



**CITY OF ORINDA  
INITIAL STUDY/NEGATIVE  
DECLARATION**

**CITY OF ORINDA  
Planning Department**  
22 Orinda Way  
Orinda, CA 94563  
PHONE: (925) 253-4210

This Negative Declaration was prepared by the City of Orinda pursuant to the California Environmental Quality Act (CEQA) and CEQA Guidelines (Public Resources Code sections 21000 et seq. and California Code of Regulations, title 14, sections 15000 et seq.) for the project described below and in the attached Initial Study.

**PROJECT:** Senior affordable housing project, community parking lot and associated land use policy amendments.

**BRIEF DESCRIPTION:** Development of 71 residences (70 one bedroom senior affordable units and one two bedroom manager's unit), development of a 10-space community parking lot and the following land use policy amendments: (1) Amendment of the General Plan land use designation of 2 Irwin Way from Public Semi-Public to Residential-Multifamily and (2) creation of a Senior Housing Overlay District applied to 2 Irwin Way (site of former Orinda Library) and 20 Irwin Way (site of Orinda Senior Village).

**LOCATION:** The senior affordable housing project and General Plan amendment are at 2 Irwin Way, the community parking is at 10 Irwin Way and the Senior Housing Overlay District applies to 2 and 20 Irwin Way.

**SUMMARY OF ANALYSIS:** With mitigation, the proposed project would result in impacts that are less than significant. Mitigation measures to decrease temporary air quality impacts as a result of construction activities are necessary due to the project's location near Orinda Senior Village and Orinda Community Park, both of which are sensitive receptors.

**INITIAL STUDY:** An Initial Study of this proposed project was undertaken and prepared in accordance with the CEQA for the purpose of ascertaining whether this project might have a significant effect on the environment. A copy of the Initial Study is attached. Further documents related to the project are on file with the City of Orinda Planning Department at City Hall, 22 Orinda Way, Orinda CA 94563. The Initial Study documents the reasons to support the finding below.

**FINDING:** It is hereby determined that, based on the information contained in the attached Initial Study, that the proposed project would not have a significant adverse impact on the environment and, therefore, does not require the preparation of an environmental impact report. There is no substantial evidence, in light of the whole record before the City, that the project may have a significant effect on the environment.

Emmanuel Ursu  
Director of Planning

Date: Oct. 19, 2010

**Initial Study  
Environmental Checklist**  
California Environmental Quality Act

**A. Summary Information**

1. **Project Title:** Eden Senior Housing Project
2. **Lead Agency Name and Address:** City of Orinda Planning Department  
22 Orinda Way  
Orinda, CA 94563
3. **Contact Person and Phone Number:** Emmanuel Ursu, Director of Planning  
(925) 253-4210
4. **Project Location:** 2, 10 and 20 Irwin Way  
Orinda CA 94563  
(APN 260-200-017, 260-200-015 and 260-200-016)

Figure 1 shows the regional location and Figure 2 shows the location within Orinda.

5. **Project Sponsor's Name and Address:** Eden Housing, LLC  
22645 Grand Street  
Hayward, CA 94541

- |                                     |                            |                            |
|-------------------------------------|----------------------------|----------------------------|
| <b>6. General Plan Designation:</b> | <b><u>Existing</u></b>     | <b><u>Proposed</u></b>     |
|                                     | <u>2 Irwin Way</u>         | <u>2 Irwin Way</u>         |
|                                     | Public and Semipublic      | Residential – Multi-Family |
|                                     | <u>10 Irwin Way</u>        | <u>10 Irwin Way</u>        |
|                                     | Public and Semipublic      | Public and Semipublic      |
|                                     | <u>20 Irwin Way</u>        | <u>20 Irwin Way</u>        |
|                                     | Residential – Multi-Family | Residential – Multi-Family |

- |                   |                                |  |
|-------------------|--------------------------------|--|
| <b>7. Zoning:</b> | <b><u>Existing</u></b>         | <b><u>Proposed</u></b>                                 |
|                   | <u>2 Irwin Way</u>             | <u>2 Irwin Way</u>                                     |
|                   | Public, Semipublic and Utility | Residential – Medium Density<br>Senior Housing Overlay |
|                   | <u>10 Irwin Way</u>            | <u>10 Irwin Way</u>                                    |
|                   | Public, Semipublic and Utility | Public, Semipublic and Utility                         |
|                   | <u>20 Irwin Way</u>            | <u>20 Irwin Way</u>                                    |
|                   | Residential – Medium Density   | Residential – Medium Density<br>Senior Housing Overlay |

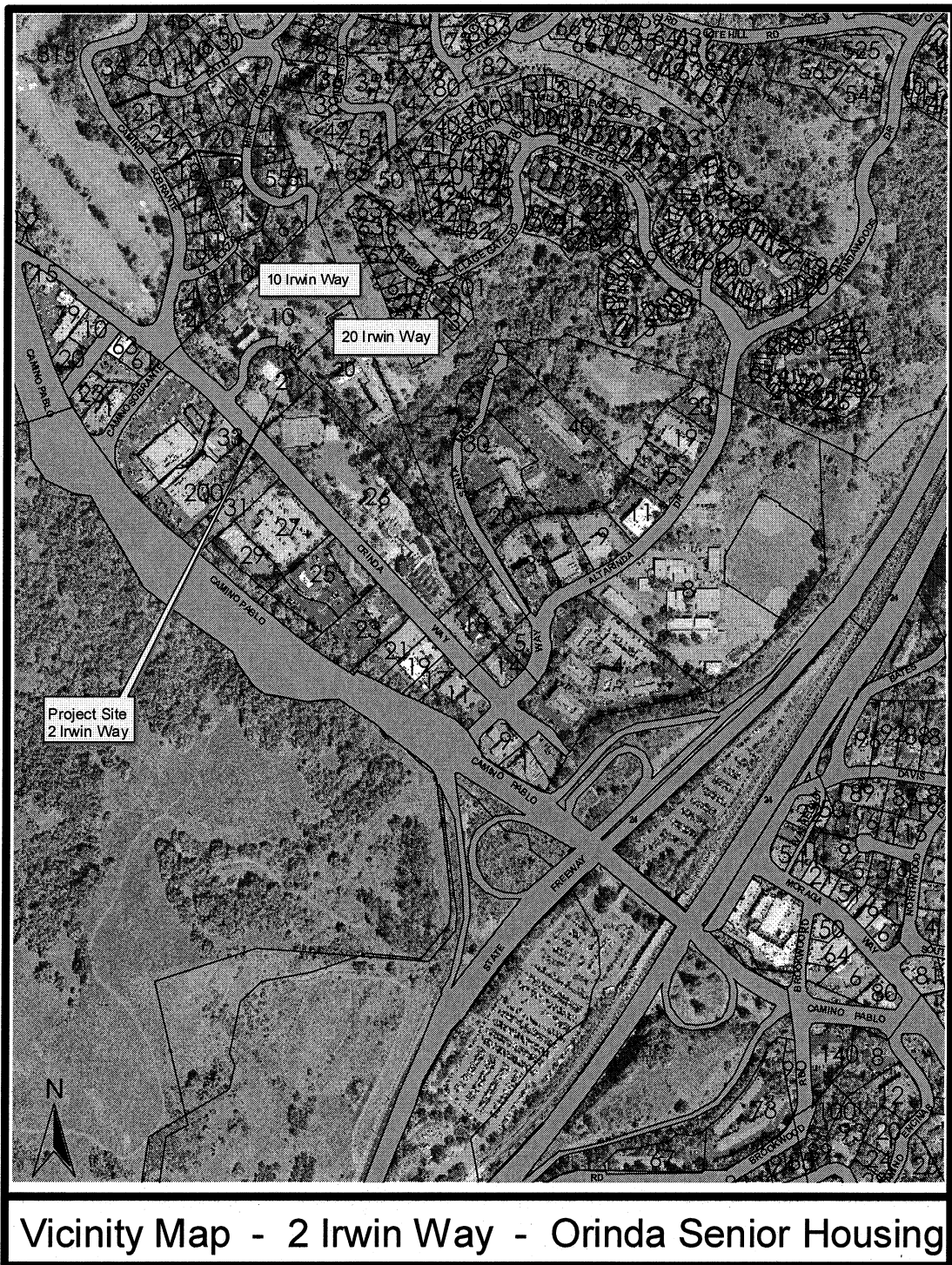


Figure 1: Vicinity Map

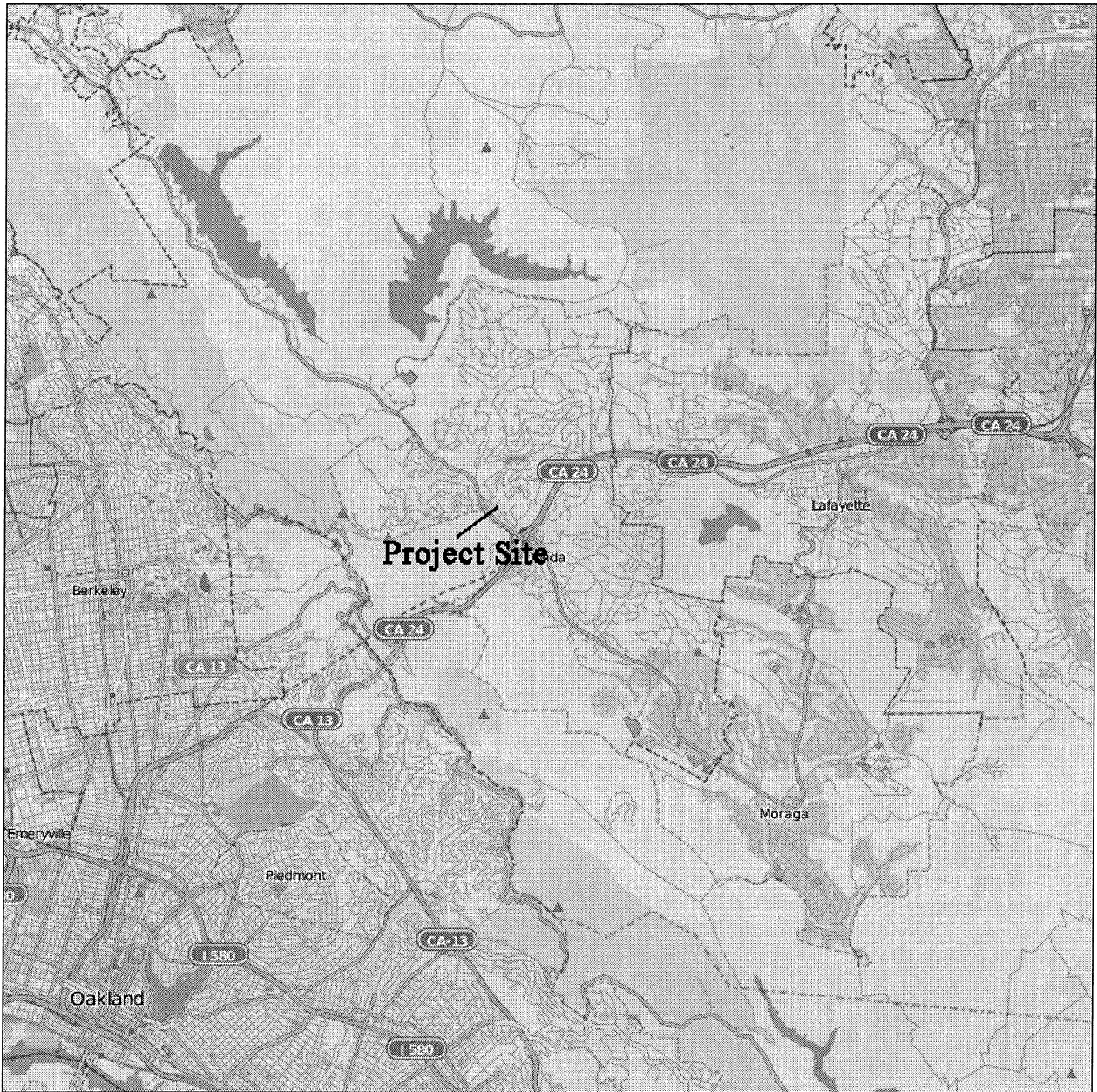


Figure 2: Project Location Map



## **8. Description of Project:**

The proposed project consists of developing an affordable senior housing project containing approximately 71 units on the property at 2 Irwin Way and the development of a community parking lot with ten spaces on the property at 10 Irwin Way. This development will entail changing the General Plan Land Use designation and the zoning of the property at 2 Irwin Way from Public and Semipublic to Residential Multifamily and establishing a Senior Housing Overlay district and applying the new overlay district to 2 and 20 Irwin Way. These amendments are consistent with the following implementation measure and policy of the City's Housing Element (2004):

- "Amend the zoning designation on the 1.4 acre former Orinda Library site to Medium-Density Residential" (Implementation Measure 3-3)
- "Encourage development of housing designed to meet the unique needs of senior and persons with disabilities." (Policy 4.2).

These amendments will allow the development of a proposal by Eden Housing, LLC to construct an affordable senior housing project on the 2 Irwin Way site with a density no more than 50 dwelling units per acre, including the state density bonus, at a maximum height of 50 feet and four stories, and with a parking ratio of approximately 0.6 stalls per unit, including guest parking.

All existing site improvements, including the former library building, retaining walls, and parking lot will be demolished to accommodate the proposed senior housing development.

As a part of its project, Eden Housing proposes to accommodate community parking that is currently on the former library site in a new parking lot consisting of 10 spaces on property of the Orinda Community Church. The Community Church has agreed in concept to the proposed parking lot; however, a formal agreement has not been reached yet. Access to the proposed community parking lot will be from the existing driveway entrance located on the west (lower) side of the main church building. No structures will be removed to accommodate the proposed parking area and one protected Coast Live Oak tree and 13 other trees are proposed to be removed. The other trees proposed for removal are not protected by City ordinance and include a mix of Evergreen pear, Monterey pine, and Chinese pistache.

A complete analysis of the Eden proposal will be prepared and processed through Planning Commission design review after Eden Housing revises its conceptual plans and completes its development application. This Initial Study evaluates the development proposal to the extent feasible, based on currently available information. The conceptual development application submitted by Eden Housing contains 71 units (70 one bedroom senior affordable units and one two bedroom manager's unit) in a 4-story building with 44 on-site parking spaces (37 stalls in a garage for staff and residents and 7 stalls in a surface lot for guests, including one for passenger loading and unloading). Through the Planning Commission review process on the general plan and zoning amendments, Eden Housing's architects

sketched revisions to their conceptual building elevations to demonstrate potential plan revisions to address the Commission's recommendations to the City Council on the development standards. The draft revisions to the plans resulted in 3 to 4 fewer units than the initial 71-unit design. Pending City Council review and adoption of the land use amendments, the plans and application will be revised to conform to the standards adopted by the City and resubmitted for Planning Commission design review.

Eden Housing proposes to develop the housing project on property to be acquired from the City and with funds provided by the City and others.

## **9. Surrounding Land Uses and Setting:**

### Former Library Site

Two Irwin Way is a 1.45-acre site currently occupied by the former library building, an 8,931 square foot structure built in 1959. Since 2001 when the library was relocated to a new building, the former library building has had a variety of temporary uses including storage for the City's Parks and Recreation and Public Works Departments and other community organizations, campaign call centers, and staging area for local community events. The lower parking lot is used by the public, primarily by visitors to the Community Park and for the farmers' market.

The site is located on a southwest facing moderately sloped (average slope of 14%) hillside with two tiers. The center of the lower tier is approximately 12 to 17 feet above Orinda Way and is occupied by a 28-space parking lot and the second tier is approximately 28 to 33 feet above Orinda Way and contains a parking lot with six spaces, three of which do not meet current parking standards. The existing building is in the middle of the property at approximately the same level of the upper parking lot and is 20 feet tall. A drainage swale traverses the rear of the property which is approximately 25 feet higher than the upper parking lot area. Vehicular access to the main parking lot on the site is taken from Irwin Way and access to the upper parking lot is at the rear of the parcel from the parking lot on the Orinda Senior Village property. An easement over the Orinda Senior Village property provides access to the rear of the 2 Irwin Way site.

Landscaping on the site consists of a mix of native and ornamental trees, shrubs and ground cover with heavy vegetative screening along the Orinda Way frontage, the south property line and the east property line. There are several large pine trees on the east and northeasterly portions of the site. According to the arborist report, there are 115 trees on the site.

In 1948, East Bay Municipal Utility District sold the library site to the Orinda Association and the adjoining property, now developed with the Orinda Senior Village, was sold to the Orinda Community Church. Both sites were sold with restrictions on the deeds limiting use of the sites to "religious, civic, community or school purposes." In March 1980, the EBMUD Board approved use of the adjoining site for affordable senior housing and recently, EBMUD representatives indicated that the same consent to use the 2 Irwin Way site for affordable housing would be granted.

### Orinda Senior Village

Orinda Senior Village is a 150-unit affordable senior housing development on a 3-acre site. Built in 1983, the building has seven levels and a maximum height of 76 feet and a total of approximately 82,500 square feet. The building is predominately four stories and approximately 45 feet in height and at the southern end of the building it steps down with the topography and has sections that are five stories tall. There are 74 parking stalls on-site which are shared with the Orinda Community Church.

### Orinda Community Church

Orinda Community Church is at 10 Irwin Way, across Irwin Way and north of the former library site. The church has approximately 300 members and the facilities are also used for a private high school (Holden High School) and a pre-school. Holden High School has an enrollment of 40 students and about 20 staff members and The Orinda Preschool (TOPS) has a current enrollment of approximately 120 children ages 2 to 5 of which generally no more than 80 children are on site at the same time. There are approximately 15 staff members plus 4 to 5 parent volunteers that work at the preschool.

### Surrounding Uses

The Moraga Orinda Fire District's downtown Fire Station and a bank are located to the west, across Orinda Way from the former library site and Community Church. The approximately 3-acre Orinda Community Park is southeast of the former library site and west of Orinda Senior Village. There are three tennis courts in the Community Park near the 2 Irwin Way property line. The tennis courts are situated at approximately a 45 degree angle in relation to the common property line, are approximately 20 feet from the closest 2 Irwin Way property line at one corner and are illuminated with six pole lights, with four light fixtures on each pole.

A steep hillside rises above the east side of Orinda Senior Village. The hillside is a part of the open space area of the Orindawoods subdivision with the nearest homes approximately 125 feet from Orinda Senior Village and about 60 feet above Orinda Senior Village. The former library site is approximately 450 feet from the closest homes in Orindawoods and at an elevation approximately 120 feet lower.

Within 500 feet of the proposed Eden Housing development project site, there are two banks, a supermarket, a post office and several retail shops, restaurants and professional offices. These uses are located west of the project site in the downtown commercial district. The BART station is approximately 2,500 feet from the project site and has uninterrupted pedestrian access. A County Connection bus stop is located directly in front of 2 Irwin Way on Orinda Way.

### **10. Other agencies whose approval is required (e.g. permits, financing approval, or participation agreement):**

An EBMUD deed restriction on the property limits use of the property to "religious, civic, community or school purposes." Consent to use the former library site for

senior affordable housing is required from EBMUD. Funding for the project is from local and federal sources including the land transfer and loan from the City of Orinda and federal funding through a variety of programs potential including HOME, CDBG, and tax credit financing programs. HOME and CDBG funds for the project are administered through Contra Costa County. The County is the lead agency on the project for review under NEPA.

## **B. Environmental Analysis**

### **Environmental Factors Potentially Affected:**

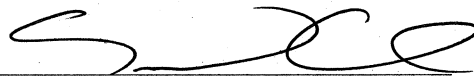
The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> Aesthetics            | <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Public Services                    |
| <input type="checkbox"/> Agriculture Resources | <input type="checkbox"/> Hydrology/Water Quality       | <input type="checkbox"/> Recreation                         |
| <input type="checkbox"/> Air Quality           | <input type="checkbox"/> Land Use/Planning             | <input type="checkbox"/> Transportation/Traffic             |
| <input type="checkbox"/> Biological Resources  | <input type="checkbox"/> Mineral Resources             | <input type="checkbox"/> Utilities/Service Systems          |
| <input type="checkbox"/> Cultural Resources    | <input type="checkbox"/> Noise                         | <input type="checkbox"/> Mandatory Findings of Significance |
| <input type="checkbox"/> Geology/Soils         | <input type="checkbox"/> Population/Housing            | <input type="checkbox"/> No Potentially Significant Impacts |



Determination: On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ 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 revisions in the project have been made by or agreed to by the project proponent. 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.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.



Emmanuel Ursu

Oct. 19, 2010  
Date

## **Evaluation of Environmental Impacts:**

- (1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
- (2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- (3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
- (4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analysis," may be cross-referenced).
- (5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:
  - (a) Earlier Analysis Used. Identify and state where they are available for review.
  - (b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - (c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures that were incorporated or refined from the earlier document and the extent to which they address site- specific conditions for the project.
- (6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances).

Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

- (7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- (8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
- (9) The explanation of each issue should identify:
- (a) The significance criteria or threshold, if any, used to evaluate each question; and
  - (b) The mitigation measure identified, if any, to reduce the impact to less than significance

**Issues:**

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
<b>I. AESTHETICS -- <i>Would the project:</i></b>				
a) Have a substantial adverse effect on a scenic vista?				X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			X	
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?				X
The project sites are not part of a scenic vista. The Orinda Municipal Code defines a "View" as a scene from the primary living area of a residence or the active use area of a nonresidential building. The term "view" includes both upslope and downslope scenes,				

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact

*but is generally medium or long range in nature, as opposed to short range. View includes but is not limited to distinctive geologic features, hillside terrains, wooded canyons, ridges, and bodies of water. Some examples are:*

- 1. Mt. Diablo;*
- 2. Prominent features of the East Bay Hills, such as Round Top, Huckleberry Preserve and Tilden Park;*
- 3. Briones Reservoir;*
- 4. Briones Agricultural Preserve."*

Scenic vistas in the area are of the EBMUD-owned open space on the hills rising to the west of the Village area of downtown Orinda and views of the scenic vista from properties in the vicinity are taken from residences east of the project site in the Orindawoods development, from the entry courtyard of the Community Church and from Orinda Senior Village. Views of the scenic vista from the surrounding properties are over the former library site. Residences in Orindawoods are approximately 120 feet above the former library site and 60 feet above the Orinda Senior Village site. Views of the former library site from Orinda Senior Village are screened by existing dense vegetation at the rear of the former library site. There are approximately 56 existing trees in the area between the proposed building and the Orinda Senior Village parking lot of which 37 will remain. In addition to the existing vegetation to remain, 10 additional trees are proposed at the rear of the building. Story poles silhouetting a conceptual project design were erected on the former library site. The building poles were not visible from homes in Orindawoods and only partially visible from Orinda Senior Village. The top of the conceptually designed building is at elevation 500 and the first floor of Orinda Senior Village is approximately at elevation 510.

