COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
TOM BURNS, PLANNING DIRECTOR

NOTICE OF ENVIRONMENTAL REVIEW PERIOD

SANTA CRUZ COUNTY

APPLICANT: **Owen Lawlor / Richard and Loretta Anderson**

APPLICATION NO.: **07-0112**

APN: **041-481-04**

The Environmental Coordinator has reviewed the Initial Study for your application and made the following preliminary determination:

XX Negative Declaration
(Your project will not have a significant impact on the environment.)

XX Mitigations will be attached to the Negative Declaration.

_____ No mitigations will be attached.

_____ Environmental Impact Report
(Your project may have a significant effect on the environment. An EIR must be prepared to address the potential impacts.)

As part of the environmental review process required by the California Environmental Quality Act (CEQA), this is your opportunity to respond to the preliminary determination before it is finalized. Please contact Matt Johnston, Environmental Coordinator at (831) 454-3201, if you wish to comment on the preliminary determination. Written comments will be received until 5:00 p.m. on the last day of the review period.

Review Period Ends: **October 14, 2009**

Randall Adams, staff planner

Phone: **Phone #: (831) 454-3218**

Date: **September 21, 2009**

NAME: Wallace Ave
APPLICATION: 07-0112
A.P.N: 041-481-04

NEGATIVE DECLARATION MITIGATIONS

A. In order to avoid impacts to bats, raptors or migratory songbirds, tree removal activities shall be limited to the months between September 1 and December 15, if feasible.

   a. If trees must be removed outside of the timeframe above, surveys for protected species shall be conducted by a qualified biologist prior to site disturbance. If active nests are present in trees to be retained, no disturbance zones, set by the biologist based on the particular species present, will be fenced off around the subject tree to ensure other construction activities do not harm sensitive species.
   b. In order to prevent impacts to special status bat species, before any trees are removed outside of the maternity roost season (March1 – July 31), a qualified biologist shall perform surveys. Roosting bats shall be excluded from trees prior to disturbance. If maternal roosts are present, disturbance shall be avoided until roosts are unoccupied.
   c. If active raptor, migratory bird, or bat nests or roosts are found in trees to be retained, a qualified biologist shall be required to be on site during any initial vegetation or ground disturbance activities (e.g. vegetation clearing, grading, excavation, tree pruning/removal) that could potentially impact listed species. Roosting bats shall be excluded from trees prior to any disturbance. The biologist shall be responsible for setting and maintaining the disturbance buffers from active nests during construction activities, and for ensuring bat roosts are vacated. Buffers and exclusionary measures shall be implemented only after consultation with CDFG.

B. In order to adequately mitigate impacts from the proposed development on oak woodland, the applicant shall:

   a. Remove all invasive acacia and eucalyptus trees;
   b. Submit a revised tree removal plan and landscape/re-vegetation plan depicting the removal of all non-native tree species;
   c. Provide an updated arborist's letter which addresses removal of all non-native trees and reviews the landscape/re-vegetation plan for consistency with the goal of oak woodland restoration.

C. In order to mitigate potential impacts from sanitary waste, prior to map recordation the applicant shall provide proof that the property has been annexed into the Santa Cruz County Sanitation District. Prior to final inspection the applicant shall provide proof that all lots have been connected to the sanitary sewer system.

Environmental Review Initial Study

Application Number: 07-0112

Date: 9/14/09
Staff Planner: Randall Adams

I. OVERVIEW AND ENVIRONMENTAL DETERMINATION

APPLICANT: Owen Lawlor **APN:** 041-481-04

OWNER: Richard & Loretta Anderson **SUPERVISORAL DISTRICT:** 2

LOCATION: Property located at the end of Wallace Avenue (access between 3105 and 2280 Wallace Avenue), in Aptos.

SUMMARY PROJECT DESCRIPTION: Proposal to divide an approximately 6.08 acre parcel into three parcels of 1.44, 1.34, and 3.30 acres and to construct three single family dwellings.

Requires a Minor Land Division, Residential Development Permit, an exception for access from a right-of-way of less than 40 feet in width, a Roadway/Roadside exception, a Geologic Hazards Assessment, a Geologic Report Review, a Soils Report Review, and annexation into the Santa Cruz County Sanitation District.

ALL OF THE FOLLOWING POTENTIAL ENVIRONMENTAL IMPACTS ARE EVALUATED IN THIS INITIAL STUDY. CATEGORIES THAT ARE MARKED HAVE BEEN ANALYZED IN GREATER DETAIL BASED ON PROJECT SPECIFIC INFORMATION.

X	Geology/Soils	____	Noise
____	Hydrology/Water Supply/Water Quality	____	Air Quality
____	Biological Resources	____	Public Services & Utilities
____	Energy & Natural Resources	____	Land Use, Population & Housing
____	Visual Resources & Aesthetics	____	Cumulative Impacts
____	Cultural Resources	____	Growth Inducement
____	Hazards & Hazardous Materials	____	Mandatory Findings of Significance
____	Transportation/Traffic		

DISCRETIONARY APPROVAL(S) BEING CONSIDERED

____	General Plan Amendment	__X__	Grading Permit
__X__	Land Division	____	Riparian Exception
____	Rezoning	____	Other:
__X__	Development Permit	____	
____	Coastal Development Permit	____	

NON-LOCAL APPROVALS

Other agencies that must issue permits or authorizations:

ENVIRONMENTAL REVIEW ACTION

On the basis of this Initial Study and supporting documents:

___ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

__X__ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the attached mitigation measures have been added to the project. A MITIGATED NEGATIVE DECLARATION will be prepared.

___ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Matt Johnston

Sept 17, 2009
Date

For: Claudia Slater
Environmental Coordinator

NAME: Wallace Ave
APPLICATION: 07-0112
A.P.N: 041-481-04

NEGATIVE DECLARATION MITIGATIONS

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   c. If active raptor, migratory bird, or bat nests or roosts are found in trees to be retained, a qualified biologist shall be required to be on site during any initial vegetation or ground disturbance activities (e.g. vegetation clearing, grading, excavation, tree pruning/removal) that could potentially impact listed species. Roosting bats shall be excluded from trees prior to any disturbance. The biologist shall be responsible for setting and maintaining the disturbance buffers from active nests during construction activities, and for ensuring bat roosts are vacated. Buffers and exclusionary measures shall be implemented only after consultation with CDFG.

B. In order to adequately mitigate impacts from the proposed development on oak woodland, the applicant shall:

   a. Remove all invasive acacia and eucalyptus trees;
   b. Submit a revised tree removal plan and landscape/re-vegetation plan depicting the removal of all non-native tree species;
   c. Provide an updated arborist's letter which addresses removal of all non-native trees and reviews the landscape/re-vegetation plan for consistency with the goal of oak woodland restoration.

C. In order to mitigate potential impacts from sanitary waste, prior to map recordation the applicant shall provide proof that the property has been annexed into the Santa Cruz County Sanitation District. Prior to final inspection the applicant shall provide proof that all lots have been connected to the sanitary sewer system.

II. BACKGROUND INFORMATION

EXISTING SITE CONDITIONS

Parcel Size: 6.08 acres
Existing Land Use: Vacant
Vegetation: Oak woodland with acacia, pine, and eucalyptus trees
Slope in area affected by project: _X_ 0 - 30% _X_ 31 – 100% (small sections)
Nearby Watercourse: Valencia Creek
Distance To: 1,500 feet

ENVIRONMENTAL RESOURCES AND CONSTRAINTS

Groundwater Supply: Not mapped
Water Supply Watershed: Not mapped
Groundwater Recharge: Not mapped
Timber or Mineral: Not mapped
Agricultural Resource: Not mapped
Biologically Sensitive Habitat: Not mapped
Fire Hazard: Not mapped
Floodplain: Not mapped
Erosion: Not mapped
Landslide: Not mapped
Liquefaction: Low potential
Fault Zone: Not mapped
Scenic Corridor: Not mapped
Historic: Not mapped
Archaeology: Not mapped
Noise Constraint: Not mapped
Electric Power Lines: N/A
Solar Access: Adequate
Solar Orientation: West & south
Hazardous Materials: N/A

SERVICES

Fire Protection: Aptos/La Selva Fire Protection District
School District: Pajaro Valley Unified
Sewage Disposal: Santa Cruz County Sanitation District
Drainage District: None
Project Access: Unnamed right of way at the end of Wallace Avenue
Water Supply: Soquel Creek Water District

PLANNING POLICIES

Zone District: R-1-1AC
General Plan: R-UVL
Special Designation: None

Urban Services Line:	_X_ Inside	___ Outside
Coastal Zone:	___ Inside	_X_ Outside

PROJECT SETTING AND BACKGROUND:

The subject property is approximately 6 acres located on the southeast side of the end of Wallace Avenue in Aptos. The property is accessed via a private right of way which continues on through private property to Huntington Drive. The property is hilly and wooded, with a mix of oak, pine, acacia, and eucalyptus trees. Historic grading appears to have occurred on the southern portion of the property which resulted in three distinct terraces. These terraces are the locations where the three new building sites are proposed. Although this area is located within the Urban Services Line, the surrounding neighborhood has a rural residential character with single family residences on large parcels.

DETAILED PROJECT DESCRIPTION:

This application is a proposal to divide an approximately 6 acre property (into three parcels of 1.44, 1.34, and 3.30 acres) and to construct three single family dwellings (Attachment 2). The three single family dwellings would be located on the existing graded terraces on the subject property. Parking for the residences would be provided on each parcel. A 24 feet wide access road (within a 40 feet wide right of way) would be constructed along the southern property boundary to access the new lots. The access road would terminate in a cul-de-sac on Lot 2. Lot 3 would be accessed by a driveway 12 feet wide, with a hammerhead fire turnaround provided at the end of the driveway. A small section of the roadway from Wallace Drive to the subject property would be constructed to a maximum width of 20 feet, within the existing 20 foot wide right of way adjacent to the subject property. The project requires an exception to the County Design Criteria Urban Local Street Standard, with a reduced roadway width, no sidewalks, or landscaping strips. The small portion of the access road to Wallace Drive within the existing 20 feet wide right of way would require a Residential Development Permit for access on a less than 40 feet wide right of way.

Grading would be required for the access road and driveways to serve the proposed development. Grading volumes would be approximately 1,404 cubic yards (cut) and 208 cubic yards (fill), with the remaining 946 cubic yards to be exported off site. The grading has been minimized through reducing the roadway width and in stepping the houses down the hillside where possible. 144 trees are proposed to be removed to accommodate the proposed development. Many of the trees proposed to be removed are non-native invasive species (acacia & eucalyptus) or are in poor health. 146 replacement trees are indicated on the landscape plan.

This project would require annexation into the Santa Cruz County Sanitation District and all lots would be connected to the public sanitary sewer system.

III. ENVIRONMENTAL REVIEW CHECKLIST

A. Geology and Soils

Does the project have the potential to:

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable
1. Expose people or structures to potential adverse effects, including the risk of material loss, injury, or death involving:				
A. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or as identified by other substantial evidence?	____	____	X	____
B. Seismic ground shaking?	____	____	X	____
C. Seismic-related ground failure, including liquefaction?	____	____	X	____
D. Landslides?	____	____	X	____

All of Santa Cruz County is subject to some hazard from earthquakes. However, the project site is not located within or adjacent to a county or state mapped fault zone. A geotechnical investigation for the proposed project was performed by AMSO Consulting Engineers, revised 8/10/07 (Attachment 3). The report concluded that seismic shaking can be managed through proper foundation design, that landslides are not a potential hazard, and that the potential for liquefaction is low. A Geologic Hazards Assessment was performed to assess the stability of the slopes on the subject property (Attachment 4). Following the Geologic Hazards Assessment, a geologic report was prepared by Nielsen & Associates, dated 5/08 (Attachment 5) to allow a reduced slope setback (from 50 feet to 25 feet) for development on the proposed Lot 3. The project geologist determined that a slope setback of 25 feet (from slopes in excess of 30 percent) would provide adequate stability for the building site on proposed Lot 3. The reports have been reviewed and accepted by Environmental Planning staff (Attachment 6).

	Significant Or *Potentially* Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable
2. Subject people or improvements to damage from soil instability as a result of on- or off-site landslide, lateral spreading, to subsidence, liquefaction, or structural collapse?	____	____	X	____

The geotechnical and geologic reports cited above did not identify a significant potential for damage caused by any of these hazards.

3. Develop land with a slope exceeding 30%?	____	____	X	____

There are slopes that exceed 30% on the property and in the area of the proposed development. However, these steeply sloped areas are the result of historic grading to create the three terraces on the property. The project design works with the existing topography to avoid the steeply sloped areas wherever possible and no roadways, driveways, or building sites are proposed on slopes in excess of 30%.

4. Result in soil erosion or the substantial loss of topsoil?	____	____	X	____

Some potential for erosion exists during the construction phase of the project, however, this potential is minimal because standard erosion controls are a required condition of the project. Prior to approval of a grading or building permit, the project must have an approved Erosion Control Plan, which will specify detailed erosion and sedimentation control measures. The plan will include provisions for disturbed areas to be planted with ground cover and to be maintained to minimize surface erosion.

5. Be located on expansive soil, as defined in section 1802.3.2 of the California Building Code, creating substantial risks to property?	____	____	X	____

The geotechnical report for the project did not identify any elevated risk associated with expansive soils.

6. Place sewage disposal systems in areas dependent upon soils incapable of adequately supporting the use of septic tanks, leach fields, or alternative waste water disposal systems?	____	X	____	____

No septic systems are proposed. Annexation to the Santa Cruz County Sanitation District will be required prior to recordation of the parcel map. After annexation, the development will be connected to the Santa Cruz County Sanitation District

	Significant Or *Potentially* Significant Impact	Less than Significant *with* Mitigation Incorporation	Less than *Significant* Or No Impact	Not Applicable
(Attachment 7). The applicant will be required to pay standard sewer connection and service fees that fund sanitation improvements within the district as a Condition of Approval for the project.				
7. Result in coastal cliff erosion?	____	____	____	X

B. Hydrology, Water Supply and Water Quality

Does the project have the potential to:

1. Place development within a 100-year flood hazard area?	____	____	X	____

According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Map, dated March 2, 2006, no portion of the project site lies within a 100-year flood hazard area.

2. Place development within the floodway resulting in impedance or redirection of flood flows?	____	____	X	____

According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Map, dated March 2, 2006, no portion of the project site lies within a 100-year flood hazard area.

3. Be inundated by a seiche or tsunami?	____	____	____	X
4. Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit, or a significant contribution to an existing net deficit in available supply, or a significant lowering of the local groundwater table?	____	____	X	____

The project would obtain water from Soquel Creek Water District and would not rely on private well water. Although the project would incrementally increase water demand, Soquel Creek Water District has indicated that adequate supplies are available to serve the project as the project is required to participate in the District's offset program (Attachment 8). The project is not located in a mapped groundwater recharge area.

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable
5. Degrade a public or private water supply? (Including the contribution of urban contaminants, nutrient enrichments, or other agricultural chemicals or seawater intrusion).			X	

Runoff from this project may contain small amounts of chemicals and other household contaminants. No commercial or industrial activities are proposed that would contribute a significant amount of contaminants to a public or private water supply. Potential siltation from the proposed project will be mitigated through implementation of erosion control measures.

6. Degrade septic system functioning?				X

There is no indication that existing septic systems in the vicinity would be affected by the project.

7. Alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which could result in flooding, erosion, or siltation on or off-site?			X	

The proposed project is not located near any watercourses, and would not alter the existing overall drainage pattern of the site. Department of Public Works Drainage Section staff has reviewed and approved the proposed drainage plan.

8. Create or contribute runoff which would exceed the capacity of existing or planned storm water drainage systems, or create additional source(s) of polluted runoff?			X	

Drainage Calculations prepared by Ifland Engineers (Attachment 9) have been reviewed for potential drainage impacts and accepted by the Department of Public Works (DPW) Drainage Section staff. The calculations show that the net increase in runoff would be 0.98 cubic feet per second for a ten year storm event before considering the detention systems. The runoff rate from the property will be controlled by recharge chambers on each lot and below ground detention pipes for the access road and driveways as shown on the proposed improvement plans (Attachment 2). Existing downstream storm water facilities are adequate to handle the increase in runoff associated with the project. Refer to response B-5 for discussion of urban contaminants and/or other polluting runoff.

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable
9. Contribute to flood levels or erosion in natural water courses by discharges of newly collected runoff?			X	

See response B-8 above.

10. Otherwise substantially degrade water supply or quality?			X	

Best Management Practices and treatment of road and driveway runoff are proposed to minimize the effects of urban pollutants.

C. Biological Resources

Does the project have the potential to:

1. Have an adverse effect on any species identified as a candidate, sensitive, or special status species, in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service?			X	

According to the California Natural Diversity Data Base (CNDDB), maintained by the California Department of Fish and Game, there are no known special status plant or animal species in the site vicinity, and there were no special status species observed in the project area.

2. Have an adverse effect on a sensitive biotic community (riparian corridor), wetland, native grassland, special forests, intertidal zone, etc.)?		X		

There are no mapped sensitive biotic communities on or adjacent to the project site. Oak woodlands (protected under California Public Resources Code 21083.4) are present on the project site. The oak woodland would be affected by the proposed project, through tree removals and site disturbance. An arborist's report, prepared by Maureen Hamb, dated 2/21/07 & 8/27/07 (Attachment 10), discusses the health of the trees and the proposed tree removals. The 144 trees to be removed include oaks, pines, and non-native species (eucalyptus and acacia) and 46 replacement oak trees are proposed to compensate the 12 oak trees to be removed. County Code (Section 16.32 - Sensitive Habitat Ordinance and the General Plan (Policies 5.1.5 - Land Division and Density Requirements in Sensitive Habitats & 5.1.6 Development within Sensitive Habitats) limits development of sensitive habitat areas and requires that any proposed development maintain or enhance the functional capacity of the habitat area.

Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable

The project has been designed to minimize impacts to the oak woodland by locating building sites within existing disturbed areas, through the removal of invasive tree species, and the planting of replacement oak trees and other native species. In order to adequately mitigate impacts from the proposed development, it will be necessary to: remove all invasive acacia and eucalyptus trees; to submit a revised tree removal plan and landscape/re-vegetation plan depicting the removal of all non-native tree species; and to provide an updated arborist's letter which discusses removal of all non-native trees and reviews the landscape/re-vegetation plan for consistency with the goal of oak woodland restoration. With these mitigations, the removal of the invasive tree species and the 3:1 oak tree replacement ratio will prevent any adverse effect on the oak woodland on the subject property associated with the proposed project.

Removal of a large stand of trees has the potential to impact bats and birds that are protected under state and federal laws. In order to avoid impacts to bats, raptors or migratory songbirds, tree removal activities shall be limited to the months between September 1 and December 15, if feasible.
If trees must be removed outside of that timeframe, surveys for protected species shall be conducted prior to site disturbance. If active nests are present in trees to be retained, no disturbance zones, set by a qualified biologist based on the particular species present, will be fenced off around the subject tree to ensure other construction activities do not harm sensitive species. In order to prevent impacts to special status bat species, before any trees are removed outside of the maternity roost season (March1 – July 31), a qualified biologist shall perform surveys. Roosting bats shall be excluded from trees prior to disturbance. If maternal roosts are present, disturbance shall be avoided until roosts are unoccupied.
If active raptor, migratory bird, or bat nests or roosts are found in trees to be retained, a qualified biologist shall be required to be on site during any initial vegetation or ground disturbance activities (e.g. vegetation clearing, grading, excavation, tree pruning/removal) that could potentially impact listed species. Roosting bats shall be excluded from trees prior to any disturbance. The biologist shall be responsible for setting and maintaining the disturbance buffers from active nests during construction activities, and for ensuring bat roosts are vacated. Buffers and exclusionary measures shall be implemented only after consultation with CDFG.

3.	Interfere with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native or migratory wildlife nursery sites?	____	____	X	____

The proposed project does not involve any activities that would interfere with the movements or migrations of fish or wildlife, or impede use of a known wildlife nursery site.

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable
4. Produce nighttime lighting that will illuminate animal habitats?			X	

The subject property is surrounded by existing residential development that currently generates nighttime lighting.

5. Make a significant contribution to the reduction of the number of species of plants or animals?			X	

See responses C-1 and C-2 above.

6. Conflict with any local policies or ordinances protecting biological resources (such as the Significant Tree Protection Ordinance, Sensitive Habitat Ordinance, provisions of the Design Review ordinance protecting trees with trunk sizes of 6 inch diameters or greater)?		X		

See response C-2. County Code (Section 16.32 - Sensitive Habitat Ordinance and the General Plan (Policies 5.1.5 - Land Division and Density Requirements in Sensitive Habitats & 5.1.6 Development within Sensitive Habitats) limit development of sensitive habitat areas and require that any proposed development maintain or enhance the functional capacity of the habitat area. In addition to the 46 proposed replacement oak trees, the project would result in the planting of an additional 100 replacement trees (for a total of 146 replacement trees) to compensate for the 144 tree removals (including the 12 oak trees to be removed) on the subject property. The site design for the proposed project takes the location of existing trees into consideration and the proposal is not in conflict with the County Design Review ordinance.

7. Conflict with the provisions of an adopted Habitat Conservation Plan, Biotic Conservation Easement, or other approved local, regional, or state habitat conservation plan?				X

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable
D. Energy and Natural Resources Does the project have the potential to:				
1. Affect or be affected by land designated as "Timber Resources" by the General Plan?				X
2. Affect or be affected by lands currently utilized for agriculture, or designated in the General Plan for agricultural use?				X

The project site is not currently being used for agriculture and no agricultural uses are proposed for the site or surrounding vicinity.

3. Encourage activities that result in the use of large amounts of fuel, water, or energy, or use of these in a wasteful manner?				X
4. Have a substantial effect on the potential use, extraction, or depletion of a natural resource (i.e., minerals or energy resources)?				X
E. Visual Resources and Aesthetics Does the project have the potential to:				
1. Have an adverse effect on a scenic resource, including visual obstruction of that resource?			X	

The project would not directly impact any public scenic resources, as designated in the County's General Plan (1994), or obstruct any public views of these visual resources.

2. Substantially damage scenic resources, within a designated scenic corridor or public view shed area including, but not limited to, trees, rock outcroppings, and historic buildings?			X	

The project site is not located along a County designated scenic road or within a designated scenic resource area.

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable
3. Degrade the existing visual character or quality of the site and its surroundings, including substantial change in topography or ground surface relief features, and/or development on a ridge line?	____	____	X	____

The existing visual setting is a vacant parcel within an existing developed residential area. The proposed project is designed and landscaped as an infill project to fit into this setting.

4. Create a new source of light or glare which would adversely affect day or nighttime views in the area?	____	____	X	____

The project would create an incremental increase in night lighting. However, this increase would be small, and would be similar in character to the lighting associated with the surrounding existing uses.

5. Destroy, cover, or modify any unique geologic or physical feature?	____	____	X	____

There are no unique geological or physical features on or adjacent to the site that would be destroyed, covered, or modified by the project.

F. Cultural Resources

Does the project have the potential to:

1. Cause an adverse change in the significance of a historical resource as defined in CEQA Guidelines 15064.5?	____	____	X	____

There are no designated historic resources on the subject property.

2. Cause an adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines 15064.5?	____	____	X	____

No archeological resources have been identified in the project area. Pursuant to County Code Section 16.40.040, if at any time in the preparation for or process of excavating or otherwise disturbing the ground, any human remains of any age, or any artifact or other evidence of a Native American cultural site which reasonably appears to exceed 100 years of age are discovered, the responsible persons shall immediately cease and desist from all further site excavation and comply with the notification

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable

procedures given in County Code Chapter 16.40.040.

3. Disturb any human remains, including those interred outside of formal cemeteries?			X	

Pursuant to Section 16.40.040 of the Santa Cruz County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this project, human remains are discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the sheriff-coroner and the Planning Director. If the coroner determines that the remains are not of recent origin, a full archeological report shall be prepared and representatives of the local Native California Indian group shall be contacted. Disturbance shall not resume until the significance of the archeological resource is determined and appropriate mitigations to preserve the resource on the site are established.

4. Directly or indirectly destroy a unique paleontological resource or site?				X

G. Hazards and Hazardous Materials

Does the project have the potential to:

1. Create a significant hazard to the public or the environment as a result of the routine transport, storage, use, or disposal of hazardous materials, not including gasoline or other motor fuels?				X
2. 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 it create a significant hazard to the public or the environment?			X	

The project site is not included on the 7/31/09 list of hazardous sites in Santa Cruz County compiled pursuant to the specified code.

3. *Create a safety hazard for people* residing or working in the project area as a result of dangers from aircraft using a public or private airport located *within two miles of the project site?*				X

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable
4. Expose people to electro-magnetic fields associated with electrical transmission lines?				X
5. Create a potential fire hazard?			X	

The project design incorporates all applicable fire safety code requirements and will include fire protection devices as required by the local fire agency.

6. Release bio-engineered organisms or chemicals into the air outside of project buildings?				X

H. Transportation/Traffic

Does the project have the potential to:

1. Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			X	

The project would create a small incremental increase in traffic on nearby roads and intersections. However, given the small number of new trips created by the project (3 new peak trips - 1 new peak trip per dwelling unit), this increase is less than significant. Further, the increase would not cause the Level of Service at any nearby intersection to drop below Level of Service D.

2. Cause an increase in parking demand which cannot be accommodated by existing parking facilities?			X	

The project meets the code requirements for the required number of parking spaces and therefore new parking demand will be accommodated on site.

3. Increase hazards to motorists, bicyclists, or pedestrians?			X	

The proposed project would include an exception to the County Design criteria for the shared access driveway, which is considered as a new roadway because it serves 3 or more residences. The County standard for new roadways is a 56 foot wide right of way with parking, sidewalks, and landscape strips on both sides. The project design

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable

includes an exception to reduce the driveway shared by Lots 1, 2 & 3 to a 24 foot wide paved surface with no parking along the driveway. Parking would be provided on each individual parcel. Due to the limited amount of traffic along the proposed driveway, adequate pavement width, and an open line of sight, pedestrians and bicycles would be able to share the driveway with motor vehicles without causing a potential hazard to motorists, bicyclists, and/or pedestrians.

4.	Exceed, either individually (the project alone) or cumulatively (the project combined with other development), a level of service standard established by the county congestion management agency for designated intersections, roads or highways?	____	____	X	____

See response H-1 above.

I. Noise

Does the project have the potential to:

1.	Generate a permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	____	____	X	____

The project would create an incremental increase in the existing noise environment. However, this increase would be small, and would be similar in character to noise generated by the surrounding existing uses.

2.	Expose people to noise levels in excess of standards established in the General Plan, or applicable standards of other agencies?	____	____	X	____

Per County policy, average hourly noise levels shall not exceed the General Plan threshold of 50 L_{eq} during the day and 45 L_{eq} during the nighttime. Impulsive noise levels shall not exceed 65 db during the day or 60 db at night. The project is not located near any known noise generation sources which would exceed the noise thresholds established in the County General Plan.

3.	Generate a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	____	____	X	____

Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable

Noise generated during construction would increase the ambient noise levels for adjoining areas. Construction would be temporary, however, and given the limited duration of this impact it is considered to be less than significant.

J. Air Quality

Does the project have the potential to:
(Where available, the significance criteria established by the MBUAPCD may be relied upon to make the following determinations).

1.	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	____	____	X	____

The North Central Coast Air Basin does not meet State standards for ozone and particulate matter (PM10). Therefore, the regional pollutants of concern that would be emitted by the project are ozone precursors (Volatile Organic Compounds [VOCs] and nitrogen oxides [NOx]), and dust.
Given the modest amount of new traffic that would be generated by the project there is no indication that new emissions of VOCs or NOx would exceed Monterey Bay Unified Air Pollution Control District (MBUAPCD) thresholds for these pollutants and therefore there would not be a significant contribution to an existing air quality violation.

