APPENDIX A
NOTICE OF PREPARATION (NOP) AND INITIAL STUDY

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A1: Notice of Preparation

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NOTICE OF PREPARATION

TO: County Clerk; State Clearinghouse; Responsible Agencies; Trustee Agencies; Federal Agencies with approval or funding authority; Interested Parties

FROM: City of Pacifica

SUBJECT: The Prospects Residential Project (34 Residential Units at 801 Fassler Avenue) Notice of Preparation of a Draft Environmental Impact Report in Compliance with Title 12, Section 15082(a) of the California Code of Regulations

LEAD AGENCY: City of Pacifica
Planning Department
1800 Francisco Boulevard
Pacifica, CA 94044
Contact: Kathryn Farbstein, Assistant Planner
(650) 738-7443

PROJECT APPLICANT: Pacifica Quarry Homes, LLC

Notice is hereby given that the City of Pacifica will be the Lead Agency and will prepare an Environmental Impact Report (EIR) for the project identified below. We are requesting comments on the scope and content of this EIR. We have prepared an environmental Initial Study that identifies areas of probable environmental effects. These probable environmental effects are summarized below. The Initial Study is available at the addresses shown below or by contacting Kathryn Farbstein, Assistant Planner.

INTRODUCTION: The purpose of an Environmental Impact Report (EIR) is to inform decision makers and the general public of the environmental effects of a proposed project. The EIR process is intended to provide environmental information sufficient to evaluate a proposed project and its potential for significant impacts on the environment; examine methods of reducing adverse environmental impacts; and consider alternatives to the project.

The Prospects Residential Project Environmental Impact Report (The Prospects EIR) will be prepared and processed in accordance with the California Environmental Quality Act (CEQA) of 1970, as mandated, and the *CEQA Guidelines*. In accordance with CEQA requirements, The Prospects EIR will include the following:

- Summary of the proposed project and its potential environmental effects;
- Description of the proposed project;
- Description of the existing environmental setting, potentially significant environmental impacts, and mitigation measures;
- Alternatives to the proposed project;
- Cumulative impacts; and
- CEQA conclusions, including: 1) the growth-inducing impacts of the proposed project; 2) any significant environmental effects which cannot be avoided if the project is implemented; 3) any significant irreversible and irretrievable commitments of resources; and 4) effects found not to be significant.

PROJECT LOCATION: The proposed project is within the southwestern portion of the City of Pacifica in the Rockaway Neighborhood in the County of San Mateo. The proposed project site consists of approximately 11.2 acres of vacant land and is bounded by Fassler Avenue on the west and south, and vacant land to the north and east. Surrounding land uses are designated by the General Plan as Open Space Residential, Low Density Residential and are zoned Planned Development with a Hillside Preservation District overlay, similar to the proposed project site.

PROJECT DESCRIPTION: The project applicant proposes to construct 34 residential units, a subterranean parking garage, and associated amenities in the western two acres of the proposed project site. Half (17) of the proposed units would be detached single-family residences and the remaining half (17) of the proposed units would be attached in the form of duplexes and triplexes. In addition, the proposed project would include gardens, open space areas, an amphitheatre, a community center, and promenades/pedestrian walkways. The project boundaries are shown in Figure 1.

Implementation of the proposed project would require the following actions or approvals from the City of Pacifica or other agencies: General Plan Amendment; Rezoning to P-D with a Development Plan; Height, Land Coverage Control, and Parking Variances; and Specific Plan (future application). Other discretionary permits and/or ministerial approvals including grading, foundation and building permits, utility connections permits and any other ministerial actions may be required.

PROBABLE ENVIRONMENTAL EFFECTS: It is anticipated that the proposed project may have environmental effects in the following areas: Aesthetics; Biological Resources; Cultural Resources; and Transportation and Traffic. The level of analysis for these subject areas may be refined or additional subject areas may be analyzed based on responses to this Notice of Preparation (NOP), and/or refinements to the project that may occur subsequent to the publication of this NOP.

ENVIRONMENTAL EFFECTS NOT LIKELY TO REQUIRE FURTHER ANALYSIS: An environmental Initial Study was prepared and it was determined that the following potential environmental effects of the proposed project would be less than significant or have no impact and will not be further studied in the Draft EIR: Agriculture Resources; Air Quality; Geology/Soils; Hazards and Hazardous Materials; Hydrology/Water Quality; Land Use/Planning; Mineral Resources; Noise; Population/Housing; Public Services; Recreation; and Utilities/Service Systems.

