foundations may be utilized.

Expansive lithologies were encountered within the westerly portion of the site within the Saugus Formation. These expansive beds typically consist of reddish brown sandy clay (paleosol). Such beds will require overexcavation where encountered within lots and streets in order to mitigate the potential for differential expansion. The depth of such overexcavation typically ranges between 7 and 10 feet.

# **Sulfates and Corrosivity**

Based on our laboratory testing and that performed on similar soils from the adjacent developments, we anticipate sulfate contents to be relatively low (< 150 ppm). Special concrete design is not anticipated.

As with the majority of soils in the Santa Clarita Valley, chemical testing has shown them to be corrosive to ferrous metals. Appropriate mitigation measures should be incorporated in the project design.

# **Transition Lots and Fill Caps**

To provide uniform foundational support for future structures, we recommend the creation of fill caps for cut/fill lots. Shallow cut lots and cut/fill lots should be provided with a minimum five feet cap of compacted fill. Cut/fill lots underlain by 10 feet or less of compacted fill on the fill portion of the lot should have the cut portion overexcavated a minimum of 5 feet below finish grade and replaced with compacted fill, thus providing a fill cap with a minimum 5 feet fill thickness. For those transition lots with 10 to 20 feet of fill on the fill side, the cut side should be provided with a minimum 7 feet thick fill cap. For those transition lots with in excess of 20 feet of fill on the fill side, the cut side should be provided with a minimum 10 feet thick fill cap. Fill caps should extend a minimum of 5 feet beyond the perimeter footings.

Where the backslope is 3:1 or steeper, the last bench prior to reaching the undercut should be at least 15 feet in width in accordance with Plate GS7. The 15 feet wide bench is intended to reduce the steep dip of the fill-bedrock contact commonly created during undercutting. Plate GS7 provides a graphical representation of the fill cap construction. Preliminary fill cap depths for transition lots are presented on the enclosed Removal Map (Plate 1.3).

# **Grading - Engineered Fills**

The following recommendations pertain to the placement of, and preparation for, engineered fills;

- 1. The on-site soils are suitable for use as structural fill. Any import materials that are to be used as structural fill should be approved by this office prior to placement.
- 2. Shrinkage refers to the lesser volume of fill that results from a given volume of excavation. Conversely, bulking refers to the increase in volume upon excavation of dense material (i.e. bedrock formations) and ensuing placement as engineered fill. The following shrinkage and bulking estimates are provided for your consideration in the earth balance of the site

Earth Material	Estimated Shrinkage	Estimated Bulking
Alluvium (Qal)	10-15%	
Colluvium/Slopewash (Qc)	10-15%	
Landslide Debris	0-5%	·
Terrace Deposits	5-10%	
Saugus Formation		4 - 8%
Mint Canyon Formation		5 - 10%

- 3. Subsidence includes the general lowering of the ground due to in-place compaction by construction equipment. Subsidence is anticipated to range from 1.0 to 1.5 tenths of a foot.
- 4. All vegetation, trash debris or other deleterious material should be stripped from the area to

be graded. Soils bearing sparse grasses may be <u>thoroughly</u> mixed with at least ten parts clean soil and incorporated into the engineered fill. Other materials should be wasted from the site.

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- 5. Compressible soils that lie within the area to be filled should be removed to relatively incompressible material and replaced as properly compacted fill. Portions of the compressible materials that are sufficiently thin may be scarified, watered or air dried to approximately the material's optimum moisture content, and compacted in-place. The anticipated removal depths are illustrated on Plate 1.3.
- 6. Fill slopes which toe onto sloping ground should be founded in bedrock, below the compressible surface soils. The key should be at least 20 feet wide and 3 feet deep (measured on the downslope side). The bottom of the key should be graded so that there is at least one foot of fall across its width (toward the upslope side). The key should be located in front of the toe of slope (as shown on the plan) so that the outside limit of the key lies at or beyond a 1:1 projection from the planned toe of the slope. Typical fill key construction is illustrated on Plate GS3.
- 7. Fill-over-cut slopes should have the fill founded on a 20 foot wide bench cut into the bedrock or, where bedrock is not present in the cut portion of the slope, on a key cut below the toe of the slope. The 20 foot bench should be graded to provide at least 1 foot of fall toward its upslope side. If keyed below the toe of slope, then the key should be at least 20 feet wide, 3 feet deep (below the toe), and tilted (at least 1 foot) into the slope. The cut portion of the slope should be exposed (and observed by a representative of this firm) prior to constructing the fill portion of the slope. Typical fill-over-cut slope construction is illustrated on Plate GS8.
- 8. Exposed surfaces should be scarified, moistened or air dried as appropriate, and compacted to 90% of the material's maximum dry density prior to placement of fill.

- 9. Where the ground slopes steeper than 5:1 (H:V), the fill should be properly benched into bedrock. Typical benching is illustrated in Plate GS3.
- 10. Fill slopes constructed of clean sand are commonly subject to excessive erosion or shallow slope failures. Similarly, fill slopes constructed with clayey soils may be subject to desiccation, cracking, creep or other surficial deterioration. Utilizing mixed soils (sand with some proportion of fines, i.e. clayey sand) in the outer 20 feet of the fill slope may serve to minimize the potential for surficial slope deterioration.
- 11. Fill materials should be placed in thin lifts, watered to near the material's optimum moisture content (or to near 2% over optimum moisture content, and compacted to the applicable level of relative compaction prior to placing the next lift). Compaction criteria varies depending on the depth of fill as outlined in the following table.

Depth of Fill	Moisture Level	Minimum Relative Compaction
< 20 feet	near optimum	90%
20 to 50 feet	near 2% over optimum	92%
> 50	near 2% over optimum	95%

On account of the primarily sandy nature of the on-site soils, compaction with the high moisture content is not anticipated to be difficult. The intent of this compaction criteria is to reduce the amount and duration of settlement.

- 12. The 90% relative compaction standard applies to the face of fill slopes. This may be achieved by overfilling the constructed slope and trimming to a compacted finished surface, rolling the slope face with a sheepsfoot, or any method that achieves the desired product.
- 13. All grading should comply with the grading specifications and requirements of the local governing agency.

# **SETTLEMENT MONITORING**

Several areas of deep engineered fill are planned and approach maximum depths of 140 feet after anticipated removals. While the vast majority of earth materials are coarse-grained and anticipated to consolidate rapidly, settlement monitoring remains a prudent measure. Fills in excess of 50 feet in depth within residential areas be should be monitored to evaluate the rate and amount of settlement.

Surface settlement monuments should consist of 1-inch diameter metal pipe cast, surrounded by a 4 inch diameter solid pvc casing (See Plate SM). Both the pipe and casing should be cast in a concrete pad, founded at least five feet below pad grade. The concrete pad should be at least 2 feet by 2 feet and a minimum of 6 inches in thickness. The pad and a portion of the casing should be backfilled with nonexpansive sand or gravel. Typical settlement monument construction is illustrated on Plate SM. Settlement surveys should be performed at the following intervals:

- 1) At the completion of settlement monitor construction
- 2) One week after installation
- 3) Every two weeks for a period of 2 months following installation.
- 4) Monthly thereafter as necessary.

The monitors should be surveyed with sufficient precision to allow detection of movements that are on the order of 0.005 feet. The monitoring surveys should be performed in a closed loop, with the originating benchmark in a static location. Monitoring should be continued until plotted survey data indicate that the estimated rate of settlement and estimated remaining settlement is no longer significant.

A total of 60 preliminary settlement monument locations (SM1-SM60) have been illustrated

on the enclosed Plate 1.3 in areas of deep engineered fill. The number and location of settlement monuments should be revisited at the 40-scale grading plan stage. Based on our experience from other sites with similar soils, settlement monitoring for moderate depth fills (50 to 75 feet deep) is anticipated to continue for 9 to 12 months following the conclusion of grading. Monitoring of deep fills (75 to 140 feet deep) is anticipated to continue for 18 to 24 months following the conclusion of grading. We recommend that models and early phases of construction be situated in areas of planned cut. Periodic settlement monitoring reports should be prepared to indicate the status of the monitoring process.

# **POST-TENSION FOUNDATIONS**

Different methods are used to account for the potential effects of expansive soils. One method of mitigation, the California Slab Method (Spanability Method) utilizes deepened footings and pre-swelling of foundation soils. UBC Standard 18-III, 1997, outlines another method, the Post-Tensioned Institute (PTI) Method, which relies upon increased stiffening of post-tension slabs to resist significant soil stresses due to variations caused by climatic conditions. The former attempts to retard soil movement; the latter attempts to minimize slab deflection in the face of soil movement. Recommendations for both post-tension design methods are provided herein.

#### California Slab (Spanability) Method

This method reduces the potential for the soil to exert expansion-induced stresses by impeding the lateral migration of near-surface moisture. This method has proven successful. When utilizing deepened footings and pre-saturation techniques, the structural design need not employ the methodology from UBC Standard 18-III.

Geotechnical based input parameters for design of this foundation system are based, in part, upon the expansive properties of the soils near pad grade. Samples judged representative of these soils were determined to have an expansion index in the range of 0-20, 21-50, and 51-90. "K" values, span criteria, recommended minimum perimeter footing embedment and pre-saturation guidelines that are commensurate with each range of soil expansiveness are provided in the accompanying table.

Expansion Index	Typical "K" Values	Span Criteria	Exterior Footing Depth	Pre-satura- tion Depth
0 - 20	900 - 200	4' - 6'	12"	12"
21 - 50	200 - 100	6' - 7'	15"	21"
51 - 90	100 - 40	7' - 9'	21"	27"

# **Post-Tensioning Institute Method**

The potential for differential uplift in this method can be evaluated using the Uniform Building Code (UBC) Section 1816, based on the design specifications of the Post-Tension Institute.

The following table presents suggested minimum coefficients to be used.

Suggested Coefficients

Thornthwaite Moisture Index	-20 in/yr
Depth to Constant Soil Suction	5 feet
Constant Soil Suction	3.25 to 3.67 pf

Based on the above parameters, the following values were obtained from figures or tables in the UBC Section 1816. The values may not be appropriate to account for possible differential settlement of slabs due to other factors. If a stiffer slab is desired, higher values of  $Y_m$  and  $E_m$  can be considered.

<u>Parameter</u>	El 0 to 50	El 51 to 90
E <sub>m</sub> Center Moisture Variation Distance	5.5 feet	5.5 feet
E <sub>m</sub> Edge Moisture Variation Distance	2.5 feet	2.7 feet
Y <sub>m</sub> Center Lift	1.5 in.	2.5 in.
Y <sub>m</sub> Edge Lift	0.25 in.	0.5 in.

These edge lift values are based on the effects of climatic variations only, as specified in the UBC. In an attempt to account for the potential effects of irrigation, we recommend that horizontal moisture barriers in the form of deepened perimeter beams be used to retard non-uniform surface moisture migration beneath the slab. The bottom of the deepened perimeter beams should be designed to resist tension, using cable or reinforcement per the Structural Engineer. Pre-swelling of the soils must also be used to minimize uplift after construction. For perimeter beam depths and pre-saturation criteria see the previous table in the <u>California (Spanability) Method</u> Section of this report.

The design criteria are considered minimums and may not be adequate to represent worst-case conditions such as adverse drainage and/or improper landscaping and maintenance. Additional protection may be provided by adjusting the edge lift parameters for a greater Thornthwaite Moisture Index value (to simulate irrigation or wetter conditions than the presumptive climatic conditions). This is discretionary. Additional parameters for this modification can be provided upon request.

#### **General Post-Tension Discussion**

The allowable bearing capacity may be taken as 1000 PSF at pad grade and 1500 PSF at twelve inches embedment and with a minimum width of twelve inches. This may be increased by one-third for short duration loading, such as by wind or seismic forces. Care should be exercised

to see that all spoils from the slab subgrade are removed or property compacted.

Pre-saturation of the foundation soils should be initiated well before concrete is scheduled to be placed. Care should be taken to see that the water has properly penetrated the soil. Last minute flooding is not a good practice. Excess water remaining in the target pre-saturation zone at the time of concrete placement will penetrate further into the soil, possibly causing additional expansion and uplift of the curing concrete.

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A minimum of one inch of sand should be placed beneath the slab. A vapor barrier (i.e., ten mil visqueen) should be installed where moisture penetration of the slab is undesirable.

Other aspects of the design, including but not limited to minimum reinforcement, footing embedment and the need for interior footings, are to be determined by the project structural engineer. However, cold joints (in deepened footings and/or sunken rooms) should not be allowed.

#### **CONVENTIONAL FOUNDATION SYSTEMS**

Continuous or pad footings may be used to support the proposed residential and/or accessory structures. In order to achieve the capacities specified below, they should be founded a minimum of 12 inches into bedrock or engineered fill (not partially into each), with the concrete placed against in-place, undisturbed material. Foundation design criteria are based, in part, upon the expansive properties of the materials present near the finished pad grade. Laboratory testing to verify the expansive properties of the near-pad-grade materials should be performed at the completion of rough grading.

Pre-saturation guidelines are presented in the following table. Pre-saturation of the foundation soils should be initiated well before concrete is scheduled to be placed. Care should be taken to see that the water has properly penetrated the soil. Last minute flooding is not a good

Pardee Homes

W.O. 8838

practice. Excess water remaining in the target pre-saturation zone at the time of concrete placement will penetrate further into the soil, possibly causing additional expansion and uplift of the curing concrete.

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Expansion Index Range	
Footings <sup>(1)</sup> Allowable Bearing Capacity	o, 1 near
Slabs-On-Grade Bedding	· —
(1) Bearing portions of all footings should be at least five feet (measured horizontally) from the face of adjace slopes. All footings should bear at least three feet below an imaginary plane projected upward at 1.5:1 from tover-steepened slopes. Pad footings should be at least 24 inches square.	
(2) May be increased by 1/3 for short duration loading such as by wind or seismic forces.	
(3) Decrease by 1/3 when combined with friction.	
(4) Applies to exterior footings.	
(5) Place vapor barrier (6 mil. visqueen) one inch below top of sand layer beneath all areas where moisture the slab is undesirable.	e penetration of
Expansion Index Range	
Footings <sup>(1)</sup> Allowable Bearing Capacity	o, 1 near
Slabs-On-Grade  Bedding	· —

- (1) Bearing portions of all footings should be at least five feet (measured horizontally) from the face of adjacent, descending slopes. All footings should bear at least three feet below an imaginary plane projected upward at 1.5:1 from the toe of locally over-steepened slopes. Pad footings should be at least 24 inches square.
- (2) May be increased by 1/3 for short duration loading such as by wind or seismic forces.
- (3) Decrease by 1/3 when combined with friction.
- (4) Applies to exterior footings.
- (5) Place vapor barrier (6 mil. visqueen) one inch below top of sand layer beneath all areas where moisture penetration of the slab is undesirable.

Expansion Index Range	 51 - 90
Pre-saturation	

#### Footings(1)

-	<b>3</b> -	
	Allowable Bearing Capacity	1500 PSF <sup>(2)</sup>
	Lateral Resistance	325 PSF/Ft <sup>(2) (3)</sup>
	Maximum Lateral Resistance	2000 PSF(2) (3)
	Coefficient of Friction	0.3
	Minimum Embedment Into Foundation Material	

footing, bend 3' into slab

Slabs-On-Grade

Thickness ..... Nominal 4"

Minimum Reinforcement<sup>(6)</sup> ..... #3 bars @ 24" o.c., e.w.

- (1) Bearing portions of all footings should be at least five feet (measured horizontally) from the face of adjacent, descending slopes. All footings should bear at least three feet below an imaginary plane projected upward at 1.5:1 from the toe of locally over-steepened slopes. Pad footings should be at least 24 inches square.
- (2) May be increased by 1/3 for short duration loading such as by wind or seismic forces.
- (3) Decrease by 1/3 when combined with friction.
- (4) Applies to exterior footings.
- (5) Place vapor barrier (6 mil. visqueen) one inch below top of sand layer beneath all areas where moisture penetration of the slab is undesirable.
- (6) Dowel slab to exterior footing using #3 bars @ 24" on center, bent 3' into slab.

#### **Settlement**

We anticipate total settlement due to foundational loads to be on the order of 1 inch or less while differential settlement is anticipated to be on the order of 1/4 to ½ inch across a distance of 30 feet.

Settlement associated with consolidation of the deep engineered fills under their own weight is anticipated to be on the order of 2 to 3 inches. Settlement monitoring (as discussed above) is

recommended such that this settlement may be recorded and monitored for consideration of the release of monitored lots.

#### RETAINING WALL RECOMMENDATIONS

Retaining walls are anticipated in the development plans. Foundation design criteria are provided in the preceding section. Lateral loading criteria for cantilevered wall designs are presented in the table below. Lateral loading criteria for unyielding (basement, braced etc.) walls and walls constructed prior to placement of the fill that the wall is to support may be provided if such are to be utilized in the project.

#### Lateral Design<sup>(1)</sup>

Slope of	Equivalent Fluid
<u>Backfill</u>	Density (PCF)
Level	30
2:1	43

(1) Special design required for wall height in excess of fifteen feet.

All retaining walls should be provided with adequate backdrainage systems. Perforated pipe backdrains should be installed in accordance with Plate RW1. Free draining material should be used around pipe drains and care should be exercised to see that backdrain outlets are installed and maintained above the finish grade adjacent to the face of the wall. Backdrains should outlet to a nonerosive device or surface.

Backfill for retaining walls should be properly compacted. An impervious cap should be provided at the top of the backfill to retard infiltration of water.

Additional surcharge, such as that due to proposed structures, traffic, or other loading, should be included in the wall design. Use of expansive soil as backfill for retaining walls will result in a surcharge to the wall, the magnitude of which is dependent upon the expansion index of the backfill. This may be avoided by using sand or gravel as backfill adjacent to the wall. Details regarding this type of construction may be provided upon request.

#### **SLOPE SETBACKS**

Slope setbacks (H/3, max. 40 feet) set forth in the Los Angeles County Building Code should be applied to residences and appertunent structures. The setback should be taken as H/3 where H is the height of the descending slope, with a typical maximum of 40 feet for graded slopes. Structures situated within the setback area will require special foundation design, which might include deepening footings, pile/caisson construction, and/or consideration of creep loads. Recommendations should be developed on a case by case basis.

Daylight cut lots in the vicinity of Cross Section R-R' will be subject to greater setbacks on account of the descending natural slope. At this time, a preliminary 50 foot setback from the top of slope has been demonstrated to provide a factor of safety of 1.5. At the grading plan stage, additional cross sections and analyses should be performed.

#### RESTRICTED USE AREAS

Landslides (or portions thereof) that remain in-place following the grading of the subject tract will require placement within Restricted Use Areas in accordance with LACDPW requirements. Restricted Use Areas have been illustrated on the enclosed Removal Map (Plate 1.3) for Landslides L9, L21, and L22.

#### IRRIGATION PRACTICES

The surficial stability of graded slopes is diminished by changes in their moisture content. Permanent changes induced by the drying influence of the sun and the wetting influence of rainfall prior to establishment of plant cover may bear upon long term slope performance. Maintenance of constant moisture content prior to planting may necessitate covering the slope with plastic sheeting or a polymer spray, regular application of water (during hot weather), or other procedures. Slopes that are not planted directly upon the completion of grading should be evaluated by a representative of this firm after each drying or wetting season.

Control of irrigation and precipitated water will serve to retard the occurrence of seeps. Obviously, minimizing the excess water that infiltrates into the ground will minimize the amount of water that finds its way back to the surface. Considering the above, it should be obvious that all irrigation systems should be adjusted to provide the minimum water needed to sustain landscaping. As general rules, (1) if runoff increases notably during irrigation, then the duration of irrigation should be reduced, (2) if notable run off occurs at the onset of irrigation, then the rate of water application should be reduced, and (3) if wet soils persist below the root zones, then the amount of irrigation should be reduced. Adjustments should be made for changes in the climate. Irrigation should stop when sufficient water is provided by precipitation. Broken, leaking, or plugged sprinklers or irrigation lines should be repaired immediately. Frequent inspections of the irrigation systems should be performed.

# **DRAINAGE**

Positive drainage should be established to carry pad waters away from structures and foundations, and to prevent uncontrolled or sheet flow over manufactured slopes. We recommend as steep a gradient as possible be established around the residence, to the street or other non-erosive drainage devices. Fine-grade fills placed to create pad drainage should be compacted in order to retard infiltration of surface water.

Preserving proper surface drainage is also important. Planters, decorative walls, plants, trees or accumulations of organic matter should not be allowed to retard surface drainage. Area drains and roof gutters (if present) should be kept free of obstruction. Roof gutters (if present) and condensation lines from air conditioners should outlet to area drains or paved areas which conduct the water to the street. Positive drainage along the backs of retaining walls should be maintained. Any other measures that will facilitate positive surface drainage should be employed.

# **Utility Trench Backfill**

Backfill for utility trench excavations should be compacted to at least 90% relative compaction. Where installed in sloping areas, the backfill should be properly keyed and benched.

# **CONSTRUCTION MONITORING**

Finalized grading plans and foundation plans should be submitted to this office. Additional recommendations may be provided at that time, if such are considered warranted.

Placement of all fill and backfill should be monitored by representatives of this office. This includes our observation of prepared bottoms prior to filling. All excavated slopes, both temporary and permanent, should be observed by a representative of this office. Supplemental recommendations may prove warranted based upon the materials exposed in the actual excavations.

Foundation excavations should be observed by representatives of this office to see if the recommended penetration of proper supporting strata has been achieved. Such observations should be made prior to placing concrete, steel or forms. This office should be notified at least 24 hours prior to placing concrete.

#### 111 STATEMENT

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2) the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or warranty, express or implied.

#### **CLOSURE**

This geotechnical report has been prepared in accordance with generally accepted engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

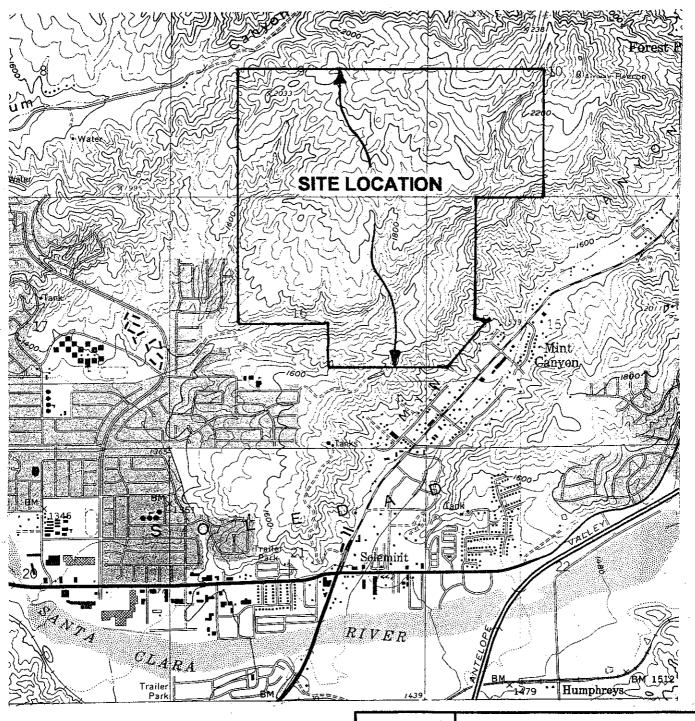
Thank you for this opportunity to be of service. Please do not hesitate to call if you have any questions regarding this report. Respectfully submitted, GEOLABS-WESTLAKE No. 35444 Exp. 09/30/05 David Sarkisian C.E.G. 2183 Enclosures: RONALD Z. SHMERLING NO. 1047 CERTIFIED Remedial Grading Map ..... Plate 1.3 ENGINEERING Geologic Map (without TTM) ..... Plate 1.4 GEOLOGIS1 Landslide Inventory Map from CDMG OFR98-09 . . . . . . . . . . Plate 1.5 Seismic Hazard Zone Map ..... Plate 1.6 Historical High Groundwater Map .... Plate 1.7 Cross Sections . . . . . . . . . . . . . . . . . Plates 2.1- 2.11 Boring Logs ...... Plates B1-B27, B1(1995)-B12(1995), B115 (by PSE) Seismicity Analyses . . . . . . . . Appendix A Shear Test Diagrams ..... Appendix B Consolidation Test Results ..... Appendix C Slope Stability Analyses ..... Appendix D Chemical Test Results . . . . . . . Appendix E Grading Details ..... Appendix F B7-B8 JPG files on Direct CD Rom ... CD1 References . . . . . . . . . . . . . . . . . Plates R.1 and R.2

XC: (6) Addressee

- (3) Sikand Engineering
- (2) County of Los Angeles, Land Development

# **SITE LOCATION MAP**

# VESTING TENTATIVE TRACT MAP NO. 060922 SKYLINE RANCH, SANTA CLARITA AREA, COUNTY OF LOS ANGELES, CALIFORNIA

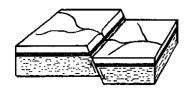


Geolabs - Westlake Village GEOLOGY AND SOIL ENGINEERING

DATE 3/6/04 BY 55

# RESPONSE TO LACDPW REVIEW SHEETS DATED MAY 25 AND JUNE 15, 2004 FOR TENTATIVE TRACT 60922, SKYLINE RANCH, SANTA CLARITA AREA, COUNTY OF LOS ANGELES, CA

August 23, 2004 W.O. 8838



R & R Services

Corporation

GEOLABS-WESTLAKE VILLAGE

Foundation and Soils Engineering, Geology

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Fax: (818) 889-2995 (805) 379-2603

August 23, 2004 W.O. 8838

Pardee Homes 26650 The Old Road, Suite 110 Valencia, California 91381

Attention:

Mr. Wade Lewis

SUBJECT:

Response to LACDPW Review Sheets dated May 25 and June 15, 2004

for Tentative Tract No. 60922, Skyline Ranch, Santa Clarita Area,

County of Los Angeles, California

Mr. Lewis:

In accordance with your request, we present herein our responses to the issues raised by the LACDPW Materials Engineering Division in their review of our Tentative Tract Report dated March 6, 2004. Copies of the review sheets are provided in Appendix A for your reference.

The tasks performed for the response included the drilling and sampling of an additional two large-diameter bucket-auger borings, dozer work to provide further access within the site, excavation and logging of an additional seven test pits (TP17-TP23), laboratory testing of selected samples, the revision of the Geologic Map and applicable cross sections, review of pertinent references, additional soils engineering analyses, and preparation of this report. Specific responses to the issues raised by LACDPW are provided later in this report, following brief discussions of the revisions to the Tentative Tract Map design and supplemental data obtained since our March 6, 2004 report.

# REVISIONS TO TENTATIVE TRACT MAP

Minor revisions have been made to the Tentative Tract Map by Sikand Engineering and include: changes to interior street layouts and circulation, changes to lot layouts, the

incorporation of eleven basins around the site perimeter, and engineered slopes covering L1. A booster station pad is also proposed adjacent to Lot 766. A total of 1341 residential lots are currently proposed.

# SUPPLEMENTAL EXPLORATION AND LABORATORY TESTING

Borings B28 and B29 were advanced in the southerly portion of the site to further define the stratigraphy and geologic structure of the site. Logs are enclosed as Plates B28.1, B28.2, B29.1, B29.2, and B29.3. In addition, seven exploratory test pits were advanced in the main canyon to determine the depth of alluvial deposits. These deposits were found to be notably coarse-grained and contain abundant oversized boulders, commonly in a clast-supported condition (see Plates TP17-TP23).

Samples from borings B28 and B29 were submitted to our laboratory for selected testing. Moisture-dry density test results are presented on the enclosed boring logs (Plates B28 & B29). The results of direct shear tests are provided in Appendix D. Maximum dry density test results are provided in the following table.

#### **Laboratory Test Data**

		Optimum	
		Dry	Moisture
		Density	Content
Sample	Description	PCF_	%
B29@63'	Saugus Fm. – Tan silty med-cs. SAND	130	9

# RECENT LEIGHTON & ASSOCIATES STUDY

A Leighton & Associates report dated April 19, 2004 for Tr. 46018-10 & -11 was reviewed by our office since it included exploration of Qls-9A, and Qls-10 near the northwesterly portion of the subject property. Borings BCW-4 and BCW-5 and trench T-22 did not show evidence of the existence of Landslide Qls-9. We have removed it from our Geologic Map, as

did Leighton & Associates in the referenced report. Copies of Leighton's logs for their borings and test pits are provided in Appendix C.

#### RAPID DRAWDOWN ANALYSES FOR BASINS

Due to the incorporation of basins around the site, additional cross sections (B1 through B7) were prepared and evaluated for rapid drawdown conditions. Analyses are specifically discussed under Soils Eng. Item #1.

#### RESPONSES TO GEOLOGIC REVIEW COMMENTS

#### Item #1 - Landslide L23

Landslide L23 is scheduled for complete removal and recompaction. The Tentative Tract Map has been modified to include a graded slope across the anticipated limits of this removal (See Plate 1.2).

# Item #2 - Landslides L1 and L17

Landslides L1 and L17 are scheduled to be completely removed and recompacted to bedrock. The Tentative Tract Map has been modified to include a graded slope over L1 for its reconstruction. In the case of L17, it is located within an area of planned fill, with a daylight fill extending above its head to the easterly ridgeline. The creation of this daylight fill and the mitigation of L17 will require off-site grading.

# Item #3 - Buttress Keyway per Section C-C'

The slope illustrated by Cross Section C-C' will require buttressing. Revised slope stability analyses were performed (see Soils Eng. Item #1) and led to a key width of 130 feet and depth of five feet. This keyway has been added to the Geologic Map and Removal Map.

#### Item #4 - Cross Section O-O'

Cross Section O-O' has been revised to include the recommended stability fill at its

northerly end (W=25', D=5'): (see Plate 2.7).

# Item #5 - Depiction of L10 on Cross Sections

Cross Sections U-U' and Y-Y' have been revised to depict Landslide L10 (not L11, see Plates 2.10 & 2.11) at the easterly ends of these sections. This landslide should be removed and recompacted in its entirety during the grading of the site.

# Item #6 - Down Dip Cross Sections through Entire Site

Per the request of the Geologic Reviewer, we have prepared Cross Sections AA-AA', BB-BB', and CC-CC' through the entire site in the down-dip direction (see Plate 2.12). These cross sections were drawn with a southwesterly orientation on account of this prevailing orientation of the Saugus Formation and its basal contact across the site. This orientation also captures much of the vertical relief across the site (in comparison to a due-west orientation). Additional discussion with respect to the geologic conditions modeled in our analyses for these sections is provided under Soils Engineering Item #4.

#### RESPONSES TO SOILS ENGINEERING REVIEW COMMENTS

#### Soils Eng. Item #1 - Direct Shear Strength Testing

In our March 6, 2004 report, shear strengths for along-bedding bedrock materials were developed through a combination of correlations (Stark & McCone, 2001) and direct shear strength testing. We understand that County policy has yet to accept the Stark & McCone correlations for use in shear strength estimation and slope stability analyses. Accordingly we present herein discussion of the direct shear test results and determination of the shear strengths utilized in this report.

#### **Saugus Formation**

A composite plot of multi-cycle shear tests performed on fine-grained Saugus Formation

lithologies is presented on Plate STQsm. As seen, a lower-bound shear strength of phi = 11 deg., C=150 psf is appropriate for use in modeling *fine-grained*, *sheared* beds of the Saugus Formation. (A shear strength of phi = 12 deg., C=200 psf was utilized by Pacific Soils Eng. and GeoSoils for the adjacent Tr. 46626, while a shear strength of phi = 13.8 deg., C=200 psf was utilized by Leighton & Associates (2004)). This revised shear strength is utilized for Cross Sections B-B', C-C', D-D', AA-AA', and BB-BB' presented herein.

The along-bedding shear strength of phi = 17 deg., C=150 psf passes through the lowermost third of this data and is considered appropriate for *fine-grained*, *unsheared* Saugus Fm. beds. This shear strength was previously utilized for Cross Sections O-O', V-V', Y-Y and remains applicable to those sections. Hence, revised slope stability for those sections are not presented. This shear strength has also been utilized for Cross Section CC-CC', where boring data indicates a lack of fine-grained, sheared lithologies.

The along-bedding shear strength of phi = 25 deg., C=100 psf is applicable to coarse-grained lithologies of the Saugus Formation (and Mint Canyon Formation).

## **Mint Canyon Formation**

Fine-grained beds within the Mint Canyon Formation at the site are generally lacking, as similarly noted in Tr. 46018-10 and -11 of Plum Canyon. In our March 6, 2004 report, a shear strength of phi = 12 deg., C=150 psf was utilized to model the along-bedding strength for fine-grained sheared lithologies of the Mint Canyon Formation. This shear strength is significantly weaker than that used by Leighton & Associates (for the adjacent Plum Canyon project), which was based on the lower mean/median shear strength parameters for along-bedding of the Mint Canyon Formation (phi = 23 deg., C=250 psf) presented in CDMG, 1998. It is also slightly less than the along-bedding shear strength utilized by GeoSoils (1998) for the Mint Canyon

Formation (phi = 12 deg. C=200 psf) for the adjacent (westerly) Tr. 46626. Accordingly, revision of this strength and applicable slope stability analyses from our March 6, 2004 report is not warranted.

For coarse-grained lithologies of the Mint Canyon Formation, an along-bedding strength of phi = 25 deg., C=100 psf was utilized in our March 6, 2004 report. This strength is relatively similar to the along-bedding of the Mint Canyon Formation (phi = 23 deg., C=250 psf) presented in CDMG (1998).

Cross sections which were analyzed for gross stability and required the use of revised along-bedding strengths are discussed herein. The results of the revised analyses are presented in Appendix B.

## **Cross Section B-B'**

The analyses for Cross Section B-B' were revised for the phi = 11 deg., C=150 psf shear strength. Bedding condition described in our March 6, 2004 report remain applicable. A key width of 180 feet, and depth of 5 feet, along with a backcut of 2.2:1 provide for adequate factors of safety with Spencer's Method. The 2.2:1 backcut yields a temporary factor of safety of 1.27 with Spencer's Method.

#### Cross Section C-C'

This cross section was also reevaluated with the phi=11 deg., C=150 psf along-bedding TQs shear strength. A key width of 130 feet, depth of 5 feet provide for factors of safety of 1.69 (static) and 1.24 (pseudostatic) with Spencer's Method. A 3:1 backcut provides for a temporary factor of safety of 1.26.

#### Cross Section D-D'

Analyses were revised for the phi=11 deg. C=150 psf along-bedding TQs shear strength.

A factor of safety of 1.62 was obtained for the static condition and a key width of 140 feet and depth of 5 feet. A 2.75:1 backcut yields a temporary factor of safety of 1.25.

# Cross Section O-O'

Boring 28 was advanced in the southerly portion of the site to further define the geologic structure and stratigraphy for the north-facing cut slope. Poorly-bedded sandstone and conglomerate was encountered throughout the depth explored, with refusal occurring at 59 feet. Bedding attitudes recorded render an overall shallow westerly dip, resulting in a laterally-supported bedding condition relative to the proposed cut slope. Hence, slope stability analyses are not warranted. However, the stabilization of the slope remains appropriate in light of the friable nature of the sandstones encountered. The W=70', D=5' keyway and 1.5:1 backcut remain applicable.

# Cross Section R-R'

As with Section O-O', Boring 28 indicates that the bedding of the Saugus Formation is laterally supported relative to this cut slope, and lithologies are predominantly coarse-grained. Stabilization of the slope remains appropriate, with a key width of 60 feet, depth of 5 feet, and 1.75:1 backcut at the location of R-R'.

#### Cross Section V-V'

The along-bedding TQs shear strength of phi = 17 degrees, C=150 psf remains applicable to this cross section. Hence, revision of the analyses is not warranted, and the W=130' D=5' keyway remains applicable.

#### Cross Section Y-Y'

The along-bedding TQs shear strength of phi = 17 degrees, C=150 psf remains applicable to this cross section. Hence, revision of the analyses is not warranted, and the keyway (W=40'

D=5') remains applicable.

# Cross Section B1-B1' Rapid Drawdown

Based on the data from surrounding borings, the Saugus Formation dips shallowly to the west rendering a laterally supported bedding condition for this south-facing slope. Due to its height and basin, this section was evaluated for the rapid drawdown condition with circular failure surfaces. Factors of safety of 2.3 (static) and 1.59 (pseudostatic) were obtained (See Plates B1.1-B1.4 and B1p.1-B1p.4).

# Cross Section B2-B2' Rapid Drawdown

A stability fill (W=80', D=5') is recommended for this cut slope in order to remove the southerly-dipping bedrock indicated by Boring 26. Boring 25 and surrounding data indicate that the Saugus Formation within the backcut and ascending natural slope is westerly-dipping. Factors of safety of 1.89 (static) and 1.32 (pseudostatic) were obtained for this profile and the rapid drawdown condition (See Plates B2.1-B2.4, B2p.1-B2p.4 of Appendix B).

#### Cross Section B3-B3' Rapid Drawdown

Since the bedding of the Saugus Formation dips shallowly into this section (based on B23), this slope was evaluated with rotational failure surfaces. A stability fill key width of 100 feet and depth of 5 feet is recommended (as an intermediate key width between Section D-D' and the portion of slope further east to remain as cut. A rapid drawdown condition was considered and factors of safety of 1.94 (static) and 1.34 (pseudostatic) were obtained (see Plates B3.1-B3.4, B3p.1-B3p.4).

#### Cross Section B4-B4' Rapid Drawdown

Boring 15 indicates that the Mint Canyon Formation dips shallowly to the west in the vicinity of Cross Section B4-B4'. This boring encountered an entirely coarse-grained

stratigraphy (as did other borings in the Mint Canyon Fm. on this ridge). Thus, the along-bedding shear strength of phi = 25 deg., C=100 psf was applied to a dip range of 4 to 8 degrees. A static factor of safety of 1.6 was obtained for this natural slope.

#### Cross Section B5-B5' Rapid Drawdown

This cut slope is anticipated to encounter daylighted bedding of both the Saugus and Mint Canyon formations. Coarse-grained lithologies are anticipated based on the findings from B11, B15, and B20. Critical geometries were found to pass primarily through the Mint Canyon Formation and through the heel of the keyway. A 40 feet wide, 5 feet deep keyway provides for a static factor of safety of 2.0. The 2:1 backcut yields a temporary factor of safety of 1.61.

#### Cross Section B6-B6' Rapid Drawdown

This section was evaluated in consideration of the daylighted bedding condition of both the Saugus and Mint Canyon Formations and their coarse-grained stratigraphy. Failure geometries through the Mint Canyon were found to be the most critical. A dip range of 5 to 10 degrees was utilized for the Saugus Formation, while the steeper dip range of 10 to 15 degrees was utilized for the Mint Canyon Formation. The lower key width of 50 feet and upper key width of 40 feet (and depths of 5 feet) were found to yield satisfactory factors of safety for static (factor of safety = 1.59) and pseudostatic (factor of safety = 1.11 with Spencer's Method) conditions.

The composite backcut yields a temporary factor of safety of 1.43 (see Plates B6b.1-B6b.3)

#### Cross Section B7-B7' Rapid Drawdown

This section was evaluated with the same 5 to 12 degrees daylighted bedding condition as H-H', and the coarse-grained along-bedding strength based on B13 and B22. A 60 feet wide, 5

feet deep keyway and 2:1 backcut provide for a static factor of 1.67 (see Plate B7.1-B7.3). The 2:1 backcut yields a temporary factor of safety of 1.55 (See Plates B7b.1-B7b.3).

# Soils Engineering Item #2

The landslide denoted as Qls-10 was explored by Leighton & Associates with Boring BCW-3 which encountered landslide debris to a depth of 25 feet. We recommend the removal and recompaction of this landslide in its entirety in order to mitigate its influence on the proposed Whites Canyon Road. As noted by Leighton & Associates on p. 13 of their April 19, 2004 report, Qls-10 should be mitigated by removal of landslide debris and constructing of buttress fills when plans for future development south of the proposed Farrell Road are developed. Hence, this work may be implemented by Shapell-Monteverde prior to the grading of T.T.M. 060922.

# Soils Engineering Item #3

The grading required for the removal and recompaction of Landslide L1 has been added to the Tentative Tract Map.

In the case of L17, it is located within an area of planned fill, with a daylight fill extending above its head to the easterly ridgeline. The creation of this daylight fill and the mitigation of L17 will require off-site grading.

Landslide L23 is scheduled for complete removal and recompaction. The Tentative Tract

Map should be modified to include a graded slope across the anticipated limits of this removal.

Landslide Qls-10a was explored by boring BCW-2 which encountered landslide debris to a depth of 35 feet. This landslide should be removed and recompacted in its entirety, with any affected portions of the planned cut slope provided with a stability fill keyway (Min. W=20', D=3'). Backdrains and/or subdrains should be installed in the removal. As in the cases of Qls-

9a and Qls-10, landslide Qls-10a may be removed under future Shapell-Monteverde plans as discussed by Leighton & Associates (2004).

# Soils Engineering Item #4

Cross Sections AA-AA', BB-BB', and CC-CC' were prepared in the down-dip direction (south-westerly) through the entirety of the site to address this comment. Analyses were performed first with Janbu's Method, followed by Spencer's Method for a more rigorous treatment of inter-slice forces. The Spencer's Method output also lists the shear strengths utilized along segments, thus allowing review of which material strength/type was encountered along the segments of the most critical geometry.

#### Cross Section AA-AA'

Data along the profile of AA-AA' indicates that the Saugus Formation has dips generally ranging from 5 to 10 degrees, while the Mint Canyon dips at steeper inclinations, in the range of 20 to 30 degrees. Review of the profile relative to these dips indicates that the only the Saugus Formation (and its basal contact) might yield daylighted bedding conditions. Search blocks were defined to evaluate such conditions.

The weak parallel to bedding shear strengths were applied to the Saugus and Mint Canyon Formations since boring data along the section is lacking to dispel the presence of such weak beds. The most critical failure geometries were found to nearly parallel the TQs/Tmc contact, and pass through planned fills (were encountered). A Spencer's factor of safety of 3.99 was obtained (See Plates AAs.1-AAs.6). Pseudostatic analyses were not performed since the Saugus Formation dips at inclinations of less than 12 degrees.

#### **Cross Section BB-BB'**

Based on the available data, the Saugus Formation generally dips between 4 to 9 degrees

along this section, with the exception of the western-most portion of the section, where attitudes from outcrop indicate a northwesterly dip. This yields a very flat to neutral apparent dip relative to the cross section. This portion of the Saugus Formation was modeled as isotropic (between x=0 and x=1730', soil unit type #5). Critical failure surfaces were generally found to toe-out near this zone, yielding a minimum Spencer's factor of safety of 2.86 (see Plates BBs.1-BBs.5).

Circular failure surfaces were also evaluated since the westerly end of the section presents a relatively tall fill slope above a descending natural slope. Factors of safety of 2.6 (static) and 1.75 (pseudostatic) were obtained (see Plates BBc.1-BBc.6, BBcp.1-BBcp.6).

# **Cross Section CC-CC'**

This cross section passes through several of the deep borings performed at the site which document the lack of continuity of fine-grained beds within the Saugus and Mint Canyon Formations. Specifically, borings B2, B3, B4, B7, and B8 penetrated the formational contact, and document a lack of fine-grained beds. In fact, the base of the Saugus Formation is clearly conglomeratic as documented in these borings.

Due to this documented stratigraphy, the higher parallel to bedding strengths were utilized for the Saugus (phi = 17 deg., C=150 psf) and Mint Canyon Formations (phi = 25 deg., C=100 psf) for this section. The most critical failure surfaces were found to occur in the westerly portion of the section, and yielded a minimum Spencer's factor of safety of 2.12 (see Plates CCs.1-CCs.6).

#### Soils Engineering Item #5

Our recommendation for the incorporation of a small, descending 2:1 fill slope for daylight fill lots is one means of protecting lots from potential surficial instability of ascending natural slopes. Alternatives such as impact walls may also achieve adequate levels of protection.

The depiction of a five feet high fill slope is barely visible at the Tentative Tract Map scale of 1"=200'. In light of this, we consider the depiction of this element on the Tentative Tract Map itself as unnecessary. However, this recommendation is clearly shown on our enclosed Removal Map (Plate 1.3) and shall be implemented at the grading plan stage (i.e. 1"=40' scale), where fill slopes or impact walls can be more readily designed and depicted.

# Soils Engineering Item #6

The following items are presented on the Removal Map, Plate 1.3:

- Approximate limits and depths of removal for landslides, alluvium, and other unsuitable soils,
- Buttress and stability fill keyways (including for C-C' and O-O'),
- Restricted Use Areas for landslides or portions thereof (including L9, L21 and L22),
- All other recommended mitigation measures such as subdrains and fill caps.

#### **CLOSURE**

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2) the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or warranty, express or implied.

No. 35444 Exp. 09/30/05

RONALD Z. SHMERLING NO. 1047

CERTIFIED ENGINEERING

This geotechnical report has been prepared in accordance with generally accepted engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

Thank you for this opportunity to be of service. Please do not hesitate to call if you have

any questions regarding this report.

Respectfully submitted,

GEOLABS-WESTLA

David Sarkisian C.E.G. 2183 Jimula 2 Handrling C.E.G. 1047 R.C.E. 35444

Enclosures: Geologic Map.......Plate 1.2 (in pocket)

FNGINEERING

Cross Sections Plate 2.1- 2.15

Boring Logs by GWV ......Plates B28.1, B28.2, B29.1, B

Test Pit Logs ......Plates TP17-TP23

Review Sheet ......Appendix A

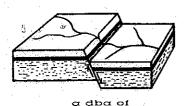
Slope Stability Analyses ......Appendix B

Exploratory Logs by Leighton & Assoc...Appendix C

Shear Test Diagrams .......Appendix D
References ......Plate R.1-R.2

XC: (4) Addressee

- (1) Addressee, Attention Mr. Jim Bizzelle
- (2) Sikand Engineers, Attention Mark Sikand
- (2) LA County, Land Development
- (1) Impact Science, Attention Ken Koch



R & R Services Corporation GEOLABS-WESTLAKE VILLAGE

Foundation and Soils Engineering, Geology

31119 Via Colinas, Suite 502 • Westlake Village, CA 91362

Voice: (818) 889-2562 (805) 495-2197 Fax: (818) 889-2995 (805) 379-2603

> January 3, 2005 W.O. 8838

Pardee Homes 26650 The Old Road, Suite 110 Valencia, California 91381

Attention:

Mr. Wade Lewis

SUBJECT:

Response to LACDPW Review Sheets dated October 12 and 15, 2004

Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area,

County of Los Angeles, California

Mr. Lewis:

We present herein our response to comments raised in the LACDPW Geologic and Soils Engineering Review Sheets dated October 12 and 15, 2004 for the subject property. Copies of these review sheets are provided in Appendix A for your reference.

#### Geologic Item #1 - Use of Latest Tentative Tract Map

The latest Tentative Tract Map layout has been obtained from Sikand Engineering and is utilized as the base for our enclosed Geologic Map (see Plate 1.2) and Removal Map (see Plate 1.3). Changes to the Tentative Tract Map include: minor revision to lot lines, a reduction of residential lot count from 1341 to 1251, and increase in minimum lot size from 4,830 sqft. to 5,775 sqft. The reduction in residential lot count also resulted in the creation of small lot-sized parks (Lots 1255 to 1259) and the increase in size of the Lot 1253 park site. Minor modifications to the street layouts/circulation were also made in the area of the Lot 1253 park site.

No major slope or grading revisions were made to warrant revising cross sections, or slope stability analyses.

#### Soils Engineering Item #1 - Use of Latest Tentative Tract Map

As noted above, the enclosed maps utilize the latest Tentative Tract Map (scale 1"=200") prepared by Sikand Engineering. In order to conform as closely as possible with the Tentative Tract Map submittal, we have "unfrozen" the 5 foot contours on the attached maps. These contours were previously left off of our maps such that the geologic and geotechnical information could be readily visible.

#### Soils Engineering Item #2

#### a) Illustration of Restricted Use Areas

Restricted Use Areas have been illustrated for Landslides L9, L21, and L22 (or portions thereof within tract boundary) on the enclosed Geologic and Removal Maps. It should be noted that the limits of Tentative Tract Map No. 060922 extend to the north, well beyond the limits of proposed development. In keeping with the LACDPW requirements, we have mapped known landslides in that portion of the site and placed them in Restricted Use Areas. That northern area and those landslides and corresponding Restricted Use Areas are presented on Plate 1.4 at a scale of 1"=600'.

#### b) Depiction of Recommended Mitigation Measures

Mitigation measures such as limits of removal, depths of removal, keyways, backcut gradients, fill caps, and proposed subdrains are illustrated on the Removal Map, Plate 1.3.

#### 111 STATEMENT

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2)

NO. 1047

the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or warranty, express or implied.

#### CLOSURE

This geotechnical report has been prepared in accordance with generally accepted engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

Thank you for this opportunity to be of service. Please do not hesitate to call if you have

any questions regarding this report. Respectfully submitted, GEOLABS-WESTLAKE VII No. 2183 No. 35444 David Sarkisian CERTIFIED Exp. 09/30/05 C.E.G. 2183 R.C.E. 35444 ATE OF CALL Geologic Map Plate 1.2 (in pocket) Enclosures: Restricted Use Area Map for TTM 060922 .... Plates 1.4 (in pocket) RONALD Z SHMERLING CERTIFIED ENGINEERING XC: (3) Addressee

- (1) Pardee-Valencia, Attention Jim Bizzelle
- (2) Sikand Engineers, Attention Mark Sikand
- (2) County of Los Angeles, Land Development
- (1) PCR Services, Attention Stephanie Eyestone-Jones 233 Wilshire Blvd., Suite 130 Santa Monica, CA 90401

Copies of Maps on file with the County of Los Angeles, Department of Public Works, Land Development **Bedding** 

Joint or fracture

Shear or fault

Geologic Contact (dashed where approx., dotted where covered)

Fault (dashed where approx., dotted where covered)

Line of Cross Section

Buttress or Stability Fill Keyway with dimensions

MAJOR LAND DIVISION

ENTATIVE TRACT NO. 060922 HE UNINCORPORATED TERRITORY OF

F LOS ANGELES, STATE OF CALIFORNIA

Geolaba - Westlake Village

Geolaba - Westlake Village

GEOLOGY AND SOIL HINGINEERING

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FLATE 1.2

060922-55,dwg Map\Dwg\TM sikand\5097-019\13\Planning\Tentative

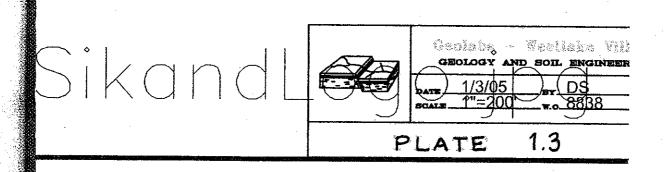


Proposed subdrain and cut-off wa

Proposed swale/fill slope at daylight of fill lots

Restricted Use Area

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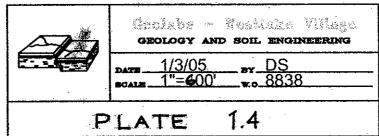
ILSHIRE BLVD., SUITE 130 A MONICA, CA 90401 451-4488

### **ENGINEER:**

N FOUST ASSOCIATES NORTH TUSTIN AVENUE A ANA, CA 92705 667-0496

#### D PERMITTING

N LUKOS ASSOCIATES CHARD FOREST, CA 92630-8300 837-0404



MAJOR LAND DIVISION

G TENTATIVE TRACT NO. 060922

IN THE UNINCORPORATED TERRITORY OF
TY OF LOS ANGELES, STATE OF CALIFORNIA

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## APPENDIX A

## LACDPW REVIEW SHEETS DATED OCTOBER 12 & 15, 2004 FOR TENTATIVE TRACT NO. 060922, SKYLINE RANCH

Sheet 1 of 1

#### County of Los Angeles Department of Public Works GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION **GEOLOGIC REVIEW SHEET**

900 So. Fremont Ave., Alhambra, CA 91803 TEL. (626) 458-4925

D	ISTRIBL	NOITL
1	Geolog	ist

Soils Engineer

**GMED File** Subdivision -

TENTATIVE TRACT 60922	TENTATIVE MAP DATED 3/9/04 (Tentative)
SUBDIVIDER Pardee Homes	LOCATION Santa Clarita
ENGINEER Sikand	
GEOLOGIST & SOILS ENGINEER Geolabs - Westlake Village	REPORT DATE 8/23/04, 3/6/04

The Regional Planning Commission, developer, and engineer are advised that:

#### PRIOR TO RECOMMENDING APPROVAL OF THE TENTATIVE TRACT OR PARCEL MAP:

- Provide a geotechnical map that uses the latest version of the tentative map as a base.
- The Soils Engineering review dated 10/15/04

SCHIVED SOT 2 2 2004

NOTE: Provide a copy of this review sheet with your resubmittal.

NOTE Provide a copy of this review with your resubmittal

Prepared by

Geir R. Mathisen

Reviewed by

Charles T. Nestle

Date 10/12/04

# COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION

#### SOILS ENGINEERING REVIEW SHEET

Telephone: (626	S. Fremont Ave., Alhambra, CA 91803 ) 458-4925	District Office Job Number Sheet 1 of 2	8.2 GMTR
Review No. 2	(1458-4913), (1875), (1975), (1975), (1975), (1976), (1986), (	DISTRIBI	
Tentative Map (Tract) Location	60922 Santa Clarita		Soils Central File
Developer/Owner Engineer/Architect Soils Engineer	Pardee Homes Sikand Geolabs - Westlake Village	1 Geol 1 Soils	Engineer
Geologist	Same as above	1_ Engi	neer/Architect

Review of:

Tentative Map (Tract) Dated By Regional Planning 3/09/04 Soil Engineering and Geologic Report Dated 8/23/04, 3/06/04

Previous review sheet dated 6/15/04

ACTION:

Tentative Map feasibility is not recommended for approval.

#### REMARKS:

- Requirements of the Geology Section are attached. The topography and/or grading shown on the geotechnical map and the latest tentative map must conform.
- 2. Show the following on the geotechnical map:
  - a. Location of "Restricted Use Area(s)". Per the soils engineer, portions of landslides L9, L21, and L22 shall be placed in "Restricted Use Area(s)".
  - b. All recommended mitigation measures.
- 3. Include a copy of this review sheet with your response.

#### NOTE(S) TO THE PLAN CHECKER/BUILDING AND SAFETY ENGINEER:

- A. THE ON-SITE SOILS ARE SEVERELY CORROSIVE TO FERROUS METALS.
- B. THE ON-SITE SOILS HAVE A MEDIUM EXPANSION POTENTIAL.
- C. OFF-SITE GRADING IS RECOMMENED FOR THE REMOVAL AND RECOMPACTION OF LANDSLIDES QLS-9A, QLS-10, QLS-10A, L1, AND L17.

Prepared by Yorkniya Worisaku Reviewed by Yoshiya Morisaku

PROFESSIONAL PROFE

Date

10/1<u>5/04</u>

NOTICE: Public safety, relative to geotechnical subsurface exploration, shall be provided in accordance with current codes for excavations, inclusive of the Los Angeles County Code, Chapter 11.48, and the State of California, Title 8, Construction Safety Orders.
P:\Yosh\60922TentTa

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#### **AERIAL PHOTOGRAPHS**

Flight C-300, 1928, Frames F9, F10, F11, E243, E244, E245, Scale 1:18,000

Flight C-17727, 1952, Frames 4-72, 4-73, 4-74, Scale 1:14,400

Flight TG-7600, 1976, Frames 21-3, 21-4, 21-5, Scale 1:24,000

Flight 94-028, acc. 04684, 1994, Frames 106, 107, 108, 1:32,500

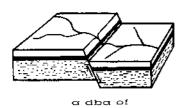
Horizon Surveys, performed for Sikand Engineering, Tr. 50846, Monarch Hills project, dated January 29, 1994, Frames 1-5, Scale 1:4800 +/-

Plate R.2

## ADDENDUM GEOTECHNICAL REPORT, TENTATIVE TRACT MAP NO. 060922, SKYLINE RANCH, SANTA CLARITA AREA, COUNTY OF LOS ANGELES, CALIFORNIA

November 16, 2006 W.O. 8838

GEOLABS-WESTLAKE VILLAGE



R & R Services

Corporation

GEOLABS-WESTLAKE VILLAGE

Foundation and Soils Engineering, Geology

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Fax: (818) 889-2995 (805) 379-2603

November 16, 2006 W.O. 8838

Pardee Homes 26650 The Old Road, Suite 110 Valencia, California 91381

Attention:

Mr. Tom Mitchell

SUBJECT:

Addendum Geotechnical Report,

Tentative Tract Map No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

Mr. Mitchell:

We present herein an addendum geotechnical report for Tentative Tract Map No. 060922 to address the changes made to the Tentative Tract Map design since the issuance of our last geotechnical report dated January 3, 2005. That report was approved in the LACDPW Geologic and Soils Engineering Review Sheets dated February 7 and 22, 2005.

Since the issuance of our January 3, 2005 report, additional field exploration and laboratory testing has been performed for the purpose of evaluating the future 40-scale grading plans. An additional forty-seven borings (B30 through B76) have been performed, the logs of which are provided in Appendix A. In addition, an additional 185 test pits (TP24-TP208) have been performed throughout the site (See Appendix B).

Based on our review of the available data and the revised Tentative Tract Map design prepared by Sikand Engineers, the development of Tentative Tract Map No. 60922 is considered feasible from a geotechnical engineering and engineering geologic perspective. Recommendations presented in our previous reports remain applicable, unless superseded herein.

#### MODIFICATIONS TO THE TENTATIVE TRACT MAP

Pertinent modifications to the Tentative Tract Map (since our January 3, 2005 report) consist of the following elements:

- \* Incorporation of new topographic base map, which is incorporated in our enclosed maps with 5-foot contour intervals;
- \* The water tank site formerly located in the easterly portion of the site has been moved to the northwesterly portion of the site (Lot 1321) at elevation 1962'. The former water tank site has been redesigned for residential lots.
- \* Cut slopes in the northwesterly corner of the site have been modified to accommodate basins and the new water tank site (See Cross Sections B, B1, B2, and C).
- \* Grades in the southeasterly portion of the site (vicinity of Lots 1-80) have been lowered five to ten feet for earthwork balance purposes. Minor grade changes and lot line adjustments have been made throughout the rest of the tract.
- \* The vertical and horizontal alignment of Skyline Ranch Road has been modified slightly in the southeasterly portion of the site, warranting revisions to Cross Sections L-L', M-M', N-N', P-P', and B6-B6'.
- \* A total of 1270 residential lots are proposed (Lots 1-1270). Lot 1271 is designated as a school site, Lots 1272-1278 are dedicated as parks, and Lots 1279-1306 are Open Space Lots. Debris basins are planned as Lots 1307-1320 and the Water Tank sites and Water Pump/Booster Stations are denoted as Lots 1321-1324.
- \* Improvements (sidewalks, medians, parkways) along Skyline Ranch Drive have been modified/enhanced.

#### **GEOLOGIC FINDINGS**

The additional exploration performed at the site and new topography has allowed for the

refinement of numerous geologic contacts, in particular that of the alluvium within the canyon bottoms. In particular, test pits within the main canyon (Whites Canyon) have verified the relatively shallow (5 to 15 feet on average) of the alluvial deposits, as well as their notably coarse-grained nature. The distribution of terrace deposits has also been reduced on the basis of test pit findings. The distribution and geologic structure of the Saugus Formation and underlying Mint Canyon Formation generally remains as previously defined in our referenced reports, albeit contacts have been updated in light of the new topography and additional geologic mapping.

Numerous borings were advanced within mapped landslides for the purpose of defining their depth of failure. A possible landslide was encountered by Boring B69 in the north-central portion of the site. The majority of this queried landslide is within an area of deep planned cut.

#### PROPOSED WATER TANK SITE

A new water tank site for two tanks is proposed at elevation 1962' in the northwesterly portion of the site. The westerly tank footprint will be comprised entirely of bedrock cut, however the easterly tank is underlain by a cut-fill transition. Hence the easterly tank should be anticipated to be undercut (5 to 10 feet) so that a relatively uniform depth of engineered fill is provided beneath the tank. The southerly-facing cut slope associated with this site is anticipated to be buttressed, as discussed in the slope stability section.

#### REVISED CROSS SECTIONS AND SLOPE STABILITY ANALYSES

Based on our review of the additional geologic data and revised Tentative Tract Map, the following cross sections warranted revision and slope stability analyses: B1-B1', B2-B2', B3-B3', B6-B6', C-C', D-D', L-L', M-M', N-N', P-P', and R-R'.

Shear strengths previously utilized in our referenced reports were assigned to the various material types. These are summarized in the following table:

Material	Cohesion (psf)	Angle of Internal Friction
Engineered Fill	200	34
Saugus Formation Across-Bedding	225	40
Saugus Formation Along-Bedding for Coarse- grained Lithologies	100	25
Saugus Formation Along-Bedding for Fine-grained Unsheared Lithologies	150	17
Saugus Formation Along Bedding for Fine-Grained Sheared Lithologies	150	11
Mint Canyon Formation Across-Bedding	200	40
Mint Canyon Formation Along-Bedding for Coarse- grained Lithologies	100	25
Mint Canyon Fm. Along-Bedding for Sheared Fine- grained Lithologies	150	12

#### Cross Section A-A'

Cross Section A-A' has been updated to illustrate the off-site grading and the proposed stability fills recommended by Geosoils, Inc. in their report dated June 5, 2006.

#### Cross Section B-B'

Borings B25 and B46 were advanced in the vicinity of this south-facing perimeter cut slope to define the geologic structure and stratigraphy to be exposed. The structural data from B25 and B46 indicate that the Saugus Formation is predominantly dipping to the southwest, with local southerly and westerly dips associated with scoured, irregular lithologic contacts. An apparent dip of 10 to 14 degrees was considered appropriate for consideration of translational failure surfaces. Review of the stratigraphy from B25, B46, and the projection of nearby B48 indicates that the coarse-grained along bedding strength (phi = 25 deg., C=100 psf) is applicable to the stratigraphy encountered in B25 and B46. Data from B48 indicates that the unsheared fine-grained along-bedding strength (phi=17 deg., C=150 psf) is applicable to its stratigraphic section to the depth of 125 feet. Stratigraphy below 125 feet in B48 was assigned the sheared

fine-grained along bedding strength (phi = 11 deg., C=150 psf) on account of the sheared claystones encountered at and below this depth.

Analyses indicated that the most critical trial failure surfaces occur within the unsheared fine-grained stratigraphy zone, below the buttress key. Failure surfaces in the sheared, fine-grained along bedding strength zone were sufficiently deep to provide factors of safety well above the required minimums. A buttress key width of 100 feet and depth of 5 feet, along with a 1.94:1 backcut were incorporated in the analyses. Factors of safety of 1.71 (static) and 1.32 (pseudostatic, Spencer's) were obtained. The 1.94:1 backcut provides for a temporary factor of safety of 1.33.

#### Cross Section B1-B1'

This cross section has been revised to evaluate the minor northward shift of the slope and the additional data obtained from B66. This boring encountered southwesterly-dipping Saugus Formation, which was modeled with an apparent dip range of 13 to 16 degrees. The rapid drawdown condition was also incorporated in these analyses on account of the basin. Based on the stratigraphy of B66, the sheared fine-grained along-bedding strength of the Saugus Formation was assigned to materials below 125 feet in B66. This boundary is illustrated on the cross section. The most critical failure surfaces were found to pass through this zone. A buttress key width of 100 feet and depth of 5 feet, along with a 1.9:1 backcut yielded factors of safety of 1.58 and 1.17 for static and pseudostatic conditions respectively. The 1.9:1 backcut yields a temporary factor of safety of 1.32.

#### Cross Section B2-B2'

Due to the southwesterly-dipping bedding identified by B48, a southeasterly cut slope was recommended by our office so as to reduce the loading relative to the south-facing slope associated with the proposed basin. In addition, the southeasterly-facing cut slope eliminates the

exposure of Lots 1248 and 1249 to potential surficial instability within a tall natural slope. Cross Section B2-B2' was drawn to capture the south-facing slope associated with the basin and an apparent dip condition relative to this slope. Review of B48 indicates that the majority of bedding attitudes yield flat apparent dips (typically 6 to 12 degrees) or are supported relative to the line of section. However, a sheared clay with a true-dip roughly parallel the line of section was observed at a depth of 125 feet. The Saugus Formation above this depth was assigned the fine-grained along bedding strength to a dip range of 6 to 12 degrees. The Saugus Formation below the top of this critical bed was assigned the sheared fine-grained along bedding strength. A buttress key width of 60 feet and depth of 5 feet was incorporated in the analysis as well as the rapid drawdown condition due to the basin. The critical failure surface was found to occur in the deeper zone and exit beyond the toe of slope. A factor of safety of 1.52 was obtained. A factor of safety of 1.48 was obtained for the backcut.

#### Cross Section C-C'

This cross section illustrates the new water tank site and the south-facing slopes associated with the water tank site. As discussed in our previous reports, a daylighted bedding condition exists for this southwesterly-facing cut slope based on the B16 data. The slope was reevaluated in light of the lesser total slope height. A five feet thick fill cap for the water tanks and the stabilization of the southwesterly-facing descending slope was also incorporated in the slope stability analyses. A bedding dip range of 21 to 24 degrees was assigned the sheared fine-grained along bedding shear strength (phi = 11 deg., C=150 psf) of the Saugus Fm. A buttress key width of 110 feet and depth of 5 feet, along with a 2.3:1 backcut provide for adequate factors of safety for static (F.O.S. = 1.60) and pseudostatic (F.O.S. = 1.12) conditions. The 2.3:1 backcut yields a factor of safety of 1.4 with Spencer's Method.

#### Cross Section C3-C3'

Boring B70 was advanced in the locality of an interior southwesterly-facing cut slope with a daylighted bedding condition. A dip range of 12 to 16 degrees was considered, along with the sheared fine-grained along bedding strength. A W=90' D=5' keyway, along with a 3:1 backcut was necessary to demonstrate adequate factors of safety (static F.O.S. = 1.7, pseudostatic F.O.S. = 1.25 with Spencer's Method). The 3:1 backcut yields a temporary factor of safety of 1.27.

#### Cross Section D-D'

The terraced pads illustrated in this cross section have been modified in elevation and result in a lesser slope height for the 2:1 perimeter slope. In addition, the data from B49 indicates that the Saugus Formation is generally coarse-grained and yields highly variable bedding attitudes on account of channels and cross-bedding. In general, the downhole data from B49 yields westerly to northwesterly data. Cross-cutting, and generally discontinuous clay shears with variable orientations were also recorded. Bedding data from B17 was generated from the downhole BIPS camera and yielded similarly highly variable dip directions. Consideration of an adverse dip range of 6 to 11 degrees relative to the section is a grossly conservative manner of modeling this slope. The Saugus Formation was assigned the fine-grained along-bedding strength (phi =17 deg., C=150 psf) for this dip range. A phreatic surface was also incorporated into the analysis based on the groundwater depth of 125 feet recorded in B49.

A buttress key width of 100 feet, and depth of 5 feet, along with a 2:1 backcut provides for a factor of safety of 1.56. The backcut yields a temporary factor of safety of 1.27.

#### Cross Sections L-L', M-M', N-N', B6-B6' and P-P'

These cross sections depict the proposed grading of Skyline Ranch Road and the large

west to southwesterly-facing cut slope along its easterly side. Numerous borings have been advanced within this slope to define the structure and stratigraphy of the Saugus and underlying Mint Canyon Formations. Both of these formations are notable coarse-grained with lithologies being dominated by conglomerates, conglomeratic sandstone, and sandstone. The Saugus Formation is interpreted to dip very shallowly to the west and southwest. The Mint Canyon Formation in this locality generally dips to the west and northwest at angles between 10 and 17 degrees. Bedding attitudes recorded from the various borings yield notable variations on account of the irregular and channelized nature of the deposits.

The vast majority of this west to southwesterly-facing slope is recommended for buttressing on account of the anticipated daylighted bedding condition. The coarse-grained along-bedding strengths for the formations were utilized in these analyses based on the boring data. Minor modifications to the buttress dimensions and backcut gradients have been made in our review of the modified grading design. The following table summarizes the factors of safety and buttress dimensions for these four cross sections.

Cross Section	Buttress Keyway Dimensions	Static F.O.S.	Pseudostatic F.O.S.
L-L'	W=70', D=5'	1.86	1.31
M-M'	W=60', D=5'	1.86	1.21
N-N'	W=80', D=5' Lower Key	2.26	1.54
	W=50', D=5' Upper Key		
B6-B6'	W=70' D=5' Lower Key	1.60	1.2
	W=50', D=5' Upper Key		
P-P'	W=80', D=5' Lower Key	2.1	1.49
<u>_</u>	W=50', D=5' Upper Key		

#### **Cross Section R-R'**

The proposed 2:1 cut slope at the south end of Cross Section R-R' was revisited due to the increase in its slope height. Factors of safety of 2.49 (static) and 1.74 (pseudostatic) were obtained in consideration of a W=40', D=5' keyway. The 1.85:1 backcut yields a factor of safety of 1.9.

At the north end of R-R', the lowering of the proposed grade results in a lesser total slope

height of the descending natural slope. As with our previous analyses, this slope was analyzed assuming that the slide debris and proposed fill at the toe are absent (this creating a taller and steeper natural slope condition). Circular trial failure searches were performed to identify the distance into the pad at which adequate factors of safety are present. This distance was found to be 40 feet at the location of R-R', which represents the worst-case condition for this natural slope. This slope setback of 40 feet is presented for Lots 80 through 86 as a preliminary slope setback.

#### SUMMARY

Based on our review of the available data and Tentative Tract Map design prepared by Sikand Engineers, Tentative Tract Map No. 60922 is considered feasible from a geotechnical engineering and engineering geologic perspective. Remedial grading recommendations such as keyways, alluvial and landslide removals, subdrains, and settlement monuments are illustrated on the enclosed Removal Map (Plate 1.3). Grading plans should be provided to our office for our review and comment. Design-level geotechnical recommendations shall be provided at that time.

#### 111 STATEMENT

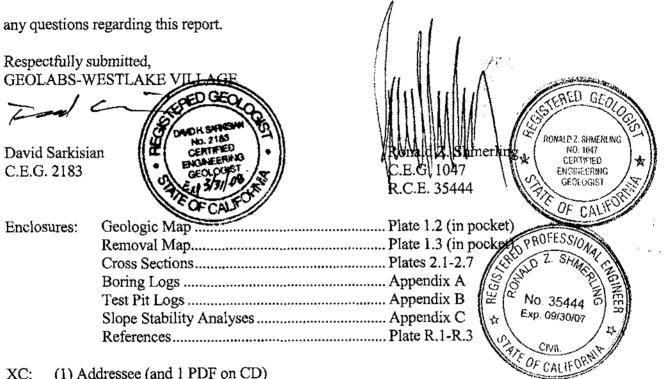
Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2) the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or

warranty, express or implied.

#### **CLOSURE**

This geotechnical report has been prepared in accordance with generally accepted engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

Thank you for this opportunity to be of service. Please do not hesitate to call if you have



- XC:
- (1) Addressee (and 1 PDF on CD)
- (1) Pardee-Valencia, Attention Jim Bizzelle
- (2) Sikand Engineers, Attention Craig Young
- (2) County of Los Angeles, Land Development (and 1 PDF on CD)
- (2) PCR Services, Attention Jay Ziff (and 1 PDF on CD)

233 Wilshire Blvd., Suite 130 Santa Monica, CA 90401

(1) File

# GEOLOGIC MAP OF VTTM 060922, SKYLINE RANCH, COUNTY OF LOSANGELES, CALIFORNIA

11/16/06

PLATE 1.2

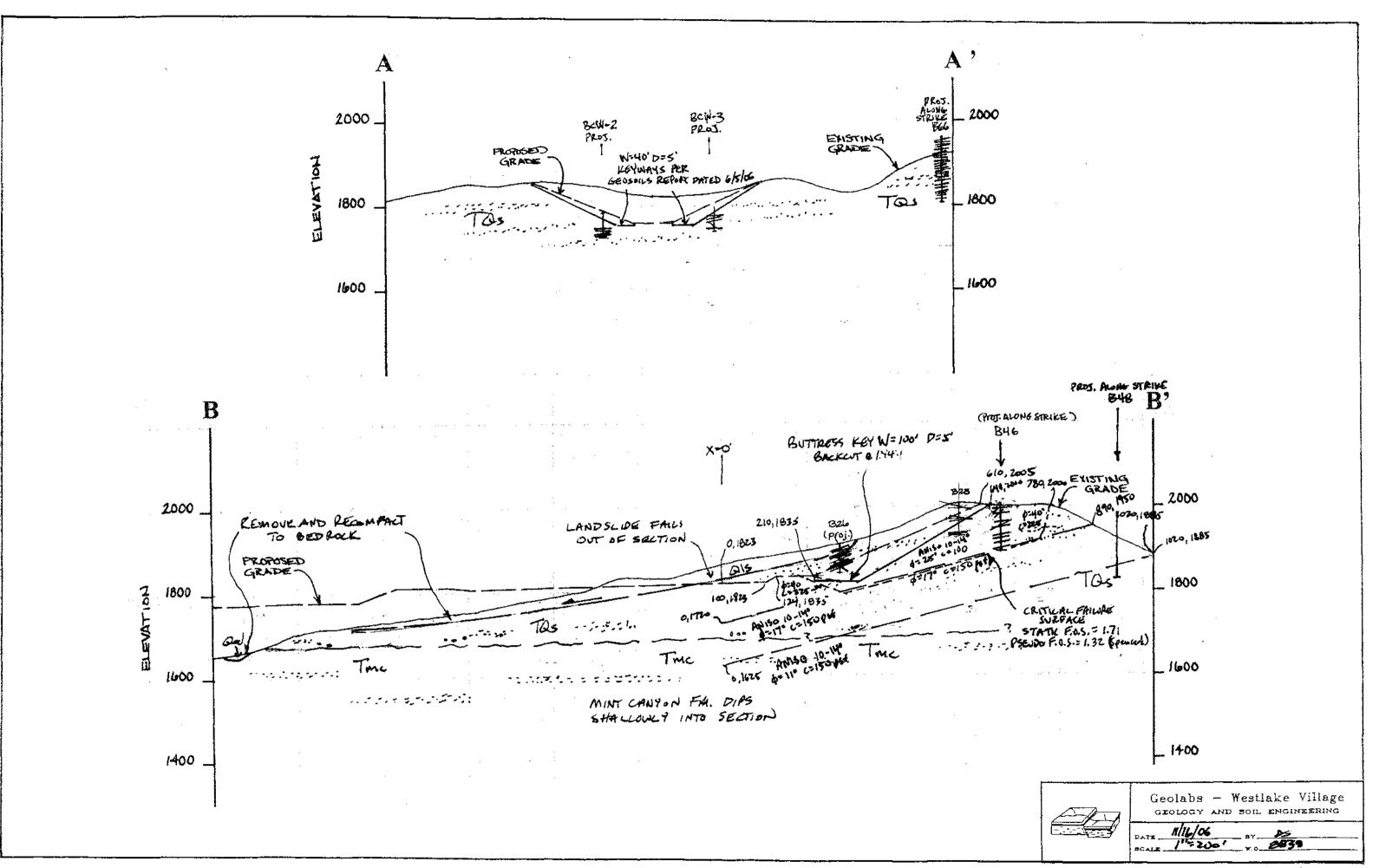
MAP ON FILE WITH THE LOS ANGELES COUNTY DEPARTMENT OF REGIONAL PLANNING

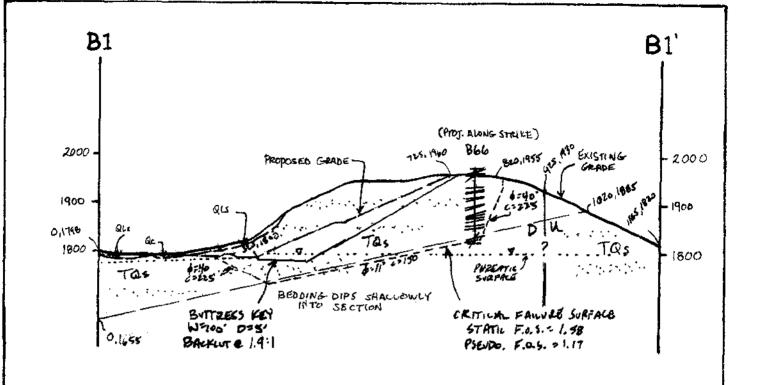
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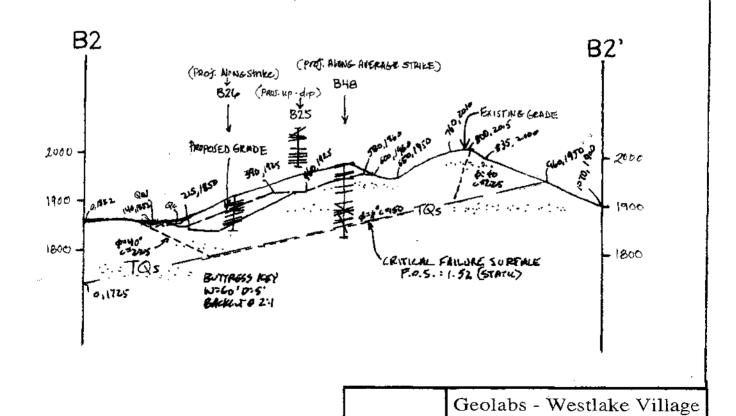
11/16/06

PLATE 1.3

MAP ON FILE WITH THE LOS ANGELES COUNTY DEPARTMENT OF REGIONAL PLANNING





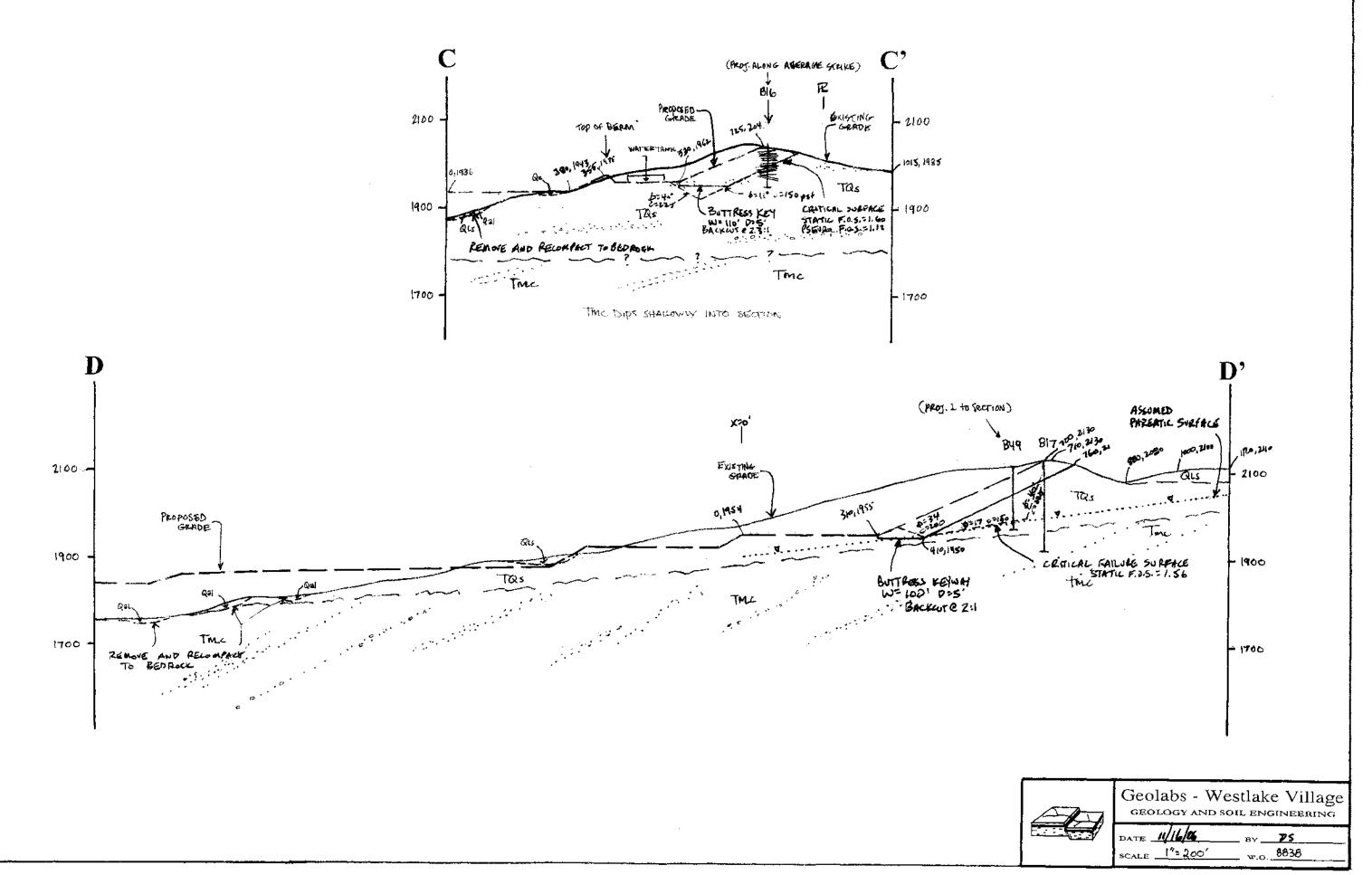


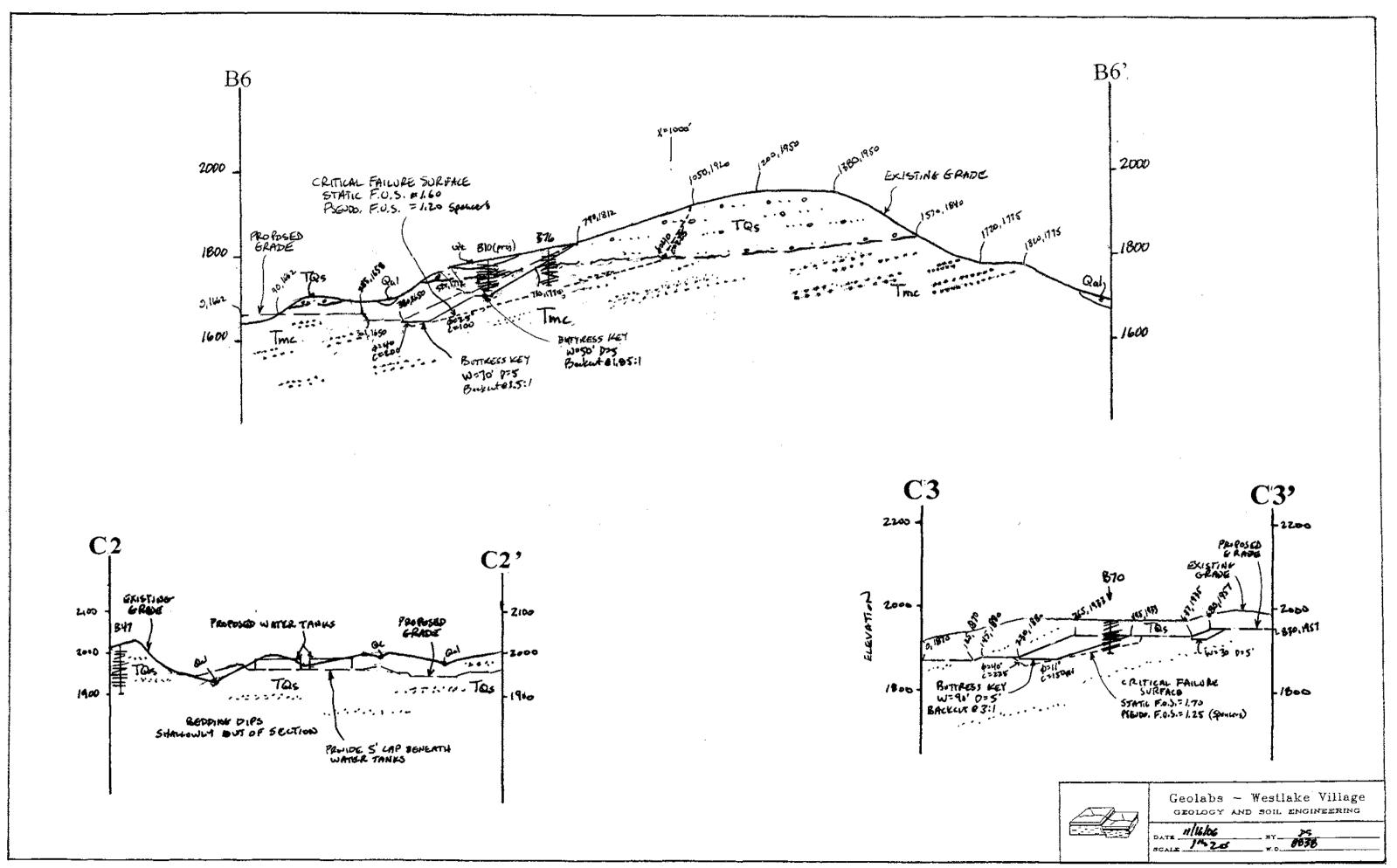
W.O. 9838

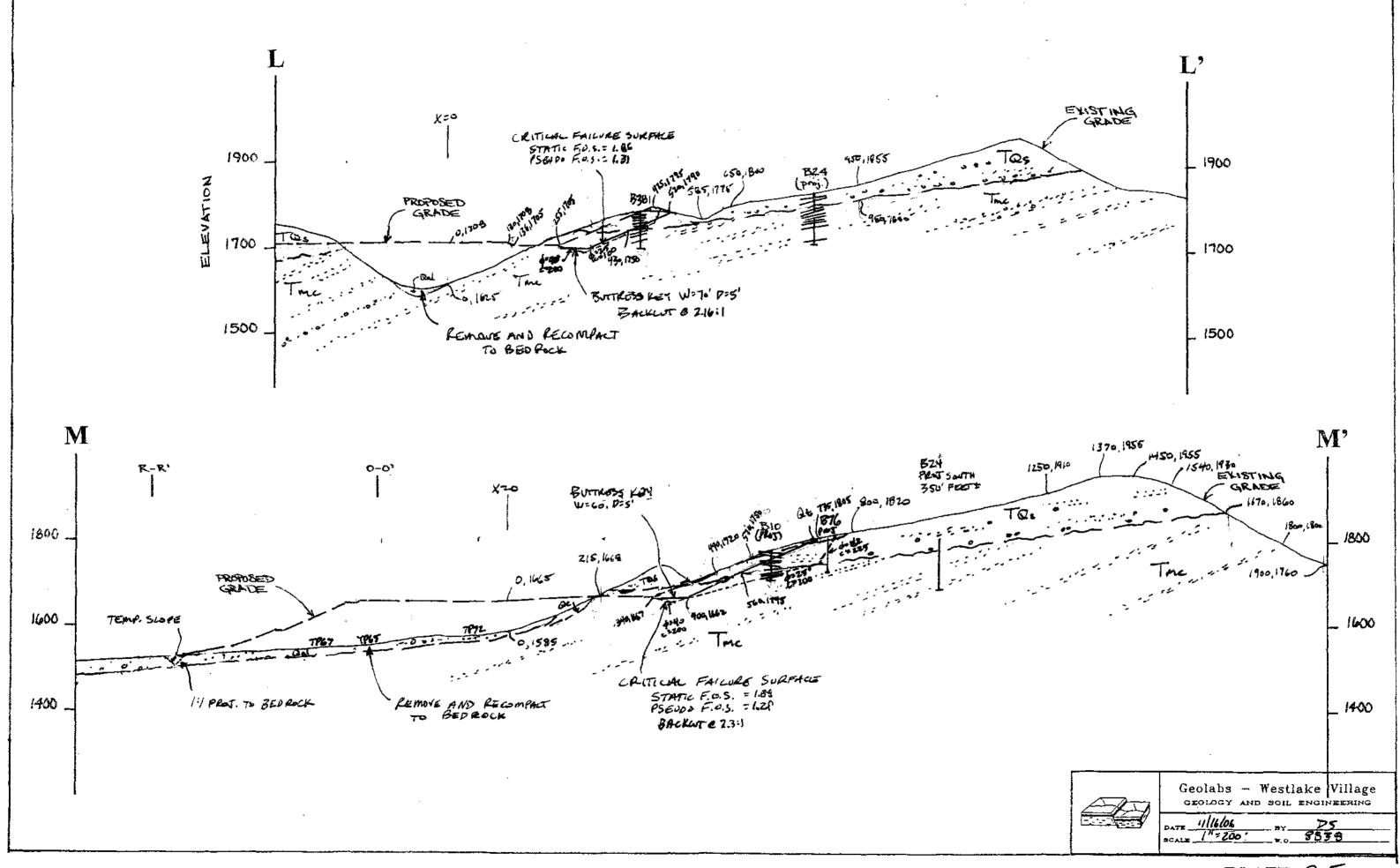
GEOLOGY AND SOIL ENGINEERING

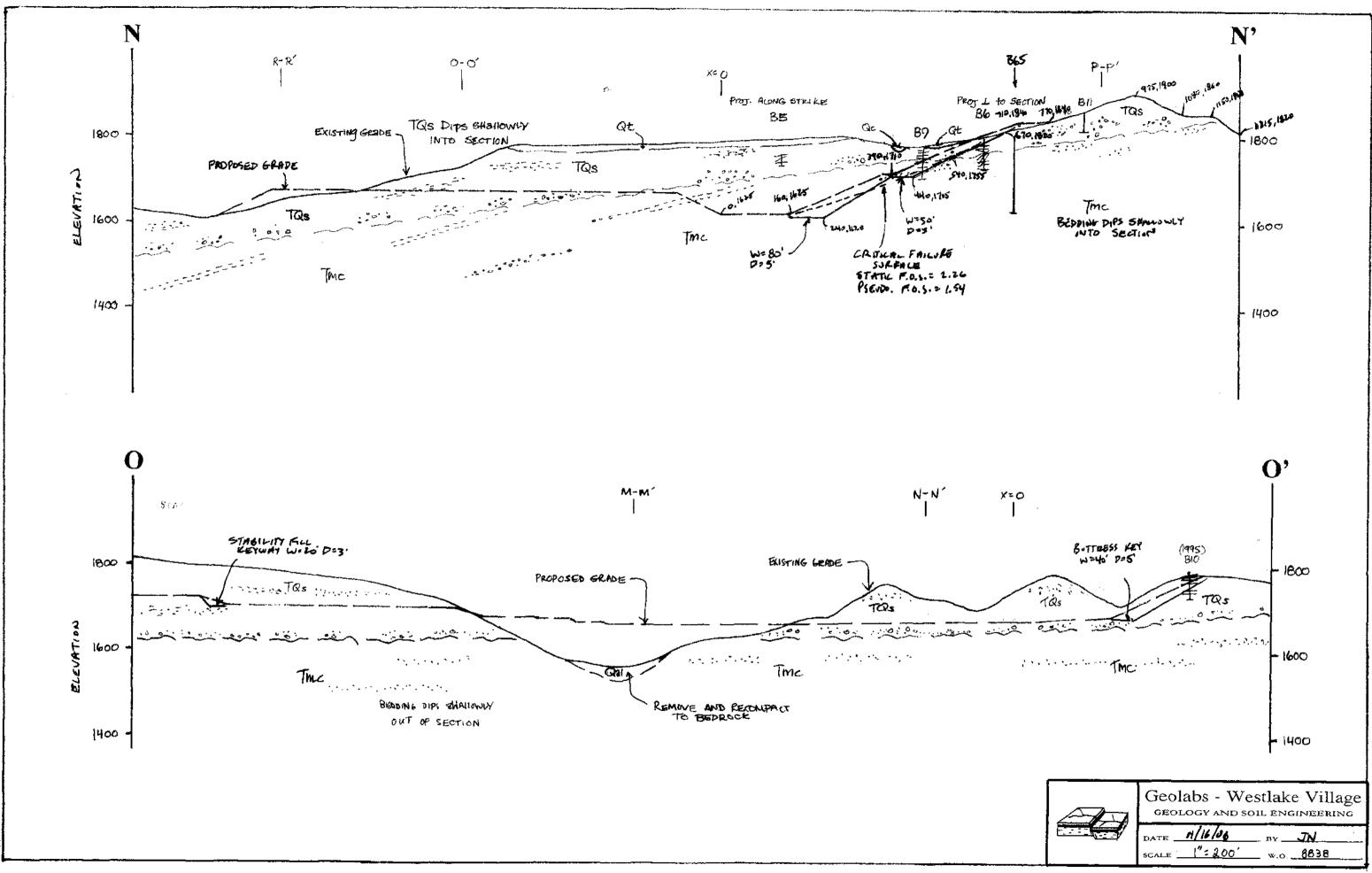
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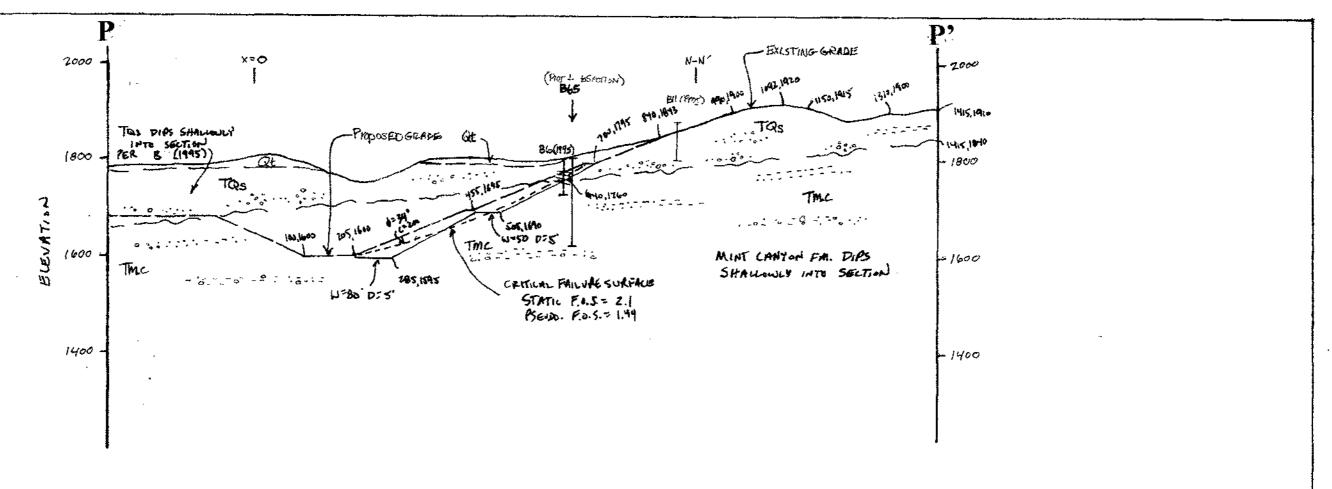
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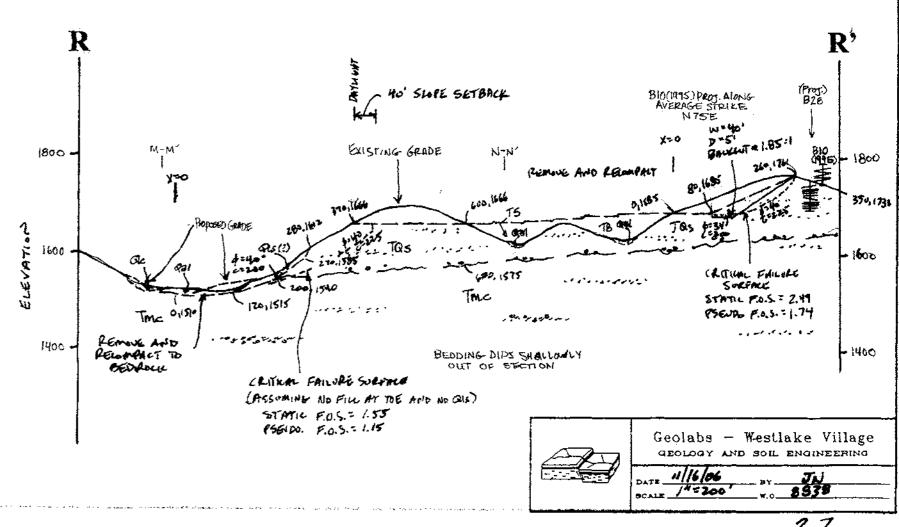












## APPENDIX A

## BORING LOGS B30 THROUGH B76

TTM 060922, SKYLINE RANCH COUNTY OF LOS ANGELES, CALIFORNIA

LOG OF BORING B30

SUBSURFACE DATA		KING DOU
CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Ciarita	ELEVATION: 1518'	DATE: 3/24/06
RIG TYPE: 6" HSA	HAMMER WEIGHTS: 140 lbs.	DROP: 30"
N UBM DD	DESCRIPTION	ATTITUDES
0 X X X X X X X X X X X X X X X X X X X	Alluvium: Brown silty fine to coarse grained SAND with gravel and cobbles, abundant roothairs, loose, moist.	
5 17/22/19 C 2.2 125.0	Light gray gravelly SAND, medium dense, dry.	
10 15/50-6" C	Tan to light gray sandy GRAVEL, friable, dry (no sample recovered).	
15 50-3" C	Tan to light gray sandy GRAVEL, friable, dry (no sample recovered).	
20 50-5" C	Tan to light gray sandy GRAVEL, friable, dry (no sample recovered).	
25 8/13/26 C 5.6 121.9	Olive to tan gravelly fine to coarse grained SAND, friable, medium den moist.	se,
35	Refusal on boulder Total Depth - 30' No groundwater No caving	
45 ADDITIONAL COMMENTS:	Blows per 6" unless otherwise noted C = California Sampler	

C = California Sampler

UBSURFACE DATA LOG OF BORING B31						
CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838				
LOCATION: Santa Clarita	ELEVATION: 1518'	DATE: 3/24/06				
RIG TYPE: 6" HSA	HAMMER WEIGHTS: 140 lbs.	DROP: 30"				
N UBM DD	DESCRIPTION	ATTITUDES				
0	Alluvium: Brown silty fine to coarse grained SAND with gravel and cobbles, very dense at surface, but loose at 6" below surface, moist.					
5 12/21/32 C 3.2 116.7	Tan silty gravelly fine to coarse grained SAND, friable, loose, moist.  @7' - Drilling through cobbles.					
10 50-5" C	Tan gravelly fine to coarse grained SAND, friable, dry (no sample recovered).					
15 21/35/33 C 3.0 132.8	Tan gravelly fine to coarse grained SAND with cobbles, friable, dense, dry to moist.					
20 50-4" C	Tan gravelly fine to coarse grained SAND with small cobbles, friable, dry (no sample recovered).					
25 50-0" S	Refusal on cobble/boulder. Total Depth - 25' No groundwater No caving					
30						
35						
40						
45 ADDITIONAL COMMENTS:	Blows per 6" unless otherwise noted C = California Sampler					

C = California Sampler S = Standard Penetration Test

SUBSURFACE DATA LOG OF BORING B32

SUBS	SUBSURFACE DATA LOG OF BORING B32						
	CLIENT: Pardee Homes					PROJECT: Skyline Ranch	W.O.: 8838
	LOCATION: Santa Ciarita				rita	ELEVATION: 1518'	DATE: 3/24/06
	RIG TY	PE:	6" H	ISA		HAMMER WEIGHTS: 140 lbs.	DROP: 30"
	N_	U		М	DD	DESCRIPTION	ATTITUDES
이						Alluvium: Brownish tan gravelly SAND with cobbles, loose, dry.	
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						Refusal on boulder/cobble	
						Total Depth - 3'	
5						No groundwater	
						No caving	
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SUBSURFACE DATA LOG OF BORING B33

	CLIE	NT:	Par	iee H	omes	PROJECT: Skyline Ranch	W.O.: 8838
_	LOCATION					ELEVATION: 1518'	DATE: 3/24/06
	RIG TY	PE:	6" H	ISA		HAMMER WEIGHTS: 140 lbs.	DROP: 30"
	N	U	В	М	DD	DESCRIPTION	ATTITUDES
0						Alluvium: Brownish tan gravelly SAND with cobbles, loose, dry.	[
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						Total Depth - 3'	
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	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O. <u>:</u> 8838
	LOCATION	ON:	San	ita Cla	rita	ELEVATION: 1518'	DATE: 3/24/06
	RIG TY	PE:	6" ⊦	ISA		HAMMER WEIGHTS: 140 lbs.	DROP: 30"
	N	U	В	М	DD		ATTITUDES
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	<u>CLI</u> E	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838		
	LOCATION	ON:	Sar	ita Cla	arita	ELEVATION: 1518'	DATE: 3/24/06		
	RIG TY	PË:	6" F	-ISA		HAMMER WEIGHTS: 140 lbs.	DROP: 30"		
	N	U	В	M	DD	DESCRIPTION	ATTITUDES		
0			X		Ţ	Alluvium: Brownish tan fine to coarse grained SAND with gravel and			
			Х	1		cobbles, roothairs, loose, moist.			
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	!		X X						
			^	}		Drilling on cobble/boulder, no sample taken.			
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H	38/50-3"	С		6.2	119.5	Brownish tan silty fine to coarse grained SAND with gravel, medium			
			}	}		dense, moist.			
10	38/50-4"	С	]	9.8	111.2				
		ļ			1	SANDSTONE, friable, dense, moist.	:		
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15	50-3"	s				Gray gravelly fine to coarse grained SANDSTONE, friable, moist (no			
						sample recovered).			
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	<b></b>				1	Gray fine to medium grained SANDSTONE with gravel, friable, very			
20	50-6"	S		}	1	hard, moist.			
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25	50-6"	s		}		Gray fine to medium grained SANDSTONE with gravel, hard, moist.			
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						S = Standard Penetration Test			
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SUBSURFACE DATA

LOG OF BORING B36

SUBS	SUBSURFACE DATA LOG OF BORING B36						
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838
	LOCATION: Santa Clarita					ELEVATION: 1518'	DATE: 3/24/06
	RIG TY	PE:	6" F	HSA.		HAMMER WEIGHTS: 140 lbs.	DROP: 30"
	N	U	В	М	DD	DESCRIPTION	ATTITUDES
0	•		Х			Alluvium: Brown silty fine to coarse grained SAND with gravel and	
			Х	ĺ		cobbles, roothairs, loose, moist.	
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5	8/21/26	٦				Tan gravelly fine to coarse grained SAND, loose, dry.	
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						Refusal on cobble/boulder.	
						Total Depth - 8'	
10						No groundwater	1
$\square$						No caving	
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SUBS	SURFACE	DA	TA.			LOG OF BORING B37					
1. 2				dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838				
	LOCATI	ON:	San	ta Cla	ırita	ELEVATION: 1518'	DATE: 3/24/06				
	RIG TY	PE:		ISA		HAMMER WEIGHTS: 140 lbs.	DROP: 30"				
	N	U	В	М	DD	DESCRIPTION	ATTITUDES				
0						Alluvium: Brown/tan silty fine to coarse grained SAND with gravel					
						and cobbles, roothairs, loose, moist.					
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5											
						@8' Cobble zone.					
10						Refusal on cobble/boulder.					
		\		ŀ		Total Depth - 8'					
<u> </u>						No groundwater No caving					
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SUBSURFACE DATA						LOG OF BOX	
CLIENT: Pardee Homes						PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita						ELEVATION: 1787'±	DATE: 4/21/06
	RIG TY	PE:	24"	Bucke	et :	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N .	U	В	М	DD	DESCRIPTION	ATTITUDES
5			× × × ×			Colluvium: Medium brown silty SAND and abundant scattered gravel and cobbles, subrounded, occasional rootlets, damp, medium dense.  Weathered Saugus Formation: Tan to light brown silty SANDSTONE with abundant gravel and cobbles, well graded, friable, weathered, damp, dense.	@7' Approx. BN90/17W
10	5-12"	С		9.5	115.0	Highly channelized friable SANDSTONE with gravel to weakly cemented sandy CONGLOMERATE, well graded, very dense, moist.	@10' Approx. Horizontal bedding
15						Saugus Formation: Undulatory, scoured contact with cobble to boulder CONGLOMERATE with occasional zones of gravelly SANDSTONE, interbedded.	@13' Approx. Horizontal bedding
		<u> </u>			! 	Gravel CONGLOMERATE.	@17' Approx. BN25W/5SW
20	5-12"	С		10.4	115.9	Tan medium to coarse grained SANDSTONE, slightly friable to friable, dense, moist.  @20' - Cobble CONGLOMERATE.  @22' - Medium to coarse grained SANDSTONE with abundant gravel, friable, well graded.	@20' Approx. BN23W/8SW @23' Approx. Horizontal bedding
25						@25.5' - Gravelly SANDSTONE with occasional subrounded cobbles, well graded.	@27' Approx. Channel N68E/6NW
30	14-12"	С	X X X X	4.3	111.5	Tan coarse grained SANDSTONE with scattered gravels, moist, friable. @31.5' - Fine to coarse gravel CONGLOMERATE, matrix supported, slightly friable to friable, matrix is well graded silty SAND.	
35 40	12-12 <sup>t</sup>	С		10.3	104.5	Tan coarse gravel CONGLOMERATE, matrix supported, slightly friable to friable with occasional interbeds of well graded SANDSTONE massive, very dense, moist.  Discontinuous sand lens.  Silty very fine to medium grained SANDSTONE, friable.	@39' Approx. BN3E/55SE
45 ADDI	TIONAL	CON	MME	NTS:		Slightly undulatory contact. Light brown silty very well graded SANDSTONE with scattered fine to coarse gravel.  Blows per 6"	@42' Approx. Horizontal beddin
		- <b></b> •	• -			C = Modified California Sampler Kelly Bar Weights: 0 - 30', 5,619 lbs. 31 - 60', 3,745 lbs. 61 - 90', 2,280 lbs.	

Logged by: AH/DS

	OL 100	A 1191	IA D	d 11		DDO ISOT, OLULIA DANA	W.O. 2022 000
CLIENT: Pardee Homes						PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita						ELEVATION: 1787'±	DATE: 4/21/06
<u> </u>	RIG TY	_				HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
<u> </u>	<u>N</u>	U	В	M	DD	DESCRIPTION	ATTITUDES
40							
<u> </u>							
╟							
<b> </b>							
45							
<u>-</u> -							
						@47.5' - Tan fine to coarse grained SANDSTONE with scattered	
				ļ		gravel, friable, very dense.	@48' Approx.
							BN26E/4NW
50	15-12"	С		2.9	122.3		
					ŀ		0.501.4
<b> </b>						Buff fine to very coarse grained SANDSTONE with scattered gravel,	@52' Approx. BN26E/5NW
<b>-</b>						well graded.  Cobble to boulder CONGLOMERATE, matrix supported, well graded,	BINZOE/SINVV
55						sand and gravel matrix.	
$\mathbb{H}^{3}$						[@56.5' - Medium to coarse grained SANDSTONE with gravel interbeds.	
							@57' B
							N26E/8NW
		l				Tan to light brown to orangish brown sandy CONGLOMERATE with	
60		•		1		gravel to cobble clasts, matrix supported, friable, moist, very dense.	
					}		
				l			
	20-10"	C	Х	5.7	122.2	Mint One of Franchisch Country and and all the country to the country of the coun	©C4L Ammunu
			1			Mint Canyon Formation: Highly scoured undulatory contact, light gray gravel CONGLOMERATE, moderately cemented, hard, moist.	@64' Approx.  Contact Horizontal
65						@66.5' - Base of CONGLOMERATE, cemented zone (approx. 6" thick)	@66,5' Approx.
						with scattered cobbles.	Contact
		l				@67' - Light gray fine to medium grained SANDSTONE, poorly graded,	N20E/24NW
						moderately cemented, hard, moist.	
70	11-5"			6.2	115.3	Light gray gravelly SANDSTONE with occasional brown siltstone ripup	
	18-8"	C				clasts (clasts up to 12" diameter), friable, moist, very dense.	
					]		074.51.4
					1	@74.5' - Massively bedded light gray fine to medium grained	@74.5' Approx. BN14W/18SW
75						SANDSTONE, poorly graded, moderately cemented, hard, moist.	DIV 14 VV/ 10 SVV
$\parallel \parallel$							
						Well graded fine to coarse gravel CONGLOMERATE.	
80	15-12"	С	Х	15.5	116.8	Black silty very fine grained SANDSTONE (3-4" thick), continuous	@80' B
						around boring.	N28W/17SW
			1			@80.5' - Light gray silty very fine to fine grained SANDSTONE, moist,	1
			1			very dense.	
				1		@83' - Light gray gravelly CONGLOMERATE.	
85	TIONIAL	<u></u>	4845	L NEC:		Total Davids COI	<u> </u>
NADOI.	TIONAL	JUN	πMΕ	NIS:		Total Depth - 90'  No groundwater	
						Minor caving at 7' Kelly Bar Weight) - 30', 5,619 lbs.	
1						Backfilled 31 - 60', 3,745 lbs.	
-						61 - 90', 2,280 lbs.	
]						· · ·	

SUBSURFACE DATA LOG OF BORING B39									
	CLIE	NT;	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002		
LOCATION: Santa Clarita						ELEVATION: 1780'±	DATE: 4/25/06		
	RIG TY	PE:	24"	Bucke	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"		
	N	Ų	В	М	DD	DESCRIPTION	ATTITUDES		
0	,		X X X			Artificial Fill: Reddish brown clayey silty fine to coarse grained SAND with gravel, moist, medium dense, trash.  @1' - Terrace Deposit: Orangish brown fine to coarse grained SAND with gravel and cobbles, dry to slightly damp.			
10	5-12"	С		12.1	112.0	Saugus Formation: Undulatory contact to brown silty medium to coarse grained SANDSTONE with gravel, very dense, moist.  @7' - Brown fine grained SANDSTONE with occasional gravel, massive, very dense, moist.  @9' - Brown fine to coarse grained SANDSTONE with occasional cobbles, friable, very dense, fining upwards, moist.  Brown fine to medium grained SANDSTONE with occasional gravel, thickly bedded, moist, weakly cemented, very dense, moist.	@6' Approx. Horizontal bedding @12' Approx. BN37E/23SE		
20	8-11"	С		1.3	121.6	Brown medium to coarse grained SANDSTONE with fine gravel and occasional cobbles, subrounded, highly channelized, friable, very dense, moist.  @19.5' - Coarse sand stringer (approx. 4" thick).  Brown fine to coarse grained sandy gravel and cobble CONGLOMERATE, friable, very dense, moist.	@17' Approx. BN45W/9NE @19.5' Approx. BN14W/6SW		
30	11-10"	C	X	1.5	117.7	3" thick fine to medium grained SANDSTONE lens with subangular fine gravel.  @29' - Brown fine to medium grained SANDSTONE, friable, well graded, very dense, moist.  @30.5' - Channelized interbedded medium to coarse grained SANDSTONE with fine gravel to occasional cobbles, interbeds 2-4" zones of fine to medium grained SANDSTONE.  @33.5' - Undulatory channelized contact between medium to coarse grained gravelly SANDSTONE and fine to medium grained SANDSTONE, contact is discontinuous around boring.	@28' Approx. Horizontal bedding @33.5' Approx. BN51E/19NW		
40	19-12"	С		4.1	116.8	Undulatory contact with brown fine grained SANDSTONE, friable, very dense with occasional cobbles and occasional zones of discontinuous silty fine grained SANDSTONE, fining upwards, moist.	@40' Approx. Horizontal contac		
45 ADD	TIONAL		<u> </u> ИМЕ	I NTS:	<u> </u>	C = Modified California Sampler	1		
,,,,,,,	ADDITIONAL COMMENTS: C = Modified California Sampler Kelly Bar Weights: 0 - 30', 5,619 lbs. 31 - 60', 3,745 lbs.								

31 - 60', 3,745 lbs.

61 - 90', 2,280 lbs.

91 - 120', 1,223 lbs.

SUBSURFACE DATA LOG OF BORING B39								
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002	
	LOCATION	ON:	Sar	ita Cla	arita	ELEVATION: 1780'±	DATE: 4/25/06	
	RIG TY	PE:	24"	Bucke	et		DROP: 12"	
	N	Ű	В	М	ĎĎ	DESCRIPTION	ATTITUDES	
45						Brown cobble CONGLOMERATE with silty sand matrix, matrix supported. @44.5' - Brown medium to coarse grained SANDSTONE and CONGLOMERATE, interbedded, undulatory, pinched contact. Massively bedded fine to medium grained SANDSTONE, poorly graded, friable.		
50	15-10"	С	X	9.1	109.7	Undulatory contact to brown cobble CONGLOMERATE, fine to medium sand matrix with occasional discontinuous pockets of clayey SANDSTONE, highly channelized, friable.  @51' - 3" thick clayey discontinuous SANDSTONE, grading into fine to medium grained SANDSTONE with occasional cobble and boulder CONGLOMERATE.	@50' Approx. Contact N88E/14SE @51' B N50W/21SW	
65	20-9"	С	×××	8.0	111.7	<ul> <li>@58.5' - Slightly irregular contact to brown fine grained SANDSTONE, friable.</li> <li>@60.5' - Channeled fine grained gravel to cobble CONGLOMERATE, subrounded to subangular (fine clasts are more angular) friable fine to coarse sand matrix, beds are 2-4" thick.</li> <li>@64.5' - Cobble CONGLOMERATE, well graded, matrix supported to fine gravel to cobble CONGLOMERATE, occasional thick clast supported beds, well graded, friable channels dipping to NW and NE.</li> </ul>	@58.5' Approx. BN24W/17SW @62' Approx. Channel contact N34W/20-33SW @64.5' B N60E/17NW	
70	21-6"	С		1.9	113.8	@71' Thin bedded fine gravel CONGLOMERATE, friable, sand matrix and thinly bedded fine gravel to cobble CONGLOMERATE, well graded, friable, sand matrix. @73' - Occasional cobble to boulder CONGLOMERATE. @74' - Fine grained gravel to cobble CONGLOMERATE with occasional subrounded boulders.	@71' B N30E/11NW @75' B N80E/19NW	
80	20-5"	С		2.4	113.2	@78' Fine gravel CONGLOMERATE to fine grained gravelly coarse grained SANDSTONE, friable. Channelized interbedded medium to coarse grained SANDSTONE, friable, damp.  Occasional boulders, boring is tighter below, fine grained to cobble CONGLOMERATE, 2-4" thick, fine gravelly medium to coarse grained SANDSTONE.	@80' Approx. Channel N40E/6NW	
	ITIONAL	ĊON	ЙМЕ	NTS:	_	C = Modified California Sampler  Kelly Bar Weights: ) - 30', 5,619 lbs.  31 - 60', 3,745 lbs.  61 - 90', 2,280 lbs.		

91 - 120', 1,223 lbs.

SUBSURFACE DATA LOG OF BORING B39								
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002	
	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 1780'±	DATE: 4/25/06	
	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"	
	N	υ	В	М	DD	DESCRIPTION	ATTITUDES	
80 85 90 95 100 1105	RIG TY	PE:	24"	Buck M	95.2	Clayey fine grained SANDSTONE, 2" thick scoured into CONGLOMERATE above, non-plastic.  @87' - Thin fine gravel to cobble CONGLOMERATE.  1/4" thick clayey SILTSTONE.  @89.5' - 1/4" thick clayey SILTSTONE.  @90' - Friable coarse grained SANDSTONE, moist.  @91' - Fine gravel to cobble to boulder CONGLOMERATE, well graded, coarse sand matrix supported.  @92' - Fine gravel to cobble CONGLOMERATE, well graded, coarse sand matrix supported.  @95' - Occasional boulder.  Brown gravelly fine to coarse grained SANDSTONE, slightly damp, friable.  Brown gravel and cobble CONGLOMERATE, fine to coarse grained sandy matrix, damp, friable, well graded.	<del>                                       </del>	
115						Backfilled		
125	ITIONAL	CON	MME	ENTS:		O. Madified Collifornia Consultan		
	ITIONAL	CO	MME	NTS:		C = Modified California Sampler Kelly Bar Weights: ) - 30', 5,619 lbs. 31 - 60', 3,745 lbs.		

31 - 60', 3,745 lbs. 61 - 90', 2,280 lbs. 91 - 120', 1,223 lbs.

SUBS	URFACE	_		dee H		PROJECT: Skyline Ranch	W.O.: 8838.001
						ELEVATION: 1651'±	DATE: 5-8-06
	LOCATION						DROP: 12"
	RIG TY N	PE: U	24 B	Bucke	DD	HAMMER WEIGHTS: Kelly Bar Weights DESCRIPTION	ATTITUDES
<del>/- </del>	- 14	<del>-</del>		101		Alluvium: Dark grayish brown fine to medium grained SAND with 40%	
$\dashv$	!					subangular fine to coarse gravel clasts and 5-10% subrounded cobble	
$\neg \uparrow$			Х			to boulder clasts, medium dense, moist, roots (1/4" diameter) to brown	
						fine to medium grained SAND, medium dense, moist.	
5						Brown fine to coarse grained SAND with 40% subangular fine to coarse	
						gravel clasts and 5-10% subrounded cobble to boulder clasts, medium dense, moist, roots (1/4" diameter).	
$\dashv$						dense, moisi, 100ts (114 diameter).	
$\dashv$		i					
10	18/	С		10.9	117.8	Mint Canyon Formation: Scoured contact to subrounded coarse gravel	@10' Contact
	Refusal	ļ				CONGLOMERATE, clasts commonly fine to coarse gravel (granitic),	N49W/13NE to
<b>—</b> і						moderately cemented, greenish gray silty fine to medium sandstone	34NE @12' Contact
$\dashv$		ĺ				matrix, channeled, hard, moist. @12' - Sharp contact to greenish gray silty fine to coarse grained	M74E/36NW
15					]	SANDSTONE (12" thick), grading to coarse grained SANDSTONE,	
		1		ļ		occasionally subrounded fine to coarse gravel, fining upward, hard,	
		İ		1		moist, moderately indurated.	
						@17' - Grading to subrounded coarse gravel to cobble (granitics)	
						CONGLOMERATE, moderately cemented greenish gray silty fine to	©201 Channal
20	13/25	C		9.5	126.1	coarse grained sandstone matrix, massive, channeled, hard, moist.	@20' Channel  N21E/40-60NW
				ļ		Subrounded coarse gravel to cobble CONGLOMERATE, moderately	11212/40 001111
						cemented greenish gray silty fine to coarse sandstone matrix,	
						channeled, massive, hard, moist.	
25							
			}				
						Bedded coarse gravel to cobble CONGLOMERATE to fine grained	@28' B
						SANDSTONE to channeled, scoured fine gravel to cobble	N33E/21NW
30	15/30	c		5.0	112.8	CONGLOMERATE.	
-	, , , , ,					Increase in subrounded coarse cobble clasts, massive.	
35					1	Subrounded gravel to cobble CONGLOMERATE, moderately	
_ 35						cemented greenish gray fine to coarse sandstone matrix, massive,	
						hard, moist.	]
			X			4-8" diameter greenish gray SILTSTONE ripup clasts in gravel to	@39.5' Contact
40	30/30	C		11.5	127.3	cobble CONGLOMERATE.	N84E/24NW
	]					Grades to greenish gray silty clayey fine grained SANDSTONE with undulatory near vertical, striated shears, hard, moist, to fine grained	@41' Shear N20E/Vertical
	-					gravel to cobble CONGLOMERATE with siltstone ripup clasts in	@41.5'B
	1					moderately cemented greenish gray fine to coarse sandstone matrix,	N18E/27NW
45	1					hard, moist.	
	ITIONAL	COI	ИМЕ	NTS:		Blows per 6"	
						C = Modified California Sampler	
						Kelly Bar Weights: 0 - 50', 2,280 lbs. 50 - 75', 1,220 lbs.	
						00 - 70 , 1,220 tus.	

SUBS	SUBSURFACE DATA LOG OF BORING 640								
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.001		
	LOCATION	ON:	Sar	ıta Cla	ırita	ELEVATION: 1651'±	DATE: 5-8-06		
	RIG TY	PE:	24"	Bucke	et	, , , , , , , , , , , , , , , , , , ,	DROP: 12"		
	N I	Ü	В	М	DD	DESCRIPTION	ATTITUDES		
45	15/30	C	x	11.0	121.7	Grading to fining upward sequences of greenish gray clayey fine grained SANDSTONE to fine grained SANDSTONE (with depth), hard, moist.  @44.5' - Light seep in west wall above greenish gray clayey fine grained SANDSTONE (1mm thick brown clayey fine grained SANDSTONE at contact, hard, moist, massive, grading to fine grained SANDSTONE, abundant white calcium carbonate nodules 4-8" diameter), hard, moist, massive.  Grades to greenish gray CLAYSTONE, hard, moist, massive, steeply dipping shears.  Grades to clayey silty fine grained SANDSTONE, hard, moist, massive.	@42.5' Contact N64E/13NW @44.5' Contact N24W/26NE @52' Shear N10E/70-85NW		
60 65 70 75 80				12.0		Continued fining upward sequences of greenish gray fine grained SANDSTONE to clayey fine grained SANDSTONE (typically 2 feet thick), hard, moist, massive.  Grades to fine to coarse grained SANDSTONE, occasional subrounded boulder, hard, moist, massive, to fine to coarse grained gravel CONGLOMERATE, moderately cemented greenish gray fine to coarse sandstone matrix, hard, moist.  Total Depth - 70' Light seep in W wall at 44.5' and seep below 70' No caving Backfilled			
	ADDITIONAL COMMENTS: Blows per 6"  C = Modified California Sampler  Kelly Bar Weights: ) - 50', 2,280 lbs.  50 - 75', 1,220 lbs								

50 - 75', 1,220 lbs.

SUBS	SUBSURFACE DATA LOG OF BORING B41								
	CLIE	NT:	Par	rdee H	omes	PROJECT: Skyline Ranch	W.O.: 8838		
	LOCATION	ON:	Sar	nta Cla	arita	ELEVATION: 1754'±	DATE: 5/10/06		
	RIG TY	PE:	24"	Buck	et		DROP: 12"		
	N	U	_	M	DD	DESCRIPTION	ATTITUDES		
						Colluvium: Light brown fine to coarse grained SAND with gravel and cobbles, subrounded clasts, friable, loose, dry.	1		
5						Saugus Formation: Light brown fine to coarse grained SANDSTONE with gravel, interbedded with gravel stringers, beds approximately 1/4" to 1/2" thick, friable, cross-bedded, highly channelized.			
						@7.5' - Medium to coarse grained SANDSTONE with gravel, dense, moist.			
10	15/16			2.1	126.0	Fine sand lens approximately 2" thick. @11' - Light brown fine to coarse grained SANDSTONE with gravel, interbedded gravel stringers, highly channelized, friable, moist, very dense.	@11' Channel BN49W/9NE		
20						Light brown cobble and boulder CONGLOMERATE, matrix supported, sand matrix. Light brown interbedded fine to coarse grained SANDSTONE and gravel CONGLOMERATE, 1" and 12" thick beds, highly channelized, slightly friable to weakly cemented, moist, hard.	@21' Channel BN39E/9SE		
30						Light brown boulder and cobble CONGLOMERATE, matrix supported, boring belied to approximately 5' diameter, corkscrewing down.	@27' Channel BN38W/25NE		
45	1			:		No downlogging below 43' because boring is excessively wide and unsafe to log.			
	ADDITIONAL COMMENTS:  Blows per 6"  C = Modified California Sampler  Kelly Bar Weights: 0 - 50', 2,280 lbs.  50 - 75', 1,200 lbs.								

ADDITIONAL COMMENTS:

80

LOG OF BORING B42

2000	SUBSURFACE DATA LOG OF BORING B42								
	CLIENT: Pardee Homes					PROJECT: Skyline Ranch	W.O.: 8838		
	LOCATI	ON:	Sar	ita Cla	arita	ELEVATION: 2160'±	DATE: 5/15/06		
	RIG TY	PE:	24"	Buck	et .	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"		
	N	U	В	М	DD	DESCRIPTION	ATTITUDES		
0						Colluvium: Brown clayey silty SAND with gravel, cobbles, and boulders, medium dense, moist.  Mint Canyon Formation: Tan SANDSTONE with gravel, cobbles, and			
5	15-6"	С		3.2	132.8	boulders, moist.  Tan fine to medium grained SANDSTONE with fine to coarse gravel,			
15						friable, dry (30-40% coarse gravel).			
20						Refusal on boulder at 17'			
25									
30									
35									
40									
	TIONAL C	ON	ME	NTS:	<del>!</del>	Blows per 6"	<u> </u>		

C = Modified California Sampler Kelly Bar Weights: 0 - 50', 2,280 lbs.

50 - 75', 1,200 lbs.

SUBSURFACE DATA

SUBSURFACE DATA LOG OF BORING B42a									
CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838							
LOCATION: Santa Clarita	ELEVATION: 2160'±	DATE: 5/15/06							
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"							
N UBM DD	DESCRIPTION	ATTITUDES							
5.	Colluvium: Brown clayey silty SAND with gravel, cobbles, and boulders, medium dense, moist.  Mint Canyon Formation: Tan CONGLOMERATE, friable sandstone matrix, dry.								
10	Subrounded to subangular coarse gravel to boulder CONGLOMERATE well graded, weakly cemented fine to coarse grained SANDSTONE matrix, bedded, hard, moist, clasts are granitic, quarzitic, volcanic (5-10% boulder size).  @10' - Slightly friable matrix.	@7' B N55W/22NE @11' B							
15	Occasional 2-12" thick subangular fine to coarse grained gravel CONGLOMERATE in fine to coarse grained sandstone matrix, slightly friable, hard, moist.  @24' - 18-30" boulder in hard, moist, slightly friable fine to coarse grained SANDSTONE, belling to 3' diameter, SW-SE dipping channels (20-30°), unsafe to downhole below 25'.	@15' B N85E/18SE							
20 4/10 C 4.9 110.4 25		BN-S/26SE to N30W/25SW @21' B N30W/19NE							
30 6/13 C 6.3 116.0 35	Tan SANDSTONE with fine cobbles and angular gravel (approximately 60% coarse clasts), cobbles are subangular, finer clasts are more angular, well graded, friable, moist.								
40 6/15 C	Cobble in shoe, no sample recovered, tan SANDSTONE with gravel to cobble clasts, clasts are subrounded, smaller clasts are subangular, moist, friable.								
45]	Blows per 6" C = Modified California Sampler Kelly Bar Weights: 0 - 50', 2,280 lbs. 50 - 75', 1,200 lbs.	<u>ł</u>							

LOG OF BORING B42a

GOBGON ACE DATA EOG OF BORING 6428								
CLIENT: Pardee Homes						PROJECT: Skyline Ranch	W.O.: 8838	
	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 2160'±	DATE: 5/15/06	
	RIG TY	PE:	24"	Bucke	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"	
	N	U	В	М	DD	DESCRIPTION	ATTITUDES	
40								
Ĭ					ļ		i	
45								
43							İ	
					ļ			
				1	İ			
50	6/17	С		5.9	126.5	Tan gravelly fine to coarse grained SANDSTONE, gravel is subrounded		
<b> </b>				}		(approximately 25% gravel), moist, friable.		
<del>  </del>								
55								
			1					
	40,000				4400	The second of the first terms of the second		
60	18/26			6.6	110.8	Tan gravelly fine to coarse grained SANDSTONE, subangular clasts (approximately 20% gravel), moist, friable.		
$\vdash$						Frequent boulders.		
						Tradition boulders.		
65								
<b> </b>							1	
<b>  </b>						Defined as haulders		
}						Refusal on boulders.		
70								
75						Total Depth - 68'	i	
$\vdash \vdash \vdash$						No groundwater No caving		
$\Vdash \vdash \vdash$						Backfilled	]	
			ĺ	Ì				
80					•			
<b>  </b>			İ		1			
<b> </b>			1					
85								
1	TIONAL C	COM	ı IMEI	NTS:	1	Blows per 6"		
∥		,				C = Modified California Sampler		

C = Modified California Sampler

Kelly Bar Weights:

) - 50', 2,280 lbs.

50 - 75', 1,200 lbs.

LOG OF BORING B43

SUBSURFACE DATA LOG OF BORING B43								
CLIENT: Pard	lee Homes	PROJECT: Skyline Ranch	W.O.: 8838					
LOCATION: Sant	ta Clarita	ELEVATION: 2115'±	DATE: 5/18/06					
RIG TYPE: 24" E		HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"					
N UB	M DD	DESCRIPTION	ATTITUDES					
5		Colluvium: Brown silty clayey gravelly SAND with cobbles, moist, medium dense.  @1' - Mint Canyon Formation: Tan cobble CONGLOMERATE, gravel and sand matrix, matrix supported, friable, moist (approximately 15% cobbles, 45% sand, 40% gravel), cobbles are subrounded, coarse sands and gravel are subangular						
10 3/5 C 8	8.0 105.0	Drilling on cobbles and boulders, drilling is very difficult.  @8' - Boulder to cobble CONGLOMERATE, clasts mostly grano-diorite, approximately 10% boulders, clast supported.  Subangular boulder CONGLOMERATE, boulders up to 2' diameter, clast supported, approximately 60% boulders, gravel and fine to medium sand matrix.	@8' Approx. BN17E/15NW					
20		Boulder to cobble CONGLOMERATE (10% boulders, 40% cobbles, 25% sand, 25% gravel), subangular to subrounded clasts, fine to medium sand and gravel matrix.	,					
23-10" C	11.6	@22.5' - Moderately cemented fine to medium grained SANDSTONE, discontinuous around hole, hard, dry. @23' - Cobble CONGLOMERATE with occasional boulder (less than 5%), subrounded to subangular cobbles, clast supported.	@23' Approx. BN36W/11SW					
30 6/10 C	7.3 93.9	Boulder and cobbie CONGLOMERATE, boulders up to 2' diameter, clast supported (40% boulders, 20% cobbles).						
35		Refusal at 34' on boulders No groundwater No caving Backfilled						
45 ADDITIONAL COMMEN	ITS:	Blows per 6"						
C = Modified California Sampler  Kelly Bar Weights: 0 - 50', 2,280 lbs.								

Kelly Bar Weights:

0 - 50', 2,280 lbs. 50 - 75', 1,200 lbs.

	SUBSURFACE DATA LUG OF BORING B44								
CLIENT:				W.O.: 8838					
LOCATION:	Santa Ci	iarita	ELEVATION: 2060'±	DATE: 5/26/06					
RIG TYPE:				DROP:					
N U	в м	DD	<u></u>	ATTITUDES					
5			Mint Canyon Formation: Dark brown clayey fine grained SAND with subrounded coarse gravel to cobble, very stiff, moist, to well graded subrounded coarse gravel to boulder CONGLOMERATE with weakly cemented greenish gray fine to medium grained sandstone matrix, hard, moist.						
10 C	7.0	126.4	@10' - Well graded subrounded coarse gravel to cobble CONGLOMERATE with weakly cemented greenish gray fine to medium sandstone matrix, hard, moist, to conglomeratic fine to coarse grained SANDSTONE with subrounded fine gravel to cobble, weakly cemented to slightly friable, hard, moist. @13' - Crudely bedded fine gravel to subrounded cobble to boulder CONGLOMERATE, well graded, weakly cemented to slightly friable, to greenish gray fine to medium grained SANDSTONE, well graded, hard, moist (20-30% gravel/cobble, 5% boulder).	N34W/25SW					
20 8/10 C 25	12.4	119.1	<ul> <li>@20.5' - Scoured contact with green gray fine grained SANDSTONE, massive, moderately indurated, very hard, moist.</li> <li>@22.5' - Contact to coarse gravel to cobble CONGLOMERATE (subrounded), in weakly cemented green gray fine to medium grained sandstone matrix, well graded, hard, moist, crudely bedded.</li> </ul>	@20' J N76W/38SW @22.5' Contact N39W/19SW					
14/25 C	9.2	107.4	@28' - Occasional subrounded boulders (5-10%).	@27' B N47W/20SW					
35 35 40 10/20 C	10.7	7 107.6	@32' - Subrounded coarse gravel to cobble CONGLOMERATE with occasional boulder in weakly cemented green gray fine to medium grained sandstone matrix, well graded, hard, moist.  Green gray fine to coarse grained SANDSTONE (12" thick) with occasional subangular fine gravel, weakly indurated, hard, moist.  @36' - Subrounded coarse gravel to cobble CONGLOMERATE, weakly cemented, green gray fine to medium grained sandstone matrix, very hard, moist, crudely bedded, occasional boulder (≤5%).  @40' - Subrounded coarse gravel to cobble CONGLOMERATE, weakly cemented, green gray fine to medium grained sandstone matrix, very hard, moist, crudely bedded, occasional boulder (≤5%).	@38.5' B N47W/23SW					
45 ADDITIONAL COM	<u>                                     </u>	:	Blows per 6" C = Modified California Sampler Kelly Bar Weights: 0 - 50', 2,280 lbs. 50 - 75', 1,200 lbs.						

LOG OF BORING B44

SUBSURFACE DATA LOG OF BORING B44									
	CLIE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838		
	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 2060'±	DATE: 5/26/06		
	RIG TY	PE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP:		
	N	U	В	M	DD	DESCRIPTION	ATTITUDES		
40									
		<b> </b>	}						
45			}						
<del>,</del>									
			1						
		]_			J <b>.</b> .				
50	15/20	C		9.2	115.4	@50' - Interbedded fine grained SANDSTONE, laminated to thinly bedded, and gravel to cobble CONGLOMERATE in weakly to			
<b>├</b> {						moderately cemented green gray fine to medium grained sandstone			
						matrix, hard, moist.			
					1				
55						`			
<u> </u>									
					1				
60	25/45	lc		8.0	109.4	@60' - Fine gravel to cobble CONGLOMERATE, slightly friable to			
						weakly cemented, greenish gray fine to medium grained sandstone			
						matrix, hard, moist.			
65					ŀ	Total Depth - 60'			
03				ļ		No groundwater			
			1		Ì	No caving			
						Backfilled			
					1				
70					1				
$\vdash$									
├				}					
$\vdash \vdash$			1	}					
75									
<del></del>									
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80		1							
		1	1		1				
igwdap									
85									
	ITIONAL (	COM	L (MF	NTS:	1	Blows per 6"			
				, . , 🔾 .		C = Modified California Sampler			
4						· · · · · · · · · · · · · · · · · · ·			

Kelly Bar Weights: ) - 50', 2,280 lbs. 50 - 75', 1,200 lbs.

SUBSURFACE DATA LUG OF BURING 845								
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.; 8838	
	LOCATIO	:NC	Sar	ita Cla	rita	ELEVATION: 2105'±	DATE: 5/30/06	
	RIG TY	PE:	24"	Bucke	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"	
	Ň	Ü	В	M	DD	DESCRIPTION	ATTITUDES	
0						Colluvium: Brown cobbly and gravelly SAND, cobbles are subrounded,		
						occasional boulders, roots, dry.		
	ļ			[				
			ļ	<b>!</b> 1		l  @4' - <u>Mint Canyon Formation</u> : Tan cobble to boulder CONGLOMERATE.		
<del></del>			}		<u>'</u>	sand and gravel matrix, matrix supported, boulders up to 2' diameter		
<b>⊣</b>				<b> </b>		(approximately 35% boulders), well graded, dry, very dense.		
				,			}	
	:							
10	12/18			121	116.4	{  @11' - Tan cobble to boulder CONGLOMERATE, friable sand and grave		
	12/10	`		13.1	110.4	matrix, clast supported, massive, moist, very dense.		
$\overline{}$		[		1		,,,,,,,,,,,,,,		
		j		Į		@14' - Fine to medium grained SANDSTONE, friable, moist.	@14' B	
15	ı				<b>1</b>	@15' - Tan cobble to gravel CONGLOMERATE, fine to medium sand	N39W/21SW	
						matrix, matrix supported, massive.	@15' B N42W/22SW	
		ĺ			•		14-244/22014	
		ļ		1		@19' - Channelized tan fine to medium grained SANDSTONE with	@19' B	
20	8/12	С		11.5	105.3	occasional coarse cobbles, well graded, moist, friable.	N15W/22SW	
					}			
				}	1	COOL D. LL. (kh/- CONC) ONEDATE annequimetals 2' diameter	}	
		}				@23' - Boulder to cobble CONGLOMERATE, approximately 2' diameter boulder, clast supported, massive.	1	
25		}		}	İ	@24' - Tan subangular gravel and cobble CONGLOMERATE with friable		
		ļ	ļ		ļ	fine to medium sand matrix, matrix supported, well graded, massive,	1	
		ĺ		İ		hard, moist.		
		ļ		}			Į.	
]	4=10-				407.0	@30' - Tan subangular gravel and cobble CONGLOMERATE with friable		
30	15/20	C		6.7	127.6	fine to medium sand matrix, matrix supported, well graded, massive,	· Į	
$\dashv$			1			hard, moist.		
35					ĺ	{		
		ł			Į			
					•		}	
	15/25	da		5.9	124.5	@39' - 2' diameter boulder, horizontally elongated.	1	
40		1				@39.5' - Gravel and cobble CONGLOMERATE with friable fine to	}	
				1		medium sand matrix, matrix supported, well graded, hard, moist.	ļ	
				}			1	
45								
	ITIONAL		<u>I</u> ∕ME	T. NTS	1	Blows per 6"		
		J - O 1				C = Modified California Sampler		

Kelly Bar Weights: 0 - 50', 2,280 lbs. 50 - 75', 1,200 lbs.