2.	Conflict with or obstruct implementation of an adopted air quality plan?	____	____	X	____

The project would not conflict with or obstruct implementation of the regional air quality plan. See J-1 above.

3.	Expose sensitive receptors to substantial pollutant concentrations?	____	____	____	X
4.	Create objectionable odors affecting a substantial number of people?	____	____	____	X

K. Public Services and Utilities

Does the project have the potential to:

1.	Result in the need for new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other				

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable
performance objectives for any of the public services:				
a. Fire protection?			X	
b. Police protection?			X	
c. Schools?			X	
d. Parks or other recreational activities?			X	
e. Other public facilities; including the maintenance of roads?			X	

While the project represents an incremental contribution to the need for services, the increase would be minimal. Moreover, the project meets all of the standards and requirements identified by the local fire agency and school, park, and transportation fees paid by the applicant will be used to offset the incremental increase in demand for school and recreational facilities and public roads.

2. Result in the need for construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	

Drainage analysis of the project Ifland Engineers (Attachment 9) concluded that existing downstream facilities are adequate to serve the proposed project. Department of Public Works Drainage staff have reviewed the drainage information and have determined that downstream storm facilities are adequate to handle the increase in drainage associated with the project (Attachment 7).

3. Result in the need for construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?		X		

The project would connect to an existing municipal water supply. Soquel Creek Water District has determined that adequate supplies are available to serve the project (Attachment 8).

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable

The subject property is located within the Urban Services Line and is not connected to the public sewer system. Public sewer connections will be available to serve the project, after annexation into the Santa Cruz County Sanitation District as reflected in the comments from Santa Cruz County Sanitation District staff (Attachment 7). In order to mitigate potential impacts from sanitary waste, it will be necessary for the property to be annexed into the Santa Cruz County Sanitation District prior to map recordation, and all lots shall be connected to the sanitary sewer system prior to final inspection. Septic systems shall not be allowed to serve the proposed parcels.

4. Cause a violation of wastewater treatment standards of the Regional Water Quality Control Board?	____	____	X	____

The project's wastewater flows would not violate any wastewater treatment standards.

5. Create a situation in which water supplies are inadequate to serve the project or provide fire protection?	____	____	X	____

The water mains serving the project site provide adequate flows and pressure for fire suppression. Additionally, the fire agency has reviewed and approved the project plans, assuring conformity with fire protection standards that include minimum requirements for water supply for fire protection.

6. Result in inadequate access for fire protection?	____	____	X	____

The project's road access has been approved by the local fire agency.

7. Make a significant contribution to a cumulative reduction of landfill capacity or ability to properly dispose of refuse?	____	____	X	____

The project would make an incremental contribution to the reduced capacity of regional landfills. However, this contribution would be relatively small and would be of similar magnitude to that created by existing land uses around the project.

8. Result in a breach of federal, state, and local statutes and regulations related to solid waste management?	____	____	X	____

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Or No Impact	Not Applicable

L. Land Use, Population, and Housing

Does the project have the potential to:

1. Conflict with any policy of the County adopted for the purpose of avoiding or mitigating an environmental effect?		X		

See responses C-2 & C-6 regarding sensitive habitat protection. The proposed project does not conflict with any other policies adopted for the purpose of avoiding or mitigating an environmental effect.

2. Conflict with any County Code regulation adopted for the purpose of avoiding or mitigating an environmental effect?		X		

See responses C-2 & C-6 regarding sensitive habitat protection. The proposed project does not conflict with any other regulations adopted for the purpose of avoiding or mitigating an environmental effect.

3. Physically divide an established community?			X	

The project does not include any element that would physically divide an established community.

4. Have a potentially significant growth inducing effect, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			X	

The proposed project is designed at the density and intensity of development allowed by the General Plan and zoning designations for the parcel. Additionally, the parcel is within the Urban Services Line and within the sphere of influence of the Santa Cruz County Sanitation District. Therefore, annexation of the project into the Santa Cruz County Sanitation District is not expected to have a significant growth-inducing effect.

5. Displace substantial numbers of people, or amount of existing housing, necessitating the construction of replacement housing elsewhere?			X	

The proposed project would entail a net gain in housing units.

M. Non-Local Approvals

Does the project require approval of federal, state, or regional agencies? Yes ____ No X

N. Mandatory Findings of Significance

1. Does the project have the potential to degrade the quality of the 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, substantially reduce the number or restrict the range of a rare or endangered plant, animal, or natural community, or eliminate important examples of the major periods of California history or prehistory? Yes ____ No X

2. Does the project have the potential to achieve short term, to the disadvantage of long term environmental goals? (A short term impact on the environment is one which occurs in a relatively brief, definitive period of time while long term impacts endure well into the future) Yes ____ No X

3. Does the project have impacts that are individually limited, but cumulatively considerable ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, and the effects of reasonably foreseeable future projects which have entered the Environmental Review stage)? Yes ____ No X

4. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? Yes ____ No X

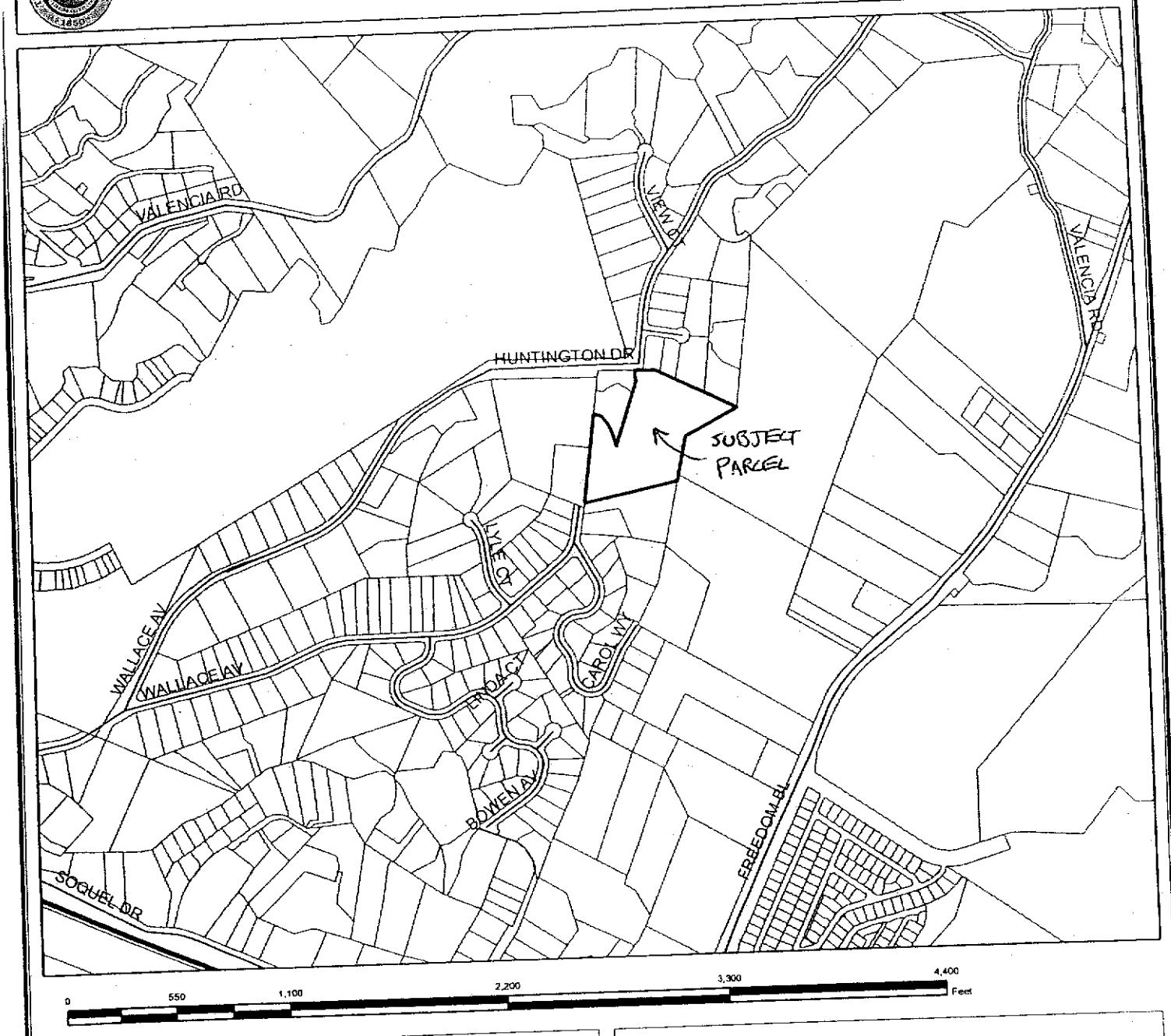
TECHNICAL REVIEW CHECKLIST

	REQUIRED	COMPLETED	N/A
Agricultural Policy Advisory Commission (APAC) Review			X
Archaeological Review			X
Biotic Report/Assessment			X
Geologic Hazards Assessment (GHA)		XXX	
Geologic Report		XXX	
Geotechnical (Soils) Report		XXX	
Riparian Pre-Site			
Septic Lot Check			
Other:			

Attachments:

1. Location Map, Map of Zoning Districts, Map of General Plan Designations, Assessors Parcel Map
2. Tentative Map prepared by Ifland Engineers, revised 7/14/09; Preliminary Improvement Plans prepared by Andrew C. Radovan Civil Engineer, revised 6/30/09; Landscape Plan prepared by SSA Landscape Architects, dated 3/4/09; Architectural Plans prepared by Anderson McKelvey Architecture & Planning, dated 7/21/08.
3. Geotechnical Investigation (Conclusions and Recommendations) prepared by AMSO Consulting Engineers, revised 8/10/07.
4. Geologic Hazards Assessment, prepared by Joe Hanna - County Geologist, dated 4/8/08.
5. Geologic Investigation (Conclusions and Recommendations) prepared by Nielsen & Associates, dated 5/08.
6. Geologic and Geotechnical Report Review Letter prepared by Joe Hanna - County Geologist, dated 8/12/08.
7. Discretionary Application Comments, dated 8/13/09.
8. Letter from Soquel Creek Water District, dated 9/2/09.
9. Drainage calculations (Summary) prepared by Ifland Engineers, undated, received 9/24/07.
10. Arborist's Report prepared by Maureen Hamb, dated 2/21/07 & 8/27/07.

Location Map



Legend

- APN 041-481-04
- Assessors Parcels
- County Maintained Streets
- State Highways

N
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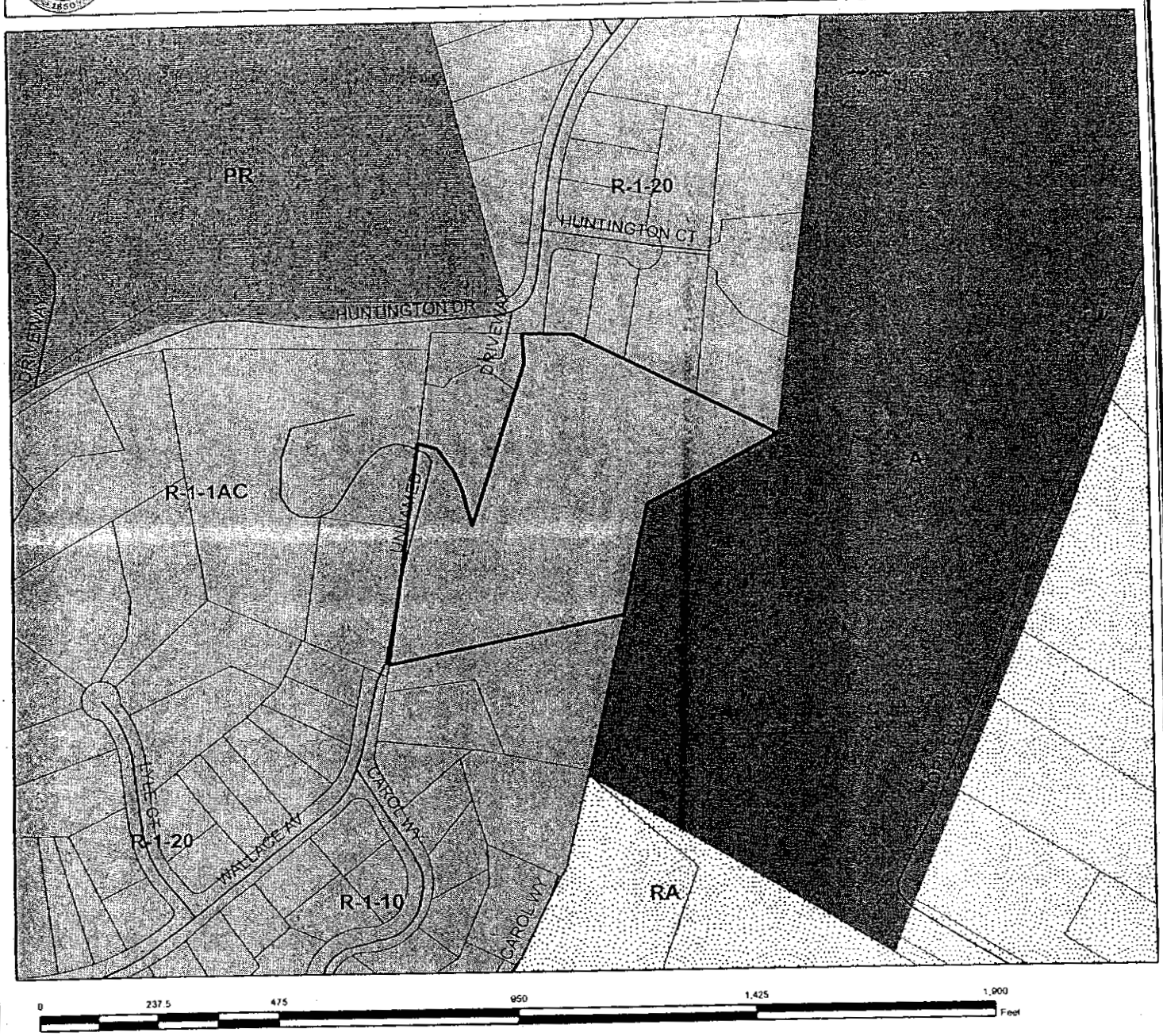
S

Map Created by
County of Santa Cruz
Planning Department
March 2007

Attachment 1

Zoning Map



Legend

- APN 041-481-04
- Assessors Parcels
- Streets
- RESIDENTIAL-SINGLE FAMILY (R-1)
- PARK (PR)
- AGRICULTURE (A)
- AGRICULTURE RESIDENTIAL (RA)

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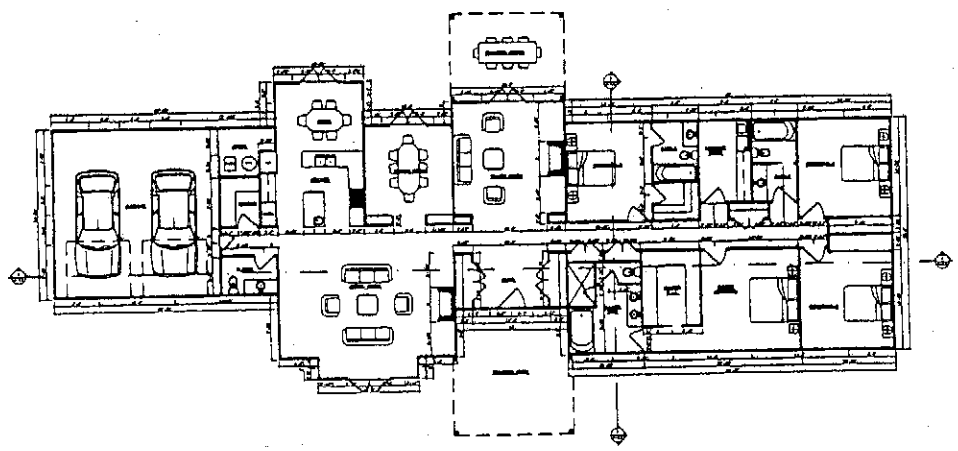
Map Created by
County of Santa Cruz
Planning Department
March 2007



FLOOR PLAN

ANDERSON
McKELVEY
ARCHITECTURE
& PLANNING

334 SOQUEL AVE
SANTA CRUZ, CA 95062
VOICE: 831 457 8348
FAX: 831 [illegible] 2724

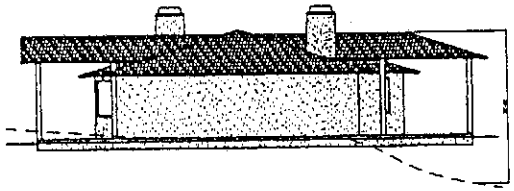
MINOR LAND DIVISION
WALLACE AVE

LOT-2 FLOOR PLAN

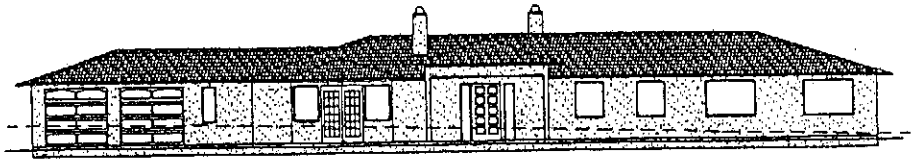
DRAWN BY: [illegible]
DATE: [illegible]
SCALE: [illegible]

REVISIONS:

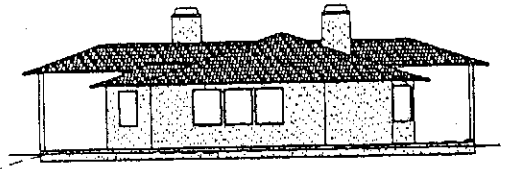
A-2.1



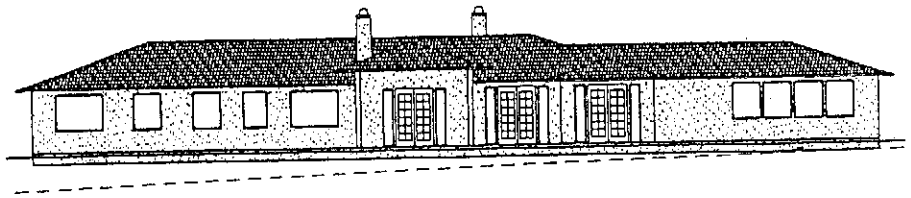
WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION



SOUTH ELEVATION

ANDERSON
McKELVEY
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MINOR LAND DIVISION
WALLACE AVE

LOT-2
ELEVATIONS

A-2.2

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McKELVEY
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& PLANNING

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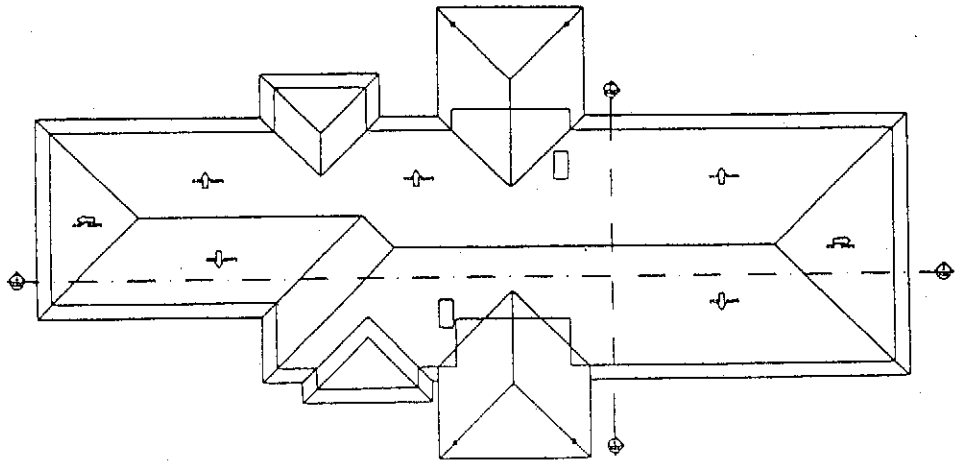
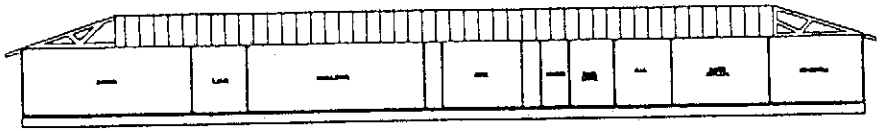
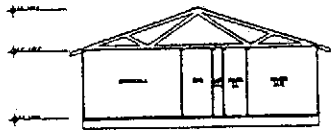
MINOR LAND DIVISION
WALLACE AVE



ROOF PLAN



BUILDING SECTION A

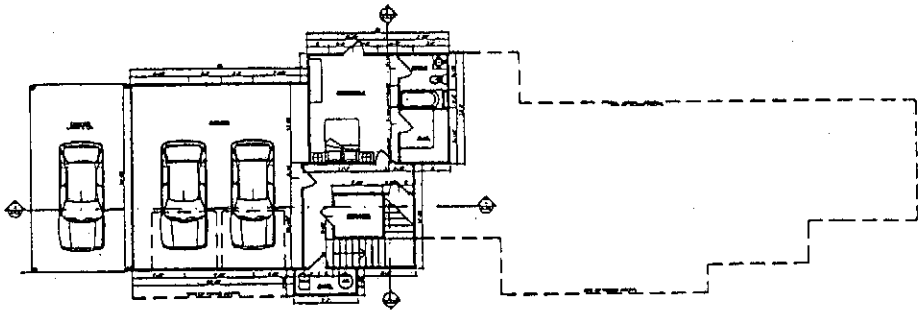


BUILDING SECTION B

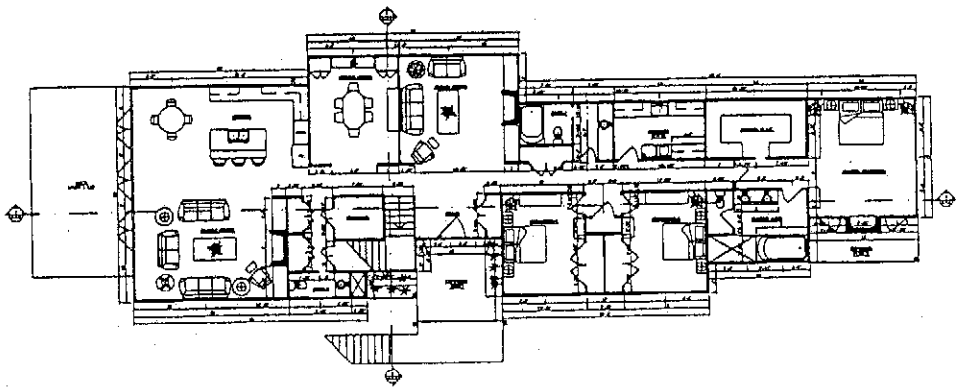
LOT-2 ROOF PLAN, BUILDING SECTIONS

A-2.3

27/118



LOWER LEVEL FLOOR PLAN



UPPER LEVEL FLOOR PLAN

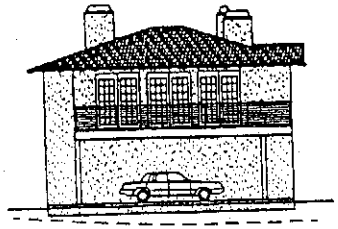
ANDERSON
McKELVEY
ARCHITECTURE
& PLANNING

536 SOQUEL AVE.
SANTA CRUZ, CA 95062
VOICE: 831 457 8546
FAX: 831 423 2724

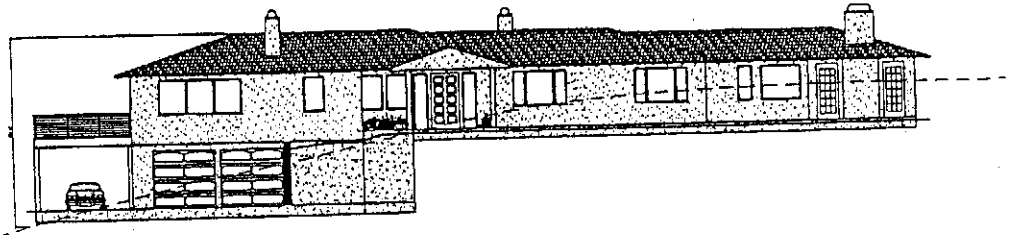
MINOR LAND DIVISION
WALLACE AVE

LOT-3 FLOOR PLANS

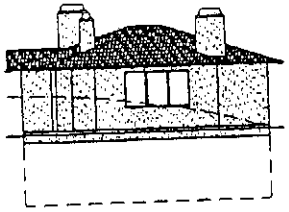
A-3.1



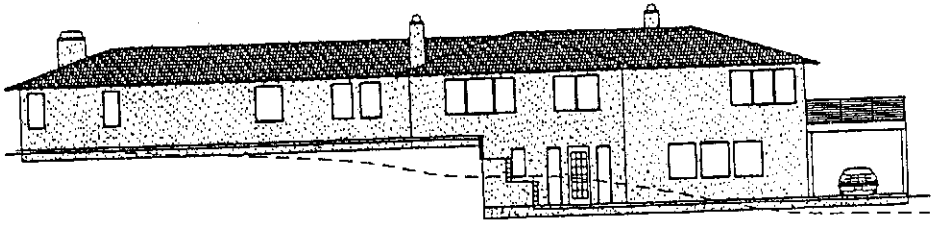
WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION



SOUTH ELEVATION

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& PLANNING

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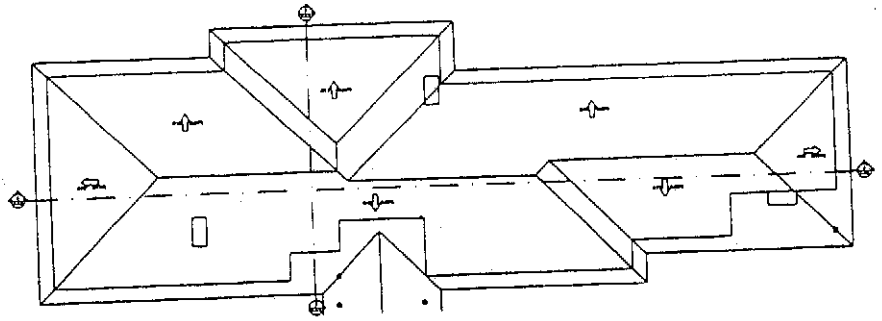
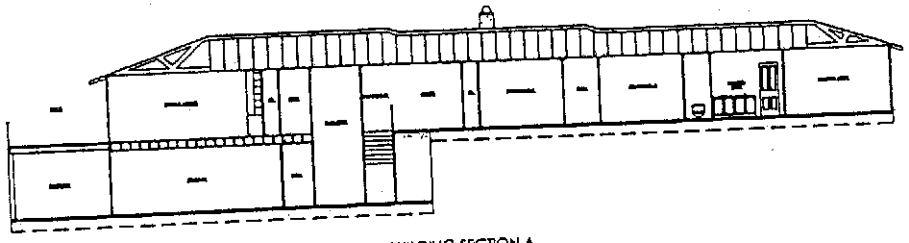
MINOR LAND DIVISION
WALLACE AVE

LOT-3
ELEVATIONS

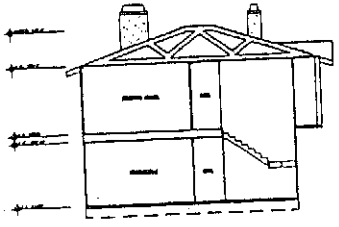
A-3.2



ROOF PLAN



BUILDING SECTION A



BUILDING SECTION B

ANDERSON
McKELVEY
ARCHITECTURE
& PLANNING

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FAX : 831 423 3724

MINOR LAND DIVISION
WALLACE AVE

LOT-3 ROOF PLAN, BUILDING SECTIONS

A-3.3

WET 516

AMSO CONSULTING ENGINEERS
SOILS, FOUNDATIONS & ENVIRONMENTAL ENGINEERING
1478 B STREET, SUITE 1C, HAYWARD, CALIFORNIA 94541
Phone (510) 690-0714, Fax: (510) 690-0721, email: basil@amsoconsulting.com

March 14, 2006
Project 3362
Revised on August 10, 2007

Mr. Richard Anderson
110 Brown Valley Road
Corralitos, California 95076

Subject: Geotechnical Investigation for
Three Lots Minor Land Division
End of Wallace Avenue, APN 041-481-04
Aptos, Santa Cruz County, California

Dear Mr. Anderson:

This report presents our geotechnical investigation for your property located at the end of Wallace Avenue, APN 041-481-04 in Aptos, Santa Cruz County, California.