The site is not visible from a state scenic highway. Highway 24 is the closest state scenic highway.

The 2 Irwin Way site is in downtown Orinda in an urbanized area with an eclectic mix of building forms, spacing, and architectural design and no new construction in over two decades. The Orinda Community Church has a very tall and steeply pitched "A" frame design, the fire station is designed in a 1970's contemporary architectural style with a visually dominant roof, and Orinda Senior Village has mansard tile roofs and long balconies and is situated behind the 2 Irwin Way site with little to no visual presence in the downtown. The Safeway grocery store is in a low-lying structure with a mansard roof on the street-facing elevation recessed behind a parking lot. Mature Sycamore trees dominate the Orinda Way streetscape and the prominence of buildings along Orinda Way varies with some structures near the street with little or no landscape screening and other structures set back far from the street and at a lower level than the street. Topography on the east side of Orinda Way slopes up from the road and on the west side the topography slopes down from the road.



	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact

Views of the building from the Orinda Community Park are limited to small portions of the south building façade due to the extensive existing vegetation in the park. Visual impacts on the south elevation are also lessened as a result of the courtyard proposed on the site. The courtyard opens toward the park and as a result there is a break in south building elevation.

Development of the site will be subject to both quantitative criteria and qualitative discretionary design review criteria. New development standards for senior multifamily housing are a part of the proposed code amendments. These standards address, among other issues, aesthetic design of development as it relates to the visual character of a project site and its surroundings. For instance, the new standards include a building plane line, which is more restrictive than the current development standards; building set backs which are either equal to or greater than the existing set back standards; building height up to 50 feet (as measured to the highest point of the roof) and qualitative design review standards that require development to be designed to respect the scale and views of nearby properties, to minimize visible building mass, to include landscaping that is appropriate for the site and the neighborhood, and to relate to natural and man-made context of the site.

Eden Housing's conceptual design proposal does not meet the proposed building plane line at the Orinda Way frontage and at portions of the Irwin Way and Community Park facades. Through the design review process the project design will be modified so that the upper portions of the building façade are recessed from the lower levels. During Planning Commission review of the proposed code amendments, Eden Housing's architects presented sketches to illustrate potential revisions to the building with the upper levels recessed. In addition, the story poles were revised to reflect the potential revisions to the building envelope. The top level of the conceptual proposal, and to a lesser degree of the revisions to the conceptual proposal, will be visible from off-site vantage points in the immediate vicinity, as depicted in the visual simulations (Figure 3) and by photographs of the story poles (Figure 4). The visual simulations indicate the initial conceptual design and the photos of the story poles illustrate the building envelope of the revisions to the conceptual design. From Orinda Way and Irwin Way, portions of the conceptual design proposal will be visible above the tops of the trees at the perimeter of the site and through the breaks in vegetation. Landscape screening is proposed to fill in voids in the vegetation near the existing Irwin Way driveway location and thereby lessen visual impacts. Modifications necessary to achieve compliance with the building plane line will also lessen the project's visual impacts.

As a result of the proposed development standards; the eclectic mix of building forms, spacing and architectural styles; and the modifications necessary for the project to achieve the proposed development standards, the existing visual character and quality of

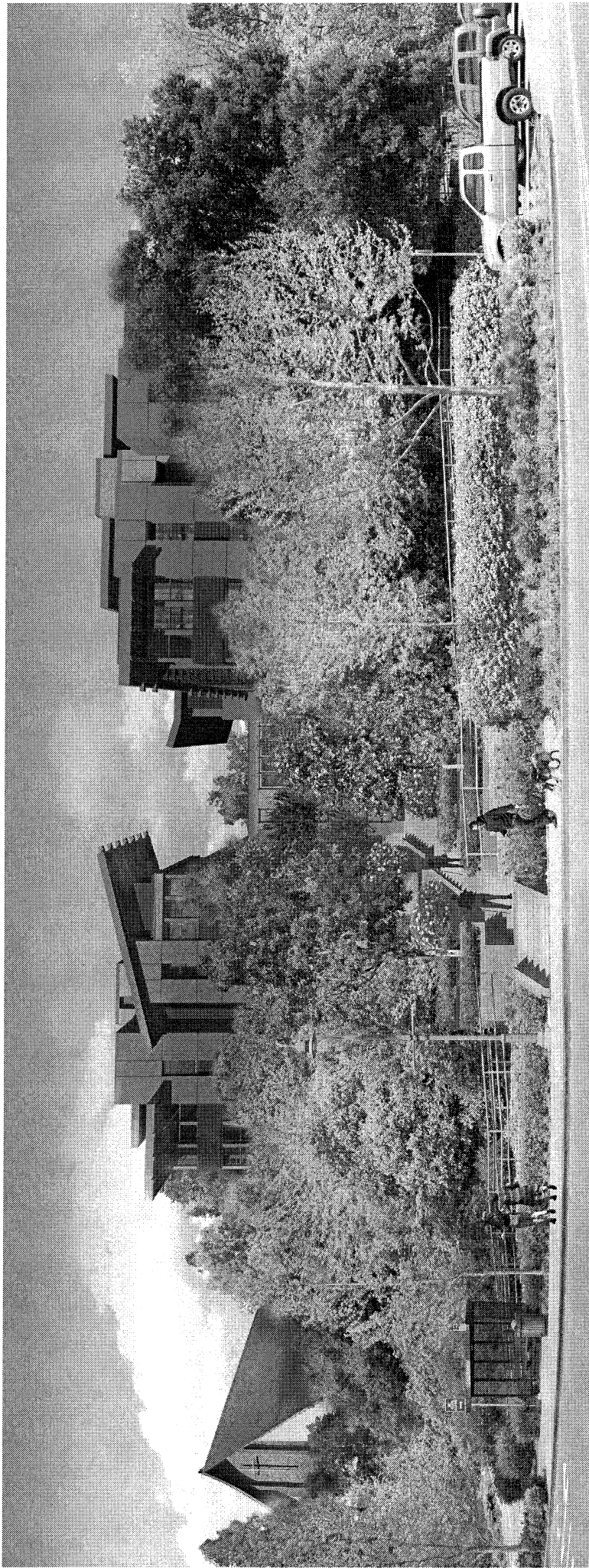
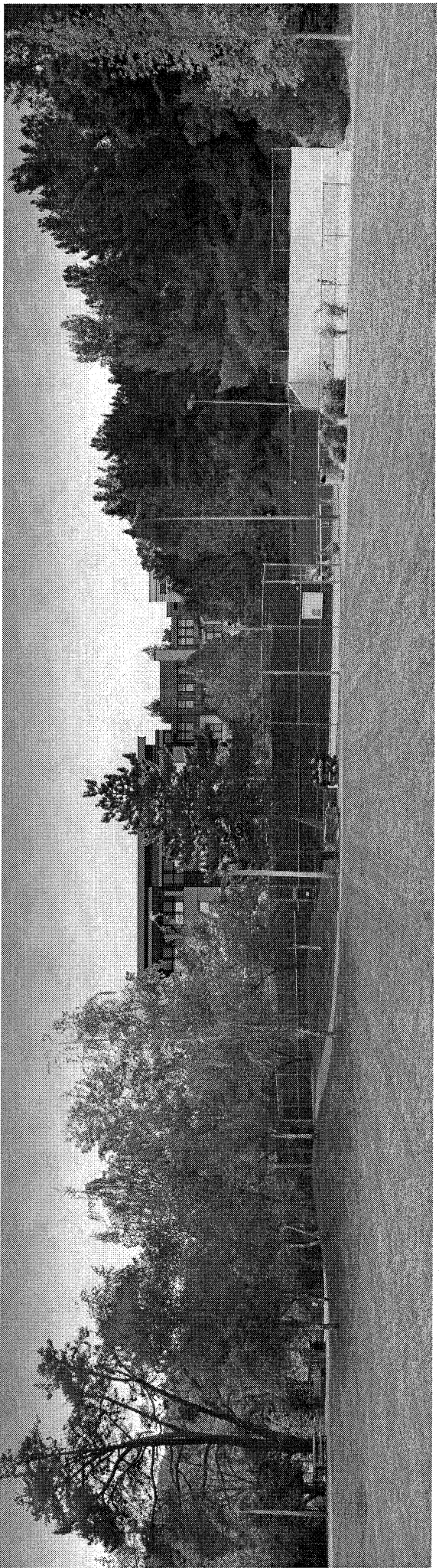
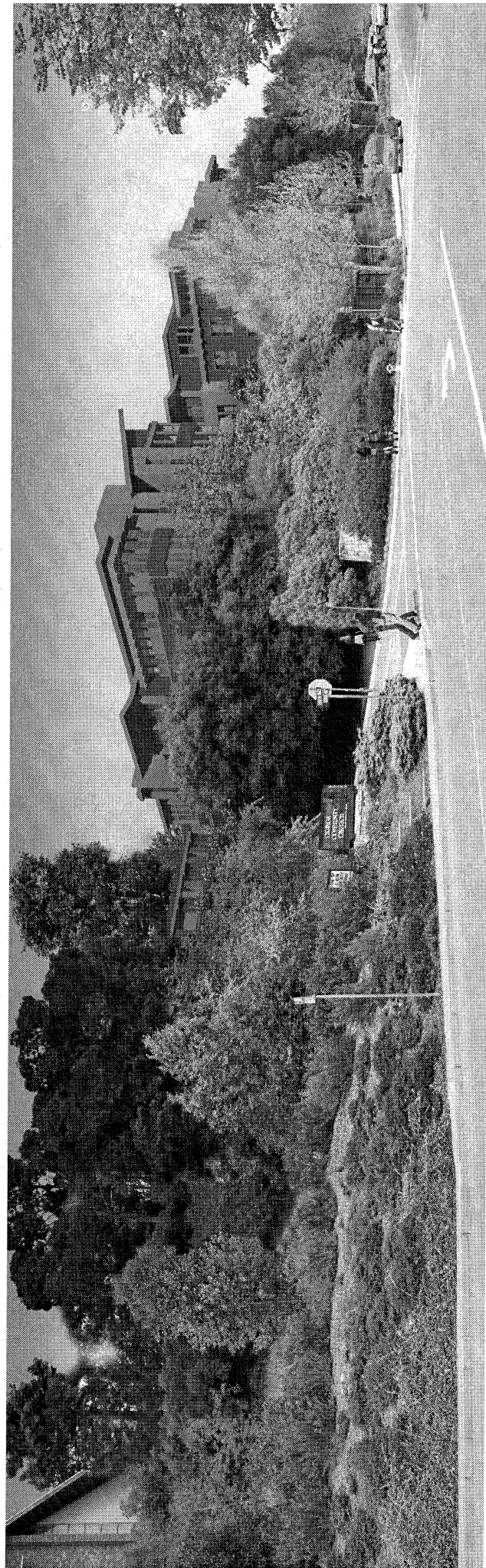


FIGURE 3









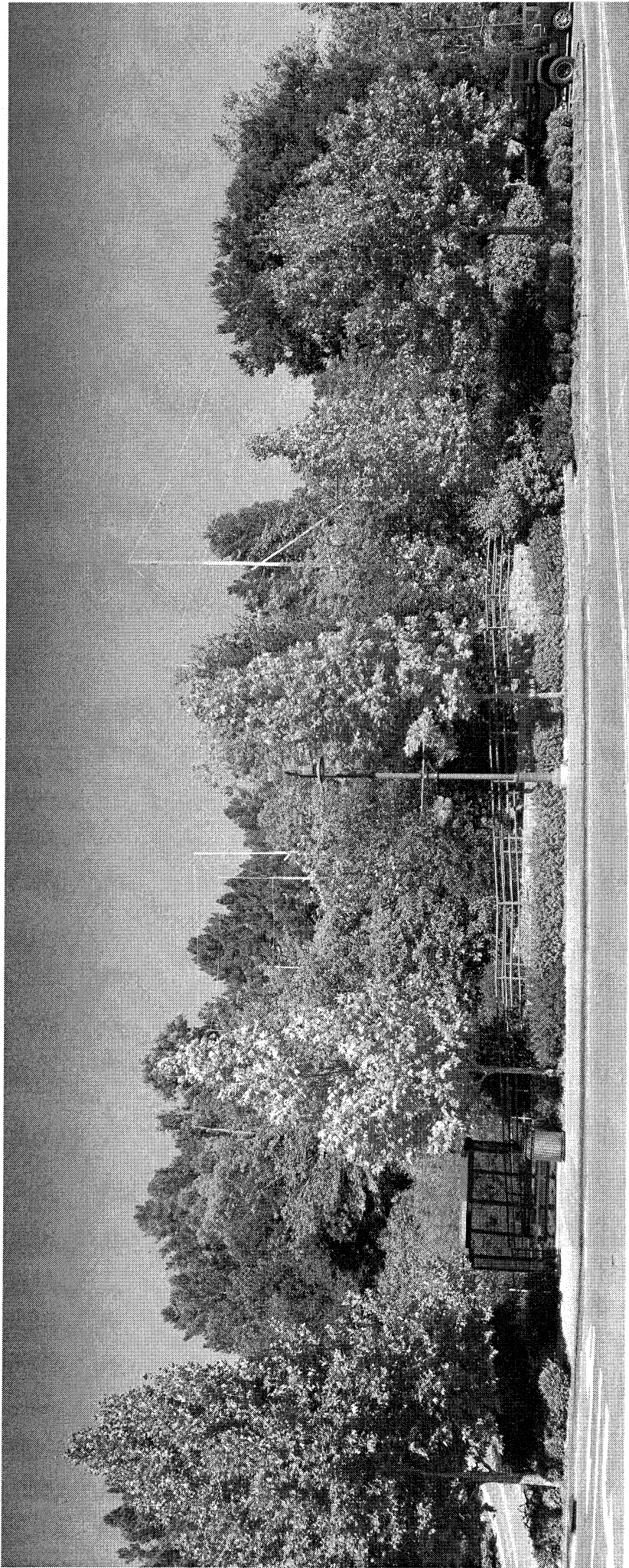
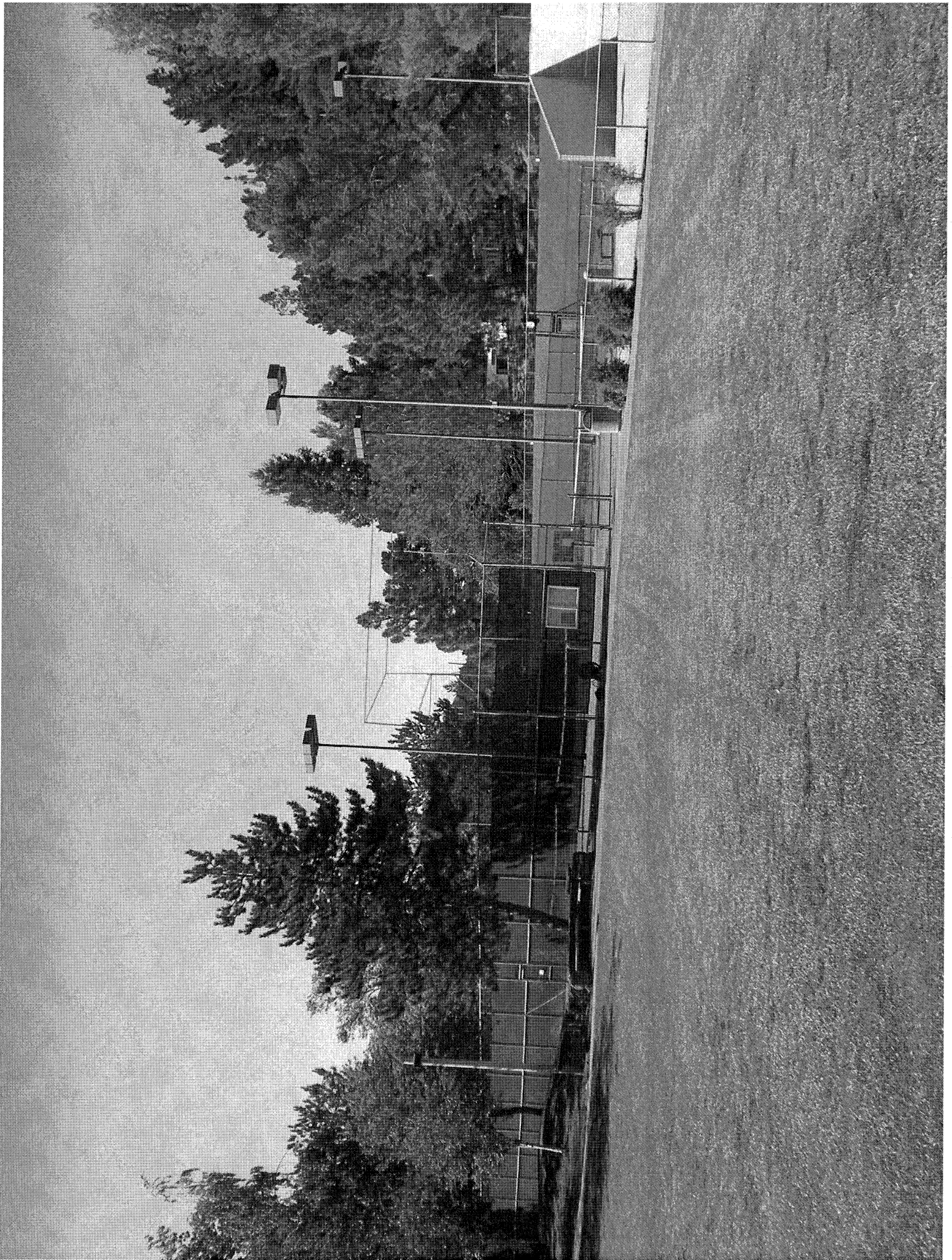


FIGURE 4





	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
<p>the site and its surroundings will not be significantly impacted.</p> <p>Existing and proposed lighting criteria of the code require new sources of light and glare to be shielded from spilling off-site and minimized. Existing lighting standards, contained in Chapter 17.16 of the Orinda Municipal Code require lighting in parking areas to be no greater than 16 feet above grade, create no cone of direct illumination greater than 60 degrees from light sources higher than 6 feet, to not directly shine onto an adjacent street and to not exceed 0.5 footcandles at ground level. In addition, the proposed standards for senior housing require that night and security lighting be shielded to prevent glare and outdoor light fixtures more than three feet above grade to be shielded to prevent direct illumination off-site.</p>				
<b>II. AGRICULTURE RESOURCES --Would the project:</b>				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X
<p>The proposed code amendments apply to two developed parcels located in downtown Orinda. The parcels are not used for farming or any agricultural purpose, are not Prime Farmland, Unique Farmland or Farmland of Statewide Importance and are not under a Williamson Act contract. Change in use of the former library site from a public library to a site for affordable senior housing could not result in conversion of farmland to a non-agricultural use. Therefore, no impacts on agricultural resources will occur as a result of the land use policy amendments and the development of the former library site with affordable senior housing.</p>				

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
<b>III. AIR QUALITY -- <i>Would the project:</i></b>				
a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?				X
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative threshold for ozone precursors)?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?		X		
e) Create objectionable odors affecting a substantial number of people?				X

The proposed change in land use policies will add multifamily residential development to the list of uses permitted on the former library site and will allow the development of the Eden Senior Housing proposal. There will be no change in the uses or density of uses permitted on the Orinda Senior Village site. The existing Public, Semipublic and Utility land use designation and zoning of the former library site allows uses ranging from cemeteries to hospitals, subject to a use permit. Residential uses are not allowed in the PS district. The uses allowed in the PS district are allowed in all zoning districts on sites less than two acres, subject to a use permit (OMC section 17.9.2.A). The former library site is less than two acres; therefore, the uses allowed in the PS district will continue to be allowed under the proposed multifamily zoning district, subject to a use permit.

Development of the former library site at up to 50 senior affordable units per acre (73 units on the 1.45-acre site) would not result in greater air quality impacts due to vehicle trip generation than development of the site under the existing uses allowed in the PS zoning district. Furthermore, development of "mid-rise" four story apartments with up to 73 senior affordable units is below the Bay Area Air Quality District's screening level size for operational criteria



	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact

and construction-related pollutants and pre-cursors which are 494 and 240 dwelling units, respectively.

Development of the former library site with senior affordable housing will result in demolition of the former library building. Demolition of buildings is subject to BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). Regulation 11, Rule 2 is intended to limit asbestos emissions from demolition and the associated disturbance of asbestos-containing waste material generated or handled during demolition. All asbestos-containing material found on the site must be removed prior to demolition in accordance with BAAQMD Regulation 11, Rule 2, including specific requirements for surveying, notification, removal, and disposal of material containing asbestos. By complying with the BAAQMD's rule, demolition activity would not result in a significant impact to air quality.

The Bay Area Air Quality Management District ("District") CEQA Guidelines outlines focuses on prevention of construction-related emissions, as they are generally short-term in duration. Fine particulate matter ("PM10") is the pollutant of greatest concern with respect to construction activities. PM10 emissions can result from a variety of construction activities, including excavation, grading, demolition, vehicle travel on paved and unpaved surfaces, and vehicle and equipment exhaust. Construction-related emissions can cause substantial increases in localized concentrations of PM10. Particulate emissions from construction activities can lead to adverse health effects as well as nuisance concerns such as reduced visibility and soiling of exposed surfaces.