SUBSURFACE DATA LOG OF BORING B45								
CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838						
LOCATION: Santa Clarita	ELEVATION: 2105'±	DATE: 5/30/06						
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"						
N U B M DD	DESCRIPTION	ATTITUDES						
40	@43' - Switch to 18" diameter digging bucket (from 24" diameter), unable to downhole log below 43', subrounded gravel to cobble CONGLOMERATE, well graded, friable sandstone matrix.							
50 140-6" C 10.7 110.0	@50' - Subrounded gravel to cobble CONGLOMERATE, friable sandstone matrix.							
55	@55' - Boulders up to 1.5' diameter in gravel to cobble CONGLOMERATE, friable sandstone matrix.							
60 50-5" C	@60' - No sample recovered, too rocky. @61' - 1.5' diameter boulder.							
70 70	Total Depth - 63' refusal on boulder No groundwater No caving Backfilled							
75 80								
85 ADDITIONAL COMMENTS:	Blows per 6"  C = Modified California Sampler  Keily Bar Weights: ) - 50', 2,280 lbs.  50 - 75', 1,200 lbs.							

Logged by: AH

LIENT: ATION: TYPE: U	: San : 24"	ta Cla Bucke M	rita	PROJECT: Skyline Ranch  ELEVATION: 2005'±  HAMMER WEIGHTS: Kelly Bar Weights  DESCRIPTION  Saugus Formation: Silty fine grained SANDSTONE with clay and subrounded to subangular cobbles, roothairs to 3'.  @5' - Massive silty fine grained SANDSTONE, weakly indurated, hard, moist.  @6' - White calcite precipitate along joint.	W.O.: 8838.002 DATE: 6/1/06 DROP: 12" ATTITUDES
TYPE:	: 24"	Bucke M	et	HAMMER WEIGHTS: Kelly Bar Weights  DESCRIPTION  Saugus Formation: Silty fine grained SANDSTONE with clay and subrounded to subangular cobbles, roothairs to 3'.  @5' - Massive silty fine grained SANDSTONE, weakly indurated, hard, moist.	DROP: 12" ATTITUDES
U		M		DESCRIPTION  Saugus Formation: Silty fine grained SANDSTONE with clay and subrounded to subangular cobbles, roothairs to 3'.  @5' - Massive silty fine grained SANDSTONE, weakly indurated, hard, moist.	ATTITUDES
	Δ			Saugus Formation: Silty fine grained SANDSTONE with clay and subrounded to subangular cobbles, roothairs to 3'.  @5' - Massive silty fine grained SANDSTONE, weakly indurated, hard, moist.	
12" C		12.1		moist.	@6' Joint
		,	112.6	<ul> <li>@8' - Brown silty fine grained SANDSTONE with sparse fine gravel, discontinuous carbonate veins, massive, weakly indurated, hard, moist.</li> <li>@10' - Brown to light brown silty fine to medium grained SANDSTONE with abundant coarse sand to fine gravel, weakly indurated, massive, hard, moist.</li> </ul>	N18E/74SE
12" C	X	16.3	111.1	@16.5' - Contact with light brown fine grained SANDSTONE and subrounded to subangular gravel CONGLOMERATE, well graded, weakly cemented, hard, moist. @18' - Thinly bedded to channelized, channels dip to west approximately 20°. @21' - Sharp contact to light brown fine grained sandy SILTSTONE with trace clay, massive, hard, multidirectional shears.	@16.5' Contact N20W/11SW @18' B N14W/19SW @21' Contact N39W/17SW @21.5' Shear N85E/40SE
13" C		2.9	118.6	@25' - Gradational contact to tan medium to coarse grained SANDSTONE with gravel and occasional cobbles.  @27' - Approximately 6" thick light brown medium to coarse grained SAND, slightly friable, interbedded with gravel to cobble CONGLOMERATE, hard, moist.  @30' - Light brown fine to coarse grained SANDSTONE with occasional gravel, friable, hard, moist.  @31' - Channelized conglomerate.  @33' - Contact to tan fine to coarse grained SANDSTONE, massive, hard, moist.  @34.5' - Gradational contact to gravel CONGLOMERATE with sand	@22' Shears N56W/38SW N33W/29SW Slicks: S40W @31' Channel N40W/16SW @33' Contact N45W/14SW
12" C		7.0	117.3	matrix, angular to subrounded clasts, undulating channels dipping approximately 17-24 SW to SE.  @37' - Appearance of fine cobbles.  @40' - Gradational contact to fine to coarse grained SANDSTONE with occasional gravel, friable, hard, moist.	@38' B N75E/20SE
13" (	С	C	C 2.9	C 2.9 118.6	Subrounded to subangular gravel CONGLOMERATE, well graded, weakly cemented, hard, moist.  (a) 18' - Thinly bedded to channelized, channels dip to west approximately 20°.  (a) 21' - Sharp contact to light brown fine grained sandy SILTSTONE with trace clay, massive, hard, multidirectional shears.  (a) 25' - Gradational contact to tan medium to coarse grained SANDSTONE with gravel and occasional cobbles.  (a) 27' - Approximately 6" thick light brown medium to coarse grained SAND, slightly friable, interbedded with gravel to cobble CONGLOMERATE, hard, moist.  (a) 30' - Light brown fine to coarse grained SANDSTONE with occasional gravel, friable, hard, moist.  (a) 31' - Channelized conglomerate.  (a) 33' - Contact to tan fine to coarse grained SANDSTONE, massive, hard, moist.  (a) 34.5' - Gradational contact to gravel CONGLOMERATE with sand matrix, angular to subrounded clasts, undulating channels dipping approximately 17-24 SW to SE.  (a) 37' - Appearance of fine cobbles.  (b) 117.3  (a) 40' - Gradational contact to fine to coarse grained SANDSTONE with occasional gravel, friable, hard, moist.

Kelly Bar Weights: 0 - 30', 5,619 lbs.

31 - 60', 3,745 lbs. 61 - 90', 2,280 lbs.

91 - 120', 1,223 lbs.

CLIENT: Pardee Homes PROJECT: Skyline Ranch W.O.: 8838.002									
<u> </u>		PROJECT: Skyline Ranch	W.O.: 8838.002						
LOCATION: Sar		ELEVATION: 2005'±	DATE: 6/1/06						
RIG TYPE: 24"		HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12" ATTITUDES						
N UB	M DD	DESCRIPTION	ATTHODES						
45		@44' - Sharp, slightly scoured contact with yellow brown fine grained SANDSTONE, massive, slightly friable, hard, moist.	@44' B N27E/22SE						
50 18-12" C	5.6 125.3	@45' - Fine grained SANDSTONE with gravel, grading to gravel CONGLOMERATE with slightly friable medium to coarse sand matrix, moist.  @49' - Thinly bedded CONGLOMERATE.  @50' - Channel, scoured into yellow brown medium to coarse grained SANDSTONE with gravel and small cobbles, slightly friable, hard, moist.	@50' Channel N35E/24SE						
55 X 60 15-12" C X	15.6 119.6	@57' - Scoured contact with clayey fine grained SANDSTONE, hard, massive. Near vertical, pervasive shears. @59.5' - Brown fine to coarse grained SANDSTONE with gravel. @60.5' - Contact with brown fine grained sandy SILTSTONE with approximately 1/4" diameter concretions, cemented, hard, moist, discontinuous, undulatory, shallow, west dipping clay-lined shears.	@57' Channel N68E/6SE @59.5' Approx. BN52W/11SW @63' Shear N45W/26SW						
70 14-12° C	7.2 118.4	@67' - Gravel cobble CONGLOMERATE with slightly friable fine to medium grained sandstone matrix.  @70' - Light brown gravelly SANDSTONE with occasional fine cobbles, friable, hard, moist.	@70' B N30W/12SW @74' B						
75 80 15-12" C	7.3 115.4	<ul> <li>@75' - Grading to fine gravel CONGLOMERATE, slightly friable, hard, moist.</li> <li>@78' - Contact to sandy SILTSTONE with occasional gravels, hard, moist.</li> <li>@81' - Scoured contact to well graded subrounded gravel to cobble CONGLOMERATE, friable yellow fine to coarse sandstone matrix, very dense, moist.</li> </ul>	@78' Contact N66W/11SW @81' Contact N80E/37SE						
	NTS:		J.,						
ADDITIONAL COMMENTS:  C = Modified California Sampler  Kelly Bar Weights: ) - 30', 5,619 lbs.  31 - 60', 3,745 lbs.  61 - 90', 2,280 lbs.  91 - 120', 1,223 lbs.									

Logged by: AH/SS

3053	SUBSURFACE DATA LOG OF BORING B46								
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002		
	LOCATION	<u>:NC</u>	San	ita Cla	rita	ELEVATION: 2005'±	DATE: 6/1/06		
	RIG TY	PE:	24"	Bucke		HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"		
	N	Ü	В	М	DD	DESCRIPTION	ATTITUDES		
80		:				@84' - Grading to gravel CONGLOMERATE with friable yellow brown fine to coarse sandstone matrix, highly channelized beds.	@84' B N25W/17SW		
90	30-10"	С		5.0	108.3	@90' - Boulder approximately 1' diameter, elongated horizontally in well graded, gravel to cobble CONGLOMERATE with slightly friable yellow brown sandstone matrix, massive, hard, moist.	@90' Channel N90E/14S		
95						@94' - Contact with friable light brown fine grained SANDSTONE, moist, hard. @95.5' - Gradational contact to subrounded gravel to cobble CONGLOMERATE, slightly friable light brown fine to coarse sandstone matrix, highly channelized.	@94' Channel N4W/16SW ]@95' B [N36W/18SW		
100	20-12"	С		7.2	116.1	<ul> <li>@100' - Light brown fine to coarse grained SANDSTONE with gravel, hard, moist, friable.</li> <li>@101' - Subrounded gravel to cobble CONGLOMERATE, slightly friable, fine to coarse sandstone matrix.</li> </ul>	@101' B N32W/19SW		
110	8-12*	C		8.5	99.9	@109' - Abundant gravel to cobble quartz clasts, granitic clasts and schist, channelized. @110' - Light brown fine to coarse grained SANDSTONE with gravel, friable, hard, moist. @111' - Channelized bedding. @115' - Light brown fine to coarse grained SANDSTONE with gravel, friable, hard, moist.	@111' B N75E/15SE		
120						Total Depth - 115' No groundwater No caving Backfilled			
ADDITIONAL COMMENTS:  C = Modified California Sampler  Kelly Bar Weights: ) - 30', 5,619 lbs.  31 - 60', 3,745 lbs.  61 - 90', 2,280 lbs.  91 - 120', 1,223 lbs.									

CLIENT: Pardee Homes PROJECT: Skyline Ranch W.O.: 8838									
			_			PROJECT: Skyline Ranch	W.O.: 8838		
	OCATI				<del></del>	ELEVATION: 2021'	DATE: 6/5/06		
	RIG TY	_	24" B		et DD	HAMMER WEIGHTS: Kelly Bar Weights  DESCRIPTION	DROP: 12"		
	19	U	<u> </u>	M	טט	<u> </u>	ATTITODES		
5 10	4-12"	C		8.2	115.4	©3' - Saugus Formation: Light brown gravelly fine to coarse grained SANDSTONE, subangular gravel, slightly friable, rootlets to 5' depth, moist, hard.  @6' - Scoured contact to light brown fine grained SANDSTONE with subangular gravel, friable, moist, hard.  @8' - Discontinuous light brown SILTSTONE bed, moist, hard, within light brown fine grained SANDSTONE with subangular gravel, friable, hard, moist.			
25	9-12"	С	X	17.5	113.9	SANDSTONE with occasional subangular gravel, moist, hard.  @20' - 12" thick sheared brown CLAYSTONE, waxy surface on shears, multidirectional shears, carbonate veins, moist, hard.  @21' - Light brown fine grained sandy SILTSTONE, moist, hard.  @25' - Light brown fine grained sandy SILTSTONE with carbonate nodules, moderately cemented, carbonate nodules are 2" maximum diameter, moist, hard.  @26.5' - Brown CLAYSTONE, discontinuous, multidirectional shears, moist, hard.			
35	11-12"	С		19.0	111.9	<ul> <li>@27' - Light brown fine grained sandy SILTSTONE to sifty fine grained SANDSTONE, massive, moist, hard.</li> <li>@30' - Grading into light brown fine grained SANDSTONE, massive, moist, hard.</li> <li>@34.5' - Grading into brown CLAYSTONE, massive, moist, hard.</li> </ul>			
40 45	12-12"		10.15		113.5	@40' - Grading into light brown silty fine to medium grained SANDSTONE with subangular gravel, massive, moist, hard.  C = Modified California Sampler			
ADDITIONAL COMMENTS: C = Modified California Sampler  Kelly Bar Weights: 0 - 30', 5,619 lbs.  31 - 60', 3,745 lbs.									

61 - 90', 2,280 lbs.

91 - 120', 1,200 lbs.

	CLIENT: Pardee Homes PROJECT: Skyline Ranch W.O.: 8838									
<u> </u>						PROJECT: Skyline Ranch	W.O.: 8838			
<u> </u>	LOCATI				-	ELEVATION: 2021'	DATE: 6/5/06			
<u> </u>	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"			
	N	U	В	M	DD	DESCRIPTION	ATTITUDES			
40		<b>\</b>		1						
				-						
<del> </del>				ĺ	ĺ	}				
						@44' - Grading into subangular gravel CONGLOMERATE with friable,				
45						light brown coarse sand matrix, matrix supported, channelized, moist,				
$\parallel$						hard.				
$\parallel$										
$\parallel$							Ļ			
50	15-12"	С		14.5	118.5					
						@51' - Scoured contact with light brown clayey fine grained	@51' Scoured			
						SANDSTONE, massive, with occasional gradational stringers of	Contact			
$\vdash$						siltstone.	N46W/18NE			
55										
						@56' - Grading into light brown fine to coarse grained SANDSTONE				
						with sparse subangular gravel, friable, moist.				
					i	@57' - Grading into light brown gravel CONGLOMERATE with	<b> </b>			
60	14-12"			6.5	1127	occasional cobbles, subangular gravel and cobbles, sand matrix,	@59' Approx.			
	14-12			0.5	113.7	matrix supported, moist, hard, channelized.  @59' - Sharp contact with light brown silty fine grained SANDSTONE,	Contact N5E/4NW			
						scoured, massive, moist, hard.	@62.5' B			
						@61.5' - Grading into light brown gravel and cobble CONGLOMERATE,	N25W/17SW			
						subangular clasts are weathered and fractured, sand matrix, matrix				
65						supported, well graded, moist, hard.				
$\parallel$										
$\vdash$							@68' B			
							N60W/14SW			
70	20-12"	С		10.7	116.5					
<b></b>						@71' - Scoured contact into light brown fine to coarse grained	@71' Scoured			
						SANDSTONE, friable, moist, hard.	Contact			
$\parallel$						@72' - Light brown gravelly fine to coarse grained SANDSTONE, subangular gravel, moist, hard.	N15E/19NW			
75						@74' - Light brown cobble and gravel CONGLOMERATE, slightly friable,				
						fine to coarse sand matrix, matrix supported, well graded, moist, hard.				
					ļ	@76.5' - Scoured contact with brown CLAYSTONE, pervasively sheared,				
						claystone shears have waxy surfaces, conglomerate above scoured				
80	17-12"	ر م		13.5	118.7	down to 79' on NW wall.  @78' - Grading into light brown silty fine grained SANDSTONE with				
╟╣	11-14			10.0	1, 10.7	sparse gravel, massive, moist, hard.				
					[	(a) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c				
85 ADDI	TIONAL C	\	L NAÈN	L ITS:	<u> </u>	C = Modified California Sampler	L			
	HONAL C	, OIVI	ı∧ı⊏l	V 1 3.		Kelly Bar Weights: ) - 30', 5,619 lbs.				
						31 - 60', 3,745 lbs.				
	61 - 90', 2,280 lbs.									
						91 - 120', 1,200 lbs.				
1						<u> </u>				

SUBSURFACE DATA LOG OF BORING B47									
ļ	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838		
<u></u>	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 2021'	DATE: 6/5/06		
}	RIG TY	PE:		Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"		
	N	U	В	М	DD	DESCRIPTION	ATTITUDES		
80									
lacksquare					Ì		ļ		
}									
$\vdash \vdash \vdash$									
85		1							
						•			
			X			@87' - Highly plastic brown CLAY seam, no noticable shears	@87' Contact		
						(approximately 2" thick).	N58W/7SW		
	"	_			}	@88' - Light brown clayey fine grained SANDSTONE with subangular	@88.5° clay seam		
90	22-10"	C		11.7	122.6	gravel, massive, hard, moist, with 1-2" thick brown clay seams at 88.5"	N55W/10SW		
$\vdash$					-	and 90', clay seams are very stiff, moist, no shear surfaces.	@90' clay seam		
$\vdash \vdash$						James Co.	N60W/20SW		
95		1		•	}				
					1				
		ļ		1	}				
						©00' Decum dispositioners along a series	†		
100	25-10"	_	ł	11.6	1242	@99' - Brown discontinuous clay seam. @100' - Brown clay seam.	@1001 Clay ocam		
100	23-10			113.0	121.3	@100.5' - Grading into light brown silty fine to medium grained	@100' Clay seam N27W/12SW		
				1		SANDSTONE, hard, moist.	1127 1177 2011		
						@103' - Grading into light brown fine to medium grained SANDSTONE,			
		ł			-	moist, hard.			
105					1	@104' - Grading into light brown gravel CONGLOMERATE with fine to			
$\vdash \vdash$		1		İ	}	coarse sand matrix, matrix supported, subangular gravel, massive,	@106' Approx.		
$\vdash$					<u> </u>	hard, moist to very moist.	BN85E/15SE		
$\vdash$					ļ				
110	25-8"	С		6.4	116.1	@110' - Brown gravelly fine to coarse grained SANDSTONE,			
						subangular gravel, friable, moist, hard.			
				ŀ					
					ŀ	@113' - Fine grained gravel CONGLOMERATE with sheared olive clay			
				}	1	(not observed downhole), only in surface cuttings.			
115			•						
<del>                                     </del>				1			†		
$\vdash \vdash$			1						
H				1					
120						Total Depth - 115'			
<u>                                     </u>		1		1		No groundwater			
<b>  </b>				j		No caving			
$\vdash \vdash \downarrow$						Backfilled	Ì		
125					1				
	TIONAL (	OM	ME	NTS:	[	C = Modified California Sampler			
						Kelly Bar Weights: ) - 30', 5,619 lbs.			
	31 - 60', 3,745 lbs.								
	61 - 90', 2,280 ibs.								
						91 - 120', 1,200 lbs.			
,									

<u> </u>	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002
,	LOCATI					ELEVATION: 1987'±	DATE: 6/7/06
	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N .	<u>, υ</u>	B	М	DD	DESCRIPTION	ATTITUDES
5 10	9-12"			3.7	124.8	Colluvium: Brown clayey fine grained SAND, moist.  @1' - Saugus Formation: Light brown fine to coarse grained SANDSTONE, with subangular cobble and gravel, moist.  @3' - Light brown silty fine to medium grained SANDSTONE, hard, moist, rootlets.  @4' - Gravel to cobble CONGLOMERATE with light brown fine to coarse sandstone matrix, matrix supported, subangular clasts.  @5' - Gravel to boulder CONGLOMERATE with light brown fine to coarse sandstone matrix, matrix supported.  @6' - Gravel to cobble CONGLOMERATE with light brown fine to medium sand matrix, matrix supported, clasts are fractured and subangular.  @8.5' - Scoured irregular contact with CLAYSTONE.  @10' - Subangular gravel to cobble CONGLOMERATE, slightly friable light brown medium to coarse sandstone matrix, hard, moist.	@4' Contact E-W/7S @7' B N72W/19SW @8.5' Approx. scoured contact N30W/28SW @12.5' B N48W/29SW
20	6-12"	С		,		@20' - Undulatory contact with subangular gravel CONGLOMERATE, occasional cobble, slightly friable light brown fine to coarse sandstone matrix, well graded, occasional silt, channelized, moist, hard.	@20' B N32W/16SW @23' Channel N70E/9SE
30	20-12"	С		5.8	127.6	<ul> <li>@25.5' - Scoured contact to fine to coarse grained SANDSTONE with gravel, moist.</li> <li>@27' - Grading to subangular gravel CONGLOMERATE with slightly friable light brown fine to coarse sandstone matrix, occasional cobbles, hard, moist.</li> <li>@28.5' - Scoured contact with silty fine to medium grained SANDSTONE with occasional subangular gravel, hard, moist.</li> <li>@31' - Grading to subangular gravel to cobble CONGLOMERATE with light brown fine to coarse sandstone matrix, hard, moist.</li> </ul>	@25.5' B N37W/19SW @28.5' Contact N48E/8SE @34.5' B N26E/22SE
40	23-12"	C		6.7	122.1	@36' - Irregular, scoured contact to brown clayey fine grained SANDSTONE, moist, hard, massive. @37.5' - Grading to light brown fine grained SANDSTONE, slightly friable, hard, moist, massive. @40' - Grading to gravel to cobble CONGLOMERATE, light brown fine to coarse sandstone matrix, hard, moist.	@36' Contact N47E/8SE
45 ADDI	TIONAL C	MOX	MEN	ITS:		C = Modified California Sampler  Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs. 31 - 60', 3745 lbs. 61 - 90', 2280 lbs. 91 - 120', 1223 lbs.	
<u></u>					<del></del>	121 - 135', 1723 lbs.	

	BOOK ACE DATA LOG OF BURING 848										
	ÇLIE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002				
	LOCAT	ON:	Sar	nta Cla	arita	ELEVATION: 1987'±	DATE: 6/7/06				
	RIG TY	PE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
	N	U	В	M	DD	DESCRIPTION	ATTITUDES				
40		7		1	Ī		<del> </del>				
			1								
							Ì				
		ł					}				
45						@45' - Gravel to cobble CONGLOMERATE, channels dipping SE and					
						NE.	<b>†</b>				
						@46.5' - Irregular, scoured contact to brown clayey fine to medium					
<b>∤</b>		}	Į	-	ļ	grained SANDSTONE with slightly friable fine to coarse gravel, hard, lmoist.					
50				6.3	120.5						
<del>  30</del>				0.3	120.5	@47' - Grading to light brown gravelly SANDSTONE to gravel CONGLOMERATE, light brown fine to coarse sandstone matrix.					
$\vdash \vdash$				]		@51' - Grading to gravel to cobble CONGLOMERATE with fine to	@52' Channel				
$\vdash$					1	coarse sand matrix supported, highly channelized.	N22W/14SW				
				1	1	@54.5' - Grading to light brown fine to coarse grained SANDSTONE	11,550,170,170,170				
55					•	with gravel, friable, hard, moist.					
					1	@56' - Grading to subangular gravel to cobble CONGLOMERATE	1				
				}	}	with light brown fine to coarse sandstone matrix.	į				
						@57' - Clast supported, highly channelized, gravel to cobble	1				
		_				CONGLOMERATE.					
60	15-12"	C		10.7	121.9	@60.5' - Sharp scoured contact with brown sandy CLAYSTONE,	@60.5' Shear				
						slightly undulatory, paper thin shear at contact.	N46W/10SW				
$\vdash$						@61' - Grading to gravelly SANDSTONE to subangular gravel	@60.5' Contact				
						CONGLOMERATE with slightly friable light brown fine to coarse	N84W/13SW				
65			ł	]		sandstone matrix, channelized, well graded.					
			]								
$\vdash$						@67' - Interbedded brown fine grained SANDSTONE and gravel					
<b> </b>						CONGLOMERATE, slightly friable.					
				}		@69' - Subangular gravel to cobble CONGLOMERATE, friable brown					
70	26-12"	С		7.1	123.4	fine to coarse sandstone matrix, hard, very moist, well graded, crudely					
			ł	}	}	bedded with occasional 2"-6" thick fine to medium sandstone beds.					
							ĺ				
							}				
75						@75' - Subangular gravel to cobble CONGLOMERATE, friable brown	[				
⊩—						fine to coarse sandstone matrix, hard, very moist, well graded, crudely					
$\vdash$						bedded.					
⊪				1							
80	2-12"			:		(@80) Subangular group to cobble CONCLONEDATE Attack					
00	2-12	`				@80' - Subangular gravel to cobble CONGLOMERATE, friable brown fine to coarse sandstone matrix, hard, very moist, well graded, crudely					
$\vdash$						bedded.					
<del>  </del>						beaucu.					
					Ì						
85							<u> </u>				
	TIONAL C	ОМ	ME	VTS:		C = Modified California Sampler	<u> </u>				
						Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs.					
1						31 - 60', 3745 lbs.					
						61 - 90', 2280 lbs.					
						91 - 120', 1223 lbs.					
<u>L</u>						121 - 135', 1723 lbs.					

	OKFACE		_			LOG OF BORING	
<u> </u>	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002
	LOCATION	:NC	Sar	ta Cla	rita	ELEVATION: 1987'±	DATE: 6/7/06
	RIG TY	PE:	24"	Bucke	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	U	В	М	DD	DESCRIPTION	ATTITUDES
80		,					
85				!		@85' - Moisture increasing in gravel CONGLOMERATE with slightly	
		i				friable brown fine to coarse sandstone matrix, hard, moist.	
						@87' - Wet.	
						@88' - Gravel CONGLOMERATE with friable brown fine to coarse sand	
			}			matrix, hard, wet.	
90	29-12"	C				@90' - Slow seepage in brown fine to coarse grained SANDSTONE to	
igsqcut			]			gravel CONGLOMERATE, sand matrix supported.	
						@91' - Grades to fine grained sandy SILTSTONE with occasional	
						coarse gravel clasts.	
95		_					
	24-12"	C	Х			COZI Democratical de AVOTONE	60.71.01
$\vdash$						@97' - Pervasively sheared CLAYSTONE, waxy surface, nearly horizontal,	@97' Shear
$\vdash \vdash \vdash$	ļ		ŀ	}		undulatory upper contact, shears cutting through silty fine grained	N43E/23SE
100						SANDSTONE.	@97.5' Shear
100						@98' - 4" thick undulatory shear.	N72W/31NE
$\vdash$						@98'3" - Contact with silty fine grained SANDSTONE, hard, moist, massive.	
<u>  </u>						@100' - 4" CONGLOMERATE bed with subangular gravel and cobbles,	shear N5E/5SE
$\parallel$						fine to coarse sand matrix supported, wet.	@103.5'
105						@100.5' - Silty very fine grained SANDSTONE, massive. @103' - 12" thick subrounded gravel CONGLOMERATE, slightly friable,	Approx. B
103			•			fine to medium sand matrix, hard, wet.	N50W/18SW
$\vdash$			1			@104' - Sharp, scoured contact with brown clayey fine grained	NOOW/TOOW
$\vdash$	30-10"	C				SANDSTONE, hard, moist, massive.	
$\parallel$	30-10	)				@107' - Conglomeratic fine to medium grained SANDSTONE, poorty	
110						bedded.	
<u>                                     </u>					}	@108' - Brown silty fine grained SANDSTONE, hard, moist.	
	i				[	@109' - 4" thick conglomeratic fine to medium grained SANDSTONE	
H						interbed.	j
				Ì		@110' - 6"thick conglomeratic fine to medium grained SANDSTONE to	
115						clayey fine grained SANDSTONE, poorly defined bedding.	@115.5'
						@110.5' - Brown clayey fine grained SANDSTONE with occasional	Approx. B
						subangular fine gravels, very dense, moist.	N75E/9SE
					ָן <u> </u>	@115' - 6" thick conglomeratic fine to medium grained SANDSTONE.	@117' Approx.
						@116.5' - 6" thick CONGLOMERATE.	contact
120			Х			@117' - Sharp contact with CLAYSTONE, hard.	N65W/6SW
						@118.5' - 1' thick CONGLOMERATE.	@119' B
						@119' - Sharp contact with sheared clayey SANDSTONE, 6" thick,	N50W/50NE
					•	undulatory imbricated shears.	@120' Approx.
					1	@120' - Strong brown CLAYSTONE, stiff, highly plastic, undulatory upper	contact
125						contact, sheared and waxy surface, pervasively sheared throughout.	N45W/16SW
ADDI	TIONAL C	OM	ME	NTS:		C = Modified California Sampler	
H						Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs.	
j						31 - 60', 3745 lbs.	
						61 - 90', 2280 lbs.	
						91 - 120', 1223 lbs.	
		_				121 - 135', 1723 lbs.	

Ĺ	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002		
	LOCATI	ON:	San	ta Cla	arita	ELEVATION: 1987'±	DATE: 6/7/06		
	RIG TY	PE:	24"	Bucke	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"		
	N	U	В	M	DD	DESCRIPTION	ATTITUDES		
125						@122.2' - Sharp contact with silty fine grained SANDSTONE, hard, moist, contact is not sheared.  @125' - 1-2" thick clay seam truncates higher angle shear.  @125' - 4" CONGLOMERATE just above clay seam.  @125' - High angle clay shear through CONGLOMERATE, slickensides indicate horizontal motion along strike.	@123' Contact N57W/32SW @125' Clay seam N65W/13SW		
130						@125.5' - Brown silty fine to medium grained SANDSTONE, hard, moist. @131' - Subangular fine to coarse grained gravel CONGLOMERATE, slightly friable, brown medium to coarse sand matrix, moderately graded, hard, moist, crudely bedded. @132' - Gravel CONGLOMERATE.	@125' Shear N86E/66NW @134' B		
135						<ul> <li>@134' - Thinly bedded.</li> <li>@137' - Contact with approximately 6" thick brown fine grained sandy SILTSTONE, hard, wet.</li> <li>@138' - Discontinuous seepage.</li> <li>@138.5' - Brown silty fine grained SANDSTONE, wet, hard, massive.</li> <li>@141' - Approximately 6" thick discontinuous SILTSTONE.</li> </ul>	N66W/9SW		
145	25-12"	С				@145' - Brown silty fine grained SANDSTONE, hard, wet, massive. @147' - Lower limit of zone of seepage. @148' - Brown silty fine grained SANDSTONE with some clay, massive.			
155	36-10"	С				@153' - Seepage from NE quadrant of boring in 12" thick gravel CONGLOMERATE.			
160 165	IONAL C	COM	MEN	ITS:		Total Depth - 155' Seepage at 90', 138-147', and 153' No caving Backfilled  C = Modified California Sampler			
1001	ADDITIONAL COMMENTS: C = Modified California Sampler Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs. 31 - 60', 3745 lbs. 61 - 90', 2280 lbs. 91 - 120', 1223 lbs. 121 - 135', 1723 lbs.								

	ON AC					LOG OF BOR	T
<u> </u>					lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
<u> </u>	LOCAT					ELEVATION: 2091'	DATE: 6/12/06
<u> </u>	RIG T			_		HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
<u> </u>	<u> N</u>	U	β	M	DD	DESCRIPTION	ATTITUDES
0				<u> </u>		Saugus Formation: Dark brown clayey fine to coarse grained SAND with subangular gravel, moist, very dense, weathered.	
55.	4-12	C		5.4	115.1	@4' - Gradational contact with yellowish brown silty fine to coarse grained SANDSTONE with occasional gravel, hard, moist. @6' - Yellowish brown fine to coarse grained SANDSTONE with occasional subangular gravel, clasts include quartz, shist, and granitics, friable, moist, hard. @8' - Discontinuous SILTSTONE (approx. 6" thick) on eastern quadrant of boring, massive, moist, hard. @9' - Highly channelized fine to medium grained SANDSTONE to subangular gravel CONGLOMERATE, matrix supported, friable, hard, moist.	@6' Approx. contact N10E/8NW
15						<ul> <li>@11' - Brown subangular gravel to cobble CONGLOMERATE, matrix supported, highly channelized, friable, hard, moist.</li> <li>@13' - Conglomeratic fine to coarse grained SANDSTONE, subangular to subrounded fine gravel to cobble clasts, moist, hard.</li> <li>@16 - Gravel to occasional boulder (&lt;5%) CONGLOMERATE, channeled, crudely bedded, slightly friable, brown fine to coarse sand</li> </ul>	BN16W/19SW  @16' Approx.  BN70E/24NW
20	5-12	C		5.7	120.2	matrix, moist, hard. @20' - Channeled CONGLOMERATE.	@20' Scoured channels dipping N & S
25 30 35	18-12'	C		13.4	119.9	<ul> <li>@23' - Channelized contact with fine to medium grained SANDSTONE with coarse sand, friable.</li> <li>@24' - Grading to subangular gravel CONGLOMERATE, sand matrix, matrix supported.</li> <li>@26' - Sharp, scoured contact with silty fine grained SANDSTONE with clay, massive.</li> <li>@27.5' - Irregular, discontinuous paper thin shear, waxy, clay lined.</li> <li>@31' - Brown silty very fine grained SANDSTONE with very sparse coarse sand and fine gravel, moist, hard.</li> <li>@32' - Grades to brown fine grained SANDSTONE with very sparse coarse sand and fine gravel, massive, moist, hard.</li> </ul>	@23' Contact N15E/21NW @25' Approx. BN45W/21NE @26' Contact N31W/25NE
40	11-12	c		17.4		@36.5' - Brown angular fine gravel CONGLOMERATE with clayey sand matrix, gradational upper contact (approximately 4" thick bed), moist, hard. @37' - Brown fine grained sandy SILTSTONE, moist, hard. @40' - Slightly waxy clayey SANDSTONE with carbonate nodules, poorly defined shears.	@37' Approx. contact N55E/25SE @40' Approx. attitude of carb. nodules N5E/25SE
	FIONAL	сом	MEI	NTS:		C = Modified California Sampler  Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs. 31 - 60', 3745 lbs. 61 - 90', 2280 lbs. 91 - 120', 1223 lbs. 121 - 135', 1723 lbs.	1

CLIENT: Pardee Homes						PROJECT: Skyline Ranch	W.O.: 8838.002
	LOCATI					ELEVATION: 2091'	DATE: 6/12/06
	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
T	N N	υ	B	M	DD	DESCRIPTION	ATTITUDES
40	<del></del> ;	<del>-</del>		<del>                                     </del>	<u> </u>	2007/11/01/	INTERIORES
			ĺ		1		
		[	ĺ	1	ĺ		{
		1	<b>!</b>	ĺ	}	@43' - Grades to brown clayey fine grained SANDSTONE with	
					1	occasional coarse sands and fine gravel, thickly bedded, hard, moist.	
45					ļ		1
$\parallel$		ļ	ĺ			@46.5' - Sandy CLAYSTONE (approx. 6" thick).	@46' Approx.
<b> </b>		}				@47.5' - Subrounded fine gravel CONGLOMERATE (approx. 6" thick).	contact
$\parallel \rightarrow \parallel$					1	@48' - Brown clayey fine grained SANDSTONE with occasional	E-W/12N
50	17-12"	ا د		10.6	104.4	coarse sands and fine gravel, massive, hard, moist.	@47.5' Approx. BN75W/17NE
	11 12	ľ,		10.0	, , , , , ,		DIALDAN/ ILIAE
		ĺ				@52' - Grades to conglomeratic fine to medium grained SANDSTONE,	
		;		ļ	] :	subangular fine to coarse gravel clasts, moist, hard (approx. 3" thick),	
						lower contact is highly scoured and irregular.	[
55						@55' - Sheared contact to brown fine grained sandy CLAYSTONE with	@55' Sheared
						poorly defined shears.	contact
<b></b>				•		@56' - Grades to brown silty fine grained SANDSTONE with occasional	N12W/60SW
$ lap{}$				ŀ		subangular fine gravel, moist, hard. @59' - Grades to brown medium to coarse grained SANDSTONE,	
60	13-12"	ြ	·	14.9	1179	moist, hard.	@60' Contact
	.0 ,2			' ' ' '	` ` ` `	@60' - Contact with gravel and cobble CONGLOMERATE, brown silty	N36W/16SW
					ļ	fine to coarse sand matrix, matrix supported, increase in moisture to	1.0011710011
			;			very moist.	ļ
				:			
65				}		@65' - Grading to gravel and cobble CONGLOMERATE with brown fine	
						to coarse sand matrix, higher % of gravel and cobble clasts.	@67' B
<b>  </b>			,			@67' - Interbedded gravel CONGLOMERATE with fine to coarse sand	N52W/34NE
$\vdash$						matrix and fine gravelly medium to coarse sandstone interbeds between 2" and 8" thick, sand is friable, both beds exhibit occasional coarse	N75W/22NE N35W/31NE
70	20-12"	С		9.9		gravel.	@67.5' B
		.		0.0		@69'8" - Sharp contact with 1" thick clayey fine grained SANDSTONE.	N49W/39NE
		}				grading to fine to coarse grained SANDSTONE.	@69.5' Contact
						@70' - Brown fine to coarse grained SANDSTONE with occasional	N30W/57NE
						cobbles.	@69'8" Contact
75						@70.5' - Silty fine grained SANDSTONE, wet, hard.	N44W/21NE
<b>  </b>						@71' - Silty gravelly fine grained SANDSTONE.	@70.5' Contact
						@71.5' - Brown CLAYSTONE, pervasively sheared, very stiff, waxy.	N59W/15NE
<del>                                     </del>			х			@72' - Very slow seepage in NW quadrant above 4" thick sheared claystone, grading to clayey fine grained SANDSTONE, waxy shear	@72' Shear N42E/20NE
80	30-12"		x	13.4			042E/20NE   0275.5' Contact
	· <b>-</b>	_	-	, •		@72.5' - Massive brown silty very fine grained SANDSTONE to very fine	
						grained sandy SILTSTONE, occasional seepage.	@79.5' Shear
		Ì				@75.5' - Gravel CONGLOMERATE with fine to coarse sand matrix, wet.	
		ļ					slicks bear
85	FIGNAL	1011	N 4 □×	JTO:		@80' - 4" thick clay shear (across bedding).	S85W
וטטאן	FIONAL C	V	ıvı⊏ſ	412;		C = Modified California Sampler  Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs.	j
						Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs. 31 - 60', 3745 lbs.	
1						61 - 90', 2280 lbs.	
						91 - 120', 1223 lbs.	3
						121 - 135', 1723 lbs.	

	CLIE	NIT:	Darc	ioo H	lomes	T	Large agencies
						PROJECT: Skyline Ranch	W.O.: 8838.002
1	LOCATI					ELEVATION: 2091'	DATE: 6/12/06
ļ,	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	<u> </u>	U	B	M	DD	DESCRIPTION	JATTITUDES
80						@80.5' - Brown fine grained SANDSTONE, hard, wet.  @82' - Grading to fine to coarse grained SANDSTONE, hard, wet.	@79.5' Shear N14E/56SE slicks bear
85						@84' - Grading to gravelly fine to coarse grained SANDSTONE, hard, wet.	N84E @80' Shear N5E/14NW
				1		@85' - Grading to gravel cobble CONGLOMERATE with weakly cemented to slightly friable brown fine to coarse sandstone matrix. @87' - Grades to brown clayey fine grained SANDSTONE, hard, wet.	@86' Approx. BN45E/18NW
90	26-8"	С				@90' - No sample recovered. @91' - Grades to fine gravel CONGLOMERATE (approx. 12" thick) interbed. @92' - Grades to brown clayey fine grained SANDSTONE. @93.5' - Fine to coarse grained SANDSTONE with occasional subround fine gravel.	@95' Shear
100	24-9"	C		5.7	112.8	<ul> <li>@95' - Sharp contact to 1" thick CLAYSTONE, pervasive shears throughout fine to coarse grained SANDSTONE with occasional subrounded fine gravel to coarse sand.</li> <li>@95.5' - Parallel shears (across bedding).</li> <li>@98' - Grades to subrounded to subangular fine to coarse grained</li> </ul>	N61W/7SW @95.5' Shear N31W/32NE @100' B
105						gravel CONGLOMERATE, weakly cemented to slightly friable, brown fine to coarse sand matrix, hard, wet.  @102' - Heavy seepage.  @103' - Grades to fine to coarse grained SANDSTONE.  @104.5' - Sharp contact to clayey fine grained SANDSTONE.  @106' - Grading to sandy CLAYSTONE, pervasive shearing, very stiff, wet.  @106-108.5' - Brecciated sandy CLAYSTONE,  @108.5' - Clayey fine grained SANDSTONE, hard, wet.	@100 B N34W/20SW @102' B N77W/20NE @104.5' Approx. contact N35W/11SW
110	30-8":	С		15.3	110.7	@113' - Sharp contact to fine gravel CONGLOMERATE, weakly	@113' Approx.
115		;				cemented brown fine to coarse sandstone matrix, hard, wet. @115' - Fine gravel CONGLOMERATE, crudely bedded, weakly cemented brown fine to coarse sandstone matrix, hard, wet.	contact N50W/27SW
120	28-10"	С		14.9	113.1		@118' Approx. BN35E/25NW
125						@122' - Contact to brown fine grained SANDSTONE.	
ADDI	TIONAL C	OM	MEN'	TS:		C = Modified California Sampler Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs. 31 - 60', 3745 lbs. 61 - 90', 2280 lbs. 91 - 120', 1223 lbs. 121 - 135', 1723 lbs.	

	ONTACE					LOG OF BORI	745
<b></b>	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002
<u></u>	LOCATI	<u>ON:</u>	Sar	ita Cla	arita	ELEVATION: 2091'	DATE: 6/12/06
1	RIG TY	PE:	24"	Bucke	<del></del> ∋t	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	Ň	U	В	M	DD	DESCRIPTION	ATTITUDES
120	:		Γ-		<u> </u>		
					[		
				]	}		
			İ			@123' - Standing water in boring (after 24 hours), unable to downhole	
				,		log below.	
125							
$\Vdash$							
420	20.40			40.4	400.4	(C420) D	
130	30-10"			12.1	123.1	@130' - Brown fine to coarse grained SANDSTONE, friable, wet,	}
$\parallel \rightarrow \parallel$						free water in sampler, hard.	
$\parallel \rightarrow \parallel$							
H							
135							1
						@137' - Brown pervasively sheared CLAYSTONE, highly plastic, wet.	
<b> </b>							
<b> </b>		_					j l
140	15-12"	C		16.7		@140' - Brown pervasively sheared CLAYSTONE, grading to brown fine	
ļI						grained SANDSTONE, wet, hard.	
<u>}</u> ——							
$\vdash$							
145							
					ĺ		
							İ
150							
Щ.							
<b>}</b>							
155		İ	, 1			Total Dooth 140	j li
100						Total Depth - 140' No caving	
$\parallel \parallel \parallel$						Seepage below 70', standing water at 123' (24 hours after drilling	
						completed)	
						Backfilled	j
160			ĺ				ļ <u> </u>
			-	ļ		•	}
				`\			ĺ
405							
165	TIONAL C	, O V 4	MEN	(TQ)		C = Modified California Sampler	L
וטטאן.	HONAL C	/UIVI	ıvı ⊏l'	VI (5).		C = Modified California Sampler Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs.	i
						Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs. 31 - 60', 3745 lbs.	ļ
						61 - 90', 2280 lbs.	
						91 - 120', 1223 lbs.	Î
						121 - 135', 1723 lbs.	
							<del></del>

SUBSURFACE DATA	LOG OF BORI	<del></del>
CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2245'±	DATE: 6/13/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
N U B M DD	DESCRIPTION	ATTITUDES
0	Topsoil: Dark gray brown clayey fine to coarse grained SAND with subangular to subrounded gravel to boulder clasts, weathered, dense, moist.  @2.5' - Mint Canyon Formation: Subangular to subrounded gravel to boulder CONGLOMERATE, weakly cemented olive brown fine to coarse sandstone matrix, well graded, moist, hard.  @6' - Subangular to subrounded gravel to boulder CONGLOMERATE, weakly cemented olive gray fine to coarse sandstone matrix, moist, massive, hardwell graded clasts predominantly granitic with some meta volcanics, channelized, crudely bedded (less than 5% 12" diameter boulders).  @10' - Subangular to subrounded gravel, cobble, boulder CONGLOMERATE, weakly cemented olive gray fine to coarse sandstone matrix, hard, moist.  @13' - Bedded zone of boulders.  @15' - Subangular to subrounded gravel to boulder CONGLOMERATE, weakly cemented olive brown fine to coarse sandstone matrix, well graded, hard, moist, increase in boulders to 5-10%.	@10' B N56W/13SW @15' Approx. BN60W/35SW
20 19/21 C X	@20' - Subangular to subrounded gravel to boulder CONGLOMERATE, weakly cemented olive brown fine to coarse sandstone matrix, well graded, hard, moist. @21' - Percentage of boulders less than 5%.	@19' B N54W/23SW
30 X	@27' - Subangular to subrounded gravel to boulder CONGLOMERATE, weakly cemented olive brown fine to coarse sandstone matrix, well graded, hard, moist, occasional poorly graded fine coarse grained gravel approximately 12" thick.  @30' - Subangular to subrounded gravel to cobble (occasional boulder) CONGLOMERATE, weakly cemented olive brown fine to coarse sandstone matrix, hard, moist.	@27' B N34E/17SE @33' B N61E/21SE
35 X 40 11/23 C 8.2 120.1	@36' - Sharp contact to olive gray fine grained SANDSTONE, moderately indurated, very hard, moist, massive. @38' - Occasional thin beds of weakly cemented fine to medium grained SANDSTONE and thin beds of slightly friable conglomeratic medium to coarse grained SANDSTONE, clasts are subangular, fine to coarse gravel (up to 4" diameter), moist, very hard. @39.5' - Sharp sheared contact to clayey fine grained SANDSTONE (approx. 1" thick), moist, very hard, grading to weakly indurated medium to coarse grained SANDSTONE, very hard.	@35' B N77W/23SW @36' Contact N62W/22SW @38' B N36W/18SW @39.5' Sheared contact N43W/26SW
ADDITIONAL COMMENTS:	Blows per 6"  C = Modified California Sampler  Kelly Bar Weights: 0 - 50', 2280 lbs.  50- 75', 1200 lbs.	

	EOG OF BORING B50									
CLIE	NT: I	Раго	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002				
LOCATION	ON: S	San	ta Cla	arita	ELEVATION: 2245'±	DATE: 6/13/06				
RIG TY			Bucke		HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
N	U	В	М	DD	DESCRIPTION	ATTITUDES				
40					<ul> <li>@40' - Light gray brown fine to coarse grained SANDSTONE with subangular to subrounded fine gravel, slightly friable, hard, moist.</li> <li>@41' - Occasional thin beds of fine grained GRAVEL.</li> <li>@43' - Subangular gravel cobble CONGLOMERATE, occasional boulders, well graded, slightly friable, olive gray fine to coarse sandstone matrix,hard, moist.</li> </ul>	@42.5' B N34W/16SW				
50 10/15		×	17.8	110.3	@47' - Sharp contact to fine to medium grained SANDSTONE, weakly indurated, very hard, moist.  @48' - Grades to subangular to subrounded fine gravel to cobble CONGLOMERATE, weakly cemented, olive gray fine to coarse sandstone matrix, hard, moist.  @50' - Light gray brown fine to coarse grained SANDSTONE with subangular to subrounded gravels, occasional cobbles, moist, hard.  @52.5' - Sharp contact to light olive gray fine to medium grained SANDSTONE, weakly indurated, moist, hard.  @54' - Grades to subangular to subrounded fine gravel to cobble CONGLOMERATE, weakly cemented.  @54.5' - Approximately 12" thick clayey fine grained SANDSTONE,	@47' Contact N34W/17SW @51' B N16W/26SW @54.75' Shear N17W/16SW				
65	С		3.5	13.6	pervasively sheared, slightly plastic, stiff, moist, grading to subangular to subrounded fine grained gravel to cobble CONGLOMERATE, massive, hard, moist.  @60' - Light gray brown fine to coarse grained SANDSTONE with subangular to subrounded coarse gravel to cobble clasts, hard, moist, friable, massive.					
70		×			@67' - Olive brown fine to coarse grained SANDSTONE with subangular to subrounded gravel, moderately indurated, moist, hard, occasional cobbles.  Total Depth - 67' No groundwater					
80 85 ADDITIONAL C	OMN	MEN	ITS:		No caving Backfilled  Blows per 6"					

C = Modified California Sampler

Kelly Bar Weights:

0 - 50', 2280 lbs.

50-75', 1200 lbs.

	EOG OF BORING BET									
	CLIE	NT:	Par	rdee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002			
	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 1765'±	DATE: 6/15/06			
	RIG TY	PE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"			
	N	Ü	В	M	DD	DESCRIPTION	ATTITUDES			
0			[	1	1	Topsoil: Medium brown fine grained SAND with fine gravel, moist.				
<u></u> _						@3' - Landslide Deposit: Near vertical carbonate veinlets/nodules				
┝╤┤						approximately 8" diameter.	<u> </u>			
						@4.5' - Medium to coarse grained SANDSTONE with subangular to subrounded fine to coarse gravel, friable, rootlets, very dense, moist.				
$\vdash$				1		@7' - Grades to fine grained SANDSTONE, sparse fine gravel, slightly				
$\vdash$						friable, very dense, moist, occasional rootlets, massive.				
$\vdash$ $\dashv$					ļ	The both of the first of the fi				
10	6/10	С		12.2	113.4	@10' - Light orange to grayish brown silty fine to coarse grained				
					}	SANDSTONE with fine to coarse gravels, occasional boulders (less than				
						5%), very dense, moist.				
							@13' Contact			
		ļ	ļ	}			N15W/46SW			
15		1					,			
$\vdash$							  @17.5' B			
$\vdash$		1		1			N87E/27SE			
-			ŀ		•		101412102			
20	7/15	C		15.1	116.0	@20' - Light orange brown fine to coarse grained SANDSTONE with				
			Х			clay, subangular to subrounded gravel, layers of highly plastic clay,	@21' Shear			
						moist, very dense, moderately to well graded.	N52W/9SW			
$ldsymbol{\sqcup}$			Ì			@21' - Clay shear (1-2" thick), waxy, internally sheared, plastic, no				
اجيا						distinct slicks.	005101			
25					•		@25' Shear N78W/21SW			
$\vdash$				1			@26' Shear			
$\vdash$					}	@28' - Grades to olive fine to medium grained SANDSTONE with fine	N79E/29NW			
		ļ	X			gravel.	@28.5' Approx.			
30	6/18	С	1	10.0	121.5	@28.5' - Contact with shear, updip side of undulatory upper contact with	Shear			
						multiple shears, to 12" thick zone of shearing in clayey fine grained sand.	N20E/15NW			
					†	@29.4' - Basal shear surface (undulatory).	@29.4' Basai			
$\vdash$						@30' - Saugus Formation: Olive silty fine grained SANDSTONE with	Shear			
						clay, oxidized, grading to greenish gray fine grained sandy SiLTSTONE,	N22W/6SW			
35					1	hard, moist, massive.	N53W/6SW			
┝╼┤					1	@32.5' - Contact to olive silty fine to medium grained SANDSTONE with loccasional fine gravel, hard, moist, slightly friable, massive.	@34' Approx. BN5W/7SW			
<del>                                     </del>				1	1	@34' - Contact to 4" thick SILTSTONE, grades to olive fine to medium	@36.5' B			
┞─┤					<b>†</b>	grained SANDSTONE, slightly friable, moist, hard.	N34W/8SW			
40	15/30	С		5.4	108.7	@40' - Light to medium yellow brown medium to coarse grained				
					[	SANDSTONE, subangular to subrounded fine gravels, occasional				
				1	1	cobbles, very dense, moist, moderately graded.				
$\vdash \dashv$			[	]	]					
<del>  </del>				1	1		1			
45	TIONAL (		<u> </u>	NTC.	<u> </u>	Blows per 6"	1			
1	TOMAL	۷۱۷	TIVIC	1413.		C = Modified California Sampler				
						Kelly Bar Weights: 0 - 50', 2280 lbs.				
						50- 75', 1200 lbs.				
1										

SUBS	SUBSURFACE DATA LOG OF BORING B51										
	CLIE	NT:	Раг	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002				
	LOCATI	ON:	Sar	ita Cla	arita	ELEVATION: 1765'±	DATE: 6/15/06				
	RIG TY	PE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
	N	Ü	В	M	DD	DESCRIPTION	ATTITUDES				
45					L. Language	@41' - Fine to coarse grained gravel CONGLOMERATE with cobbles, well graded, channels dip north and south, slightly friable olive coarse grained sandstone matrix. @44' - Medium to coarse grained SANDSTONE with occasional fine gravel and cobble CONGLOMERATE. @46' - Siltstone ripup clasts.	@46' B N30E/11NW				
50	10/30	С	×	6.2	126.0	@50' - Light yellow brown medium to coarse grained SANDSTONE with well graded fine gravel to boulder (10% boulder clasts) CONGLOMERATE moist, very weathered clasts.  @58' - Fine gravel to cobble CONGLOMERATE with occasional boulder clasts, well graded, crudely bedded, slightly friable, yellow brown fine to coarse grained sandstone matrix, hard, moist, crudely bedded.	@50' Approx. ,BN20W/21SW				
60	20/30	С	!	8.5	117.6		@57' Approx. BN10W/29SW				
70 75 80	20/25	С		9.6	111.7	@70' - Subangular to subrounded fine to coarse gravel and occasional cobble CONGLOMERATE with yellow brown medium to coarse grained sandstone matrix, well graded, hard, moist.  Total Depth - 72' No groundwater No caving Backfilled					
	ITIONAL (	CON	ME	ÑTS:		Blows per 6" C = Modified California Sampler Kelly Bar Weights: 0 - 50', 2280 lbs. 50- 75', 1200 lbs.					

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2245'±	DATE: 6/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
N UBM DD	DESCRIPTION	ATTITUDES
5	Mint Canyon Formation: Tan subrounded gravel to cobble CONGLOMERATE with fine to medium sand matrix, clasts are fractured in upper 1', moist.  @2.5' - Subrounded to rounded cobble to boulder CONGLOMERATE with fine to medium sand matrix, hard, rootlets, matrix supported, channelized.	
10 10-8" C 1.8 133.7	@7' - Scoured contact with yellowish brown fine to medium grained SANDSTONE, hard, channelized, moist. @8' - Undulatory contact with yellowish brown cobble to gravel CONGLOMERATE, coarse sand matrix, matrix supported, moist, hard. @9.5' - Yellowish brown gravel-cobble-boulder CONGLOMERATE, fine to coarse sand matrix, matrix supported, channelized, approximately 15% boulders, moist. @11' - Boulder approx. 2' diameter. @12' - Tan to gray cobble to boulder CONGLOMERATE, fine to coarse sand matrix, matrix supported, channelized. @17' - Tan to gray cobble to boulder CONGLOMERATE, fine to coarse sand matrix, matrix supported, channelized.	@7' Channel N66W/24SW @8' Contact N60W/28SW
20 9-12" C 10.7 122.0	sand matrix, matrix supported, chamienzed.	
25	@23' - Light olive brown gravel-cobble-boulder CONGLOMERATE, fine to coarse sand matrix, matrix supported, channelized, decrease in % boulders, cobbles and gravel, moist, hard. @25' - Light olive brown gravel-cobble-boulder CONGLOMERATE, fine to coarse grained sand matrix, matrix supported, channelized, increase in frequency of coarse clasts, moist.	
	@30' - Light olive brown gravel to cobble CONGLOMERATE, friable fine to coarse sand matrix, matrix supported, hard, moist.	
	@36.5' - Channelized, scoured contact to light olive brown fine grained gravelly fine to coarse grained SANDSTONE, hard, moist. @38' - Contact to light yellow brown subangular to subrounded gravel to cobble CONGLOMERATE, hard, moist.	@36.5' Channe N34W/17SW @38' Contact N50W/24SW
	C = Modified California Sampler  Kelly Bar Weights: 0 - 30', 5619 lbs.  31 - 60', 3745 lbs.  61 - 90', 2280 lbs.  91 - 120', 1223 lbs.	

				(1) (		-	LOG OF BORI	NG B52
	C	LIE	NT:	Pai	<u>rdee F</u>	<u>lomes</u>	PROJECT: Skyline Ranch	W.O.: 8838.002
	LOC	٩TI	ON:	Sar	nta Cla	arita	ELEVATION: 2245'±	DATE: 6/19/06
					Buck		<u> </u>	
<b> </b>	T N		TU	Z#	M	DD	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
40	<del></del>		┾≚	12	1 171	1 00	DESCRIPTION	ATTITUDES
1-40	4		ĺ				AAI Enhance	
	-						@41' - Light yellow brown subangular to subrounded gravel to cobble	
<b> </b>	1						CONGLOMERATE, moist.	
<b> </b>	20-	ייכו			4.8	128.3		
45		12	[		4.6	120.3		
170	7						@45.5' - Scoured, channelized contact to light olive brown fine to	@45.5' Scoured
1	1						coarse grained SANDSTONE, occasional gravel, moist.	contact
	1						@46' - Contact to fine to medium grained SANDSTONE with occasional coarse sand, moist.	N69W/19SW
<b> </b>	1		Į	ł			@47' - Irregular contact to light olive brown gravel to cobble	@46' B
50	15-1	10"	lc	}	6.3	1140	CONGLOMERATE with occasional boulders (approximately 5%), weakly	N50W/19SW
J	1			l	0.0	114.0	cemented olive gray fine to coarse sand matrix, matrix supported, moist,	
	1					İ	hard.	N36W/20SW
-	1						@49.5' - Contact to light olive brown fine to coarse grained SANDSTONE	@49.5' Contact
	1						with fine gravel, friable, moist.	@50.5' Contact
55	1		ļ	İ			@50.5' - Contact to light olive brown gravel to cobble with occasional	N57W/16SW
	1				Ì	1	boulder CONGLOMERATE, fine to medium sand matrix, matrix	1401441004
	1						supported, moist.	
	]						@51' - Approximately 18" diameter boulders.	
	1		1				@57' - Light olive brown gravel to cobble with occasional boulder	
60	1			ľ			CONGLOMERATE, fine to medium sand matrix, matrix supported,	
	17-1	2"	С	l	5.5	122.8	moist, hard.	
	1					İ		
	Ì			1				
	]							@64' B
65	]						@65' - Cobble to boulder CONGLOMERATE, clast supported to	N20E/26NW
	]						matrix supported, weakly cemented olive gray fine to medium sand	
	}						matrix with occasional gravel, moist, hard.	
70				i			@70' - Cobble to boulder CONGLOMERATE, clast supported to	
		- [			:		matrix supported, weakly cemented olive gray fine to medium sand	
	25-1	2"	C		4.2	142.0	matrix with occasional gravel, moist, hard.	
		Į	ı					
							İ	
75								
		ļ						
╙		- 1	- 1				@77.5' - Scoured contact to light olive brown fine to coarse grained	@77.5' Contact
							SANDSTONE with fine gravel, moist, hard.	N44W/29SW
		-	ľ			Ì	@78.5' - Contact to light olive brown gravel to cobble CONGLOMERATE,	@78.5' B
80	!	-	Ì				weakly cemented olive gray fine to coarse sand matrix, matrix supported,	N28W/22SW
							moist, hard.	
<u> </u>				ļ		[		
			Į		l	İ		
			ĺ			i		
85	: :=:=:=							
ADD	TIONAL	C	ОМІ	MEN	ITS:		C = Modified California Sampler	
							Kelly Bar Weights: 0 - 30', 5619 lbs.	
ľ							31 - 60', 3745 lbs.	
1							61 - 90', 2280 lbs.	]
							91 - 120', 1223 lbs.	Ĭ.

0000	SUNFACE		177			EGG OF BOKIN	0 002
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002
	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 2245'±	DATE: 6/19/06
	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
<sub>T</sub>	N N	ΙŪ	B	M	DD	DESCRIPTION	ATTITUDES
80		<del>-</del>	<del>  -</del>	<u> </u>	1		
						@81' - Grading to light olive brown cobble to boulder CONGLOMERATE,	
						weakly cemented olive gray fine to coarse sandstone matrix.	
							ļ
85		}		<b>\</b>		@85.5' - Grading to light olive brown fine to coarse grained SANDSTONE.	
			1			@86.5' - Subrounded gravel to boulder CONGLOMERATE, well graded,	@86' B
<u> </u>						crudely bedded, weakly cemented olive gray fine to coarse sand matrix,	N34W/22SW
<b>  </b>	04.408		$\left\{ \right.$	ا م	407.0	hard, moist.	(S)20'4 P
	24-12"	C		5.9	107.9		@89'± B N10E/23NW
90			1			@90' - Subrounded fine gravel to cobble CONGLOMERATE, well graded, crudely bedded, weakly cemented olive gray fine to coarse sandstone	
				ľ		matrix, hard, moist.	@92' B
$\vdash \vdash \vdash$							N10W/19SW
$\vdash$							
95						@95' - Subrounded fine gravel to cobble CONGLOMERATE, well graded,	
						crudely bedded, weakly cemented olive gray fine to coarse sandstone	
			}		}	matrix, hard, moist.	1
]			ļ				@98'± B
			1			CARLO A LA CONCIONEDATE II	N40W/20SW
100						@100' - Subrounded fine gravel to cobble CONGLOMERATE, well	
<u> </u>						graded, crudely bedded, weakly cemented olive gray fine to coarse	
╟─┤						sandstone matrix, hard, moist.	
$\vdash$							
105						@105' - Subrounded fine gravel to cobble CONGLOMERATE, well	
				]		graded, crudely bedded, weakly cemented olive gray fine to coarse	@106'B
						sandstone matrix, hard, channeled, moist.	N47W/19SW
			ļ		ļ	@109' - Subrounded fine gravel to cobble CONGLOMERATE, well	1
110		1				graded, crudely bedded, weakly cemented olive gray fine to coarse	
<u> </u>						sandstone matrix, hard, channeled, moist.	
$\mid - \mid$						@1131 Subrounded fine group to cobble CONGLOMERATE well	@113'± B
$\vdash\vdash\vdash$				-		@113' - Subrounded fine gravel to cobble CONGLOMERATE, well graded, crudely bedded, weakly cemented olive gray fine to coarse	M30W/24SW
115	•					sandstone matrix, hard, channeled, moist.	10011/23011
<del>``</del> ,				ļ			
				1		@118' - Subrounded fine gravel to cobble CONGLOMERATE, well	
			1			graded, crudely bedded, weakly cemented olive gray fine to coarse	[
120						sandstone matrix, hard, channeled, moist.	
						@122' - 12" thick olive gray fine to medium grained SANDSTONE to	
<u> </u>						subrounded gravel to boulder CONGLOMERATE, well graded, weakly	
125	ľ		]	1	<u> </u>	cemented olive gray fine to coarse sandstone matrix, moist.  Total Depth - 123', No groundwater, No caving, Backfilled	
11	ITIONAL (		I IME	NTS:	<u> </u>	C = Modified California Sampler	<u> </u>
100	THOINAL '	JUN	HAIL	H10.		Kelly Bar Weights: 0 - 30', 5619 lbs.	
						31 - 60', 3745 lbs.	
						61 - 90', 2280 lbs.	
						91 - 120', 1223 lbs.	
						<u></u>	_

SUBS	SUBSURFACE DATA LOG OF BORING B53										
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002				
	LOCAT	ON:	Sar	nta Cla	ırita	ELEVATION: 1770'±	DATE: 6/16/06				
	RIG TY	PE:	24"	Bucke		HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
	N	U	В	M	DD	11000	ATTITUDES				
0						Saugus Formation: Dark grayish brown clayey fine grained SANDSTONE with abundant subangular fine gravel, very dense, moist.					
5						@4' - Grades to dark yellowish brown fine grained SANDSTONE with subangular fine gravel, very dense, moist, crudely bedded.					
10	6/12	C	X	11.2	122.5	@10.5' - Sheared clay at contact to strong brown silty fine grained SANDSTONE, very dense, moist. @12' - 2"-6" thick sheared clay, stiff, highly plastic, to dark yellow brown fine to medium grained SANDSTONE with fine gravel and clay, very dense, moist, massive.	@10.5' Shear N44W/17SW @12' Approx. shear N12W/8SW @14' B N25W/25SW				
20	10/15	o C		12.0	124.6	@17' - Brown SILTSTONE, very stiff, moist, to clayey fine grained SANDSTONE, hard, moist, massive. @19' - Grades to slightly friable medium to coarse grained SANDSTONE with fine gravel, hard, moist, crudely bedded. @20' - Scoured contact to fine grained SANDSTONE, hard, moist. @22' - 12" thick gravel CONGLOMERATE channel, to slightly friable yellow brown fine to medium grained SANDSTONE, massive, hard, moist, grading to channelized medium to coarse grained SANDSTONE and gravel CONGLOMERATE.	@20' Contact N65W/16NE @22' Channel N34E/17NW @23' Contact N28W/13SW @26' Channel				
30	1   	8 C	X	16.0	114.5	@27' - Scoured contact (E dipping) to dark yellow brown fine grained SANDSTONE, massive, hard, moist.  @32' - 1"-3" thick strong brown CLAY shear, highly plastic, to 12" CLAYSTONE, grading to yellow brown fine grained SANDSTONE, massive, hard, moist.	@32' Shear N6E/7NW				
40		2 C		10.1	127.9	@36' - Pinhole seep on NW wall. @37' - Nearly horizontal, undulatory 1" thick CLAY seam, highly plastic, sheared.  @40' - Undulatory, nearly horizontal, highly plastic 1" thick CLAY shear, to yellow brown fine grained SANDSTONE with subangular gravel, massive.	@37' Shear Horizontal @40' Shear Horizontal				
45 ADD	DITIONAL	CO	MMI	ENTS:	<u> </u>	Blows per 6"  C = Modified California Sampler					

C = Modified California Sampler

Kelly Bar Weights:

0 - 50', 2280 lbs.

50-75, 1200 lbs.

SUBSURFACE DATA LOG OF BORING B53										
	CLI	ENT:	Pai	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002			
	LOCAT	ION:	Sar	nta Cla	arita	ELEVATION: 1770'±	DATE: 6/16/06			
	RIG T	YPE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"			
	N	U		M	DD	DESCRIPTION	ATTITUDES			
40										
					1					
						@42' - Grading to subangular fine to coarse grained gravel				
						CONGLOMERATE, well graded, crudely bedded, slightly friable yellow				
45			Į		İ	brown fine to coarse grained sandstone matrix, hard, moist.	@44' Approx.			
45					i	@44" - Sharp, slightly scoured contact to yellow brown clayey fine grained SANDSTONE, massive, hard, moist.	contact			
$\vdash$		}	-	İ		@47' - Grading to slightly friable medium to coarse grained SANDSTONE	N40E/44NW			
		ł	İ	}	ļ	with abundant subangular fine gravel, hard, moist.				
			]		]	@49' - Sharp, slightly scoured contact to clayey fine grained	@49 <sup>s</sup> Approx.			
50	10/20	C	1	13.8	122.7	SANDSTONE, hard, moist, massive, with occasional subangular fine	contact			
			1			gravel.	N-S/5W			
<b></b>			]		]	@52' - Grading to slightly friable subangular fine gravel CONGLOMERAT	E.			
<b></b>					†	@53' - Irregular sharp contact to clayey fine grained SANDSTONE				
55						with occasional carbonate nodules and fine gravel, massive, hard, moist.				
-35			-							
			1	ł			j .			
				Ì	]					
60	15/20	C		12.4	119.2	@60' - Brown clayey SILTSTONE, massive, hard, moist.				
<b> </b>					]	@62! Orados to massive destruction because the second second				
<b>  </b>				}	-	@63' - Grades to massive dark yellow brown fine grained SANDSTONE with subangular fine gravel, hard, moist.				
65					•	with subangular line graver, hard, moist.				
<b> </b>			1	}	ł					
		-								
						@68' - Grades to massive dark yellow brown fine grained SANDSTONE	@68' Approx.			
		_				with subangular fine gravel, hard, moist.	BN70W/14NE			
70	15/25	C		10.6	120.9		İ			
		1								
				•						
					]					
75					[ :	Total Depth - 75'				
						Light seepage at 36'				
						No caving				
					:	Backfilled	1			
_ 80										
$\vdash \vdash \vdash$										
				,						
<b>  </b>			<u> </u>				į			
85					<u> </u>					
ADDIT	FIONAL (	COM	MEI	NTS:		Blows per 6"	<u> </u>			
						C = Modified California Sampler				
	Kelly Bar Weights: 0 - 50', 2280 lbs.									
i						50- 75', 1200 lbs.				
Ì										
<u> </u>				·						

	***			<del>_</del> _	-	TOGOF BOR	110 004
<u> </u>	CLIE	NT:	Par	dee F	lomes	PROJECT: Skyline Ranch	W.O.: 8838
<u> </u>	LOCAT	ON:	Sar	nta Cla	arita	ELEVATION: 1845'±	DATE: 6/19/06
	RIG TY	PE:	24"	Buck	 et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	U	В	M	DD	DESCRIPTION	ATTITUDES
0		_ <u></u>	<u> </u>	·		Landslide Deposit: Dark grayish brown medium to coarse grained	1
				}		SAND with gravels, subangular to subrounded, clayey, moist, very	
			1			dense, occasional rootlets.	
╟┈┤				İ			
<u> </u>							
-5		ļ					ļ
<b>  </b>		}		]		@7.5° Grades to light around become a discrete	1
				}		@7.5' - Grades to light orange brown medium to coarse grained SANDSTONE, increasing coarse gravels with depth, moist, dense,	
		1		}		loccasional rootlets.	į
10	6/10	lc		12.2	113.5	@10' - Light orange brown fine to coarse grained SANDSTONE with	}  @10.8' Contact
	· •					traces of sandy clay, subangular to subrounded fine to coarse gravels.	N32E/32NW
					-	occasional small cobbles, well graded, moist, very dense.	@12' Approx.
						@10.8' - Medium brown CLAY, stiff, occasional rootlets, downdip side	BN30E/29NW
				İ	†	approx. 1/4" to 1/2" thick, updip side approx. 12" thick.	ļ
15		}	}			@11' - Grades to slightly friable medium to coarse grained SANDSTONE	 
<b>  </b>					1	with coarse gravels, moist, dense.	
<del>                                     </del>		1	ļ ,		1	@13' - Severely weathered granite boulder in gravel cobble	
		į	} ;			CONGLOMERATE with slightly friable light orange brown medium to	@18' Contact
20	6/12	C		5.9	1107	coarse grained sandstone matrix, moist, dense, gravels and cobbles increase with depth.	N46E/16NW
-20	0/12	ľ		0.5	' ' ' ' '	@18' - Scoured contact to orange brown clayey SILTSTONE with	
$\vdash$						gravels, grading to SiLTSTONE with sand.	)
		İ				@22' - Interbeds of gravel to cobble CONGLOMERATE with medium	
						to coarse grained sandstone matrix and SILTSTONE, moist, dense.	
25					1		
					]	@26.3' - Highly scoured contact to fine to coarse grained silty	@26.3' Contact
						SANDSTONE, occasional gravels, moist, slightly friable, massive.	N50E/50SE
<u> </u>	ĺ				1		
	0140			0.0	400.0	COOK Valley is because to the second of the	
30	8/12			8.9	122.3	@30' - Yellowish orange brown fine to medium grained SANDSTONE	
						with subrounded to subangular fine to coarse gravel channels, moist, dense, moderately graded.	
	!					dense, moderately graded.	
<del>                                     </del>						@34' - Subangular to subrounded gravel cobble CONGLOMERATE,	@34' Approx.
35						slightly friable fine to coarse grained sand matrix, very dense, moist.	BN50W/29SW
						J - Tanta tilaning tany autoor, motor.	
	,					@38' - Interbeds of gravel cobble CONGLOMERATE with medium to	
		_ ]				coarse grained sandstone matrix and fine grained silty sandstone (2	@39' Approx.
40	10/13	С		11.4	120.9	6" thick interbeds).	BN66W/19SW
	İ					@40' - Yellowish brown medium to coarse grained SANDSTONE with	
						subangular to subrounded fine to coarse gravels, occasional cobbles,	
$\vdash$	:					well graded, moist, dense.	
45							
	ΓΙΟΝΑL C	LI MO:	MEN	VTS:		Blows per 6"	<u> </u>
						C = Modified California Sampler	
						Kelly Bar Weights: 0 - 50', 2280 lbs.	
						50- 75', 1200 lbs.	
		<u>,</u>		_			

SUBS	SURF	ACE	DATA
000		/ W_	

SUBS	SUBSURFACE DATA LUG OF BURING 854										
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838				
	LOCATION	:NC	Sar	ıta Cla	ırita	ELEVATION: 1845'±	DATE: 6/19/06				
	RIG TY	PE:	24"	Bucke	∋t	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
	N	Ų	В	M	DD	DESCRIPTION	ATTITUDES				
40 40 45 50 50 60 65 70 75	10/18 10/20	C		M		@42' - Scoured, irregular contact to fine grained sandy SILTSTONE, hard, moist. @43' - Grades to fine to medium grained SANDSTONE with occasional gravels. @45' - Grades to fine grained SANDSTONE with occasional clay.  @49' - Interbedded fine grained sandy SILTSTONE and gravel cobble CONGLOMERATE, friable, moist. @50' - Yellowish orange brown medium to coarse grained SANDSTONE with fine to coarse gravels, subangular to subrounded, well graded, dense, moist. @52' - Interbedded gravel cobble CONGLOMERATE and medium to coarse grained SANDSTONE. Conglomerate is wet. @56' - Sharp contact to CLAY, water seepage stops at top of contact, imbricated, sheared (not sheared at contact), low plasticity. @56.5' - Upper shear, highly plastic, mullion surface, very stiff, 1-2" thick.	@50' Approx. BN80E/12SE @53' B N87E/14SE @56' Contact N84E/21SE @56.5' Shear N80E/6SE @56.9' Shear N69W/4SW @62' Approx. contact N70W/6SW @64' Channel N40E/23SE				
85 ADD	DITIONAL	COM	MMF	NTS.		Blows per 6"					
	A FONAL		111VIL	., 4 , 0.		C = Modified California Sampler					

Kelly Bar Weights:

0 - 50', 2280 lbs. 50- 75', 1200 lbs.

## SUBSURFACE DATA

CI	IEN"	r: P	ardee	Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCA	TIOI	4: S	anta	Clarita	ELEVATION: 2145'±	DATE: 6/20/06
RIG	TYPE	E: 2	4" Bu	cket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
N			BIN			ATTITUDES
5					Colluvium: Brown clayey gravelly SAND, dry, hard.  @1' - Mint Canyon Formation: Gravel cobble CONGLOMERATE with occasional boulders, fine to medium grained sandstone matrix, subangular to subrounded, moist, dense.	
10					@10' - Light olive brown gravel cobble CONGLOMERATE with occasional boulders, fine to medium grained sand matrix, moist, very dense.  @13' - Boulder (approximately 24" diameter) metavolcanic, granitic, schist, occasional volcanic clasts.  @15' - Light olive brown gravel cobble CONGLOMERATE with occasional boulders, fine to medium sand grained sand matrix, moist, hard.	@7' Approx. BN65W/21SW @7.5' Approx. Channel N65E/21SE @10' Approx. BN15W/22SW @13' Approx. BN45W/21SW @17' Approx. BN45W/21SW
20 10/ 25	15 C		9.5	5 106.	@21' - Subangular to subrounded fine gravel cobble CONGLOMERATE, well graded, weakly cemented, olive gray fine to coarse grained sandstone matrix, hard, moist, crudely bedded.  @23' - Scoured contact to light olive brown fine to coarse grained SANDSTONE, weakly indurated, moist, massive.	
	20 C		4.7	7	@27' - Thin (1-2' thick) SILTSTONE interbedded (3" apart) with subangular to subrounded fine gravel cobble CONGLOMERATE, olive gray fine to coarse grained sandstone matrix.  @29' - Seepage in NW quadrant, then wet all around with depth.  @30' - Fine gravel cobble CONGLOMERATE with light olive brown fine to coarse grained sandstone matrix, weakly to moderately cemented, well graded, hard, moist, crudely bedded, occasional boulders.	
35 40 10/	25 C		4.9	127.	with medium to coarse grained sandy clay matrix, wet, hard.  @38' - Fine gravel cobble CONGLOMERATE with light olive brown fine to coarse grained sandstone matrix, weakly to moderately cemented, well graded, hard, moist, crudely bedded.  @40' - Approximately 12" thick conglomeratic fine to medium grained SANDSTONE, scoured contact.	@36' Channel N80E/25NW
45 ADDITIONA	L CC	) MMV	] IENT:		Blows per 6" C = Modified California Sampler Kelly Bar Weights: 0 - 50', 2280 lbs. 50- 75', 1200 lbs.	

	JUNIACE				· · · · · · · · · · · · · · · · · · ·	LOG OF BORI	NO 855
<b> </b>	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002
	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 2145'±	DATE: 6/20/06
	RIG TY	Έ:	24"	Bucke	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	U	В	M	DD	DESCRIPTION	ATTITUDES
40	<del></del>			T	]		
		Į		1	İ	@41' - Boulder clasts, moderately cemented.	
						•	
				l			ļ
45						(CACL E) 45 15 10 10 10 10 10 10 10 10 10 10 10 10 10	@45' Approx.
┝─┤						@46' - Fine to medium grained SANDSTONE bed, scoured contact	BN5W/23SW
┞─┤						(approximately 6" thick), very hard, moist, massive.	@47' B N29W/24SW
			X				@49' Approx.
50					[	@50' - Gravel cobble CONGLOMERATE with occasional boulders with	BN34W/28SW
						olive brown fine to coarse grained sandy clay matrix, moist, hard.	@51' Approx.
			1				BN34W/28SW
		}					
<u> </u>		Ì					
_ 55							
			]				
60	30/B	lc		13.8	116.2	@60' - Subangular to subrounded gravel cobble CONGLOMERATE,	
	00.2	ľ	Х		1,0.2	weakly cemented olive brown sandy clay matrix, hard, moist.	
			1			,	
						@64' - Subangular to subrounded gravel cobble CONGLOMERATE with	
65						moderately cemented olive gray fine to medium grained sandstone	
<u> </u>						matrix, well graded, very hard, moist.	
$\vdash$							
			}		•		
70						Refusal at 65'	
						Seepage at 29-30'	
						No caving	
						Backfilled	
75				,			
				\ '			
$\vdash$							
80							
				;			
			,		ļ		
85	<u>-</u>						
ADDI	TIONAL C	MO:	MEI	NTS:		Blows per 6"	
						C = Modified California Sampler	
						Kelly Bar Weights: 0 - 50', 2280 lbs.	
						50- 75', 1200 lbs.	

3000	UBSURFACE DATA LOG OF BURING 1856									
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002			
	LOCATION	ON:	Sar	ita Cla	erita	ELEVATION: 2066'±	DATE: 6/26/06			
	RIG TY	PE:	24"	Bucke	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"			
	N	U		М	DD	DESCRIPTION	ATTITUDES			
Ö			ΪX		Ì	Colluvium: Brown fine to coarse grained SAND with clay and subangular				
						to subrounded fine gravel, moist, hard, rootlets.				
	l				<b>\</b>					
5						Saugus Formation: Yellowish brown conglomeratic medium to coarse				
						grained SANDSTONE with fine to coarse gravel, occasional fine boulder,	ŀ			
				İ		well graded, moist, very dense, crudely bedded.				
				İ			@8' Approx.			
							BN30W/20SW			
10	8/12	С		3.6	122.7	@10' - Yellowish brown conglomeratic medium to coarse grained	@10' Approx.			
<u> </u>						SANDSTONE with fine to coarse gravel, occasional fine boulder, well	BN85W/22SW			
$ldsymbol{ld}}}}}}}}}$						graded, moist, very dense, crudely bedded.				
igsqcut										
			1			0451 (0.4011111) 011 TOTONIE 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0451.4			
15						@15' - (6-12" thick) SILTSTONE interbed, irregular, scoured by	@15' Approx.			
						conglomeratic SANDSTONE, irregular lower contact.	contact N10W/45-60SW			
						@18' - Fine gravel CONGLOMERATE, coarsening upwards.				
			ł				@17' Approx. BN15W/26SW			
20	10/14	_	-	8.0	126.0	@20' - Yellowish brown medium to coarse grained SANDSTONE with	@20.5' Approx.			
-24	10/14/		1	0.0	120.0	silt, fine to coarse gravel, occasional cobble, subangular to subrounded	BN8E/28NW			
<b> </b>			x			granitic clasts, moist, hard.	@22.5' Approx.			
$\vdash \vdash$			<u> </u> ``			@21' - Discontinuous medium brown CLAY, pervasively sheared.	shear			
						@22.5' - Highly irregular contact to CLAY, grades to sandy CLAY,	N20E/23NW			
25						pervasively sheared (approximately 1" thick).	@24.5' Approx.			
						@23.5' - Downdip side of contact, pervasively sheared CLAY, grades to	shear			
						sandy CLAY, moist, hard, massive.	N60W/5SW			
						@24.5' - Approximately 1/8" thick CLAY shear (no slicks), plastic, stiff,				
						grades to blocky clayey SILTSTONE to clayey fine grained SANDSTONE,				
30	5/8	С				hard, moist.				
					1	@26.5' - Interbeds of highly scoured coarse grained SANDSTONE with				
					1	gravel, clayey fine grained SANDSTONE with occasional gravels, fine				
						and coarsening sequences.				
<b> </b>						@29' - Yellow brown fine to coarse grained SANDSTONE with gravel,				
35						grades to clayey fine to coarse grained SANDSTONE.				
<b> </b>						@33' - Silty fine grained SANDSTONE, grading to yellow brown silty fine	@36' Approx.			
╟┷┩						to medium grained SANDSTONE, moist, hard.	contact			
<u> </u>						@36' - Sharp contact to brown medium to coarse grained SANDSTONE	N60E/35SE			
	4040			0.0	105.4	with some gravels at contact, moist, hard.	@37' Approx.			
40	10/13		1	9.9	125.4	@37' - Gravel channels in medium to coarse grained SANDSTONE,	channel N55E/58SE			
$\vdash \vdash \vdash$						slightly friable, moist, hard. @37.5' - Sharp contact to clayey SILTSTONE to scoured, irregular, rough				
$\vdash \vdash \vdash$						horizontal contact with 1" thick CLAYSTONE within irregular gravel lens,	N7W/14NE			
╟─┤						discontinuous.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
45			x	}		and on this day.	1			
	TIONAL C	OM		NTS:	L	Blows per 6"	<del>1</del>			
		,				C = Modified California Sampler				
l						Kelly Bar Weights: 0 - 50', 2280 lbs.				

Kelly Bar Weights:

0 - 50', 2280 lbs. 50- 75', 1200 lbs.

3083	ORFACE				<del></del>	LOG OF BOR	NG B56
					lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
<del> </del>	LOCATI					ELEVATION: 2066'±	DATE: 6/26/06
<u> </u>	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	Ŭ	В	M	DD	DESCRIPTION	ATTITUDES
45	12/18	С		10.0	126.0	@42* - Dark yellow brown clayey fine grained SANDSTONE, occasional fine gravel, moist, hard. @43.5* - Sharp contact to brown clayey fine grained SANDSTONE, moist, hard. @45* - Pervasively sheared CLAYSTONE, sheared zone (approximately 12" thick) grades to clayey fine grained SANDSTONE with pervasive shearing. @48* - Fine to medium grained SANDSTONE with fine gravels, moist, massive. @50* - Medium brown fine to coarse grained clayey SANDSTONE with occasional fine gravels, moist, hard. @53* - Increase in subangular coarse gravel clasts in medium brown medium to coarse grained SANDSTONE, moist, subangular clasts.	@43.5' Approx. contact N45W/12SW
60	15/20	С		12.1	119.6	medium to coarse grained SANDSTONE, moist, subangular clasts.  @56' - Sharp contact, brown clayey fine grained SANDSTONE, moist.  @60' - Medium brown clayey fine to coarse grained SANDSTONE with subangular fine gravel, moist, hard.	@56' Approx. BN55W/10SW @56.5' Approx. contact N20W/10SW
75	15/15	С		10.6	120.0	@67' - Strong brown medium to coarse grained clayey SANDSTONE, fine gravels, moist, hard.  @70' - Gray light brown fine to coarse grained silty SANDSTONE with clay, fine gravels, subangular clasts, well graded, moist, hard.  @72' - Coarse cobble and gravel clasts in medium to coarse grained SANDSTONE, moist, hard, well graded.  Total Depth - 72'  No groundwater  No caving  Backfilled	
85] ADDiT	TIONAL C	MO:	MEN	NTS:		Blows per 6" C = Modified California Sampler	

Kelly Bar Weights:

0 - 50', 2280 lbs. 50- 75', 1200 lbs.

F	CLIENT: Pardee Homes PROJECT: Skyline Ranch W Q : 8838 002											
<u> </u>	CLIE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002					
<u> </u>	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 2105'	DATE: 6/27/06					
	RIG TY	PE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"					
	N	U	В	М	DD	DESCRIPTION	ATTITUDES					
0	· · · · ·					Saugus Formation: Fine to coarse grained SANDSTONE with silt and fine	T ====					
						gravel, graded, very dense, brown, moist, weakly indurated, rootlets, veins of	Ì					
						light yellowish brown fine gravelly silty fine grained SAND, dry, and patches of very						
$\square$			[		ĺ	dark brown clayey SANDSTONE to CLAYSTONE.						
				ļ	ļ		1					
5				ļ								
<b>_</b>						@6'7" - Grades to 1'7" thick coarse grained gravel CONGLOMERATE with fine to						
╟						coarse grained sandy matrix, slightly friable to friable with depth, reddish brown,						
<b> </b>						roots, metamorphic (schist and gneiss) clasts.	@8'2" C					
10	6/12				4040	@8'2" - Sharp, irregular contact with fine grained SANDSTONE with fine gravel,	N61E/42NW					
10	0/12			8.2	124.9	clay, and silt, poorly graded, dense, brown to light brown, moist, rootlets.	1					
$\vdash \longrightarrow$		[ ;				@8'7" - Grades to fine to medium grained SANDSTONE with clay, silt, and	@11.5' C					
╟╼╌┤		•			İ	fine gravel, graded to well graded.	N61E/35NW					
╟──┤						@9'9" - Fine grained sandy silty CLAYSTONE, non-plastic, grades to fine grained gravelly silty clayey fine grained SANDSTONE, poorly graded to graded, dense,	@12' C					
15		:				dark brown, moist, rootlets.	N55E/34NW					
						@11.5' - Sharp contact with 6" thick coarse grained gravel CONGLOMERATE						
		j l			ļ	with silty fine to coarse grained sand matrix, well graded, dense, brown, moist,						
		,		İ		friable, no continuous thickness around hole, channeled.	]					
						@12' - Sharp contact with fine grained sandy silty CLAYSTONE, graded, very stiff,						
20	7/10	С		9.2	111.6	dark brown, moist, plastic, grades to fine grained SANDSTONE at 14' and coarse						
						grained gravel CONGLOMERATE at 15', slightly friable to friable.						
		i				@15.5' - Clayey silty fine grained SANDSTONE, very dense, brown, grades to	@22'5" Shear					
						2" thick coarse grained gravel CONGLOMERATE.	N46E/21NW					
						@16.5' - Silty fine to coarse grained sand matrix, graded, slightly friable, lesser						
25		J				gravel than material above.						
<b> </b>						@16'8" - Sharp contact with CLAYSTONE with sand and silt, poorly graded, very	@26.5' Shear					
$\vdash$					i	stiff, brown, moist, grades to silty fine to medium grained SANDSTONE.	N64E/13NW					
<u> </u>		ĺ				@17'7" - Grades to coarse grained gravel CONGLOMERATE.	@27' C					
30	10/12	_		5.3		@19'3" - Slightly friable, small percentage of gravel.	N70E/36NW					
H-54	10/12	<u>'</u> ` ا		0.5	124.7	@20' - Sharp contact with CLAYSTONE.	@30'8" C					
$\vdash$						@22'5" - Sheared CLAYSTONE with upper and lower bounding shears, no slickensides, grades to coarse grained gravel CONGLOMERATE, slightly friable	N73E/16NW					
						to friable.						
$\vdash$		ĺ	ĺ		· · · · · · · · · · · · · · · · · · ·	@24'9" - Sharp, irregular, contact with CLAYSTONE, grading to fine grained						
35		1	ł	ľ		SANDSTONE.						
		}				@25'10" - CLAYSTONE, sharp contact with 12" thick coarse grained gravel						
		Ì				CONGLOMERATE with friable fine to coarse sand matrix.						
			ļ	ľ		@26.5' - 1mm thick sheared CLAY with well defined shear, no slickensides, highly						
						plastic, moist.						
40	9/11	c		17.0	110.7	@28' - Contact between CONGLOMERATE above and CLAYSTONE, brown,						
				- 1		grading to 2" thick coarse grained gravel CONGLOMERATE at 30'8", yellowish						
		}	ł	\		brown.	,					
$\square$						@30'10" - Fine grained gravelly silty fine grained SANDSTONE, graded, light						
4.5	ļ	-		[	ļ	brown, moist, slightly friable.						
45	FICALAL		\ <u>\</u>	iTC:		Diama a a Cil						
וטטא.	FIONAL C	OIVI	VIEN	HS:		Blows per 6"	ļ					
						C = Modified California Sampler Kelly Bar Weights: 0 - 50', 2280 lbs.						
}						Kelly Bar Weights: 0 - 50', 2280 lbs. 50- 75', 1200 lbs.						
[						JU- 7J, 1200 IDS.	j					

Logged by: RMP

300	SUBSURPACE DATA LOG OF BORING B57											
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002					
	LOCATI	ON:	Sar	ita Cla	rita	ELEVATION: 2105'	DATE: 6/27/06					
	RIG TY	PE:	24"	Bucke	∋t	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"					
	N	U	В	M	DD	DESCRIPTION	ATTITUDES					
40						@34' - Coarse grained gravel CONGLOMERATE with fine to coarse sand matrix.						
						@34'5" - Fine grained sandy SILTSTONE, yellowish brown, grading to fine						
						grained sandy clayey SILTSTONE with trace gravel, brown.						
						@37'2" - Silty CLAYSTONE streaks white, dry.	ļ					
45			{		{	@38'10" - SILTSTONE, grades to sitty fine grained SANDSTONE, then to coarse grained gravel CONGLOMERATE beds, approximately 6" thick, with light brown	Ì					
H 44						silty fine grained SANDSTONE between 39' and 40'4".						
						@40'9" - Sharp contact with CLAYSTONE, poorly graded, very stiff, brown, moist,	:					
						waxy (suggesting shear), but no shear plane visible.						
			]		ļ	@42' - Grades to silty fine to medium grained SANDSTONE with trace fine gravel,						
50	10/14	С	1	20.8	106.5	graded, hard, light brown, moist, friable to slightly friable.	1					
<u> </u>						@44'3" - Grades to clayey fine grained sandy SILTSTONE, poorly graded, very						
						stiff to hard, moist, brown.						
$\vdash \vdash \vdash$						@46'9" - Grades to coarse grained gravel CONGLOMERATE, moist, friable, irregular contact with claystone below, contact dips roughly NNE.	]					
55			ĺ			@48'3" - Silty CLAYSTONE, poorly graded, very stiff, dark brown, moist, highly	1					
			]	ŀ		plastic, roughly horizontal.						
	i		1			@48'8" - Clayey SILTSTONE with fine sand, poorly graded, hard, light brown,						
				}		moist.						
			ļ	_		@53'4" - Grades to clayey sitty fine grained SANDSTONE with trace gravel,	J					
60	15/20	C		16.8	113.7	graded, hard, dark brown, moist.	1					
$\vdash \vdash \vdash$						@60' - Grades to fine grained gravel CONGLOMERATE with clayey fine to coarse						
├						grained sand matrix, well graded, hard, dark brown, moist.						
├──┤					<u> </u>							
65			İ	1	İ	Total Depth - 60'	ŀ					
			İ	<b> </b>		No groundwater	1					
					 	No caving						
						Backfilled						
	1	ļ		ļ		<u></u>						
-/0												
}	l			}	1							
$\vdash$												
$\Box$												
75					ĺ							
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00												
$\vdash \vdash \vdash$												
85				<u>L                                    </u>			<u> </u>					
ADDI	TIONAL	COM	ME	NTS:		Blows per 6"						
ļ						C = Modified California Sampler						
						Kelly Bar Weights: 0 - 50', 2280 lbs.						
ļ	50- 75', 1200 lbs.											

				dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002
<u> </u>	LOCATION					ELEVATION: 1696'	· · · · · · · · · · · · · · · · · · ·
							DATE: 6/27/06
$\vdash$	RIG TY	PE:	24" B	M Bučke	DD	HAMMER WEIGHTS: Kelly Bar Weights  DESCRIPTION	DROP: 12" ATTITUDES
	IN	Ų	l D	IVI	00	1	ATTITUDES
$\vdash \dashv$			]			Colluvium: Tan fine to coarse grained SAND with subangular cobbles and gravel, dry.	
			]			igraver, dry.	
						@3' - <u>Saugus Formation</u> : Light brown silty fine to medium grained	@3'3" B
						SANDSTONE with gravel, moist, dense, poorly graded, rootlets,	N17W/11SW
5						occasional streaks of white fine grained dry material oriented subvertical	
						and subhorizontal.	
							@7' C
						@8' - Yellow fine grained SANDSTONE, 1" thick gray green fine	N54W/7SW
						subrounded gravel CONGLOMERATE with fine to medium grained sand	
10						matrix, weakly cemented, well graded, dense, moist.	@10'2" C
$\vdash$						@10' - No sample recovered.	N67W/12SW
$\vdash$				ļ		@10'2" - Abrupt, irregular contact with gravel cobble CONGLOMERATE	
$\vdash$						with slightly friable to friable fine to coarse grained sand matrix, well graded, dense to very dense, pale brown, moist to wet, subangular to	  @14'1" Approx.
15	6-10"	С		117	1160	subrounded metamorphic clasts.	CN56E/15SE
	2 10 1	]		','.'		@12' - Yellowish brown friable fine to coarse grained SANDSTONE with	
$\Box$						gravel to occasional cobbles, moist.	
						@14'1" - Sharp irregular scoured contact with yellowish brown silty fine	
						grained SANDSTONE, poorly graded to graded, very dense, moist.	
20						@15' - Olive fine grained SANDSTONE with silt, moist, hard.	
				ļ		@16'7" - 4" thick fine to coarse grained subangular gravel	
					ŀ	CONGLOMERATE with pale brown slightly friable to friable fine to coarse	
$\vdash\vdash$						grained sand matrix, well graded, hard, very moist.	
25						@20'11" - Silty fine grained SANDSTONE, poorly graded, hard, interbedded light brown, orange brown, and gray brown, moist, shallow,	
25					i	subhorizontal bedding, cross bedding, only exposed in SE wall, channel	
$\vdash$	10-10"	lc		6.0	117.5	shaped.	
	, , , ,	ľ		"		@21' -Tan fine to coarse grained SANDSTONE with subangular gravel	
						to cobble clasts, moist.	
30			] [		}	@24'5" - CONGLOMERATE, extremely friable.	
						@27' - Pale olive friable medium grained SAND with occasional coarse	
					]	gravel, moist, hard,	
						@33' - Light brown subangular to subrounded gravel to cobble	
						CONGLOMERATE, friable, fine to coarse grained sand matrix, moist.	
35						@36' - Brown SANDSTONE with subrounded to subangular gravel and	
$\vdash$						cobbles, friable, moist.	
$\vdash$						@37'4" - Matrix fining to clayey, fine to medium grained SANDSTONE,	
						wet.	
40	21-10"	С		11.9	99.3	@37'10" - Matrix resumes coarseness.	
						@39'8" - Transition to fine gravelly fine to coarse grained SANDSTONE	
						with occasional subrounded cobbles, graded, very dense, light brown,	
		ŀ				moist.	
<u>                                     </u>						@40' - Light yellowish brown fine to coarse grained SANDSTONE with	
45	TIONAL		 	UTC:		occasional gravel.	1
AUUI	TIONAL	JUIV	IIVIEI	V12:		Blows per 12" C = Modified California Sampler	
						Kelly Bar Weights: 0 - 30', 5619 lbs.	
1						31 - 60', 3745 lbs.	
						61 - 90', 2280 lbs.	
1						91 - 120', 1223 lbs.	

	ÇLIE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 1696'	DATE: 6/27/06
	RIG TY	PE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	Ü	В	М	DD	DESCRIPTION	ATTITUDES
40					, , , , , , , , , , , , , , , , , , ,	@41'5" - Grades subrounded to subangular to fine gravel CONGLOMERATE to coarse gravel CONGLOMERATE with light brown fine to coarse grained sand matrix, well graded, hard, moist.	
50	7-5"	С				@50' - No sample recovered, subangular gravel to cobble CONGLOMERATE, fine to coarse grained sand matrix, moist, possible minor seep at 50-52', coarsens to boulder CONGLOMERATE, matrix is wet, possibly from seep above.	
65	15-5"	С		5.4	100.5	@59'3" - Clast decreasing in coarseness to cobbles (up to 6"), iron staining in matrix and clasts. @60' - Light brown subangular gravel CONGLOMERATE with friable fine to coarse grained sand matrix, moist.	
75	22-12" 16-5"			8.5	109.9	@70' - Dark yellowish brown subangular fine gravel CONGLOMERATE with fine to coarse grained sand matrix, moist, friable, poorly graded, hard. @71' - Light brownish gray subrounded coarse gravel CONGLOMERATE with fine to coarse grained sand matrix, well graded, hard, moist, metamorphic clasts.  @72' - Seeping.  @74' - Greenish gray fine to medium grained SANDSTONE with trace fine gravel, graded, hard, moist.  @74'11" - Mint Canyon Formation: Sharp, scoured, irregular contact with subrounded cobble CONGLOMERATE, gray brown fine to coarse grained sand matrix, weakly to moderately cemented, very moist, hard, well graded.  @75' - Greenish gray silty fine grained SANDSTONE, poorly graded, hard, moist.	@76'8" Approx. contact N35E/8SE
85 ADDI	TIONAL (	COM	MEI	NTS:		@76'8" - Abrupt transition to subrounded cobble CONGLOMERATE with greenish gray fine to coarse sand matrix, very dense, moist, well graded.  Blows per 12"  C = Modified California Sampler  Kelly Bar Weights: 0 - 30', 5619 lbs.  31 - 60', 3745 lbs.  61 - 90', 2280 lbs.  91 - 120', 1223 lbs.	

		- 1 -	-			LOG OF BORI	<del>/************************************</del>
<b></b>					lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
<u> </u>	LOCAT	<u>ION:</u>	Sar	nta Cla	arita	ELEVATION: 1696'	DATE: 6/27/06
lL	RIGTY	PE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	U	В	М	DD	DESCRIPTION	ATTITUDES
80					<del></del>	@80' - Greenish gray subrounded cobble CONGLOMERATE with silty	<u> </u>
						fine to coarse grained sand matrix, well graded, hard, moist, metamorphic	
						clasts.	
		1		1		@83' - Greenish brown subrounded cobble CONGLOMERATE with silty	
						fine to coarse grained sand matrix, well graded, hard, moist, metamorphic	
85		( :	ļ	ĺ	ľ	clasts.	ł
السلا			ĺ				
						@87'4" - Fine grained gravelly fine to coarse grained SANDSTONE,	@87'4" B
$\parallel$		_				graded, hard, gray, moist to very moist.	N23W/8SW
	30-10"	C		14.0	104.3	@88' - Light brownish gray silty fine to medium grained SAND with trace	
90						subangular fine gravel, graded to well graded, hard, dense, moist,	ĺ
<b> </b>		}		}	1	metamorphic clasts.	]
						@88'4" - Scoured contact between subrounded coarse gravel	[
$\parallel$					] .	CONGLOMERATE, slightly friable, and silty fine grained SANDSTONE	
95				1		below, poorly graded to graded, hard, gray, moist.	
93				•		@89' - Gray very silty fine to medium grained SANDSTONE, poorly	
						graded to graded, hard, moist. @92' - Grades to silty fine to coarse grained SAND over fine gravel	
<del> </del>						CONGLOMERATE, over cobble CONGLOMERATE, friable, gray fine to	
		1				coarse grained sand matrix, hard, wet.	
100		\		1		Coarse grained sand matrix, hard, wet.	
					.		
						@103' - Brown to dark brown cobble CONGLOMERATE with subrounded	
						gravelly fine to coarse grained sand matrix, well graded, hard, moist,	
105	30-5"	C		5.3	87.1	metamorphic clasts.	
		1 1				@105' - Gray subrounded to subangular coarse gravel to cobble	
						CONGLOMERATE with friable fine to to coarse grained sand matrix, well	
		l 1				graded, hard, moist, metamorphic clasts, in SE wall weakly cemented	
				!		fine to coarse grained SANDSTONE, graded, hard, gray, moist, truncated	
110						by CONGLOMERATE.	
			ļ	'	i i		
445							
115						@115' - Cobbles coarsening to boulder size.	
$\vdash$							:
$\vdash$							
$\vdash\vdash\vdash$							
120						Total Depth 116'	
140		]				Total Depth - 116' Minor seep at 50'	
<del></del>						Minor seep at 50' Seep causing sand to run at 72'	
						Backfilled	
						- Laborating G	
125	•						
	IONAL C	ОМІ	MEN	JTS:		Blows per 12"	
						C = Modified California Sampler	
						Kelly Bar Weights: 0 - 30', 5619 lbs.	
						31 - 60', 3745 lbs.	
						61 - 90', 2280 lbs.	
						91 - 120', 1223 lbs.	
				DAAD			

SUBSURFACE DATA LOG OF BORING B59

1000	CLIENT: Pardee Homes PROJECT: Skyline Ranch W.O.: 8838,002										
						PROJECT: Skyline Ranch	W.O.: 8838.002				
ļ	LOCATI				<del></del>	ELEVATION: 1678'±	DATE: 6/30/06				
<u></u>	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
	N	U	В	M	DD	DESCRIPTION	ATTITUDES				
0						Saugus Formation: Brown coarse grained gravel to cobble					
						CONGLOMERATE with fine to coarse grained sand matrix, well graded,					
<u> </u>						dense, moist, clasts metamorphic and subrounded to subangular,					
			<b>i</b> ,			metamorphic clasts, slightly friable, rootlets.	@3.5' C				
<u> </u>						@2' - Pale brown coarse grained gravel CONGLOMERATE with fine to	N80W/9NE				
屵의					:	coarse grained sand matrix, well graded, dense, moist, subrounded metamorphic clasts.					
<del>  </del>		1			•	@5' - Mottled light yellowish brown, pale brown, and gray green silty fine					
						grained SAND, poorly graded, medium dense, moist, with trace iron					
<b>}</b>						staining, to fine grained gravelly sifty fine to medium grained SAND,					
10	8	С		12 1	118.0	poorly graded, dense, moist.	@10'3" B				
	J				1.0.5	@7'4" - Grades to very silty fine grained SANDSTONE, poorly graded,	N64W/8SW				
						very dense, brown, moist.					
						@9' - Dark brown fine to coarse grained sandy clayey SILT, poorly graded,					
						very stiff, moist, bedded with gray green beds from above.	@14.6" B				
15			'			@10' - Light yellow brown fine grained gravel CONGLOMERATE with fine	N41W/12SW				
					) ;	to medium grained sand matrix, graded to well graded, dense, moist,					
						subrounded, over interbedded gray green silty fine to coarse grained					
						SAND, graded, dense, moist, and dark brown silty fine to coarse grained	@18'10" B				
	4.0.00	_				SAND, graded, dense, moist.	N86W/11SW				
20	10-8"	C	:	4.0	117.6	@17' - Gray green interbeds, color change to clive and very moist.	}				
						@18'10" - Subrounded to subangular cobble CONGLOMERATE, well					
						graded, slightly friable, olive silty fine to coarse grained sand matrix, very					
<b></b>					] :	dense, moist. @20' - Yellowish brown fine grained gravel CONGLOMERATE with fine					
25						to coarse grained sand matrix, well graded, hard, moist, subrounded					
╟╧┦						metamorphic clasts.	]				
						@21' - Coarsens to cobble CONGLOMERATE.					
$\  \Box \ $						@21.5' - Yellow brown fine to coarse grained SANDSTONE, graded,					
						hard, friable, irregular thickness.	@29'4" C				
30	15-10"	C		4.6	116.6	@22.5' - Subangular coarse grained gravel CONGLOMERATE, friable.	N51E/12SE				
						@23' - Yellow brown fine to coarse grained SANDSTONE, graded, hard,					
		-				moist, friable, irregular thickness.					
			1	· '		@23.5' - Yellow brown fine to coarse grained gravel CONGLOMERATE	}				
اييل					ĺ	with friable fine to coarse grained sand matrix, well graded, hard, moist,					
35						subangular metamorphic clasts, occasional cobbles.	}				
⊩						@29'4" - Yellow brown fine to coarse grained SANDSTONE, graded, hard, moist, friable, contact with above is irregular and scoured.					
<b>}</b> -						@32' - Yellowish brown fine grained gravel CONGLOMERATE with fine					
₽₩						to coarse grained sand matrix, well graded, hard, moist, subangular	1				
40	14-6"	C		6.3	103.0	metamorphic clasts.					
┢╧		Ĭ	]			@33' - Dark yellowish brown coarse grained gravel CONGLOMERATE					
		]			] :	with fine to coarse grained sand matrix, well graded, very dense, moist,					
						subrounded metamorphic clasts, also boulder sized pocket of silty fine					
			,		<b> </b>	grained SANDSTONE, poorly graded, dense, brown to yellowish brown,					
45				<u> </u>		moist, weakly indurated, only in N wall (ripup clast?).					
ADDI	TIONAL	COM	IME	NTS:		Blows per 12"	<u>-</u> -				
						C = Modified California Sampler					
						Kelly Bar Weights: 0 - 30', 5619 lbs.					
						31 - 60', 3745 lbs. 61 - 90', 2280 lbs.					
1						91 - 120', 1223 lbs.					
<u> </u>	=					VI 124, 1220 100.	·····				

SOBSURFACE DATA	LOG OF BORII	
CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1678'±	DATE: 6/30/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
N UBM DD	DESCRIPTION	ATTITUDES
40 45 50 50 60 60 70	@34'5" - Grades to fine grained gravelly fine to coarse grained SANDSTONE, graded, slightly friable. @35'2" - Dark yellowish brown fine to coarse grained gravel CONGLOMERATE with fine to coarse grained sand matrix and occasional cobbles, subrounded metamorphic clasts. @40' - Yellowish brown to dark yellowish brown coarse grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, subrounded metamorphic clasts, also discontinuous lens of brown CLAYSTONE, very stiff, wet, waxy, non-slightly piastic, boulder sized and only in SW wall. @44' - Several cobbles approach boulder size. @46' - Grades to pale brown fine to coarse grained SANDSTONE with coarse gravel, graded, hard, moist, slightly friable, subangular metamorphic clasts. @47'3" - Pale brown fine to coarse grained gravel to cobble CONGLOMERATE, well graded, hard, moist, subangular metamorphic clasts. @49' - Yellowish brown to dark yellowish brown cobble CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, subangular to subrounded metamorphic clasts, also boulder sized ripup clast of clayey SILTSTONE in SE wall, poorly graded, very stiff, dark brown, moist, slightly plastic. @55' - Occasional boulder sized clasts in CONGLOMERATE. @56'4" - Sharp, erosional contact with pale brown fine to coarse grained SANDSTONE, poorly graded to graded, hard, moist, thinly bedded. @57'8" - Sharp, irregular, erosional contact with coarse grained gravel to cobble CONGLOMERATE, well graded, pale brown, weakly cemented to cemented fine to coarse grained sand matrix, hard, moist, subangular metamorphic clasts. @61'7" - Pocket of gravelly fine to coarse grained SANDSTONE, graded, hard, moist, pale brown, slightly friable, only in E wall. @70' - Boulder sized clast. @71'5' - Orange CLAY rind around clasts, soft, moist to wet, highly plastic, approximately 1/2mm thick but same matrix from 57'8" exists, mostly clast supported, very little matrix.	@56'4" C N89W/15NE @57'5" B N20E/16NW
	Blows per 12" C = Modified California Sampler Kelly Bar Weights: 0 - 30', 5619 lbs. 31 - 60', 3745 lbs. 61 - 90', 2280 lbs. 91 - 120', 1223 lbs.	

	CLIE	NT:	Parc	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002				
ļ	LOCATION	ON:	San	ta Cla	irita	ELEVATION: 1678'±	DATE: 6/30/06				
	RIG TY	PE:				HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
	N	U	В	М	DD	DESCRIPTION	ATTITUDES				
80	21-8"	C		7.4	h	Light yellowish brown coarse grained gravel CONGLOMERATE with					
<u> </u>						silty fine to coarse grained sand matrix, well graded, very dense,					
						moist, subrounded metamorphic clasts.					
85				!	}						
			Į		ļ						
90											
$\vdash$						Total Depth - 92'					
						No groundwater					
						No caving					
95						Backfilled					
<u> </u>							1				
100											
1					}						
400											
105											
$\parallel$											
		ĺĺ			}						
110					}						
					1						
$\vdash$											
115											
400											
120											
$\parallel \rightarrow \parallel$											
125											
ADDI	TIONAL C	COM	ΜEΙ	NTS:		Blows per 12"					
1	C = Modified California Sampler  Kelly Bar Weights: 0 - 30', 5619 lbs.										
	Kelly Bar Weights: 0 - 30', 5619 lbs. 31 - 60', 3745 lbs.										
	61 - 90', 2280 lbs.										
						91 - 120', 1223 lbs.					