As now proposed and based on the tentative map prepared by Ifland Engineers and provided by Lawler Land Use and Consulting the property will be divided into three building sites. Access to the new parcels will be provided by a new private driveway from Wallace Avenue. The purpose of this investigation is to provide generalized geotechnical recommendation for site development.

SCOPE OF WORK

We performed the following scope of work for this geotechnical investigation.

1. Reviewed geologic and geotechnical information in our files pertinent to the site and the surrounding area.

2. Explored, sampled and classified foundation soils by means of eight exploration borings. All holes were advanced to at least 10 feet into competent soil or to drilling refusal. At the end of drilling, all holes will be backfilled with soil cutting.

3. Performed laboratory test on selected soil samples obtained from the exploration holes to determine their index and engineering characteristics.

4. Reviewed and analyzed information collected above.

Attachment 3

5. Developed site seismic characteristics, zone factor (Z) and seismic near-source factors (N_a and N_v) for site structure resonance in accordance with the 1997 Uniform Building Code.

6. Prepared this report summarizing our findings, conclusions, and geotechnical recommendations.

FINDINGS

Surface Conditions

The property is located in Aptos, Santa Cruz County, California along north side of a the end of Wallace Avenue ((see Figure 1, Vicinity Map). The property slopes down to the north and west at gradients of between 2 and 4 to 1 (horizontal to vertical). Ground elevations at the property range from an assumed elevation of 100 feet near Wallace Avenue to about 230 feet (Based on the Tentative Map prepared by Ifland Engineers, Inc.)

At the time of our subsurface exploration, the site was vacant of any structure. The majority of the site was covered with native trees, eucalyptus trees, bushes and grass.

Subsurface Conditions

Subsurface conditions at the site were explored by means of six exploration drill holes extended to a depth of between 9 and 20 feet. Within the depth of our exploration, the native soils at the site consist of clay, silt, sand and weathered sandstone.

A surficial layer of sandy clay (CL) of low plasticity and low potential for expansion was encountered in all exploration holes. This layer of sandy clay varies in thickness between 2 and 3 feet below existing ground surface and is underlain by very dense to hard and slightly cemented clayey sand (weathered sandstone). This layer of sandstone extends to the maximum depth of our exploration.

No ground water was encountered in any of our borings at the time of our subsurface exploration.

The descriptions given above pertain only to the subsurface conditions found at the site at the time of our subsurface exploration in February of 2006. Subsurface conditions, particularly ground water levels and the consistency of the near-surface soils will vary with the seasons.

Detailed descriptions of the materials encountered in the borings are given on the appended boring log together with the results of some of the laboratory tests performed on selected samples obtained from the boring.

Seismic Considerations

This site is located within a seismically active region but outside any of the Alquist-Priolo Earthquake Fault Zones. Type A and Type B faults as defined in the UBC 1997 that are close to the site are listed in the following table.

TABLE 1 – TYPES A AND B FAULTS CLOSE TO THE SITE

Fault	Type	Maximum Moment Magnitude	Slip Rate (mm/yr)	Distance (miles)	(km)	Peak Site Acceleration (g)
SAN ANDREAS (1906)	A	7.9	24	5	8	0.52
SAN GREGORIO	A	7.3	5	18	29	0.18
ZAYANTE-VERGELES	B	6.8	0.1	2.3	3.6	0.55
SARGENT	B	6.8	3	9	14	0.28
MONTEREY BAY - TULARCITOS	B	7.1	0.5	13	21	0.25
MONTE VISTA - SHANNON	B	6.8	0.4	16	26	0.16
CALAVERAS (So.of Calaveras	B	6.2	15	20	31	0.07

Seismic hazards can be divided into two general categories, hazards due to ground rupture and hazards due to ground shaking. Since no active faults are known to cross this property, the risk of earthquake-induced ground rupture occurring across the project site appears to be remote.

Should a major earthquake occur with an epicentral location close to the site, ground shaking at the site will undoubtedly be severe, as it will for other property in the general area. Even under the influence of severe ground shaking, the soils that underlie the area proposed for development are unlikely to liquefy.

The following general site seismic parameters may be used for design in accordance with the 1997 Uniform Building Code.

Seismic Zone:	4
Soil Type:	S_C: Very Dense Soil and Soft Rock
Seismic Source:	Type A; (San Andreas); 8 km Type B; (Zayante – Vergeles); 3.6 km
Near Source Factors:	Consistent with source type A of distance 8 km and for source type B of distance less than 3.6 km
	N_a: 1.14 N_v: 1.39

We should point out that the structural seismic design is not intended to eliminate damage to a structure. The goal of the design system is to minimize the loss of human life. It is unlikely that any structure can be designed to withstand the forces of a great earthquake without any damage at all.

Potential Geologic and Geotechnical Hazards

There are several potential geologic and geotechnical hazards that can affect any given site. They are discussed below, along with any required mitigation measures.

Ground Rupture: In our opinion, this is not a significant hazard to this site. No mitigation is required.

Ground Shaking: This hazard is common to all properties in California. Mitigate by proper structural design and by following the recommendations presented in this report.

Lurching and Lateral Spreading: Such seismically generated movements are induced in areas with weak soils near open cuts or slopes. Such conditions do not exist on this site. No mitigation is required.

Liquefaction: In our opinion, liquefiable soils are not a hazard to this property. No mitigation is required.

Landsliding: Slope stability analysis was beyond the scope of this investigation. Based on the consistency and strength of the shallow sandstone at this site, it is our opinion that landsliding is not a potential hazard to this property provided that recommendations for surface and subsurface drainage are followed. No mitigation is required.

Compressible Soils: Compressible soils are not present on this site. No mitigation is required

Expansive Soils: No potentially expansive soils were found at this site. No mitigation is required.

Erosion: The site soils are easily eroded. Mitigate by controlling the discharge of concentrated water, both during and after construction.

Flooding: Flooding is not a potential hazard to this site. No mitigation is required.

CONCLUSIONS AND RECOMMENDATIONS

In our opinion, the site is suitable for the proposed new houses provided the recommendations presented in this report are followed. Considering the sloping nature of the ground, however, the houses should be supported on reinforced concrete piers and beam foundation.

The following recommendations, which are presented as guidelines to be used by project planners and designers, have been prepared assuming AMSO CONSULTING ENGINEERS will be commissioned to review the grading and foundation plans prior to construction, and to observe and test during site grading and foundation construction. This additional opportunity to inspect the project site will allow us to compare subsurface conditions exposed during construction with those that were observed during this investigation.

Site Preparation, Grading and Compaction

Trees and shrubs designated for removal on the Project Plans should be felled and their stumps and roots should be grubbed. Areas of the site that will be built on or paved should be stripped to remove surface vegetation and organics. Soils containing more than 2% by weight of organic matter should be considered organic.

Any loose soils below areas of the site to be paved should also be excavated. The depth and horizontal limits of these excavations should be determined in the field by the Soils Engineer at the time of excavation.

Soil surfaces exposed by removal of trees and bushes and by removal of any loose soils should be scarified to a depth of 8 inches, conditioned with water (or allowed to dry, as necessary) to produce a soil water content of about 2 percent above the optimum value and then compacted to at least 90 percent relative compaction based on ASTM Test D1557-91.

Structural fill may then be placed up to design grades in the proposed building and pavement areas. Structural fill using on-site inorganic soil, or approved import, should be placed in layers, each not exceeding 8 inches thick (before compaction), conditioned with water (or allowed to dry, as necessary) to produce a soil water content of about 2 percent above the optimum value, and then compacted to at least 90 percent relative compaction based of ASTM Test D1557-91. The upper 8 inches of pavement subgrades should be compacted to about 95 percent relative compaction based on ASTM Test D1557-91.

Structural fill placed on sloping ground should be keyed in accordance with the CALTRANS STANDARD SPECIFICATIONS, latest edition. The following excerpt from subsection 19-6.01 of those specifications is pertinent:

> "When embankment is to be made and compacted on hillsides....the slopes of original hillsides....shall be cut into a minimum of 6 feet horizontally as the work is brought up in layers. Material thus cut out shall be compacted along with the new embankment material....."

The toe key for structural fill placed on sloping ground should be at least 8 feet wide with its base horizontal or gently sloping back into the hillside.

Cut and fill slopes should be constructed no steeper than 2½ :1 (horizontal to vertical).

On-site soils proposed for use as structural fill should be inorganic, free from deleterious materials, and should contain no more than 15% by weight of rocks larger than 3 inches (largest dimension) and no rocks larger than 6 inches. The suitability of existing soil for reuse as a structural fill should be determined by a member of our staff at the time of grading. We expect that most of the existing soil will be suitable for reuse as structural fill. If import is required for use as structural fill, it should be inorganic, should preferably have a low expansion potential and should be free from clods or rocks larger than 4 inches in largest dimension. Prior to delivery to the site, proposed import should be tested in our laboratory to verify its suitability for use as structural fill and, if found to be suitable, further tested to estimate the water content and density at which it should be placed.

Building Foundation

The proposed houses should be supported on reinforced concrete "pier and beam" foundations with the piers deriving their vertical support from "skin friction" or adhesion. Piers should extend to a depth of at least 12 feet below the bottom of grade beams and should penetrate at least 6 feet into native undisturbed soil.

Piers should be spaced at least 3 diameters apart (center to center) but no more than 8 feet apart. The allowable load-carrying capacity (dead plus normal live loads) of each pier may be calculated assuming "skin friction" or adhesion of 400 psf between the shaft of the pier and the adjacent soil. "End bearing" of the pier should also be ignored. For lateral resistance, a passive pressure of 350 pounds per cubic foot acting across 1.5 pier diameter may be used.

The allowable foundation pressures given previously may be increased by one-third when considering additional short-term wind or seismic loading.

Perimeter reinforced concrete foundation beams should be designed to safely transmit all imposed loads to the supporting piers.

During foundation construction, care should be taken to minimize evaporation of water from foundation and floor subgrades. Scheduling the construction sequence to minimize the time interval between foundation excavation and concrete placement is important. Concrete should be placed only in foundation excavations that have been kept moist, are free from drying cracks and contain no loose or soft soil or debris.

Concrete Slabs-On-Grade

Concrete floor slabs should be constructed on compacted soil subgrades prepared as described in the section on Site Preparation, Grading and Compaction.

To minimize floor dampness, a section of capillary break material at least five inches thick and covered with a membrane vapor barrier should be placed between the floor slab and the compacted soil subgrade. The capillary break should be a free-draining material, such as 3/8" pea gravel or a permeable aggregate complying with CALTRANS Standard Specifications, Section 68, Class 1, Type A or Type B. The material proposed for use as a capillary break should be tested in our laboratory to verify its effectiveness as a capillary break. The membrane vapor barrier should be a high quality membrane such as Moistop (by Fortifiber Corporation) or similar. A protective cushion of sand or capillary break material at least two inches thick should be placed between the membrane vapor barrier and the floor slab.

If floor dampness is not objectionable, concrete slabs may be constructed directly on the water-conditioned and compacted soil subgrade.

Retaining Walls

The following may be used in the design calculations for any reinforced concrete retaining walls that may be needed at this site.

1. The average bulk density of material placed on the backfill side of the wall will be 120 pcf.

2. The vertical plane extending down from the ground surface to the bottom of the heel of the wall will be subject to pressure that increases linearly with depth as follows.

Condition	Design Pressure
Active, drained	45 pcf
At-rest, drained	65 pcf

The above values are non-seismic conditions. Active pressures should only be used for walls that are not restrained to move. At-rest pressures should be used for the design of the basement walls.

3. The effects of earthquakes may be simulated by applying a horizontal line load surcharge to the stem of the wall at a rate of 14 H^2 lb/horizontal foot of wall, where H is the height of the surface of the backfill above the base of the wall. This surcharge should be applied at a height of 0.6H above the base of the wall.

4. A coefficient of "friction" of 0.35 may be used to calculate the ultimate resistance to horizontal sliding of the wall base over the ground beneath the base.

5. An equivalent fluid pressure of 350 psf/ft may be used to calculate the ultimate passive resistance to lateral movement of the ground in front of the toe of the wall and in front of any "key" beneath the toe or stem of the wall.

6. 2000 psf may be used as the maximum allowable bearing pressure for the ground beneath the toe of the wall. This value is for non-seismic conditions and may be increased to 3000 psf when considering additional loads on the wall resulting from earthquakes.

A zone of drainage material at least 18 inches wide should be placed on the backfill side of walls designed for drained condition. This zone should extend up the back of the wall to about 18 inches down from the proposed ground surface above. The upper 18 inches or so of material above the

drainage material should consist of native, clayey soil.

The drainage material and the clayey soil cap should be placed in layers about 6 inches thick and moderately compacted by hand-operated equipment to eliminate voids and to minimize post-construction settlement. Heavy compaction should not be applied; otherwise, the design pressure on the wall may be exceeded.

The drainage material should consist of either Class 2 Permeable Material complying with Section 68 of the CALTRANS Standard Specifications, latest edition, or 3/4 to 1½ inch clean, durable coarse aggregate. If the coarse aggregate is chosen as the drainage material, it should be separated from all adjacent soil by Mirafi 700X or a similar filter fabric approved by the project Soil Engineer.

Any water that may accumulate in the drainage material should be collected and discharged by a 4-inch-diameter, perforated pipe placed "holes down" near the bottom of the drainage material. The perforated pipe should have holes no larger that 1/4-inch diameter.

Utility Trenches

The attention of contractors, particularly the underground contractor, should be drawn to the requirements of California Code of Regulations regarding Safety Orders for "Excavations, Trenches, Earthwork".

For purposes of this section of the report, bedding is defined as material placed in a trench up to 1 foot above a utility pipe and backfill is all material placed in the trench above the bedding.

Unless concrete bedding is required around utility pipes, free-draining sand should be used as bedding. Sand proposed for use in bedding should be tested in our laboratory to verify its suitability and to measure its compaction characteristics. Sand bedding should be compacted by mechanical means to achieve at least 90 percent compaction density based on ASTM Tests D1557-91.

Approved, on-site, inorganic soil, or imported material may be used as utility trench backfill. Proper compaction of trench backfill will be necessary under and adjacent to structural fill, building foundations, concrete slabs and vehicle pavements. In these areas, backfill should be conditioned with water (or allowed to dry) to produce a soil-water content of about 3 percent above the optimum value and placed in horizontal layers not exceeding 6 inches in thickness (before compaction). Each layer should be compacted to 90 percent relative compaction based of ASTM Test D1557-91.

Where any trench crosses the perimeter foundation line of any building, the trench should be completely plugged and sealed with compacted clay soil for a horizontal distance of at least 2 feet on either side of the foundation.

Surface Drainage

Surface drainage gradients should be planned to prevent ponding and to promote drainage of surface water away from building foundations, slabs, edges of pavements and sidewalks, and towards suitable collection and discharge facilities.

Water seepage or the spread of extensive root systems into the soil subgrades of foundations, slabs, or pavements, could cause differential movements and consequent distress in these structural elements. This potential risk should be given due consideration in the design and construction of landscaping.

Providing adequate surface and subsurface drainage is of great importance, as most structures constructed on a hillside and/or with raised floors are generally prone to drainage problems. All site drainage waters should be handled and discharged in a legal, prudent, reasonable and proper manner so as not to create a nuisance, risk or hazard to this property or adjoining properties.

We generally recommend that structures be equipped with roof gutters and downspouts. All runoff waters including all downspouts, patio, parking, and driveway drainage, and all other drainage should be collected in closed solid pipes with periodic cleanouts and discharged into legal approved area storm drain system.

If the above is not totally practical or feasible, then all site drainage waters should be discharged well away from edge of pavements and all building and foundation areas. Care should be used so that drainage waters are not concentrated and discharged on adjacent properties. Site drainage waters should be well dispersed in as natural a manner as possible and should not be discharged in a concentrated manner if a legally-approved storm drain system is not present.

It should be noted that moisture is usually present under most structures, as surface and subsurface waters flow from higher surrounding elevations. To minimize the amount of moisture under a structure, a sub-surface drainage system may be constructed around the perimeter of the structure. The building designer and contractor should very carefully consider and provide for drainage waters that might flow into and be trapped in the foundation crawl space area and also consider potential higher humidity and very good cross-ventilation.

The above site drainage recommendations are general in nature and should be carried out by the house designer, contractor, owner, and future owners to the fullest possible extent. However, from many years of soil engineering experience within Northern California, we have found that water and moisture below most structures is relatively common. Therefore, we suggest that if the owner desires assurance with respect to site drainage, an expert in the field of hydrology and drainage should be retained to prepare specific recommendations.

AMSO CONSULTING ENGINEERS

Follow-up Geotechnical Services

Our recommendations are based on the assumption that AMSO CONSULTING ENGINEERS will be commissioned to perform the following services.

1. Review final grading and foundation plans prior to construction.
2. Observe, test and advise during grading and placement of structural fill.
3. Observe and advise during foundation construction.
4. Observe, test and advise during utility trench backfilling

LIMITATIONS

The recommendations contained in this report are based on certain plans, information and data that have been provided to us. Any change in those plans, information and data will render our recommendations invalid unless we are commissioned to review the change and to make any necessary modifications and/or additions to our recommendations.

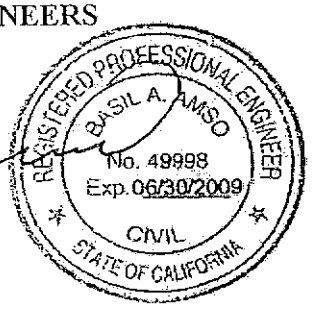
Subsurface exploration of any site is necessarily confined to selected locations. Conditions may, and often do, vary between and around such locations. Should conditions different from those encountered in our explorations come to light during project development, additional exploration, testing and analysis may be necessary; changes in project design and construction may also be necessary.

Our recommendations have been made in accordance with the principles and practices generally employed by the geotechnical engineering profession. This is in lieu of all other warranties, express or implied.

All earthwork and associated construction should be observed by our field representative, and tested where necessary, to compare the generalized site conditions assumed in this report with those found at the site at the time of construction, and to verify that construction complies with the intent of our recommendations.

Report prepared by:

AMSO CONSULTING ENGINEERS



Basil A. Amso
CE 49998

COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
TOM BURNS, PLANNING DIRECTOR

April 8, 2008

Richard and Loreta Anderson, Trustees
C/o Owen Lawlor
612 Spring Street
Santa Cruz, CA 95060

Subject: GEOLOGIC HAZARDS ASSESSMENT
APN: **041-481-04**
LOCATION: **Wallce Avenue**
PERMIT APPLICATION NUMBER: **07-0112**
OWNER: Richard and Loreta Anderson, Trustees

Dear Richard and Loreta Anderson,

I performed a site reconnaissance of the parcel referenced above on April 3, 2008, where a 6-acre parcel is proposed to be divided into three smaller parcels. The parcel was evaluated for possible geologic hazards due to its location adjacent to steep slopes. This letter briefly discusses my site observations and conclusions, and state conditions to be included of the minor land-division approval. The letter will also briefly describe requirements for further technical investigation.

Completion of this hazards assessment included a site reconnaissance, a review of maps and other pertinent documents on file with the Planning Department, and an evaluation of aerial photographs. The scope of this assessment is not intended to be as detailed as a full geologic or geotechnical report completed by a state registered consultant. Rather the work is completed to determine what additional information about the site's geologic hazards and constraints are required to comply with County Code.

SITE DESCRIPTION

The parcel is located off Wallace Road in the Aptos area of Santa Cruz, CA. The 6.08-acre parcel is currently undeveloped except for older site grading. Application 07-0112 proposes to divide this property into three lots of 1.44 acre, 1.34 acres and 3.30 acre. The proposed building sites are located on a 10 to 30% slope that drains towards Wallace Avenue. As currently shown, an access to these new parcels will require the grading of a single access roadway adjacent to the southerly property line that will require a moderate amount of grading. Each pad will require grading and drainage improvements. Although the southerly portion of the property is relatively flat the

Attachment 4

northern portion of the property has a hillslope that drops off towards the north with a slope of 50 percent.

SEISMIC HAZARDS

This property is located in a seismically active region of northern California and very strong ground shaking is likely to occur on the parcel during the anticipated lifetime of the proposed dwellings. Current California Building Standards require the homes on the proposed lots be constructed based upon the classification of the site soils in a manner that is different than those specified by Amso Consulting Engineers Report for the site's geotechnical investigation dated March 14, 2006 (hereafter ACE.) This is not fault of ACE since the report predates the enactment of these requirements, but will need to be modified before the preparation of the staff report for the approval of the project by the Planning Commission.

In addition to intense ground shaking hazard, development on this parcel could be subject to the effects of ridgetop shattering, ridge and/or lateral spreading, and seismically-induced landsliding during a large magnitude earthquake occurring along one several active nearby faults.

SLOPE STABILITY HAZARDS AND OTHER ISSUES RELATED TO SLOPES

A field reconnaissance was conducted on the property, along with the review of several sets of aerial photographs, general geologic maps of the area, unpublished consultant reports, and the map entitled "Preliminary Map of Landslide Deposits in Santa Cruz County" which was prepared in 1975 as part of the County's General Plan.[1] Our evaluation of the steep slopes, on the northern part of the parcel, was to determine if these steep slopes are related to landsliding or rapid erosion. This evaluation was also completed to determine if a building setback is necessary from these steep slopes on Lot 3 to compensate for any future erosion or landsliding of this slopes.

The Cooper Clark map does show a large landslide to the north of this property (see the attached Geologic Hazards Map figure 1.) After our site review and review of aerial photographs several processes were considered for the formation of this slope. One possible process for formation of the steep slope on proposed Lot 3 could be related to

[1] The Preliminary Map of Landslide Deposits in Santa Cruz County" was prepared in 1975 as part of the County's General Plan. This interpretive map was prepared from aerial photographs and was designed only for "regional land use evaluations." The map indicates areas where questionable, probable, or definite past instability is suspected. While not a susceptibility map indicating potential site-specific stability problems, when utilized in conjunction with other published data and documents the map is a useful planning resource.

the hypothesized landslide shown on the Cooper Clark map. This hypothesis would assume that the Cooper Clark landslide actually exists and similar or related landsliding processes have occurred on this property (see the Geologic Location Map figure 2). In this case, the steep slope on Lot 3 would indicate the location of the pull-apart of this landslide.

Processes other than landsliding could also have caused the steep slope. Without geologic mapping and additional exploration any correlation of this slope's formation to landsliding is hypothetical, and is presented here to help explain a building setback that will be required (as explained in the next paragraph). No recent landslide movement was obvious in the site reconnaissance, but erosion continues on the slope. This setback will compensate for any uncertainty concern the slope's stability, and/or ground cracking near these steeper slopes.

The California Building Code requires a setback based upon the height of the slope, which on this site, results in a maximum setback of 40 feet from the base of the foundation to the face of the slope. In addition to this setback, this GHA[2] will establish a minimum setback of 50 feet from the edge of the 30 to 50% slope line to the home and related development (see the attached copy of sheet TM2 of the Ifland Inc Plan). No decks requiring building permits, fills, drainage systems, septic system components and related improvements are allowed in the setback. This setback shall be shown on the recorded map with reference to Lot 3.

Alternatively, the applicants' geotechnical engineer may work with an engineering geologist to determine a smaller setback, but this work and determination must be completed prior to recordation of the minor land division, and their setback must shown on the record map.[3] The County must also review and approve these reports to confirm the adequacy of the setback.

No drainage shall be diverted over the steeper slopes on the property especially on Lot 3.

Other steep slopes occur on the property near the building site for Lot 2. These slopes appear to be excavated slopes related to grading for a flat pad and access driveways on this property. This pad is over fifty years old, and has concrete drainage devices that have now deteriorated to the point that they no longer function. The excavated slopes expose a well indurated green/buff to red colored sandstone at its base and a soil zone of approximately five feet in depth is exposed above the sandstone. Even with the

[2] This setback is based upon the use of a pier and grade beam foundation designed to current code requirements.
[3] *This is a completeness issue and must be determined before the project is complete.*

extent of deterioration the cut and fill slopes have only minor amounts of visible failure. In accordance with the ACE report, these slopes must be either regarded to the 2.5 horizontal to 1 vertical ratio slope gradient proposed, retained, or combination of regrading and retention of the slopes must occur to achieve a final slope with a ratio of 2.5 horizontal to 1 or flatter.

ACE may also desire to remove the debris from the excavated slope and re-evaluate their recommendation that excavations should have a final slope ratio of 2.5 horizontal to 1 or flatter.

ON SITE GEOLOGIC UNITS AND SOILS:

The information about the site's geologic and soils characteristics cannot be determined reliably without better exposures. Some generalities can be made about these materials as follows.

The geotechnical engineer's exploration suggests that the site is underlined by dense sandstone. Alternatively, the geologic mapping shows the site as underlain by the Aromas Formation, which is characterized by medium to lower density sands. This difference between the map formation and testing data could mean that the current geologic maps are incorrect and the site is underlain by another formation. I observed only one obscured exposure of well-indurated buff to reddish green sandstone. This exposure did not look like the Aromas formation, but I cannot make a definitive statement about the nature of the bedrock without other exposures.

Legacy fill has also been placed on part of the property in relationship to an older grading operation. This fill varies from a few feet in thickness along an access roadway and up to 8 feet in the vicinity of the graded pad. Minor grading has occurred throughout the property and small amounts of fill can be expected throughout the property.

Several feet of soil covers the site. Deeper soils can be expected in the vicinity of Lot 1 (see the attached copy of sheet TM2 of the Ifland Inc Plan.)

REPORT REQUIREMENTS

Based on my site visit and review of pertinent maps and other documents, further geologic evaluation in the form of a full geologic report is <u>not</u> required for your proposed development on this parcel. You may choose to obtain the services of an engineering geologist if you desire a more complete evaluation of the sites geologic constraints and

hazards, or to reduce the setback that is required by this letter. The geotechnical engineer must modify his report to comply with the current California Building Code, as well as review and approve all of the proposed improvement plans.

Two copies of this modified report must be submitted to County Planning Department for review. These reports must be wet stamped and must include necessary modifications to comply with the current CBC seismicity and other foundation related provisions. If the geotechnical engineer addresses this request with an addendum letter two wet signed copies of the addendum and the original report must be submitted. The following apply to any future geotechnical engineering work:

A. All slope stability analysis' shall include the determination of the strength of the on-site earth material based upon appropriate testing of the materials.

B. The Engineering Geologist must assist the geotechnical engineer in their analysis of the slope stability. As part of this assistance they must prepare an accurate and precise cross-section based upon a surveyed topographic map.