Construction emissions of PM10 can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions and other factors. Despite this variability in emissions, experience has shown that there are a number of feasible control measures that can be reasonably implemented to significantly reduce PM10 emissions from construction activity. The BAAQMD's approach to CEQA analyses of construction impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions. The District has identified a set of feasible PM10 control measures for construction activities on sites greater than 4 acres. While 2 Irwin Way is less than 4 acres, it is possible that grading and construction activities on the site will be disruptive to users of the Community Park immediately adjacent to the site and of occupants of the Orinda Senior Village and therefore, the following mitigation should be implemented.

#### **Mitigation Measures:**

##### BAAQMD Basic Control Measures

- 1) Water all active construction areas as needed to control fugitive dust.
- 2) Cover all trucks hauling soil, sand, and other loose materials or require all trucks

		Summary of Impacts			
		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
to maintain at least two feet of freeboard.					
3)	Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.				
4)	Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.				
5)	Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.				
<u>Enhanced Control Measures</u>					
1)	All "Basic" control measures listed above.				
2)	Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).				
3)	Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)				
4)	Install sandbags or other erosion control measures to prevent silt runoff to public roadways.				
5)	Replant vegetation in disturbed areas as quickly as possible.				
<b>IV. BIOLOGICAL RESOURCE -- <i>Would the project:</i></b>					
a)	Have a substantial adverse effect, either directly or through habitat modifications, 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
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				X
c)	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal,				X

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
filling, hydrological interruption, or other means?				
d) Interfere substantially 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 wildlife nursery sites?				X
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X	
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

The project site is an infill site in an urbanized area that is currently developed and landscaped with a mix of native and non-native trees and shrubs. The site is not on or near any migratory wildlife corridors nor would construction impede access to any native wildlife nursery sites since there are none near the site. The sites are not within a habitat conservation plan area. A natural drainage course traverses the southern side of the Orinda Senior Village site and the former library site does not contain any natural drainage courses or wetlands. The creek setback requirements of the Orinda Municipal Code would remain in effect with the proposed amendments to the development code. Development on the 2 Irwin Way site is not near any sensitive natural community identified in local or regional plans, policies, and regulations or by any state or by the California Department of Fish and Game or US Fish and Wildlife Service.

Oak trees 12 inches in diameter and greater, as measured 4 ½ feet above grade, are protected by the Orinda Municipal Code. Based on the conceptual development plans submitted for the affordable senior housing project on the former library site, three Coast live oak trees will be removed; one 12-inch, one 15-inch and one 17-inch. If approved for removal, the three oak trees would be required to be replaced with 16 15-gallon container trees of the same genus and species. In addition, one 13.5-inch Coast live oak tree on the

	Summary of Impacts			
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Community Church property would be removed to accommodate the proposed parking area. Six 15-gallon container trees will be required to replace the tree. As a result of the replacement requirements of the municipal code, the project will have less than significant impacts.				
<b>V. HISTORIC &amp; CULTURAL RESOURCE --</b> <i>Would the project:</i>				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?			X	
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?				X
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
d) Disturb any human remains, including those interred outside of formal cemeteries?				X
<p>Public Resources Code section 21084.1 states that "A project that may cause a substantially adverse change in the significance of an historic resource is a project that may have a significant effect on the environment. For purposes of this section, an historical resource is a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources. Historical resources included in a local register of historical resources, as defined in subdivision (k) of Section 5020.1, or deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1, are presumed to be historically or culturally significant..."</p> <p>Public Resources Code 5020.1(k) states that "'Local register of historical resources' means a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution." The former Orinda Library is not designated or recognized as historically significant by ordinance or resolution of the City of Orinda.</p> <p>CEQA Guidelines section 15064.5 states that "a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the</p>				

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact

*California Register of Historical Resources... including the following:*

- (A) *Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;*
- (B) *Is associated with the lives of persons important in our past;*
- (C) *Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or*
- (D) *Has yielded, or may be likely to yield, information important in prehistory or history."*

In addition to meeting one or more of the above criteria, the California Register requires that sufficient time must have passed to allow a "scholarly perspective on the events or individuals associated with the resource." Fifty years is used as a general estimate of the time needed to understand the historical importance of a resource.

While built in 1958 and meeting the 50 year criterion for California Register eligibility, the former library building is not listed in the California Register of Historical Resources and does not appear to meet any of the California Register significance criteria as described below:

- 1) The construction of the library is associated with the needs of a locally growing population and does not represent a significant contribution to the broad patterns of California's history and cultural heritage.
- 2) The library is not associated with persons important in our past.
- 3) The library has contemporary style architecture with a modular building attached to the southwest side of the building. It does not constitute an exceptional example of the type, period, region, or method of construction. In addition, under this criterion the building does not appear to possess high artistic value, nor does it represent the work of an important creative individual. Plans for the building were prepared by Aitken and Collin Architects.
- 4) The library has not yielded, nor is it likely to yield, information important in prehistory or history. Information about the history of the library is readily available in existing documents.

The history of the Orinda Library is cataloged in the *Historic Sites of Orinda* (2001) booklet prepared by the City of Orinda Historic Landmark Committee (HLC) and in *The History of Orinda* (Muir Sorrick, 1970 pp. 150 -154). The HLC booklet includes a brief description of the various locations in which the public library existed in Orinda starting in 1915 at the Orinda Park School through to the new Orinda Library completed in 2001. With regard to the library when it was located at 2 Irwin Way, the booklet states that: "The library building in use from 1958 to 2001 was the joint effort of Orinda community groups, and the only modern Contra Costa County library financed solely through



	Summary of Impacts			
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<p><i>community donations.</i>" In <i>The History of Orinda</i>, a more detailed account of the history of the Orinda Library is provided.</p> <p>In accordance with SB 18, which requires local agencies to provide 90-day notice and, and as requested, to consult with native American tribal organizations prior to adopting or amending general plans, the City provided notice to the organizations on the Native American Heritage Commission's list on June 30, 2010. No responses were received.</p> <p>No resource meeting the criteria defined in section 15064.5 of the CEQA guidelines exist on the site. The library is not listed in the California Register of Historical Resources or eligible for classification as a historical resource by the State historical Resources Commission. Nor has the site been identified as being historically significant via a historical resource survey meeting the requirements laid out in the Public Resources Code.</p>				
<b>VI. GEOLOGY AND SOILS -- <i>Would the project:</i></b>				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				X
i) 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 based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?				X
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?				X

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X

Development could result in impacts relating to geology and soils; however, such impacts would be less than significant. Any future development would be required to comply with the rules designed to address geologic instability and prevent soil erosion (e.g. the California Building Standards Code, Orinda grading regulations, Orinda design review guidelines). Compliance with these laws and standards will ensure that any potential impact to geology and soils are less than significant.

Furthermore, the Geotechnical Investigation of the site dated February 23, 2009 by AMSO Consulting Engineers shows that no fault exists under the site and the closest fault is the Hayward fault which is 3 miles west of the site. According to the report, "the risk of earthquake-induced ground rupture occurring across the project site appears to be remote." (p. 4) The Report also states that "should a major earthquake occur with an epicentral location close to the site, ground shaking at the site will undoubtedly be severe..."(p. 4). Strong seismic ground shaking is a hazard common to all properties in California and the project site is no different. Shaking can be mitigated by proper structural design and by following the recommendations presented in the Geotechnical Investigation report.

The Geotechnical Investigation found that liquefiable soils are not a hazard to this property. (p.5)

The Report states that "considering the gentle nature of the site slopes and the stiff to very stiff consistency of the underlying soil, it's been determined that landsliding is not a potential hazard to this property."

Summary of Impacts				
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<p>According to the Report, the site soils are easily eroded. However, the project will not result in substantial soil erosion or loss of topsoil because through the grading and building permit plan check process, drainage plans are reviewed to ensure that concentrated flows of stormwater are discharged from the site both during and after construction in a controlled manner that will not erode soils.</p> <p>The Geotechnical Investigation found that below the layers of fill soil; the site is underlain by very stiff silty clay (CL) of low plasticity and low moderate potential for expansion. The clay was tested and was exposed to 1500 pounds per square foot of pressure and was then submerged in water for 48 hours. The clay showed no detectable sign of expansion during or after this period.</p> <p>The site will have access to public sewer system and therefore, there will be no impacts to soils from septic systems.</p>				
<b>VII. GREENHOUSE GAS EMISSIONS -- Would the project:</b>				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X	
<p>The Bay Area Air Quality Management District Board (BAAQMD) approved thresholds of significance for land development projects and plans. The BAAQMD CEQA Air Quality Guidelines, June 2010, is a reflection of California statewide mandate (AB 32) to reduce greenhouse gas emissions (GHG) in year 2020 to the 1990 level. As a part of the GHG threshold criteria and based upon BAAQMD modeling, the BAAQMD determined that various land uses which exceed a screening size level would likely have GHG emissions that the BAAQMD deems significant. For mid-rise multi-family residential development projects, the threshold is 87 dwelling units; therefore, the proposed 71-unit project is considered a less than significant impact.</p>				
<b>VIII. HAZARDS AND HAZARDOUS MATERIALS -- Would the project:</b>				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				X

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?				X
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk of loss, injury or death				X

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				

The proposed project will not involve the transport, use, or disposal of hazardous materials.

The project site is not located on a site that has been identified as a hazardous material site.

The proposed project is not located within an airport land use plan nor is it located within two miles of an airport or private airstrip.

Adding multifamily residential uses to the list of uses allowed on the 2 Irwin Way site and development of the site with 71 senior affordable residences would not physically interfere with any emergency response plan or emergency evacuation plan.

While the project site is not in the Very High Fire Hazard Severity Zone, many portions of the City of Orinda are and Orinda is a wooded community where fire safety is a major concern. Development of a 71 unit senior affordable housing facility at 2 Irwin Way would potentially decrease the risk of wildland fires by removing approximately 29 Monterey Pine trees and three Eucalyptus trees from the site and replacing them with vegetation that poses less fire hazard. Monterey Pine and Eucalyptus trees are on the Disallowed Plant List jointly developed by the Moraga Orinda Fire District (MOFD) and the City of Orinda to reduce fire hazards. In addition, as part of the development review process, the fire district will review development proposals to ensure all fire code requirements (including requiring fire sprinklers and Class A roofing) are met and thereby, reduce fire related impacts to a level considered less than significant.

	Summary of Impacts			
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<b>IX. HYDROLOGY AND WATER QUALITY --</b> <i>Would the project:</i>				
a) Violate any water quality standards or waste discharge requirements?				X
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of				X



	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?				X
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?				X
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	
f) Otherwise substantially degrade water quality?			X	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area				X

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
structures that would impede or redirect flood flows?				
i) Expose people or structure to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X

Development of the site will result in replacement of impervious surface area on the property including new vehicular driveways, pedestrian pathways and building footprint all of which will create storm water runoff. Runoff from the development could contain pollutants with the potential impact to the existing storm water.

The City of Orinda and 20 other Contra Costa County co-permittees are subject to the requirements of the National Pollutant Discharge Elimination System (NPDES) permit issued by the San Francisco Bay Regional Water Quality Board. The permit requires permittees to reduce pollutants to the maximum extent feasible. The City's storm water management plan contains specific best management practices required for all new development designed to help reduce the amount of stormwater runoff and potential discharge of pollutants into water systems including the following:

- To the extent feasible, use permeable material wherever hardscape areas are proposed.
- During construction activities, the project sponsor shall reduce or prevent to the maximum extent feasible, the direct or indirect discharge or any pollutant into the onsite stream and the storm drain system utilizing best management practices contained in the California Storm Water Best Management Practices Handbook for Construction Activities.

Groundwater supplies will not be impacted by the project. While the project site and much of Orinda are in the San Pablo Reservoir watershed, neither the project site nor the City of Orinda is located over any significant groundwater basin as identified by the San Francisco Regional Water Quality Control board.

No stream or rivers exist near the site whose courses could be altered by alterations to the drainage pattern of the site.

		Summary of Impacts			
		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
Development of the former library site with senior housing as conceptually designed will replace existing impervious surfaces to the largely paved site and may result in a net increase in the amount of impervious surface area. These improvements could result in an increase in storm water runoff and additional sources of pollution if not properly handled. To ensure this does not occur, the City of Orinda regulates all proposed grading and drainage improvements and, as applicable, requires implementation of the C3 storm water control measures and best management practice along with the requirement meet the current development standards administered by the City of Orinda Engineering Department.					
The project site is not located within a 100-year flood hazard area and none of the structures or buildings surrounding the site are within a 100-year flood hazard.					
Lake Cascade is the closest reservoir to the project site and is located approximately 2100 feet away. Should the dam at Lake Cascade fail, the project site would not be subject to flooding because of the sites' elevated location above the flow line below the dam.					
Seiche activity at the Lake Cascade will not affect the project site due to distance from the reservoir. Tsunami activity is not considered a potential hazard for Orinda.					
X. LAND USE AND PLANNING -- <i>Would the project:</i>					
a) Physically divide an established community?					X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			X		
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?					X
Development of the 2 Irwin Way site with senior housing would blend into the downtown					

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact

and compliment the mix of existing uses in the immediate vicinity. It would not physically divide an established community.

Amendment of the General Plan Land Use designation and the zoning of the 2 Irwin Way site is consistent and necessary to implement the goals and policies of the Housing Element of the General Plan. Specifically, the proposed project directly or indirectly implements the following policies and implementation measures (IM) of the 2004 Housing Element of the General Plan:

*"IM- 1-3 Continue to work with nonprofit housing agencies to coordinate and encourage affordable housing.*

*IM 1-4 Implement the City's Affordable Housing Incentive Program to reduce production costs in projects containing affordable units by adjusting design standards for setbacks, lot coverage, street width, unit size and parking, for senior projects. In order to stimulate developer interest in this program, establish a set of development standards applicable to affordable housing projects.*

#### *Housing Policy 2.1*

*Encourage the preservation of affordable housing and encourage the development of more new affordable housing.*

*IM 2-3 Support the efforts of non-profit organizations and developers to obtain State and/or Federal funds for the construction/preservation of affordable housing for lower income residents.*

*Policy 3.1 Locate sites for multifamily housing near Downtown.*

*IM 3-3 Amend the zoning designation on the 1.4 acre former Orinda Library site to Medium-Density Residential.*

*IM 3-4 ...offer the City-owned former Orinda Library for sale to a developer of affordable senior housing at up to 30 units per acre.*

*IM 3-10 Continue to encourage development of affordable senior housing in and near the downtown through increases in density, including up to 30 dwelling units per acre where appropriate.*

*IM 4.2 Encourage development of housing designed to meet the unique needs of seniors and persons with disabilities."*

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
Amending the land use designation of the former library site and developing zoning regulations to encourage development of affordable senior housing is consistent with existing General Plan policy.				
There are no applicable habitat conservation or natural community conservation plans that apply to the project site.				
<b>XI. MINERAL RESOURCES -- <i>Would the project:</i></b>				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X
There are no known mineral resources on the site or delineated on the site in the General Plan or other land use plan.				
<b>XII. NOISE -- <i>Would the project:</i></b>				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			X	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the			X	



	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
project vicinity above levels existing without the project?				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

		Summary of Impacts			
		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
<p>Policies of the General Plan require acoustical studies and any necessary mitigation where development is proposed along Highway 24 and where projected noise contours are 60 Ldn or more (IM 4.3.2.A and B). In addition, IM 4.3.2.B requires multi-family development in the 60 Ldn noise contour to comply with the 45 Ldn limit in any habitable room.</p> <p>The project site is not along Highway 24 and is not within the projected 60 Ldn noise contour (Figure 9 Orinda General Plan).</p> <p>Although the project is not within the 60 Ldn projected in the General Plan, the tennis courts in the Community Park are adjacent to the site and use of the courts could potentially impact residential development on the former library site. There are three tennis courts in the park and the closest corner of the courts are approximately 30 feet from the building set back line. There is no spectator seating around the courts and no organized tournaments are played on the courts. The courts are oriented at approximately a 45-degree angle to the property line and are lighted between 6 AM and midnight. Orinda Senior Village is approximately 100 feet from the closest portion of the courts. No noise complaints from OSV have been received.</p> <p>Noise impacts from use of the tennis courts is less than significant; however, it may be perceived as a nuisance to some occupants who may not be aware of their presence prior to moving into a residence on the former library site. According to the project sponsor, prospective tenants of the residences next to the tennis courts will be informed of the presence of the tennis courts and the potential noise associated with use of the courts prior to moving in.</p> <p>Temporary construction noise will have less than significant noise and vibration impacts. The Orinda Municipal Code restricts construction hours on Monday through Friday from 8 AM to 6 PM and on Saturday and Sunday from 10 AM to 5 PM. On Sundays, construction is limited to the property owner and one additional person. Compliance with the noise regulations of the municipal code will result in less than significant noise impacts from construction activities.</p> <p>A slight increase in traffic during construction would produce an insignificant increase in the noise levels in the project vicinity. No permanent increase in ambient noise levels would result.</p> <p>The proposed project is not located within an airport land use plan or within the vicinity of a private airstrip.</p>					
<b>XIII. POPULATION AND HOUSING -- <i>Would the project:</i></b>					
a) Induce substantial population growth in an area, either directly (for example, by					X

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X
<p>The proposed project will cause a minor increase in the population in the area. However, the increase in population will be less than substantial and development of the former library site will not displace any existing housing and as a function of its infill location in downtown Orinda, will not induce additional population growth through the extension of roads or other infrastructure.</p>				
<b>XIV. PUBLIC SERVICES -- <i>Would the project:</i></b>				
<p>a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:</p>				
Fire protection?			X	
Police protection?				X
Schools?				X
Parks?				X
Other public facilities?				X

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
<p>Multi-family residential development on the former library site would increase, to a very limited degree, the demand for certain existing public services in Orinda. No new or physically altered governmental facilities would be needed to provide services such as fire protection, police protection, schools or parks following development on the vacant parcel.</p> <p>The conceptual development plans for the Eden development proposal have been reviewed by MOFD and will be required to comply with the fire district's requirements.</p> <p>The project would generate little or no addition demand for police protection, according to the Orinda Police Department.</p> <p>General Plan policy 2.2.1.E states "Retain existing private and public recreation open space, and acquire additional land for public park development to meet the needs of all sectors of Orinda and all age groups in the community. A minimum of five acres of land for each 1,000 city residents should be devoted to public park and recreational purposes but more may be needed." Based on the current population of 18,271 residents, 91.3 acres of parkland are required to meet the General Plan policy. Currently there are a total of 171.8 acres of public park land in Orinda, or 80.5 acres in excess of the General Plan policy. Development of 71 additional units with an average of 1.2 occupants per unit will generate the demand for approximately 0.43 acres of parkland. The existing parkland in the City is adequate to accommodate the additional demand projected by the project.</p> <p>Developers of multi-family residential projects typically are required to pay City and regional development impact fees for traffic impacts and City impact fees for impacts to drainage infrastructure and parks; however, affordable housing projects are exempt from payment of City impact fees (OMC sections 3.20.040.E, 3.24.240.E, and 3.28.240.E). Affordable housing projects are not exempt from regional traffic impact fees.</p> <p>The project is an affordable senior housing development. Therefore, school aged children are highly unlikely to occupy the residences and no impacts to schools are expected.</p>				
<b>XV. RECREATION -- <i>Would the project:</i></b>				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Does the project include recreational facilities or require the construction or				X



	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
expansion of recreational facilities that might have an adverse physical effect on the environment?				
<p>The project site is adjacent to the Orinda Community Park and existing residents of OSV frequent the park typically for passive recreational use. The addition of 71 additional units occupied by seniors will result in minor increase in the use of the park by seniors but is not anticipated to result in substantial physical deterioration of the park facilities.</p> <p>The proposed development standards include a requirement for on-site outdoor open space and the conceptual development plans for the Eden Housing project include a communal dining facility, a library, and an exercise area, none of which expand into the surrounding environment in such a way that can cause adverse physical effects.</p>				
<b>XVI. TRANSPORTATION/TRAFFIC -- <i>Would the project:</i></b>				
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			X	
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?				X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
e) Result in inadequate emergency access?				X
f) Result in inadequate parking capacity?			X	
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X

According to the Eden Senior Housing Traffic Study prepared by the TJKM Transportation Consultants, the proposed project is expected to generate approximately 247 daily trips on a typical weekday. The peak volume of traffic for multi-family senior housing projects does not coincide with the traditional peak commute hours, which are 7 AM to 9 AM and 4 PM to 6 PM. According to the TJKM study, the conceptual Eden Housing project will generate 9 trips and 11 trips during the AM and PM peak commute hours, respectively. All study intersections operate at an acceptable level of service (LOS) C or better under existing conditions. With the addition of approved and the proposed project trips, all the study intersections are expected to continue to operate acceptably (LOS C or better) during both peak hours. The increase in traffic will not be substantial.

Under the existing PS zoning designation for the 2 Irwin Way site, land uses that generate substantially greater amounts of traffic are allowed.

The proposed project is not near any air strip. The proposed project will not be engaging in any activities that can impose any danger on the air craft traveling above it (such as by disrupting radar and communications). The project amends the land use designation and zoning to allow the development of affordable senior housing in structures no greater than four stories tall and cannot interfere with existing air traffic patterns.

The proposed project does not have any design features that can create hazards for the surrounding traffic and people. Vehicles existing the parking lot indicated in the conceptual development plans have adequate line of sight towards the Orinda Way/ Irwin Way intersection (downhill grade) and towards the Orinda Community Church & Orinda Senior Village (uphill grade) and with implementation of the driveway visibility requirements of section 17.16.12 of the OMC, line-of-sight will be maintained. The design of the proposed project will also improve safety on Irwin Way with the inclusion of a sidewalk. The proposed project is likely to improve road and pedestrian safety.