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<u> </u>	CLIE	ENT:	Pai	rdee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
	LOCATI	ON:	Sai	nta Cla	arita	ELEVATION: 1664'	DATE: 7/7/06
	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N N	ΙŪ	<u>Z</u> 4	M	DD	DESCRIPTION	ATTITUDES
o		<del>1 -</del>	Ť	1	1 22	Saugus Formation:	1
						Saugus i Gilliation.	
$\vdash \vdash \vdash$							
						@3' - Mottled gray green, rusty orange, brown fine to coarse grained gravelly fine to	
┞╼╼┪						coarse grained SANDSTONE, graded, weakly indurated, very dense, moist, massive,	
5						subangular metamorphic clasts, rootlets to 5'.	
						@5'4" - Grades to fine grained gravel CONGLOMERATE with weakly cemented to	@6'11" B
						slightly friable fine to coarse sand matrix, graded to well graded, very dense, moist.	N48W/85SW
						@5.5' - Dark brown CLAYSTONE, highly plastic, moist.	
		į				@6'7" - Grades to fine grained gravel CONGLOMERATE with weakly cemented fine	@9'4" B
10	10	c		14.0	115.2	to coarse grained sand matrix, graded to well graded, very dense, moist.	N7W/7SW
		ł				@9'4" - Grades to yellow brown fine to coarse grained grave! CONGLOMERATE,	
			}			subangular metamorphic clasts, friable in west wall.	@12' B
						@10' - Brown silty fine to medium grained SANDSTONE, poorly graded, weakly	N32W/8SW
				ļ	-	indurated, very dense, moist, subangular metamorphic fine gravels.	
15			}			@12' - Grades to light yellowish brown fine grained gravel CONGLOMERATE with	
igsqcup						friable fine to coarse sand matrix, well graded, hard, moist, subangular metamorphic	@16' B
Щ					1		N22W/7SW
$\parallel \perp \parallel$						@12'5" - Grades to yellowish brown silty fine grained SANDSTONE, poorly graded	
						graded, weakly indurated, hard, moist, massive.	COOLON D
20					]		@20'3" B
						massive.	N66W/8SW
$\vdash \vdash$			1			@15' - Grades to pale brown fine grained gravel CONGLOMERATE, well graded,	
$\vdash$		ļ	1			friable, hard, moist, subangular metamorphic clasts. @15.5' - Grades to yellowish brown silty fine grained SANDSTONE, poorly graded	
25			}		1	to graded, weakly indurated, hard, moist.	
			}			@16' - Grades to cobble CONGLOMERATE with friable light yellowish brown fine to	@26'8" B
						coarse sand matrix, well graded, hard, moist, subrounded metamorphic clasts.	N9W/8SW
$\vdash \vdash$		l				@18'4" - Grades to yellowish brown silty fine grained SANDSTONE, poorly graded	11.511.0011
						to graded, weakly indurated, hard, moist.	
30		{				@20'3" - Grades to coarse grained gravel CONGLOMERATE with friable yellow	
				İ		brown fine to coarse sand matrix, well graded, hard, moist, subrounded metamorphic	
						clasts.	
				l		@22'4" - Grades to yellowish brown silty fine to coarse grained SANDSTONE,	
		1	ļ	}	}	graded, weakly indurated to slightly friable, hard, moist.	}
35						@23'4" - Grades to yellowish brown fine grained gravel CONGLOMERATE with friable	
Щ.						fine to coarse sand matrix, well graded, hard, moist, subrounded metamorphic	
<b> </b>						clasts.	
Щ						@26'8" - Coarsens to coarse grained gravel CONGLOMERATE.	@38'9" B
$\sqsubseteq$							N17W/20SW
40						friable, hard, moist.	
$\vdash \vdash$						@28'2" - Grades to subrounded fine to coarse grained gravel to cobble	
$\vdash \vdash \vdash$				1		CONGLOMERATE, friable.	
$\vdash \vdash \vdash$			İ			@30' - Yellow brown coarse grained gravel to cobble CONGLOMERATE with fine	
45				1		to coarse sand matrix, well graded, hard, moist, subrounded metamorphic clasts.	
	TIONAL		/MF	NTS	}	Blows per 12"	!
```	TOMPL	J ()				C = Modified California Sampler	
Ī						Kelly Bar Weights: 0 - 50', 2280 lbs.	
						50- 75', 1200 lbs.	
							i

20B	UBSURFACE DATA LOG OF BORING B60										
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002				
L	OCATIO	ON:	San	ita Cla	arita	ELEVATION: 1664'	DATE: 7/7/06				
_	RIG TY	PF:	24"	Bucke	et .	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
- !	N	U	В	М	DD	DESCRIPTION	ATTITUDES				
40						@35' - Brown coarse grained gravel to cobble CONGLOMERATE with fine to coarse					
						sand matrix, well graded, hard, moist, subangular metamorphic clasts.					
						@37'9" - Sharp, irregular, scoured contact with yellowish brown fine to coarse grained					
						SANDSTONE, graded, friable, hard, moist.	ļ				
						@38'9" - Grades to coarse grained subangular gravel CONGLOMERATE, friable.					
45						@38'11 - Sharp, irregular, scoured contact with yellowish brown fine to coarse	ļ				
						grained SANDSTONE, graded, hard, moist, friable.					
						@40' - Grades to cobble CONGLOMERATE with friable yellowish brown fine to coarse					
						sand matrix, graded, hard, moist, subangular metamorphic clasts.					
						@41' - Pale yellowish brown fine grained subangular gravelly fine to coarse grained					
50						SANDSTONE, graded, hard, moist.					
						@42' - Fines to fine to coarse grained gravel CONGLOMERATE.					
						@45' - Yellow brown coarse grained gravel to cobble CONGLOMERATE with fine to	@52' B				
				]	1	coarse sand matrix, well graded, hard, moist, clasts subangular to subrounded	N63W/12SW				
						metamorphics.					
55		' 		i		@45.5* - Matrix color grades to very pale brown, approx. 50% of conglomerate is	}				
						matrix material, most clasts subangular fine gravel, occasional cobbles, hard, moist,					
						friable to slightly friable. @47' - Moisture increases to very moist, subangular cobble clasts.					
					ŀ	@53' - Grades to brown coarse grained gravel to cobble CONGLOMERATE with fine					
60						to coarse sand matrix, well graded, hard, very moist, clasts subangular to					
<del></del>	22-10"	С		16.1	113.2	subrounded metamorphics.					
$\neg$		•			1	@55'2" - Matrix color grades to very pale brown, approx. 50% of conglomerate is	@62'1" C				
						matrix material, most clasts subangular fine gravel size, occasional cobbles, hard,	N2E/11NW				
		<u>.</u>				moist, friable to slightly friable, massive.	@64'11" C				
65						@59' - Orange highly plastic CLAYSTONE, appears in matrix surrounding clasts.	N2E/14NW				
						@61' - Brownish yellow fine grained gravelly slightly plastic clayey fine to medium	@65'8" B				
						grained SANDSTONE, poorly graded, very dense, moist, gravels subrounded to	N11W/16SW				
				ļ		subangular metamorphics, overlying mottled brownish yellow and gray silty fine					
						grained SANDSTONE, poorly graded to graded, dense, moist.	i				
70	j					@62'1" - Sharp, irregular contact along a 1mm thick highly plastic CLAYSTONE bed,					
	i				1	soft, moist, light brown to brown, overlying dark yellowish brown silty fine grained	@71' B				
		!				SANDSTONE, poorly graded, weakly indurated, hard, moist, thinly bedded.	N34W/4SW				
						@63' - Light gray silty fine grained SANDSTONE, poorly graded, weakly to moderately					
						indurated, hard, moist.					
75						@64'11" - Contact between dark yellowish brown and gray silty fine grained					
						SANDSTONE.					
						@65'3" - Grades back to dark yellowish brown.					
						@67.5' - Contact with gray silty fine grained SANDSTONE.  @68' - Color change to mottled gray and dark yellowish brown.					
80						@69' - Mottled gray and yellowish brown to dark yellowish brown silty fine grained	}				
						SANDSTONE, poorly graded, hard, moist.					
						a a. a. a. pourty graduu, ridiu, muun	1				
						Total Depth - 76', Seep from 56-58', No caving, Backfilled					
85			L	L_							
ADDI	TIONAL	. CC	MM	ENTS	<b>}</b> :	Blows per 12"					
						C = Modified California Sampler					
						Kelly Bar Weights: 0 - 50', 2280 lbs.					
	50- 75', 1200 lbs.										

				<u> </u>			
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002
	OCATI	ON:	San	nta Cla	rita	ELEVATION: 1684'	DATE: 7/11/06
<del></del> -	RIG TY	-				HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
<del>  − т</del>	N N	U	B	M	DD	DESCRIPTION	ATTITUDES
		H		) IVI			ATTOOLO
니						Saugus Formation: Very pale brown silty fine to coarse grained gravelly fine to	
⊩⊣						coarse grained SANDSTONE, graded, hard, dry, gravel clasts are subangular.	6010
<u> </u>			ŀ			@2' - 4" thick fine grained grave! CONGLOMERATE with slightly friable silty fine to	@2' B
$\vdash$						coarse sand matrix, well graded, hard, moist, rootlets, clasts are subangular and	N52W/14SW
ightharpoonup			Ì			metamorphic.	
5						@2'4" - Mottled yellowish brown and gray green fine grained gravelly silty fine to	
╙						coarse grained SANDSTONE, graded, hard, moist, gravels are subangular, end of	@6' B
						rootlets, massive.	N48W/6SW
$ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ld}}}}}}$						@3'3" - Absence of gray green color.	
igsquare						@5' - Dark yellowish brown and mottled olive gray clayey silty fine to medium	į
10	7	С		12.7	121.7	grained SANDSTONE, graded, hard, moist.	
			ነ	) '	1	@6' - Grades to yellowish brown fine to coarse grained gravel CONGLOMERATE	@11'10" B
						with friable fine to coarse sand matrix, well graded, hard, moist, clasts are subrounded	N25W/5NW
						and metamorphic.	
						@9' - Sharp, scoured contact with 12" thick section of interbedded yellowish brown	
15						and gray green fine grained sandy SILTSTONE, poorly graded, hard, moist, interbeds	
						approximately 1.5" thick.	
						@10' - Yellowish brown thinly bedded SILTSTONE.	
						@11'10" - Grades to reddish brown clayey silty fine to coarse grained SANDSTONE	
		l	ļ			with fine gravel, graded, hard, moist.	
20	11-10"	С		8.6	115.2	@12'5" - Grades to coarse grained gravel to cobble CONGLOMERATE with friable	@20' B
				1		yellow brown fine to coarse sand matrix, well graded, hard, moist, clasts are	N37W/6SW
			-			subrounded and metamorphic.	
						@13'5" - Matrix color changes to pale brown.	
					ŀ	@14.5' - Matrix occasionally turns reddish brown for 2", then back to pale brown.	
25						@17'10" - Sharp, irregular scoured contact with dark yellowish brown fine grained	
		ŀ				gravelly silty fine to medium grained SANDSTONE, graded, weakly indurated, hard,	
					ļ	moist, massive.	
				ĺ		@20' - Grades to yellowish brown coarse grained gravel to cobble CONGLOMERATE	
						with slightly friable fine to coarse sand matrix, well graded, hard, moist, occasional	
30	19-8"	lc		8.7	120.9	cobbles, clasts are subrounded and metamorphic.	ļ
<b>₽</b>	10 0				,_0.0	@22' - Scoured contact with dark yellowish brown silty fine to coarse grained	
						SANDSTONE, graded, hard, moist, thickly bedded.	
$\vdash$						@23'7" - Grades to yellowish brown fine to coarse grained gravel CONGLOMERATE.	
$\vdash$						@23'11" - Yellow brown silty fine grained gravelly fine to coarse grained	
35				ļ		SANDSTONE, slightly friable, graded, hard, moist, massive.	@35' B
<b>₩</b>					}	@25'1" - Grades to yellow brown coarse grained gravel to cobble CONGLOMERATE,	ı <del>-</del> .
$\vdash\vdash\vdash$						friable to slightly friable, well graded, hard, moist, clasts are subrounded and	10211/1011
$\vdash\vdash\vdash$						metamorphic.	
$\vdash\vdash\vdash$			1			@30' - Grades to yellowish brown coarse grained gravel to cobble	
40						CONGLOMERATE with fine to coarse sand matrix, well graded, slightly friable to	
<b>-4</b> 0						friable, hard, moist, occasional cobbles, clasts are subrounded and metamorphic.	
$\parallel$							
⊩						@31' - 1" thick discontinuous brown clayey silty SAND, poorly graded, stiff, moist,	
<b> </b>						90° around hole in SE quadrant.	
						@31'5" - Occasional boulders begin appearing in conglomerate for remainder of boring	y. 
45	TIONA		] }\\\	I E NOTES	<u>Ļ</u>	@35' - Matrix coarsens and becomes friable.	
ADDI	TIONA	_ (((	JIVIV	IEN IS	). 	Blows per 12"	
						C = Modified California Sampler	1
						Kelly Bar Weights: 0 - 30', 5619 lbs.	
1						31 - 60', 3745 lbs.	
						61 - 90', 2280 lbs.	
f							

3000	UKFAL	<u> </u>	J/ \ I /	<u> </u>		LOG OF BORING	<u>~</u>
_	CLIE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
L	OCATI	ON:	Sar	nta Cla	arita	ELEVATION: 1684'	DATE: 7/11/06
	RIG TY			-		HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
<u> </u>	N	Ū	B	M	DD	DESCRIPTION	ATTITUDES
40		_	<del>† -</del>	<del> </del>	<del>                                     </del>		=
			1				
			1		1	@42' - Grades to fine grained gravel CONGLOMERATE.	
$\vdash \dashv$	!	ļ				i di dada ta inia granica graca, a a receniza a re	
$\vdash \dashv$						@44' - Grades to coarse grained gravel to cobble CONGLOMERATE.	
45						@44'5" - Boulder sized pocket of brown silty fine grained SANDSTONE, poorly graded,	
						dense, moist, thinly bedded, occurs in south wall.	
						@47' - Yellowish brown fine grained gravelly fine to coarse grained SANDSTONE,	
$\overline{}$			1			graded, slightly friable, hard, moist, massive.	
						@49' - Very pale brown fine grained gravelly fine to coarse grained SANDSTONE,	
50						friable, graded, hard, very moist.	
					ļ	@51' - Grades to yellowish brown fine grained gravel CONGLOMERATE with slightly	
						friable fine to coarse sand matrix, well graded, hard, moist, subangular metamorphic	
						clasts.	1
55						@55' - Grades to cobble CONGLOMERATE.	
		1	1		Ì	@56'5" - Grades to subrounded fine grained gravel CONGLOMERATE.	)
			1				
	00.40	٦	ĺ	ا د	00.0	COOL V. Havrida Survey Casta and annual CONCLOMEDATE with fine to	
60	22-10"			8.5	99.3	@60' - Yellowish brown fine to coarse grained gravel CONGLOMERATE with fine to	
⊢			1		[	coarse sand matrix, well graded, hard, moist, subangular metamoprhic clasts, orange	
$\vdash$ $\dashv$						highly plastic clay in matrix around clasts.  @60.5' - Matrix color changes to very dark brownish black.	
┝┈╡						@64' - Matrix color changes to very dark brownsh black.	
65					i	10004 - Matrix color changes back to pale yellowish brown.	
03					l		
$\vdash \dashv$			ļ				1
$\vdash$			1				
├─┤							
70						@70' - Yellow brown subangular fine to coarse grained gravel CONGLOMERATE	
	i				ļ	with fine to coarse sand matrix, well graded, hard, moist.	
	!				1		
[							
75						@75' - Yellow brown subangular fine to coarse grained gravel CONGLOMERATE	[
					1	with fine to coarse sand matrix, well graded, hard, moist.	
							@77' B
<u> </u>			}				N20W/12NW
<u> </u>							}
_80					1	@80' - Yellow brown subangular fine to coarse grained gravel CONGLOMERATE	ţ
<u> </u>						with fine to coarse sand matrix, well graded, hard, moist.	
ļ						Total Division COI	
<b> </b>						Total Depth - 80'	
0.5						No groundwater, No caving	
85	ITIONA	L	<u> </u>	ALNIT :	<u> </u>	Blows per 12"	<u> </u>
טטאן	HIONA	_ ()	O IVII/	/I⊏IN E	٥.	C = Modified California Sampler	
						Kelly Bar Weights: 0 - 30', 5619 lbs.	
						31 - 60', 3745 lbs.	
						61 - 90', 2280 lbs.	
						V 1 mmes	
L		_					

SUBSURFACE DATA LOG OF BORING B62							
CLIENT: Pardee Homes					omes	PROJECT: Skyline Ranch	W.O.: 8838.002
	LOCATION	ON:	San	ta Cla	arita	ELEVATION: 1998'	DATE: 7/12/06
RIG TYPE: 24" Bucket					et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	Ū	В	М	DD	DESCRIPTION	ATTITUDES
Ö						Saugus Formation: Brown fine grained gravelly fine to coarse grained SANDSTONE,	
						graded, slightly friable, dense, moist.	
						@3' - Color change to yellow brown fine to coarse grained gravel to cobble	@3' B
			·			CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist,	N58E/24NW
_ 5						clasts are subrounded and metamorphic.	
						@5' - Reddish yellow silty fine to medium grained sandy SILTSTONE, weakly indurated, poorly graded, very stiff, moist.	
			'	\ 		indusated, poorty graded, very still, moist.	
-						@9'9" - Grades to channelled gravels, 2" thick, rootlets.	@9'9" B
10	7	С		12.6	118.3	@10' - Dark yellowish brown clayey slity fine to medium grained SANDSTONE,	N69E/14NW
						weakly indurated, hard, moist, occasional white streaks.	@11.5' B
						@11.5' - Grades to fine to coarse grained gravel CONGLOMERATE with slightly	N79E/26NW
					ĺ	friable coarse sand matrix, well graded, hard, moist, clasts are subrounded and	1
						metamorphic.	
15					1	@13' - Yellowish brown fine grained gravelly fine to coarse grained SANDSTONE	  @16' B
					1	with occasional coarse gravel, graded, slightly friable, hard, moist, massive,	N49E/23NW
						occasional gravel beds. @16' - Coarse gravel bed.	11496/231100
$\dashv$						@ 10 - Coalse glavel bed.	
20	4	lc	1	10.4	116.7	@20' - Grades to fine grained gravel CONGLOMERATE with pale brown fine to	
					i	coarse sand matrix, well graded, hard, moist.	@21'3" C
						@21'3" - Sharp, scoured contact along bedding, yellow brown clayey silty fine	N31E/27NW
			ļ			grained SANDSTONE, poorly graded, hard, moist, slightly plastic.	@21'9" B
						@21'9" - 1/4" thick clay bed.	N38E/22NW
25			1	}		@23' - Yellowish brown clayey fine to coarse grained SANDSTONE, occasional	
			ļ			coarse gravel, graded, hard, moist.	
						@24'4" - 6" thick discontinuous yellow brown clayey silty fine grained SANDSTONE, poorly graded, slightly plastic, hard, moist.	
						@25' - Grades to coarse grained gravel to cobble CONGLOMERATE, slightly	
30	9	С		122	114.9		
		<b> </b>			1	@30' - Light yellowish brown coarse grained gravel to cobble CONGLOMERATE	@31'7" B
	'	ĺ	ł			with fine to coarse sand matrix, well graded, hard, moist.	N65E/31NW
	 			ļ		@31'7" - Yellowish brown fine to coarse grained SANDSTONE, graded, slightly	
						friable, hard, moist, poorly bedded.	
35						@34'4" - Grades to subrounded fine grained gravel to cobble CONGLOMERATE,	
			1			slightly friable.	
				]			
						@39' - Yellowish brown coarse grained gravel to cobble CONGLOMERATE with	
40	15		1	13.0	1100	fine to coarse sand matrix, well graded, hard, very moist, clasts are subrounded	
~+∪	15	ĭ		'0.3	' ' 3.9	and metamporhic.	@41'10" B
						@40' - Matrix becomes slightly plastic clayey fine grained SAND.	N29E/24NW
		1		1			
45			<u> </u>			401	
ADD	ITIONAL (	JON	ιМΕ	NTS:		Blows per 12"	
						C = Modified California Sampler Kelly Bar Weights: 0 - 30', 5619 lbs.	
ŀ						31 - 60', 3745 lbs.	
						61 - 90', 2280 lbs.	
ĺ							

SUBS	SURFAC	E D	ATA	<del>\</del>		LOG OF BORING E	362
	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002
Ĺ.	OCATIO	:NC	San	ita Cla	rita	ELEVATION: 1998'	DATE: 7/12/06
	RIG TYPE: 24" Bucket				et _	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N .	Ü	В	М	DD	DESCRIPTION	ATTITUDES
45	13			10.4		@43' - Moisture increases to wet. @44' - Seep within cobble CONGLOMERATE.  @47' Sharp, irregular, nonsheared contact with brown CLAYSTONE, very stiff, wet, pervasively sheared, corn flaky texture. @47.5' - 6" thick conglomeratic SANDSTONE interbed truncated by shear below.	@47' C N49E/26NW @47'3" S
55	13		C	12.1	119.0	@48' - Brown CLAYSTONE, very stiff, wet, pervasively sheared, corn flaky texture, medium plastic. @49' - Brown fine grained sandy clayey SILTSTONE, poorly graded, stiff, moist, with sheared, waxy slickensided clay bed, overlying yellow brown subangular fine grained gravel CONGLOMERATE with clayey fine to coarse grained sand matrix, well graded, hard, very moist to wet. @50' - Brown to dark brown fine to medium grained sandy silty CLAYSTONE, poorly graded, hard, moist. @51' - Shear in claystone with slickensides (34°, N54W), NW dipping shears are	M49E/29NW @48' S N50W/43SW @51' S N43E/37NW
65	14		С			dominant as they truncate SW dipping shear at 48'.  @54' - Highly plastic CLAYSTONE, brown to dark brown, moist, very stiff.  @57' - Brown to dark brown very clayey fine to medium grained SANDSTONE, graded, hard, moist, slightly to medium plastic.  @59' - Dark yellowish brown clayey silty fine to medium grained SANDSTONE, graded, hard, moist.  @60' - Yellowish brown fine grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, wet, clasts are subrounded and metamorphic.  @63' - Dark yellowish brown clayey fine to medium grained SANDSTONE, graded, hard, moist, slightly plastic.	
75	21		C	12.1	125.0	@70' - Brown silty fine to medium grained SANDSTONE, graded, hard, moist.  @75' - Yellowish brown fine grained gravelly fine to coarse grained SANDSTONE, graded, hard, moist.	
80			С			@80' - Grades to yellowish brown subrounded to rounded fine grained gravel CONGLOMERATE with clayey fine to coarse grained sand matrix, well graded, hard, to contact with brown clayey silty fine to medium grained SANDSTONE, graded, hard, moist.	
ADD	AMOITI	L C	MMC	MENT:	<b>3</b> :	Blows per 12"  C = Modified California Sampler  Kelly Bar Weights: 0 - 30', 5619 lbs.  31 - 60', 3745 lbs.  61 - 90', 2280 lbs.	

SUBS	SUBSURFACE DATA LOG OF BURING 862						
CLIENT: Pardee Homes					lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
L	OCATIO	ON:	Sar	ita Cla	arita	ELEVATION: 1998'	DATE: 7/12/06
RIG TYPE: 24" Bucket					et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	Ü	В	М	DD	DESCRIPTION	ATTITUDES
80							
						@82' Brown clayey fine to medium grained SANDSTONE, graded, hard, wet, medium	
			1		)	to highly plastic.	
							. 1
85				]			
			}			COTO DE LA CONCLOANT DATE MAN	
						@87' - Brown to yellowish brown fine to coarse grained gravel CONGLOMERATE with	
$\vdash$			}		}	fine to coarse sand matrix, well graded, hard, moist, subrounded metamorphic clasts.	]
00	26-10"	_	1	16.7	106.7	@90' - Dark yellow brown fine grained sandy clayey SILTSTONE, poorly graded,	
<del></del>	20-10	`	ĺ	10.7	100.7	hard, moist.	1
<u> </u>						@92' - Dark yellowish brown clayey silty fine to medium grained SANDSTONE, graded,	
<b> </b>			1			hard, moist.	
95							
		ĺ					
		]					
						@98' - Dark yellowish brown clayey silty fine grained subrounded to subangular	1
<u> </u>			1			gravelly fine to coarse grained SANDSTONE, well graded, hard, moist, clasts are	
100	30-10"	C		4.9	106.9	subrounded and metamorphic.	
<u> </u>		ļ				@100' - Light yellowish brown fine to coarse grained gravel CONGLOMERATE with	
<u> </u>		1				friable fine to coarse sand matrix, well graded, hard, moist, clasts are subrounded	
						and metamorphic.	
405						@101' - Color change to dark yellowish brown. @104' - Abundant cobbles.	
105						@105' - Moisture increase to very moist, matrix coarsens to fine to coarse grained	
╟──┤		ŀ	l	1		sandy fine grained gravel.	
╟──		}			}	@106' - Seep.	
<b>├</b>						@109' - Yellowish red subrounded cobble CONGLOMERATE with weakly cemented	
110						clayey fine to coarse sand matrix, well graded, hard, moist, clasts are subrounded.	
<u> </u>			1	1		@110' - Yellowish brown fine grained gravel CONGLOMERATE with weakly cemented	
	İ	1				clayey fine to coarse sand matrix, well graded, hard, moist, low to medium plastic	
	1					matrix, clasts are subrounded and metamorphic.	
	1						
115							
	Į						
<u> </u>							
400	}				1	Total Donth 115'	
120	1					Total Depth - 115' Seens at 44'-54' and 106'	
	-					Seeps at 44'-54' and 106'   Caving at 51'-53'	
<b> </b>	1					Backfilled	
#	1						
125	1				1		
	ITIONA	iL C	ЮΜ	MENT	S:	Blows per 12"	
						C = Modified California Sampler	
						Kelly Bar Weights: 0 - 30', 5619 lbs.	
						31 - 60', 3745 lbs.	
1						61 - 90', 2280 lbs.	
• •							

SUBSU	IRE	ACE.	DA <sup>-</sup>	ГΔ
	21 NI.	ヘンに	$\sim$	. ^

SUBS	UBSURFACE DATA LOG OF BORING 863							
	CLIE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002	
	LOCATION: Santa Clarita					ELEVATION: 2165'	DATE: 7/14/06	
	RIG TYPE: 24" Bucket				et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"	
	N	U	В	М	DD	DESCRIPTION	ATTITUDES	
0						Saugus Formation: Dark brown clayey silty fine to coarse grained SANDSTONE,		
			ĺ		]	graded, dense, moist, rootlets.		
				:	 	@2' - Light yellowish brown fine to coarse grained gravelty silty fine grained		
				ļ		SANDSTONE, poorly graded, dense, moist, weakly cemented, clasts are subangular.		
				1				
5	•		ļ			@5'5" - Grades to fine to coarse grained gravel CONGLOMERATE with friable fine	@5'5" Approx.	
			ĺ	İ		to coarse sand matrix, well graded, dense, moist, abundant rootlets.	BN79E/10NW	
						@7.5' - Irregular, scoured contact with brown clayey silty fine to medium grained	<u> </u>	
						SANDSTONE, graded, dense, moist, weakly indurated.		
			Į			@8' - Color change to yellowish brown.		
10	4	С		13.0	110.8	{		
			1	[		@11' - Grades to yellowish brown fine grained gravel CONGLOMERATE with slightly		
					<b>}</b>	friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	@12'2" Approx.	
	1		}	}	}	@11.5' - Irregular, scoured contact with brown clayey silty fine to medium grained	BN58E/11NW	
	:		}		İ	SANDSTONE, graded, dense, moist, weakly indurated.		
15			ł		<u> </u>	@12'2" - Grades to yellowish brown fine to coarse grained gravel CONGLOMERATE	@15'11" B + S	
					Ì	with slightly friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	Horizontal	
				ļ	ł	@15'11" - 2" thick brown claystone bed, stiff, moist, medium to highly plastic, waxy,		
			ļ			corn flaky texture, internally sheared.		
			ĺ			@19' - Very pale brown fine grained gravelly fine to coarse grained SANDSTONE,	@19' Approx.	
_20	4	С		9.8	117.2	poorly graded to graded, hard, moist, friable.	BN55E/14NW	
					1	@20'7" - Dark yellowish brown fine grained gravelly clayey silty fine grained	@20'7" C	
.—						SANDSTONE, graded, hard, moist, subrounded gravels, massive, weakly	N84E/13SE	
			İ			indurated, occasional discontinuous fine to coarse sandstone channels.		
25				}				
					i			
$\vdash \vdash \vdash$							ļ	
					ł	  @29' - Yellowish brown fine grained gravelly fine to coarse grained SANDSTONE,	@29'8" Approx.	
30	13,	ار		4.4	110 8	graded, hard, moist, gravels are subangular.	BN69W/12SW	
-30	,5			14.4	1 10.0	@29'8" - Grades to yellowish brown subrounded fine to coarse grained gravel	@30'10" B	
			l	}		CONGLOMERATE with with slightly friable fine to coarse sand matrix, well graded,	N56W/5SW	
						moist.	11001170011	
					}	@30'10" - Material becomes thinly bedded with cross bedding.		
35						@31'7" - Matrix becomes clayey.	  @35'2" Approx	
-55				ĺ	}	@33'4" - Clayey silty fine grained SANDSTONE, poorly graded.	CN37W/2SW	
						@34'3" - Grades to fine grained gravel CONGLOMERATE.	@35'3" S	
$\vdash \vdash \vdash$		ĺ				@35'2" - Sharp, scoured contact with 8" thick brown CLAYSTONE, stiff, moist, highly	N37W/2SW	
						plastic, internally sheared, corn flaky texture, waxy.		
40	20	lc		9.1	120 4	@35'10" - Clayey silty fine to medium grained SANDSTONE, massive, weakly		
-,,,		Ĭ		]	,	indurated, slightly plastic, occasional subangular fine gravet.		
			}	1		@38' - Loose clay in matrix.		
						@40' - Dark yellowish brown fine grained gravelly clayey silty fine to coarse grained		
			İ			SANDSTONE, graded, hard, moist.		
45					}	1	ļ	
	ITIONAL	<u>co</u>	MM	ÉNTS		Blows per 12"	•	
C = Modified California Sampler								
	Kelly Bar Weights: 0 - 30', 5619 lbs.							

0 - 30', 5619 lbs. 31 - 60', 3745 lbs.

61 - 90', 2280 lbs.

	5011171					1	<del> </del>
·- <del></del>	CLI	ENT:	Par	rdee F	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
Į.	OCAT	ION:	Sar	nta Cla	arita	ELEVATION: 2165'	DATE: 7/14/06
	RIG T	/PE:	24"	· Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	Τu	В		DD	DESCRIPTION	ATTITUDES
40		╁	†-	1	1		
_ <del>-</del>					İ		1
· <del>-</del>					ļ		1
					ļ	GA21 Dispositions of the grained group about denseit	1
		ļ	1		1	@43' - Discontinuous fine grained gravel channel deposit.	
7.5		-		ļ			
45		1			}	OAN OAR ALL ALL ALL ALL ALL ALL ALL ALL ALL A	G 405 A
-						@46' - Grades to subrounded coarse grained gravel to cobble CONGLOMERATE,	@46' Approx.
						weakly cemented, hard, moist.	BN9W/8SW
					1	@48.5' - Pale yellowish brown subrounded fine to coarse grained gravel	@48.5' Approx.
	0.0	٦		0 7	4400	CONGLOMERATE with weakly cemented fine to coarse sand matrix, well graded,	BN2W/7SW
50	20		]	2.7	118.6	hard, moist.	@50'4" B
						@50' - Light gray subangular fine to coarse grained gravel CONGLOMERATE with	N56W/10SW
						fine to coarse sand matrix, well graded, hard, moist, thinly bedded with cross bedding.	@52' B
		1	1			@51' - 1' thick dark grayish brown to grayish brown subangular fine to coarse grained	N56W/9SW
	1		}		1	gravelly fine to coarse grained SANDSTONE, graded, hard, moist.	
55						@54' - Yellowish brown fine grained subangular to angular gravelly fine to coarse	
		1			)	grained SANDSTONE, graded, hard, moist.	
		}			ļ	@55.5' - Grades to coarse grained gravel CONGLOMERATE.	<u> </u>
		}			Ì	@56'1" - Reddish brown to yellowish red fine grained gravelly clayey fine to coarse	
						grained SANDSTONE, well graded, hard, moist, slightly plastic, clasts are subrounded.	@59' Approx.
60					}	@59' - Sharp, irregular scoured contact with fine to coarse grained sandy	C Horizontal
		1	}			CLAYSTONE, graded, very stiff, moist, slightly plastic.	
		. _				@60'4" - Grades to yellowish brown subrounded fine grained gravel to cobble	
	19	C		9.2	121.7	CONGLOMERATE with fine to coarse sand matrix, graded, hard, moist.	
			1	ļ		@63'9" - Brownish yellow clayey fine to coarse grained SANDSTONE, graded, hard,	
65		ĺ				very moist, slightly plastic, weakly indurated.	
			ĺ			@65.5' - Grades to light brownish gray subrounded to subangular coarse grained	
		ļ	]	J		gravel to cobble CONGLOMERATE with weakly cemented fine to coarse sand matrix,	
			1		1	graded, hard, moist.	
			ĺ			@66'7" - Matrix color changes to pale brown.	
70			1			@68' - Yellowish brown subrounded to subangular coarse grained gravel to cobble	
						CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, slightly	
	25-10	' C		8.3	105.6	plastic.	
						@69' - Grades to light brownish subrounded to subangular gray coarse grained	
						gravel to cobble CONGLOMERATE with weakly cemented fine to coarse silty sand	
75			1.			matrix, graded, hard, moist.	l
						@70' - Pale brown subrounded fine grained gravel to cobble CONGLOMERATE with	
				į		fine to coarse sand matrix, graded, hard, moist.	+
		Ì	]	1	1	@72' - Color change to pale yellow.	
							1
80						Total Depth - 72'	
						No groundwater	
			1			No caving	]
						Backfilled	
				}	}		}
85	L	1	-				
ADD	TIONA	L C	MMC	/ENTS	S:	Blows per 12"	
						C = Modified California Sampler	
						Kelly Bar Weights: 0 - 30', 5619 lbs.	
						31 - 60', 3745 lbs.	
						61 - 90', 2280 ibs.	

	CLIE	ENT:	Pai	rdee F	domes	PROJECT: Skyline Ranch	W.O.: 8838.002
L	.OCAT	ION:	Sai	nta Ci	arita	ELEVATION: 1978'	DATE: 7/17/06
	RIG TY	/PE:	24"	' Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	U	В		DD	DESCRIPTION	ATTITUDES
10 15 20 25 30		C	<u>B</u>	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	111.7	Artificial Fill: Brown silty fine to medium grained SAND, poorly graded, medium dense, dry, pieces of grass.  @1' - Saugus Formation: Brown fine grained gravelly clayey silty fine to coarse grained SANDSTONE, well graded, very dense, moist, subangular gravels, weakly cemented, rootlets.  @3.5' - Yellowish brown fine grained gravelly clayey silty fine to medium grained SANDSTONE, graded, dense, moist, slightly friable, rootlets.  @3'10" - 6" thick blue gray cementation, pervasive white carbonate veins.  @6' - Some coarse gravels.	@8' Approx. B N4E/17NW @10'7" B N24E/15NW akly @19' Approx. BN4W/11SW
35						fine to coarse sand matrix, graded, hard, moist.  @35' - Fine grained gravel interbed.	@35' Approx. BN12E/13NW
40	9-6"	С		7.1		@40' - Yellowish brown subrounded cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, black carbonate cemented gravels.	@40' Approx. BN38E/2NW
45				<u> </u>			
ADDI	ADDITIONAL COMMENTS:  Blows per 12"  C = Modified California Sampler  Kelly Bar Weights: 0 - 30', 5619 lbs.  31 - 60', 3745 lbs.  61 - 90', 2280 lbs.						
		-					

SUBSURFACE DATA LOG OF BURING B64								
CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838,002						
LOCATION: Santa Clarita	ELEVATION: 1978'	DATE: 7/17/06						
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"						
N UBM DD	DESCRIPTION	ATTITUDES						
40 45 50 21-10" C 8.3 119.1	@45' - Yellowish brown fine grained gravelly silty fine to coarse grained SANDSTONE, graded to well graded, hard, moist, slightly friable, clasts are subangular.  @48'8" - Abrupt contact with very pale brown silty fine to coarse grained SANDSTONE with clay and subangular to subrounded fine gravel clasts, well graded, weakly indurated, hard, moist.  @49' - Very pale brown fine grained gravelly fine to coarse grained SANDSTONE, graded, hard, moist, clasts are subrounded.  @50' - Very pale brown subangular fine grained gravel CONGLOMERATE with clayey silty fine to coarse sandstone matrix, well graded, hard, moist.  @51' - Grades to very pale brown subangular to subrounded coarse grained gravel to cobble CONGLOMERATE, well graded, hard, moist, weakly cemented.  @54' - Color change to dark yellowish brown, moisture to very moist.  @56' - Color change to light yellowish brown, moist.	@45' Approx. BN50E/9NW @48'8" C N9E/27NW						
60 17-9" C 65 65 65 65 65 65 65 65 65 65 65 65 65	@65' - Mint Canyon Formation: Sharp, irregular, scoured contact with gray silty fine grained SANDSTONE, poorly graded, hard, moist, moderately indurated. @67'10" - Irregular contact with subangular to subrounded coarse grained gravel to cobble CONGLOMERATE with slightly friable to weakly cemented clayey silty fine to coarse sand matrix, well graded, hard, moist.  Total Depth - 72' No groundwater No caving Backfilled	@65' Approx. CN24W/6SW @67'4" B N2W/14SW @67'10" C N60W/15NE						
C = Modified California Sampler Kelly Bar Weights: 0 - 30', 5619 lbs.								

31 - 60', 3745 lbs. 61 - 90', 2280 lbs.

30B30KI ACE DATA							
	CLI	ENT:	Par	dee		PROJECT: Skyline Ranch	W.O.: 8838
1	OCAT	TON:	Sar	ita Cla	rita	ELEVATION: 1806'	DATE: 7/18/06
	RIG T	YPE:	HQ	Core		HAMMER WEIGHTS: N/A	DROP: N/A
						DESCRIPTION	ATTITUDES
40						@42.5' - Subangular to subrounded fine gravel to cobble CONGLOMERATE,	}
		es)				with light brown medium to coarse grained sand matrix.	<u> </u>
<u> </u>	<u>(</u>	5					]
	ر م	===		9		@45' - Mint Canyon Formation: Subrounded gravel to cobble CONGLOMERA	ŗE ļ
	<u>~</u>	£.		4" (inches)	4"/Core	clasts commonly andesite and granodiorite. Matrix is friable light greenish	ĺĺ
45	S e	Ba		اق ا	, 'C	gray medium to coarse grained sand, moist.	
$\vdash$	ecc	эте	'		<u>1</u> 4	(6)47.5' Light brown silty SANDSTONE poorly graded bord maint grading	}
<b></b>	<u>ب</u>	Š	еī	^ ×	Total	@47.5' - Light brown silty SANDSTONE, poorly graded, hard, moist grading to fine to coarse gravel to cobble CONGLOMERATE, hard, moist	]
	Depth (for Recovery/RQD)	Recovery/Core Barrel (inches)	Recovery	Length Rx >	L %	to the to coarse graver to copple convocomentale, hard, moist	@49.5'
50	pth	Ś	Sec	g.		@50' - Fine to coarse gravel CONGLOMERATE approx. 3" thick, light gray.	True dip =45°
	De	æ	%	Ę.	RQD	ger and ger ger ger ger ger ger ger ger ger ger	
	@42.5	20/30	_	4/30	13	@53.5' - Sharp contact to cobble CONGLOMERATE	
						@54' - Sharp contact to friable medium grained SANDSTONE with fine	
<u> </u>	@45'	28/30	93	0/30	0	to coarse gravel (clasts commonly andesite and diorite), hard, moist.	
55			İ.			@55' - Occasional cobble clast. Sharp contact to CONGLOMERATE below.	]
	@47.5	27/30	90	4/30	30	@55.5' - Fine to coarse gravel CONGLOMERATE, well graded, friable	}
	0.50			2/22		greenish gray medium to coarse grained sand matrix, hard, moist.	ļ
<b></b>	@50'	28/30	93	6/30	20	@57' - Dark reddish brown silty CLAYSTONE, medium plastic,	
60	@53'	6/24	25	0/24	0	in tip of core barrel (less than 1/4" thick). @57'4" - Tan medium to coarse grained SANDSTONE, well graded, hard, mois	1
- 50	@55	0/24	20	0/24		hard, moist.	1
-	@55'	17/24	71	0/24	0	@57'8" - Gabbro cobble, dark gray to black, sharp basal contact.	
					_	@59'4" - Subangular to subrounded gravel CONGLOMERATE	
	@57	31/36	86	6/36	17	(approximately 30% gravel clasts). Matrix is fine to coarse sand.	
65		:	,				1
	@60'	57/60	95	38/60	63	@60' - Medium grained SANDSTONE with approximately 15%	
<u> </u>						subangular to subrounded fine gravel clasts, hard, moist.	@67.5'
<u> </u>	@65	58/60	97	30/60	<b>5</b> 0	@62' - Grades to fine grained SANDSTONE, hard, moist.	True Dip ≃ 10°
<del></del>			_			@62'2" - Greenish gray silty CLAYSTONE, medium plastic, stiff, moist.	1
70	@70	57/60	8	45/60	75	Slickensides. @62'10" - Fine grained SANDSTONE with occassional subrounded gravel,	ļ
<b> </b> -						friable, hard, moist.	
<b> </b>						mable, hard, molat.	
-						@65' - Fine to coarse grained gravel CONGLOMERATE, weakly cemented	
75	@75'	50/54	93	29/54	54	olive brown medium to coarse grained sand matrix, hard, moist.	
	_			·		<u> </u>	
						@70' - Fine grained gravel to cobble CONGLOMERATE with friable	ļ
	;			ļ		olive brown fine to coarse grained sand matrix, hard, moist.	]
80				1	ł	0751 Outron double and a second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second	
-						@75' - Subangular to subrounded fine to coarse gravel CONGLOMERATE,	
-						slightly friable dark brown (mottled tan) medium grained sand matrix,	
			'			hard, moist. Overlying coarse grained SANDSTONE.	
85	,					·	
1——	TION	AL CC	MMC	ENTS	);	I	<u> </u>

2085	SURFA					LOG OF BORING	
	CLI	ENT:	Pard	ee		PROJECT: Skyline Ranch	W.O.: 88 <u>38</u>
L	<u>OCAT</u>	ION:	Sant	a Clari	ta	ELEVATION: 1806'	DATE: 7/19/06
	RIG T	YPE:				HAMMER WEIGHTS: N/A	DROP: N/A
		]				DESCRIPTION	ATTITUDES
80						@79.5' - Light olive gray fine grained SANDSTONE with fine gravet, hard,	
		es)				moist.	
	୍ର	달				@82' - Granodiorite cobble, porphyritic.	
	ğ	호		(9)		@82'8" - Light gray medium to coarse grained SANDSTONE, with	
	<u> </u>	Barrel (inches)		che	ore	occasional fine to coarse gravel clasts of gabbro and diorite, slightly friable,	
85	Š e	Ba		4" (inches)	4"/Core	hard, moist.	İ
$\vdash$	ಭ	2	ļ	.4	4	@85' - Light gray fine to coarse grained SANDSTONE with fine gravel, poorly	1
	Depth (for Recovery/RQD)	Recovery/Core	Ϋ́	Length Rx >	Total	graded, slightly friable, hard, moist. Occasional granodiorite cobble clast.  @87.5' - Sharp contact with fine to coarse grained SANDSTONE with	
<b>├</b> ─	<u>ē</u>	5	Recovery	8	_ \	fine gravel clasts of rhyolite and diorite, poorly graded, slightly friable, hard,	
90	٤	Š	Şec	gth		moist.	@90.5
-90	ğ	Şec	%	en Le		@89.5' - Granodiorite cobble, porphyritic, light gray, 4" diameter.	True dip = 15°
<del> </del>	@79.5 <sup>1</sup>			15/30	50	@90' - Brown medium to coarse grained SANDSTONE with subrounded	@91'
$\vdash$	₩, U.U	50100	.00	, 5, 50		coarse gravel, poorly graded, slightly friable, hard, moist.	True dip = 10°
$\vdash$	@82'	29/36	81	10/30	33	@92' - Light gray medium to coarse grained SANDSTONE with subangular	,
95			- 1			to subrounded fine to coarse gravel, well graded, slightly friable, hard, moist.	
	@85	28/30	93	15/30	50	@95' - Fine gravel to cobble CONGLOMERATE, weakly cemented light	
						greenish gray fine to coarse sand matrix, well graded, hard, moist.	
	@87.5	26/30	87	6/30	20	@97' - Light gray fine to coarse grained SANDSTONE with fine gravel to	Į
						cobble clasts, well graded, slightly friable, hard, moist.	
100	@90'	50/60	83	25/60	42	@100' - Granodiorite gravel (2.5" diameter), gravel clasts are subangular.	
						@103' - Medium to coarse grained SANDSTONE with subangular fine	
	@95'	24/24	100	12/24	50	gravel clasts, well graded, friable, hard, moist.	G 4001
ļI						@105' - Light gray fine to medium grained SANDSTONE, well graded,	@103'
405	@97'	27/36	75	24/36	67	weakly indurated, hard, moist.	True dip = 20° (@104'
105				2004		@105'4" - Light gray fine to coarse gravel CONGLOMERATE, slightly	True dip = 14°
<b></b> -	@100'	19/24	58	8/24	33	Ifriable light gray fine to coarse sand matrix, well graded, hard, moist.  To fining upward sequences of gravel CG to coarse SS.	@105'
<b> </b>	@102	20120	100	29/36	81	@107' - 1/8" diameter clay ripup clasts, slightly plastic, medium stiff,	True dip = 15°
	@102	30/30	100	29130	"	@109.5' - Occasional granitic cobble clast within fine to coarse	
110	@105	46/54	85	14/54	26	SANDSTONE to grave! CONGLOMERATE.	1
<del>  ' ' `</del>	@100	10,04	000	17,57	20	OF HEROTOTIE to graver outstand with E.	}
<b> </b> -'	i <b>@109</b> .5	26/36	72	11/36	31	@111' - Fine gravel CONGLOMERATE, grading downward to fine to coarse	
				*****	•	grained SANDSTONE with fine gravel clasts, well graded, friable, hard,	<u> </u>
	@112.5	14/30	46	0/30	0	moist.	
115				1			ļ
	@115'	24/30	80	0/30	0	@112.5' - Fine to coarse grained SANDSTONE, poorly graded,	
						slightly friable, hard, moist.	
			ļ				
		[				@115' - Fine gravel to cobble CONGLOMERATE, well graded, hard, moist.	@119.4'
120			1	}	1		True dip = 11°
<u></u>							@121'
<u> </u>		[	[	İ			True dip = 15°
<b></b>							@123' True dip = 18°
405	Į	ļ	1				True dip = 18
125	ITION/	1 ~	) )	<u> </u>	<u> </u>	<u></u>	
llann,	HOW	4F ()		#141. <b>⊘</b> ;			

UBSURFACE DATA         LOG OF BORING B65           CLIENT: Pardee         PROJECT: Skyline Ranch								
CLIEN	NT: F	arc	lee		PROJECT: Skyline Ranch	W.O.: 8838		
LOCATIO	ON: S	Sant	ta Cla	rita	ELEVATION: 1806'	DATE: 7/19/06		
RIG TYF	PE:  -	IQ	Core		HAMMER WEIGHTS: N/A	DROP: N/A		
	Ű	В	М	DD	DESCRIPTION	ATTITUDES		
@117.5' 29 @120' 52 135	9/30 2/60	87	68 68 Ength Rx > 4" (inches)	9 E RQD % Total 4"/Co	@117.5' - Cobble CONGLOMERATE, weakly indurated greenish gray fine to coarse grained sand matrix, well graded, hard, moist. Grades to medium to coarse grained SANDSTONE with fine gravel, poorly graded, hard, moist.  @120' - Light gray fine to coarse grained SANDSTONE with fine gravel, poorly graded, mod indurated, hard, moist. To light olive brown fine to coarse grained SANDSTONE with subrounded fine gravel, poorly graded, weakly indurated, hard, moist. 1/8 inch thick CLAY, slightly plastic, stiff, moist.  @125' - Fine to coarse gravel CONGLOMERATE, weakly cemented light gray fine to coarse sand matrix, well graded, hard, moist.  @127' - Light gray fine to coarse grained SANDSTONE, well graded, weakly indurated, hard, moist.	@128.5' True dip = 18°		
	4/36 8/44	67 } 41	13/36 19/44 0/18	36	@140' - Fine to coarse gravel CONGLOMERATE, weakly cemented light gray fine to coarse sand matrix, poorly graded, hard, moist. Sharp contact with light gray fine to coarse grained SANDSTONE with gravel, poorly graded, moderately indurated, hard moist.	@139' True dip = 16°		
@135' 39 145 @138.5' 14 @140' 56	4/18 8/60	78 97	22/42 0/18 40/60	67	@145' - Light gray medium to coarse grained SANDSTONE, hard, moist. 12 inch thick interbed of weakly cemented gravel to cobble CONGLOMERATE. To olive gray medium to coarse grained SANDSTONE, hard, moist. @148' - Fine to coarse gravel CONGLOMERATE, weakly cemented light greenish gray sand matrix, hard, moist.	0450.5)		
0150 @145' 53 @150' 58	ļ			1	@150' - Light greenish gray medium grained SANDSTONE, poorly graded, hard, moist. 12 inch thick fine to coarse gravel CONGLOMERATE, moderately cemented medium grained sand matrix. @152' - Sharp contact with light gray fine to medium grained SANDSTONE,	@150.5' True dip = 9° @153'		
@155 <sup>1</sup> 3 <sup>2</sup>		Ì			poorly graded, hard, moist, massive.  @ 155' - Light gray medium to coarse grained SANDSTONE to coarse gravel	True dip = 13		
160 165 ADDITIONAL	CON	ИMI	ENTS		CONGLOMERATE, weakly cemented sand matrix, hard, moist.  @158' - Fine to coarse grained gravel CONGLOMERATE with moderately cemented light greenish gray sand matrix, well graded, hard, moist.			

SUBSURFACE DATA LOG OF BURING 865									
CLIENT: Pardee		PROJECT: Skyline Ranch	W.O.: 8838						
LOCATION: Santa Clar	ita_	ELEVATION: 1806'	DATE: 7/19/06						
RIG TYPE: HQ Core		HAMMER WEIGHTS: N/A	DROP: N/A						
N U B M	DD	DESCRIPTION	ATTITUDES						
RIG TYPE: HQ Core    N	0 8 2 1 RQD % Total 4"/Core	HAMMER WEIGHTS: N/A							
205									
ADDITIONAL COMMENTS	5:								
ll .	ADDITIONAL CONSTRUCTOR								

3003	SUBSURFACE DATA LOG OF BORING Bob										
	CLIEN	<u> </u>	Parc	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002				
Ĺ	OCATIO	N:	San	ta Cla	rita	ELEVATION: 1964't	DATE: 7/19/06				
	RIG TYP	E:	24"	Bucke	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
	N	ŪΪ	В	М	DD	DESCŘIPTION	ATTITUDES				
Ö	İ			i		Saugus Formation: Yellowish brown coarse grained gravel to cobble					
	ļ		1	ļ		CONGLOMERATE with clayey silty fine to coarse sandstone matrix, well					
$\vdash \lnot$	1			ĺ	ļ	graded, dense, moist, rootlets, clasts consist of subangular to subrounded	]				
	ŀ					schist, granodiorite and quartzite.	]				
						@2.5' - Pale brown subrounded fine to coarse grained gravel					
5						CONGLOMERATE with weakly cemented fine to coarse sand matrix, well	<b>-</b>				
						graded, hard, moist, rootlets.	@6' B				
	1					@6' - Highly scoured contact with dark yellowish brown silty fine grained	N68W/15SW				
Щ						SANDSTONE, poorly graded, hard, moist, weakly indurated, material blocky	@6-7.5'				
	_	_				and fractured in sets every few inches, grades downward to fine grained	fracture set N82E/40SE				
10	5	C		11.2		SANDSTONE with gravel. @10' - Grades to pale brown fine grained SANDSTONE with fine gravel, silt,	14026/4036				
$\vdash$			ļ <u> </u>			and clay, well graded, dense, moist, slightly friable, pervasive subvertical dry					
$\vdash$	İ			İ '		white carbonate veins, grading to fine to medium grained sandy clayey					
╟─┤			•			SILTSTONE, dark yellowish brown, weakly indurated.	@14'8" Approx.				
15			{			@15'5" - Contact to pale brown fine to medium grained SANDSTONE,	BN24W/18SW				
<del>'-</del>	ļ					graded, hard, moist.	@15'5" Fault				
						@16' - Discontinuous one foot thick zone on SW wall, pervasive subvertical	N76E/70SE				
<u> </u>			1			carbonate fractures.					
	}		Į į			@19' - Grades to yellowish brown fine grained gravel to cobble	@19' Approx.				
20	7	С		10.7	116.3	CONGLOMERATE with slightly friable fine to coarse sandstone matrix, well	BN4W/11SW				
	į		1	<u> </u>		graded, hard, moist.					
	]					@21' - Channeled.					
	}			-		@22'5" - Fine grained gravel CONGLOMERATE with fine to coarse sand					
						matrix, well graded, hard, moist.					
25					ļ	@24' - Pocket of fine grained sandy clayey SILTSTONE in south wall.					
					Ì	@24'8" - Reddish brown fine to medium grained sandy clayey SILTSTONE					
<b> </b>			1		ļ	with occasional fine gravel, poorly graded, hard, moist, weakly indurated,	@28' Fault				
⊩					!	confined to NNE portion of boring with steep, sharp contact with sandstone	N75E/80NW				
	40	_		_ ,	125 4	from 22'5". @30' - Grades to yellowish brown fine grained gravel to cobble	INTOLIOUNV				
30	12	U		7.1	120.4	CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well					
<b> </b>						graded, hard, moist, subangular to subrounded.					
}						@33'8" - Reddish brown clayey SILTSTONE exits boring.	@33'8" C				
<b> </b>					}	County of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the county of the	N84W/65NW				
35			X	1			@33'9" Approx.				
$\vdash$							BN57W/14SW				
				]							
				1			<b>{</b>				
		İ		ļ	]		1				
40	20-10"	С		8.9	121.4	@40' - Three 1/4" thick bedding parallel orange weathering surfaces.	@40' B				
							N30W/7SW				
			]				*				
						@43' - Yellowish brown clayey silty fine grained gravelly SANDSTONE,	1				
أيبا						graded, hard, moist.	]				
45	TICS		1	<u> </u>	<u> </u>	Kolly Bar Weighter 0 30' 5640 lbs					
ADDITIONAL COMMENTS: Kelly Bar Weights: 0 - 30', 5619 lbs. 31 - 60', 3745 lbs.											
Die	n na= 401	,				61 - 90', 2280 lbs.					
	s per 12'		ifarn	ia Sar	nnlar	91 - 120', 1223 lbs.					
= r	C = Modified California Sampler 91 - 120', 1223 lbs. 121 - 140', 1620 lbs.										
}											
!	161 - 160', 2020 lbs.										

	CL	ΙE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002	
ļ	LOCA						ELEVATION: 1964'±	DATE: 7/19/06	
					Buck		HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"	
	N	<u></u>	ับ	B	M	DD	DESCRIPTION	ATTITUDES	
40	<del></del>	Ħ	<del></del>		<del>                                     </del>	Ì		7111110000	
						ļ		1	
							@44'7" - Grades to coarse grained gravel to cobble CONGLOMERATE	@44' Approx.	
45		- [		ļ		ĺ	with fine to coarse sand matrix.	BN55W/17SW	
				Х			@46'3" - Slightly irregular and scoured contact to dark yellowish brown	@46'3" C	
							clayey SILTSTONE with fine to medium sand, poorly graded, hard, moist,	N65W/10SW	
							weakly indurated.	@48' B	
	,		_				@46'10" - Grades to fine to medium grained SANDSTONE.	N43W/11SW	
50	2	24	Ç		7.6	121.8	@47'8" - Grades to fine to coarse grained gravel CONGLOMERATE.		
				i			@48.5' - Contact with dark yellow brown clayey SILTSTONE.		
╟─┤		ĺ				[	@49.5' - Grades to yellowish brown fine grained gravel CONGLOMERATE	05010	
$\vdash$							with silty fine to coarse sand matrix, well graded, hard, moist, subangular, slightly friable.	@53' C	
55							@53' - Slightly irregular, scoured contact to dark yellow brown clayey	N60E/10SE	
H				[			SILTSTONE, hard, moist.		
$\  \neg \ $							@54' - Grades to fine to medium grained SANDSTONE.	@57' Approx.	
							@55' - Grades to grayish brown clayey silty fine to coarse grained gravelly	CN20W/8SW	
		-			}	}	SANDSTONE, well graded, slightly friable, hard, moist, clasts are		
60	2	1	C .		6.3	122.3	subrounded.		
							@56' - Grades to fine to coarse grained gravel CONGLOMERATE.		
		j					@57' - Slightly irregular to scoured contact with dark yellow brown clayey		
<b>  </b>				ĺ		:	SILTSTONE.		
0.5		1					@59' - Grades to grayish brown to dark yellowish brown subrounded fine	@64' B	
65		- }		ļ			grained gravel CONGLOMERATE with slightly friable fine to coarse sand	N32W/16SW	
$\vdash$							matrix, well graded, hard, moist.	@66.5'B	
$\vdash\vdash\vdash$							@62' - 6" thick fine grained SANDSTONE bed, discontinuous. @67' - 6" thick dark yellow brown SILTSTONE.	N47W/15SW	
		-					@69'5" - Grades to dark yellowish brown subangular to subrounded fine to	@67' C N47W/15SW	
70	2	4	С		4.5	126.9	· · · · · · · · · · · · · · · · · · ·	@69.5' B	
m	•	`	•		'		sand matrix, well graded, hard, moist, occasional cobbles.	N42W/16SW	
		}					osina matrix, non grados, mara, morat, obditional obblica,	11421110011	
		-						ļ	
							@74" - Discontinuous 3" thick clayey SANDSTONE, matrix grades to weakly		
75		1					cemented.		
							@77' - Matrix grades to brown clayey fine to coarse grained SANDSTONE;	@77' Approx.	
		-					channel deposit.	Channel	
	-	اے	_ ا		40.0	ا مم		N30E/25SE	
80	2	5	C		12.9	120.6	© 94 Et Diagnotia de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra del contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra del contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra de la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la contra del la co	@80' B	
$\vdash$							@81.5' - Discontinuous claystone, 8" diameter pocket on west side of	N40W/16SW	
		+					boring, within dark yellow brown fine to coarse grained gravel CONGLOMERATE, slightly friable fine to coarse sand matrix, well graded,		
							hard, moist.		
85									
ADDITIONAL COMMENTS: Kelly Bar Weights: 0 - 30', 5619 lbs.									
31 - 60', 3745 lbs.									
11	per 12						61 - 90', 2280 lbs.		
C = N	lodified	Ca	alifo	rnia	Samp	ler	91 - 120', 1223 (bs.	ļ	
							121 - 140', 1620 lbs.		
		_					161 - 160', 2020 lbs.		
	Logar				_		Coolaba Waatlaka Villaga		

	CLI	ENT:	Par	dee F	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002		
-	LOCAT					ELEVATION: 1964'±	DATE: 7/19/06		
	RIG T					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"		
	N	Ū	В	M	DD	DESCRIPTION	ATTITUDES		
80	·								
85	30-7'			12.1	140 5	@86' - Dark yellow brown clayey fine to medium grained sandy SILTSTONE, discontinuous, poorly graded, hard, moist, weakly indurated. @88.5' - Sharp, slightly scoured contact with medium grained SANDSTONE.	@87' B N56W/17SW		
95	30-1			13.1	)	@90.5' - Grades to dark yellowish brown angular to subrounded coarse grained gravel to cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist. @92.5' - Slightly scoured contact with 1' thick SILTSTONE. @93.5' - Grades to dark yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with weakly cemented fine to coarse sand matrix, well graded, hard, moist. @95' - Color change to yellowish brown. @96' - Bedding becoming slightly crude.	@92.5' C N85E/14SE @96' B N80W/18SW		
100	30-10'	C		6.8	114.5	@103' - Color change to dark yellowish brown and clayey matrix.	@101' B N65E/14SE		
110	30-10'			5.3		@107' - 2" thick bed of dark yellow brown clayey SILTSTONE with fine to medium sand, hard, moist.  @110' - Grades to dark yellowish brown subangular to subrounded fine	@106' Approx. BN50E/10SE @108' C N73W/16SW		
	30-10			0.3		grained gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist.	@111' Approx. BN79E/9SE		
115						@114'7" - Dark yellowish brown fine to coarse grained SANDSTONE, graded, hard, moist, slightly friable, thinly bedded. @115' - Grades to fine grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, subangular to subrounded clasts. @118' - Moisture change to wet.	@114'7" B N48W/6SW		
120			×			@119'4" - Minor seep along contact with dark yellowish brown fine grained sandy SILTSTONE, poorly graded, hard, moderately indurated, moist. @121' - 12" thick clayey SILTSTONE.	@119'4" C N22W/10SW		
125			×	ENTO		@124.5' - 1/2" thick dark yellowish brown CLAYSTONE, poorly graded, very stiff, moist, highly plastic, corn flaky texture.	@124.5' S N35W/12SW		
Blow	ADDITIONAL COMMENTS: Kelly Bar Weights: 0 - 30', 5619 lbs. 31 - 60', 3745 lbs. Blows per 12" 61 - 90', 2280 lbs. C = Modified California Sampler 91 - 120', 1223 lbs. 121 - 140', 1620 lbs. 161 - 160', 2020 lbs.								

		•			1	LOG OF BORING BO		
<b></b>					omes	PROJECT: Skyline Ranch	W.O.: 8838.002	
LO	CATI	:NC	San	ta Cla	erita	ELEVATION: 1964'±	DATE: 7/19/06	
R	IG TY	PE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"	
	N	U	В	М	DD	DESCRIPTION	ATTITUDES	
120					=			
		i						
			İ		1		,	
				ļ		@125.5' - Grades to dark yellowish brown silty fine to coarse grained	ļ	
125		1	Ì		Ì	SANDSTONE with subangular to subrounded fine to coarse gravel, graded,		
						hard, moist.		
			-			@127' - 4" thick fine to coarse grained gravel bed.	@127' Approx.	
			ļ	į		@128' - Sharp, slightly irregular, scoured contact with dark yellowish brown fine	BN74W/8SW	
				]		to medium grained sandy clayey SILTSTONE, weakly indurated, sheared.	@128'	
130						@128.5' - Grades to fine to medium sandy SILTSTONE, not sheared.	SN70W/78NE	
	į		[			@129' - Dark yellowish brown silty fine grained SANDSTONE to fine grained	Slicks Plunge	
		l	ļ	1	Į.	sandy SILTSTONE with occasional subangular fine gravel, poorly graded, hard,	11°, S82E	
		ļ	ļ	į	,	moist.		
			}			@131' - Grades to dark yellowish brown fine grained gravelly silty fine to		
135				j	:	medium grained SANDSTONE, graded, hard, moist, subangular clasts.		
						@132' - Yellowish brown silty fine to medium grained SANDSTONE to fine to		
						medium grained sandy SILTSTONE.		
	22	C	}	11.0	122.8	@133.5' - 6" thick clayey SANDSTONE.	1	
						@135.5' - 12" thick dark yellowish brown fine grained gravelly clayey fine to	[	
140			1	Ì	·	coarse grained SANDSTONE, graded, hard, very moist, slightly to medium		
						plastic, subangular clasts.	@141.5' \$	
ļ						@138' - Dark yellowish brown fine grained gravelly silty fine to coarse grained	N20W/16SW	
			į			SANDSTONE, well graded, hard, moist, 1/2mm thick discontinuous clay bed.	@142.5' S	
			-			@141.5' - Shear zone, dark yellowish brown CLAYSTONE, highly plastic where	N82E/27SE	
145			{			sheared, very stiff, poorly graded, moist. Shear at 141.5' truncates others and	@143.5¹ B	
			-		- 1	is dominant.	N49W/22SW	
<u></u>			ļ	ļ		@142.5' - Dark yellowish brown to yellowish brown subangular to subrounded	@146' C	
			ļ			fine grained gravel CONGLOMERATE with slightly friable fine to coarse sand	N56W/16SW	
						matrix, well graded, hard, moist, occasional rounded cobbles.	@148' S	
150						@143' - Color change to yellowish brown.	N78E/14SE	
						@144' - Dark yellowish brown fine gravel CONGLOMERATE, weakly cemented.	1 -	
						@145' - Matrix becomes clayey for 3".	N81W/56SW	
				,, ,		@146' - Dark yellowish brown clayey SILTSTONE to silty CLAYSTONE, poorly	<b>!</b>	
	24	C	· {	12.6		graded, stiff, moist.		
155			\	ľ		@147.5' - Clayey SILTSTONE, pervasively sheared, shear at 148' is dominant.		
$\parallel$						@148.5' - Grades to clayey silty fine to coarse grained SANDSTONE with		
<b> </b>	į					slightly friable channel deposit in E wall of fine grained gravel to cobble		
<b> </b>	•					CONGLOMERATE, fine to coarse sand matrix.		
100						@150' - Dark yellowish brown fine grained sandy clayey SILTSTONE, poorly	<u> </u>	
160						graded to graded, hard, moist.		
⊩					;	@151' - Shear, truncated above by shear at 148'.		
				ļ		@154' - Dark yellowish brown silty fine to coarse grained SANDSTONE,	<b>i</b>	
<b> </b>						graded, hard, moist.	1	
165							ļ	
11	TION	<u> </u>			TS:	Kelly Bar Weights: 0 - 30', 5619 lbs.	1	
	ADDITIONAL COMMENTS: Kelly Bar Weights: 0 - 30', 5619 lbs. 31 - 60', 3745 lbs.							
Blows	Blows per 12" 61 - 90', 2280 lbs.							
III .	-		alifor	nia S	amolei	·		
<b>∥</b> `` - ;∨	C = Modified California Sampler 91 - 120', 1223 lbs. 121 - 140', 1620 lbs.							
İ						161 - 160', 2020 lbs.		
<u> </u>						Casteka Wastlaka Villaria	<del></del>	

300	CLIENT: Pardee Homes PROJECT: Skyline Ranch W.O.: 8838.002									
						PROJECT: Skyline Ranch  ELEVATION: 2325'				
-	LOCATION						DATE: 8/28/06			
Т	RIG TY	PE: U	24 B	M	et DD	HAMMER WEIGHTS: Kelly Bar Weights  DESCRIPTION	DROP: 12" ATTITUDES			
ő	=		<u> </u>	171	1 00	Mint Canyon Formation: Brown to dark grayish brown cobble	ATTIODES			
$\dashv$	·					CONGLOMERATE with slightly friable silty fine to medium sand matrix, well				
						graded, hard, moist, clasts are subangular to subrounded.				
						graded, nard, mole, stable are baseligated to basis and a				
5							@5' Approx.			
					<b>!</b>	@6.5' - 5%-10% boulders.	BN45E/9SE			
						@7.5' - Discontinuous pale brown fine to coarse grained SANDSTONE with				
						subangular fine gravel, moderately graded, hard, moist, cross bedded,				
						slightly friable.				
10						@10' - End roots.				
						(A40) Linkhaullaudah kuraum aukan autan autan autan (A40)	(A) 101 A ==			
$\longrightarrow$			!			@12' - Light yellowish brown subangular to subrounded cobble	@12' Approx. BN5W/20SW			
$\dashv$						CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist, 20% boulders, increasing with depth, occasional	NSON/SON			
15			į			subangular to subrounded gravel CONGLOMERATE interbeds.				
			!			Subangular to subtourided graver CONOLOMETANTE Interbeds.				
$\neg \neg$						@17' - Sharp scoured contact to discontinuous pale brown to light gray	@17' C			
			i			silty fine to medium grained SANDSTONE, poorly graded, hard, moist,	N25W/23SW			
$\neg$						weakly indurated.	@19' B			
20						@19' - Abruptly grades to pale brown to light gray subangular to	N75W/15SW			
						subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse	@20' C			
						sand matrix, well graded, hard, moist.	N12W/22SW			
					Ì	@20' - Sharp scoured contact to discontinuous pale brown to light gray				
						silty fine to medium grained SANDSTONE, poorly graded, hard, moist,	@24' B			
25						weakly indurated.	N25W/19SW			
						@23' - Abruptly grades to pale brown to light gray subangular to				
						subrounded fine grained gravel CONGLOMERATE with slightly friable silty				
				}		fine to coarse sand matrix, well graded, hard, moist. @24' - Grades to pale brown to light gray subangular to subrounded cobble				
30						CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix,				
30	;					well graded, hard, moist.	@31' B			
				1		@26.5' - Light gray to pale brown scoured-out discontinuous pocket of	N42W/16SW			
$\dashv$						fine to coarse grained SANDSTONE with subangular fine gravel, poorly	@32.5' B			
$\overline{}$					}	graded, very dense, moist, slightly friable to weakly cemented.	N41W/19SW			
35						@27' - Olive brown subangular to subrounded fine cobble CONGLOMERATE				
					1	with slightly friable clayey fine to medium sand matrix, well graded, hard,				
						moist, with occasional fine gravel CONGLOMERATE interbeds.				
				]	1	@28' - Occasional boulders (10%) to 30' depth.	@38' Approx.			
						@32.5' - 3" thick discontinuous light gray silty fine to medium grained	BN43W/20SW			
40						SANDSTONE.				
			1			@36' - Olive brown to light gray subangular to subrounded cobble				
				}		CONGLOMERATE with slightly friable silty fine to coarse sand matrix with				
				]		lean clay, well graded, hard, moist, with occasional fine gravel	Ì			
				1		CONGLOMERATE interbeds.				
45	TIONAL		I	!	<u> </u>	@38' - Matrix grades to slightly plastic and clayey.				

LOG OF BORING B67 SUBSURFACE DATA W.O.; 8838.002 CLIENT: Pardee Homes PROJECT: Skyline Ranch DATE: 8/28/06 LOCATION: Santa Clarita ELEVATION: 2325' RIG TYPE: 24" Bucket HAMMER WEIGHTS: Kelly Bar Weights DROP: 12" ATTITUDES DESCRIPTION UBIM T DD 40 @41' - Occasional boulders (10%) in olive brown to light gray subangular to subrounded cobble CONGLOMERATE with slightly friable, slightly plastic silty fine to coarse sand matrix with CLAY, well graded, hard, moist. @45' B 45 N40W/12SW @49' - Lean clay in matrix, non-plastic. 50 @52' - End boulders to light gray subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist, with occasional poorly graded conglomerate. @55.5' Appox. 55 BN28W/20SW @57.5' B N38W/19SW 60 @62.5' - Light gray cobble boulder CONGLOMERATE,. 65 @66' - Refusal on boulder. Total Depth - 66' 70 No groundwater No caving Backfilled 75 80 85 ADDITIONAL COMMENTS:

SUB	SUBSURFACE DATA LOG OF BORING 868										
	CLIE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002				
	LOCATION	ON:	Sar	nta Cla	arita	ELEVATION: 2014'	DATE: 9/1/06				
	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
	N	U		М	DD	DESCRIPTION	ATTITUDES				
0						Saugus Formation: Dark brown to grayish brown silty fine to medium grained					
			1			SANDSTONE with trace angular to subangular fine gravel, poorly graded, dense, dry,					
<u> </u>				[		rootiets.	:				
<b></b>						COL Dala heavy aith fine to madium avained CANDSTONE with authorized to					
2.5						@2' - Pale brown silty fine to medium grained SANDSTONE with subangular to subrounded fine gravel, poorly graded, dense, dry, subhorizontal calcium carbonate					
2.5						veins spaced 3-4" apart.					
						@4' - Moist.					
				İ			:				
5											
<b> </b>				]	l .	CANDOTONIC					
$\parallel$						@6' - Yellowish brown silty fine to medium grained SANDSTONE, poorly graded, dense, moist.					
-			х			@7' - Grades to yellowish brown clayey SILTSTONE, poorly graded, dense, moist,					
7.5				]		slightly friable, subhorizontal calcium carbonate veins.					
				]		@8' - Grades to silty fine grained SANDSTONE to fine grained sandy SILTSTONE.					
				]							
							G40 F1				
10							@10.5'				
$\parallel$						@11' - 2' thick discontinuous channel deposit in S quadrant, fine to coarse gravel	carbonate vein N35E/21NW				
<b> </b>					-	CONGLOMERATE with slightly friable clayey fine to coarse sand matrix, well graded,	· .				
	1					dense, moist.	@12' Approx.				
12.5			•			@11.5' - Silty fine grained SANDSTONE to fine grained sandy SILTSTONE, coarsens					
							N86W/18SW				
						to coarse sand matrix, well graded, hard, moist.					
$\blacksquare$				İ		@12' - Sharp, slightly scoured contact with discontinuous silty fine grained					
15	4/10-5"	c ·		8.9	122.0	SANDSTONE to fine grained sandy SILTSTONE, poorly graded, hard, moist, slightly friable, scoured out by gravels from 11'.					
	4, 10-0	•		0.3	122.0	@13' - Slightly irregular contact to yellowish brown clayey SILTSTONE, poorly graded					
			x			hard, moist, slightly friable with mottled 1/2" claystone veins.					
						@14' - Reddish brown clayey SILTSTONE with olive green streaks, poorly graded,					
					1	dense, moist.	@17' Approx.				
17.5	.					@15' - Grades to dark yellowish brown subangular fine gravel CONGLOMERATE	contact				
<u> </u>	1		X		1	with fine to medium sandy silty clay matrix, well graded, very dense, moist, slightly	horizontal				
<b> </b>					1	friable, matrix is slightly plastic. @15.5' - Grades to silty clayey SANDSTONE to clayey SILTSTONE with coarse sand	ļ				
$\parallel$						and fine gravel, poorly graded, dense, moist, slightly friable, wavy.					
20					1	@17' - Grades to yellowish brown gravel to cobble CONGLOMERATE with friable					
	j				:	to slightly friable fine to coarse sand matrix with trace silt, well graded, hard, moist.					
						@18' - Matrix changes to reddish brown, clayey silty fine to coarse sand.					
<b> </b>			ł			@20' - Trace clay in matrix, coarse gravel CONGLOMERATE.					
20.5						@22' - Boulders.					
22.5 ADD	TIONAL	CO	MM	FNTS	<u>.                                    </u>	Blows per 6"					
ישטאו	HORAL	-	TALIAL)	110		C = Modified California Sampler					
#						Kelly Bar Weights: 0 - 24¹, 2854 lbs.					
						25 - 47', 1802 lbs.					
						48 - 70', 1091 lbs.					
<u>L</u>	<u>=.</u>										

	CLIE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 2014'	DATE: 9/1/06
<u></u> ,	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	U	В	M	DD	DESCRIPTION	ATTITUDES
22.5			x			@23' - Matrix changes to yellowish brown fine to coarse sand.  @24' - Boulder.  @25' - Dark grayish brown subangular to subrounded coarse gravel  CONGLOMERATE with very clayey fine to coarse sand matrix, well graded, hard,  moist.  @26' - Yellowish brown trace silty fine to coarse sand matrix.  @265' - Yellowish brown interbedded clayey silty fine grained SANDSTONE to fine  grained sandy clayey SILTSTONE, poorly graded, hard, moist, slightly friable.	
32.5	5/10-5"	С		14.5		@30' - Grades to light yellowish brown clayey silty fine to coarse grained SANDSTONE with trace subangular to subrounded fine to coarse gravel and trace fine gravel sized pockets of dark yellowish brown clayey SiLT to silty CLAY, moderately graded, hard, moist, slightly friable.  @31' - Grades to subangular to subrounded gravel CONGLOMERATE with slightly friable clyey silty fine to coarse sand matrix, well graded, hard, moist.  @33.5' - Grades to grayish brown subangular to subrounded gravel to cobble CONGLOMERATE with fine to coarse sand matrix with trace silt, moderately graded, hard, moist.  @35' - Boulder.  @36' - 1.5' diameter boulder.	@30' Approx. contact @30.5' Approx. BE-W/14S
40						@40' - Yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with trace silty fine to coarse sand matrix, moderately graded, hard, moist.	@39' B N42E/7SE
	TIONAL	CO	MM	ENTS	:	Biows per 6" C = Modified California Sampler Kelly Bar Weights: 0 - 24', 2854 lbs. 25 - 47', 1802 lbs. 48 - 70', 1091 lbs.	

	CLIENT: Pardee Homes PROJECT: Skyline Ranch W.O.: 8838 002										
<b>}</b>							W.O.: 8838.002				
	LOCATI	ON:	Sar	nta Cla	arita	ELEVATION: 2014'	DATE: 9/1/06				
	RIG TY	PE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"				
	N		В		DD	DESCRIPTION	ATTITUDES				
40											
		1	}		-		<b>j</b>				
				ļ		@41' - Yellowish brown fine to coarse grained SANDSTONE, poorly graded, hard,					
						moist.					
42.5			1								
$\vdash \vdash$					1						
$\vdash$						@44' - Yellowish brown clayey fine to coarse grained SANDSTONE with subrounded					
45	12-6"	_	]	10.0	98.6	fine gravel, moderately graded, hard, moist.  @45' - Grades to yellowish brown subangular to subrounded fine to coarse grained					
╟╼┷	12-0			10.5		gravel CONGLOMERATE with trace clayey fine to coarse sand matrix, well graded,					
┢─┤						hard, moist.					
47.5						Total Depth - 45'					
						No groundwater					
						No caving					
╟——┤		ŀ		ŀ		Backfilled	ŀ				
50											
00											
$\Vdash \vdash \vdash$											
$\square$	:										
52.5											
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55											
<b> </b>											
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$\vdash \vdash \vdash$											
57.5											
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$ldsymbol{ldsymbol{eta}}$				ĺ							
<u> </u>											
60											
<del>  </del>											
$\vdash$	•										
H											
62.5	i										
	TIONAL	CO	ММ	ENTS		Blows per 6"	<del></del>				
						C = Modified California Sampler					
						Kelly Bar Weights: 0 - 24', 2854 lbs.					
						25 - 47', 1802 lbs.	-				
						48 - 70', 1091 lbs.	1				
<u></u>				<del></del>							

<u> </u>	SUKFA		-			DDO ITOT OLUTE DANS	
<b> </b>				dee H			W.O.: 8838.002
1	LOCATI	ON:	Şar	ita Cla	rita	ELEVATION: 2080'	DATE: 9/5/06
1	RIG TY	PE:	24"	Bucke	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	U	В	M	D	DESCRIPTION	ATTITUDES
Ö						Landslide Debris?: Yellowish brown gravel to cobble CONGLOMERATE with silty fine	
						to medium sand matrix, well graded, medium dense, dry, rootlets, blocky and fractured	
						in upper 8", slightly friable.	
						@2' - Moist.	@2' B
2.5							N78E/24NW
L						@3' - Sharp, scoured contact with dark yellowish brown CLAYSTONE, stiff, moist,	@3' C
ļ			ļ.,			massive.	N86E/19NW
<u> </u>			Х				
<u></u>							
5			[				
⊩—						@6' - End roots.	
<u> </u>						lwe - End 1968.	
$\vdash$							
7.5						[@7.5′ - 3″ of medium plasticity within claystone.	
' ' '			х			Service of modular products man stayers.	
			<b></b>				
						@9' - Grades to dark yellowish brown fine to coarse grained sandy clayey SILTSTONE	
						with trace subangular fine gravel, poorly graded, stiff, moist.	
10			ļ				
				1			
						@11' - Grades to dark yellowish brown clayey silty fine to medium grained	
						SANDSTONE with 15% subangular fine gravel, moderately graded, medium dense,	
	ŀ					moist, slightly friable.	
12.5						@12.5' - Slightly scoured contact to dark yellowish brown clayey fine grained sandy	@12.5' C
			Х			SILTSTONE, poorly graded, stiff, moist, slightly plastic, slightly friable.	N24E/16NW
						@13.5' - 1-3" thick CLAYSTONE, stiff, moist, highly plastic, corn flaky texture, internall	@13.5' S
						sheared, bounded below by clayey silty fine grained SANDSTONE, poorly graded,	N8E/19NW
<u> </u>						medium dense, moist, slightly plastic.	
15	2/2	Ç.		15.5		@15' - Dark yellowish brown silty fine to coarse grained sandy CLAYSTONE, stiff,	
			}	1		moist, medium plastic.	@15.5' Approx.
<b> </b>			ŀ			@15.5' - Scoured contact to fine grained sandy SILTSTONE, poorly graded, stiff,	CN72W/4NE
<b> </b> -						moist, slightly plastic, slightly friable.	
17.5	1					@16' - Discontinuous 1" thick CLAYSTONE, sheared, highly plastic.	
11.3						@18' - Grades to fine gravel fine to coarse grained sandy SILTSTONE.	
		1				E to Stand to this State into the section States of the Other Other	
-							
<b>—</b>	1				1	@19.5' - Grades to yellowish brown subangular fine grained gravel CONGLOMERATE	, !
20	1					well graded, medium dense, moist, slightly friable.	[
	]		Х			@20' - Grades to dark yellowish brown clayey silty fine to coarse grained	
	]					SANDSTONE with subangular fine gravel, poorly graded, medium dense, moist.	@21' Approx.
	]					@21' - Sharp contact to 2" thick dark yellowish brown silty CLAYSTONE, poorly	BN19W/10NE
						graded, stiff, moist, internally sheared, shear cuts bedding in sands above.	
22.5		<u> </u>			<u> </u>		
NDD	ITIONAL	_ CC	MMC	ENTS	5:	Blows per 6"	ļ
						C = Modified California Sampler	Ì
1						Kelly Bar Weights: 0 - 24', 2854 lbs.	ļ
						25 - 47', 1802 lbs. 48 - 70', 1091 lbs.	
						40 - 10 , 100 t 105.	
<u> </u>							

	SURFAC					LOG OF BORING	
					omes		W.O.: 8838.002
<u> </u>	LOCATIO	ON:	Sar	nta Cla	arita	ELEVATION: 2080'	DATE: 9/5/06
<u> </u>	RIG TY	PE:	24"	Buck		HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	ט	В	М	DD	DESCRIPTION	ATTITUDES
20						@21.5' - Grades to clayey fine grained sandy SILTSTONE with trace subengular fine gravel, poorly graded, stiff, moist, slightly friable.	@21'1" S N60E/45SE
25			С			@26.5' - Abruptly grades to yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, moderately graded, medium dense, moist, 3-12" thick.  @27' - Sharp, irregular contact to 3" thick dark yellowish brown CLAYSTONE, stiff, moist, highly plastic, grades to clayey fine grained sandy SILTSTONE, poorly graded, stiff, moist, slightly friable.	@27' Approx. CN6W/27NE
32.5	2/4	С	X	20.2	105.2	<ul> <li>@29' - Grades to yellowish brown silty fine grained SANDSTONE, poorly graded, medium dense, moist, slightly friable.</li> <li>@29.5' - Sharp contact with discontinuous fine to coarse grianed SANDSTONE with fine gravel.</li> <li>@30' - Contact with 1-10" thick dark yellowish brown silty CLAYSTONE, poorly gradestiff, moist, highly plastic, pervasively sheared, sheared lower contact.</li> <li>@31' - Saugus Formation: Dark yellowish brown SILTSTONE, weakly indurated, very stiff, moist.</li> <li>@32.5' - Grades to dark yellowish brown silty fine to medium grained SANDSTONE with trace subangular to subrounded fine gravel, poorly graded, dense, moist, massive, slightly friable.</li> </ul>	]
37.5				in the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of th		@36.5' - 4" thick subangular fine grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, moderately graded, dense, moist.  @37' - 3" thick subangular fine grained gravel CONGLOMERATE.  @38' - Grades to yellowish brown fine to coarse grained SANDSTONE with trace subangular to subrounded fine gravel, poorly graded, dense, moist, slightly friable.  @38.5' - Sharp contact to dark yellowish brown clayey SILTSTONE, poorly graded, very stiff, moist, slightly friable.  @40' - Dark yellowish brown fine to medium grained sandy clayey SILTSTONE, poorly graded, very stiff, moist, slightly plastic, slightly friable.	@37' B  @37' B  N35E/11SE  @38.5' C  N57E/8SE
42.5 ADD	ITIONAL	Blows per 6" C = Modified California Sampler Kelly Bar Weights: 0 - 24', 2854 lbs. 25 - 47', 1802 lbs. 48 - 70', 1091 lbs.					

## SUBSURFACE DATA

CLIENT: Pardee Home	s PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2080'	DATE: 9/5/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
N U B M DD	DESCRIPTION	ATTITUDES
40	@42' - Grades to fine grained sandy clayey SILTSTONE, medium plastic.  @43' - Grades to dark yellowish brown clayey silty fine to medium grained SANDSTONE, poorly graded, dense, moist, slightly plastic, slightly friable.  7@45' - Dark yellowish brown fine to medium grained sandy clayey SILTSTONE, poorly graded, very stiff, moist, medium plastic, slightly friable.  @49' - Grades to dark yellowish brown very clayey silty fine grained SANDSTONE, poorly graded, dense, moist, slightly plastic, slightly friable.	ATTITUDES
50 52.5 55 57.5	@55.5' - 5" thick dark yellowish brown fine grained gravel CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, dense, very moist. @56' - Dark yellowish brown clayey silty fine to coarse grained SANDSTONE, poorly graded, dense, moist, slightly friable.	@55.5' B N74E/9SE
60 15-8" C 13.3	@60' - Yellowish brown silty fine grained SANDSTONE with mottled iron staining and olive green veins, poorly graded, dense, moist, slightly plastic, slightly friable.	
62.5	Blows per 6"	
ADDITIONAL COMMENTS.	C = Modified California Sampler Kelly Bar Weights: 0 - 24', 2854 lbs. 25 - 47', 1802 lbs. 48 - 70', 1091 lbs.	

	CLIE				lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
<u> </u>	LOCATI					ELEVATION: 2080'	DATE: 9/5/06
<b> </b>							·
<b> </b>	RIG TY	PE:	24" B	Bucki M	DD	HAMMER WEIGHTS: Kelly Bar Weights DESCRIPTION	DROP: 12" ATTITUDES
60		<del>                                     </del>		141		DECOME HON	ATTIODES
				:			
							:
62.5							
<b> </b> —							
$\vdash$						@64' - Yellowish brown clayey fine grained sandy SILTSTONE to clayey silty fine	
}						grained SANDSTONE, poorly graded, dense, moist, slightly friable.	
65						g	
<b>  </b>						Chert. One does to uniformish homes along with the continue of CANDOTONIC	
67.5					}	@67' - Grades to yellowish brown clayey silty fine grained SANDSTONE, poorly graded, dense, moist, slightly plastic, slightly friable.	
10, 3						@68' - Abruptly grades to yellowish brown gravel to cobble CONGLOMERATE with	
				,		slightly friable clayey silty fine to medium sand matrix, well graded, dense, moist.	
							1
70						Total Depth - 70'	1
$\vdash$						No groundwater No caving	
-						Backfilled	
$\parallel$							
72.5							
$\blacksquare$							]
<b></b>		'					
75							
<b> </b>							1
77.5							
H							
80							
$\parallel$							
⊩		[ ]					
$\parallel$							
82.5							
	TIONAL	CO	ММ	ENTS		Blows per 6"	<del> </del>
						C = Modified California Sampler	ļ
						Kelly Bar Weights: 0 - 24', 2854 lbs.	
ļ						25 - 47', 1802 lbs. 48 - 70', 1091 lbs.	
1							·····

208	SUBSURFACE DATA LOG OF BORING B70							
CLIENT: Pardee Homes						PROJECT: Skyline Ranch	W.O.: 8838.002	
<u> </u>	OCATI	ON:	Sa	nta Cl	arita	ELEVATION: 1966'	DATE: 9/7/06	
RIG TYPE: 24" Bucket					et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"	
	N	Ū	_		DD	DESCRIPTION	ATTITUDES	
0				_		Saugus Formation: Yellowish brown silty fine grained SANDSTONE with subangular		
						to subrounded fine to coarse gravel, poorly graded, medium dense, moist, blocky and	ł	
						fractured in upper 6", rootlets to 3'.	ł	
				1				
2.5						@2.5' - Dark yellowish brown clayey fine to medium grained sandy SILTSTONE with		
		1		ł	ŀ	trace subangular fine gravel, poorly graded, stiff, moist, slightly friable.  @3.5' - Grades to yellowish brown silty fine to medium grained SANDSTONE, poorly	ļ	
						graded, medium dense, moist, slightly friable.		
		İ	х		]	@4.5' - Grades to yellowish brown subangular fine grained gravel CONGLOMERATE		
5			Х	•		with slightly friable fine to medium sand matrix, moderately graded, medium dense,	@5' C	
╟┈┤				ľ	ļ	moist.	N29W/12SW	
		1				@5' - Sharp contact with yellowish brown clayey fine to medium grained sandy	1.12014/12044	
						SILTSTONE, poorly graded, stiff, moist, slightly friable.	@6.5' B	
							N29W/16SW	
7.5						with slightly friable fine to medium sand matrix, moderately graded, medium dense,		
		ļ		}	ļ	moist.	@8' C	
						@5'9" - Sharp contact with yellowish brown clayey fine to medium grained sandy	N56W/22SW	
						SILTSTONE, poorly graded, stiff, moist, slightly friable.		
					:	@6.2' - Grades to yellowish brown subangular fine grained gravel CONGLOMERATE		
10						with slighlty friable fine to medium sand matrix, moderately graded, medium dense,		
						moist.		
<u> </u>						@8' - Slightly scoured contact with dark yellowish brown clayey very silty fine to		
		:		•	1	medium grained SANDSTONE with trace subangular fine gravel, poorly graded,		
10.5				ŀ	1	medium dense, moist, slightly plastic, massive.		
12.5			i		1			
$\vdash$				1				
<del>  </del>		,						
						@14.5' - Grades to clayey silty fine to medium grained SANDSTONE with 15%		
15	2/4	c		5.4	1195	subangular to subrounded fine gravel, moderately graded, medium dense, moist,		
┝┷┩	-,-	٦		~ ~	]	subangular to subrounded line graver, moderately graded, medium dense, moist, slightly friable.		
						@15' - Grades to yellowish brown subangular to subrounded gravel CONGLOMERATI	@16' B	
$\vdash \dashv$							N6W/16SW	
						moist.	IAOAN IOOAA	
17.5								
	ľ							
						@18.5' - Sharp highly scoured (2.5' in SE quadrant) contact with dark yellowish brown	@18.5' Approx	
							CN47E/47SE	
						waxy, corn flaky texture, medium plastic.	@19.5' Approx.	
20	į						BN65E/10SE	
	ŀ							
						İ	ſ	
igsqcut							ļ	
		ŀ					İ	
22.5	FICE				<u></u>	Discussion of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of th		
ADDI	TIONAL	. CC	MM	ENTS		Blows per 6"		
						C = Modified California Sampler  Keilly Box Weighter		
						Kelly Bar Weights: 0 - 24', 2854 lbs.		
						25 - 47', 1802 lbs. 48 - 70', 1091 lbs.		
						40 - 70, 108 t lbs.		

CLIENT: Pardee Homes PROJECT: Skyline Ranch LOG OF BORING B70							
ļ	CLIE	NT:	Par	dee H	lomes		W.O.: 8838.002
LO	CATI	NC:	Sar	ta Cla	arita	ELEVATION: 1966'	DATE: 9/7/06
RIG TYPE: 24" Bucket						HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	U	В	M	DD	DESCRIPTION	ATTITUDES
20 22.5 25 27.5 30 32.5 37.5 40 42.5 ADDIT	3/8	C	X	10.3	123.9 S:	@23' - Grades to dark yellowish brown very clayey fine to medium grained sandy StLTSTONE, poorly graded, stiff, moist, slightly plastic.  @27' - Grades to dark yellowish brown very fine grained very sitty SANDSTONE, poorly graded, stiff, moist, slightly plastic.  @30' - Grades to dark yellowish brown sitty fine grained SANDSTONE with trace subrounded fine gravel, poorly graded, dense, moist.  @30.5' - Contact with dark yellowish brown 1" thick CLAYSTONE, stiff, moist, highly plastic, internal discontinous shear, truncated by sandstone above.  @32' - 2-8" thick subangular fine grained gravel CONGLOMERATE, slightly friable.  @32-5' - Dark yellowish brown sitty fine grained SANDSTONE, poorly graded, dense, moist, slightly friable.  @34' - 6" dark yellowish brown CLAYSTONE, highly plastic, stiff, moist, internally sheared, waxy, corn flaky, slightly friable.  @35' - Grades to brown sitty fine to coarse grained SANDSTONE with subangular fine gravel, moderately graded, dense, moist.  @36.5' - Sheared contact to 3" thick dark yellowish brown CLAYSTONE, highly plastic.  @36.6' - Grades to clayey sitty fine grained SANDSTONE, poorly graded, dense, moist, slightly plastic, slightly friable.  @38' - Dark yellowish brown fine grained SaNDSTONE, poorly graded, dense, moist, slightly plastic, slightly friable.  @38' - Dark yellowish brown fine grained sandy sitty CLAYSTONE with trace subangular fine gravel, poorly graded, very stiff, moist, medium plastic.  @40' - Dark yellowish brown sitty very clayey fine to coarse grained SANDSTONE with 10% subangular fine gravel, moderately graded, dense, moist, medium plastic.	
						Kelly Bar Weights: 0 - 24', 2854 lbs. 25 - 47', 1802 lbs.	
						48 - 70', 1091 lbs.	
i						ישיין ושטר ואטטי.	

LOG OF BORING B70								
CLIENT: Pardee Home	es PROJECT: Skyline Ranch	W.O.: 8838,002						
LOCATION: Santa Clarita	ELEVATION: 1966'	DATE: 9/7/06						
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"						
N U B M D	DESCRIPTION	ATTITUDES						
40 X 42.5 45 4/10 C 12.9 123	@42' - 4" thick dark yellowish brown highly plastic CLAYSTONE, stiff, moist, sheared 1/4" below contact, parallel to contact, waxy, corn flaky texture. @42.3' - Dark yellowish brown clayey SILTSTONE, poorly graded, hard, moist, slightly plastic.  5 @45' - Grades to dark yellowish brown clayey silty fine to medium grained	@42' Sheared contact N53W/12SW						
47.5	SANDSTONE, poorly graded, very dense, moist.  @47' - Dark yellowish brown silty fine to medium grained SANDSTONE with sparse coarse sand and subangular fine gravel, poorly graded, very dense, moist, discontinuous subangular fine gravel CONGLOMERATE with silty fine to coarse sand matrix.	@47' B N66W/24SW						
52.5	<ul> <li>@51.5' - 4" thick dark yellowish brown CLAYSTONE, highly plastic, discontinuous shear.</li> <li>@53' - 1-2" thick dark yellowish brown CLAYSTONE, stiff, moist, waxy, corn flaky texture, highly plastic where sheared, medium plastic otherwise.</li> </ul>	@51.5' Approx. SN18E/8NW @53' Shear N30W/10SW						
57.5	<ul> <li>@55.5' - Discontinuous one foot thick fine gravel CONGLOMERATE.</li> <li>@56.5' - Dark yellowish brown fine grained sandy SILTSTONE, poorly graded, hard, moist, slightly friable.</li> <li>@58' - Grades to dark yellowish brown clayey silty fine to medium grained SANDSTONE, poorly graded, dense, moist, slightly friable.</li> </ul>	@55.5' B N55W/16SW						
62.5	3 @60' - Yellowish brown fine to medium grained sandy SILTSTONE, poorly graded, very stiff, moist, with dark yellowish brown trace fine to coarse grained sandy CLAYSTONE, highly plastic.							
ADDITIONAL COMMENTS:	Blows per 6" C = Modified California Sampler Kelly Bar Weights: 0 - 24', 2854 lbs. 25 - 47', 1802 lbs. 48 - 70', 1091 lbs.							

<b>-</b>	-		-		<del></del>	LOG OF BORING	D10
<u></u>	CLIE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
<u> </u>	OCATI	ON:	Sar	ita Cla	arita	ELEVATION: 1966'	DATE: 9/7/06
	RIG TY	PE:	24"	Buck	et	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	U	В	М	DD	DESCRIPTION	ATTITUDES
60	7						1
			1				}
		} .	•		[	@61.5' - Brown subangular cobble CONGLOMERATE with slightly friable silty fine to	
						coarse sand matrix, well graded, dense, moist, thickly bedded.	
62.5			] .				
							f
		ł					
					ŀ		1
7.5							}
65						@65' - Brown subangular cobble CONGLOMERATE with slightly friable silty fine to	@65' Approx.
$\parallel$						coarse sand matrix, well graded, dense, moist, thickly bedded.	BN71W/18SW
<b> </b>		}					
<b>  </b>							]
67.5		 					Ì
J			.				
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					:		
70						@70' - Brown subangular cobble CONGLOMERATE with slightly friable silty fine to	
						coarse sand matrix, well graded, dense, moist, thickly bedded.	
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<b> </b>							}
-0.5	i						
72.5			•				
$\vdash$			ł				
$\parallel$		1	1			T-4-1 D9- 745	
						Total Depth - 74*	}
75						No groundwater	
<del> </del>		ì	- 1	i		No caving Backfilled	[
$\vdash$						oooning a	
$\parallel \parallel$				ſ			
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77.5			ļ				
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82.5	İ	ļ		i			
	TIONAL	CO	MMF	L ENTS	l :	Blows per 6"	
				_, • , •		C = Modified California Sampler	1
						Kelly Bar Weights: 0 - 24', 2854 lbs.	
						25 - 47', 1802 lbs.	[
						48 - 70', 1091 lbs.	
							:

30B30KFACE					8/1
CLIENT	Par	rdee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION	Sar	nta Cla	arita	ELEVATION: 1815'	T
RIG TYPE	24"	" Bucke	et	HAMMER WEIGHTS: Kelly Bar Weights	† <del></del>
N Ü	В	М	DD	DESCRIPTION	
RIG TYPE	24" B	"Bucke	108.9	HAMMER WEIGHTS: Kelly Bar Weights  DESCRIPTION  Landslide Debris: Dark grayish brown to dark yellowish brown fine to coarse grained SAND with 10% subangular to subrounded fine to coarse gravel, graded, medium dense, dry.  @1' - Grades to dark yellowish brown fine to coarse grained SAND with 20% subangular to subrounded fine to coarse gravel, well graded, dense, moist.  @4' - Color change to yellowish brown and fine gravel to cobble sized clasts.  @6' - Absence of clasts, yellowish brown clayey fine to medium grained SAND, poorly graded, dense, moist, subvertical 1/4" thick carbonate stringers.  @8' - Dark yellowish brown fine to coarse grained SAND with 20% subangular to subrounded fine to coarse gravel, well graded, dense, moist.  @12' - Clay lens.  @15' - Yellowish brown fine to coarse grained SAND with angular to subangular fine gravel, moderately graded, dense, moist, contact with strong brown clayey fine grained SANDSTONE in tip, poorly graded, dense, moist, medium plastic.  @17' - Grades to yellowish brown fine to coarse grained SAND with angular to subangular fine gravel and clayey fine sand interbeds.  @20' - Sharp contact with 6" thick strong brown clayey fine grained SAND, very moist to wet.  @20.5' - Contact with yellowish brown 6" thick fine to coarse grained SAND with gravel.	@4' Approx. BN65E/16SE  @11' Approx. BN65E/16SE  @20' Approx. CN55E/15SE @22.5' S N26E/17SE @23' S N74E/4NW @25' Approx. CN55E/17SE
35 40 45 ADDITIONAL CO	MMC	MENTS	;; -	indurated.  @26' - Grades to gray subangular to subrounded fine gravel to cobble  CONGLOMERATE with moderately cemented fine to coarse sand matrix, well graded, hard, moist.  @30' - Grades to coarse gravel CONGLOMERATE, poorly graded, hard, moist.  @31' - Crude bedding.  @33' - Scoured contact to light gray fine to coarse grained SANDSTONE, weakly ndurated.  @35' - Thin coarse gravel to boulder CONGLOMERATE within sandstone.  @36' - Grades to conglomeratic fine to coarse grained SANDSTONE with fine gravel clasts and occasional boulders, very dense, moist, weakly cemented.  @39' - Grades to boulder CONGLOMERATE.	@31' B N18W/22SW @32' B N50W/16SW @33' C N55E/29NW @35' Approx. BN5E/18NW
			E	No groundwater, No caving, backfilled. Blows per 6" C = Modified California Sampler Kelly Bar Weights: 0 - 25', 2854 lbs. 25 - 49', 1802 lbs.	

CLIENT: Pardee Homes					lomes	PROJECT: Skyline Ranch	W.O.; 8838.002
LOCATION: Santa Clarita					arita	ELEVATION: 1846'	DATE: 9/13/06
II	RIG TY					HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	U	В	M	DD	DESCRIPTION	ATTITUDES
0		_		<u> </u>		Saugus Formation: Yellowish brown subangular fine grained gravel CONGLOMERATE	
						with slightly friable silty fine to coarse sand matrix, well graded, dry in upper 6", moist	@1'8
						below, blocky and fractured in upper 8", roots to 3'.	N58W/17NE
						@2' - Discontinuous dark brown CLAY pocket in N wall.	
			×	]	}	@2'3" - Slightly scoured contact with silty fine grained SANDSTONE, poorly graded,	
5						hard, moist.	
						@2.5' - Grades to dark brown very clayey fine to medium grained SANDSTONE with	
						coarse sand sized dry white carbonate nodules, hard, moist.	
			İ			@4.5' - Grades to yellowish brown subangular to subrounded fine gravel to cobble	@8' Approx.
						CONGLOMERATE with silty fine to medium sand matrix, well graded, hard, moist.	BN30W/16SW
_10					1	@9.5' - Absence of clasts in yellowish brown fine to coarse grained SANDSTONE.	
$\vdash$						@11' - Grades to subangular to subrounded fine grained gravel CONGLOMERATE	@11'B
$\vdash$						with fine to coarse sand matrix, well graded, hard, moist, slightly friable.	N52W/13SE
$\parallel$		}			;	@11.5' - Sharp scoured contact to strong brown very silty fine grained SANDSTONE.	@11.5' Approx.
15	2/4			444	120 6	@12' - 6" thick fine to coarse grained SANDSTONE with subangular to subrounded	CN57E/11NW
13	214			14.4	120.0	fine gravel.	@14.5' Approx.
$\parallel$				i l		@14.5' - Undulatory sharp upper contact with strong brown CLAYSTONE, sheared, highly plastic, waxy, corn flaky texture, moist.	SN22W/1SW
$\vdash$						@15' - Brown clayey silty fine to coarse grained SANDSTONE with subangular fine	
$\vdash$						gravel, poorly graded, hard, moist.	@19'B
20						@19' - Abruptly grades to yellowish brown subangular to subrounded gravel	N50W/12SW
1						CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist.	110011/12011
						@19.5' - Slightly scoured contact to dark yellowish brown 4" thick very silty fine grained	
						SANDSTONE, overlying strong brown clayey SILTSTONE.	
						@21.3' - Becomes waxy for 3".	
25			[			@23' - Grades to dark yellowish brown clayey slity fine grained SANDSTONE with	
						sparse medium to coarse sand, poorly graded, hard, moist.	
						@27.5' - 3" thick section of subrounded fine gravel in silty fine to medium grained	:
						SANDSTONE.	
							·
30	4/8	С		14.8	118.7	@30' - Brown to dark yellowish brown silty fine to medium grained SANDSTONE,	
Щ						poorly graded, hard, moist.	
$\square$							]
						@33.5' - 1' thick section of subrounded fine gravel within silty fine to medium grained	
<b> </b>			:			SANDSTONE.	
35						@35.5' - Abruptly grades to subangular to subrounded gravel CONGLOMERATE	
<b> </b>						with slightly friable fine to coarse sand matrix, well graded, hard, moist.	@36' B
$\parallel$						@301 Clightly approach the result to the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the sta	N46W/15SW
$\parallel \rightarrow \parallel$						@38' - Slightly scoured sharp contact to strong brown clayey fine grained sandy	@38' C
40					1 3	SILTSTONE, poorly graded, hard, moist.	N21W/22NE
						@39.5' - Two 6" thick channel deposits, yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded,	:
$\parallel \rightarrow \parallel$						very dense, moist, exits in N and W walls.	
$\parallel - \parallel$						tory dense, moist, exite in it and if wans.	
$\parallel \parallel$							
45							
·——	TIONAI	CC	MM	ENTS		Blows per 6"	<u>-</u>
						C = Modified California Sampler	
						Kelly Bar Weights: 0 - 25', 2854 lbs.	ŀ
						25 - 48', 1802 lbs.	ļ
Į .						48 - 70', 1019 lbs.	
<u>L</u>							

	CLIE	NT:	Par	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita						ELEVATION: 1836'	DATE: 9/14/06
RIG TYPE: 24" Bucket						HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
	N	Ú	В	М	DD	DESCRIPTION	ATTITUDES
0						Landslide Debris: Brown to dark brown fine grained sandy silty CLAY, poorly graded, hard, moist, slightly plastic, upper 1' is dry.	
5			×			@3' - Yellowish brown subangular to subrounded coarse grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dense, dry.	@3' Approx. BN54E/20SE
	i					@7.5' - Sharp, irregular, scoured contact with yellowish brown silty fine grained SAND with angular to subangular fine gravel and sparse medium to coarse sand, poorly graded, very dense, moist, occasional dry white carbonate stringers, subvertical to	@7.5' Approx. CN87W/12SW
10	,					subhorizontal.  @11' - 3" thick light yellowish brown silty fine to medium grained SAND layer.  @11.5' - Discontinuous 3" thick clayey SILT to silty CLAY, irregular upper and lower contacts, medium plastic.  @13.5' - Abruptly grades to cobble to boulder CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, predominantly massive.	@13.5' Approx. BN65E/17NW
20	2/5	С	×	14.4	118.4	@22' - Sheared contact to 1/2" to 1" thick dark yellowish brown CLAY, highly plastic, waxy, corn flaky texture, grades to dark yellowish brown clayey SILT, poorly graded, hard, moist. @24' - Dark yellowish brown clayey SILT, poorly graded, hard, moist.	@22' Sheared contact N63W/11SW
30	3/11	С	X	16.3	114.4	<ul> <li>@27' - Grades to clayey silty fine to coarse grained SAND with subrounded fine gravel.</li> <li>@28' - Irregular, slightly scoured contact to fine to coarse grianed sandy clayey SILT, poorly graded, hard, moist.</li> <li>@29' - Sheared upper contact to strong brown 1/4" to 1" thick CLAYSTONE, highly plastic, waxy, corn flaky texture.</li> <li>@30' - Yellowish brown silty fine to medium grained SANDSTONE, poorly graded, very dense, moist.</li> <li>@30.5' - Grades to clayey silty fine to medium grained SAND, poorly graded, very dense, moist, slightly plastic.</li> <li>@34' - Grades to yellowish brown subrounded fine grained gravel CONGLOMERATE with clayey silty fine to coarse sand matrix, well graded, very dense, moist to very moist, highly channelized.</li> </ul>	@28' C N52W/20SW @29' S N39W/8SW @35.5' C N42W/13SW
40						@35.5' - Sharp, irregular slightly scoured contact to dark yellowish brown clayey silty fine grained SAND, poorly graded, very dense, moist, slightly plastic.  @39.8' - 2-5" thick olive brown fine to coarse grained SAND with subrounded fine gravel in clayey silty fine grained SAND from 35.5'.	@39.8' B  N41W/13SW 
45 ADDI	TIONÁ	L L C	AMC	I MENTS	<u>l</u>	Blows per 6"  C = Modified California Sampler  Kelly Bar Weights: 0 - 25', 2854 lbs.  25 - 48', 1802 lbs.  48 - 70', 1019 lbs.	<u> </u>

SUBSURFACE DATA

SUBSURFACE DATA LOG OF BURING B/3								
CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002						
LOCATION: Santa Clarita	ELEVATION: 1836'	DATE: 9/14/06						
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"						
N U B M DD	DESCRIPTION	ATTITUDES						
40								
N U B M DD	DESCRIPTION  @41.5' - Abruptly grades to olive brown subangular to subrounded gravel CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, very dense, moist. @43' - Slightly scoured, sharp contact to dark yellowish brown fine grained sandy clayey SILT, poorly graded, hard, moist, slightly plastic, @44' - 1/4' thick strong brown CLAY, highly plastic, sheared on upper contact, waxy, com flaky, bedding below this point is well defined. @44.5' - Saugus Formation: Olive brown silty fine grained SANDSTONE, poorly graded, very dense, moist, weakly cemented between many discontinuous lenses of this material and dark yellowish brown fine grained sandy clayey SILTSTONE. @45' - Olive brown clayey fine grained sandy SILTSTONE to silty fine grained SANDSTONE, poorly graded, very dense, moist, grades to subangular to subrounded gravel CONGLOMERATE with olive silty fine sand matrix. @46.8' - Sightly scoured contact to olive fine to coarse grained SANDSTONE, hard, moist, slightly friable to friable. @48.5' - Grades to olive fine to coarse grained SANDSTONE with 20% subrounded fine gravel. @55.5' - Grades to olive fine grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist. @55' - Olive cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist. @55' - Olive brown gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist.  Total Depth - 60' No groundwater No caving Backfilled	@42' B N34W/15SW @43' C N33W/12SW @46' B N41W/15SW  @49.5' B N14W/8SW  @53' B N55W/18SW						
85								
ADDITIONAL COMMENTS:	Blows per 6"							

C = Modified California Sampler

Kelly Bar Weights:

0 - 25', 2854 lbs.

25 - 48', 1802 lbs.

48 - 70', 1019 lbs.

LOG OF BORING B74 SUBSURFACE DATA

SUBSURFACE DATA	LOG OF BORING E	3/4
CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1713'	DATE: 9/20/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
		ATTITUDES
5 10	DESCRIPTION  Landslide Debris?: Soil formation, dark brown, blocky and fractured, dry, roots to 3'.  @1' - Olive green slity fine grained SAND with 2" thick gravel CONGLOMERATE layer at base, poorly graded, very dense, moist. @1.5' - Yellowish brown silty fine grained SAND with pervasive carbonate stringers, poorly graded, moist, pervasively fractured. @3.5' - Yellowish brown silty fine grained SAND mottled with material from 1'. @5' - Yellowish brown silty fine grained SAND mottled with material from 1'. @5' - Yellowish brown fine grained sandy SILT with sparse medium to coarse sand, poorly graded, very dense, moist, slightly friable, slightly plastic. @8' - Grades to olive yellow silty fine grained SAND, poorly graded, very dense, moist. @9.5' - 10% subangular fine to coarse grained GRAVEL with trace subangular small cobbles. @11' - Grades to olive yellow gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, slightly friable. @12' - Pale yellow silty fine to medium grained SAND, poorly graded, very dense, moist, slightly friable. @13' - Grades to fine to coarse grained SAND. @14' - Grades to fine to coarse grained SAND with abundant fine to coarse gravel. @14'- Grades to fine to coarse grained SAND with abundant fine to coarse gravel. @15' - Light yellowish brown fine to coarse grained SAND with 30% angular to subangular fine gravel and trace subagular cobbles, very dense, moist. @18-5' - Grades to yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, slightly friable. @20-22' - Boulders. Refusal on boulder.  Blows per 6" Commontate Refused California Sampler.	@1.5' B N31W/9SW @3.5' B N40W/10SW  @11' B N13W/12SW @13.5' B N70E/16NW  @16' B N22E/9NW  @22.5' B N36W/8SW
₩	C = Modified California Sampler	

Kelly Bar Weights: 0 - 25', 2854 lbs.

25 - 48', 1802 lbs.

SUBS	SUBSURFACE DATA LOG OF BORING 875						
	CLIE	NT:	Раг	dee H	omes	PROJECT: Skyline Ranch	W.O.: 8838.002
LC	CATIO	ON:	Sar	ita Cla	arita	ELEVATION: 1752'	DATE: 9/19/06
RIG TYPE: 24" Bucket			Buck	et _	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"	
	N	U	В	М	DD	DESCRIPTION	ATTITUDES
0						<u>Landslide Debris?</u> : Strong brown silty fine to medium grained SAND, poorly graded,	
$\Vdash$						loose, moist, dry in upper 6", roots to 4', slightly friable.	
$\mathbb{H}$						@2" - Grades to irregular contact with yellowish brown angular to subrounded fine gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded,	@3' C
			[				N8W/26SW
5	ļ					sandy material from above and below.	@3.5' Approx.
$\parallel$						@3' - Slightly scoured contact to strong brown silty fine to medium grained SAND,	BN10W/25SW
						poorly graded, loose, moist, slightly friable.	@7' B
						@3.5' - 3" thick dark brown silty CLAY, poorly graded, very stiff, moist, grades to strong	N2E/19SW
						brown silty fine to medium grained SAND with subangular fine gravel and sparse	@9' C
10			X	1		sand, poorly graded, dense, moist, slightly friable.	N19W/12SW
			1			@6.5' - Grades to strong brown subangular to subrounded gravel CONGLOMERATE	@10'S
<b>}</b>			1			with clayey sand matrix.	N32W/17SW
$\vdash$						@7' - Pale brown loose clay in matrix. @9' - Slightly scoured contact with brown fine grained sandy clayey SILTSTONE, poorly	
15						graded, stiff, moist.	
						@10' - Dark yetlowish brown CLAY, poorly graded, very moist, highly plastic, upper inch	
						is sheared, corn flaky texture, waxy, laminated.	@17' B
	2/7-5°	С		16.7	114.3	@10.5' - Grades to dark grayish brown fine to coarse grained sandy CLAY with trace	N17W/6SW
						subangular to subrounded fine gravel, poorly graded, stiff, moist.	@17.5' C
20			1			@12' - Yellowish brown very clayey fine to coarse grained SAND with 20% to 30%	N35W/10SW
<b></b>	:				<u> </u>	subangular gravel, moderately graded, medium dense to dense, moist.	@19' C
<b>  </b>						@14' - Gravel to cobble (angular to subangular) in clay, disturbed (mottled appearance).	@21' C
$\vdash$						@15' - Pale brown clayey sitty fine to coarse grained SAND with angular to subangular fine gravel, moderately graded, moist, dense to very dense, slightly friable.	W44W/10SW
25						@16.5' - Olive green silty fine to medium grained SAND, poorly graded, very dense,	@23' C/B
1-5					ļ	moist, slightly friable.	N48W/9SW
				į		@17' - Grades to subrounded fine gravel CONGLOMERATE with fine to coarse sand	@24' C
				]		matrix, well graded, very dense, moist, slightly friable.	N84W/8SW
						@17.5' - Slightly scoured contact with strong brown fine grained sandy clayey	
30						SILTSTONE, poorly graded, hard, moist, weakly indurated.	
						@18.5' - Mottled strong brown and pale brown fine grained sandy SILTSTONE, poorly	
						graded, moist, overlying olive green clayey sitty fine to coarse grained SAND with	;
H				1	ł	channeled pockets of subangular to subrounded fine gravel CONGLOMERATE.  @21' - Strong brown clayey silty fine grained SAND, poorly graded, very dense, moist.	
35			ļ	ļ	ļ	@23' - Olive green clayey silty fine to coarse grained SAND.	
						@24' - Strong brown clayey silty fine grained SAND, poorly graded, very dense, moist.	
						@26' - Olive green very silty fine grained SAND, poorly graded, very dense, moist.	
						@27' - Grades to olive green silty fine to medium grained SAND with subangular	
						fine gravel and sparse coarse sand;.	
40			•			@27.5' - Cobbies.	
				İ			:
-		}	}		}	Total Depth - 28', refusal on boulder	
$\vdash$			-			No groundwater, No caving	
45				1		Backfilled	
	TIONA	VL C	ОМ	MENT	S:	Blows per 6"	<u>.                                    </u>
						C = Modified California Sampler	
						Kelly Bar Weights: 0 - 25', 2854 lbs.	
	25 - 48', 1802 lbs.						

	COBSON ACE DATA LUG OF BURING B/6									
	CLIE	NT:	Par	dee H	lomes	PROJECT: Skyline Ranch	W.O.: 8838.002			
LOCATION: Santa Clarita					arita	ELEVATION: 1804'	DATE: 9/20/06			
RIG TYPE: 24" Bucket						HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"			
	N	U	В	М	DD	DESCRIPTION	ATTITUDES			
Ö						Saugus Formation: Dark brown soil formation, moist.				
						@1.5' - Yellowish brown subangular to subrounded cobble CONGLOMERATE				
						with slightly friable silty fine sand matrix with sparse coarse sand, well graded,				
<u> </u>		l				moist, medium dense, roots to 4'.				
<u></u>			'							
5										
<u> </u>			l ,				07.5			
<b>├</b>			х				@7' B N19E/7NW			
ļ			^				IN I SELVINAA			
10										
						@11' - Grayish brown subangular to subrounded cobble CONGLOMERATE				
						with slightly friable clayey silty fine to coarse sand matrix, well graded, very				
						dense, moist.				
		_		_	 					
15	4/8	C		7.8	123.7	@15' - Yellowish brown subangular to subrounded gravel CONGLOMERATE				
<b>  </b>						with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.				
$\vdash \vdash$							@17.5' Approx.			
$\vdash$	•		:				BN75W/15SW			
20						@20' - Yellowish brown subangular to subrounded gravel CONGLOMERATE				
						with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.				
						J,,				
25										
<b>}</b>							:			
<b> </b>						@39' Conside because out assessment out the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control				
$\vdash$						@28' - Grayish brown subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, hard,				
30						moist.				
	4/18	c :		6.7		@31' - Pale brown to yellowish brown subangular to subrounded cobble				
						CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix,				
						well graded, hard, moist.				
35						@35' - Mint Canyon Formation: Sharp scoured contact with yellowish brown	@35'			
							CN6E/17NW			
<b> </b>						sheared upper contact and shear in upper inch making material soft and	SN22E/32NW			
$\parallel$ — $\parallel$						slightly friable.	(A20) A			
40						@37' - Grades to olive brown subangular to subrounded cobble CONGLOMERATE, slightly friable clayey silty fine to coarse sand matrix, hard,	@39' Approx.			
╟┯						moist, well graded.	DINZVVIIIVV			
							-			
				+						
45				·						
ADDI	TIONA	L C	MMC	IENT		Blows per 6"				
C = Modified California Sampler										
l						Kelly Bar Weights: 0 - 25', 2854 ibs.	ļ			
						25 - 48', 1802 lbs. 48 - 70', 1019 lbs.	Ì			
						48 - 70', 1019 lbs. 70 - 95', 1491 lbs.				
	<del></del>					ru-vu, itulius.				

	LUG OF BURING B	
CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1804'	DATE: 9/20/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"
N U B M DD	DESCRIPTION	ATTITUDES
40		
45 5/15 C 7.3 119.9	@45' - Olive brown subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, hard, moist, well graded, overlying light gray fine grained sandy SILTSTONE, poorly graded, weakly indurated, hard, moist.  @50' - Sharp scoured contact with gray very silty fine grained SANDSTONE, poorly graded, very dense, moist, weakly indurated.  @50.5' - Clay healed fracture, 1/2mm thick, highly plastic, moist.	@50' C N80W/15SW @50.5' FR
55	@52' - Grades to CONGLOMERATE. @54' - 8-10" thick interbed of silty fine to medium grained SANDSTONE, poorly graded, weakly indurated, cross-bedded, roughly horizontal, very dense, moist, to olive brown subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	N31E/14SE
65	@63' - Olive brown subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	@68' B
70 15-6" C 11.6 105.1	@70' - Brown clayey SILTSTONE, poorly graded, hard, moist, weakly indurated.  @73' - Olive brown subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.	M10E/17NW @70.5' C N2E/12NW
80	@77' - Matrix grades to clayey silty fine to medium sand with sparse coarse sand.  Total Depth - 78' No groundwater Minor caving from 17-22' Backfilled	
85 ADDITIONAL COMMENTS:	Blows per 6" C = Modified California Sampler Kelly Bar Weights: 0 - 25', 2854 lbs. 25 - 48', 1802 lbs. 48 - 70', 1019 lbs. 70 - 95', 1491 lbs.	

## APPENDIX B

## TEST PIT LOGS TP24 THROUGH TP208

TTM 060922, SKYLINE RANCH COUNTY OF LOS ANGELES, CALIFORNIA

	Comments			T				
Client: Pardee Homes			ΓΟΝΕ, cobbles are rounded, gravels are subrounded, weakly cemented, moist,					PLATE TP24
3/27/06 Client:		ots, loose, moist.	are rounded, gravels are su				В	8838.002
Date Excavated:		l and cobbles, abundant ro				0		W.O.
Logged By: AH	Description	Colluvium: Brown silty SAND with gravel and cobbles, abundant roots, loose, moist.	Saugus Formation: Brown gravelly cobbly SANDSTvery dense, abundant rootlets, massive.	7,5' tter		0 0 0		GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP24	Depth (ft)	0 - 2 Colluvium: Br	2 - 7.5 <u>Saugus Form</u> very dense, a	Total Depth - 7.5' No groundwater No caving Backfilled	Graphic Log			 scale 1"=5"

LOG OF EXCAVATION Trench No. TP25	VATION TP25	Logged By: AH		Date Excavated:	ed: 3/27/06		Client: Parde	Pardee Homes			
ľ		Description									Comments
0-3	Colluvium: Brov	Colluvium: Brown silty SAND with gravel, roots, very moist.	el, roots, ve	ery moist.							
3 - 8.5	Saugus Format	Saugus Formation: Orangish brown SANDSTONE with subrounded gravel and cobbles, moist, very dense, massive.	ANDSTON	E with subrou:	nded gravel	and cobbles,	moist, very	dense, ma	ssive.		
										•	
	Total Depth - 8.5' No groundwater No caving	ĵĊ, Ľ									
hèr.	Backfilled									<u>.</u>	
	:			ļ							
Graphic Log											
			<u>-                                    </u>								· ·
		<u> </u>	1. 1	.,,,							
			0								
		0	0.0	000			<del></del>				<del></del>
								-	1		
scale 1"=5	ĬG.	GEOLABS-WESTLAKE VILLAGE	(E VILLAGI	W.O.	8838.002		PLATE		TP25		

LOG OF EXCAVATION Trench No. TP26		Logged By:	АН	Date Excavated:	d: 3/27/06		Client. Pardee Homes	S		
Depth (ft)		Description								Comments
0-1	Colluvium: Dark brown sity SAND with gravel and	c brown silty SA	ND with gravel	and organics, roo	organics, roots, very moist.				· · · · · · · · · · · · · · · · · · ·	
1-8	Saugus Format	<u>ion</u> : Orangish b	arown silfy fine t	Saugus Formation: Orangish brown silty fine to medium grained SANDSTONE, moist, very dense, massive.	SANDSTONE,	moist, very de	nse, massive.			
	Total Depth - 8' No groundwater	ر.								
	Backfilled	:								
Graphic Log										
scale 1"=5		GEOLABS-WI	GEOLABS-WESTLAKE VILLAGE	W.O.	8838.002		PLATE	TP26		