C. The Engineering Geologist must help the geotechnical engineer to determine correct seismic parameters to apply to analysis of the slope's stability.

PERMIT CONDITIONS

Permit conditions will be developed for your proposal after the technical report has been reviewed. At a minimum, however, you can expect to be required to follow all the recommendations contained in the report in addition to the following items:

I. Grading activities must be kept to a minimum.

II. No building site may be located on slopes over 30 %.

III. An engineered grading, drainage, erosion control, and driveway plan is required.

IV. The driveway through Lot 2 must be completed before pouring of the foundations of any of the buildings.

V. The grading and drainage plan must correct any concentrated erosion problem as part of the installation of the driveway to Lot 2.

VI. Unless overridden by other County Resource issues, all tree removal must be completed before the start of construction on any of these parcels. Your landscape architect shall prepare a final revegetation plan with the assistance of a registered professional forester. A primary goal of this plan shall be the restoration of natural vegetation and the reduction of erosion.

VII. All lots shall be conditioned to maintain the vegetation outside of the building envelopes in accordance with the approved site revegetation plan.

VIII. Drainage from impermeable surfaces (such as the proposed roof and driveway) must be collected and properly disposed of as required by the Drainage Section of the Public Works Agency. Runoff must not be allowed to sheet off these areas in an uncontrolled manner, and any onsite retention of drainage must be pre-approved by the geotechnical. Drainage control along the driveway must be design so as to not cause damage to Wallace Road.

IX. The geotechnical engineer shall review and approve the locations of the septic system drain fields.

X. The geotechnical engineer shall review and approve all of the improvement plans including the drainage plans, grading plans, utility plans and other construction related plans for the project improvements and building permits.

XI. A building envelope shall be designated on the recorded map and shall include the septic system and all accessory structures including non-habitable structures, pools, and septic systems. The geotechnical engineer and the County Geologist shall review these envelopes.

XII. Excavations and fill slopes shall have a maximum steepness of a 2.5 horizontal to 1 vertical ratio.

XIII. The existing excavated embankments steeper that 2.5 horizontal to 1 vertical must be either regraded to the 2.5 horizontal to 1 vertical ratio slope gradient proposed within the ACE report, retained, or combination of regrading and retention of the slopes must occur to achieve a final slopes with a ration of 2.5 horizontal to 1 or flatter.

XIV. All fills within the building envelope must be removed and replaced as engineered fills at with a ration of 2.5 horizontal to 1 or flatter.

XV. The proposed home on Lot 3 must be set back a minimum setback of 50 feet from the edge of the 30 to 50% slope line on shown on TM2 of the Ifland Inc Plan. No decks that requiring building permits, fills or cuts, drainage systems, septic system components and related improvements are allowed in the setback, and this setback shall be shown on the recorded map with reference to Lot 3.

Final building plans submitted to the Planning Department will be checked to verify that the project is consistent with the conditions outlined above prior to issuance of a building permit. If you have any questions concerning these conditions, the hazards assessment, or geologic issues in general, please contact me at 454-3175. It should be noted that other planning issues not related specifically to geology may alter or modify your development proposal and/or its specific location.

Sincerely,

JOE HANNA
County Geologist
CEG #1313

9/8/09
Date

For: Claudia Slater
Principal Planner
Environmental Planning

Enclosure(s)

Geologic Hazards Map
Geologic Location Map
Reduced Copy of the TM2 Ifland Engineers Map

07-0112
041-481-04
Anderson Trust

References:

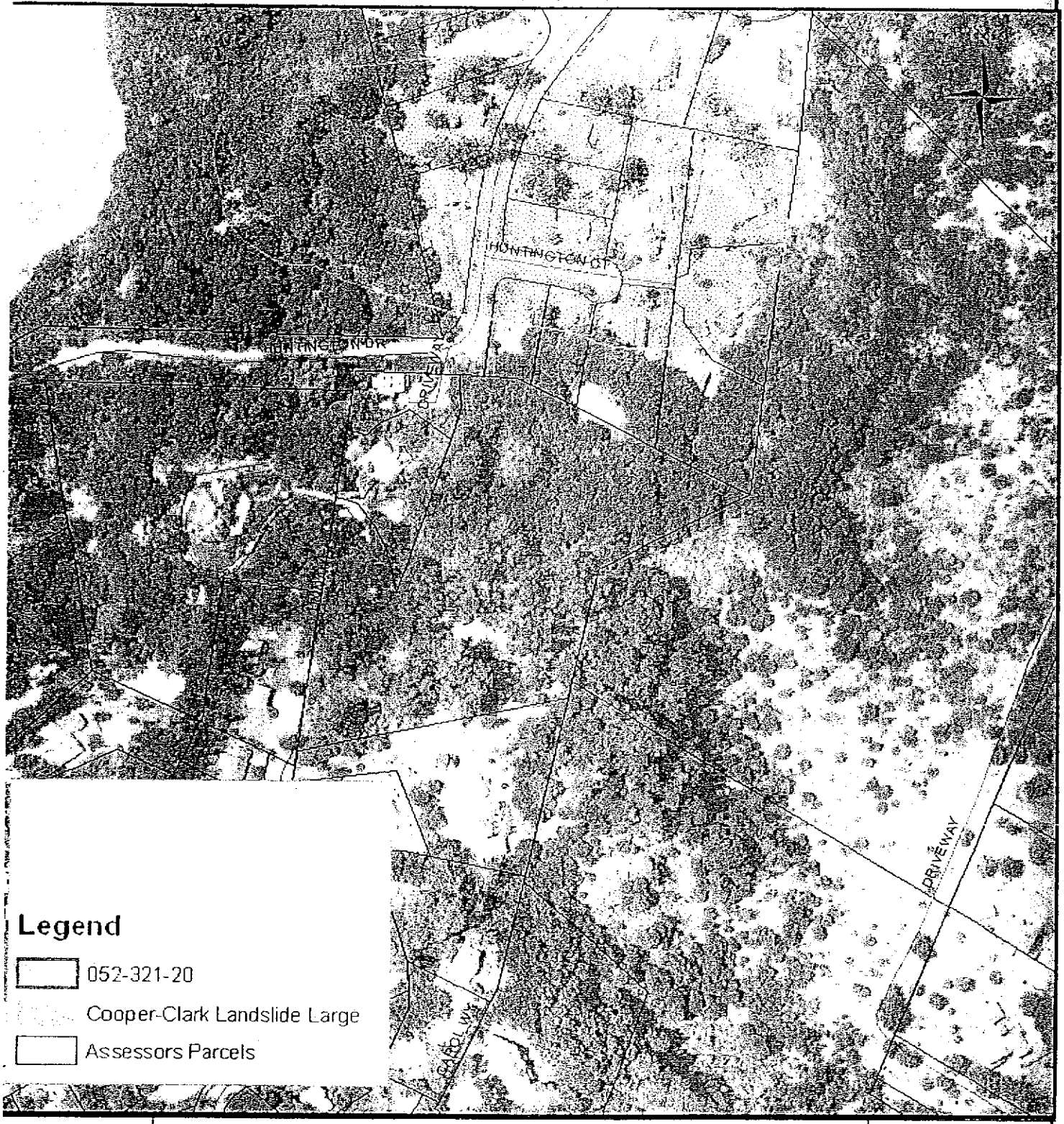
Maps and Reports

ACE, Amso Consulting Engineers, Unpublished Report on a Geotechnical Investigation for Four Lots Minor Land Division, End of Wallace Avenue, APN 041-481-04, Aptos, Santa Cruz County, California dated March 14, 2006

Brabb, E.E., 1989, Geologic map of Santa Cruz County, California, U.S. Geological Survey Miscellaneous Investigations Series Map I-1905, scale 1:62,000.

Cooper, Clark and Associates, 1975, Preliminary map of landslide deposits in Santa Cruz County, California, scale 1:62,000

Geologic Hazards Map
Anderson Property
APN 041-481-04



Legend

- 052-321-20
- Cooper-Clark Landslide Large
- Assessors Parcels

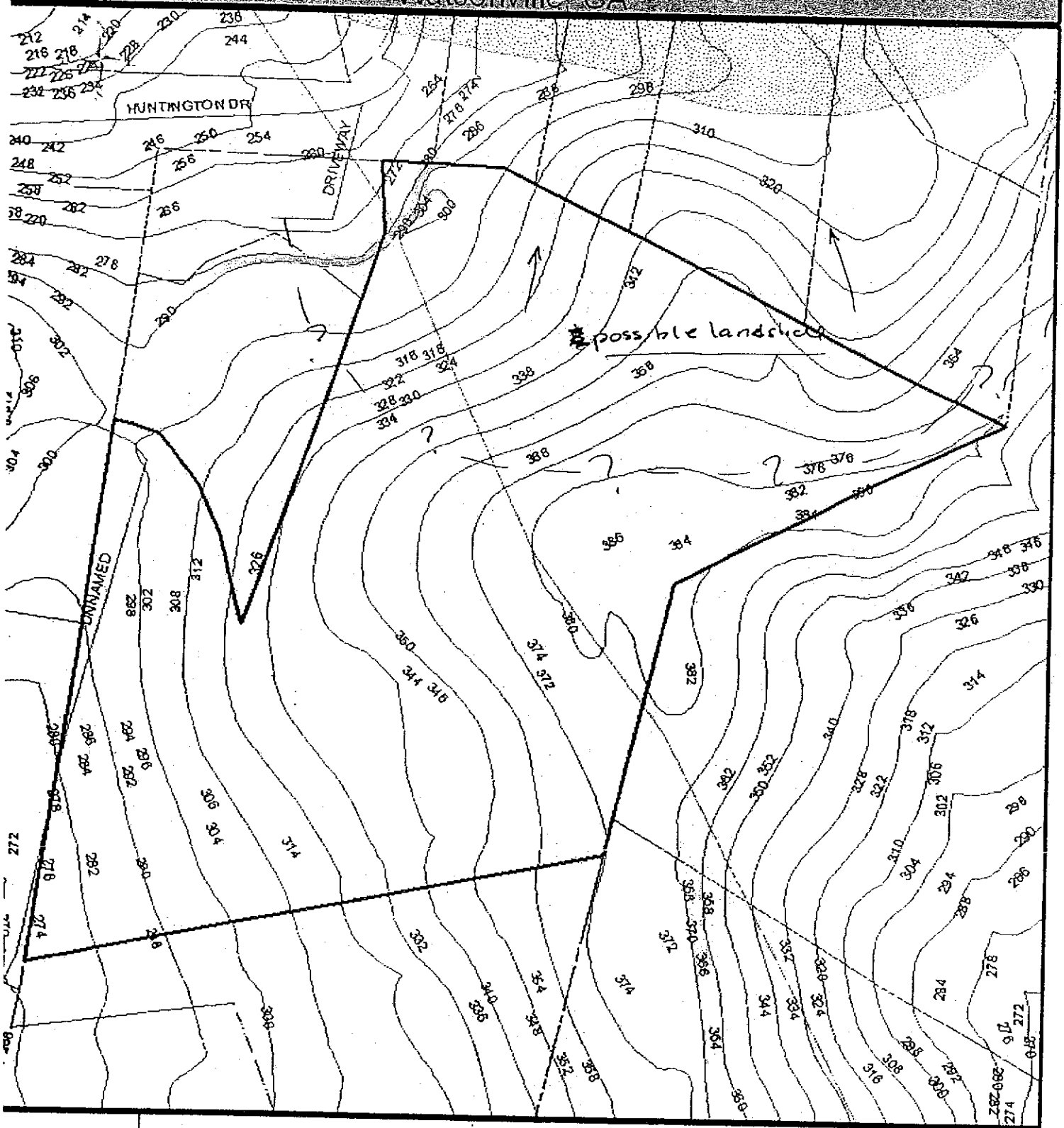
0 55 110 220 330 440 Feet

Figure #

1

Map created by JLH
April 2008

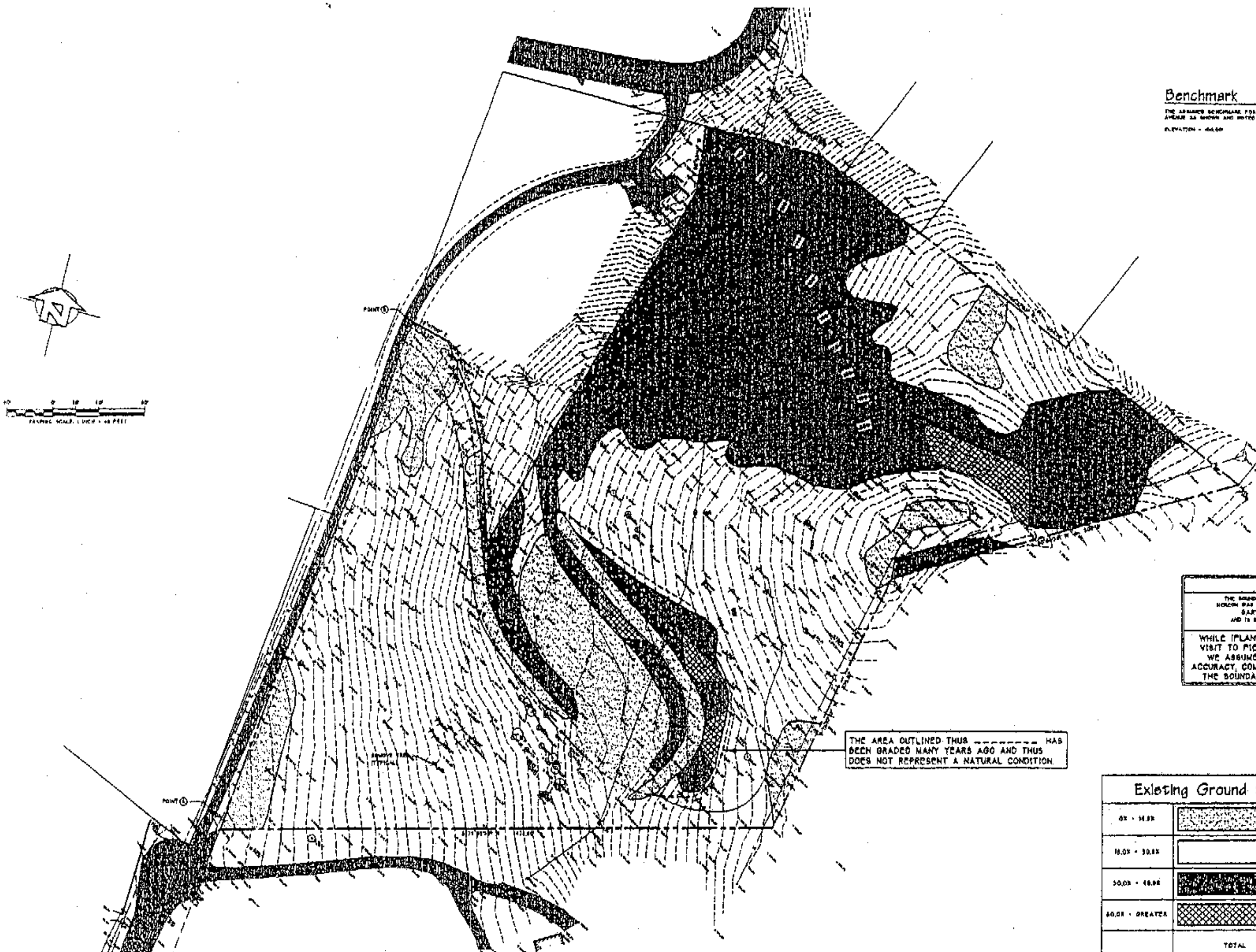
Geologic Location Map
714 Casserly Road
Watsonville, CA



0 45 90 180 270 360 Feet

Figure # 2

Map created by JLH
April 2008



Slope Map & Existing Trees

NOTE:

THE BOUNDARY AND/OR TOPOGRAPHIC DATA SHOWN HEREON WAS PROVIDED TO IFLAND ENGINEERS, INC. BY: GARY IFLAND AND ASSOCIATES AND IS BASED UPON A FIELD SURVEY DATED: 12/10/03

WHILE IFLAND ENGINEERS HAS MADE A SITE VISIT TO FIELD CHECK THE DATA PROVIDED, WE ASSUME NO RESPONSIBILITY FOR THE ACCURACY, COMPLETENESS AND SUFFICIENCY OF THE BOUNDARY AND/OR TOPOGRAPHIC DATA.

Existing Ground Slope Data		
0% - 14.9%		0.60 ACRES
15.0% - 29.9%		3.04 ACRES
30.0% - 39.9%		2.10 ACRES
40.0% - GREATER		0.10 ACRES
	TOTAL	6.04 ACRES

APPLICATION NO. 07-0112

Slope Map - Lands of
Richard Anderson
Wallace A... Santa Cruz County, California

Ifland ENGINEERS, INC.
CIVIL ENGINEERING • LAND PLANNING • STRUCTURAL DESIGN
1100 WATER STREET, SUITE 2
SANTA CRUZ, CA 95062

ASSESSOR'S PARCEL NUMBER 041-481-04

SHEET TM-2 of 6 SHEETS

JOB NO. 03115

NIELSEN and ASSOCIATES

ENGINEERING GEOLOGY AND COASTAL CONSULTING

GEOLOGIC REPORT
for a
PROPOSED SINGLE FAMILY HOMESITE

Wallace Avenue, Aptos
Santa Cruz County
APN 041-481-04

Job No. SCr-2009-G

May 2008

Attachment 5

NIELSEN and ASSOCIATES

ENGINEERING GEOLOGY AND COASTAL CONSULTING

May 20, 2008

Job No. SCr-2009-G

Richard and Loreta Anderson, Trustees
c/o Lawlor LandUse, Owen Lawlor
612 Spring Street
Santa Cruz, CA 95060

SUBJECT: Geologic Investigation of a proposed single family homesite, one of three in a proposed minor land division, focusing specifically on slope stability issues and development of a building setback from moderately steep slopes.

REFERENCE: The uppermost proposed homesite on APN 041-481-04, Wallace Avenue, Aptos, Santa Cruz County, California.

Dear Mr. and Mrs. Anderson:

This report presents the results of our Geologic Investigation which addressed the geologic conditions at the upper proposed homesite of three on a 6.9 acre property at the end of Wallace Avenue in Aptos. A letter from the County Geologist, Joseph Hanna, suggested a building setback of 50 feet from greater than 50% slopes but left open the option of reducing that setback based on site specific work.

The upper homesite is located near a hilltop, the highest part of the property. The area is covered with a dense forest of eucalyptus trees. At the time of our study, there were no signs of erosion on the side slopes off this ridge. The steepest slopes lie to the north and southeast sides of the ridge. The majority of slopes below these short sections are predominantly less than 50%, but there is a very short section of hillside in excess of 55% gradient off the north side. We saw no signs of concentrated runoff anywhere on the property.

Our study revealed that the study area is underlain entirely by eolian sand of the Aromas Formation which consists of very fine to fine-grained sand. A 61-foot deep boring encountered only such sand, and the local geologic map indicates the sand continues another 120 feet below this.

In our opinion, the geologic conditions at the homesite are not adverse with respect to potential landsliding or slope instability. However, we still recommend a 25-foot setback from greater than 30% slopes.

The property is not located in a known fault zone, the closest of which is the Zayante fault situated about 2¾ miles northeast of the property. The property can be expected to experience

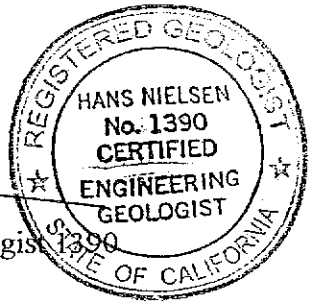
1070 W. Antelope Creek Way●Oro Valley, Arizona 85737●(831) 295-2081

moderate to severe ground shaking during the lifetime of the proposed home due to its proximity to several active and potentially active faults.

The greatest hazard at the property is erosion from concentrated runoff. The earth materials are highly susceptible to erosion due to their uncemented, friable character. It is very important that drainage from impermeable surfaces be collected and well controlled, either by dispersion or disposal in the subsurface.

In general, the proposed building site is well suited for the proposed development of the new home provided that our building setbacks are adhered to.

Sincerely,



Hans Nielsen
Certified Engineering Geologist 1390

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INTRODUCTION

This report presents the results of our geologic investigation of one homesite of three in a proposed minor land division of a 6.9 acre property know by the Assessors Parcel Number 041-481-04. Two of the homesites are located on moderate slopes with no apparent concerns for slope instability as indicated in a letter from the Santa Cruz County Geologist, Joseph Hanna, dated 8 April 2008. The third and uppermost homesite is located near 30% and greater slopes from which the County Geologist recommended a 50 foot building setback but allowed for the reduction in this setback based on site specific work. The purpose of our study was to assess the geologic conditions at the upper homesite in this regard.

The investigation consisted of: 1) a review of selected pertinent published and unpublished geologic literature and information including a geotechnical study by Amso Consulting Engineers in March 2006, 2) examination and interpretation of four sets of historical stereoscopic aerial photographs dating back to 1939, 3) field traverse of the property, 4) geologic mapping and the construction of geologic cross sections, 4) observation and logging of a 61-foot deep exploratory boring, 5) discussions with the project geotechnical engineer, 6) discussions with the project planner Owen Lawlor, and 7) preparation of this report and the accompanying graphics.

SITE CONDITIONS

The property occupies the west side of a hillside in the foothills of the Santa Cruz Mountains near the town of Aptos (Figures 1 and 2). Access is Wallace Avenue which the property is at the end of.

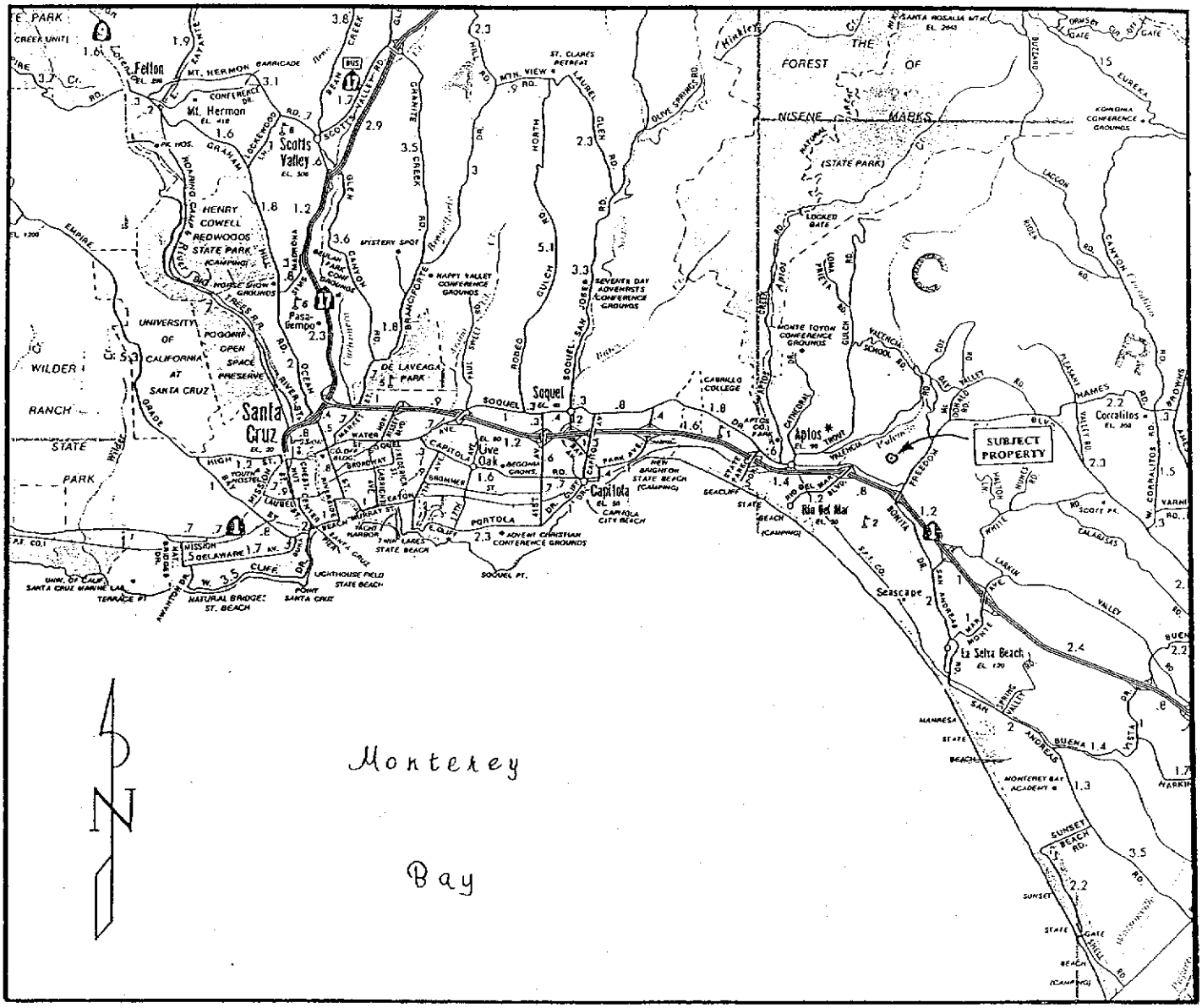
Slopes on the southwest side of the property, where the three homesites are located, are moderate. There are steeper slopes on the north side of the property and off the property to the east that drop down towards Freedom Blvd.. In the development area, the property climbs at a moderate gradient of 15% to 20% from Wallace Avenue. Elevation gain is on the order of 120 feet to a ridge top in the northeast part of the property. Off the north side of the ridge, slopes drop at 30% to 50% gradient to adjacent properties and Huntington Drive. Off the southeast side of the ridge, slopes also decline on the order of 30%-50% gradient for several hundred feet. These conditions are shown on Plate 1 in Appendix C.

The property is vegetated with grasses and a dense eucalyptus forest. The southern part of the property, where two of the three homesites are located, is primarily open grassland with sparse eucalyptus trees. In the area of the upper homesite, situated near the ridge top in the northeastern part of the property, there is a dense eucalyptus forest. The northern part of the property is covered in widely spaced oak trees as are the hillsides east of the property.