The proposed development standards and the conceptual Eden Housing design will not

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
<p>result in inadequate emergency access. The sites are easily accessible from Orinda Way and Irwin Way.</p> <p>The proposed parking standards are for 0.5 stalls per senior occupied unit, 1 per manager occupied unit and 1 guest space per 10 units. The conceptual building design submitted by Eden Housing provides a 10-space surface parking lot for use by the community on the adjacent property owned by the Orinda Community Church, a 37-stall on-site garage for residents and 7 on-site surface parking spaces for visitors near the building's entrance. TJKM in the recent past has conducted senior housing parking studies. Analysis of these parking studies found that the peak parking demand ratio surveyed at sites in San Ramon and San Leandro ranges from a low 0.36 vehicles per dwelling unit to a high of 0.49 vehicles per dwelling unit. According to the TJKM Traffic Study, the proposed site has parking generation characteristics similar to the San Ramon site. The expected peak parking demand for the project would be approximately 34 spaces (0.49 x 68). Thus, the provided number of parking spaces is expected to be adequate.</p> <p>The proposed project will not conflict with adopted policies or plans.</p>				
<b>XVII. UTILITIES AND SERVICES SYSTEMS</b>				
<i>-- Would the project:</i>				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	
c) Require or result in the construction of a new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X
<p>Development of senior housing would slightly increase the demand for utilities and services systems such as storm water drainage, wastewater treatment, water and landfill services.</p> <p>No new or physically altered facilities would be needed off-site to provide such services following development of the project. Central Contra Costa Sanitary District and East Bay Municipal Utility District have confirmed that adequate sanitary and water systems infrastructure exist to provide sewer and water service to the site (attached). Such development would be required to pay applicable development fees to EBMUD and CCCSD to offset any system impacts with connection fees.</p>				
<b>XVIII. MANDATORY FINDINGS OF SIGNIFICANCE</b>				
a) 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, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important				X

	Summary of Impacts			
	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less than Significant Impact	No Impact
examples of the major periods of California history or prehistory?				
b) 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, the effects of other current projects, and the effects of probable future projects)?				X
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?				X
<p>None of the standards for mandatory findings of significance are met. With regard to cumulative impacts, development of the senior affordable housing project would not result in any significant environmental impacts. Likewise, the project would not result in any incremental effects that would be cumulatively considerable when viewed in combination with past and probably future projects. Thus, the cumulative impacts of this project are less than significant.</p>				

**Attachments:**

1. Arborist Report, Kielty Arborist Services, January 4, 2010
2. Geotechnical Investigation, AMSO Consulting Engineers, November 23, 2009
3. Geotechnical Engineering Peer Review, Fugro West, Inc. February 1, 2010
4. Eden Senior Housing Traffic Study, TJKM Transportation Consultants, February 2, 2010
5. Conceptual development plans (8 ½ " X 11" reduction)
6. Planning Commission Staff Report with recommended land use policy changes, September 14, 2010.
7. CCCSD and EBMUD Will Serve letters, October 14 and 18, 2010

# Kielty Arborist Services

P.O. Box 6187  
San Mateo, CA 94403  
650-525-1464

January 4, 2010

Mr. Woody Karp  
Senior Project Developer  
Eden Housing, Inc.  
22645 Grand Street  
Hayward, CA 94541

Site: 2 Irwin Way, Orinda, CA

Dear Mr. Karp,

At your request on Monday, December 28, 2009, I visited the above location for the purpose of inspecting and commenting on the trees on site. New structures are planned for this site prompting the need for this report. A tree protection plan will be included for all the trees to be retained. The appraised values for the trees will be included.

## **Method:**

The protected trees at this location were located on a site plan provided by you. Each tree was given an identification number. This number was inscribed on a metal foil tag and nailed to each tree at eye level. The trees were then measured for diameter at 54 inches above ground level (DBH or diameter at breast height). The trees were each given a condition rating of 1 – 100 representing form and vitality using the following system.

1	-	29	Very Poor
30	-	49	Poor
50	-	69	Fair
70	-	89	Good
90	-	100	Excellent

The height of each tree was estimated and the spread was paced off. Lastly, a comments section will be provided.

The appraised values of the trees were calculated by using the Trunk Formula Method. The trunk formula method is a preferred method approved by the International Society of Arboriculture.



**Summary:**

The trees located at the above site are a mix of native oaks and imported trees (exotics). The property has a high number of trees for the size of the lot and in areas is quite dense. This overcrowding has caused many of the trees to grow in a suppressed manner resulting in poor form. The trees competing for available light have grown with a lean or are extremely tall for their individual diameter.

The oaks on site are no exception; many of the trees have grown with severe leans. The Monterey pines are fast growing, short lived trees that for a period of time will out compete the native oaks. The Monterey pines have become quite mature and have begun to decline. As the pines decline they will become susceptible to red turpentine bark beetle. Several of the pines are currently showing symptoms of the beetle. As beetle numbers increase the decline of the pines will accelerate.

The eucalyptus trees have a history of limb loss common for this species. The eucalyptus trees are also a fast growing tree often considered invasive. The remaining imported trees on the library site have competed with the larger trees or have had years of neglect and may not be good candidates for retention. The small pistache, pears and oaks on the church lot may be candidates for relocation.

A large number of trees will be removed from the site to facilitate the planned new construction. The majority of the imported trees should be removed and can be replaced at the time of landscaping. The pines will become hazardous if surrounding trees are removed exposing the suppressed trees. The majority of the native oaks are near the perimeter of the property. With proper tree protection they may possibly be retained.

**Tree Protection Plan:**

Tree protection zones:

- ◆ Should be established and maintained throughout the entire length of the project.
- ◆ Fencing for the protection zones should be 6 foot tall metal chain link type supported by 2 inch metal poles pounded into the ground by no less than 2 feet. The support poles should be spaced no more than 10 feet apart on center.
- ◆ The location for the protection fencing should be as close to the dripline as possible still allowing room for construction to safely continue.
- ◆ Signs should be placed on fencing signifying "Tree Protection Zone - Keep Out".
- ◆ No materials or equipment should be stored or cleaned inside the tree protection zones.
- ◆ Areas outside the fencing but still beneath the dripline of protected trees, where foot traffic is expected to be heavy, should be mulched with 4 to 6 inches of chipper chips. The spreading of chips will help to relieve compaction and improve the soil structure.

**KIELTY ARBORIST SERVICES**

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P.O. Box 6187, San Mateo, CA 94403 • TEL (650) 525-1464 • FAX (650) 525-1439  
[Kkarbor0476@yahoo.com](mailto:Kkarbor0476@yahoo.com)

**Root Cutting:**

- ◆ Any roots to be cut should be monitored and documented.
- ◆ Large roots or large masses of roots to be cut should be inspected by the site arborist.
- ◆ The site arborist may recommend fertilizing or irrigation if root cutting is significant.
- ◆ Cut all roots clean with a saw or loppers.
- ◆ Roots to be left exposed for a period of time should be covered with layers of burlap and kept moist.

**Trenching:**

- ◆ Trenching for irrigation, electrical, drainage or any other reason should be hand dug when beneath the driplines of protected trees. Hand digging and carefully laying pipes below or beside protected roots will dramatically reduce root loss of desired trees thus reducing trauma to the entire tree.
- ◆ Trenches should be backfilled as soon as possible with native material and compacted to near its original level.
- ◆ Trenches that must be left exposed for a period of time should also be covered with layers of burlap and kept moist. Plywood over the top of the trench will also help protect exposed roots below.

**Irrigation:**

- ◆ Normal irrigation should be maintained throughout the entire length of the project.
- ◆ The imported trees on this site will require irrigation during the warm season months.
- ◆ During the summer months the trees on this site should receive heavy flood type irrigation 2 times a month.
- ◆ Irrigation during the winter months may also be necessary, depending on the seasonal rainfall. Flood type irrigation 1 time per month, during the fall and winter months may be advised by the site arborist.
- ◆ Mulching the root zone of protected trees will help the soil retain moisture, thus reducing water consumption.

**Demolition:**

- ◆ During the demolition process all tree protection must be in place.
- ◆ An inspection prior to the start of the demolition is required.
- ◆ A pre-demolition meeting with the site arborist is highly advised.
- ◆ All vehicles must remain on paved surfaces if possible. If vehicles are to stray from paved surfaces, 4 to 6 inches of chips shall be spread and plywood laid over the mulch layer when inside root zones. This type of landscape buffer will help reduce compaction of desired trees.
- ◆ Parking will not be allowed off the paved surfaces near protected trees.

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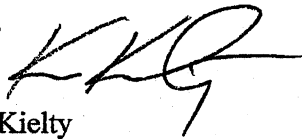
- ◆ The removal of foundation materials (including curbs, asphalt and retaining walls), when inside the driplines of protected trees, should be carried out with care. Hand excavation may be required in areas of heavy rooting.
- ◆ Exposed or damaged roots should be repaired and covered with native soil.
- ◆ Tree protection fencing may need to be moved after the demolition. The site arborist should be notified and the relocated fence should be inspected.

**Inspection Schedule**

- ◆ A tree protection schedule will be required prior to any construction activities including demolition.
- ◆ A pre construction meeting with the contractor may be required prior to the start of construction.
- ◆ The site arborist will be on site for any excavation near protected trees.
- ◆ Monthly documented inspections of the construction site are highly recommended.
- ◆ All other inspections will be on an as needed basis.

This information should be kept on site at all times. The information included in this report is believed to be true and based on sound arboricultural principles and practices.

Sincerely,



Kevin R. Kielty  
Certified Arborist WE#0476A



**KIELTY ARBORIST SERVICES**

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# Tree Survey

Kevin R. Kiely  
Certified Arborist  
650-515-9783

## Site: Orinda Senior Housing

Tree #	Species	Botanical Name	DBH (inches)	Condition	Ht./ Spread	Comments
1	Coast live oak	<i>Quercus agrifolia</i>	13.2, 16.2	60	35/30	Codominant at base with poor crotch; included bark; Abundance of lower deadwood; good vigor.
2	Coast live oak	<i>Quercus agrifolia</i>	15.8	65	30/30	Good form and vigor; slight bend in trunk; on slope below parking; good vigor.
3	Fruitless Mulberry	<i>Morus alba</i>	15.2	45	35/35	Pollarded in past; 8" from pavement; poor crotch at 5'.
4	Fruitless Mulberry	<i>Morus alba</i>	14.1	40	30/25	Pollarded in past; 8" from pavement; poor crotch at 3'.
5	Coast live oak	<i>Quercus agrifolia</i>	8.5	60	30/15	On slope below parking; suppressed by # 4.
6	Fruitless Mulberry	<i>Morus alba</i>	12" est.	35	25/20	poor crotch at 3'; decay from past wounding.
7	Fruitless Mulberry	<i>Morus alba</i>	3 x 3" est.	30	20/15	Resprouts from previously removed tree; suppressed by #8.
8	Coast live oak	<i>Quercus agrifolia</i>	18.4, 16.3	60	40/40	Codominant at 1'; poor crotch formation; included bark; good vigor; abundance of lower deadwood.
9	Arbutus marina	<i>Arbutus marina</i>	4.1	75	15/10	Good vigor; leans south west; slight stump sprouts.
10	Arbutus marina	<i>Arbutus marina</i>	3.6	50	15/10	Decline in top; leans south west; stump sprouts.
11	Coast redwood	<i>Sequoia sempervirens</i>	18.8, 18.4, 18.3	70	60/40	Codominant at 1'; good vigor.
12	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	7.5	35	20/10	In decline.
13	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	3.4	45	15/10	Fair vigor; poor form; sap sucker damage on trunk.
14	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	4.4	35	15/10	Sap sucker on trunk; in decline.
15	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	4	35	15/10	In decline.
16	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	3.1, 3.2	35	15/10	In decline; codominant at base.
17	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	5.1, 5.3	40	15/10	In decline; codominant at base.
18	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	5.1	40	15/10	In decline.
19	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	2.3, 2.8	30	10/10	codominant at 1'; decay on main trunk.
20	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	4.5, 6.2	50	20/15	Codominant at base; poor form; fair vigor.
21	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	5.8	45	10/10	In decline.
22	Catalina cherry	<i>Prunus ilicifolia lyonii</i>	5.9	55	10/10	Good vigor; leans west.
23	Pittosporum	<i>Pittosporum eugenioides</i>	14" est.	45	30/25	In decline; limb die cack.
24	Pittosporum	<i>Pittosporum eugenioides</i>	12" est.	40	20/15	Decay at base; poor form.
25	Monterey pine	<i>Pinus radiata</i>	25.4	50	50/40	Vigor poor to fair heavy to south west.
26	Monterey pine	<i>Pinus radiata</i>	15.5	0	35/25	Dead.
27	Coast live oak	<i>Quercus agrifolia</i>	5.6	70	10/10	Longest of several volunteers.
28	Monterey pine	<i>Pinus radiata</i>	27.4	45	60/40	History of bark beetle; vigor is fair.
29	Monterey pine	<i>Pinus radiata</i>	22.2	45	55/35	In decline; vigor poor; form poor.
30	Monterey pine	<i>Pinus radiata</i>	17.3	50	55/30	Tall for DBH; leans south.
31	Valley oak	<i>Quercus lobata</i>	6" est.	45	50/10	Top has failed; decay from that point.
32	Valley oak	<i>Quercus lobata</i>	21.2	60	45/40	Codominant at 10'; multi from that point; vigor fair.
33	Coast live oak	<i>Quercus agrifolia</i>	13.7	60	40/45	Heavy to the east; good vigor at edge of south wall.
34	Valley oak	<i>Quercus lobata</i>	11.9	55	40/30	Suppressed by trees to west near drain swail.
35	Valley oak	<i>Quercus lobata</i>	8.7	55	30/20	Suppressed by #37; leans east over parking.

# Tree Survey

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Certified Arborist  
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Tree #	Species	Botanical Name	DBH (inches)	Condition	Ht./ Spread	Comments
36	Coast live oak	<i>Quercus agrifolia</i>	13.6	45	40/50	Leans south east at 45 degree angle; root crown covered with debris; vigor good.
37	Coast live oak	<i>Quercus agrifolia</i>	26.4	65	55/50	On drainage bank; codominant at 5'; heavy to north. Suppressed trunk bends south than north; on drainage bank.
38	Coast live oak	<i>Quercus agrifolia</i>	18.4	60	60/40	Top is thinning abundance of lower deadwood.
39	Monterey pine	<i>Pinus radiata</i>	25.8	55	70/40	Top is thinning; tall for DBH.
40	Monterey pine	<i>Pinus radiata</i>	15.3	95	65/25	Suppressed by # 40-42; leans to east; abundance of lower deadwood.
41	Monterey pine	<i>Pinus radiata</i>	24.2	50	65/40	Leans to South West; large surface roots; abundance of lower deadwood.
42	Monterey pine	<i>Pinus radiata</i>	26.3	55	65/55	Grown in shock; spindly.
43	Incense cedar	<i>Calocedrus decurrens</i>	6.1	55	30/10	Grown in shock; spindly.
44	Incense cedar	<i>Calocedrus decurrens</i>	6.8	50	30/10	Grown in shock; spindly.
45	Incense cedar	<i>Calocedrus decurrens</i>	7.2	50	30/10	Grown in shock; spindly.
46	Incense cedar	<i>Calocedrus decurrens</i>	6.1	0	25/10	Dead.
47	Monterey pine	<i>Pinus radiata</i>	18.5	45	50/45	Vigor fair; leans heavily to south east over drive.
48	Monterey pine	<i>Pinus radiata</i>	22	55	45/40	Heavy to south west; in decline.
49	Birch	<i>Betula pendula</i>	4.4, 6.4, 5.2	40	35/25	3 trunks from base (clump); canker on south trunk.
50	Birch	<i>Betula pendula</i>	7	10	30/20	Nearly dead; decay in trunk; hazard.
51	Incense cedar	<i>Calocedrus decurrens</i>	12.1	50	40/20	Codominant at 12'; foliage thin.
52	Incense cedar	<i>Calocedrus decurrens</i>	8.1	55	40/10	Tall for DBH; spindly.
53	Incense cedar	<i>Calocedrus decurrens</i>	6.9	0	35/10	Dead; leaning on 52 (failed).
54	Monterey pine	<i>Pinus radiata</i>	13.4	50	40/30	Leans heavily to west over existing building; hazard.
55	Monterey pine	<i>Pinus radiata</i>	21.6	55	70/50	Leans south; abundance of lower deadwood.
56	Monterey pine	<i>Pinus radiata</i>	10.9	40	50/40	Leans west over existing building; in decline; hazard.
57	Monterey pine	<i>Pinus radiata</i>	17.1	50	70/40	Tall for DBH; leans west (suppressed).
58	Incense cedar	<i>Calocedrus decurrens</i>	6	55	35/10	Tall for DBH; spindly.
59	Monterey pine	<i>Pinus radiata</i>	15.3	50	65/35	Trunk bends west over building; hazard.
60	Monterey pine	<i>Pinus radiata</i>	20.9	55	70/40	Trunk bends west then south; tall for DBH.
61	Monterey pine	<i>Pinus radiata</i>	16" est.	55	65/40	Codominant at 35'; foliage thin.
62	Monterey pine	<i>Pinus radiata</i>	9.4	40	45/40	Trunk bends west over building; hazard.
63	Monterey pine	<i>Pinus radiata</i>	19.1	50	65/40	Codominant at 35' from past topping.
64	Arizona Cypress	<i>Cupressus arizonica</i>	6.8	0	40/20	Dead.
65	Coast live oak	<i>Quercus agrifolia</i>	16.1, 9.6	60	40/45	Codominant at base; in drainage area; good vigor.
66	Canary island pine	<i>Canariensis</i>	9.1	30	40/15	Suppressed by tree #67; tall for DBH; no live foliage till 30'.
67	Monterey pine	<i>Pinus radiata</i>	37.2	65	70/50	Leans to east over parking; heavy lateral limbs; vigor is fair.
68	Coast live oak	<i>Quercus agrifolia</i>	6.5	65	35/30	Good vigor; fair form; scar on trunk at 2'.
69	Monterey pine	<i>Pinus radiata</i>	9.6	45	35/35	Wester gull rust disease on limbs; leans east.
70	Coast live oak	<i>Quercus agrifolia</i>	11.7	65	35/30	Codominant at 8'; good vigor.

# Tree Survey

Kevin R. Kielty  
Certified Arborist  
650-515-9783

Tree #	Species	Botanical Name	DBH (inches)	Condition	Ht./ Spread	Comments
71	Valley oak	<i>Quercus lobata</i>	11.1	65	40/25	Leans to northeast; suppressed
72	Monterey pine	<i>Pinus radiata</i>	28 est.	60	80/50	Suppressed; leans north
73	Monterey pine	<i>Pinus radiata</i>	40.8	55	85/60	Foliage thin; abundance of lower deadwood
74	Coast live oak	<i>Quercus agrifolia</i>	13.4	55	25/30	Leans west 45 degree angle
75	Monterey pine	<i>Pinus radiata</i>	24.9	50	65/30	Leans west; suppressed
76	Monterey pine	<i>Pinus radiata</i>	11.2	25	35/25	Nearly dead
77	Coast live oak	<i>Quercus agrifolia</i>	12.3	50	20/20	Leans heavily to west over building
78	Coast live oak	<i>Quercus agrifolia</i>	9.9	50	25/20	Leans heavily to west over building
79	Monterey pine	<i>Pinus radiata</i>	24 est.	60	60/25	Leans heavily to west over building
80	Monterey pine	<i>Pinus radiata</i>	23.7	60	70/35	Vigor fair; Tall for DBH
81	Monterey pine	<i>Pinus radiata</i>	27.4	50	70/40	Codominant @25'; Poor crotch formations
82	Monterey pine	<i>Pinus radiata</i>	20.6	45	70/30	Tall for DBH; Foliage thin
83	Monterey pine	<i>Pinus radiata</i>	19.9	50	65/20	Tall for DBH; Western Gall rust on trunk
84	Monterey pine	<i>Pinus radiata</i>	21.9	55	65/30	Tall for DBH; Suppressed
85	Monterey pine	<i>Pinus radiata</i>	23.4	55	70/45	Trunk bends west
86	Monterey pine	<i>Pinus radiata</i>	20.6	50	65/40	Codominant @ 10'
87	Monterey pine	<i>Pinus radiata</i>	20.1	45	75/35	Codominant @ 40'; bends east
88	Monterey pine	<i>Pinus radiata</i>	17.6	40	70/20	Leans heavily on tree #87
89	Incense cedar	<i>Calocedrus decurrens</i>	6.9	55	35/15	Suppressed by larger trees
90	Incense cedar	<i>Calocedrus decurrens</i>	5.6, 4.4	45	30/15	Codominant @ base; Suppressed
91	Incense cedar	<i>Calocedrus decurrens</i>	7.2, 3.9	45	30/15	Codominant @ base; Suppressed
92	Monterey pine	<i>Pinus radiata</i>	24.7	55	80/40	Tall for DBH; Ivy to 40'
93	Arizona Cypress	<i>Cupressus arizonica</i>	5.6, 6.4	35	35/25	Codominant @ 1'; Foliage thin
94	Monterey pine	<i>Pinus radiata</i>	23.7	35	65/40	Codominant @ 15' with included bark
95	Cottonwood	<i>Populus fremontii</i>	34.1	60	60/25	Large limbs removed @ 20'; Vigor fair; Hazard
96	Monterey pine	<i>Pinus radiata</i>	20 est.	50	70/40	Very tall for DBH; Poison oak on trunk
97	Monterey pine	<i>Pinus radiata</i>	21.3	45	70/40	Severely codominant @ 30'
98	Monterey pine	<i>Pinus radiata</i>	15.3	55	70/35	Tall for DBH; Codominant @ 40'
99	Monterey pine	<i>Pinus radiata</i>	24.6	55	70/40	Trunk bends to south
100	Monterey pine	<i>Pinus radiata</i>	18.5	55	55/35	Heavy lateral limbs
101	Monterey pine	<i>Pinus radiata</i>	23.4	55	70/30	No live foliage for 40'
102	Monterey pine	<i>Pinus radiata</i>	19.9	50	70/40	Tall for DBH; Trunk bends south; Codominant @ 40'
103	Coast live oak	<i>Quercus agrifolia</i>	16.9	65	45/40	Codominant @ 15'; Fair crotch
104	Monterey pine	<i>Pinus radiata</i>	15.1	50	65/20	Tall for DBH
105	Monterey pine	<i>Pinus radiata</i>	20.2	55	70/30	Western gall rust on limbs
106	Monterey pine	<i>Pinus radiata</i>	27.6	50	65/40	Foliage thin; branches on one side
107	Monterey pine	<i>Pinus radiata</i>	29.8	55	80/50	History of limb breakage
108	Coast live oak	<i>Quercus agrifolia</i>	7.5	60	30/15	Suppressed by Tree # 107
109	Monterey pine	<i>Pinus radiata</i>	37.2	55	70/50	Leans slightly south; foliage thinning
110	Monterey pine	<i>Pinus radiata</i>	24.4	50	60/35	All foliage on west side
111	Red gum eucalyptus	<i>Eucalyptus camaldulensis</i>	28 est.	60	60/55	Good vigor; Multi leader @ base; Leans west
112	Red gum eucalyptus	<i>Eucalyptus camaldulensis</i>	25.7	60	55/50	Recent large limb failure