	Comments			@5' Contact N88W/5SW					
Client: Pardee Homes				LOMERATE with contact to brown clayey SILTSTONE, moist, very stiff, massive.					PLATE TP27
Client: Par		s, loose.		own clayey SILTS					P
d: 3/27/06		Altuvium: Brown silty SAND with gravel and cobbles, abundant roots and roothairs, loose.		with contact to bro					8838.002
Date Excavated:		obbles, abundantı		ONGLOMERATE					W.O.
AH		with gravel and co	et, loose.	Saugus Formation: Orange, white, and tan CONGI			0.0.0.		GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	rown silty SAND	Cobbies, gravel and sand, wet, loose.	<u>mation</u> : Orange,	 			100	GEOLABS-v
LOG OF EXCAVATION Trench No. 1P27		Altuvium: Br	Cobbles, gra	Saugus Fon	Total Depth - 8' Wet from 2-3' No caving Backfilled	 D		īc	= 0
LOG OF EX Trench No.	Depth (ff)	0-2	2-3	3-8	 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100	Graphic Log		i oicon	scale

-ogged By: AH Date Excavated: 3/27/06 Client: Pardee Homes	scription	Alluvium: Brown clayey fine to coarse grained SAND with gravel and (5-10%) boulders, pockets of friable medium to coarse SAND with gravel and boulders, wet, medium dense, roots.	Saugus Formation: Gravel CONGLOMERATE with orangish tan medium to coarse sand matrix, very moist, very dense, massive.				
	Description	Alluvium: Brown clayey fine to coarse grained SAND with gravel and boulders, wet, medium dense, roots.	<u>ition:</u> Gravel CONGLOMERATE w	Total Depth - 6' Wet to 2' No caving Backfilled			

LOG OF EXCA Trench No.	LOG OF EXCAVATION Logged By: AH Date Excavated:  Trench No. TP29	1By: AH	Date Excavated:		3/27/06 Client: Pardee Homes	mes	
Depth (ff)	Description	-G					Comments
0-1	Alluvium: Brown silty SAND with gravel and cobbles, moist, loose, roots and roothairs.	ND with gravel and cob	bles, moist, loose,	roots and roothair	ø,		
1 - 4.5	Saugus Formation: Orangish brown CONGLOMERATE, moist, dense, weathered, roothairs.	igish brown CONGLOM	€ERATE, moist, de	nse, weathered, κ	othairs.		
	Total Depth - 4.5' No groundwater No caving Backfilled						
gen of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of							
scale 1"=5'		GEOLABS-WESTLAKE VILLAGE	W.O.	8838.002	PLATE	TP29	

LOG OF EXCAVATION Trench No. TP30		
0 - 1	Comments  Colluvium: Brown silty SAND with gravel, roots, very moist.	nents
1 - 8.5	Saugus Formation: Orangish brown medium to coarse grained SANDSTONE with gravel and cobbles, friable, moist, dense, massive.	
<del></del> ,		- <del>W</del>
	Total Depth - 8.5' No groundwater No caving	
	Backfilled	<del></del>
Graphic Log		
		<b>=</b>
	10.00	
	0.00	· · ·
<b>—</b>	0.00000	
scale 1"=5"	GEOLABS-WESTLAKE VILLAGE W.O. 8838.002 PLATE TP30	

	Comments								
nt. Pardee Homes				rery stiff, massive.	massive.				PLATE TP31
Date Excavated: 3/27/06 (Client:		t, loose, roots.		Saugus Formation: Light brown sandy SILTSTONE, hard, weathered, moist to very moist, very stiff, massive.	Brown fine to coarse grained SANDSTONE with gravel and cobbles, moist, dense, friable, massive.				W.O. 8838.002
Logged By: AH Dat	Description	Colluvium: Dark brown sifty SAND with gravel, moist, loose, roots.	Light brown sandy SILT, wet, roots and roothairs.	ion: Light brown sandy SILTSTONE,	arse grained SANDSTONE with gra	ĵo			GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP31		0 - 1 Colluvium: Dark	1 - 2 Light brown sand	2 - 4 Saugus Formati	4 - 6.5 Brown fine to co	Total Depth - 6.5' Wet from 1-2' No caving Backfilled	Graphic Log		scale 1"=5

LOG OF EXCAVATION Trench No. TP32 Depth (ft)  0 - 4 Colluviur 4 - 8 Brown si 8 - 11 Mint Car 11 - 13 Fan grav No cavin Backfille	TP32  Colluvium: Brown Brown sifty SANIT Canyon For Total Depth - 13' No groundwater No caving Backfilled Backfilled	NATION  1-ogged By AH  Date Excavated: 3/27/06  Clenft: Paridee Homes  Description  Colluvium: Brown slity SAND with gravel and cobbles, loose, very moist.  Brown slity SAND with gravel cobbles, and boulders (approximately 20% up to 3' diameter), very moist, loose.  Mint Carryon Formation: Tan gravelly SANDSTONE with cobbles, massive, weathered, friable, moist, dense.  Total Depth - 13' No cavind Backfilled  Backfilled	cobbles, loose, very moist.  cobbles, loose, very moist.  TONE with cobbles, mass sive, friable, moist, dense.	moist.  sproximately 20% massive, weather ense.	Up to 3' diameter), very mored, friable, moist, dense.	ery moist, loose.	Comments
- 11				9			
scale 1" = 5'		GEOLABS-WESTLAKE VILLAGE	W.O.	8838.002	PLATE	TP32	

	Comments			
Client: Pardee Homes	very moist, stiff.	Mint Canyon Formation: Gray fine grained SANDSTONE, moist, very dense, weakly cemented, massive, occasional subrounded cobbles.		PLATE TP33
Date Excavated: 3/27/06	nd cobbles (less than 5% boulders), v	SANDSTONE, moist, very dense, wee		1LAGE   W.O. 8838.002
	Description <u>Colluvium</u> : Brown sandy SILT with gravel and cobbles (less than 5% boulders), very moist, stiff.	<u>Canyon Formation</u> : Gray fine grained bles.	Total Depth - 7' No groundwater No caving Backfilled	GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP33		2 - 7 Mint cobb	Total No g No c Back	Graphic Log

LOG OF EXCAVATION Trench No. TP34 Depth (ft)	VATION Logged By: RMP Date Excavated: 4/19/06 Client: Pardee Homes TP34 Description	Comments
0 - 1	Topsoil: Very dark brown fine to medium grained sandy clayey SILT, graded, soft, very moist, roots.	
1-14.5	Saugus Formation: Tan cobble CONGLOMERATE, rounded to subrounded clasts commonly granitoid, gneiss, and quartzite, well graded, massive, slightly friable, very dense, moist.	
	Total Depth - 14.5' No groundwater No caving Backfilled	
Graphic Log		
scale 1"=5	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838.002 PLATE TP34	

Comments		@6' BN45E/19NW			
	ery moist, roots.	anitoid and quartzite, well graded, diameter.			PLATE TP35
	r graded, soft, v	ds commonly gr cobble is 10" in			
	ડોLT, moderatel <sub>ક</sub>	subrounded clas ans at 6', largest			8838
	d sandy clayey S	TE, rounded to s ts to 6', gravel le			3E W.O.
C.	fine to medium grained	obble CONGLOMERA able, dense, moist, roo			GEOLABS-WESTLAKE VILLAGE
Description	<u>i</u> l: Very dark brown	<u>s Formation:</u> Tan o bedded, slightly fria	Depth - 9' undwater ing led		GEOLAE
epth (ft)		2 - 9 Saugus poorly	Total C No gro No cav Backfil	hic Log	scale 1" = 5'
	(ft) Description	Description  Topsoil: Very dark brown fine to medium grained sandy clayey SILT, moderately graded, soft, very moist, roots.	Description  Topsoil: Very dark brown fine to medium grained sandy clayey SILT, moderately graded, soft, very moist, roots.  Saugus Formation: Tan cobble CONGLOMERATE, rounded to subrounded clasts commonly granitoid and quartzite, well graded, poorly bedded, slightly friable, dense, moist, roots to 6', gravel lens at 6', largest cobble is 10' in diameter.	Description  Iopsoil: Very dark brown fine to medium grained sandy clayey SILT, moderately graded, soft, very moist, roots.  Saugus Formation: Tan cobble CONGLOMERATE, rounded to subrounded clasts commonly granitoid and quartzite, well graded, poorly bedded, slightly friable, dense, moist, roots to 6', gravel lens at 6', largest cobble is 10" in diameter.  Total Depth - 9'  No groundwater  No caving  Backfilled	Description  Topsoil: Very dank brown fine to medium grained sandy clayey SILT, moderately graded, soft, very moist, roots.  Sautuse Formation: Tan cobbie CONGLOWERATE, rounded to subrounded clasts commonly granibid and quartitie, well graded, poorly bedded, slightly friable, dense, moist, roots to 6', gravel lens at 6', largest cobbie is 10' in diameter.  No caving Backfilled  Backfilled

	Comments	·			
Client: Pardee Homes		d gravel, well graded, soft, moist, roots.	Terrace Deposit: Orange to tan cobble GRAVEL with sand, subrounded to rounded clasts commonly gneiss, volcanic and granitoid, well graded, massive, slightly friable, dense, dry to very moist (inconsistent moisture).		PLATE TP36
Date Excavated: 4/19/06		<u>Topsoll</u> : Very dark brown sandy, silty CLAY, with subrounded fine to coarse grained gravel, well graded, soft, moist, roots.	<u>Terrace Deposit</u> : Orange to tan cobble GRAVEL with sand, subrounded to rounded cl well graded, massive, slightly friable, dense, dry to very moist (inconsistent moisture).		LAGE W.O. 8838.002
Logged By: RMP	Description	Very dark brown sandy, silty CLAY,	<u>Deposit</u> : Orange to tan cobble GRA\ led, massive, slightly friable, dense,	pth - 9' Idwater g	GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP36	Depth (ff)	0 - 2.5 <u>Topsoil</u> : \	2.5 - 9 Terrace L well grad	Total Depth - 9' No groundwater No caving Backfilled	scale 1"=5

<		
Depth (ft)	Description	Comments
0 - 1	Topsoil: Very dark brown fine to medium grained sandy clayey SILT, graded, soft, moist, roots.	
1-3	Saugus Formation: Orange to tan gravel CONGLOMERATE, subrounded clasts, well graded, massive, weakly cemented, very dense, moist, roots throughout.	
	Total Depth - 3' No groundwater No caving Refusal at 3' Backfilled	
Graphic Log		
scale 1"=5'	:5' GEOLABS-WESTLAKE VILLAGE W.O. 8838.002 PLATE TP37	

	Comments			<del>.</del>			
Client: Pardee Homes		oist, abundant roots.	Saugus Formation: Orange to tan fine to coarse grained sandy cobble GRAVEL, subrounded clasts, well graded, massive, friable, highly weathered, very moist, disturbed by roots.	nons.	Orange to tan gravel cobble CONGLOMERATE, subrounded clasts commonly granitoid and quartzite, moderately graded, massive, slightly friable, dense, moist.		PLATE TP38
4/19/06 Clier		LT, graded, soft, mo	RAVEL, subrounde	tiff, moist, discontinu	monly granitoid and		
Date Excavated: 4		rained sandy clayey SI	irained sandy cobble G	e, moderately graded, stiff, moist, discontinuous.	subrounded clasts com		GE W.O. 8838.002
Logged By: RMP	Description	<u>Topsoil</u> : Very dark brown to black fine to coarse grained sandy clayey SILT, graded, soft, moist, abundant roots.	Saugus Formation: Orange to tan fine to coarse highly weathered, very moist, disturbed by roots.	Interbed of brown fine grained sandy SILTSTONE,	l cobble CONGLOMERATE, e, moist.		GEOLABS-WESTLAKE VILLAGE
	Desi	Topsoil: Very dark b	Saugus Formation: (highly weathered, ve	Interbed of brown fir	Orange to tan gravel cobble slightly friable, dense, moist.	Total Depth - 9' No groundwater No caving Backfilled	
A	Depth (fl)	0 - 1		7 - 7.5	7.5-9		Graphic Log

	Comments			@7.5' N62E/19NW			
Client: Pardee Homes		ained sandy clayey SILT, moderately graded, soft, moist, abundant roots.	moderately graded, massive, slightly friable, loose, moist, subrounded clasts aded, poorly bedded, friable.	to coarse grained SANDSTONE and gravel to cobble CONGLOMERATE, us, granitoid, well graded, bedded, slightly friable, dense, moist, interbeds occur			PLATE TP39
4/19/06 Client		ILT, moderately grad	nassive, slightly friab friable.	IDSTONE and graveed, bedded, slightly			
Date Excavated: 4/		ained sandy clayey S	moderately graded, massive raded, poorly bedded, friable.	o coarse grained SANs, granitoid, well grad			W.O. 8838.002
RMP Da		Topsoil: Very dark brown to black fine to medium gra	Terrace <u>Deposit</u> : Tan fine to coarse grained SAND, commonly quartzite, metaigneous, granitoid, well gra			DO TIMO DAY ILO	GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	ery dark brown to bla	<u>eposit</u> : Tan fine to co quartzite, metaignec	Saugus Formation: Orange to tan interbedded fine subrounded clasts commonly quartzite, metaigneou in fining upwards sequences.	n - 9.5' water	SECULO A COLOR	GEOLABS-WE
LOG OF EXCAVATION Trench No. TP39	th (ft)				Total Depth - 9.5' No groundwater No caving Backfilled	Log 	-
LOG OF EXC Trench No.	Dept	0 - 0.5	0.5 - 3	3 - 9.5		Graphic Log	Scale

	Comments					
S		ense.	dasts are typically are weathered and			TP40
t. Pardee Homes		moist, medium d	ed sand matrix, cer), some clasts a			PLATE
Client:		ant roots, r	dium graine 2" diamete			j
5/23/06		cobbles, abund	RATE with med		10.00	8838
Date Excavated:		<u>Alluvium</u> : Dark brown clayey silty SAND with scattered gravels and cobbles, abundant roots, moist, medium dense.	Mint Canyon Formation: Light brown to grayish brown CONGLOMERATE with medium grained sand matrix, clasts are typically rounded to subrounded gravels and cobbles (approximately 10-15% greater than 12" diameter), some clasts are weathered and gracture with a hammer strike, well graded, moist, very dense.			W.O.
NM		y SAND with sca	own to grayish b and cobbles (apl vell graded, mois			GEOLABS-WESTLAKE VILLAGE
y:	Description	brown clayey silt	Mint Canyon Formation: Light brown to grayish brown CONGL rounded to subrounded gravels and cobbles (approximately 10 gracture with a hammer strike, well graded, moist, very dense.	: <b>a</b>		GEOLABS-WE
VATION TP40		Alluvium: Dark	Mint Canyon E rounded to sub gracture with a	Total Depth - 7' No groundwater No caving Backfilled		5,
LOG OF EXCAVATION Trench No. TP40	Depth (ft)	0-3	3-7			scale 1" = 5'

LOG OF EXCAVATION Trench No. TP41		Logged By: NM Date Excavated:	avated: 5/23/06	Client: Pardee Homes	es	
Depth (ft)	Des	Description				Comments
0 - 2.5	Alluvium: Dark brown up to 3' diameter, ap	Alluvium: Dark brown silty sandy CLAY with abundant rounded to subrounded granitic boulders (mostly on surface and upper 2') up to 3' diameter, approximately 25% are boulders, moist, medium stiff, abundant roots, porous.	int rounded to subrounded granitic boulders moist, medium stiff, abundant roots, porous.	tic boulders (mostly on soots, perous.	urface and upper 2')	
3-5	Mint Canyon Format diameter), well grade	<u>Mint Canyon Formation</u> : Light grayish brown CONGLOMERATE with abundant fractured granitic clasts (mostly less than 1 diameter), well graded, moist, very dense.	RATE with abundant frac	tured granitic clasts (mos	dly less than 1'	
5-6	Gradational contact moist, very dense.	Gradational contact with light brown fine to medium grainec moist, very dense.	grained SANDSTONE with disseminated organic stains, massive, poorly graded,	eminated organic stains.	massive, poorly graded,	
	Total Depth - 6' No groundwater No caving Backfilled					
Graphic Log						
scale 1"=5"		GEOLABS-WESTLAKE VILLAGE W	W.O. 8838	PLATE	TP41	

LOG OF EXCAVATION Trench No. TP42	VATION TP42	Logged By: NM	Date Excavated:	5/23/06	Client: Parde	Pardee Homes	
Depth (ft)		Description					Comments
0 - 4	<u>Alluvium:</u> Dark l 25% are greate	<u>Alluvium:</u> Dark brown sandy silty CLAY with dispersed rounded and subrounded granitic boulders up to 3' diameter (approximately 25% are greater than 12" diameter), very moist, medium stiff, rootlets.	spersed rounded an ", medium stiff, rootk	d subrounded grai ets.	nitic boulders up t	o 3' diameter (approximately	
4-6	Dark brown clay dense.	Dark brown clayey fine to coarse grained SAND with gravels, cobbles, and lesser boulders (less than 10%), well graded, moist, dense.	D with gravels, cobb	iles, and lesser bo	ulders (less than	10%), well graded, moist,	
2-9	Mint Canyon Fo	Mint Canyon Formation: Sharp undulating contact with light grayish to yelllowish brown medium grained SANDSTONE with occasional coarse sand lenses, moderately graded, moist, very dense.	act with light grayisl very dense.	n to yelllowish brov	wn medium grain∈	ed SANDSTONE with occasion	- Te
	Total Depth - 7' No groundwater No caving Backfilled						
Graphic Log							
scale 1"≖£	5,	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	TE TP42	

	Comments		·····					
		ers), rootlets, moist,	ulders up to 13* ry dense.					TP43
t. Pardee Homes		Colluvium: Dark brown sandy silty CLAY with occasional boulders up to 18" diameter (approximately 10% boulders), rootlets, moist, medium stiff, pinhole porosity.	<u>Mint Canyon Formation:</u> Light brown to yellowish brown sandy gravel cobble CONGLOMERATE with sparse boulders up to 13* diameter, well graded, subrounded to rounded clasts (mostly granitic with abundant fractures in clasts, moist, very dense.					PLATE T
6   Client:		ameter (approx	ONGLOMERA					
ed: 5/23/06		ers up to 18" di	gravel cobble C anitic with abur					8838
Date Excavated:		casional boulde	i brown sandy ( asts (mostly gr		0	00		SE W.O.
NM		y CLAY with oc	wn to yellowish ed to rounded ol					STLAKE VILLA
.;.	Description	c brown sandy silt	<u>rmation:</u> Light bro jraded, subrounde					GEOLABS-WESTLAKE VILLAGE
VATION TP43		Colluvium: Dark brown sandy medium stiff, pinhole porosity.	Mint Canyon Fc	Total Depth - 7' No groundwater No caving Backfilled				5'
LOG OF EXCAVATION Trench No. TP43	Depth (ft)	0 - 3	3 - 7		 Graphic Log			scale 1"= E

	Comments				
Client: Pardee Homes	osity, moist, medium stiff.	Mint Canyon Formation: Light orangish brown sandy gravel cobble CONGLOMERATE, subangular to rounded clasts, massive, well graded,moist, very dense.			PLATE TP44
Date Excavated: 5/23/06 C	Description <u>Topsoil</u> : Dark brown silty sandy CLAY with occasional cobbles, roots/rootlets, pinhole porosity, moist, medium stiff.	sandy gravel cobble CONGLOMERATE, s		0. 150 30 1	GE W.O. 8838
Logged By: NM	Description cover silty sandy CLAY with occ	Formation: Light orangish brown ; , very dense.	7; tfer		GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP44		3.5 - 7 Mint Canyon Formation: L graded,moist, very dense.	Total Depth - 7' No groundwater No caving Backfilled		scale 1"=5

	Comments						
		sparse boulders and cobbles, typically 1-2' diameter, one 4' diameter boulder	%), granitic clasts	Mint Canyon Formation: Irregular contact (undulating amplitude approximately 8") with light brown sandy CONGLOMERATE with boulders up to 12" diameter, well graded, moist, very dense.			TP45
Pardee Homes		'diameter, one	oximately 25-309 ).	own sandy CON			PLATE
Client:		s, typically 1-2	oulders (appro n of boulders)	) with light bro			
5/23/06		rs and cobbles	cobbles and b	proximately 8"			8838
Date Excavated:		vith sparse boulde	Alluvium: Medium to dark brown silty clayey SAND with dispersed cobbles and boulders (approximately 25-30%), granitic clasts typically 8" to 18" in diameter up to 2', poorly graded at base (higher concentration of boulders).	ating amplitude ap very dense.			W.O.
ΜN		Topsoil/Alluvium: Dark brown sandy silty CLAY with at 3-4' depth, moist, medium stiff.	Alluvium: Medium to dark brown silty clayey SAND v typically 8" to 18" in diameter up to 2", poorly graded	Mint Canyon Formation: Irregular contact (undulating ampliti boulders up to 12" diameter, well graded, moist, very dense.			GEOLABS-WESTLAKE VILLAGE
Logged By: NM	Description	Topsoil/Alluvium: Dark brown san at 3-4' depth, moist, medium stiff.	um to dark browr 8" in diameter up	<u>ormation:</u> frregula 12" diameter, we	_ ريَّ		GEOLABS-WE
VATION TP45		Topsoil/Alluviur at 3-4' depth, m	Alluvium: Medit typically 8" to 18	Mint Canyon Fc boulders up to	Total Depth - 8.5' No groundwater No caving Backfilled		
LOG OF EXCAVATION Trench No. TP45	Depth (ft)	0 - 3.5	3.5 - 7	7-8.5		Graphic Log	scale 1"=5

LOG OF EXCAVATION Trench No. TP46	NOI NOI	Logged By: NM	Date Excavated:	5/23/06	Client: P	Client: Pardee Homes		
Depth (ft)		Description					Con	Comments
0-3.5 Tops	<u>soil</u> : Mediui	Topsoil: Medium to dark brown silty clayey SAND with gravels and lesser cobbles.	ND with gravels and	l lesser cobbles.				
3.5 · 8 <u>Lanc</u>	<u>idslide Depr</u> I graded, m≀	Landslide Deposit: Light brown to yellowish brown sandy gravel cobble CONGLOMERATE, approximately 30% sandstone matrix, well graded, massive, moist, very dense, no clasts greater than 12" observed.	own sandy gravel cobble CONC asts greater than 12" observed.	bbble CONGLOM "observed.	ERATE, appr	oximately 30% sandstone ma	atrix,	·-
<u></u>								<del> </del>
Tota No c No c Back	Total Depth - 8' No groundwater No caving Backfilled	. <del>.</del> .						
								<u>,                                      </u>
Graphic Log								
			100 mg					
					<u>.</u> . ,			
scale 1"=5"		GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE TP46		

LOG OF EXCAVATION Trench No. TP47	VATION TP47	Logged By: NM	Date Excavated:	1: 5/23/06	Client: Pardee Homes	S	
Depth (ft)		Description					Comments
0 - 4	Alluvium: Dark 16" diameter (a down to approx	<u>Alluvium:</u> Dark brown silty sandy CLAY with dispersed angular to rounded gravels, cobbles and lesser boulders, typically up to 16" diameter (approximately 10% greater than 12" diameter clasts), single approximately 5' by 3' rounded granitic boulder at st. down to approximately 3.5', moist, medium stiff.	spersed angular to 12" diameter clas f.	rounded gravels, ts), single approxin	sed angular to rounded gravels, cobbles and lesser boulders, typically up to diameter clasts), single approximately 5' by 3' rounded granitic boulder at surface	s, typically up to nitic boulder at surface	
4 - 7	Landslide Depc (approximately	Landslide Deposit: Light brown to grayish brown sandy gravel cobble CONGLOMERATE with sparse boulders up to 16" diameter (approximately 2-4" apart), well graded, moist, very dense.	vn sandy gravel co very dense.	bble CONGLOME	RATE with sparse boulders	up to 16" diameter	·
2-8	Gradational cor moderately grad	Gradational contact with light brown to light grayish moderately graded, massive, moist, very dense.	ish	medium grained S	brown fine to medium grained SANDSTONE with gravels and lesser cobbles,	and lesser cobbles,	
	Total Depth - 8' No groundwater No caving Backfilled						
Graphic Log							
scale 1" = 5	5.	GEOLABS-WESTLAKE VILLAGE	AGE W.O.	8838	PLATE	TP47	

	Comments							
Pardee Homes		Alluvium: Dark brown clayey fine to coarse grained SAND and gravelly SAND with abundant cobbles and boulders up to 3' diameter, clasts are mostly granitic and subrounded, approximately 50% greater than 12", moist, medium stiff.	Mint Canyon Formation: Light gray fine grained SANDSTONE, poorly graded, massive, discontinuous disseminated organic stringers 1-2cm thick, slightly moist, very dense.					re TP48
Client: Pardee		oundant cobbles a	/e, discontinuous					PLATE
5/23/06		velly SAND with at ater than 12", mois	orly graded, massi					8838
Date Excavated:		ed SAND and grav ximately 50% gre	SANDSTONE, poc			8 / / / / / / / / / / / / / / / / / / /		W.O.
MN		ne to coarse graine ubrounded, appro	yray fine grained S dense.		000			GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	k brown clayey fin stly granitic and s	Mint Canyon Formation: Light gray fine 1-2cm thick, slightly moist, very dense.	6.5' ter			 	GEOLABS-W
CAVATION TP48		Alluvium: Darl clasts are mo:	Mint Canyon 1	Total Depth - 6.5' No groundwater No caving Backfilled				= 5'
LOG OF EXCAVATION Trench No. TP48	Depth (ft)	0 - 4	4 - 6.5		Graphic Log			scale 1"

LOG OF EXCAVATION Trench No. TP49	VATION TP49	Logged By: NM	Date Excavated:	5/24/06	Client: P	Pardee Homes		
Depth (ft)		Description						Comments
2-0	Alluvium: Medit crudely bedded	<u>Alluvium:</u> Medium and light brown clayey sitly fine to coarse grained SAND with cobbles and boulders (one up to 4' diameter), crudely bedded, slightly friable at base, moist, medium dense, approximately 35-40% is greater than 12" diameter, typically 12-24".	fine to coarse graine medium dense, appi	ed SAND with cobroximately 35-40°	ibles and boul % is greater th	ders (one up to ian 12" diametei	4' diameter), r, typically 12-24".	
7 - 10	Mint Canyon Formation: Li graded, moist, very dense.	Mint Canyon Formation: Light brown sandy CONGL graded, moist, very dense.	ONGLOMERATE wit	OMERATE with occasional boulders up to approximately 12" diameter, well	lders up to ap	proximately 12"	diameter, well	
	Total Depth - 10' No groundwater No caving Backfilled	۳. ت						
Graphic Log				0 0000				
scale 1"={	5'	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE TE	TP49	

omes	Comments	Alluvium: Dark brown clayey silty fine to coarse grained gravelly SAND with cobbles and boulders up to 2' diameter, approximately 25% greater than 12" diameter, well graded, slightly moist, slightly friable, dense.	Mint Canyon Formation: Light gray fine to coarse grained gravelly SANDSTONE to sandy gravel CONGLOMERATE with cobbles up to 10" diameter, massive, slightly moist, very dense.			
Client: Pardee Homes		nd boulders up to 2	ndy gravel CONGL			
5/24/06		SAND with cobbles all y friable, dense.	/ SANDSTONE to sa			
Date Excavated:		e grained gravelly S lightly moist, slightly	rse grained gravelly y dense.		6.0	
J By: NM	on	yey silty fine to coars meter, well graded, s	Light gray fine to coa ive, slightly moist, ve			
ON Logged By:	Description	Alluvium: Dark brown clayey sifty fine to coarse grained gravelly SAND with cobb 25% greater than 12" diameter, well graded, slightly moist, slightly friable, dense.	Mint Canyon Formation: Light gray fine to coarse grainup to 10" diameter, massive, slightly moist, very dense.	Total Depth - 4.5' No groundwater No caving Backfilled		
LOG OF EXCAVATION Trench No. TP50	Depth (ft)	0 - 3 <u>Alluv</u>	3 - 4.5 Mint	Total No gi No gi Back	Graphic Log	

	Comments	· <u>-</u> ·	<u> </u>			
Pardee Homes		Alluvium: Dark brown fine to coarse grained sandy CLAY and clayey SAND with gravets, cobbles, and lesser boulders (approximately 25% greater than 12" diameter), well graded, moist, medium stiff/medium dense to dense with depth.	Mint Canyon Formation: Light gray fine to coarse grained gravel cobble CONGLOMERATE with occasional boulders up to 16" diameter, approximately 5% greater than 12" diameter, moist, very dense.			PLATE TP51
Client: P		avets, cobbles dense with de	AERATE with o			
5/24/06		y SAND with gr edium dense to	bble CONGLOM dense.			8838
Date Excavated:		CLAY and claye , medium stiff/m	rained gravel co			W.O.
		s grained sandy ell graded, moist	fine to coarse g r than 12" diam			LAKE VILLAGE
Logged By: NM	Description	Alluvium: Dark brown fine to coarse grained sandy CLAY and clayey SAND with gravels, cobbles, an 25% greater than 12" diameter), well graded, moist, medium stiff/medium dense to dense with depth.	<u>Mint Canyon Formation</u> : Light gray fine to coarse grained gravel cobble Codiameter, approximately 5% greater than 12" diameter, moist, very dense.	Ĩ0		GEOLABS-WESTLAKE VILLAGE
		Alluvium: Dark b 25% greater that	<u>Mint Canyon Fol</u> diameter, appro	Total Depth - 9.5' No groundwater No caving Backfilled		Į.
Ĭ,	Depth (ft)	0 - 8.5	8.5 - 9.5		Graphic Log	scale 1"=5

<	VATION TP52	Logged By: NM	Date Excavated:	5/24/06	Client:	Pardee Homes	S	
		Description						Comments
0 - 13.5	Colluvium: Medium brown boulders up to 3' diameter dense to dense with depth.	Colluvium: Medium brown clayey sifty fine to coarse grained SAND with abundant subangular to rounded gravels, cobbles, and lesser boulders up to 3' diameter (approximately 10-15% greater than 12" diameter), well graded, coarsening with depth, moist, medium dense to dense with depth.	varse grained SAND 5% greater than 12"	with abundant s diameter), well	subangular te graded, coar	rounded grav sening with de	rels, cobbles, and lesser pth, moist, medium	
13.5 - 14	Mint Canyon Fo	<u>Mint Canyon Formation</u> : Light gray sandy CONGLO	GLOMERATE, well	MERATE, well graded, moist, very dense.	ery dense.			
	Total Depth - 14' No groundwater No caving Backfilled							
Graphic Log				0.00				
				0000				
			7	A 10 0 0 0				
scale 1"=5'	2,	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE	TP52	

LOG OF EXCAVATION Trench No. TP53	VATION TP53	Logged By: NM	Date Excavated:	5/24/06	Client: Pardee Homes	dee Homes	
Depth (ft)		Description					Comments
0 - 7.5	Colluvium: Medi observed), well	Colluvium: Medium brown sitty sandy CLAY and cobserved), well graded, massive, moist, very stiff.	and clayey SAND with	h abundant subar	igular to rounde	Colluvium: Medium brown sitty sandy CLAY and clayey SAND with abundant subangular to rounded gravels and cobbles (no boulders observed), well graded, massive, moist, very stiff.	ers
7.5-9	Mint Canyon Fo	Mint Canyon Formation: Light gray sandy gravel CONGLOMERATE, slightly moist, very dense.	vel CONGLOMERAT	ΓE, slightly moist,	very dense.		
	Total Depth - 9' No groundwater No caving						
	packilled						
Graphic Log			0.00				
scale 1" = 5	5.	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	ā	PLATE TP53	

Date Excavated: 5/24/06 Client: Pardee Homes	Comments	Colluvium: Medium brown silty dayey SAND with gravels and scattered cobbles and boulders up to 14" diameter (approximately 5% greater than 12"), well graded, massive, occasional pinhole porosity, moist, medium dense.	rained SANDSTONE, poorly graded, massive, moist, very dense.			
	Description	Colluvium: Medium brown silty clayey SAND with gravels and scattered cobbles and boulders or 5% greater than 12"), well graded, massive, occasional pinhole porosity, moist, medium dense.	Mint Canyon Formation: Light gray fine to medium g	Approximate horizontal contact with gravel CONGLOMERATE.	Total Depth - 8.5' No groundwater No caving Backfilled	
LOG OF EXCAVATION Trench No. TP54	Depth (ft)	0 - 6.5 <u>Colluviu</u> 5% gree	6.5 - 8.5 Mint Ca	@8' Арргохі	Total Dept No ground No caving Backfilled	Graphic Log

LOG OF EXCAVATION Trench No. TP55	WATION TP55	Logged By: NM	Date Excavated:	5/24/06	Client: Pardee Homes	ee Homes	
Depth (ft)		Description					Comments
0 - 4	Topsoil: Dark brown si stiff to medium dense.	<u>Topsoil</u> : Dark brown sandy CLAY to clayey SAND with gravels and lesser cobbles, massive, pinhole porosity, moist, medium stiff to medium dense.	ND with gravels an	d lesser cobbles, n	nassive, pinhole	porosity, moist, medium	
4 - 11.5	Alluvium: Medi subangular to	<u>Alluvium</u> : Medium brown silty clayey gravelly SAND with abundant cobbles and boulders, subangular to rounded clasts, well graded, approximately 35% greater than 12" diameter.	AND with abundan roximately 35% gr∈	it cobbles and bould sater than 12" diam	ders, typically 1- ieter,	with abundant cobbles and boulders, typically 1-2' diameter up to 3', nately 35% greater than 12" diameter.	
11.5 - 13.5	Light brown me amount of fine:	Light brown medium to coarse grained SAND with g amount of fines, slightly friable, moist, dense to very	with gravels, cobble very dense.	ષ્ક, and lesser bouk	lers (approxima	ravels, cobbles, and lesser boulders (approximately 10% up to 1' diameter, low dense.	*
13.5 - 14	Mint Canyon F	Mint Canyon Formation: Light gray sandy CONGLOMERATE, massive, moist, very dense.	GLOMERATE, ma	ssive, moist, very o	lense.		
	Total Depth - 14' No groundwater No caving Backfilled	9r					<del></del>
Graphic Log							
					O		
				0000			
scale 1"=5'	5,	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PL	PLATE TP55	

	Comments			ains.					
Pardee Homes		dium dense.	Alluvium: Light brown clayey silty SAND with subrounded to rounded gravels, cobbles, and lesser boulders up to 2' diameter (approximately 20% greater than 12" diameter), well graded, moist, dense.	Mint Canyon Formation: Light gray brown sandy gravel cobble CONGLOMERATE, moist, very dense, occasional oxidation stains.					Thes
Client: Pardee		ets, moist, me	d lesser bould	very dense, c					ם אום
	!	porous, rootk	s, cobbles, an	RATE, moist,				_	
ed: 5/24/06		onal cobbles,	ınded gravels oist, dense.	CONGLOME					8838
Date Excavated:		els and occasio	rounded to rou vell graded, m	gravel cobble (			0.0,		O.W.
		AND with grave	SAND with subi 2" diameter), v	/ brown sandy (					TI AKE VILI AG
Logged By: NM	Description	Topsoil: Dark brown silty clayey SAND with gravels and occasional cobbles, porous, rootlets, moist, medium dense.	<u>Alluvium</u> : Light brown clayey silty SAND with subrounded to rounded grave (approximately 20% greater than 12" diameter), well graded, moist, dense.	<u>ırmation</u> : Light gray	مَآ				GEOI ABS-WESTI AKE VILLAGE
VATION TP56		Topsoil: Dark br	Alluvium: Light t (approximately 2	Mint Canyon Fo	Total Depth - 13.5' No groundwater No caving Backfilled				5.
LOG OF EXCAVATION Trench No. TP56	Depth (ft)	0-3	3-12	12 - 13.5		Graphic Log			scale 1"=5

	Comments					
Client: Pardee Homes		proximately 5% greater than 12"	Mint Canyon Formation: Light gray fine to medium grained gravelly SANDSTONE with dispersed cobbles, well graded, massive, moist to very moist, very dense.			PLATE TP57
5/25/06		Colluvium: Dark brown silty clayey SAND with gravels and occasional cobbles and boulders (approximately 5% greater than 12" diameter and one clast up to 2' diameter), moist, medium dense.	velly SANDSTONE with disperse			8838
NM Date Excavated:		Colluvium: Dark brown silty clayey SAND with gravels and occas diameter and one clast up to 2' diameter), moist, medium dense.	ray fine to medium grained grav			GEOLABS-WESTLAKE VILLAGE W.O.
Logged By:	Description	olluvium: Dark brown silty clay ameter and one clast up to 2'	Mint Canyon Formation: Light gr to very moist, very dense.	Total Depth - 12.5' No groundwater No caving Backfilled		GEOLABS-WE
<u> </u>	Depth (ft)	<u>ठा ह</u>	5 - 12.5 Mi	řžžď	Graphic Log	scale 1"=5"

l≮		Logged By: NM	Date Excavated:	1. 5/25/06	Client:	Pardee Homes	<b>S</b>	
Depth (ft)		Description						Comments
8-0	Alluvium: Dark t greater than 12"	Altuvium: Dark brown fine to coarse grained sandy CLAY with abundant ggreater than 12" diameter), well graded, moist to very moist, medium stiff.	ndy CLAY with ab to very moist, med	undant gravels, α lium stiff.	obbles and le	sser boulders	CLAY with abundant gravels, cobbles and lesser boulders (approximately 30% ery moist, medium stiff.	
8 - 10	Mint Canyon Fo	Mint Canyon Formation: Light gray fine to coarse grained gravel cobble CONGLOMERATE with occasional boulders approximately 12" diameter, well graded, moist, very dense.	se grained gravel o	cabble CONGLON	AERATE with	occasional b	oulders approximately	
	Total Depth - 10' No groundwater No caving Backfilled							
Graphic Log					0000			
scale 1"=5"		I GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE	TP58	

Logged By: NM Date Excavated: 5/25/06 Client: Pardee Homes	Description	Colluvium: Medium brown silty SAND with gravels and abundant cobbles and boulders (approximately 35% greater than 12" diameter), clasts are subangular to rounded, typically 12"-18" diameter up to 2', well graded, moist, medium dense.	Mint Canyon Formation; Light gray sandy gravel cobble CONGLOMERATE, well graded, massive, slightly moist, very dense.	epth - 6' undwater ing ed			
	Descript	Colluvium: Medium brow diameter), clasts are sub	Mint Canyon Formation:	Total Depth - 6' No groundwater No caving Backfilled			_
LOG OF EXCAVATION Trench No. 7P59	Depth (ft)	0 - 3	3-6		Graphic Log		

LOG OF EXCAVATION Trench No. 7P60	AVATION Logged By: NM Date Excavated: 5/25/06 Client: Pardee Homes TP60	
Depth (ft)	Description	Comments
0 - 7.5	Alluvium: Medium brown silty SAND with abundant gravels, cobbles, and boulders (30% greater than 12" diameter), well graded, slightly moist, medium dense, several clasts up to 3' diameter.	
7.5 - 9	Mint Canyon Formation: Light gray gravel cobble CONGLOMERATE, well graded, slightly moist, very dense.	
	Total Depth - 9' No groundwater No caving Backfilled	
Graphic Log		
scale 1"=5	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP60	

Logged By: NM Description	LOG OF EXCAVATION Logged By: NM Date Excavated: 5/25/06 Client: Pardee Homes  Trench No. TP61 Depth (ft) Description	Comments
Mediur nately 3 t at dep	<u>Alluvium:</u> Medium brown silty SAND and fine to coarse grained SAND with abundant gravels, cobbles, and lesser boulders (approximately 35% greater than 12" diameter), subangular to rounded clasts typically 18" to 24" diameter, well graded, moist to very moist at depth, slightly friable, medium dense.	
n For , moi	Mint Canyon Formation: Light gray sandy gravel cobble CONGLOMERATE with occasional boulders (typically 12" to 16" diameter), well graded, moist to very moist, very dense.	
Total Depth - 10' No groundwater No caving Backfilled		
	GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP61	

LOG OF EXCAVATION Trench No. TP62		Logged By: NM	Date Excavated:	5/25/06	Client.	Client. Pardee Homes		
Depth (ft)		Description						Comments
6-0	Topsoii: Dark bri diameter), porou	Topsoif: Dark brown sity clayey SAND with gravels and occasional boulders up to 2' diameter (approximately 10% greater than 12" diameter), porous, abundant roots, slightly moist, medium dense.	wels and occasional st, medium dense.	boulders up to 2	" diameter (a	approximately	10% greater than 12"	,
ත - ෆ	Colluvium: Medi	Colluvium: Medium brown clayey SAND with abundant gravels, cobbles, and boulders (approximately 35% greater than 12" diameter, up to 3' diameter), subrounded to rounded clasts typically 12" to 18" diameter, well graded, moist, medium dense.	bundant gravels, cot inded clasts typically	obles, and bould y 12" to 18" diam	ers (approxir eter, well gra	nately 35% gre aded, moist, m	ater than 12" edium dense.	
9 - 11.5	Mint Canyon For	<u>Mint Canyon Formation</u> : Light gray brown sandy gravel cobble CONGLOMERATE, moist, very dense.	y gravel cobble COI	NGLOMERATE,	moist, very (	lense.		
,	Total Depth - 11.5' No groundwater No caving Backfilled	ين						
Graphic Log								
scale 1"=5'	5,	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE	TP62	

	Comments	iter than 12" diameter),	oximately 20%	sive, very moist,			
Olient: Pardee Homes		(approximately 15% grea inse.	coarse gravel, occasional boulders up to 18" diameter (approximately 20% ations, well graded, very moist, seepage at base of unit.	e matrix supported), mass			-N
ted: 5/25/06		or cobbles and boulders orted, moist, medium de	vel, occasional boulders graded, very moist, see	iLOMERATE (sandston			
Date Excavated:		with gravels and lesse 2" diameter, poorly sc	AND with coarse gravude laminations, well.	sandy cobble CONG			
Logged By: NM	Description	Colluvium: Medium brown clayey SAND with gravels and lesser cobbles and boulders (approximately 15% greater than 12" diameter), angular to rounded clasts typically 6" to 12" diameter, poorly sorted, moist, medium dense.	Light gray brown fine to coarse grained SAND with coarse gravel, occasional boulders up to 18" diameter ( greater than 12" diameter), occasional crude laminations, well graded, very moist, seepage at base of unit.	Mint Canyon Formation: Light gray brown sandy cobble CONGLOMERATE (sandstone matrix supported), massive, very moist, very dense.	Total Depth - 10' Seep at 8' (bottom of colluvium) No caving Backfilled		
AVATION TP63		Colluvium: Med angular to round	Light gray brow greater than 12'	Mint Canyon Fo	Total Depth - 10' Seep at 8' (botto No caving Backfilled		
LOG OF EXCAVATION Trench No. TP63	Depth (ft)	0 - 5	5-8	8 - 10		Graphic Log	

	Comments					
Pardee Homes		Alluvium: Medium brown sifty clayey SAND with abundant gravels, cobbles, and boulders (approximately 50% greater than 12" diameter), boulders are typically 2' to 2.5' diameter (closely spaced), well graded, very moist to wet at base (seepage in bottom ±6" to 12"), loose to medium dense, bottom 2' is coarse grained.	Mint Canyon Formation: Light gray brown fine to coarse grained sandy gravel CONGLOMERATE to fine grained SANDSTONE, very moist, very dense.			PLATE TP64
Client: Pa		ılders (approxiry moist to we	SLOMERATE			
5/25/06		cobbles, and bou , well graded, ve	ıdy gravel CONC			8838
Date Excavated:		undant gravels, c (closely spaced) arse grained.	arse grained sar			W.O.
		y SAND with ab to 2.5' diameter bottom 2' is co	brown fine to co			AKE VILLAGE
Logged By: NM	Description	Alluvium: Medium brown sitty clayey SAND with abundant grave diameter), boulders are typically 2' to 2.5' diameter (closely spac ±6" to 12"), loose to medium dense, bottom 2' is coarse grained.	mation: Light gray	om of alluvium)		GEOLABS-WESTLAKE VILLAGE
VATION TP64	J	Alluvium: Mediun diameter), boulde ±6" to 12"), toose	Mint Canyon Form moist, very dense.	Total Depth - 8' Seep at 6.5' (bottom of alluvium) No caving Backfilled		
LOG OF EXCAVATION Trench No. TP64	Depth (ff)	0 - 6.5	8 - 8 - 8	- V/ Z W	Graphic Log	scale 1"=5

Ϋ́		Logged By: NM	Date Excavated: 5/25/06	5/25/06	Client: F	Client: Pardee Homes	S	
Depth (ft)	Δ	Description						Comments
9-0	Alluvium: Medium approximately 55%	<u>Alluvium</u> : Medium brown silty clayey SAND with abundant gravels, cobbles, and boulders (occasionally up to 3.5' diameter, approximately 55% greater than 12" diameter), bottom 12" is coarse grained SAND with seepage at base.	ith abundant gravels, ), bottom 12" is coars	cobbles, and bouse grained SAND	ilders (occasi with seepage	ionally up to at base.	3.5' diameter,	
6-8	Mint Canyon Forn	Mint Canyon Formation: Light gray brown sandy gravel cobble CONGLOMERATE, very moist, very dense.	idy gravel cobble CO	NGLOMERATE, '	very moist, v¢	ery dense.		
	Seep at 6' (bottom of alluvium) No caving Backfilled	n of alluvium)						
Graphic Log				0,0				
			<del></del>					
	<u>.</u> .			<u> </u>				
	<u> </u>							
•			,					
scale 1"=5"		GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE	TP65	

	Comments					
Pardee Homes		Alluvium: Medium brown sity SAND with abundant gravels, cobbles, and boulders (approximately 20% greater than 12" diameter), occasional clasts up to 3' diameter, well graded, loose to medium dense, wet in bottom 12", continuous slow seepage at base (bottom 12" is coarse grained).	rse.			E TP66
Client: Pardee		proximately 20% n 12", continuous	ry moist, very der			PLATE
5/25/06		and boulders (ap nse, wet in botton	SLOMERATE, ve			88
NM Date Excavated: 5/25/06		t gravels, cobbles, ose to medium de	Mint Canyon Formation: Light gray brown sandy gravel cobble CONGLOMERATE, very moist, very dense.			W.O. 8838
N.W		«ND with abundan er, well graded, lo	ay brown sandy g		131.31.31	GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	Alluvium: Medium brown sitty SA occasional clasts up to 3' diamet (bottom 12" is coarse grained).	ormation: Light gr	Total Depth - 5.5' Seep at 4' (bottom of alluvium) No caving Backfilled		GEOLABS-WE
AVATION TP66		Alluvium: Medit occasional clas (bottom 12" is c	Mint Canyon Ec	Total Depth - 5.5' Seep at 4' (botton No caving Backfilled		5.
LOG OF EXCAVATION Trench No. TP66	Depth (ft)	0-4	4 - 5.5		Graphic Log	scale 1" = 5'

	Comments	1. L E			
Client: Pardee Homes		kimately 35% greater than 12" diameter), medium dense, minor seepage at	very dense.		PLATE TP67
Date Excavated: 5/26/06 C		Alluvium: Medium brown silty SAND with abundant gravels, cobbles, and boulders (approximately 35% greater than 12" diameter), subrounded to rounded clasts up to 3' diameter, well graded, moist to very moist at base, medium dense, minor seepage at base (bedrock contact).	Mint Canyon Formation: Light gray coarse grained gravel CONGLOMERATE, very moist, very dense.		AGE W.O. 8838
ON Logged By: NM	Description	Alluvium: Medium brown silty SAND with abun subrounded to rounded clasts up to 3' diamete base (bedrock contact).	Canyon Formation: Light gray coarse grai	Total Depth - 7.5' Seep at 6' (bottom of alluvium) No caving Backfilled	GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP67	Depth (ft)	0 - 6 Alluv Subn base	6 - 7.5 Mint	Tota Seet No c No c	scale 1" = 5'

<b>4</b>	VATION TP68	Logged By: NM	Date Excavated:	5/26/06	Client: Pa	Client: Pardee Homes	
Depth (ft)		Description					Comments
0 - 4	Alluvium: Mediu subangular to re	Alluvium: Medium brown silty SAND with abundant gravels, cobbles, and boulders (approximately 35% greater than 12" diameter), subangular to rounded clasts typically 1-2" diameter up to 3', well graded, moist, medium dense.	dant gravels, cobble neter up to 3', well g	s, and boulders ( raded, moist, me	approximately dium dense.	.35% greater than 12" diamel	(er),
4-6	Mint Canyon Fc	Mint Canyon Formation: Light gray sandy gravel cobble CONGLOMERATE (sandstone matrix supported), moist, very dense.	el cobble CONGLON	MERATE (sandst	one matríx sup	oported), moist, very dense.	
	Total Depth - 6' No groundwater						
	Backfilled						
Graphic Log							
scale 1"=5'	=5'	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE TP68	

<b>1</b> 5		Logged By:	NM	Date Excavated	1. 5/26/06	Client	Pardee Homes	S	
Depth (ft)		Description							Comments
0 - 3	Topsoil: Medium brown silty S slightly moist, medium dense.	i brown silty S/ edium dense.	ND with gravel	s and occasional (	obbles and bo	ulders (approxì	mately 15% gr	<u>Topsoil</u> : Medium brown silty SAND with gravels and occasional cobbles and boulders (approximately 15% greater than 12" diameter), slightly moist, medium dense.	
ග ' හ	<u>Alluvium</u> : Mediur diameter), well g	m brown coars iraded, subang	e grained grave jular to rounded	A <u>lluvium</u> : Medium brown coarse grained gravelly SAND with abundant cobbles and boulders (approximately 25% greater tha diameter), well graded, subangular to rounded clasts typically 6" to 18" diameter (up to 3'), moist to wet at 8', medium dense.	indant cobbles to 18" diamete	and boulders (a	approximately Set to wet at 8°,	Alluvium: Medium brown coarse grained gravelly SAND with abundant cobbles and boulders (approximately 25% greater than 12" diameter), well graded, subangular to rounded clasts typically 6" to 18" diameter (up to 3'), moist to wet at 8', medium dense.	
9 - 10.5	Mint Canyon For	<u>mation:</u> Light ç	gray gravel cobk	<u>Mint Canyon Formation:</u> Light gray gravel cobble CONGLOMERATE with sandstone supported matrix, very moist, very dense.	ATE with sand	stone supporter	d matrix, very n	noist, very dense.	
	Total Depth - 10.5' Seep at 9' (bottom of alluvium) No caving Backfilled	.5' m of alluvium)							
Graphic Log									
scale 1" = 5'	2,	GEOLABS-W	GEOLABS-WESTLAKE VILLAGE	AGE W.O.	8838		PLATE	TP69	

Pardee Homes	Comments	Alluvium: Medium brown silty clayey fine to coarse grained gravelly SAND with cobbles and lesser boulders (approximately 15% greater than 12" diameter), well graded, at 6' becoming very moist to wet, medium dense.	Mint Canyon Formation: Light gray gravel cobble CONGLOMERATE with occasional boulders (approximately 12" diameter), moist, very dense.					_
Client: Par		es and lesser t mse.	boulders (app					
5/26/06		ly SAND with cobble t to wet, medium de	TE with occasional					_
Date Excavated:		se grained gravell coming very moist	CONGLOMERA		0.00	0.00		_
NM .		<u>Alluvium:</u> Medium brown sitty clayey fine to coarse grained gravelly SAND with cobbles a greater than 12" diameter), well graded, at 6' becoming very moist to wet, medium dense.	ıt gray gravel cobbl∈		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0.0		_
Logged By:	Description	fium brown silty 2" diameter), w	<u>-ormation</u> : Ligh	5.				
VATION TP70		<u>Alluvium:</u> Medi greater than 12	Mint Canyon F very dense.	Total Depth - 9.5' Wet from 6'-8' No caving Backfilled				
LOG OF EXCAVATION Trench No. TP70	Depth (ft)	0 - 8	8 - 9.5		Graphic Log			_

	Comments	<del></del>			. =				
Client: Pardee Homes		abundant cobbles and boulders up to 3' diameter, typically 6" to 18" edium dense to loose, slightly moist.	Medium brown clayey coarse grained gravelly SAND with abundant cobbles and boulders (approximately 35% greater than 12" diameter), clasts typically 8" to 18" diameter up to 3" (observed 5 at this size), well graded, very moist to wet at base (slow seepage at base).	Mint Canyon Formation: Light gray sandy gravel cobble CONGLOMERATE, fine to medium sandstone matrix, very moist, very dense.					PLATE TP71
Client: P		rs up to 3' diam moist.	boulders (appro Il graded, very n	to medium sand					
5/26/06		bles and boulde loose, slightly i	int cobbles and at this size), wel	OMERATE, fine		0,00			8838
Date Excavated:		th abundant cobl medium dense t	AND with abunds o 3' (observed 5	cobble CONGLO			0.00		W.O.
NM		indy GRAVEL wi r 12" diameter), .	ained gravelly S/ 8" diameter up t	ay sandy gravel		0.			GEOLABS-WESTLAKE VILLAGE
<b>&gt;</b>	Description	Alluvium: Light grayish brown sandy GRAVEL with abundant cobbles and boulders up (approximately 25% greater than 12" diameter), medium dense to loose, slightly moist.	Medium brown clayey coarse grained gravelly SAN diameter), clasts typically 8" to 18" diameter up to 3 (slow seepage at base).	<u>ırmation</u> : Light gı	Total Depth - 8' Seep at 6.5' (bottom of alluvium) No caving Backfilled				GEOLABS-WE
VATION TP71		Alluvium: Light (approximately:	Medium brown clayey or diameter), clasts typical (slow seepage at base).	Mint Canyon Fo	Total Depth - 8' Seep at 6.5' (bo No caving Backfilled				
<u> </u>	Depth (ft)	0-3	3-6.5	6.5-8 8-1		Graphic Log	,		scale 1"=5"

5/26/06 Client: Pardee Homes	Comments	Alluvium: Medium brown silty fine grained SAND with abundant gravels, cobbles and lesser boulders (approximately 10% greater than 12" diameter) up to 24", matrix supported, well graded, wet, medium dense, continuous seepage at base.	sandy gravel cobble CONGLOMERATE, very moist, very dense.			
Date Excavated:		AND with abundant gravels, ed, well graded, wet, mediun	ish gray sandy gravel cobble			
Logged By: NM	Description	<u>Alluvium:</u> Medium brown silty fine grained SAND wit than 12" diameter) up to 24", matrix supported, well	Mint Canyon Formation: Light gray to greenish gray	Total Depth - 4' Seep at 3' (bottom of alluvium) No caving Backfilled		
LOG OF EXCAVATION Trench No. TP72	Depth (ft)	0 - 3 <u>Alluvium</u> : Mediu than 12" diamet	3 - 4 Mint Canyon Fo	Total Depth - 4' Seep at 3' (botte No caving Backfilled	Graphic Log	0000 1" - E'

	Comments							
Client: Pardee Homes		<u>Topsoil</u> : Dark brown silty fine grained SAND with occasional gravels and cobbles, porous, abundant roots, moist, medium dense.	SAND with abundant gravels, cobbles, and boulders (approximately 35% greater to 3' diameter, poorly sorted, slightly friable, moist, medium dense.	Medium brown coarse grained SAND with gravels and cobbles (low amount of fines), well graded, friable, wet, dense, minor seepage at base.	ATE, very moist, very dense.			PLAIE IP/3
Date Excavated: 5/26/06		vith occasional gravels and cobbles, porc	rained SAND with abundant gravels, cobbles, and boulders (approximatel ists up to 3' diameter, poorly sorted, slightly friable, moist, medium dense.	ivels and cobbles (low amount of fines), v	o light gray sandy gravel CONGLOMERATE, very moist, very dense.			LAUE W.U. 8838
N Logged By: NM	Description	ر Dark brown silty fine grained SAND باز: Dark	Alluvium: Medium brown silty fine to coarse grained than 12" diameter), subangular to rounded clasts up	ım brown coarse grained SAND with gra ie.	Mint Canyon Formation: Light greenish gray to light	Total Depth - 11' Seep at 10' (bottom of alluvium) No caving Backfilled	OFOLIVE WIFE TAKE WEST AKE	GEOLABS-WESTLARE VILLAGE
LOG OF EXCAVATION Trench No. TP73	Depth (ft)	0 - 3 Topso	3 - 8 Alluvit	8 - 10 Medium at base.	10 - 11 Mint C	Total Dept Seep at 10 No caving Backfilled	Graphic Log	-

LOG OF EXCAVATION Trench No. TP74 Depth (ft)	VATION Logged By: NM Date Excavated: 5/26/06 Client: Pardee Homes  TP74 Description	Comments
0 - 4.5 Allu	Alluvium: Medium brown silty fine to coarse grained SAND with abundant gravels, cobbles, and boulders approximately 40% greater 12* diameter), several large rounded boulders up to 3.5' diameter, well graded, moist, medium dense to dense.	eater
4.5 - 5.5 Mee	Medium brown coarse grained gravelly SAND with occasional cobbles and boulders approximately 12" diameter, friable, water seeping at base, wet, dense.	
5.5 - 6.5 Min oxid	Mint Canyon Formation: Light greenish gray sandy gravel cobble CONGLOMERATE, very moist to wet, very dense, orange oxidation stains.	
No See	Total Depth - 6.5' Seep at 5.5' (bottom of alluvium) No caving Backfilled	
Graphic Log		
1" = 5'	GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP74	

LOG OF EXCAVATION Trench No. TP75 Depth (ft)		Logged By: NM Description	Date Excavated:	: 5/26/06	Client: Pardee	Client: Pardee Homes	Comments
0 - 3.5	Alluvium: Mediul greater than 12" base, clasts typi	Alluvium: Medium brown silty fine to coarse grained SAND with abundant gravels, cobbles, and lesser boulders (approximately 2 greater than 12" diameter), well graded, very moist to wet at base, bottom 12" is silty coarse grained gravelly SAND, seepage at base, clasts typically 1' diameter and as coarse as 2' diameter.	grained SAND with at y moist to wet at base arse as 2' diameter.	bundant gravels, c	obbles, and lesser by coarse grained gra	SAND with abundant gravels, cobbles, and lesser boulders (approximately 20% to wet at base, bottom 12" is silty coarse grained gravelly SAND, seepage at 2' diameter.	
3.5 - 5	Mint Canyon For	Mint Canyon Formation: Light gray sandy gravel cobble CONGLOMERATE, very moist to wet, very dense.	ravel cobble CONGLC	ОМЕRАТЕ, very m	oist to wet, very dens	وي	
	Total Depth - 5' Seep at 3.5' (bot No caving Backfilled	Total Depth - 5' Seep at 3.5' (bottom of alluvium) No caving Backfilled					
Graphic Log				0.			
scale 1"=5'	150	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	TP75	

LOG OF EXCAVATION Trench No. TP76	VATION TP76	Logged By: NM	Date Excavated:	5/26/06	Client: Pardee Homes		
Depth (ft)		Description				3	Comments
0-11	Colluvium: Light graded, massive	Colluvium: Light medium brown fine to medium grained sifty SAND with gravels and cobbles (approximately 20%), moderately graded, massive, rootlets down to 8', moist, medium dense (no boulders observed).	n grained silty SAND adíum dense (no bou	with gravels and (	cobbles (approximately 20%	), moderately	····
11 - 13	Mint Canyon Fo very dense.	Mint Canyon Formation: Light greenish gray fine grained SANDSTONE with occasional cobbles and gravels, poorly graded, moist, very dense.	ne grained SANDST(	ONE with occasion	nal cobbles and gravels, poc	nly graded, moist,	
	Total Depth - 13' No groundwater No caving Backfilled	žn					
							•
Graphic Log	۰	-0 -0 -0 -0	; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;				
			77				
scale 1"=5'	2.	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE TI	TP76	

LOG OF EXCAVATION Trench No. TP77	VATION TP77	Logged By: NM	Date Excavated:	5/26/06	Client: Pardee Homes	Ş	
Depth (ft)		Description					Comments
0 - 1	Topsoil: Dark t	Topsoil: Dark brown sandy CLAY, rootlets, occasional gravels, porous, slightly moist, medium stiff.	asional gravels, por	ous, slightly mois	t, medium stiff.		
4-	Colluvium: Mer coarse grained	<u>Colluvium</u> : Medium brown silty fine to medium grained SAND with gravels and cobbles up to 12" diameter (approximately 25% is coarse grained cobble), massive, slightly moist, medium dense.	grained SAND with t, medium dense.	gravels and cobb	es up to 12" diameter (ap	proximately 25% is	
4 - 5.5	Mint Canyon Formation: Ligraded, moist, very dense.	Mint Canyon Formation: Light greenish gray fine to medium grained SANDSTONE with occasional gravels, cobbles, moderately graded, moist, very dense.	ne to medium graine	d SANDSTONE v	víth occasional gravels, co	obbles, moderately	
	Total Depth - 5.5' No groundwater No caving Backfilled	5.51 er					
Graphic Log							
			A				
scale 1"=	5'	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	TP77	

	Comments						
: Pardee Homes		subangular to rounded gravels, cobbles and boulders (approximately 50% greater cally 1-2' diameter, well graded, moist, medium dense.	Medium brown clayey coarse grained gravelly SAND with cobbles and lesser boulders up to 1' diameter, clasts are angular to rounded, low % of fines, well graded, very moist, dense.	very fine grained SANDSTONE, poorly graded, massive, moist, very dense.			PLATE TP78
5/26/06 Client:		d gravels, cobbles ar ell graded, moist, me	sser boulders up to 1	IDSTONE, poorly gra			
Date Excavated: 5		subangular to rounde cally 1-2' diameter, w	o with cobbles and lense.	very fine grained SAN			W.O. 8838
NM Da		<u>Alluvium: Medium brown silty SAND with abundant subangular to rounded gravels, cobbles and boulders than 12" diameter), up to 3' diameter, boulders typically 1-2' diameter, well graded, moist, medium dense.</u>	Medium brown clayey coarse grained gravelly SAND wirounded, low % of fines, well graded, very moist, dense	Mint Canyon Formation: Light greenish gray fine to			GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	Medium brown silty Siamefer), up to 3' dis	rown clayey coarse g ow % of fines, well gr	on Formation: Light o	.h - 7' Iwater		GEOLABS-W
LOG OF EXCAVATION Trench No. TP78	Depth (ft)				Total Depth - 7' No groundwater No caving Backfilled	l l l l l l l l l l l l l l l l l l l	1"=5'
LOG OF EX Trench No.	Dept	0 - 4.5	4.5 - 5.5	5.5 - 7		Graphic Log	scale

LOG OF EXCAVATION Trench No. TP79	VVATION TP79	Logged By: NM	Date Excavated:	: 6/1/06	Client:	Pardee Homes	
Depth (ft)		Description					Comments
0 - 2.5	Alluvium: Light   diameter), well	<u>Alluvium</u> : Light brown fine to coarse grained gravelly SAND with abundant cobbles and boulders (approximately 5% greater than 1' diameter, friable, moist, medium dense.	avelly SAND with a 1' diameter, friable	rbundant cobbles e, moist, medium	and boulder dense.	s (approximately 5% greater	than 1'
2.5 - 6	Medium brown diameter) up to well graded, mc	Medium brown silty fine to medium grained gravelly SAND with abundant cobbles and boulders (approx. 15% greater than 1' diameter) up to approximately 3' diameter, clasts are typically 6" to 1' diameter and are subrounded to rounded (mostly granitic), well graded, moist, medium dense.	velly SAND with al Is are typically 6" t	oundant cobbles a	and boulders are subrour	SAND with abundant cobbles and boulders (approx. 15% greater than 1's typically 6" to 1' diameter and are subrounded to rounded (mostly granit	, (fíc),
8-9	Mint Canyon Fo very dense.	<u>Mint Canyon Formation</u> : Light greenish gray conglomeratic SANDSTONE with occasional cobbles, well graded, massive, moist, very dense.	nglomeratic SAND	ISTONE with occ	asional cobb	les, well graded, massive, mo	oist,
	Total Depth - 8' No groundwater No caving Backfilled						
Graphic Log							
	i						
scale 1"= {	2.	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE TP79	

	Comments							
Pardee Homes		Alluvium: Medium brown sity fine to coarse grained gravelly SAND with abundant subangular to rounded cobbles and boulders (approximately 15% greater than 1' diameter), occasional pockets of clean gravelly SAND, well graded, clasts typically a few inches to 1' diameter and up to 2.5' diameter, friable, moist, medium dense.	Mint Canyon Formation: Grayish green to greenish gray fine to medium grained SANDSTONE with occasional white catcium carbonate stringers, poorly graded, occasional blocky planar randomly oriented fractures, moist to very moist, very dense.					PLATE TP80
Client: Pa		subangutar to r y SAND, well gr	ANDSTONE wi					
6/1/06		with abundant of clean gravell e.	dium grained S, mly oriented fra		2000			8838
Date Excavated:		Alluvium: Medium brown silty fine to coarse grained gravelly SAND v (approximately 15% greater than 1' diameter), occasional pockets of to 1' diameter and up to 2.5' diameter, friable, moist, medium dense.	h gray fine to meo			8.08.9		W.O.
WN		to coarse grain 1' diameter), oc reter, friable, moi	green to greenis d, occasional bk			200000000000000000000000000000000000000		GEOLABS-WESTLAKE VILLAGE
Logged By: N	Description	n brown sity fine 5% greater than id up to 2.5' diam	<u>mation:</u> Grayish ers, poorly grade					GEOLABS-WE
VATION TP80	<b>-</b>	<u>Alluvium</u> : Mediur approximately 1 o 1' diameter an	<u>Mint Canyon For</u> zarbonate stringe	Total Depth - 7' No groundwater No caving Backfilled	:		163	
LOG OF EXCAVATION Trench No. TP80	Depth (ft)	9-0	2 - 2		Graphic Log			scale 1" = 5'

LOG OF EXCAVATION Trench No. TP81 Depth (ft)	VATION TP81	Logged By: NM	Date Excavated:	6/1/06	Client:	Pardee Homes		toma
0-4	Colluvium: Mec greater than 1'	Colluvium: Medium brown silty fine grained SAND with subangular to rounded gravels, cobbles and boulders (approximately 10% greater than 1' diameter), clasts typically 1-2' diameter, well graded, moist, medium dense.	AND with subangular Jiameter, well graded	to rounded graw 1, moist, medium	els, cobbles a	and boulders (appro		
4 - 7.5	Mint Canyon Figraded, faint gr	Mint Canyon Formation: Light greenish gray fine to medium grained SANDSTONE with dispersed gravels and cobbles, moderately graded, faint gradational contact at 7' to sandy CONGLOMERATE, calcium carbonate stringers, moist, very dense.	ne to medium graine CONGLOMERATE,	d SANDSTONE , , calcium carbona	with disperse ite stringers,	ed gravels and cobbi moist, very dense.	es, moderately	
	Total Depth - 7.5' No groundwater No caving Backfilled	رن. ا						
Graphic Log								
scale 1" = 5'	5,	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE TP81		

	Comments					
les		<u>Alluvium:</u> Medium brown silty fine to coarse grained SAND with gravels, cobbles, and boulders (approximately 10% greater than 1' diameter), clasts up to 2' diameter, well graded, very moist to wet with depth, continuous seepage at base, medium dense.	Mint Canyon Formation: Light gray sandy gravel CONGLOMERATE with lesser cobbles and boulders (one or two up to approximately 14" diameter), very moist to wet, very dense.			TP82
Client: Pardee Homes		oulders (approximat s seepage at base,	and boulders (one			PLATE
9/1/06		<u>Alluvium</u> : Medium brown silty fine to coarse grained SAND with gravels, cobbles, and boulders (approximately 10% greate diameter), clasts up to 2' diameter, well graded, very moist to wet with depth, continuous seepage at base, medium dense.	E with lesser cobbles			8838
Date Excavated:		ained SAND with gra I, very moist to wet v	el CONGLOMERAT			W.O.
y. NM		ty fine to coarse grameter, well graded	iht gray sandy grave wet, very dense.	Ê		GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	: Medium brown sil ), clasts up to 2' dik	<u>Mint Canyon Formation</u> : Light gray sandy gra 14" diameter), very moist to wet, very dense.	Total Depth - 6' Seep at 3' (bottom of alluvium) No caving Backfilled		GEOLABS
LOG OF EXCAVATION Trench No. TP82	Depth (ft)	0 - 3 Alluvíum: diameter	3 - 6 Mint Can 14" diam	Total Depth - 6' Seep at 3' (botte No caving Backfilled	Graphic Log	scale 1" = 5'

	Comments		<u></u>					
Pardee Homes		grained gravelly SAND with abundant subangular to rounded cobbles and boulders y friable, moist to very moist with depth, medium dense.	Mint Canyon Formation: Light green gray sandy gravel CONGLOMERATE, very moist, very dense, sandstone matrix supported.					E TP83
Client: Pardee		subangular tc դ, meɗium den	ary dense, sar					 PLATE
6/1/06 C		Alluvium: Medium to light brown silty fine to coarse grained gravelly SAND with abundant subangular to ro (20% greater than 1' diameter), well graded, slightly friable, moist to very moist with depth, medium dense.	E, very moist, ve		0,00			
		gravelly SANI , moist to very	INGLOMERAT		0.00			W.O. 8838
Date Excavated:		coarse grained slightly friable	ndy gravel CO		000			
WN		n silty fine to c ), well graded,	green gray sai			0		GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	im to light brow an 1' diameter	<u>vmation:</u> Light				:	GEOLABS-W
VATION TP83		Alluvium: Medium to light brown silty fine to coarse (20% greater than 1' diameter), well graded, slightly	<u>Mint Canyon Fo</u>	Total Depth - 9' No groundwater No caving Backfilled				
Ä,	Depth (ft)	) 2-0	V - 6	<u> </u>	Graphic Log			scale 1"=5"

	Comments								
Pardee Homes		<u>Topsoil</u> : Dark brown clayey sandy SILT with dispersed gravels, cobbles and boulders (2 clasts up to 2' diameter), abundant rootlets, porous, slightly moist, medium stiff (approx. 35% greater than 1' diameter).	Alluvium: Medium brown silty fine to medium grained SAND and gravelly SAND with abundant cobbles and boulders (approximately 35% greater than 1' diameter, 3 boulders as coarse as approximately 3' diameter), well graded, slightly friable, moist, medium dense.	cobble CONGLOMERATE with fine to medium grained sandstone matrix,					PLATE TP84
Client: Pa		ers (2 clasts up l	th abundant cob well graded, sli	fine to medium					F
6/1/06		obles and boulde ameter).	avelly SAND wit ely 3' diameter),	OMERATE with			200		8838
Date Excavated:		<u>Topsoil</u> : Dark brown clayey sandy SILT with dispersed gravels, cobbles an porous, slightly moist, medium stiff (approx. 35% greater than 1' diameter).	ned SAND and gr se as approximat	el cobble CONGL			9.0 99 13.		W.O.
MM		y SILT with dispe iff (approx. 35%	e to medium grain boulders as coan	Mint Canyon Formation: Light greenish gray gravel well graded, slightly moist, very dense.					GEOLABS-WESTLAKE VILLAGE
×	Description	own clayey sand moist, medium st	m brown silty fine in 1' diameter, 3 l	<u>Mint Canyon Formation</u> : Light greenish well graded, slightly moist, very dense.	, QÎ				GEOLABS-WE
VATION TP84		Topsoil: Dark br porous, slightly	Alluvium: Mediu 35% greater tha	Mint Canyon Fo well graded, slig	Total Depth - 5.5' No groundwater No caving Backfilled				
LOG OF EXCAVATION Trench No. TP84	Depth (ft)	0 - 1.5	1.5 - 4	4 - 5.5		Graphic Log			scale 1"=5'

LOG OF EXCAVATION Trench No. TP85	AVATION TP85	Logged By: NM	Date Excavated:	6/1/06	Client: Pardee Homes		
Depth (ft)		Description				Comn	Comments
0-1	Topsoil: Mediu	Topsoil: Medium brown sifty fine to medium grained SAND with gravels and cobbles, well graded, rootlets, dry, medium dense.	ained SAND with gr	avels and cobbles,	well graded, rootlets, dry, mediu	m dense.	
1-1.5	Bum Horizon?: dry, medium de	Burn Horizon?: Black silty fine grained SAND to sandy SILT with coarse sand and gravels, organic rich, abundant rootlets, porous, day, medium dense to medium stiff.	o sandy SILT with c	coarse sand and gra	wels, organic rich, abundant roo	llets, porous,	
1.5 - 6	Alluvium: Medii (approximately slightly friable,	Alluvium: Medium brown silty fine to coarse grained gravelly SAND to sandy GRAVEL with abundant cobbles and boulders (approximately 20% greater than 1' diameter), well graded, angular to rounded clasts typically a few inches to approximately slightly friable, slightly moist, medium dense.	ained gravelly SANI well graded, angulk	D to sandy GRAVEL ar to rounded clasts	I gravelly SAND to sandy GRAVEL with abundant cobbles and boulders graded, angular to rounded clasts typically a few inches to approximately 1' diameter,	lders mately 1' diameter,	18-70-1
6-7	Light brown co:	Light brown coarse grained sandy GRAVEL, well graded, friable, slightly moist, dense.	eli graded, friable, t	slightly moist, dense	٠		
7 - 8	Mint Canyon Fo	Mint Canyon Formation: Light greenish gray sandy		≀ATE, sandstone m≀	CONGLOMERATE, sandstone matrix supported, slightly moist, very dense.	ry dense.	<del></del>
	Total Depth - 8' No groundwater No caving Backfilled	<b>-</b> -					
Graphic Log		D.00000	000				
			)				
scale 1"=	5'	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE TP85		

	Comments	reter), cobbles	ge at base.						
nes		ater than 1' dian r, predominantly	ontinuous seepa	wet, very dense					TP86
Client: Pardee Homes		ximately 30% gre oprox. 2' diamete e.	% of fines, wet, c	NTE, very moist to			: 		DI ATR
6/2/06 CI		nd boulders (appro diameter up to ag pth, medium dens	i, well graded, low	ei conglomer/			_		
Date Excavated:		<u>Alluvium:</u> Medium brown sity sandy GRAVEL with abundant cobbles and boulders (approximately 30% greater than 1' diameter), subangular to rounded granitic clasts typically a few inches to approx. 1' diameter up to approx. 2' diameter, predominantly cobbles and boulders (clast supported), well graded, moist to very moist with depth, medium dense.	Medium brown coarse grained sandy GRAVEL with occasional cobbles, well graded, low % of fines, wet, continuous seepage at base	Mint Canyon Formation: Light greenish gray coarse grained sandy grave! CONGLOMERATE, very moist to wet, very dense, difficult to excavate.			0000		W. O. 8838
NM Da		ndy GRAVEL with a asts typically a few rell graded, moist t	andy GRAVEL with	enish gray coarse		0000			GEOLABS,WESTLAKE VILLAGE
Logged By: N	Description	Al <u>luvium:</u> Medium brown silty sandy GRAVEL with subangular to rounded granitic clasts typically a fevand boulders (clast supported), well graded, moist	coarse grained so	<u>ormation</u> : Light gre vate.	Total Depth - 7' Seep at 5.5' (bottom of alluvium) No caving Backfilled				CEO! ARS.WE
AVATION TP86	<b>-</b>	Alluvium: Mediu subangular to ro and boulders (c)	Medium brown	Mint Canyon Fo	Total Depth - 7' Seep at 5.5' (bo No caving Backfiled				īc
LOG OF EXCAVATION Trench No. TP86	Depth (ft)	9-0	5 - 5.5	5.5-7		Graphic Log			= "L electe

	Comments						
sə		greater than 1' graded, slightty	medium grained SANDSTONE, poorly graded, massive, very moist, very dense,				TP87
Client: Pardee Homes		ders (approx. 15% 1.5' diameter, well	graded, massive,				PLATE
6/2/06 Cli		SAND with gravels, cobbles, and boulders (approx. 15% greater than 1' iew inches to 1' diameter up to approx. 1.5' diameter, well graded, slightly	NDSTONE, poorly			 	
Date Excavated:		AND with gravels, w inches to 1' diam	edium grained SAI		00000		W.O. 8838
		o coarse grained S Aasts typically a fer n dense.	ish green fine to m				TLAKE VILLAGE
Logged By: NM	Description	Alluvium: Medium brown silty fine to coarse grained diameter), subangular to rounded clasts typically a fimoist to very moist at base, medium dense.	Mint Canyon Formation: Light grayish green fine to sparse cobbles in bottom 6".				GEOLABS-WESTLAKE VILLAGE
VATION TP87		Alluvium: Mediur diameter), subar moist to very mo	Mint Canyon Formation: Light sparse cobbles in bottom 6".	Total Depth - 5' No groundwater No caving Backfilled			5'
LOG OF EXCAVATION Trench No. TP87	Depth (ft)	0-2	2-5		Graphic Log		scale 1"=

LOG OF EXCAVATION Trench No. TP88	VATION TP88	Logged By: NM	Date Excavated:	6/2/06	Client: Pardee Homes	S	
Depth (ft)		Description					Comments
9-0	Colluvium: Med supported, crud	<u>Colluvium</u> : Medium brown silty fine to medium grained SAND with scattered coarse sand, gravels, and lesser cobbles, matrix supported, crudely bedded, dipping gently toward canyon, moist, medium dense, porous, abundant rootlets.	grained SAND with ird canyon, moist, r	scattered coarse nedium dense, po	sand, gravels, and lesser rous, abundant rootlets.	cobbles, matrix	
თ დ	Alluvium: Mediu 1' diameter), su friable medium	<u>Alluvium</u> : Medium brown silty fine to coarse grained gravelly SAND with abundant cobbles and boulders (approx. 10% greater than 1' diameter), subangular to rounded clasts typically a few inches to 1' diameter up to approx. 1.5' diameter, occasional pockets of friable medium to coarse sand, well graded, moist, medium dense.	ined gravelly SAND cally a few inches to vist, medium dense.	) with abundant con 1' diameter up to	d gravelly SAND with abundant cobbles and boulders (approx. 10% greater that a few inches to 1' diameter up to approx. 1.5' diameter, occasional pockets of medium dense.	rox. 10% greater than casional pockets of	
9 - 10.5	Mint Canyon Fc	Mint Canyon Formation: Light greenish gray gravel		GLOMERATE, m	to cobble CONGLOMERATE, massive, moist, very dense.		
	Total Depth - 10.5' No groundwater No caving Backfilled	0.5°					
Graphic Log							
scale 1" = 5'	5,	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	TP88	

LOG OF EXCA Trench No.	LOG OF EXCAVATION Lo	Logged By:	NM	Date Excavated:	6/2/06	Client	Pardee Homes	S	
Depth (ft)		Description							Comments
0-2.5	Alluvium: Mediu greater than 1' d	ım brown silty fii Iiameter), clasts	Alluvium: Medium brown silty fine to coarse graine greater than 1' diameter), clasts up to 2' diameter,	ined SAND with subangular to rounded gravels, cobbles and boulders (apper, typically a few inches to 1' diameter, well graded, moist, medium dense.	ubangular to rou nches to 1' dian	inded gravels, neter, welf gra	cobbles and bided, moist, me	Alluvium: Medium brown silty fine to coarse grained SAND with subangular to rounded gravels, cobbles and boulders (approx. 30% greater than 1' diameter), clasts up to 2' diameter, typically a few inches to 1' diameter, well graded, moist, medium dense.	
2.5 - 4	Mint Canyon Fo	<u>imation</u> : Light ç	reenish gray cor	nglomeratic SAND	STONE, clasts	predominantly	/ gravel to cobb	Mint Canyon Formation: Light greenish gray conglomeratic SANDSTONE, clasts predominantly gravel to cobble size, moist, dense.	
	Total Depth - 4' No groundwater No caving Backfilled								
Graphic Log									
									1
scale 1"≍5	25	GEOLABS-W	GEOLABS-WESTLAKE VILLAGI	= W.O.	8838		PLATE	TP89	

rd By: NM Date Excavated: 6/2/06 Client: Pardee Homes	tion	Alluvium: Medium brown clayey silty fine to coarse grained gravelly SAND with dispersed cobbles and boulders (approx. 10% greater than 1' diameter), clasts up to 2' diameter but typically a few inches to 12" diameter, occasional crude bedding, increasing moisture with depth, medium dense.	Gradational irregular contact to medium brown gravelly SAND, well graded with occasional cobbles to boulders up to 14" diameter (approximately 5% greater than 1' diameter), very moist, dense.	Mint Canyon Formation: Light green gray sandy CONGLOMERATE, moist, very dense.					ABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP90
Logged By: NM	Description	Alluvium: Medium brown clayey silty fine to coarse grainthan 1' diameter), clasts up to 2' diameter but typically a with depth, medium dense.	Gradational irregular contact to medium brown gravelly (approximately 5% greater than 1' diameter), very mois	Mint Canyon Formation: Light green gray sandy CONG	Total Depth - 10.5' No groundwater No caving Backfilled		0 0 0		GEOLABS-WESTLAKE VILLAG
LOG OF EXCAVATION Trench No. TP90	Depth (ft)	80	6-80	9 - 10.5		Graphic Log			scale 1"=5'

LOG OF EXCAVATION Trench No. TP92		
Depth (ft)	Description	Comments
0 - 4.5 <u>Co</u>	Colluvium: Medium brown silty sandy CLAY to clayey SAND with gravels and lesser cobbles, porous, abundant rootlets, moist, medium dense.	
4.5 - 8.5 Alk	<u>Aliuvium:</u> Medium brown silty fine to coarse grained gravelly SAND to sandy GRAVEL with abundant gravels and cobbles and lesser boulders (approximately 10% greater than 1'), boulders as coarse as approximately 2' diameter, well graded, moist, medium dense.	
8.5 - 11 Me	Medium to light brown fine to coarse grained gravelly SAND with cobbles and boulders (approximately 15% greater than 1' diameter), well graded, low % of fines, moist to very moist, dense, boulders up to 2.5' diameter.	,; 
11 - 12.5 Mir	Mint Canyon For <u>mation</u> : Light greenish gray sandy gravel CONGLOMERATE, moist, very dense.	
B N O	Total Depth - 12.5' No groundwater No caving Backfilled	
Graphic Log		
scale 1" = 5"	GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP92	

LOG OF EXCAVATION Trench No. TP93	WATION TP93	Logged By: NM	Date Excavated:	6/2/06	Client: P	Pardee Homes		
Depth (ft)		Description						
0 - 2.5	Colluvium: Med porosity, mediu	Colluvium: Medium brown clayey silty SAND with g porosity, medium dense, moist.	ith gravels and lesse	iravels and lesser cobbles and boulders (less than 15% is boulders), pinhole	ulders (less	than 15% is b	oulders), pinhole	
2.5 - 12	Alluvium: Light greater than 1' massive, slight	Alluvium: Light grayish brown fine to coarse grained gravelly SAND with abundant cobbles and occasional boulders (approx. 5% greater than 1' diameter), angular to rounded clasts (mostly subrounded), with very faint imbrication dipping gently (1°-3°) downslope, massive, slightly friable, rootlets, moist, medium dense to dense with depth.	ained gravelly SANC clasts (mostly subrou m dense to dense wi	with abundant or inded), with very fith depth.	obbles and o aint imbricat	ccasional bou ion dipping ge	ulders (approx. 5% ently (1°-3°) downslope	
12 - 13.5	Faint contact to subangular to n slight caving, m	Faint contact to light brown fine to coarse grained gravelly SAND with cobbles and boulders (30% greater than 1' diameter), subangular to rounded clasts typically 6" to 14" up to 2.5' diameter, some boulders supported by fine to medium sand matrix, friable, slight caving, moist, dense, 14' maximum depth for backhoe, boulder on bottom won't break free enough to reach 13.5'	ned gravelly SAND w "up to 2.5' diameter, Ih for backhoe, bould	rith cobbles and the some boulders some boulders some bottom wor	oulders (30% upported by n't break free	6 greater thar fine to mediu enough to re	n 1' diameter), m sand matrix, friable, ach 13.5'	
	Total Depth - 13.5' No groundwater No caving Backfilled	3.5.						
Graphic Log		0.00		000				
		0	00000					
			0.00					
scale 1"=5'	QŽ	GEOLABS-WESTLAKE VILLAGE	E W.O.	8838		PLATE	TP93	

LOG OF EXCAVATION Trench No. TP94	VATION TP94	Logged By: NM	Date Excavated: 6/5/06 Client: Pardee Homes	90/5/9	Client:	Pardee Homes		
Depth (ft)		Description						Comments
0-2.5	Alluvium: Medit (approx. 35% g	Alluvium: Medium brown clayey silty SAND with dispersed gravels and cobbles, occasional boulders up to approx. 1.5' diameter (approx. 35% greater than 1' diameter), well graded, porous, rootlets, moist, medium dense.	ith dispersed gravel raded, porous, root	s and cobbles, oc lets, moist, mediu	casional bou m dense.	ders up to appr	ox. 1.5' diameter	
2.5 - 4	Mint Canyon Fr	Mint Canyon Formation?: Light brown fine to medium grained SANDSTONE with occasional gravels and cobbles, moderately graded, moist, very dense,oxidation stains.	nedium grained SA	NDSTONE with o	ccasional gra	vels and cobbit	es, moderately	
	Total Depth - 4' No groundwater No caving Backfilled	_ \						
Graphic Log				0.00				
				-				
							_	
scale 1" = {	5'	GEOLABS-WESTLAKE VILLAGE	AGE W.O.	8838		PLATE	TP94	

	Comments							
omes		J SAND with gravels, cobbles and boulders (approx. 10% greater than 1' few inches to 1' diameter (predominantly cobbles and gravels), well graded,	Mint <u>Canyon Formation?</u> : Light greenish gray gravel cobble CONGLOMERATE, moist, very dense, sandstone matrix supported.					TP96
Client: Pardee Homes		oulders (approx. 10 rantly cobbles and o	very dense, sands					PLATE
]		<u>Alluvium:</u> Medium brown silty fine to coarse grained SAND with gravels, cobbles and boulders (approx. 10% greater than 1' diameter), subangular to rounded clasts typically a few inches to 1' diameter (predominantly cobbles and gravels), well grad moist, medium dense.	.OMERATE, moist,		0.0			8838
Date Excavated: 6/5/06		ned SAND with gravia a few inches to 1'.	avel cobble CONGL					W.O.
		Alluvium: Medium brown silty fine to coarse grained diameter), subangular to rounded clasts typically a moist, medium dense.	nt greenish gray gra		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3.0		GEOLABS-WESTLAKE VILLAGE
Logged By: NM	Description	edium brown silty ubangular to roun um dense.	յ <u>Formation ?</u> ։ Ligh	· 7.5' ater				GEOLABS-W
CAVATION TP96		Alluvium: Medium brodiameter), subangular moist, medium dense.	Mint Canyor	Total Depth - 7.5' No groundwater No caving Backfilled				1"=5'
LOG OF EXCAVATION Trench No. TP96	Depth (ft)	0-5	5 - 7.5		Graphic Log		ll ll	scale 1"

LOG OF EXCAVATION Trench No. TP97	VATION TP97	Logged By: NM	Date Excavated:	90/5/9	Client	Pardee Homes		
Depth (ft)		Description						Comments
0-2	Alluvium; Mediu than 1' diameter (one clast 4' by	Alluvium; Medium brown silty fine to coarse grained gravelly SAND with abundant cobbles and boulders (approx. 70% greate than 1' diameter), clasts are subangular to rounded and typically 6" to 2.5' diameter with a few boulders up to 3 or 4' diameter (one clast 4' by 2.5'), well graded, moist, medium dense.	ained gravelly SANC inded and typically 6 um dense.	gravelly SAND with abundant cobbles and boulders (approx. 70% greater and typically 6" to 2.5' diameter with a few boulders up to 3 or 4' diameter inse.	obbles and l with a few b	ooulders (approoulders up to 3	ox. 70% greater 3 or 4' diameter	
2 - 4.5	Mint Canyon Formation?: Light moist, very dense, massive.	Mint Canyon Formation?: Light greenish gray medium to coarse grained gravel CONGLOMERATE (sandstone matrix supported), moist, very dense, massive.	medium to coarse g	rained gravel COI	NGLOMERA	.TE (sandstone	matrix supported),	
	Total Depth - 4.5' No groundwater No caving							
	Backfilled							
Graphic Log			3867,	0				
scale 1" = 5'		GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE	ТР97	

	Comments						
omes		Alluvium: Medium brown clayey silty fine to coarse grained SAND with dispersed gravels and lesser cobbles (approx. 15%), well graded, moist, medium dense.	Saugus Formation?: Light brown to tan fine to coarse grained SANDSTONE with gravels and lesser cobbles (occasional severely weathered granitic clast approx. 1' diameter), moderately graded, moist, very dense.				1P98
Client: Pardee Homes		els and lesser cobb	els and lesser cobt				PLATE
1: 6/5/06		O with dispersed gravi	Saugus Formation?: Light brown to tan fine to coarse grained SANDSTONE with grav weathered granitic clast approx. 1' diameter), moderately graded, moist, very dense.				8838
NM Date Excavated:		parse grained SANE	coarse grained SA moderately graded				AGE W.O.
l	מנ	clayey silty fine to co inse.	brown to tan fine to pprox. 1' diameter),		1,000		GEOLABS-WESTLAKE VILLAGE
N Logged By:	Description	Alluvium: Medium brown claye graded, moist, medium dense.	<u>is Formation?</u> : Light ered granitic clast a	Total Depth - 6' No groundwater No caving Backfilled			GEOLAE
LOG OF EXCAVATION Trench No. TP98	Depth (ft)	0 - 3 Alluviu graded	3 - 6 Saugu weath	Total Dept No ground No caving Backfilled	Graphic Log		 scale 1"=5'

Comments									
	rs (approx. 5% greater than 1' diameter)	ers (approx. 5% greater than 1'	dense.						PLATE TP99
	and sparse boulders	nd occasional bould	ERATE, moist, very						
	with gravels, cobbles n stiff.	AND with cobbles a se.	I cobble CONGLOM			, ,			W.O. 8838
	/ SAND to sandy SILT of edium dense to mediur	parse grained gravelly S Il graded, medium dens	iht greenish gray grave		0.000	7.3. 6.0			GEOLABS-WESTLAKE VILLAGE
Description	: Medium brown sitty i diameter, moist, m	brown medium to co ), slightly friable, we	<u>ıyon Formation?;</u> Lig	pth - 5.5' ndwater g d					GEOLABS-
Septh (ft)				Total Del No grour No cavin Backfiller	ohic Log				scale 1"=5'
		Description  Alluvium: Medium brown sity SAND to sandy SILT with gravels, cobbles and sparse boulders (approx. 5% greater than 1' diameter)  up to 1.5' diameter, moist, medium dense to medium stiff.	Description  Altuvium: Medium brown sity SAND to sandy SILT with gravels, cobbles and sparse boulders (approx. 5% greater than 1' diameter)  up to 1.5' diameter, moist, medium dense to medium stiff.  Medium brown medium to coarse grained gravelly SAND with cobbles and occasional boulders (approx. 5% greater than 1' diameter), slightly friable, well graded, medium dense.	Description  Alluvium: Medium brown sity SAND to sandy SILT with gravels, cobbles and sparse boulders (approx. 5% greater than 1' diameter) up to 1.5' diameter, moist, medium dense to medium stiff.  Medium brown medium to coarse grained gravelly SAND with cobbles and occasional boulders (approx. 5% greater than 1' diameter), slightly friable, well graded, medium dense.  Mint Canyon Formation?: Light greenish gray gravel cobble CONGLOMERATE, moist, very dense.	Alluvium: Medium brown sity SAND to sandy SILT with gravels, cobbles and sparse boulders (approx. 5% greater than 1' diameter) up to 1.5' diameter, moist, medium dense to medium stiff.  Medium brown medium to coarse grained gravelly SAND with cobbles and occasional boulders (approx. 5% greater than 1' diameter), slightly friable, well graded, medium dense.  Mint Canyon Formation?: Light greenish gray gravel cobble CONGLOMERATE, moist, very dense.  Total Depth - 5.5'  No groundwater  No caving  Backfilled	Description  Alluvium: Medium brown sity SAND to sandy SILT with gravels, cobbles and sparse boulders (approx. 5% greater than 1' diameter) up 1.5 diameter, moist, medium dense to medium stiff.  Medium brown medium to coarse grained gravelly SAND with cobbles and occasional boulders (approx. 5% greater than 1' diameter), slightly friable, well graded, medium dense.  Mint Canyon Formation?: Light greenish gray gravel cobble CONGLOMERATE, moist, very dense.  Total Depth - 5.5  No groundwater No caving Backfilled  Backfilled	Allavium: Medium brown sity SAND to sandy SILT with gravets, cobbles and sparse boulders (approx. 5% greater than 1' diameter) up to 1.5' diameter, moist, medium dense to medium stiff.  Medium brown medium to coarse grained gravely SAND with cobbles and occasional boulders (approx. 5% greater than 1' diameter), slightly friable, well graded, medium dense.  Mint Canyon Formation?: Light greenish gray gravel cobble CONGLOMERATE, moist, very dense.  No groundwater  No groundwater  No caving  Backfilled	Description  Alluvium: Medium brown sity SAND to sandy SILT with gravets, cobbles and sparse boulders (approx. 5% greater than 1' diameter), up to 1.5 diameter, moist, medium dense to medium stiff  Medium brown medium to coarse grained gravelly SAND with cobbles and occasional boulders (approx. 5% greater than 1' diameter), stignly frable, well graded, medium dense.  Mint Canyon Formation?: Light greenish gray gravel cobble CONGLOMERATE, moist, very dense.  Total Depth - 5.5  No groundwater  Backfilled  Backfilled	Alkevium: Medium brown sity SAND to sandy SLT with gravets, cobbles and sparse boulders (approx. 5% greater than 1' dameter) up to 1.5 diameter, moist, medium dense to medium stiff.  Mind Carwon medium to coarse gramed gravely SAND with cobbles and occasional boulders (approx. 5% greater than 1' diameter), slightly firable, well graceful medium dense.  Mind Carwon Formation?: Light greenish gray gravel cobble CONGLOMERATE, moist, very dense.  No groundwater  No caving  Backfilled  Backfilled

115		Logged By: NM	Date Excavated:	: 6/6/06	Client: Pardee Homes	Homes	
Depth (ft)		Description					Comments
0 - 3	Alluvium: Medium brov greater than 1' diamete dense to medium stiff.	<u>Alluvium:</u> Medium brown silty SAND to sandy SILT with gravels, cobble, and lesser boulders (approx. 10% is boulder and 5% is greater than 1' diameter), clasts are subangular to rounded and typically a few inches to 1' diameter, well graded, moist, medium dense to medium stiff.	SILT with gravels, a ir to rounded and t	cobble, and lesser ppically a few inche	ooulders (approx. ' s to 1' diameter, w	10% is boulder and 5% is ell graded, moist, medium	
3-4	Saugus Formation to excavate.	Saugus Formation: Light orangish brown medium to to excavate.		ed sandy CONGL(	OMERATE, slightly	coarse grained sandy CONGLOMERATE, slightly moist, very dense, difficult	
	Total Depth - 4' No groundwater No caving						
	Backfilled						
Graphic Log		i i	0000			,	
scale 1"=5'	2,	GEOLABS-WESTLAKE VILLAGE	AGE W.O.	8838	PLATE	E TP100	

	Comments					
nes		Alluvium: Medium brown sifty clayey medium to coarse grained SAND with gravels, cobbles and lesser boulders (approx. 5% greater than 1' diameter), clasts are typically a few inches to 10" diameter up to 1.5', moist, medium dense, porous.	Saugus Formation: Light brown sandy CONGLOMERATE with 1' thick poorly graded discontinuous fine grained SANDSTONE interbed. Conglomerate is fine to medium grained sandstone matrix supported, moist, very dense, clasts are granitic and sedimentary (sandy claystone ripups or highly weathered volcanics).			TP101
Client: Pardee Homes		and lesser bou nedium dense,	ERATE with 1' thick poorly graded discontinuous fine grained SANDST sandstone matrix supported, moist, very dense, clasts are granitic and thered volcanics).			PLATE
		avels, cobbles o 1.5', moist, r	graded discon d, moist, very o			
90/9/9 :pa		SAND with gra diameter up t	1' thick poorly latrix supporterics).			8838
Date Excavated:		oarse grained w inches to 10'	MERATE with d sandstone m athered volcar			E W.O.
ΜN	_	ey medium to c ire typically a fer	andy CONGLOI medium graine ups or highly we		130	TLAKE VILLAG
Logged By: N	Description	Alluvium: Medium brown sifty clayey medium to coarse grained SAND with gravels, cobbles and lesser boulders (a greater than 1' diameter), clasts are typically a few inches to 10" diameter up to 1.5', moist, medium dense, porous.	Saugus Formation: Light brown sandy CONGLOMERATE with 1' this interbed. Conglomerate is fine to medium grained sandstone matrix sedimentary (sandy claystone ripups or highly weathered volcanics).			GEOLABS-WESTLAKE VILLAGE
VATION TP101		Alluvium: Mediui greater than 1' d	Saugus Formati interbed. Congle sedimentary (sa	Total Depth - 5' No groundwater No caving Backfilled		
LOG OF EXCAVATION Trench No. TP101	Depth (ft)	0-2	2 - 5		Graphic Log	scale 1"=5'

LOG OF EXCAVATION Trench No. TP102	(VATION TP102	Logged By: 1	MN	Date Excavated:	d: 6/6/06		Client: Pardee Homes		
Depth (ft)		Description							Comments
0 - 2	Landslide Depor medium stiff.	<u>sit</u> : Medium brow	m sandy CLAY	with gravels, col	obles and occasio	nal boulders t	up to 14" diame	<u>Landslide Deposit</u> : Medium brown sandy CLAY with gravels, cobbles and occasional boulders up to 14" diameter, well graded, moist, medium stiff.	<u>پر</u>
2 - 8.5	Saugus Formati approximately 1 very dense, upp	<u>ion?:</u> Light brown 5% to 20%), gra er 1' is weathere	r to light grayish nitic and lesser id/oxidized, app	ı brown gravel α sedimentary da roximately 5% a	Saugus Formation?: Light brown to light grayish brown gravel cobble CONGLOMERATE (medium grained sandstone matrix approximately 15% to 20%), granitic and lesser sedimentary clasts (bluish gray coarse grained sandy claystone), slightly moist, very dense, upper 1' is weathered/oxidized, approximately 5% are boulders up to 16" diameter.	ERATE (medi oarse grained 16" diameter.	um grained sa sandy claystor	ndstone matrix ne), slightly moist,	
	Total Depth - 8.5' No groundwater No caving Backfilled	تہ ر							
Graphic Log					0/00/00/00/00/00/00/00/00/00/00/00/00/0				
	5.	GEOLABS-WE	 GEOLABS-WESTLAKE VILLAGI	AGE W.O.	8838		PLATE	TP102	

LOG OF EXCAVATION Trench No. TP103		y: NM	Date Excavated: 6/6/06	90/9/9	Client: Pardee Homes	nes	
Depth (ft)		Description					Comments
0 - 1.5	Alluvium: Light to diameter up to 2	<u>Alluvium</u> : Light to medium brown fine to coarse grained SAND with gravels, cobbles and boulders (approximately 20% greater than 1' diameter up to 2'), approximately 30% is fine grained, loose, dry.	iined SAND with gr ed, loose, dry.	avels, cobbles an	d boulders (approxi	nately 20% greater than 1'	
1.5 - 3	Saugus Formation	Saugus Formation2: Light brown gravel cobble CONGLOMERATE, moist, very dense, difficult to excavate at 3'.	NGLOMERATE, π	ioist, very dense,	difficult to excavate	at 3'.	
<u></u>	Total Depth - 3' No groundwater No caving Backfilled						
. 22 3124							
Graphic Log							
					_		
scale 1"=5'	5'	GEOLABS-WESTLAKE VILLAGE	w.o. 8838	8	PLATE	TP103	

LOG OF EXCAVATION Trench No. TP105	WATION TP105	Logged By: NM	Date Excavated:	90/9/9	Client: Pardee Homes	S	
Depth (ft)		Description					Comments
9-0	Landslide Debri cobbles, well gr	<u>Landslide Debris:</u> Medium orangish brown silty clayey fine to medium grained SAND with coarse sand and small gravels, occasional cobbles, well graded, massive, pinhole porosity, rootlets, slightly moist, medium dense.	r clayey fine to mediu y, rootlets, slightly mo	m grained SAND vist, medium dense	with coarse sand and sugar.	nall gravels, occasional	
2-9	Irregular contac occasional smal	Irregular contact to medium brown CLAYSTONE with abundant polished shears/calcium carbonate specks, manganese stains, occasional small gravels and coarse sand grains, moist, medium stiff to stiff.	VE with abundant poli	ished shears/calciu iff to stiff.	ım carbonate specks, ı	nanganese stains,	
7-7.5	Light brown clay	Light brown clayey SILTSTONE to SILTSTONE, massive, moist, very stiff.	E, massive, moist, ve	ny stiff.			
7.5-8	Discontinuous li	Discontinuous light grayish brown fine to coarse SANDSTONE with gravels, moderately to well graded, slightly moist, very dense.	e SANDSTONE with	gravels, moderate	ly to well graded, slight	ly moist, very dense.	
80 - 80 3°	Light brown SIL	Light brown SILTSTONE, massive, moist, very stiff	/ stiff.				
@873"	2-3 mm thick cla	2-3 mm thick claystone shear, over light brown silty		STONE, poorly gra	very fine SANDSTONE, poorly graded, moist, massive, very dense.	ery dense.	
#6,8@	1/4" thick CLAY	1/4" thick CLAYSTONE shear, irregular sharp contact.	contact.				
8'9.25" - 10	Medium brown s	Medium brown sandy CLAYSTONE with dispersed		iins and very spars	coarse sand grains and very sparse small gravels, massive, moist, very stiff.	/e, moist, very stiff.	
10 - 12	Grades to light r Total Depth - 12	Grades to light medium brown silty very fine grained SANDSTONE, massive, moist, very dense. Total Depth - 12', No groundwater, No caving, Backfilled	ained SANDSTONE, Backfilled	massive, moist, v	ery dense.		
Graphic Log					6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
				0 1 1 0 0 11			
		111					
scale 1"= 5	5,	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	TP105	

	Comments						
Client: Pardee Homes		asional gravels and very sparse	ely graded, massive, moist, seepage				PLATE TP106
: NM Date Excavated: 6/7/06	Description	Alluvium: Medium brown silty clayey fine to coarse grained SAND to sandy CLAY with occasional gravels and very sparse cobbles and boulders up to 1' diameter, porous, rootlets, moist, medium stiff.	<u>Saugus Formation?</u> : Reddish brown sandy MUDSTONE with coarse sand grains, moderately graded, massive, moist, seepage observed in small tight fractures at approximately 6'.				GEOLABS-WESTLAKE VILLAGE W.O. 8838
AVATION TP106		····	Saugus Formation observed in small	Total Depth - 7' Seep at 6' No caving Backfilled	- Bc		1"=5'
LOG OF E Trench N	Depth (ft)	0-3	3-7	<u>.</u>	 Graphic Log		scale

	Comments								
S		Alluvium: Dark brown sandy silty CLAY with occasional gravels and boulders (2-3 approx. 1' diameter), porous, moist, medium stiff.	supported, moist,	OSTONE from 4-5'.					TP107
Client: Pardee Homes		.1' diameter), porou	Severely Weathered Saugus Formation: Medium brown gravel cobble CONGLOMERATE, clayey sand matrix supported, moist, medium dense to dense.	Saugus Formation: Light brown gravel cobble CONGLOMERATE with a 1' thick interbed of fine grained SANDSTONE from 4-5'. Contacts are gradational, moist, very dense.					PLATE
90/1/9		oulders (2-3 approx.	CONGLOMERATE	a 1' thick interbed (					8
Date Excavated:		sional gravels and b	brown gravel cobble	NGLOMERATE with			9 00		E W.O. 8838
NM		ilty CLAY with occas	<u>-ormation:</u> Medium	n gravel cobble CO કાં, very dense.		0-			VESTLAKE VILLAGE
Logged By:	Description	ırk brown sandy si	sathered Saugus F	Saugus Formation: Light brown gravel cobbl Contacts are gradational, moist, very dense.	- 6، ater				GEOLABS-WESTI
LOG OF EXCAVATION Trench No. TP107	(t	Alluvium: Da	Severely Weathered Sau medium dense to dense.	Saugus Forr	Total Depth - 6' No groundwater No caving Backfilled				1"=5'
LOG OF EX Trench No.	Depth (ft)	0 - 1	1-3	3-6		Graphic Log	-		scale 1"

LOG OF EXCAVATION Trench No. TP108	VATION Logged By: TP108	NM	Date Excavated	90/1/9	Client:	Pardee Homes		
Depth (ft)	Description							Comments
0-1	<u>Topsoil</u> : Dark brown sandy CLAY with dispersed gravels, cobbles, and occasional boulders, porous, slightly moist, medium stiff.	AY with disperse	d gravels, cobbles,	and occasional i	oulders, poi	rous, slightly m	oist, medium stiff,	
1-2	<u>Alluvium</u> : Medium brown sandy CLAY with gravels, cobbles and occasional boulders (1 clast near surface is approx. 2' maximum diameter), typically 1-1.5' diameter, well graded, moist, rootlets, medium dense (approximately 3% greater than 1' diameter).	y CLAY with grav leter, well graded	rels, cobbles and ox , moist, rootlets, m	ccasional boulder edium dense (ap	rs (1 clast ne proximately	ear surface is a 3% greater tha	pprox. 2' maximum n 1' diameter).	
2-3	Saugus Formation?: Light brown to light reddish brown very fine to silty very fine grained SANDSTONE, wavy irregular contact above and below, upper few inches is weathered, poorly graded, moist, very dense.	nn to light reddisl s weathered, poo	n brown very fine to rly graded, moist, v	silty very fine gr ery dense.	ained SAND	STONE, wavy	irregular contact above	
3-6	Light yellowish brown sandy CONGLOMERATE with several clasts up to approx. 1' diameter, fine to medium grained sandstone supported matrix, moist.	ONGLOMERATE	with several clast	s up to approx. 1	' diameter, fi	ne to medium ç	grained sandstone	
***************************************	Total Depth - 6' No groundwater No caving Backfilled							
Graphic Log								
	· · · · · · · · · · · · · · · · · · ·							
scale 1"=5'		GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE	TP108	

	Comments	<del>-</del>				_		
Client: Pardee Homes		Alluvium: Medium brown sandy CLAY to clayey SAND with abundant gravels, cobbles and boulders (approximately 20% greater than 1' diameter), several boulders up to approx. 2' diameter, slightly moist, medium dense.	Saugus Formation 2: Light brown sandy gravel cobble CONGLOMERATE, sandstone matrix supported, slightly moist, very dense.				PLATE TP109	
Date Excavated: 6/7/06		Alluvium: Medium brown sandy CLAY to clayey SAND with abundant gravels, cobbles and diameter), several boulders up to approx. 2' diameter, slightly moist, medium dense.	I cobble CONGLOMERATE, sandstone m				AGE W.O. 8838	<b>*</b> .C.
Logged By: NM	Description	edium brown sandy CLAY to claye several boulders up to approx. 2'	<u>nation?</u> : Light brown sandy gravel	- 6' ater			GEOLABS-WESTLAKE VILLAGE	טרטרטסטייירי יוירי
LOG OF EXCAVATION Trench No. TP109	Depth (ft)	0 - 3 Alluvium: Me	3 - 6 Saugus Form	Total Depth - 6' No groundwater No caving Backfilled	 Graphic Log		scale 1" = 5'	- 11

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	Comments	nately 25% greater n dense.	nix supported,					TP110
Client: Pardee Homes		oles and boulders (approxir cimately 1.5', moist, mediur	um grained sandstone mat					PLATE TP
Date Excavated: 6/7/06		<u>Alluvium</u> : Medium brown silty fine to coarse grained gravelly SAND with abundant cobbles and boulders (approximately 25% greater than 1' diameter), well graded, subangular to subrounded clasts typically 4-6" to approximately 1.5', moist, medium dense.	<u>Saugus Formation?</u> : Light brown sandy gravel cobble CONGLOMERATE, fine to medium grained sandstone matrix supported, moist, very dense.					3E W.O. 8838
Logged By: NM	Description	um brown silty fine to coarse grain), well graded, subangular to sul	<u>tion?</u> : Light brown sandy gravel o ise.	ين ٿ				GEOLABS-WESTLAKE VILLAGE
CAVATION TP110		0 - 3 <u>Alluvíum</u> : Mediu than 1' diameter	3 - 4.5 Saugus Formation moist, very dense.	Total Depth - 4.5' No groundwater No caving Backfilled	Graphic Log		ll ll	scale 1″=5

LOG OF EXCAVATION Trench No. TP111		Logged By: NM	Date Excavated:	90/2/9	Client: Pa	Pardee Homes		
Depth (ft)		Description						Comments
0-2	<u>Colluvium</u> : Dark	Colluvium: Dark brown sandy CLAY with occasional		gravels, rootlets, porous, slightly moist, medium stiff.	ly moist, medi	ım stiff.		
2-3	Gradational con medium dense.	Gradational contact to reddish brown clayey SAND medium dense.	SAND with occasion	al gravels and cot	bles, massive	with occasional gravets and cobbles, massive, pinhole porosity, slightly moist,	moist,	
3-5	Saugus Formati approximately 6	Saugus Formation: Light reddish brown very fine grained silty SANDSTONE with occasional discontinuous coarse grained interbeds approximately 6" thick, poorly graded, moist, very dense.	fine grained silty SA very dense.	NDSTONE with o	casional disco	ntinuous coarse grained	interbeds	
5-7.5	Gradational contact with lighwith discontinuous siltstone.	Gradational contact with light reddish brown fine grained SANDSTONE, poorly graded, massive, moist, very dense, scoured contact with discontinuous siltstone.	fine grained SANDS	TONE, poorly grad	led, massive, r	noist, very dense, scoure	ed contact	
	Total Depth - 7.5' No groundwater No caving Backfilled	יי פו		·				
Graphic Log								
scale 1"=5"	5,	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE TP111		

	Comments					
it: Pardee Homes	Description  Alluvium: Medium brown clayey fine to coarse grained gravelly SAND with abundant cobbles and boulders (approximately 35% greater than 1' diameter), clasts typically 6" to 18" diameter (as coarse as 2.5" diameter), well graded, moist, medium dense.	Saugus Formation?: Light brown gravel cobble CONGLOMERATE with medium grained sandstone supported matrix, moist, very dense.				PLATE TP112
6/7/06 Client:	) with abundant cobbles e as 2.5" diameter), wel	ith medium grained san				
Date Excavated:	grained gravelly SAND	e CONGLOMERATE wi				AGE W.O. 8838
Logged By: NM	Description m brown clayey fine to coars liameter), clasts typically 6" to	2: Light brown gravef cobb				GEOLABS-WESTLAKE VILLAGE
-		Saugus Formation? dense.	Total Depth - 5' No groundwater No caving Backfilled			2
LOG OF EXCAVATION Trench No. TP112	Depth (ft) 0 - 3			Graphic Log		scale 1"=

ders (approx. 10%) up to	nately 1' diameter, moist,					
<b>–</b> ¥	эргохіп	Se.				VTE TP113
bles and lesser bou	asional boulders ap	led, moist, very den				PLATE
ındant gravels, cob	trix supported), occ	STONE, poorly grad		0000		8838
/ey SAND with abu	lium dense. 3LOMERATE (ma	ne grained SANDS				LAGE W.O.
त andy CLAY to clay	ootlets, moist, med nown sandy CON(	own fine to very fir		0.000		 GEOLABS-WESTLAKE VILLAGE
Description <u>m</u> : Medium brown sa	reter, well graded, r <u>s Formation</u> : Light b rnse.	ar contact to light br	epth - 6' undwater ing ed			 GEOLAE
Deptit (II)  0 - 3 Alluviun			Total D No grot No cavi Backfill	ohic Log		scale 1" = 5'
				<del></del>		

<b>&lt;</b>		Logged By: NM D	Date Excavated:	90/8/9		Client: Pardee Homes		
Depth (ft)	PO	Description						Comments
0 - 4.5	Alluvium: Medium subrounded clasts	<u>Alluvium</u> : Medium brown clayey silty SAND with gravel, cobbles and boulders (approximately 10% greater than 1' diameter), subrounded clasts typically a few inches to approximately 1' diameter, moist, medium dense.	n gravel, cobbles an proximately 1' diame	id boulders (apprater, moist, mediu	oximately 10% m dense.	s greater than 1	' diameter),	
4.5 - 6.5	Mint Canyon Form supported).	Mint Canyon Formation?: Light greenish gray sandy gravel cobble CONGLOMERATE, moist, very dense (sandstone matrix supported).	andy gravel cobble	CONGLOMERAT	.E, moist, ver	y dense (sands	tone matrix	
	Total Depth - 6.5' No groundwater No caving Backfilled							
Graphic Log								
scale 1" = 5¹		GEOLABS-WESTLAKE VILLAG	. W.O.	8838		PLATE TI	TP115	

Date Excavated: 6/8/06 Client: Pardee Homes	Comments	Alluvium: Medium brown silty fine to coarse grained gravelly SAND with cobbles and lesser boulders (approximately 15%), several clasts up to approximately 2' diameter (fractures when hit with bucket) but typically 1-3" diameter, well graded, slightly friable in bottom 1' (less fines), moist, medium dense.	Mint Canyon Formation?: Light gray gravel cobble CONGLOMERATE, moist, very dense, massive.					
		bbles and lesser boulde typically 1-3" diameter, "	ist, very dense, massive					
		ned gravelly SAND with col when hit with bucket) but t	le CONGLOMERATE, moi			208		
Logged By: NM	Description	Alluvium: Medium brown silty fine to coarse grained clasts up to approximately 2' diameter (fractures wh bottom 1' (less fines), moist, medium dense.	mation?: Light gray gravel cobb					
		Alluvium: Mediun clasts up to appr bottom 1' (less fil	Mint Canyon For	Total Depth - 6' No groundwater No caving Backfilled				2
LOG OF EXCAVATION Trench No. TP116	Depth (ft)	0 - 4.5	4.5-6		· <i></i>	Graphic Log		

	Comments						
lomes			SANDSTONE with	Jous conglomeratic			TP117
Client: Pardee Homes			reddish brown claye)	with crude discontin			PLATE
: 6/8/06			medium brown and	t gray fine grained SANDSTONE moist at depth, very dense.			8838
Date Excavated:		rootlets, moist.	idational contact to dense.	nd light gray fine gra o very moist at dept		300	LLAGE W.O.
Logged By: NM	Description	Alluvium: Dark brown sandy CLAY, porous, rootlets, moist.	<u>Severely Weathered Saugus Formation</u> : Gradational contact to medium brown and reddish brown clayey SANDSTONE with occasional cobbles, porous, moist, medium dense.	Saugus Formation: Mottled reddish brown and light gray fine grained SANDSTONE with crude discontinuous conglomeratic sandstone interbeds approx. 1' thick, moist to very moist at depth, very dense.			GEOLABS-WESTLAKE VILLAGE
AVATION TP117		Alluvium: Dark b	Severely Weath: occasional cobb	Saugus Formati sandstone intert	Total Depth - 6' No groundwater No caving Backfilled		5'
LOG OF EXCAVATION Trench No. TP117	Depth (ft)	0-1	1.2	2-6	<u>.</u>	Graphic Log	scale 1" = 5'

	Comments	<u></u>		ded,			
e Homes			dense.	and cobbles, poorly gra			TF TP118
Client: Pardee Homes		s, medium stiff.	orous, moist, medium	nal scattered gravels			PIATE
ated: 6/8/06		rous, moist, rootlet	els and cobbles, po	TONE with occasio			8838
Date Excavated:		asional gravels, po	ith occasional graw	le grained SANDST			VIII AGE WO
Logged By: NM	Description	Topsoil: Dark brown sandy CLAY with occasional gravels, porous, moist, rootlets, medium stiff.	Colluvium: Medium brown clayey SAND with occasional gravels and cobbles, porous, moist, medium dense.	Saugus Formation: Light reddish brown fine grained SANDSTONE with occasional scattered gravels and cobbles, poorly graded, massive, moist, very dense.	<b>.</b>		GEOLABS-WESTLAKE VILLAGE
		Topsoil: Dark br	Colluvium: Medi	Saugus Formation: Light rec massive, moist, very dense.	Total Depth - 5.5' No groundwater No caving Backfilled		رية
LOG OF EXCAVATION Trench No. TP118	Depth (ft)	0-1	1-2.5	2.5 - 5.5	<u> </u>	Graphic Log	scale 1"=

ĺ₹ IГ		Logged By: NM	Date	Date Excavated:	90/8/9	Client: Par	Pardee Homes		
0 - 3	Alluvium: Mediu than 1' diameter diameter, moist,	Description  Medium brown clayey slity fine to coarse grained SAND with gravels, cobbles and boulders (approximately 15% greater than 1' diameter), angular to rounded clasts typically a few inches to 8" diameter with 4 or 5 clasts up to approximately 1.5-2' diameter, moist, medium dense.	to coarse gra sts typically a	ined SAND w few inches to	vith gravels, co o 8" diameter v	bbles and bo	ulders (approxi sts up to appro	grained SAND with gravels, cobbles and boulders (approximately 15% greaterly a few inches to 8" diameter with 4 or 5 clasts up to approximately 1.5-2"	Comments
3-6	Saugus Formation: Light brow fractured), moist, very dense.	<u>Saugus Formation</u> : Light brown and light greenish gray sandy CONGLOMERATE (1-2 clasts are approximately 1' diameter and highly fractured), moist, very dense.	greenish gra	y sandy CON	GLOMERATE	(1-2 clasts a	re approximatel	ly 1' diameter and highly	
	Total Depth - 6' No groundwater No caving Backfilled								
Graphic Log		100			)				
scale 1" = 5'		GEOLABS-WESTLAKE VILLAGE	VILLAGE	W.O. 86	8838		PLATE	TP119	

LOG OF EXCAVATION Logged B Trench No. TP120 Depth (ft) Description
diameter) up to 2' diameter, well graded, moist, medium dense.  Saugus Formation: Light brown sandy CONGLOMERATE with occasional boulders approximately 1' diameter, moist, very dense.
Total Depth - 4.5' No groundwater No caving Backfilled
GEOLABS-WESTLAKE VILLAGE

LOG OF EXCAVATION Trench No. TP121	VATION TP121	Logged By: NM	Date Excavated:	90/8/9		Client: Pardee Homes		
Depth (ft)		Description						Comments
0-3	Alluvium: Mediu diameter), well g	Alluvium: Medium brown silty clayey SAND with abundant gravels, cobbles and boulders (approximately 25% greater than 1' diameter), well graded, moist, medium dense, coarse sand at approximately 2-3'.	n abundant gravels, coarse sand at appro	cobbles and bou ximately 2-3'.	lders (appro	ximately 25%	greater than 1'	
3 - 6	Saugus Formati moderately grad	Saugus Formation: Light yellow brown medium to coarse grained SANDSTONE with scattered gravels and lesser cobbles, moderately graded, very moist, very dense.	to coarse grained S/	ANDSTONE wit	n scattered (	gravels and les	ser cobbles,	
	Total Depth - 6' No groundwater No caving Backfilled							
Graphic Log		000						
			0					
scale 1" = 5'		GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE	TP121	

scale 1" = 5' GEOLABS-WESTLAKE VILLAGE   W.O. 8838   PLATE TP122

LOG OF EXCAVATION Trench No. 7P124	AVATION TP124	Logged By: NM	Date Excavated:	90/6/9	Client:	Pardee Homes		
Depth (ft)		Description						Comments
0 - 0.5	Topsoil: Dark	Topsoil: Dark brown sandy CLAY with gravels and cobbles, rootlets, porous, moist, medium stiff.	and cobbles, rootle	ts, porous, moist,	medium stiff	u:	•	