At the time of our study, there was no indication of significant active erosion occurring anywhere on the property. Minor rilling was taking place on cutslopes along the rear of a large graded pad in the south-central part of the property. This pad was constructed prior to 1939

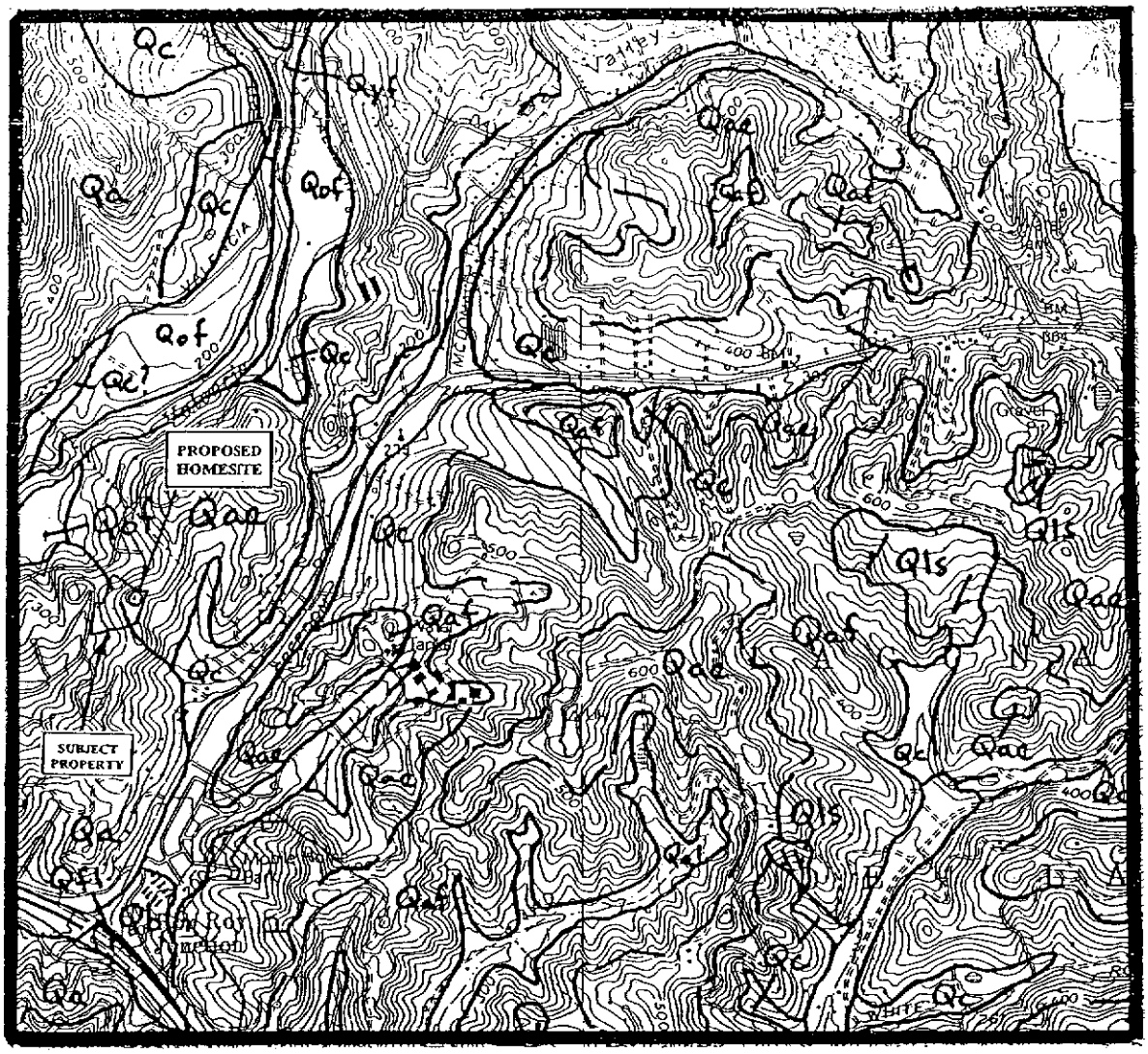
LOCATION MAP

Figure 1.



GEOLOGIC MAP

Figure 2.



EARTH MATERIALS

- **Qfl** **Fill** - man made fill from grading
- **Qb** **Basin Deposits**
- **Qyf** **Younger Fluvial Deposits**
- **Qof** **Older Fluvial Deposits**
- **Qc** **Colluvium:** sand, silt, clay and rock debris
- **Qcu** **Coastal Terrace Deposits**

AROMAS FORMATION

- **Qa** **Aromas Fm.** - undifferentiated
- **Qae** **Eolian (dune) Sands of the Aromas Fm.:** red sands deposited by wind in near shore dune fields
- **Qaf** **Fluvial Deposits of the Aromas Fm.:** interlayered sand, clay, silts and gravels deposited in a meandering stream environment

SYMBOLS

Geologic Contact: dashed where approximately located

Portion of the Watsonville West USGS 7.5 min. Quadrangle

Geology from: Tinsely and Dupré, 1980

based on stereo aerial photographs that show a long narrow building on this pad, the building appearing to be a chicken shack. Considering that this pad is over 70 years old, it illustrates the stable nature of the land since there has been essentially no significant erosion or slope instability caused by the creation of a large level pad on the hillside where the homes are proposed.

SITE GEOLOGY

According to the local geologic map, the property is underlain by the Aromas Formation. The map, Figure 2, shows the northeast half of the property underlain by the eolian facies of the Aromas Formation and the southwest half by undifferentiated Aromas. The Aromas is comprised of two distinctly different suites of earth materials called facies - a well sorted red brown sand (Qae) deposited in an ancient coastal sand dune field, and a heterogenous fluvial unit (Qaf) containing interbedded and interlayered sands, silts, clays, and gravelly sands (Dupré, 1975; Dupré and Tinsley, 1980). The Aromas is geologically young at ½ to 1½ million years old; it was the last major geologic unit deposited in what would become the Pajaro Valley and Watsonville Lowlands. In a regional sense, contacts between various earth materials in the Aromas Formation are roughly flat lying but may be locally gently inclined. However, the two facies can be juxtaposed due to their depositional environment that consisted of large rivers flowing through and over a massive sand dune field.

To evaluate the earth materials beneath the property, exploratory borings were drilled with a tractor-mounted drill rig using solid-flight auger and a 140-pound cable operated slide hammer for sampling. Eight borings were drilled by the project geotechnical engineer two years ago during their study of the property; their descriptive logs are presented in Appendix A for reference. We drilled two additional borings to aid in our interpretation of the geology, a 61-foot deep boring at the ridge top in the vicinity of the upper homesite, and a 36-foot deep boring in the southern part of the property. The latter boring was drilled to assess the nature of the "undifferentiated" Aromas. The boring locations are shown on Plate 1, and descriptive logs of our two borings are presented in Appendix B. Our interpretation of the subsurface conditions is presented in two cross sections in Appendix C. Since our study focused on only the upper homesite, our geologic cross sections are specific to this site.

Our deep boring at the ridge top, #9, encountered fine to very fine-grained brown to red brown sand for its entire depth. There was minor clay in the top five feet, the clay being a product of weathering and soil development. No groundwater nor indications of significant moisture variations were present. Our second boring, #10, encountered an 18-foot thick gravelly sand about 11 feet below ground surface which in turn was underlain by very fine-grained sand. None of the geotechnical engineer's borings encountered gravelly sands to depths of 20 feet below ground surface, one of which (#2) was located quite close to our Boring 10.

The drill data indicate that the local geologic map, Figure 2, accurately reflects the geology at the property. Our deep boring proved that the ridge is underlain by at least 61 feet of eolian sand, and the local geologic map shows another 120 feet of eolian sand below this depth.

The gravelly sand encountered in our second boring is clearly fluvial in origin. Our geologic map, Plate 1, shows this boring situated on the southwest side of the contact between eolian and undifferentiated Aromas taken from the local geologic map. Therefore, the "undifferentiated" Aromas in the southwestern half of the property is the fluvial facies.

Our best guess is that the fluvial sediments in the southwest part of the property are in buttress conformity with the eolian sands to the northeast. The depositional character of the Aromas, according to Dupré, 1975, involved a large river (or rivers) flowing through a massive field of sand dunes. It is easy to postulate that the river cut into the dunes in places depositing fluvial sediments on and against the dune sands. The absence of gravels in ALL of the geotechnical engineer's borings further suggests that the gravelly sand encountered in our Boring 10 is a local deposit, most likely a relatively small channel gravel. It is our opinion that further study of the relationship between the fluvial and eolian deposits on the property is unwarranted given the following: 1) the predominance of permeable sand found in the 10 exploratory borings, 2) the moderate to gentle nature of the hillsides on the property, and most importantly, 3) the absence of evidence of landsliding and slope instability on and adjacent the property.

LANDSLIDES

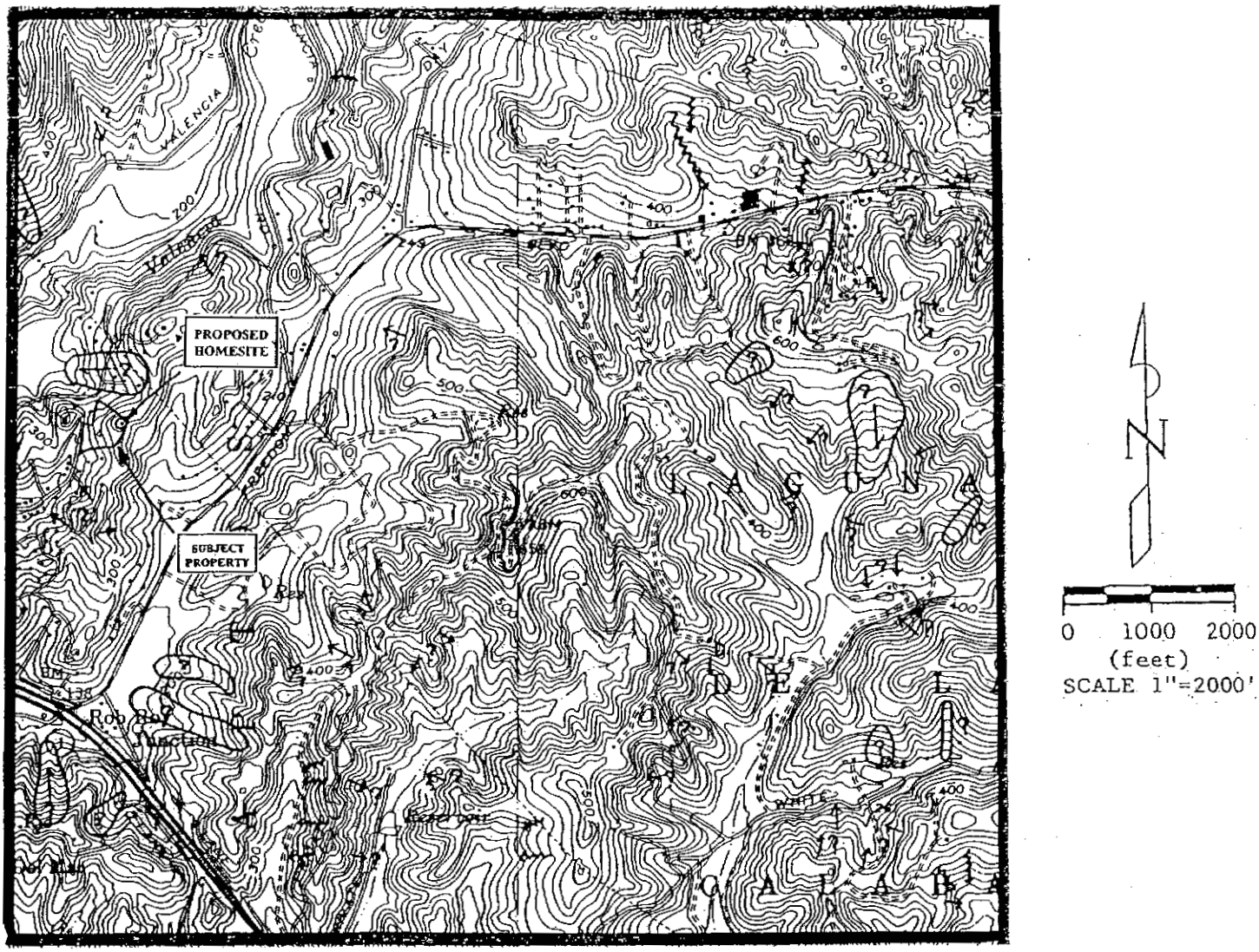
To evaluate landslides near the property for this study, we: 1) reviewed a 1974 map of landslide deposits in Santa Cruz County, 2) examined four sets of historical stereo aerial photographs, 3) reviewed the logs of eight borings drilled by the project geotechnical engineer, 4) drilled and logged two additional exploratory borings for this study, and 5) traversed the hillsides on and around the property.

Small-scale and moderate-sized landslides are not uncommon in the vicinity of the property as shown in Figure 3, The Map of Landslide Deposits in Santa Cruz County (Cooper-Clark and Associates, 1974). Many landslides in the Aromas Formation are relatively small debris flows that occur in the heads of drainages. However, there are large-scale landslides in the Aromas commonly associated with the fluvial facies where clays create low permeability horizons on which groundwater accumulates leading to excessive saturation and slope instability. Although present on the property, the fluvial facies is composed primarily of well-drained fine-grained sand and gravelly sand, conditions not conducive to landslide development.

The 1974 Landslide Map does show one significant landslide a short distance north of the property that does not directly affect the property. There is good reason to believe the existence of this slide based on evidence in stereo aerial photographs. However, there is no evidence in either the photographs nor on the ground that such sliding has taken place on the property. The hillside on the property is quite regular with no sharp drops or hillside hollows, features associated with landslides. Furthermore, there is a small ridge on this hillside (see Cross Section B-B') that greatly reduces the overall gradient as the hillside drops to Huntington Drive at the base of the slope.

1974 LANDSLIDE MAP

Figure 3.



LARGE LANDSLIDE DEPOSIT

More than 500 feet in maximum dimension. Arrows indicate general downslope direction of movement. D: definite landslide deposit; P: probable landslide deposit; ?: questionable landslide deposit; R: possible rapid rate of landslide movement (several feet to over 100 feet per second). Hachured line shows approximate position of inferred main scarp.

SMALL LANDSLIDE DEPOSIT AND GULLY

50 to 500 feet in maximum dimension. Arrow indicates general direction of downslope movement and is centered over location of deposit. Included are gullies which exhibit observable side bank slumping.

SOIL CREEP

Areas of suspected soil creep, a gradual downslope movement of soil and loose rock material on a slope. Wiggly arrow indicates general direction of soil creep and is centered over location of creeping area.

From: Cooper Clark and Associates (1974)

In regards to defining the building area at the upper homesite on the ridge top, we share the County Geologist's opinion that the home should be setback from moderately steep slopes. However, our findings indicate no adverse geologic conditions below this ridge top. A 25-foot building setback from the crest of 30%-50% slopes is sufficient to mitigate slope instability concerns at the homesite. We have shown this building setback on Plate 1 from both the north and southeast sides of the ridge top. The slopes to the west of the hilltop are less than 30% gradient, so no building setback is warranted here.

DRAINAGE

Drainage on and around the property is dominantly sheetwash. There was no evidence of concentrated flow nor significant erosion on the property at the time of our study. However, we consider erosion to be a significant concern at the property.

Erosion potential will be mitigated by controlling, dispersing, and properly disposing of runoff from impermeable surfaces. Our findings strongly suggest that the sediments underlying the property are quite permeable, and therefore, capable of absorbing the majority of runoff from the proposed development. Without evidence to the contrary, the property appears to be an excellent candidate for subsurface disposal of runoff. However, we recommend percolation testing to verify the permeability of sediments in and below subsurface disposal areas. The hillsides downslope of the homesites are not steep, so the excessive saturation created by subsurface disposal should not have an adverse affect on slope stability. It will be important to mitigate the concentration of runoff from overflow of subsurface disposal systems, and this should be accomplished by creating a system that will disperse any overflow runoff.

Runoff that is not disposed of in the subsurface should be dealt with by dispersion and the use of energy dissipaters designed to spread out flow and prevent concentration. The near–surface earth materials at the property are highly susceptible to erosion from concentrated runoff, and there is no concentrated runoff flowing across this ground now. The ground is capable of absorbing overland flow so long as concentration is kept to a minimum, and dispersed overland flow will also greatly reduce the amount of runoff leaving the property. Discharge of runoff on the gentle slopes near the base of the property is most favorable.

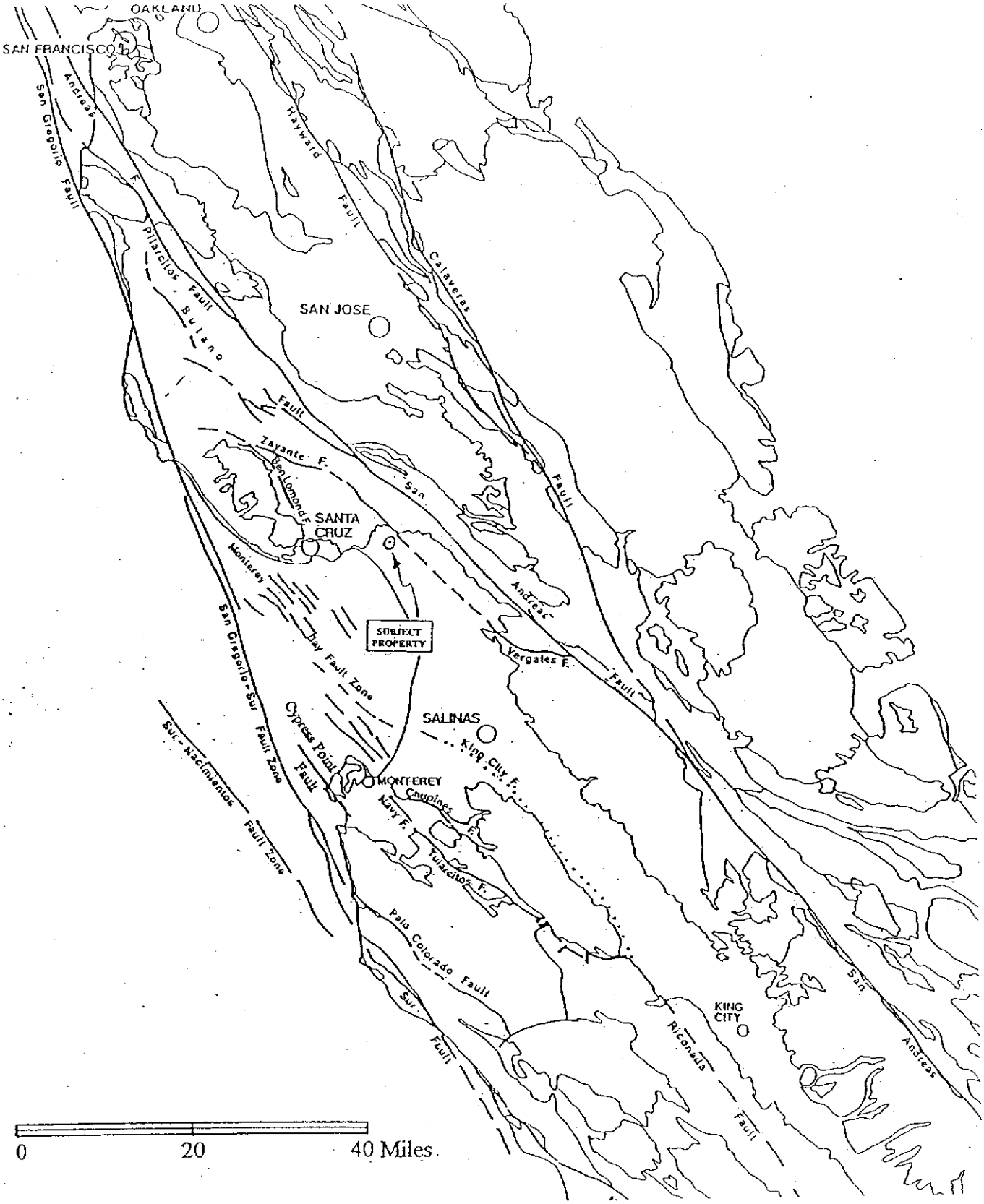
We recommend that we be afforded an opportunity to review the drainage plan for this property prior to its finalization and implementation.

FAULTS and EARTHQUAKE HAZARDS

The subject property lies in a highly seismically active region of California. A broad system of inter-related northwest-southeast trending strike-slip faults represent a segment of the boundary between the Pacific and North American crustal plates. For approximately the past 15 million years (mid-Miocene) the Pacific plate has been slipping northwestward with respect to the North American plate (Atwater, 1970; Graham, 1978). The majority of movement has been taken

REGIONAL FAULT TRACE MAP

Figure 4.



From: McCrory and Others. 1977

up by the San Andreas fault itself; however, there are many faults within this broad system that have also experienced movement at one time or another. Significant faults include, but are not limited to, the San Andreas Fault, Zayante Fault, the offshore San Gregorio Fault, and Hayward Fault in the east San Francisco Bay Area. The active San Andreas Fault lies about 6¼ miles northeast of the property. The potentially active Zayante Fault lies about 2¾ mile northeast. The active San Gregorio Fault lies about 18 miles to the southwest offshore, and the active Hayward Fault lies about 28 miles to the north (Figure 4).

The San Andreas, San Gregorio and Hayward faults are all considered active and capable of generating 7+ magnitude earthquakes. The San Andreas and Hayward faults are currently considered to be the faults with the highest potential of generating the next large earthquake in the area. To a lesser extent, the San Gregorio is considered a significant seismic threat. The Zayante fault is a potential threat, but its history is much less understood than that of these active faults. Whereas the recurrence interval of large magnitude earthquakes on the three active faults are measured in hundreds of years, the recurrence interval for the Zayante is currently estimated to be on the order of 8800 years, but there is no data as to when the last major earthquake occurred on the Zayante (Frankel, 1996).

The San Andreas and Hayward faults are considered to have high probabilities of generating large magnitude earthquakes in the next 30 years. The most recent assessment of seismic hazards in California was published jointly by the U.S. Geological Survey and the California Division of Mines and Geology in December 1996 (Frankel and others). This document is the result of a combined effort by many geologists and seismologists and is considered the most up to date compilation of fault parameters in California. The report indicates that the San Andreas fault in the vicinity of the property is capable of generating a Moment Magnitude 7.9 earthquake. The Hayward fault may also generate an earthquake with a Magnitude in excess of 7, but the greater distance from the property indicates that the greatest ground shaking at the property will be generated by the San Andreas fault.

Strong ground shaking is associated with large magnitude earthquakes, and ground shaking affects structures and the stability of landslide masses and hillsides. A number of different parameters may be used to characterize ground motion for the purpose of seismic design. Typically, these include (but are not limited to) peak horizontal acceleration, peak horizontal velocity, and duration of motion. Most emphasis in engineering practice has been placed on peak horizontal ground acceleration. Empirically derived attenuation relationships for average peak horizontal ground acceleration (PHGA) have been developed that typically relate PHGA in terms of a percentage of the force of gravity (g) to the distance from the causative fault for a specified magnitude earthquake. It has also been recognized that the attenuation relationships differ depending upon the soil conditions underlying the site.

We used attenuation equations developed by Abrahamson and Silva (1997) to estimate the ground motion parameter of horizontal ground acceleration at the properties. These attenuation equations are relative to the type of bedrock or thickness of recent sediments covering

bedrock. We consider the earth materials present in the hillside at the properties to be soft rocks or deep soil because of their uncemented character.

The two faults of interest are the San Andreas and Zayante faults. The San Andreas is much more active than the Zayante; however, the Zayante is much closer to the property than the San Andreas. The Zayante is only 2¾ miles to the northwest whereas the San Andreas is 6¼ miles to the northwest. The currently accepted maximum Moment Magnitude Earthquake on the San Andreas is 7.9 and on the Zayante is 6.8.

Using Abrahamson and Silva's (1997) attenuation equations, the estimated mean peak horizontal ground acceleration for sites underlain by deep soil-type earth materials are:

SAN ANDREAS FAULT	ZAYANTE FAULT
0.36g Mean	0.43g Mean
0.56g Mean + 1 standard deviation	0.68g Mean + 1 standard deviation

The Zayante values are greater than the San Andreas values due to the proximity of the former fault. This presents a dilemma due to the extreme nature of the values for the Zayante. We are hesitant to suggest that the Zayante values be ignored since the fault is recognized in the current literature as being capable of generating a Moment Magnitude 6.8 Earthquake. On the other hand, we think the probability of an earthquake occurring on the San Andreas is far greater than one occurring on the Zayante during the lifetime of the proposed home. Engineers should decide which values to use and contact us with any questions.

The house should be designed to stringent seismic resistant standards. Not only will the site probably be subjected to moderate, possibly severe, ground shaking from a large magnitude earthquake, but the position of the homesite on a ridge top increases the potential for amplification of ground motion due to topographic effects. We do not consider ridge top cracking, a phenomenon that occurred on some ridge tops in the Santa Cruz Mountains, a potential hazard at the homesite since the earth materials are uncemented sands. In almost all instances of ridge top cracking, the ridges were underlain by hard cemented brittle sandstone.

CONCLUSIONS

1. This study evaluated one of three proposed homesites on a 6.9 acre property proposed for a minor land division into three separate parcels. The property was undeveloped with structures at the time of our study, but a rather large graded pad more than 70 years old still exists in the area of the proposed development.

2. The proposed homesite is situated near a ridge top on moderate slopes of less than 30% gradient in the area of dense eucalyptus forest. Moderately steep slopes of 30%-50% gradient drop off this ridge to the north and southeast.

3. The homesite is underlain by the eolian facies of the Aromas Formation that extends at least 61 feet beneath the homesite and probably as deep as 180 feet. These earth materials consist of very fine to fine-grained, well sorted, uncemented ancient dune sands.

4. No landslides were evident on the hillsides immediately surrounding the proposed homesite. The geologic conditions are not adverse with respect to landslide potential, but it is prudent to set the home back from moderately steep slopes in excess of 30% gradient.

5. No groundwater nor evidence of it was found during this study. Additionally, there was no concentrated drainage at the property at the time of our study.

6. The property is located 2¾ mile south of the Zayante fault zone. The active San Andreas fault lies about 6¼ miles northeast of the property. The active San Gregorio fault lies about 18 miles to the southwest offshore, and the active Hayward fault lies about 28 miles to the north in the East San Francisco Bay Area.

7. Moderate to severe ground shaking is likely at the site in the next 30 years. Ground motion parameters at the site in the event of a large magnitude earthquake on the San Andreas and Zayante faults are presented in this report.

8. The property is geologically acceptable for the proposed new single family home so long as development adheres to the building setbacks noted herein.

RECOMMENDATIONS

1. This study followed an investigation by the geotechnical engineering firm of Amso Consulting in March 2006. Their report, including updates, shall be considered an integral part of the evaluation of the property and shall accompany this geologic report in all future phases of the project including but not limited to review, design, and construction.

2. The proposed single family home should adhere to the building setbacks shown on Plate 1 of this report. Nielsen and Associates or a California Certified Engineering Geologist shall review any home location prior to finalization and approve the location relative to the information presented herein.

3. A geotechnical engineer shall investigate the earth materials beneath the homesite and provide criteria for foundation design. We understand that Amso Consulting is doing this.

4. An engineered drainage plan shall be developed for the homesite. Efforts should be made to dispose of runoff in the subsurface and by overland flow so long as runoff is well dispersed to mitigate concentrated flow which can and most likely will lead to adverse erosion. Energy dissipaters shall be installed at discharge points to both reduce erosive

energy and to disperse runoff. We recommend percolation testing to verify the ability of the ground to accept subsurface disposal of runoff in the areas of percolation fields.

5. We recommend that we, or a certified engineering geologist in the State of California, be provided the opportunity for a general review of final design specifications. If we are not accorded the privilege of making the recommended reviews, we can assume no responsibility for misinterpretation of our recommendations.

6. If any unexpected variations in soil conditions, or if any unanticipated geologic conditions are encountered during construction, or if the proposed project will differ from that discussed or illustrated in this report, we require to be notified so supplemental recommendations can be given.

INVESTIGATION LIMITATIONS

1. This report presents the results of our Geologic Investigation which addresses the geologic conditions and potential geologic hazards associated with the upper homesite of three in a proposed minor land division. This report outlines the general geologic conditions at the site and presents general recommendations to help mitigate potential risks associated with the geologic hazards. This report does not include geotechnical engineering, structural engineering, civil engineering, or architectural evaluations.

2. This written report comprises all of our professional opinions, conclusions and recommendations. This report supersedes any oral communications concerning our opinions, conclusions and recommendations.

3. The conclusions and recommendation noted in this report are based on probability and in no way imply the site will not possibly be subjected to ground failure or seismic shaking so intense that structures will be severely damaged or destroyed. The report does suggest that building structures at the recommended site, in compliance with the recommendations noted in this report and any other engineering reports, reduces the potential for damage to the home.

4. This report is issued with the understanding that it is the duty and responsibility of the owner, or of their representative or agent, to ensure that the recommendations contained in this report are brought to the attention of the architect and engineer for the project, incorporated into the plans and specifications, and that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

5. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by an engineering geologist.