# Tree Survey

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Tree #	Species	Botanical Name	DBH (inches)	Condition	Ht./ Spread	Comments
113	Red gum eucalyptus	<i>Eucalyptus carnaldulensis</i>	22.6	65	60/40	Good vigor; Heavy to south
114	Maytens	<i>Maytenus boaria</i>	15.9	55	30/35	History of recent limb failure
115	Valley oak	<i>Quercus lobata</i>	16 est.	70	45/35	Multi leader @ 10'
116	Evergreen pear	<i>Pyrus kawakamii</i>	8.1	60	20/30	Form fair; leaf spot on defoliated tree
117	Evergreen pear	<i>Pyrus kawakamii</i>	7.8	60	20/30	Form fair; leaf spot on defoliated tree
118	Evergreen pear	<i>Pyrus kawakamii</i>	6.9	60	20/30	Form fair; leaf spot on defoliated tree
119	Evergreen pear	<i>Pyrus kawakamii</i>	6.2	60	20/30	Grown in shade; Codominant @ 6'
120	Monterey pine	<i>Pinus radiata</i>	23.8	55	50/35	Vigor fair; Leans east
121	Monterey pine	<i>Pinus radiata</i>	19.2	45	70/40	Tall for DBH; leans south.
122	Monterey pine	<i>Pinus radiata</i>	24.8	55	70/45	Abundance of deadwood
123	Monterey pine	<i>Pinus radiata</i>	29.9	60	70/60	Good vigor; Leans south
124	Monterey pine	<i>Pinus radiata</i>	20.1	45	50/35	Stunted by larger pine
125	Monterey pine	<i>Pinus radiata</i>	23.5	55	65/40	Leans to south; Vigor fair
126	Chinese pistache	<i>Pistacia chinensis</i>	6.2	70	30/20	Form good; Vigor good
127	Evergreen pear	<i>Pyrus kawakamii</i>	7.1	60	25/25	Sprouting from root stalk
128	Evergreen pear	<i>Pyrus kawakamii</i>	6.5	60	25/25	Sprouting from root stalk
129	Evergreen pear	<i>Pyrus kawakamii</i>	7.6	60	25/25	Sprouting from root stalk
130	Chinese pistache	<i>Pistacia chinensis</i>	5.6	75	30/20	Form good; Vigor good
131	Valley oak	<i>Quercus lobata</i>	6.4	65	30/15	Codominant @ 10'
132	Chinese pistache	<i>Pistacia chinensis</i>	4	70	30/15	Suppressed by Tree # 133
133	Coast live oak	<i>Quercus agrifolia</i>	13 est.	65	35/30	Multi leader @ 3'; Vigor fair
134	Monterey pine	<i>Pinus radiata</i>	5.6	45	15/15	Leans west; Western gall rust; Suppressed
135	Coast live oak	<i>Quercus agrifolia</i>	13.5	60	40/30	Vigor good; Roots exposed by drain pipe; Leans south
136	Coast live oak	<i>Quercus agrifolia</i>	12 est.	60	30/25	Vigor good; Multi leader @ 3'
137	Chinese pistache	<i>Pistacia chinensis</i>	5.2	70	25/30	Trunk swoops to south

Tree Survey

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Site: Orinda Senior Housing Project - Values

Tree #	Species	Nursery Group	Adjusted DBH (Inches)	Trunk Area (TA)	Replacement Trunk Area (TA <sub>r</sub> )	TA <sub>net</sub> (= TA - TA <sub>r</sub> )	Basic Tree Cost (= TA <sub>net</sub> x Unit Tree Cost)	Installed tree cost (= \$30.00)	Condition	Location	Species	Unit Tree Cost
1	Coast live oak	3	29	660	2.2	657.8	\$29,904	\$30,254	60%	75%	90%	\$12,253
2	Coast live oak	3	15.8	201	2.2	198.8	\$9,037	\$9,387	65%	75%	90%	\$4,119
3	Fruitless Mulberry	3	15.2	177	2.2	174.8	\$7,946	\$8,296	45%	75%	50%	\$1,400
4	Fruitless Mulberry	3	14.1	154	2.2	151.8	\$6,901	\$7,251	40%	75%	50%	\$1,088
5	Coast live oak	3	8.5	64	2.2	61.8	\$2,809	\$3,159	60%	75%	90%	\$1,280
6	Fruitless Mulberry	3	12	113	2.2	110.8	\$5,037	\$5,387	35%	75%	50%	\$707
7	Fruitless Mulberry	3	9	64	2.2	61.8	\$2,809	\$3,159	30%	75%	50%	\$355
8	Coast live oak	3	25	491	2.2	488.8	\$22,221	\$22,571	60%	75%	90%	\$9,141
9	Arbutus marina	2	4.1	13	1.69	11.31	\$871	\$1,221	75%	75%	90%	\$618
10	Arbutus marina	2	3.6	13	1.69	11.31	\$871	\$1,221	50%	75%	90%	\$412
11	Coast redwood	4	55	1711	2.46	1708.54	\$62,123	\$62,473	70%	75%	70%	\$22,959
12	Catalina Cherry	2	7.5	50	1.69	48.31	\$3,722	\$4,072	35%	75%	50%	\$534
13	Catalina Cherry	2	3.4	7	1.69	5.31	\$409	\$759	45%	75%	50%	\$128
14	Catalina Cherry	2	4.4	13	1.69	11.31	\$871	\$1,221	35%	75%	50%	\$160
15	Catalina Cherry	2	4	13	1.69	11.31	\$871	\$1,221	35%	75%	50%	\$160
16	Catalina Cherry	2	6	28	1.69	26.31	\$2,027	\$2,377	35%	75%	50%	\$312
17	Catalina Cherry	2	10	79	1.69	77.31	\$5,956	\$6,306	40%	75%	50%	\$946
18	Catalina Cherry	2	5.1	20	1.69	18.31	\$1,411	\$1,761	40%	75%	50%	\$264
19	Catalina Cherry	2	5	20	1.69	18.31	\$1,411	\$1,761	30%	75%	50%	\$198
20	Catalina Cherry	2	10	79	1.69	77.31	\$5,956	\$6,306	50%	75%	50%	\$1,182
21	Catalina Cherry	2	5.8	28	1.69	26.31	\$2,027	\$2,377	45%	75%	50%	\$401
22	Catalina Cherry	2	5.9	28	1.69	26.31	\$2,027	\$2,377	55%	75%	50%	\$490
23	Pittisporum	2	14	154	1.69	152.31	\$11,734	\$12,084	45%	75%	70%	\$2,855
24	Pittisporum	2	12	113	1.69	111.31	\$8,575	\$8,925	40%	75%	70%	\$1,874
25	Monterey pine	4	25.4	491	2.46	488.54	\$17,763	\$18,113	50%	75%	30%	\$2,038
26	Monterey pine	4	15.5	201	2.46	198.54	\$7,219	\$7,569	0%	75%	30%	\$0
27	Coast live oak	3	5.6	28	2.2	25.8	\$1,173	\$1,523	70%	75%	90%	\$720
28	Monterey pine	4	27.4	572	2.46	569.54	\$20,708	\$21,058	45%	75%	30%	\$2,132
29	Monterey pine	4	22.2	380	2.46	377.54	\$13,727	\$14,077	45%	75%	30%	\$1,425
30	Monterey pine	4	17.3	227	2.46	224.54	\$8,164	\$8,514	50%	75%	30%	\$958
31	Valley oak	2	6	28	1.69	26.31	\$2,027	\$2,377	45%	75%	90%	\$722
32	Valley oak	2	21.2	346	1.69	344.31	\$26,526	\$26,876	60%	75%	90%	\$10,885
33	Coast live oak	3	13.7	154	2.2	151.8	\$6,901	\$7,251	60%	75%	90%	\$2,937
34	Valley oak	2	11.9	113	1.69	111.31	\$8,575	\$8,925	55%	75%	90%	\$3,314
35	Valley oak	2	8.7	64	1.69	62.31	\$4,800	\$5,150	55%	75%	90%	\$1,912
36	Coast live oak	3	13.6	154	2.2	151.8	\$6,901	\$7,251	45%	75%	90%	\$2,202
37	Coast live oak	3	26.4	531	2.2	528.8	\$24,039	\$24,389	65%	75%	90%	\$10,701
38	Coast live oak	3	18.4	254	2.2	251.8	\$11,447	\$11,797	60%	75%	90%	\$4,778

# Tree Survey

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Tree #	Species	Nursery Group	Adjusted DBH (inches)	Trunk Area (TA)	Replacement Trunk Area (TA <sub>r</sub> )	TA <sub>net</sub> (= TA - TA <sub>r</sub> )	Basic Tree Cost (= TA <sub>net</sub> x Unit Tree Cost)	Installed tree cost (+\$350.00)	Condition	Location	Species	Unit Tree Cost
39	Monterey pine	4	25.8	531	2.46	528.54	\$19,218	\$19,568	55%	75%	30%	\$2,422
40	Monterey pine	4	15.3	177	2.46	174.54	\$6,346	\$6,696	95%	75%	30%	\$1,431
41	Monterey pine	4	24.2	452	2.46	449.54	\$16,345	\$16,695	50%	75%	30%	\$1,878
42	Monterey pine	4	26.3	531	2.46	528.54	\$19,218	\$19,568	55%	75%	30%	\$2,422
43	Incense cedar	1	6.1	28	1.63	26.37	\$2,184	\$2,534	55%	75%	70%	\$732
44	Incense cedar	1	6.8	38	1.63	36.37	\$3,012	\$3,362	50%	75%	70%	\$983
45	Incense cedar	1	7.2	38	1.63	36.37	\$3,012	\$3,362	50%	75%	70%	\$983
46	Incense cedar	1	6.1	28	1.63	26.37	\$2,184	\$2,534	0%	75%	70%	\$0
47	Monterey pine	4	18.5	283	2.46	280.54	\$10,200	\$10,550	45%	75%	30%	\$1,068
48	Monterey pine	4	22	380	2.46	377.54	\$13,727	\$14,077	55%	75%	30%	\$1,742
49	Birch	3	15	177	2.2	174.8	\$7,946	\$8,296	40%	75%	30%	\$747
50	Birch	3	7	38	2.2	35.8	\$1,627	\$1,977	10%	75%	30%	\$44
51	Incense cedar	1	12.1	113	1.63	111.37	\$9,224	\$9,574	50%	75%	70%	\$2,513
52	Incense cedar	1	8.1	50	1.63	48.37	\$4,006	\$4,356	55%	75%	70%	\$1,258
53	Incense cedar	1	6.9	38	1.63	36.37	\$3,012	\$3,362	0%	75%	70%	\$0
54	Monterey pine	4	13.4	133	2.46	130.54	\$4,746	\$5,096	50%	75%	30%	\$573
55	Monterey pine	4	21.6	380	2.46	377.54	\$13,727	\$14,077	55%	75%	30%	\$1,742
56	Monterey pine	4	10.9	95	2.46	92.54	\$3,365	\$3,715	40%	75%	30%	\$334
57	Monterey pine	4	17.1	227	2.46	224.54	\$8,164	\$8,514	50%	75%	30%	\$958
58	Incense cedar	1	6	28	1.63	26.37	\$2,184	\$2,534	55%	75%	70%	\$732
59	Monterey pine	4	15.3	177	2.46	174.54	\$6,346	\$6,696	50%	75%	30%	\$753
60	Monterey pine	4	20.9	346	2.46	343.54	\$12,491	\$12,841	55%	75%	30%	\$1,589
61	Monterey pine	4	16	201	2.46	198.54	\$7,219	\$7,569	55%	75%	30%	\$937
62	Monterey pine	4	9.4	64	2.46	61.54	\$2,238	\$2,588	40%	75%	30%	\$233
63	Monterey pine	4	19.1	283	2.46	280.54	\$10,200	\$10,550	50%	75%	30%	\$1,187
64	Arizona Cypress	2	6.8	38	1.69	36.31	\$2,797	\$3,147	0%	75%	50%	\$0
65	Coast live oak	3	26	531	2.2	528.8	\$24,039	\$24,389	60%	75%	90%	\$9,878
66	Canary Island pine	3	9.1	64	2.2	61.8	\$2,809	\$3,159	30%	75%	90%	\$640
67	Monterey pine	4	37.2	1018	2.46	1015.54	\$36,925	\$37,275	65%	75%	30%	\$5,451
68	Coast live oak	3	6.5	38	2.2	35.8	\$1,627	\$1,977	65%	75%	90%	\$868
69	Monterey pine	4	9.6	79	2.46	76.54	\$2,783	\$3,133	45%	75%	30%	\$317
70	Coast live oak	3	11.7	113	2.2	110.8	\$5,037	\$5,387	65%	75%	90%	\$2,364
71	Valley oak	2	11.1	95	1.69	93.31	\$7,189	\$7,539	65%	75%	90%	\$3,308
72	Monterey pine	4	28	615	2.46	612.54	\$22,272	\$22,622	60%	75%	30%	\$3,054
73	Monterey pine	4	40.8	1191	2.46	1188.54	\$43,215	\$43,565	55%	75%	30%	\$5,391
74	Coast live oak	3	13.4	133	2.2	130.8	\$5,946	\$6,296	55%	75%	90%	\$2,337
75	Monterey pine	4	24.9	491	2.46	488.54	\$17,763	\$18,113	50%	75%	30%	\$2,038
76	Monterey pine	4	11.2	95	2.46	92.54	\$3,365	\$3,715	25%	75%	30%	\$209
77	Coast live oak	3	12.3	113	2.2	110.8	\$5,037	\$5,387	50%	75%	90%	\$1,818

# Tree Survey

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Tree #	Species	Nursery Group	Adjusted DBH (inches)	Trunk Area (TA)	Replacement Trunk Area (TA)	T <sub>sur</sub> (= TA - TA <sub>repl</sub> )	Basic Tree Cost (= T <sub>sur</sub> x Unit Tree Cost)	Installed Tree Cost (+\$350.00)	Condition	Location	Species	Unit Tree Cost
78	Coast live oak	3	9.9	79	2.2	76.8	\$3,491	\$3,841	50%	75%	90%	\$1,296
79	Monterey pine	4	24	452	2.46	449.54	\$16,345	\$16,695	60%	75%	30%	\$2,254
80	Monterey pine	4	23.7	452	2.46	449.54	\$16,345	\$16,695	60%	75%	30%	\$2,254
81	Monterey pine	4	27.4	572	2.46	569.54	\$20,708	\$21,058	50%	75%	30%	\$2,369
82	Monterey pine	4	20.6	346	2.46	343.54	\$12,491	\$12,841	45%	75%	30%	\$1,300
83	Monterey pine	4	19.9	314	2.46	311.54	\$11,328	\$11,678	50%	75%	30%	\$1,314
84	Monterey pine	4	21.9	380	2.46	377.54	\$13,727	\$14,077	55%	75%	30%	\$1,742
85	Monterey pine	4	23.4	415	2.46	412.54	\$15,000	\$15,350	55%	75%	30%	\$1,900
86	Monterey pine	4	20.6	346	2.46	343.54	\$12,491	\$12,841	50%	75%	30%	\$1,445
87	Monterey pine	4	20.1	314	2.46	311.54	\$11,328	\$11,678	45%	75%	30%	\$1,182
88	Monterey pine	4	17.6	227	2.46	224.54	\$8,164	\$8,514	40%	75%	30%	\$766
89	Incense cedar	1	6.9	38	1.63	36.37	\$3,012	\$3,362	55%	75%	70%	\$971
90	Incense cedar	1	10	79	1.63	77.37	\$6,408	\$6,758	45%	75%	70%	\$1,597
91	Incense cedar	1	11	95	1.63	93.37	\$7,733	\$8,083	45%	75%	70%	\$1,910
92	Monterey pine	4	24.7	491	2.46	488.54	\$17,763	\$18,113	55%	75%	30%	\$2,242
93	Arizona Cypress	2	12	113	1.69	111.31	\$8,575	\$8,925	35%	75%	50%	\$1,171
94	Monterey pine	4	23.7	452	2.46	449.54	\$16,345	\$16,695	35%	75%	30%	\$1,315
95	Cottonwood	4	34.1	882	2.46	879.54	\$31,980	\$32,330	60%	75%	50%	\$7,274
96	Monterey pine	4	20	314	2.46	311.54	\$11,328	\$11,678	50%	75%	30%	\$1,314
97	Monterey pine	4	21.3	346	2.46	343.54	\$12,491	\$12,841	45%	75%	30%	\$1,300
98	Monterey pine	4	15.3	177	2.46	174.54	\$6,346	\$6,696	55%	75%	30%	\$829
99	Monterey pine	4	24.6	491	2.46	488.54	\$17,763	\$18,113	55%	75%	30%	\$2,242
100	Monterey pine	4	18.5	283	2.46	280.54	\$10,200	\$10,550	55%	75%	30%	\$1,306
101	Monterey pine	4	23.4	415	2.46	412.54	\$15,000	\$15,350	55%	75%	30%	\$1,900
102	Monterey pine	4	19.9	314	2.46	311.54	\$11,328	\$11,678	50%	75%	30%	\$1,314
103	Coast live oak	3	16.9	227	2.2	224.8	\$10,219	\$10,569	65%	75%	90%	\$4,637
104	Monterey pine	4	15.1	177	2.46	174.54	\$6,346	\$6,696	50%	75%	30%	\$753
105	Monterey pine	4	20.2	314	2.46	311.54	\$11,328	\$11,678	55%	75%	30%	\$1,445
106	Monterey pine	4	27.6	615	2.46	612.54	\$22,272	\$22,622	50%	75%	30%	\$2,545
107	Monterey pine	4	29.8	707	2.46	704.54	\$25,617	\$25,967	55%	75%	30%	\$3,213
108	Coast live oak	3	7.5	50	2.2	47.8	\$2,173	\$2,523	60%	75%	90%	\$1,022
109	Monterey pine	4	37.2	1018	2.46	1015.54	\$36,925	\$37,275	55%	75%	30%	\$4,613
110	Monterey pine	4	24.4	452	2.46	449.54	\$16,345	\$16,695	50%	75%	30%	\$1,878
111	Red gum eucalyptus	3	28	615	2.2	612.8	\$27,858	\$28,208	60%	75%	50%	\$6,347
112	Red gum eucalyptus	3	25.7	531	2.2	528.8	\$24,039	\$24,389	60%	75%	50%	\$5,488
113	Red gum eucalyptus	3	22.6	415	2.2	412.8	\$18,766	\$19,116	65%	75%	50%	\$4,659
114	Maytens	1	15.9	201	1.63	199.37	\$16,512	\$16,862	55%	75%	50%	\$3,478
115	Valley oak	2	16	201	1.69	199.31	\$15,355	\$15,705	70%	75%	90%	\$7,421
116	Evergreen pear	1	8.1	50	1.63	48.37	\$4,006	\$4,356	60%	80%	50%	\$1,045

**Kevin R. Kielty**  
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Mr. Woody Karp  
Senior Project Developer  
**Eden Housing, Inc.**  
22645 Grand Street  
Hayward, California 94541

Orinda Planning Dept.

JAN 22 2010

RECEIVED

Subject: Geotechnical Investigation for  
Orinda Senior Housing, 2 Irwin Way  
Orinda, California

Dear Mr. Karp:

This report presents the results of our geotechnical investigation for the Orinda Senior Housing development proposed for construction at the former Orinda Library located at 2 Irwin Way (APN 260-200-017) in Orinda, California.

We understand that the project will include a senior housing residential building that will include 71 units. The building will be between four and three-story high, wood frame construction and will be constructed at-grade. The ground level of the north portion of the building will be used for vehicular parking and will have a concrete slab-on-grade floor. The south portion of the building will have raised wooden floor.

Access to the development will be provided by a paved driveway from Irwin Way. At-grade paved parking will be constructed along the northwest side of the proposed building.

We were provided with an electronic copy of a topographic map of the property and with a Site Plan that shows the location of the proposed buildings. This topographic map was used to prepare our site plan (Figure 2) that shows the location of our exploration holes that were made as part of this geotechnical investigation.

**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.

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2. Explored, sampled and classified subsurface soils by means of eight small diameter exploration borings. A drilling permit (Number 09B-1015) was obtained from the Contra Costa County, Environmental Health Division. At the end of drilling all exploration holes were backfilled with cement slurry and were inspected by a County representative.
3. Performed laboratory testing on soil samples to measure their pertinent index and engineering properties.
4. Reviewed and analyzed of the information collected from our literature review, subsurface exploration and laboratory test data.
5. Developed site seismic characteristics in accordance with the 2007 California Building Code.
6. Prepared this report summarizing our findings, conclusions, and geotechnical recommendations.

## **FINDINGS**

### **Surface Conditions**

The property is located along the northeast corner of the intersection of Orinda and Irwin Way in the City of Orinda, California. The property and the general vicinity slopes down to the southwest with a gradient of about 5:1 (horizontal to vertical) with an average ground elevation of about 465 feet (Based on the USGS Topographic Maps).

The property is bordered by Orinda Way on the south, Irwin Way on the west and partially on the north, a paved parking on the north and by tennis courts and recreation area on the east. At the time of our subsurface exploration in January of 2009, the site was occupied by a one-story building for the former Orinda Library with asphalt concrete paved parking along the south of the building. There is paved driveway that provides access to the rear of the existing building from the neighboring residential building along the north side of the property. Most of the asphalt concrete paved parking and driveways at the property exhibits cracks that are parallel to the slope. These cracks are associated with underlying fill settlement and deformation.

Several wood and concrete retaining walls of various heights are constructed along the uphill side of the building and along the uphill and downhill sides of the parking located along the south side of the existing buildings. These retaining walls will be removed as part of the new project construction.