0.5 - 1.5	Alluvium: Mec granitic clasts	<u>Alluvium</u> : Medium brown sandy CLAY with abundant gravels, cobbles and lesser boulders (approximately 5%), angular to rounded granitic clasts up to approx. 1' diameter, well graded, moist, medium dense.	undant gravels, cob praded, moist, medi	ibles and lesser b um dense.	oulders (app	roximately 5%), angular to	rounded	
1.5 - 5	Saugus Form with a discont	Saugus Formation: Gradational contact to mottled light reddish brown and light greenish gray gravel cobble CONGLOMERATE with a discontinuous 1' thick interbed of light gray silty fine grained SANDSTONE at 3-4', moist, very dense.	ttled light reddish bi ray silty fine grained	own and light gre s SANDSTONE a	enish gray gi t 3-4', moist,	ravel cobble CONGLOMEF very dense.	SATE	
	Total Depth - 5' No groundwater No caving Backfilled	5. ter						
Graphic Log		000						
			Vo C)					
								-
scale 1"=	5'	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE TP124		

1"=5' GEO! ARS-WEST! AKE VILLAGE W.O. 8838 DI ATE T0426			Total Depth - 5' No groundwater No caving Backfilled			ant gravels, cobbles and le reater than 12" diameter), noist, massive, very dense.	brown clayey SAND with abunda diameter (approximately 10% gr below.  SANDSTONE, poorty graded, n avels (approximately 35%), mois	Description  um brown to medium orangish to subrounded clasts up to 18" dense, clear contact with untit liton: Yellow brown fine grained grained SANDSTONE with gra	
				Total Depth - 5' No groundwater No caving Backfilled					
				Total Depth - 5' No groundwater No caving Backfilled					
				Total Depth - 5' No groundwater No caving Backfilled					
				Total Depth - 5' No groundwater No caving Backfilled					
Fotal Depth - 5' No groundwater No caving Backfilled	Total Depth - 5' No groundwater No caving Backfilled	Fotal Depth - 5' No groundwater No caving Backfilled				t, very dense.	avels (approximately 35%), mois	grained SANDSTONE with gra	
			-		ai.	noist, massive, very dense	SANDSTONE, poorly graded, n	<u>tion</u> : Yellow brown fine grained	
					esser boulders (approximately abundant rootlets,	ant gravels, cobbles and le reater than 12" diameter),	brown clayey SAND with abunds diameter (approximately 10% gr below.	um brown to medium orangish to subrounded clasts up to 18" dense, clear contact with unit I	·
				·	Comments			Description	
 Description  Alluvium: Medium brown to medium orangish brown clayey SAND with abundant gravels, cobbles and lesser boulders (approximately 10%, angular to subrounded clasts up to 16" diameter (approximately 10% greater than 12" diameter), abundant rootlers, motist, medium du subrounded clasts up to 16" diameter (approximately 10% greater than 12" diameter), abundant rootlers.  Saugus Formation: Velow brown fine grained SANDSTONE with gravels (approximately 35%), moist, very dense.  Grading to fine grained SANDSTONE with gravels (approximately 35%), moist, very dense.  No caving Backfilled  Backfilled	Alluvium: Medium brown to medium orangish brown clayey SAND with abundant gravels, cobbles and lesser boulders (approximately 10% greater than 12" diameter), abundant rootlets, 10%, angular to subrounded clasts up to 18" diameter (approximately 10% greater than 12" diameter), abundant rootlets, saugus Formation: Yellow brown fine grained SANDSTONE, poorly graded, moist, massive, very dense.  Grading to fine grained SANDSTONE with gravets (approximately 35%), moist, very dense.  No groundwater No caving Backfilled  Backfilled	Description  Alluvium: Medium brown to medium orangish brown clayey SAND with abundant gravels, cobbles and lesser boulders (approximately 10%), angular to subrounded clasts up to 18" diameter (approximately 10% greater than 12" diameter), abundant rootlets, moist, medium dense, clear contact with unit below.  Saugus Formation: Yellow brown fine grained SANDSTONE, poorly graded, moist, massive, very dense.  Grading to fine grained SANDSTONE with gravels (approximately 35%), moist, very dense.  Total Depth - 5"  No groundwater  No caving  Backfilled	Description  Medium brown to medium orangish brown clayey SAND with abundant gravels, cobbles and lesser boulders (approximately 10%), angular to subrounded clasts up to 18" diameter (approximately 10% greater than 12" diameter), abundant rootlets, moist, medium dense, clear contact with unit below.  Saugus Formation: Yellow brown fine grained SANDSTONE, poorly graded, moist, massive, very dense.  Grading to fine grained SANDSTONE with gravels (approximately 35%), moist, very dense.	Description  Alluvium: Medium brown to medium orangish brown clayey SAND with abundant gravels, cobbles and lesser boulders (approximately 10%), angular to subrounded clasts up to 18" diameter (approximately 10% greater than 12" diameter), abundant rootlets, moist, medium dense, clear contact with unit below.  Saugus Formation: Yellow brown fine grained SANDSTONE, poorly graded, moist, massive, very dense.  Grading to fine grained SANDSTONE with gravels (approximately 35%), moist, very dense.				,	Trench No. TP125

	Comments							
Pardee Homes		Alluvium: Medium brown to reddish brown(with depth)sandy CLAY to clayey SAND with abundant gravels, cobbles, and lesser boulders (approximately 15% greater than 1' diameter), 1 or 2 boulders up to 1.5' diameter, porous, moist, medium dense.	Saugus Formation; Yellow brown fine and fine to coarse grained SANDSTONE with scattered gravels and cobbles, massive, moist, very dense.					PLATE TP126
Client:		ID with abundar diameter, poro	vith scattered gr					
90/6/9		Y to clayey SAN ulders up to 1.5	SANDSTONE v				 _	8838
Date Excavated:		lepth)sandy CLA meter), 1 or 2 bo	o coarse grained					GE W.O.
By: NM		reddish brown(with o % greater than 1' dia	brown fine and fine to			)		GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	edium brown to oproximately 15	<u>mation;</u> Yellow	- 5' ater			 	GEOLAB
AVATION TP126		Alluvium: Me boulders (ap	Saugus Forr	Total Depth - 5' No groundwater No caving Backfilled				: 5,
LOG OF EXCAVATION Trench No. TP126	Depth (ft)	0-2	2-5		Graphic Log			scale 1" =

	Comments				
mes		Alluvium: Medium brown silty clayey SAND with abundant gravels, cobbles, and lesser boulders up to approximately 1' diameter, well graded, moist, medium dense.	Saugus Formation: Sharp contact to yellowish brown fine to coarse grained conglomeratic SANDSTONE (approximately 50% is sandstone), moist, very dense, massive.		TP127
Client: Pardee Homes		r boulders up to appi	ratic SANDSTONE (		PLATE
90/6/9		, cobbles, and lesser	e grained conglomer		8838
Date Excavated:		ith abundant gravels	brown fine to coars		W.O.
By: NM	Li.	wity clayey SAND windense.	contact to yellowish :nse, massive.		ABS-WESTLAKE VILLAGE
ON Logged By:	Description	Alluvium: Medium brown silty claye well graded, moist, medium dense.	Saugus Formation: Sharp contact to yell sandstone), moist, very dense, massive.	Total Depth - 5' No groundwater No caving Backfilled	GEOLAB
LOG OF EXCAVATION Trench No. TP127	Depth (fl)	0 - 2 Ailuvi well g	2 - 5 Saug	Total Dept No ground No caving Backfilled	scale 1"=5'

	Comments	Бt	<u>a</u>					
lomes		2' diameter), becomii	CONGLOMERATE, moist, very dense, clasts commonly gravel and cobble,	ntact with unit below.	ery dense.			
Client: Pardee Homes		(2-3 boulders up to	lense, clasts commo	ense, faint crude co	aly graded, moist, ve			
90/6/9		bbles and boulders	RATE, moist, very c	ist, massive, very de	0% fines), moderate		Di	
Date Excavated:		oundant gravels, coledium dense.	ained CONGLOME w.	, poorly graded, mo	/E (approximately 5			
Logged By: NM	ption	Alluvium: Medium brown clayey SAND with abundant gravets, cobbles and boulders (2-3 boulders up to 2' diameter), becoming more sandy with depth, well graded, moist, medium dense.	Saugus Formation: Orangish brown coarse grained slightly undulating crude contact with unit below.	Light yellow brown fine grained SANDSTONE, poorly graded, moist, massive, very dense, faint crude contact with unit below.	Light yellow brown conglomeratic SANDSTONE (approximately 50% fines), moderately graded, moist, very dense.			
	Description	<u>Niuvium</u> : Medium brov nore sandy with depth	Saugus Formation: Or lightly undulating cruc	ight yellow brown fine	ight yellow brown con	Total Depth - 5' No groundwater No caving Backfilled		
LOG OF EXCAVATION Trench No. TP128	Depth (ft)	0 - 1.5 A I	1.5 - 2.5 S	2.5-4 L	4-5 L	<u> </u>	Graphic Log	

omes	Comments	lly moist, rootlets, medium	TONE, moderately	pproximately 15%),			TP129
Client: Pardee Homes		els and cobbles, sligh	to orangish brown medium to coarse grained SANDSTONE, moderately	scattered gravels (a			PLATE
90/6/9 :pe		ded to rounded grave	brown medium to co	ed SANDSTONE with			8838
Date Excavated:		n abundant subround		ium to coarse graine nse.			LLAGE W.O.
Logged By: NM	Description	<u>Colluvium</u> : Medium brown sandy CLAY with abundant subrounded to rounded gravels and cobbles, slightly moist, rootlets, medium dense.	Weathered Saugus Formation: Gradational contact graded, slightly moist, dense.	<u>Saugus Formation</u> : Light yellow brown medium to coarse grained SANDSTONE with scattered gravels (approximately 15%), moderately graded, massive, moist, very dense.		000/	GEOLABS-WESTLAKE VILLAGE
		<u>Colluvium</u> : Mediu dense.	Weathered Saugus Formatio graded, slightly moist, dense.	Saugus Formation moderately grade	Total Depth - 6' No groundwater No caving Backfilled		5'
LOG OF EXCAVATION Trench No. TP129	Depth (ft)	0 - 2.5	2.5 - 3	3-6		Graphic Log	scale 1" = 5

	Comments				•					
t: Pardee Homes		Topsoil/Dump Fill: Dark brown sandy clayey SILT with abundant pieces of small trash (bottles, tin, plastic), dry, loose.	Weathered Saugus Formation: Light brown sitty fine to coarse grained SANDSTONE with gravels, moderately graded, slightly friable, moist, medium dense.		stiff.	t, hard.				PLATE TP130
6/9/06 Client:		s of small trash (bottles	SANDSTONE with gra	, massive, moist, hard.	polished, moist, very s	2mm), massive, moist				
Date Excavated:		T with abundant pieces	fine to coarse grained	to clayey SILTSTONE,	rnal shears, not highly	t white round specs (1-				3E W.O. 8838
By: NM	UC.	rown sandy clayey SIL	ation: Light brown silty nse.	ım brown SILTSTONE	NE with pervasive inte	STONE with abundan				GEOLABS-WESTLAKE VILLAGE
	Description	opsoil/Dump Fill: Dark b	Weathered Saugus Formation friable, moist, medium dense.	Saugus Formation; Medium brown SILTSTONE to clayey SILTSTONE, massive, moist, hard.	Medium brown CLAYSTONE with pervasive internal shears, not highly polished, moist, very stiff.	Light medium brown MUDSTONE with abundant white round specs (1-2mm), massive, moist, hard.	Total Depth - 6' No groundwater No caving Backfilled			GEOLA
LOG OF EXCAVATION Trench No. TP130	Depth (ft)	0 - 1.5 To	1.5 - 2.5 W	2.5 - 3'4" Sa	3'4" - 3'5" Me	3.5"-6 Lig		Graphic Log		scale 1"=5

LOG OF EXCA Trench No.	VATION TP131	y: NM	Date Excavated:	90/6/9	Client:	Client: Pardee Homes		
Depth (ft)		Description						Comments
0-2	Dump Fill/Colluvi diameter, abunda	<u>Dump Fill/Colluvium</u> : Medium brown clayey silty SAND with gravels, cobbles, and occasional boulders up to approximately 1' diameter, abundant trash (glass, tin, metal pipe), porous, moist, medium dense.	SAND with gravels ), porous, moist, me	, cobbles, and o	ocasional bo	vulders up to ap	proximately 1'	
2-3	Severely Weathe moderately grade	Severely Weathered Saugus Formation: Orange brown medium to coarse grained SANDSTONE with gravels and cobbles, moderately graded, slightly moist, dense.	e brown medium to	coarse grained	SANDSTON	E with gravels	and cobbles,	
3-5	Saugus Formatio moderately grade	Saugus Formation: Light brown fine to coarse grained SANDSTONE with scattered gravels (approximately 25%), massive, moderately graded, moist, very dense.	rained SANDSTON	E with scattered	l gravels (ap	proximately 25°	%), massive,	
	Total Depth - 5' No groundwater No caving Backfilled							
Graphic Log				7:01				
scale 1" = 5'		GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE .	TP131	

	Comments							
Homes	Description <u>Dump Fil/Colluvium</u> : Medium brown clayey silty SAND with gravels, cobbles and boulders (approximately 10%), with 2-3 clasts up to approximately 15' diameter abundant transh (mostly metal cansiboxes) in sinner 2.5', day loces.	Saugus Formation: Light yellow brown medium to coarse grained SANDSTONE with scattered gravels (approximately 30%), moderately graded, massive, moist, very dense.						
Client: Pardee Homes	ders (approximate	scattered gravels						
90/6/9	Description <u>Dump Fil/Colluvium</u> : Medium brown clayey siity SAND with gravels, cobbles and boulders (approxim to approximately 15' diameter abundant transh (mostly metal cansiboves) in super 25', day lose	SANDSTONE with					•	Access to the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se
Date Excavated:	SAND with gravels	to coarse grained (					-	
MN	brown clayey sifty	Saugus Formation: Light yellow brown medium t moderately graded, massive, moist, very dense.						
Logged By:	Description    Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   Description   D	mation: Light yellor graded, massive, I	- 4.5' ater					1010
LOG OF EXCAVATION Trench No. TP132			Total Depth - 4.5' No groundwater No caving Backfilled		D)			711 - 61
LOG OF EXC Trench No.	Depth (f	3-4.5		175 GR.LA.W	Graphic Log	 		

LOG OF EXCAVATION Trench No. TP133	AVATION TP133	Logged By: NM	Date Excavated:	90/6/9	Client: Pardee Homes	Sel	
Depth (ft)		Description					Comments
0-3	Topsoil: Mediun pipe.	Topsoil: Medium brown clayey silty SAND with occasional gravels, slightly moist, porous, medium dense, occasional old metal pipe.	th occasional gravels	, slightly moist, pon	ous, medium dense, oc	casional old metal	
3 - 5.5	Colluvium: Light medium dense.	Colluvium: Light medium brown silty fine to medium medium dense.		) and clayey SAND	grained SAND and clayey SAND with occasional gravels, slightly moist,	s, slightly moist,	
5.5 - 6'3"	Saugus Formati moist, very stiff.	<u>Saugus Formation</u> : Medium brown clayey StLTSTONE to sitty CLAYSTONE with occasional claystone fragments, massive, moist, very stiff.	.TSTONE to sity CL	4YSTONE with occ	asional claystone fragn	nents, massive,	,
6'3" - 7'3"	Light grayish br	Light grayish brown fine to medium grained SANDSTONE, moderately graded, slightly moist, very dense.	ANDSTONE, moder	ately graded, slightl	y moist, very dense.		
7'3" - 8	Medium brown	Medium brown clayey fine grained SANDSTONE with coarse sand grains, slightly moist, very dense.	NE with coarse sand	J grains, slightly mo	ist, very dense.		
	Total Depth - 8' No groundwater No caving Backfilled						
Graphic Log							
scale 1" = 5'	5.	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	TP133	

	Comments							
Client: Pardee Homes		cobbles and occasional boulders (approximately 2-3% greater than 1' diameter), to 8" diameter, well graded, dry to slightly moist with depth, medium dense,	OMERATE with sandy clay matrix,	light greenish gray CONGLOMERATE with fine to medium grained sandstone				PLATE TP134
Date Excavated: 6/12/06		ivels, cobbles and occasional boulders (a ches to 8" diameter, well graded, dry to s	ational contact to orange brown CONGL(	and		0 0 0 0		4GE W.O. 8838
	Description	Alluvium: Medium brown sandy CLAY with gravels, subangular to rounded clasts typically a few inches rootlets coarser grained with depth,	<u>Severely Weathered Saugus Formation</u> : Gradational contact to orange brown CONGLOMERATE with sandy clay matrix, occasional rootlets, moist, dense.	Saugus Formation: Mottled light reddish brown and matrix (approximately 15%), moist, very dense.	Total Depth - 4' No groundwater No caving Backfilled			GEOLABS-WESTLAKE VILLAGE
<b>S</b>	Depth (ft)	0-2.5	2.5-3	4	7 des de LL	Graphic Log		scale 1" = 5'

	Trench No. TP135	Logged by: NM Description	Uate Excavated:	6/12/06	Client: Parde	Pardee Homes	
	<u>Alluvium</u> : Mediur 1' diameter, clast	Alluvium: Medium brown sandy CLAY with subangular to subrounded gravels, cobbles, and occasional boulde 1' diameter, clasts typically 3'' diameter, well graded, dry to moist with depth, medium dense, rootlets, porous.	ibangular to subrounc graded, dry to moist w	ded gravels, cobbil vith depth, medium	es, and occasion dense, rootlets	Alluvium: Medium brown sandy CLAY with subangular to subrounded gravels, cobbles, and occasional boulders up to approximately 1' diameter, clasts typically 3' diameter, well graded, dry to moist with depth, medium dense, rootlets, porous.	Comments
2-3	Saugus Formatic crude faint flat lyi	Saugus Formation: Light orangish brown medium crude faint flat lying contacts, moist, very dense.		d SANDSTONE W	ith gravels (10-1	to coarse grained SANDSTONE with gravels (10-15%), moderately graded with	
3-4	Light yelfow brow very dense,	Light yellow brown medium to coarse grained SANDSTONE with very sparse gravels (less than 10%), moderately graded, moist, very dense.	SANDSTONE with v	ery sparse gravek	(less than 10%)	, moderately graded, moist,	
4-5 C	Srude faint conta	Crude faint contact to light yellow brown medium to		i graveliy SANDST	ONE, moderatel	coarse grained gravelly SANDSTONE, moderately graded, moist, very dense.	
F Z Z Ø	Total Depth - 5' No groundwater No caving Backfilled						
Craptine Log							
scale 1"=5'		GEOLABS-WESTLAKE VILLAGE	.0.W	8838	PLATE	E TP135	

LOG OF EXCAVATION Trench No. TP136	Logged By: NM	Date Excavated: 6/12/06	Client: Pardee Homes	
Depth (ft)	Description			Comments
0-2	<u>Alluvium: Medium brown sandy CLAY with gravels, cobbles, and boulders (approximately 'to subrounded clasts up to 2' diameter, rootlets, well graded, slightly moist, medium dense.</u>	cobbles, and boulders (approxi I graded, slightly moist, medium	cobbles, and boulders (approximately 15% greater than 1' diameter), subangular I graded, slightly moist, medium dense.	ngular
2-4	Saugus Formation: Light yellow brown gravelly SAN	IDSTONE with occasional oxida	DSTONE with occasional oxidation stains, moderately graded, moist, very dense.	dense.
4 - 6	Light yellow brown medium to coarse grained SANDSTONE with sparse gravels and cobbles, moderately graded, massive, moist, very dense.	OSTONE with sparse gravels ar	nd cobbles, moderately graded, massive, n	oist,
	Total Depth - 6' No groundwater No caving Backfilled			
Graphic Log				
scale 1"=5"	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP136	

	Comments	<u> </u>							
	Com								
		slightly	sive, very						
	<b>.</b>	ll graded,	ided, mass					:	TP137
Homes		ootlets, we t.	poorly gre						ļ
: Pardee Homes		oulders, ro ory contac	xidation,					,	PLATE
Client:		les and bo al undulate	e brown c			<u> </u> 			
6/12/06		rels, cobbi gradations	ight orang						
		inded grav lameter),	STONE, s'						8838
Date Excavated:		<u>Alluyium:</u> Medium brown sandy CLAY with subangular to subrounded gravels, cobbles and boulders, rootlets, well graded, slightly moist, medium dense (several large boulders approximately 3' diameter), gradational undulatory contact.	<u>Mint Canyon Formation:</u> Light greenish gray fine grained SANDSTONE, slight orange brown oxidation, poorly graded, massive, very dense, moist.		0.1		I		E W.O.
		with suban oulders app	h gray fine (		0		,		KE VILLAG
NC :		dy CLAY al large b	if greenis!						WESTLA
Logged By:	Description	m brown san dense (sever	<u>rnation:</u> Ligh	Ω					GEOLABS-WESTLAKE VILLAGE
NC VC		<u>ium</u> : Mediu t, medium c	<u>Mint Canyon For</u> dense, moist.	Total Depth - 4.5' No groundwater No caving Backfilled					
CAVATION TP137	(a	Alluv moisi		Total No g No G Back					, = 5 <sub>1</sub>
LOG OF EXCAVATION Trench No. TP137	Depth (ff	0 - 2.5	2.5 - 4.5		Graphic Log				scale 1"

Comments ameter),				
ameter),	_			
ਚ	uous 1			
roximately 1'	h a discontin			TP138
ers up to app aps).	MERATE wit se.			PLATE
asional boulde 1" (metal scr	ble CONGLO iist, very dens			
cobbles (occa	m gravel cob 3.5-4.5'), mo			8
ed gravels and e	iht reddish brow DSTONE (from			W.O. 8838
with scattere	gray and lig grained SAN			VILLAGE
ly silty CLAY s, dry to mois	light greenish h brown fine			GEOLABS-WESTLAKE VILLAGE
k brown sand vrous, rootlets	<u>tion</u> : Mottled of light reddisl	ين يـ		GEOLABS
<u>ʻolluvium</u> : Dari rell graded, po	iaugus Formai nick interbed o	otal Depth - 5. lo groundwate lo caving ackfilled		
	3 - 5.5 IS	FZZ®	aphic Log	scale 1" = 5'
	Colluvium: Dark Well graded, por			

	Comments		•,	ssive,	<u>-</u>		
Pardee Homes		n dense.	<u>Alluvium</u> : Medium brown sandy CLAY with abundant fine gravels and lesser coarse gravels and cobbles, well graded, massive, moist, medium stiff.	reddish brown fine to medium grained SANDSTONE, moderately graded, massive,	Gradational contact to light greenish gray fine grained SANDSTONE with angular to subrounded gravel and cobbles at 5.5', poorly to moderately graded, moist, very dense.		PLATE TP139
ed: 6/12/06 Client:		ravels and cobbles, porous, rootlets, medium dense.	Is and lesser coarse gravels an	n fine to medium grained SAND	ONE with angular to subrounde		8838
NM Date Excavated		f with occasional gravels and c	CLAY with abundant fine grave	nge brown to light reddish brown carbonate specs.	nish gray fine grained SANDS1 ry dense.		GEOLABS-WESTLAKE VILLAGE   W.O.
Logged By:	Description	<u>Topsoi</u> : Dark brown clayey SILT with occasional g	Alluvium: Medium brown sandy moist, medium stiff.	Saugus Formation: Medium orange brown to light moist, very dense, small calcium carbonate specs.	Gradational contact to light greenish gray to moderately graded, moist, very dense.	Total Depth - 6' No groundwater No caving Backfilled	GEOLABS-WE
5	Depth (ft)	0-1	4-1 A) F	4 - 5.5	5.5 - 6 G	H Z Z 6	scale 1" = 5"

4		Logged By: NM	Date Excavated:	6/12/06	Client:	Client: Pardee Homes	Ş	
Depth (ft)		Description						Comments
0 - 3.5	Alluvium: Mediur (approximately 2 graded.	<u>Alluvium</u> : Medium brown sandy CLAY to clayey SAND with abundant subangular to rounded gravel, cobble, and boulders (approximately 25% greater than 1' diameter), abundant rootlets, pinhole porosity, grading to coarse grained SAND at 2.5', well graded.	y SAND with abunda abundant rootlets, pi	nt subangufar to nhole porosity, ç	rounded gra	vel, cobble, a arse grained \$	ind boulders SAND at 2.5', well	
3.5 - 6	<u>Saugus Formatic</u>	Saugus Formation: Tan to light brown fine to medium grained SANDSTONE, massive, moist, very dense, occasional gravels.	nedium grained SANI	OSTONE, massi	ve, moist, ve	ry dense, occ	asional gravels.	
	Total Depth - 6' No groundwater No caving Backfilled							
Graphic Log			1.00	10000				
- 11	i							
scale 1"=5		GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE	TP140	

LOG OF EXCAVATION Trench No. TP141 Depth (ft)	AVATION TP141	Logged By: NM Description	Date Excavated:	6/13/06	Client: Pardee Homes	mes	Comments
0 - 1.5	Colluvium: Med	<u>Colluvium</u> : Medium brown silty SAND with gravels, porous, well graded, roots, medium dense.	rels, porous, well grad	ded, roots, mediu	m dense.		
1.5 - 5	Saugus Format typically 3" to 1(	<u>Saugus Formation</u> : Light orangish brown fine to coarse grained SANDSTONE with abundant gravels and cobbles, clasts are typically 3" to 10" diameter, massive, moist, very dense.	o coarse grained SAN y dense.	VDSTONE with at	oundant gravels and c	obbles, clasts are	
	Total Depth - 5' No groundwater No caving Backfilled						
Graphic Log							
				_			
scale 1"=5"	22.	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	TP141	

Description  um brown clayey fine to coarse grained SAND with abundant gravels and cobb  2 diameter at surface), well graded, medium dense, dry. <u>ared Saugus Formation</u> : Orange brown coarse grained sandy gravel cobble CO <u>ared Saugus Formation</u> : Orange brown sandy gravel cobble CONGLOMERATE ( very dense.	Homes Comments Iral boulders up to	ERATE with clay in matrix, ne matrix supported),				
Description  The straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of the straight of t	gravels and cobbles (several bou	gravel cobble CONGLOM				
Description  Um brown clayey fine to coarse  2' diameter at surface), well grage area Saugus Formation: Orange to very dense.	grained SAND with abundant	e brown coarse grained sandy brown sandy gravel cobble CC		01100		
	Description lium brown clayey fine to coarse 1-2' diameter at surface), well gra	Severely Weathered Saugus Formation: Orange moist, dense. Saugus Formation: Light brown to light orange to massive, moist, very dense.	Total Depth - 5.5' No groundwater No caving Backfilled			

l.≲	VATION TP143	Logged By: NM	Date Excavated:	6/13/06	Client: Par	Client: Pardee Homes	
Depth (ft)		Description					Comments
0 - 3.5	Colluvium: Medium roots, medium stiff.	Colluvium: Medium brown sandy CLAY with scattered gravels and cobbles, occasional boulders up to 1' diameter, porous, moist, roots, medium stiff.	attered gravels and	cobbles, occasior	al boulders up	to 1' diameter, porous, π	noist,
3.5 - 4.5	Weathered Sau matrix, rootlets,	Weathered Saugus Formation: Gradational contact matrix, rootlets, slightly moist, medium dense.	ntact to medium bro	wn sandy gravel c	abble CONGL	to medium brown sandy gravel cobble CONGLOMERATE with sandy clay	134
4.5 - 6.5	Saugus Format	Saugus Formation; Light brown sandy gravel cobble CONGLOMERATE, massive, moist, very dense.	obble CONGLOME	RATE, massive, m	oist, very dens	φ	
6.5 - 7	Irregular scoure	Irregular scoured contact to light brown very fine grained SANDSTONE, poorly graded, moist, massive, very dense.	ne grained SANDST	ONE, poorly grad€	:d, moist, mas:	iive, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	<u></u>					-
Graphic Log							
scale 1"=5"		GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE TP143	

	Comments	<u> </u>						
mes		<u>Topsoil</u> : Medium brown clayey SAND to sandy CLAY with abundant gravels and cobbles, well graded, roots, slightly moist, medium dense to medium stiff.	Colluvium: Medium brown sandy CLAY with scattered gravels and cobbles (higher % of clasts from 3.5-4.5' depth), occasional rootlets, moist, stiff.	Sauqus Formation: Light brown medium to coarse grained gravelly SANDSTONE with a 1' thick discontinuous interbed of gravel CONGLOMERATE from 5-6', moist, very dense.				TP144
Client: Pardee Homes		well graded, root	asts from 3.5-4.5	thick discontinue				PLATE
6/13/06 CII		ils and cobbles, v	s (higher % of cla	STONE with a 1'		101		
Date Excavated: 6/		h abundant grave	avefs and cobble	d gravelly SAND				W.O. 8838
Date Ex		sandy CLAY witl	with scattered gra	to coarse graine / dense.			,	<u> </u>
d By: NM	tion	clayey SAND to	n sandy CLAY v	t brown medium 5-6', moist, very			 	GEOLABS-WESTLAKE VILLAGE
	Description	Topsoil: Medium brown (dense to medium stiff.	Colluvium: Medium brow rootlets, moist, stiff.	Sauqus Formation: Light brown medium to coars CONGLOMERATE from 5-6', moist, very dense.	ppth - 7' ndwater ng id			GEOLA
LOG OF EXCAVATION Trench No. TP144	т (ft)				Total Depth - 7' No groundwater No caving Backfilled	- Bo		1" = 5'
LOG OF EX( Trench No.	Depth (ft)	01	1 - 4.5	4.5 - 7		Graphic Log	 <u>-</u>	scale

LOG OF EXCAVATION Trench No. TP145 Depth (ft)	Logged By: NM Date Excavated: 6/13/06 Client: Pardee Homes Description	iee Homes	Comments
Medi	Colluvium: Medium brown sifty clayey SAND with gravels and cobbles (mostly in bottom 6"), well graded, porous, rootlets, slightly moist to moist with depth, medium dense.	aded, porous,	
Formati ely to w	Saugus Formation: Light yellow brown sandy gravel CONGLOMERATE to conglomeratic fine to medium grained SANDSTONE, moderately to well graded, moist, very dense.	dium grained SANDSTONE,	
Total Depth - 5' No groundwater No caving Backfilled			
	W 0 8838	ATE TP145	
	0000	PLAIE 17143	

	Comments					
les		Colluvium: Medium brown fine to coarse grained SAND with gravel to sandy GRAVEL (mostly fine gravels), rootlets, slightly moist, medium dense.	Landslide Deposit (remnant Saugus Formation): Light yellow brown coarse grained fine gravel CONGLOMERATE, massive, moist, very dense.			TP146
Client: Pardee Homes		stly fine gravels),	ivel CONGLOME			PLATE
6/13/06 Clie		y GRAVEL (mos	grained fine gra			
Date Excavated: 6/1		h gravel to sand	w brown coarse			W.O. 8838
Date Exc		ained SAND wit	<u>tion)</u> : Light yello			
y: NM		ne to coarse gra	Saugus Forma			GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	fedium brown fil se.	eposit (remnant	r 7. ater		GEOLABS
AVATION TP146		Colluvium: Med medium dense.	Landslide De very dense.	Total Depth - 7" No groundwater No caving Backfilled		= 5'
LOG OF EXCAVATION Trench No. TP146	Depth (ft)	0-1.5	1.5 - 7		Graphic Log	scale 1"=

	Comments					
mes		Alluvium: Medium brown silty clayey fine to coarse grained SAND with abundant gravels, cobbles, and boulders (a few 3-4' subrounded boulders at surface), approximately 15% greater than 1' diameter, well graded, less fine content with depth, dry to moist at 3.5', medium dense.	Saugus Formation?: Light greenish gray and light brown CONGLOMERATE with fine to coarse grained sandstone supported matrix, moist, very dense, one 1.5' diameter clast.			TP147
Client: Pardee Homes		vels, cobbles, and bou graded, less fine conte	e to coarse grained sa			PLATE
ed: 6/13/06		۷D with abundant gra اعت 1′ diameter, well و	LOMERATE with fin			8838
Date Excavated:		xoarse grained SAN (ely 15% greater th	Hight brown CONG			LAGE W.O.
Logged By: NM	uc	silty clayey fine to c urface), approxima	l greenish gray and 5' diameter clast.			GEOLABS-WESTLAKE VILLAGE
	Description	Alluvium: Medium brown subrounded boulders at sat 3.5', medium dense.	Saugus Formation?: Light greenish gray a moist, very dense, one 1.5' diameter clast.	Total Depth - 5.5' No groundwater No caving Backfilled		GEOLAB
LOG OF EXCAVATION Trench No. TP147	_	0 - 4 Alluvi Subro at 3.5	4 - 5.5 Saug	Total Depl No ground No caving Backfilled	Graphic Log	scale 1" = 5'

	Comments							
Client: Pardee Homes		SAND with abundant gravels, cobbles and lesser boulders (approximately 10%) diameter, moist, medium dense.	oist, very dense.					PLATE TP148
Date Excavated: 6/13/06		_	Saugus Formation?: Light orangish brown sandy gravel cobble CONGLOMERATE, moist, very dense.					GE W.O. 8838
Logged By: NM	Description	Alluvium: Medium brown silty fine to coarse grained approximately 15% of boulders are between 1' to 2'	<u>mation?</u> : Light orangish brown sand	- 4.5' vater				GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP148	Depth (ft)	0 - 3 Alluvium: Mapproximate	3 - 4.5 Saugus For	Total Depth - 4.5' No groundwater No caving Backfilled	Graphic Log		=	scale 1"=5

5		Logged By: NM	Date Excavated: 6/13/06	6/13/06	Client: Pardee Homes	omes	
Depth (ft)	φ.	Description					Comments
2-0	Colluvium: Mediui 7', abundant bould	Colluvium: Medium brown silty fine to medium grained SAND with gravels and cobbles, moist to wet with seepage at approximately 7, abundant boulders on surface up to approx. 2' diameter, medium dense, steeply incised at contact.	rained SAND with o	gravels and cobbles n dense, steeply inc	, moist to wet with sised at contact.	eepage at approximately	
7 - 8.5	Saugus Formation approximately 2' o	Saugus Formation?: Light yellow brown sandy CONGLOMERATE with occasional boulders (one clast in bottom of trench approximately 2' diameter), very moist, very dense.	ONGLOMERATE Se.	with occasional bou	iders (one clast in t	ottom of trench	
	Total Depth - 8.5' Seep at 7' No caving Backfilled						
Graphic Log		( )					
		0,0					
			<del></del> ,				
scale 1" = 5'		GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	TP149	

	Comments								
Pardee Homes		Alluvium: Medium to dark brown silty clayey SAND with abundant gravels and cobbles with lesser boulders (approx. 15%), subangular to rounded clasts typically a few inches diameter with 3 or 4 clasts up to 2' diameter, roots, porous, slightly moist, medium dense.	grained sandy gravel CONGLOMERATE, massive, slightly moist, roots, dense,	ry dense.					PLATE 7P150
Client:		bles with less to 2' diameter	OMERATE, m	iive, moist, ve					
d: 6/13/06		nt gravels and cob h 3 or 4 clasts up	Jy gravel CONGL(	Light yellow brown fine to medium grained sandy gravel CONGLOMERATE, massive, moist, very dense.		0000	<u></u>		8838
Date Excavated:		ND with abundar hes diameter wit	ium grained sand	iy gravel CONGL					GE W.O.
NM		Alluvium: Medium to dark brown silty clayey SAND subangular to rounded clasts typically a few inches medium dense.	Saugus Formation?: Orange brown fine to medium highly weathered.	ium grained sand					GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	um to dark brow rounded clasts t	<u>tion?</u> : Orange bi ed.	own fine to med	<del>-</del> -				GEOLABS-W
VATION TP150		Alluvium: Medit subangular to n medium dense.	Saugus Formation highly weathered	Light yellow br	Total Depth - 5' No groundwater No caving Backfilled				5'
LOG OF EXCAVATION Trench No. TP150	Depth (ft)	0-2	2-3	3-5		Graphic Log			scale 1"=5

	Comments							-
dee Homes		Alluvium: Medium to dark brown sandy CLAY with scattered gravels and cobbles (approximately 15%), rootlets, moist, porous, medium stiff.	Saugus Formation: Light grayish brown sandy silty CLAY, moist, massive, medium stiff, occasional rootlets, highly weathered to 3'.	silty fine grained SANDSTONE, poorly graded, massive, moist, very dense.				PLATE TP151
Client: Pardee Homes		(approximately 15)	m stiff, occasional I	NE, poorly graded,				PL
ited: 6/14/06		ravels and cobbles	ist, massive, mediu	grained SANDSTC				8838
Date Excavated:		4Y with scattered g	ndy silty CLAY, moi					ILLAGE W.O.
Logged By: NM	otion	irk brown sandy CL	ıt grayish brown saı	Light brown and light reddish brown fine grained and				GEOLABS-WESTLAKE VILLAGE
	Description	Alluvium: Medium to da medium stiff.	igus Formation: Ligh	at brown and light re	ָרָ בְּיִבְּיִבְּיִרְ בִּיִּבְּיִרְ בִּיִּבְּיִרְ בִּיִּבְּיִרְ בִּיִּבְּיִרְ בִּיִּבְּיִרְ בִּיִּבְּיִבְּיִרְ	No groundwate No caving Backfilled		GEOL
LOG OF EXCAVATION Trench No. TP151	Depth (ft)	0 - 1.5 Allu	1.5 - 3 Sau	3-5 Ligh	, the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the	N N N N N N N N N N N N N N N N N N N	Graphic Log	scale 1"=5

	Comments				<del>-</del>		
Client: Pardee Homes		ately 15% greater than 1' diameter), typically	cobbles and lesser boulders (approximately 15% greater than 1' diameter, typically nedium stiff to stiff.	Ill gravels, moderately graded, massive. se, calcium carbonate stains.			PLATE TP152
Date Excavated: 6/14/06		, cobbles, and lesser boulders (approxim: , medium dense.	vels, cobbles and lesser boulders (approx oist, medium stiff to stiff.	grained SANDSTONE with scattered sma lined SANDSTONE at 4', moist, very dens			LAGE W.O. 8838
	Description	Topsoil: Dark brown clayey SAND with gravels, cobbles, and lesser boulders (approximately 15% greater than 1' diameter), typically 1-1.5' diameter, rootlets, porous, slightly moist, medium dense.	Alluvium: Medium brown sandy CLAY with gravels, cobbles and lesser 1-1.5' diameter), sandy CLAY at 2', massive moist, medium stiff to stiff.	Saugus Formation: Light brown fine to coarse grained SANDSTONE with scattered small gravels, moderately graded, massive. Gradational contact with medium to coarse grained SANDSTONE at 4', moist, very dense, calcium carbonate stains.	Total Depth - 5' No groundwater No caving Backfilled		GEOLABS-WESTLAKE VILL
X I	Depth (ft)	0-1	1 - 3 <u>All</u>	3.5	or N N S R B	Graphic Log	scale 1"=5"

	Comments			5 · 10	
Client: Pardee Homes		<u>Alluvium</u> : Medium brown fine to coarse grained clayey SAND with abundant angular to subrounded gravels, cobbles and lesser boulders (approximately 15%) up to 1.5' diameter, well graded, porous, rootiets, moist, medium dense.	Saugus Formation: Light brown and light orangish brown sandy CONGLOMERATE, abundant cobbles, massive, moist, very dense, sandstone supported matrix.		PLATE TP153
		gular to subrounde , moist, medium d	ATE, abundant co		4
Date Excavated: 6/14/06		with abundant and ed, porous, rootlets	idy CONGLOMER.		8838
⊢⊣		ined clayey SAND ameter, well grade	rangish brown san		"LLAGE W.O
Logged By: NM	Description	<u>Alluvium:</u> Medium brown fine to coarse grained clayey SAND with abundant angular to subrounded graboulders (approximately 15%) up to 1.5' diameter, well graded, porous, rootiets, moist, medium dense.	n: Light brown and light o rted matrix.		GEOLABS-WESTLAKE VILLAGE
		Alluvium: Medium boulders (approxi	Saugus Formation: Light bro sandstone supported matrix.	Total Depth - 5' No groundwater No caving Backfilled	
LOG OF EXCAVATION Trench No. TP153	Depth (ft)	e-0	3-5		scale 1"=5'

	Comments					
706 Client: Pardee Homes		<u>Alluvium</u> : Medium brown clayey fine to coarse grained SAND with abundant gravels, cobbles and boulders (approximately 25% greater than 1' diameter), several boulders up to 3' diameter, coarsening with depth, well graded, slightly moist, medium dense.	<u>Saugus Formation</u> : Light brown sandy CONGLOMERATE fine to coarse grained sandstone supported matrix, occasional boulders up to 1.5' diameter, moist, very dense.			PLATE TP154
Date Excavated: 6/14/06		grained SAND with abundant g to 3' diameter, coarsening with	OMERATE fine to coarse grain			4GE W.O. 8838
Logged By: NM	Description	um brown clayey fine to coarse diameter), several boulders up	Saugus Formation: Light brown sandy CONGL up to 1.5' diameter, moist, very dense.	L		GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP154		0 - 2.5 <u>Alluvium</u> : Mediu greater than 1' o	2.5 - 5 Saugus Formati up to 1.5' diame	Total Depth - 5' No groundwater No caving Backfilled	<u> </u> S	scale 1"=5'

	Description	Alluvium: Medium brown silty fine to coarse grained SAND with abundant gravels, cobbles and boulders (approximately 25% greater than 1' diameter up to approximately 2.5' diameter), moist, medium dense, rootlets.	Saugus Formation: Light orangish to light brown fine to coarse grained sandy CONGLOMERATE with several 1.5' diameter clasts of granite/tonalite, moist to very moist with depth, very dense.	Depth - 5' vundwater ving led			
<u> </u>	Descript	<u>lluvium</u> : Medium brown ian 1' diameter up to a <u>ç</u>	augus Formation: Light granite/tonalite, moist	Total Depth - 5' No groundwater No caving Backfilled			
LOG OF EXCAVATION Trench No. TP155	Depth (ft)	0-2.5 A	2.5 - 5 S.	ĭ Ž Ž Š	 Graphic Log		

	Comments				
Client: Pardee Homes		Alluvium: Medium brown clayey silty fine to coarse grained SAND with abundant angular to subrounded gravels, cobbles and lesser boulders (approximately 10% greater than 1' diameter up to 2' diameter), pockets of medium to coarse grained SAND at 2', well graded, rootlets, moist, medium dense.	Saugus Formation: Irregular undulating contact to light brown gravel cobble CONGLOMERATE (approximately 40% fine to coarse grained sandstone supported matrix), massive, moist to very moist, very dense.		PLATE TP156
		nt angular to sub ets of medium to	NGLOMERATE.		
ed: 6/14/06		ND with abundar diameter), pocke	ıravel cobble CC loist, very dense		8838
Date Excavated:		irse grained SAN ameter up to 2' o	t to light brown g moist to very m		IGE W.O.
NIN :		rey silty fine to coa greater than 1' di um dense.	Saugus Formation: Irregular undulating contact to light brown gravel cobble CO grained sandstone supported matrix), massive, moist to very moist, very dense.		GEOLABS-WESTLAKE VILLAGE
Logged By:	Description	Alluvium: Medium brown clayey silty fin boulders (approximately 10% greater the graded, rootlets, moist, medium dense.	<u>nation:</u> Irregular i Istone supported	. S. ster	GEOLABS-\
LOG OF EXCAVATION Trench No. TP156		Alluvium: Me boulders (app graded, rooth	Saugus Form grained sand	Total Depth - 5' No groundwater No caving Backfilled	= 5'
LOG OF EXC Trench No.	Depth (ft)	0-3	3.5		scale 1"=

LOG OF EXCAVATION Trench No. TP157	VATION TP157	Logged By: NM	Date Excavated:	6/14/06	Client: Parde	Pardee Homes	
Depth (ft)		Description					Comments
0 - 3.5	Colluvium: Mediu	Colluvium: Medium brown sandy CLAY with gravels		occasional boulder	s approximately	and cobbles, occasional boulders approximately 1' diameter, moist, stiff, rootlets.	 .y.;
3.5 - 4'2"	Saugus Formation moist, very dense.	Saugus Formation: Gradational contact with light brown silty very fine grained SANDSTONE, moderately graded, massive, slightly moist, very dense.	ght brown silty very	fine grained SAND	STONE, modera	tely graded, massive, slightly	
4'2" - 4'10"	Light medium browith a discontinuo	Light medium brown StLTSTONE ranging from 3" to 8" thick, base is interfir with a discontinuous paper thin silty claystone bed at base, molst, very stiff.		is interfingered wi very stiff.	th sandstone bel	8" thick, base is interfingered with sandstone below, semi planar contacts t base, molst, very stiff.	··-·
4'10" - 5'4"	Light reddish bro	Light reddish brown silty fine to medium grained SANDSTONE, moderately graded, massive with semi planar contact at base.	ed SANDSTONE, m	oderately graded, ı	nassive with sen	ni planar contact at base.	
5'4" - 8.5	Light brown to lig	Light brown to light greenish brown fine to coarse grained SANDSTONE with gravels and cobbles (conglomeratic sandstone).	rse grained SANDS	TONE with gravels	and cobbles (co	inglomeratic sandstone).	
	Total Depth - 8.5' No groundwater No caving Backfilled						
Graphic Log							
		000	° 0 0	000			
			000				
scale 1"=	5,	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	VTE TP157	

LOG OF EXCAVATION Trench No. TP158	4VATION TP158	Logged By: NM	Date Excavated:	6/14/06	Client: Pardee Homes	mes	
Depth (ft)		Description					Comments
4-0	Alluvium: Mediu greater than 1' c moist to very ma	Alluvium: Medium brown clayey fine to coarse grained SAND with abundant gravels, cobbles and boulders (approximately 35% greater than 1' diameter), boulder clasts typically 1-2' diameter, well graded with discontinuous pockets up to 1' thick of coarse sand, moist to very moist at base, medium dense.	grained SAND with a ly 1-2' diameter, we	abundant gravels, il graded with disα	cobbles and boulders intinuous pockets up	(approximately 35% to 1' thick of coarse sand,	
4-6	Saugus Format	Saugus For <u>mation</u> : Light brown sandy CONGLOMERATE, very moist, very dense.	OMERATE, very m	oist, very dense.			
	Total Depth - 6' No groundwater No caving Backfilled	L					
Graphic Log							
			9	0000			
		<u>.</u>		:			
scale 1"=5	5.	GEOLABS-WESTLAKE VILLAGE	. W.O.	8838	PLATE	TP158	

	Comments				<del>-</del>				
omes		Alluvium: Medium brown silty SAND with gravels and cobbles up to 1' diameter, porous, well graded, rootlets, moist, medium dense.	Saugus Formation: Light brown fine to coarse grained SANDSTONE with gravels (conglomeratic sandstone), moderately to well graded, massive, moist, very dense.						TP159
Client: Pardee Homes		graded, rootl	ratic sandstor						PLATE
		, porous, well	els (conglome				·		
6/14/06		to 1' diameter	NE with grave				0		8838
Date Excavated:		and cobbles up	ined SANDSTO				000		W.O.
		ND with gravels	ne to coarse gra se.				0:		TLAKE VILLAGI
Logged By: NM	Description	m brown silty SAN	Saugus Formation: Light brown fine graded, massive, moist, very dense.					_	GEOLABS-WESTLAKE VILLAGE
	4	<u>Alluvium:</u> Mediur dense.	Saugus Formati graded, massive	Total Depth - 5' No groundwater No caving Backfilled					
LOG OF EXCAVATION Trench No. TP159	Depth (ft)	0-2.5	2.5 - 5			Graphic Log			scale 1"=5'

	Comments							
VATION Logged By: NM Date Excavated: 6/14/06 Client: Pardee Homes TP160	Description	Colluvium: Medium to dark brown fine to coarse grained sandy CLAY to clayey SAND with gravels and occasional cobbles, porous, rootlets, slightly moist, medium stiff.	Weathered Saugus Formation: Red brown fine to coarse grained sandy CLAY, moist, stiff.	<u>Saugus Formation</u> : Light yellowish brown fine to coarse grained SANDSTONE with scattered gravels (approximately 10%), moderately graded, massive, moist, very dense	Total Depth - 5' No groundwater No caving Backfilled			GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP160
LOG OF EXCAVATION Trench No. TP160	Depth (ft)	0-2	2-2.5	2.5-5		Graphic Log		scale 1"=5

	Comments								
	Ö		lying tely						
		<u>Alluvium:</u> Medium brown clayey fine to coarse grained SAND with gravels, cobbles and boulders (approximately 25% greater than 1' diameter), boulders typically 1.5-2' diameter, mostly granitic, well graded, rootlets, moist, medium dense.	Saugus Formation: Irregular undulating contact with light brown fine grained SANDSTONE, poorly graded with a gradational flat lying contact at approximately 4', with light yellowish brown fine to coarse grained SANDSTONE with gravels and cobbles (approximately 20%), moderately graded, moist, very dense.						TP161
e Homes	<b>!</b>	roximately 2 se.	is and cobb						
Client: Pardee Homes		oulders (app medium den	E, poorly gra E with grave						PLATE
		bbles and bo lets, moist, a	SANDSTON						
6/15/0		gravels, col graded, root	ne grained S se grained S			1:0			8838
Date Excavated: 6/15/06		ed SAND with gravels, cobbles and boulders (approvigranitic, well graded, rootlets, moist, medium dense.	ght brown fii fine to coar			0 80	2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00	-	W.O.
Date		arse grainec er, mostly g	ontact with li wish brown ise.			0.8			VILLAGE
MN		y fine to co. .5-2' diamet	ndulating co th light yello ist, very den			9			VESTLAKE
Logged By:	Description	<u>Alluvium:</u> Medium brown clayey fine to coarse grain diameter), boulders typically 1.5-2' diameter, mostly	Saugus Formation: Irregular undulating contacontact at approximately 4', with light yellowis 20%), moderately graded, moist, very dense.			V			GEOLABS-WESTLAKE VIL.
N -		<u>ım</u> : Medium ter), boulde	us Formation ct at approxi moderately	Total Depth - 5.5' No groundwater No caving Backfilled					
CAVATION TP161		<u>Alluvit</u> diame	Sauge contac 20%),	Total Dept No ground No caving Backfilled					= 5'
LOG OF EXCAVATION Trench No. TP161	Depth (ft)	0-3	3 - 5.5		Graphic Log				scale 1"

<b>!</b>		Logged By: NM	Date Excavated:	6/15/06	Client: Par	Client: Pardee Homes			
Depth (ft)	Ш	Description						Comments	suts
0 - 3	Alluvium: Medium boulders typically	Alluvium: Medium brown clayey silty SAND with gravels, cobbles and boulders (approximately 25% greater than 1' diameter), boulders typically 1-2' diameter, well graded, rootlets, dry at surface to moist with depth, medium dense.	th gravels, cobbles are	nd boulders (approse) to moist with dep	oximately 25% th, medium de	s greater than ense.	r 1' diameter),	1000	<u> </u>
3-6	Saugus Formatio (abundant gravelt	Saugus Formation: Gradational contact witho orangish brown and light reddish brown fine to coarse grained sandy CONGLOMERATE (abundant gravels and cobbles), massive, moist, very dense.	orangish brown and l st, very dense.	ight reddish browr	fine to coars	e grained sar	ndy CONGLOMER	АТЕ	
	Total Depth - 6' No groundwater No caving Backfilled								<del> = '</del> *
									<del></del>
Graphic Log									
		0000		6					
		00	000		_				
scale 1"=5'		GEOLABS-WESTLAKE VILLAGE	W.O.	8838	<u>a</u>	PLATE T	TP162		

LOG OF EXCAVATION Trench No. TP163	VATION TP163	Logged By: NM	Date Excavated:	d: 6/15/06	Client: F	Client: Pardee Homes		
Depth (ft)		Description						Comments
0-3	Alluvium: Mediu graded, roottets,	<u>Alluvium</u> : Medium brown clayey silty SAND with gravels, cobbles and lesser boulders (approximately 5%) up to 1.5' diameter, well graded, rootlets, slightly moist, medium dense.	n gravels, cobble:	s and lesser bould	ers (approxim	ately 5%) up to	1.5' diameter, well	
3-6	Saugus Formati graded, massive	<u>Saugus Formation</u> : Gradational contact with light reddish brown silty fine grained SANDSTONE with coarse sand grains, moderately graded, massive, moist, very dense, calcium carbonate stains in upper 2'.	ht reddish brown irbonate stains in	silty fine grained \$ r upper 2'.	SANDSTONE	with coarse san	nd grains, moderately	
	Total Depth - 6' No groundwater No caving Backfilled							
Graphic Log								
			1 2		00			
scale 1" = {	5'	GEOLABS-WESTLAKE VILLAGE	AGE W.O.	8838		PLATE	TP163	

LOG OF EXCAVATION Trench No. TP164	VATION Logged By: TP164	d By: NM	Date Excavated:	6/15/06	Client: Pardee Homes	nes	
Depth (ft)	Description	lon					Comments
0 - 2'	Topsoil: Medium brown sandy CLAY with occasional gravels, porous, rootlets.	sandy CLAY with occar	sional gravels, poro	us, rootlets.			
2-9	Landslide Debris: Crudely interbedded light medium brown silty fine to coarse grained SAND and medium brown sandy CLAY, occasional graevis, discontinuous wavy contact, abundant rootlets, pinhole porosity.	ly interbedded light me ontinuous wavy contac	dium brown silty fine t, abundant rootlets,	e to coarse graine pinhole porosity.	d SAND and medium b	rown sandy CLAY,	
.8.6 - 6	Medium brown sandy CLAYSTONE, grading to silty CLAYSTONE in bottom 2-3 inches (possible base of slide but with no clearly defined bounding surface), slightly polished when picked fresh, moist, massive, stiff.	_AYSTONE, grading to e), slightly polished wh	silty CLAYSTONE I	in bottom 2-3 inchist, massive, stiff.	ies (possible base of si	de but with no clearly	
9'8" - 10'4"	Saugus Formation?: Contact not planar but clear to	itact not planar but cle		/ fine grained SA)	light brown silty fine grained SANDSTONE, massive, moist, very dense.	oist, very dense.	
10'4" - 10'7"	Grading to medium brown silty CLAY, massive, moi	n silty CLAY, massive,	, moist, very stiff.				·
10'7" - 11'7"	Grading to light brown sandy SILTSTONE, massive, moist, very stiff.	andy SILTSTONE, mas	ssive, moist, very stil	<u></u>			_
11'7" - 12.5	Light grayish brown fine to coarse grained SANDST moist, very dense to hard.  Total Depth - 12.5', No groundwater, No caving, Bar	to coarse grained SAN 1. roundwater, No caving	DSTONE with abun	dant fine gravels,	well graded, massive,	ONE with abundant fine gravels, well graded, massive, calcium carbonate stains, ckfilled	
Graphic Log							
	<u></u>	Rage of Ole	0/0//				
scale 1"=5		GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	TP164	

LOG OF EXCAVATION Trench No. TP165	(VATION TP165	Logged By: NM	Date Excavated:	6/16/06	Client: Pa	Pardee Homes		
Depth (ft)		Description						Comments
0 - 4.5	Landslide Debr diameter, well g	<u>Landslide Debris?</u> : Medium brown silty sandy CLAY with scattered gravels and cobbles, several boulders at base up to 14" diameter, well graded, moist, medium stiff.	CLAY with scattered	d gravels and cobb	les, several b	oulders at base	up to 14"	
4.5-7	Gradational cor	Gradational contact with medium brown silty very fir		le grained SANDSTONE, massive, moist, very dense.	e, moist, very	dense.		
7 - 13	Saugus Format and fine gravel, gradational con	<u>Saugus Formation?</u> : Gradational contact to medium brown to light reddish brown silty fine grained SANDSTONE with coarse sand and fine gravel, 8-10' has higher concentration of small gravels (approximately 40%), massive with occasional vague flat lying gradational contacts, moist, very dense.	nedium brown to ligh n of small gravels (a	ıt reddish brown sil pproximately 40%)	y fine grainec , massive with	d SANDSTONE 1 occasional vaç	with coarse sand jue flat lying	
	Total Depth - 13' No groundwater No caving Backfilled	čo. L						
Graphic Log								
		0.0	0.		<u> </u>	<u> </u>	-···	
		1,	0	000				
			/0.			,		
			000	<u> </u>				
							,	
scale 1" = 5	ري.	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE TF	TP165	

K	VATION TP166	Logged By: NM	Date Excavated:	90/19/09		Client: Pardee Homes		
Depth (ft)		Description						Comments
0 - 1.5	Alluvium: Medi (one at surface	Alluvium: Medium brown fine to coarse grained gravelly SAND with scattered cobbles and very sparse boulders up to 1.5' diameter (one at surface approximately 2' diameter), well graded, loose to medium dense, dry, rootlets.	ed gravelly SAND wi	th scattered cobb medium dense, di	les and very s. y, rootlets.	parse boulders	up to 1.5' diameter	
1.5 - 4	Saugus Forma very dense.	<u>Saugus Formation:</u> Light brown sandy CONGLOME very dense.	LOMERATE with fin	te to coarse grain	ed sandstone	supported matr	:RATE with fine to coarse grained sandstone supported matrix, massive, moist,	
	Total Depth - 4' No groundwater No caving Backfilled	÷						
Graphic Log								
				000 000 000	A			
scale 1"=	5.	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE T	TP166	

LOG OF EXCAVATION Trench No. TP167		y: NM	Date Excavated:	6/16/06	Client: Pardee Homes	Homes	
	Description	ption					Comments
0-2	<u>Alluvium</u> : Medium brow well graded, porous, roo	Alluvium: Medium brown silty fine to coarse grained SAND with grave well graded, porous, rootlets, dry to moist with depth, medium dense.	ed SAND with grav pth, medium dense	/els, cobbles, and e.	sparse boulders	SAND with gravels, cobbles, and sparse boulders (approximately 1' diameter), , medium dense.	
2 - 5	Saugus Formation: Gradatic massive, moist, very dense.	Saugus Formation: Gradational contact with medium brown silty fine grained SANDSTONE with coarse sand and fine gravel massive, moist, very dense.	ium brown silty fine	e grained SANDS1	ONE with coarse	sand and fine gravel	
	Total Depth - 5' No groundwater No caving Backfilled						
Graphic Log							
scale 1" = {	5' GEOL	GEOLABS-WESTLAKE VILLAGE	W.O.	8838	PLATE	E TP167	

LOG OF EXCAVATION Trench No. TP168	VATION TP168	Logged By: NM	Date Excavated:	6/16/06	Client: F	Pardee Homes		
Depth (ft)		Description						Comments
0 - 4.5	Alfuvium: Medito 1.5' diamete	<u>Alluvium:</u> Medium brown sandy CLAY with scattered angular to subrounded gravels, cobbles and lesser boulders (in upper 18") up to 1.5' diameter, rootlets, moist, medium stiff to stiff with deph.	ttered angular to su stiff with deph.	ubrounded gravel	s, cobbles and	lesser boulder	s (in upper 18") up	
4.5 - 7	Saugus Forma at 6', grades to dense.	Saugus Formation: Light medium brown silty fie to medium grained SANDSTONE with occasional coarse sand and fine gravel at 6', grades to silty fine to medium grained SANDSTONE with abundant coarse sand and small gravels, massive, moist, very dense.	e to medium graine NDSTONE with ab	d SANDSTONE	with occasions nd and small i	il coarse sand a gravels, massiv	and fine gravel e, moist, very	
	Total Depth - 7' No groundwater No caving Backfilled	- In						
Graphic Log								
			06:	00,1	000			
			·	100 800		- · • · · · ·		
scale 1"=5'	.0	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE 1	TP168	

	Comments							
Client: Pardee Homes	7.784	Alluvium: Medium brown silty clayey SAND with gravels, cobbles and occasional boulders, approximately 1' diameter, well graded, slightly moist, medium dense, rootlets.	Saugus Formation: Gradational contact with light reddish brown silty fine to medium grained SANDSTONE with scattered coarse sand and sparse fine gravels, calcium carbonate stains, rootlets, massive, moist, dense, highly weathered to 4.5'.	Grading to light reddish brown to medium brown fine to medium grained SANDSTONE with scattered coarse sand and fine subangular to rounded fine gravels, massive, moist, very dense.			<u> </u>	PLATE TP169
6/16/06 Client		ocasional boulders, ap	e to medium grained S /e, moist, dense, highl	I SANDSTONE with so			0.00.00	
Date Excavated:		ravels, cobbles and oc	reddish brown silty fine stains, rootlets, massiv	ine to medium grained st, very dense.			000000	E W.O. 8838
MN	١	ilty clayey SAND with g se, rootlets.	ional contact with light	own to medium brown t gravels, massive, moi				 GEOLABS-WESTLAKE VILLAGE
ION Logged By:	Description	Alluvium: Medium brown silty clayey S slightly moist, medium dense, rootlets.	<u>Saugus Formation:</u> Gradational contact with light reddish brown silty fine to medium grained SANDSTONE with s sand and sparse fine gravels, calcium carbonate stains, rootlets, massive, moist, dense, highly weathered to 4.5'.	Grading to light reddish brown to medium brown fine subangular to rounded fine gravels, massive, moist,	Total Depth - 6' No groundwater No caving Backfilled			 GEOLAB
LOG OF EXCAVATION Trench No. TP169	Depth (ft)	0 - 2 Allu	2 - 4.5 <u>Sau</u> san	4.5 - 6 Grasubi	Tote No ( No e	Graphic Log		scale 1" = 5'

LOG OF EXCAVATION Trench No. TP170	VATION TP170	Logged By: RMP	Date Excavated:	8/2/06	Client: P	Pardee Homes		
Depth (ft)		Description						Comments
0 - 1.5	Topsoil: Dark br	Topsoil: Dark brown fine to medium grained sandy clayey SILT, graded, stiff, moist, rootlets.	andy clayey SILT, go	aded, stiff, moist,	rootlets.			
1.5 - 3	Saugus Formation	Saugus Formation: Yetlowish brown sandy SILTSTONE, poorly graded, very stiff, moist, weakly indurated.	-TSTONE, poorly gr	aded, very stiff, m	oist, weakly	ndurated.		
3-5	Grades to subangular to si well graded, dense, moist.	Grades to subangular to subrounded fine grained gravel CONGLOMERATE with weakly cemented silty fine to coarse sand matrix, well graded, dense, moist.	ned gravel CONGLC	MERATE with we	akly cement	ed slity fine to co:	arse sand matrix,	@5' B N86W/28NE
5 - 5.5	Dark brown CLA	Dark brown CLAYSTONE, poorly graded, very stiff,	r stiff, moist, sheared	I, varíable thickne	ss (1-6" thick	) but continuous,	moist, sheared, variable thickness (1-6" thick) but continuous, wavy upper contact.	. *
5.5-8	Grades to subar	Grades to subangular to subrounded yellow brown fine grained gravel CONGLOMERATE, well graded, dense, moist, trace cobbles.	own fine grained gra	avel CONGLOME	≳ATE, well g	raded, dense, mo	oist, trace cobbles.	
	Total Depth - 8' No groundwater No caving Backfilled							
Graphic Log		8		2				
			38.9	000				
scale 1"=5	2	GEOLABS-WESTLAKE VILLAGE	W.O.	8838		PLATE TP	TP170	

LOG OF EXCAVATION Trench No. TP171	AVATION Logged By: RMP Date Excavated: 8/2/06 Client: Pardee Homes TP171	
Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Brown sifty fine to coarse grained SAND, graded, dense, dry to moist, with depth, rootlets.	
1.5 - 3.5	Saugus Formation: Yellowish brown fine grained gravelly silty fine to coarse grained SANDSTONE, graded, dense, moist, weakly cemented.	
3.5 - 4.5	1' thick channeled sand in east wall, yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dense, moist.	
4.5 - 5.5	Brown silty CLAYSTONE with fine to coarse sand, graded, hard, moist.	
5.5 - 5.7	Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with weakly cemented silty fine to coarse sand matrix, well graded.	
5.7.7	Brown fine to coarse grained sandy silty CLAYSTONE, graded, hard, moist.	
8-7	Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with weakly cemented silty fine to coarse sand matrix, well graded.	
8 - 9.5	1.5' thick dark yellowish brown CLAYSTONE, hard, moist, sheared, waxy.	Total Depth - 9.5' No groundwater
@9.5/	Grades to fine grained gravelly fine to coarse grained sandy CLAYSTONE, graded, hard, moist, weakly indurated.	No caving Backfilled
Grapnic Log		
scale 1"= 5	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP171	

LOG OF EXCAVATION Trench No. TP172	AVATION         Logged By:         RMP         Date Excavated:         8/2/06         Client:         Pardee Homes           TP172         AVATION         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available         Available	
Depth (ft)	Description	Comments
0 - 2	Topsoil: Dark brown clayey fine to coarse grained SANDSTONE, graded, dense, moist, rootlets, pervasive white carbonate veinlets in lower 6".	veinlets
2 - 3.5	Saugus Formation: 4" thick dark yellowish brown fine to medium grained sandy CLAYSTONE, very stiff, moist.	
3.5 - 5.5	Grades to yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with weakly cemented to slightly friable clayey fine to coarse sand matrix, well graded, dense, moist.	tty friable
5.5 - 6.5	Reddish brown fine grained gravelly clayey fine to medium grained SANDSTONE, graded, dense, moist, weakly indurated discontinuous.	
6.5 - 7.5	Discontinuous channeled sand in head wall and part of west wall, yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, dense.	ravel
7.5-8	6" thick yellowish brown fine to medium grained sandy SILTSTONE, poorly graded, very stiff, moist.	
8.8.8	2" thick dark yellowish brown silty CLAYSTONE, grades to 6" thick silty fine grained SANDSTONE interbed.	
8'8" - 9,5	CLAYSTONE grades to fine grained gravel CONGLOMERATE at 9'.	
	Total Depth - 9.5', No groundwater, No caving, Backfilled	
Graphic Log		
scale 1"= (	5 GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP172	

	Comments			***************************************	BN26W/27SW		
	Description  Toosoil: Dark brown fine to coarse grained SAND with clay silf and gravel well graded dense dry to moist with denth subangular	to subrounded clasts, rootlets.	Saugus Formation: Yellowish brown clayey fine to coarse grained SAND with fine gravel, graded, very dense, moist, weakly indurated, clasts are subangular to subrounded.	Grades to yellowish brown subangular to subrounded fine grained gravel-cobble CONGLOMERATE with slightly friable to weakly cemented silty fine to coarse sand matrix, well graded, very dense, moist.	Sharp scoured contact with yellowish brown silty fine to medium grained SANDSTONE, poorly graded, very dense, moist, weakly to moderately indurated, grades to coarse sand at 6', mottled appearance.	Total Depth - 7' No groundwater No caving Backfilled	GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP173
LOG OF EXCAVATION Trench No. TP173	Depth (ft)		3 - 4 E	4 - 5.5 G	5.5 - 7   SI	řžžď	scale 1"=5'

Excavated: 8/2/06 Client: Pardee Homes	Comments	SAND, graded, dense, dry to moist with depth, rootlets.	Saugus Formation: Yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with fine to coarse sand matrix, matrix, well graded, dense, moist, pervasive fractures, rootlets	Yellowish brown fine grained sandy SILTSTONE, poorly graded, very stiff, moist, rootlets, pervasive fractures.	BN46W/10SW	welly fine to coarse grained SANDSTONE with silt, graded, very dense, moist,	Grades to yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist.		2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	W.O. 8838 PLATE TP174
Logged By: RMP Date	Description	Topsoil: Dark brown clayey silty fine to coarse grained	Saugus Formation: Yellowish brown subangular to submatrix, well graded, dense, moist, pervasive fractures,	fine grained sandy SILTSTONE, poor	ned gravel layer.	Grades to yellowish brown subangular fine grained gra weakly indurated, upper 6" pervasively fractured.	vish brown subangular to subrounded in se, moist.	Total Depth - 6' (refusal on cobble) No groundwater No caving Backfilled	S	GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP174	Depth (ft)	0 - 1 Topsoil: Dark bro	1 - 1.5 Saugus Formation matrix, well grad	1.5-2 Yellowish brown	2 - 2.5 1" thick fine grained gravel layer.	2.5 - 4.5 Grades to yellow weakly indurated	4.5 - 6 Grades to yellowish brown graded, very dense, moist.	Total Depth - 6' ( No groundwater No caving Backfilled	1 I I	scale 1" = 5'

	Comments			@8.5' Approx. CN2E/36SE			
Client: Pardee Homes		.ND, graded, medium dense, moist.	subrounded cobble GRAVEL with slightly friable fine to coarse sand matrix, lets to 7.	ined sandy SILTSTONE, poorly graded,			PLATE TP175
Date Excavated: 8/2/06 Clie		Topsoil: Dark brown to yellowish brown fine grained gravelly silty fine to coarse grained SAND, graded, medium dense, moist.	ular to subrounded cobble GRAVEL with sli 5', rootlets to 7'.	Saugus Formation: Sharp, wavy, and slightly scoured contact with yellowish brown fine grained sandy SILTSTONE, poorly graded, very dense, moist.			IGE ( W.O. 8838
Logged By: RMP	Description	Dark brown to yellowish brown fine grai	<u>Terrace Deposits:</u> Pale yellowish brown subangular to subrount well graded, very dense, moist, weathered to 8.5', rootlets to 7'.	Saugus Formation: Sharp, wavy, and slightly sovery dense, moist.	oth - 9' Idwater	AS	GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP175	Depth (ft)	0 - 1.5 <u>Topsoil</u> : l	1.5 - 8 Terrace [ well grad	8 - 9 Saugus F	Total Depth - 9' No groundwater No caving Backfilled	BO I	scale 1" = 5'

LOG OF EXCAVATION Trench No. TP176	4VATION     Logged By:     RMP     Date Excavated:     8/2/06     Client:     Pardee Homes       TP176     TP176	
Depth (ft)	Description	Comments
0 - 1	.Topsoil: Dark brown clayey silty fine to coarse grained SAND, graded, dense, dry to moist with depth, rootlets.	
1-2	Saugus Formation: Dark brown clayey silty fine to coarse grained SANDSTONE, graded, very dense, moist.	
2-3	Yellowish brown silty fine to medium grained SANDSTONE, poorly graded, very dense, moist.	
3 - 4.5	Pale brown fine grained gravelly silty fine to medium grained SANDSTONE, graded, dense, moist, pervasively fractured, pervasive white carbonate veins, rootlets.	
4.5 - 6	Grades to pale brown silty fine to coarse grained SANDSTONE, poorly graded to graded, very dense, moist, carbonate veins, no fractures.	
6-9	Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with silty fine to coarse sand matrix, well graded, very dense, moist.	
9 - 10.5	Yellowish brown fine grained gravelly fine to coarse grained SANDSTONE with silt and clay, graded, very dense, very moist.	
10.5 - 11	Grades to fine grained gravel CONGLOMERATE.	Total Depth - 12' No groundwater
11 - 12	Sharp, wavy, slightly scoured contact with dark yellowish brown fine to coarse grained sandy SILTSTONE, poorly graded, hard, moist.	
i i		
scale 1"=:	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP176	

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	Comments				BN15E/9NW				
Client: Pardee Homes		e, moist.	vel, graded, dense, moist, weakly		ominant shear plane, although shears	ot.		NE	PLATE TP177
Date Excavated: 8/2/06 Clie		ID with gravel, poorly graded, medium dense, moist.	<u>Saugus Formation</u> : Dark yellowish brown silty fine to coarse grained SANDSTONE with gravel, graded, dense, moist, weakly indurated, blocky appearance, pervasive fracturing.		4" thick dark yellowish brown CLAYSTONE, pervasively sheared, waxy, highly plastic, no dominant shear plane, although shears are roughly parallel to bedding.	ındy SILTSTONE, poorly graded, hard, moist.			GE W.O. 8838
Logged By: RMP	Description	Topsoil: Brown silty fine to medium grained SAND with	Saugus Formation: Dark yellowish brown silty fine tindurated, blocky appearance, pervasive fracturing.	Pervasive, dry, white carbonate veins for 1.5'	4" thick dark yellowish brown CLAYSTONE, per are roughly parallel to bedding.	Dark yellowish brown fine to medium grained sandy SI	- To.	Ŋ,	GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP177	Depth (ft)	0 - 2 .Topsoil: Brown	2 - 3.5 Saugus Forma indurated, bloc	3.5 - 6.5 Pervasive, dry	6.5 - 6'10"   4" thick dark your are roughly pa	6'10" - 9 Dark yellowish	Total Depth - 9' No groundwater No caving Backfilled	Graphic Log	scale 1" = 5'

<b>15</b> 11		Logged By: RMP	Date Excavated:	d: 8/2/06	Client: Pardee Homes	Homes	
Depth (II)	<b>-</b>	Description					Comments
0-1	Topsoil: Brown v	Topsoil: Brown very clayey fine to coarse grained SAND, graded, dense, moist	hed SAND, gradeo	d, dense, moist.			
1-2	Saugus Formation indurated, dry, w	Saugus Formation: Yellowish brown clayey silty fine to coarse grained SANDSTONE, graded, dense to very dense, moist, weakly indurated, dry, white carbonate veins throughout, rootlets.	ly fine to coarse g rut, rootlets.	rained SANDSTO)	IE, graded, dense to	very dense, moist, weakly	
2-2.5	Fine grained grav	Fine grained gravels in SANDSTONE.					
2.5-3	Mottled appearal medium grained	Mottled appearance (brown, olive green, yellowish brown) in SANDSTONE, olive green colored material is finer grained (fine to medium grained sandy clayey SILTSTONE).	wish brown) in SA	NDSTONE, olive g	reen colored materia	il is finer grained (fine to	
တ ဗ	Grades to yellow	Grades to yellow brown fine to medium grained SANDSTONE, hard, moist	d SANDSTONE, I	nard, moist.			
	Total Depth - 5' No groundwater No caving Backfilled						
Graphic Log	MS						NE
			Mirrain-				
scale 1"=5	.2	GEOLABS-WESTLAKE VILLAGE	AGE W.O.	8838	PLATE	TP178	

Logged By: RMP Date Excavated: 8/2/06 Client: Pardee Homes	Description	Topsoil: Brown to yellowish brown silty fine to medium grained SAND to fine to medium grained sandy SILT, poorly graded, medium dense to stiff, dry.	Saugus Formation: Yellowish brown silty fine to coarse grained SANDSTONE, graded, dense, dry, rootlets, weakly indurated.	Grades to subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dense, dry, rootlets, pervasively fractures.	Olive green subangular to subrounded fine to coarse grained gravel CONGLOMERATE with weakly cemented silty fine to coarse BN69W/8SW sand matrix, well graded, very dense, moist.	Yellowish brown silty fine grained SANDSTONE to fine grained sandy SILTSTONE, poorly graded, hard, moist, weakly indurated.	Olive green silty fine to coarse grained SANDSTONE, hard, moist, weakly indurated.	dwater  3	S
Logged By:	Description	<u>Topsoil</u> : Brown to yellowish brow dense to stiff, dry.	Saugus Formation: Yellowish bro	Srades to subangular to subrour graded, dense, dry, rootlets, pen	Olive green subangular to subro sand matrix, well graded, very d	Yellowish brown silty fine graine	Olive green silty fine to coarse g	Total Depth - 7' No groundwater No caving Backfilled	
LOG OF EXCAVATION Trench No. TP179	Depth (ft)	0-2	2-2.5	2.5-4 6	4 - 5.5	5.5-6 Y	0 2-9	F 2 2 W	Graphic Log

LOG OF EXCAVATION Trench No. TP180	VATION Logged By: RMP Date Excavated: 8/4/06 Client: Pardee Homes TP180	
Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Dark brown silty fine to coarse grained SAND with subangular fine gravel, graded, medium dense, moist, weakly cemented, rootlets.	
1.5 - 3.5	Colluvium: Yellowish brown very silty fine grained SAND, poorly graded, medium dense, moist, weakly cemented, pervasive fracturing filled with white carbonate veins, rootlets.	
3.5 - 4	6" thick dark yellowish brown fine to medium grained sandy silty CLAY, poorly graded, very stiff, moist, non-plastic, weakly cemented.	
4 - 7	Saugus Formation; Mottled dark yellowish brown sity fine grained SANDSTONE to fine grained sandy SILTSTONE, poorly graded, very dense to hard, moist, weakly cemented, and olive green clayey silty fine to coarse grained SANDSTONE, graded, very dense, moist, weakly cemented.	@7' CH N45W/14SW
7 - 9	3-4" thick discontinuous channel deposit, olive green fine gravel CONGLOMERATE with sifty fine to coarse sand matrix, graded, weakly cemented, subangular to subrounded.	
	Total Depth - 9' No groundwater No caving Backfilled	
Graphic Log		
scale 1"=5"	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838   PLATE TP180	

Logged By: RMP Date Excavated: 8/4/06 Client: Pardee Homes	Description	Topsoil: Dark brown clayey silty fine to coarse grained SAND with fine gravel, graded, medium dense, moist, weakly cemented, rootlets.	Saugus Formation: Weathered to 4' (rootlets).	Grades to dark yellowish brown coarse gravel CONGLOMERATE with silty fine to medium sand matrix, well graded, dense, moist, subounded to rounded, weakly cemented, pervasive carbonate veinlets.	Yellowish brown silty fine to coarse grained SANDSTONE with fine gravel, graded, dense, moist, weakly cemented.	Color change to pale brown, lose silt, gravels coarsen to cobbles.	Wavy slightly scoured contact with 3" thick dark yellowish brown CLAYSTONE, poorly graded, very stiff, moist, slightly plastic.	Grades to yellowish brown clayey silty fine to coarse grained SANDSTONE, graded, moist, weakly cemented.	Grades to pale brown cobble CONGLOMERATE with silty fine to coarse sand matrix, well graded, dense, moist, slightly friable, @8.5' B subrounded.	h - 9' water, No caving, Backfilled NIS W			
	Description	Topsoil: Dark brown clayey silty fine rootlets.	ugus Formation: Weathered to 4'	ades to dark yellowish brown coa xounded to rounded, weakly cem	lowish brown silty fine to coarse	or change to pale brown, lose sit	wy slightly scoured contact with 3	ades to yellowish brown clayey si	Grades to pale brown cobble CONG subrounded.	Total Depth - 9' No groundwater, No caving, Backfilled			TSEW SAVIOUS
LOG OF EXCAVATION Trench No. TP181	Depth (ft)	0 - 1.5 <u>Tog</u>	1.5 - 9 Sau	2.5 - 3 Gra sub	3-4 Yell	4-5 CO	5 - 5'3" Wa	5:3" - 8 Gra	8-9 Gra sub	***************************************	Graphic Log		erate 1"= 5'

	Comments		@2' C N88W/49NE @2.5' B Approximate N79E/19SE		2	
Date Excavated: 8/4/06 Client: Pardee Homes		ained SAND with fine gravel, graded, medium dense, moist, weakly cemented,	avel to cobble CONGLOMERATE with silty fine to highly scoured contact with dark yellowish brown ed, pervasive carbonate veins, contact is sharp in			3E W.O. 8838 PLATE TP182
Logged By: RMP	Description	Topsoil: Dark brown clayey silty fine to coarse grained rootlets.	Saugus Formation: Weathered to 6' (rootlets, carbonate veins), pale brown gracoarse sand matrix, well graded, moist, slightly friable, subrounded, overlying I silty CLAYSTONE, poorly graded, very stiff, moist, non-plastic, weakly cement northern portion of trench on west wall only, other walls have scoured contact.	th - 6' dwater		GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP182	Depth (ft)	0 - 2 Topsoil: C rootlets.	2 - 6 Saugus F coarse sa silty CLA) northern (	Total Depth - 6' No groundwater No caving Backfilled		scale 1"=5"

	Comments		11	@6' B N7W/16SW				
Client: Pardee Homes		ightly friable, rootlets.	to coarse sand matrix, well graded, ATE at base with trace boulders.	ith fine to coarse sand matrix, well				PLATE TP183
Date Excavated: 8/4/06 Clien		SAND with fine gravel, graded, loose, dry, slightly friable, rootlets	<u>Terrace Deposits:</u> Reddish brown fine to coarse grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, dense, moist, subangular to subrounded, weakly cemented, grades to cobble CONGLOMERATE at base with trace boulders.	<u>Saugus Formation</u> : Weathered to 7' (rootlets), yellowish brown cobble CONGLOMERATE with fine to coarse sand matrix, well graded, dense, moist, slightly friable, subrounded to rounded.	MGE			3E W.O. 8838
y. RMP	Description	Topsoil: Dark brown silty fine to coarse grained SAND	<u>eposits:</u> Reddish brown fine to coarse goist, subangular to subrounded, weakly	Saugus Formation: Weathered to 7' (rootlets), yellowish brow graded, dense, moist, slightly friable, subrounded to rounded.	th - 7' Iwater			GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP183	Depth (ft)	0 - 1.5 <u>Topsoil</u> : D	1,5 - 5 Terrace D dense, mc	5 - 7 Saugus Fr	Total Depth - 7' No groundwater No caving Backfilled	Graphic Log		scale 1" = 5'

	Comments									
nt: Pardee Homes		friable, rootlets.	ONE, graded, medium dense, moist,	roist, slightly plastic.		oist, grades down to yellowish brown ble.		:	PLATE TP184	
Date Excavated: 8/4/06 Client:		D with fine gravel, graded, loose, dry, slightly friable, rootlets.	Weathered Saugus Formation: Yellowish brown clayey sitty fine to coarse grained SANDSTONE, graded, medium dense, moist, slightly friable, occasional subangular to subrounded gravels and cobbles, rootlets to 8'.	1-3" thick discontinuous red clayey SILTSTONE to silty CLAYSTONE, poorly graded, stiff, moist, slightly plastic.	6" thick discontinuous pale brown silty fine to coarse grained SANDSTONE with fine gravel.	Silty fine grained SANDSTONE to fine grained sandy SILTSTONE, poorly graded, dense, moist, grades down to yellowish brown clayey silty fine to coarse grained SANDSTONE, graded, medium dense, moist, slightly friable.			GE W.O. 8838	
Logged By: RMP Date Excavated	Description	Topsoil: Brown silty fine to coarse grained SAND with	Saugus Formation: Yellowish brown ble, occasional subangular to subrou	iscontinuous red clayey SILTSTONE	continuous pale brown silty fine to co	Silty fine grained SANDSTONE to fine grained sandy clayey silty fine to coarse grained SANDSTONE, grac	ı - 12.5'	<i>«</i> ater	GEOLABS-WESTLAKE VILLAGE	בייי ביייי ביייי ביייי
LOG OF EXCAVATION Trench No. TP184	Depth (ff)	0 - 3 <u>Topsoii</u> : Br	3 - 12.5 Weathered slightly frial	7 - 7'3" 1-3" thick d	8 - 8.5 6" thick dis	8.5 - 12.5 Silty fine gr dayey silty	Total Depth - 12.5'	No groundwater No caving Backfilled	Graphic Log	- II

	Comments			@5' B N80W/37NE	 				
nt: Pardee Homes		ightly friable, rootlets.	graded, dense, moist, weakly cemented, /EL at base.						PLATE TP185
Date Excavated: 8/4/06 Client:		d SAND with fine gravel, graded, loose, dry, slightly friable, rootlets.	Terrace Deposits: Reddish brown fine grained GRAVEL with fine to coarse sand matrix, well graded, dense, moist, weakly cemented, subangular to subrounded, upper foot fractured and blocky, rootlets, grades to cobble GRAVEL at base.	Saugus Formation: Yellowish brown gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, dense, moist, slightly friable, subangular to subrounded.		N52E			AGE W.O. 8838
VATION Logged By: RMP TP185	Description	Topsoil: Dark brown silty fine to coarse grained SAND	<u>Terrace Deposits</u> : Reddish brown fine grained subangular to subrounded, upper foot fracture	Saugus Formation: Yellowish brown gravel to slightly friable, subangular to subrounded.	Total Depth - 9' No groundwater No caving Backfilled				GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP185	Depth (ft)	0 - 0.5	0.5-3	3-9			Graphic Log		scale 1" = 5'

	Comments				@8' B N76W/24NE				
Client: Pardee Homes		se, dry, rootlets, weakly cemented.	well graded, medium dense, moist,	silty CLAY, poorly graded, stiff, moist,	RATE with silty fine to coarse sand	ssive.			PLATE TP186
Date Excavated: 8/4/06 Clier		ed SAND with fine gravel, graded, medium dense, dry, rootlets, weakly cemented	Colluvium: Yellowish brown fine to coarse grained GRAVEL with fine to coarse sand matrix, well graded, medium dense, moist, slightly friable.	Highly irregular contact with mottled yellowish brown clayey SILT and dark yellowish brown silty CLAY, poorly graded, stiff, moist, non-plastic, weakly cemented.	<u>Saugus Formation:</u> Weathered to 9', rootlets to 8', pale brown gravel to cobble CONGLOMERATE with silty fine to coarse sand matrix, well graded, dense, moist, slightly friable, occasional rootlets in upper foot.	Yellowish brown clayey SILTSTONE, poorly graded, very stiff, moist, weakly cemented, massive.			LLAGE W.O. 8838
Logged By: RMP	Description	Topsoil: Dark brown silty fine to coarse grained SAND	ellowish brown fine to coarse gra e.	Highly irregular contact with mottled yellowish non-plastic, weakly cemented.	<u>nation:</u> Weathered to 9', rootlets graded, dense, moist, slightly fria	own clayey SILTSTONE, poorly (	- 10′ ater	u)	GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP186		0 - 2 Topsoil: Dark	2 - 4 Colluvium: Yel slightly friable.	4 - 7 Highly irregu	7 - 9 Saugus Forn matrix, well g	9 - 10 Yellowish bro	Total Depth - 10' No groundwater No caving Backfilled	60-	scale 1"=5"

	Comments	ets.	fine to coarse sand	ense, moist. @4' Approx. BN79E/14NW				
RMP Date Excavated: 8/4/06 Client: Pardee Homes		to coarse grained SAND with fine gravel, graded, loose, dry, slightly friable, rootlets.	ed to 14', rootlets, reddish brown fine grained gravel CONGLOMERATE with silty fine to coarse sand weakly cemented, clasts are subangular to subrounded.	cobble CONGLOMERATE with friable fine to coarse sand matrix, well graded, dense, moist.		N20E>		
	Description	Topsoil: Dark brown silty fine to coarse grained SAND	Saugus Formation: Weathered to 14', rootlets, reddish matrix, graded, dense, moist, weakly cemented, clasts	Yellowish brown subrounded cobble CONGLOMERAT	Total Depth - 14' No groundwater No caving Backfilled			
LOG OF EXCAVATION Trench No. TP187	Depth (ft)	0-1	1-2.5	2.5 - 14			Graphic Log	1 = 1 to 0

	Comments		@3.5' B N11W/6SW	<b>-</b>					
it: Pardee Homes		able, rootlets.	Saugus Formation: Weathered to 6.5' (rootlets), yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable to weakly cemented clayey silty fine to coarse sand matrix, well graded, very dense, moist, rootlets, clasts coarsen to cobbles with depth.	Wavy, scoured contact with yelfowish brown fine to coarse grained SANDSTONE, poorly graded, very dense, moist, weakly cemented.					PLATE TP188
8/4/06   Client:		with fine gravel, graded, loose, dry, friable, rootlets.	ubangular to subrounded f and matrix, well graded, v	SANDSTONE, poorly gra		1			8838
Date Excavated:		ned SAND with fine gra	ets), yellowish brown su ey silty fine to coarse s	n fine to coarse grained		N2!E			W.O.
Logged By: RMP	Description	Topsoil: Dark brown silty fine to coarse grained SAND	n: Weathered to 6.5' (rootle to weakly cemented clayes with depth.	ontact with yelfowish brow					GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP188	-	Topsoil: Dark brov	Saugus Formation: Weathered with slightly friable to weakly or coarsen to cobbles with depth.	Wavy, scoured co cemented.	Total Depth - 8' No groundwater No caving Backfilled		б		1"=5'
LOG OF EX Trench No.	Depth (ft)	0-1	1-6	8 - 9			Graphic Log		scale

LOG OF EXCAVATION Trench No. TP189	ļ.	
Depth (ft)	Description	Comments
0 - 2.5	Topsoil: Dark brown silty fine to coarse grained SAND with fine gravel, graded, loose, dry, friable, rootlets.	
2.5 - 3.5	Saugus Formation: Weathered to 9' (rootlets to 7.5'), yellowish brown silty fine grained SANDSTONE, poorly graded, dense, moist, weakly indurated, massive.	
3.5-4	6" thick subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable to weakly cemented sitty fine to coarse sand matrix, well graded, very dense, moist.	
4 - 5.5	Yellowish brown fine grained sandy SILTSTONE, poorly graded, very stiff, moist, weakly indurated, massive.	
5.5 - 8.5	Grades to pale brown slity fine to medium grained SANDSTONE.	@8' B
8.5 - 9	Grades to subangular to subrounded gravel to cobble CONGLOMERATE with weakly cemented silty fine to coarse sand matrix, well graded, very dense, moist.	
9-9.5	Yellowish brown silty fine grained SANDSTONE, poorly graded, very dense, moist, weakly indurated, massive.	
_	Total Depth - 9.5'  No groundwater  No caving  Backfilled	
603		
scale 1" = 5'	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP189	

LOG OF EXCAVATION Logged By: RMP Date Excavated: 8/ Trench No. TP190 Description	8/4/06 Client: Pardee Homes	Comments
Topsoil: Dark brown silty fine to coarse grained SAND with sparse fine gra	with sparse fine gravel, graded, loose, dry, friable, rootlets.	
Saugus Formation: Weathered to 10' (rootlets to 8.5'), yellowish brown fin pervasively fractured and blocky, pervasive carbonate veins.	yellowish brown fine grained sandy SILTSTONE, poorly graded, stiff, dry, veins.	
Grades to 3" thick subrounded fine grained gravel CONGLOMERATE with friable fine to coarse sand matrix, graded, medium dense, dry.	friable fine to coarse sand matrix, graded, medium dense,	
3" thick dark yellowish brown silty CLAYSTONE, poorly graded, very stiff, moist, carbonate veinlets, non-plastic, weakly indurated	moist, carbonate veinlets, non-plastic, weakly indurated.	
Grades to yellowish brown subangular to subrounded fine to coarse grain fine to coarse sand matrix, well graded, dense, moist.	fine to coarse grained gravel CONGLOMERATE with weakly cemented silty  B	@7' Approx. BN2E/4SE
2' thick dark yellowish brown CLAYSTONE, hard, moist, non-plastic.		
Grades to silty fine grained SANDSTONE with sparse fine gravel, graded,	fine gravel, graded, very dense, moist, weakly indurated.	
Total Depth - 12'  No groundwater  No caving  Backfilled		
GEOLABS-WESTLAKE VILLAGE W.O. 8838	PLATE TP190	

LOG OF EXCAVATION Trench No. TP191		Logged By: RMP	Date	Date Excavated:	d: 8/7/06		Client: Pardee Homes		
Depth (ft)	sag	Description							Comments
0 - 1	Topsoil: Dark brown silty fine to coarse grained sandy fine GRAVEL with cobbles, well graded, loose, moist, rootlets.	silty fine to coars	e grained s	andy fine GRA	/EL with cobbles	, well graded, lo	ose, moist, ro	otlets.	
1 - 7.5	Mint Canyon Formation: Weathered to 5', rootlets to 2. subrounded cobble CONGLOMERATE with trace boul moist.	<u>tion:</u> Weathered to CONGLOMERAT	o 5', rootlets E with trace	to 2.5", scoure boulders and	.5', scoured interbeds of reddish brown and olive green subangular to iders and weakly cemented silty fine to coarse sand matrix, well grade	ddish brown and silty fine to coa	olive green s rse sand mat	Mint Canyon Formation: Weathered to 5', rootlets to 2.5', scoured interbeds of reddish brown and olive green subangular to subrounded cobble CONGLOMERATE with trace boulders and weakly cemented silty fine to coarse sand matrix, well graded, hard, moist.	@5' B N28W/21SW
	Total Depth - 7.5' No groundwater No caving Backfilled								
				N2W	1				
Graphic Log									
					io.				
scale 1"≍	S. G.	GEOLABS-WESTLAKE VILLAGE	KE VILLAG	3E W.O.	8838		PLATE	TP191	

LOG OF EXCAVATION Trench No. TP193	AVATION Logged By: RMP Date Excavated: 8/7/06 Client: Pardee Homes TP193	
Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Dark brown fine to coarse grained sandy silty GRAVEL, well graded, loose, dry, weakly cemented, fractured and blocky.	
1.5 - 4.5	Saugus Formation: Weathered to 5' (roots to 4'), yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix (trace silt), well graded, very dense, dry.	@4' B N24W/16SW
4.5 - 5.5	Wavy, sharp, slightly scoured contact to mottled brown and olive green trace gravelly sitty fine to coarse grained SANDSTONE, poorly graded, very dense, moist, weakly cemented, massive.	
5.5 - 7	Yellow brown subangular to subrounded gravel to cobble CONGLOMERATE with slightly firable fine to coarse sand matrix (trace silt), well graded, hard, moist.	
	Total Depth - 7' No groundwater No caving	
	Backfilled	
	N52E	
Graphic Log		
scale 1"=	= 5' GEOLABS-WESTLAKE VILLAGE   W.O. 8838   PLATE TP193	-

LOG OF EXCAVATION Trench No. TP194	Logged By: RMP	Date Excavated: 8/7/06	Client: Pardee Homes	S	
Depth (ft)	Description				Comments
0 - 1	Topsoil: Dark brown fine to coarse grained sandy SILT with fine gravel, graded, soft, dry, slightly friable	vith fine gravel, graded, so	ft, dry, slightly friable.		
1-2.5	<u>Saugus Formation</u> : Weathered to 5' (roots to 3'), yellowish brown fine to coarse grained SANDSTONE, poorly graded, very dense, moist, slightly friable.	sh brown fine to coarse gគ	ained SANDSTONE, poorl	y graded, very dense,	
2.5-7	Grades to yellowish brown subangular to subrounded co well graded, very dense, moist.	cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix,	rith slightly friable silty fine	to coarse sand matrix,	@6' B N44W/20SW
7-7.5	Wavy, sharp, scoured contact with 6" thick mottled dark brown and olive green silty fine to medium grained SANDSTONE, poorly graded, hard, moist, weakly indurated.	brown and olive green silt	fine to medium grained S	ANDSTONE, poorly	
7.5-8	Grades to yellowish brown subangular to subrounded cowell graded, hard, moist.	cobbie CONGLOMERATE with slightly friable silty fine to coarse sand matrix,	गंth slightly friable silty fine	to coarse sand matrix,	
	Total Depth - 8' No groundwater No caving Backfilled	NYOE			
Graphic Log					
scale 1"=5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE	TP194	

	Comments		@5' B N35E/18NW					
Client. Pardee Homes		, dry, weakly cemented, rootlets.	subrounded cobble CONGLOMERATE			0,000		PLATE TP195
Date Excavated: 8/7/06 Cli		Topsoil: Dark gray brown sitty fine to coarse grained SAND with fine gravel, graded, loose, dry, weakly cemented, rootlets.	Mint Canyon Formation: Weathered to 8', rootlets to 5', light yellowish brown subangular to subrounded cobble CONGLOMERATE with slightly friable matrix, well graded, very dense, moist.		N59E			AGE W.O. 8838
Logged By: RMP	Description	cgray brown sitly fine to coarse gr	Formation: Weathered to 8', rootli riable matrix, well graded, very de	g. ater				GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP195	Depth (ft)	0 - 1 <u>Topsoil</u> : Dark	1 - 9 Mint Canyon with slightly fr	Total Depth - 9' No groundwater No caving Backfilled		Graphic Log		scale 1" = 5'

[ <b>&lt;</b>		
Depth (ft)	Description	Comments
0 - 2.5	<u>Topsoil</u> : Dark brown fine to coarse grained sandy SILT, graded, loose to medium dense, moist, slightly friable.	
2.5-9	Mint Canyon Formation: Weathered to 9' (roots to 8'), yellowish brown fine grained sandy SILTSTONE, poorly graded, very stiff, moist, weakly indurated, white carbonate veinlets, occasional subangular fine gravel, massive.	
9 - 10	Hard.	
	Total Depth - 10' No groundwater No caving Backfilled	
	N26E	
Graphic Log		
scale 1"=5"	GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP196	

LOG OF EXCAVATION Trench No. TP197 Depth (ft)  0 - 2.5   Topsoil: 2.5 - 5.5   Mint Cagravel Cagravel Cagraded, 7.5 - 9.5   Scourect Stigntty teachers 9.5 - 10.5   Grades Stigntty teachers	NATION  Logged By: RMP  Date Excavated: 8/7/06   Client: Pardee Homes  Description  Logsoil: Dark brown fine to coarse grained sandy SILT with fine gravel, graded, stiff, moist, weakly cemented.  Mint Canyon Formation: Weathered to 8.5' (roots to 5', carbonate veins), pale yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable with slity fine to coarse sand matrix, well graded, medium dense, moist.  Scoured, irregular contact with discontinuous pale brown silty fine to coarse grained SANDSTONE, poorly graded, hard, moist, slightly friable, massive, white carbonate veins.  Grades to subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist, and moist.	Comments @8' Approx. BN57W/19SW
	Total Depth - 10.5' No groundwater No caving Backfilled	
Graphic Log		
scale 1"=5'	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP197	

LOG OF EXCAVATION Trench No. TP198		
Depth (ft)	Description	Comments
0-2	Topsoil: Dark brown fine to coarse grained sandy SILT with fine gravel, graded, soft, moist, rootlets.	····
2 - 12	Mint Canyon Formation: Weathered to 8', roots to 4', light yellowish brown subangular to subrounded cobble CONGLOMERATE with slightly friable matrix, well graded, dense, moist, trace boulders.	OMERATE @7' Approx. BN5W/15SW
8 9	Grades to very dense.	
	Total Depth - 12' No groundwater No caving Backfilled	
	N68W	
Graphic Log		
	0.0	
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scale 1"=5'	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP198	89

LOG OF EXCA Trench No.	LOG OF EXCAVATION Logged By: RMP Date Excavated: 8/7/06 Client: Pardee Homes  Trench No. TP199	
Depth (ft)	Description	Comments
0-3	Topsoil: Dark brown fine to coarse grained sandy SILT with fine gravel, graded, very stiff, moist, rootlets.	
3 - 5.5	<u>Saugus Formation</u> : Weathered to 9' (roots to 5'), yellowish brown silty fine grained SANDSTONE, poorly graded, dense, moist, weakly indurated, massive.	
5.5-6	Grades to yellowish brown fine to coarse grained SANDSTONE with fine gravel, graded, dense, moist, slightly friable.	@5.5' B
8-9	Wavy, scoured contact with yellowish brown fine grained sandy SILTSTONE, poorly graded, very stiff, moist, slightly friable, massive, white carbonate veins.	No let con
8 - 8.5	6" thick dark yellowish brown clayey SILTSTONE, poorly graded, hard, moist, weakly indurated, massive.	
8.5 - 11	Grades to yellowish brown SILTSTONE.	•
11 - 11,5	Grades to yellowish brown silty fine grained SANDSTONE, poorly graded, hard, moist, weakly indurated.	
	Total Depth - 11.5'  No groundwater  No caving  Backfilled	
Graphic Log		
scale 1" = 5	GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP199	

	Comments		-	@7' Approx. BN43E/10SE	_			
AVATION TP200		Topsoil: Dark brown clayey fine to coarse grained sandy SILT, graded, very stiff, moist, blocky and pervasively fractured, rooflets.	<u>Terrace Deposits:</u> Weathered to 6' (rootlets), yellow brown silty fine grained SAND, poorly graded, dense, moist, consolidated, pervasive carbonate veins.	Grades to yellow brown cobble to boulder GRAVEL with stightly friable fine to coarse sand matrix, well graded, very dense, moist, subrounded to rounded, 10% boulders.	Total Depth - 11' No groundwater No caving Backfilled	N7E>		= 5' GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP200
LOG OF EXC Trench No.	Depth (ft)	0-3	3-6	6 - 11	<u> </u>		Graphic Log	scale 1"=

LOG OF EXCAVATION Trench No. TP201		
Depth (ft)	Description	Comments
0 - 3	Topsoil: Dark brown clayey sitty fine to coarse grained SAND with fine gravel, graded, dense, moist, rootlets.	
3-4	Terrace Deposits: Yellowish brown silty fine to coarse grained SAND, poorly graded, very dense, moist, consolidated, roots.	
4 - 6	Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, very dense, moist.	
6 - 6,5	Saugus Formation: Weathered to 9.5', irregular scoured contact with yellowish brown fine grained sandy SILTSTONE, poorly graded, very dense, moist, slightly friable.	
6.5 - 9	Grades to silty fine to medium grained SANDSTONE.	
9 - 9.5	Gradational contact with 6" thick dark yellowish brown CLAYSTONE, very stiff, moist, weakly indurated, medium plastic, pervasive internal shearing truncated above and below by sandstone beds, discontinuous (scoured out by conglomerate on east wall), sharp, irregular, sheared contact with material below.	@10' B N6E/19NW
9.5 - 10.5	Channel Deposit: Yellow brown subangular to subrounded gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, very dense, moist.	Total Depth - 12.5
10.5 - 12.5	Yellowish brown fine to coarse grained SANDSTONE, poorly graded, very dense, moist, slightly friable, massive. N25 $E$	No groundwater No caving Backfilled
Graphic Log		
- [[	J GEOLAGS-WESTLAKE VILLAGE   W.O. 8838   PLATE TP201	

	Comments							
ient: Pardee Homes		dense, moist, rootlets.	e sand matrix, well graded, very dense,	INE, poorly graded, very dense, moist,		A STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STA	0 ()	PLATE TP202
Logged By: RMP Date Excavated: 8/8/06 Client: Pardee Homes		dy sity CLAY with fine gravel, graded, very dense, moist, rootlets.	Terrace Deposits: Pale brown cobble to boulder GRAVEL with slightly friable fine to coarse sand matrix, well graded, very dense, moist.	Saugus Formation: Weathered to 11.5', yellowish brown fine to coarse grained SANDSTONE, poorly graded, very dense, moist, slightly friable.				AGE W.O. 8838
<u>-</u>	Description	Topsoil: Dark brown fine to coarse grained sandy sifty	ace <u>Deposits</u> : Pale brown cobble to boulde it.	Saugus Formation: Weathered to 11.5', yellowi slightly friable.	Total Depth - 11.5' No groundwater No caving Backfilled	× · · · · · · · · · · · · · · · · · · ·		GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP202		0-3 <u>Tops</u>	3 - 11 Terrao moist.	11 - 11.5 Sauc	Tota No g No c Back	Graphic Log		scale 1" = 5'

(CAVATION         Logged By: RMP         Date Excavated:         8/8/06         Client: Pardee Homes           7. TP203         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1	Topsoil: Dark brown clayey silty fine to coarse grained SAND with fine gravel, graded, very dense, moist.	Saugus Formation: Weathered to 4.5' (roots to 4'), yellow brown subangular to subrounded gravel to cobble CONGLOMERATE with @3' Approx. slightly friable matrix, well graded, very dense, moist, trace boulders (2' diameter in east wall).	Total Depth - 6' No groundwater No caving Backfilled	1 3LN			
LOG OF EXCAVATION Trench No. TP203	0 - 1 Topsoil	1 - 6 Saugus slightfy	Total C No gro No cav Backfill	<u> </u>	Graphic Log		

OG OF EXCA Trench No. Denth (#)	LOG OF EXCAVATION       Logged By: RMP       Date Excavated:       8/8/06       Client: Pardee Homes         Trench No.       TP204         Denth (ff)       Description	
<b>≩</b>	Description:    Topsoil: Dark grayish brown silty fine to coarse grained SAND with fine to coarse gravel, graded, dense, dry, slightly friable, rootlets.	Comments
2 - 3	Saugus Formation: Weathered to 8' (roots to 5'), brown fine grained sandy CLAYSTONE with subangular fine gravel, graded, very stiff, moist, weakly indurated.	
3-4	1' thick discontinuous channeled sand, yellowish brown silty fine to coarse grained SANDSTONE with subangular fine gravel, graded, very dense, moist, massive, slightly friable.	@3' CH N39E/25SE
- 4.5	Dark yellowish brown clayey silty fine to coarse grained SANDSTONE, graded, very dense, moist, weakly indurated.	
4.5 - 7	Yellowish brown silty fine to coarse grained SANDSTONE, poorly graded, very dense, moist, weakly indurated, massive, pervasive subhorizontal carbonate veins.	
7 - 10	Yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with slightly friable sifty fine to coarse sand matrix, well graded, hard, moist.	
	Total Depth - 10' No groundwater No caving Backfilled	
Graphic Log		
-		
1"= [	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP204	

OG OF EXCAN Trench No. Depth (ft)	LOG OF EXCAVATIONLogged By: RMPDate Excavated:8/8/06Client: Pardee HomesTrench No. TP205Description	Comments
0-1	Topsoil: Dark grayish brown silty fine to coarse grained SAND with fine gravel, graded, dense, dry, rootiets, slightly friable.	
8 -	Saugus Formation: Weathered to 6' (rootlets to 3'), yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, very dense, moist.	@6' B N64W/17SW
.9@ @	1' thick fine to coarse grained SANDSTONE layer.	
	Total Depth - 8' No groundwater No caving Backfilled	
	NIOW -	
Graphic Log		
<b>-</b>		
scale 1" = 5'	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP205	

	Comments		@5' Approx. BN13W/17SW					
Client: Pardee Homes		, very dense, moist, rootlets.	Saugus Formation: Weathered to 6' (roots to 3'), Yellow brown gravelly SANDSTONE, grading to gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, very dense, moist.					PLATE TP206
Date Excavated: 8/8/06 CI		Topsoil: Yellow brown clayey slity fine to coarse grained sandy fine GRAVEL, well graded, very dense, moist, rootlets.	, Yellow brown gravelly SANDSTONE, gra ell graded, very dense, moist.		SBOR			AGE W.O. 8838
LOG OF EXCAVATION Logged By: RMP Trench No. TP206	Description	ellow brown clayey silty fine to coarse	Saugus Formation: Weathered to 6' (roots to 3'), Yellow brown gravelly SAND with slightly friable fine to coarse sand matrix, well graded, very dense, moist.	th - 7' Jwater				GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP206		0 - 2 Topsoil: Y	2 - 7 Saugus F. with slight	Total Depth - 7' No groundwater No caving Backfilled	,-	Graphic Log		scale 1"=5

LOG OF EXCAVATION Trench No. TP207	VATION Logged By: RMP Date Excavated: 8/8/06 Client: Pardee Homes TP207	
Depth (ft)	Description	Comments
0-1.5	Topsoil: Brown clayey silty fine to coarse grained SAND with fine gravel, graded, very dense, moist.	
1.5 - 3.5	Saugus Formation: Weathered to 8' (roots to 4', matrix tighter at 8' with more fines), yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, very dense, moist.	·
3.5 - 6	Bedding subparallel carbonate veins.	
5.5 - 8.5	Yellowish brown fine to coarse grained SANDSTONE with fine gravel, graded, very dense, moist, slightly friable, massive.	
8.5 - 9.5	Grades to subangular to subrounded gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist.	ed, @9'B N35W/8SW
9.5 - 10	Yellowish brown fine to coarse grained SANDSTONE with fine gravel, graded, hard, moist, slightly friable, massive.	
	Total Depth - 10' No groundwater No caving Backfilled	
Graphic Log		
scale 1"= E	5' GEOLABS-WESTLAKE VILLAGE W.O. 8838 PLATE TP207	

	Comments				@8' B N52W/14SW						
Client: Pardee Homes		otlets.	ANDSTONE, poorly graded, very dense, ining in fractures.	parse fine gravel, poorly graded, very dense, moist, weakly indurated, massive.	fine to coarse grained gravel CONGLOMERATE with slightly friable silty fine	LTSTONE, poorly graded, very dense, moist, weakly indurated, massive.				90.	PLATE TP208
Date Excavated: 8/8/06		Topsoil: Brown silty fine to coarse grained SAND, poorly graded, very dense, moist, rootlets.	Saugus Formation: Weathered to 9.5' (roots to 8'), yellowish brown silty fine grained SANDSTONE, poorly graded, very dense, moist, moderately indurated, pervasively fractured and blocky with white carbonate staining in fractures.	E with sparse fine gravel, poorly graded,		andy SILTSTONE, poorly graded, very c		N27E		06	4GE W.O. 8838
	Description	rown silty fine to coarse grained SAN	Saugus Formation: Weathered to 9.5' (roots to 8'), yelk moist, moderately indurated, pervasively fractured and	Yellowish brown silty fine grained SANDSTONE with s	Grades to yellowish brown subangular to subrounded sand matrix, graded, very dense, moist.	Dark yellowish brown fine to medium grained sandy SI	ih - 10' Water				GEOLABS-WESTLAKE VILLAGE
LOG OF EXCAVATION Trench No. TP208	Depth (ft)	0 - 2.5 <u>Topsoil</u> : B	2.5 - 5 Saugus F moist, mo	5 - 7.5 Yellowish	7.5 - 8.5 Grades to sand matr	8.5 - 10 Dark yello	Total Depth - 10' No groundwater No caving	Backfilled	Graphic Log		scale 1" = 5'

#### APPENDIX C

#### SLOPE STABILITY ANALYSES

TTM 060922, SKYLINE RANCH COUNTY OF LOS ANGELES, CALIFORNIA

Sec. B-B' W=100' D=5'

11-20-\*\* 10:15 XSTABL File: 8838B

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Problem Description : Sec. B-B' W=100'0=5'

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Soil Unit Below Segment Y-right (ft) 1835.0 2005.0 2000.0 2000.0 2000.0 1550.0 1860.0 x-right (ft) 124.0 210.0 610.0 640.0 780.0 890.0 1020.0 120.0 1823.0 1835.0 1835.0 2005.0 2000.0 2000.0 1950.0 1860.0 y-left (ft) 124.0 215.0 615.0 645.0 785.0 1950.0 x-left 끂 Segment No.

5 SUBSURFACE boundary segments

Soil Unit Below Segment 1830.0 1830.0 2000.0 1950.0 1885.0 y-right (ft) 210.1 310.0 640.0 890.0 x-right y-left (ft) 1835.0 1830.0 1830.0 1720.0 210.0 210.1 310.0 x-left (ft) . 2

A CRACKED ZONE SAS REEN SPECIFIED

(feet) (feet) (pcf) Depth of crack below ground surface = 8.00 Kaximum depth of warer in crack = .00 Unit weight of water in crack = 62.40 Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

Mater	Surface No.	n	O	0	0	
essure	Constant (psf)	a.	9,	a.	o,	
Pore Pressure	Parameter Fu	000'	000	000	000	
Friction	Angle (deg)	40.00	34.00	40,00	40.00	
Cohesion	Intercept (psf)	225.0	200.0	225,0	225.0	
Weight	Moist Sat. (pcf) (pcf)	140,0	135.0	140,0	140,C	
Unit	Moist (pcf)	130.0	125.0	130.0	130.0	
5011	Shit No.	-	73	ო	7	

ANISOTROFIC STRINGTH PARAMETERS specified for 3 Soil Unit(s)

Number of direction ranges specified = 3

Soil Unit 1 is ANISOTROPIC

i-value (degrees]	40.00 25.00 40.00
c-value (psf)	225.0 100.0 225.0
Counterclockwise Direction Limit (deg)	10.00 14.00 90.00
Direction Range No.	- 01 m

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degraes)	40,00 17,00 40,00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	16.30 14.50 90.00
Direction Range No.	чию

Soil Unit 4 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 11.00 40.00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	10.00 14.00 90.00
irection ançe Mo.	<b>→ 0</b> M

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

The active and passive portions of the sliding surfaces

## Sec. B-B' W=100' D=5'

are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is  $100.0\ \mbox{ft}$ 

70.07 Hidth (ft) 1860.0 1940.0 500.0 810.0 y-left (ft) 1790.0 1870.0 x-left (ft) 210.0 540.0 8 g П 8

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JAMED NETHOD \* \* \* \* \*

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

Failure surface No. 1 specified by 9 coordinate points

y-surf (ft)	1835.00	1783.83	1783.59	1858.12	1877.13	1967.76	1992.00	2000.00	
x-surf (ft)	137.25	246.99	247.49	603.62	20,809	650.29	651.59	661.59	
Pcint No.	- 1	ym	=	ţ	9	7	8	o,	

(Fo factor = 1.071) \*\* Corrected JANBU POS = 1.713 \*\*

Failure surface No. 2 specified by 8 coordinate points

y-surf (ft)	1835.00 1830.37 1788.11 1787.44 1908.01 1914.50 1988.71	
X-surf (ft)	163.00 172.93 263.56 264.99 749.62 752.65 787.25	
Point No.	ଳ ରା ମଧ୍ୟ ଓ ଓ ୯ ୦ ୦	

(Fo factor = 1.049) \*\* Corrected JANEL FOS = 1.727 \*\*

Failure surface No. 3 specified by 9 coordinate points

x-surf (ft) Point No.

	ctor =	ordinate points	(Fo factor = 1.075) ordinate points	(Fo factor = 1.081)	ordinate points	(Fo factor = 1.061) ordinate points
1835.00 1786.73 1785.01 185.01 1867.43 1968.30 1962.03 1992.00	1.731	ified by 9 000 Y-surf (Ft) 1825.00 1784.65 1783.67 1858.87 1874.44 1992.00 2007	1.74 ified b y-s (f	1832.19 1789.93 1789.93 1786.71 1865.41 1956.04 1999.13 1994.78 2002.78		1.752 ** (fied by 9 coo
166,74 175,33 265,97 272,91 607,49 612,56 654,82 665,58	JANEJ FOS	No. 4 apec x-surf [ft] 142.41 159.68 252.48 252.48 590.47 597.75 640.01 652.55	JAKBU F No. 5 x-su (ft	179.97 270.60 270.60 270.60 270.60 604.95 620.84 623.31 623.31	x-surf (f1) 150.53 164.90 255.53 255.65 699.42 695.01 737.28 738.10	JANES FOS =
ଳ <b>ପ</b> ରେ ଅଟେ ଅଟେ ଅଟେ ଅଟେ ଅଟେ ଅଟେ ଅଟେ ଅଟେ ଅଟେ ଅଟ	3	Fairure surface Point No. 1 2 3 3 4 4 6 6 6 9	** Corrected. Fallure surface Point No.	22 33 55 66 7 7 9 9 10	Failure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surface of Pailure surfa	** Corrected

W.O. 8838 Sec. B-B' W=100' D=5'

	Y-surf (ft)
C±O	x-surf (ft)
.c=n.nn.=w.:	Point No.
r P	

									(Fo factor = 1.079)
1835.00	1834.60	1792.34	1788.19	1857.94	1868,24	1958.87	1953.34	2001.34	1.754 +*
183.44	189.29	279.93	288,82	568.81	573.61	615.87	631.95	631.95	Corrected JANSU FOS #
.1	ભ	е	7	5	y	۲.	æ	on.	Corrected
									:
	1835	1835	1835 1834 1752	1835 1834 1798	1835 1934 1792 1798	1835 1793 1798 1788 1869	1834 17934 1793 1798 1986	1834 1792 1793 1798 1993 1993	1833 1733 1738 1738 1950 1950

points	
coordinate points	1
ø	44
À	y-surf (ft)
specified	
00	K-surf (ft)
£	•
Failure surface No. 8 specified by 9	Point No.

(££)	1835,00	1829,44	1787.18		1851.95	1872.82	1963.45	1992,00	2000.00	
(LL)	157.41	169.33	259,96	262.31	581.52	591.36	633.62	646,93	646.93	
No.		8	m	**	S	yg.	r	90	Ø	

# Failure surface No. 9 specified by 9 coordinate points

\*\* Corrected JANBU FOS = 1,764 \*\* (Fo factor = 1.078)

										(Fo factor = 1.061)
y~surf (ft)	1835.00	1830,32	1788,06	1784.34	1888.06	1900.61	1991.24	1992.00	2000,00	1,770 **
x-surf (ft)	162,69	172.72	263.35	271.32	693.02	698.87	741,13	741,49	741.49	JANES FOS =
Point No.	F1	Ø	C1	7	ĸï	ys	۲-	æ	σ'n	Corrected JANBU FOS
										*

# Failure surface No.10 specified by 9 coordinate points

y-surf (ft)	1835.00	1829.88	1787,62	1785.21	1870.00	1886.71	1977.35	1952,00	2000.00
x-surf (ft)	160,05	171.03	261.66	266.82	637.32	645.11	687.38	694.21	694.21
Point No.	1	2	m	4	٧ı	w	ŗ-	8	o,

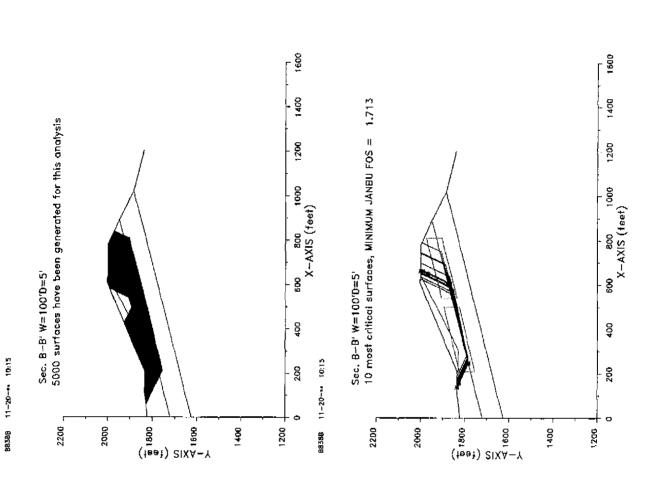
\*\* Corrected JANBU FOS = 1.775 \*\* (Fo factor = 1.070)

## The following is a summary of the TEN most critical surfaces Problem Description : Sec. B-B' W=100'D=5'

Available Strength (1b)	2.4851+06	2.524E+06	2.532E+06	2.2778406 2.724E+06	2.355E+06	2.5255+06	2.8248+06	2.682E+06
Terminal x-coord (ft)	661.59	665.58	652.55	158.10 738.10	631.95	646.93	741.49	694.21
Initial x-coord (ft)	137.25	166.74	142.41	150.53	158.44	157.41	162.69	150.05
Correction	1.071	1.073	1,075	1.061	1.039	1.078	1.061	1.670
Modified JayBU 705	1,713	2.731	1.742	1.752	1.754	1.764	1.770	1.775
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#### \* \* \* END OF FILE \* \* \*





Sec. B-B' W=100' D=5'

W.O. 8838

#### W.O. 8838 Sec. B-B' Pseudo

XSTABL File: 8838BP 11-20-\*\* 10:15

X S T A B L

Slope Stability Analysis

Waing the
Hethod of Slides

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Year. 5.201

Water Surface Mo.

0000

Problem Description : Sec. B-B' W=100'D=5' Pseudo

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Segment x-left y-left x-right y-right soil Unit No. [ft] (ft) (ft) (ft) (ft) Selow Segment 2 1 2.24.0 1823.0 124.0 1825.0 210.0 1825.0 210.0 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2 2000.0 2

Below Segment Soil Unit y-right (ft) 1830.0 1830.0 2000.0 1950.0 1885.0 x-right 213.1 313.0 640.0 890.0 (ft) 5 SURSURFACE boundary segments y-left 1835.0 1830.0 1720.0 1625.0 (£t) 210.0 210.1 310.0 .0 x-left (ff) Segrent No.

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf)

Pailore surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

	OPIC Soil	1 124 1	o control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the cont			
a O	Soil writ(s)		specified			
Soil Unit No.	Unit ) Moist (pof)	Weight Sat. (Pcf)	Cohesion Intercept {psf}	Friction Angle (deg)	Pore Pressure Parameter Const	pessure Constant (psf)
- 0. m	130.0 125.0 130.0	140.0 135.0 140.0	225.0	34.00	000	0,0,0
4	130°C	140.0	225.0	40.00	000	0.
ANISOTROP specified	ပ္မရ	STRENGTH	PARANTERS   Unit(s)	! !		
- Cos	Obsit.	SENA 20	ANISOTROPIC			
	of		ranges spec	specified =	гð	
Direction Range No.	Ko.	Counter Direction	Counterclockwise rection Limit (deg)	ù	-value (psf)	i-value (degrees)
- O M			10.00 14.00 90.00		225.0 100.0 225.0	40,00 25.00 40.00
Soil 1	Մուշ 3	is anisk	ANISOTROPIC			
Number	'H	direction 1	rangea spec	specified =	m	
Direction Range No.		Counter Jirection	Counterclockwise rection Limit (deg)	U	-value (psf)	í-value (dagraes)
- 0 F			10.00 14.00 90.00		225.0 350.0 225.0	40.00 17.00 40.00
Soil (	Ocit 4	is Ariso	ANISOTROPIC			