REGISTERED GEOLOGIST HANS NIELSEN No. 1390 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

NIELSEN AND ASSOCIATES

Hans Nielsen
C.E.G. 1390

COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
TOM BURNS, PLANNING DIRECTOR

August 12, 2008

Richard and Loreta Anderson, Treasuer
C/o Lawlor LandUse, attention: Owen Lawlor
612 Spring Street
Santa Cruz, CA 95060

Subject: Review of Engineering Geology Report, by Nielsen and Associates.
Dated May 20, 2008; Project # SCR-2009-G
Review of Geotechnical Engineering Report, by ACE Engineering
Dated March 14, 2006; Project # 3362
APN 041-481-04, Application #: 07-0112

Dear Applicant:

The purpose of this letter is to inform you that the Planning Department has accepted the subject reports and the following items shall be required:

1. All construction shall comply with the recommendations of the reports.

2. The setbacks for Lot 3 shall be as indicated on Plate 1 of the approved Engineering Geology report. Prior to the submittal of the proposed building plans Nielsen and Associates, or an Certified Engineering Geologist, must review and approve the location of the setback on the construction plans.

3. The setback shown on Plate 1 of the subject report shall be recorded with the other development envelopes on the final map of the minor land division. Slopes over 30% shall not be included in the development envelopes, and all access roadways/driveways, drainage dispersion areas, and building areas shall be included within the development envelopes.

4. All of the conditions of the Geologic Hazards Assessment prepared for this project shall remain project conditions.

5. A separate project specific geotechnical engineer report update shall be prepared for each of the proposed homes. These updates must be prepared to comply with the requirements of the 2007 CBC. Please note that your report has identified potentially expansive soils (Section 1802.3.2 of the 2007 CBC) and the updates will need to address expansive soils per the requirements of the 2007 CBC.

6. Final plans shall reference the reports and include a statement that the project shall conform to the reports' recommendations. Plans shall also provide a thorough and realistic representation of all grading necessary to complete this project

7. Prior to building permit issuance and approval of the improvement plans a *plan review letter* from the geotechnical engineer and engineering geologist shall be submitted to

(over)

Attachment 6

Environmental Planning. The authors of the reports shall write the *plan review letters*. These letters shall state that the project plans conform to the reports' recommendations.

8. The geotechnical engineer recommends that all excavations and fill embankments be constructed at a slope gradient of 2.5:1. Implicit in this requirement is the need to re-grade the existing excavations and fill embankments to a slope gradient that is 2:5:1 or less steep.

9. Please submit an electronic copy of the soils report in .pdf format via compact disk or email. Emails may be directed to pln829@co.santa-cruz.ca.us.

After building permit issuance the soils engineer and engineering geologist *must remain involved with the project* during construction. Please review the *Notice to Permits Holders* (attached).

Our acceptance of the reports is limited to its technical content. Other project issues such as zoning, fire safety, septic or sewer approval, etc. may require resolution by other agencies.

Please call the undersigned at (831) 454-3175 if we can be of any further assistance.

Sincerely,

Joe Hanna
County Geologist CEG1313

Carolyn Banti PE
Associate Engineer

Kent Edler PE
Senor Civil Engineer

Cc: Antonella Gentile, Resource Planner
Carolyn Banti, Civil Engineer
Nielsen and Associates
ACE Inc.

Environmental Planning Completeness Comments

========= UPDATED ON DECEMBER 31, 2008 BY CAROLYN I BANTI =========
Comments from previous dates have been deleted due to lack of space, but can be found in the project file.

The site was staked and field reviewed by Planning staff on 12/22/08. Full grading plans have been prepared and reviewed. Comments are as follows:

1. Grading quantities for the project exceed 1000 cubic yards and will require environmental review.

2. It appears there may be discrepancies in the grading quantities. Please provide backup grading calculations for review.

3. Please provide a grading cross-section for Lot 2.

4. Grading plans for Lot 3 must include the western retaining walls shown on cross-sections A and B.

5. Please provide updated plan review letters from the soils engineer and engineering geologist that reference the revised plan set. ========= UPDATED ON APRIL 14, 2009 BY ANTONELLA GENTILE =========
Update the tentative map to reflect correct lowest finished floor elevations for Lot 1 and the removal of parking in the fire truck turnaround for Lot 3.

All other completeness items have been addressed per Environmental Planning.

Environmental Planning Miscellaneous Comments

========= UPDATED ON DECEMBER 31, 2008 BY CAROLYN I BANTI =========

Comments from previous dates have been deleted due to lack of space, but can be found in the project file.

--- Compliance --- Fourth Review --- Soils and Grading ---

After reviewing the staked site, it was determined that existing Lot 1 grades are in compliance with the grades required by the General Plan. Driveway grades have also been revised to comply with Code requirements. The following are the remaining Compliance Comments:

1. It appears grading can be minimized on Lot 1 by utilizing alternate site design and foundation approaches as recommended in General Plan Policy 6.3.9.Please revise.

2. The current plans show the Lot 3 fire truck turn-around obstructed by parked cars; please revise the plans to show the entire fire truck turn-around free of parking.

3. The grading plans show a retaining wall adjacent to the driveway on Lot 2 to

prevent grading on 30-percent slopes. This wall should also be shown on the Tentative map and preliminary driveway plan.

--- Misc. Comments/Conditions --- Fourth Review --- Soils and Grading ---

During our recent field visit, it was noted that there is a portion of the property on Lot 2 that is greater than 30 percent and not designated on the slope map. This portion does not impact the feasibility of the development, but is provided for informational purposes only. ========= UPDATED ON DECEMBER 31, 2008 BY ANTONELLA GENTILE =========
Additional compliance comments:

4. The tree removal plan is misleading in that groups of trees are counted as single trees in order to provide tree removal totals. Change the wording to reflect this detail.

5. It appears that some trees are being removed that can be saved and are in fair condition. Provide an explanation for removal or change the plans to show these trees to remain. Such trees include: the 14" pine included in tree cluster 1.04, the 30" pine (tree 1.11), the 16" pine (tree 2.14), and several oaks in the northwestern portion of the development area of lot 3.

6. The 60" oak cluster within the right of way on lot 3 shown to remain on sheet L1.2 is not shown on sheet L3.2.

7. Removed oak trees with 5" or greater DBH shall be replaced with oaks on a 3:1 basis. The current tree removal plan shows removal of 12 oak trees and clusters. Please indicate the total number of oaks with DBH of 5" or greater. Individual oak trees on the landscape plan (currently 14) will count toward overall oak tree replacement, however, an area should be designated for oak tree replacement outside of the development area.

8. Show a minimum of 3 new oak trees for each oak tree with DBH over 5" to be removed. ========= UPDATED ON APRIL 14, 2009 BY ANTONELLA GENTILE =========
Compliance comments:

Although it is forseeable that minor changes to the landscape plan may be necessary, any changes to the plant palette must be approved by Environmental Planning. Note 1 on sheet L3.2 should be revised to reflect this requirement or deleted.

Driveway grading plans show cut/fill slopes at 2:1, while the soils report requires a maximum 2.5:1 for these slopes. The soils engineer will be required to approve driveway grading plans prior to improvement plan approval by Environmental Planning. If the soils engineer cannot approve these slopes, changes to proposed retaining walls along the driveway will be required.

All other compliance comments have been addressed.

Please note that Environmental Review is required for this project because the grading amounts exceed 1,000 cubic yards.

Additional Conditions:

Prior to parcel map recordation, plan review letters shall be required from the soils engineer and engineering geologist.

Prior to building permit issuance, plan review letters shall be required from the soils engineer and engineering geologist.

Improvement plans and subsequent building plans shall show tree protection measures for all mature trees to be retained. These plans shall be approved by the project arborist.

Any changes to the plant palette shall be subject to review and approval/denial by Environmental Planning.

A preconstruction meeting shall be scheduled by the project applicant and held on-site prior to the beginning of improvement construction. The soils engineer, grading contractor, Department of Public Works inspector, applicant, project arborist, and Environmental Planning staff shall attend the meeting.

A minimum of three oak trees shall be planted for each oak tree removed.

A mitigation and monitoring plan shall be required for the new oaks prior to improvement plan approval. ========= UPDATED ON APRIL 14, 2009 BY ANTONELLA GENTILE =========

Dpw Drainage Completeness Comments

LATEST COMMENTS HAVE **NOT YET** BEEN SENT TO PLANNER FOR THIS AGENCY

========= REVIEW ON APRIL 3, 2007 BY ALYSON B TOM ========= Application with civil plans dated 2/20/07 has been received. Please address the following: 1) This project is required to

1) This project is required to limit post development runoff rates to predevelopment levels. Utilizing detention to meet this requirement is only allowed if other measures are not feasible. Are facilities to retain and infiltrate added runoff due to additional impervious areas feasible on this site? If so, please incorporate retention/infiltration measures prior to detention. If not, please submit reasons and technical support of infeasibility for review. If detention is accepted the required storage volume should be recalculated and redesigned for grading. Per SWM-15A and SWM-17 the required storage is around 1535 c.f. Why was figure SWM-15C referenced on sheet TM6?.

2) This project is required to provide mitigations for new impervious areas for a range of storms. Best management practices such as minimizing impervious areas, expanded pervious surfacing, disconnected impervious area, etc. should be considered and appropriate measures should be incorporated per the County Design Criteria (CDC). The proposed project does not appear to provide any mitigations for storms smaller than the 10 year storm. How will impacts to these small storms be mitigated?

3) The proposed plan indicates the majority of runoff from proposed impervious areas will discharge to a pipe and open channel system along Wallace Avenue. Are the 12 inch pipe sections shown on sheet TM3 existing or proposed? Please demonstrate that this system is adequate to handle all existing and proposed runoff. Based on the results of the assessment this project may be required to upgrade downstream facilities and/or provide additional on-site mitigations.

4) The preliminary drainage map has been received. Please show proposed impervious areas on the map. How will proposed impervious areas in drainage areas 2, 3, and 4 on lots 3 and 4 be mitigated for? Since a complete grading plan was not provided please confirm that the existing drainage patterns shown on the drainage map will not be altered with the land division or lot grading. If complete grading plans will not be provided include this at least as a note on the preliminary and final plans.

5) Completely detailed drainage plans for each individual lot are not required as part of the land division. However, the methods and patterns of dealing with runoff from proposed lot development are required. Also, if common facilities (ex: detention pond) to be built as part of the land division will be providing mitigation for lot development then the maximum impervious area allowed per lot should be included as part of the land division as well as requirements for routing for meeting CDC requirements.

6) It was not clear from the grading information provided on TM3 that only runoff from proposed impervious areas would be routed to the proposed detention facility per CDC requirements. Plans should clearly describe how open area runoff will be routed safely around the proposed detention pond. Contours shown on sheet TM3 indicate runoff may be routed into the detention facility.

7) Please submit a review letter from the Geotechnical engineer approving of the preliminary drainage plan. The letter should refer to dated plans.

8) The extent of the proposed development included as part of the minor land division is unclear and inconsistent between the architectural, landscaping and civil plans. Please clearly describe what work is included under this specific application.

All submittals for this project should be made through the Planning Department. For questions regarding this review Public Works stormwater management staff is available from 8-12 M-F at 454-2160.

========= UPDATED ON OCTOBER 5, 2007 BY RACHEL J FATOOHI =========

It is understood that the retention chambers will be used on each parcel to mitigate small storms for runoff from house roofs, patios and parking areas. Please show tentative location of these chambers and show how over flow from them is being handled without impacting adjoining parcels. Please account for the overflow path/amounts in the site's drainage system design. Since the retention chambers are feasible for these impervious areas, please investigate such feasibility to intercept driveway runoff at different segments along the driveway and treat it in the same fashion for a range of storms. supporting calculations for the retention system are required prior to recording the map. Because this project is within the Aptos

Creek Watershed area, release rate from the detention system shall be based on a 5-year storm predevelopment rate conditions. detailed drawings and calculations are requiered during the map recording process.

========= UPDATED ON OCTOBER 5, 2007 BY RACHEL J FATOOHI =========
========= UPDATED ON AUGUST 8, 2008 BY ALYSON B TOM ========= Application with civil plans dated 7/22/08 has been received. Please address the previous completeness comments from October 5, 2007 along with the following:

1) The photocopied plans received are not legible. Text in hatched areas cannot be read.

2) The extent of the proposed development included as part of the minor land division is unclear and inconsistent between the architectural, landscaping and civil plans. Please clearly describe what work is included under this specific application.
========= UPDATED ON DECEMBER 29, 2008 BY ALYSON B TOM ========= Previous completeness comments from 10/5/07 and 8/8/08 have been partially addressed. The following is still outstanding from 10/5/07:

Since the retention chambers are feasible for small storm mitigations for runoff from the house roofs, please investigate such feasibility to intercept driveway and parking area runoff at different segments along the driveway and treat it in the sme fashion for a range of storms. As proposed, it appears that there are no mitigations provided for impacts to small storms for runoff from new driveway and parking areas.
========= UPDATED ON APRIL 8, 2009 BY GERARDO VARGAS ========= Previous completeness comment not addressed. See below.

Since the retention chambers are feasible for small storm mitigations for runoff from the house roofs, please investigate such feasibility to intercept driveway and parking area runoff at different segments along the driveway and treat it in the same fashion for a range of storms. As proposed, it appears that there are no mitigations provided for impacts to small storms for runoff from new driveway and parking areas.

Please see compliance issues to be addressed prior to final map recordation. Please call the Dept. of Public Works, Stormwater Management Section, from 8:00 am to 12:00 noon if you have questions.

Dpw Drainage Miscellaneous Comments

LATEST COMMENTS HAVE **NOT YET** BEEN SENT TO PLANNER FOR THIS AGENCY

========= REVIEW ON APRIL 3, 2007 BY ALYSON B TOM ========= The following should be addressed prior to final map recordation.

1) All runoff from parking and driveway areas should go through water quality treatment prior to discharge from the site. Consider outsloping driveways to drain to landscaped areas for filtering prior to discharge from the site. If structural treatment is proposed, recorded maintenance agreement(s) are required.

2) Please show drainage easements for all common drainage facilities, including the detention system. Specify on the final plans and in recorded eement(s) who is responsible for maintaining these common drainage facilities.

3) Please provide permanent markings at each inlet that read: "No Dumping Drains To Bay - No Tire Desecho Al Mar", or equivalent. The homeowner's association should be responsible for maintaining these markings.

4) Submit detailed plans and supporting calculations demonstrating that the site storm water system, including the proposed detention system, meets CDC requirements (capacity, safe overflow, freeboard, velocity, etc.). Include drainage area maps.

5) Include maintenance requirements for proposed drainage facilties including all best management practices on the final plans. The plans should also specify who is responsible for maintenance.

6) Please submit a review letter from the Geotechnical engineer approving of the final drainage plan. The letter should refer to dated plans.

7) Construction activity resulting in a land disturbance of one acre or more, or less than one acre but part of a larger common plan of development or sale must obtain the Construction Activities Storm Water General NPDES Permit from the State Water Resources Control Board. Construction activity includes clearing, grading, excavation, stockpiling, and reconstruction of existing facilities involving removal and replacement. For more information see:
http://www.swrcb.ca.gov/stormwtr/constfaq.html

========= UPDATED ON OCTOBER 5, 2007 BY RACHEL J FATOOHI =========
Currently the site is not in a drainage zone. If the site will be annexed to the sanitation district, it will also be annexed to Zone 6 flood Control Distcict and Zone 6 fees will be asessed for the net increase in impervious area. Semi impervious area are encouraged and are charged half the fees compared to impervious surfacing. Currently the fees for impervious area are $1.00 per square foot. ========= UPDATED ON AUGUST 8, 2008 BY ALYSON B TOM ========= COMPLIANCE ISSUES: 1) The preliminary drainage map has been received. The notes indicate a proposed diversion of runoff from the building on lot 3 to drain to drainage area 1 rather than drainage area 2 per topography. Please update plans to eliminate this diversion.

2) It was not clear from the grading information provided on TM3 that only runoff from proposed impervious areas would be routed to the proposed detention facility per CDC requirements. Plans should clearly describe how open area runoff will be routed safely around the proposed detention facilities (the detention system should be located -off-line-). Contours shown on sheet TM3 indicate open area runoff may be routed into the detention facility.

3) Submit detailed plans and supporting calculations demonstrating that the on-site storm water system, including the proposed detention/retention systems, meets CDC requirements (capacity; safe overflow, freeboard, velocity, etc.). Include drainage area maps that are consistent with the calculations (e.g. what does an area of 0.95 acres used in detention volume calculation correspond to?). Provide details and analysis for the outflow restriction for the detention facility. How have the sys-

tems been designed to minimize clogging and maintenance? Provide safe overflow details for the systems. Analysis for the pipe system should be on Figure SWM-6.

INFORMATION ISSUES: 1) Completely detailed drainage plans for each individual lot are not required as part of the land division if separate building permits will be obtained for each lot. However, the methods and patterns of dealing with runoff from proposed lot development are required. Also, if common facilities (ex: detention) to be built as part of the land division will be providing mitigation for lot development then the maximum impervious area allowed per lot should be included as part of the land division as well as requirements for routing for meeting CDC requirements.

2) All runoff from parking and driveway areas should go through water quality treatment prior to discharge from the site. Consider outsloping driveways to drain to landscaped areas for filtering prior to discharge from the site. How will runoff from the base of the new private drive be treated?

3) Include maintenance requirements for proposed drainage facilties including all best management practices on the final plans. The plans should also specify who is responsible for maintenance. Submit a recorded maintenance agreement for the proposed detention and structural water quality treatment systems.

4) Please submit a review letter from the Geotechnical engineer approving of the final drainage plan. The letter should refer to dated plans.

5) Construction activity resulting in a land disturbance of one acre or more, or less than one acre but part of a larger common plan of development or sale must obtain the Construction Activities Storm Water General NPDES Permit from the State Water Resources Control Board. Construction activity includes clearing, grading, excavation, stockpiling, and reconstruction of existing facilities involving removal and replacement. For more information see:
http://www.swrcb.ca.gov/stormwtr/constfaq.html

6) As proposed the retention system may be regulated by the EPA as a Class V injection well. The applicant/owner is responsible for meeting the EPA-s requirements, if necessary. For more information see: http://www.epa.gov/npdes/pubs/swclassvwells-fs.pdf
========= UPDATED ON DECEMBER 29, 2008 BY ALYSON B TOM ========= Previous compliance issue No. 1 has been addressed. All other compliance and information issues from 8/8/08 are still outstanding.

The following is an additional compliance comment:

4) Sheets C1-C4 show proposed discharge pipes from the proposed retention chambers crossing property boundaries (from Lot 3 to Lot 2). Easements are required for these types of common drainage facilities. Show how these pipes will connect with the system shown on sheets TM3.

The following is an addition to previous information comment No. 4.

4) Please submit a review letter from the Geotechnical engineer approving of the final drainage plan. The letter should refer to dated plans and should specifically

approve of the outlet design to the ditch along Wallace. The letter should state that as designed the outlet should will not cause erosion or stability problems.

Dpw Road Engineering Completeness Comments

========= REVIEW ON MARCH 28, 2007 BY GREG J MARTIN =========
The access road from Wallace Avenue is recommended to be 24 feet wide within a 40 foot right-of-way for the first 50 feet from Wallace Avenue. A transition with a 15:1 taper is recommended as well. The pavement is recommended to be a minimum of 2 inches of asphalt concrete over 6 inches of aggregate base.
---------- Contact Greg Martin at 831-454-2811 with questions. ========= UPDATED ON OCTOBER 3, 2007 BY GREG J MARTIN =========
Previous comments apply. ========= UPDATED ON AUGUST 7, 2008 BY GREG J MARTIN =========
Previous comments apply.

Dpw Road Engineering Miscellaneous Comments

========= REVIEW ON MARCH 28, 2007 BY GREG J MARTIN =========
========= UPDATED ON OCTOBER 3, 2007 BY GREG J MARTIN =========
========= UPDATED ON AUGUST 7, 2008 BY GREG J MARTIN =========

Dpw Sanitation Completeness Comments

========= UPDATED ON APRIL 5, 2007 BY DREW BYRNE =========
The subject parcel is outside the District boundary; therefore, sewer service is not currently available. Contact the Local Agency Formation Commission regarding annexation into the District.

This application is incomplete because the engineered preliminary sewer plan needs to be revised as noted below. The noted conditions regarding sewer redesign and sewer lateral abandonment shall be included on the proposed tentative map. The District reserves the right to expand, modify, /or rescind these requirements up to the time the tentative map is approved.

The proposed collector sewer shall be publicly maintained, shall be placed in a minimum 20-foot wide easement dedicated to the District, and shall be eight-inch in diameter. No. 07-0112 Review Summary Statement; APN: 41-481-04:

The Proposal is out of compliance with District or County sanitation policies and the County Design Criteria (CDC) Part 4, Sanitary Sewer Design, June 2006 edition, and also lacks sufficient information for complete evaluation. The District/County Sanitation Engineering and Environmental Compliance sections cannot recommend approval of the project as proposed.

Reference for County Design Criteria: http://www.dpw.co.santa-cruz.ca.us/DESIGNCRITERIA.PDF

Policy Compliance Items:

Item 1) This review notice is effective for one year from the issuance date allow the applicant the time to receive tentative map, development or other discretionary permit approval. If after this time frame this project has not received approval from the Planning Department, a new availability letter must be obtained by the applicant. Once a tentative map is approved this letter shall apply until the tentative map approval expires.

Information Items:

Item 1) A complete engineered sewer plan, addressing all issues required by District staff and meeting County -Design Criteria- standards (unless a variance is allowed), is required. District approval of the proposed discretionary permit is withheld until the plan meets all requirements. The following items need to be shown on the plans:

Proposed sewer shall be publicly maintained. Minimum size of public sewer is 8-inch diameter.

Include profile of proposed sewer with slope, length of pipe and elevations manholes. Show pipe elevations at utility crossings.

Replace upstream cleanout with manhole. Note on plans that all manhole frames and covers shall meet new District standard detail. Sewer shall be centered in 20-feet wide easement to Sanitation District.

Include finished floor elevations for backflow prevention device requirements.

Include Sanitation District -General Notes.-

Any questions regarding the above criteria should be directed to Diane Romeo of the Sanitation Engineering division at (831) 454-2160.

There are no miscellaneous comments. ========= UPDATED ON JANUARY 21, 2009 BY DREW BYRNE =========
After approval of annexation into the District, sewer service would be available. Applicable conditions noted previously will be enforced after tentavive map approval.

Dpw Sanitation Miscellaneous Comments

========= REVIEW ON APRIL 5, 2007 BY DREW BYRNE =========
Following completion of the discretionary permit process and prior to obtaining a building permit, the following conditions shall be met during the final plan (Public Works) review process:

Item 1) Department of Public Works and District approval shall be obtained for an engineered sewer improvement plan showing sewers needed to provide service to each lot or unit proposed. This plan shall be approved by the District and the County of Santa Cruz Public Works prior to the issuance of building permits. This plan shall conform to the County of Santa Cruz Design Criteria and shall show any easements necessary. Existing and proposed easements shall be shown on any required Final Map.

The proposed road right-of-way shall be separately offered for dedication to the District and be shown on the Final Map.

Item 2) The applicant proposes to extend a public sewer across private property (APN: 41-481-09). An offer of dedication to the District for a minimum 20-foot wide sewer easement shall be obtained across this parcel. Following completion of the above mentioned engineered sewer plan and Final ; the following conditions shall be met during the building permit process: Item 3) Proposed location of on site sewer lateral(s), clean out(s), and connection(s) to existing public sewer must be shown on the plot plan of the building permit application. Item 4) Show all existing and proposed plumbing fixtures on floor plans of building application. Completely describe all plumbing fixtures according to table 7-3 of the uniform plumbing code.
========= UPDATED ON APRIL 5, 2007 BY DREW BYRNE =========

Aptos-La Selva Beach Fire Prot Dist Completeness C

LATEST COMMENTS HAVE **NOT YET** BEEN SENT TO PLANNER FOR THIS AGENCY

========= REVIEW ON APRIL 16, 2007 BY ERIN K STOW =========
DEPARTMENT NAME:Aptos/La Selva Fire Dept. DENIED
The access road shall be 24 feet minimum width and maximum twenty percent slope with NO PARKING ON EITHER SIDE. Roadway shall be marked as a FIRE LANE - NO PARKING and have painted red curbs and proper signs.
The access road shall be in place to the following standards prior to any framing construction, or construction will be stopped:
- The access road surface shall be "all weather", a minimum 6" of compacted aggregate base rock, Class 2 or equivalent, certified by a licensed engineer to 95% compaction and shall be maintained. - ALL WEATHER SURFACE: shall be minimum of 6" of compacted Class II base rock for grades up to and including 5%, oil and screened for grades up to and including 15% and asphaltic concrete for grades exceeding 15%, but in no case exceeding 20%. The maximum grade of the access road shall not exceed 20%, with grades greater than 15% not permitted for distances of more than 200 feet at a time. The access road shall have a vertical clearance of 14 feet for its entire width and length, including turnouts. A turn-around area which meets the requirements of the fire department shall be provided for access roads and driveways in excess of 150 feet in length. Drainage details for the road or driveway shall conform to current engineering practices, including erosion control measures. All private access roads, driveways, turn-around and bridges are the responsibility of the owner(s) of record and shall be maintained to ensure the fire department safe and expedient passage at all times.
========= UPDATED ON OCTOBER 24, 2007 BY ERIN K STOW =========
DEPARTMENT NAME:Aptos/La Selva Fire Dept. APPROVED
All Fire Department building requirements and fees will be addressed in the Building Permit phase.
Plan check is based upon plans submitted to this office. Any changes or alterations shall be re-submitted for review prior to construction.

Aptos-La Selva Beach Fire Prot Dist Miscellaneous

LATEST COMMENTS HAVE **NOT YET** BEEN SENT TO PLANNER FOR THIS AGENCY

========== REVIEW ON APRIL 16, 2007 BY ERIN K STOW ==========
NO COMMENT
========== UPDATED ON OCTOBER 24, 2007 BY ERIN K STOW ==========
NO COMMENT

SOQUEL CREEK WATER DISTRICT

September 2, 2009

Mr. Owen Lawlor
612 Spring Street
Santa Cruz, CA 95060

SUBJECT: Conditional Water Service Application – Richard Anderson, End of Wallace Avenue, Aptos, APN 041-481-04

Dear Mr. Lawlor:

In response to the subject application, the Board of Directors of the Soquel Creek Water District at their regular meeting of September 1, 2009 voted to grant you a Conditional Will Serve Letter for your proposed minor land division consisting of three new single-family dwellings located in Aptos, so that you may proceed through the appropriate planning entity. An Unconditional Will Serve Letter cannot be granted until such time as you are granted a Final Discretionary Permit on your project. At that time, an Unconditional Will Serve Letter will be granted subject to your meeting the requirements of the District's Water Demand Offset Program and any additional conservation requirements of the District prior to obtaining the actual connection to the District facilities subject to the provisions set forth below.