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### **Subsurface Conditions**

Subsurface conditions under the proposed building were explored by means of eight small diameter exploration borings that were advanced to between 10 feet and 20 feet. Because of access and potential location of underground utilities around exploration boring (B-7), the boring was terminated at a depth of about 2 feet. Within the depths of our exploration, the native soils at the site consist of clay, silt and sand.

The existing paved parking along the south side of the existing building is underlain by a layer of fill soil that varies in thickness between 3 feet (borings B-2 and B-3) and about 7 feet (boring B-1). This fill soil consists mostly of silty clay (CL) of low plasticity and low to moderate potential for expansion. A thin layer of similar fill soil was also encountered within boring (B-4) located within the upper parking behind the existing building.

Below the layers of fill, the site is underlain by very stiff silty clay (CL) of low plasticity and low to moderate potential for expansion. The potential for expansion of this layer of clay was tested by subjecting an undisturbed soil sample to vertical pressure of 1500 pounds per square foot and then submersing with water. Even with this vertical pressure, there was no detected expansion after 48 hours of saturation. Below this layer of clay, the site is underlain by alternate layers of weathered to severely weathered claystone, siltstone and sandstone that extend to the bottom of our exploration holes.

Ground water was not encountered in any of our exploration holes at the time of our subsurface exploration in February of 2009.

The descriptions given above pertain only to the subsurface conditions found at the site at the time of our subsurface exploration in January of 2009. 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 and cone penetration test logs together with the results of some of the laboratory tests performed on selected samples obtained from the drill holes.

### Seismic Considerations

This site is located within the seismically active San Francisco Bay region but outside any of the Alquist-Priolo Earthquake Fault Zones. The following faults are closest to the site.

Fault	Distance to Fault		Maximum Moment Magnitude
	Miles	Kilometers	
HAYWARD (Total Length)	3	5	7.1
CALAVERAS (No. of Calaveras)	9	14	6.8
CONCORD - GREEN VALLEY	10	17	6.9
GREENVILLE	15	24	6.9
RODGERS CREEK	16	26	7
WEST NAPA	19	31	6.5

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. Based on historic records and on the known general seismicity of the San Francisco Bay region, we consider it probable that during the next 30 to 50 years the site will be shaken by at least one earthquake of Richter Magnitude 6.5 or greater, and by numerous earthquakes of lesser Magnitude, all having epicentral locations within about 20 miles of the site.

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. Based on the 2002 Seismic Hazard Zone Report number 058 prepared for the San Jose West 7.5-Minute Quadrangle, Santa Clara, California, prepared by the Department of Conservation Division of Mines and Geology, Peak Ground Acceleration at this site is expected to be about 0.56g. 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 2007 California Building Code.

Site Class: C (Very Dense Soil and Soft Rock)

Mapped Acceleration Parameters:  $S_s$  (for short periods) = 1.519g  
 $S_1$  (for 1-second period) = 0.600g

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Site Coefficient:  $F_a$  (for short periods) = 1.0  
 $F_v$  (for 1-second period) = 1.3

Adjusted Maximum Considered EQ Spectral Response Acceleration Parameters:

$$S_{MS} = F_a * S_s = 1.519g$$

$$S_{M1} = F_v * S_1 = 0.780g$$

Design Spectral Response Acceleration Parameters:

$$S_{DS} = 2/3 * S_{MS} = 1.013g$$

$$S_{D1} = 2/3 * S_{M1} = 0.520g$$

Seismic Design Category: **D**

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.

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

#### 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.

Landsliding: Considering the gentle nature of the site slopes and the stiff to very stiff consistency of the underlying soil, we judge that landsliding is not a potential hazard to this property. No mitigation is required.

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

Expansive Soils: Such soils do not exist on 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**

The most geotechnical concern about this site is the presence of considerable amounts of fill soils under the existing parking area. If left untreated, this layer of fill soil will settle under the new proposed building and pavements.

To minimize the potential effect of fill settlement on the proposed development, we recommend that this fill should be subexcavated and re-compacted as described in the following section for "Site Preparation, Grading and Compaction" if the building will be supported on conventional shallow foundations. If the reinforced concrete pier and beam foundation option was selected for the support of the building, then upper 18 inches of this fill will need to be subexcavated and recompacted under and structure or pavements proposed for construction on top.

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 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**

- Areas of the site to be built on or paved should be stripped to remove any surface vegetation and organic topsoil. Soils containing more than 2% by weight of organic matter should be considered organic. Stripping depths should be determined in the field by the Soils Engineer at the time of stripping but, for planning purposes, an average stripping depth of 3 inches may be assumed. Strippings should be wasted off-site or, if so required by the Project Architect, stockpiled for subsequent use in landscape areas.
- Existing structures, utility lines including electric, water, sanitary sewers and storm drains designated for abandonment on the Project Plans, should be dug out and removed. All debris and materials arising from demolition and removal operations should be wasted off-site.

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- Existing fill soils within areas of the site to be built on or paved should be sub-excavated. The depth and horizontal limits of these excavations should be determined in the field by the Soils Engineer at the time of excavation. For planning purposes, however, it may be assumed that these excavations will extend to an average depth of about 3 feet below existing ground surface along the north portion of the existing parking to about 5 feet along the south portion. These excavations should extend 5 feet horizontally beyond proposed building lines and should extend 3 feet horizontally beyond edges of pavement.
- Soil surfaces exposed by excavations should be scarified to a depth of 10 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 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 on 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.

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If import is required for use as structural fill, it should be inorganic, should have a low expansion potential (with a plasticity index of 15 percent or less) 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 fills and, if found to be suitable, further tested to estimate the water content and density at which it should be placed.

### **Building Foundations**

#### **Conventional Shallow Foundations**

Considering the gentle nature of the ground slope at this site, the proposed buildings may be supported on conventional shallow foundations bearing on competent in-place native soil or on compacted structural fill placed as described in the Site Preparation, Grading and Compaction section of the geotechnical investigation report.

Continuous, reinforced concrete foundations may be designed to impose pressures on foundation soils up to 3000 pounds per square foot from dead plus normal live loading. Continuous foundations should be at least 12 inches wide and should be embedded at least 24 inches below rough pad grade or adjacent finished grade, whichever is lower.

Interior isolated foundations, such as may support column loads, may be designed to impose pressures on foundation soils up to 3500 pounds per square foot from dead plus normal live loading. Interior foundations should be embedded at least 18 inches below rough pad grade.

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

Based upon our experience with similar buildings constructed on similar foundation soils, we expect the total long-term static settlement of the building to be approximately 1(±) inch. Using the design values presented above, and assuming a minimum embedment of both continuous and isolated footings, we would expect the post-construction differential settlement of a relatively uniformly loaded structure to be no more than about 3/4 of the total settlement.

Building foundations constructed along a slope or close to the crest of slope should be embedded so that the downhill face of the foundation is located a horizontal distance of at least 10 feet away from the face of slope measured at the bottom of the foundation. The bottom of continuous foundations constructed perpendicular to slopes should be stepped and the bottom of each step should be maintained at an equal level.

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### Pier and Grade Beam Foundations

The proposed building may be supported on reinforced concrete "pier and beam" foundations with the piers deriving their vertical support from "skin friction" or adhesion. Piers should be embedded a depth of at least 8 feet into the underlying native soils.

Piers should be at least 18 inches in diameter and 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 500 pounds per square foot between the shaft of the pier and the adjacent soil, but ignoring an average of about 4 feet of the upper portion of embedment of the pier below the lowest adjacent grade. "End bearing" of the pier should also be ignored.

The depth of embedment of piers along the southern most portion of the development (within the existing parking lot) should be designed to resist a lateral pressure equivalent to 55 pounds per cubic foot acting on the top 4 feet of piers and across at least 2 pier diameters. A passive resistance of 300 pounds per cubic foot across 1.5 pier diameter may be used for the soils below the upper 4 feet. The actual depth of embedment of the piers should be decided by the Soils Engineer in the field at the time of drilling of the pier holes. For planning purposes, however, it may be assumed that the required pier embedment will be at least 15 feet below existing grade for piers.

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

Reinforced concrete foundation beams should be designed to safely transmit all imposed loads to the supporting piers. The perimeter grade beams should be embedded at least 12 inches below lowest adjacent grade.

We anticipate the total long-term static settlement of the pier supported building to be approximately  $\frac{1}{2}$  ( $\pm$ ) inch. Using the design values presented above, and assuming a minimum embedment of piers, we would expect the post-construction differential settlement of a relatively uniformly loaded structure to be no more than about  $\frac{3}{4}$  of the total settlement.

### General

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

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only in foundation excavations that have been kept moist, are free from drying cracks and contain no loose or soft soil or debris.

### Retaining Walls

The following may be used in the design calculations of reinforced concrete and segmental (such as Keystone) retaining walls.

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.

<u>Condition</u>	<u>Design Pressure</u>
Active, level backfill	55 pcf
At-rest, level backfill	75 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 walls that are restrained from movement.

3. Retaining walls should be designed for seismic loading. The effects of earthquakes may be simulated by applying a horizontal line load surcharge to the stem of the wall at a rate of  $16 H^2$  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 0.3 may be used to calculate the ultimate resistance to sliding of the wall base over the ground beneath the base.
5. An equivalent fluid pressure of 300 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.
6. Foundations for reinforced concrete retaining walls should be embedded at least 18 inches below rough pad grade or adjacent finished grade, whichever is lower.
7. A maximum allowable bearing pressure of 3000 psf may be used for the ground beneath the toe of the wall. This value is for non-seismic conditions and may be increased to 3750 psf when considering additional loads on the wall resulting from earthquakes.

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A zone of drainage material at least 12 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 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 don" near the bottom of the drainage material. The perforated pipe should have holes no larger than 1/4-inch diameter.

#### **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.

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

To minimize floor dampness, however, the following general guidelines may be used to minimize moisture-related problems in concrete floor slabs-on-grade that will be covered with moisture-sensitive floor coverings, adhesives, and coatings.

1. Install a section of capillary break material at least five inches thick. 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.
2. Cover the capillary break material with a high quality membrane vapor barrier. The membrane should be at least 10-mil thick.

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3. To minimize the potential of accidental damage to the membrane vapor barrier and the potential of concrete slab curling, a protective cushion of sand or 3/8" pea gravel at least two inches thick should be placed between the membrane vapor barrier and the floor slab.
4. At the owner's option, the layer of protective sand mentioned above may be omitted provided that a 15 mil or thicker membrane vapor barrier is used and that additional attention be given to the design of reinforcement so that potential curling stresses within the slab are addressed.
5. Consider using concrete having a water/cement ratio not greater than 0.45 to accelerate slab drying time. Use of fly ash may help reduce soluble alkali content in the slab. Water should not be added to the concrete after initial batching.
6. Cover slabs for 7-days with sheet material rather than using membrane curing compounds in order to minimize drying time and surface preparation costs.
7. Water vapor emission levels and pH should be measured as required by the flooring material manufacturer prior to floor installation. Measurements and calculations should be performed in accordance with ASTM F1868-98 and F710-98.

The guidelines presented above are based on information obtained from various published sources including the American Concrete Institute (ACI) and Portland Cement Association (PCA). These guidelines are only intended to present information that can be utilized to minimize the potential of long term impact from slab moisture infiltration. The application of these procedures does not affect the geotechnical aspect of foundation performance.

#### **Vehicle Pavements**

The clayey and silty near-surface soils across the site have a low pavement-supporting capacity. Considering the clayey nature of the pavement subgrade soils, an R-value of 5 at 300 psi exudation pressure was assumed in pavement design calculations. The actual R-value of the pavement soil subgrade should be tested and verified prior to construction.

Recommended minimum sections for pavement areas are presented in Table 1. A pavement section based on a Traffic Index of at least 5 should be selected for areas where traffic includes occasional light trucks.

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TABLE 1 - RECOMMENDED MINIMUM ASPHALT CONCRETE PAVEMENT SECTIONS			
Traffic Index (T.I.)	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)	Total Thickness (inches)
4.5	3.0	9.0	12.0
5.0	3.0	10.0	13.0
5.5	3.5	11.0	14.5
6.0	4.0	12.0	16.0

Pavement subgrades should be compacted as described above in the section for Site Preparation Grading and Compaction.

Curbs and gutters should be constructed directly on the soil subgrade rather than on a layer of aggregate base. This will minimize the amount of surface water that seeps below the curb and into the pavement subgrade. The seepage of water into subgrade soils beneath vehicle pavements, can result in subgrade softening and premature pavement distress.

Pavement construction should comply with the requirements of the CALTRANS Standard Specifications, latest editions, except that compaction requirements for pavement soil subgrades and aggregate base should be based on ASTM Test D1557-91, as described in the part of this report dealing with "Site Preparation, Grading and Compaction."

### **Utility Trenches**

The attention of contractors, particularly the underground contractor, should be drawn to the requirements of California Code of Regulations, Title 8, Construction Code Section 1540 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.

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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 5 percent above the optimum value and placed in horizontal layers not exceeding 6 inches in thickness (before compaction). Each layer should be compacted to 87-90 percent relative compaction based on ASTM Test D1557-91. The upper 8 inches of pavement subgrades should be compacted to about 90 percent relative compaction based on 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.

#### Soil Corrosivity

Two soil samples were obtained from the site at depths of 2 and 3 feet below existing ground surface. These soil samples were delivered to Cooper Testing Laboratory to test for the potential for soil corrosivity. The laboratory test results of these samples are attached to this report.

#### Resistivity

Soil resistivity test (ASTM G57) was performed on the soil samples and was found to range from 1187 to 3495 Ohm-cm. Soils with this resistivity are classified by The National Association of Corrosion Engineers (NACE) as "Moderately to Mildly Corrosive".

#### Chloride

Soil Chloride test (Cal 422-Mod) was performed on the soil samples and was found to be between 16 and less than 2 mg/kg. This chloride content is below threshold values for corrosion of steel.

#### Sulfate

Soil Water Soluble Sulfate test (Cal 417-Mod) was performed on the soil samples and was found to be less than 5 mg/kg. This amount of water soluble sulfates is considered negligible.

Based on the results of the corrosion test performed on the soil samples, on site soils are considered potentially corrosive for steel and cast iron. Portland Cement Type II may be used for all concrete in contact with soil. Concrete steel reinforcement should have at least 3 inches cover for all concrete in contact with water. A corrosion engineer should be consulted with regarding coating utility pipes that are in contact with soil.

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### **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.

### **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 and advise during clearing and stripping of the site.
3. Observe, test and advise during grading and placement of structural fill.
4. Test proposed capillary break material that will be used beneath concrete slabs-on-grade and advise on suitability.
5. Observe and advise during foundation and slab construction.
6. Observe, test and advise during utility trench backfilling.
7. Observe, test and advise during construction of pavements.

### **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.

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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:

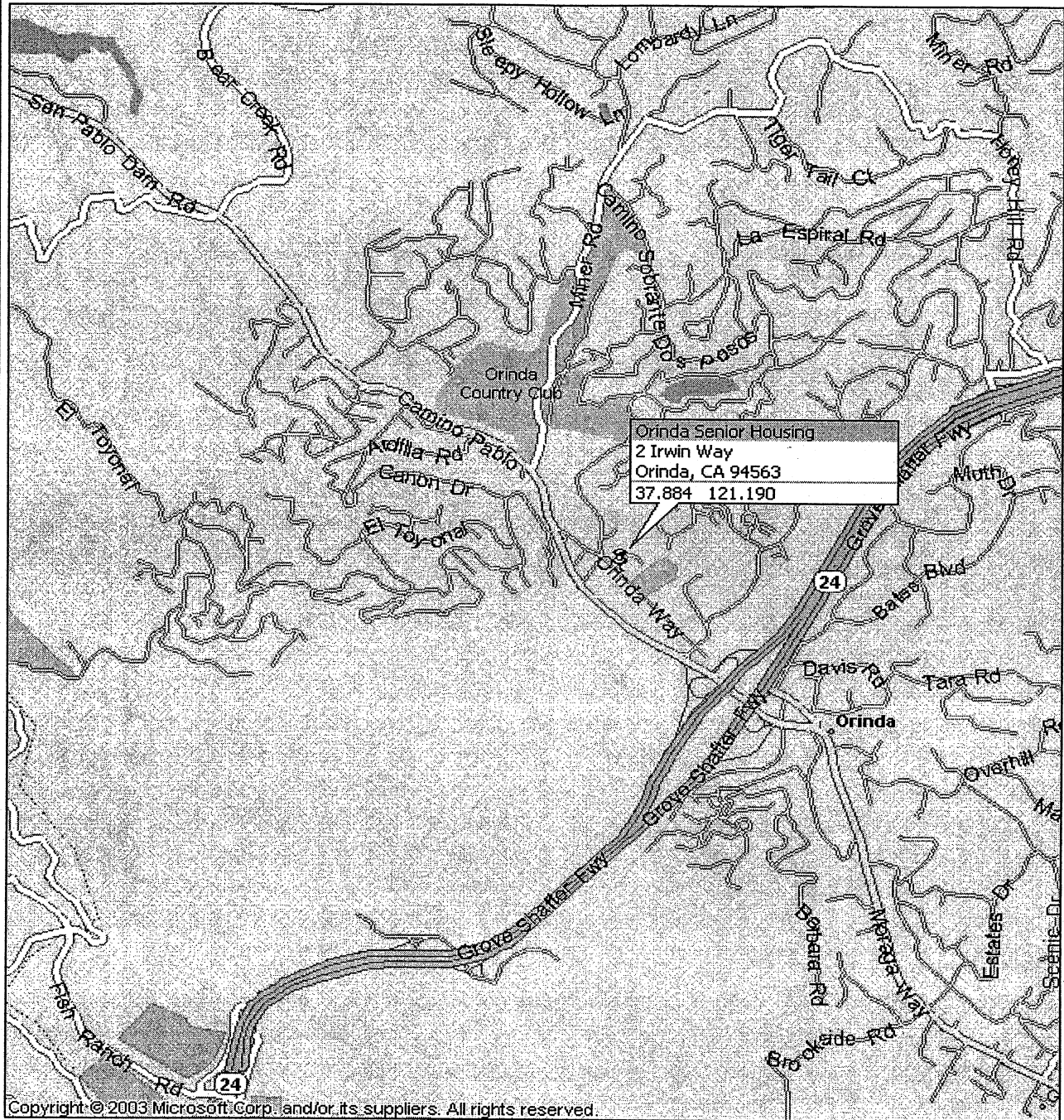
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Basil A. Amso  
CE 49998



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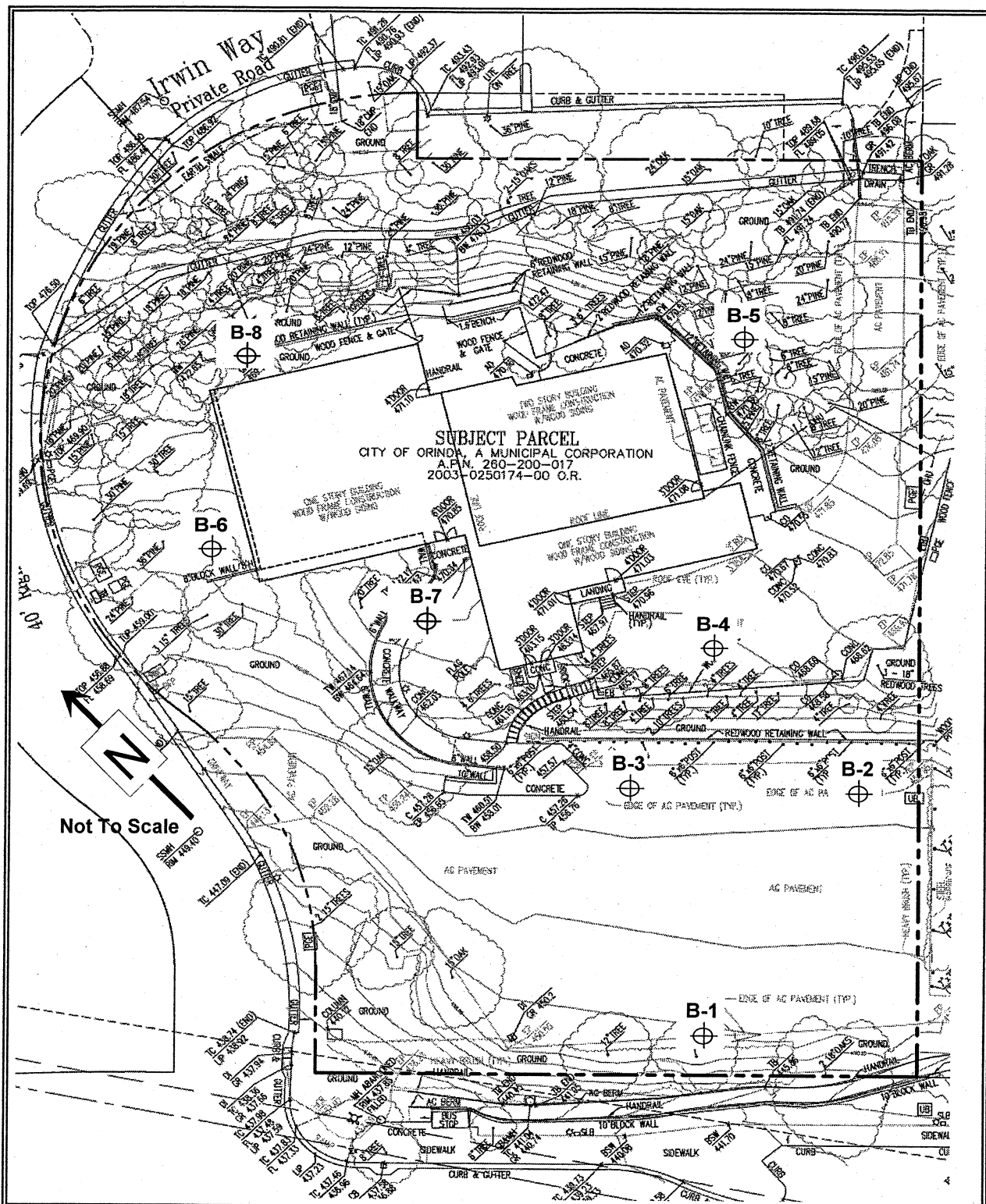
FEBRUARY 2009

**VICINITY MAP**

**ORINDA SENIOR HOUSING  
2 IRWIN WAY  
ORINDA, CALIFORNIA**

**FIGURE  
1**

**PROJECT  
3515**



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**FEBRUARY 2009**

**SITE PLAN AND  
LOCATION OF EXPLORATION BORINGS  
ORINDA SENIOR HOUSING  
2 IRWIN WAY  
ORINDA, CALIFORNIA**

**FIGURE  
2**

**PROJECT  
3515**



# LEGEND

Type "A" Faults  
 SA San Andreas  
 SG San Gregorio  
 HA Hayward  
 CA Calaveras  
 RC Rodgers Creek

Type "B" Faults  
 GV Greenville  
 CG Concord Green valley

Site Location

This map should not be used to determine whether or not a given property lies on a fault line. Its only purpose is to give the reader of this report a feel of approx. distances to Types A & B fault.  
 Faults other than Types A & B are not shown on this map.