Murber	ō	direction	ranges spec	specified =	e	
Direction Range No.	Yo.	Counter Direction	Counterclockwise rection Limit (deg)		c-value (psf)	=~value (degrees)
H 121 €		7.4.0	10.00 14.00 50.00		225.0 150.0 225.0	40.00 11.00 40.00
A hor	horizental. 150 has	earthg	pake loading assigned	coefficient	ant	
A ver	vertical ear	thqua	loading signed	coefficient	د	

#### W.O. 8838 Sec. B-B' Pseudo

esing a random ses, has been	; surfaces	analyzed.	block base	portions of	y-right Ridth (ft) (ft)	1860.0 70.0 1940.0 70.0	.,		as examined	ite points							(Fo factor = 1.049)	coordinate points							(So factor = 1.044)
e searching method, usisilating BLOCK surfaces,	cions of the sliding the Mankine theory.	be generated and a	generation of central	for active and passive O ft	x-right (ft)	500,0 810.0	safety have been calculated by the		il the failure surfaces most critical first	specified by 8 coordinate	y-surf (ft)	1835.00	1788.11	1787.44	1514,50	1588,71	1.097 **	specified by 7 coording	Y-surf (ft)	1835.00 1829.42	1787.16	1910.58	1977.97	1985.97	1.108 **
failure surfac for generating	active and passive portions generated according to the 9	trial surfaces will	specified for	of line segments block is 106.	x-left y-left (ft) (ft)	210.0 1793.0 540.0 1873.0	ð.		10 most critical of all displayed below - than	Surface No. 1	Point x-surf No. (£t)	1 163.00	3 263.56			7 787.25 8 787.25	Corrected JANHU 705 =	surface No. 2	Point x-surf No. (ft)	1 156.30			6 610.87	7 810.87	Corrected JANEL FOS -
A critical technique specified.	The act	5000 t	2 boxes	Length	30X 110.	7	Factors	*	The 10	Failure							3 ‡	Failure							\$ *

coordinate points						(Fo factor = 1.049)	coordinate points										(Fo factor = 1.042)	coordinate points										[Fo factor = 1.061)	coordinate points								(Fo factor = 1.049)	
specified by 8 o	y-surf (ft)	1835.CC 1830,12 1787.85	1787.24	1920.26	1981.36 1989.36	1.122 **	fied by 9	y-surf	(££)	1835,00	833	9 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	35.	1914.55	926	1981.91	1.126 **	fied by 9	y-surf (ft)	DO REGI	1828.30	1786.04	1785.98	1887.62	1999.61	1992.00	2000.00	1.127 **	specified by 6 o	y-surf		835	793	606	1915,68	1995.20	1.132 **	
m	x-surf (ft)	161.47 171.94 262.57	263.89	774.93	803.42	JANEU FCS =	e No. 4 speci	x-surf	( <del>)</del>							819.79	JANBU FOS =	e No. 5 specil	x-surf (ft)	.50	164.90	255.53	255.65	589.42	737 2B	738.10	738.13	JANEU FOS =	No. 6	1108-X	_	- 8	8	3 3	790.55	790,56	JAMBU FOS =	
Failure surface No.	Point No.	HOR	-9 u	s us	P- 00	** Corrected	Failure surface	Point	No.	п	61.17	กษา	· 14	w	r- (	u on	** Corrected	Failure surface	Point No.	-	101	M	4	ur l	o r-	o do	On.	** Corrected	Sailure surface	Point	No.	-	OI I	m -	er in	, v	** Corrected	

Failure surface No. 7 specified by 8 coordinate points

		(Fo factor = 1.048)	coordinate points			(Fo factor = 1.042)	coordinate points		(Fo factor = 1.053)	coordinate points						
(ft)	1823,10 1780,84 1778,95 1907,04 1960,74 1980,75	1.135	specified by 7 coc	y-surf (ft)	1835.00 1830.34 1788.08 1909.69 1930.50 1968.28	1.139	by 8 -surf (ft)	1835,00 1832,61 1789,65 1789,65 1934,61 1948,61 1963,46	141	by B	(ft)	1838.34	1798.06	1913.43	:926.27 :973.69	1981.69
(11)	120.10 144.80 235.43 239.48 770.37 776.76 804.75	CANBU FOS =	00	x-surf (ft)	157.11 167.09 257,72 804 85 814.56 832.18	JAMBU FOS =	No. 9 specified x-surf y (ft)	176,46 181,59 272,22 273,72 753,72 768,54 798,78	TANBU ?	. ×	(££)	217.85	302.04	792.19		
No.	പെ വർ എവ വരെ വ	** Corrected	Failure surface No.	Point No.	ግ ር/ W <b>ቆ</b> ጥ ሶ ኮ	** Corrected	Failure surface Point No.	ପାଣ ବଳ ବଳ କ	a .	Failure surface Point	Š.	F 2	rr) e	·w	<b>v</b> r-	. 60

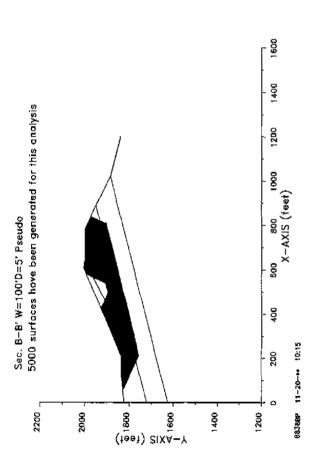
The following is a summary of the TDM most critical surfaces

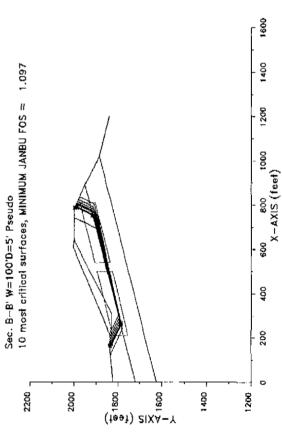
# Problem Description : Sec. 3-B' Wal00'D=5' Pseudo

Available Strength [lb]	2.7978+06 2.9008+006 2.9538+06 2.7048+06 2.7048+06 3.03958+05 3.03958+05 2.98088+06 2.98088+06
Terminal x-coord (ft)	787.25 810.87 803.42 819.79 738.10 790.56 804.75 820.29
Initial x-coord (ft)	163.00 136.30 161.47 206.79 150.53 190.18 120.10 157.11 176.46
Correction Factor	3.049 1.049 1.049 1.042 1.042 1.049 1.042 1.053
Modified JANBU FOS	1,097 1,108 1,122 1,124 1,126 1,137 1,138 1,139 1,141
	માં <u>પ્રાથમિયા તે પ્રાથ</u> ય છે.

\* \* \* TIL JO QNE \* \*

W.O. 8838 Sec. B-B' Pseudo





## Sec. B-B' Pseudo., Spencer's

XSTABL File: 8838BFS 11-20-\*\* 10:16

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Water Surface No.

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Problem Description : Sec. B-B' W=100"D=5' Pseudo Spencer

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

 Segment
 x-laft
 y-laft
 x-right
 y-right
 Scil Unit

 No.
 (ft)
 (ft)
 (ft)
 Below Segment

 1
 .0
 1823.0
 124.0
 1835.0
 1

 2
 124.0
 1835.0
 210.0
 1835.0
 1

 4
 610.0
 2005.0
 540.0
 2005.0
 2

 5
 640.0
 2006.0
 780.0
 2006.0
 2

 6
 780.0
 2006.0
 1890.0
 1895.0
 3

 7
 890.0
 1220.0
 1895.0
 3

 8
 1020.0
 1865.0
 1120.0
 4

 9
 1120.0
 1860.0
 1860.0
 4

Segment x-left y-laft x-right y-right Soil Unit No. (ft) (ft) (ft) Below Segment

1 210.0 1835.0 210.1 1830.0 1

2 210.1 1830.0 310.0 1930.0 1

3 310.0 1830.0 640.0 200.0 1

4 0 1720.0 890.0 1950.0 5

5 0 1625.0 1020.0 1885.0 4

A GRACKED ZONT HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00
Maximum depth of water in crack = .00
Unit weight of water in crack = 62.40

(feet) (feet) (pcf)

i-value (degrees)

c-value (psf)

Counterclockwise Direction Limit (deg)

Direction Range Mo. 40,00 40,00

225.0 150.0 225.0

10.00 14.00 90.00 A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROFIC		Soil Parameters	eters			
4 Scil	unit(s)		specified			
Soil U Unit Mo No. (p	Unit Moist Moist (pef)	Waight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Const	ressure Constant (psf)
1 13 2 12	130.0 125.0	140.0 135.0	225.0 200.0	40.00	C00.	o o
	130.0	140.0	225.0	40.00	000	ο. <b>ດ</b>
ANISOTROPIC Specified for		STRENGTS I	PARAMETERS [ Unit(s)	! !		
Soil Unit Number of		.a. \$		specified =	m	
Direction Range No.		Counterclockwi Direction Limit	Counterclockwise rection Limit (deg)		c-value (psf)	i-value (degrees)
-1		-	10.00		225.0	40,00
CN ED			14.00 90.00		100.0 225.0	25.00
Soil Unit	it Ed	is AMISOTROPIC	DIROPIC			
Number o	of di	dizection z	ranges spec	specified =	m	
Direction Range No.		Counterd Direction	Counterclockwise rection Limit (deg)		c-value (ps:)	i-value (degrees)
0			10.00		225.0	40.00
4 M		1 (/)	30.00		225.0	40.00
Soil Unit	<b>4</b>	. 2	ANISOTROPIC			
Number of		direction ranges	canges spec	specified =	m	

GEOLABS-WESTLAKE VILLAGE

Sec. B-B' Pseudo., Spencer's W.O. 8838

888888888

و بر بر ف	00	666	si .		of slice base		Pore Water	Pressure (psf)		.0 3367.1	,,,					.0 1647.8 .0 583.1		- Magnitude & Location of Interslice Forces		varepunda ex		(£E)		21.92								0 26.84									700.97 feet		
	66	ه څ څ	j		center of				6,0	ر در در	۲.,	9 64	m .	7. 7.	ō.,	- · · ·		ion of In		e Force	Height	Œ		15.52					38.85			8.90	,			ы		(nef)			ŧŧ		
46.30 17.90	17.60	65.00 63.00 63.00	. O.		Stresses at		Vertical	Stress (psf)		2842.2		9556	٠,	13731.4		7301.7		la s locat		Interslice	Force	(1p)	14999	227747	228653	1194065	1163775	492102	405453	159580	136550	B547	-252			RE SURFAC		10542 42		3369	re surface		
		225.0			- TOTAL S		Normal	Stress (psf)	1294.9	5051.6 8075.0	16287.8	8554.1	12109.3	12300,0	3756.6	2335.3 653.1		- Magnitus		Force	Angle	(degrees)	17,82	17.62	17.82	77.67 11.62	17.82	17.82	17,82	17.82	17.82	17.82	00.			LONG PALLU		H REGITAR H		II so	h of failu		
24894.5 8554.1 12109.3	14566.4 12300.0	3756.6 2335.3 652.1	433.1		(1973)		Base	x-000in (ft)	167.96	210.05	236.83	287.49	460.00	694.81	751.14	783,62		SPENCER'S (1973)		Right	·u	(£F)	172.93	210.00	210.10	264 00	310.00	610.00	640,00	749.62	752.65	780.00	787,25			AVERAGE VALUES ALONG PALLURE SURFACE		Total Normal	Pore Nater Pressure	Shear Stress	Total Length of failure		
ክዩr		2112			SPENCER'S		Slice.	•	<b>ਜ</b> !	n m	<b>V</b> U	იდ	r 0	o ch	2 :	# 51		SPENCER		Slice	*		г)	ณ	<b>n</b> =	ę w	) vo	,	80	ភា	10	11	12			AVERAG		÷	Œ.	to	Ę.		
י מי																	weight	(16)	298B.		m	12867.	4	487892.	34987	-																191 191	
ANALYSIS										***	***						beta weight		.00 298B.	23,03	23.03	23.03	23.03 4	-	ģ	90	-24.44						S moment	1.3433		1,3325	1.3241	 L.325I				(15)	
FIED FOR ANALYSIS										**************************************	1973) **************					,	alpha beta		-25.00 .00	-25.00 23,03	-25.00 23.03	13.97 23.03	13.97 23.03 4	13.97 -9.46	69 67	65.00 00 1	65.00 -24.44						SO	1.3433	1))!	1.3325	1.3241	1.3251			: :	(15)	,
EN SPECIFIED FOR ANALYSIS	by nts :	-sur£ (ft)	35.00	30.37	88.11 87.44	08.01	14.50	96.71		<b>经济的政治的 医生生性病病 医生生性病病</b>	Dender (1973)						width alpha beta	(It)	37.07 -25.00 .00	.10 -25.00 23,03	53.46 -25.00 23.03	1.43 -25.11 23.03 45.01 13.97 23.03	360.00 13.97 23.03 4	9.46 00	3.03 64.53 00	27.35 65.00 00 1	7.25 65.00 -24.44						force FOS		3325	1.3241 1.3325		1.3257 1.3251				(15)	,
HAS BEEN	pecified by nate points :	*	1835.	1630.	1788.	1908.	1914.	1996.		安全不会 人名英格兰 医二二氏 医二二氏 医二二氏 医二二氏 医二二氏 医二二氏 医二二氏 医二二	SIS: Spencer (1973)				**************************************	774 CANA **********************************	height width alpha beta	(It)	-25.00 .00	.10 -25.00 23,03	53.46 -25.00 23.03	13.97 23.03	360.00 13.97 23.03 4	330.00 13.97 -9.46	3 03 64 63 00	27.35 65.00 00 1	7.25 65.00 -24.44			: WETHOD		,	FOS force FOS	7777	1,3325	324.		3257				(1b) (1b) (1b)	
HAS BEEN	purface specified by 8 coordinate points :	x-surf y-surf (ft) (ft)	1835.	1630.	1788.	1908.	1914.	787.25 1996.71		· 张兴州的建筑的城市的 医克里氏 医克里氏氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医原生性 医原生性 医原生性 医原生性 医原生性 医原生性 医原生性 医原生性	) OF ANALYSIS: Spence: (1973)				TATES BELLEVANDED TO THE TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL	100 T. 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T.	e height width alpha beta	(It) (It)	37.07 -25.00 .00	21.96 .10 -25.00 23,03	45.83 53.46 -25.00 23.03	1.43 -25.11 23.03 45.01 13.97 23.03	105.29 360.00 13.97 23.03 4	30.00 13.97 -9.46	88.74 3.03 64.57 00	56.17 27.35 65.00 00 1	17.42 7.25 65.00 -24.44			SPENCER'S METHOD		,	FOS force FOS		1,3325	1.3241		3257		beuntinoo	the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the cu	(1b) (1b) (1b)	
SINGLE FALLURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS	Trial failure surface specified by the following 8 coordinate points:		163.00 1835.	172,93 1830.	1788.	749.62 1908.	727.55 1914.	787.25 1996.		· 有一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个	SELECTED METHOD OF ANALYSIS: Spence: (1973)				AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	**************************************	e y-base height width alpha beta	(It) (It) (It)	2.31 9.93 -25.00 .00 13.27 37.07 -25.00 00	1813.06 21.96 .10 -25.00 23.03	45.83 53.46 -25.00 23.03	1793,04 74.50 45.01 13.97 23.03	00 1835.96 105.29 360.00 13.97 23.03 4	125.49 30.00 13.97 -9.46	1911.26 88.74 3.03 64.93 00	1943.83 56.17 27.35 65.00 00 1	1980,93 17.42 7.25 65.00 -24,44			ITERATIONS FOR SPENCER'S METHOD		i	Theta FOS force FOS	7777	18.0995 1,3325	17,7540 1,3241	11,8272	17.8183 1.3257			the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the culture of the cu	(psf) (1b) (1b) (1b)	110% p 20% p 40 %

837 708 388 388 326 326 326 332 - 332 - 008

Boundary Reight Height Ratio (ft)

925.0 3367.1 10478.8 110478.8 2085.3 2095.7 3472.3 2249.7 2249.7 2547.4 1647.4

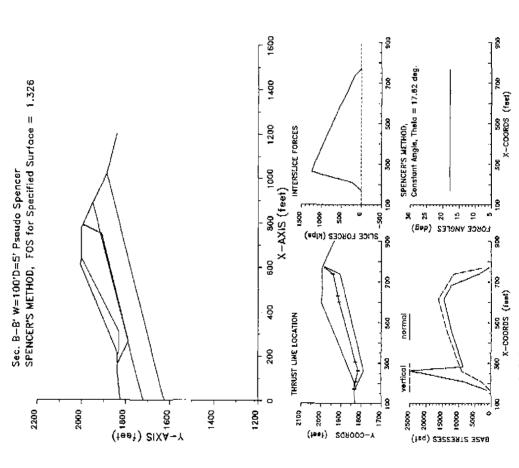
Sec. B-B' Pseudo., Spencer's

of the interslice forces, the SFENCER'S (1973) procedure gives a

FACTOR OF SAFETY = 1,326

Total shear strength available along specified failure surface = 313.16E+04 lb

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Sec. B-8' W=100'D=5' Pseudo Spencer SPENCER'S METHOD, FOS for Specified Surface = 1.326

Sec. B-B' Backcut

XSTABL File: 88383B

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Problem Description : Sec. B-B' Backcut

SEGMENT BOONDARY COORDINATES

10 SURFACE boundary segments

Soil Unit Below Segment 1835.0 1835.0 1830.0 1830.0 2000.0 2000.0 1950.0 1885.0 1860.0 x-right (ft) 124.0 210.0 210.1 310.0 640.0 786.0 890.0 1026.0 1823.0 1835.0 1835.0 1830.0 1830.0 2000.0 2000.0 1950.0 1860.0 y-left (ft) .0 124.0 210.0 210.1 780.0 890.0 1020.0 1120.0 310.0 x-left 640.0 (ft)

2 SUBSIRFACE boundary segments

Below Segment Soil Unit 1950.0 1885.0 y-right 890.0 1020.0 x-right (£ y-left (ft) 1720.0 1625.0 óó (ff) Segment No.

A CRACKED ZONE BAS BZEN SPECIFIED

(feet) (fæt) (pcf) Depth of craci below ground surface = 0.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 62.40 Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

4 Soil unit(s) specified

Water Surface No.	6000
essure Constant (psf)	0000
ction Pore Pressure ngle Parameter Constant deg) Ru (psf)	000,
E. A.	40.00 34.00 40.00
Cohesion Intercept (psf)	225.0 200.0 225.0 225.0
: Weight C : Sat. I (pcf)	140.0 135.0 140.0 140.0
Waist (pcf)	130.0 125.0 130.0 130.0
Soil Unit No.	404

ANISOTROPIC STRENGTH PARAMETERS specified for 3 Soil Unit(s)

Soil Unit 1 is AMISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40,00 25,00 40,00
c-value (psf)	225.0 100.0 225.0
Counterclockwise Direction Limit (deg)	10,00 14,00 90,00
Ourection Range No.	-1 64 E

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00
c-value (psf)	225.0
Counterclocivise Direction Limit [deg)	10.00
Direction Range No.	, ( 0)

40.00

225,0

90,00

Soil Unit 4 is ANISCIROPIC

Number of direction ranges specified =

i-value (degrees)	40.00 11.00 46.00
c-value (psf)	228.0 150.0 225.0
Counterclockwise Direction Limit (deg)	10.00 14.00 90.00
lirection Garge No.	.1 (4) (5)

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

#### Sec. B-B' Backcut

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding black is 100.0 ft

Midth (ft)	73.0 83.0
y-right (ft)	1830.0
x-right (ft)	400.0
y-left (ft)	1790.0
x~left (ft)	31C.D 50C.D
Box 10	1 2

Factors of safety have been calculated by the :

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

Failure surface No. 1 specified by 8 coordinate points

y-surf (ft)	1830.00	1804.71	1803.69	1865,98	1871.38	1962,01	1992,00	2000.00
x-surf (f:)	273,59	327.81	330.01	583.27	585.79	628.05	642.03	642,03
Point No.	-	7	eп	4	<b>s</b> n	Ψ	۲-	œ

\*\* Corrected JANBU FOS = 1.336 \*\* (Fo factor = 1.880)

Failure surface No. 2 specified by 7 coordinate points

y-surf (ft)	1831.57 1812.10 1873.31 1878.67 1969.31 1992.00
x-surf (ft)	323.05 354.81 531.50 614.00 655.26 665.85
Point No.	

\*\* Corrected JANBU FOS = 1.351 \*\* (Fo factor = 1.078)

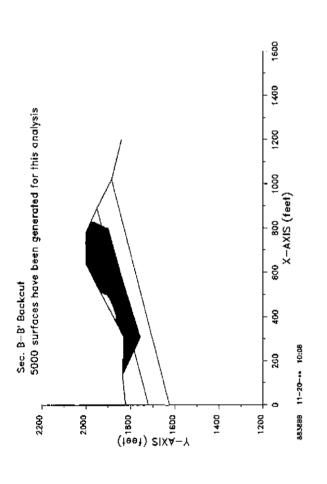
Failure surface No. 3 specified by 8 coordinate points

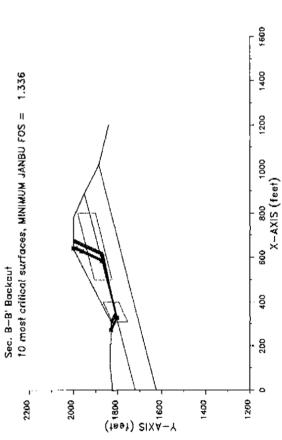
y-surf (ft)	1830,00 1804,52 1804,04
x-surf (ft)	272.44 327.07 328.12 616.41
Point Mo.	ାରା ଓ ସ

	[Fo factor = 1.077]	coordinate points							(Fo factor = 1.081)	coordinate points									(Po factor = 1.081)	coordinate points								(Fo factor = 1.079)	coordinate points						
1880.80 1971.43 1992.00 2000.00	1.351 **	8 Āq	y-surf (ft)	1830.00	1808.02	1862.54	1963.73	1992.00 2000.00	1.354 **	fied by 8 co	y-surf		1805,22	80	862.	961	991.	999.	1,354 **	ě.	y-surf (ft)	1830 00	1805.03	1804.73	1854.59	1970.51	1952.00 2000.00	1.364 **	by g	Y-surf	_	1820.00	1806.27 1803.56	1861.25	1871,78 1962,41
622.21 664.47 674.06 674.06	JAKBU FOS =	No. 4 specified	A-Surf (ft)	296,82	343.94	587.51	634.69	647.87 647.87	JANBU FOS =	. Yo. 5 speci	X-suzf		329.75	331.53	578,35	624.53	638,58	538.58	JANBU FOS =	No. 6 specified	x-surf (ft)	275 46	329.02	329,64	511.49	660,93	670.95	JANGU FOS =	No. 7 specified	X-surf	(LE)	282.93	333.82	582.42	587.34 629.60
ማዋኮመ	** Corrected	Failure surface	Point No.	٦,	ım	÷ u	n vo	r- 80	** Corrected	Failure surface	15 CA	į ,	2 1	ım	TO U	n v	ı r~	60	** Corrected	Failure surface	Point No.	-	10	m ·	og iv	, w	r- eo	** Corrected	Failure surface	Point	Кэ,	<b>F</b>	വത	ব	ധായ

	1,354 1,081 276.62 638.58 1,364 1,079 275.46 670.95	8. 1.374 1.077 226.11 669.59 1.468E-06 9. 1.379 1.062 305.27 648.56 1.311E-06	1.381 1.079 295.67 679.91	* * * EMD OF FILE * * *															
		= 1.081)	ę			(7707)	ZJ				= 1.082)	ts			= 1.079)	urfaces		Available Strength (lb)	1.2611.06
		(Fo factor = 1.081)	ccordinate points			(Fo factor = 1.077)	coordinate points				(fo factor	ocordinate points			(Fo factor	most critical surfaces		Terrinal x-coord (ft)	642.03
	1992.00 2000.00	1,368 **	<b>ć</b> -	y-surf (ft)	1830, 00 1804, 77 1869, 22 1879, 48 1970, 11 2000, 00	1.374 **	r.	y-surf (ft)	1830.00 1810.55	1873,30 1963.93 1992,00	2000.00	60	Y-surf (ft)	1830.00 1808.39 1808.37 1864.93 1882.51 1973.14 1992.00	1,381 **		: Sec. B-3' Backcut	Initial x-coord (ft)	273.59
	643,39 1 643,39 2	ji.	Failure surface No. 8 specified by	x-surf (ft)	266.11 320.23 612.34 617.12 559.38 669.59	1	lo. 9 specified by	x-surf (ft)	346.97			Failure surface No.10 specified by	x-surf (ft)	295.67 342.02 342.05 628.85 671.11 679.91	1	a successy of the TEN	on : Sec. B-	Correction Factor	1,080
:. B-B' Backcut	r 8	Corrected JAMBU FOS	re surface N	Point No.	<b>ገ ሪ ጥ ጣ ጣ ካ ካ ካ ካ</b>	Corrected Janet FDS	, Failure surface No.	Point No.	. 1 (2) (7	ነቀጣው	15	re surface N	Point No.	ലേരത്യന്നെയ്റമ	Corrected JANAU FOS	The following is a	Problem Description	Modified CAMBO FOS	1.336
3-B' E		<b>:</b>	Failu			:	, Failu				‡	<b>Va</b> ilu			*	The f	Probl	-	.; ,







GEOLABS-WESTLAKE VILLAGE

## Sec. B1-B1, W=100, D=5,

XSTABL File: 883881 11-13-\*\*

XSIABL	#
	*
Slope Stability Analysis	•
using the	•
Method of Slices	*
	*
Copyright (C) 1992 A 96	*
Interactive Software Designs, Inc.	*
Moscow, ID 83843, U.S.A.	•
	*
All Rights Reserved	*
	*
Vor 5 261	4 49

Problem Description : Sec. Bl.Bl' W=100' D=5'

SECRENT BOUNDARY COORDINATES

## 12 SURFACE boundary segments

Soil Unit Below Segment	1	-	-1	F	m	7	2	61	۲.	1	т	M
y-right (ft)	1799,0	1804.0	1804.0	1800.0	1300.0	1804.0	1960.0	1960.0	1955.0	1930.0	1885.0	1820.0
x-right (ft)	250.0	260.0	265.0	275.0	320.0	328.0	725.0	740.0	820.0	925.0	1020.0	11.65.0
y-left (ft)	1798.0	1799.0	1834.0	1804.0	1800.0	1800.0	1804.0	1960.0	1960.0	1955.0	1930.0	1885.0
x-left (ft)	9,	250.0	260.0	265.0	275.0	320.0	328,0	725.0	740.0	820.0	925.0	1020.0
Segment No.	г	CNI	m	4	ıŋ	vo	۲-	m	o,	10	11	12

## 4 SUBSURFACE boundary segments

Soil Unit Below Segment	~ m
y-right (ft)	1795.0 1795.0 1960.0 1885.0
x~right (ft)	320.1 420.0 740.0 1020.0
y-left (ft)	1800.0 1795.0 1795.0
x-left (ft)	320.0 320.1 420.0
Segment No.	កែលកទ

A CRACKED ZONE RAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf)

Pailure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

	Water	Surface No.	1	-1	-1
	955UT&	Constant (psf)	°.	9	•
	Pore Pressure	Angle Parameter Constant (deg) Ru (psf)	000	000	000
	Friction		40.00	34.00	40.00
ters :	Cobesion	Intercept (psf)	225.0	200.0	225.0
ISOTROPIC Soil Parameters	is, speci leight	Sat.	140.0	135.0	340.0
OPIC Soi	Soil Unit Weight	Moist (pcf)	130.0	125.0	130.0
ISOTROPIO	Soil Soil	Umit No.		64	m

ANISOTROPIC STRENGTH PARAMETERS specified for 2 Soil Unit(s)

### Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

i-vaine (degrees)	40,00 17,00 40.00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	13.00 16.00 90.00
Direction Range No.	пие

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

i~value (degrees)	40.00 11.00 40.60
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	13.00 16.00 90.00
irection ange No.	- c) M

## : Water surface(s) have been specified

62.40 (pof) Unit weight of water = Water Surface No. 1 specified by 5 coordinate points

PHREATC SURFACE,

y-water (ft)	1780.00 1830.00 1830.00
x-vater (??)	300.00 320.00 320.00
Point No.	~ 12 M ₽

#### Sec. B1-B1, W=100, D=5, W.O. 8838

A critical failure surface searching method, using a random rechnique for generating sliding BLOCK surfaces, has been specified.

1804.00

1955,68

809.19

רכו

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 180.0 ft

Width (ft)	100.0
y-right	1800.0
(ft)	1870.0
x-right	600.0
(ft)	920.0
y-left	1730.0
(ft)	1810.0
x-left (ft)	300.0
Box no.	7 77

Sactors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANBU METHOD \* \* \* \* \*

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

Failure surface No. 1 specified by 9 coordinate points

y-surf (ft)	1775.84 1775.84 1773.58 1772.66 1825.07 1523.97 1949.88
¥,	1775. 1775. 1736. 1826. 1833. 1941.
x-surf (ft)	268.52 257.94 348.47 363.44 787.52 790.91 833.17 841.52
Point No.	ማ መ ግ ጭ መ ቴ መ ያ ነ

(Fo factor = 1.064) \*\* Corrected JANES FOS = 1,448 \*\*

Failure surface No. 2 specified by 9 coordinate points

y-surf (ft)	1798.92 1779.66 1736.80 1728.80 1818.25 1824.52	89 206.
x-suff (ft)	229.53 272.12 362.75 379.91 748.84 751.76	806 J
Point No.	ተያመቀማወት	α

	450 ** (Fo factor = 1.071	by 9 coordinate points	-surf	(ft)	98.95	80.38	28.30	31.50	35.89	26.51	47.72	453 ** (Fo factor = 1.664)	by 9 coordinate pounts	9 5	(ft)						42.05		155 ** (Fo fac	by 9 coordinate points	-surf (ft)	58,92	79,56	35.EU	22.63	26.02	16.65	55,33	464 ** (Fo factor = 1.069)	by 8 coordinate points	-surf (ft)		20 00	45.08 51.08
1.		ecified b	ž	E	179	1780	1728	183	183	1924	1947.	1,4	fied	Ĭ,	=	179%	1730	172	182	192	1942	195			ķ	179	1771	173	182	182	16.	1955	1.4	fied	ž	÷	1798	
	JANEL FOS =	No.3 sp	x-surf	(g.e)	238.14		389.65	11.008	802.15	644.42	850.58	JAMBU FCS =	No. 4 speci	x-surt	(££)						840.77		e danad	a No. 5 specified	x-surf (ft)		272.14	362.17	756.86	758.44	800,70	6,5,00	JAMBU FOS =	яа, 6 speci	x-surf (ft)	į,	236.72	-
	* Corrected	Failure surface	Point	Νo.	1	D) IF	) <b>4</b> 7	ιέĵ	w	r- (	<b>o</b> on	• Corrected	Failure surface	Point	.40°.		V 1º	, <del>-4</del>	ירט	-، و		ð,	ы	Sailure surface	Point No	1	N A	Y1 ~	'n	g	r- c	ാത	Corrected	Pailure surface	Point No.	į		r

	(Fo factor = 1.055)
1921.73 1929.73	1,458 **
925.56 925.56	JANEU FOS =
r~ 00	Corrected
	*

Failure surface No. 7 specified by 9 coordinate points

y-surf (ft)	1800,00	1788.28	1746.02	1740.85	1837.88	1838.55	1929.18	1937.45	1945.45
x-surf (fc)	287.69	313.02	403.65	414,74	813,69	914.00	856.26	860.12	860.12
Point No.	1	7	m	4	ľ	9	۲-	80	os.

\*\* Corrected JANEU FOS = 1.470 \*\* (Fo factor = 1.061)

Failure surface No. 8 specified by 9 coordinate points

										(Fo factor = 1.056)
y-surf (ft)	1803.32	1784.92	1742.66	1730,01	1836.92	1538.41	1929.04	1937.56	1945.56	1.493 **
x-surf (ft)	258.64	298.11	388.74	415.87	812,70	813,40	E55.66	659,63	659,63	JAKRU FOS =
Polat No.	1	2	rη	7	2	9	7	æ	Ø)	* Corrected JAMBU #08
										#

Failure surface No. 9 specified by 9 coordinate points

(ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft)		
253 2622 353 374 374 141 741 741 741 741	y~suef (ft)	
נע	x-surf (ft)	215,19 262,37 353,00 374,99 741,78 741,78 181,04 800,51
or and in or and and and and and and and and and and	Point No.	ним филороо

\*\* Corrected JAMES FOS = 1.493 \*\* (Fo factor = 1.074)

Failure surface No.10 specified by 9 coordinate points

Y~surf (ft)	1798.68 1769.77 1727.50 1720.35
x-surf (ft)	168,91 230,91 321,54 336,69
Point No.	የነ መ ቅ አህ

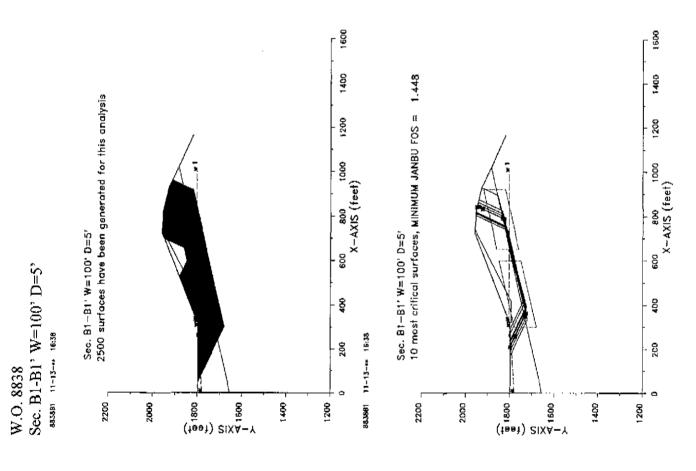
				(Fo factor ≈ 1.060)
1841.96	1932.59	1934.55	1942.55	1,495 **
629.12	871.39	872.30	872,30	JANED FOS =
œ	r	Б	σι	Corrected JANSD FOS
				ż

The following is a summary of the TBN most critical surfaces

Problem Description : Sec. B1-B1' W=100' D=5'

Available Strength [1b)	2,387E+D6	2.311E+06	2,4018+06	2.443E+06	2.434€+06	2.424E+06	2.232E+06	2.451E+06	2.436E+06	2,5230+06
ferminal x-coord (ft)	941.52	905.19	850.58	840.77	815.00	925.55	860,12	859.63	800.51	872.30
Initial x-coord (ft)	208.52	229.53	238.14	189,92	229,57	236,72	287.89	258.64	215.19	168.91
Correction	1.064	1,071	1.064	1.064	1.069	1.055	1.061	1,065	1.074	1.060
Modified JANEO FOS	1.448	1.450	1.453	1.455	1.464	1.468	1.470	1,493	1,493	2.495
	-	۸i	ei	ď	ικί	œ.	ŗ.	œ.	ó	10.

\* \* \* 2113 90 GN3 \* \*



GEOLABS-WESTLAKE VILLAGE

W.O. 8838 Sec. B1-B1' Spencer's

XSTABL File: 8838BJS 11-13-\*\* 16:38

\* Slope Stability Analysis \*

\* Slope Stability Analysis \*

\* Using the \*

\* Method of Slices \*

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\* Ver. 5.201 96 A 1245 \*

Problem Description : Sec. Bl-Bl' %=100' D=5' Spencer

SEGMENT BOUNDARY COORDINATES

12 S.RFACE boundary segments

 Segment
 x-left
 y-left
 x-right
 y-right
 Soil Unit

 No.
 (ft)
 (ft)
 (ft)
 (ft)
 Bolov Segment

 1
 .0
 1798.0
 25C.0
 1799.0
 26C.0
 1804.0
 1

 2
 25C.0
 1799.0
 26C.0
 1804.0
 1
 1

 3
 26C.0
 1804.0
 275.0
 1804.0
 1
 1

 4
 265.0
 1804.0
 1804.0
 1
 1
 1

 5
 25C.0
 1806.0
 320.0
 1804.0
 2
 1

 6
 32D.0
 1806.0
 725.0
 1960.0
 2
 2

 7
 32B.0
 1806.0
 730.0
 1960.0
 2
 2

 8
 740.0
 1960.0
 820.0
 1960.0
 2
 1

 10
 920.0
 1955.0
 1950.0
 2
 1
 1

 11
 925.0
 1995.0
 1
 1955.0
 1
 1
 <td

4 SUBSURFACE boundary segments
ment x-left y-right y-right

 Segment
 x-left
 y-left
 x-right
 y-right
 Soil Unit

 No.
 (ft)
 (ft)
 (ft)
 Balow Segment

 1
 320.0
 1800.0
 320.1
 1795.0
 1

 2
 320.1
 1795.0
 420.0
 1795.0
 1

 3
 420.0
 1795.0
 1
 1

 4
 .0
 1655.0
 1020.0
 1885.0
 3

A CRACKED ZONE BAS BEEN SPECIFIED

Depth of craci below ground surface = 8.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

3 Soil unit(s) specified

3 Soil unit(s) specified

Soil Unit Weist Sat. Intercept Angle Parameter Constant Surface
No. (pcf) (pcf) (deg) Ru (psf) No.

1 130.0 140.0 225.0 46.30 .000 .0

2 125.0 135.0 225.0 40.00 .000 .0

ANISOTROPIC STRENGTH BARAMETERS specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Counterclockwise c-value i-value
Range No. Direction Limit (deg) (psf) (degrees)

1 13.00 225.0 40.00

2 16.00 150.0 17.00

90.00 40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pof)

Mater Surface No. 1 specified by 5 coordinate points

 Point X-water y-water No. (ft) (ft) 1 .00 1780.00 2 320.00 1860.00 4 328.00 1860.00

	pencer's
W.O. 8838	Sec. B1-B1; Sp

SLICE INPORMATION sontinued :	Slice Sigma c-value phi U-base U-top P-top Delta (psf) (psf) (lb) (lb) (lb)	225.0 40.00 0.00 0.00.00.00.00.00.00.00.00.00.0	3598.3 225.0 40.00 10350. 0. 0.	4541.1 225,0 40,00 3246. 0, 0. 487 3 225,0 40,00 8168. 0. 0.	4879.0 225.0 40.00 19075, 0. C.	5479.4 225.0 40.0C 63674, O. C.	6845.6 225.0 40,00 66760. 0. 0.	8508.6 225.0 40.00 293. 0. C.	2018.1 225.0 40.00 24620. 0. C. C. C. C. C. C. C. C. C. C. C. C. C.	12589.4 225.0 40.00 76154. 0. 6.	8032.4 150.0 11,00 256539. 0, 0.	13329.3 150.0 11.00 561967, 0. 0.	18395.9 150.0 11.00 0. 0. 0.	18215.7 150.0 11.00 0. 0. 0.	6792.5 225.0 40.00 0. 0. 0.	4845.5 225.0 40.00 0. 0. 0.	225.0 40.00 0. 0. 225.0 40.00 0. 0.	CUDACTOIC (1973) TAMES Chances at carter of click back	- TOTOP STEERE OF CENTER OF	De Base Mormal Vertical Pore Water	r x-coord stress stress rressure stress (ft) (psf) (psf) (psf) (bsf)	ó	2602.3	3220,6 1196.5 3875 3 1369 1	262.5c 6351.9 4181.6	4416.2 1728.9	287.50 7787,7 5310.3 2308.3	9870,8 6787,5 3025,3	220.02 1434.4 2253.4 224.05 17938.0 7953.0 2848.3	339.24 14082.5 9648.7 4096.5	355.95 17201.5 11675.8 4612.1	391.72 12448.3 12992.2 4415.9	15330.3 16030.9 2001.0	. 69.21 18895,9 18943.9 .0	17 763.75 1738.9 17942.3 .0 2202.5	789.22 6792.5 16538.3 .0	805.46 4845.5 11878.7 .0	2249.4 5665.9 .0	837.34 855.7 2333.1 .0			SPENCIR'S (1973) - Magnitude & Location of Interslice Forces	Slice Right Force Laterslice Force Boundary Height  # x-coord Angle Force Height Height Ratio
																				:	weight (1b)	2619.	52736.	25250.	20508.	44162.	132757.	135749.	(43.	197555.	174730.	734838.	4383269.	598113.	852521.	56085.	345537.	74620.	19478.				
	FOR AMALYSIS														****		****				Deta	.23	.23	26.57	00.	-21.80	9,	90.	25.57	21 45 1	21.45	21.45	21.45	21.45	9.88	20 P	-3.58	-13.39	-13.39				FOS moment 1,7254 1,5784
dayararago	SPECIFIED	. by nts :	-surf	(fe)	98.83	75.84	33,58	26.60	26,07	00.54 03.07	600	88.67				pencer (1973)	州副林林歌和林林拉建安的李林宗为永均和杜		arrexarr POPASTION +************************************	•	width alpha beta (ft)	9.26 -25.00 .23	32.22 -25.00 .23 5	7,84 -25.00 26,57	5.00 -25.00 .00	10.00 -25.00 -21.80	25.00 -25.00 .00	20,00 -25,00 .00	72 35 00 35 no T	20 d7 -25 00 21 d5 1	14,97 -25.00 21.45	56.56 13.20 21.45	273.43 13.20 21.45	31.57 13.20 21.45	47.52 13.20 -3.58	3,39 65,00 -3.58	29,09 65.00 -3.58 3	13.17 65.00 -13.39	8.35 65.00 -13.39	ļ		•	
dayararago	SPECIFIED	pecified by nate points:	>+							7 1003 67						YSIS: Spencer (1973)	计划水本状态分析状态 计专业计划 医二甲基二甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲		**************************************	•	height width alpha beta (ft) (ft)	2.18 9.26 -25.00 ,23	11.93 32.22 -25.00 .23 5	23.29 7.84 -25.00 26.57	30.33 5.00 -25.00 .00	31.83 10.00 -25.00 -21.80	37,99 25.00 -25.00 .00	48.48 20.00 -25.00 .00	53,19 ,10 -25,30 25,5,	51,00 7,30 723.30 25.37 69.67 20.47 -25.00 21.45 1	84.90 14.97 -25.00 21.45	95.81 56.56 13.20 21.45	121.94 273.43 13.20 21.45	146.09 31.57 13.20 21.45	138.02 47.52 13.20 -3.58	127,22 3,39 65,00 -3.58	91.37 29.09 65.00 -3.58 3	43.58 13.17 65.00 -13.39	17.95 8.35 65.00 -13.39		S METHOD	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	708 force 1.5784
dayararago	SPECIFIED	surface specified by 9 coordinate points :	u,	(ft) (ft)	22	94						B41.52 1949.88			医动物性病病 计计算数据 医克里氏试验检尿病 医克里氏病 医克里氏病 医克里氏病 医克里氏病 医克里氏病 医克里氏病 医克里氏病	OF AMALYSIS: Spencer (1973)	计分子记录 计分子记录 医克里特氏 医克里特氏 医克里特氏 医克里特氏 医克里特氏 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里特氏征 医克里氏征 医克里氏征 医克里特氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医克里氏征 医皮氏征 医皮氏征 医皮氏征 医皮氏征 医皮氏征 医皮氏征 医克里氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤炎 医皮肤炎 医皮肤皮肤炎 医皮肤炎 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮肤氏征 医皮氏征 医皮氏征 医皮氏征 医皮氏征 医皮氏征 医皮氏征 医皮氏征 医皮		SUPPLIES OF INDIVIDUAL SLICE INFORMATION	•	width alpha beta (ft)	2.18 9.26 -25.00 ,23	11.93 32.22 -25.00 .23 5	23.29 7.84 -25.00 26.57	5.00 -25.00 .00	31.83 10.00 -25.00 -21.80	37,99 25.00 -25.00 .00	20,00 -25,00 .00	53.19 .10 -25.30 25.57	20 d7 -25 00 21 d5 1	84.90 14.97 -25.00 21.45	95.81 56.56 13.20 21.45	273.43 13.20 21.45	146.09 31.57 13.20 21.45	47.52 13.20 -3.58	127,22 3,39 65,00 -3.58	91.37 29,09 65.00 -3.58 3	43.58 13.17 65.00 -13.39	92 17.95 8.35 65.00 -13.39		ITERATIONS FOR SPENCER'S METHOD		

Sec. B1-B1' Spencer's W.O. 8838

	, 664	.570	448	424	.414	.466	.473	.471	.470	.433	.383	.355	.311	.220	.225	.239	306	309	.287	.297	.451
	4.35	19.50	27.08	29.17	31,50	32.16	43.82	53.14	53.24	60,88	78.47	91.33	100.28	143,59	148.59	145.08	130.96	123.49	59.27	27.89	B.00
	2.89	11.12	12.14	12,38	13.03	14,97	20.71	25.03	25.05	26,39	30.04	32.41	31,20	31.64	33,50	34,72	40.06	38.14	17.02	8.29	3,61
	7270.	87222.	122047.	133649.	162452.	221307.	390436.	560090.	561088.	645259.	894205.	1119126.	1013930.	498573.	437065.	407640.	320203.	283059.	56982.	10482.	-1.
	8.97	8.97	8.97	6.97	6.97	8.97	8.97	6.97	8,97	8.97	8.97	8.97	8,97	8.97	8.97	8,97	8,97	8.97	76, B	8.97	0.
•	217.78	250,00	257,84	260.00	265.00	275.30	300.00	326.00	320,10	328.00	348.47	363,44	420,00	693,43	725.00	740,00	787.52	799.91	820,00	833.17	841.52
	1	04	m	7	ις	ø	۲	Ю	6	10	11	12	13	14	35	16	13	18	19	20	21

## AVERAGE VALUES ALONG FALLURE SURFACE

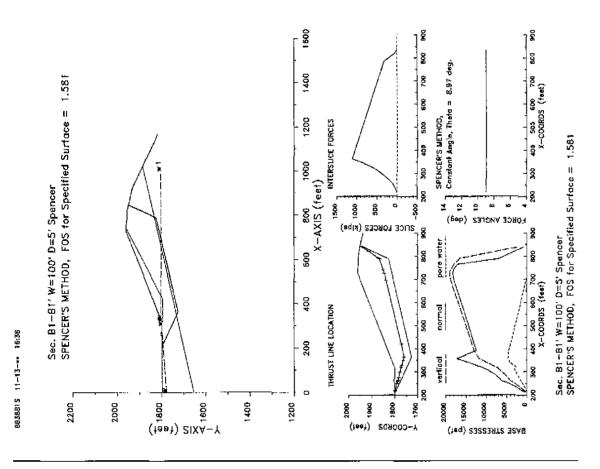
Jotal Normal Stress = 13364.58 Fore Water Pressure = 1637.70 Shear Stress = 2599.61

Total Length of failure surface = 734,30 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

1,581 PACTOR OF SAFETY =

4 Total shear strength available along specified failure surface = 253.6EE+04



Sec. B1-B1' Pseudo

XSTAEL File: 8938Blp 11-13-\*\* 16:39

18 4 6 8 X	1	*
		*
Slope Stability Analysis	ty Analysis	*
using the	the	*
Mathod of Slices	Slices	*
		*
Copyright (C) 1992 Ä 96	1 1992 Ä 96	*
Interactive Software Designs, Inc.	re Designs, Inc.	*
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All Rights Reserved	Reserved	*
•		*
Ver 5 20*	96 \$ 1545	*

Problem Description : Sec. B1-B1' W=100' D=5' Pseudo

SECNENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Soil Unit Below Segment		7	-	-1	-1	7	7	2	1	<b></b>	1	e
y-right (ft)	1799.0	1804.0	1604.0	1800.0	1300.0	1804.0	1960.0	1960.0	1955.0	1930.0	1885.0	1820.0
x-zight (Et)	250.0	260.0	265.0	275.0	320.0	328.0	725.0	740.0	820.0	925.0	1020.0	11.65.0
y-left (ft)	1798.0	1799.0	1804.0	1804.0	1800.0	1800.0	1804.0	1950.0	1950.0	1955.0	1930.0	1885.0
r-left (ft)	o.	250.0	260.0	265.0	275.0	320.0	328.0	725.0	740.0	820.0	925.0	1020.0
Segment No.		2	т	7	r)	9	r	80	on	10	11	32

Soil Unit Below Segment y-right (ft) 1795.0 1795.0 1950.0 1885.0 320.1 420.0 740.0 1020.0 x-right [ft] 4 SUBSURFACE boundary segments 1800.0 1795.0 1795.0 y-left (ft) x-left (ft) 320.0 320.1 420.0 Segment: No.

A CRACKED ZONE HAS BREN SPECIFIED

Depth of crack below ground surface = 3.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

Friction Fore Pressure Water Angle Parameter Constant Surface (pst) 2 (ded) Soil Unit Weight Cohesion F Unit Moist Sat. Intercept No. (pcf) (pcf) (psf) ISCTROPIC Soil Parameters 3 Soil unit(s) specified

ž

000

\$4.00 \$4.00

22**5**.0 200.0 225.0

140.0 135.0 140.0

130.0 125.0 130.0

ANISOTROPIC STRENGTB PARAMETERS specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 17.00 40.00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	13.00 16.00 90.00
Nirection Namge Mc.	୮୯୩

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

1-value (degrees)	\$0.00 11.00 \$0.00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	13.00 16.00 90.00
Direction Range No.	୮୯୯

1 Water surface(s) have been specified

62.40 (pcf) Unit weight of water = Water Surface No. 1 specified by 5 coordinate points

PHREATIC SURFACE,

1780.00 1800.00 1800.00 y-vater (ft) x-vater (ft) .00 300.00 320.00 328.00 Point No.

#### W.O. 8838 Sec. B1-B1' Pseudo

1804.00

	:	Pati				*	Eail				*	Ž							*	Fail
		random been	S e		base	ons of	Width (ft)	100.0 100.0			nined	ats.						= 1.056)	7. 8	
at T		od, using a rfaces, has	sliding surfa theory.	d analyzed.	of central block base	ssive portic	y-right (ft)	1800.0 1870.0	т ф	*	surfaces examined	coordinate points						(Fo factor	coordinate points	
A horizomtal earthquake loading coefficient of .150 has been assigned	earthquake loading coefficient nas been assigned	A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.		surfaces will be generated and analyzed		Length of line segments for active and passive portions of sliding block is 100.0 ft	x-right (ft)	600.0 920.0	safety have been calculated by	* * GOETEN	of all the failure see the most critical	œ	y-surf (ft)	1798.95	1780.16	1655.25 1855.25	1921.73	.911 **	a	y-surf (ft)
quake loadit assigned	ake loading assigned	surface sed rating slid	active and passive portions of the generated according to the Rankine	es will be	d for generation	ments for ac 100,0 ft	y-left (ft)	1730,0 1810.0	have been c	SIMPLIFIED JANBU METBOD	al of all the cos	. I specified by	x-surf (ft)			894.56 895.33		= 504 08	. 2 specified by	s-surf (£t)
izontal earthquake loan .150 has been assigned		cal failure Ne for game ed.	ive and pas erated acco		es specified for	of line seg   block is	x-left (ft)	330.0 650.0	ů,		The 10 most drithcal ore displayed below -	Failure surface No.	Point No.		n m ·	ray	D r- 60	Corrected JANAU FOS	Failure surface No.	Point No.
A horiz	A vertical	A critical technique s specified.	The act are gen	2500 trial	2 boxes	Length of lins sliding block	Box no.	нк	Factors	*	The 10	Failure						ა :	Failure	

	· ·	ordinate points	(Fo factor = 1,060) ordinate points	(Fo factor = 1.064) ordinate points	[Fo factor = 1.064] ordinate points
1798.83 1795.84 1795.84 1726.60 1826.07 1923.34 1923.97 1941.68	326	Y-surf [ft] [79] [178-77] [1727-50] [1727-50] [1835-52] [1835-52] [1841-55]	931 931 931 931 .y-sur (ft)	99. 30. 23. 23. 50. 50.	ff1    1798-95   1780-38   1780-38   1788-12   1788-12   1875-86   1875-86   1875-86   1976-51   1977-72   1947-72   1947-72   1947-72   1947-72
208.52 257.84 348.47 363.44 787.90 790.91 833.17 841.52	JANBU F	x-eurf (ft) (ft) 168.91 230.91 321.54 326.89 825.12 872.39	S72.30 d JANBU 50S : ce No. 4 spec x-surf (ft)	189.9. 245.1. 335.8. 353.3. 353.4. 787.4. 832.7. 840.7. 840.7. 840.7. 840.7.	(ft) 238.14 277.97 388.60 388.60 389.65 800.11 802.15 844.42 850.58 850.58 ed JAKEJ FOS = ed JAKEJ FOS =
номенореар	20 1	Failure surface Point No. 1 3 4 4 6 5	9 ** Correcte Failure surfa Point No.	1 2 2 4 5 5 6 6 9 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	No. No. 1 1 2 2 3 3 4 4 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6

x-surf y-suxf

Peint

Sailure surface No.10 specified by 8 coordinate points

(Fo factor  $\approx$  1.058)

\*\* ES6

\*\* Corrected JAMBJ FOS =

1804.00 1785.87 1743.61 1731.36 1856.38 1958.81 1918.77

263.44 302.32 392.95 419.23 902.73 903.86 931.82

- 01 m 4 m 6 r 8

	Pseudo
W.O. 8838	Sec. B1-B1

					W coordinate points		.86			4th,	.a.a.	** (Fo factor = 1.058)	9 coordinate points					•					** (Fo factor = 1.071)	8 coordinate points	
0	(ft) (ft)		414.74 .740.85 813.69 .837.89 814.00 .1838.55 856.26 .1929.18	= SO4 D					901.89 1941.16		936.95 1924	JAMEU FOS = ,947	No. 8 specified by	x-surf y-surf		229.53 1798.92	362,75 1736.80	16	748.84 1818.25	704 03 1015 15	3 6		JAMBU POS = . 952	No. 9 specified by	x-surf y-surf (ft) (ft)
BI-BI Pseudo	№.	нам	എന്ന പ്ര	rected	Failure surface No. Foint x	. Po	20	) 🗢	un u	a r-	æ	** Corrected	Failure surface No.	Point	GE	н I	n M	1 737	<b>v</b> n v	P F	~ 60	φ.	** Corrected JANBU FOS	Failure surface Mo.	Point No.

									(Fo factor = 1.062)
(ft)	1798.74	1772.26	1730.00	1710.71	1853.25	1855.72	1922.84	1930,84	.953 **
(ft)	185.20	241,99	332.62	373.98	889,00	890,16	921.46	921.45	JAMBU FCS =
No.	F,	61	ពា	7	(4)	ç	۲-	æ	Corrected JANBU FCS
									‡

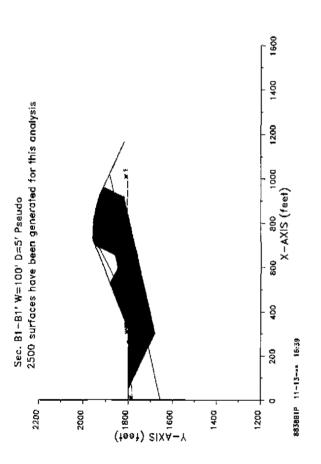
# The following is a surmary of the TEN most critical surfaces

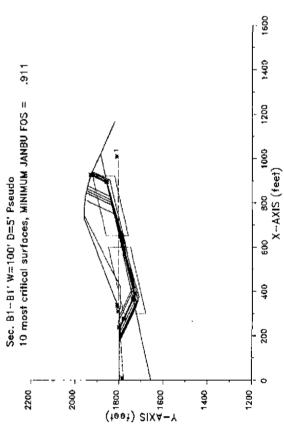
# Problem Description : Sec. Bl-B1 W=100' D=5' Pseudo

Available Streogth (1b)	2.5916+06 2.4706+06 2.6476+06 2.5392+06 2.5038+06	2.3242+06 2.9952+06 2.3712+06 2.6685+06 3.0095+06
Terminal x-coord (£E)	925.56 641.52 872.30 840.77 850.58	860,12 936.95 809.19 931.82
Initial x-coord (ft)	236.72 208.52 168.91 189.92 236.14	287.89 175.04 229.53 263.44 185.20
Correction	1.056 1.064 1.064 1.064	1.061 1.058 1.071 1.058
Modified JANEJ FOS	.911 .926 .931 .933	962 952 953
	எவ்ளிச்சி	0 4 9 9 Q

#### \* \* \* END OF FILE \* \* \*

W.O. 8838 Sec. BI-BI' Pseudo 82381P 11-13-11 15.39





# Sec. B1-B1' Pseudo., Spencer's

XSTABL File: 8838Blps 11-13-\*\* 16:39

	XSTABL	*
_		*
Slop	Slope Stability Analysis	*
	using the	*
	Method of Slices	*
		*
8	Copyright (C) 1992 A 96	*
Interacti	Interactive Software Designs, Inc.	*
HOSC +	Moscow, ID 83843, U.S.A.	*
•		*
74	All Rights Reserved	٠
		*
* Ver. 5.201	96 A 1545	*

Problem Description : Sec. Bi-Bi' W=100' D=5' Fseudo Spend

SEGMENT HOUNDARY COORDINATES	
HOUNDARY	
SEGMENT	

## 12 SURFACE boundary segments

Soil Unit		1	7	7	7	1	64	ev	2	7	7	-	m
y-right		1799.0	1804.0	1804.0	1800.0	1800,0	1804.0	1960.0	1960.0	1955.0	1930.0	1885.0	1820.0
x-right	(££)	250.0	260.0	265.0	275,0	320.3	328.0	725.9	740.0	820.0	925.0	,020,D	1165.0
y-left	(£f;)	1798.0	1799.0	1804.0	1804.0	1800.0	1800.0	1804.0	1960.0	1,960.0	1955.0	1930.0	1885.0
x-left	(ft)	0.	250.0	260.0	265.0	275.0	320.0	328.0	725.0	740.0	820,0	923.0	1020.0
Segment	Š	-	0	М	4	'n	va	۲	æ	D)	10	11	13

## 4 SUBSURFACE boundary segments

Soil Unit Below Segment		<b>→</b> en
y-right (ft)	1795.0	1885.0
x-right (ft)	320.1 420.0	1020.0
y-left (ft)	1795.0	1655.0
x-left (ft)	320.0 320.1	3.C.
Segment No.	г а (	ጣਚ

Depth of crack below ground surface = 8.00 Haximum depth of water in crack = .00 Unit weight of water in crack = 62.40 A CRACKED ZONE HAS BEEN SPECIFIED

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

il Parameters	
ISOTROPIC Soil	

## 3 Soil unit(s) specified

Water Surface No.	аан
essure Constant (psf)	9 9 0
Fore Pressure Parameter Constant Ru (psf)	000°
Friction	40.00
Angle P	34.00
(deg)	40.00
Cohesion	225.0
Intercept	230.0
(psf)	225.0
Weight	140.0
Sat.	135.0
(pcf)	140.0
Unit	130.0
Moist	125.0
(pcf)	130.0
Spil Unit No.	пип

ANISOTROPIC STRENGTH PARAMETERS specified for 2 Soil Unit(s)

### Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40,00 17,00 40,00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	13.00 16.00 90.00
Direction Range No.	H M M

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

í-value (degrees)	46.00 11.00
c-value (psf)	225.0 150.0 225.0
Counterclocktse Direction Limit (deg)	13,00 16,00 90,00
krection Wange No.	- C 6

1 Mater surface(s) have been specified

62.40 (pcf) Unit weight of water = Water Surface No. : specified by 5 coordinate points

y-water (ft)	1780.00 1800.00 1800.00
x-vater (ft)	300.00 320.00 320.00
Point No.	ଜରଣ

Sec. B1-B1' Pseudo., Spencer's

1804.00 1000.00 A horizontal earthquake loading coefficient of 150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A SINGLE FALLURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by the following 9 coordinate points:

Y-surf (fe)	98.9	1780,16	1737.90	1728.44	1855.25	1856.89	1921,73	1921.73	1929,73
x-surf (ft)		277.01	367,64	387,93	894,56	895.33	925.56	325.56	925.56
Point No.	1	(N	m	7	ιζ	ų	۲-	00	ф

ALLEGED METHOD OF ANALYSIS: Spencer (1973)

Slice	x-base (ft)	y-base (ft)	height (ft)	width (ft)	alpha	r r	#etght (1b)
-1	239,69	1797,56	1.40	5,94	-25.00	.23	1078
(V	246,33	1794.47	4.52	7,34	-25.00	.23	4456
۳	255.00	1790.42	11.08	10.00	-25.00	26,57	15058
4	262.50	1786.93	17,07	2.00	-25.00	8	11627
ď	270.03	1783.43	18.57	10.00	-25.00	-21.80	25600
9	276.01	1783,63	19,37	2.01	-25.00	9	5419
۲	288.51	1774.80	25,20	32.99	-25.00	8	80932
αn	310,00	1764.78	35.22	20.00	-25,00	8	99624
п	320,05	1760.09	39,93	GI.	-25.00	26,57	558.
<b>1</b> 0	324.05	1758.23	43.60	7,90	-25,00	26,57	18165
1:	347.82	1747.14	64.65	39,64	-25,00	21.45	35236C
12	377.79	1733.17	90,39	20.29	-25.60	21.45	249896
13	403.96	1732,45	101.40	32, 07	14.05	21.45	439449
24	554.90	1776.23	122.93	269.81	14.05	21,45	4364185.
15	707.4C	1808.40	144.68	35.19	14.05	21.45	660195
3.6	732,50	1814.69	145.31	15.00	14.05	.00	283072
17	780,00	1826.58	130,92	80.00	14.05	-3.58	136,614
18	857.28	1845.92	160.20	74.56	14.05	-13.39	97:267
19	894,35	1856.07	81.09	52.	64.85	-13.39	1119
20	510.17	1888.71	44.82	29.67	65,00	-13,39	172895
ć	44						

1.0680 1.0680 1.1924 1.1635 1.1758	U-top P-top (1b) (1b)		6000	000	666666
11924 12835 11758 11758 11765	r. U-base (lb)	984. 4508. 3624.	9938. 2449. 38524. 48522. 220.	19059. 155184. 98941. 147594.	586028. 0. 0. 0.
	continued: ue phi	00.00	40.00 40.00 40.00	40.00 40.00 40.00	11,00 11,00 11,00 11,00 11,00
15.2186 14.9445 14.9785 14.9615 14.9757	 (ps.f	225.0 225.0 225.0 225.0	225.0 225.0 225.0 225.0	225.0 225.0 225.0 150.0	150.0 150.0 150.0 150.0 150.0
രുകൾൾ	SLICE INFORMATION Slice Sigma (	893.7 1751.9 3488.7 5106.2	\$128.5 \$005.0 \$223.8 \$380.3 \$0652.9	11587.1 15815.0 22991.4 7885.1	12460.2 16923.5 17024.9 15335.0 11752.6 3368.8
	SLICE I	чинди	w ro un on on	9125	14 15 17 19 19

Slice	Base	Normal	Vertical	Pore Water	Shear
-	x-coord	Stress	Stress	Pressure	Stress
	(££)	(jsď)	(jsd)	(jsd)	(bst)
H	239.68	893.7	183.6	٥.	828.5
8	246.33	1873.4	607.1	121.5	1440.5
m	255.00	3897.3	1505.8	438.6	2679.0
7	262.50	5763.2	2325.4	656.9	3832
S	270.00	6033,7	2560,0	935.2	3848.4
ø	275.01	6109.0	2696.0	0.0011	3760.
[-	288.51	7741.7	3520.3	1517.9	4629
æ	310.00	10578,2	4931.2	2,97,9	5167.2
o	320.05	12646.4	5578.2	1993.5	7787.8
10	324.05	13773.6	6036.8	2,86.5	8454.0
=	347.82	19363.0	8888.7	2548.0	11469.0
12	377.79	27411.2	12316.6	4419.8	16586.3
13	403.96	12350.6	13702.8	4464.5	1430.2
1,	554,90	14587.2	16175.2	2107.0	2189.
15	707.40	16923.5	18759.1	٥.	2923.
16	732,50	17024.9	18871.5	٥,	2939.
17	780.00	15355.0	1702C.2	0.	2664.0
18	857.28	11752,6	13025.6	0.	2068.9
13	894.95	3368.8	10541.2	0,	2593.6
20	910.17	1797.1	5826.9	C,	1472

## GEOLABS-WESTLAKE VILLAGE

Sec. B1-B1' Pseudo., Spencer's W.O. 8838

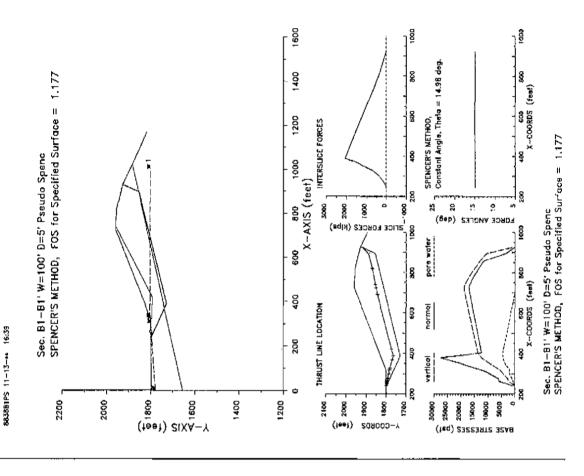
b	242.66 250.00 265.00		Takend 1 in	Longon		to: oth
	2,66 0.00 0.00 5.00	Angle	Force	Het aht	Beight	Ratio
	90.00	(degrees)	(1P)	(ft)	(££)	
	888	14.98	7489.	2.16	2.79	.775
	5.00	14.98	24380.	4.12	6.25	.660
	2.00	14.98	68585.	6.25	15,91	393
		14.98	100525.	7.20	18.24	395
	275,00	14.98	165511.	10.05	18.90	.521
	277.01	14.98	178420.	10.69	19.84	539
7 330	330.00	14.98	361936.	17.43	30.56	.570
)ZE B	320,00	14.98	576422.	22.42	39.89	.562
	320,10	14.98	577752.	22.44	39.98	.561
	32B.30	14.98	691929.	23,82	47.62	503
11 357	357.64	14.98	1478342.	31.32	81,68	.383
	387.93	14.98	2056306.	34,47	11.66	.348
13 420	420.00	14.98	1932925.	35.49	103.68	. 342
	16'689	14.98	846934	40.15	142.17	.282
	725.00	14.98	696595.	38.86	147.19	.264
	740.00	14.98	632122.	38.05	143.44	.265
	820.00	14.98	323033.	33.63	118.41	.284
3B 894	894,56	14.98	104859.	34.13	82.C0	416
19 89	895,33	14.98	99947,	33.83	80.17	.422
20 925	00.0	14.98	-52.	-, 63	6.47	-, 366
21 925	95.5	00.	-277.	-,05	8,00	508
AVERACE V	VALUES	ALONG FAILURE	URE SURFACE			
-						
in to	2	North Chrose	18359 30	(nef)		
Dona	. 4	Deposition 1		(port)		

1463,15 (psf) 3945,41 (psf) Pore Water Pressure = Shear Stress Total Length of failure surface = 762.45 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

FACTOR OF SAFETY = 1.17

9 fotal shear strength available along specified failtre surface = 307.66E+04



#### Sec. B1-B1' Backcut W.O. 8838

XSTABL file: 8838B1B 11-13-\*\* 16:41

\* Ver. 5.201 化子丛内丛子的白龙子子的白色的名词复数山田汉文文学学的文文文学学与《《 Copyright (C) 1992 à 96 Interactive Software Designs, Inc. Moscow, ID 83843, U.S.A. Slope Stability Analysis All Rights Reserved using the Method of Slices XSTABL

Problem Description : Sec. Bl-Bl' Backcut

SECRENT SOUNDARY COORDINATES

12 SURFACE boundary segments

Soil Unit Selow Segment 11799.0 1804.0 1804.0 1800.0 3800.0 3795.0 1795.0 1795.0 1795.0 1965.0 1820.0 7-right £ 250.0 260.0 265.0 275.0 320.1 420.3 740.3 920.0 925.0 1804.0 1800.0 1795.0 1795.0 1966.0 1955.0 1799.0 y-left 1798.0 (ff) x-left (ft) 250.0 260.0 265.0 275.0 320.1 420.0 740.0 820.0 Segment Š

1 SUBSURFACE boundary segments

Soil Unit Below Segment y-right (ft) 1385.0 x-right (ft) 1020.0 y-left (ft) 1655.0 x-left (ft) 0, Segment ě

A CRACKED ZONE HAS BEEN SPECIFIED

(feet) (feet) (pcf) Depth of crack below ground surface = 8.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 52.40 Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTA	ISOTROPIC Se	Scil Parameters	eters				
& **	3 Soil unit(s)	oeds (s):	specified				
Soil Unit No.	Unit Moist [pcf]	Weight Sat. (pof)	Ochesion Intercept (psf)	Friction Argle (deg)	Pore Pr Parameter Ru	Pore Pressure ameter Constant Ru (psf)	Water Suiface No.
<i>→</i> α ₹	130.0	140.0	225.0	\$0.00 34.00	000	o' c'	000
M	130,0		225.0	9	000	,	÷
ANISOTROP	TROPIC S'	ANISOTROPIC STRENGTH P specified for 2 Soil	PASAMETERS 1 Unit(s)	l m			
Soil	Orit 2		is ANISOTROPIC				
Number	Ą	direction	ranges spec	specified =	m		
Direction Range No.	tion No.	Counterclockwi Direction Limit	Counterclockwise rection Limit (deg)		c-value (psf)	i-value (degraes)	
<b>ଟ</b> ପ ମ			13.00 16.00 90.60		225.0 150.0	40.00 17.00	
Soil	Jaj t	3 is ANISOTROPIC	OTROPIC				
	φŧ		ranges spec	specified =	en		
Direction Range No.	tion No.	Counterd Direction	slockwi Limit	Se (deg)	c-value (psf)	i-value (degrees)	
~ C) m			13.00 16.00 90.00		225.0 150.0 225.0	40,00 11,00 40.00	
A critica tachnique specified	- T	Jure		e searching me! sliding BLOCK :	thod, using surfaces, l	ig a random has been	
Ine a	active and generated	active and passive p generated according	ž S	of the Ganitine	sliding switheory.	surfaces	
2500	trial	surfaces	41 11 be	generated a	and analyzed	χ <b>i</b>	
5 Б	рсхөз sg	specified	for generation	41	central block	ok base	
Lengt slidi	Length of line sliding block i	ne segments skis 100.	, ti	active and g	and passive portions	rtions of	
Bax no.	*	x-left (ft]	y-left (ft]	x-right (ft)	y-right (ft)	(£2)	a o

#### W.O. 8838 Sec. B1-B1' Backcut

																											•	_					
100.0			eranined	points							1.080)	points								(650.1 = 1	nts									7 = 1.082)	nts		
1800.0 1870.0	· the :	•	surfaces exa first	coordinate poi							(Fo factor	coordinate poi								(30 factor	coordinate points									(Fo factor	coordinate points		
600.0 920.0	palculated by	000170	failure critical		y-surf (ft)	1795.00	1753.72	1815.57	1906.20	1949.84 1957.84	1,323 **	00	y-surf (ft)	1795.00	1794.45	1747,72	1842.86	1844.77	1932.16 1940.16	1,333 **	00	,	(ft)	1795.00	1758.56	1751,88	1816.85	1907.49	1949.52 1957.52	1.351 **	•	y-surf (ft)	
1735.0 1810.0	have been	4	lofall - the mo	No. 1 specified by	x-surf (ft]	349.27	437.80	711.98	754.24	774.59	- SOM DENVEC	No. 2 specified by	x-surf (ft)	339.17	340.36 430.99	443,56	840.58	841.57	882.33 882.33	CANEU FOS =	No. 3 specified by		(F)	361.09	459.24	473.55	717.79	760.05	779.65 779.65	JANBU ROS =	No. 4 specified by	x-surf (ft)	
400,0 650.0	Tights * * *	•	10 most critical displayed below	surface	Point No.	1	۱ به	Y) =7	ς,	φ ~	Corrected JA	surface	Point No.		61 6	) <b>=</b> 3	ū	v	r- 00	Corrected 3	surface		No.		8	n) ea	, 41	v	r- 60	Corrected JA	surface	Poins No.	
по	Factors	•	The 1 are d	Failure							;	Failure								;	Failure									;	Failure		

1 386.10 1795.CC 2 462.62 1759.32 3 475.79 1753.18 4 605.74 1831.87 5 606.52 1927.86 7 655.49 1938.55 8 855.49 1946.55 ** Corrected JANBU FOS = 1.352 ** (Fo factor = 1.070)  Failure surface No. 5 specified by 8 coordinate points  Food	Point x-surf Y-surf No. (fc) (ft) 1 352.60 1795.00 2 440.04 1754.22 3 462.41 1743.80 4 796.21 1743.80 6 800.05 1835.40 6 842.31 1925.03 7 848.88 1940.12	rface No. 7 specified by  rface No. 7 specified by  t	FOS × 1.401 specified by TYF TY TY TY TY TY TY TY TY TY TY TY TY TY
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------	---------------------------------------------------------------------

759.59	746.99	825.76	1829.11	919.74	945.47	.953.47	
			772.15 1			826.41 1	
61	e	-	uo	ş	<b>-</b>	w	

(Fo factor = 1.076)

\*\* Corrected JANBU FOS = 1.404 \*\*

Failure surface No. 9 specified by 9 coordinate points

y-surf (ft)	1795.00	1752 05	1741.70	1612.24	1823.22	1913,85	1947.99	1955.99	
x-surf (ft)	338,28	339.75	452.57	740.90	746.02	788,28	804.20	804.20	
Polit No.	,-4 (	N m	4	ις	v	د	æ	o.	

(Fo factor = 1.079) \*\* Corrected JANBU FOS = 1.404 \*\*

Failure surface No.10 specified by 6 coordinate points x-surf Point

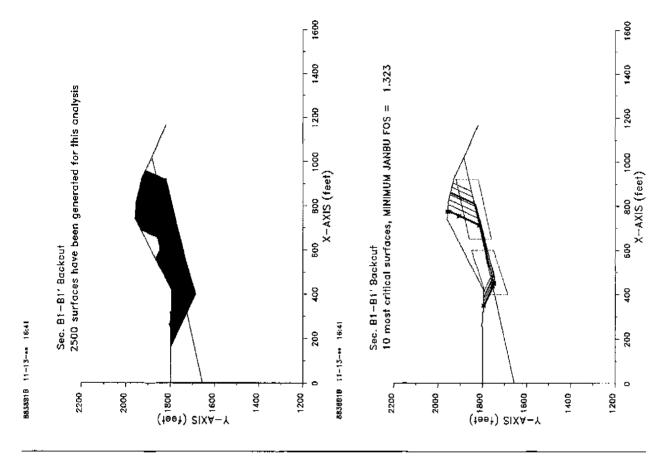
[ft)	1795.00 1762.90 1758.02 1850.46 1927.49	
(££)	409.65 478.49 488.96 866.02 901.94	
No.	። (የጠ ቋ ሳን ሰን	

(Fo factor = 1.056) \*\* Corrected JAMBC FOS = 1.408 \*\*

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. B1-B1 Backcut

Available Strength (1b)	1.660E+06	1.700E+06	1.844E+05	2.C22E+06	2.C15E+06	1.9935+06	1.986£+06	1.993E+06	1.866E+06
Terminal x-coord (ft)	774.59	779.65	855.49	850.12	848.83	858.69	826.41	804.20	901.94
Initial x-coord (ft)	349.27	381.05	386.13	366.98	352.60	387.84	387.91	338.28	409.65
Correction Factor	1.080	1.082	1.070	1.066	1.070	1.069	1.076	1.079	1.056
Modified JANSU FOS	1.323	1.351	1.352	1.365	1.378	1.401	1.404	1.404	1.408
	-: «	ရ် က	4	'n,	ú	Ŀ,	œ	ø,	.01



\* \* END OF FILE \* \*

## Sec.B2-B2, W=60, D=5

XSTABL File: 883882 | 11-14-\*\* 14:56

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Problem Description : Sec. B2-B2' W=60' D=5'

SECHENT BOUNDARY COORDINATES

16 SURFACE boundary segments

Soil Unit Below Segment	-			-	1	ď	7	-1	-1	-	1	1	,-I	ы		2				Soil Unit Below Segment	•
y-right (ft)	1852.5	1856.0	1856.0	1850.0	1850.0	1925.0	1925.0	1925.0	1960.0	1960.0	1950.0	2010.0	2015.0	2000.0	1950.0	1900.0				y-right (ft)	
x-right (ft)	140.0	148.0	153.0	165.0	215.0	395.0	440.0	460.0	580.0	600.0	650.0	360.0	800.0	835.0	960.0	1070.0		ments		x-right (ft)	;
y-left (ft)	1850 0	1852.0	1856.0	1856.0	1850.0	1850.0	1925.0	1925.0	1925.0	1,960.0	1,960.0	1,950,0	2010.c	2015,0	2000.0	1950.0		vundary seq		Y-veft (ft)	i i
x-left (ft)	c	140.0	148.0	153.0	165.0	215.0	395.0	440.D	460.0	580.0	630.0	650.0	760.0	BD0.0	835.0	960.0		SURFACE DO		x-left (ft]	1
Segment No.	-	. 2	m	~	w	φ	۲-	œ	on.	07	11	12	13	14	57	16		ans 7		Segment No.	
	x-left $y-left$ $x-right$ $y-right$ $(ft)$ $(ft)$ $(ft)$	x-left y-left x-right y-right (ft) (ft) (ft) (ft) (ft)	x-left y-left x-right y-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	x-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	x-loft y-loft x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	x-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	x-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	*-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	x-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	x-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	x-left         y-left         x-right         y-right           (ft)         (ft)         (ft)         (ft)           .0         1852.0         140.0         1852.0           140.0         1852.0         140.0         1856.0           153.0         1856.0         165.0         1856.0           155.0         1856.0         165.0         1856.0           155.0         1850.0         215.0         1850.0           215.0         1850.0         395.0         1925.0           395.0         1925.0         440.0         1925.0           440.0         1925.0         460.0         1925.0           460.0         1925.0         580.0         1960.0           580.0         1960.0         3960.0	*-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	x-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	*-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	*-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	x-left         y-left         x-right         y-right           (ft)         (ft)         (ft)         (ft)           .0         1852.0         140.0         1852.0           140.0         1852.0         140.0         1852.0           140.0         1852.0         1856.0         1856.0           153.0         1856.0         165.0         1856.0           215.0         1856.0         165.0         1856.0           215.0         1856.0         165.0         1856.0           215.0         1855.0         1856.0         1856.0           395.0         1925.0         440.0         1925.0           460.0         1925.0         440.0         1925.0           460.0         1950.0         590.0         1960.0           580.0         1960.0         1960.0         1960.0           650.0         1960.0         2010.0         1960.0           760.0         2010.0         893.0         1960.0           835.0         1960.0         2010.0           835.0         1960.0         2010.0           835.0         2000.0         1960.0           835.0         2000.0         1960.0	x-left         y-left         x-right         y-right           (ft)         (ft)         (ft)         (ft)           (0         1852.0         140.0         1852.0           140.0         1852.0         148.0         1856.0           140.0         1856.0         1856.0         1856.0           153.0         1856.0         165.0         1856.0           215.0         1856.0         165.0         1856.0           215.0         1850.0         215.0         1856.0           215.0         1825.0         440.0         1925.0         1925.0           440.0         1925.0         460.0         1960.0         1960.0           580.0         1960.0         590.0         1960.0         1960.0           650.0         1960.0         590.0         1960.0         2010.0           890.1         1960.0         500.0         1960.0         2010.0           890.1         1960.0         500.0         1960.0         2010.0           895.0         1960.0         600.0         1960.0         2010.0           895.0         1960.0         2010.0         2010.0         2010.0           895.0         196	x-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	*-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	*-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	x-left y-left x-right (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft

Soil Unit Below Segment	ਜ਼ਿਜ਼ਲ ਜ਼ਿਜ਼ਲ
y-right (ft)	1845.0 1845.0 1925.0
x-right (ft)	215.1 275.0 440.0 960.0
y-left (ft)	1850.0 1845.0 1845.0
x-left (ft)	215.0 215.1 275.0
Segment No.	нипа

A CRACKED ZONE HAS BEEN SPECIFIED

(feet) (feet) (pcf) Depth of crack below ground surface = 8.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 62.40

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

Soil unit(s) s Soil unit(s) s Soil unit Reigh Unit Reigh The Motst S No. (pcf) (pc The Motst S No. (pcf) (pc The Motst S No. (pcf) (pc The Motst S Soil Unit 1 is S Number of direction The Motst S Soil Unit 3 is S Number of direction The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S The Motst S T	rameters 	t Cohesion Friction Pore Pressure Fater tt. Intercept Angle Parameter Constant Surface xf) (psf) (deg) Ru (psf) No.	0.0 225.0 40.00 .000 .0 1 0.0 200.0 34.00 .000 .0 1 0.0 225.0 40.00 .00 .0 1	GGH PARAMETERS Soil Unit(s)	WISOTROPIC	on ranges specified $= 3$	Counterclockwise c-value i-value rection Linit (deg) (psf) (degraes)	6.00 225.0 40.00 12.00 150.0 17.00 90.00 325.0 40.00	WISOTROPIC on ranges specified = 3	Counterclockwise c-value i-value rection Limit (deg) (psf) (degrees)	6.00 225.0 40.00 12.00 150.0 11.00 90.00 225.0 40.00	<pre>Kater surface(s) have been specified Fresht of water = 62.40 fresh</pre>	1 specified by	**************************************	Total Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the
	Spec Spec	Unit Weight Cohe Moist Sat. Inte (pcf) (pcf) (k	130.0 140.0 2 125.0 135.0 2 130.0 140.0 2	Soi:	1 is AMISOTROPIC	direction range	Counterclockw Direction Limit	26.08 20.08	is AMIS rection	Counterclocker Direction Limit	6.00 12.00 90.00	nurface(s) have	No. 1	**************************************	x-water

#### Sec.B2-B2' W=60' D=5' W.O. 8838

1850.00	1850.00	1856.00	1856.00
00,	215.00	227.00	1000.00
1	ç,	m	4

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

the active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is  $100.0\ {\rm ft}$ 

Width (ft)	100.0
Y-right	1835.0
(ft)	1930.0
x-right	360.0
(ft)	880.0
y-left	1800.0
(ft)	1840.0
x-left	220.0
(ft)	380,0
Box Po.	1 2

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANBU METHOD \* \* \* \* \*

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

Failure surface No. 1 specified by 9 coordinate points

										(Fo factor = 1.056)
y-surf (ft)	1852.00	1822.07	1779.81	1778.28	1889,76	1906.85	1997,48	1998.94	2006.94	1.521 **
x-surf (ft)	79.04	143.22	233,85	237.14	767,91	775.87	816.13	81E.B2	818.82	JANBU 705 =
Point No.	1	73	m	=7	'n	ø	1	Ф	ð	Corrected JANBU 705
										<b>‡</b>

Pailure surface No. 2 specified by 8 coordinate points

1852.00 1829.19 1786.93 1786.15 y-surf (ft) 124.66 173.59 264.22 265.86 X-surf (ft) Point No.

(Fo factor = 1.056)	coordinate points	coordinate points  (Fo factor = 1.034)	(Fo factor a 1 BS2)	ite points	(Fo factor = 1.360)
1886.96 1911.26 1992.92 2000.92	1616d by 5 Y-suff (ft) 1850.30 1830.14 1939.30 2005.48 2013.48	ed by 5 Y-surf(ft) 1850.00 1836.27 1953.58 2001.62 2009.62 1.574 **	y-surf (£t) 1862.00 1862.03 1774.29 1875.91 1875.91 1875.91 1875.91 1875.91	y-surf (ft) (ft) 1852.00 1825.00 1773.56 1773.56 1977.55 1907.55	= 1.580 **
783.45 794.78 832.85 832.85 d JANEU POS =	No. 3 spee x-surf (ft) 181.10 223.70 785.95 787.81 787.81	Mo. 4  x-su (ft 198. 228. 790. 812. 812. WANBU F	85.17 (f2) 85.17 147.30 233.93 233.93 752.99 805.25 809.25 809.25	x - su (ff. (ff. (ff. (ff. (ff. (ff. (ff. (ff	ed JAMBU FOS =
5 5 7 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Pailure surface Point No. 1 2 2 4 5 5 4 5 Corrected	Failure surface Point No. 1 2 3 3 4 5 ** Corrected	Peint No. 13 2 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Pailure surface No. 2 3 4 6 6 6 6 6 6 7	** Correct

#### W.O. 8838 Sec.B2-B2' W=60' D=5'

Failure surface No. 7 specified by 8 coordinate points											(Fo factor = 1.062)
ned by 8 c	y-surf	(ff)	1852,00	1819, 64	1777,38	1879.77	1899,74	1990.37	2006.41	2014,41	1.581 **
No. 7 specif	x-surf	[£2)	62,55	131.94	222.57	736.25	745.57	787.83	195.31	795,33	Corrected JANBU FOS =
ire surface	Pozne	No.	1	2	m	·	(c)	ç	-	Φ	Corrected
Fail											*

Failure surface No. 8 specified by 7 coordinate points

/ ccordinat									
	y-surf (ft)	1850,00	1845,33	1845.00	1832.29	1939, 73	2005,72	2013,72	
No. el speci	x-surf (ft)	206.32	215.09	215.72	243.01	772.21	802,98	802.98	
libre surface No. 8 specified by	Point No.	1	2	m	4	'n	9	r-	

\*\* Corrected JANET FOS = 1.586 \*\* (Fo factor = 1.044)

Failure surface No. 9 specified by 10 coordinate points

		(Fo factor = 1.056)
Y-surf (ft)	1850, 00 1845, 00 1845, 00 1798, 98 1798, 48 1912, 20 192, 20 1995, 69	1.595 **
x-surf (ft)	207.58 215.08 215.08 225.04 315.67 315.75 798.75 835.79 835.79	JANBU POS =
Point No.	ଳାରାଜୀ <b>କ</b> ଥାଉଟ କଥାଉଁ	Corrected JANBU FOS
		#

Failure surface No.10 specified by 8 coordinate points

		(Fo fax
y-surf (ft)	1850.00 1834.91 1752.65 1788.58 1902.15 1923.91 1976.68	1.597 **
x-surf (ft)	165.64 198.00 288.63 297.36 938.56 948.70 973.30	JANEU FOS =
Point No.	~ 00 M 4 00 00 C C	Corrected JANBU FOS
		‡

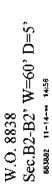
The following is a summary of the TEN most critical surfaces

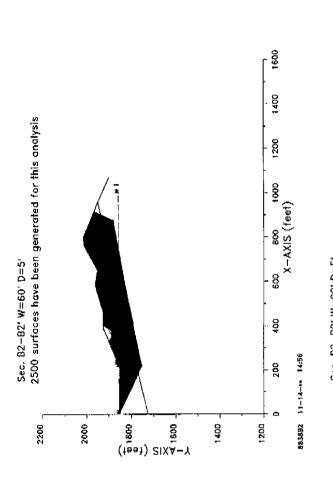
Problem Description : Sec. E2-E2' W-60' D-5'

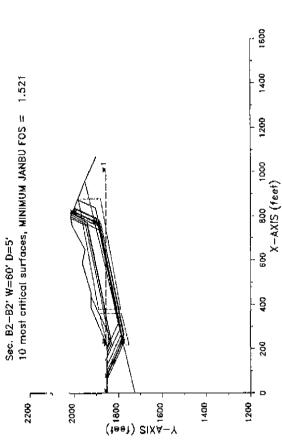
Available Strength (1b)	2.353E+06 2.302E+06	1.2468+06	2,533E+06	2,606E+06	2.344E+06	1,329E+06	2,157E+06	2.282E+06
Terminal x-ccord (ft)	818,82 832,85	787.81	812.33	821.06	795.31	802,98	835,79	873.30
Thitial x-coord (ft)	79.04	181.10	138.87	98.21	62.55	206.32	207.58	165.64
Correction Factor	1,056	1.043	1.062	1,060	1.062	1,044	1.056	1,049
Modified JANEJ FOS	1,521	1.567	1,575	1.580	1.581	1.586	1.595	1.597
	.; ¢,	ei •	÷ vi	ý	ŗ.	é	ç.	ģ

\* \* END OF FILE \* \* \*

(Fo factor = 1.049)







GEOLABS-WESTLAKE VILLAGE

### Sec. B2-B2' Backcut

XSTABL File: 8838B2B 11-14-\*\* 14:59

Shope Stability Analysis  Shope Stability Analysis  waing the Hethod of Slices  Copyright (C) 1992 Å 96  Interactive Software Designs, Inc.  All Rights Reserved  Ver. 5.231  96 Å 1545

Problem Description : Sec. 82-82' Backcut

SECMENT BOUNDARY COORDINATES

17 SUREACE boundary segments

Soil Unit Below Segment	,,	-4		1	-1	-1	-1	-	-	1	-	r-1	-	1	-	1	2
y-right (ft)	1852.0	1856.0	1856.0	1850.0	1850,0	1845.0	1845.0	1925.0	1925.0	1960.0	1960.0	1950.0	2010.0	2015.0	2000,0	1950.0	0.0061
x-right (ft)	140.0	148.0	153.0	165.0	215.0	215.1	275.0	440.0	460.0	580.0	600.0	650.0	760.0	800.0	835.0	0.096	1070.0
y-left (ft)	1852.0	1852.0	1856.0	1856.0	1850.0	1850,0	1845.0	1845.0	1925.0	1925.0	1960.0	1960.0	1950.0	2010.0	2015.0	2000.0	1950,0
x-left (ft)	0	140.0	248.0	153.0	165.0	215,0	215.1	275.0	440.0	460.0	0.082	600.0	650.0	760.0	600.0	835.0	960.0
Segment No.	1	2	m	4	u'}	φ	۲-	<b>c</b> o	Ø,	10	11	12	13	14	15	16	17

Soil Unit Below Segment y-right (ft) 1950.0 x-right (ft) 960.0 1 SUBSURFACE boundary segments y-left (ft) 1725.0 x-left (ft) ٥, Segment No.

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00
Maximum depth of water in crack = .00
Unit weight of water in crack = 62.40

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic

force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit[s] specified

Mater Surface No.	000
essure Constant (psf)	6 6 6
Pore Pressure Parameter Constant Ru (psf)	000
Friction Angle (deg)	40.00 40.00
Cohasion Intercept (psf)	225.0 200.0 225.0
Weight Sat. (pcf)	140.0 135.0 140.0
Chit Moist (pcf)	130.0 125.0 130.0
Soil Unit	- 0 M

ANISOTROPIC STRENGTH PARAMITERS specified for 2 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 17.00 40.00
c-value (psd)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	6,00 12.00 90.00
Direction Range No.	- K M

Soil Unit 3 is ANISDTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40,00 11.00 40.00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	6.00 90.00
Direction Range No.	H 67 65

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of

sliding block is	lock is	100.0 ft					
Box no.	x-left (ft)	y-left (ft)	x-right (ft)	Y-right (ft)	Width (ft)		
F 84	260.0 380.0	1780.0	360,0	1835.0 1930.0	100.0		*
Factors of		. һауе Бееп	safety have been calculated by	/ the :			Fail
*		SIMPLIFIED JANBU METHOD	*	*			
The 10 most critical are displayed below	10 most critical displayed below	2 2	all the failure s ne most critical f	surfaces examined first	ined		
failure surface No.	urface N	-	specified by 9 cor	coordinate points	5	<del></del>	;
Q Z	Point No.	x-eurf (ft)	y-surf (ft)			<b></b> .	` <i>'</i>
	ଳା (ବା ମି ସ ଓ ଦେଇ ଓ)	217.47 225.36 315.99 323.73 766.89 777.22 819.38	1845.00 1841.32 2799.06 2795.45 2889.49 2997.14 2997.77			· ··-	of in
** Corr	Corrected JANBU	NBU SOS U	1.489 **	(Fo factor	- 1.062)		*
Failure s	surface M	Mo. 2 specif	specified by 5 con	coordinate points	ş		Fail
ÖŽ	Point No.	x-surf (ft)	y-surf (ft)				
	ଲାର୍ମହେଣ	289.91 295.62 466.30 485.48	1652.23 1649.56 1883.30 1924.43 1932.43			_	
**	Corrected JA	JANEU 205 =	2.492 **	(Fo factor = 1.067)	= 1.067)		*
Failure surface	urface M	No. 3 specif	specified by 5 coo	coordinate points	\$2		Failt
ÖŽ	Point No.	x-surf (ft)	y-surf (ft)				
	-1 ೧೯೮೩ ಈ ಬ	259.59 277.40 751.13 786.67	1836.00 1836.69 1929.13 2005.33 2013,33			···	
** Corn	Corrected JA	JANBU FOS *	1.500 **	(Fo factor	= 1.052)		<b>#</b>
Failure surface No.	urface N	o. 4 specified by	73	coordinate points	ķ		Fall
o z	Point No.	x-surf (ft)	y-surf (ft)				

(Fo factor = 1.043) oxidinate points	(Fo factor = 1.049)	ordinate points (Po factor = 1.078)	(Fo factor = 1.054) pordinate points	(fo factor = 1.040) ordinate points
1870.78 1865.24 1955.99 2005.91 2013.91 1.513 **	y-surf (ft) 1846.22 1840.63 1934.34 2003.97 2011.97	ified by 5 co y-surf (ft.) 1862.24 1856.24 1876.24 1925.00 1.524 ** Ified by 5 co	200 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1861.35 1855.72 1951.69 2000.91 2008.91 1.541 ** 1.540 by 5 cc
328.16 340.03 761.28 791.28 JANBU FOS = UNN. 5 specia	x-surf (ft) 277.52 289.50 774.59 807.06 807.06	x-surf (ft) 310.66 323.64 433.25 451.24 451.24 451.24 57.00 78.00 78.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00 16.00	27 28 28 75 75 75 77 78 8 No.	308.72 320.80 791.26 814.21 814.21 JANDU 70S = R Vo. 9 specii
1 2 3 4 4 5 5 ** Corrected	Point No. 1 1 2 2 3 3 4 4 5 5 4 4 5 5 4 4 4 5 5 4 4 5 5 4 4 5 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Failure surface Point No. 1 2 3 4 5 ** Corrected Failure surface No. No.	Ai ai	1 3 3 4 5 ** Corrected ** Fallure surface ** Point ** Mo.

W.O. 8838

Sec. B2-B2' Backcut

1859.96	1856.28	1940.09	2005,80	2013.80	
305.86	313.76	759.75	790.39	790.39	
<del>, -</del> 1	cı	æ	4	leī	

Failure surface No.10 specified by 6 coordinate points

(30 factor = 1.050)

\*\* Corrected JAMBU FOS = 1.546 \*\*

5 coordinate poin	414
specified by	y-suzf
edic no abe	1-sur
ture surface No.10	Point
int.	

y-surt (ft)	1845.00 1806.47 1891.47	1913.14 1990.48 1998.48
X-surf (ft)	259.93 342.55 792.62	838.79 838.79 838.79
No.	er tymo	գտ տ

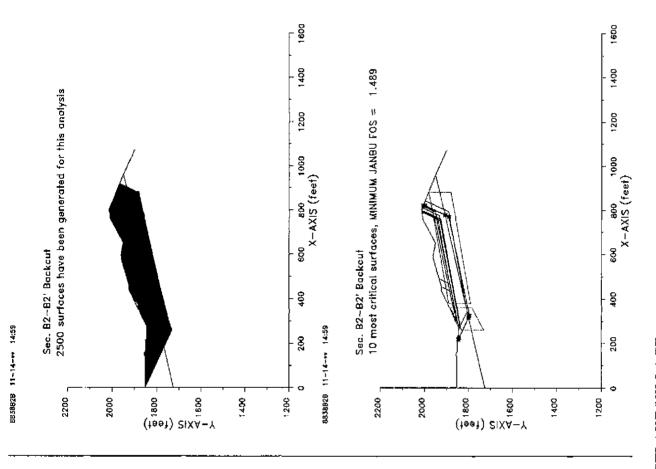
\*\* Corrected JAMB) FOS = 1.550 \*\* (Fo factor = 1.060)

The following is a summary of the TEM most critical suxfaces

Problem Description : Sec. B2-B2 Backcut

Available Strength (1b)	2.161E+06	2.820E+05	1.1728+05	7,4321+05	1.2062+06	2,1112+05	1.247E+06	9.525E+05	9.361E+05	2,0661+06
Terminal x-coord (ft)	819.74	485.48	786,67	791.28	807.06	451,24	795,38	814.21	790.39	838.79
Initial x-coord (ft)	217.47	289.91	259.59	328,16	277.52	310.65	275.82	308.72	305.86	259.93
Correction Factor	1.062	1.067	1.052	1,043	1.049	1.078	1,054	1.040	1.050	1.060
Modified JANEJ FOS	1.489	3.492	1.500	1.513	1.523	1.524	1.533	1.541	1.546	1.550
	ï	4	m	÷	'n	٠,	۲.	<b>.</b>	o,	

\* \* \* END OF FILE \* \* \*



GEOLABS-WESTLAKE VILLAGE

W.O. 8838 Sec. B6-B6'

XSTABL File: 8838B6 11-22-\*\* 9:24

X S T A B I.

Slope Stability Analysis

Valing the
Method of Slices

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Moscow, ID 82843, U.S.A.

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Yer, S.201

96 A 1545 +

Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5'

SEGMENT BOOKDARY COORDINATES

12 SURFACE boundary segments

8 SUBSURFACE boundary segments

Segment x-left y-left x-right y-right Soil Unit No. (ft) (ft) (ft) (ft) Ealow Segment 1 ... (ft) (ft) (ft) Ealow Segment 2 380.0 1550.0 380.1 1645.0 2 3 380.1 1645.0 450.0 1645.0 2 4 450.0 1707.0 595.0 1707.0 2 595.0 1707.0 2 595.0 1707.0 2 595.0 1707.0 1707.0 2 7 7 720.0 1707.0 1812.0 3 2 8 720.0 1770.0 1570.0 1812.0 3 2

A CRACKED ZONE EAS BREN SPECIFIED

Depth of grack below ground surface = 9.00 (feet) Maximum depth of water in crack = 0.00 (feet) Onit Weight of Water in crack = 62.40 (pcf)

Pailure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soul unit(s) specified

 Soil Unit Reight Cohesion Friction
 Pore Pressure
 Mater

 Unit Moist Sat. Intercept Mogle Parameter Constant Surface
 3.0.0
 (psf)
 (deg)
 Ru
 (psf)
 No.

 1 125.0
 135.0
 200.0
 34.00
 .000
 .0
 1

 2 130.0
 140.0
 200.0
 40.00
 .000
 .0
 1

 3 130.0
 140.0
 225.0
 40.00
 .000
 .0
 1

ANISOTROPIC STRENGTH PARAMETERS specified for 2 Soil Unit(s)

Soil Unit 2 is AMISOTROPIC

Number of direction ranges specified = 3

Direction Counterclockwise c-value i-value
Range No. Direction Limit (deg) (psf) (degrees)
1 10.00 225.0 40.00
2 15.00 100.0 25.00
3 90.00 20.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

 Direction
 Counterclockwise
 c-value
 i-value

 Range No.
 Direction Limit (deg)
 (psf)
 [degrees)

 1
 5.00
 225.0
 40.00

 2
 10.00
 100.0
 25.00

 3
 90.00
 225.0
 40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 6 coordinate points

Point x-water y-water No. (ft) (ft)

W.O. 8838 Sec. B6-B6

··· <del>-</del>						•		•									
	random been	ø,		base	ns of	Width (ft)	80.0 160.0			pauj	ģ			1.057)	s,		
	using a Ges, has	sliding surfaces theory.	and analyzed.	central block b	and passive portions	y-right (ft)	1650.0	the :	*	surfaces examined first	coordinate points			(Fo factor =	coordinate points		
000000000000000000000000000000000000000	e searching method, sliding BLOCK surfa	of the Rankine	generated and	j	active and pas	x-right (ft)	525.0 1100.0	calculated by	METROD * *	failure critical	by 7	y-surf (fi)	1650,00 1630,49 1781,13 1791,95 1862,58 1904,50	.601 **	by 7	y-surf (ft)	1650.00 1627.91 1782.20 1791.26
00 1650.00 00 1658.00 00 1650.00 00 1658.00 00 1658.00	lure surface sea generating slidà	passive portions according to the 3	surfaces will be q	l for generation	segments for ac is 100.0 ft	y-left (ft)	1600,0 1650.0	<b>4</b>	JANEL	il of all the	. 1 specified	x-surf (fb)	365.86 407.70 974.61 979.66 1021.92 11032.19	FOS = 1	. 2 specified	x-surf [ft]	339.11 1 386.48 1 966.99 1
.00 285.00 301.00 380.00 396.00 1.500.00	l fai for	<u> </u>	trial surface	es specified	of line block	x-left (ft)	350.0 550.0	of safety have	CILETANIS .	10 most critical displayed below	Surface No.	Point , No.	100 400 400 400 400 400 400 400 400 400	Corrected JANET.	surface No	Point ,	- N M 4
ଳା ଓ ଓ ସଂଶ୍ରେଶ	A critical technique specified	The active are genera	5000 5	2 boxes	Length sliding	Box 110,	7 2	Factors	* *	The 10 care disp	Failure	-			Failure	-	

	(Fo factor = 1.055)	coordinate points								(Fo factor = 1.058]	coordinate points								(Fo factor = 1.057)	coordinate points							(Fc factor = 1.056)	coordinate points						
1881.89 1900.42 1908.42	1.604 **	specified by 9 co	Y-surf (15)	1650.00	545	633	200	882	906	1.613 **	fied by 7	Y-surf (ft)			1783.54				1.615 **	ted by 7	y-surf (ft)	1650.00	1621.26	1783,03	1885.31	1915.94	1.623 **	, yo	y-surf (ft)	1650,00	ž	795.	1919.21	927.
1013.47 1022.11 1022.11	= FOS =	ř5, 3	x-surf (ff)	379.57				022	1033.29 1033.29	JAKBU FOS =	De No. 4 speci	x-surf (ft)	342.22	404.73	1015.19	1050.03	1077.67	1077.67	JANSU FOS =	a No. 5 specif	x-surf (ft)					1069.70	- SOE DENYD	a No. 6 specified	x-surf (fc)	360.87				
<b>ሪ</b> ነ ሪን ኮ-	** Corrected	Failure surface	Point No.	н 6	m	43° U	n vo	, p.	യർ	** Corrected	Failure surfac	Point No.	1	2	(F) *	7 15	ιφ	7	** Corrected	Failure surface	Forn: No.		67	ማ ସ	· LC	ው ሎ	** Corrected	Failure surface	Point No.	F 62	m	<b>~</b>	יטי	P-s

Sec. B6-B6'

\*\* Corrected JANBU FUS = 1.626 \*\* (Fo factor = 1.054)

Failure surface No. 7 specified by 7 coordinate points

y-surf (ft)	1650.00 1626.92 1786.11 1794.71 1885.34 1916.03	CO. P261
x-surf (ft)	333,36 382,85 1009,57 1013,58 1055,84 1070,15	7
Point No.	። የመዳከው፣	

(70 factor = 1.056)\*\* Corrected JANBU FOS = 1.627 \*\*

Failure surface No. 8 specified by 7 coordinate points

Y-surf (ft)	1650.00 1633.57 1785.28 1791.30 1881.93 1900.63
x-surf (ft)	344.70 379.94 968.84 971.64 1013.90 1022.62
Point No.	። የ የ ል የ የ ል የ ል የ ል የ ል የ ል የ ል የ ል የ

(Fo factor = 1.054) \*\* Corrected JAMBU FOS = 1.630 \*\*

Failure surface No. 9 specified by 7 coordinate points

Y-surf (ft)	1650,00 1621,22 1777,30 1795,40 1886,03 1917,84
x-surf (ft)	361,31 423.04 1013.64 1022.09 1064.35 1079.18
Point No.	→ 0 W 4 W 6 F

(Fo factor = 1.059) \*\* Corrected JAMBU FOS = 1,633 \*\*

Failure surface No.10 specified by 9 coordinate points

Y-surf (ft)	1650,00	1646.68	1645.00	1632.54	1783,46	1795.47	1886.10	1918.02	1526.02
x-surf (ft)	373.82	380.07	383.22	409.95	1017,35	1022,95	1065.21	1080.09	1080.09
Point No.	1	2	67	7	υń	و	۲.	₩	Ø

The Following is a summary of the TEN most critical surfaces

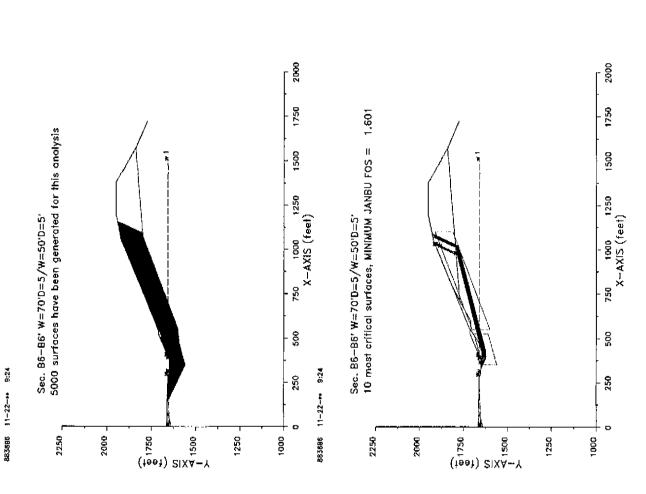
Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5'

Available Strength (1b)	2.7095+06 2.5598+06 2.7155+06 3.4163+06 3.2448+06 3.0048+06 3.0708+06 2.4108+06 2.4108+06	3.ZZ9E+UB
Terminal x-coord (ft)	1032.19 1022.11 1033.29 1077.67 1066.04 1070.15 1022.62	FORD T
Initial x-coord (ft)	355.86 339.11 340.12 327.76 361.70 361.70	313.02
Ocrrection Factor	1,057 1,058 1,058 1,057 1,054 1,054 1,054 1,054	I. u.so
Modified JAMBJ FOS	1.601 1.604 1.613 1.615 1.623 1.623 1.627 1.630	1.0.1
	મુજ્જનુજ જે મેં જ જે <u>છે</u>	į

\* \* \* END OF FILE \* \* \*

(Fo factor = 1.058)

\*\* Corrected JANBU FOS = 1.637 \*\*



W.O. 8838 Sec. B6-B6'

GEOLABS-WESTLAKE VILLAGE

## Sec. B6-B6' Pseudostatic

9:56 XSTABL File: 883886P 11-22-\*\*

XSTABL	*
	*
Slope Stability Analysis	*
using the	H
Method of Sliges	*
	4
Copyright (C) 1992 A 96	*
Interactive Software Designs, Inc.	*
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	*
All Rights Reserved	*
	*
Ver. 5.201 96 A 1545	*

Problem Description : Sec. B6-B6' W=70'3=5/W=50'D=5' Pseud

SZGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Soil Unit Below Segment	пиииччне	ാ എ ന ന വ
y-right (ft)	1652.0 1658.0 1650.0 1712.0 1712.0 1912.0	1950.0 1950.0 1840.0 1775.0
x-right (ft)	90.0 285.0 301.0 380.0 525.0 790.0	1200.0 1380.0 1570.0
y-left (ft)	1662.0 1662.0 1658.0 1650.0 1712.0 1712.0	1920.0 1950.0 1950.0 1860.0
x-left (ft)	90.0 285.0 301.0 380.0 525.0 545.0	1050.0 1200.0 1380.0
Segment No.	ተሪያ መ ቁ ሳ <b>ዕ</b> ዮ ወ	12 11 2 9

Soil Unit Below Segment . . . . . . . . . . . . . . . y-right (ft) 1662.0 1645.0 1707.0 1707.0 1707.0 1707.0 1812.0 90.0 380.1 450.0 545.0 595.0 710.0 790.0 8 SUBSTRINCE boundary segments y-left (ft) 1640.0 1650.0 1645.0 1707.0 1770.0 x-left (f:) 380.0 380.0 380.1 450.0 545.0 710.0 Segment No.

A CRACKED ZONE HAS BREN SPECIFIED

(feet)	(feet]	(bct)
¥ 8.00	00.	≈ 62.40
Depth of crack below ground surface	Maximum depth of water in crack	Unit weight of water in crack

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

	sure Mater Constant Surface (psf) No.	0.00
	Pore Pressure Parameter Constant Ru (psf)	000
	Friction Angle (deg)	34,00 40.00 40.00
eters ified	Unit Weight Cohesion 1 Woist Sat. Intercept (pcf) (pcf) (psf)	200.0 200.0 225.0
Soil unit(s) specified	Weight Sat. (pcf)	135.0 140.0 140.0
OFIC SO	Unit Moist (pcf)	125.0 130.0 130.0
S Sou	Soil Unit No.	- 2 E

ANISOTROPIC STRENGTH PARAMETERS specified for 2 Soil Unit(s)

Soil Unit 2 is ANISCTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 25.00 40.00
c-value (psf)	225.0 100.0 225.0
Counterclockwise Direction Lamit (deg)	10.00 15.00 90.00
Direction Range No.	нојю

Soil Unit 3 is AMISOTROPIC

Number of direction ranges specified = 3

oriection make (owy)	(psf)	(degrees)
10.00	100.0	25.00

1 Water surface(s) have been specified

62.40 (pcf) Unit weight of water = Water Surface No. 1 specified by 6 coordinate points 

y-water (ft) x-water (ft) Point No.

## Sec. B6-B6' Pseudostatic

1650.00	1658.00	1650.00	1650.00	1658.00	1658.00
00.	285.00	301.00	380.00	396.00	1500.00
1	2	m	₹	ın	u

A horizontal earthquake loading coefficient of 150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical fallure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of slidding block is 100.0 ft

Rides	90.0
(fe)	100.0
y-right	1650.0
(ft)	1860.0
x-right	525.0
(ft)	1100.0
y-left	1600,0
(ft)	1650,0
x-left (ft)	350.0
Box no.	2 1

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANEU METHOD \* \* \* \* \*

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

Failure surface No. 1 specified by 7 coordinate pounts

y-surf (ft)	1650.00	1630.49	1781.13	1791.95	1882.58	1904.60	1912.60
x-surf (f:)	365.86	407.70	974.61	979.66	1021.92	1032,19	1032,19
Point No.	ı <b>⊣</b>	2	e	₹.	ιςŋ	φ	1

Failure surface No. 2 specified by 7 coordinate points

(Fo factor = 1.057)

\*\* Corrected JANBU FOS = 1.073 \*\*

	(Fo factor = 1.055) pordinate points		factor = 1.	[Fo factor = 1.357] coordinate points	(Fo factor = 1.054) ordinate points
Y-surf (ft) 1650.00 1627.91 1781.26 1881.26 1891.26	1.074 **	Y-surf (fc) 1650.00 1649.77 1645.00 1633.53 1779.55 1779.65 1779.65 1792.65 1792.65	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1.082 ** fied by 7 y-surf (ft) 1650.00 1654.29 1794.86 1794.86 1795.93 1886.56 1919.21	1.083 ** fied by 7 co: Y-surf (ft)
x-surf (ft) 339-11 386-48 966-99 971-21 1013-47 1022-11	1 JAMBU FOS =	x-surf (ft) 379.57 380.98 413.58 980.58 1022.84 1032.94	342 AD4 1015 1077	- JANBU FOS = e No. 5 speci x - surf (ft) 360.87 334.57 1028.06 1028.06 1096.04 1086.04 1086.04	JAMBO FOS = e No. 6 speci x-surf (ft)
Point No. 1 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	** Corrected Pailure surfac	Point No. No. 22 22 22 24 4 4 4 4 4 4 4 4 4 4 4 4 4	7	** Corrected Failure surface Roint No. 1 2 4 4 5 5	** Corrected Failure surface Point No.

Sec. B6-B6' Pseudostatic

1650.00	1621.26	1783.03	1794.67	1885.31	1915.94	1923.54
327.76	389.39	1007.72	1013.15	1055.41	1069,70	1069.70
м	2	m	4	Ŋ	9	۴.

\*\* Corrected JANES FOS = 1.085 \*\*

(Fo factor = 1.056)

Pailure surface No. 7 specified by 7 coordinate points

y-surf (ft)	1626.92 1626.92 1786.11 1794.71 1885.34 1916.03
x-surf (ft)	333.36 382.85 1009.57 1013.58 1055.84 1070.15
Point No.	ተለጠቀላወጉ

### (Fo factor = 1.056)\*\* Corrected JANEJ FOS = 1.085 \*\*

Failure surface No. 8 specified by 7 coordinate points

Y-surf (ft)	1650.00 1633.57 1785.28 1793.30 1801.93 1900.63
x-surf (ft)	344.70 379.94 968.84 971.64 1013.90 1022.52
Point Mo.	የመቋቋ የ

(Fo factor = 1.054)

\*\* Corrected JANEG FOS = 1.089 \*\*

Pailure surface No. 9 specified by 9 coordinate points

1650,00	1646.68	1645.00	1632.54	3783.46	1795,47	1886.10	1918.02	1926.02
373,82	380.07	383,22	409.95	1017.35	1022.95	1065.21	1080.09	1080,09
п	64	m	**	ហ	90	ŗ.	æ	σ,
	.82 1650,	373.82 1650. 380.07 1646.	373,82 1650, 390.07 1646, 383,22 1645,	373.82 1650, 380.07 1646. 383.22 1645. 409.95 1632.	373.82 1650, 390.07 1646. 383.22 1645. 409.95 1632.	373.82 1650, 380.07 1646, 383.22 1645, 409.95 1632, 107.35 3783,	373.82 1650, 380.07 1646, 380.07 1646, 409.95 1632, 1017.35 1783, 1022,91 1895,	22 1650. 07 1646. 22 1645. 95 1632. 35 1793. 21 1795. 09 1918.

\*\* Corrected JANEU FOS = 1,095 \*\*

 $(Fo\ factor = 1.058)$ 

Failure surface No.10 specified by 9 poordinate points

y-surf (ft)	1648,71 1648,71 1645,00 1637.02
x-surf (ft)	377,60 380.03 387.0 <u>1</u>
Point No.	tt Ct W 로

.46	64.	.12	.79	.79	3 ** (Fo factor = 1.358
1777.46	1791.49	1882.12	1901.79	1909.79	= 1.093
967,45	973,99	1016,25	1025.42	1025.42	Corrected JAMBU FOS
w	φ	۲	*	ON.	Corrected
					*

(Fo factor = 1.358)

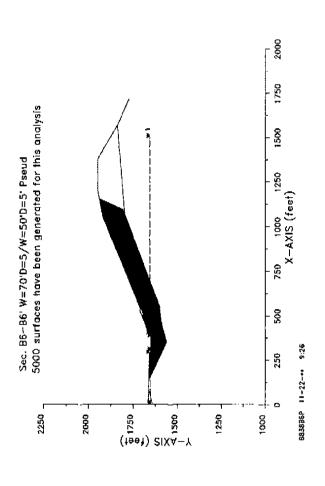
# The following is a summary of the TEM most critical surfaces

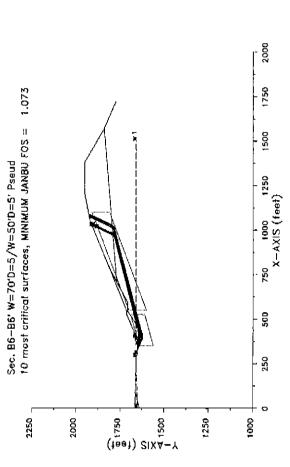
Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5' Pseud

Available Strength (1b)	2.559E+06 2.418E+06 2.561E+06 2.256E+06 2.830E+06 3.089E+06 2.897E+06 2.271E+06	2.4344.00
Terminal x-coord (ft)	1032.11 1033.29 1077.67 1086.70 1070.15 1022.62 1098.09	Treat
Initial x-coord (ft)	365.86 339.11 342.12 360.87 327.76 333.36 344.70	3
Correction Factor	1.057 1.058 1.057 1.057 1.056 1.056 1.056 1.058	, , , ,
Modified JAMEG FOS	1,093	
		i

### \* \* END OF FILE \* \* \*

Sec. B6-B6' Pseudostatic





GEOLABS-WESTLAKE VILLAGE

Sec. B6-B6' Pseudo. Spencer's

XSTABL File: 883836PS Il-22-\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* \* Ver. 5.201 Copyright (C) 1992 A 96 Interactive Software Designs, Inc. Moscow, ID 83843, U.S.A. Slope Stability Analysis All Rights Reserved Method of Slaces XSTABL using the

Problem Description : Sec. B6-B6' W=70'D=5/W=50'D>5' PsSpe

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Soil Unit Below Segment 1650.0 1650.0 1712.0 1712.0 1912.0 1950.0 1950.0 1840.0 1775.0 1658.0 1562.0 x-right (ft) 90.0 285.0 301.0 380.0 525.0 545.0 790.0 1250.0 1380.0 y-left (ft) 1662.0 1662.0 1658.0 1650.0 11650.0 1712.0 1712.0 1712.0 1712.0 1712.0 1712.0 1712.0 1712.0 1712.0 1712.0 1712.0 1712.0 1712.0 90.6 285.0 301.0 301.0 525.0 525.0 545.0 790.0 11200.0 x-left Segment No.

8 SUBSURFACE boundary segments

Below Segment Soil Unit y-right (ft) 1662.0 1645.0 1707.0 1707.0 1770.0 1812.0 x-right (fb) 90.0 380.1 450.0 545.0 595.0 710.0 1646.0 1650.0 1645.0 1707.0 1770.0 y-left (££) x-left (ft) .0 386.0 380.1 450.0 545.0 595.0 710.0 Segment No.

A CRACKED ZONE HAS BEEN SPECIFIED

(feet) (feet) (pcf) # 8.00 # .00 # 62.40 Depth of crack below ground surface Maximum depth of water in crack Unit weight of water in crack

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters 3 Soil unit(s) specified

Angle Farameter Constant Surface (deg) Nu (psf) No. 999 000 Friction 34.00 40.00 Intercept [psf) 200.0 200.0 225.0 Cohesion 135.0 140.0 Sat. Unit Weight Soil Unit F Unit Moist 125.0 130.0 130.0 (Jod)

ANISOTROPIC STRINGTH PARAMETERS specified for 2 Soil Unit(s)

Soil Thit 2 is AMISOTROPIC

Number of direction ranges specified =

i-value (degrees) 40.00 25.00 40.00 c-value (psf) 225.0 100.0 225.0 Counterclockwise Direction Limit (deg) 10.00 15.00 90.00 Direction Range No.

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees) 40.00 40.00 225.0 100.0 225.0 c-value (jsd) Counterclockwise Direction Limit (deg) 5,00 10.00 Direction Range No.

1 Water surface(s) have been specified

62.40 (pcf) Unit weight of water = Water Surface No. 1 specified by 6 coordinate points

y-water (ft) x-water (ft) Point

Š

Sec. B6-B6' Pseudo. Spencer's

		1650.00				
8		301.00				
, <b>⊣</b>	7	M	7	ß	ø	

A horizontal earthquake loading coefficient of 150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

## A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

fied by points:	y~surf (ft)	1650.00 1630.49 1781.13 1791.95 1862.58 1904.60
unface specified by B coordinate points	x-surf (ft)	365.86 407.70 974.61 979.66 1021.92 1032.19
Trial failure surface specified by the following 8 coordinate points	Point No.	ଳ ପ ଶ କ ଶ କ ନ ବ

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* SUMMARY OF INDIVIDUAL SLICE INFORMATION

27100	X-Lase	Y-base	herght	viden	alpha	Pe ta	weight
	(£	(££)		T T			(q1)
	372.93	1646.70	3.30	14.14	-25.00	90	6526,
N	380.05	1643.38	6.64	.10	-25.00	23.15	- 55
Ľή	389.05	1639.65	13.79	15.90	-25.00	23.15	30024
प	401.85	1633.22	26,12	11.70	-25.00	23.15	41796.
u)	428.85	1636,11	34,78	42.30	14.88	23.15	195026.
φ	430.61	1649.86	43.16	61.23	14.88	23.15	339916.
۱۰	518.11	1659,83	49.23	13,77	14.88	23.15	86773.
00	535,00	1664.32	47.58	20,00	14.38	00.	122825.
Ġ,	570,00	1673.62	48.59	50.00	14.88	22.23	312C1B.
ន	652.50	1695,54	63.34	115.00	14.88	22.20	892076.
;;	750.00	1721,45	74.23	00.08	14.88	22.20	770092.
12	882,30	1756.60	93,74	164.61	14.68	22,56	2249679.
13	977.14	1786.54	103.19	5,05	64.58	22.56	67746.
14	1000.79	1837.26	62.29	42,26	65,00	22.56	342231.
ur.	30 7001	1002 60	16 00	10 0.			-

66666666**666666** FOS moment 1.1571 1.2386 1.2077 1.12077 1.12077 1.12076 1.2006 1.2017 3210. 37. 12587. 19963. 59784. 866666666 1.2077 SLICE INFORMATION ... continued : Theta 25.6036 22.9147 24.2591 23.7545 24.0828 23.9186 23.9753 225.0 225.0 225.0 225.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 225.0 225.0 2794.4 4869.1 4869.1 14530.9 2661.2 5473.6 557.9 5881.1 10659.4 3388.7 557.2 557.2 Slice 

8888888888888888

SPENCE	SPENCER'S (1973)	- Total Str	resses at cer	- TOTAL Stresses at center of slice base	eseq.
Slice	Base	Normal	Vertical	Pore Mater	Shear
₩:	x-coord	Seress	Stress	Pressure	STEBSS
	(££)	(psf)	(bst)	(Jsd)	(bst)
-	372.93	3000:	461.5	205.7	2138.9
۲۷	380.05	5200.7	911.0	331.6	3587.9
m	388,05	9692.2	1924.7	717.5	6455.3
4	401.85	16077.3	3572.3	1546.4	10335.8
ų	428.85	4027.1	4610.5	1365,9	1116.1
ú	180,61	4921.3	5551.5	507.6	1796.3
7	518.11	5622.2	6301.4	ن.	2265.3
00	535.00	5479.7	6141.3	٥.	2210.0
o,	570.00	5567,9	6240.4	٥.	2244.3
2	652.50	6917.8	2,757,2	٥.	2768.2
11	750,00	8581.1	9626.1	0.	3413.8
175	882.30	10859.4	12186,1	o,	4298.0
13	977.14	3868.7	13415.1	ø.	2903.2
14	1000,79	2305,5	8098.2	°.	1797,4
15	1027.05	557.2	2194.3	ė,	576.4

83	SPENCER'S (1973)	973) - Magnitu	SESECTR'S (1973) - Magnitude & Location of Interslice Forces	cation of Interslice Fo	rslice Porc	1 8 1
2 K _	Righ: x-coord (ft)	Force Angle (degrees)	Intexslice Force (1b)	Force Height (ft)	Boundary Maight (ft)	Keight Ratio
നെത	380.00 380.10 396.00	23.96 23.96 23.96	53670. 54333. 240604.	6.40 6.42 10.19	6.59 6.68 20.90	.971 .960 .488

## GEOLABS-WESTLAKE VILLAGE

TERATIONS FOR SPENCER'S METHOD

.488

.421	.541	.627	. 635	.770	.793	.788	.743	457	1471	₹ 71 17	.018
31.35	38.20	48.11	50.34	45.03	52.15	58.53	79.92	107.55	98.83	25.76	B.30
13.21	20.66	30.15	31.96	34.65	41.37	54.02	59.35	49.13	46.54	11.69	.15
462054.	432172.	409114.	406494.	402834	393461.	364064	336895.	252960,	211842.	10145.	-460.
23.56	23,96	23.56	23.96	23.96	23.96	23,96	23.96	23,96	23,96	23,96	8,
407,70	450,00	511.23	525.00	545.00	595.00	710.00	790,00	974.62	979.66	1021.92	1032.19
4	4	9	ŗ	œ	Óη	<b>1</b> 0	11	12	E	7,	1.5

AVERAGE VALUES ALONG FAILURE SURFACE

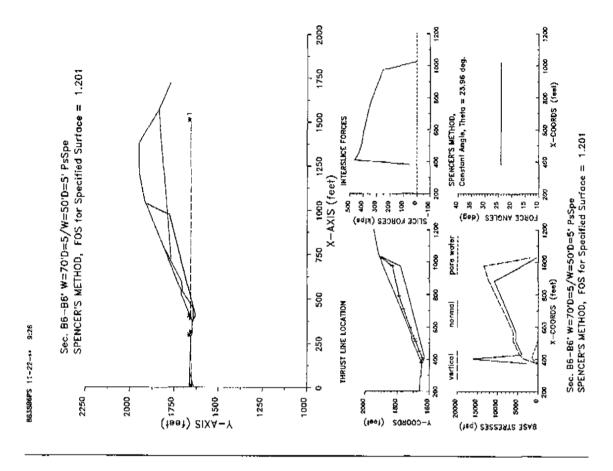
Total Normal Stress = 7049.07 (psf)
Pore Mater Pressure = 166.12 (psf)
Shear Stress = 3068.03 (psf)

Total Length of Failure surface = 768.98 feet

For the single specified surface and the assumed angle of the incerslica forces, the SPENCER'S (1973) procedure gives a

FACTOR OF SAFETY = 1.231

Total shear strength available along specified failure surface = 276.16E+04 lb



Sec. B6-B6' Backcut

XSTABL File: 863836B 11-22-\*\* 9:32

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Slope Stability Analysis

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Problem Description : Sec. B6-B6' Backout

SEGMENT BOUNDARY COORDINAITES

15 SURFACE boundary segments

 Segment
 x-left
 y-left
 x-right
 y-right
 Soil Unit

 Mo.
 (ft)
 (ft)
 (ft)
 (ft)
 Relow Segment

 1
 .0
 1662.0
 90.0
 1662.0
 1

 2
 90.0
 1662.0
 285.0
 1
 2

 3
 226.0
 1652.0
 285.0
 2
 2

 4
 301.0
 1650.0
 380.0
 1650.0
 2

 5
 380.1
 1650.0
 380.0
 1645.0
 2

 6
 380.1
 1645.0
 450.0
 1645.0
 2

 7
 450.0
 1645.0
 2
 2

 8
 564.0
 1707.0
 2
 2

 9
 595.0
 1707.0
 7
 2

 10
 770.0
 770.0
 1770.0
 3

 11
 780.0
 1812.0
 3
 3

 12
 1050.0
 1950.0
 1950.0
 3

 13
 1200.0
 1950.0</t

2 SUSSURFACE boundary segments
Segment x-left y-left x-right y-right Soil Unit
No. (ft) (ft) (ft) (ft) Below Segment

2 .0 1640.0 90.0 1662.0 2
2 710.0 1770.0 1570.0 1840.0 2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 [feet] Maximum depth of water in crack = .00 [feet] Unit weight of water in crack = 62.40 [pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROFIC Soil Parameters

3 Soil unit(s) specified

Water Surface No.	000
essure Constant (psf)	000
Pore Pressure Parameter Constant Ru (psf)	000.
Friction Angle (deg)	34.00 40.00 40.00
Cahesion Intercept (psf)	200.0 200.0 225.0
Weight Sat. (pcf)	135.0 140.0
Unit ( Moist (pof)	125.0 130.0 130.6
Soil Unit No.	H 8) F)

ANISOTROPIC STRENGTH PARAMETERS specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC
Number of direction ranges specified = 3

i-value (degrees)	40.00 25.00 40.00
e-value (psf)	225.0 100.0 225.0
Counteralockwise Direction Limit (deg)	10,00 15,00 90,00
Direction Range No.	- 0 m

Soil Unit 3 is AMISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 25.00 40.30
c-value (psf)	225.0 100.0 225.0
Counterclockwise Direction Limit (deg)	5.00 10.00 90.00
Nirection Namge No.	поп

A critical failure surface searching method, using a random combingue for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is  $100.0\ {\rm ft}$ 

1 482.85 1666.44 2 490.88 1662.69 3 618.83 1750.26 4 632.70 1779.99 5 856.84 1831.76 6 856.84 1839.76	** Corrected JANEU FUS = 1.512 ** (Fo factor = 1.062)	Failure sunface No. 5 specified by 6 coordinate points Point vent cent	(ft)	1 429.82 1645.00 2 449.31 1635.92 3 895.55 1754.95 4 910.17 1786.29		** Corrected JANE: FDS = 1.513 ** (Fo factor = 1.062)	Failure surface No. 6 specified by 7 coordinate points	Point x-surf y-surf No. (ft) (ft)	467.43 477.00 951.08		7 1504.44 1901.08 ** Corrected JANBO FOS = 1.513 ** (Fo factor = 1.060)	Failure surface No. 7 specified by 6 coordinate points	¥ .		4 867.27 1,184,43 5 9295 1858.81 6 927.95 1866.81	** Corrected JANEU FOS $= 1.516$ ** (Fo factor $= 1.064$ )	Sailure surface No. 8 specified by 6 coordinate points	Point x-surf y-surf No. (ft) (ft)	425.61 445.43 778.29	4 803.86 1777.64 5 922.43 1817.47 6 922.43 1825.47	** Corrected JANEU FOS = 1.519 ** (Fo Factor = 1.065)
Box       x-left       y-left       x-right       y-right       Nidth         no.       (ft)       (ft)       (ft)       (ft)         1       445.0       1600.0       530.0       1650.0       80.0         2       600.0       1656.0       100.0       1860.0       100.0		Factors of safety have been calculated by the :	* * * * * SINGLIFIED JANSU MOTHOD * * * * *	The 10 most critical of all the failure surfaces examined are displayed below - the most critical first	Failure surface No. I specified by 6 coordinate points	Point x-surf y-surf No. (ft) (ft)	454.49	3 754.97 1721.41 4 756.30 1775.72 5 794.33 8405.80	794.33	Failure surface No. 2 specified by 6 coordinate points	Point x-surf y-surf No. (ft) (ft)	1 456.24 1649.07 2 465.65 1644.69 3 877 24 1753 56		** Corrected JAMBU FOS = 1.502 ** (Fo factor = 1.062)	ace No. 3 specifie	Foint x-surf y-surf No. (ft) (ft)	1 463.44 1653.77 2 467.44 1651.90 3 727.76 1730.16	793.53 810.11 810.11	thed JANBU 205 =	ace No. 4 specifie	Point x-surf y-surf No. (ft) (ft)

W.O. 8838 Sec. B6-B6' Backcut

Pailure surface No. 9 specified by 6 coordinate points

y-surf (£5)	1649.49 1641.76 1733.07 1780.38 1834.16
x-surf (ft)	456.88 473.47 815.46 837.52 862.60
Point No.	пишаюю

\*\* Corrected JANBU FOS = 1.521 \*\* (Fo factor = 1.066)

Failure surface No.1D specified by 6 coordinate points

y-sut: (ft)	1672.28 1670.06 1759.01 1781.06 1838.32
(ft)	496.57 496.57 835.64 845.92 872.62
No.	∺имдиф

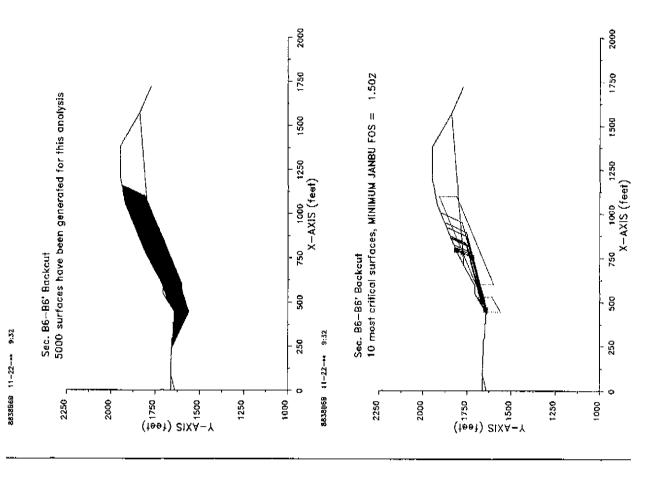
\*\* Corrected JANES FOS = 1.522 \*\* (Fo factor = 1.060)

The following is a summary of the TEM most critical surfaces

Problem Description : Sec. 86-B6' Backout

Available Strength (1b)	9.0338+05	1.583E+06	8.765E+03	9.622E+05	1.905E+06	1.97015+06	1.711E+06	1.1702+06	1.386E+06	9.214€+05
Terminal x-coord (ft)	794.33	921,13	810.11	855.84	949.28	1004.44	921.95	822.43	862.63	872.62
Initial x-coord (ft)	454,49	456.24	463.44	482,85	429.82	467.43	456,41	425.61	456.88	491.81
Correction Factor	1.066	1.062	1.054	1.062	1.062	1,060	1.054	1.055	1.066	1.060
Modified JAMBO POS	1.502	1.502	1.505	1.512	1.513	1.513	1,516	1.519	1.521	1.522
	1,	61	m	÷	δ,	ė	r.'	66	6	10.

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GEOLABS-WESTLAKE VILLAGE

#### W.O. 8838 Sec. C-C' W=110' D=5'

11-13-\*\* 12:22

XSTAEL File: 8838C

X S T A B L

X S T A B L

Slope Stability Analysis

whethor of Slopes

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Problem Description : Sec. C-C' R=110' D=5'

SECNENT ECCNDARY COORDINATES

9 SURFACE boundary segments

Segment x-left y-left x-right y-right Epil Unit No. [Ft] [Ft] (ft] Epil Unit Segment 1. [Ft] [Ft] (ft] Epil Unit Segment 2. [Ft] (ft] (ft] Epilow Segment 2. [Ft] (ft] Epilow Segment 2. [Ft] (ft] Epilow Segment 2. [Ft] (ft] Epilow Segment 2. [Ft] (ft] Epilow Segment 2. [Ft] (ft] Epilow Segment 2. [Ft] (ft] Epilow Segment 2. [Ft] (ft] Epilow Segment 2. [Ft] (ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epilow Segment 2. [Ft] Epil

8 SUBSURFACE boundary segments

Soil Unit Below Segment	2	61	7	84	61	2	2	N
y-right (ft)	1938.0	1938.0	1957.0	1957.0	1962.0	1957.0	1957.0	2025.0
x-right y (ft)	280.0	310.0	381.0	509.0	510.0	530.1	640.0	e00.0
y-left (ft)	1875.0	1938.0	1938.0	1957.0	1957.0	1962.0	1957.0	1957.0
x-left (ft)	0,	280.0	310.0	381.0	509.0	530.0	530.1	0.030
Segment No.	1	7	m	4	'n	40	٢	æ

A CRACKED ZONE HAS BLEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vartical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

SOTROPIC Soil Parameters

Water Surface No.	00
essure Constant (psf)	0, 0,
. Pore Pressure Parameter Constant Ru (psf)	000.
Friction Angle (deg)	34.00 40.00
Cohasion Intercept (psf)	205.0
Weight (Sat. ) (pcf)	130.C
Unit Moist (pcf)	125.0
Soil Unit No.	пи

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	21.00 24.00 90.00
Direction Range No.	ири

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central bicck base

Length of line segments for active and passive portions of sliding block is  $100.0\ {\rm ft}$ 

Width (ft)	53.0
y-right (ft)	1950.0
x-right (ft)	670,0 900,0
y-left (f:)	1930.0
x-left (ft)	560.0 730.0
Box no.	7 %

Eactors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANBU METHOD \* \* \* \* \*

## W.O. 8838 Sec. C-C' W=110' D=5'

# # # # # # # # # # # # # # # # # # #	** Corrected JANGU FOS = 1.609 ** (?o factor = 1.664)  Failure surface No. 2 specified by 6 coordinate points  Foint x-surf y-surf No. (ft.) (ft.)  2 524.35 1962.00  2 530.06 1958.96  3 533.75 1957.00  4 585.90 1932.80  5 773.80 2018.24  6 793.80 2026.24	** Corrected JANES FDS = 1.610 ** (Fo factor = 1.061)  Failure surface No. 3 specified by 5 coordinate points  Point X-surf Y-surf No. (ft) (ft)  1 532.70 1963.38  2 544.14 1957.30  3 589.53 1935.83  4 797.61 2017.48  5 797.61 2025.48	Point   X-surf   Y-surf   No.   A specified by 7 coordinate points

	(Fo factor = 1,367) ordinate points								(Fo factor = 1.071)	ordinate points								(Fo factor = $1.067$ )	ordinate points								(Fo factor = 1,072)	vordinate points								(Fo factor = 1.072)
86558	1.6(3 ** fied by 7.89	7	y-surf (ft)	1962.00				2034.04	1.629	fied by 7 co	Jans-A	(££)	565.	200	25.00	009	2023.04	1.655 **	ified by 7 ∞	y-surf	ì	1962.00 1958.61	926	992	599	2024.82	1.659 **	ified by 6 co	Y-surf	(3,5)	1962.00	1930.34	1990.46	2027.14	2035.14	1.567 **
N C T O O	JANEU FOS =		x-surf (ft)	498.32	570.23	738.52	740.91	754.81	JAMBU FOS =	e No. 7 specil	X-SUL	(tt)	539.28	555.66	595.75 761.58	762.34	769.81 769.81	JANEJ FOS	e No. 8 speci	Jans-X	17	502.94	573.96	732.95	735.31	750,89	JAMBO FOS =	e No. 9 speci	x-surf	(ft)	511.62	519,52	730,21	749.31	749.31	JAMEC FOS =
ហាស់ស់បោក	** Corrected	2	Point No.		v m	• •	ιńί	ra c	** Corrected	Failure surface	Point	Ño.	1	CN 1	ri w	• 55	9 6	** Corrected	Failure surfac	Point Mr	È	п с	1 (1)	•	י וע	vo r-	** Corrected	Failure surface	Point	No.	1	Ø	m =	·u	φ	** Corrected

W.O. 8838 Sec. C-C' W=110' D=5'

Failure surface No.10 specified by 5 coordanate points

y-surf (ft)	1952.00 1957.52 1924.98 2018.47 2026.47
x-surf (ft)	500, 68 509, 10 578, 89 792, 66 792, 66
Point No.	កែបុស្ទីយ

The following is a summary of the TEN most critical surfaces

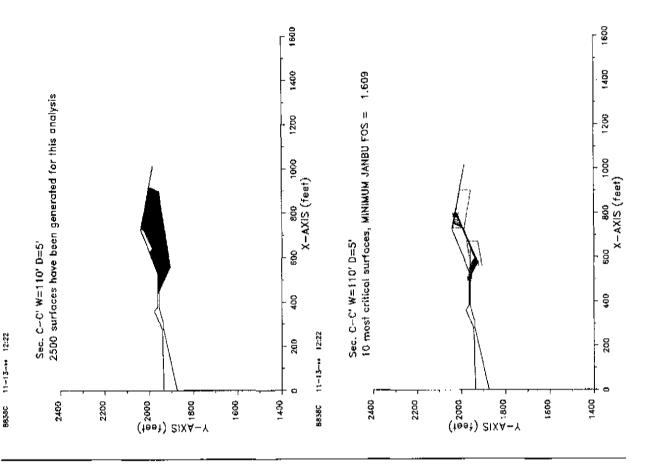
(Fo factor = 1.067)

\*\* Corrected JANBU FOS = 1.686 \*\*

Problem Description : Sec. C-C' #=110' D=5'

tal Available ord Strength (1b)	.74 5.525E+05									
<pre>fnitial Terminal x-coord x-coord (ft) (ft)</pre>					510,93 780,75					
Correction Init Factor x-cx (4					1.067 510					
Modified C Jawau Fos	1.609	1.610	1.611	1.631	1.643	1.649	1,655	1.659	1.667	
	Ţ.	ó	m	4	ń	ě.	۲,	8	ó	

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GEOLABS-WESTLAKE VILLAGE

Sec. C-C' Pseudo

XSTABL File: BESBCP

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Slope Stability Analysis

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Problem Description : Sec. C-C' W=110' D=5' Pseudo

SECRENT BOUNDARY COCRDINATES

9 SURFACE boundary segments

Segment x-left y-left x-right y-right Soil Unit
No. (ft) (ft) (ft) (ft) Ralow Segment
1 .0 1936.0 280.0 1943.0
2 280.0 1943.0 355.0 1975.0 1
3 355.0 1975.0 365.0 1975.0 1
4 365.0 1975.0 381.0 1962.0 1
5 310.0 1962.0 530.0 1962.0
5 510.0 1962.0 530.0 1962.0
7 533.0 2962.0 530.0 1962.0
8 725.0 2040.0 8103.0 2025.0 1
9 800.0 2025.0 1015.0 1985.0

8 SUBSURFACE boundary segments

 Segment
 x-left
 y-left
 x-right
 y-right
 Soil Unit

 No.
 (ft)
 (ft)
 (ft)
 (ft)
 slow Segment

 1
 .c
 1875.0
 280.0
 1938.0
 2

 2
 280.0
 1338.0
 381.0
 1998.0
 2

 3
 310.0
 1378.0
 1998.0
 2

 4
 381.0
 1957.0
 2

 5
 539.0
 1957.0
 509.0
 1967.0
 2

 5
 530.0
 1957.0
 500.0
 1967.0
 2

 7
 530.1
 1957.0
 640.0
 1957.0
 2

 8
 640.0
 1957.0
 800.0
 2055.0
 2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit Weight Cohasion Friction Fore Pressure Water Unit Moist Set. Intercept Angle Parameter Constant Surface No. (pcf) (pcf) (pcf) (deg) Ru (pcf) No. 125.0 130.0 200.0 34.00 .000 .000 .0 0 225.0 40.00 .000 .000 .0 0

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 11.00 40.00
c-value (psf)	225.0 156.0 225.0
Counterclockwise Direction Limit (deg)	21.00 24.00 90.03
Direction Range No.	поп

A horizontal earthquake loading coefficient of ...50 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliching block is  $100.0\ {\rm ft}$ 

Rideh (ft)	0.08
y-raght (ft)	1050.0
x-right (ft)	0 063
y-leít (ft)	1037
x-left (ft)	0 093
Box no.	

GEOLABS-WESTLAKE VILLAGE

W.O. 8838 Sec. C-C' Pseudo Failure surface No. 5 specified by 7 coordinate points

50.0		p				1.058)				1.061)	_			1.064)				1.069)
1980.0	; the ::	eurfaces examined first	coordinate points			(Fo Eactor =	coordinate points			(Fo factor =	coordinate points			(Fo factor =	coordinate points			(Fo factor =
900.0	calculated by	the failure st critical	fied by 5 coc	Y-surf (ft)	1963.08 1957.00 1935.83 2037.48	2025.48	و آم.	Y-surf (ft)	1962.00 1958.96 1957.00 1932.68 2018.24	1.133 **	fied by 5 cox	y-surf (ft)	1962.00 1957,54 1927,77 2019.05	1.139 **	7	y-surf (ft)	1962.00 1957.00 1928.22 1997.43 2003.68 2024.79	1,152 **
0 2010.0	afety have been o	ofal -the	No. 1 speci	x-surf (ft)	532,70 544,14 589,53 797,61	797.61 JAMBU FOS =	. No. 2 specified	x-surf (ft)	524,35 530,06 533,75 585,90 793,80	JAMBO FOS =	No. 3 speci	x-surf (ft)	500.72 509.11 572.94 789.74	JAMEU FOS =	a No. 4 specified	x-surf (ft)	497.22 506.62 568.34 746.93 749.84	Ž
-C' Pseudo	Factors of safety	The 10 most critical are displayed below	failure surface	Point No.	ା (ମ ଅଷ	5 ** Corrected	Failure surface	Point No.	። የመቀው	** Corrected	Failure surface	Point No.	ଲମ୍ବଟ	** Corrected	Failure surface	Point No.	- ରଣ ବର୍ଷ ଦେମ	** Corrected

	coordinate points	(Fo factor = 1.067) ordinate points	(Fo factor = 1.071)  coordinate points  (Fo factor = 1.063)  coordinate points
surf (ft) 55,00 57,00 97,84 99,00 23,04 31.04	by 6 -surf (ft) 62.00 28.72 26.88	1.172 ** fied by 7 doos Y-surf (ft) 1962.00 1957.76 1927.76 1999.89 2026.04	175 **  by 6 -  -surf (-5.00 55.00 59.86 57.00 17.41 182 **  by 7 -  -surf (f.5)
(ft	x-surf Y (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft)	JANED FOS = 1 No. 7 specified x=surf Y (ft) 498.12 19 507.53 19 570.23 19 740.91 19 754.81 20 754.81 20	JANEJ FOS = 1.3  ND. 8 specified  7-surf  (ft)  526.02 199 535.42 199 537.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200 797.96 200
O H	Failure surface Point No. 1 2 3 4 6	** Corrected. Failure surface Roint No. 1 2 3 3 4 4 5 5	Failure surface Point No.  1 2 2 3 4 4 5 6 FR Corrected Pailure surface Point No.

1957.00	1925.89	1999,33	2008.87	2023.08	2031.08
505.67	572.39			769.60	769,60
71	m	4	κŋ	w	r

Failure surface No.10 specified by 7 coordinate points

(Fo factor = 1.070)

\*\* Corrected JANBU FOS = 1,185 \*\*

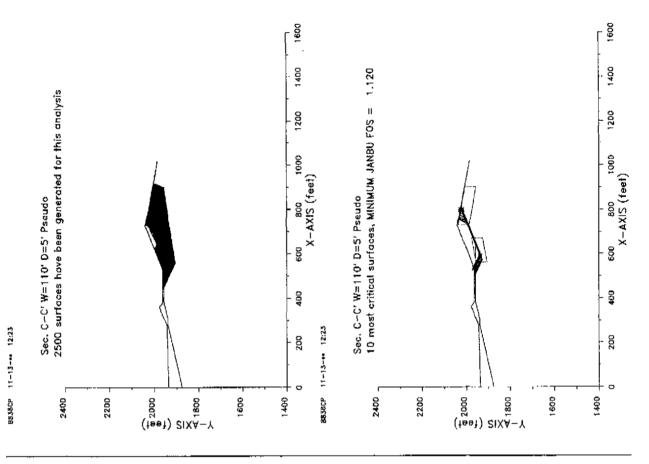
								(Fo factor = 1.072)
y-surf (ft)	1962.00	1958.61	1528.47	1992.45	1997, 52	2026.82	2034.82	1.189 **
x-surf (ft)	502.94	509.32	573.96	732,95	735.31	750,89	750.89	Corrected JANEU FOS =
Point No.	1	Ŋ	m	ø	ស	9	7	
								*

Problem Description : Seq. C-C' W=113' D=5' Pseudo

The following is a summary of the TEN most critical surfaces

Available Strength (15)	5.3806+05	5,646E+05	5.944E+05	5.822E+05	5.136E+05	6.0145+05	5.8872+05	6,1962+05	6.382E+05	5.8582+05
Terminal x-coord (ft)	797,61	793,80	789.74	761.07	769.82	780.75	754.81	797.96	769.60	750.89
Initial x-coord (ft)	532,70	524.35	500.72	497,22	539.28	510.93	498.12	526.02	496.27	502.94
Correction	1.059	1.061	1.064	1.069	1.067	1.067	1.071	1.063	1.070	1.072
Modified JANEU POS	1.120	1.133	1.139	1.152	1.171	1.172	1.175	1.182	1,185	1.189
	ij	6	m	÷	'n	ý	۲,	<b>%</b>	ď	.01

\* \* \* TILE SO ONE \* \*



Sec. C-C' Backeut

XSTABL File: 8838CB 11-13-\*\* 12:21

Problem Description : Sec. C-C' Backcut

SEGMENT BOUNDARY COORDINATES

10 SURFACE boundary segments

5 STRSURFACE boundary segments

 Segment
 x-left
 y-left
 x-right
 y-right
 Soil Unit

 No.
 (ft)
 (ft)
 (ft)
 (ft)
 (ft)
 (ft)

 1
 .0
 1875.0
 280.0
 1938.0
 2

 2
 280.0
 1938.0
 2
 2

 3
 330.0
 1938.0
 381.0
 1956.0
 2

 4
 381.0
 1958.0
 509.0
 1958.0
 2

 5
 509.0
 1958.0
 5.0.0
 1952.0
 2

A CRACKED ZONE EAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (fee Maximum depth of water in crack = .00 (fee Unit weight of water in crack = 62.40 (pcf

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

Parameters	
ISCTROPIC Soil	

### 2 Soil unit(s) specified

Hater Surface No.	00
Pressure er Constant 8 (psf)	9.9
Parameter Ru	000.
Friction Angle (deg)	34,00
Cohesion Intercept (psf)	200.D 225.0
Weight Sat. (pcf)	130,0
Chit Moist (pcf)	125.0 130.0
Soil Unit No.	7 7

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOFFDFEC

Number of direction ranges specified = 3

i-value (degrees)	40.00 11.00 40.00
c-value (psf)	225,5 150.0 225.0
Counterclockwise Direction Limit (deg)	22.00 24.00 90.00
Direction Kange Mo.	ส ผ ต

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2 boxes specified for generation of central block base

2500 trial surfaces will be generated and analyzed.

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANES METHOD \* \* \* \* \*

### Sec. C-C' Backcut

72								(Fo factor = 1.037)
<u>*</u>	t,							11
E 2	-5							성
Ø.	Д,							Š
Se	atr.							14
es P	ä							8
803 ££0	ğ							
The 10 most milled of all the failure surfaces examined are displayed below - the most critical first	Failure surface No. 1 specified by 5 coordinate points							×
i) Lic	ធា	¥ ~	88	-	98	8	25	*
Ø 7	ă	y-surf (ft)	1962.88	1954.47	2011.86	2014.52	2022.52	133
ë ti	8	≯	19	6	20	20	ő	=
1 t	5							
al Fe	8.	4	æ	ø	a	m	8	Corrected JAMBJ FOS = 1.113 **
₽₽₽	66	x-surf (ft)	653,83	671.86	812.09	813.33	813.33	£
ы з т	Ξ.	× =	653	67	912	913	813	Ä
tic No	ž							ã
11 4	ē.							귟
ارخ ب	£	날.			_			į,
S d	S.	Point No.	-1	N	[7]	-	LCT	H
0 1	ire.	_						8
Ø Ø	딒							*
# #	E.							*

5 coordinate points	
specified by	
Failure surface No. 2	

	Y-surf (ft)	1963.01 1954.18 2008.95 2015.52 2023.52
	x-surf (f:)	654.14 673.07 804.92 807.98
contract to the state of	Point No.	покур

# \*\* Corrected JANBU FOS = 1.135 \*\* (Fo factor = 1.640)

points
coordinate
4
ģ
specified
rr)
Ж
surface
failtre

y-surf (ft)	1972.31 1967.01 2016.14 2024.14
x-surf (ft)	676.03 687,41 804,63
Point No.	୷େଥମସ

\*\* Corrected JANBU FOS = 1.139 \*\*

[Fo factor = 1.030]

## Failure surface No. 4 specified by 5 coordinate points Point x-surf Y-surf Feb. (6+1)

(FE)	1964.03 1955.22 2006.47 2016.13 2024.13	
בינו בינו	656.55 675.44 800.17 804.67	
No.	e d c 4 m	

\*\* Corrected JANED FOS = 1.149 \*\* (Fo factor = 1.041)

## Failure surface No. 5 specified by 4 coordinate points Point x-surf y-surf

y-surf (ft)	1957.28 1954.72 2012.40 2020.40
x-surf (ft)	640.66 646.15 789.17 789.17
Point No.	нипт

# Failure surface No. 6 specifies by 5 coordinate points

						(Fo factor = 1.045)
Y-surf (ft)	1965.95	1957.60	2004.40	20:6.37	2024.37	1.159 **
x-surf (ft)	661.07	678.98	797.83	803.41	803.41	Corrected JANBU FOS =
Point No.	-4	2	m	4	v.	Corrected

# Failure surface No. 7 specified by 5 coordinate points

						(70 factor = 1.041)
y-sucf (ft)	1964,95	1955.41	2010.75	2013,68	2021.68	1,161 **
x-surf (ft)	658.70	679.17	816.48	817.84	817.84	JAMBU FOS =
Point No.	1	O	ተሳ	7	и	Corrected JAMBU FOS
						:

# Failure surface No. B specified by 5 coordinate points

						(Po factor = 1.043)
y-surf (ft)	1957.00	1943.97	2010.51	2010,55	2016,55	1,164 **
x-surf (ft)	634.45	662.39	834.63	834.65	834.65	Corrected JANBU FOS =
Point No.	1	2	m	v	S	Corrected

# Failure surface No. 9 specified by 4 coordinate points

Y-surf (ft)	1960,21 1949,32 2013,60 2021,60
x-surf (ft)	647,56 670,92 817,19 817,19
Point No.	-1 (7 th -3

# \*\* Corrected JAMBJ FOS = 1.166 \*\* (Fo factor = 1.043)

Failure surface No.10 specified by 4 coordinate points		
ified by 4	y-surf (ft)	1961.77 1949.73 2012.97 2020.93
No.10 spec	(45) Juns-x	651.23 677,04 821,68 821.68
Failure surface	Point No.	ਜਿ ਦੇ ਜ਼ਿਲ੍ਹ

(Fo factor = 1.047)

\*\* Corrected JANBU FDS = 1.210 \*\*

## GEOLABS-WESTLAKE VILLAGE

(Fo factor = 1.021)

\*\* Corrected JAMBU FOS = 1.154 \*\*

W.O. 8838 Sec. C-C' Backcut

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C-C' Backcut

Mcdified Correction Initial Terminal Available
JANNE: FOS Factor (ft) (lb)

1. 1.113 1.037 653.83 813.33 1.1712.05

2. 1.135 1.040 654.14 807.98 1.1996.05

3. 1.149 1.021 656.55 804.67 1.1892.05

5. 1.154 1.021 650.66 789.17 4.9702.05

6. 1.156 1.042 656.55 804.67 1.1412.05

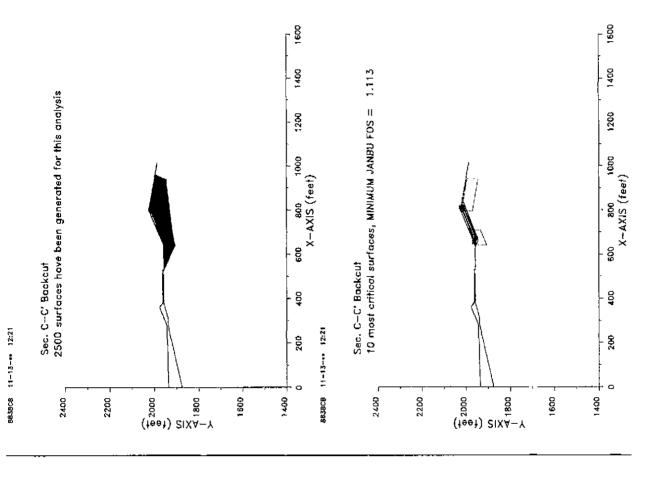
7. 1.161 1.043 654.15 817.84 1.3162.05

8. 1.164 1.043 654.15 817.84 1.3162.05

9. 1.166 1.043 647.56 817.19 1.4772.05

10. 1.210 1.043 647.56 817.19 1.4772.05

END OF PILE



## Sec. C-C' Backcut, Spencers

XSTABL File: 8838CBS 11-13-\*\* 12:21

Problem Description : Sec. C-C' Backeut Spencer

SECMENT BOUNDARY COORDINATES

### 10 SURPACE boundary segments

egment	x-left		x-right	Y-right	Soil Unit
No.	(£t)	(£)	(ft)	(ff)	Below Segment
1	٩.	1936.0	280.0	1943.0	1
2	280.0	1943.0	355.0	1975.0	7
٣	355.0	1975.0	365.0	1975.0	7
7	365.0	1,975.0	381.0	1962.0	٦
κJ	381.0	1962.0	510.0	1962.0	,
ų	510.0	1962.0	530.0	1962.0	EN
۲-	530.0	1962.0	530.1	1957.0	7
ø	530.1	1957.0	640.0	1957.0	~
ΔV	640.0	1957.0	800.0	2025.0	7
10	900,0	2025.0	1015.0	1985.0	2

### 5 SUBSURFACE boundary segments

Soil Unit Below Segment	<b>00000</b> 000
y-right (ft)	1938.3 1939.0 1958.0 1958.0
x-right (ft)	280.0 310.0 381.0 509.0 510.0
y-left (ft)	1875.0 1938.0 1938.0 1958.0 1958.0
x-left (fc)	280.0 310.0 381.0 509.0
Segment No.	୯୬୧୯

## A CRACKED ZONE HAS BEEN SPECIFIED

(feet)	(feet)	(joč)
CO.8 = 4	co. =	= 62.40
Depth of crack below ground surface	g	Unit weight of water in crack

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

### 2 Soil unit(s) specified

	Surface		0,
e55::re	Constant	(Jsd)	Q
Pore Pr	Parameter Constant	30	000
Friction	Angle	(ded)	34,00
Cohesion	Intercept	(psg)	200.0
Weight	Sat	. (pcf) (pcf)	125.0 130.0
Umit	Hoist	(pot)	125.0
Soil	Unit	ģ	-

o

9

000

40,30

225.0

140.0

130.0

N

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

### Soil Unit 2 is ANIBOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 11.00 40.00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	21,00 24,00 90.00
Direction Range No.	3 2 1

## A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by the following 6 coordinate points:

Y-surf (ft)	1962.89 1954.47 2011.86 2014.52 2014.52
x-surf (ft)	653.83 671.86 812.09 813.33 813.33
Point No.	୮୮୯୯୫୯୫

SELECTED METHOD OF AGALYSIS: Spencer (1973)

## SIGNARY OF INDIVIDUAL SLICE INFORMATION

weight (1b)	18834.
beta	23.03
alça	-25.00
width (ft)	18.63
height (ft)	9.04
y-base (ft)	1958.67
x-base (ft)	662.84
Slice	

## Sec. C-C' Backcut, Spencers

284509	22773.	1523.			
23.03	-10.54	-10.54			
22.26	22.26	65.01			
128.14	12.09	1.24			
17.08	14.49	9.45		AR THOO	
1980,69	2009,39	2013,19		ITERATIONS FOR SPENCER'S METHOD	
735.93	806,05	812,71		CLOKS FOR	
64	m	•	1	ETERA	

4

Total shear strength available along specified failure surface = 133.99E+03

FOS\_moment 1.5270 1.4212 FOS\_force 1.4212 1.4210 Theta 17.1736 17.1708 Iter # 2 3

SLICE INFORMATION ... continued :

Delta	8888
P-top (1b)	0000
U-top (2b)	6666
U-base (1b)	6666
cho	40,00 11,00 11,00 40,00
c-value (psf)	225.0 150.0 150.0 225.0
Sigma (psf)	2932.4 1938.1 1542.8 341.4