Possible Infrastructure Check List	yes	no
1. LAFCO Annexation required		X
2. Water Main Extension required off-site	X	
3. On-site water system required	X	
4. New water storage tank required		X
5. Booster Pump Station required		X
6. Adequate pressure pressure waivers required		X
7. Adequate flow		X
8. Frontage on a water main		X
9. Other requirements that may be added as a result of policy changes.	X	

This present indication to serve is valid for a two-year period from the date of this letter; however, it should not be taken as a guarantee that service will be available to the project in the future or that additional conditions, not otherwise listed in this letter, will not be imposed by the District prior to granting water service. Instead, this present indication to serve is intended to acknowledge that, under existing conditions, water service would be available on condition that the developer agrees to provide the following items without cost to the District:

1) Destroys any wells on the property in accordance with State Bulletin No. 74;
2) Satisfies all conditions imposed by the District to assure necessary water pressure, flow and quality;
3) Satisfies all conditions of Resolution No. 03-31 Establishing a Water Demand Offset Policy for New Development, which states that all applicants for new water service shall be required to offset expected water use of their respective development by a 1.2 to 1 ratio by retrofitting existing developed property within the Soquel Creek Water District service area so that any new development has a "zero impact" on the District's groundwater supply. Applicants for new service shall bear those costs associated with the retrofit as deemed appropriate by the District up to a maximum set by the District and pay any associated fees set by the District to reimburse administrative and inspection costs in accordance with District procedures for implementing this program;
4) Satisfies all conditions for water conservation required by the District at the time of application for service, including the following:
    a) Plans for a water efficient landscape and irrigation system shall be submitted to District Conservation Staff for approval. Current Water Use Efficiency Requirements are enclosed with this letter, and are subject to change;
    b) All interior plumbing fixtures shall be low-flow and all Applicant-installed water-using appliances (e.g. dishwashers, clothes washers, etc.) shall have the EPA Energy Star label plus new clothes washers also shall have a water use factor of 8.5 or less;
    c) District Staff shall inspect the completed project for compliance with all conservation requirements prior to commencing domestic water service;
5) Completes LAFCO annexation requirements, if applicable;
6) All units shall be individually metered with a minimum size of 5/8-inch by ¾-inch standard domestic water meters;
7) A memorandum of the terms of this letter shall be recorded with the County Recorder of the County of Santa Cruz to insure that any future property owners are notified of the conditions set forth herein.

Future conditions which negatively affect the District's ability to serve the proposed development include, but are not limited to, a determination by the District that existing and anticipated water supplies are insufficient to continue adequate and reliable service to existing customers while extending new service to your development. In that case, service may be denied.

You are hereby put on notice that the Board of Directors of the Soquel Creek Water District is considering adopting additional policies to mitigate the impact of new

development on the local groundwater basins, which are currently the District's only source of supply. Such actions are being considered because of concerns about existing conditions that threaten the groundwater basins and the lack of a supplemental supply source that would restore and maintain healthy aquifers. The Board may adopt additional mandatory mitigation measures to further address the impact of development on existing water supplies, such as the impact of impervious construction on groundwater recharge. Possible new conditions of service that may be considered include designing and installing facilities or fixtures on-site or at a specified location as prescribed and approved by the District which would restore groundwater recharge potential as determined by the District. The proposed project would be subject to this and any other conditions of service that the District may adopt prior to granting water service. As policies are developed, the information will be made available at the District Office.

Sincerely,
SOQUEL CREEK WATER DISTRICT

Jeffery N. Gailey.
Engineering Manager/Chief Engineer

Enclosures: Water Use Efficiency Requirements & Sample Unconditional Water Service Application

IFLAND ENGINEERS, INC
1100 Water Street
Santa Cruz, CA 95062
(831) 426-5313 FAX (831) 426-1763
www.iflandengineers.com

Job 03115 Richard Anderson

Calculated by GHI

Sheet 1 of 11

Date Revised

PRLEIMINARY STORM DRAINAGE CALCULATIONS

(For Tentative Map Only)

Pre-Development

Runoff Coefficient	= 0.30	Rural Sloping Wooded
P60 Value	= 1.5	
T.C.	=10 Min	
Rainfall Intensity	10 Year Storm	= 2.10 in./hr.
	100 Year Storm	= 3.15 in./hr.
Site Area	= 3.56 Acres	=155,074 Sq. Ft.

(See Preliminary Drainage Map)

Pre-Development Run-off

Q_{10} = (0.30)(2.10)(3.56)

= **2.24 C.F.S.**

Q_{100} = (2.24)(1.5)(1.25)

= **4.2 C.F.S.**

Proposed Impervious Surfaces

House Roofs	=	9,396 Sq. Ft.
Driveways and Parking	=	10,150 Sq. Ft.
Private Drive	=	11,284 Sq. Ft.
Misc: Patios, Walks etc.	=	3,254 Sq. Ft.
Total	=	**34,084 Sq. Ft.**

Attachment 9

IFLAND ENGINEERS, INC
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Sheet 2 of 11

Date Revised

Post-Development Run-off

Q_{10} = (0.30)(2.10)(2.78) + (0.90)(2.10)(0.78)

=(1.75) +(1.47)

= 3.22 C.F.S.

Q_{100} = (3.22)(1.5)(1.25)

= 6.05 C.F.S.

Detention Storage

Per Fig. SWM – 15C

= (0.78)(1,100) Cu. Ft.

= 858 Cu. Ft.

The Geotechnical Engineer has recommended using a "cultic recharge 330HD chamber" on each lot to handle the runoff from the house roofs, patios and parking areas. This would leave the driveways and private road runoff to be detained in storage pipes at the lowest corner of the site.

17,500 Sq. Ft. (0.40 Ac)
(0.40)(1100) = 440 Cu. Ft.

Use 100 L.F. 30" diameter pipe.

4.909 Cu. Ft./L.F.

Storage Volume = 490 Cubic Feet

The site storm runoff collects into a natural channel at the end of Wallace Avenue where an existing catch basin picks up the flow. The total area upslope from this catch basin is 5.10 acres. There is a narrow paved road and two existing houses within the area. (See attached topo map). The storm runoff from this area is:

Q_{10} = (0.35)(2.10)(5.10)

=3.75 Cubic Feet per Second (C.F.S.)

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Sheet 3 of 11

Date Revised

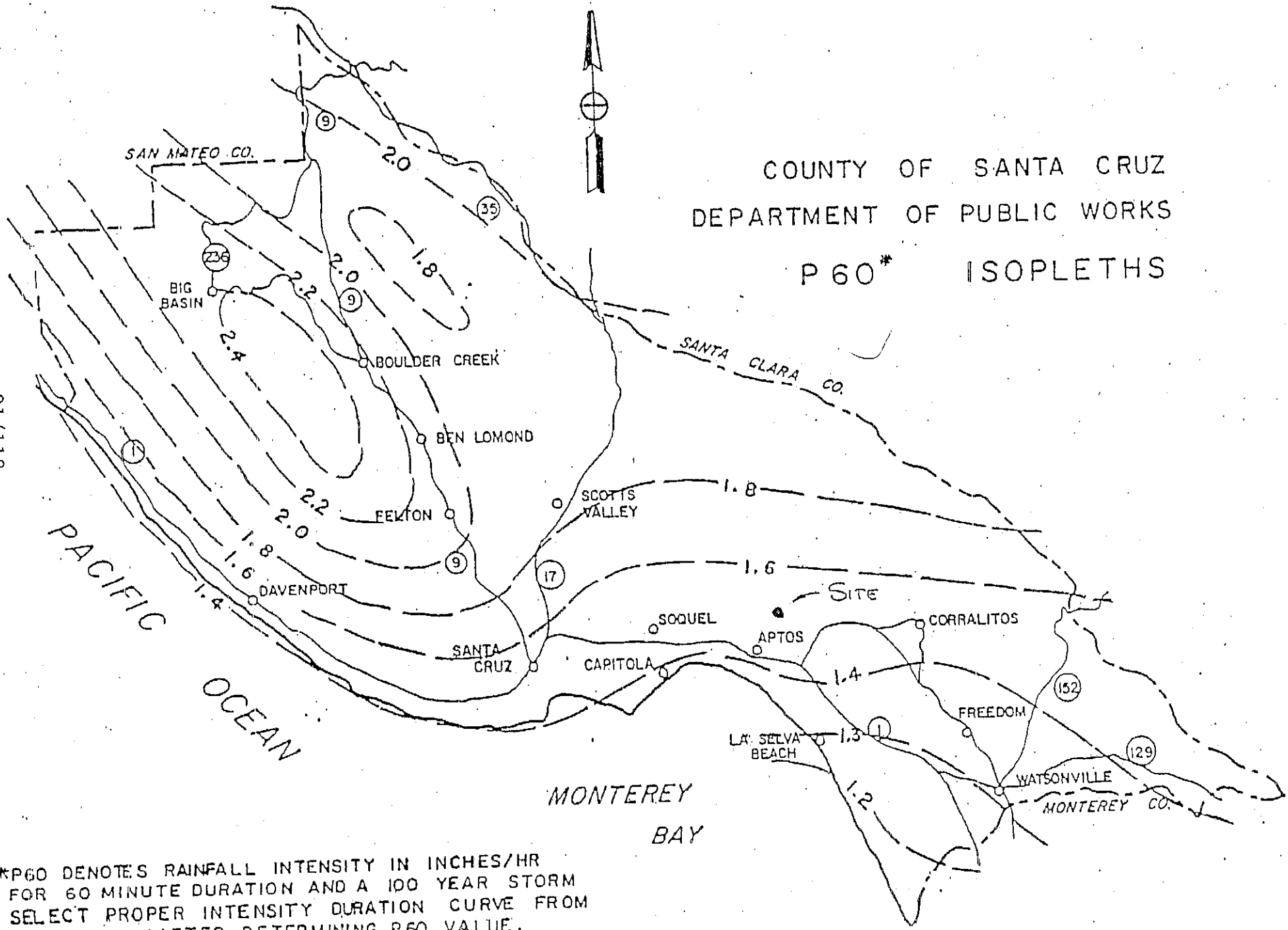
The pipe leaving the catch basin at the end of Wallace Avenue is a 12" diameter corrugated polyethylene pipe at a slope of 4.96%. The maximum flow capacity of this pipe is 5.75% C.F.S.
From the end of Wallace Avenue to the intersection with Lyle Court, 650 feet, there are 6 driveway culverts through which the runoff is channeled connected by an asphalt-paved ditch. These driveway culverts vary from 12" in diameter to 1.5' x 2.3' rectangular boxes. All the culverts slope at over 5%.

At Lyle Court intersection there is an 18" diameter reinforced concrete pipe (part of the original subdivision improvements and assumed to be a part of County Drainage Zone 6 system). This pipe slopes at 5.26% with a flow capacity of 20.26 C.F.S. The total area collecting at the location is about 20 acres. This area is partially built out with single-family residences on large lots. The remaining area is open land. The runoff is:

Q_{10} = (0.40(2.10)(20)

=16.80 Cubic Feet per Second (C.F.S.)

The system of driveway culverts and asphalt concrete paved ditches continues until it reaches a catch basin at Bowen Avenue. Here there is a pipe system all the way to Huntington Drive and continues until it reaches Valencia Creek.



*P60 DENOTES RAINFALL INTENSITY IN INCHES/HR FOR 60 MINUTE DURATION AND A 100 YEAR STORM SELECT PROPER INTENSITY DURATION CURVE FROM FIGURE SWM-3 AFTER DETERMINING P60 VALUE.

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TYPE OF AREA	10- YEAR RUNOFF COEFFICIENTS
Rural, park, forested, agricultural	0.10 - 0.30
Low residential (Single family dwellings)	0.45 - 0.60
High residential (Multiple family dwellings)	0.65 - 0.75
Business and commercial	0.80
Industrial	0.70
Impervious	0.90

REQUIRED ANTECEDENT MOISTURE FACTORS (Ca) FOR THE RATIONAL METHOD*

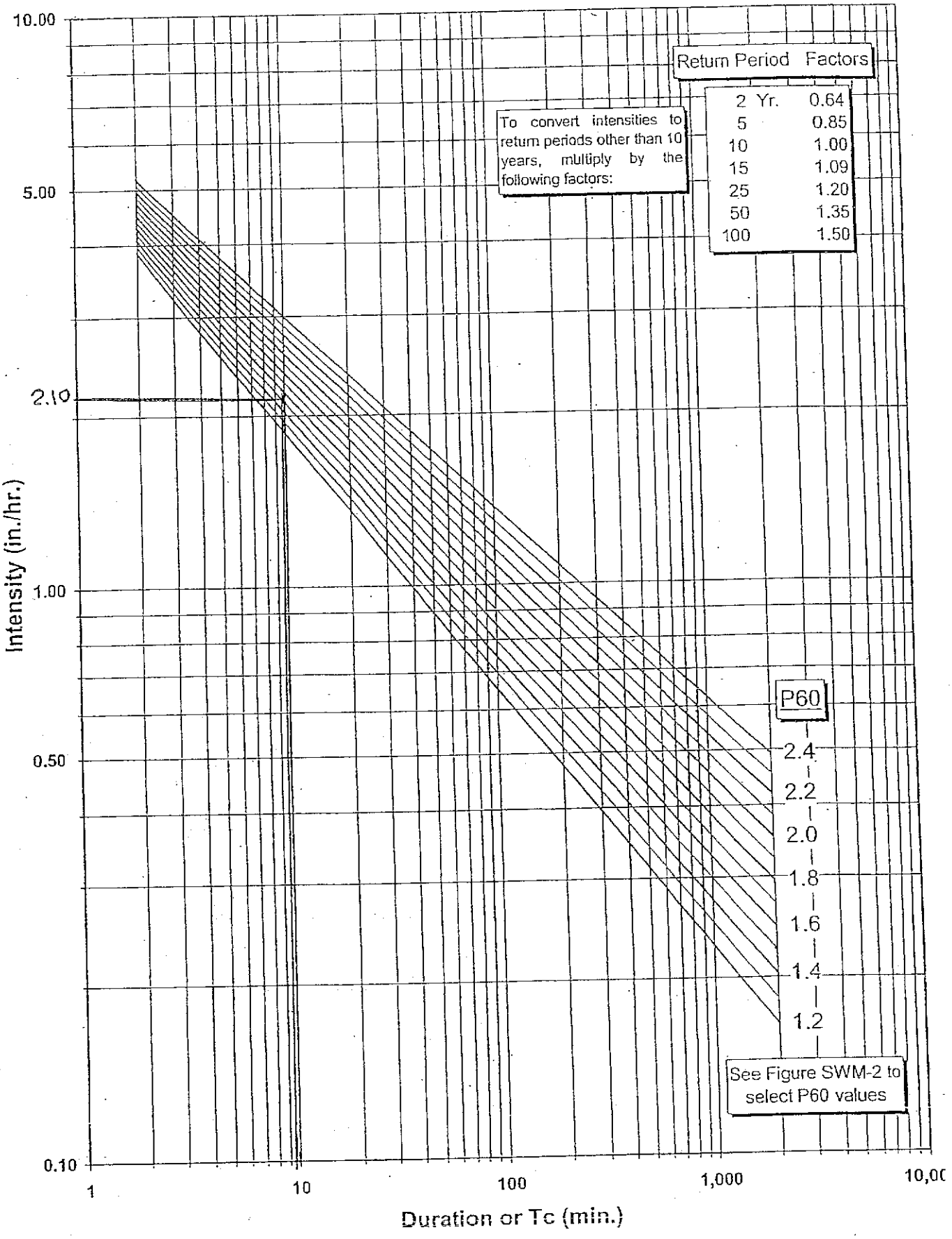
Recurrence Interval (Years)	Ca
2 to 10	1.0
25	1.1
50	1.2
100	1.25

Note: Application of antecedent moisture factors (Ca) should not result in an adjusted runoff coefficient (C) exceeding a value of 1.00

*APWA Publication "Practices in Detention of Stormwater Runoff"

Rainfall Intensity - Duration Curves
10 Yr. Return Period

((4.29112)*(1.1952)^P60_VALUE)/(DURATION^((0.60924)*(0.78522)^P60_VALUE))



Rev. 11-05

FIG. SWM-3

Detention Storage Volume (CF/Acre)

5-Year Pre-Development Allowable Release @ 15 Minute Tc

10-Year Post-Development Storage Volume to be Area Adjusted, C_{POST} = 0.9

Chart Based on the Modified Rational Method with 1.25 Safety Factor

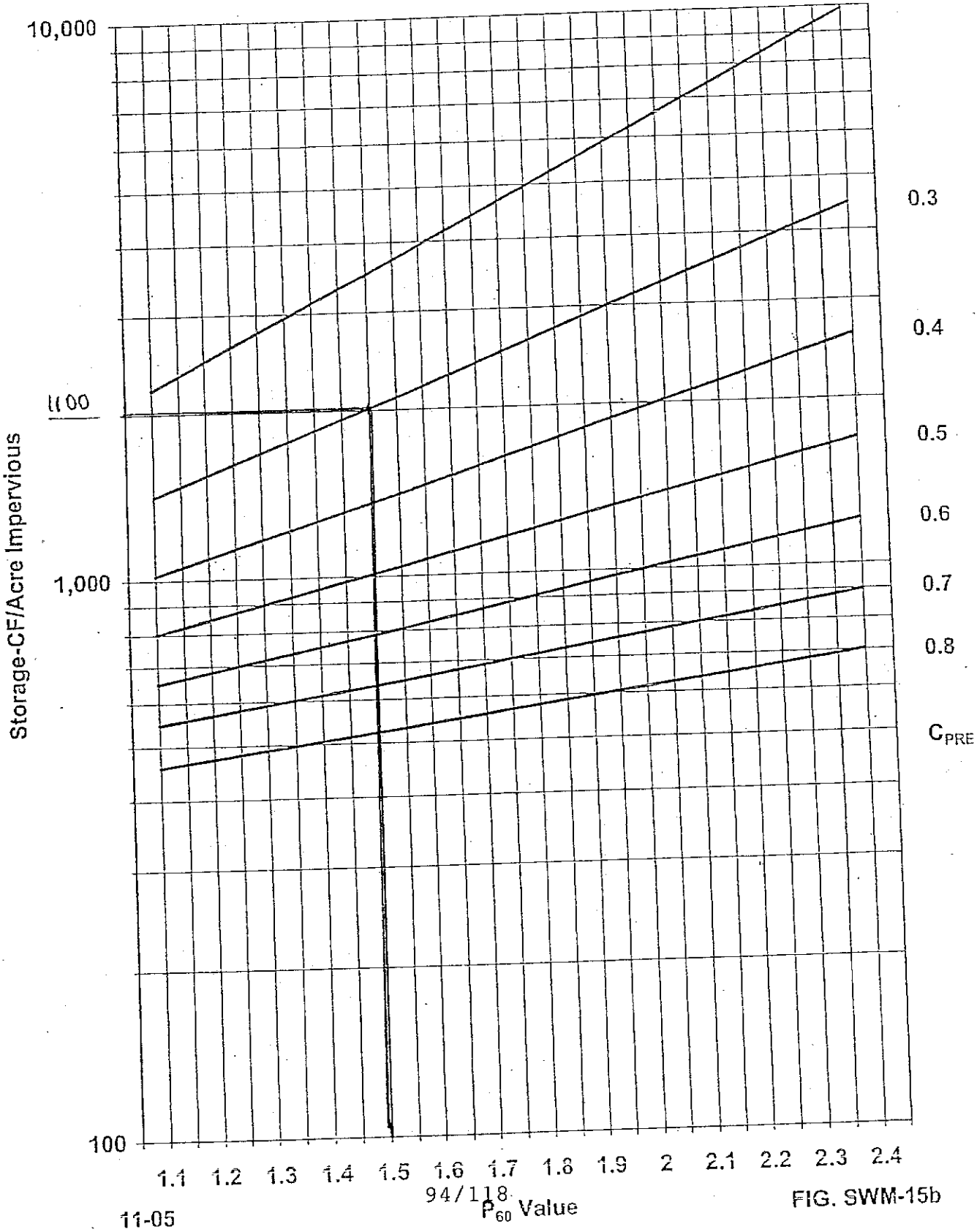


FIG. SWM-15b

TYPE OF CONDUIT OR CHANNEL	ROUGHNESS COEFFICIENT
Plastic (PVC, ABS, or HDPE)	0.010 to 0.012
Concrete gutters	0.015
Corrugated metal (annular corrugations)	0.024
Reinforced concrete pipe 300 to 525mm (12 to 21 in)	0.015
Reinforced concrete pipe 600 to 825mm (24 to 33 in)	0.013
Reinforced concrete pipe 900 mm (36 in) and larger	0.011
Lined channels	
Concrete	0.014
Air blown mortar	0.016
Bituminous	0.018
Sacked concrete	0.025

To determine roughness coefficients for natural channels, refer to "Handbook of Hydraulics," King & Brater; "Open-Channel Hydraulics," V.T. Chow; or "Street and Highway Drainage," Institute of Transportation, University of California.

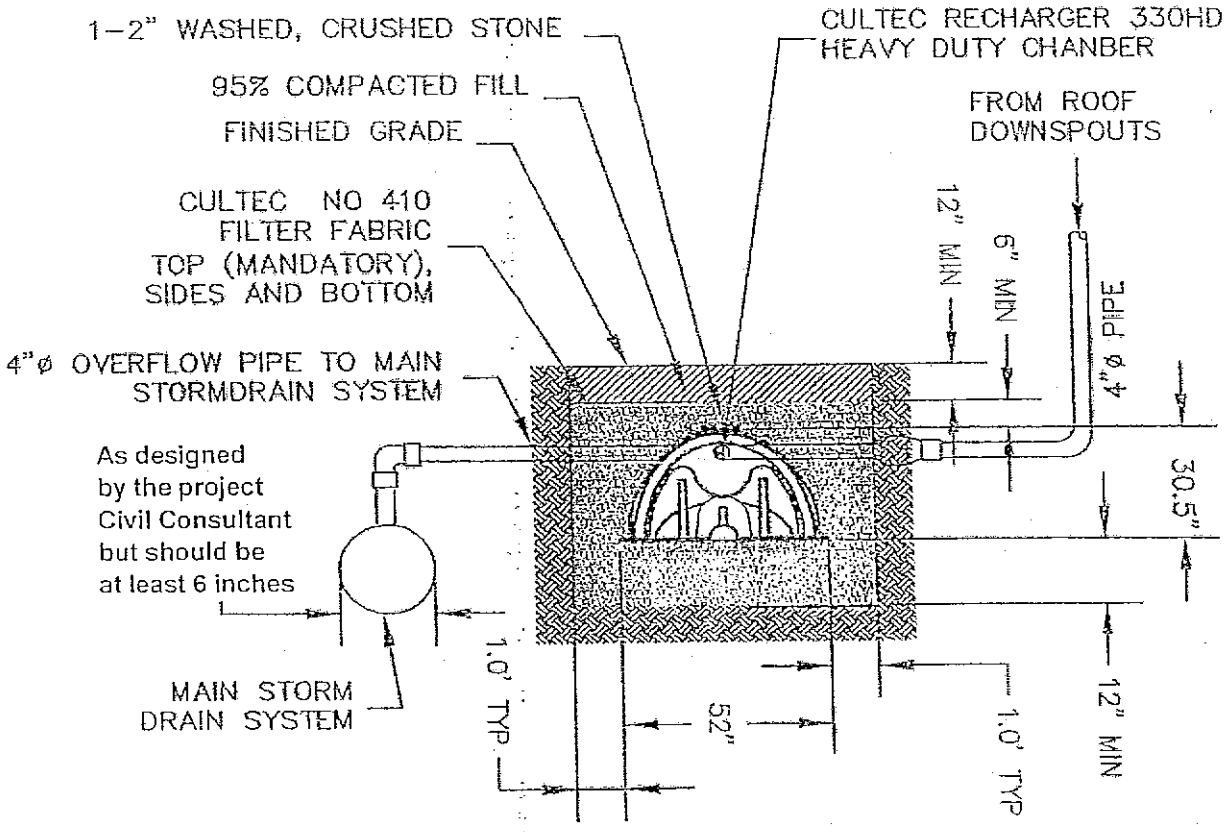
TABLE 7

CIRCULAR PIPE FLOW CAPACITY
Full Flow (cubic feet per second)

Mannings "n"= 0.015

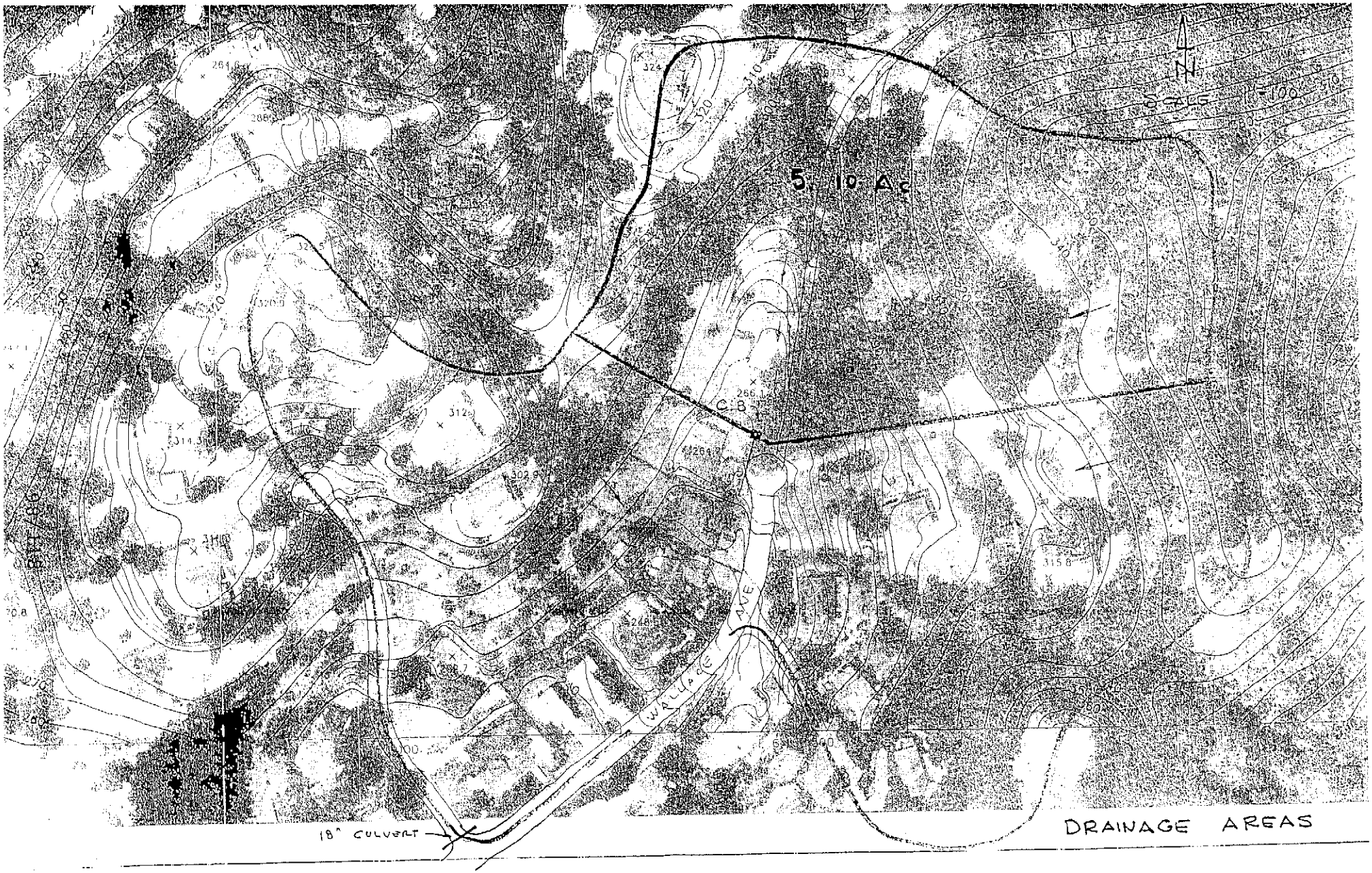
Dia. (in.)	*Conv. Factor	% Slope (feet per 100 feet) 0.02	0.05	0.10	0.20	0.35	0.50	0.75	1.00	1.25	1.50	1.75	2.0	2.5	5.0	10.0	20.0
		(c.f.s.)															
3	0.766	0.011	0.017	0.024	0.034	0.045	0.054	0.066	0.077	0.086	0.09	0.10	0.11	0.12	0.17	0.24	0.34
4	1.649	0.023	0.037	0.052	0.074	0.098	0.117	0.143	0.165	0.184	0.20	0.22	0.23	0.26	0.37	0.52	0.74
5	2.991	0.042	0.067	0.095	0.134	0.177	0.211	0.259	0.299	0.334	0.37	0.40	0.42	0.47	0.67	0.95	1.34
6	4.863	0.069	0.109	0.154	0.217	0.288	0.344	0.421	0.486	0.544	0.60	0.64	0.69	0.77	1.09	1.54	2.17
8	10.473	0.148	0.234	0.331	0.468	0.620	0.741	0.907	1.047	1.171	1.28	1.39	1.48	1.66	2.34	3.31	4.68
10	18.99	0.27	0.42	0.60	0.85	1.12	1.34	1.64	1.90	2.12	2.33	2.51	2.69	3.00	4.25	6.00	8.49
12	30.88	0.44	0.69	0.98	1.38	1.83	2.18	2.67	3.09	3.45	3.78	4.08	4.37	4.88	6.90	9.76	13.81
15	55.98	0.79	1.25	1.77	2.50	3.31	3.96	4.85	5.60	6.26	6.86	7.41	7.92	8.85	12.52	17.70	25.04
18	91.04	1.29	2.04	2.88	4.07	5.39	6.44	7.88	9.10	10.18	11.15	12.04	12.87	14.39	20.36	28.79	40.71
21	137.32	1.94	3.07	4.34	6.14	8.12	9.71	11.89	13.73	15.35	16.82	18.17	19.42	21.71	30.71	43.43	61.41
24	196.06	2.77	4.38	6.20	8.77	11.60	13.86	16.98	19.61	21.92	24.01	25.94	27.73	31.00	43.84	62.00	87
27	268.41	3.80	6.00	8.49	12.00	15.88	18.98	23.24	26.84	30.01	32.87	35.51	37.96	42.44	60.0	84.9	120.0
30	355.48	5.03	7.95	11.24	15.90	21.03	25.14	30.79	35.55	39.74	43.54	47.03	50.27	56.21	79.5	112.4	159.0
36	578.05	8.17	12.93	18.28	25.85	34.20	40.87	50.06	57.81	64.63	70.80	76.47	81.75	91.40	129.3	182.8	258.5
42	872.0	12.33	19.50	27.57	38.99	51.6	61.7	75.5	87.2	97.5	106.8	115.3	123.3	137.9	195.0	275.7	389.9
48	1244.9	17.61	27.84	39.37	55.67	73.6	88.0	107.8	124.5	139.2	152.5	164.7	176.1	196.8	278.4	393.7	556.7

* Conveyance Factor = (1.486 x R2/3 x A) / n



The chamber's capacity should be designed by the project Civil Engineer based upon anticipated storm water.