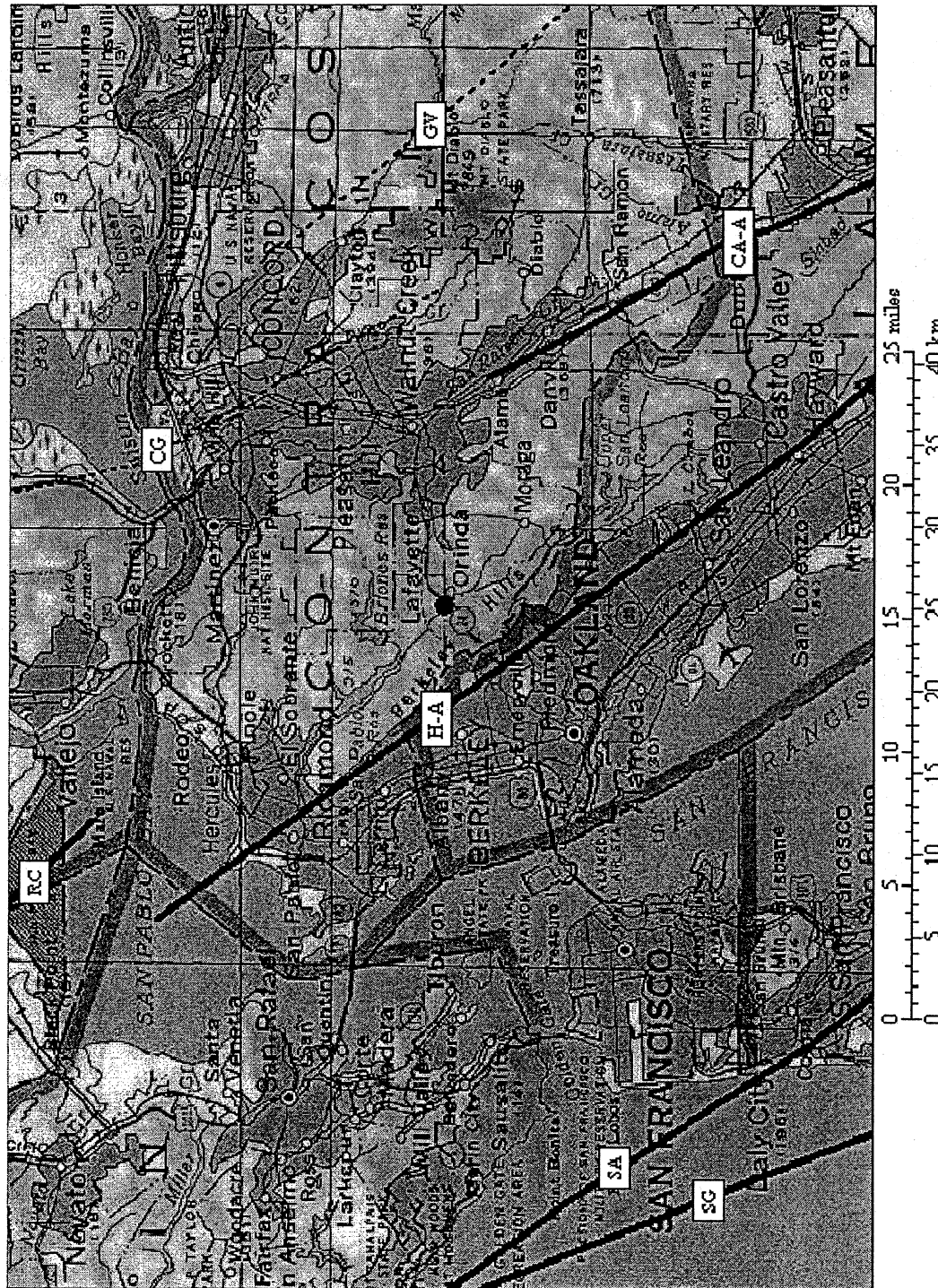


FIGURE  
 3

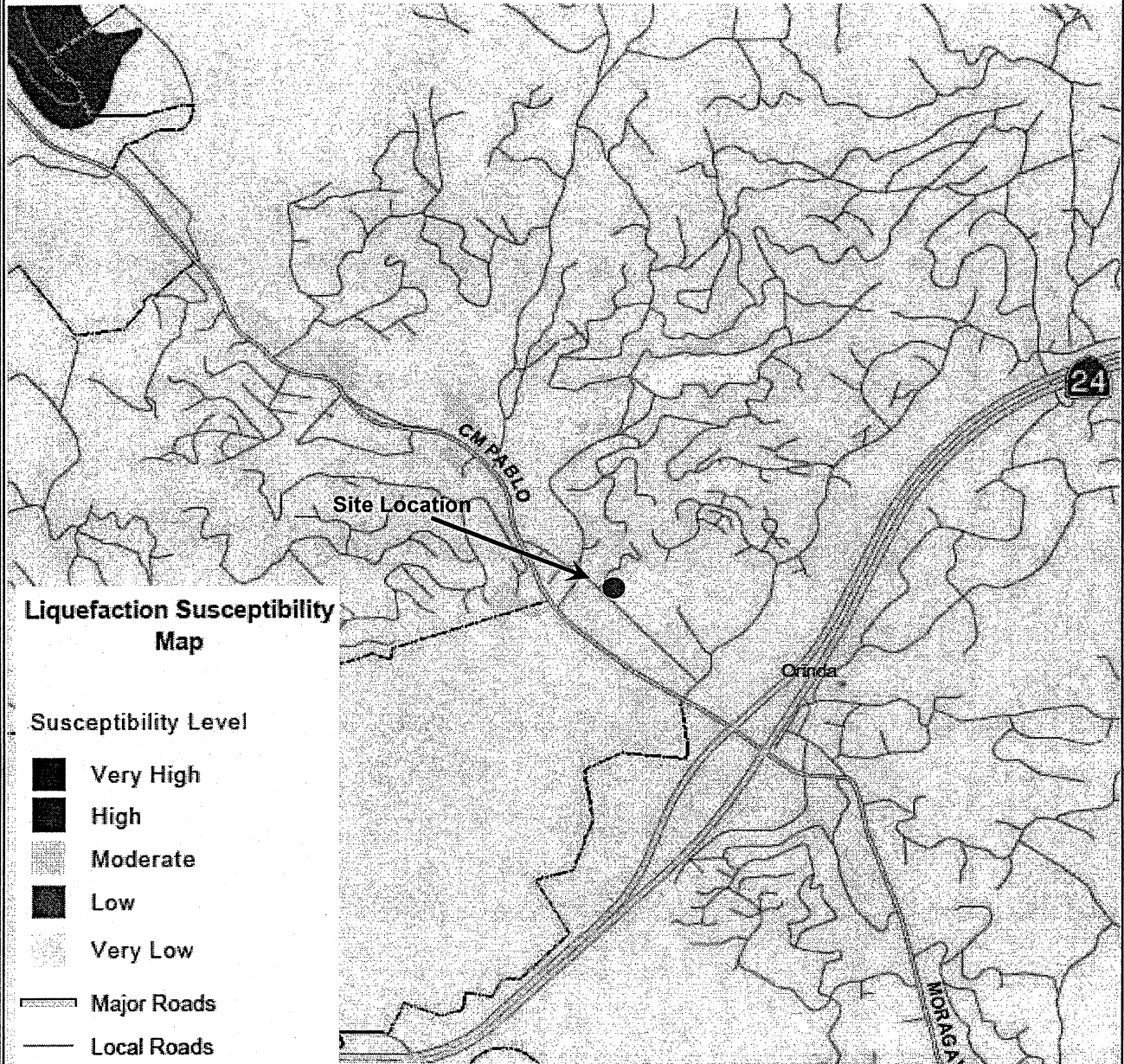
Project  
 3515

## APPROXIMATE LOCATION OF FAULTS

ORINDA SENIOR HOUSING  
 2 IRWIN WAY  
 ORINDA, CALIFORNIA

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FEBRUARY 2009



**Source:** This map is based on work by William Lettis & Associates, Inc. and USGS. USGS Open-File Report 00-444, Knudsen & others, 2000

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**FEBRUARY 2009**

**LIQUEFACTION SUSCEPTIBILITY MAP**

**ORINDA SENIOR HOUSING  
2 IRWIN WAY  
ORINDA, CALIFORNIA**

**FIGURE  
4**

**PROJECT  
3515**

## **APPENDIX A**

### **Key to Exploration Logs and Boring Logs**

# KEY TO EXPLORATORY BORING LOGS

## SOIL CLASSIFICATIONS

PRIMARY DIVISIONS			GROUP 1 SYMBOL	SECONDARY DIVISIONS
<b>COARSE GRAINED SOILS</b>  More than half of material is larger than No. 200 sieve size	<b>GRAVELS</b> More than half coarse fraction is larger than No.4 sieve	Clean Gravels (less than 5% fines*)	<b>GW</b>	Well graded gravels, gravel-sand mixtures, little or no fines
			<b>GP</b>	Poorly graded gravels, gravel-sand mixtures, little or no fines
		Gravel with fines*	<b>GM</b>	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			<b>GC</b>	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	<b>SANDS</b> More than half coarse fraction is smaller than No.4 sieve	Clean Sands (less than 5% fines*)	<b>SW</b>	Well graded sands, gravelly sands, little or no fines
			<b>SP</b>	Poorly graded sands or gravelly sands, little or no fines
		Sands with fines*	<b>SM</b>	Silty sands, silt-sand mixtures, non-plastic fines
			<b>SC</b>	Clayey sand, sand-clay mixtures, plastic fines
<b>FINE GRAINED SOILS</b>  More than half of material is smaller than No. 200 sieve size	<b>SILTS AND CLAYS</b>  Liquid limit is less than 35		<b>ML</b>	Inorganic silts, clayey silts, rock flour, silty very fine sands
			<b>CL</b>	Inorganic clays of low plasticity, gravelly clay of low plasticity
			<b>OL</b>	Organic silts and organic silty clays of low plasticity
	<b>SILTS AND CLAYS</b>  Liquid limit is between 35 and 50		<b>MI</b>	Inorganic silts, clayey silts and silty fine sand with intermediate plasticity
			<b>CI</b>	Inorganic clays, gravelly clays, sandy clays and silty clays of intermediate plasticity
			<b>OI</b>	Inorganic clays and silty clays of intermediate plasticity
	<b>SILTS AND CLAYS</b>  Liquid limit is greater than 50		<b>MH</b>	Inorganic silts, clayey silts, elastic silts, micaceous or diatomaceous silty or fine sandy soil
			<b>CH</b>	Inorganic clays of high plasticity
			<b>OH</b>	Organic clays and silts of high plasticity
<b>HIGHLY ORGANIC SOILS</b>			<b>Pt</b>	Peat, meadow mat, highly organic soils

### GRAIN SIZES

U.S. STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENINGS			
200	40	10	4	3/4"	3"	12"	
Silts and Clays    Fine    Medium    Coarse				Fine    Coarse		Cobbles	Boulders
<b>SAND</b>				<b>GRAVEL</b>			

RELATIVE DENSITY	
SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT*
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CONSISTENCY		
CLAYS AND PLASTIC SILTS	UNCONFINED SHEAR STRENGTH (PSF)	BLOWS/FOOT*
VERY SOFT	0 - 250	0 - 2
SOFT	250-500	2 - 4
FIRM	500-1000	4 - 8
STIFF	1000-2000	8 - 16
VERY STIFF	2 000 - 4000	16 - 32
HARD	>4000	OVER 32

SYMBOLS	
	Initial Ground Water Level
	Final Ground Water Level
*	Standard Penetration Sampler
X	Modified California Sampler
D	Dames & Moore Sampler

NOTES
*BLOWS per FOOT - Resistance to advance the soil sampler in number of blows of a 140-pound hammer falling 30 inches to drive a split spoon sampler.
Stratification lines on the logs represent the approximate boundary between soil types, and the transition may be gradual.
Modified California Sampler - 2 1/2 O.D. (1 7/8 Inch I.D.) sampler
Standard Penetration Sampler - 2 inch O.D. (1 3/8 Inch I.D.) split spoon sampler (ASTM D1586).
Dames & Moore Sampler - 3 inch O.D. (2.5 inch I.D.) sampler

BORING LOG							No. B-1					
PROJECT Orinda Senior Housing				DATE 01/26/2009		LOGGED BY BAA						
DRILL RIG Truck Mounted Continuous Flight		HOLE DIA. 4"		SAMPLER X - Modified California; * - S.P.T								
GROUND WATER DEPTH INITIAL		FINAL		HOLE ELEVATION								
DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	LIQUID LIMIT (%)	WATER CONTENT (%)	PLASTIC LIMIT (%)	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
3 inch AC over 8 Inch Base Rock	PV	1										
Silty Clay, brown, damp, medium stiff, with few pieces of gravel; Fill	CL	2	x	12	1.8		42	14	24	99	10	2335
		3										
pieces of angular rock		4										
		5	x	13	2.1			22		98	10	2105
		6										
		7										
Silty Clay; brown, damp, very stiff to hard; native	CL	8										
		9										
very silty and sandy		10	x	22	3.5			15		113	6	3355
		11										
Silty Clayey Sand; light greenish gray, damp, very dense to hard; weathered sandstone	SC	12										
		13										
harder drilling		14										
		15	*	50/4"				18				
		16										
alternating thin lenses of silty sand and sandysilt		17										
		18										
		19										
Bottom of hole at 20 feet		20	*	50/4"								
No ground water encountered												

Project # 3515
AMSO CONSULTING ENGINEERS
Page 1 of 1

**BORING LOG****No.** B-2

PROJECT Orinda Senior Housing

DATE 01/26/2009

LOGGED BY BAA

DRILL RIG Truck Mounted Continuous Flight

HOLE DIA. 4"

SAMPLER X - Modified California; \* - S.P.T

GROUND WATER DEPTH INITIAL ---

FINAL ---

HOLE ELEVATION

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	LIQUID LIMIT (%)	WATER CONTENT (%)	PLASTIC LIMIT (%)	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
1 inch AC over 10 Inches Base Rock	PV	1										
Clay; brown, damp, stiff	CL	2	x									
		3	x	61	2.8			7		118	3	2360
		4										
fragments of sandstone		5	x	20	3.5							
Very Silty Clay; dark gray, dry, very stiff to hard; weathered claystone and sandstone	CL	6										
		7										
		8										
		9										
		10	x	35	>4.5			14		104	6	4575
		11										
Very Silty Clayey Sand; light gray, dry, very dense to hard; weathered sandstone	SM/SC	12										
		13										
		14										
		15	*	50/4"				14				
		16										
		17										
		18										
		19										
Bottom of hole at 20 feet No ground water encountered		20	*	50/6"				17				

Project #

3515

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of

1

# BORING LOG

No. B-3

PROJECT Orinda Senior Housing

DATE 01/26/2009

LOGGED BY BAA

DRILL RIG Truck Mounted Continuous Flight

HOLE DIA. 4"

SAMPLER X - Modified California; \* - S.P.T

GROUND WATER DEPTH INITIAL ---

FINAL ---

HOLE ELEVATION

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	LIQUID LIMIT (%)	WATER CONTENT (%)	PLASTIC LIMIT (%)	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
1 inch AC over 10 Inches Base Rock	PV	1										
Silty Clay, brown, damp, stiff; Fill	CL/ CH	2	x	60	>4.5		40	17	25	105	5	2170
Silty Clay; dark brown and greenish brown, damp, very stiff to hard; weathered claystone	CL	3										
		4										
		5	x	28	4.1							
		6										
Very Silty Clay to Clayey Silt; grayish brown, damp, very stiff to hard; weathered siltstone and claystone	CL/ ML	7										
		8										
		9										
		10	x	60	>4.5			15		114	3	5330
		11										
		12										
		13										
		14										
		15	x	50/8"	>4.5			18		118	4	3755
		16										
		17										
		18										
		19										
Bottom of hole at 20 feet												
No ground water encountered		20	*	50/4"	>4.5			17				

Project # 3515

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# BORING LOG

No. B-4

PROJECT Orinda Senior Housing

DATE 01/26/2009

LOGGED BY BAA

DRILL RIG Truck Mounted Continuous Flight

HOLE DIA. 4"

SAMPLER X - Modified California; \* - S.P.T

GROUND WATER DEPTH INITIAL ---

FINAL ---

HOLE ELEVATION

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	LIQUID LIMIT (%)	WATER CONTENT (%)	PLASTIC LIMIT (%)	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
1 inch AC over 10 Inches Base Rock	PV	1										
Silty Clay; brown, damp, stiff, Fill	CH	2										
			x	31	>4.5			20		101	5	6485
Silty Clay to Clayey Silt; light brown, damp very stiff to hard; weathered siltstone and claystone	CL/ML	3										
		4										
very hard sandy siltstone		5	x	57	>4.5			19		102	8	4250
		6										
		7										
		8										
		9										
siltstone and claystone		10	x	42	>4.5			18		107	6	4650
		11										
		12										
		13										
		14										
siltstone and claystone		15	*	34	>4.5			17				
		16										
		17										
		18										
		19										
Bottom of hole at 20 feet		20	*	45	>4.5			16				
No ground water encountered												

Project # 3515

AMSO CONSULTING ENGINEERS

Page 1 of 1

**BORING LOG****No.** B-5

PROJECT Orinda Senior Housing

DATE 01/26/2009 LOGGED BY BAA

DRILL RIG Truck Mounted Continuous Flight

HOLE DIA. 4"

SAMPLER X - Modified California; \* - S.P.T

GROUND WATER DEPTH INITIAL ---

FINAL ---

HOLE ELEVATION

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	LIQUID LIMIT (%)	WATER CONTENT (%)	PLASTIC LIMIT (%)	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
Very sandy silty clay; light brown, damp, very stiff	CL	1										
Very Clayey Sand; light brown, dry to damp, very dense to hard; weathered sandstone	SC	2	x	42				15		101		
		3										
		4										
harder drilling sandy silt, siltstone		5	*	50/3"								
		6										
		7										
		8										
		9										
		10	*	42								
Very Silty Clay to Clayey Silt; gray, very stiff to hard; weathereed siltstone and claystone	ML CL	11										
		12										
		13										
		14										
		15	x	83	>4.5			21		101	6	5435
		16										
		17										
		18										
		19										
Bottom of hole at 20 feet No ground water encountered		20	x	76	>4.5			22		100	4	6035

Project # 3515

AMSO CONSULTING ENGINEERS

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**BORING LOG****No.** B-6

PROJECT Orinda Senior Housing

DATE 01/26/2009

LOGGED BY BAA

DRILL RIG Truck Mounted Continuous Flight

HOLE DIA. 4"

SAMPLER X - Modified California; \* - S.P.T

GROUND WATER DEPTH INITIAL ---

FINAL ---

HOLE ELEVATION

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	LIQUID LIMIT (%)	WATER CONTENT (%)	PLASTIC LIMIT (%)	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
Silty Clay; brown, damp, medium stiff; with random pieces of crushed rock; Fill	CL	1										
very silty; with roots		2	x	24	2.8			14		98	6	2105
		3										
		4										
		5	x	21	4.0			16		101	4	3650
Silty Clay; brown, damp, stiff to hard	CL	6										
		7										
		8	*	28	>4.5			18				
		9										
		10										
		11										
		12										
		13	x	37	4.1			18		102	7	3895
		14										
		15										
		16										
		17										
		18	*	46	4.2			17				
Bottom of hole at 18 feet		19										
No ground water encountered		20										

**BORING LOG****No.** B-7

PROJECT Orinda Senior Housing

DATE 02/03/2009 LOGGED BY BAA

DRILL RIG Hand Held

HOLE DIA. 4"

SAMPLER X - Modified California; \* - S.P.T

GROUND WATER DEPTH INITIAL ---

FINAL ---

HOLE ELEVATION

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	LIQUID LIMIT (%)	WATER CONTENT (%)	PLASTIC LIMIT (%)	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
Sandy Clay; brown, damp, loose; Fill	CL	1										
		2										
Refusal on obstruction.		3										
		4										
		5										
		6										
		7										
		8										
		9										
		10										
		11										
		12										
		13										
		14										
		15										
		16										
		17										
		18										
		19										
		20										

Project #

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**BORING LOG****No.** B-8

PROJECT Orinda Senior Housing

DATE 02/03/2009 LOGGED BY BAA

DRILL RIG Minute Man

HOLE DIA. 4"

SAMPLER X - Modified California; \* - S.P.T

GROUND WATER DEPTH INITIAL ---

FINAL ---

HOLE ELEVATION

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	LIQUID LIMIT (%)	WATER CONTENT (%)	PLASTIC LIMIT (%)	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
Silty Clay; brown, damp, medium stiff;	CL	1										
thin lense of pea gravel		2										
Very Silty and Sandy Clay; light brown, damp, stiff to very stiff	CL	3	x	22	2.5			15		101	8	3130
		4										
		5	x	26	3.5			16		102	7	3870
Silty Clay; brown, damp, stiff to hard	CL	6										
		7										
		8	x	32	>4.5			14		102	6	5625
		9										
		10										
Bottom of hole at 10 feet		11										
No ground water encountered		12										
		13										
		14										
		15										
		16										
		17										
		18										
		19										
		20										