Slice	→ 61 M →

SPENCER'S (1973) - TOTAL Stresses at center of slice base

Shear Stress (psf)	1890.0 370.7 330.3 360.0
Pore Water Pressure (psf)	0000
Vertical Stress (psf)	1044.6 2220.3 1883.6 1227.9
Normal Stress (psf)	2932.4 1938.1 1642.8 341.4
Base x-coord (ft)	662.84 735.93 806.05 812.71
Slice *	። የላ የነ ቁ

SPENCER'S [1973] - Magnitude & Location of Interslice Forces

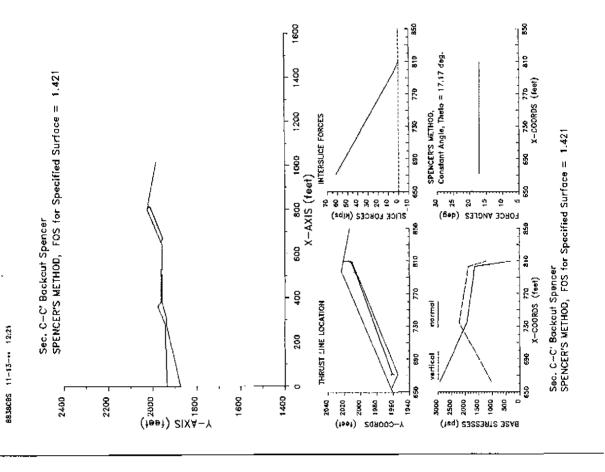
Height Ratio	.435 .043 .000
Boundary Height (ft]	16,07 18.09 20.89 8.00
Force Height (ft)	6,99 77, 100.
Interslice Force (1b)	51471. 4808. 480. -3.
Force Angle (degrees)	71.71 71.71 71.71
Right x-coord (ft)	671.86 900.00 812.09 813.33
S. i.o.	нива

AVERAGE VALUES ALONG FALLURE SURFACE

(psf) (psf) (psf) 2002.52 .00 540.82 Total Normal Stress = Pore Hater Pressure = Shear Stress = Total Length of failure surface = 174.35 feet

For the single specified surface and the assumed angle of the intersition forces, the SPENCER'S (1973) procedure gives a

FACTOR OF SAFETY = 1.421



GEOLABS-WESTLAKE VILLAGE

#### Sec. C3-C3, W=90, D=5, W.O. 8838

XSTABL File: 0038C3 11-20-\*\* 12:18

\* Ver. 5.201 96 Å 1545 \* Copyright (C) 1992 Å 96 Interactive Software Designs, Inc. Moscow, ID B3843, U.S.A. Slope Stability Analysis All Rights Reserved using the Method of Slices

Problem Description : Sec. C3-C3 W-90 D-5

SECRENT BOUNDARY COORDINATES

Soil Unit Below Segment y-right (ft) 1870.0 1880.0 1880.0 1933.0 1935.0 1957.0 1957.0 1957.0 125.0 145.0 230.0 365.0 495.0 680.0 680.0 830.0 9 SURFACE boundary segments y-left 1670,0 1870,0 1880,0 1933,0 1933,0 1935,0 1957,0 (££) x-left (ft) .0 125.0 145.0 230.0 365.0 495.0 637.0 680.0 Segment No.

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
	230.0	1880.0	230.1	1875.0	п
12	230.1	1875.0	320.0	1875.0	п
E)	320.0	1875.0	495.C	1933.0	-
4	637.0	1935.0	637.1	1930.0	-
ur)	637.1	1930.0	0,699	1930.0	
w	657.0	1930.0	720.0	1957.0	-

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 62.40

Pailure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

8	il unit	2 Soil unit(s) specified	ified				
Soil Unit No.	Unit Moist (pof)	Soil Unit Weight Unit Moist Sat. No. (pof) (pcf)	Cohesion Friction Intercept Angle (psf) (deg)	Friction Angle (deg)	riction Pore Pressure Angle Parameter Constant (deg) Ru (psf)	essure Constant (psf)	Water Surface No.
_	130.0	140.0	225.0	40.00	000	0.	0
cı	125.0		200,0	34,00	200.	٥,	•

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 11.00 40.00
c-value (psf)	225.0 350.0 225.0
Counterclockwise Direction Limit (deg)	12,00 16,00 90,00
Direction Range No.	пом

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Width (ft)	50.0
y-right (ft)	1870.0 1500.0
x-right (ft)	363.0
y-left (ft)	1850.0 1900.0
x-left (ft)	230.0
30.	L D

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANGU METHOD \* \* \* \* \*

1680.00 1854.55

194.36 248,94

-4 N

#### W.O. 8838 Sec. C3-C3' W=90' D=5'

surfaces examined first	coordinate points			(Fo factor = 1,048)	coordinate points							coordinate points								(Fo factor = 1.053)	coordinate points						(Fo factor = 1.039)	coordinate points	
1 the failure somest critical for	specified by 5 coo.	y-surf (ft)	1880.00 1857.35 1917.81 1925.00 1933.00	1.766 **	specified by 8 coo	y-sur? (ft)	1880.00	1875.00	1905.75	1918.46	1933.00	9	•	y-surf (ft)	1880.00	1855.72	1923 94	1925.30	1933.00	1,756 **		y-surf (ft)	1880.00	1859.75	1917.44	1925.30 1933.30	1,759 **	specified by 6 coo	y-surf (ft)
critical of all	No. 1	x-surf (ft)	211.57 260.15 477.04 480.39	JANEU FOS =	No. 2	x-surf (ft)	227.90	237.30	445.21	451.13	1.61	, ~	)	x-surf (ft)	208.15	260.23	467.67	468.24	168.24	JAMBU FOS =	No. 4 specified	x-surf (ft)	216 14	259,55	512.28	515.95 515.95	TANBU FOS =	u)	x-surf (ft)
The 10 most cri	Pailure surface	Point No.	ଳା (ଏ ୯୩ ସ ଏ)	** Corrected	Sailure surface	Point No.	но	. M •	ים ולי	9 1-	60	Failure surface No		Point No.	1	64 10	7 5	r uń	w	** Corrected	Failure surface	Point No.	_	2 2	m	ସ୍ଥା	** Corrected	Failure surface No.	Point No.

3 437.69 1906.55 4 441.80 1915.37 5 446.92 1925.00 6 446.92 1933.00	** Corrected JAMBU FOS = 1.768 ** (Fo factor = 1.055)	Failure surface No. 6 specified by 6 coordinate points	Foint x-surf y-surf		4 448-51 1917.59 5 452-45 1955.00 6 452-45 1933.00	** Corrected JANSU FOS = 1,730 ** (Fo factor	Failure surface No. 7 specified by 5 coordinate points	Foint x-surf y-surf	1 216.01 1880.00 2 259.93 1856.72 3 533.30 1994.53 4 533.77 1995.55 5 533.77 1933.55	** Corrected JAMBU FOS = 1.774 ** (Fo factor	Failure surface No. 8 specified by 5 coordinate points	Point x-sumf y-sumf No. (ft) (ft)	1 190.29 1880.00 2 244.24 1854.84 3 515.71 1931.55 4 517.46 1955.32	517,46	** Corrected JAWBU FOS = 1.775 ** (Fo factor	Failure surface No. 9 specified by 6 coordinate pounts	Point x-surf y-surf No. (ft) [ft)	271.02	4 400.57 1925.00 6 490.67 1933.00	** Corrected JANBU FOS = 1.775 ** (Fo factor	Failure surface No.10 specified by 6 coordinate points	Foint $x$ -surf $y$ -surf No. (ft) (ft)	/ILLAGE
ined			_	= 1.048}					1.048)	נג פי				= 1.053)				_	1.039)	<b>S</b>			GEOLABS-WESTLAKE VILLAGE

W.O. 8838 Sec. C3-C3' W=90' D=5'

1880,00	1855.50	996,	1904.75	82	1933.00
194.11	246.43	405.74	409.75	420.52	420.52
п	71	m	4	മ	9

(Fo factor = 1.060)

\*\* Corrected JANBU FOS = 1.794 \*\*

The following is a surmary of the TRN most critical surfaces

Problem Description : Sec. C3-C3' W=90' D=5'

Available Strength (1b)	3.567E+05	3.248E+05	3.7388+05	3.742E+05	3.636E+35	3,664B+05	4.066E+05	4.015E+05	3.391E+05	3.433E+05
Terminal x-coord (ft)		454.61	468,24	515.95	446.92	452,45	533.77	517.46	490.67	420.52
Initial x-coord (ft)	211.57	227.90	208.15	215.14	194.36	188.44	210.01	190.29	232.60	194.11
Correction	1,048	1.048	1.053	1.039	1.056	1.055	1.041	1,043	1.042	1,060
Modified Jaway RCS	1.706	1.752	1.756	1.759	1.768	1.770	1,774	1.775	1.778	1.754
	1.	ς.	ä	÷	3	ě,	۲,	θ.	ó	ď

\* \* \* STI JO ON F \* \* \*

Sec. C3-C3, Pseudo

XSTABL File: 8838C3P 11-20-\*\* 12:18

X S T A B L

Slope Stability A-alysis

Using the
Wethod of Slices

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Ver. S.201

96 À 1545

Problem Description : Sec. C3-C3 F=90' D=5' Pseudo

SEGMENT BOUNDARY COCRDINATES

9 SURFACE boundary segments

Segment x-left y-left x-right y-right Soil Unit

No. (ft) (ft) (ft) (ft) ED ION Segment

1 .C 1870.0 125.0 1870.0 1

2 125.0 1870.0 125.0 1880.0 1

2 145.0 1880.0 230.0 1880.0 1

4 230.0 1890.0 245.0 1933.0 2

5 365.0 1933.0 495.0 1933.0 2

6 495.0 1933.0 637.0 1935.0 1

7 637.0 1935.0 680.0 1957.0 2

8 680.0 1957.0 2

9 720.0 1957.0 1957.0 1

6 SUBSURFACE boundary segments

Segrent x-left y-left x-right y-right Scil Unit No. (ft) (ft) (ft) (ft) Below Segment 1 230.0 1860.0 230.1 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0 1875.0

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf) Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

	Parameters	
******	ISOTROPIC Soil	

2 Soil unit(s) specified

Water Surface No.	٥٥
essure Constant (psf)	66
Pore Pressure Parameter Constant Ru (psf)	000
Friction Angle (deg)	34.00
Cohesion Intercept (psf)	225.0
Weight Cast.	140.0
Unit Moist (pcf)	130.0 125.0
Boil Unit No.	г 8

AHISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 11.00 40.00
c-value (psf]	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	12.00 16,00 90.00
Direct.on Range No.	- to M

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .600 has been assigned

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

 Box
 x-left
 y-left
 x-right
 y-right
 Ridth

 no.
 (ft)
 (ft)
 (ft)
 (ft)
 (ft)

 1
 230.0
 1850.0
 360.0
 1970.0
 50.0

 2
 400.0
 1900.0
 620.0
 1900.0
 50.0

### W.O. 8838 Sec. C3-C3' Pseudo

by the :	* * * *	surfaces examined first	coordinate points			$(Fo\ factor = 1.039)$	coordinate points						(Fo factor = 1.034)	coordinate points			(Fo factor = 1.039)	coordinate points					(Po factor = 1.039)	coordinate points
calculated	* dokazak u	ll the failure most critical	cified by 5 co	y-surf (ft)	1880.00 1859.75 1917.44 1925.30	1.045 **	fied by 7 co	y-surf (ft)	1880.00 1879.20	1875,00	1862.90	1925,47	1,046 **	Z Z	y-surf (ft)	1860.57 1914.47 1925.12	1,057 **	r S	y-surf (ft)	1880.00	1920.02	1925.87 1933.87	1,071 **	by 5
ty have been	SIMPLIFIED JANGU	cal of al ow - the	No. 1 spe	x-surf (ft)	216.14 259.55 512.28 525,95	JANBU FOS =	No. 2 speci	x-surf (ft)	228.50 230.32	237.91	526.89	528.70 528.70	JANBU FOS =	No. 3 specified	X-surf (ft)	208.72 250.40 499.42 503.38	JANEU ROS =	No. 4 specified	x-surf (ft)	203.53	553.94	555.67	JANEU FOS =	No. 5 specified
Factors of safety	* * * * *	The 10 most criti are displayed bel	Failure surface	Pcint No.	- የወቅብ	** Corrected	Failure surface	Point No.	. 2	en •	og u/s	9 6	** Corrected	Failure surface	Potnt No.	ଳା (ଧାରୀ ସଂଧାର	** Corrected	Failure surface	Point No.	1 ,	N M	-2rΩ	** Corrected	Failure surface

		(Fo factor = 1.041)	coordinate points							(Fo factor = 1.038)	coordinate points						(Ro factor = 1.043)	coordinate points						(Fo factor = 1.048)	coordinate points								(Fc factor = 1.037)
y~surf (ft) 1880.00 1656.72	1924.53 1925.55 1933.55	1.073 **	124	y-surf (ft)	1880.00	1878.16	1859.76	1922,89	1925.56	1.074 **	AT Pe	y-surf (ft)		1880.00	1927.55	1925.32 1939.32	1.074 **	fied by 5 co	Y-surf (ft)	1000	1857.35	1917.81	1925,00	1.084 **	9 <b>X</b> Q		y-sucr (ft)	1882.01	1875.00	1922.91	1925.61	1935.91	1.089 44
x-surf (ft) 210.01 259.93	533.30 533.77 533.77	JANEO FOS .	No, 6 specified	x-surf (ft)	226.58	230.04	268.67	533.42	534.67	JAMBU POS =	No. 7 specifi	x-surf (ft)		244.24	515.71	517.46 517.46	JANTEU FOS =	No. 8 speci	x-surf (f:)	231 57	260.15	477.04	480.39	CANBU POS =	No. 9 specified	<b>9 1</b> 1	x-surr (ft)	235.11	248.78	537.15	538.41	17.000	JAMES FOS =
Point Mo.	i ጠ se sa	** Corrected	Failure surface	Point No.	p4 (	OI 67	1 -9	LO Y	9 1	** Corrected	Failure surface	Point No.	•	r (4	ศา	Δ-n)	** Corrected	Failure surface	Point No.		• 64	m	<b>4</b> €	** Corrected	Failure surface	į	No.		<b>7</b> 1 C	7 - 57	in v	o	** Corrected

Sec. C3-C3' Pseudo W.O. 8838

Failure surface No.10 specified by 8 coordinate points

y-surf (ft)	1880.00 1878.87 1875.00 1861.44 1905.76 1918.46 1925.00	
x-sucf (ft)	227,90 230.02 237,30 266,38 445,21 451,13 454,61	
Point No.	୮ ପୋରା କର୍ମ କେ ୮ ଉ	,

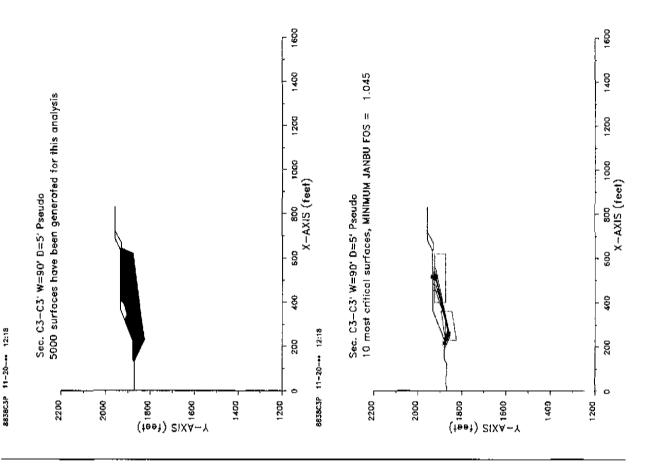
(Fo factor = 1.048) \* \*\* Corrected JANBU FOS = 1.091

Problem Description : Sec. C3-C3' W=90' D=5' Pseudo

The following is a summary of the TEN most critical surfaces

Available Strength (1b)	3.9592+05	3.7828+05	3.6346+05	4.7962+05	4.3365+05	4.171E+05	4,2735+05	3.8012+05	4.03BE+05	3.409E+05
<pre>ferminal x-ccord (ft)</pre>	513.95	528,70	503.38	555.67	533.77	534.67	517.46	480.39	538.41	454.61
Initial x-coord (ft)	216.14	228,50	208.72	203.53	210.01	226.58	190.29	211.57	235.11	227.90
Correction Factor	1.039	1.034	1.039	1.039	1.041	1.038	1.043	1.048	1.037	1.048
Modified JANEU FOS	1.045	1.046	1,057	1.071	1.073	1.074	1.074	1.084	1.089	1,091
•	1	εĭ	'n	4	'n	ý	Ļ.	o)	ď	10.

\* \* \* END OF FILE \* \* \*



GEOLABS-WESTLAKE VILLAGE

## Sec. C3-C3' Pseudo., Spencer's

XSTABL File: 8838C3PS 11-20-\*\* 12:19

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Slope Stability Analysis	is
using the	
Method of Slices	
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* Ver. 5.201	96 A 1545
	6 A 15

Problem Description : Sec. C3-C3' W=90' D=5' Pseudo Spend

SLEMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Soil Unit Below Segment	1	7		7	61	н	8	5	
y-right (ft)	1870.0	1680.0	1880.0	1933.0	1933.0	1935.0	1957.0	1957.0	1957.0
x-right (ft)	125.0	145.0	230.0	365.0	495.0	637.0	680.0	720.0	830.0
y~left (ft)	1870.0	1870.5	1680.0	1880,0	1933.0	1933.0	1935.0	1957.0	2957.0
x-left (ft)	o.	125.0	145.0	230.0	365.0	495.0	637.0	680.0	720.0
Segment No.	-	2	M	4	ιŋ	ø	۲.	B	យា

6 SUBSURPACE boundary segments

Soil Unit Balow Segment	
y-right (fc)	1875.0 1875.0 1933.0 1930.0 1930.0
x-right (ft)	230.1 320.0 495.0 637.1 667.0
y-left (ft)	1880.0 1875.0 1875.0 1935.0 1930.0
x-left (ft)	230.0 230.1 320.0 637.0 687.1
Segment No.	። የ ነን ላን ላን

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 62.40

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

Parameters	
Soi.	
ISOTROPIC	

#### 2 Soil unit(s) specified

Water Surface No.	00
easure Constant (psf)	9.9
Pore Pressure Parameter Constant Ru (psf)	000.
Friction Angle P (deg)	40.00
Cohesion Intercept (psf)	225.0 200,0
Unit Weight Moist Sat. (pcf) (pcf)	140,0 135,0
Unit Moist (pcf)	130.0 125.0
Soil Unit No.	по

AMISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

#### Soil Unit 1 is AKISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40,00 11.00 40.00
c-value (psd)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	12.00 16,00 90,30
Direction Range No.	H 69 FB

A horizontal earthquake loading coefficient of  $\cdot$  .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by the following 5 coordinate points:

y-surf (f:)	1859.75 1959.75 1917.44 1925.30
X-surf {ft}	216.14 259.55 512.28 515.95
Point No.	

GEOLABS-WESTLAKE VILLAGE

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## Sec. C3-C3' Pseudo., Spencer's

Slice	x-base (ft)	y-base (ft)	height (ft)	Hidth (fc)	alpha	<b>1</b>	weight (1b)
	223.07	1876.77	3.23	13,85	-25.01	8	5825.
CV	230,05	1873.51	6.51	.10	-25.01	21.43	83.
m	244.82	1966.62	19.20	29,45	-25.01	21.43	71919.
4	289,77	1866.65	36.82	60,45	12.86	21.43	280728.
z,	342.50	1878.68	45.48	45.00	12.86	21.43	256684,
ø	430.00	1898.66	34.34	130.00	12.86	90.	566376.
۲-	503,64	1915.47	17.65	17.28	12.86	. 81	39658
80	514,11	1921.37	11.90	3.67	64.97	.81	5675.

TOS moment	1.171.1	1,2704	1	1.2637	1.2579
FOS force	1.2704		1.2637	1,2579	1.2583
Theta	14.5280	13,9876	14.2578	14,0187	14.0327
Iter 4	٧	m	m	737	κij

### SLICE INFORMATION ... continued :

Delta	0,00	888	88	00.
P-top (1b)	66	ဝ ဝ ဝ	3 0 0	.;
0-top (1b)	9.9			0.
U-base (1b)	00	000	00	ó
ī id	40.00	11.60	11.8	40.00
c-value (psf)	225.0	150.0	150.0	225.0
Signa (psf)	1312.9	6110.0 4244,5 5313.0	3982.1 2098.9	412.1
Slice	- 6	n er e	140 1~	69

# SPENCER'S (1973) - TOTAL Stresses at center of slice base

Shear Stress (psf)	1054.4	1708.2	4253.3	774.9	924.5	734.4	443.4	9 65 8
Pore Water Pressure (psf)	0.	0,	0,	Φ,	Φ,	9.	0,	0.
Vertical Stress (psf)	420.3	833.5	2442.1	4644.0	5704.1	4356.7	2295.0	1547.2
Mormal Stress (psf)	1312.9	2293.4	6130.0	4244.5	5212.9	3982,1	2098.9	412.1
Ease x-coord (ft)	223.07	230.05	244.82	289.77	342.50	430.00	503.64	514.13
e i ce	1	63	m	7	v	۵	۲-	60

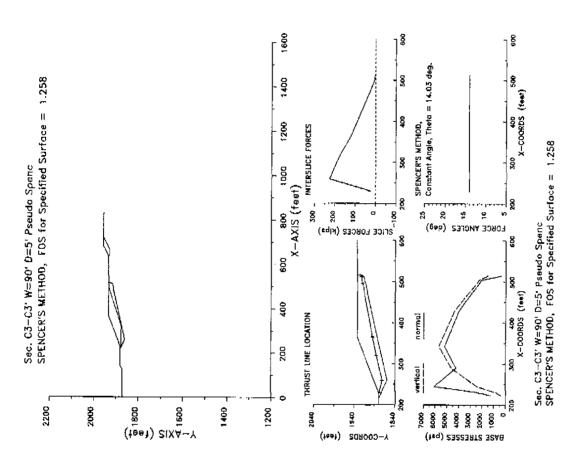
# SPENCER'S (1973) - Magnitude & Location of Interslice Forces

Height Ratio	. 75B
Boundary Seight (ft)	6.55
Force Height (ft)	4.93
Interslice Force (1b)	22912. 23186.
Force Angle (degrees)	14.03
Right x-coord (ft)	230.00 230.10
Slice	- ra

# For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

	4
88	446,65E+03
ci.	П
FACTOR OF SAFETY = 1	otal shear strength available long specified failure surface
	Total aleng

GEOLABS-WESTLAKE VILLAGE



Sec. C3-C3' Pseudo., Spencer's

W.O. 8838

8838C3PS 11-20-44 12:19

#### Sec. C3-C3' Backcut

XSTABL File: 8838C3B 11-20-\*\* 12:13

*********	***************************************
*	X STABI
+	*
* Slope St	Slope Stability Analysis *
*	using the +
* Wet	Wethod of Slices *
*	*
* Copyriq	Copyright [C] 1992 À 96 *
* Interactive S	Interactive Software Designs, Inc. *
* Moscow,	Moscow, ID 83843, J.S.A. *
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* A:1 35	All Rights Reserved *
*	•
* Ver. 5.201	96 Å 1545 *
*************	***************************************

Problem Description : Sec. C3-C3' Backcut

 SECHENT BOUNDARY COORDINATES	
 ECONDARY	
 SECHENT	

#### 10 SURFACE boundary segments

, č	x-left (f:)	y-left (ft) 1870.0	x-right (ft) 125.0	y-right (ft) :870.0	Soil Unit Below Segment 1
	125.0	1870.0	145.0	1880.0	1
	145.0	1880.0	230.0	1880.0	
	230.0	1880.0	230.1	1875.0	
	230.1	1875,0	320,0	1875.0	1
	320,0	1875.0	496.D	1,933.0	1
	455.0	1933.0	637.0	1935.0	1
	637.0	1935.0	0.089	1957.0	⟨Ч
	680.0	1957.0	720.0	1957.0	2
	720.0	1957.0	830.0	1957,0	-

### 3 SUBSURFACE boundary segments

Soil Unit Below Segment	ннн
y-right (ft)	1930.0 1930.0 1957.0
x-right (ft)	637.1 667.0 720.0
y-left (ft)	1935.0 1930.0 1930.0
x-left (ft.)	637.0 637.1 667.0
Segment No.	нмп

### A CRACKED ZONE HAS BEEN SPECIFIED

(feet	(feet	(Sod)
8.00	00'	62.40
ı)	٠	V
Depth of crack below ground surface	of water in	Unit weight of water in crack

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

Parameters	
Soil	-
ISOTROPIC	

#### 2 Soil unit(s) specified

Water Surface No.	00
essure Constant (psf)	
Pore Pressure Parameter Constant Ru (psf)	000.
Friction Angle (deg)	40.00 34.00
Cohesion Intercept (psf)	225.0
Unit Weight Moist Sat. (pcf) (pcf)	140.0 135.0
Umit Moist (pcf)	130.0 125.0
Soil Unit No.	нΝ

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

#### Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 11.00 40.00
c-value (psf)	225.0 250.0 225.0
Counterclockwise Direction Limit (deg)	12.00 16.00 90.00
Direction Range No.	ଜଷ୍ଟ

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is  $100.0\ {\rm ft}$ 

Width	50.0
(ft)	50.0
y-right	1870.0
(ft)	1910.0
x-right (ft)	400.0
y-left	1850.0
(ft)	1905.0
x-left (ft)	320.0
For no.	45

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANBU METHOD \* \*

The 1C most critical of all the failure surfaces examined are displayed below - the most critical first

### W.O. 8838 Sec. C3-C3' Backcut

coordinate points			(Fo factor = 1.019)	coordinate points					(Fo factor = $1.023$ )	coordinate points						(Fo factor = 1.018)	coordinate points					į	(to factor = 1.03/)	Goordinate points					(Fo factor = 1.029)
fied by 5	Yrsurf (ft)	1876.98 1871.37 1925.28 1925.58 1933.58	1.274 **	specified by 5	y-surf (ft)	1875.00	1922.72	1939.37	1.288 **	5	y-surf (ft)	;	1878.88 1874.06	1925.38 1925,63	1933,63	1.292 **	s řá	y-surf (ft)	875	1869.84	1925.10	933.10	1.295	S Va	y-surf (ft)	26.77.78	1874.05	1925.39	1.297 **
e No. 1 speci	x-surf [ft]	325.98 338.02 536.19 536.32 536.32	JANBU FOS =	Йо. 2	x-surf (ft)	310,61	519.74	520.97	- SOE DENEC	e No. 3 specified	x-surf (ft)		331.70	539.66	539.77	JAMED FOS =	No. 4 specified	x-surf (ft)	313.05	324,11	501.80		JAMEJ FUS =	No. 5 specified	x-surf (ft)	328.42	336.43	522.73	JANEU FOS =
Pailure surface	Point No.	የመመትኮ	** Corrected	Sailure surface	Point No.	H 6	N (T) To	<b>ร</b> เค	** Corrected	Failure surface	Point No.		H 8	M es	Ś	** Corrected	Failure surface	Point Mo.	• •	61.6	ग चं∗	4	** Lorrected	Failure surface	Point No.	•	, (A) (A)	ነ የም ሄን	** Corrected

y 5 coordinate points	-surf (ft)	00 30 52	8 ** (Fo factor = 1.029)	y 4 coordinate points	surf ft)	.00 .05 .92 .92	9 ** (Fo factor = 1.019)	y 5 coordinate points	surf ft)	.16 .07 .29	0 ** (Fo factor = 1.026)	y 5 coordinate points	surf ft)	.00 .93 .93 .37	5 ** (Fo Factor = 1,020)	4 coordinate points	surf ft)	2.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1
specified by	, ,	6 1875.00 3 1870.30 7 1918.62 4 1925.21 4 1933.21	S ≈ 1.298	specified by	,	5 1875.00 5 1868.05 8 1925.92 8 1933.92	5 = 1.299	specified by	,	1875.00 1867.16 6 1920.07 9 1925.29	5 = 1.300	specified by	¥.	1875.00 1871.93 1923.93 1925.37 1933.37	s = 1.305	specified by	-K	3978,15 1 1970,91 1 1925,66 1 1933,66
No. 6	x-surf (ft)	312.66 322.73 506.87 509.94 509.94	d JAMBU POS	surface No. 7 s	x-surf (ft)	313.35 328.25 560.08 560.08	d Janeo Fos	No.	x-surf (ft)	308,89 325,70 512,96 515,39 515,39	d JANEO ROS	No. 9	x-surf (ft)	316.11 322,69 520,42 521.10	d Javaso Pos	No.10	x-surf (ft)	329.49 345.01 541.53 541.53
Failure surface	Foint No.	⊣ ८०० च ४०	** Corrected	Failure surfa	Point No.	स्थलाच	** Corrected	Failure surface	Point No.	ମଧାମସଂଖ	** Corrected	Failure surface	Point No.	H M M A N	** Corrected	Failure surface	Point No.	लिश्हाच

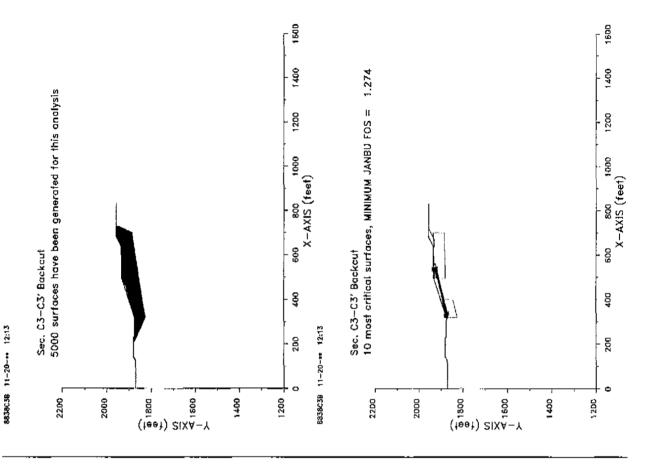
W.O. 8838 Sec. C3-C3' Backcut

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C3-C3' Eachcut

Available Strength (1b)	1.145E+05	1.10SE+05	1.089E+05	9.945E+04	1.010E+05	9.449E+04	1.4541.405	1.1582+05	8.531E+04	1.298E+05
Terminal x-coord (ft)	536.32	520.97	539.77	501.80	522.73	509.94	560.08	515,39	521.10	541.53
Initial x-coord (ft)	325.98	310.61	331.70	313.05	328.42	312.66	313.35	308.89	316.11	329.49
Correction Factor	1.019	1.023	1.018	1.037	1,029	1.029	1,019	1.026	1.020	1.023
Modified JANEU FOS	1.274	1,288	1,292	1.295	1,297	1.298	1.299	1.300	1,305	1,305
	-i	ч	m	7	ď	φ	۲,	ø,	φ.	10.

\* \* \* ENG OF FILE \* \* \*



#### Sec. D-D' W=100' D=5' W.O. 8838

11-13-\*\* 15:12 XSZABL File: 8838D

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Problem Description : Sec. D-D' WellD' D=5'

#### SECRENT BOANDARY COORDINATES

	Soil Unit Below Segment	г	۲,	C3	23	-	m	ო
	y-right (ft)	1955.0	2130.0	2130.0	2120.0	2080.0	2100.0	2:10.c
41	x-eight (ft)	310.0	0.007	710.0	760.0	860.0	1000.0	1120.0
7 SURPACE boundary segments	y-left (ft)	1954.0	1955.0	2130.0	2130.0	2120.0	2080.0	2100.0
FACE bounds	x-left (ft)	ė.	310,0	0,007	710,0	760.0	0.088	1000.0
SUR!	Segment. No.	7	2	M	4	κij	9	۲۰

### 5 SUBSURFACE boundary segments

Soil Unit Below Segment	еее пч	
Y-right (ft)	1950.0 1950.0 2120.0 2080.0	
x-zight (ft)	310.1 410.0 760.0 1120.0	
y-left (ft)	1955.0 1950.0 1950.0 2080.0	0.000
x-left (ft)	310.0 310.1 410.0 880.0	
Segment. No.	፡፡ መህወሳ	>

### A CRACKED ZONE HAS BEEN SPECIFIED

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

#### 4 Soil unit(s) specified

Hater Surface No.	
essure Constant (ps:)	o'o'o'o'
Pore Pressure Parameter Constant Ru (ps:)	000
Friction Angle (deg)	40.00 34.00 30.00 40.00
Cohesion Intercept (psf)	225.0 200.0 200.0 200.0
Weight Sat. (pcf)	140.0 135.0 135.0 140.0
Unit Moist [pcf]	130.0 125.0 125.0 130.0
Scil Unit No.	କଥାପରେ ୟ

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 17.00 40.00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	6.00 11.60 90.00
Direction Range No.	-4 (N M)

1 Water surface(s) have been specified

62,40 (pcf) Unit weight of water = Water Surface No. 1 specified by 3 coordinate points

y-water (ft)	1905.00 1950.00 2050.00
x-water (ft)	410.00
Point No.	ଜରାଣ

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

### W.O. 8838 Sec. D-D' W=100' D=5'

Length of line sliding block	line segments lock is 100	for 3 ft	active and	passive portions	ns of
Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
2 1	380.0 620.0	1940.0	600,0 980,0	2040.5	60.08 0.08
Factors of	səfəty h	have been	calculated by	the :	
*	SIMPLIFIED	IED JANBU	* CORTEX	•	
The 10 most crare displayed	critical ed below	of all - the mo	.1 the failure s most critical f	surfaces examined first	ined
Failure sur	surface No.	1 specified	9 Āq	coordinate points	ts
Point No.	ĸ	-swrf (ft)	y-surf (ft)		
	m	368.44	1981.22		
N M	<b>-</b> ∓ 06	414.36 651.46	1956.81 2001.74		
ልየኒል	373	690.97 709.86 709.86	2086.47 2122.00 2130.00		
** Corrected		JANBU FOS =	1.562 **	(Fo factor	= 1.082}
Failure sur	surface No.	2 specif	specified by 8 coc	coordinate points	ts
Point No.	×	-surf (ft)	y-surf [ft]		
-	ei,	37.91	1967.52		
0 M	im in	370.87 395.90	1950.00 1938.33		
107 V	1 G	65.92	1990.72		
n vo	-	715,31	2098.78		
r- <b>0</b> 0	22	726.86	2118.63		
** Corrected	ted JANEU	U FOS =	1.575	(Fo factor	= 1.080)
Failure sur	surface No.	3 speci£	specified by 6 co	coordinate points	ts .
Point No.	ĸ	-surf (ft)	y-surf		
	ři)	55.65	1975.48		
Nr	Мiù	395.14	1954.48		
1 जा	1 120 1	71.10	2076.82		
ብ ነን	<i></i>	693.59 693.59	2119.12 2127.12		
** Corrected		JARBU FOS =	1.578 **	(Fo factor	= 1.08;)
Failure sur	surface No.	4 specií	specified by 6 coc	coordinate points	ts

			coordinate points							(Fo factor = 1.077)	coordinate points						(Fo factor = 1.081)	្គ ភ្ន						(Fo factor = 1.084)	coordinate points			
Y-sucf (13)	1974.34 1958.35 2003.64 2079.84 2121.84	184	by B	(£¢)	1973.15 1950.00	1949.34	2091,29	2111.64	2123.08	1.611 **	e Š	y-surf (ft)	1996.77	2019.06	2083.56	2122.00	. 627 **	g A	y-surf (ft)	1988.13	1964.02	2087,36	2121.78 2129.78	1,641 **	by 6	Y-surf (ft)	1989,00	1968.04 2020.55 2111.28
x-surf (ft)	353.11 383.19 641.78 677.31 699.65	JAMEU F	No. 5	(ft)	350.44	394,95	733,29	742,78	744.61	JAMBU FOS =	No. 6 specified	x-surf (Et)	403.08	654.90	684.97	705,43	AANBU FOS #	No. 7 spe	x-surf (ft)	383.82	429,15	692.81	01.117 01.117	JANEU FOS =	No. 8 specified	x-surf (ft)		425.18 705.16 747.42
Point No.	- ଟୋଲ ବଣ ନ	71	Failure surface Point	NO.	-1 (2)	е ч	לוטי	<b>10</b> F	- <b>2</b> 0	** Corrected	Failure surface	Foint No.	н с	иm	, 7	un va	** Corrected	lure s	Point No.	-	cv M	. ~	ம் 10	** Corrected	Failure surface	Point No.	-	नं ए। लाच्च

## GEOLABS-WESTLAKE VILLAGE

W.O.	.O. 8838	$\overline{}$
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			(Fo factor = 1.074)
	2114.24	2122.24	1.653 **
D=5;	748.80	748,80	JANEG FOS =
), W=100; D=5;	'n	9	Corrected JANBU FOS
~			•

points Fai

coordinate	
ųς	
λ	
specified	
Øή.	
ğ	
surface	
ilure	

y-surf (ft)	1981.84 1973.31 2019.88 2102.09 2117.71
x-surf (ft)	369.81 385.84 684.79 723.13 731.43
Point No.	មលាយ១០៤

\*\* Corrected JANBU FOS = 1.659 \*\*

Failure surface No.10 specified by 5 coordinate points

y-surf (ft)	1981.25	2030.17	2113.57	2121.57
x-surf (ft)	368.51	713.28	752.17	752.17
Point No.	п.	1 177	*	s

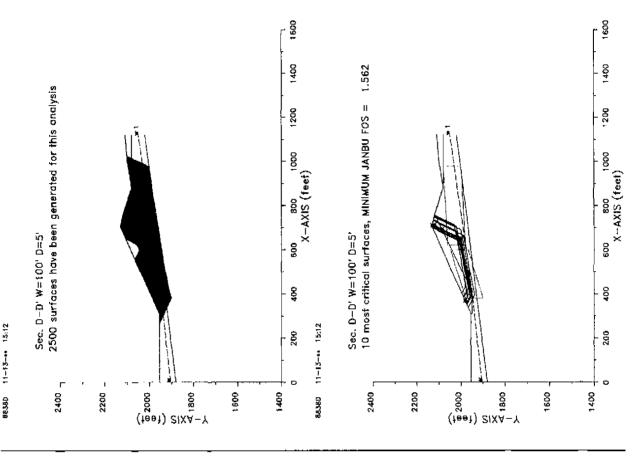
(Fo factor = 1.067)\*\* Corrected JANBU FOS = 1.671 \*\*

The following is a summary of the TEM most critical surfaces

Problem Description : Sec. D-D' W=100' De3'

Available Strength (1b)	1.277E+06	1.594E+06	1.2152+06	1.2022+06	1.6142+06	9.991E+05	1,264E+06	1,329E+06	212E+06	1,263E+06
Terminal x-coord (ft)									731.43	
initial x-coord (ft)	368.44	337.93	355,65	353.11	350.44	403.08	383.82	385.76	369.81	369.51
Correction Factor	1.082	1.080	1.081	1.090	1.077	1.081	1.084	1.074	1.074	1.067
Modified JANTBU FOS	1.562	1,575	1,578	1.584	1.611	1,627	1.641	1,653	1.659	1.671
٠,	ri	ς,	ų.	÷	'n,	, 6	7.	ë	ď	10

\* \* \* 37113 30 CKE \* \*



## GEOLABS-WESTLAKE VILLAGE

#### Sec. D-D' Backcut

XSTABL File: 8838DB 11-13-\*\* 15:11

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*	*	*	*	*	#	*	*	*	*	*	*	*	į

Problem Description : Sec. D-D' Backout

	Soil Unit Below Segment	ਜਜਜਜਗਲ
	y-right (ft)	1955.0 1950.0 1950.0 2120.0 2080.0 2110.0
φ,	x-right (ft)	310.0 310.1 410.1 410.0 760.0 880.0 1000.0
ENT BOUGHARY COORDINATES  7 SURFACE boundary segments	y-left (ft)	1954.0 1955.0 1950.0 1950.0 2120.0 2080.0
SECRENT BOUGDARY COORDINATES	x-left [ft)	.0 310.0 316.1 410.0 760.0 880.0
SEGMENT BOUNDA	Segment No.	2000年后右介

### 2 SUBSURFACE boundary segments

Soil Unit Selow Segment	1 4
y-right (ft)	2080.0 2020.0
x-raght (ft)	1120.0
y-left (ft)	2080.0 1880.0
x-left (ft)	0.088
Segment No.	1 2

### A CRACKED ZONE HAS BEEN SPECIFIED

(feet)	(feet)	(Jod)
H		þ
Depth of crack below ground surface	Maximum depth of water in crack	Unit weight of water in crack

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

#### 4 Soil unit(s) specified

	Surface No.	1	7	-	H
PESUTE	Constant (psf)	ď,	•.	0,	₽.
Pore Pr	Angle Parameter Constant (deg) Ru (psf)	000	000	000	000
	Angle (deg)	40.00	34.00	30.06	40.00
Cohesion	Intercept (psf)	225.0	200.0	200.0	200.0
oil Unit Weight Cohe	Moist Sat. (pcf) (pcf)	140.0	135.0	135.0	140.0
Unit	Możst (pcf)	130.0	125.0	125.0	130.0
Soil	Unit No.	-	8	m	4

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

#### Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 17.00 40.00
c-value (psf)	225.0 156.0 225.0
Counterclockwise Direction Limit (deg)	6,00 11.00 90,00
Direction Range No.	ଳସ୍କ

### 1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 3 coordinate points

#### 

y- <b>Kate</b> t (ft)	1905,00 1950.00 2050.00
x-water (ft)	.00 410.00 1120.00
Point No.	n 00 ft

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

The active and passive portions of the sliding surfaces are generated according to the Pankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is  $100.0\ \mbox{ft}$ 

	5 761.02 2111.66 6 761.02 2119.66	** Derrected JawsU Fos = 1.317 ** (Fo factor = 1.081)	ace No. 5 specifie	Point X-Surf Y-Surf No. (ft) (ft)	1 425.03 1957.30 2 451.57 1944.92 3 709.33 1994.22 4 751.59 2084.85	763.68	** Corrected JANBU FOS = 1.318 ** (Fo factor = 1.079)	Failure surface No. 6 specified by 7 coordinate points	Point x-surf y-surf No. (ft) (ft)	393.74	2 428.88 1993.91 3 431.73 1993.30 A 731 N 1987.43		ted JANBU FOS =	Failure surface No. 7 specified by 5 coordinate points	Point x-surf y-surf No. (ft) (f;)	1 477.13 1982.50 2 483.46 1979.55 3 680.41 2015.46	715.31	** Corrected JANBU FOS = 1.339 ** (Fo factor = 1.077)	Failure surface No. 8 specified by 5 coordinate points	Foint x-surf y-surf No. (ft) (ft)	496.11	3 715.10 2025.76 4 755.54 2109.06 5 753.94 2117.06	cted JANBU FOS =	6 0001
Box x-left y-left x-right y-right Width no. (ft) (ft) (ft) (ft)	410.0 1915.0 600.0 2C07.0 620.0 2UII.0 980.0 2C40.0		Eactors of safety have been calculated by the :	* * * * SIMBLIFIED JAMED METHOD * * * * *	The 10 most critical of all the failure surfaces examined are displayed below - the most critical first	Failure surface No. 1 specified by 6 coordinate points	Point x-surf y-surf No. (ft) (ft)	397,18 417 65	3 677.07 1987.92 4 773.83 2076.55	727.58	** Corrected JANSU FOS = 1.279 ** (Fo factor = 1.078)	Failure surface Mo. 2 specified by 6 coordinate points	Point x-surf y-surf No. (ft) (ft)	1 371.80 1950.00 2 41.16 1931.65 7 171 2 1931.65		oted JANEU FOS = 1,286	Failure surface No. 3 specified by 6 coordinate points	Point x-surf y-surf	1 387.00 1950.00 2 417.55 1935.76		5 777.37 2106.22 6 777.37 2114.2;	** Corrected JANBU FOS = 1.295 ** (Fo factor = 1.077)	Failure surface No. 4 specified by 6 coordinate points	Point x-surf y-surf

W.O. 8838 Sec. D-D' Backcut

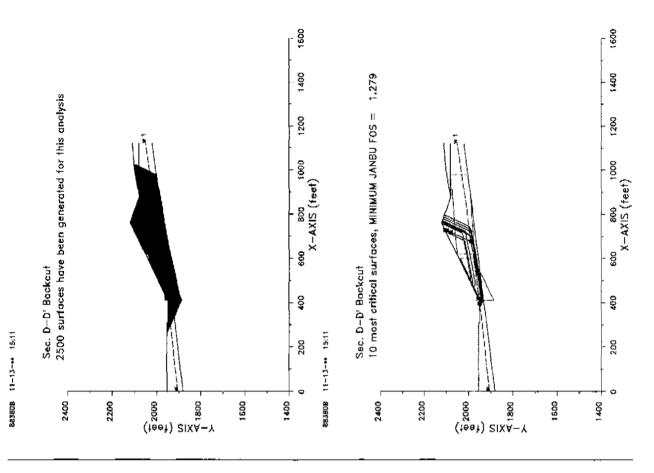
		** (Fo factor = 1.074) 6 coordinate points		(Fo factor = 1.077)
y-surf (ft)	1950.00 1939.57 1993.10 2083.73 2100.56 2108.56		Y-Surf (ft) 1977.13 1968.64 2013.31 2109.24 2117.24	1.344 **
x-surf (ft)	408.57 430.93 744.22 786.48 794.32	JANBU FOS = No.10 specii	x-surf (ft) 465.85 484.06 723.56 765.82 766.29	JANBU FOS =
Point No.	୴୰୴୷୵୵	** Corrected JANBU FOS = 1.342 Failure surface No.10 specified by	Soint Mo. Mo. Mo. Mo. Mo. Mo. Mo. Mo. Mo. Mo.	Corrected JAMBU FOS
		:		#

The following is a summary of the TBN most critical surfaces

Problem Description : Sec. D-D' Backout

Available	Strength	(16)	8.3346+05	1.2246.06	1.205E+06	1.1276+06	1.0406+06	1,3412+06	4.5182+05	5.3546-05	1,2611-06	8.136E+05
Terminal	x-coord	(£¢)	727,58	776.75	75.33	761.02	763.68	785.18	715.31	753.94	794.32	768.29
Initial	x-coord	(ft)	397,18	371.80	387.00	380,63	425.03	393, 74	477.13	495.11	408.57	453.85
Correction	Factor		1,078	1.076	1.077	1.081	1.079	1,073	1.077	1.077	1.074	1.077
Modified	CANEL FOR		1.279	1,289	1,296	1,317	1.318	1.335	1.339	1.340	1.342	1,344
			٦,	2.	m	ď	Ŋ	Ģ.	۴,	œ	o,	10.

\* \* \* SIIIS \* \* \*



### Sec. L-L' W=70' D=5'

11-21-\*\* 11:31 XSTABL File: 8838L

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	*	Ver. 5.201 96 À 1545	٠

Problem Description : Sec. L-L' N=70' D=5'

SEGGET BOUNDARY COORDINATES

## 9 SURFACE boundary segments

	x-left (ft)	Y-left (ft)	x-right (ft) 130 0	y-right (ft) 1708.0	Soil Unit Below Segment
130	. 0.	1708.0	136.0	1705.0	
136	٥.	1705.0	200.0	1705.0	64
200	٥.	1705.0	255.0	1705.0	7
255	0	1705.0	475.0	1795,0	1
475	0	1795.0	520.0	1790.0	-
520	٥	1790.0	585.0	1775,0	מו
585	0	1775.0	650.0	1800.0	m
650	o.	1800.0	950.0	1855.0	m

### 6 SUBSURFACE boundary segments

Soil Unit Below Segment	0000na	
y-right (ft)	1705.0 1706.0 1706.0 1750.0 1796.0	
x-right y (ft)	200.0 255.1 325.0 430.0 520.0	
y-left (ft)	1625.0 1765.0 1760.0 1760.0 1750.0	
x-left [ft]	255.0 255.1 255.1 325.0 430.0	
Segment No.	୷େମେନଅଧ୍ୟ	

### A CRACKED ZONE HAS BEEN SPECIFIED

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ters		fied
 ISOTROPIC Soil Parameters	· · · · · · · · · · · · · · · · · · ·	3 Soil unit(s) specified

Water Surface No.	000
Pore Pressure Waltameter Constant Su	ööö
Parameter Co	980.
Friction Angle (deg)	34.00 46.00 40.00
Cohesion Intercept (psf)	200.0 200.0 225.0
Unit Weight Moist Sat. (pcf] (pcf)	135.0 140.0
Unit Moist (pcf]	125.0 130.0 130.0
Soil Unit No.	пак

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

#### Soil Unit 2 is ANISOFROPIC

Number of direction ranges apecified = 3

i-value (degrees)	40.00 25.00 40.00
c-value (psf)	200.0 100.0 200.0
Counterclockwise Direction Limit (deg)	17.00 24.00 90.00
Direction Range Mo.	321

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is  $100.0\ \mathrm{ft}$ 

Width	60.0
(ft)	70.0
y-right	1690.0
(ft)	1740.0
x-right	350.0
(fc)	570.0
y-left	1670.0
(ft)	1710.0
x-left	255.0
(ft)	386.0
Box To:	H 64

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANBU METGOD \* \* \* \* \*

### W.O. 8838 Sec. L-L' W=70' D=5'

								_									_							_							_								_	,	
by 7 coordinate points	y-surf (ft)	705.00	1683.58	7.0 A.N.	1764.81	1786.99	1794.99	.861 ** (Fo factor = 1.057)	by 9 coordinate points	y-surf	(ft)		1705.00	10.10	85.52	45.35	52.54	1764.12	1786.45	1794.45	1.872 ** (Fo factor = 1.061)	by 6 coordinate points	-surf		1705.00	1582.87	1734.91	1786.62	1794.62	,883 ** (Fo factor = 1.057)	by 8 coordinate points		(ft)	1718.94	00,00	60.00	55.02 50.03	22.30	63.32	1783.72	1.890 ** (Fo factor = 1.065)
No. I specified by	x-surf y (ft)	239.04 17						JANBU 705 = 1.	No. 2 specified by	y jus-x	(ft)		249.54					461.78 17		473.65 17		No. 3 specified by	x-sus_x	ft)	234.29 17					JANTEU FOS = 1.	No. 4 specified by	y v			.69		453.88 17				П
Failure surface No.	Point No.		0) (	7 -0		L		** Corrected .	Failure surface No.	Point	No.	,		۰ ۳		'n	40		- 60	• •	** Corrected JANBU FCS	Failure surface	Point	No.	1	CN C	n =	y LC)	UD	** Corrected	Failure surface	Tr. CO	. O.	1	2	m	- T	กเ	p r	~ 00	** Corrected JANBU 508

	(Fo factor = 1.062) ordinate points		(Fo factor = 1.056)	(Fo factor = 1.060) coordinate points	(Fo factor = 1.060) coordinate points
y-surf (fb) 1713.18 1790.00 1693.19 1792.03 1752.03 1763.04 1791.64	. 1.903 **	-surf (ft) 10.45 52.55 53.80 53.80 53.80	1.909 **  Ified by S.  Y-Suff (ft) 1706.79 1700.00 1606.41 1747.45	1766.31 1794.31 1.910 ** Fied by 8 Y-curf (ft) 1765.35 1760.00	1747.12 1752.52 1786.35 1794.35 1.916 ** ed by 7 Y-surf (ft)
x-surf (ft) 275.01 299.80 314.41 454.74 466.77	IMKEU ROS :	x-surf (ft) 268.32 287.97 300.89 469.49 477.59 477.59 485.40	ANNU FOS = No. 7 spec;  x-surf (ft) 259.37 272.13 301.27 461.94	471 481 481 7AVBU X~S X~S (f	455.67 456.18 461.55 473.42 473.42 JAMHU FOG = No. 9 specifi x -surf (ft)
Point Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint Voint	** Corrected . Failure surface	Δ,	** Corrected. Pailure surface Point No. 1 2 2 3 3 5 6	** Corrected Failure surface Point No. 1	5 6 7 8 8 ** Corrected • Pailure surface Poin:

1705.00		3	녆	1761.01	B.	91
8				454.78		Ġ
-1	2	rħ	77	S	و	-

Pailure surface No.10 specified by 7 coordinate points

(Fo factor = 1.060)

\*\* Corrected JAMBU FOS = 1.919 \*\*

y-surf (ft)	1705.00	1687.14	1749.39	1752.40	1763.37	1785.77	1793.77
x-surf (ft)	241.55	279.84	453,56	454.96	460.08	471.59	471.99
Point No.	1	2	٣	77	so.	9	r

# \*\* Corrected JAMBU FQS = 1.919

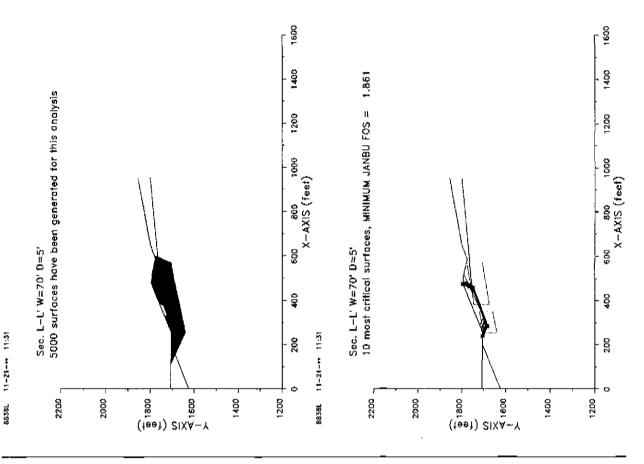
(Fo factor = 1.057)

\*

The following is a summary of the TEN most critical surfaces Problem Description : Sec. L-L' M=70' D=5'

		(15)	5,3632+05									
Termina1	x-coord	(££)	475.11	473.65	478.40	471.87	466.77	485.40	481.22	473.42	466.82	471.99
Initial	x-coord	(££)	239.04	249.54	234.29	289.03	275.C1	268.32	259.37	255.85	239.48	241.55
Correction	Factor		1.057	1.061	1.057	1.065	1.062	1.056	1.060	1.060	1,060	1.057
Modif: ed	JAMBU FCS		1.861	1,872	1.883	1,890	1,903	1.909	1.910	1.916	1.919	1.919
			ť	ς,	m	Ť	'n	ķ	ć,	œ	ď	ģ

#### \* \* END OF FILE \* \* \*



## Sec. L-L' W=70' D=5' Pseudo

XSTABL File: 8038LP 11-21-\*\* 11:31

Slope Stability Analysis

Slope Stability Analysis

Method of Slices

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Ver. 5.201

Problem Description : Sec. L-L' Wr70' D=5' Pseudo

SEGMENT BOUNDARY COCRDINATES

9 SURFACE boundary segments

 Segment
 x-left
 y-left
 x-right
 y-right
 Soil Unit

 No.
 [ft]
 (ft)
 (ft)
 Balow Segment

 1
 .0
 1708.0
 136.0
 1708.0
 1

 2
 136.0
 1708.0
 1708.0
 1

 4
 200.0
 1705.0
 255.0
 1705.0
 2

 5
 255.0
 1705.0
 1795.0
 2

 6
 475.0
 1795.0
 1790.0
 1

 7
 520.0
 1779.0
 1
 3

 8
 565.0
 1775.0
 3
 3

 8
 565.0
 1775.0
 3
 3

 9
 550.0
 1775.0
 3
 3

6 SUBSURFACE boundary segments

Soil Unit Below Segment	пппппп	
y-right (ft)	1705.0 1706.9 1700.0 1750.0 1790.0	
x-right (ft)	200.0 255.1 325.0 430.0 520.0 950.0	
y-left (ft)	1625.0 1705.0 1700.0 1700.0 1750.0	
x-left (ft)	255.0 255.0 255.1 325.0 430.0	
Segment No.	имнемю	

A CRACKED ZONE HAS REEN SPECIFIED

Depth of crack below ground surface = 8.30 (feet) Maximum depth of water in crack = .30 (feet) Unit weight of water in crack = 62.40 (pcf)

Pailure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC SOLL Parameters	3 Soil unit(s) specified

Water Surface No.	000
Constant (psf)	666
Fore Pressure Parameter Constant Ru (psf)	000
Friction	34.00
Angle	40.00
(deg)	40.00
Cohesion	200.0
Intercept	200.0
(psf)	225.0
Weight	135.0
Sat.	140.0
(pcf)	140.0
Unit	125.0
Moist	130.0
(pcf)	130.0
Soil Uhit No.	нак

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

Soil Unit 2 is ANISCTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40,00 25,00 40.00
c-value (psf)	200.0 200.0 200.0
Counterclockwise Direction Limit (deg)	17.up 24.up 90.00
Direction Range No.	୷ଉଅ

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of ,000 has been assigned

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of lane segments for active and passive portions of sliding block is  $100.0\ \mbox{ft}$ 

	Width (ft)	60.0 76.0
		1690.0 3740.0
	x-right (ft)	350.0 570.0
	y-left (ft)	1670.0 1710.0
7	x-left (ft)	255.0 380.0
	BOX Jo.	1 67

#### W.O. 8838 Sec. L.L' W=70' D=5' Pseudo

IED JANBO METHOD  I of all the failum  - the most critical  1 specified by 9 -surf (tt) (50,30 1705.00 55.04 1702.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.00 60,30 1705.	* <del>*</del>	surfaces examined	Liate points	•		(Fo factor ≈ 1.056)	coordinate points		(Fo factor = 2.057) coordinate points			(Fo factor = 1.061)
### ### ##############################			6 A	y-surf (ft)	1705.00 1702.80 1700.00 1601.20 1747.98 1755.16 1778.73 1779.48	.311 **	, #_ 8	1683 58 1749 30 1752 66 1764 81 1786 99	# 01	y-surf (ft) 1705.00	1702 07 1700 00 1700 00 1745 35 1752 54 1764 12 1786 45	<b>*</b>
	PLIFIED JANBO	of all the m	7	x-surf (ft)	250.90 255.04 260.30 260.30 480.76 493.65 494.64 497.70		2 kg 8	284.98 456.09 457.65 463.32 475.11		x-surf (ft) 249.54	255.06 258.95 288.95 458.36 456.36 473.65	

(95) [ = 40.40 F3	iation - 1		[Fo factor = 1.055] coordinate points		(Fe factor = 1.049) ccord:nate points	(Fo factor = 1,065)	
1710.45 1700.00 1693.98 1752.55 1753.80 1771.15 1793.84	fied by 7	1716.10 1700.00 1697.79 1755.18 1777.26 1784.74	324 ** 539 6 -Surf	(ft) 705.00 684.44 757.53 781.44 783.99 791.99	1.324 ** fied by 8 (ft) y-surf (ft) 1718.94 1706.00 1699.59 1750.28	1763.32 1763.72 1793.72 1.330 **	Y-surf [ft] [711.55 [700.00 [756.94
268.32 297.97 300.89 468.91 469.49 477.59 477.59 485.40 485.40	No. 5 speci x-surf	282.14 312.42 317.16 481.05 491.35 495.32	ORNEU No.	ft) 5.65 9.74 9.73 2.09 2.09	No. 7 speci X-surf (ft) 289.07 324.69 453.88 454.87	471 471 471 JANBU	x-surf (ft) 271.00 292.72 304.11 462.58
** HUWANAWA P	: coffee flure sur Foin	୍ କଥାଅକ୍ତନ୍ତ	** Corrected Failure surface Point	୪ ⊣ <i>ାଧ୍ୟ</i> ତ୍ତ	** Corrected. Failure surface Point No. 2 2 4 4 5	cted	Q.

## GEOLABS-WESTLAKE VILLAGE

## Sec. L-L' W=70' D=5' Pseudo

			(Fo factor = 1.063)
1769,12	1786.21	1794.21	1.330 **
473.03	482,11	482.11	rected JANES FOS =
w	-	В	Corrected
			*

Failure surface No. 9 specified by 6 coordinate points

y-surf	1705.00 1682.87 1754.91 1766.83 1786.62	
(LE)	234,29 281,76 462,32 467,88 478,40	
Point No.	കേവനുകമായ	

Failure surface No.10 specified by 8 coordinate points

(Fo factor = 1.057)

\*\* Corrected JANES FOS = 1.332 \*\*

Y-8ULE (ft)	1705.35 1700.30 1690.52 1747.12	1752.52 1764.02 1786.35 1794.35
x-surf (ft)	255.85 265.93 286.23 453.67	456.18 461.55 473.42 473.42
Point No.	ମର୍ଶ୍ୱ	n w ~ a

The following is a summary of the TBN most critical surfaces

(Fo factor = 1.060)

\*\* Corrected JANBU FOS = 1.336 \*\*

Problem Description : Sec. L-L' W=70' D=5' Pseudo
Modified Correction Initial Terminal Availab

		(15)										
Terminal	x-coord	(£t.)	497.76	475.11	473.65	485.40	495.32	502.09	471.87	482.11	478.40	473.42
Initial	x-coord	[££)	250.90	239.04	249.54	268.32	282.14	235.65	289.07	271.00	234.29	255.85
Correction	Factor		1.056	2.057	1.061	1.056	1.055	1.349	1.065	1.063	1.057	1,060
Modified	JAMBU Pos		1.311	1.338	1.32;	1.323	1.324	1.324	1,330	1.330	1.332	1.336
			i	ĸi	m	4	'n,	Ģ.	ŀ.	ė	ç,	9.

\* \* END OF FILE \* \* \*

1600 1600 1400 1400 Sec. L-L' W=70' D=5' Pseudo 10 most critical surfaces, MINIMUM JANBU FOS = 1.311 Sec. L-L' W=70' D=5' Pseudo 5000 suríaces have been generated for this analysis 1200 1200 600 800 1000 X-AXIS (feet) 600 800 1000 X-AXIS (feet) 400 400 8838UP 11-21-++ 11:31 #838LP 11-21-44 11:31 200 200 (teet) SIXA-Y 줄 ^ ^ (feet) 2IXA-Y 2000 2200 2000 400 2200 1438 1200 1200

Sec. L-L' Backcut

11-21-\*\* 11:34 XSTABL File: 8838LB

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Problem Description : Sec. L-L' Backcut

SECMENT ECONDARY COORDINATES

11 SURFACE boundary segments

Soil Unit Below Segment 1738.0 1735.0 1735.0 1735.0 1730.0 1750.0 1750.0 1750.0 1855.0 130.0 136.0 200.0 255.0 255.1 325.0 430.0 520.0 550.0 y-left (ft) 1708.0 1708.0 1705.0 1705.0 1705.0 1700.0 1770.0 1770.0 1770.0 1775.0 x-left [ft] 130.0 136.0 200.0 255.0 255.1 255.1 255.1 255.0 550.0 650.0

2 SUBSURFACE boundary segments

Soil Unit Below Segment 1705.0 1800.0 y-right x-right 200.0 950.0 (EE) y-left (ft) 1625.0 1750.0 x-left (ft) 0.054 Segment

A CRACKED ZONE HAS BEEN SPECIFIED

(feet) (feet) (pcf) Depth of crack below ground surface = 9.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 62.40 Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTR 3 So	OPIC St	ISOTROPIC Soil Parameters Soil unit(s) specified	eters 				
Soil Unit	Umit Moist (pof)	Unit Reight Loist Sat. Pof) (pof)	Cohesion Intercept (psf)	Friction Angle (deg)	Fore Pressure Parameter Const Ru (psf	essure Constant (psf)	
ଧାର	125.0 130.0 130.0	135.0 140.0 140.0	200.0 200.0 225.0	34.00 40.00 40.00	000	999	
ANISO	TROFIC fied fo	STRENGTH	AMISOTROFIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)	1 10			

Mater Surface No.

000

Number of direction ranges specified = 3

Soil Unit 2 is ANTSOTROPIC

i-value (degrees)	40.00 25.00 40.00
e-value (psf)	200.0 100.0 200.0
Counterplockwise Direction Limit (deg)	17.00 24.00 90.00
Direction Range No.	- 0 E

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of slideng block is 100.0 ft

0.02 Width (ft) 1695.0 1750.0 y-right (ft) x-right (ft) 390.0 530.0 y-left (ft) 1665.0 x-left (ft) 325.0 400.0 ğ é

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JAMES METHOD \* \* \* \* \*

#### W.O. 8838 Sec. L-L' Backcut

1757.04 1779.10 1787.10

503.18 513.47 513.47

9 N W

<u></u>	4		FR			_	-	í	100					**		Fat	•			_	**	- E				· · · · · · · · · · · · · · · · · · ·		Sai		_
of all the failure surfaces examined . the most critical first	fied by 5 coordinate points	y-surf (fc)	1703.17 1699.22	1754.02 1761.25 1769.25	1.479 ** (Fo factoz = 1.035)	specified by 6 coordinate points	y-surf (ft)	1300 00	1699.74	1750.89 1753.76	1760.87 1768.87	1.491 ** (Fo factor = 1.040)	specified by 6 coordinate points	y-surf (ft)	0000	1700.00 1696.33	1757.37	1781.08 1789.08 1789.08	1.496 ** (Fo factor = 1.647)	fied by 6 coordinate points	y-surf	(ft)	1706.43	1702.13 2754.29	1755,66 1771,45 3779,45	1.506 ** (70 factor = 1.047)	5 specified by 6 coordinate points	y-surf (ft)	1704.77 1706.89	0F 32F
tical of all welow - the m	No. 1 speci	x-surf (ft)	331.66	469.94 473.31	JANBU FOS =	No. 2	x-surf (ft)	000	341.23	467.81	472,46	JANEU FOS =	Мо. Э	x-surf (ft)	6	331,66	512.95	524.01 524.01 524.01	JANBU FOS =	surface No. 4 specified by	x-surf	(£¢)	338,51	347.73	496.27	JANEU FOS =		x-surf (ft)	335.01	1 0 0 0
The 10 most critical are displayed below	Failure surface No. 1 specified by	Point No.	2	ਲ ਵਾਲੇ	** Corrected JANBU FOS	Failure surface	Point No.	•	. 2	n) es	in vò	** Corrected	Pailure surface	Point No.	•	<b>⊣</b> ⊘	m =	≠un w	** Corrected	Failure surface	Point	No.	7	ଠା ଦେ	<b>⊽</b> ເກ (v	cted	Failure surface No.	Point No.	C/	1 4

** Corrected	d JANBU FOS =	1.507 **	(Fo factor = 1.050)
Failure surface	No.6 sp	ecified by 6 co	coordinate points
Point No.	x-surf	Y-surf	
	331.02	1702.87	
N OF	483.90	1751.11	
) •	485.73	1755.36	
, rv	492.45	1759.75	
ę	492.45	1777.75	
** Corrected	1 JAKEU POS =	1.507 **	(Fo factor = 1.048)
Failure surface	oe No. 7 specified	ρλ	coordinate points
Point No.	x~surf (ft)	y-sucf (ft)	
	329.00	1701.90	
ON I	336.31	1698,49	
ণ ব্	498.28	1756.57	
. 129.1	507.56	7	
w	507.56	1784.47	
** Corrected	JANBU FOS =	1.509 **	(Fo factor = 1.051)
Failure surface	be No. B specified	5. √G	coordinate points
Point No.	(EE)	y-surf (ft)	
-	378 83	1701 82	
7 (2)	341.17	1696.06	
rð	488.16	1757.69	
งเก	494.14	1770.51	
** Corrected	1 JAMBO ROS =	1,510 **	(Fo factor = 1.039)
Fallure surface	80.08	specified by 5 cm	coordinate points
Point No.	I-surf	y-surf	
		;	
T F	314.04	1700.00	
u m	482.02	1755.78	
TO US	487.52	1767.56 1775.56	
** Corrected	JANEU FOS =	1.512 **	(Fo factor = 1.037)
Failure surface	se No.10 specified	by 6	coordinate points
Point	X-surf	Y-surf	
No.	(££)	(ft)	

## GEOLABS-WESTLAKE VILLAGE

W.O. 8838

Sec. L-L' Backcut

1700,00	1694.22	9	1753.11		1765.24
317.70		459.50			464.29
m	CV	m	٠,	Ľń	19

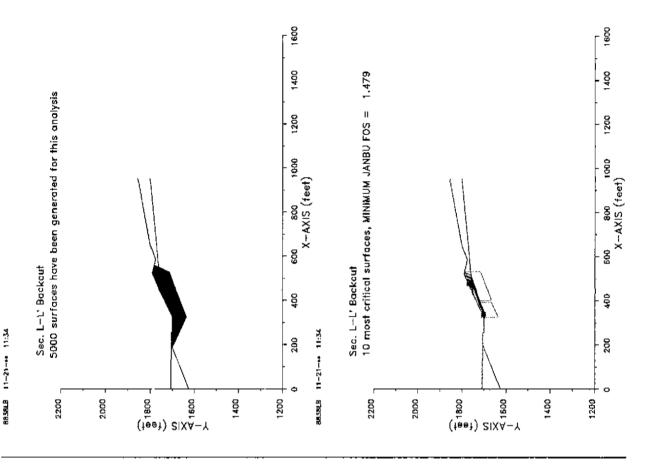
\*\* Corrected JANBU FOS = 1.513 \*\* (Fo factor = 1.040)

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. I-L' Backout

Available Strength (1b)	1.1071+05	1.1812+05	2.4845+05	1.6562+05	2.1452+05	1.6891+05	2.0762+05	1,7685+05	1.7161+05	1.246E+05
Terminal x-coord (ft)	473.31	472.46	524.01	496.27	513.47	492.45	507.56	494.14	487.52	464.29
<pre>initial x-coord (ft)</pre>	331.66	332.76	323.79	338.51	335.01	331.02	329.00	328.82	314.04	317.70
Correction Factor	1.035	1.040	1.047	2,047	1,050	1,348	1.051	1.039	1.037	1.040
Modified JANEU FOS	1.479	1.491	1,496	1.506	1.507	1.507	1.509	1.510	1.512	1.513
	1.	۲,	۳,	÷	14)	ý	۲.	80	ο,	10

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GEOLABS-WESTLAKE VILLAGE

### Sec. M-M' W=60'D=5'

XSTABL File: B836M 11-22-\*\* 12:03

Slope Stability Analysis

Slope Stability Analysis

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Ver. 5.201

Problem Description : Sec. M-M' W=60' D=5'

SECHENT BOUNDARY COORDINATES

11 SURFACE boundary segments

Soil Unit Below Segment	<b>→</b> ¢	<b>.</b> 1	1		en	т	~	ĸ	m	M
y-right (ft)	1667.0	1720.0	1750.0	1805.0	1820.0	1910,0	1955,0	1955,0	1930.0	1860.0
x-right (ft)	215.0	490.0	570.0	735.0	0.008	1250.0	1370.0	1450.0	1540.0	1670.0
y-left (ft)	1665.0	1667.0	1720.0	1750.0	1805.0	1820.0	1910.0	1955.0	1955.0	1930.0
x-left (ft)	6, 210 6, 210	340.0	490.0	570.0	735.0	800.0	1250.0	1370.0	1450.0	1540.0
Segment No.	. 4 0	m	ų	ហ	ø	<b>r</b> ~	æ	o,	10	ננ

6 SUBSURFACE boundary segrents

Soil Unit Below Segment	ଜାପରାର୍ଥ୍ୟ
y-right (ft)	1662.0 1662.0 1662.0 1745.0 1805.0
x-right (ft)	215.0 340.1 400.0 560.0 735.0
y-left (ft)	1585.0 1667.0 1662.0 1662.0 1745.0
x-left (ft)	340.3 340.1 340.1 400.3 550.0
Segment No.	нимапп

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROFIC Soil Parameters

#### 3 Soil unit(s) specified

Water Surface No.	000
Pore Pressure Parameter Constant Ru (psf)	ဝခ်စ်
Pore Pr Parameter Ru	000. 000.
Friction	34.00
Angle	40.00
(deg)	40.00
chesion	200.0
ctercept	200.0
(psf)	225.0
Weight C	135.0
Sat. I	140.0
[pcf]	140.0
Unit 1	125.0
Moist	130.0
(pef)	130.0
Soil Unit No.	แผต

ANISOTROPIC STRUNGTH PARAMETERS specified for 2 Soil Unit(s)

#### Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

1-value (degrees)	40.00 25.00 40.00
c-value (psf)	200.0 100.0 200.0
Counterclockwise Direction Limit (deg)	10,00 15,00 90,00
Direction Range No.	- ୧୯୩

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40,00 25.00 40,00
c-value (psf)	225.0 100.0 225.0
Counterclockwise Direction Limit (deg)	5.00 10.00 90.00
Direction Range No.	–ା ଅଟ

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

The active and passive portions of the sliding surfaces are generated according to the Fankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is  $-100.0\ {\rm fr}$ 

GEOLABS-WESTLAKE VILLAGE

#### W.O. 8838 Sec. M-M' W=60'D=5'

Width (ft)	70.0 90.0			peul	7.							- 1.045}	<b>8</b> 1							= 1.052]	ă						= 1.041)	ký.	
y-right (ft)	1670.0 1760.0	the :	*	surfaces examined first	coordinate points							(Fo factor	ooordinate point							(Fo factor	poordinate point						(Fo factor	coordinate points	
x-zight (ft)	480.0 850.0	calculated by	* *	e failure critical	t Ka	y-surf (ft)	1673.27	1662.00	1754.48	1762.58	1807.77	1,867 **	۴	y-surf (ft)	;	1674,03	1659.71	1743.32	1797.84 1805.84	1.884 **	φ	y-suzf (ft)	1674.97	1662.25 1767-92	1768.51	1813.59 1821.59	1.886 **	φ	y-surf (ft)
Y-ieft (ft)	1620.0	safety have been c	SINFLIZIEJ JANBU MSTROD	l of all - the mo	No. 1 specified	x-surf (ft)		378.93			747.00	JANEU FOS =	No. 2 specified by	x-surf (ft)	;				738.65 738.65	ZANBU FOS =	No. 3 specified by	x-surf (ft)		386,50 785,60		807,89 807.89	JANBO FOS =	lo. 4 specified by	x-surf (ft)
x-left (ft)	340.0 500.0	of	*	10 most critical displayed below	surface	Point No.	1	OI (	শ ক	<b>ω</b> '	<b>0</b> ~	Corrected JA	surface	Point No.	,	7 7	m	ey kn	ውሎ	Corrected JA	surface	Point No.	e¶ (	N M	1 47	uν	Corrected JA	re surface No.	Point No.
Вох ло.	7 7	Factors	*	The :	Failure							‡	Failuse							;	Failure						<b>#</b>	Failure	

(Fo factor = 1.644)	ordinate points	(Fo factor = 1.049) coordinate points	(Po factor = 1.046)	(Fo factor = 1.046) coordinate points
1678.02 1668.57 1758.86 1763.64 1802.28 1810.28	fied by 6 coo. Y-surf (ft) 1667.00 1649.55 1737.94 1739.96 1788.58	OS = 1.896 **  specified by 6 000  rf Y-8urf  1 (ft)  26 1681.58  97 1672.56  94 1750.25  56 1789.15  46 1799.15	397 *** by 7 - 58urf (ftt) 73.44 58.20 58.40 58.20 58.10 11.72	1.898 **  fied by 7.  y-surf (ft)  1677.15  1662.05  1662.27  1759.68  1912.92  1820.92
371.18 388.95 737.64 739.87 757.89 757.89	Mo. 5 spect x-surf (ft) 315.88 353.30 686.13 686.13 696.74	7. No. 6  1. No. 6  1. No. 6  1. No. 6  1. No. 6  1. No. 6  1. No. 6  1. No. 6  1. No. 6  1. No. 6  1. No. 6  1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. No. 1. N	JANEY FOS = 1.4  2 No. 7 specified  X-surf Y  (ft)  358.23 16 391.77 16 739.6 10 778.24 177 778.24 178 799.81 188	MANDO FOS = NO. 8 speci x-surf (ft) 368.73 397.23 398.81 779.79 783.75 804.61 804.61
Corrected	Failure surface Soint No. 1 2 3 3 4 6	** Corrected . Fallure surface No. No. 1	** Corrected Pailure Surface Point No. 1 2 2 3 4 5 5 6	** Corrected Failure surface No. 1 2 3 3 4 4 5 5

Sec. M-M' W=60'D=5' W.O. 8838

 $(Fo\ factor = 1.046)$ \*\* Corrected DawsD FOS = 1.904 \*\*

Failure surface No. 9 specified by 6 coordinate points

y-swrf (ft)	1667.30 1650.42 1733.57 1758.69 1787.12
x-surf (ft)	320.11 355.68 680.39 692.10 705.36
Point No.	⊶ 61 પ 4 વ વ

\*\* Corrected JANBU FOS = 1.912 \*\*

(Fo factor = 1.051)

Failure surface No.10 specified by 7 coordinate points

y-surf (ft)	1669.44 1662.00 1655.43 1734.08 1759.82 1791.24
x-surf (ft)	346.91 360.90 374.99 691.07 703.08 717.73
Point No.	човенос

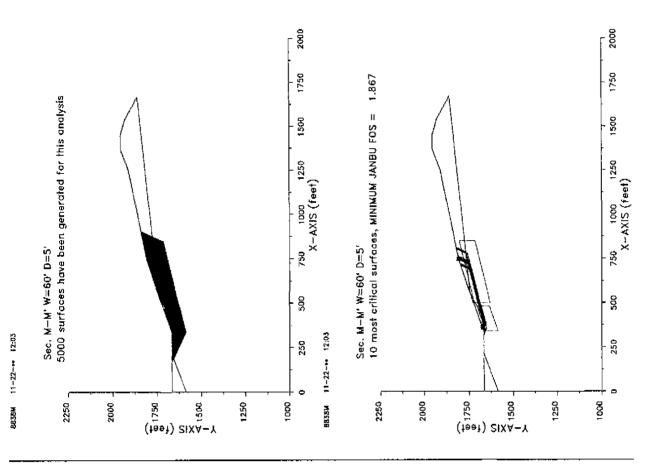
(Fo factor = 1.054) \*\* Corrected JANES FOS = 1.914 \*\*

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. M-M' W=60' D=5'

Available	Strength	(15)	8.6161+05	9.7312+05	1,0792+06	8,147E+05	9,120E+05	6.304E+05	1.2341-06	1.1905+06	9.222E+05	9.568£+05
Terminal	proop-x	(£¢)	747.00	738.65	867,89	757.89	769,74	711.46	198-81	804.61	705.36	717.73
Initial	x-000rd	(ft)	357.74	359.89	362.57	371.18	315.88	381.26	358.23	368.73	TL'CZE	346.92
Correction	Factor		1.045	1.052	1.041	1.044	1.049	1.046	1.046	1.046	1.051	1.054
Modified	JANSU FOS		1.867	1.884	1,886	1,891	1.896	1.897	1.898	1.904	1.912	1.914
	•		1	κ,	m	Ť	'n	9	ŗ.	a,	oí	10.

\* \* END CF FILE \* \* \*



Sec. M-M' Pseudostatic

XSTASL File: BB38MP 11-22-\*\* 12:03

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Problem Description ; Sec. M-K' W=63' D=5' Pseudo

SECMENT BOUNDARY COCADINATES

Soil Uni: Below Segment 1667.0 11657.0 11720.0 11720.0 11820.0 11820.0 11910.0 11955.0 11955.0 11955.0 11955.0 y-right 215.0 340.0 490.0 570.0 735.0 800.0 11250.0 1370.0 1670.0 x-right 11 SURFACE boundary segments y-left (f:) 1665.0 1667.0 11667.0 1720.0 1750.0 1805.0 1910.0 1910.0 1955.0 x-left (ft) 215.0 340.0 490.0 570.0 735.0 800.0 1250.0 1370.0 1450.0

6 SUBSURZACE boundary segments

Soil Unit 1667.0 1662.0 1662.0 1745.0 1805.0 y-right 215.0 340.1 400.0 560.0 735.0 x-right (£.E.) y-left (ft) 1585.0 1667.0 1662.0 1662.0 1745.0 x-left (ft) .0 340.0 340.1 400.0 560.0 ģ

A CRACKED ZONE HAS BEEN SPECIFIED

(feet) (feet) (pof) Depth of crack below ground surface = 8.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 62.40 Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

		mssure Constant (psf) .0 .0
		Pore Pressure Parameter Const. Ru (psf
		Angle (deg) 34.00 40.00 40.00
ters	fied	Cohesion Intercept (psf) 200.0 225.0
ISOTROPIC Soil Parameters	3 Soil unit(s) specified	Jnit Weight Sat. (pcf) (pcf) (pcf) 125.0 135.0 130.0 140.0 130.0 140.0
DPIC SO	il unit	Unit Moist (pcf) 125.0 130.0
ISOIR	3 \$0	Soil Unit No. 1

Water Surface No.

000

ANISOTROPIC STRENGTH PARAMETERS specified for 2 soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 25.00 40.00
o-value (psf)	200.0 100.0 200.0
Counterclockwise Direction Limit (deg)	10.00 15.00 90.00
Direction Range No.	୮୯୩

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 25.00 40.00
c~value (psf)	225.0 100.0 225.0
CounterclockWise Direction Limit (deg)	5,00 10,00 90.00
Direction Range No.	H 63 E

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical fallure surface searching nethod, using a random technique for generating sliding ELOCK surfaces, has been specified.

the active and passive portions of the sliding surfaces are generated according to the Rankine theory.

## GEOLABS-WESTLAKE VILLAGE

### Sec. M-M' Pseudostatic

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

 Box
 x-left
 y-left
 x-right
 y-right
 width

 no.
 (ft)
 (ft)
 (ft)
 (ft)
 (ft)

 1
 340.0
 1520.0
 480.0
 1670.0
 70.0

 2
 500.0
 1675.0
 850.0
 1760.0
 90.0

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANBU METHOD \* \* \* \* \*

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

Failure surface No. 1 specified by 6 coordinate points

Point x-surf y-surf No. (ft) [ft] [ft] 2 362.57 1674.97 2 386.50 1662.25 3 786.60 1767.92 4 786.87 1768.51 5 807.89 181.58 6

\*\* Corrected JANEU FOS = 1.213 \*\* (Fo factor = 1.041)

Failure surface No. 2 specified by 7 coordinate points

Point x-surf y-surf No. (ft) [ft] 1 357.74 1673.27 2 379.59 1662.00 3 379.58 1667.0 4 725.88 1754.48 5 7729.65 1752.58 6 747.00 1807.77 \*\* Corrected JAMBU FGS = 1.219 \*\* (Fc factor = 1.045)

Failure surface No. 3 specified by 6 coordinats points

Point x-curf y-surf No. (ft) (ft) 1 371.18 1678.02 2 388.95 1668.57 3 737.64 1788.86 4 739.87 1783.64 5 757.89 1800.28 6 757.89 1800.28

(Fo factor = 1.044)	Failure surface No. 4 specified by 7 coordinate points			(Fo factor = 1.045)
;	r-	4	W C F 60 60 K K	
1.226	ξ	y-surf (f:)	1677.15 1662.00 1661.27 1759.68 1768.18 1812.92	1.226
	3	>-	167 166 166 175 175 181	1.2
lı	ğ			n
50	<b>2</b> 4	t ir	56644666	
2		x—suzf (ft)	368.73 397.23 398.85 779.79 783.75 804.65	8
2	<u>2</u>			P.
Corrected JANBU FCS =	fac	щ		Corrected JAMBU FOS
O A	312	Point No.	→ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	oai:
ő	ure	•••		Ë
<b>‡</b>	Fail			#

Failure surface No. 5 specified by 6 coordinate points

Point x-surf y-surf No. [ft] [ft] 1 361.09 1464.45 2 378.93 1664.97 3 781.95 1768.02 4 782.23 1768.02 5 803.01 1820.60 Failure surface No. 6 specified by 7 coordinate points

(Fo factor = 1.041)

1.226 ++

\*\* Corrected JANBU 705 =

 Point
 x-surf
 y-surf

 No.
 (ft)
 (ft)

 1
 342.95
 1668.04

 2
 343.25
 1668.04

 3
 364.32
 1657.37

 4
 814.59
 1770.17

 5
 815.18
 1771.44

 6
 837.50
 1827.52

 7
 837.50
 1827.52

\*\* Corrected JAMBU FOS = 1.227 \*\* (Fo factor = 1,040)

failure surface No. 7 specified by 7 coordinate points

Point x-surf y-surf No. (ft) (ft) 1 342.56 1667.90 2 353.67 1662.00 3 371.85 1653.35 4 807.67 1753.38 5 8011.24 1771.33 6 833.47 1816.59 7 933.47 1826.69

\*\* Corrected JANES FOS = 1.229 \*\* (Fo factor = 1.043)

Failure surface No. 8 specified by ? coordinate points

Point x-surf y-surf No. (ft) (fc)

## GEOLABS-WESTLAKE VILLAGE

Sec. M-M' Pseudostatic

1673.44			1758.22			1819.72
358.23			773.86			
-	٨	۳	7	u)	Ģ	۲-

\*\* Corrected JANEW FOS = 1.232 \*\* (70 factor = 1.046)

Failure surface No. 9 specified by 7 coordinate points

y-surf (ft)	1674,03 1662,00 1659,71 1743,32 1761,77 1797,84	
x-surf (ft)	359.89 382.51 389.55 713.23 721.83 738.55	
Point No.	ተልጠታካልዮ	

Failure surface No.10 specified by 6 coordinate points

\*\* Corrected JAMBU FOS = 1.235

(Fo factor = 1.052)

y-surf (ft)	1667.51 1662.00 1653.79 1775.03 1821.31	
x-surf (ft)	341.46 351.83 369.44 824.98 845.56	
Point No.	የመ ቀ ላ ላ	

The following is a summary of the TRN most exitical surfaces

(Fo factor = 1.037)

#

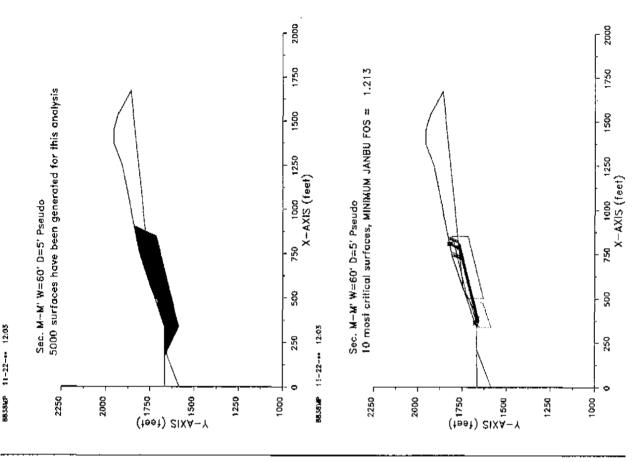
\*\* Corrected JANBU FOS = 1.235

Problem Description : Sec. M-M' W=60' D=5' Pseudo

Available Strength (1b)	1.032E+06 8.232E+05 7.772E+05 1.141E+06 9.596E+06 1.20E+06 1.39E+06 1.33E+06 1.33E+06	
Terminal x-coord (f:)	807 89 747 00 757 89 804 51 803 50 833 47 799 81 738 65	
Initial x-coord (ft)	362.57 357.74 357.74 368.73 361.09 362.95 359.95 359.23	, , ,
Correction Factor	1,041 1,045 1,046 1,040 1,040 1,040 1,043 1,043	1
Modified JANBU FOS	1,213 1,226 1,226 1,226 1,226 1,227 1,232 1,235 1,235	1
٠	世代·安安 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	

GEOLABS-WESTLAKE VILLAGE

\* \* \* 2012 6F 2712 \* \* \*



Sec. M-M' Backcut

XSTABL File: B838MB

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Problem Description : Sec. M-M' Backcut

SECRENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Eelow Segment
	•	0 3337		-	•
4	?	0.0001	C.53.	1301.0	-
7	215.0	1667.0	340.0	1667.0	2
m	340.0	1667.0	340,1	1662.0	7
ঘ	340.1	1662.0	400.0	1662.0	8
'n	400.0	1662.0	0.095	1745.0	2
و	560.0	1745.0	735.0	1805.0	m
<b>[~</b>	735.0	1805.0	800.0	1820.0	m
\$0	900,0	1920.0	1250.0	1910.0	M
an.	1250.0	1910.0	1370.0	1955.0	m
01	1370.0	1955.0	1450.0	1955,0	m
11	1450.0	1955.0	1540.0	1930.0	m
12	1540.0	1930.0	1670.0	1860.0	۳

	Soil Unit Below Segment	ପପ	
	y-right [ft]	1667.0 1860.0	
ments	x-right (ft)	215.0 1670.0	
2 SUBSURFACE boundary segments	y-left (ft)	1585.0	
SURFACE '>	x-left (ft)	556.0	
ECS S	Segment No.	4 6	

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 62.40

Pailure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters	3 Soil unit(s) specified

Water Surface No.	900
essure Constant (psf)	o' o' o'
Parameter Constant Ru (psf)	000.
Friction	34.00
Pangle	40.00
[deg]	40.00
Cohesion	200.0
Intercept	200.0
(paf)	225.0
Weight C	135,0
Sat. I	140,0
[pcf]	140,0
Unit	125.0
Moist	130.0
(pof)	130.0
Sail Unit No.	-1 64 W

ANISOTROPIC STRENGTH PARAMETERS specified for 2 Soil Unit(s)

Soil Unit 2 is AMISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 25.00 40.00
c-value (psf)	200.0 100.0 200.0
Counterclockwise Direction Limit (deg)	10.00 15.00 90.00
Direction Range No.	3.62

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified  $\approx$  3

i-value (degrees)	40.00 25.00 40.00
c-value (psf)	225.0 100.0 225.0
Counterclockwise Direction Limit (deg)	5.00 10.00 90.00
Direction Range No.	паю

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

x-right y-right y-left x-left

Box

Width

	_
	۵
8838	
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>	
-	-0

\*\* Corrected JANBU FOS = 1.654 \*\* (Fo factor = 1.066)

1771.65

537.72

Pailure surface No. 5 specified by 6 coordinate points

(ft)	70.0								Ĩ.					65)							(23)
(ft) (1	1655.0 70 0.007(	the :	* * *	surfaces examined first	coordinate points				(Po Cactor = 1.007) coordinate points					(Fo Factor = 1.065)	coordinate points						(Fo factor = 1.067)
(£F)	480.0 850.0	alculated by	•	of all the failure : the most critical	9	Y-surf (ft)	1669.79 1665.54 1710.87 1750.98	1757,88 1765.88		y-surf (ft)	1662.00 1657.18	1710.31 752.71	1764.51 1772.51	1.631 **	w	y-surf (ft)	1662.06	1709.89	1753.31	1766,63 1774,63	1,639 **
(ft)	1620.0 1670.0	safety have been calculated by	SIMPLIFIED JANBU MITHOD	٠,	o. 1 specified by	x-surf (ft)	415.01 424.13 598.98 617.63	620.90 620.90	NEU FOS = 1.530 lo. 2 specified by	(tr)	395.72 406.06	615.20	640.52 640.52	≈ SOJ DEN	lo. 3 specified by	x-serf (בֹּד)	400.11	619.95	540.20	546.41 546.41	WBU FCS =
(tt)	400.0 500.0	Factors of safety	*	The 10 most critical are displayed below	Failure surface No.	Point No.	H 52 ES 4	ın vo	** Corrected JANBU FOS Failure sunface No. 2 sp	Point No.	F1 63	w æ	ν, va	Corrected JAMBU FOS	Failure surface No.	Point No.		νM	7	നയ	Corrected JANBU FCS
-06	7 7	Facto	*	The 1 are d	Failu				Failu					*	Fail:						#

	[Fo factor = 1.064]		(Fo factor = 1.062) coordinate points	Fo factor = 1.063      coordinate points		(Fo factor = 1.077) coozdinate points
y-surf (ft) 1568.16 1661.85 1720.14 1755.95 1776.14 1784.14	0S = 1.662 ** specified by 6 co	Y-surf (ft) 1664.18 1657.57 1727.16 1759.68 1790.50	1.668 ** ified by 6 y-surf (ft)	1665.29 1656.41 1726.74 1760.22 1792.52 1800.52 1,582 **	Y-surf (ft) 664.06 654.48 690.66 747.04	1.686 **  'fied by 6  y-surf  (ft)
X-surf (ft) 411.88 425.42 644.69 674.15 674.15	MANBU F	x-surf (ft) 404.20 418.36 686.51 701.68 716.05	DANNED 3 No. 7 X-Su (ft	406, 425. 691. 706. 721. 721. JANEU F	x-surf (ft) 403.97 424.50 563.00 589.29 589.29	LANBU F E No. 9 X-su (ft
700 X No. 1 100 H W W W W W W W W W W W W W W W W W W	** Corrected .	Point No. 2 2 2 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	** Corrected. Failure surface Point No.	1 2 2 5 6 6 6 6 6 ** Corrected	Point No. 1	** Corrected . Failute surface Foint No.

## GEOLABS-WESTLAKE VILLAGE

1673.39 1667.87 1715.79 1752.51 1763.65

421.96 433.81 625.40 632.53 637.72

Point No. 1 2 2 3

y-susf (ft)

x-surf (ft) 403.33 1663.73

W.O. 8838

Sec. M-M' Backcut

1659,35	1723.80	1758,72	1786.86	1794.86	
412.70	676.02	692.30	705.43	705.43	
C)	en	₹	ń	ŵ	

(50 factor = 1.063)

\*\* Corrected JANEST FOS = 1.687 \*\*

Failure surface No.10 specified by 5 coordinate points

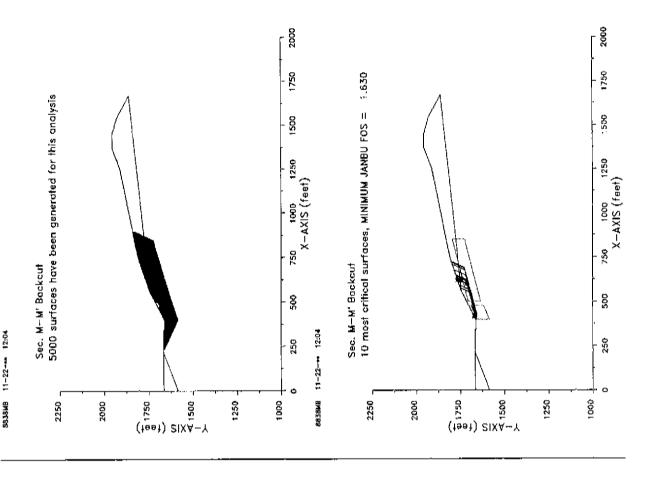
						(Fo factor = $1.079$ )
y-surf (ft)	1664.40	1659.79	1686.59	1741.64	1749.64	1,688 **
x-surf (ft)	404.63	414.52	547.85	573.52	573.52	Corrected JANBU FOS =
Point No.	1	2	ጣ	7	υĵ	Corrected.
						*

The following is a summary of the TBN most critical surfaces

Problem Description : Sec. M-M' Backcut

Available Strength (1b)	4.166E+05	5.989£+05	4.635£+05	6,4752+05	8,532E+05	9.235E+05	4.54BE+05	7.9048+03	3.640E+0\$
Terminal x-coord (ft)	620.90	646,41	637.72	674.15	716.05	721.94	589.29	705.43	573,52
Initial x-coord (ft)	415.03	400.11	421.96	411.88	404.20	406.33	403.97	403,33	404.63
Correction Factor	:.067	3.067	3.065	1.064	1.062	1.063	1.077	1.063	1.079
Modified JANED FOS	1.630	1.639	654	1.662	1.668	1.682	1.686	1.687	1.686
	۲, د	i m	ý	'n	9	ج.	₩.	ó	10.

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GEOLABS-WESTLAKE VILLAGE

W.O. 8838 Sec. N-N XSTABL File: 8838N 11-20-\*\* 14:49

X S T A B L

Slope Stabillry Analysis

using the

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Ver. 5.201

96 A 1545

Problem Description : Sec. N-N' M=80' D=5'/M=50' D=5'

SEGMENT BOUNDARY COORDINATES

11 SURFACE boundary segments

Segment x-left Y-left x-right y-right Soil Unit
No. (ft) (ft) (ft) (ft) Below Segment

1 .0 1625.0 160.0 1755.0 2

2 160.0 1255.0 370.0 1710.0 2

3 370.0 1710.0 390.0 1710.0 2

5 770.0 1838.0 770.0 1843.0 2

6 770.0 1846.0 975.0 1900.0 1

7 975.0 1860.0 1150.0 1858.0 1

110 1170.0 1858.0 1170.0 1858.0 1

111 1190.0 1858.0 1190.0 1

112 1190.0 1860.0 1190.0 1

113 1190.0 1860.0 1215.0 380.0 1

114 1190.0 1860.0 1215.0 380.0 1

115 1190.0 1860.0 1215.0 380.0 1

115 1190.0 1860.0 1215.0 380.0 1

SUBSURFACE boundary segments

Soil Unit Salow Segment	I*	ı m	æ	ស		1	m
y-right (ft)	1620.0	1705.0	1705.0	1755.0	1815.0	1840.0	1840.0
x-right ) (ft)	160.1	390.0	440.0	540.0	670.0	770.0	1390.0
y-left (ft)	1625.0	1620.0	1705.0	1705.0	1755.0	1815.0	1755,0
x-left (f:)	160.0	240.0	390.0	440.0	540.0	670.0	540.0
Segment No.	٦ ٨	ነጣ	4	9	9	1	æ

A CRACKED 20NE HAS BEEN SPECIFIED

Depth of crack below ground surface = 0.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pof)

Pailure surfaces will have a vertical side equal to the

specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTECPIC Soil Parameters

3 Soil unit(s) specified

Water Surface No.	000
essure Constant (psf)	666
n Pore Pressure Parameter Constant Ru (psf)	000
Friction Angle (deg)	40.00 34.00
Cohesion Intercept (psf)	225.0 200.0 200.0
Unit Weight Moist Sat. (pcf) (pcf)	140.0 135.0 140.0
Unit Moist (pcf)	130.0 125.0 130.0
Soil Unit No.	<b>⊣</b> 01 €

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

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 1C points equally spaced along the ground surface between  $\kappa=-155.0$  ft and  $\kappa=-165.0$  ft

Each surface terminates between x = 700.0 ft and x = 1080.0 ft Unless further limitations were imposed, the minimum elevation at which a surface extends is y = 0 ft

\* \* \* \* \* DEFAULT SEGMENT LENGTH SELECTED BY MSTABL \* \* \* \* \*

24.0 ft line segments define each trial failure surface.

AMEJIAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees Upper angular limit := (slope angle - 5.0) degrees

Rectors of safety have been malculated by the :

\* \* \* \* \* SIMPLIPIED BISHOP METHOD

The most critical circular failure surface

W.O. 8838 Sec. N-N'

is specified by 24 coordinate points

Y-suzf (ft)	1625.22 1631.40 1654.38 1658.20 1658.20 1668.43 1672.86 1688.33 1773.63 1773.63 1773.63 1773.63 1773.63 1773.63 1778.94 1778.94 1778.94 1778.94 1778.94 1778.94 1778.94 1778.94 1778.94 1778.94 1778.94	
x-surf (ft)	160.56 229.96 229.96 229.96 275.97 275.97 275.97 275.97 289.68 473.06 475.06 475.06 567.75 567.75 567.75 611.42 633.11	!
Point No.	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	i

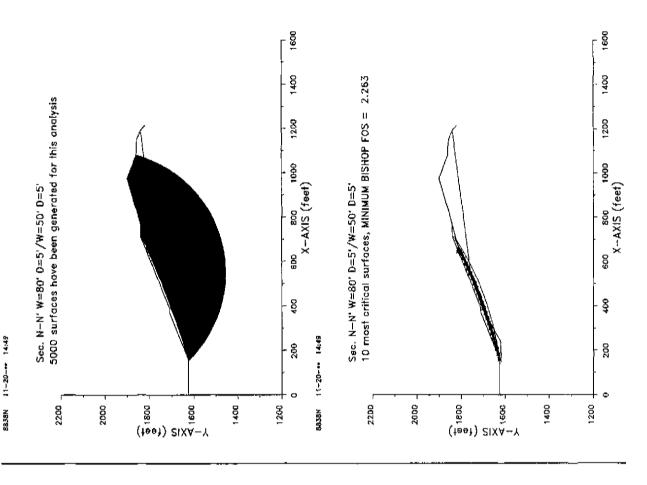
\*\*\*\* Simplified BISHOP FCS = 2.263 \*\*\*\*

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. N-N' W=80' D=5'/W=50' D=5'

Resisting Moment (ft-1b)	1.6348+09 1.5386+09 1.5918+09 1.9098+09 2.466+09 1.6946+09 1.6946+09 1.6216+09 2.0186+09	
Terminal x-coord (ft)	644.82 626.93 660.82 652.38 640.33 701.18 654.76 654.76	1
Initial 7 x-coord (ft)	160.55 163.89 152.78 150.56 163.89 161.67 163.00 163.00 163.00	
Radius (ft)	2644.75 2863.88 3722.24 4212.66 4116.59 2532.87 2076.80 1987.02	
Circle Center coord y-coord (ft) (ft)	4183.95 4389.77 5200.47 5659.96 5569.72 4085.17 3649.48 3655.27 3655.27	
Circle X-coord (ft)	-508.49 -588.84 -876.05 -2018.43 -444.99 -272.55 -272.55	1
FOS (31SEOP)	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
	သံလံက်နော်တ်လ်လ်ထော်တ်ဋ	,

\* \* \* END 05 FILS \* \* \*



Sec. N-N' Pseudo.

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Problem Description : Sec. N-N' WeBO' D=5'/N=50' D=5' Pse

SECMENT BOUNDARY COORDINATES

11 SURFACE boundary segments

Soil Unit Below Segment y-right (ft) 25.0 2710.0 1710.0 1838.0 1838.0 1850.0 1850.0 1850.0 1850.0 1820.0 160.0 370.0 390.0 770.0 975.0 11080.0 1170.0 11190.0 1838.0 1840.0 1900.0 1860.0 1858.0 1850.0 1625.0 1625.0 1710.0 1710.0 (££) .0 160.0 370.0 390.0 710.0 770.0 975.0 1150.0 x-left (E) š

y-right x-right 6 SUBSURFACE boundary segments y-left (ft) x-left Segment No.

Below Segment Soil Unit 1620.0 1705.0 1705.0 1755.0 1755.0 1815.0 (Et) 160.1 240.0 390.0 440.0 540.0 770.0 1625.0 1620.0 1620.0 1705.0 1705.0 1755.0 1815.0 160.0 160.1 240.0 390.0 440.0 540.0 540.0 

A CRACKED ZOME HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00
Maximum depth of water in crack = .00
Unit weight of water in crack = 62.40

Sailure surfaces will have a vertical side equal to the

specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

	essure Constant [psf)	र् न न
	riction Pore Pressure Angle Parameter Constant (deg] Ru [psf]	000
	Friction Angle (degl	40,00 34.00 40.30
eters 	Cohesion Intercept (psf)	225.0 200.0 200.0
ISOTROPIC Soil Parameters Soil unit(s) specified	Soil Onit Weight Unit Moist Sat. No. (pcf) (pcf)	140.0 135.0 140.0
OPIC So	Unit Moist (pcf)	130.0 125.0 130.0
ISOTR 3 So.	Soil Unit No.	ተላይ

Water Surface No.

000

A horizontal earthquake loading coefficient .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

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

5000 trial surfaces will be generated and analyzed

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between  $x=-155.0 \ {\rm ft}$  and  $x=-165.0 \ {\rm ft}$ 

700.0 ft 1080.0 ft \* \* Each surface terminates between Unless further limitations were imposed, the minimum elevation at which a surface extends is  $\gamma = -$  .0 ft

\* \* \* \* \* DEFAULT SEGMENT LENGTH SELECTED BY XSTABL \* \* \* \* \*

24.0 ft line segments define each trial failure surface.

ANGLIAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

\* \* \* \* \* SEMPLIFIED BISHOP METHOD \* \* \* \*

The most critical circular failure surface is specified by 24 coordinate points

y-surf (ft)		1748.94 1758.41 1768.07 1771.94 1798.00 1798.26 1803.93
x-surf (ft)		523.73 545.78 567.75 511.42 633.11 644.82
Point No.	11 0 0 4 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1	17 18 20 21 23 24

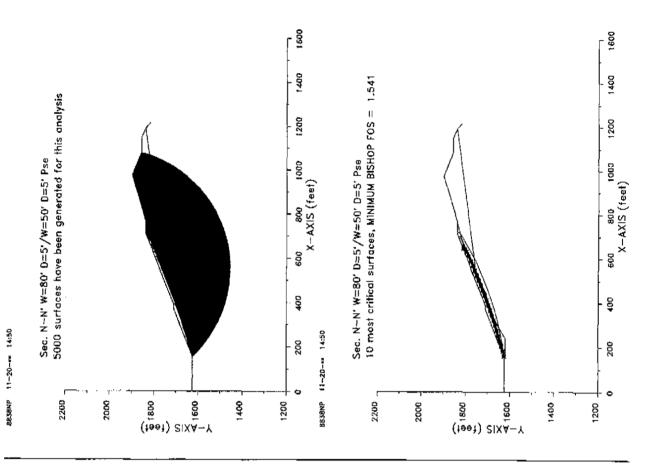
\*\*\*\* Simplified BISHOP FOS = 1.541 \*\*\*\*

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. N-N' ReSO' D=5'/N=50' D=5' Pse

Resisting Moment (ft-1b)	1.5568+09 1.4688+09 1.9028+09 1.9578+09 1.6125+09 2.0402+09 1.5412+09 1.5412+09 1.9162+09
Initial Terminal x-coord (ft) (ft)	644.82 626.93 660.82 652.38 640.33 657.96 701.18 654.76
Initial Tar-	160.56 163.89 162.78 160.56 163.89 161.67 163.89 165.00 162.78
Radius (ft)	2644.75 2863.88 3722.24 4272.66 4116.59 2075.80 2532.87 1987.02 2055.10
Center y-coord (ft)	4183,95 4389,77 5200,47 5659,96 5569,72 3649,48 4085,17 3665,27 3655,27 3650,00
Circle Center x-coord y-coord (ft) (ft)	-508.49 -588.84 -876.05 -1018.43 -304.50 -41.99 -272.55 -280.74
POS (81580P)	1.541 1.565 1.596 1.596 1.606 1.606 1.603 1.618
	4 5 6 6 6 6 6 6 6 6

\* \* END OF FILE \* \* \*



### Sec. N-N. Backcut

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Problem Description : Sec. N-N' Backout

SECMENT BOUNDARY COORDINATES

## 13 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
п	٩.	1625.0	160.0	1625.0	
2	160.0	1625.0	160.1	1620.0	1
m	160.1	1620.0	240.0	1620.0	7
7	240.0	1620.0	390.0	1705.0	-
ın	390.0	1705.0	440.0	1705.0	-
w	440.0	1705.0	540.0	1755.0	7
۲-	540.0	1755.0	670.0	1820.0	-
œ	670.0	1820.0	770.0	1840.0	-
0	770.0	1840.0	975.0	0.0021	7
10	975.0	1900.0	1150.0	1858.0	-1
11	1150.0	1858.0	1170.0	1850.0	-
12	1170.0	1850.0	1190.0	1840.0	1
13	1190.0	1840.0	1215.0	1820.0	EŤ.

## : SUBSURFACE boundary segments

Soil Unit Balcy Segment	m
y-right (ft)	1640.0
x-right (ft)	1190.0
y-left (ft)	1755.0
x-left (ft)	540.0
Segment No.	п

# A CRACKED ZONE EAS BEEN SPECIFIED

(feet)	(feet)	(bcf)
9.30	00. =	62.40
Depth of crack below ground surface	r in crack	in crack
of crack below	Maximum depth of water in crack	Unit weight of water in
Depth	Maxim	Onit w

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

		Pore Pressur
		Priction
seters	:ified	Cohesion Friction
ISOTROPIC Soil Parameters	3 Soil unit(s) specified	Unit Weight
ISOTRO	3 Soi	Soil

Argle Parameter Constant Surface (deg) Ru (psf) No. 000 9 9 8 40.00 34.00 40.00 225.0 200.0 200.0 140,0 135.0 140.0 130.0 125.0 130.0 Moist (pcf) Unit 1 No.

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

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between  $x=240.0~{\rm ft}$  and  $x=240.0~{\rm ft}$ 

600,0 ft 1080.0 ft Each surface terminates between x = a

Unless further limitations were imposed, the minimum elevation at which a surface extends is  $\gamma=-0.0\,{\rm ft}$ 

26.0 ft line segments define each trial failura surface.

### ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees Upper angular limit := (slope angle = 5.0) degrees

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP METHOD

The most critical circular failure surface is specified by 22 coordinate points

y-surf (ft) x-suzf (ff) Point No

W.O. 8838 Sec. N-N' Backcut

1625.00	1624.97	1630,55	1636.73	1643.50	1650.87	1658.84	1667.38	1676.51	1686.22	1696.49	1707.33	1718.73	1730.68	1743.18	1756.21	1769.78	1783.87	1798.47	1813.58	1316.87	1824.87
240.00	265.52	290.92	316.17	341,27	356.20	390.96	415.51	439.86	463.98	487.86	511.49	534,86	557.95	580.75	603.25	625.43	647.28	668.79	689,95	694,33	694.33
	23	m	*7	w	ø	<b>C</b>	80	ø,	10	11	12	13	14	15	16	17	18	19	50	21	22

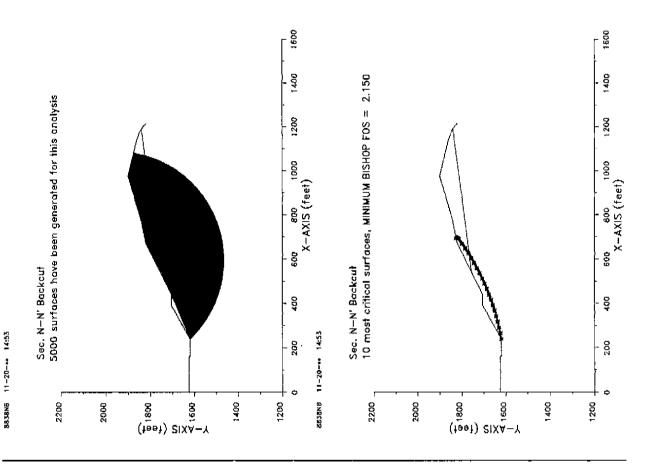
\*\*\*\* Simplified BISHOP FOS = 2.150 \*\*\*\*

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. N-N' Backcut

Resisting Moment (ft-1b)	1.5578+09	1.539E+09	1.5846+09	1,6726+09	1.5048+09	1.567E+09	1.408E+09	1.5228+09	1.3916+09	1.6732+09
Terminal x-coord (ft)	694.33	633.04	694.88			693.41			684,22	
Initial x-coord (ft)		240.00						240.00	240.00	240.00
Radius (ft)	1094.16	1092,64	1139.25	1116.15	1090,43	1148.57	1007.44	942,41	1004,72	1015.40
Canter y-coord (ft)				2719.46	2692.18	2747.47	2613.11			
S Circle Center OP) x-coord y-coord (ft) (ft)	43,56	42.87	25.69	42.03	41.32	20.36	70.66	107.61	70.59	86,23
FOS (BISHOP)	2,150	2.151	2.151	2.151	2.251	2.151	2,153	2,153	2.153	2,153
	4	5	ë	ý	'n	9	۲,	æ	ó	10

\* \* \* END OF FILE \* \* \*



GEOLABS-WESTLAKE VILLAGE

#### W.O. 8838 Sec. P-P'

XSEABL File: 8838P 11-20-\*\* 15:10

x S T A B I

Slope Stability Analysis
wing the
Method of Slices
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Yer, 5.201

Problem Description : Sec. P-P' H=80'D=5'/R=50' D=5'

## SECRENT SCUNDARY COORDINATES

## 14 STRFACE boundary segments

Segment	x-left	y-left	x-right	<u>γ-right</u>	Soil Unit
KO.	£	(ft)	(ft)	(££)	Below Segment
1	o,	1650.0	100.0	1630.0	1
74	100.0	1600.0	205.0	1600.0	
m	205.0	1.50C.D	435.0	1695.0	67
7	435.0	1695.0	455.0	1695.0	EN
U)	455.0	1695.C	680.0	1795.0	2
ç	680.0	1795.0	700.0	1795.0	41
۲	700.0	1795.0	840.0	1843.0	m
w	940.0	1843.0	990.0	0.0061	m
œ	990.0	2,000,0	1092.0	1920.0	m
07	1092.0	1920.0	1150.0	1915.0	м
11	1150.0	1915.0	1228.0	1380.0	e
12	1228.0	1880.0	1310.0	0.0061	M
13	1310.0	1905.0	1358.0	1900.0	m
14	1358.0	1900.0	1415.0	0.0161	ო

## 7 SUBSURFACE boundary segments

Soal Unit Below Segment	444484 44484	
y-right (ft)	1595.0 1595.0 1690.0 1690.0 1760.0 1795.0	
x-right (ft)	205.1 285.0 455.0 505.0 640.0 700.0	
y-16£t (ft)	1600.0 1595.0 1595.0 1690.0 1760.0	
x-left (ft)	205.1 205.1 285.0 455.0 505.0 640.0	
Segment Ma.	ମ୍ୟାନ୍ତ	

# A CRACKED ZONE BAS BEEN SPECIFIED

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

		Water Surface No.
		essure Constant (psf)
		Priction Pore Pressure Angle Parameter Constant (deg) Ru (psf)
		Priction Angle (deg)
eters	ified	Cohesion Intercept (psf)
SOVEOPIC Soil Parameters	3 Soil unit(s) specified	Unit Weight Moist Sat. (pcf) (pcf)
OPIC So	il unit	
SOTE	3 80	Soil Uni: No.

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

000

0,00

000

40.00 34.00 40.00

200.0

140.0 135.0 140.0

130.0 125.0 130.0 5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between  $x=205.0 \ {\rm tt}$  and  $x=205.0 \ {\rm tt}$ 

Each surface terminates between  $x=580.0 \ \mathrm{ft}$  and  $x=1150.0 \ \mathrm{ft}$ 

Unless further limitations ware imposed, the minimum elevation at which a surface extends is  $\gamma = 0.0 \ ft$ 

\* \* \* \* \* DEFAILT SEGRENT LENGTH SELECTED BY XSTABL \* \* \* \*

32.0 ft line segments define each trial failure surface.

AND THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPER

### ANGULAR RESTRICTIONS

the first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP METHOD \* \* \* \* \*

W.O. 8838 Sec. P-P

The most critical circular failure surface is specified by 19 coordinate points

y-surf (ft)	1600, 00 1617, 44 1618, 44 1623, 99 1623, 99 1632, 94 1652, 94 1652, 94 1659, 10 1799, 10 1725, 36 1739, 27 1746, 62 1784, 06 1795, 00 1795, 00	
x-surf (f=)	205.00 235.12 267.11 227.34 228.62 328.62 328.62 339.46 419.61 419.61 419.61 556.62 556.61 556.63 666.33 666.63	
Point No.		

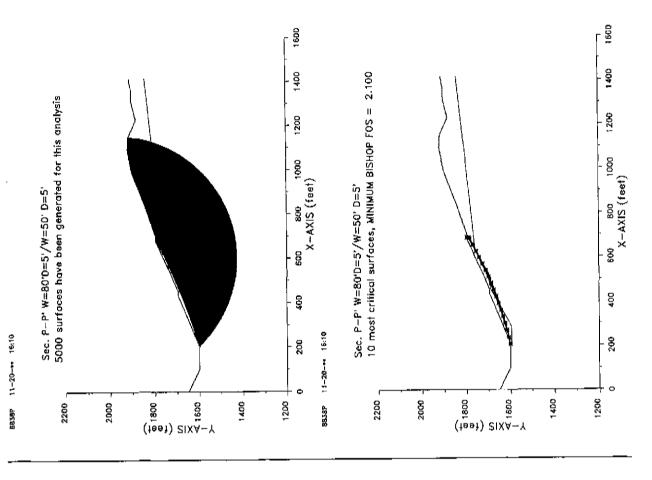
\*\*\*\* Simplified BISHOP POS = 2.100 \*\*\*\*

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. P-P' W=80'D=5'/H\*50' D=5'

Resisting	Morient	(ft-1b)	1,401E+09	1.3678+09	1.312E+09	1.2696+09	1,3751+09	1,3231+09	1.217E+09	1.420E+09	1,4558+09	1.4472+09
Initial Terminal	x-coord x-coord	(£	686.03	685,11	Ī	•	684.14		677.96			684.83
Initial	x-cookd	(ft)	205.00	205.00	205.00	205.00	205.00	205.00	205.00	205.00	205.00	205,00
Radius		(£3)	1186.45	1693,73	1496.01	1433,39	1896.30	1835,58	1415.82	2138.15	1812.22	2228.35
Center	y-coord	(ft)	3341.14	3258, 13	3056.30	3006, 52	3443.73	3385.83	2589,16	3671.02	3366,08	3755,87
Circle	x-coord	(ft) (ft)	-194.83	-164.18	-91.66	-71.22	-238.41	-2.9.48	-68,46	-326,59	-201.34	-358,30
	(BISHOP)		2 100	001.6	101.6	2 105	2.106	2.108	2,111	2 113	2,115	2.116
			•		. «	9	ď	, ve	,	. α	ď	10

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GEOLABS-WESTLAKE VILLAGE

## Sec. P-P' Pseudostatic

XSTABL file: 8838PP 11-20-\*\* 16:11

X S T A B L

Slope Stability Analysis

using the
Nethod of Slices

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Your, S.201

96 Å 1545

Problem Description : Sec. P-P' R=80'D=5'/N=50' D=5'Pseudo

SEGMENT BOUNDARY COORDINATES

14 SURFACE boundary segments

Below Segment Soil Unit 1843.0 1900.0 1920.0 1915.0 1880.0 1900.0 1910.0 1600.0 1600.0 1695.0 1695.0 1795.0 1795.0 y-right (££) 205.0 435.0 455.0 680.0 700.0 840.0 840.0 1150.0 1328.0 1338.0 x-right 1600.0 1600.0 1695.0 1795.0 1795.0 1795.0 1843.0 1920.0 1915.0 1930.0 1930.0 1650.0 y-left (£E) 205.0 435.0 435.0 455.0 680.0 700.0 990.0 990.0 1150.0 1316.0 x-left (ft)Segment Š. B 6 2 2 2 2 2 3

7 SUBSURFACE boundary segments

Segment x-1eft y-left x-right y-right Soil Unit (ft) (ft) Relow Segment (ft) (ft) (ft) Relow Segment 2 205.1 1595.0 205.1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0 1 1595.0

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 [pcf]

Pailore surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit Weight Cohesion Friction Fore Pressure Fater
Unit Moist Sat. Intercept Angle Parameter Constant Surface
No. (pcf) (psf) (deg) Ru (psf) No.
1 130.0 140.0 200.0 40.00 .000 .0 0
2 125.0 135.0 200.0 34.00 .000 .0 0
3 130.0 140.0 225.0 40.00 .000 .0 0

A corizontal earthquare loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

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

5000 trial surfaces will be generated and analyzed.

50C Surfaces initiate from each of 10 points equally spaced along the ground surface between x =  $205.0 \; ft$  and x =  $205.0 \; ft$ 

Each surface terminates between  $x=680.0\ ft$  and  $x=1150.0\ ft$ 

Unless further limitations were imposed, the minimum elevation at which a surface extends is  $\gamma = -.0 \ {\rm ft}$ 

\* \* \* \* \* DEFAULT SECHENT LENGTH SELECTED BY XSTABL \* \* \* \* \*

32.0 ft line segments define each trial failure surface.

ANGILAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees Upper angular limit := (slope angle - 5.0) degrees

Sec. P-P' Pseudostatic W.O. 8838

factors of safety have been calculated by the :

\* \* \* \* \* SIMPLISIED BISHOP METHOD \* \* \* \* \*

The most critical circular failure surface is specified by 19 coordinate points

y-surf (ft)	1600.00	1615.44	1633.09	1652.94	1674.95	1699.10	1725.36	1753.69	1784.06 1787.00 1795.00
x-surf (ft)	205,00	C C		389.46		508.82	567.19	652,87	690.90 686.03 686.03
Point No.	пп	i M sa	v v v	۳. ه	9 0 0	11	13.1	15	11 11 11 11

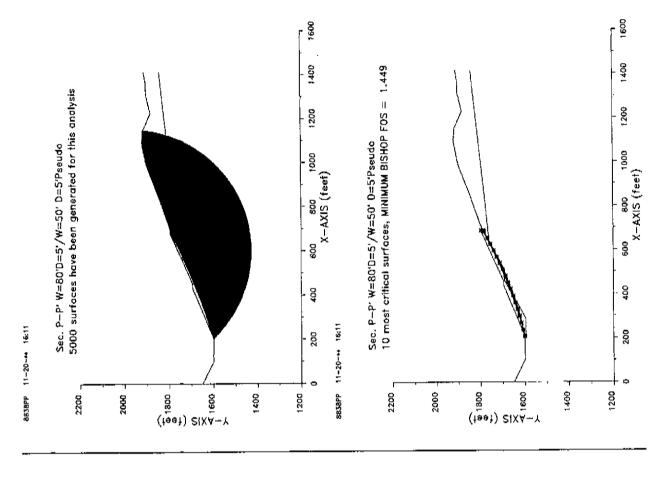
# \*\*\*\* Simplified BISHOP FOS = 1.449 \*\*\*\*

The following is a surmary of the TZN most critical surfaces

Problem Description : Sec. P-P' W=80'D=5'/W=50' D=5'Pseudo

Resisting	COMMENT	(ft-1b)	1.3292+09	1.2978+09	1.244E+09	1,2035+09	1.3065+09	1.2565+09	1.155E+09	1.380E+09	1.3492+09	1,3752+09	
		(35)	•			681.96					684.37	_	
Initial	x-00010	(£c)	205.00	205.00	205.00	205.00	255.00	205,00	205.00	205,00	205.00	205.00	
Radius		(£€)	1786.45	1698.73	1495.01	1433,39	1896.33	1835.58				**	
Circle Center	y-coord	(ft)	3341.14	3258.13	3066.30	3006.52	3443,73	3385.83	2989.16	3366.08	3671.02	3755.87	
Circle	K-Goord	(ft)	-194.83	-164.18	-91.66	-71.22	-238.41	-219.48	-68.46	-201.34	-326.59	-358.70	
FOS	(BISHOP)		1.449	946	1.450	1.452	1.453	1.456	1.456	1.458	1.460	1.462	
			F	,	· ~	9	μ	Ý	ŗ-	æ	0	ä	

\* \* END OF FILE \* \*



#### Sec. P-P' Backcut W.O. 8838

11-20-\*\* 16:09

XSTABL File: 8838F3

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4 New E 201

Problem Description : Sec. P-?' Backcut

SECRENT BOUNDARY COCRDINATES

16 SURFACE boundary segments

Section	X-10-K	v-left	x-right	v-right	Soil Unit
E	(fft)	(ft)	(fb)	(ft)	Below Segment
1	٥.	1650.0	100.0	1600.0	
N	100.0	1,600,0	205.0	1600.0	П
ო	205.0	1600.0	205.1	1595.0	
7	205.1	1595.0	285.0	1595.0	1
va	285.0	1595.0	455.0	1590.0	1
9	455.0	1690.0	505.0	1650.0	1
r-	505.0	2.690.C	640.0	1760.0	٣
00	640.0	1760.0	0.007	1795.0	٣
ø	700.0	1795.0	640.0	1843.0	m
10	940.0	1843.0	990.0	1900.0	m
11	9.066	1900.0	1092.0	1920.0	m
?;	1092.0	1920.0	1150.0	1915.0	eh
13	1150.0	1915.0	1228.0	1880.0	m
14	1228.0	1880.0	1310.0	1900.0	m
1.5	1310.0	1900.0	1358.0	1900.0	m
9.	1358.0	1900.0	1415.0	191C.0	m

# 1 SUBSURFACE boundary segments

Soil Unit Below Segment	1
y-right (ft)	1840,0
x-right (ft)	1415.0
y-left (ft)	1750.0
x-left (ft)	640.0
Segment No.	г

A CRACKED ZONE HAS BEEN SPECIFIED

(feet) (feet) (pcf) Depth of crack below ground surface = 0.03
Maximum depth of water in crack = .03
Unit weight of water in crack = 52.40 Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

t(s) specified	(s) specifie	
š	1 unit(s	
	Soil uni	š

Water	Surface	χo.	0	0	O
essure	Constant	(bst)	٥.	0.	e,
Pore Pr	Parameter Constant	₹	000	000	000
Friction	Angle	(deg)	40.00	34.00	40.00
Cohes; on	Intercept	(bst)	200.0	200.0	225.0
#eight	Motst Sat.	(J2d)	140.0	135.0	140.0
Unit	Moist	(bct)	130.0	125.0	130.0
	Chit		٦	N	m

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

5000 trial surfaces will be generated and analyzed

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x=-285.0 ft and x=-285.0 ft

680.0 ft 1150.0 ft Sach surface terminates between and Unless further limitations were imposed, the minimum elevation at which a surface extends is  $\gamma = -0$  ft

\* \* \* \* \* DEFAULT SEGMENT LENGTH SELECTED BY XSTABL \* \* \* \* \*

33.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by  $\dot{z}$ 

Lower angular limit := -45.0 degrees Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLITIED BISHOP METHOD \* \* \* \* \*

The most critical circular failure surface is specified by 19 coordinate points

W.O. 8838 Sec. P-P' Backcut

Y-surf (ft)	1595.00 1603.70 1603.70 1627.10 1627.10 1648.39 1660.32 1666.71 1701.14 1712.44 1749.28 1749.28 1749.40	
x-surf (ft)	285.00 231.31 231.31 331.31 331.32 331.32 331.32 336.21 536.52 536.63 536.63 536.64 537.60 777.00	
Point No.	- N C A C N P B B B B B B B B B B B B B B B B B B	

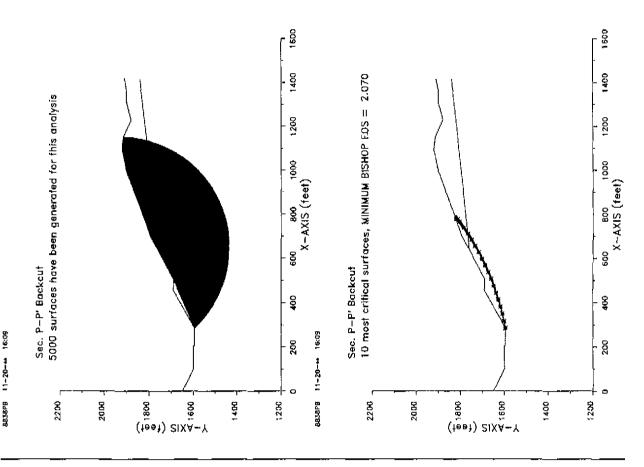
\*\*\*\* Simplified BISHOP FOS = 2.070 \*\*\*\*

The following is a summary of the TEN most critical surfaces

Backent
7
Sec.
Description
Problem

Resisting	(ft-1b)	1.9478+09	2.030E+09	2.187E+09	2.213E+03	2.1715+09	1.7748+09	1.755E+09	2.010E+09	1.6818+09	1.7655+09
Sernina: Re	(FE)	777,00	783,58	794,63	794.35	789,64	767.15	765.61	785.69	758.33	767.42
Initia:	(££)	285,00	285,00	285,00	285.00	285,00	285.00	285.00	285,00	285.00	285,00
Radius	(tp)	1195.89	1198,34	1240.81	1299.09	1334,25	1368.46	1067.61	11.03.04	1089.60	1038,19
Center	(£t)	2769.24	2772.47	2813.83	2868.45	2900,67	2648.11	2647.11	2683.00	2665.86	2619.58
Circle Center	(Et)	58,49	62.32	52,50	28.18	10.32	104.53	103.73	103.44	89.21	117.45
FOS		2,070	2.071	2,072	2.072	2.072	2.072	2.072	2,072	2.073	2.073
		1	7	ų	*	ırs	ď,	r.	θ.	o,	10.

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# Sec. R-R' W=40' D=5'

XSTABL File: 8838R 11-20-\*\* 16:45

Problem Description : Sec. R-R' Wed0' De5'

SEGMENT BOUNDARY COORDINATES

3 SURFACE boundary segments

soil Unit Below Segment	ппи
y-right (ft)	1685,0 1761.0 1738.0
x-right (ft)	80.0 260.0 350.0
y-left (ft)	1685.0 1685.0 1761.0
x-left (ft)	.0 80.0 260.0
Segment No.	H 22 E

4 SUBSIRPACE boundary segments

Soil Unit Below Segment	a
y-right (ft)	1680.0 1680.0 1756.0 1761.0
x-right (ft)	80,1 120.5 259.9 260.0
y-left (ft)	1685.0 1680.0 1680.0 1756.0
x-left (ft)	80,0 80,1 120.0 259.9
Segment No.	- C1 CC #

A CRACKED ZONE HAS BEEN SPECIFIED

(feet)	(feet)	(g G
8.00	ô.	62,40
ė,	ı	11
Depth of crack below ground surface	Maximum depth of water in crack	Unit weight of water in crack

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOIROPIC Soil Parameters

2 Soil unit(s) specified

Water Surface No.	a ø	τ <del>ό</del>
riction Pore Pressure Angle Farameter Constant (deg) Ru (psf)	6,4	A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.
Pore Pressure Farameter Const: Ru (psf)	000.	A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specific
Friction Angle (deg)	40.30 34.00	rching met LAR surfac
Cohesion Friction Intercept Angle (psf) (deg)	225.0	urface seal ting ciRCU
Soil Unit Weight Unit Moist Sat. No. (pcf) (pcf)	130.0 140.0 125.0 135.0	ailure su or geneta
Soil Unit Unit Moist No. (pcf)	130.0 125.0	tical f ique fo
Soil Umit No.	7 7	A ori techn

5000 trial surfaces will be generated and analyzed.

100 Surfaces initiate from each of 50 points equally spaced along the ground surface between  $~x~\approx~80.0~{\rm ft}$  and  $~x~=~80.0~{\rm ft}$ 

Each surface terminates between x = 250.0 ft and x = 330.0 ft

Unless further limitations were amposed, the minimum elevation at which a surface extends is  $\gamma=-0.0\,{\rm ft}$ 

6.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP METHOD \* \* \* \*

The most critical circular failure surface is specified by 35 coordinate points

1685.00	1685,12	1685.36	1685,74	1686.24	1686.87	1687.63	1688.52
80.00	86.30	91.99	97.98	103.96	109.93	115.88	121.81
1	2	m	₹.	ın	ψ	۲-	Œ
	80.00 1685.	1685.	80.00 1685. 86.00 1685. 91.99 1685.	80.00 1685. 86.00 1685. 91.99 1685. 97.98 1685.	80.00 1685. 86.30 1685. 91.99 1685. 97.98 1685.	80.00 1685. 86.30 1685. 91.99 1685. 103.98 1685. 109.93 1686.	80.00 1685.0 86.00 1685.1 91.99 1685.3 97.98 1685.3 103.96 1686.2 115.93 1686.8

W.O. 8838 Sec. R-R' W=40' D=5'

1689.53	1690.67	1691.93	1693.32		1696.48	1698.24	1700,12	1702.13	1704.26	1706.50	1708,87	1711.35	1713.95	1715.66	1719.49	1722.43	1725.48	1728.64	1731.91	1735.29	1738.77	1742.36	1746.05	1749.84	1752.91	1760.91
127,73		139.48	145.32	151.13	156,90	162.63	168.33	173.98	179.60	5.1		6,1	201,54	206.89	212.19	217.42	222,58	N		237.67	242.56	**	252.10	256.75	260.36	260.36
Ø	10	11	12	13	71	15	16	1.7	81	19	20	21	22	23	24	25	56	2.3	28	29	30	33	32	33	7	SE

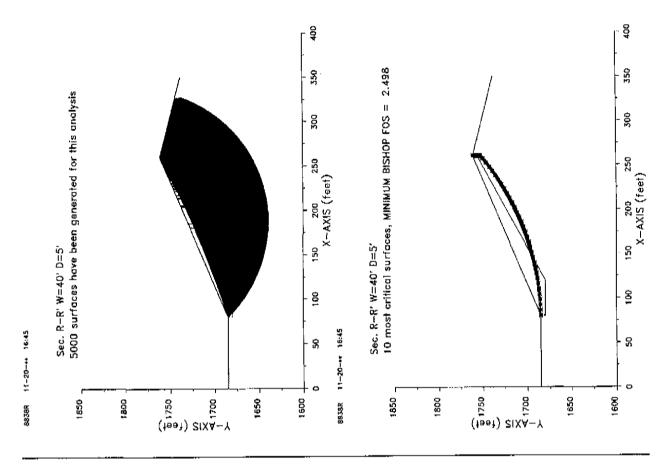
\*\*\*\* Simplified BISHOP FOS = 2,498 \*\*\*\*

The following is a surmary of the TIN most critical surfaces

Problem Description : Sec. R-R' H=40' D=5'

æ	Moment	(ft-1b)	9.786£+07	9.590E+07	1.C06E+08						1.045E-08	1.032E+08	
тетшіпаі	x-coord	(ft) (ff)					261,23					262.39	
Tritial	x-coord	(££)	80.00	80.00	90.00	80,00	90.00	80.00	80.00	80,00	80.00	80.00	
Radius		(ft)	280.20	283,10	276,34	293.09	269.06	315.38	319.33	282,27	283.22	275,84	
Center	y-coord	(£	1965.19	1968.06	1961.34	1977.97	1954.05	2000.02	2003.85	1967.23	1969.21	1960.84	
Circle	x-ccord	(ft) (ft)	17.49	75.49	80,39	71.57	82,85	64,88	62.41	75.06	79.22	81.77	
	(BISHOP)		2,498	2,500	2.501	2.501	2,502	2,502	2.503	2,503	2.504	2,504	
			H	i ci	m	-	'n	ų	۲,	00	6	30.	

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GEOLABS-WESTLAKE VILLAGE

# Sec. R-R' Pseudostatic

XSTABL File: 8838RP 11-20-\*\* 16:46

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Problem Description : Sec. R-R' W=40' D=5' Pseudo

SECREMI BOUNDARY COORDINATES

3 SURFACE boundary segments

Soil Unit Below Segment y-right (ft) 1685.0 1761.0 1738.0 x-right 80.0 260.0 350.0 1685.0 1685.0 1761.0 y-left (ff) ,0 80.0 260.0 x-left (ft) Segment No.

4 SUBSTREACE boundary segments

Below Segment Soil Unit y-right (ft) 1680.0 1680.0 1756.0 1761.0 x-right (ft) 80.1 120.0 259.9 260.0 y-left (ft) 1685.0 1680.0 1680.0 1756.0 80.1 80.1 120.3 259.9 x-left (ft) Segment No.

A CRACKED ZONE HAS BEEN SPECIFIED

(feet) (feet) (pcf) Depth of crack below ground surface = 8.00 kaximum depth of water in crack = .00 Unit weight of water in crack = 62.40 Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROFIC Soil Parameters

2 Soil unit(s) specified

Water Surface No	٥	0
essure Constant frefi	Ď.	o.
Parameter Constant	000	000
Friction Angle Pa	8 9	34.00
Cohesion Intercept	225.0	200.0
Unit Weight Moist Sat.	140.0	135.0
Unit	ל באקו ה מגר	125.0
Soil Unit		10

A horizontal earthquake loading coefficient of 150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

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

S000 trial surfaces will be generated and analyzed.

100 Surfaces initiate from each of 50 points equally speced along the ground surface between  $x=60.0\ \rm fc$  and  $x=60.0\ \rm fc$ 

250.0 ft 330.0 ft Each surface terminates between x = and x =

Unless further limitations were imposed, the minimum elevation at which a surface extends is  $\gamma = -0.5\,{\rm ft}$ 

\* \* \* \* \* DEFAULT SEGGENT LENGTH SELECTED BY XSZAGL \* \* \* \* \*

6.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP METHOD \* \* \* \* \*

The most critical circular failure surface is specified by 35 coordinate points

y-surf (ft) x-surf (ft) Point Ġ,

W.O. 8838 Sec. R-R' Pseudostatic

685	4 6	685.7	Œ	1686.87	1687.63	1688.52	1689.53	1690.67	H	1693,32	1594.84	- 1	1598,24	1700.12	1702.13	1704.26	1706.50		11.	Ε.	1716.66		22	25.4	Ň	1731.91	1735.29	1738,77	1742.36	1746.05	2749.84	1752.91	150.51
	, o	9	8	109,93	115.88	121.61	÷	133.62	139,48		*	156.90	62.	168,33	Γ-	179.60	185.16	8	196.14	201.54	206.89	212.19	217,42	222.58	27.	232.71	(*)		247.37	252.10	256.75	250,36	
-10	y m		Z.	w	۲	œ.	ō	01	3.1	12	13	14	15	16	17	16	19	20	77	23	23	24	52	36	27	28	23	8	31	32	33	ř	X)

\*\*\*\* Simplified BISHOP FOS = 1.744 \*\*\*\*

The following is a surmary of the TEM most critical surfaces

Problem Description : Sec. R-R' W=40' D=5' Pseudo

Resisting Morent (ft-lb)	9.3178+07 9.7308+07 9.58111+07 9.58111+07 9.1308+07 9.1708+07 1.0058+08 1.0058+08 9.6272+07
<pre>Initial Terminal x-coord x-coord (ft) {ft}</pre>	260.36 261.47 261.47 262.62 259.05 259.68 259.68 262.99 262.99 264.60
Initial x-coord (ft)	80.00 80.00 80.00 80.00 80.00 80.00 80.00 80.00 80.00
Radius (ft)	280.20 315.38 276.34 263.22 283.10 293.09 319.33 314.03 275.84
Center y-coord (ft)	1965.19 2000.02 1961.34 1968.21 1968.06 1977.97 2063.85 2967.15
Circle ( x-ccord ) (f=)	54.88 80.39 80.39 79.22 71.57 62.41 80.19 80.19
FDG (BISHOP)	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
	1. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4.

\* \* END OF TILE \* \* \*

喜 <del>4</del>0 Sec. R-R' W=40' D=5' Pseudo 10 most critical surfaces, MINIMUM BISHOP FOS = 1.744 350 350 Sec. R-R' W=40' D=5' Pseudo 5000 surfaces have been generated for this analysis 300 300 150 200 250 X-AXIS (feet) 150 200 250 X-AXIS (feet) 100 휺 8838RP 11-20-4 16:46 B838RP 11-20-← 15:46 ŝ ŝ (teet) SIXA-Y (feet) SIXA-Y 989 1600 1800 1650 1600 1800 1850 1850

Sec. R-R' Backcut

XSTABL File: 8838RB

11-20-\*\* 16:49

\* SIOPE Stability Analysis

\* Slope Stability Analysis

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Problem Description : Sec. R-R' Sackout

SECHENT BOUNDARY COORDINATES

6 SURFACE boundary segments

Segment x-left y-left x-right y-right Soil Unit

Mo. (ft) (ft) (ft) (ft) Soil Unit

1 .0 1885.0 80.0 1685.0 1

2 80.0 1685.0 80.1 1680.0 1

3 80.1 1680.0 120.0 1680.0 1

4 120.0 1680.0 269.9 1756.0 1

5 260.0 1761.0 350.0 1781.0 1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit seight of water in crack = 62.40 (pcf)

Failure synfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

1 Soul unit(s) specified

Soil Unit Meight Cohesion Friction Pore Pressure Rater Unit Moist Sat. Intercept Angle Parameter Constant Surface No. (pcf) [pcf) [pef) (deg) Ru [psf] No. 130.0 140.0 225.0 40.00 .000 0

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

5000 trial surfaces will be generated and analyzed.

100 Surfaces initiate from each of 50 points equally spaced along the ground surface between  $\,x=120.0\,$  ft and  $\,x=120.0\,$  ft

Each surface terminates between x=230.0 ft. and x=330.0 ft.

Unless further limitations were imposed, the minimum elevation at which a surface extends is  $\gamma=-0.5\,t$ 

\* \* \* \* \* DEFAULT SECRENT LENGTH SELECTED BY XSTABL \* \* \* \* \*

7.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.6 degrees Upper angular limit := (slope angle - 5.0) degrees

factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP METHOD \* \* \* \* \*

The most critical chroular failure surface is specified by 26 coordinate points

Point x-surf y-surf No. (ft) 1 120.00 1660.00 2 126.00 1660.00 3 133.87 1631.86 4 140.76 1633.13 5 144.42 1668.19 6 154.42 1668.19 7 161.17 1688.04 8 167.49 1692.35 10 181.05 1634.79 11 187.53 1697.44 12 200.24 1700.27 14 206.46 1706.51 17 224.50 177.36

W.O. 8838

## Sec. R-R' Backcut

ŭ	М	729,5	733.9	739.5	1743.33	748.2	751.5	59.5
ä	35.	17	46	8	257.35	62	65	65.
81	19	20	21	22	53	24	52	5e

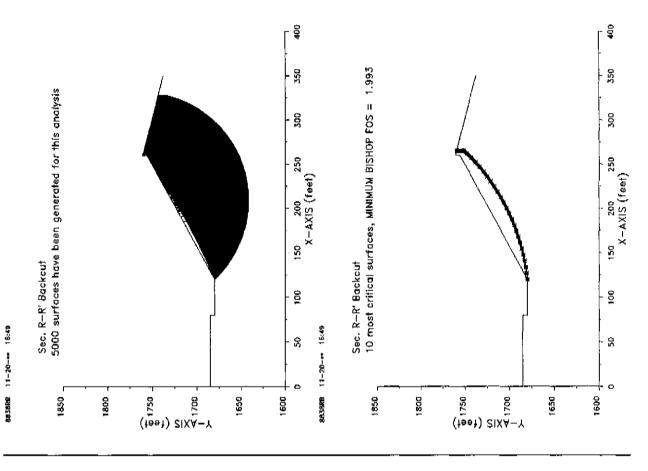
\*\*\*\* Simplified BISHOP FOS = 1.993 \*\*\*\*

# The following is a summary of the TEN most critical surfaces

Problem Description : Sec. R-R' Backcut

œ	(ft-1b)	5.8425+07	5.6046+07	6.2635+07	5.902E+07	5.8778+07	5.6758+07	5.7218+07	5,5552+07	6.320E+07	5.2846+07
Terminal	(ft)								263,99		
Initial ?	(£t)	120.00	120.00	120.00	120.00	120.00	120.00	120,00	120,00	120,00	120.00
Radius	(ff)	234.17	235.81	240,17	253,81	219,89	246.71	248.95	240.92	251.6B	224.40
Center	(ft) (ft)	1912,93	1914.32	1918,91	1931.54	1899,27	1924.66	1926.82	1919.11	1939.31	1903.24
Circle	(ft)	98,86	93.48	95.52	86.15	103.44	88.30	87,47	90.52	84.85	97.21
FOS	(acusera)	1.993	3.994	1.995	1.995	1.996	3,996	1.996	1,996	1.997	1.937
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# Sec. R-R' Natural slope 40' setback

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Slope Stability Analysis

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Problem Description : Sec. R-R' Matural slope 40' Setback

SEGMENT BOUNDARY COORDINATES

6 SURFACE boundary segments

 Segment
 x-left
 y-left
 x-right
 y-right
 Soil Unit

 No.
 (ft)
 (ft)
 (ft)
 Balow Segment

 1
 .0
 1510.0
 1515.0
 1515.0

 2
 120.0
 1515.0
 1560.0
 1540.0

 3
 200.0
 1540.0
 270.0
 1585.0
 2

 4
 270.0
 1650.0
 2
 2

 5
 200.0
 1666.0
 200.0
 1666.0

 6
 370.0
 1666.0
 600.0
 1666.0

1 SUBSURFACE boundary segments

Segment x-laft y-laft x-right y-right Soil Unit
No. (ft) (ft) (ft) (ft) (2t) Below Segment
I 200.0 1540.0 660.0 1575.0 1

A CRACKED ZONE HAS BZEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 52.40 (pcf)

Failure surfaces will have a varincal side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTECPIC Soil Parameters

2 Soil Unit(s) specified

Water Surface No.	00
essure Constant (psf)	. o.
Porm Pr Parameter Ru	000,
Friction Angle (deg)	40.00
Cohesion Intercept (psf)	200,0
Unit Weight Moist Sat. (pcf) (pcf)	135.0
Unit Moist (pof)	130.0 125.0
Soil Unit No.	н ю

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

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between  $x=-120.0 \ {\rm ft}$  and  $x=-270.0 \ {\rm ft}$ 

Each surface terminates between x = 410.0 ft and x = 520.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is  $\gamma = 0.0 \ {\rm ft}$ 

\* \* \* \* \* DEFAULT SEGMENT LENGTH SELECTED BY KSTABL \* \* \* \*

16.0 ft line segments define each trial failure surface.

ANCULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by  $\boldsymbol{\epsilon}$ 

Lower angular limit := -45.0 degrees Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP NETROD \* \* \* \* \*

The most critical circular failure surface is specified by 19 coordinate points

Point x-surf y-surf No. (ft) (ft) 1 166.67 1535.83 2 202.32 1539.15 3 217.83 1543.38 4 233.17 1547.63 5 248.32 1552.77 6 253.25 1558.77 7 277.88 8 292.38 1572.74

W.O. 8838 Sec. R-R' Natural slope 40' setback

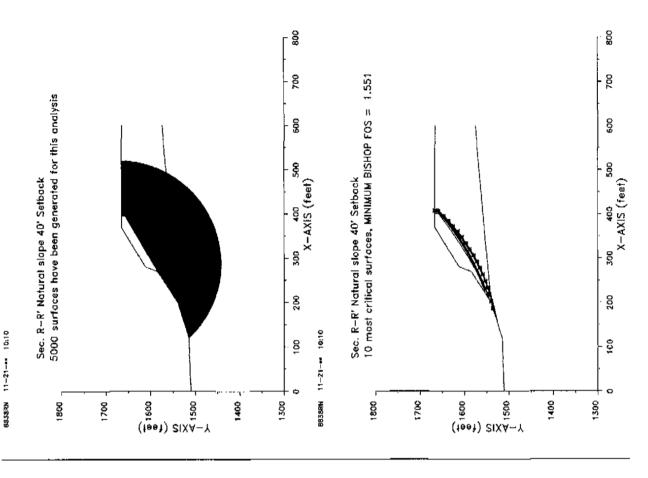
53	2.78	595.7		61.4	24	1635.17	646.	1657, 72		566.
306.53		33.8	Ĉ.	359,86	ž	384.27	8	406.96	407.21	
6	10	11	12	13	77	15	9.7	ņ	8.	on • * *

\*\*\*\* Simplified BISEOF FOS = 1.551 \*\*\*\*

The following is a summary of the TDN most critical surfaces

Problem Description : Sec. R-R' Natural slope 40' Setback

\* \* \* END OF FILE \* \* \*



GEOLABS-WESTLAKE VILLAGE

# Sec. R-R', Nat. Slope, 40' Setback, Pseudo

XSTABL File: 8838RNF 11-21-\*\* 10:10

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Problem Description : Sec. R-R' Natural slp 40' Sethi, pse

SECRET BOUNDARY COORDINATES

6 SURFACE boundary segments

Below Segment Scil Unit 1515.0 1540.0 1585.0 1612.0 1666.0 Y-right 120.0 200.0 270.0 280.0 370.0 x-right (ft) y-left (ft) 1510.0 1515.0 1540.0 1585.0 1612.0 120.0 200.0 270.0 230.0 370.0 x-left (ff)

1 SUBSURFACE boundary segments

Soil Unit Below Segment y-right [ft] 1575.0 x-right (fi) 600.009 y-left (ft) 1540.0 x-left (ft) 200.0 Segment No.

A CRACKED SONE RAS BEEN SPECIFIED

feet) (feet) Depth of crack below ground surface = 8.00
Maximum depth of water in crack = .00
Unit weight of water it crack = £2.40 Unit weight of water in crack Pailure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

riction Pore Pressure Water Angle Parameter Constant Surface (deg) Ru (psf) No. 00 000 40.00 Cohesion F Intercept (psf) 200.0 225.0 140.0 Unit Weight
Moist Sat.
(pcf) (pcf) Sat. 130.0 Soil Unit No.

A horizontal earthquake loading coefficient of 150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

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

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 120.0 ft and x = 270.0 ft

413.6 ft 520.0 ft || || || X Each surface terminates between and Unless further limitations were imposed, the minimum elevation at which a surface extends is  $\gamma\approx-0$  ft

\* \* \* \* \* DEFAULT SECRENT LENGTH SELECTED BY XSTABL \* \* \* \*

15.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

\* \* \* \* \* \* SIMPLIFIED BISHOP METHOD \* \* \* \* \*

The most critical circular failure surface is specified by 17 coordinate points

y-surf (ft) x-surf (ft) Point ğ

Sec. R-R', Nat. Slope, 40' Setback, Pseudo

1542,14	1548.49	1555.10	1561.97	1569.11	1576.51	1584.17	1592.08	1600.25	1608.66	1617.32	1626.23	1635.38	1644.76	1654.39	1658.00	1666.00
203.33	218.02	232.59	247.04	261.36	275.55	289.59	303.50	317,26	330,87	344.32	357.61	370,74	383,70	396,48	401,10	401.10
М	N	m	9	ษา	ø	Ļ	œ	ďΛ	10	11	12	13	14	15	16	17

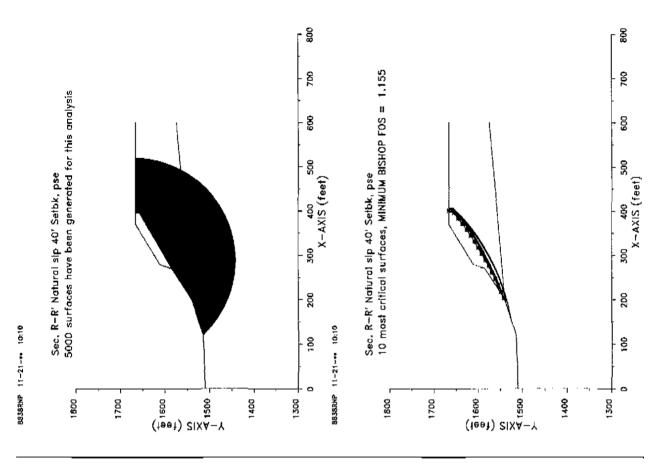
\*\*\*\* Simplified BISHOP FOS = 1.155 \*\*\*\*

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. R-R' Natural slp 40' Setbk, pse

Resisting Moment (ft-1b)	3.4935+08 2.9755+08	2.902E+D8	Z.4542+08 3.4222+08	2.5355+08	2.8652+08	2.394E+08	2.8392+08	2.0652+08
Terminal x-coord (ft)	401.10	406.23			406.16	403,75	407.00	405.29
Initial 7 x-coord {ft}	203.33	203.33	203.33	186.67	153.33	220.00	153.33	220.00
Radius (ft)	875.63 625.31	597,62	751.77	416.33	437,56	558,75	453.61	430.21
Canter Y-coord (ft)	2349.15	2109.07	2245.14	1944.30	2004.59	2081,66	1973.20	1967.98
Circle Canter x-coord y-coord (ft) (ft)	-136.47	14.27	-63.03	106.14	63.30	39.51	80.87	107.08
FOS (BISROP)	1.155	1.158	1.164	1.157	1.169	1.169	1.172	1.176
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Plate R.1

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Plate R.2

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#### **AERIAL PHOTOGRAPHS**

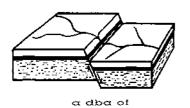
Flight C-300, 1928, Frames F9, F10, F11, E243, E244, E245, Scale 1:18,000

Flight C-17727, 1952, Frames 4-72, 4-73, 4-74, Scale 1:14,400

Flight TG-7600, 1976, Frames 21-3, 21-4, 21-5, Scale 1:24,000

Flight 94-028, acc. 04684, 1994, Frames 106, 107, 108, 1:32,500

Horizon Surveys, performed for Sikand Engineering, Tr. 50846, Monarch Hills project, dated January 29, 1994, Frames 1-5, Scale 1:4800 +/-



R & R Services

Corporation

GEOLABS-WESTLAKE VILLAGE

Foundation and Soils Engineering, Geology

31119 Via Colinas, Suite 502 • Westłake Village, CA 91362

Voice: (818) 889-2562 (805) 495-2197

Fax: (818) 889-2995 (805) 379-2603

April 13, 2007 W.O. 8838

Pardee Homes 26650 The Old Road, Suite 110 Valencia, California 91381

Attention:

Mr. Tom Mitchell

SUBJECT:

Response to Soils Engineering Review Sheet dated February 8, 2007,

Tentative Tract Map No. 060922, Skyline Ranch,

Santa Clarita Area, County of Los Angeles, California

Mr. Mitchell:

We present herein our responses to the issued raised by the Los Angeles County Department of Public Works Soils Engineering Review Sheet dated February 8, 2007. A copy of the letter, along with the Geologic Review Sheet which did not contain any comments, is provided in Appendix A.

Item #1 - Slope Stability Analyses for Cross Sections B6-B6' and N-N'

The Geologic Map presented in our November 16, 2006 report utilized the 1"=200' scale Tentative Tract Map provided to our office by Sikand Engineers. This map is attached as Plate 1.2. At the 1"=200' scale, the eight feet wide terrace benches in the cross section (and map) are difficult to distinguish, let alone to illustrate. Cross Section B6-B6 and N-N' depict one of the largest slopes proposed, that contains up to six 8-foot benches, and two 20-foot wide benches. Our previously submitted analyses and cross sections included one 20-foot wide bench, and "smoothed" the terrain between the 20-foot bench and the top and toe of slope. This smoothing of the terrain (elimination of the smaller benches) allowed for a cleaner depiction of the slope, and yielded the 2.5:1 overall slope gradient as noted by the reviewer. In our experience of

evaluating slopes of such height (particularly for feasibility purposes), there is typically little change in the factor of safety by the "smoothing" of such slopes, since the overall gradient of the slope (from top to toe of slope) remains nearly the same.

Cross Sections B6-B6' and N-N' have been revised to reflect all of the benches and reanalyzed to verify the consistency in the factor of safety (versus the smoothing). It should be noted that the overall slope gradient of these slopes remains about 2.5:1 due to the numerous benches and intervening 2:1 slope gradient.

The revised analyses for Cross Sections B6-B6' and N-N' are presented in Appendix B. Shear strengths and the method of analysis remain as outlined in our referenced reports for Tentative Tract Map No. 060922. We have also revisited the other cross sections exhibiting tall graded slopes which were simplified and drawn with overall gradients slightly flatter than 2:1. Those slopes with factors of safety near the required minimum of 1.5 were reanalyzed. The output for such analyses is also provided in Appendix B. The following table summarizes the factors of safety for these analyses, and those previously presented in our November 16, 2006 report for comparison purposes.

Analysis	F.O.S. Revised Analyses with all 8' benches depicted	F.O.S. from November 16, 2006 Report
B6-B6' static	1.66	1.60
B6-B6' pseudostatic	1.20	1.20
N-N' static	2.15	2.26
N-N' pseudostatic	1.47	1.54
C3-C3' static	1.70	1.70
C3-C3' pseudostatic	1.24	1.25
B2-B2' static	1.50	1.52
C-C' static	1.59	1.60
C-C' pseudostatic	1.11	1.12
D-D' static	1,58	1.56

As indicated, the slopes have factors of safety above the required minimums. Refinement of the proposed grading led to very minor differences in the factors of safety. Slope stability analyses for these areas shall be revisited at the 1"=40' scale grading plan stage for design and

verification purposes.

#### Item #2 - Tentative Tract Map Modifications

The reviewer noted that the Tentative Tract Map configuration presented in our previous report does not conform with the map on file with Regional Planning (dated December 27, 2004). As the processing of TTM 060922 continues, we anticipate that Regional Planning will ultimately have the map/layout presented in this report and our November 16, 2006 report. Should further changes be made to the Tentative Tract Map, supplemental geotechnical report(s) shall be submitted by our office to address such changes.

#### **SUMMARY**

Based on our review of the available data and Tentative Tract Map design prepared by Sikand Engineers, Tentative Tract Map No. 60922 is considered feasible from a geotechnical engineering and engineering geologic perspective.

#### 111 STATEMENT

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed grading and proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2) the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or warranty, express or implied.

#### CLOSURE

This geotechnical report has been prepared in accordance with generally accepted

engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

Thank you for this opportunity to be of service. Please do not hesitate to call if you have

any questions regarding this report. Respectfully submitted, GEOLABS-WESTLAKE VILLAGE RONACD Z. SHARERLING CERTIFIED ENGINEERING David Sarkisian C.E.G. 2183 Enclosures: Geologic Map Plate 1.2 (in pocket) No. 35444 LACDPW Review Sheets...... Appendix A Exp. 09/30/07 Slope Stability Analyses...... Appendix B

XC:

- (1) Addressee
- (1) Pardee-Valencia, Attention Jim Bizzelle
- (2) Sikand Engineers, Attention Craig Young
- (2) County of Los Angeles, Land Development (and 1 PDF on CD)
- (2) PCR Services, Attention Jay Ziff (and 1 PDF on CD) 233 Wilshire Blvd., Suite 130 Santa Monica, CA 90401
- (1) File

Copies of Maps on file with the County of Los Angeles, Department of Public Works, Land Development

Proposed lot cap

Geologic Contact (dashed where approx., dotted where covered)

Fault (dashed where approx., dotted where covered)

Estimated removal depth

Line of Cross Section

**Buttress keyway** 

LE 1"=200' 400 800 FEET

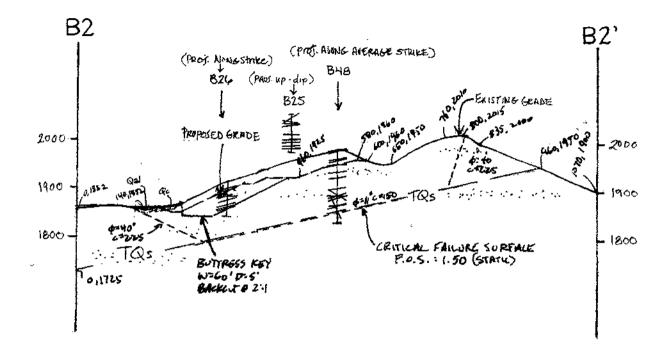


REISSVED 4/13/67

Geology AND SOIL ENGINEERING

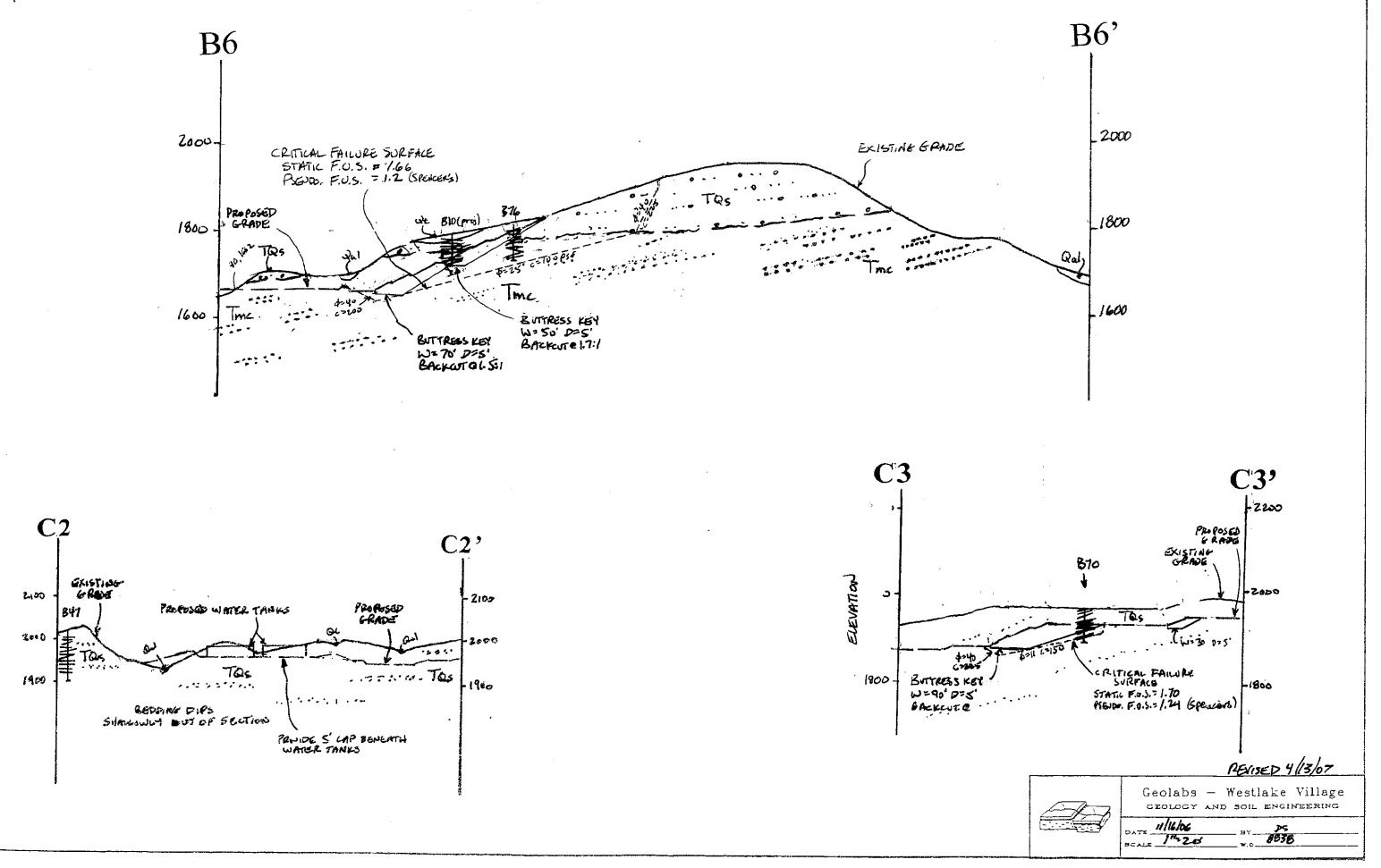
11/16/06 KMM/TC

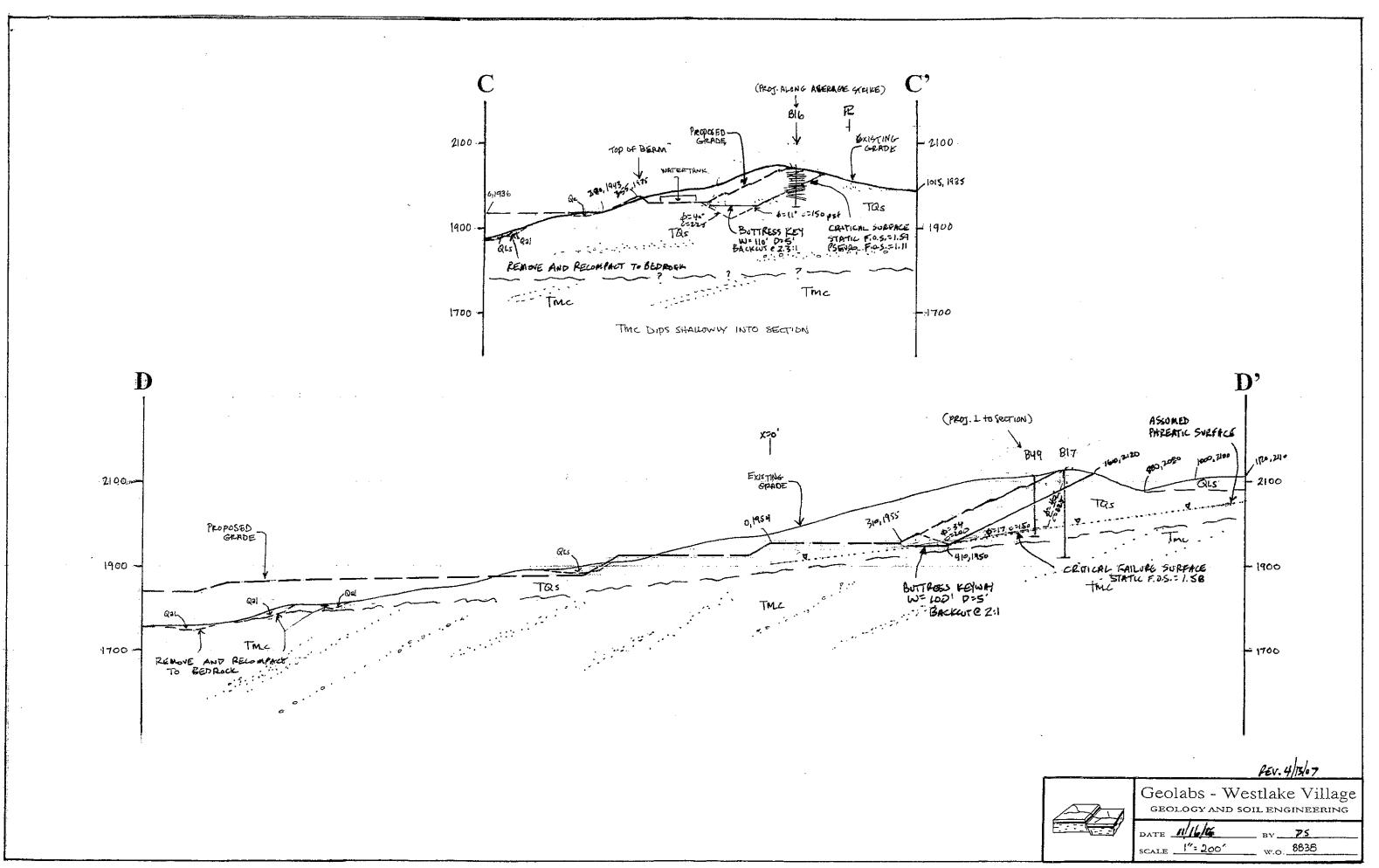
PLATE 1.2

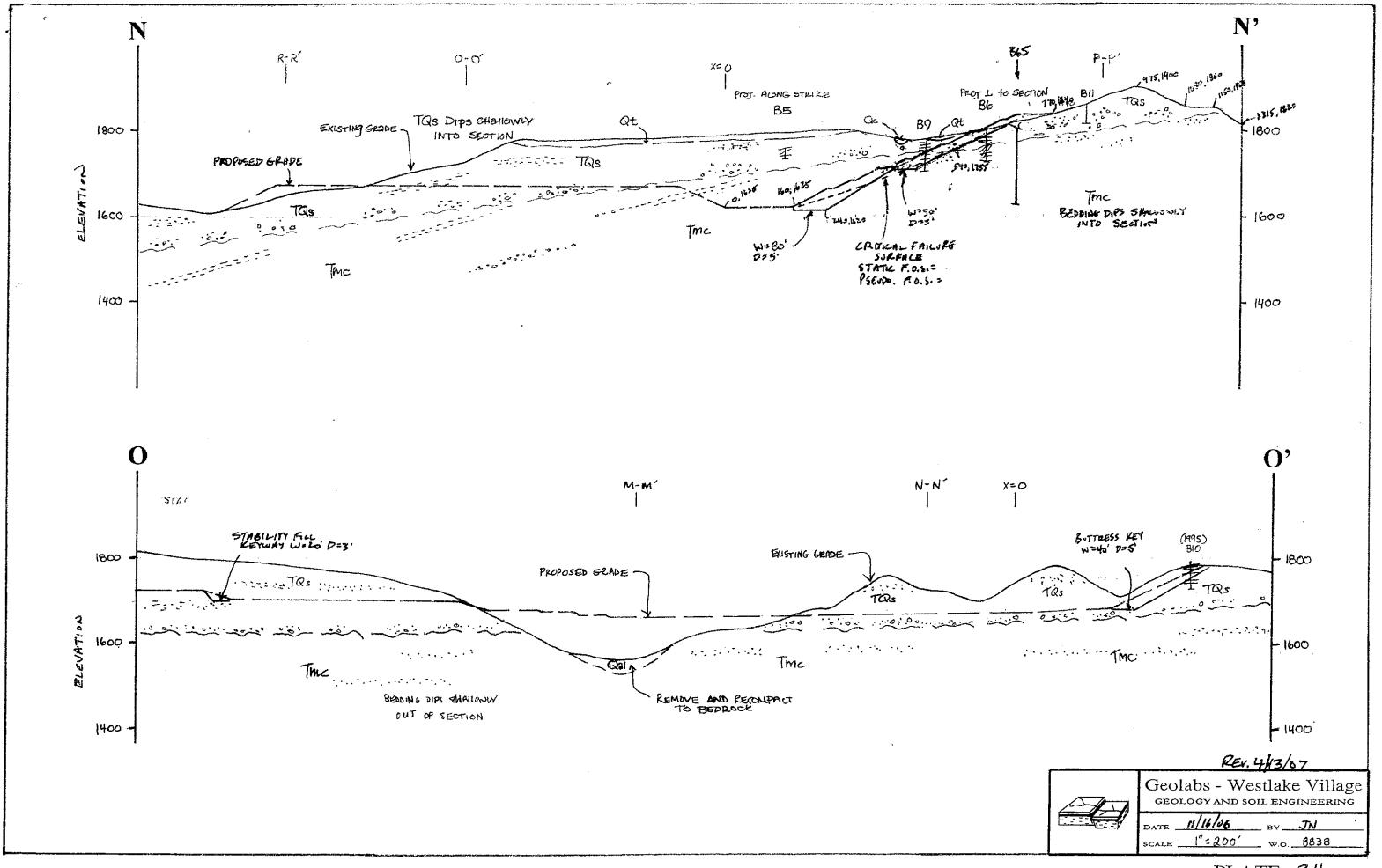


Geolabs - Westlake Village GEOLOGY AND SOIL ENGINEERING

DATE 1 1 = 2.06' NO 8938







#### APPENDIX A

#### LACDPW REVIEW SHEETS FOR TTM 060922, SKYLINE RANCH, COUNTY OF LOS ANGELES, CALIFORNIA

∙Sheet 1 of 1

Prepared by

#### County of Los Angeles Department of Public Works GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION GEOLOGIC PEVIEW SHEET

GEOLOGIC REVIEW SHEET 300 So. Fremont Ave., Alhambra, CA 91803 \_\_\_\_\_ Geologist

\_\_\_\_\_\_ Date \_\_2/6/07

Soils Engineer

DISTRIBUTION

	3) 458-4925 <b>RECEIVED</b> FEB 1 4 2017 1 Subdivision
TENTATIVE TRACT MAP 60922	TENTATIVE MAP DATED 12/18/06 (Revised)
SUBDIVIDER Pardee Homes	LOCATION Santa Clarita
ENGINEER Sikand	
GEOLOGIST & SOILS ENGINEER Geolabs – Westlake Village	REPORT DATE 11/16/06 (CD), 1/3/05, 8/23/04, 3/6/04
The Regional Planning Commission, developer, and er	igineer are advised that:
PRIOR TO RECOMMENDING APPROVAL OF THE T	
1. The Soils Engineering review dated 2/8/07 is	attached.
, ,	
·	
•	
NOTE D. (1)	
NOTE Provide a copy of this review with your resubmittal	

Reviewed by

Geir R. Mathisen

#### COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION

#### **SOILS ENGINEERING REVIEW SHEET**

Addı			Fremont Ave., Alhambra, CA 91803	District Office	8.2
Fax:	phone:		58-4925 58-4913	Job Number Sheet 1 of 2	LX001129
Tent Loca Deve Engi Soils	ative Tract	Map er	60922 Santa Clarita Pardee Homes Sikand Geolabs - Westlake Village Same as above	DISTF	RIBUTION: rainage irading ieo/Soils Central File istrict Engineer ieologist oils Engineer ngineer/Architect
Revi	ew of:				
Soil	Engineering	and Ge	Map Dated By Regional Planning <u>12/18/06</u> cologic Report Dated <u>11/16/06, 1/3/05, 8/23/04, 3/06/04</u> ated <u>1/10/07</u>		
ACT	ION:				
Tent	ative Map f	easibility	is not recommended for approval.		
REM	IARKS:				
As F	reviously R	equeste	d:		