AMSO CONSULTING ENGINEERS	STORM WATER RETENTION CHAMBER DETAIL	FIGURE 1
AUGUST 2007	ANDERSON PROPERTY WALLACE AVENUE APTOS, SANTA CRUZ COUNTY, CALIFORNIA	PROJECT 3362



DRAINAGE AREAS

Maureen Hamb-WCISA Certified Arborist #2280
Professional Consulting Services

TREE RESOURCE EVALUATION
WALLACE AVENUE
APN 041-481-04

Prepared for
Owen Lawlor
Land Use Planner

February 21, 2007

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ASSIGNMENT/SCOPE OF SERVICES

A minor land division and eventual residential development is planned for a 6.88-acre site off Wallace Avenue in Aptos. Large areas of the property are densely forested with trees that could be affected by the eventual development. Owen Lawlor, the property owners representative retained me to complete an analysis of overall tree condition and evaluate the suitability of the trees for incorporation into the development. To complete the assessment I have performed the following:

- Locate, number and map 69 individual trees and large groupings of trees growing adjacent to the proposed building envelopes.
- Identify trees as to species and document trunk diameter at 4.5 above grade.
- Visually inspect each tree to evaluate health status, structural integrity and suitability for incorporation into the project.
- Provide preliminary recommendations for tree removal based on tree condition

This type of assessment is used to determine the suitability of individual trees and tree groups for incorporation into a developed site. It can be used by the design team and property owners to determine the most appropriate locations for site improvements, while retaining trees that will be an asset to the site, rather than a liability.

The impacts to trees related to the construction of the site are not included in this report. Once plans are finalized a separate report will be prepared that assesses impacts and outlines tree preservation specifications.

SUMMARY

At least 400 trees are growing on the undeveloped 6.88-acre property on Wallace Avenue. I have inventoried 69 individual trees and large groups of trees that are of the same species with similar characteristics. Tree health and structural integrity have been evaluated to determine suitability for incorporation into a developed site.

Eucalyptus growth dominates the site. The trees range from young saplings to large mature trees. They tend to develop in groves where space is limited for proper growth. A number of the interior trees display structural defects that include lack of taper in the lower trunk that is needed for stability. At least two of the large eucalyptus display significant structural weaknesses that could lead to failure.

Interior live oaks are also present within the forest on the site. They are multi-trunked trees that have developed as clusters. The dense forest over story has suppressed the development of the oaks. They are generally in fair to poor condition with sparse canopy development.

Monterey pines are also represented on the property. The area proposed for lot #1 has the highest concentration of this species. The mature specimens are in various stages of decline. A number of trees are under attack by bark beetles, several are standing dead. In general they are in decline, a situation that is common in our area due to Pine Pitch Canker.

BACKGROUND

To complete the inventory and assessment I visited the site in February of this year. For purposes of identification numbered metal tags have been affixed to tree trunks and the corresponding locations documented on an attached site map.

Both individual trees and larger groves were included in the inventory. Group evaluations were completed in areas where more than five trees of one species were present. And structural form and overall health were similar. If individual trees within the group were found to have characteristics that were inconsistent with the other trees they were evaluated as individuals. This procedure allowed structurally dangerous trees or those in severe decline to be identified separately as a potential risk.

The attached inventory documents tree species and trunk diameter at 54 inches above natural grade. Ratings for tree health and structural integrity are also included. Ratings are determined following the completion of a visual tree inspection. This type of evaluation is based on methods developed by Claus Mattheck and documented in The Body Language of Trees. It involves an analysis of the biology and mechanics of each tree, which are then rated as "good", "fair" or "poor".

Suitability for incorporation into a developed site, tolerances to site changes and construction impacts are based on overall tree condition and industry data on species characteristics and tolerances.

The biological assessment determines health status and includes an evaluation of the following:

- Vitality of the leaves, bark and twigs
- Presence of fungi or decay
- Percentage and size of dead branching
- Status of old wounds or cavities

Healthy trees in "good" condition display dense full canopies with dark green foliage. Dead branching is limited to small twigs and branches less than one inch in diameter. No evidence of disease, decay or insect activity is visible.

Trees in "fair" health have 10-30% foliar dieback, minor dieback of branches greater than one-inch diameter and minor evidence of disease, decay or insect activity.

Trees in "poor" health display greater than 30% foliar dieback, dead branches greater than two inches in diameter and/or areas of decay, disease or insect activity.

The mechanical assessment determines the structural integrity of the tree and includes and evaluation of the following:

- Integrity of the framework of the tree (supporting trunk and major branches)
- External symptoms (bulges, ribs or cracks) that can indicate internal defects
- Lean of main trunk and canopy configuration
- Development of root buttress

Trees with "good" structure are well rooted with visible taper in the lower trunk, leading to buttress root development. These qualities indicate that the tree is solidly rooted in its growing site. No significant structural defects such as codominant stems (two stems of similar size that emerge from the same point on the trunk), weakly attached branches, cavities or decay are present.

Trees with "fair" structural integrity may have defects such as poor taper in the trunk, inadequate root development or growing site limitations. They may have multiple trunks, included bark (where bark turns inward at an attachment point), or suppressed canopies. Small areas of decay or evidence of small limb loss may be present in these trees. Trees in this condition can be improved using common maintenance procedures.

Poorly structured trees display one or more serious structural defects that may lead to the failure of branches, trunk or the whole tree due to uprooting. Trees in this condition may have had root loss due to decay or site conditions. The supporting trunk or large stems could be compromised by decay or structural defect (large codominant stems with included bark). Trees in this condition present a risk. In some situations maintenance can reduce, but not eliminate the potential hazard.

OBSERVATIONS

Site Description
The property is a sloping site that is densely forested with trees. The areas proposed as lot #1 and lot #2 contain large open spaces that are surrounded with dense tree growth.

The areas where lot #3 and #4 are proposed are more densely forested, with areas of complete canopy coverage.

Tree Description
The large property is a diverse variety of tree species that is dominated by eucalyptus (*Eucalyptus globulus*). Other tree species populate the site, including two oak species, coast live oak (*Quercus agrifolia*) and interior live oak (*Quercus wislizenii*), Monterey pine (*Pinus radiata*) and acacia.

The forest is well represented by all generations of trees and a variety of structural forms. The eucalyptus are found in very large groves that are primarily located on the portion of the property projected as lot #1 and #2.

Tree growth within the eucalyptus groves include as many as 30 trees with trunk diameters that range from 2" saplings to 40 inches. Tree height reaches upwards of 80 feet on some of the larger specimens. Most of the trees growing within the groves display suppressed lower growth along with dead and decayed branching. The trunks of the younger trees are tall and absent of lower lateral branching due to the suppressed nature of the site.

Trees #8, #20 and #22 are examples of larger diameter eucalyptus growing within or adjacent to the groves that display serious structural weaknesses that could lead to whole tree failure.

The mature pines on the western portion of the site (proposed for lot #1) are generally in poor condition. The grove of pines in this area are either dead or in the last stages of their lives. The trees have been infested with Red Turpentine beetles, an insect pest. This insect bores into the trees vascular system laying eggs. The larvae feed within the cambial layer; the part of the tree that is responsible for transporting moisture and nutrients. Infestations of this insect can kill a tree that may already be in decline for other reasons. As with the eucalyptus, pine growth is mainly found on lot #1 and #2.

The two species of oak are growing on lots #3 and #4. They are in fair to poor condition due to the suppressed growing environment. The trees near the building envelope for lot #4 are good examples of this condition. Several coast live oaks growing along the eastern property boundary are in the best condition of the oak species

Acacia trees growing along the southern property boundary are in poor condition. Most of the trees have uprooted or are at risk of uprooting. This aggressive, non-native species is not appropriate for incorporation into the development.

DISCUSSION

Preliminary Construction Impacts
The land division and eventual residential development of this large property will include tree removal. Each of the proposed lots is forested with trees that constrain the development areas. The goal development should be to retain the more suitable trees and removal of those that are in poor health or weakly structured.

The forest on this property is dominated by non-native invasive species that are generally in poor condition. The native oaks have been suppressed by the dense over story and consequently are in low vigor with poor structure.

Lot #1 is forested with groves of eucalyptus and pines. The removal of pines that represent a risk of failure should be viewed as a priority. Eucalyptus tree removal will also be necessary to provide development space on the site.

At least 10 trees will need to be removed to develop this lot. Tree removal within the groves should be evaluated after the preliminary project approvals. Fragmentation of groves can lead to structural failure of the trees that remain as the new edge. If necessary entire groups of trees can be removed to eliminate the risk of failure.

Lot #2 has the largest area of development space and tree removal will be the minimum necessary to construct the site. It may only require the removal of two or three eucalyptus and the acacia.

Lot #3 is densely forested in some areas. Most of the trees are poorly structured; the suppressed growing environment does not allow the trees to develop proper taper or lower branching, components necessary for structural stability. Upwards of 10 trees will require removal to develop this lot.

Lot #4 contains the largest number of native oak trees. They are generally in fair to poor condition. Several oaks in fair to good condition growing along the driveway access should be retained, as they are the best examples of their species on the property. At least 15 trees will require removal to develop this lot.

CONCLUSION

The trees on this site are generally in fair to poor condition and are not suitable for incorporation into the development project. Although tree removal will be a necessary component of the project, the preliminary removal, approximately 40 trees, is not a significant impact when compared with the overall density of the forest within the undisturbed areas.

The removal of trees on this property should be mitigated with a re-planting plan that includes native trees and under story plants that are appropriate for the site and have been suppressed by the eucalyptus and acacia growth.

Please call my office with any questions or concerns about the trees on this project site.

Respectfully submitted,

Maureen Hamb-WCISA Certified Arborist #2280

Maureen Hamb-WCISA Certified Arborist
Professional Consulting Services

Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
1	acacia	10 clusters 8-20"	fair	poor	poor	Poorly structured clusters of trees growing along the southern property boundary. A number of trees have uprooted and are laying on the ground. A driveway access is proposed in this area/Unsuitable species due to propensity for failure. Removal & replacement for screening purposes is recommended.
2	eucalyptus	32.5	fair	fair	fair	Growing on lot #1,large tree with long lateral branching/May require safety pruning to shorten branching.
3	eucalyptus	41	fair	poor	poor	Codominant stems divided at 10' above grade, area of included bark. Long lateral branching/May require safety pruning and cabling if located near use area.
4	eucalyptus	20.3	fair	fair	fair	Young tree
5	eucalyptus	34.4	fair	poor	poor	Codominant attachment at 20' above grade, long lateral branching/Adjacent to development area of lot #1, unsuitable for retention due to severe structural weakness. Removal may be required if less than 20 feet from structure or other use areas.
6	eucalyptus	grove 15 trees	fair	fair/poor	poor	Grove of trees growing between Wallace Avenue and the building envelope for lot #1. Tall trees with suppressed lower growth/A portion of this group may require removal to develop lot #1. Avoid fragmentation of group.

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Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
7	Monterey pine	20	fair/poor	poor	poor	Growing near center of lot #1. Large diameter dead lower branching, infested with Red Turpentine beetles/Removal will be required due to declining condition and safety.
8	Monterey pine	29	poor	poor	poor	Growing on lot #1, only 10% live foliage, infested with Red Turpentine beetles. At risk of falling/Recommend removal due to risk.
9	Monterey pine	29.3	poor	poor	poor	Growing with other pines in the northern portion of lot #1. As with #8 infested with beetles and in significant decline/Removal will be necessary of proposed residence or other use areas are within 50'
10	Monterey pine	35.7	fair/poor	fair/poor	fair/poor	Growing with other pines in the northern portion of lot #1. As with #8 infested with beetles and in significant decline/Removal will be necessary of proposed residence or other use areas are within 50'
11	Monterey pine	29.4	fair/poor	poor	poor	Growing with other pines in the northern portion of lot #1. As with #8 infested with beetles and in significant decline/Removal will be necessary if proposed residence or other use areas are within 50'
12	Monterey pine	33	fair	fair/poor	fair/poor	Growing with other pines in the northern portion of lot #1. As with #8 infested with beetles and in significant decline/Removal will be necessary if proposed residence or other use areas are within 50'

106/118

Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
13	Monterey pine	33.8	fair	fair/poor	fair/poor	Growing with other pines in the northern portion of lot #1. As with #8 infested with beetles and in significant decline/Removal will be necessary if proposed residence or other use areas are within 50'
14	Monterey pine	26	fair/poor	fair/poor	poor	Growing with other pines in the northeast portion of lot #1.Trunk is leaning downhill, lower canopy is suppressed, foliage concentrated in tree top/Removal will be necessary if residence or other use areas are within 50"
15	Monterey pine	32.2	fair	fair/poor	fair/poor	Growing with other pines in the northeast portion of lot #1.Healthier than adjacent trees.
16	Monterey pine	28	fair	fair/poor	fair/poor	Growing adjacent to other pines in the northeast portion of lot #1. Healthier than adjacent trees. Growth is suppressed on one side, larger diameter dead branching/May require safety pruning of use area is located within 50'.
17	Monterey pine	35	fair	fair/poor	fair/poor	Growing adjacent to other pines in the northeast portion of lot #1. Healthier than adjacent trees. Large diameter dead branching/May require safety pruning of use area is located within 50'.
18	Monterey pine	23	poor	poor	poor	Smaller tree with codominant stems that divide at 5' above grade. In decline, foliage thinning/Removal may be required if use area is within 50'

107/118

Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
19	Monterey pine	33.4	poor	poor	poor	Infested with Red Turpentine beetles, area of decay at base. Foliage thinning and concentrated at top of tree. Leaning trunk/Removal may be required if use area is within 50'
20	eucalyptus	18.7	fair	poor	poor	Growing on the southeastern portion of lot #1. Area of damage on lower trunk, internal decay possible/Removal will be necessary due to risk.
21	eucalyptus	grove 25 trees10-24"	fair	fair/poor	fair/poor	Large grove, suppressed lower branch development. Structural stability can be compromised if fragmented by partial tree removal. Actual impacts will be assessed once building footprints are approved and defined.
22	eucalyptus	38	fair	poor	poor	Area of decay at base and within structural roots/Not suitable for retention on a developed site due to potential risk.
23	eucalyptus	3 trees	fair	fair	fair	Growing on lot #2, dense canopies with long lateral branching/Retain as a group
24	eucalyptus	23 trees 4-45"	fair	fair	fair	Group of trees growing between lots #1 and #2. Lower growth is suppressed/Group may benefit from minor thinning and safety pruning.

Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
25	eucalyptus	triple	fair	poor	poor	Three codominant stems, weakly attached/Tree represents risk unsuitable for developed site, recommend removal
26	acacia	clump of stems	fair	poor	poor	Partially uprooted/Unsuitable for retention
27	acacia	clump	fair	poor	poor	Partially uprooted/Unsuitable for retention
28	acacia	clump	fair	poor	poor	Partially uprooted/Unsuitable for retention
29	eucalyptus	3 trees	fair	fair/poor	fair/poor	Growing near center of lot #2, tall without proper taper in the lower potions/May not be suitable for retention.
30	eucalyptus	11 trees 12-30"	fair	fair/poor	fair/poor	Group of trees growing on the southern portion of lot #2.Tall trees without proper taper, suppressed growth/May not be suitable for retention due to weak structure, prone to failure when grove is fragmented.

8117/09

Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
31	eucalyptus	double 50	fair	poor	poor	Large tree with codominant attachment near base/Removal may be required if within 50' of use area.
32	eucalyptus	double 60	fair	poor	poor	Large tree with codominant attachment near base/Removal may be required if within 50' of use area.
33	oak	11 stems	fair	fair	fair	Growing on the northeast portion of lot #2, multi-stemmed cluster 2-8" in diameter
34	oak	3 stems	fair	fair	fair	Growing on the northeast portion of lot #2
35	oak	6 stems	fair	fair	fair	Growing on the northeast portion of lot #2
36	Monterey pine	12	fair	fair	fair	Suppressed lower growth, foliage is healthy

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Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
37	oak	16.2	fair/poor	fair/poor	fair/poor	Growing near center of lot #3,Suppressed lower growth, broken and decayed branching/May not be suitable for retention.
38	oak	7 stems	fair	fair	fair	Growing near the center of lot #3/Reqires at least 20' of undisturbed area of retained.
39	Monterey pine	14	fair	fair	fair	Growing near center of lot #3. Suppressed lower growth/May not be suitable for retention.
40	eucalyptus	12.4	fair	fair/poor	fair/poor	Growing in dense brushy area adjacent to #38 and #39/May not be suitable for retention after clearing.
41	eucalyptus	49	fair	fair	fair	Larger tree with well spaced branching, located adjacent to overhead power lines.
42	eucalyptus	12 trees 8"-40"	fair	fair/poor	fair/poor	Grove of trees near the western boundary of lot #3. Trunks have not developed proper taper needed for stability or lower branching due to suppression. Not suitable for retention if fragmented by tree removal.

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Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
43	eucalyptus	15 trees2"-24"	fair	fair/poor	fair/poor	Grove of trees near the boundary of lots#2 and lot #3. Trunks have not developed proper taper needed for stability or lower branching due to suppression. Not suitable for retention if fragmented by tree removal.
44	Monterey pine	26	fair/poor	poor	poor	Trunk leans downhill, roots are exposed, tree top is gone/Not suitable for retention on developed site.
45	oak	8 stems 5"-11"	fair	fair/poor	fair/poor	Growing in densely forested portion of southern lot #3, suppressed growth, no lower branching or foliage.
46	pine	12.4	poor	poor	poor	10% live foliage/Remove if within 30' of use area
47	coast live oak	12.6	fair/poor	fair/poor	poor	Decayed main stem, suppressed foliar development/Not suitable for retention.
48	pine	14.7	poor	poor	poor	10% live foliage, pitch exudation along trunk/Not suitable for retention.

112/118

Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
49	oak	double	fair	fair	fair	Minor dead branching and dieback, suppressed interior and lower. Growing in densely forested area at southern portion of lot #3/Attempt to retain.
50	oak	multi 8 stems	fair	fair	fair	Multiple stems, suppressed lower growth. Growing in densely forested area at southern portion of lot #3/Attempt to retain.
51	Monterey pine	16.7	fair	fair	fair	Young tree with suppressed lower development. Growing in densely forested area at southern portion of lot #3.
52	Monterey pine	14.9	fair	fair	fair	Young tree with suppressed lower development. Growing in densely forested area at southern portion of lot #3.
53	Monterey pine	12.6	fair	poor	fair/poor	Leaning trunk, large diameter dead branching, suppressed lower growth.
54	coast live oak	22	fair/good	fair	fair/good	Growing along eastern property boundary, entry to lot #4. Tall with healthy canopy/Attempt to retain and provide 15' of undisturbed area

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Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
55	coast live oak	15 & 14.7 & 15.4	fair	fair	fair	Growing along eastern property boundary, entry to lot #4.Suppressed lower growth, foliage is healthy/Attempt to retain and provide 15' of undisturbed area
56	oak	5 stems	poor	poor	poor	Growing along eastern property boundary, 2 failed stems remainder at risk of falling/Remove due to risk.
57	oak	32.7	fair	fair/poor	fair/poor	Growing along eastern property boundary. Codominant stems, area of decay at base/May not be suitable for retention, further evaluation of impacts needed.
58	eucalyptus	10 trees 2"-14"	fair	fair/poor	fair/poor	Suppressed growth and lack of taper. Growing near eastern property boundary at entry to lot #4/Remvoal of trees within group may be necessary.
59	eucalyptus	group of 4 10-24"	fair	fair	fair	Suppressed growth and lack of taper. Growing near eastern property boundary at entry to lot #4/Remvoal of trees within group may be necessary.
60	oak	8 stems	fair/poor	fair/poor	fair/poor	Cluster of small diameter stems/May require removal for development of lot #4

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Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
61	Monterey pine	20.2	fair	fair	fair	Suppressed lower growth/May require removal for development of lot #4
62	oak	9 stems	fair/poor	fair/poor	fair/poor	Cluster of small stems with suppressed and thinning foliar development/Will require removal for development of lot #4
63	Monterey pine	25.3	fair/poor	fair/poor	fair/poor	Pitch exudation along trunk, suppressed and dead lower growth/Will require removal for development of lot #4
64	coast live oak	11	fair/poor	fair/poor	fair/poor	Suppressed development, foliage only produced at top of tree/Will require removal for development of lot #4
65	oak	12 stems	poor	poor	poor	Suppressed development, significant dead and dying branching/Will require removal for development of lot #4
66	oak	3 stems	poor	poor	poor	Suppressed, decayed and dead branching/Will require removal for development of lot #4

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Tree #	Species	Diameter @ 4.5	Health	Structure	Suitability	Comments/Recommendations
67	oak	9 stems	poor	poor	poor	Suppressed, decayed and dead branching/Will require removal for development of lot #4
68	oak	11.7	fair/poor	fair/poor	fair/poor	Dead lower branching, suppressed foliar development/Will require removal for development of lot #4
69	oak	4 stems	fair/poor	fair/poor	fair/poor	Suppressed, decayed and dead branching/Will require removal for development of lot #4

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Maureen Hamb-WCISA Certified Arborist #2280
Professional Consulting Services

August 27, 2007

Owen Lawlor
Lawlor Land Use
612 Spring Street
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Project: Wallace Avenue/APN 041-481-04

As you requested I have reviewed the most recent plans (SSA Landscape Architects dated 7/26/07) for the Wallace Avenue project.

I previously prepared an analysis of 69 individual trees or large tree groups growing on the property (Tree Resource Evaluation dated 2/21/07). The purpose of the analysis was to determine the overall condition of the trees and suitability for incorporation into the project.

The site is forested with eucalyptus, pine, oak, and acacia species. The eucalyptus tend to be located in larger dense groups with suppressed lower development. The Monterey pines are in poor condition. They have been affected by infestations of bark beetles and pitch canker disease. The oak woodland development has been limited by the surrounding eucalyptus growth.

Lot 1
The forest development on this lot is dominated by eucalyptus and Monterey pine trees. The pines are in severe decline; large diameter dead branching and decay will lead to both branch and trunk failure. The eucalyptus grove near the southeast property boundary (1.07 on SSA Tree Removal Plan) contains 25 trees with trunk diameters ranging from 10 to 24 inches. A group of weakly structured acacia trees are located along the southern property boundary. These trees are weakly structured and evidence of uprooting is visible throughout the group.

Most trees on this parcel will require removal to construct the site as proposed. The pines and acacia are not suitable for retention due to the risk of failure. The main portion of the eucalyptus group is within the proposed driveway/parking area. The structural integrity of the trees outside the driveway construction may be compromised by the fragmentation of the grove.

Lot #2
This parcel is also forested with eucalyptus groups, acacia and pines. Several multi-stemmed coast live oaks are also growing on the site. The footprint of the proposed residence is in the most open portion of the property. As with the trees on lot #1, most are weakly structured with suppressed development.

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The eucalyptus grove near the southern property boundary (#2.02 on the SSA Tree Removal Plan) is adjacent to the proposed driveway access. It contains 23 trees that range from 4 to 45 inches in trunk diameter. Natural open areas occur within this grove that will allow for selected tree retention. The natural openings allow for this type of selective removal without the problems typically associated with the fragmentation of dense tree growth. Any eucalyptus trees retained will require maintenance pruning to improve structure.

Several coast live oaks are growing in the northern and eastern portion of the property (#2.11. 2.17 and 2.18 on the SSA Tree Removal Plan). Although they display suppressed development, they are outside the proposed development area and should be retained. Maintenance pruning, along with the removal of the oppressive, dense overstory can improve tree condition.

Lot #3

This parcel is covered in dense tree growth that creates a continuous canopy. As with the other lots, it is forested with eucalyptus, pine and native oak trees. A number of trees will require removal to construct the proposed residence and driveway access.

Several of the oaks (#3.19. 3.26, 3.27 3.28 on the SSA Tree Removal Plan) can be considered for retention. They are outside the development envelope and condition could be improved with maintenance pruning and removal of the oppressive, dense overstory.

A group of eucalyptus (# 3.24 on the SSA Tree Removal Plan) is also located outside the development envelope and can be considered for retention. As with the other eucalyptus, maintenance pruning to improve structure will be required.

Conclusion

Tree removal will be a necessary component of this development project. The Monterey pines and acacia are not suitable for retention due to declining condition and the risk associated with falling branches and whole tree failure. A tree re-planting plan that utilizes appropriate species and placement will be implemented during the landscape phase of the project.

The retention of selected eucalyptus and coast live oaks will preserve the natural appearance of the site and maintain screening. The specific impacts to the retained trees along with a specific tree protection plan will be prepared after plans are finalized.

Respectfully,

Maureen Hamb-WCISA Certified Arborist #2280