Project #

3515

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## **APPENDIX B**

### **Laboratory Test Results**

# PLASTICITY INDEX

TEST DESIGNATION: ASTM D4318 OR CAL 204

Project Name: ORINDA SENIOR HOUSING

Project No.: 3515

Sample No.: B1 @ 2 FT

Lab No.:

Location

Test Date: 02/04/2009

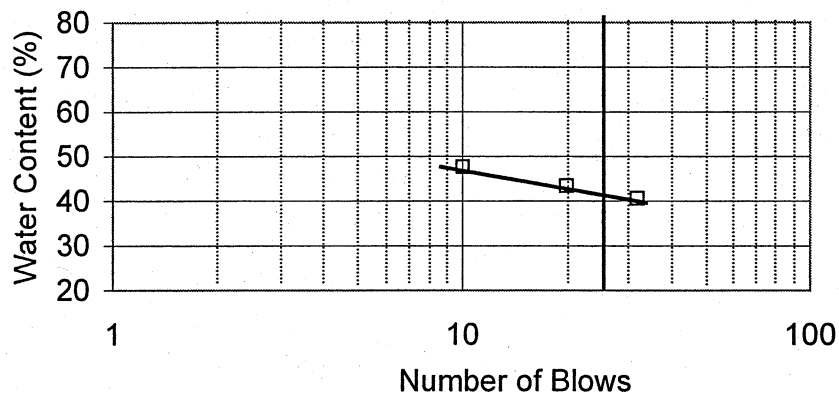
Description: Silty Clay

Tested By: MT

## TEST DATA

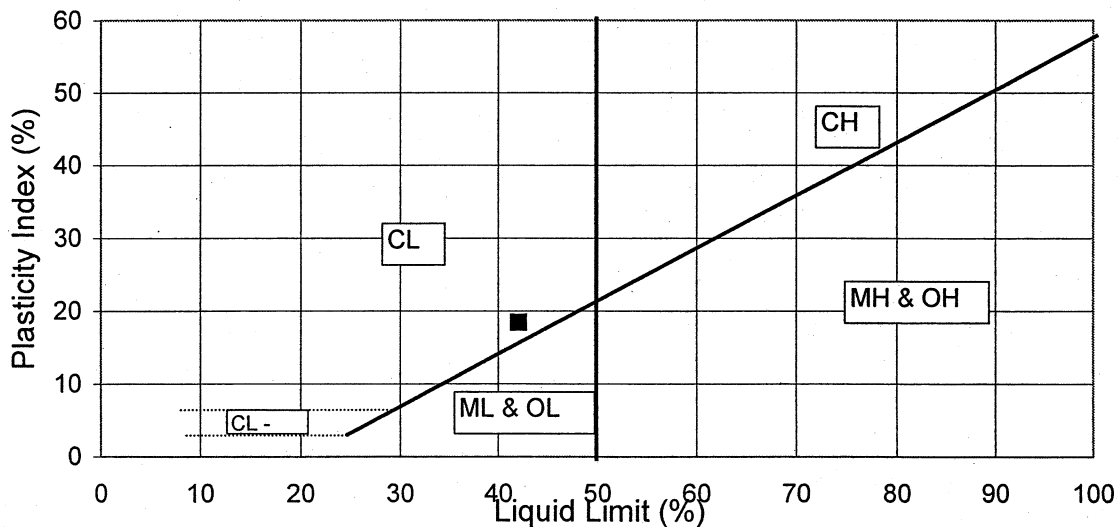
	Liquid Limit				Plastic limit			Water Content
Number of Blows	10	20	32					
Tare Number	4	22	2		5			
Tare + Wet Wt (gm)	48.35	46.82	46.16		157.00			
Tare + Dry Wt (gm)	38.70	37.40	37.33		133.20			
Tare Wt (gm)	18.48	15.74	15.62		32.20			
Wt of Water (gm)	9.65	9.42	8.83		23.80			
Soil Dry Wt (gm)	20.22	21.66	21.71		101.00			
Water Content (%)	47.73	43.49	40.67		23.56			
Average					23.56			

## Liquid Limit Test



LL	PL	PI
42	24	18

## Plasticity Chart





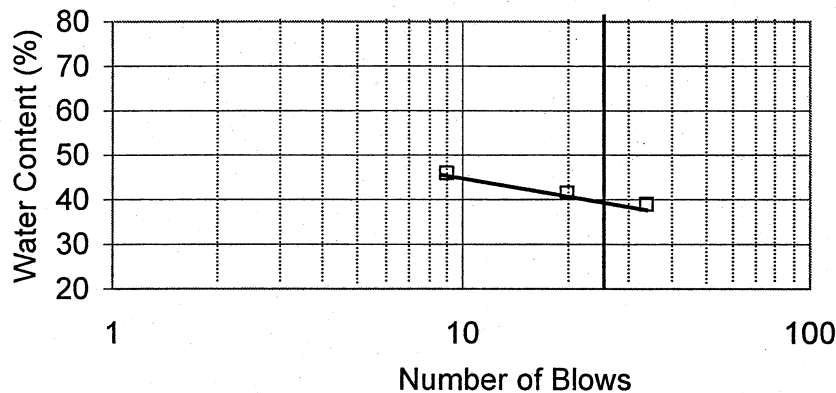
# PLASTICITY INDEX

TEST DESIGNATION: ASTM D4318 OR CAL 204

Project Name:	ORINDA SENIOR HOUSING	Project No.:	3515
Sample No.:	B3 @ 2 FT	Lab No.:	
Location		Test Date:	02/04/2009
Description:	Silty Clay	Tested By:	MT

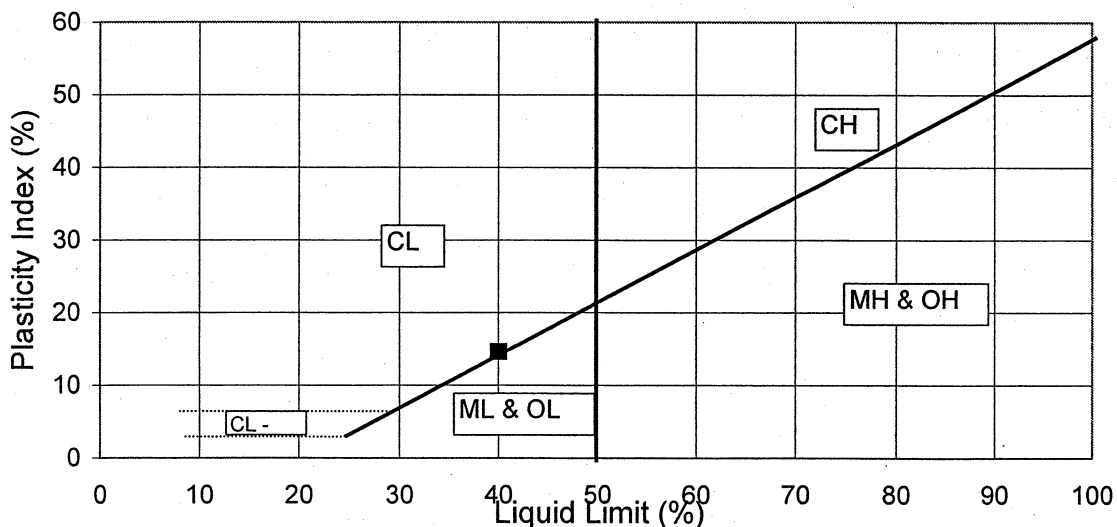
TEST DATA							
Liquid Limit				Plastic limit		Water Content	
Number of Blows	9	20	34				
Tare Number	J	H	M	O			
Tare + Wet Wt (gm)	46.74	44.23	44.33	158.92			
Tare + Dry Wt (gm)	37.00	35.80	36.26	133.30			
Tare Wt (gm)	15.82	15.52	15.57	32.35			
Wt of Water (gm)	9.74	8.43	8.07	25.62			
Soil Dry Wt (gm)	21.18	20.28	20.69	100.95			
Water Content (%)	45.99	41.57	39.00	25.38			
Average				25.38			

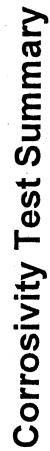
## Liquid Limit Test

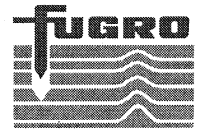


LL	PL	PI
40	25	15

## Plasticity Chart



[illegible]



1000 Broadway, Suite 440  
Oakland, California 94607  
Tel: (510) 268-0461  
Fax: (510) 268-0545

February 1, 2010  
Project No. 1406.154

City of Orinda Planning Department  
22 Orinda Way  
Orinda, California 94563

Attention: Ms. Dorothy Dickson-Dodds

Subject: Geotechnical Engineering Peer Review, 2 Irwin Way, Orinda, California

Dear Ms. Dickson-Dodds:

In accordance with your request, Fugro West, Inc., (Fugro) has reviewed the geotechnical engineering aspects of the submitted documents for the proposed new senior housing complex to be located at 2 Irwin Way, in Orinda, California. Our review included the following scope of work:

- A review of a report prepared by Amso Consulting Engineers (ACE), titled "Geotechnical Investigation for Orinda Senior Housing, 2 Irwin Way, Orinda, California," dated November 23, 2009;
- A review of the project architectural drawings for the project prepared by Dahlin Group, Sheets A1 through A11, dated December 11, 2009;
- A review of the project civil drawings for the project prepared by Luk and Associates, Sheets C1.1, C1.2, C2, C3.1 and C3.2, dated December, 2009,
- A review of the project landscape drawings for the project prepared by The Guzzardo Partnership, Sheets L1 through L3, dated December 11, 2009,
- A review of available published geologic information relevant to the proposed project,
- A review of pertinent select aerial photographs of the project vicinity,
- Site reconnaissance by a registered geotechnical engineer on January 27, 2010, and
- Preparation of this peer review letter.

#### **PROJECT SUMMARY**

Based on our review of the submitted plans and the geotechnical investigation report provided by your office, it is our understanding that the project will consist of the construction of a new two-building, three to four-story senior housing complex at the former 1.44-acre site of the Orinda Public Library at 2 Irwin Way. Eden Housing, Inc., of Hayward, California, is the developer for this proposed non-profit housing project.



As proposed, the project will consist of the demolition of the existing former library building, and construction of a 71-unit senior housing complex of wood-frame construction. The complex will include a larger T-shaped building, the northeast portion of which to be three stories, and the southwestern "T" extension to be four stories. The lower, at-grade level of the northeastern, three story portion of the building will be used as a parking garage with access provided by a new driveway from Irwin Way. A smaller four-story, rectangular building will be constructed at the southern corner of the property, adjacent to Orinda Way. The larger building will be stepped upward toward the northeast to follow the existing site topography and reduce the amount of required site grading. The parking level will be underlain by a concrete slab on grade, while the living area lower levels will be underlain by a raised wood floor. Project plans provided for our review did not include a site grading plan. The project geotechnical engineer provided an option to support the new buildings by either shallow footing foundations, or by drilled pier and grade beam foundations.

### **SITE RECONNAISSANCE, AND EXISTING CONDITIONS**

Our geotechnical engineer viewed pertinent aerial photographs of the site and vicinity taken in 1957 and 1969. Our geotechnical engineer also conducted a site reconnaissance on January 27, 2010. Generally, the surface conditions encountered at the site were similar to those shown on the submitted plans, and as indicated in the geotechnical report, available published data and aerial photographs.

The subject property is situated northeast of the intersection of Orinda Way and Irwin Way in central Orinda. The property is situated in the Orinda business district north of Highway 24, within the San Pablo creek drainage area, and at the base of hills extending to the northeast of the site. The property is irregularly shaped, and is bounded by Irwin Way to the northwest and north, Orinda Way to the southwest, City tennis courts to the southeast, and the Orinda Senior Village parking lot to the northeast.

The property generally slopes to the southwest (Orinda Way) and appears to have been graded by cut and fill to create two relatively level pads. An upper pad, occupying the central & eastern portion of the property is currently occupied by the abandoned Orinda Library building (Photo Nos. 1 and 2), and a small parking area (Photo No. 3). This pad is separated from an upslope parking area for the neighboring Orinda Senior Village by a landscaped, tree-covered slope. A driveway connects the parking area to the senior village parking lot. A lower pad, situated between the library building and Orinda Way, is occupied by a larger, paved parking lot (Photo No. 4). The elevation of the lower pad/ parking lot is on the order of 10 feet higher than adjacent Orinda Way. Sloped areas not occupied by buildings or pavements were occupied by native oak and pine trees and developed landscaping. Several wood and concrete retaining walls were present across various portions of the property. In general, these walls will be removed as part of the project construction.

The existing pavement areas show significant cracking. Such cracking appears to be a result of a combination of pavement wear and settlement, the latter which has been attributed by the project geotechnical engineer to be the result of underlying fill settlement and deformation.



## REVIEW OF GEOTECHNICAL REPORT AND AVAILABLE INFORMATION

Dibblee (2005) mapped the site area as underlain by Quaternary-age, late-Pleistocene older alluvial soils consisting largely of sands and gravels. Underlying bedrock, as exposed in the hills to the northeast of the site and present at relatively shallow depth as identified in test borings, consists of Pliocene-age non-marine sedimentary rock of the Orinda Formation, consisting primarily of siltstone, conglomerate, sandstone, and claystone. Nilsen (1975) showed no photointerpreted landslides in close proximity of the site, but his map does show two small, narrow photointerpreted slides on the steeper slope northeast of the site and the adjacent Orinda Senior Village and Orinda Community Church. This map also maps the site, as well as the adjacent business district, as underlain by Quaternary-age artificial fill, indicating these areas to have been mass graded as a part of the original development of this area. The Rogers/Pacific (R/P) photointerpretation map (1993) similarly shows the site to be located on artificial fill indicative of mass grading development, with the area to northeast occupied by the Orinda Senior Village to be underlain by colluvial soils. The R/P map shows no photointerpreted slides in the vicinity of the site, and shows the area upslope of the Senior Village apartment buildings to be a graded slope. The site is mapped by the Association of Bay Area Governments (2009) as having a very low susceptibility to liquefaction, and the project geotechnical engineer has indicated that liquefiable soils were not encountered below the site, and not a hazard to this property.

The project geotechnical engineer performed a subsurface exploration program for the proposed development, which consisted of drilling a total of eight test borings spread across the property. Six borings (No. B-1 through B-6) were drilled on January 26, 2009 using a truck mounted drill rig equipped with a 4-inch diameter, continuous solid flight auger. Two borings were drilled on February 3, 2009 using a hand auger (B-7) and a portable Minuteman drill rig (B-8) equipped with a solid flight auger. The borings were drilled to depths of 10 to 20 feet, except for hand auger Boring B-7 which encountered refusal at a depth of about 3 feet. Borings drilled in the existing lower parking lot generally encountered 3 to 7 feet of surficial fill, overlying very stiff native clay. The surficial clays were judged to be of low plasticity and low to moderate expansion potential, based on laboratory measured Atterberg liquid limits of 42 and 40 and respective plasticity index values of 18 and 15, as well as a measured zero swell under a 1,500 psf laboratory test load on a recovered sample. Boring B-4, drilled in the upper parking area, encountered about 3 feet of pavement section and underlying clay fill. Weathered siltstone and claystone bedrock were at depths of 1 to 7 feet in four borings, and at a depth of 11 feet in Boring B-1 drilled at the outer edge of the lower parking lot. Bedrock was not encountered in Borings B-6 and B-8, drilled on the western side of the existing building to depths of 18 and 10 feet, respectively. No groundwater was encountered in any of the borings during drilling.

## SIGNIFICANT GEOTECHNICAL CONSIDERATIONS

Based on our review of the geotechnical report, available literature, grading plan, air-photo review and site reconnaissance, it is our opinion the following significant geotechnical considerations exist at the site:



- Undocumented fill underlying the existing parking lot and proposed building pad areas, and
- Site and area drainage.

### **CONCLUSIONS**

Based on our review and reconnaissance, it is our opinion the geotechnical information and recommendations for the project as submitted satisfactorily address and account for the geotechnical considerations noted above, and generally conform to accepted local and current geotechnical engineering principles and practices, and the Soils Report Standards for the City of Orinda. We note the project geotechnical engineer has recommended that the undocumented fill soils be removed below building and pavement areas, and replaced with compacted, engineered fill. The geotechnical engineer also recommended that foundations be supported either by compacted, engineered fill or competent native soils underlying the site.

### **FUTURE DOCUMENTATION**

The project geotechnical engineer should review the completed project civil and architectural drawings, and provide a professional certification letter to the City to that effect. The project geotechnical engineer should also be consulted by the project structural engineer during the design process and should review the completed structural plans and calculations for conformance to his geotechnical recommendations, provide supplemental recommendations as necessary, and also provide a professional certification letter to the City to that effect.

The project geotechnical engineer should be retained to observe the geotechnical aspects of the construction. The geotechnical engineer should provide written documentation to the City for the following activities:

- Earthwork operations, including subgrade preparation, earthwork construction, and site drainage installations, as appropriate;
- Recording of test locations and results of field and laboratory compaction tests where determined to be appropriate by the project geotechnical engineer;
- Building foundations, including observation of foundation excavations, and confirmation of individual foundation embedment and supporting materials with respect to the geotechnical engineer's recommendations; and
- Site drainage, including finish grading around and below the residential construction, and discharge of collected surface and subsurface water to appropriate discharge facilities.

### **LIMITATIONS**

Our role as a third-party reviewer has been solely to provide technical advice to assist the City of Orinda in their discretionary permit decisions, and we are afforded the same protection



under law. Our services were limited to the review of the documents described; a visual review of the property; and developing a professional opinion as to the project geotechnical engineer's conformance to local geotechnical engineering standard practice at the time the review was performed, and the intent of the City's Soil Report Standards. We cannot confirm the accuracy of the information provided by others, nor can we confirm their conclusions and design recommendations. In addition, we have no control over the design or construction on this property and make no representations regarding its future condition(s).

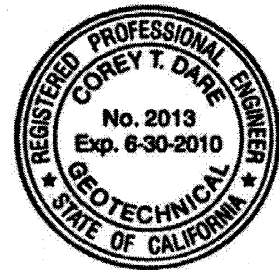
The opinions presented in this letter were prepared in accordance with generally accepted, local geotechnical engineering principles and practices at the time this review was performed. Should you have any questions or require additional information, please contact us.

Sincerely,

FUGRO WEST, INC.

A handwritten signature in black ink that reads "Corey T. Dare".

Corey T. Dare, P.E., G.E.  
Geotechnical Engineer



CTD:afp

Copies: (2) Addressee + pdf





## REFERENCES

### **Publications and Geologic and Landslide Photointerpretation Maps:**

Association of Bay Area Governments, 2009, *Liquefaction Susceptibility Map*: Website: [www.abag.ca.gov/bayarea/eqmaps/liquefac/liquefac.html](http://www.abag.ca.gov/bayarea/eqmaps/liquefac/liquefac.html).

California Geological Survey, 2008, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*: Special Publication 117A.

Dibblee, T.W., Jr., 2005, *Geologic map of the Briones Valley Quadrangle, Contra Costa and Alameda Counties, California*: Santa Barbara Museum of Natural History, Dibblee Geology Center Map No. DF-148.

Nilsen, T.H., 1975, *Preliminary photointerpretation map of landslide and other surficial deposits of the Briones Valley 7½" Quadrangle, Contra Costa and Alameda Counties, California*: U.S. Geological Survey Open-File Map 75-277-8.

Rogers/Pacific, 1993, *Photointerpretive landslide features map*: consultant's map prepared for the City of Orinda.

### **Aerial Photographs:**

Pacific Aerial Surveys, May 4, 1957, AV-253-12-17 and 18, 1:12,000 scale.

Pacific Aerial Surveys, May 28, 1969, AV-905-12-18 and 19, 1:12,000 scale.

## SITE PHOTOGRAPHS



Photo No. 1: Abandoned Orinda Library Building (Front)



Photo No. 2: Abandoned Orinda Library Building (Side)

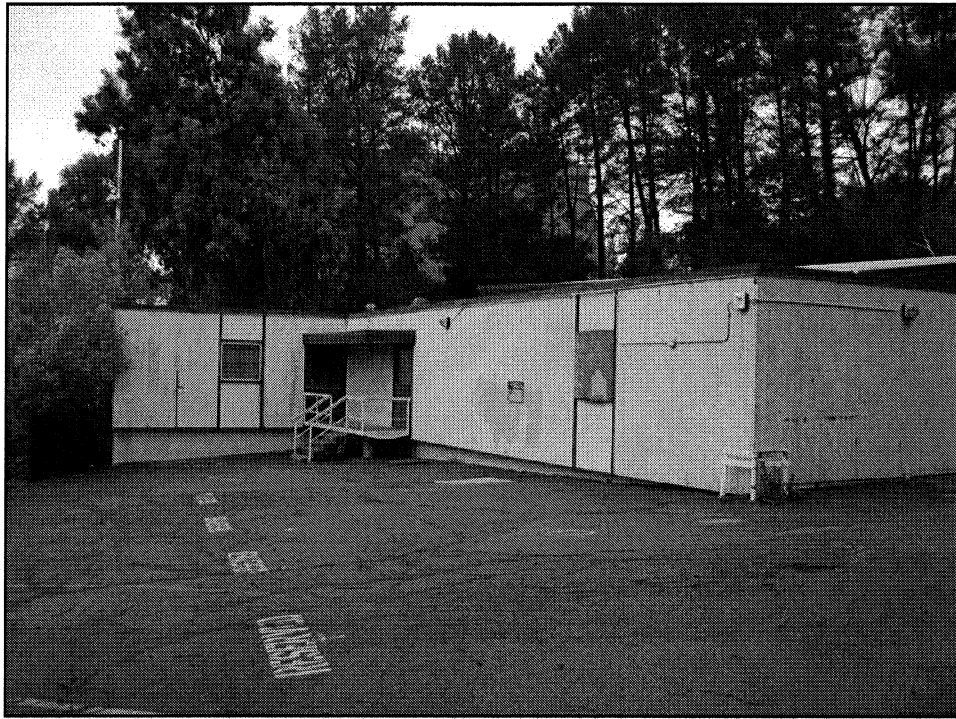


Photo No. 3: Upper Parking Area



Photo No. 4: Lower Parking Lot Area