	B6' and Cro are propose	oss Sect ed to be	analyses within the submitted report, the profile of the proposed sloper ion N-N' is at 2.5:1 gradient. However on the submitted geotechnical mat 2:1 gradient. Verify the gradient of the proposed slopes for all slope ses as necessary. Recommend mitigation if factors of safety are below	naps and on the te stability analyses	ntative map the slopes and provide revised
			aps within the submitted report do not conform to the latest tentative mal maps and tentative maps that conform, as requested by the Geology		onał Planning 12/27/04.
3.	Include a co	opy of th	is review sheet with your response.		
A. B. C.	THE ON-SI THE ON-SI	TE SOIL TE SO!! GRADIN	N CHECKER/BUILDING AND SAFETY ENGINEER: LS ARE SEVERELY CORROSIVE TO FERROUS METALS. LS HAVE A MEDIUM EXPANSION POTENTIAL. IG IS RECOMMENED FOR THE REMOVAL AND RECOMPACTION O	F LANDSLIDES (	QLS-9A, QLS-10, QLS-
M	iouod by		PROFESSIONAL PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE P		Deta 9/0/07

NOTICE: Public safety, relative to geotechnical subsurface exploration, shall be provided in accordance with current codes for excavations, inclusive of the Los Angeles County Code, Chapter 11.48, and the State of California, Title 8, Construction Safety Orders.
P:\text{Yosh\60922TentTe}

#### APPENDIX B

#### SLOPE STABILITY ANALYSES TTM 060922, SKYLINE RANCH, COUNTY OF LOS ANGELES, CALIFORNIA

Sec. B2-B2, W=60, D=5

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* \* Copyright (C) 1992 à 96 \* Interactive Software Designs, Inc. \* Moscow, ID 83843, U.S.A. Slope Stability Analysis All Rights Reserved using the Method of Slices XSTABL XSTABL File: 8838B2 4-13-\*\* 13:40

Problem Description : Sec. 32-82 | WasG' D=5'

SECRENT BOUNDARY COORDINATES

20 SURFACE boundary segments

Soil Unit Eslow Segment y-right (ft) 1852.0 1856.0 1856.0 1850.0 1850.0 1875.0 1875.0 1876.0 1925.0 1925.0 1925.0 1925.0 1925.0 1925.0 1925.0 1925.0 1925.0 1925.0 1925.0 1925.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 1920.0 19 146.0 148.0 165.0 2230.0 224.0 234.0 342.0 342.0 342.0 340.0 600.0 600.0 600.0 600.0 y-ieft (ft) 1952.0 1952.0 1955.0 1955.0 1950.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 1975.0 19 x-left (ft) 140.0 148.0 153.0 230.0 286.0 294.0 342.0 350.0 460.0 650.0 760.0 800.0 935.0 

Sail Unit Below Segment 1845.0 1845.0 1925.0 1950.0 230.1 290.0 440.0 960.0 x-right £, 4 SCHSUREACE boundary segments y-left (ft) 1850.0 1845.0 1845.0 1725.0 x-left (ft) 230.0 230.1 290.0 Segment No.

A CRACKED ZONE HAS BEEN SPECIFIED

GEOLABS-WESTLAKE VILLAGE

(feet)	(feet)	(bct)
9.00	× .03	× 62.40
Depth of crack below ground surface	Maximum depth of water in grack	Unit weight of water in crack

Failure surfaces will have a vertical side equal to the

3 5011 un	unit(s) spec	specified				
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Water Surface No. 1 specified by 4 coordinate points

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* PERSATIC SURFACE, treatfixture treatfix

## 8838 Sec. B2-B2' W=60' D=5'

(Fo factor = 1.055)		(Po factor = 1.060) coordinate points	(Fo factor = 1.056)	(Fo factor = 1.067) ordinate points
40.49 99.23 96.93 97.92 12.20 91.69 99.69	Y-surf (ft) (ft) 1850.00 1839.95 1797.69 1797.83 1799.88 1998.83 1996.83	1.520 ***  filed by 7  y-surf (ft) 1850.00 1841.74 1799.48 1799.48 1999.05	1,534 ** fied by 9 ccc: Y-surf fft) 1650.00 1838.26 1791.35 1791.35 1878.86 1993.28 2003.28	1.547 **  fied by 8 cod:  y-surf  (fc)  1850.00  1803.15
221.80 18 312.43 17 315.21 17 792.02 18 794.72 19 835.79 19 835.79 19 635.79 19	x-surf (ft) 197.96 219.51 310.51 315.25 775.54 784.33 825.09	No. 4 spect X-surf (ft) 194.15 211.87 302.50 795.28 829.68	ANNER FOS = 1  No. 5 specified x-surf (ft)   187 09 18 212.27 18 312.80 17 750.68 18 69 808.69 20 808.69 20	JANEJ FOS = No. 6 speci x-surf (ft) 202.09 216.78 307.41
2 3 4 4 5 6 6 7 7 8 8 ** Corrected (	Point No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4 No. 4	** Corrected. Failure surface Roint No. 1 2 3 4 4 6 5 5	** Corrected. Failure surface Point No. 2 2 3 4 4 4 6 9	** Corrected Failure surface Point No. 1

_	_						
					(Fo factor = 1,062)	rdicate points	
1885,49	1907.14	1397.77	1998.54	2006,54	1.549 **	ied by 5 coo	y-surf (ft)
768.89	777.12	819.38	819.74	819.74	Corrected JANEO FOS = 1.549 **	No. 7 specif	x-surf (ft)
47	uh	9	۴-	vo	** Corrected	Failure surface No. 7 specified by 5 coordinate points	Point No.

1 191.86 1850.00 2 238.03 1828.10 3 772.21 1938.73 4 802.98 2035.72 5 802.98 2013.72

\*\* Corrected JAMBU FOS = 1.551 \*\* (Fo factor = 1.043)

Failure surface No. 8 specified by 7 coordinate points

Point x-surf y-surf No. (ft) (ft) 1 167.39 1850.00 2 191.37 1836.84 3 281.95 1996.58 4 800.53 1888.45 6 846.64 1995.34 7 846.64 1995.34

\*\* Corrected JANES FOS = 1.558 \*\* (Fo factor = 1.055)

Failure surface No. 9 specified by 8 coordinate points

Point x-surf y-surf 30. f(t) (t) 1 103.56 1852.00 2 146.96 1852.00 3 229.53 1786.59 4 761.57 1884.43 5 771.66 1905.96 6 813.93 1996.49 7 815.59 2000.28 8 815.59 2000.28

\*\* Corrected JANSU FOS = 1.565 \*\* (Fo factor = 1.039)

Failure surface No.10 specified by 8 coordinate points

Point x-surf y-surf No. (ft) (ft) 1 133.26 1852.00 2 179.30 1830.53 3 269.34 1788.27 4 282.89 1782.37 5 765.55 1871.50 6 782.90 1906.49 7 824.04 1906.70

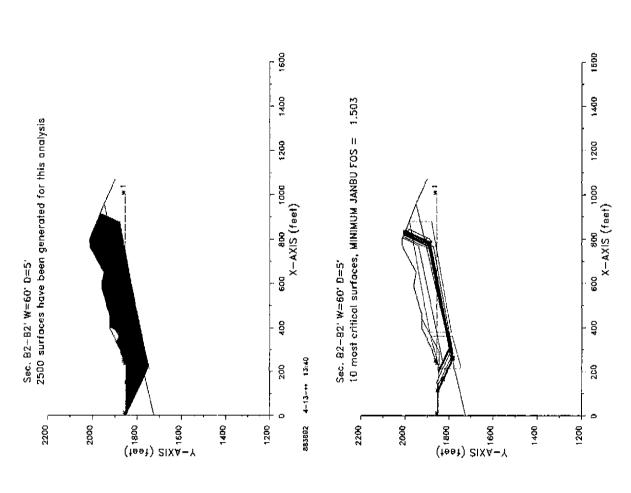
\*\* Corrected JANBU FOS = 1.565 \*\* (Fo factor = 1.064)

The following is a summary of the TBN most critical surfaces Problem Description : Sec. BZ-B2, W=60' D=5'

Available Strength (1b)	2.317E+06 2.087E+06 2.153E+06 2.102E+06 2.139E+06 2.1337E+06 2.1337E+06 2.193E+06 2.282E+06	2.475E+06
Terminal x-coord (ft)	832.85 835.76 825.09 829.68 808.69 819.74 802.98 815.66	824.04
Initial x-cocrd (ft)	114.09 201.41 157.96 194.15 167.09 202.09 157.86 167.39	133.26
Correction Factor	1.056 1.055 1.060 1.060 1.062 1.062 1.063	1.064
Modified JAMEC FOS	2 563 2 563 2 553 2 534 2 534 2 534 2 539 2 539 2 551	1.565
	면 성실 속 약 전 번 <b>모</b> 및	.ct

\* \* END OF FILE \* \* \*





Sec. B2-B2' W=60' D=5'

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Sec. B2-B2' Backcut

XSTAEL File: 8638628 4-13-\*\* 13:44

Slope Stability Analysis

Slope Stability Analysis

Slope Stability Analysis

Slope Stability Analysis

Method of Elloes

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Yer. S.201

Problem Description : Sec. B2-B2' Backout

SECRENT BOUNDARY COCRDINATES

17 SURFACE boundary segments

	Soil Unit	Below Segment	,	7	-		1	**			- 1	.4	-1	-	-1	-1			(4)
	y-right	(LF)	1852.0	1856.0	1856.0	1850.0	1850.0	1845.0	1845.0	1925.0	1,925.0	1950.0	1960.0	1950.0	2010.0	2015.5	2000.0	1950,0	1900.0
5	x-right	(Et)	140.0	148.0	153.0	. 165.0	230.0	230.1	290.0	440.0	460.0	580.0	0.009	650.0	760.0	0.008	835.0	0.096	1070.0
South Francisco	y-left	(££)	1852.0	1852,0	1856.0	.1856.0	1850.0	1850.0	1845.0	1845.0	1925.0	1925.0	1960.0	1950.0	1950.0	2010.0	2015.0	2000.0	1950.0
	x-left	(ft)	0,	140.0	148.0	153.0	165.0	230,0	230.1	290.0	440.D	460.0	580.0	6,003	650.0	760.0	0.038	835.0	0.036
	Segment	Š	**1	O)	e	7	м	Va	۲	₩	Q.	10	11	12	13	14	15	16	17

Segment x-left y-left x-right y-right Soil Unit
No. {ft} (ft) {ft} (ft) 3 (ft) 125.0 960.0 1950.0 3

1 SUBSURFACE boundary segments

A CRACKED ZONE BAS BEEN SPRCIFIED

Depth of crack below ground surface = 8.00 (feet) Maximum depth of water in crack = 0.00 (feet) Unit weight of water in crack = 52.00 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic

force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

fater Surface No.	000
Parameter Constant Ru (psf)	<u> </u>
Fore Pr Parameter Ru	000.
Prict.com	40.00
Angle	34.00
(deg)	40.00
Cohesion	225.0
Intercept	200.0
(psf)	225.0
Weight C	140.0
Sat. I	135.0
(pcf)	140.0
Unit 9	130.0
Monst	125.0
(pcf)	130.0
Soil Unit No.	H N M

AMISOTROPIC STRENGTH PARAMETERS specified for 2 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 17.00 40.00
o-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	6.00 12.00 90.00
Direction Vange No.	- O M

Soil Unit 3 is ANISCIROPIC

Number of direction ranges specified = 3

i-value (degrees)	40,00 11,00 40,00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	6.00 12.00 90.00
Direction Range No.	7 2 5

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of

Sec. B2-B2' Backcut

sliding block is 100.0 ft

Width (ft)	100.0
y-right	1835.0
(ft)	1930.0
x-right	365.0
(ft)	880.0
Y-left	1760.0
(ft)	1840.0
x-left	265.0
(ft)	380.0
Box	4 2

Factors of safety have been calculated by the :

\* \* \* \* \* OORIGN DENKE CHIRITENIS \* \* \* \* \*

The 1C most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 5 coordinate points

y-surf (ft)	1856.24 1878.43 1917.00 1925.00
x-surf {ft}	315.27 328.64 133.25 451.24 451.24
Point No.	ଟ ରାଜ ସଂସ

\*\* Corrected JANSU FOS = 1.401 \*\* (Fo factor = 1.078)

Sailure surface No. 2 specified by 5 coordinate points

	(Fo factor
y-surf (ft) 1850.08 1849.56 1883.30 1924.43	1.422
x-surf (fc) 299.52 300.62 466.30 485.48	JAMES FOS =
Point No. 10 at	Corrected JANES FOS
	:

(Fo factor = 1.06B)

Failure surface No. 3 specified by 5 coordinate points

y-surf (ft)	1842.50 1863.12 1917.00 1925.00
(££)	295.80 307.78 431.70 456.83
Point No.	<b>ሣ የሃ መ</b> ቋ ጭ

Sailure surface No. 4 specified by 6 coordinate points

(Fe factor = 1.082)

\*\* Corrected JAMBU FOS = 1.465 \*\*

state contact for a spectated by a contaminate politic

γ-surf (ft)	1845.00 1806.47 1892.47
x-surf (ft)	264.93 347.55 792.62
Point No.	- Q M

	(Fo factor = 1.060)	ordinate points			(Fo factor = 1.081)	doordinate points			[Fo factor = 1.052]	coordinate points			(Fo factor = 1.049)	coordinate points				(Fo factor = 1.071)
1913.14 1990.48 1998.48	1.482 **	specified by 5 co	Y-surf (Ft)	1853,33 1859,78 1876,81 1917,00 1925,00	1.484 **	specified by 5 co	yrsurf (ft)	1845.00 1836.69 1929.13 2005.33 2013.33	1,486 **	specified by 5 co	y-surf (ft)	1845.00 1840.63 1934.34 2003.97 2011.97	1,494 **	fied by 8	15.00	1864.31 1850.96 1895.54 1986.18	2004.30	1,499 **
802.73 838.79 838.79	ed JANBO FOS =	No. 5	x-surf (ft)	324.38 332.60 433.39 452.13	d Jawau Fos =	¥0. 6	x-surf (ft)	264.59 282.40 751.13 786.67	- SOL DENKIO P	No. 7	x-surf (f:)	265.14 294.50 774.59 807.06 807.06	d Janeu Pos =	ce No. 8 speci x surf	262.42 345.90	349,68 720,85 727,66 769,92	778.37 778.37	A JANBU FOS =
<u> </u>	** Correcte	Failure surface	Point No.	ተ ሪ ነ ነ ተ ላ	** Corrected	Failure surface	Point No.	ন পে তে ৰাং ফ	** Corrected	Failure surface	Point Ro.	ଲେଉମ ବର	** Corrected	Failure surface Point		.സെയം	r- 60	** Corrected

GEOLABS-WESTLAKE VILLAGE

Pailure surface No. 9 specified by 5 coordinate points

y-surf (ft)

x-surf (f:)

Paint No.

#### W.O. 8838 Sec. B2-B2' Backcut

1845.00	1639.01	1926.39	900	2014,42
281.68	294.53	758.06		
г	73	47)	٠,	ın

Failure surface No.10 specified by 5 coordinate points

(Fo factor = 1,054)

\*\* Corrected JANBO FCS = 1.504 \*\*

y-surf (ft)	1859,63 1855,72 1951,69 2000,91 2008,91
x-surf (ft]	317,42 325,80 791,26 814,21 814,21
Point No.	ଗଟମ୍ପ୍ରୟନ

(Fo factor = 1.040)

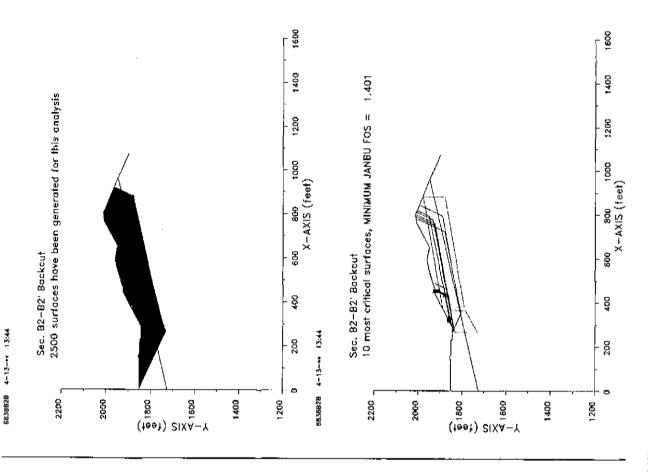
\*\* Corrected CANBU FOS = 1.510 \*\*

Problem Description : Sec. 52-82' Backout

The following is a summary of the TEM most critical surfaces

Available Strength (1b)	1.88CE+05	2.588E+05	3.026£+05	1.990E+06	1.872E+05	1.154E+C6	1.181E+06	1.846E+C6	1.222E+06	9.3772+05
Terminal x-coord (ft)	451.24	485.48	455.83	838.79	452.33	786.67	807.06	778.37	795, 38	814.21
Initial x-coord (ft)	319.27	299.52	295.80	264.93	324.38	264,59	285.14	262.42	281.68	317,42
Correction Factor	1.078	1.068	1.092	1.060	1.081	1.052	1.049	1.071	1.054	1.040
Modified JANDU FOS	1.401	1.422	1.465	1.482	1.484	1.486	1.494	1.499	1.504	1.510
		rý	σi	÷	'n.	ú	7	Ф,	ó	10.

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## GEOLABS-WESTLAKE VILLAGE

XSTABL File: 883886 4-12-\*\* 15:28

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* Ver. 5.201	96 A 1545 *

Problem Description : Sec. B5-86' W=70'0=5/N=50'0=5'

	SECRENT BOUNDARY COORDINATES	
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١	-	١
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Segments
boundary
SURFACE
7

Soil Unit	Below Segment	1	2	£4	2		-	7	1	1	м	1		-1	<b>,1</b>		1	1	m	m	m	m	m	CN3	8
y-right	(43)	1662.0	1658.0	1650.0	1650.0	1663.0	1653.0	1688.0	1688.0	1712.0	1712.0	1739.0	1739.0	1763.0	1763.0	1789.0	1789.0	1817.0	2830.0	1920.0	1950.C	1950.0	2940.0	1775.0	1775.0
x-right	(ft)	0.08	285.0	301.0	338,0	362.0	370.0	421.0	429.0	481.0	501.0	553.0	561.0	612.0	620.0	670.0	67B.0	738.0	790.0	1050.0	1200.0	1380.0	1570.0	1720.0	1820.0
y-left	(t£)	1662.0	1662.0	1658.0	1650.0	1650.0	1663.0	1663.0	1688.0	1668.0	1712.0	1712.0	1739.0	1739.0	1763.0	1763.0	1789.0	1789.0	18:7.0	2830.0	1920.0	1950.0	1950.0	184C.0	1,775.0
x-left	(£¢)	o.	0.08	285.0	301.0	338,0	362.0	370.0	421.0	429.C	491.0	501.0	553.0	561.0	612.0	620.0	670.0	678.0	738.0	790.0	1050.0	1200.0	1380.0	1570.0	1720.0
Segment	%о.	1	2	m	7	Ŋ	9	7	80	0	10	=	12	13	14	15	15	13	9 1	61	22	21	22	23	Š,

## 8 SUBSURFACE boundary segments

Scil Unit Below Segment	7	5	5	C)	2	N
Y-right (ft)	1662,0	1645.0	1545.0	1707.0	1707.0	1775.0
x-right (ft)	90.0	338.1	408.0	501.0	551.0	675.0
y-left (ft)	1640.0	1650.0	1645.0	1645.0	1707.0	1707.0
x-left (ft)	0,	338.0	338.1	408.0	501.0	551.0
Segment No.	-	Ŋ	m	7	úή	w

MIN	
1817.0 1840.0	
738.0 1570.0	IFIED
1775.C 1775.0	DIAS NAIB
675.0 675.0	S#
r~ 60	A CRACKED ZONE

(feet)	(feet)	(bcf)
8.00	0	62.40
100 H	II	H
ground surfa	in crack	n crack
ф 101 101	th of water in	water 1
Septit of crack	Maximum depth	Jnit weight of
	•	

Pailure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

### ISOTROPIC Soil Parameters

### 3 Scil unit(s) specified

Water Surface Mc.	
essure Constant (psf)	666
Pore Pressure Parameter Constant RU (psf)	000,
riction Angle (deg)	34.00 40.00
Cohesion F Intercept (psf)	20C.0 20C.0 225.0
Weight C Sat. 1 (pcf)	135.0 140.0
Unit Moist (pcf)	125.0 130.0 130.0
Soil Unit No.	1 5 E

## ANISOTROPIC STRENGTH PARAMETERS specified for 2 Soil Unit(s)

### Soil Unit 2 as ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 25.00 40.00
c-value (psf)	200.0
Counterclockwise Direction Limit (deg)	10.00 15.00 90.00
Direction Range No.	нин

### Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40,00 25,00 40.00
c-value (psf)	225.0 100.0 225.0
Counterclockwise Direction Limit (deg)	5,00 20,00 90,00
Direction Range No.	ጠርህርባ

1 Water surface(s) have been specified

#### Sec. B6-B6'

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 5 coordinate points

Moint x-water y-water
No. [ft] (ft)

1 .00 1650.00
2 288.00 1658.00
3 338.00 1658.00
4 356.00 1659.00
5 500.00 1659.00

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is  $100.0 \ {\rm ft}$ 

 Box
 x-left
 y-left
 x-right
 y-right
 H-dth

 no.
 (ft)
 (ft)
 (ft)
 (ft)

 1
 320.0
 1600.0
 525.0
 1670.0
 60.0

 2
 550.0
 1670.0
 1100.0
 1860.0
 100.0

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANEU METHOD \* \* \* \* \*

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

Failure surface No. 1 specified by 7 coordinate points

Point x-surf y-surf No. (ft) (ft) 1 318.24 1650.00 2 359.26 1630.87 3 976.00 1793.46 4 977.64 1796.98 5 1027.67 1964.27 1 2027.67 1912.27 GEOLABS-WESTLAKE VILLAGE

(Po factor = 1.051)

1,660 \*\*

\*\* Corrected JAKBU FOS =

coordinate points			(Ep factor = 1,054)			(Fo factor = 1.053) ordinate points		(Fo factor = 1.056)	coordinate points		(Fo fac	ordinate points
e Ž	y-surf (ft)	1650.00 1645.79 1645.00 1632.19 1773.43 1792.44 1879.33	** 0.70	-surf (ft)	1652.17 1646.06 1748.05 1760.72 1817.19	1.673 **	y-surf (ft) 1650.00 1631.04 1739.31	1825.84 1833.84 1.670 ***	ied by 7 y-surf (ft)	1650,00 1632.08 1787.04 1796.53 1887.16 1901.79	1,680 **	ried by 8 co y-surf (ft)
e No. 2 specified	x-surf (ft)	330.17 338.08 339.57 337.20 905.22 915.03 955.61	JANED FOS = 1.0	x-su (ft	342.01 353.49 738.50 753.74 770.74	JANBU FOS =	x-surf (ft) 302.51 343,18 750.75	801.10 801.10 JANEU FOS =	e No. 5 specif x-surf (ft)	324,30 362,73 966,99 971,41 1013,67 1020,50	VBU FOS ⇒	e ho. 6 speci x-surf (ft)
Failure surface	Point No.		** Corrected.	Δ,	បលកម្សេក	** Corrected .	Point No. 1	5 6 ** Corrected	Failure suzface Point No.	ницафпр	reacte	Failure Surjac Point No.

	(Fo factor = 1.054)	coordinate pounts		(Fo factor = 1.050)	coordinate points		(Fc factor = 1.058)			(Fo factor = 1.058) coordinate points		
1649.70 1649.70 1645.00 1637.22 1762.83 1786.38 1865.05	G	fied by 7 cod y-surf (ft)	1659.10 1629.57 1794.43 1887.05	269 189.	by 6 surf	(ft) 1650.00 1624.01 1745.31 1796.79 1848.30	583 tr	y-surf (ft)	1650,75 1645,00 1633,51 1753,39 1787,89 1854,38	1.686 ** fred by 6 coo	Y-surf (ft)	1659,00 1644,76 1747,81 1780,17 1815,10
337.59 336.00 346.99 353.68 847.3: 859.23 891.25	။ တွ	No. 7 spect x-surf (ft)	280.12 341.29 968.53 970.03 1012.29	1018.90 JANBU FOS =	No. 8 speci x-surf	<b>~</b> Ο φ − π φ φ	JANSU FOS = 1.	ft.)	339.38 350.19 374.82 836.45 852.53 883.54	JAMEJ POS =	x-surf (ft)	324.30 335.52 731.03 746.12 762.41
	Correc	Failure surface Point No.	୴ପଅସପର	7 ** Corrected	Failure surface Point	О памата	** Corrected Failure surface	Point No.	ማ ሪስ ህ ቅ ላህ ነው ኮ	** Corrected Failure surface	Foint No.	ପର୍ମ୍ୟର

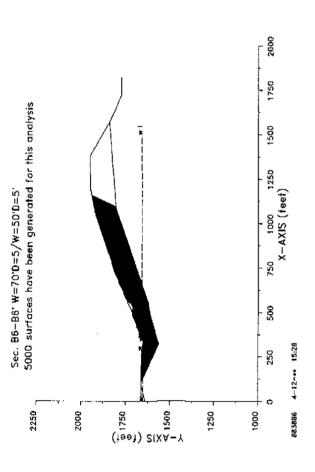
(Fo factor = i.051) \*\* Corrected JANBU FOS = 1.686 \*\*

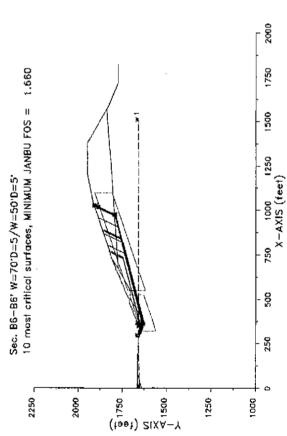
The following is a summary of the TEN most critical surfaces

Probl	lem Descripti	Problem Description : Sec. B6-B5' W=70'D=5/H=50'D=5'	=0.00=M -38	5/7=50:0=5:	
	Modified JANEU FOS	Correction Factor	Initial x-coord (ft)	Ferminal x-coord (ft)	Available Strength (1b)
÷	1.660	1.051	318,24	1627.67	2.930E+06
ς,	1.570	1.054	330.17	955.61	2.527E+06
E,	1.673	1.053	342.01	770.74	1.0952+06
÷	1.678	1.056	302.51	801.10	3.5775+06
κí	1.580	1.053	324.30	1020,50	2.9641106
ú	1.587	1.054	337.59	891.25	1.995E+06
r-,	1.682	1.050	280,12	1018.90	2.820E+06
₽,	1.683	1.058	307.05	865.99	2.1935+06
o,	1,586	1.058	339.38	893.54	2.1402+06
	1 586	1 051	234 30	163 41	1 0117-06

\* \* END OF FILE \* \* \*







Sec. B6-B6' Pseudostatic

XSTABL File: 0030B6P 4-12-\*\* 15:28

X S A B L

Slope Stability Analysis

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Method of Slices

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Problem Description : Sec. B6-86' W=70'D=5/W=50'D=5'Pseudo

SECRENT BOUNDARY COORDINATES

24 SURFACE boundary segments

Soil Unit Below Segment 1662.0 1658.0 1659.0 1663.0 1663.0 1663.0 1663.0 11688.0 1712.0 1712.0 1739.0 1763.0 1763.0 1950.0 1840.0 1775.0 1920.0 1950.0 90.0 301.0 301.0 338.0 370.0 421.0 421.0 481.0 561.0 672.0 673.0 673.0 673.0 673.0 673.0 673.0 673.0 673.0 673.0 y-left (ft) 1662.0 1662.0 1659.0 1650.0 1663.0 1663.0 1663.0 1663.0 1712.0 1712.0 1712.0 1739.0 1763.0 1763.0 1789.0 1789.0 1817.0 1830.0 1920.0 1950.0 1950.0 1840.0 1775.0 x-left (ft) 338.0 362.0 370.0 421.0 429.0 481.0 501.0 561.0 620.0 670.0 738.0 790.0 1050.0 1200.0 1390.0 1570.0 1720.0 612,0 ģ 

8 SUBSURFACE boundary segments

	Soil Unit Below Segment	24	7	2	84	44	۲,
	y~right (ft)	1562.0	1645.0	1645.0	1707.0	1707,0	1775.0
3	x-right y (ft)	90.0	338.1	408.0	501.0	551.0	675.0
25 T-100	y-left (ft)	164C.0	1650.0	1645.0	1645.0	1707.0	1737.0
	x-left (ft)	0.	338.0	338.1	409.0	501.0	551.0
	Segment. No.	-	73	m	•	49	٥

6.61	
1817,C 1840,C	
738.0 1570.0	0315103
1775.0	A CRACKED ZONE HAS REEN SPECIFIED
675.0 675.0	A CRACKED ZONE HAS BEEN SE
r- 00	A CRACKED 24

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of mater in the crack

Depth of crack below ground surface = 0.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 62.40

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Rater Surface No.	
essure Constant (psf)	0,00
Fore Pressure Paramete: Constant Ru {psf}	000
Priction Angle Pa (deg)	34.03 40.00 40.00
Cohesion Cotercept (psf)	200.0 200.0 225.0
Weight (Sat. )	135.0 140.0 140.0
Unit Moist [pof]	125.0 130.0 130.0
Soil Unit No.	ыыш

ANISOTROPIC STRENGTH PARAMETERS specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

í~value {degrees}	40,00 25,00 40.00
c-value (psf)	200.0 100.0 200.0
Counterclockwise Direction Limit (deg)	15.00 15.00 90.00
Direction Range No.	пом

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40,00 25.00 40.00
c-value (12q)	225.0 100.0 225.0
Counterclockwise Direction Limit (deg)	5.00 10.00 90.00
Direction Range No.	HOD

l Water surface(s) have been specified

62,40 (pof) Sec. B6-B6' Pseudostatic Unit weight of water =

Water Surface No. 1 specified by 5 coordinate points

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

PHREATIC SURFACE,

y-water (ft) 1650.00 1658.00 1650.00 1658.00 1658.00 .00 285.00 338.00 356.00 x-water (£E) Point No.

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .COO has been assigned

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

The active and passive portions of the sidding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of slading block is  $100.0\ {\rm ft}$ 

Width (ft) 86.0 100.0 1670.0 x-right (ft) 525.0 y-left (ft) 1600.0 x-left (ft) 320.0 550.0 Box

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED TANKU METHOD \* \* \* \* \*

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

Failure surface No. : specified by 7 coordinate points

y-surf 1650.00 318.24 1 Point . No.

2 359.26 16 3 976.00 17 4 1019.91 18 6 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.67 19 1027.	630.87 2793.46 1796.98 1887.61 1904.27	093 ** (Fo factor = 1.051)	by 8 coordinate points	y-surf (ft)	1650.00 1645.79 1645.00 1773.43 1772.44 1879.33
		83		x-surf (ft)	330.27 338.08 339.53 367.04 905.22 955.65

 $(Fo\ factor = 1.054)$ 1,103 \*\* \*\* Corrected JANSU FCS =

Failure surface No. 3 specified by 7 coordinate points

y-sarf (ft) 1650.00 1632.08 1787.04 1796.53 1887.16 1901.79 324.30 362.73 966.99 971.4: 1013.67 1020.50 x-surf (ft) Point No.

(Pc factor = 1.053) 1.105 \*\* \*\* Corrected JANBU 30S =

Failure surface No. 4 specified by 7 coordinate points

1658,10 1629,57 1793,22 1796,43 1887,06 1901,23 y-sarf (50) x-surf (ft) 280,12 341,29 968,53 970,03 1012,29 1018,90 Point ģ

(Fo factor = 1.050) 1.106 \*\* \*\* Corrected JANEU 705 -

Failure surface No. 5 specified by 8 coordinate points

1650,00 1649.78 1645.00 1637.22 1762.83 Y-surf (ft) x-surf (ft) 338,05 338,05 346,99 363.68 847.31 859.23 Point No.

GEOLABS-WESTLAKE VILLAGE

## Sec. B6-B6' Pseudostatic

		(Fo factor = 1.054)	Failure surface No. 6 specified by 6 coordinate points									
	1857.05 1855.05	1.112 **	fied by 6 oc	Y-surf	(tr)	1658,06	1628.40	1769.36	1791.36	1672.43	1581.43	
	891,25	Corrected Janes FOS =	No. 6 speci	x-surf	(ft)	282.04	345,65	68,59	900.32	938.59	938.59	
A COMPONENTS	r- do	** Corrected	Failure surface	Point	жo.	ı	2	m	Tr.	ιΩ	9	

# \*\* Corrected DANES FOS = 1.113 \*\* (Fc factor = 1.054)

# Failure surface No. 7 specified by 9 coordinate points

y-surf (ft)	1550.00	1649.78	1645.00	1630,88	1782,44	1796.56	1887,19	1901.97	1509.97
x-sorf (ft)	337.59	338.00	346.99	377,28	965,29	971.87	1014,14	1021.03	1021.03
Pcint No.		cs	m	4	v	vo	۲-	œ	σ

# \*\* Corrected JANBU FOS = 1.114 \*\* (Fo factor = 1.055)

## Failure surface No. 8 specified by 7 coordinate points

		(Fo fac
y-sorf (ft)	1650.00 1622.17 3774.36 1795.45 1895.90 1995.90	1.114 **
x-surf (ft)	363.87 363.56 946.80 956.64 998.90 1003.48	JAMBU 905 =
Point No.	പരുത്തന്റെ	Corrected JAMBU 905
		‡

# \*\* Corrected JAMBU 905 = 1.114 \*\* (Fo factor = 1.056)

# Failure surface No. 9 specified by 6 coordinate points

Y-surf (ft)	1650.00 1638.42 1767.43 1788,35 1856.86 1864.86
x-surf (ft]	324.30 349.13 849.01 858.76 890.71
Point No.	4 00 W ቷ NO W

## Failure surface No.10 specified by 6 coordinate points

y-surf (ft)	1650.00 1631.04 1739.31 1782.70 1825.84 1833.84
x-sorf (ft)	342.51 343.18 760.75 780.98 801.10
Point No.	ካሪመቋጥቀ

# The following is a summary of the TEN most critical surfaces

(To factor = 1.056)

\*\* Corrected JANBU FOS = 1.116 \*\*

# Problem Description : Sec. B6-B6' #=70'J=5/W=50'D=5'Psecdo

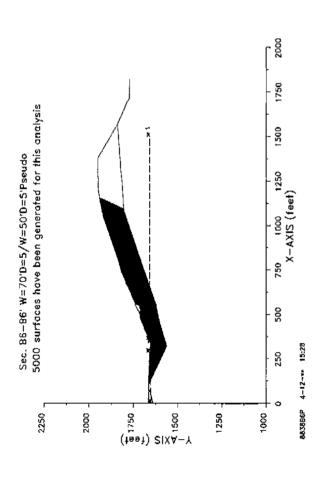
Available Strength (1b)	2.776E+06	2,3965+36	2.8072+05	2.6735+06	1.8683+06	2.3225+06	2.9741.406	3,0502+06	1.7702+06	3.4932+06
Terminal x-coord (ft)	1027,57	955,61	1020.50	1018.90	891.25	938.59	1021.03	1003.48	17.068	801,10
Initial x-coord (ft]	316.24	330.17	324.30	280.12	337,59	282,04	337,59	303.87	324.30	302,51
Correction Factor	1.051	1.054	1.053	1.050	1.054	1.054	1.055	1,056	1.052	1.056
Modified JANBU FOS	2.093	1.103	1.105	1.106	1.112	1.113	1.114	1.114	1,115	1.116
	m	κ.	ค่	÷	ď	6.	۲,	В.	ď,	70.

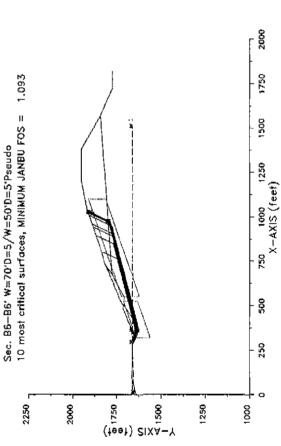
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(Fo factor = 1.052)

\*\* Corrected JANBU FOS = 1.115 \*\*

Sec. B6-B6' Pseudostatic





GEOLABS-WESTLAKE VILLAGE

W.O. 8838
Sec. B6-B6' Pseudo. Spencer's
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Ver. 5 20	96 - 1545	٠

Problem Jesoription : Sec. 36-B6' N#70'0=5/Www50'0=5'9s Spe

SECRET: BOUNDARY COORDINATES

24 SUREACE boundary segments

	Soil Unit Belch Segment	-	. 2	. 2	8	-	г	rt	1	гч	-	-4	- 1	1	7	1	1	1	m	m	m	ć*)	m	7	N
	y-right (ft)	1662.0	1658.0	1650.0	1650.0	1663.0	1663.0	1688.3	1688,0	1712.0	1712.0	1739.0	1739.0	1763.0	1763.0	1789,0	1789.0	1817.0	1930.0	1920.0	1950.0	1950.0	1840.0	1775.0	1775.0
	x-right (ft)	0.06	285.0	301.0	338.0	362.0	370.0	421.0	429.0	481.0	501.0	553.0	561.0	612.0	620.0	670.0	678.0	738.0	790.0	1050.0	1200.0	1380.0	1570.0	1720.0	1820,0
,	y-left (ft)	1662.0	1662.0	1658.0	1650.0	1650.0	1663.0	1563.0	1688.0	1688.0	1712.0	1712.0	1739.0	1739.0	1763.0	1763.0	1789.0	1789.0	1817.0	1830.0	1920.0	1950,0	1950.0	1840.0	1775.0
	x-left (ft)	0.	90.0	285.0	301.0	336.0	362.0	370.0	421.0	429.0	481.0	501.0	553.0	561.0	612.0	620.0	670.0	678.0	738.0	0.067	1050.0	1200.0	1360.0	1570.0	1720.0
	Segment No.	1	2	m	•	ιń	w		w	φ	70	::	7.7	13	14	15	16	13	18	61	20	23	22	23	24

	Scil Unit Below Segment	N	2	2	2	5	64
	y-right (fe)	1662.0	1645.0	1645.0	1707.3	1707.0	1775.0
cents	x-right (ft)	0.06	336.1	408.5	501.0	551.0	675.0
B SUBSURFACE boundary segments	y-left (ft)	1640.0	1650.0	1545.0	1545.0	1707.0	2,707.0
SURFACE DO	x-left (ft]	o,	338.0	338.1	408.0	501.0	551.0
B SUB	Segment No.	ч	Ø	m	7	ΔI	9

				Nater Surface	Š. 4	11 14							
ጠሎ	(feet) (feet)	X2.40 (pcf) equal to the a hydrostatic ther in the crack		Pressure un Constant	(jsd) C.	୧.୧			p-value [degrees)	40.00 25.00 40.00		o-value (degrees)	40.00 25.00 40.90
1817.3 1840.c				Parameter	<b>3</b> 8	90c.		m	c-value (psf)	200.0 100.0 200.0	m	c-value (psf)	225.0 100.0 225.0
738.0	SPECIFIED  Ground surface er in crack	in orack a vertical sind be affected cified depth o		Friction Rate		40.00		specified =	(£		= perilipeds	288 C	
1775.C 1775.0	BEEN SPE	vater 1 have rack a	Parameters	specified ht Cohesion at. Intercept	(psf) 200.0	200.0	CTH PARAMETERS Soil Unit(s)	ANISOTROPIC tion ranges spe		20.00 25.00 90.00	OTROFIC ranges spe	464	5.60 10.00 90.03
675.0 675.0	ZONE HAS		Soil Paran	t(s) Reig S		0 146.0	E 0	2 is ANIS direction	Counterclocker Direction Limit		3 is AMISOTROPIC direction ranges	Counterclockw Direction Limit	
r- 00		chit weight Failure surfaces specified depth c force according t	ISOTROPIC	3 Soil uni: Soil Unit Unit Moist		3 130.0	AMISOTROPIC S Specified for	Soil Unit Number of	Direction Range No.	ଜାରଣ	Soil Unit Number of d	Direction Range No.	
							1	-, <b>-</b>	ц		wz	H &	

1 Water surface(s) have been specified

## Sec. B6-B6' Pseudo. Spencer's

Unit weight of water = 52.40 (pcf)

points						AVALYSIS				
specified by 5 coordinate points	***************************************	y-nater (ft)	1650.00 1658.00 1650.00 1658.00 1658.00	earthquake loading ocefficient been assigned	ding coefficient ed	STRFACE HAS BEEN SPECIFIED FOR AVAINEIS	face specified by coordinate points :	y-surf	1650.00 1630.87 1793.46	1796,98 1887,61 1904,27 1904,27
Surface No. 1 spe	statetetetetetetetetetetetetetetetetetet	x-water (ft)	.00 285.00 338.00 356.00	izontal earthquake loa 156 has been assigned	A vertical earthquake loading of .000 has been assigned	FAILTE SURFACE	B. St.	nt x-surf		977.64 1019.91 1027.67 1027.67
Water Surf	***************************************	Point No.	रा था ला चळा	A horizontal of .156 has	A vertical of .000	A SINGLE E	Trial failure the following	Point No.	ним	<b>ማ</b> ተወטኑ

4. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		****					
Slice	x-base [ft]	y-base (ft)	y-base height (ft) (ft)	width (ft)	alpha	<b>%</b>	velght (Ib)
-	328.12	1645.39	4.61	19,76	-25,00	8,	12747
C)	338,05	1640.76	9.27	.10	-25,00	28.44	128
m	347,05	1636,56	18,34	17.90	-25,00	28.44	44911
Ť	357.63	1,631.63	29.00	3.26	-25,00	28.54	12396.
'n	360,63	1631.23	31.03	2,74	14.77	28.44	11549
ъ	366,00	1632,65	30,35	9,00	14.77	00	32876
۲	389.00	1638.71	33.60	38.00	14, 17	26.13	168141
œ	414 50	1645 42	90	12 00			0000

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85000 0000 0000 0000 0000 0000 0000 000	਼ ਲੂਜਿੰਜੇਸੀ ਜੋਸੋਜੋ -	0-base (1b) (1b) (1b) (1b) (1b) (1b) (1b) (1b)
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20 111 112 113 114 116 116 117 117 117 117 117 117 117 117	SUICE	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

. Total strasses at center of slice base

SPENCER'S (1973)

## W.O. 8838 Sec. B6-B6' Pseudo. Spencer's

Shear Stress (ps:)	2721.2 4642.8 8360.2	910.3 848.5 848.7	1508.0 1595.1	826.4 163.4 143.6	2300.6 2575.5 2739.7	3180.2 3140.9 3397.8	3664.6 3931.5 4758.9 2763.5 1722.0
Pore Water Pressure (psf)		1645.5 11 1670.4 1582.0			9 <b>9 9 9</b> 9		
Vertical Pore Stress Pred (psf) (g					6430.0 7223.2 7136.5 7706.3	6 88 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	10395.0 11170.8 12122.5 12928.3 7796.5
Normal Vert Stress Str (psf) (p				5387,6 5387,6 5335,4 5330,4			9275.1 103 9966.2 111 10814.0 121 2210.0 771 489.4 19
z v)	-						
Slice Base # x-coccd (ft)	1 328.12 2 338.05 3 347.05	4 357.63 5 369.63 6 366.00	6 414.50 9 425.00	10 443.59 11 471.59 12 491.00 13 526.00			21 754,00 22 754,00 23 883,00 24 976,82 25 998,78 26 1023,79

# SPENCER'S (1973) - Magnitude & Location of Interslice Forces

Height Ratio		979.	076	.461	. 433	439	. 523	.592	. 605	.674	. 695	. 698	848	.781	.778	.827	.786	.826	747	.765	376	.700	.114	.457	.453	424	- 033
Soundary Eeight	(LE)	9.22	9,32	27.36	30,65	31.41	29.30	27.91	40.85	38.74	45.33	49.04	43.76	56.54	57.05	54.95	55,50	63.39	76.21	74,89	74.10	86,28	85.57	100.92	18.76	21.97	8.00
Force Height	(IC)	9.02	9.04	12.62	13.27	13.79	15.32	22.45	24.74	26,13	31.49	34.20	37.13	44.15	44.41	45.44	51.51	52.38	56.94	57.29	57.51	60.40	61.08	46,13	45,38	9.32	- 29
Interslice Force	(TD)	97885,	98728,	371984.	443431.	441185.	434971.	4:1148.	404986.	401777.	392940.	389599.	386102.	376337.	375875.	374059.	361181.	356957.	343462.	341743.	340728.	338347.	297141.	213356.	200397.	6188.	-699
Porce	(cedrees)	24,35	24,35	24.35	24.35	24,35	24.35	24.35	24.35	24.35	24.35	24.35	24.35	24.35	24.35	24,35	24.35	24.35	24.35	24.35	24.35	24.35	24.35	24.35	24.35	24.35	00.
Kight x-coord	7	338.00	338,10	356.00	359.25	362,00	370.00	£08,00	.21.00	429.00	462.17	481.30	531.00	551.00	553.00	561,00	612.00	620.00	670,00	675.00	678.00	738.00	790,00	976.00	977.64	1019.97	1027,67
511Ce		1	2	m	•	L/J	φ	۲-	80	Ø	2	11	12	13	14	12	16	3.7	18	13	50	21	55	13	24	52	26

## AVERAGE VALUES ALONG FAILURE SURFACE

(fsd)	(5sd)	(jsd)
7335.36	151.66	3126.85
Total Normal Stress =	Pore Mater Pressure =	Shear Stress =

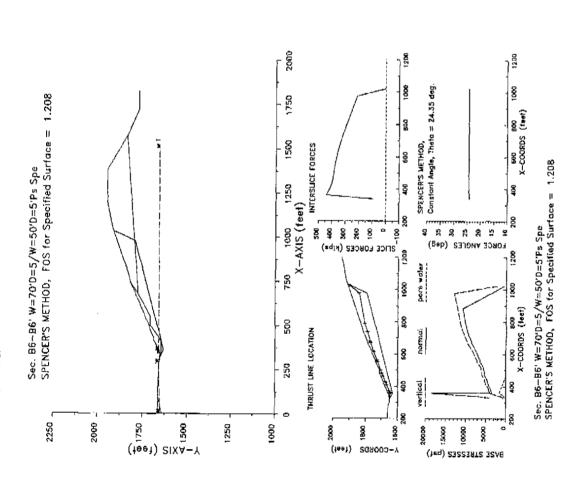
lotal Length of failure surface = 805.34 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

FACTOR OF SAFETY = 1.208

Total shear strength available along specified failure surface = 297.18E+04 lb

W.O. 8838 Sec. B6-B6' Pseudo. Spencer's sesseers ←12--- 1528



Sec. B6-B6' Backcut

4-12-\*\* 16:16 XSCABL File: 883836B

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Problem Description : Sec. B6-B6' Backcut

SECRENT BOUNDARY COORDINATES

16 SURFACE boundary segments

Soil Unit Below Segment	1	63	eve eve	C)	64	7	2	2	2	m	m	٣	m	m	23	2
y-right (ft)	1662.0	1658.0	1650.0	1650.0	1645.0	1645.0	1707.0	1707.0	1775.0	1817.0	1920.0	1950.0	1950.0	1840.0	1775,0	1775.0
x-right (ft)	0.06	285.0	301.0	338.0	338.1	408.0	501.0	551.0	675.0	738.0	1050.0	1200.0	1380,0	1570.0	1720.0	1820.0
y-left (ft)	1662.0	1662.0	1658.0	1650.0	1650.0	1645.0	1645.0	1707.0	1707.0	1775.0	1817.0	1920.0	1950,0	1950.0	1840.0	1775.0
x-left (ft)	٥.	90.06	285.C	301.0	338.0	338.1	408.0	501.0	35I.C	675,0	738.0	1050.0	1200.0	1380.0	1570.0	1720.0
Segment No.	-1	6	m	4	ហ	9	7	Ф	o,	10	1:	12	13	14	15	16

2 SUBSURFACE boundary segments

Soil Unit Below Segment	લ્ય લ્ય
	1562,0 1840.0
x-right (ft)	90.0 1570.0
y-left (ft)	1646.0 1775.0
x-left (ft)	675.0
Segment No.	12

A CRACKED ZONE HAS BEEN SPECIFIED

(feet) (feet) (pof) Depth of crack below ground surface = 8.30
Maximum depth of water in crack = .30
Unit weight of water in crack = 62.40 Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic

force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Water Surface No.	
essure Constant (psf)	ن و م
Pors Pressure Parameter Constant Ro (psf)	000
Priction	34.00
Angle	40.00
(deg)	40.00
Cohesion	200.0
Intercept	200.0
(psf)	225.0
Weight C	135.0
Sat. 3	143.0
(pof)	140.0
Unit 1	125.0
Moist	130.0
(pof)	130.0
Sox: Unit No.	11010

AMISOTROPIC STRENGIH PARAMETERS specified for 2 Sail Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

í~value (degrees)	40.00 25.00 40.00
c-value (psf)	200.0 100.0 200.0
Counterclockwise Direction Limit (deg)	10.00 15.00 90.00
Direction Range No.	-1 6) FB

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified =  $\beta$ 

i-value [degrees]	40.00 25.00 40.00
c-value (psf)	225.0 100.0 225.0
Counterclockwise Direction Limit (deg)	5,00 10,00 90.00
Direction Range No.	el N M

A critical failure surface searching method, wsing a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Mankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of

GEOLABS-WESTLAKE VILLAGE

Backcut
B6-B6'
Sec.

	Width (ft)	90.001			ned	sq.					= 1.070)	ន						= 1.068)	ī,						= 1.067)	ø,		
	y-right (ft)	1650.0 1860.0	the :	* *	surfaces examined first	coordinate points					(Fo factor	coordinate point						(So factor	coordinate points						(Fo factor	coordinate point		
	x-right (ft)	520.0 1100.0	calculated by	JANBU METHOD ••	failure critical	fied by 6 coo	Y-surf (ft)	1645.00 1639.48	1709.80	1802.97 1809.97	1.480 **	ρž	y-surf (ft)	1651.23	1644.53 1728.31	1782.65	1836,31 1838,31	1.497 **	ad by 6	y-surf [ft)	1657.58	1651.90	1783.62	1835.33 1843.33	1.518 **	Ψ	y-surf (ft)	1645.00
II 100.0 ft	Y-left (ft)	16C0.5 1660.0	ћаче Бееп	SIMPLIFIED JANBU	of all - the mo	No. 1 specifi	x-surf (ft)	00		5.5	CANBU FOS =	No. 2 specified	x-suzf (ft)	417.34	431.70	780.32	802.54	= SOS DENAC	Ko. 3 specifi	x-surf (ft)	425.88	439.06	793.65	817,76 817,76	JANEU FOS =	No. 4 specified by	x-surf (ft)	390,73
-Bo Backcull sliding block is	x-left (ft)	410.0 600.0	rs of safety	#	10 most critical displayed below	surface	Point No.	1 2	m ч	ינאי	Corrected CA	ure surface M	Point No.	<b>,-</b> 1	en m	<b>.</b>	пф	Corrected J3	surface	Point No.	-1	<b>N</b> (	ul an	иv	Corrected J?	surface	Point No.	1
. 50-50	Box nc.	+1 NI	Factors	*	The 1 are d	Failure					‡	Failu						*	Failure						*	Failure		

: (Fo factor = 1.067) ccordinate points	(Fo factor = 1.067)	(Fo factor = 1.06B)	• (Fo factor = 1.073)	* (Po factor = 1.074)
1635.76 1729.24 1784.37 1839.23 1847.23 1.519 *** Fied by 6	1655.38 1646.24 1733.68 1835.60 1835.23 1.519 **	7-8011 (ff) 1645.30 1633.14 1724.61 1784.41 1847.47 1.530 ***	y-surf (F:) 1654.17 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 1720.79 17	Y-surf (ft) 1645.00 1629.75 1781.52 1821.42 1831.42 1.550 **
410.55 778.29 823.99 823.58 825.58 3ANBJ FOS = No. 5 specii x-surf (ft)	423.57 443.18 770.13 793.35 817.45 817.45 JANED FOS =	(ft) 392-92 418-36 776-74 804-63 830-30 830-30 JANBU POS =	X-surf (Et) 435.32 454.71 723.47 751.33 769.44 JAVBU FOS =	x-surf (ft) 405.41 438.12 726.75 752.05 731.68 731.68 734.69
2 4 6 5 second of the surfact Point No.	1 2 3 4 4 6 6 ** Corrected:	reinc No. 1 2 3 3 4 5 6 6 ** Corrected	Point No. 1 2 3 4 4 5 6 6 6 6 7 8 1 8 1 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Point No. 1 2 3 3 4 4 6 6 6 Failure sucface

## GEOLABS-WESTLAKE VILLAGE

Sec. B6-B6' Backcut

							(Fo factor = 1.071)
y-surf (ft)	1645.CO	1634.01	1718.02	1784.03	1837.47	1845.47	1.552 **
x-surf (ft)	396.65	420.22	768.53	799.33	824.25	624,25	Corrected JANBU FOS =
Point No.		63	m	4	ស	ý	Corrected
							*

Failure surface No.10 specified by 6 coordinate points

y-surf (ft)	1645.86 1641.83 1726.07 1784.50 1839.92
x-surf (ft)	409.30 417.94 778.56 805.81 831.65
Point No.	ପର ଓ କ୍ରହ

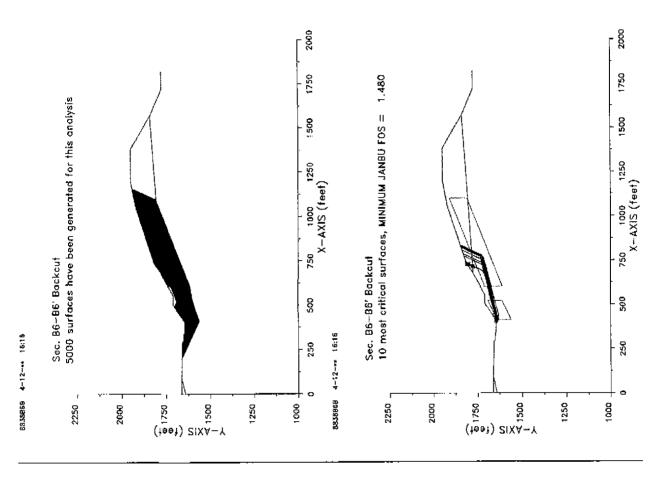
(Fo factor = 1.069) 1.552 \*\* \*\* Corrected JANBU FUS =

The following is a surmary of the CEN most critical surfaces

Problem Description : Sec. 86-36' Backcut

Avzilable Strangth (1b)	8.886E+05 1.308E+06	1.2835+06	1.3962+06	1,7:02+06	1.0755+06	1.581E+06	1,7285+06	1.5910+06
Terminal x-cootd (ft)	727.45	817.76	829.58 817.45	830.30	769,44	78. 68	824.25	831.65
Initial x-coord (ft)	407.00	426.88	390.73	392.92	435.32	405.41	396,65	409.30
Correction Factor	1.070	1.067	1.067	1.068	1.073	1.074	1.071	1,069
Modified Jawau Fos	1.480	1.518	1.519	1.530	1.531	1,550	1.552	1.552
-	1.	'n	∳ က်	6	Ļ.	ю	o,	10,

\* \* \* FND OF FILE \* \* \*



GEOLABS-WESTLAKE VILLAGE

Sec. C-C' W=110' D=5' W.O. 8838

4-13-\*\* 14:11

XSTABL File: 8838C

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* \* Var. 5.2Cl 96 à 1545 \* Copyright (C) 1992 A 96 Interactive Software Designs, Inc. Moscow, ID 83843, U.S.A. Slope Stability Analysis All Rights Reserved using the Method of Slices XSTABL

Problem Description : Sec. C-C' Wmilt' D=5'

SEGMENT BOUNDARY COORDINATES

15 SURFACE boundary segments

Soil Unit Below Segment 1943.0
1975.0
1975.0
1962.0
1962.0
1962.0
1962.0
2010.0
2010.0
2032.0
2032.0
2040.0 x-right (ft) 280.0 355.0 365.0 3810.0 510.0 576.0 678.0 643.0 643.0 693.0 725.0 y-left (ft) 1936.0
1943.0
1975.0
1975.0
1962.0
1962.0
1962.0
1962.0
2010.0
2010.0
2010.0
2010.0
2010.0
2010.0
2010.0
2010.0
2010.0 x-left (ft) .0 280.0 355.0 365.0 381.0 510.0 528.0 576.0 584.0 635.0 643.0 701.0 725.0 800.0 Segment No. 

8 SUBSURFACE boundary segments

Below Segment Soil Unit y-right (ft) 1938.0 1957.0 1957.0 1957.0 1957.0 1957.0 x-right (ft) 280.0 310.0 310.0 310.0 509.0 530.1 640.0 1875.0 1938.0 1538.0 1957.0 1957.0 1957.0 y-left (ft) 310.0 381.0 509.0 530.0 530.1 0.082 x-left (££) 20

A CRACKED ZONE RAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00

Failure surfaces will have a vertical side equal to the apposited depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack = .00 = 62.40 Maximum depth of water in crack Unit weight of water in crack

riction Pore Pressure Mater Angle Parameter Constant Surface ě (bsd) 990, 2 Friction 34.00 40.00 (f. Intercept (psf) ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s) 200.0 Cohesion ISOTROPIC Soil Parameters 2 Soil unit(s) specified 130.0 340.0 Sat. (bod) Unit Meight 125.0 Unit Mosst (jod) Soil ò

00

Scil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 11.00 40.00
c-value (psf)	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	21.06 24.00 90.00
Direction Range No.	-1 Q1 M

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

The active and passive portions of the sliding surfaces are generated according to the Rantine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 fr

Wicth (ft) 50.0 y-right (ft) 1950.0 1980.0 x-right (ft) 670.0 920.0 y-left (ft) 1930.0 x-left (ft) 540.0 730.0 Вех 30.

(feet)

#### W.O. 8838 Sec. C-C' W=110' D=5'

Failure surface No. 1 specified by 8 coordinate points

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

Point x-suxf y-suxf No. (ft) (ft) 1 526.81 1962.00 2 530.03 1962.29 3 536.11 1957.00 4 583.82 1934.80 5 777.81 2011.57 6 780.14 2016.56 7 782.26 2028.55

\*\* Corrected JANES FOS = 1.598 \*\* (To factor = 1.060)

Failure surface No. 2 specified by 4 coordinate points

Point x-surf y-surf No. (Et) (Et) 1 510.49 1962.00 2 577.60 1932.71 3 797.76 2017.45 4 797.76 2025.45 Failure curface No. 3 enemified by 5 coordinate points

(Fo factor = 1.060)

1.602 \*\*

\*\* Corrected JANES FOS =

Failure surface No. 3 specified by 5 coordinate points

Point x-surf Y-surf No. (ft) (ft) 1 484.25 1962.00 2 433.66 1957.00 3 562.32 1924.98 4 792.32 2018.54 5 792.32 2026.54

(Fo factor = 1.064)

1.610 \*\*

\*\* Corrected JANEC FOS =

Pailure surface No. 4 specified by 7 coordinate points

Foint x-surf y-surf
No. (ft) (ft)
1 486.94 1962.00
2 496.34 1957.00
3 553.52 1925.57
4 735.21 1991.70
5 773.17 2026.37
7 753.17 2034.37

(Fo factor > 1.066) (Fo factor = 1.068) (50 factor = 1.072) (Fo factor = 1.067) Failure surface No. 5 specified by 7 coordinate points Failure surface No. 6 specified by 7 coordinate points No. 7 specified by 7 coordinate points Failure surface No. 8 specified by 5 coordinate points Failure surface No. 9 specified by 6 coordinate points 1.666 \*\* 1.687 \*\* 1.692 \*\* 1.693 \*\* 1963.75 1957.03 1935.43 2005.43 2005.19 2022.97 1964.49 1955.00 1935.75 2004.27 2008.00 2023.37 2031.37 1997.73 1998.05 2026.64 2034.64 1962.00 1957.00 1922.90 2017.95 2025.96 y-surf (ft) y-surf (ft) y-surf [ft] 1962.00 1957.80 1957.00 y-surf (ft) 1967.53 1357.00 y-surf (ft) 1939.49 \*\* Corrected JANBU FOS = \*\* Corrected JANBU FOS = \*\* Corrected JANBU FOS = x-surf (ft) x-surf (ft) x-surf (Et) 491.21 500.61 573.75 795.20 x-surf (ft) x-sucf (ft) 533,65 546.34 592.67 761.05 762.80 770.13 535.21 549.30 594.87 758.26 760.00 768.17 541.55 561,35 598.90 736.45 735.61 751.60 522.18 530.08 531.59 \*\* Corrected JANBU FOS Failure surface Point No. Point No. Point No. Point Point -1 V M 4 V V V

## GEOLABS-WESTLAKE VILLAGE

(Fo factor = 1.072)

1.657 \*\*

\*\* Corrected JANBU FOS =

Sec. C-C' W=110' D=5'

2016.38	2024.38	
803.33	803.33	
ıΛ	çs	
	803.33	5 603.33 2016.38 5 803.33 2024.38

\*\* Corrected JANBU FOS = 1.697 \*\* (Fo factor = 1.061)

Failure surface No.10 specified by 7 coordinate points

y-surf (ft)	1967.70	1939.71	2016.06	2020.71	2028.71
x-surf (ft)	541.93	599.13	778.96	781.44	781.44
Point No.	2 1	Mα	·u)	9	ļ~s.

The following is a summary of the TEN most critical surfaces

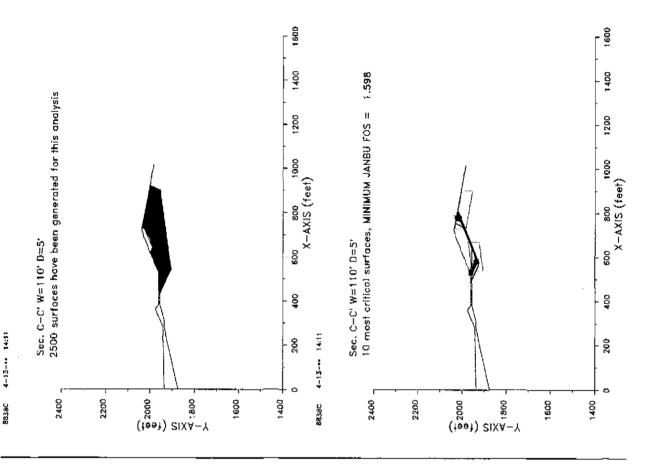
(30 factor = 1.054)

\*\* Corrected JAMEU FOS = 1.703 \*\*

Problem Description : Sec. C-C' W=110' D=5'

itial		Correction In
x-crosto (ft)	4	
526.81		
510.49	vi	
84.25	7	1.064
86.94	4	
33.65	s	
35.21	'n	
41.55	峭	
91.23	=	
22.18	И	
41.23	u	

\* \* \* END OF PILE \* \* \*



## Sec. C-C' Pseudostatic

XSTASL File: 8838CP 4-13-\*\* 14:11

Problem Description : Sec. C-C' R=110' D=5' Pseudo

SECMENT BOUNDARY COORDINATES

15 SURFACE boundary segments

Below Segment Soil Unit y-right (St.) 1943.0 11975.0 11975.0 11962.0 11962.0 11984.0 11984.0 2010.0 2010.0 2032.0 2032.0 2032.0 2032.0 280.0 355.0 365.0 365.0 510.0 576.0 584.0 663.0 643.0 643.0 643.0 693.0 x-zight (Et) y-left (ft) 1936.0 1943.0 1975.0 1962.0 1962.0 1962.0 1984.0 2010.0 2010.0 2032.0 2032.0 2040.0 1984.0 x-left (ft) .0 285.0 385.0 385.0 510.0 510.0 510.0 643.0 643.0 701.0 725.0 8D0.0 Segment Š. 

8 SUBSURFACS boundary segments

 Sagment
 x-left
 y-left
 x-right
 y-right
 y-right
 soil Unit

 No.
 (ft)
 (ft)
 (ft)
 (ft)
 soil Unit

 1
 .0
 1975.0
 280.0
 1938.0
 2

 2
 280.0
 1938.0
 310.0
 1938.0
 2

 3
 310.0
 1938.0
 381.0
 1957.0
 2

 4
 330.0
 1957.0
 509.0
 2957.0
 2

 5
 509.0
 1957.0
 509.0
 2957.0
 2

 6
 530.0
 1957.0
 640.0
 2957.0
 2

 7
 550.0
 1957.0
 500.0
 2
 2

 8
 640.0
 1957.0
 2025.0
 2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)

Maximum depth of water in crack = .00 (feet Unit weight of water in crack = 52.40 (pcf) Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROFIC Soil Parameters

2 Soil unit(s) specified

Soil Unit Meight Cohesion Friction Pore Pressure Maren Unit Moist Sat. Intercept Angle Parameter Constant Surface No. (pof) (pcf) (psf) (deg) Ru (psf) No.

00

.000. C00.

34.00 40.00

200.0 225,0

13C.D 14C.D

125.0

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

 Direction
 Counterclockwise
 c-value
 i-value

 Range No.
 Direction Lint (deg)
 (psf.)
 (degrees)

 1
 21.00
 225.0
 46.00

 2
 24.00
 150.0
 11.00

 3
 90.00
 225.0
 40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquate loading coefficient of .300 has been assigned

A critical fallure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft.

(Fo factor = 1.054]

 $\{Fc\ factor = 1.061\}$ 

	(Fo factor = 1.0	ccordinate points				(Fc factor = 1.0	coordinate points					(Fo factor = 1.0	coordinate points					(Fo factor = 1.0	coordinate points				(Fo factor = 1.0)
1939.71 2007.93 2016.C6 2025.71 2028.71	1.171	5 specified by 5 co	Y-surf (ff)	1962.00 1957.80 1957.00 1930.25	2016.3E 2024.38	1,174 **	specified by 7 co	y-surf (ft)	1962.00 1957.00	1925.67	2026.83 2034.37	1,174 **	r-	y-surf (f:)	1963,75 1957.00 1935.40	2005.43	2030.97	1.175 **	φ	y-surf (ft)	1964.99 1957.00 1935.51	2011.82 2018.65 2026.65	1,187 **
599,13 715,17 718,96 781,44	JANBU FOS =	õ	X-Surf	522.18 530.08 531.59 588.96	803.33 803.33	JAMBO 70S -	w.	x-surf (fe)	496,94	735.23	753.17 753.17	JAKEU FOS =	a Mc. 7 specified by	x-surf (ft)	533.65 546,34 592.67	761.05	770.13	JANEU FOS =	P. No. 8 specified by	(43)	536.24 551.26 597.35	788.58 791.76 791.76	JAMBU POS =
<u>ሁ</u> 44 RJ ለል L~	** Corrected	Failure surface	Point No.	ними	w w	** Carrected	Failure surface No.	Point No.	7 7	ω ⇔ n	) a t-	** Corrected	Failure surface No.	Point No.	ମ ଠା ପ			** Corrected JANEB	Failure surface	Point No.	-1 0 C	ու որ ան	** Corrected JANBU 70S
, L	1956.3 50.0 1980.3 50.0			surfaces examined	e points			-	(Fo factor = 1.060)	e points					(Fo factor = 1.060)	e points					(FG ractor = 1.064) dinate points		
x-right (ft)	900.0	4	+		ied by 4 coordinate	y-surf (ft)	1962.00	2027.45 2025.45	1.118 ** (50	ied by 8 coordinate points	y-surf (ft)	1962.00 1960.29	1934.80	2016.56 2020.55 2038.55	*	ied by 5 coordinate points	y-surf (ft)	1962.00	1957.30 1924.98 2018.54	3	1.331 ** ed by 7 coor	Y-surf (ft)	1967.70 1957.00
	2010.0	safety have been calculated by	SIMPLIFIED JANEU	tical of all selow - the mo.	No. 1 specif	x~surf (f:)	510.49	797.76	JAKBU POS -	No. 2 specifi	x-surf (ft)	525.81 530.03		780.14 782.26		No. 3 specif	x-surf (ft)	484.25	493.65 562.32 792.32		JANEU FOS =	(13)	541.93 562.06
· ·	2 730.0	Factors of safe	* * * * * SIX	The 10 most critical of all the failure are displayed below - the most critical	Failure surface No. 1 specifi	Point No.	1	ım w	** Corrected JAKBU POS	Failure surface No. 2 specifi	Point No.	01 m	ነቀረሳ	ωrα	** Corrected JANEU FOS	Failure surface No. 3 specifi	Point No.	-	ଧଳ	vs i	** Corrected Janky FUS * Failure surface No. 4 specifi	Point No.	M 62

(Fo factor = 1.072)

(Fo factor = 1.066)

(Fo factor = 1.063)

W.O. 8838

Sec. C-C' Pseudostatic

Failure surface No. 9 specified by 6 coordinate points			
ified by 6	y-surf (ft)	1962.00 1960.98 1957.00 1930.95 2016.35	2024.35
No. 9 speci	x-surf (ft)	528.10 530.02 537.50 593.36 803.48	803,48
Failure surface	Point No.	- የጠቀග	w

\*\* Corrected JANBU FOS = 1.190 \*\* (Fo factor = 1.062)

Failure surface No.10 specified by 5 coordinate points

y-surf (ft)	1962.00 1957.00 1922.90 2017.96 2025.96
x-surf (ft)	491.21 500.61 573.75 795.20
Point No.	номчи

The following is a summary of the TEN most critical surfaces

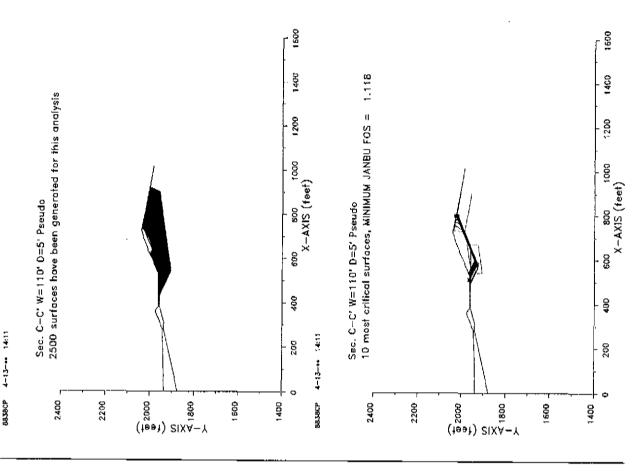
(50 factor = 1.057)

\*\* Corrected JANEU FGS = 1.190 \*\*

Problem Description : Sec. C.C. W=110: D=5: Pseudo

Available Strength (1b)	6.0538+05	5.554E+05	6.433E+05	5.398£+05	6.565E+0S	6.364E+05	5.6760+05	5.957E+05	6.5948+05	7.1452+05
<pre>ferminal x-coord {ft]</pre>	797.76	782.26	792.32	781,44	803.33	753.17	770.13	791.76	803,48	795.20
Initial x-coord (ft)	510.49	526.81	484.25	541,93	522.18	486.94	533.65	536.24	528.10	491.21
Correction Factor	1.060	1.050	1.064	1.064	1.061	1.072	1.066	1.063	1.062	1.067
Modified JANBU FOS	1.118	1.119	1.131	1.171	1.174	1.174	1.:75	1,187	1.190	1.190
	Ľ,	2.	mi		5.	ف	۲.	an)	o.	10.

\* \* \* 3III 30 ON3 \* \* \*



GEOLABS-WESTLAKE VILLAGE

## Sec. C3-C3' W=90' D=5'

XSTABL File: BB38C3 4-13-\*\* 9:22

* XSTABL		*
-		*
* Slope Stability Analysis		*
* using the		*
* Method of Slices		#
*		#
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<ul> <li>Moscow, 10 83843, U.S.A.</li> </ul>		*
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* All Rights Reserved		*
*		*
* Ver. 5.201 96.	96 A 1545	*
*****************************	******	*

Problem Description : Sec. C3-C3' W=90' D=5'

SECRENT SOUNDARY COORDINATES

12 SURFACE boundary segments

Soil Unit Below Segment	нн	н 6	1 61	2	2	27	2	m	1	5
y-right (ft)	1870.0	1880.0	1895.0	1919.0	1939.0	1935.0	1935.0	1935.0	1957.0	1957.0
x-eight (fc)	100.0	205.0	246.0	296.0	304.0	336.0	475.0	624.0	665.0	695.0
y-left (ft)	1870.0	1880.0	1895.0	1895.0	1919.0	1919.0	1935.0	1935.0	1935.0	1957.0
x-left (ft)	0.001	120.0	238.0	246.0	296.0	304.0	336.0	475.0	624.0	655.0
Segment Mo.	ı ( N	กร	run	\a	۲-	00	σ	91	11	12

6 SUBSURFACE boundary segments

Soil Unit		T	1		-	-	1
y-right	1	1875.0	1875.0	1935.0	1930.0	1930.0	1957.0
x-right	311	205.1	295.0	475.0	624.1	654.0	695.0
y-left	(11)	1880,0	1875.0	1875.0	2935.0	1930.0	1930.0
z-left	(11)	205.0	205.1	295.0	624.0	624.1	654.0
Segment	6	-	2	m	7	'n	Ψ

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.30 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vartical side equal to the specified depth of crack and be affected by a hydrostatic

force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

### 2 Soil unit(s) specified

Water Sprface No.	00
essure Constant (psf)	ਨੂੰ ਹੈ
Pore Pressure Parameter Constant Ru (psf)	000.
Friction Angle Pa (deg)	40,00
ohesion ntercept (psf)	225.0 200.0
Weight C Sat. 1 [pcf]	135,0
Unit Woist (pcf)	130.0 125.0
Soil Unit No.	1 %

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

### Soil Unit ! is ANISOTROPIC

Number of direction ranges specified = 3

1-value (degrees)	40.00 11.00 40.00
c-value [psf]	225.0 150.0 225.0
Counterclockwise Direction Limit (deg)	12.00 16.00 90.00
Direction Range Mc.	HOIM

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trual surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Langth of line segments for active and passive partions of sliding block is  $100.0\ \mathrm{ft}$ 

Ridth (ft)	50.0
y-right	1875.0
(f:)	1902.0
x-right (ft)	350.0
y-left	1850.0
(ft)	1902.0
x-left	210.0
(ft)	380.0
жож	40

Eactors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED JANED METHOD \* \* \* \*

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

Failure surface No. 1 specified by 7 coordinate points

							(Fo factor = 1.Da
y-surf (ft)	1883.00	1875.06	1858.51	1919.81	1927.00	1935.00	1.708 **
x-surf (ft)	197.70	207.10	242.47	457.04	460.39	460.39	JANES FOS =
Print No.	~ (	o m	4	ĸ	ø	۲	Corrected JANTED FOS
							<b>;</b>

Failure surface No. 2 specified by 5 coordinate points

y-surf (ft)	1855.39 1923.55 1927.00 1935.00
x-surf (ft)	172.56 225.34 495.71 497.33
Point No.	ଳା ରାଜ୍ୟ ହି

\*\* Corrected JANBU FOS = 1.714 \*\* (Fo factor = 1.043)

Failure surface No. 3 specified by 6 coordinate points

y-surf	(ft)	1880.00	1655.28	1908.55	1917.25	1927.00	1935.00
X-sur&	(££)	177.38	230.40	417.69	421.75	426.93	426.93
Point	ÑC,	.,	2	6	*7	Ŋ	ĸ

\*\* Corrected JANED FCS = 1.714 \*\* (Fo factor = 1.056)

Sailure surface No. 4 specified by 6 coordinate points

y-sarf (ft)	1858.30 1901.46 1910.26 1927.00 1935.00
x-surf (ft)	229.59 229.59 396.68 409.58 409.68
Point No.	୍ଟ ରାମ ହେଉପ

\*\* Corrected JAMBU FOS = 1.715 \*\* (Fo factor = 1.056)

Failure surface No. 5 specified by 6 coordinate points

Point x surf Y-surf

No. (ft) (ft)

(Fo factor = 1.060)	ordinate points	(Fo factor = 1.046)	(Fo factor = 1.038)	(Po factor = 1.038	(Fo factor = 1.038
1880.00 1856.24 1898.14 1906.55 1927.00 1935.00	Y-surf (ft) (ft) 1880.30 1837.25 1908.52 1927.00	fied by 7 co y-surf (ft) 1880.00 1875.00 1875.00 1927.00 1927.00	1.742 ** fied by 5 co y-surf (ft) 1880.00 1861.35 1916.47 1925.00	1.755 **  Frauf by 7 ' Y-surf (E) 1880.00 1878.48 1855.00 1825.00 1927.00	1.769
176.73 227.69 385.74 389.66 400.53 400.53	No. 6 speci x-surf (ft) 166.35 215.14 446.28 451.90 454.90	No. 7 speci x-surf (ft) 199.91 205.05 209.31 471.21 477.66	JANEU FOS = 1, No. 8 speci x-surf (ft) 192.97 478.42 483.33 483.33	JAKEN FOS =  No. 9 spect  X-surf  (ft)  202.17  205.03  211.57  241.83  452.28	JANEL FOS =
1 2 2 3 4 4 4 4 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Fallure surface Point No. 1 2 2 3 4 4	Fallure surface Point No.  1 2 2 3 4 4 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Failure surface Point No. 1 2 2 3 4	** Corrected Failure surface Point No. 1 2 3 4	f Corrected

Failure surface No.10 specified by 6 coordinate points

y-surf (ft)	1833.94	1875.00	1853.94	1921.49	1927.00	1935.00
x-surf (ft)	213.66	230,47	254.18	458.10	470.67	470.67
Point No.		63	e	7	r.s	9

The following is a summary of the TEN most critical surfaces

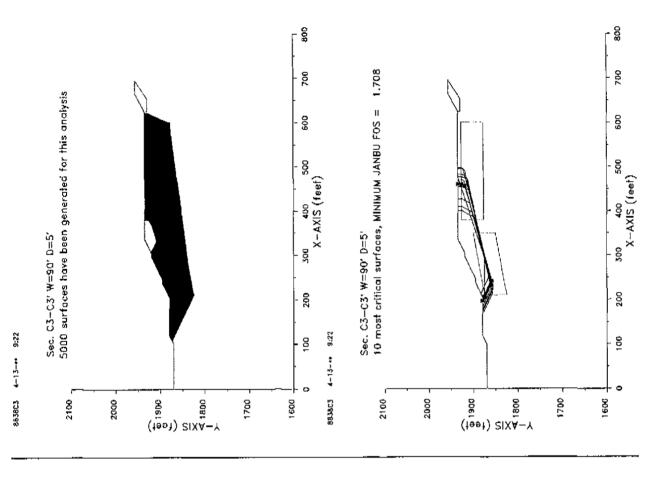
(Fo factor = 1.045)

\*\* Corrected JANEU FOS = 1.769 \*\*

Problem Description : Sec. C3-C3 # 990' D=5'

Available	Strength	(1P)	3,7188+05	4.142E+05	3.755E+05	3.4395+65	3.5396+05	3.7948+05	3.652E+05	3.771E+05	3.8892+05	3.4415+05
		(ft)	460.39	497.31	125.93	409.68	400.53	454.90	477.86	483.33	495.81	470.67
		(££)	197.70	172.56	177.38	183,44	176,73	166.35	199.91	191.97	202.17	213.66
Correction	Factor		1.047	1.043	1,055	1,056	1.060	1.046	1.039	1.038	1.038	1.045
Modified	JANUARO FOS		1.708	I.714	1.714	1.715	1.733	1.739	1.742	1.755	1.769	1 769
			1	7	'n	4	ď,	ė.	7.	æ	۰.	9

\* \* \* SMD OF FILE \* \* \*



Problem Description : Sec. C3-C3' W=90' D=5' Pseudo

SEGMENT BOOKDARY COORDENATES

12 SURFACE boundary segments

Soil Unit Below Segment	1		_	64	7	2	7	5	2	-		~
y-right (ft)	1870.0	1830.0	1880.0	1895.0	1895.0	1919.0	1919.0	1935.0	1935.0	1935:0	1957.0	1957.0
x-right (ft)	100.0	120.0	205.0	238.0	246.0	296.0	304.0	336.0	475.0	624.0	665.0	695.0
y-left (ft)	1870.0	1870.0	1880.0	1880.0	1895.0	1895.0	1919.0	1919.0	1935.0	1935.0	1935.0	1957.0
x-left (ft)	٩.	100.0	120.0	205.0	238.0	246.0	296.0	304.0	336.0	475.0	624.0	665.0
Segmen: No.	н	63	m	4	3	9	-	69	o,	01	11	12

6 SUBSIRFACE boundary segments

Soil Unit Belok Segment	1	1	-1	1	-	1	
y-right (ft)	1875.0	1375.0	1935.0	1930.0	1930.0	1,957.0	
x-right (ft)	205.1	295.0	475.0	524.1	654.0	695.0	
y-left (ft)	1880.0	1875.0	1875.0	1935.0	1930.0	1930.0	
x-left [ft)	205.0	205.1	295.0	624.0	624.1	654.0	
Segment No.	1	N	m	4	S	9	

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 0.00 (feet) Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic

force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit[s] specified

Water Surface No.	00
essure Constant (psf)	0.0
Pore Pressure Parameter Constant Ru (psf)	000.
Friction Angle (deg)	40.00
Cohesion Intercept (psf)	225.0
Weight Sat. (pcf)	140.0
Chit Moist (pcf)	130.0 125.0
Soil Unit No.	н сл

ANISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees)	40.00 11.00 40.00
c-value (psf)	225.0 150.0 225.0
Countercleskwise Direction Limit (deg)	12.00 16.00 90.00
Direction Range No.	3 12 11

A horizontal earthquake loading coefficient of 150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

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

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

length of line segments for active and passive partions of sliding block is 100.0 ft

GEOLABS-WESTLAKE VILLAGE

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	50.0 50.0			<b>7</b>	ø,			= 1.038)	8			= 1.038)	s			= 1.038)	ts			= 1.039)
	1875.0 1902.0	the :	* *	surfaces examined first	ccordinate points			(Fo factor :	coordinate points			(Fo factor	ccordinate points			(Fo factor	coordinate points			(Fo factor
	350.0	calculated by	METHOD * *	fallure critical	, yd	y-surf (ft)	1880.00 1877.26 1875.26 1862.22 1913.17	1935.00	r Ž	y-surf (ft)	1880.00 1856.96 1920.69 1927.00	1.033 **	s Ka	y-sutf (ft)	1880.00 1861.35 1916.47 1927.00 1935.00	1.039 **	'n	y-surf (ft)	1885.28 1855.28 1921.51 1927.00	1.046 **
	1850.0 1902.0	been	JANEO	ofall - the mo	o. 1 specified	x-surf (ft)	299.91 205.05 209.31 236.71 471.21	II	o. 2 specified	x-surf (ft)	175.33 224.73 523.68 526.62 526.62	JANBU FOS =	No. 3 specified	x-surf (ft)	191.97 231.97 478.42 483.33	CANEU POS =	No. 4 specified by	x-surf (ft)	167.01 220.03 523.62 526.18 526.18	n
Pseudo.	210.0	rs of safety have	* * SIMPLIFIED	lC most critical displayed below	re surface No	Point No.	ലൈവധയ	cted	re surface No	Point No.	ଜନ୍ୟନ୍ତ	Corrected JA	surface	Point No.	ጉለመቀብ	Corrected J	surface	Point No.	1 ሪ/ ጠ ቁ ነ	3
Sec. C3-C3	1 0	Factors	*	The 1 axe d	Failure			4r 4r	Failure			‡	Failure			:	Failure			:

coordinate points					(Fo factor = 1.046)	coordinate points						(Po factor = 1.043)	coordinate points								(Fo factor = 1.038)	occedinate points							(Fo factor = 1.035)	coordinate points				
s Ž	Y-surf	1880.00 1857.25	1908.52	1927.00 1935.00	1.046 **	ş Āq	y-surf	1880.00	1855.39	1923.55	1935.00	1.052 **	7	y-surf	(35)	1880.00	1878.48	1860.89	1918.44	1927.00 1935.00	1,054 **	specified by 6 oc	jans-X	(££)	1882.18	1875.00	1923.59	1927.00 1935.00	1.063 **	specified by 5 $\alpha$	y-surf (ft)	1380,00	1856.81	1927.00
Ž	x-surf (ft)	156.35	446.28	454.90	JAMBU SOS =	e No. 6 specified	x-surf (ft)	172 56	225.34	495.71	497.31	- 804 <b>USNAL</b>	e No. 7 specified	X-SULE	(III)	202.17	205.03	241,83	492.28	495.81	JAMBU FOS =	No. 8	x-surf	(fc)	209.80	223.30	506.89	508.48	JANBU FOS =	80. 9	x-surf (ft)	.63.04	212.77	457,73
Failure surface	Point No.	1 2	100	<b>13</b> (1)	** Corrected	Failure surface	Point No.		10	m	ቀወ	** Corrected	Failure surface	Point	No.	,	61 6	1 4	ιη	9 1	** Corrected	Failure surface	Point	No.		54 F	) ক	un √o	** Corrected	Failure surface	Point No.		NΜ	4

(Fo factor = 1.045) \*\* Corrected JANBU FOS = 1.069 \*\* 1935,00 457,73

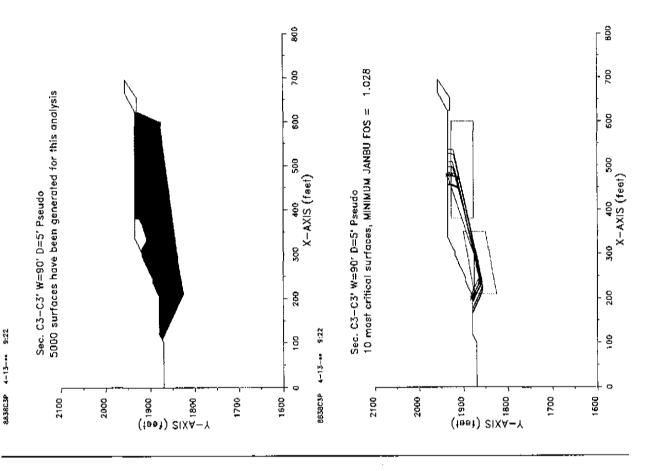
Failure surface No.10 specified by 5 coordinate points

y-surf (ft)	1856.94 1922.01 1927.00 1935.00
X-surf (ft)	187,52 236,96 533,94 536,27 536,27
Point No.	⊣ (୧୯) ସ ଏ

(Fo factor = 1.038)\*\* Corrected JANES FOS = 1.071 \*\* The following is a summary of the TEM most critical surfaces Problem Description : Sec. C3-C3: 0=90: D=5: Pseudo

Available Strength (1t)	3.8352+05	4.6621+05	3.9425+05	4,8012+05	3.973E+05	4.413E+05	4.124E+05	3.934E+05	4,085£+05	4.951E+05
Terminal x-coord (ft)	477.66	526.62	483,33	526.18	454.93	497.33	495.B.	508.48	457.73	536,27
Initial x-coord (ft)	16,661	175.33	191.97	167.01	166.35	172.56	202.17	209.80	163.04	167.52
Correction Factor	1,038	1,038	1,038	1.039	1.046	1.043	1.038	1,035	1.045	1.038
Modified JANBU 705	1.028	1.033	1.039	1.046	1.046	1.052	1.054	1.063	1.059	1.071
	ı,	6	m.	÷	'n.	ě.	ζ.	θ,	ď	10.

\* \* \* END OF FILE \* \* \*



## Sec. C3-C3' Pseudo, Spencer's

XSTABL File: 8838C3PS 4-13-\*\* 9:23

Copyright (C) 1992 A 96 Interactive Software Designs, Inc. Mascow, ID 83843, U.S.A. Slope Stability Analysis using the Method of Slices All Rights Reserved XSTABI

Problem Description : Sec. C3-C3' W=50' D=5' Pseudo Spend

SECRENT BOOKDARY COORDINATES

12 SURFACE boundary segments

Soil Unit Below Segment y-right 1880.0 1880.0 1895.0 1895.0 1919.0 1935.0 1935.0 1935.0 1870.0 100.0 120.0 205.0 2246.0 295.0 304.0 475.0 624.0 665.0 1876.0 1876.0 1886.0 1889.0 1895.0 1919.0 1919.0 1935.0 1935.0 y-left (ff.) 100.0 120.0 203.0 246.0 246.0 295.0 304.0 475.0 624.0 Segment No. 

6 SUBSURFACE boundary segments

Soil Unit Below Segment y-right (ft) 1875.0 1875.0 1935.0 1930.0 x-right (ft) 205.1 295.0 475.0 624.1 654.0 y-left (ft) 1980.0 1975.0 1875.0 1935.0 1930.0 205.0 205.1 295.0 624.0 624.1 x-left (ft) Segment Š

A CRACKED ZONE HAS BEEN SPECIFIED

(feet) (feet) (pcf) Depth of crack below ground surface = 8.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 62.40 Pailure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic

force according to the specified depth of water in the crack

ISCTROPIC Soil Parameters

2 5011 unit(s) specified

Triction Fore Pressure Rater Angle Parameter Constant Surface (deg) Ru (psf) No. Cohesion Pi Intercept (psf) Unit Weight Moist Sat. (pdf) (pdf) Soil Unit 1 Š

00

000.

40.00 34.00

225.0 200.0

140.0

130.0 125.0

AMISOTROPIC STRENGTH PARAMETERS specified for 1 Soil Unit(s)

Soil Unit : 18 ANISOTROPIC

Number of direction ranges specified = 3

i-value (degrees) 40.00 11.00 40.00 c-value (psf) 225.0 150.0 225.0 Counterclockwise Direction Limit (deg) 12.00 16.00 90.00 Direction Range No.

A horizontal earthquake loading coefficient of 150 has been assumed

A vertical earthquake loading coefficient of .000 has been assigned

A SINGLE FAILURE SURFACE BAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by the following B coordinate points

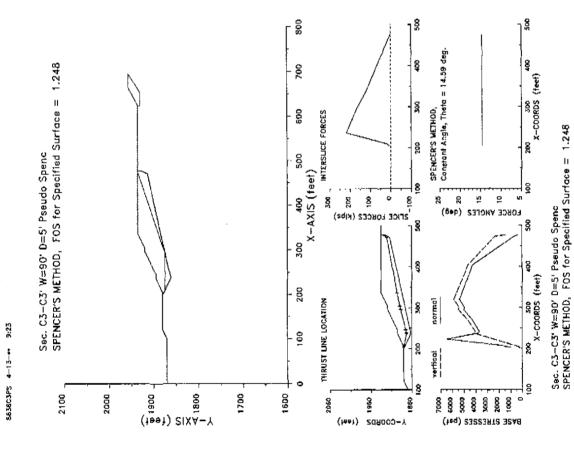
y-surf (ft) 1880.00 1877.26 1875.00 1862.22 1913.17 1927.00 1927.00 x-surf (ft) 199.91 205.05 209.31 236.71 471.21 477.66 477.66 Point ě.

SELECTED METHOD OF AMALYSIS: Spencer (1973)

GEOLABS-WESTLAKE VILLAGE

E 4 8 1 1 6 1 6 1 7 6 7 7 7 7 7 7 7 7 7 7 7 7	height width alpha beta weight (ft) (ft) (lb)	1.36 5.09 -28.06 .0	2,74 .05 -28,06 24.44	4.86 4.26 -27.95 24.44	19.58 27.40 -25.01 24.44 6	32.35 1.29 12.20	27.00 40.01 10.05 05.54	43.77 1.00 12.26	43.03 8.00 12.26 .00	46.68 32.00 12.26 26.57	35.52 135.21 12.26 .00	10.85 2.66 65.	S (4110)	FOR Force FOS morest.	1.2600		1.2532	1.2475 1.2532 3 1.2479 1.2475
\$\frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac	x-base y-base (ft) (ft)			_							1898.	1924	FOR SPENCER'S	ţ	15.0947	14.5403	14.8175	14,5784 14,5949

100.00 4931.2 5392.1 0.0 88  403.60 4241.4 6289.4 0.0 78  473.10 654.4 2306.5 0.0 78  473.10 654.4 2306.5 0.0 62  476.33 360.7 1410.7 0.0 62  476.33 - Magnitude & Location of Interslice Force  Right Force Interslice Force Boundary  **Coord Angle Force Eight Height  (Ft) (Gegrees) (1b) (ft) (ft)  205.00 14.59 6837. 2.01 2.71  205.01 14.59 16782. 10.45 32.19  236.01 14.59 16782. 10.45 32.19  236.00 14.59 16782. 11.94 43.64  256.00 14.59 16782. 11.94 43.64  256.00 14.59 16782. 11.94 43.64  256.00 14.59 155853. 12.01 51.21  477.66 0.0 14.59 15782. 11.61 51.21  477.66 0.0 14.59 15782. 11.61 51.21  477.66 0.0 14.59 15852. 12.01 62.18  477.66 0.0 14.59 15852. 12.01 62.18  477.66 0.0 0.0 0.0 0.00 (psf)  Shear Stress = 4304.00 (psf)  Shear Stress = 1176.11 (psf)  Total Length of Failure surface = 296.11 feet	100.00 6931.2 5302.1 0.0 888  420.00 5350.0 5350.0 5550.0 0.0 5550  475.33 560.7 1410.7 0.0 627  476.33 360.7 1410.7 0.0 627  476.33 360.7 1410.7 0.0 627  476.33 560.7 1410.7 0.0 627  ERYS (1973) - Magnitude & Location of Interslice Forces  Right Force Incerslice Force Boundary H x-coord Angle Force 3eight Height H 475 600 14.59 6857. 2.01 2.71  205.00 14.59 167823. 11.94 43.64  225.00 14.59 167823. 11.94 43.64  236.00 14.59 167823. 11.94 43.64  236.00 14.59 167823. 11.94 43.64  236.00 14.59 167823. 11.94 43.64  236.00 14.59 167823. 11.94 43.64  477.65 0.00 14.59 165690. 12.30.76  256.00 14.59 167823. 11.94 43.64  477.65 0.00 (psf)  Shear Stress = 4304.00 (psf)  Shear Stress = 1176.11 (psf)  Total length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S [1373)  For the single specified failure surface = 434.60E+03 lb  Forcedure gives a  FACTOR OF SAFETY = 1.248  FORCE shear strength available along specified failure surface = 434.60E+03 lb	200.00 6931.2 5302.1 0.0 88  220.00 5350.0 1465.4 6628.4 0.0 78  473.10 654.4 4628.4 0.0 78  473.10 654.4 4628.4 0.0 62  475.31 654.4 4628.4 0.0 62  477.10 654.4 1410.7 0.0 42  ERIGHT Force Intersition of intersition Force Angle Force Scient Height (ft) (fegrees) (10) (ft) (ft) (ft)  205.00 14.59 6857. 2.01 2.71  205.00 14.59 107426. 10.45 32.19  205.00 14.59 107426. 10.45 32.19  206.00 14.59 107670. 11.61 57.10  206.00 14.59 107670. 11.94 43.64  206.00 14.59 107670. 11.94 43.64  206.00 14.59 107670. 11.94 43.64  206.00 14.59 105823. 11.94 43.64  206.00 14.59 105823. 12.01 43.64  206.00 14.59 105823. 11.94 43.64  206.00 14.59 105823. 11.94 43.64  206.00 14.59 105823. 11.94 43.64  206.00 14.59 105823. 11.94 43.64  206.00 14.59 105823. 11.94 43.64  206.00 14.59 105823. 11.94 43.64  207.00 14.59 105823. 11.94 43.64  208.00 14.59 105823. 11.94 43.64  208.00 14.59 105823. 11.94 43.64  209.31 10.45 10.45 10.45 10.45 13.90  209.32 10.00 (psf)  Shear Strees = 4704.00 (psf)  For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973)  Proceedure gives a  PACTOR OF SAFETY = 1.248  Total shear strength available  along specified failure surface = 424.65E+03 lb	or- ∞	242.00	3677.1 4285.8 5013.2	4012.0 4677.0 5471.7			693.0 787.8 901.1
## 403.60 4271.4 4628.4 .0 78 475.33 350.7 1410.7 .0 42 4775.33 350.7 1410.7 .0 42  Right Fords Interslice Force Boundary  **Coord Angle Force Beight Height  (ft) (degrees) (lb) (ft) (ft)  205.00 14.59 6887. 2.01 2.71  205.01 14.59 6966. 2.02 2.77  205.01 14.59 114.56 10.42 32.19  236.00 14.59 1167823 11.94 43.64  236.00 14.59 1167823 11.94 43.64  236.00 14.59 1167823 11.94 43.60  246.00 14.59 1167823 11.94 43.60  247.00 14.59 1167823 11.91 42.16  375.00 14.59 158533 12.01 42.16  477.01 14.59 158533 12.01 42.16  477.05 .00 (psf)  Pore Rater Pressure = .00 (psf)  Shear Strees = 1176.11 (psf)  Total Length of Failure surface = 296.11 feet	### ### ### ### ### ### ### ### ### ##	### 475.53	ם לא כ	300.00	4931.2	5382			68.3
### 1473.10 654.4 2306.5 .0 62 476.33 350.7 1410.7 .0 42  Right Fords Interslice Force Boundary Force Angle Force Boundary Force Angle Force Boundary (ft) (6egrees) (1b) (ft) (ft)  205.00 14.59 6887. 2.01 2.71  205.00 14.59 6966. 2.02 2.77  205.01 14.59 14.56 10.42 32.19  236.00 14.59 10.7823. 10.41 32.19  295.00 14.59 10.7823. 11.94 43.64  296.00 14.59 16.7823. 11.94 43.64  296.00 14.59 15.6539. 12.01 42.16  336.00 14.59 15.6539. 12.01 42.16  477.01 14.59 15.8533. 12.01 42.16  477.05 .00 (psf)  Pore Mater Pressure = 1704.00 (psf)  Shear Strees = 1176.11 (psf)  Total Length of Failure surface = 296.11 feet	### ### ### ### ### ### ### ### ### ##	### ### ### ### ### ### ### ### ### ##		403,60	4241.4	4628			6.08
Hight Forces Interslice Force Boundary  X-coord Angle Force Egipt Height  (ft) (degrees) (lb) (ft) (ft)  205.00 14.59 6837. 2.01 2.71  205.31 14.59 14976. 3.34 6.96  236.70 14.59 217466. 10.45 32.19  246.00 14.59 105450. 10.45 32.19  256.00 14.59 105450. 10.45 32.19  256.00 14.59 105450. 10.45 32.19  256.00 14.59 105450. 10.45 32.19  256.00 14.59 158521. 11.34 43.64  475.00 14.59 158522. 11.34 43.64  475.00 14.59 158522. 12.01 51.21  477.00 14.59 158522. 12.01  477.00 14.59 158522. 12.01  477.00 14.59 158522. 12.01  477.00 14.59 158522. 12.01  477.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 14.59 158522. 12.01  A77.00 16.50 16.50  A77.00 16.50 16.50  A77.00 16.50 16.50  A77.00 1	### Right Force Interslice Force Boundary  **Coord Angle Force Seight Height (ft) (degrees) (lb) (ft) (ft) (ft)  205.00 14.59 6837. 2.01 2.71  205.00 14.59 6837. 2.01 2.71  205.31 14.59 11976. 10.45 32.19  236.00 14.59 107823. 11.94 43.64  236.00 14.59 107823. 11.94 43.64  236.00 14.59 153839. 12.01  236.00 14.59 153839. 12.01  471.21 14.59 153839. 12.01  471.61 14.59 153839. 12.01  471.62 14.59 153839. 12.01  471.63 14.59 153839. 12.01  471.64 14.59 153839. 12.01  471.65 14.59 153839. 12.01  471.66 14.59 153839. 12.01  471.66 14.59 153839. 12.01  471.66 14.59 153839. 12.01  472.60 14.59 153839. 12.01  473.60 14.59 153839. 12.01  473.60 14.59 153839. 12.01  473.60 14.59 153839. 12.01  473.60 14.59 153839. 12.01  474.60 10.00 (psf)  Shear Stress = 170.01 (psf)  Shear Stress = 170.01 (psf)  Shear Stress = 170.01 (psf)  For the single specified surface and the assumed angle of the indexslice forces, the SPENCER'S (1973)  Procedure gives a  **FACTOR OF SAFETT = 1.248  **Pactor Shear Strength available**  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pactor Safett = 1.248  **Pac	### Right Force Interslice Force Boundary  **Coord Angle Force G857. 2.01 2.71  205.00 14.59 6857. 2.01 2.71  205.00 14.59 6857. 2.01 2.71  205.01 14.59 6857. 2.01 2.71  205.01 14.59 1696. 2.02 2.77  206.01 14.59 1696. 10.45 32.50  236.00 14.59 16787. 10.45 32.50  236.00 14.59 16787. 10.45 32.50  236.00 14.59 16787. 10.45 32.50  236.00 14.59 16787. 10.45 32.50  236.00 14.59 15823. 11.94 43.64  336.00 14.59 15823. 11.94 43.64  475.00 14.59 15823. 12.01 21.71  475.00 14.59 15824. 11.61 51.21  477.66 0.00 (psf)  Shear Stress = 4304.00 (psf)  Shear Stress = 1176.11 (psf)  For the single specified surface and the assumed angle of the inderslice forces, the SFENCER'S [1973)  Forcedure gives a  FACTOR OF SAFETY = 1.248  FORCE: Shear strength available  Force Stream strength available  Force Stream strength available  Force: Shear strength available  Force: Shear strength available  Force: Shear strength available	o n		654.4 350.7	2306			22.8
Right         Force         Incersitor         Force         Boundary           x-coord         Angle         Force         Seight         Beight           265.00         14.59         6827         2.01         2.71           265.05         14.59         6827         2.01         2.71           265.05         14.59         6827         2.01         2.71           265.05         14.59         14976         3.34         6.96           236.71         14.59         217426         10.41         32.19           236.00         14.59         167829         10.72         30.76           256.00         14.59         167829         11.94         43.64           256.00         14.59         167829         11.94         43.64           256.00         14.59         15829         12.01         42.16           336.00         14.59         15829         12.61         43.64           477.06         14.59         1592         1.66         1.01         42.16           477.06         .00         -21         .23         8.00           477.06         .00         -21         .23         8.00	Right   Force   Incersitor   Force   Boundary	Right   Force   Incersitor   Force   Boundary	E S	· 60	, ,	4.	ä	1 1	, s
205.00 14.59 6857. 2.01 2.71 205.05 14.59 6964. 2.02 2.77 205.03 14.59 1964. 2.02 2.77 236.71 14.59 217426. 10.45 32.19 236.00 14.59 216665. 10.72 30.76 295.00 14.59 167823. 11.94 43.64 295.00 14.59 167823. 11.94 43.64 296.00 14.59 158593. 12.01 42.16 336.00 14.59 158593. 11.94 43.64 473.00 14.59 1586780. 11.94 43.60 477.00 14.59 1586780. 11.94 2.16 336.00 14.59 1586780. 11.94 3.90 477.00 14.59 1586780. 11.94 3.90 477.66 .00 6967 Seac VALUES ALONG FAILURE SIRFACE TOTAL Normal Stress = 4304.00 (psf) Spear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet	205.00 14.59 6857. 2.01 2.71 2.02 205.05 14.59 6964. 2.02 2.07 2.05 2.07 2.05 14.59 6964. 2.02 2.07 2.05 2.05 14.59 14.59 217456. 10.45 2.02 2.77 2.06.1 14.59 217426. 10.45 32.50 2.46.00 14.59 216666. 10.72 30.76 2.05 2.05 14.59 2.06666. 10.72 30.76 2.05 2.05 14.59 2.06780. 11.94 43.64 43.64 14.59 15.85593. 11.94 43.64 14.59 15.85593. 12.01 42.16 3.00 471.21 14.59 15.85593. 12.01 42.16 3.00 477.65 14.59 15.85693. 12.01 42.16 3.00 477.66 10.00 (psf) 3.00 477.66 10.00 (psf) 3.00 477.66 10.00 (psf) 3.00 477.66 10.00 (psf) 3.00 477.66 10.00 (psf) 3.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 475.00 4	205.00 14.59 6857. 2.01 2.71 205.05 14.59 14.59 6867. 2.02 2.77 209.31 14.59 14.59 2.74 6.96 236.71 14.59 2.17426. 10.45 32.50 246.00 14.59 2.17426. 10.45 32.50 256.00 14.59 16.7823 11.94 43.90 256.00 14.59 16.7823 11.94 43.90 364.00 14.59 158593, 12.01 47.16 336.00 14.59 158593, 12.01 47.16 336.00 14.59 158593, 12.01 47.16 475.00 14.59 158593, 12.01 47.17 475.00 14.59 158593, 12.01 47.18 477.6500 2.31  Total Normal Stress = 4304.00 (psf) Shear Stress = 1176.11 (psf) Total Normal Stress = 1176.11 (psf) Total Length of failure surface and the assumed angle of the incerslice forces, the SPENGER'S [1973)  Procedure gives a  FACTOR OF SAFET = 1.248  Total shear strength available along specified failure surface = 434.63E+03 1b	og C	Right x-coord (ft)	Forca Angle (degress)	Incersioe Force (1b)	Force Zeight (ft)	Boundary Height (ft)	Heigh Rati
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238.00 14.59 21657. 10.42 34.59 246.00 14.59 167823. 11.94 43.64 256.00 14.59 167823. 11.94 43.64 356.00 14.59 167823. 11.94 43.64 356.00 14.59 158593. 12.01 42.16 336.00 14.59 158593. 12.01 42.16 471.1 14.59 158593. 12.01 42.16 477.66 .00 -31. 23 8.00  Total Normal Stress = 4304.00 (psf) Spear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet	238.00 14.59 210606. 10.42 30.76 295.00 14.59 167823. 11.94 43.64 295.00 14.59 167823. 11.94 43.64 296.00 14.59 167823. 11.94 43.64 306.00 14.59 167823. 11.94 43.64 307.00 14.59 158593. 12.01 42.16 308.00 14.59 158593. 12.01 42.16 308.00 14.59 126679. 11.61 51.21 477.65 100 231. 4.59 30.00 477.65 100 (psf) Spear Mater Pressure = 4304.00 (psf) Shear Strees = 4304.00 (psf) Shear Strees = 1176.11 (psf) Total Length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the interslice forces, the SPENGER'S (1973) PACTOR OF SAFETY = 1.248  Total shear strength available along specified failure surface = 434.62E+03 1E	238.00 14.59 210606. 10.42 34.59 246.00 14.59 167823 11.94 43.64 256.00 14.59 167823 11.94 43.64 256.00 14.59 167823 11.94 43.64 336.00 14.59 167823 11.94 43.64 336.00 14.59 158593 12.01 42.16 336.00 14.59 158593 12.01 42.16 336.00 14.59 158593 12.01 473.66 100 231 4.56 21.83 A77.65 100 (psf) Sore Rater Pressure = 4304.00 (psf) Shear Stress = 4304.00 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the interslice forces, the SPENGER'S [1973) Procedure gives a PACTOR OF SAFETY = 1.248  Total shear strength available along specified failure surface = 434.63E+03 lb	ਚਾ ।	236.71	14.59	217426.	10.41	32.19	Ŋ,
295.00 14.59 167823. 11.94 43.64 256.00 14.59 167823. 11.94 43.64 256.00 14.59 166780. 11.94 43.64 33.60 14.59 166780. 11.94 43.64 33.60 14.59 158593. 12.01 47.16 33.60 14.59 122647. 11.61 51.21 477.65 0. 14.59 1592. 13.6 13.70 477.65 0.00 14.59 151.6 13.70 477.65 0.00 14.55 151.6 13.70 477.65 0.00 1675.00 16.50 16.00 16.50 16.00 16.50 16.00 16.50 16.00 16.50 16.00 16.50 16.00 16.50 16.00 16.50 16.00 16.50 16.00 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.50 16.5	295.00 14.59 167823. 11.94 43.64 256.00 14.59 167823. 11.94 43.64 256.00 14.59 167803. 11.94 43.64 256.00 14.59 165890. 12.01 42.90 306.00 14.59 158593. 12.01 42.16 306.00 14.59 158593. 12.01 42.16 51.21 471.61 51.21 14.50 15920. 7.65 21.83 477.66 0.00 -231. 4.26 12.83 8.00 -231. 80.00 (psf)	295.00 14.59 167823. 11.94 43.64 295.00 14.59 167823. 11.94 43.64 296.00 14.59 166780. 11.94 43.64 306.00 14.59 165893. 12.01 42.90 306.00 14.59 152647. 11.61 51.21 471.1 14.59 158593. 12.01 42.16 477.66 .00 -231. 23 8.00  SRACE VALUES ALCNG FAILURE SURFACE Total Normal Stress = 4304.00 (psf) Shear Strees = 1176.11 (psf) Total Length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the incersice forces, the SPENCER'S (1973)  PACTOR OF SAFETY = 1.248  Total shear strength available along specified failure surface = 434.63E+03 lb	ηų	246.00	14.59	210666	10.72	30.76	Ž,
256.00 14.59 166780. 11.94 43.90 304.00 14.59 156593, 12.01 473.10 14.59 156593, 12.01 473.00 14.59 156593, 12.01 477.65 .00 -31, 4.56 13.70 477.65 .00 -31, 23 8.00  SEMCE VALUES ALONG FAILURE SIRFACE TOTAL Normal Stress = 4304.00 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet	256.00 14.59 156590. 11.94 43.90 304.00 14.59 156593, 12.01 471.21 14.59 156593, 12.01 471.21 14.59 156593, 12.01 477.65 .00 -31. 65 13.70 477.65 .00 -31. 23 8.00  SMACE VALUES ALCNG FAILURE SURFACE Total Normal Stress = 4304.00 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the interslice forces, the SPENGER'S (1973)  PACTOR OF SAFETY = 1.248  Total shear strength available along specified failure surface = 434.62e.03 lb	256.00 14.59 156590. 11.94 43.90 304.00 14.59 156593, 12.01 473.10 14.59 156593, 12.01 471.21 14.59 156593, 11.61 473.00 14.59 156593, 12.01 477.65 .00 -31.83 477.65 .00 (psf) Sorg VALOES ALCNG FAILURE SURFACE  Total Normal Stress = 4304.00 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Shear Strength available	)  ~	295.00	14.59	167823.	11.98	43.64	12.
364.00 14.59 155593, 12.01 42.15 336.00 14.59 125547, 11.61 51.21 471.21 14.59 125547, 11.61 51.21 475.00 14.59 1514, 4.56 13.70 477.65 .00 -31. 23 8.00  56AGE VALUES ALONG FAILURE SUFFACE Total Normal Stress = 4304.00 (psf) Shear Strees = 1176.11 (psf) Total Length of failure surface = 296.11 feet	364.00 14.59 158593, 12.01 42.15 336.00 14.59 122647, 11.61 51.21 471.21 14.59 122647, 11.61 51.21 475.00 14.59 158593, 7.65 21.83 477.65 .00 14.59 1514, 0.56 13.70 477.65 .00 12.31 .23 8.00  Total Normal Stress = 4304.00 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the interslice forces, the SPENGER'S (1973) procedure gives a  PACTOR OF SAFETY = 1.248  Total shear strength available along specified failure surface = 434.62E+03 lb	364.00 14.59 158593, 12.01 42.16 336.00 14.59 122647, 11.61 51.21 471.21 14.59 122647, 11.61 51.21 475.00 14.59 152647, 11.61 51.21 477.66 .00 -31. 6.56 13.70 477.66 .00 (psf) FORM THE FROM THE SUFFACE  Total Normal Stress = 4304.00 (psf) FOR Water Pressure = .00 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the interslice forces, the SFENGER'S (1973) procedure gives a  FACTOR OF SAFETY = 1.248  Total shear strength available along specified failure surface = 434.63E+03 lb	60	256.00	14.59	166780.	11.94	43.90	.27
336.00 14.59 122647, 11.61 51.21 471.21 14.59 122647, 11.61 51.21 471.21 14.59 1592. 7.65 21.83 472.65 .00 -31. 4.56 13.70 -31. 7.23 8.00 .00 .00 .00 .00 .00 .00 .00 .00 .0	336.00 14.59 122647, 11.61 51.21 471.21 14.59 122647, 11.61 51.21 477.21 14.59 15920. 7.65 21.83 477.65 .00 14.59 1514. 4.56 13.70 477.65 .00 14.59 1514. 4.56 13.70 .00 14.59 1514. 4.56 13.70 .00 14.59 1514. 4.56 13.70 .00 1514. 4.56 13.70 .00 1514. 5.00 (psf)	336,00 14.59 122847, 11.61 51.21 471.21 14.59 152847, 1.65 21.89 473.00 14.59 1514, 4.56 21.89 477.65 .00 -3123 8.00  58AGE VALUES ALONG FAILURE SURFACE Total Normal Stress = 4304.00 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a pacron of Safery = 1.248  Total shear strength available along specified failure surface = 434.60E+03 lb	o	304.00	14.59	158593,	12.01	42.15	.28
477.66 4.59 9992. 7.55 21.84 477.66 40.99 -31. 23 8.00 477.66 .00 -31. 23 8.00  SRACE VALUES ALONG FRILINE SURFACE Total Normal Stress = 4304.00 (psf) Sore Rater Pressure = .00 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet	477.66 14.59 1592. 7.55 21.84 477.66 14.59 1592. 7.55 21.84 477.66 14.59 1514. 4.56 12.00  SRACE VALUES ALCNG EALLURE SURFACE  Total Normal Stress = 4304.00 (psf) SPORE Rather Pressure = .00 (psf) Shear Strees = 1176.11 (psf)  Total Length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the incerslice forces, the SPENGER'S [1973)  PACTOR OF SAFETY = 1.248  Total shear strength available along specified failure surface = 434.62e+03 lb	477.66 14.59 1592. 1.55 21.84 477.66 14.59 1592. 1.55 21.84 477.66 14.59 1514. 4.56 13.70 477.66 1.00 -31. 23 8.00  SRACE VALUES ALCNG EAILURE SURFACE  Total Normal Stress = 4304.00 (psf) Shear Stress = 100 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the incersice forces, the SPENCRR'S [1973]  PROTOR OF SAFETY = 1.248  Total shear strength available along specified failure surface = 434.65E+03 lb	۰,	336.00	14.59	122647.	11.61	51.21	81 8
477.65 .00 .4.59 .134 .4.25 .15.10 477.65 .003123 8.00  SEMACE VALUES ALCNG FAILURE SLERACE  TOTAL Normal Stress = 4304.00 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet	477.65 .00 .439 .134 .425 .1310  SCACE VALUES ALCNG FAILURE SLRFACE  Total Normal Stress = 4304.00 (psf) Shear Stress = 1176.11 (psf) Shear Stress = 1176.11 (psf) Total Length of failure surface = 296.11 feet  For the single specified surface and the assumed angle of the incarslice forces, the SPENGER'S (1973)  PACTOR OF SAEET = 1.248  Total shear strength available along specified failure surface = 434.62e+03 lb	477.65 .00 .439 .134 .425 .1310  SCACE VALUES ALONG FAILURE SLRFACE  Total Normal Stress = 4304.00 (psf) Store Rater Pressure = .106.11 (psf) Store Rater Pressure = .1176.11 (psf) Total length of failure surface and the assumed angle of the interslice forces, the SPENCER'S [1973)  PACTOR OF SAFET = 1.248  FACTOR OF SAFET = 1.248  Total shear strength available = 434.65E+03 lb	-a (	471.21	14.59	5992.	7.55	21.83	
VALUES ALCOG ENILURE SURFACE tal Normal Stress = 4304.00 (psf) re Actor Pressure = .00 (psf) aar Stress = 1176.11 (psf) tal Length of failure surface = 296.11	VALUES ALCNG FAILURE SLRFACE  Tell Normal Stress = 4304.00 (psf)  re Rater Pressure =	VALUES ALCOG FAILURE SLRFACE  Tall Mormal Stress = 4304.00 (psf)  Tor Ricer Pressure =	v m	477,65	8.	-31.	23	8.00	3.8
Water Pressure = .00 {psf} Strees = 1176.11 {psf} Length of failure surface = 296.11	**Rater Pressure =00 (psf)  ir Strees = 1176.11 (psf)  il Longth of failure surface = 296.11 feet  e single specified surface and the assumed integrates a  FACTOR OF SAFETY = 1.248  shear strength available specified failure surface = (34.60±03)	**Rater Pressure =00 (psf)  ir Strees = 1176.11 (psf)  il Length of failure surface = 296.11 feet  e single specified surface and the assumed integrals a  FACTOR OF SAFETY = 1.248  shear strength available specified failure surface = 434.60E+03 ]	X28	\$   B	Str	به برما	(Jsd)		
Stress = 11/6.11 (psr) Length of failure surface = 296.11	In Strees = 11/6.11 (psr)  Il Length of failure surface = 296.11 feet e single specified surface and the assumed integrals a  FACTOR OF SAFETY = 1.248 shear strength available specified failure surface = 434.65±03	In Strees = 11/6.11 (psr)  Il Longth of failure surface = 296.11 feet e single specified surface and the assumed interslice forces, the SPENCER'S [1973] lure gives a  FACTOR OF SAFETY = 1.248 shear strength available specified failure surface = 434.60E+03 ]		. 145	Pressure		(Jsd)		
Length of failure surface = 296.11	Libergth of failure surface = 296.11 feet estimate specified surface and the assumed integrals a partial forces, the SPENCER'S [1973] lure gives a FACTOR OF SAFETY = 1.248 shear strength available specified failure surface = 434.65+03 ]	Il Jength of failure surface = 296.11 feet e single specified surface and the assumed interslice forces, the SPENCER'S [1973] lure gives a  PACTOR OF SAFETY = 1.248 shear strength available specified failure surface = 434.60E+03 ]					(pst)		
	e single specified rurface and the assumed interslice forces, the SPENCER'S [1973] Nure gives a FACTOR OF SAFETY = 1.248 shear strength available specified failure surface = 434.65+03 1	e single specified surface and the assumed interstice forces, the SPENCER'S [1973] lure gives a FACTON OF SAFETY = 1.248 shear strength available specified failure surface = 434.60E+03 ]			of	surface		fee;	
200	FACTOR OF SAFETY = 1.248 shear strength available specified failure surface = 434.65±+03	FACTOR OF SAFETY = 1.248 shear strength available specified failure surface = 424.62E+03	ā.						
gives a	shear strength available specified failure surface = 434.60E+03	shear strength available specified failure surface = 434.63E+03		æ		1)	₽		
gives a FACTOR OF SAFETY =			ě Ā		ength. failu	ailable surface	434,63E+(		



Sec. C3-C3' Pseudo. Spencer's

W.O. 8838

W.O. 8838 Sec. D-D' W=100' D=5' 4-13-\*\* 14:56

XSTABL File: 8838D

X S T A B L

Slope Stability Analysis
using the
Method of Sloss
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Ver. 5.201

Problem Description : Sec. D-D' W=100' D=5'

SEGMENT BOUNDARY COORDINATES

18 SURFACE boundary segments

Below Segment Soil Unit y-right [ft] 1955.0 1974.0 1974.0 2000.0 2024.0 2024.0 2026.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 2050.0 20 310.0 347.0 406.0 475.0 475.0 475.0 525.0 604.0 604.0 604.0 775.0 775.0 775.0 775.0 775.0 x-right (ft) y-left (ft) 1954.0 1955.0 1974.0 1974.0 2200.0 2200.0 2224.0 2224.0 2225.0 2075.0 2075.0 2016.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 2126.0 21 310.0 347.0 355.0 406.0 414.0 473.0 525.0 545.0 654.3 655.0 760.0 860.0 1000.0 x-left 663.0 

Segment x-left y-left x-right y-right ScillUnit
No. (ft) (ft) (ft) (ft) (ft) (ft)
1 310.C 1955.0 310.1 1950.0 1
2 310.1 1950.0 410.0 1950.0 1
3 410.C 1850.0 76C.0 2120.0 1
4 880.C 2080.0 112C.0 2080.0 1
5 .C 1880.0 112C.0 2080.0 6

A CRACKED ZONE HAS BEEN SPECIFIED

of crack below ground surface = 8.00 (feet)

Maximum depth of water in crack = .00 (feet) Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of rater in the crack

ISOTROFIC Soil Parameters

4 Soil unit(s) specified

Rater Surface No.	
Essure Constant (psf)	0000
Fore Pressure Farameter Consta Ru (psf)	000
Priction Angle (deg)	40.00 34.00 40.00
ohesion ntercept (psf)	225.0 200.0 200.0 200.0
Reight G Sat. In (pcf)	140.0 135.0 135.0
Unit W Moist (pcf)	130.0 125.0 125.0 130.0
Soil Jait No.	- ଅମ୍ବ

AMISOTROPIC STRENGTH PARAMETERS specified for : Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Counterclockwise c-value i-value Range No. Direction Limit (deg) (psf) (degrees)

1 6.00 225.0 40.00 2 11.00 150.0 17.00 3 50.00 225.0 40.00

1 Fater surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 3 coordinate points

PHERATIC EURFACE,

Point x-water y-water

No. (ft) (ft) (ft)

1 .03 1905.00

2 410.03 1950.00

3 1120.03 2050.00

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

## W.O. 8838 Sec. D-D' W=100' D=5'

<b>,</b>				<b>.</b>						-	•••											_					_
		base	os of	Wideh (ft)	80.08 80.08			ìned	3							1.075]	t5							1,079	23		
	d analyzed.	centra, block b	Length of line segments for active and passive portions sliding block is 100.2 ft	y-right (ft)	2007.0	 	* *	e surfaces examined of first								(Fo factor	coordinate points							(Fo factor	coordinate points		
	generated and analyzed	generation of cen	ctive and pa	x-right (ft)	0.086 0.086	safety have been calculated by	METHOD * *	13 g	" "	.967.00	1950.00	2000.65	2091.29	211:.54	2113.79 2121.79	1.583 **	w	y-surf	(31)	1974.58 1952.59	2001.74	2036.47	2119.97	1.648 **	uı	y-ser: (ft)	;
	surfaces will be	10.	ments for a 100.9 ft	y-left (ft)	1935.0 2020.0	cave been o	SIMPLIFIED JANBU METHOD	1 of - th	4 4 4		365.34				743.93	ı	. 2 specified by	j:ne-x		356.13 397.49			104.53	JANTBU FOS = 1	, 3 specified by	x-surf	
	2500 trial swrfac	boxes specified	of line seg g block is	x-left (ft)	360.0 620.0	*8	* * SIMPLI	The 10 most critical are displayed below Fallure surface No.	Point No.		C4 (		· rJ	9	r 00	Corrected JANBU FOS	e surface No.	Pourt No				or kn t	Ja	Corrected JAM	Failure surface No.	Point No.	
i n i	2500	20	Length	Вэх пэ.	- 01	Factors	*	The 10 are dis Failure								ડ :	Failure							ა :	Fallute		

(fo factor = 1.365)	ccordinate points	(Fo factor = 1.072) cordinate points	(Fo factor = 1.377) ordinate points	(fo factor = 1.074) ordinate points	(Fo factor = 1.071) coordinate points
1964.95 2030.17 2112.90 2120,90 1.654 **	y-surf (ft) 1983.77 1964.06 2020.65 2111.28 2111.29 2121.29	1,659 ** Ified by 7 co y-surf (ft) 1969 82 1950 00 1949 83 1998 70 1998 70 2016 44 2110 44	1.671 **  ified by 6 co  y-surf  (f1)  1969.68  1982.26  2004.29  2013.22  2113.22	1.676 ++ fied by 6 coo fied by 1.6 coo 1974.2, 1974.2, 1968.44 2019.88 2019.82 2115.32 2123.32	1.683 ** fied by 6 con
371.15 713.28 751.86 751.86	No. 4 spe x-surf (ft) 373.17 409.29 705.16 747.42 748.36	x-surf (ft) 338 87 376.15 376.15 376.10 684.72	JANBU FOS	and to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be seen to be s	JANEU FOS =
2 3 4 5 5 6 6 7 7 8	Failure surface Point No. 1 2 2 4 6	Fallure surface Point No. 1 2 3 3 5 5 6 6	Failure surface Pailure Surface No. 1 2 3 4 4 4	** Corrected Failure Surface Point No. 1 2 2 3 4 4 5 5	<pre>r* Corrected Failure surfac</pre>

# GEOLABS-WESTLAKE VILLAGE

W.O. 8838 Sec. D-D' W=100' D=5'

Y-suct (£3)	1968.20	1953.42	2003, 54	2079.84	2105.42	2113.42
x-surf (ft)	335,70	363.48	641.78	677.31	690.92	690.92
Point No.		EN)	m	-	uŋ	ø

Failure surface No. 9 specified by 8 coordinate points

(30 factor = 1.075)

\*\* Corrected JANES FOS = 1.684 \*\*

coordinate										
20	# -	80	8	<b>4</b> 0	14	23	69	73	ĘĿ	
ĝ'	y-surf (ft)	1969.08	1950,00	1935.40	1985,14	2075.77	2099.	2115.73	2123.73	
9	<b>34</b>	61	13	Ë	33	20	8	2	22	
No. 9 specified by										
χ, Σ,	-surf (ft)	4	ģ	45	5	.17	76	Ψ,	₽.	
on	x-surf (ft)	337.41	373.29	402,45	664	707.17	717.76	726.40	726.40	
ž										
ure suriace										
suri	Point No.	7	N	М	4	Ŋ	ø	۲.	<b>E</b>	
a⊪ ⊱	Pi .									
2										

Failure surface No.10 specified by 5 coordinate points

(Fo factor > 1.081)

\*\* Corrected JANBU FOS = 1,699 \*\*

y-surf (ft)	1982.25 1968.95 2030.23 2111.34 2119.34
x-surf (ft)	371,18 396,18 724,17 761,99 761,99
Point No.	ଜାରମହାର

The following is a summary of the TBM most critical surfaces

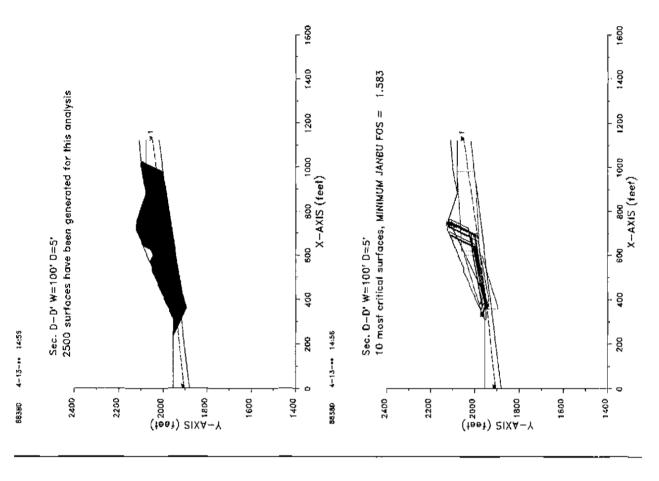
(Fo factor = 1.065)

\*\* Corrected JANBU FOS = 1.710 \*\*

Problem Description : Sec. D-D' W=100' D=5'

Available Strength (15)	1.5175+06	1.196E+05	1,194E+05	1.2715+05	1.1435+06	1.5132+06	1.126£+06	1,1256+06	1.672E+06	1,2275+06
Terminal x-coord (ft)	743.93	704.53	751.86	748,36	684.72	749.04	730,16	690,92	726.40	761.99
Initial X-coord (ft)	333,37	356.13	354,12	373.17	338,87	338.58	355.47	335, 70	337.41	371.18
Correction Factor	1.075	1.079	1.065	1.072	1.077	1.074	1.071	1.075	1,081	1.065
Modified JANBU FOS	1.583	648	1.654	1.659	1.631	1.676	1.683	1.684	1,699	1.730
	÷.	'n	'n	÷	'n	œ	r.	<u>.</u>	œ,	30.

\* \* END OF FILE \* \* \*



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•	X S . Y B L
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•	Slope Stability Analysis
	using the
	Method of Slices
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Inter	Interactive Software Designs, Inc.
-	Moscow, ID 83843, U.S.A.
	All Rights Reserved
	•
* Ver. 5.201	.201 96 À 1545

Problem Description : Sec. N-N' Ww80' D=5'/W=50' D=5'

SEGGENT BOUNDARY COGEDINATES

27 SURFACE boundary segments

	Soil Unit Below Segment	1	7	7	2	લ	2	2	~	7	7	2	[2]	13	61	CN	2	23	2	2	r.ı	7	7	-1	-1	_	-	m
	y-right {ft]	1625.0	1638.0	1638.0	1663.0	1663.0	1688.0	1588.0	1711.0	1711.0	1734.0	1734.0	1760.0	1760,0	1783.0	1783.0	1804.0	1804.0	1823.0	1823.0	1839.0	1840.0	1900,0	1860.C	1858.0	1850.0	1840.0	1820,0
ខ្លួ	x-right (ft)	160.0	194.0	202.0	251.0	259.0	310.0	318.0	367.0	387.0	435.0	443.0	493.0	501.0	549.0	557.0	603.0	623.0	0'699	677.0	710.0	0.017	975.0	1080.0	1150.0	0.0711	1190.0	1215.0
27 SUKFACE DOUGGATY SEGTONICS	y-left (ft)	1625,0	1625.0	1638.0	1638.0	1663.0	1663.0	1588.0	1588.0	1711.0	1711.0	1734.0	1734.0	1760.0	1760.0	1783.0	1783.0	1804.0	1804.0	1823.0	1823.0	1839.0	1840.0	1900.0	1850.0	1858.0	1850.0	1840.0
FACE Dougs	x-left (ft)	Ρ,	160.0	194.0	202.C	251.C	259.0	310,0	318.0	367.0	397.0	435.0	443.0	493.0	501.0	949.0	557.0	603.0	623.0	0.699	673.0	716.0	776.0	0.576	1080.0	1150.0	1170,0	1190.0
ST SUR	Segment No.	7	2	ጠ	4	ď	49	7	Œ,	o	10	11	12	13	14	15	1.6	71	81	19	20	21	32	23	24	25	26	23

				Water Surface No.	000	zi.	<b></b>		S	:
<b>ф</b> рнн ф	(feet) (feet) (pcf)	qual to the a hydrostatic		essure Constant (pef)	9,9,9,	a random n specified d.	equally spaced ft ft		un elevation	SL * * * Surface.
1706.0 1755.0 1815.0 1840.0	3 + 8,00 + ,00 = 62,40	a) res		Pore Pressure Parameter Const Ru (pef	000°	thod, using a ces has been and analyzed	points eq∪ 155.0 ft 165.0 £t	700,0 ft 1680.0 ft	, the minimum .O ft	SELECTED BY XSTABL ICh trial failure S
437.0 540.0 670.0 770.0	IFIED IFIED Und surface n crack crack	ica) iffect depth		Friction t Angle (deg)	40.00 34.00	ing me surfa rated	each of 10 ween x = and x =	een x= and x=	re imposed, Y =	્રાવ છે
1706.0 1706.0 1755.0 1815.0	BEEN SPEC	have a ack and s specif	Parameters	Cohesion Intercept (psf)	225.0 200.0 200.0	urface ting CI will b	from e Se betw	<u>\$</u>	limitations were ace extends is	LT SECMENT LENG: Segments define
387.0 437.0 540.0 670.0	ZONE HAS of crack im depth weight of	nfaces wi depth of ording to	Soil P	Unit Weight Gist Sat. (pcf) (pcf)	.0 140.0 .0 135.0 .0 140.0	l failure for gener al surface	ces ini ground	ace terminates	further limi h a surface	DEFAMLT t line seg
4 የለ ሰራ ርዕ	A CRACKED ZO Depth of Maximus Unit we	Failure s: apenified force accor	ISOTROPIC 3 Soil u	Soil Unit Unit Moist No. [pcf]	1 130.0 2 125.0 3 130.0	A critical technique f 5000 trial	500 Surfa along the	Each surface	Unless fu at which	24.0

GEOLABS-WESTLAKE VILLAGE

The first segment of each failure surface will be inclined

AMELAR RESTRICTIONS

Soil Unit Below Segment

8 SUBSURFACE boundary segments

y-left (ft)

Segment No.

1620.0 1620.0 1706.0

160.1 240.0 387.0

1525.0 1520.0 1620.0

- 10 m

x-left (ft) 150.0 150.1 240.0

Sec. N-N'

within the angular range defined by  $\circ$ 

iomer angular limit :\* -45.0 degrees Opper angular limit := (slope angle - 5.0) degrees

Eactors of safety have been calculated by the :

\* \* \* \* \* GONISH CHINITED SINGLE \* \* \* \* \*

The most critical circular failure surface is specified by 25 coordinate points

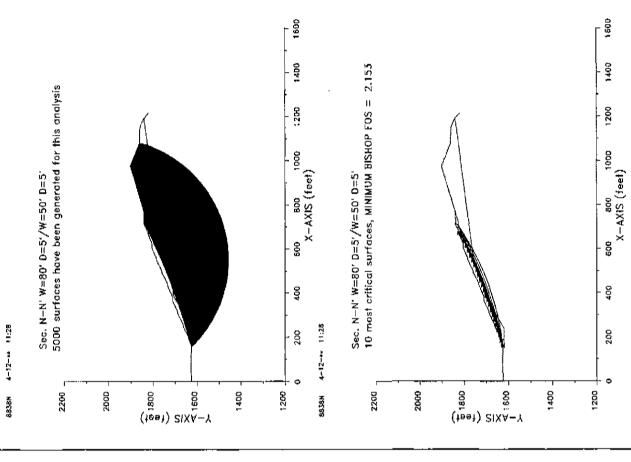
y-surf (ft)	1625, 21 1634, 75 1634, 47 1635, 44 1652, 41 1659, 65 1674, 62 1674, 62 1674, 63 1674, 63 1674, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175, 63 175
x-surf (ft)	160.56 206.69 229.68 229.68 229.68 230.63 241.13 241.13 241.49 251.11 241.49 251.11 251.11 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 261.14 26
Foint No.	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

\*\*\*\* Simplified BISHOP FCS = 2.153 \*\*\*\*

The following is a surmary of the TZN most critical surfaces

Problem Description : Sec. N-N' R=80' L=5'/%=50' D=5'

Resisting	Monent	(ft-1b)	2.2272+09	1.960E+09	2.485E+09	2.622E+09	2,504E+09	2,098E+09	2.352E+09	2.211E+09	2.018E+09	2.036E-09
Initial Terminal	x-ecord	(££)		658,92	673,53		_	669,79		712.27	670.2B	694.81
Initial	x-coord	(ft)	160.56	163.89	163.89	160,56	162.78	160.56	160,56	163,89	161,67	162.78
Radius		(ft)	3204.99	2401.10	3275,59	3357.88	3027,05	2262.75	1635,63	1206.63	1828.56	1121.91
Circle Center	Y-coord	(ft)	4712.09	3955.16	4782,35	486C.00	4549.10	3824.14	3235.26	2827.50	3415.02	2742.39
Circle	x-coord	(ft) (ft)	-701,50	-421.40	-713.64	-740.27	-623.90	-368,82	-127.56	28.36	-214.82	50.98
FOS	(BISHOP)		2.153	2.226	2.249	2,264	2.279	2.281	2.332	2,333	2,334	2.335
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\* \* \* END OF FILE \* \* \*

W.O. 8838

Sec. N-N. Pseudostatic

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Problem Description : Sec. N-N' N=80' D=5'/N=50' D=5' Pse

SECRET BOUNDARY COORDINATES

27 SURFACE boundary segments y-left (££) (£ Segment ģ

Soil Unit Below Segment 1625.9 1638.0 1638.0 1663.0 1688.0 1688.0 1711.0 1711.0 1734.0 1734.0 1760.0 1783.0 1804.0 1804.0 1823.0 1823.0 1839.0 1840.0 1900.0 1865.0 1858.0 1850.0 1840.0 1783.0 160.0 103.0 255.0 255.0 255.0 255.0 318.0 318.0 318.0 387.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 443.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 440.0 1625.0 1625.0 1638.0 1653.0 1663.0 1663.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 1711.0 17 435.0 549.0 557.0 623.0 0.699 0.017 975.C 1080.C .0 160.0 194.0 501,0 603.0 493.0 1150,0 202.0 

Soil Unit Below Segment 1620.0 1620.0 1706.0 x-right (ft) 160.1 240.0 397.0 8 SUBSURFACE boundary segments y-left (ft) 1625.0 1620.0 1620.0 x-left (ft) 160.0 160.1 240.0 Segment No.

m	M	7	,	Μ	
1705.0	1755.0	1815.0	1840.0	1840.0	
437.0	540.0	670.0	770.0	1190.0	5750
1705.0	1706.0	1755.0	1815.0	:755.0	Committee worth 988 more distriction
387.0	437.0	540.0	670.0	540.0	2007 535
7	ις)	9	۲-	œ	

## BEZN SPECIFIED A CRACKED ZONE HAS

Depth of crack below ground surface = 8.00 Maximum depth of water in crack = .00 Unit weight of water in crack = 62.40

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Water Surface No.	000
Pore Pressure Wate arameter Constant Surfa Ru (psf) No.	0,0,0,
	000,
Friction Angle (deg)	40,00 40,00
Cohesion Intercept (psf)	225.0 200.0 200.0
Weight C Sat. I (pcf)	140.0 135.0 140.0
Unit Moist (pcf)	130.0 125.0 130.0
Soil Unit No.	-1 63 E

A horizontal earthquake loading coefficient of 150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

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

5000 trial surfaces will be generated and analyzed

S00 Surfaces initiate from each of 10 points equally spaced along the ground surface between x=-155.0 ft and x=-165.0 ft

730.0 ft 1080.0 ft Each surface terminates between and Unless further limitations were imposed, the minimum elevation at which a surface extends is  $\gamma=-0.9\ {\rm ft}$ 

\* \* \* \* \* DEFNUT SECHENT LENGTE SELECTED BY XSTABL \* \* \* \* \*

24.0 ft line segments define each trial failure surface.

GEOLABS-WESTLAKE VILLAGE

### W.O. 8838 Sec. N-N' Pseudostatic

2.1206+09 2.3616+09 2.3636+09 2.3796+09 1.9906+09 2.2266+09 2.2286+09 2.0356+09

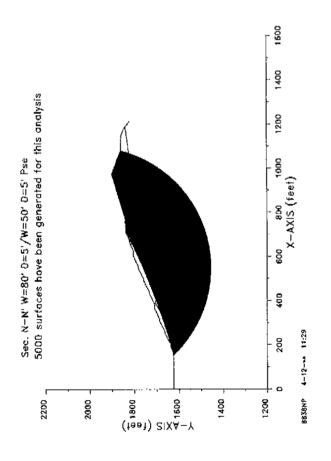
665.17 658.92 673.53 675.10 675.10 675.10 723.26 723.26 711.00

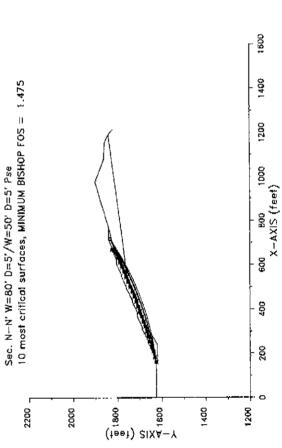
160,56 163,89 163,89 160,56 160,56 160,56 162,78 162,78 163,89

\* \*

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END OF FILE
3204.99
2401.10
3275.59
3357.88
3227.05
2261.75
3330.44
1635.63
1519.30
4712.09
3955.16
4782.35
4860.00
4549.10
3824.14
3235.26
3126.01
2827.50
-701.50
-421.40
-713.64
-740.27
-623.90
-623.90
-25.36
-78.98
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-78.98
   1,574
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       Fadius Initial Terminal Resisting x-coord x-coord Moment (ft) (ft) (ft-1b)
  Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees
   The following is a summary of the TEN most critical surfaces
  the first sequent of each failure surface will be inclined within the angular range defined by :
  Problem Description : Sec. N-N' W=80' D=5'/R=50' D=5' Pse
  * * * * * SIMPLIFIED BISHOP METHOD * * * * *
   Factors of safety have been calculated by the :
  The most critical circular failure surface is specified by 25 coordinate points
   ***
   Simplified BISHOP FOS = 1.475
  1625.21
1631.75
1645.36
1645.36
1652.4:
1667.05
1670.27
1670.27
1670.27
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1773.3
  y-surf
(ft)
   FOS Circle Center (BISHOF) x-coord y-coord (ft)
   160.56
1083.65
229.68
229.68
225.62
225.62
2343.82
366.48
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  ANGULAR RESTRICTIONS
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Saul, R.B., and Wooton, T.M., 1983, Geology of the south half of the Mint Canyon Quadrangle, Los Angeles County, California, CDMG Open File Report 83-24LA, Map Scale 1:9,600

Yerkes, R.F. (compiler), 1996; Preliminary Geologic Map of the Mint Canyon 7.5 Minute Quadrangle, Southern California, U.S. Geological Survey Open File Report 96-89, Scale 1:24,000

#### **AERIAL PHOTOGRAPHS**

Flight C-300, 1928, Frames F9, F10, F11, E243, E244, E245, Scale 1:18,000

Flight C-17727, 1952, Frames 4-72, 4-73, 4-74, Scale 1:14,400

Flight TG-7600, 1976, Frames 21-3, 21-4, 21-5, Scale 1:24,000

Flight 94-028, acc. 04684, 1994, Frames 106, 107, 108, 1:32,500

Horizon Surveys, performed for Sikand Engineering, Tr. 50846, Monarch Hills project, dated January 29, 1994, Frames 1-5, Scale 1:4800 +/-

Sheet 1 of 1

#### County of Los Angeles Department of Public Works GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION GEOLOGIC REVIEW SHEET

900 So. Fremont Ave., Alhambra, CA 91803 TEL. (626) 458-4925

DISTRIBUTION	1
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1 Geologist Soils Engineer

\_\_\_OMED File

1 Subdivision

TENTATIVE TRACT MAP 60922	TENTATIVE MAP DATED 8/27/08 (Revised)
SUBDIVIDER Pardee Homes	LOCATION Santa Clarita
ENGINEER Sikand	GRADING BY SUBDIVIDER [Y] (Y or N)
GEOLOGIST & SOILS ENGINEER Geolabs - Westlake Village	REPORT DATE 8/28/08, 4/13/07, 11/16/06, 1/3/05, 8/23/04, 3/6/04

#### TENTATIVE MAP FEASIBILITY IS RECOMMENDED FOR APPROVAL FROM A GEOLOGIC STANDPOINT

#### THE FOLLOWING CONDITIONS MUST BE FULFILLED:

- 1. The final map must be approved by the Geotechnical and Materials Engineering Division (GMED) to assure that all geotechnical requirements have been properly depicted. For Final Map clearance guidelines refer to GS051.0 in the Manual for Preparation of Geotechnical Reports (<a href="http://www.dpw.lacounty.gov/gmed/manual.pdf">http://www.dpw.lacounty.gov/gmed/manual.pdf</a>).
- A grading plan must be geotechnically approved by the GMED prior to Final Map approval. The grading depicted on the plan must agree with the grading depicted on the tentative tract or parcel map and the conditions approved by the Planning Commission. If the subdivision is to be recorded prior to the completion and acceptance of grading, corrective geologic bonds may be required.
- 3. Prior to grading plan approval a detailed engineering geology and soils engineering report must be submitted that addresses the proposed grading. All recommendations of the geotechnical consultants must be incorporated into the plan (Refer to the Manual for Preparation of Geotechnical Reports at <a href="http://www.dpw.lacounty.gov/gmed/manual.pdf">http://www.dpw.lacounty.gov/gmed/manual.pdf</a>).
- 4. All geologic hazards associated with this proposed development must be eliminated. Alternatively, the geologic hazards may be designated as restricted use areas (RUA), and their boundaries delineated on the Final Map. These RUAs must be approved by the GMED, and the subdivider must dedicate to the County the right to prohibit the erection of buildings or other structures within the restricted use areas (refer to GS063.0 in the manual for preparation of Geotechnical Reports).
- 5. The Soils Engineering review dated 9/30/08 is attached.

Prepared by	
	Geir Mathisen

#### COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION

#### **SOILS ENGINEERING REVIEW SHEET**

Tele	dress: ephone:	(626) 4	Fremont Ave., Alhambra, CA 91803	District Office _ Job Number _		8.2 001129
Fax	<b>::</b>	(626) 4	58-4913	Sheet 1 of 1		
Tentative Tract Map Location Developer/Owner Engineer/Architect		er er	60922 Santa Clarita Pardee Homes Sikand	Dr. Gr Ge Dis	BUTION ainage ading so/Soils C strict Eng sologist	Central File
Soil	s Engineer		Geolabs - Westlake Village		ils Engin	eer
Geo	ologist		Same as above		gineer/Ar	
Rev	riew of:					
Soil	s Engineerin	g Repor	el Map Dated by Regional Planning <u>8/27/08</u> rt and Addenda Dated <u>4/13/07, 11/16/06, 1/3/05, 8/23/04, 3/6/04</u> Dated <u>6/25/07</u>			
ACT	FION:					
Ten	tative Map fe	easibility	is recommended for approval, subject to conditions below:			
RE	MARKS:					
1.	At the gradi	ng plan i.	stage, submit two sets of grading plans to the Soils Section for verific	ation of compliance v	ith Coun	ty codes
2.	At the gradi submitted re	ng plan eport do	stage, provide geotechnical maps and tentative maps that conform. In not conform to the latest tentative map dated 8/27/08 by Regional Plants.	The geotechnical map anning.	os within	the
Α.	ONSITE SO	ILS HAV BRADIN	CHECKER/BUILDING AND SAFETY ENGINEER: VE A MEDIUM EXPANSION POTENTIAL AND ARE CORROSIVE TO G IS RECOMMENED FOR THE REMOVAL AND RECOMPACTION	O METALS. OF LANDSLIDES QU	.S-9A, QI	LS-10, QLS-
Revi	iewed by _		Mo. 57567 Emp. 6/2000  Mo. 57567  Emp. 6/2000  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 57567  Mo. 5756	n	_ Date	9/30/08

NOTICE: Public safety, relative to geotechnical subsurface exploration state of Saffornia, Title 8, Construction Safety Orders.

P.\Yosh\60922TentTg



R & R Services

Corporation

GEOLABS-WESTLAKE VILLAGE

Foundation and Soils Engineering, Geology

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August 28, 2008 W.O. 8838

Pardee Homes 26650 The Old Road, Suite 110 Valencia, California 91381

Attention:

Mr. Tom Mitchell

SUBJECT:

Addendum Geotechnical Report,

Tentative Tract No. 060922, Skyline Ranch,

Santa Clarita Area, County of Los Angeles, California

Mr. Mitchell:

We present herein an addendum geotechnical report for Tentative Tract Map No. 060922 to address the changes made to the Tentative Tract Map design since the issuance of our last geotechnical report dated April 13, 2007. Discussion, analyses, and recommendations provided in previous reports remain applicable unless superseded herein.

#### MODIFICATION TO TENTATIVE TRACT MAP

The Tentative Tract Map (TTM) used as a base for the geologic map in the April 13, 2007 report did not match the TTM submitted to planning. That is because updates included in our base map were ahead of the planning submittal.

There have been some minor modifications to the TTM since the April 13, 2007 report. We have compared the current TTM to the April 13, 2007 report map. Overall they maintain the same design. Differences between the two include:

Proposed grades for the park site on Lot 1272 have been lowered approximately 8 to
 II feet. These modified grades result in a reduction of the perimeter slope heights

along the southern and western sides while increasing the slope heights along the northern boarder. In addition, the previously proposed 2:1 (horizontal: vertical) slope that divided the park site into the upper eastern portion and lower western portion has been removed. An 8:1 slope is now proposed in the north central portion of the park site.

- Proposed grades for the park site on Lot 1273 have been modified by approximately four feet or less. The northern portion has been raised approximately four feet while the southern portion was lowered approximately two feet. The modified proposed grades results in minor adjustment of the adjacent proposed pad grades and slope heights.
- Proposed grades for the school site on Lot 1271 have been raised approximately four feet. The raised proposed grades results in minor adjustment of the adjacent proposed pad grades and slope heights.
- Two small basins previously proposed along the northeastern and southwestern sides
  of Skyline Ranch Road, immediately northwest of Sierra Highway, have been
  removed.
- The proposed booster station on Lot 1324 has been shifted toward the north and the proposed grades modified slightly.
- Proposed pad grades have been raised or lowered about 2 ½ feet or less in some areas throughout the site (i.e. Lots 1208-1270).
- Proposed lot lines have been shifted slightly in a few locations throughout the site (i.e. between Lots 653-659).

- The top or toe of proposed slopes about the perimeter of the proposed development have been modified slightly (i.e. northern boundary).
- An approximately 10 foot tall 2:1 slope has been eliminated from the area immediately south of Lot 80.

These differences are inconsequential to the geological and soils engineering analyses and recommendations provided in the reviewed report. Additional investigation, analyses, or recommendations are not warranted at this time.

#### 111 STATEMENT

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed grading and proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2) the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or warranty, express or implied.

#### **CLOSURE**

This geotechnical report has been prepared in accordance with generally accepted engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

SIONAL

STEPHEN D. DIEM

No. 2246

CERTIFIED ENGINEERING GEOLOGIST Exp. 07/31/10

CALIF

Thank you for this opportunity to be of service to you. Please do not hesitate to call if you

have any questions regarding this report.

Respectfully submitted;

GEOLABS-WESTLAKE VILLAG

Steve Diem C.E.G. 2246 R.C.E. 73086

Enclosures: References

XC: (1) Addressee

(1) Pardee-Valencia, Attention Jim Bizzelle

(2) Sikand Engineers, Attention Craig Young (2) County of Los Angeles, Land Development (and 1 PDF on CD)

STEPHEN D DIEM

No 73086 EXP 12-31-08

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(2) PCR Services, Attention Jay Ziff (and 1 PDF on CD)

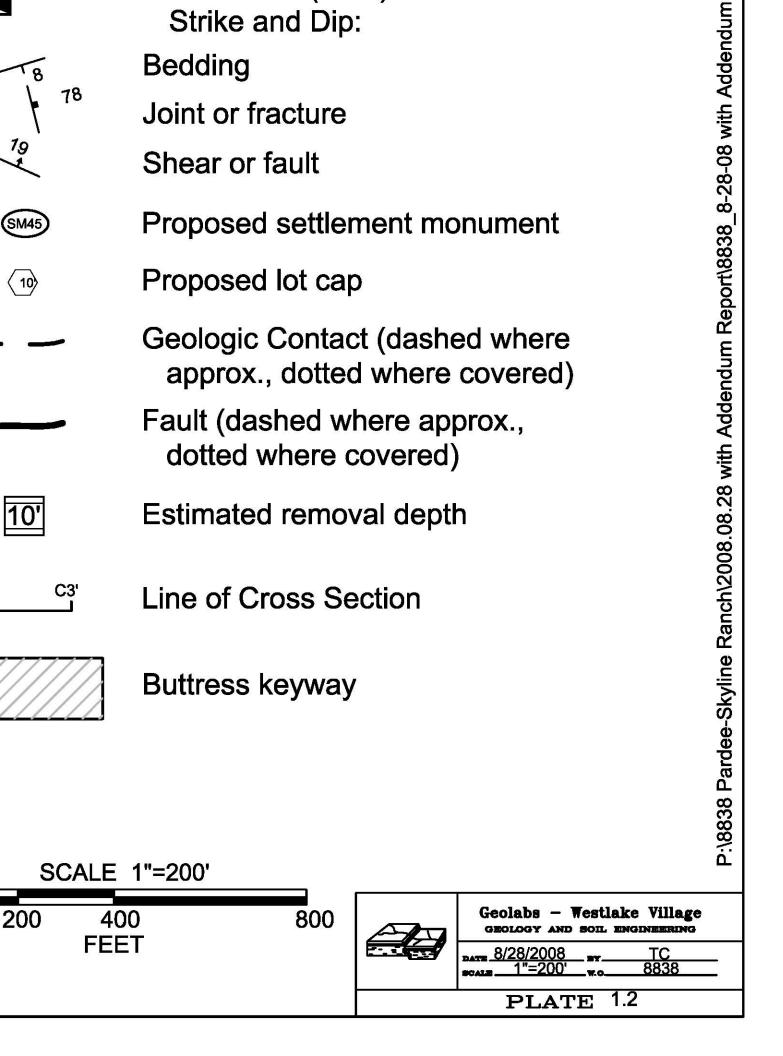
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#### References

Geolabs-Westlake Village, April 13, 2007; Response to Soils Engineering Review Sheet dated February 8, 2007, Tentative Tract Map No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

- ..., November 16, 2006; Addendum Geotechnical Report, Tentative Tract Map No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California
- ..., January 3, 2005; Response to LACDPW Review Sheets dated October 12 and 15, Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California
- ..., August 23, 2004; Response to LACDPW Review Sheets dated May 25 and June 15, 2004 for Tentative Tract No. 60922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California
- ..., March 6, 2004; Geotechnical Investigation of Vesting Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

Copies of Plate 1.2 on file with the County of Los Angeles, Department of Public Works, Land Development



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