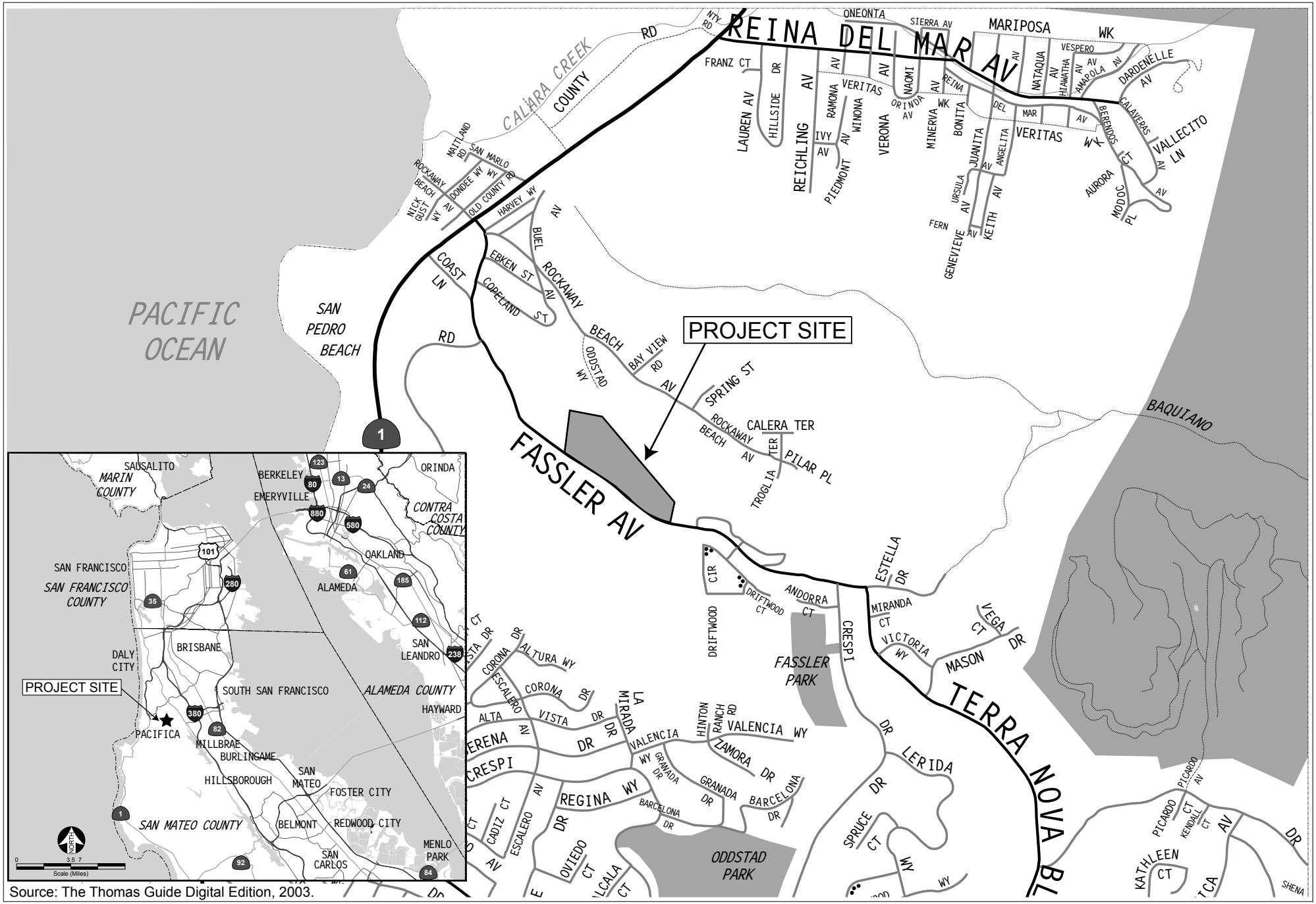
REQUEST FOR COMMENTS: Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but *no later than September 21, 2006*. Please send your response to Kathryn Farbstein, Assistant Planner at the address shown above.

DOCUMENT AVAILABILITY: The Initial Study is available for review at the following locations:

- City of Pacifica Planning Department, 1800 Francisco Boulevard
- Pacifica Library, 104 Hilton Way
- Sanchez Library, 1111 Terra Nova Boulevard

DATE: August 18, 2006 Signature: _____

Kathryn Farbstein
Assistant Planner



Source: The Thomas Guide Digital Edition, 2003.

CHRISTOPHER A. JOSEPH & ASSOCIATES
Environmental Planning and Research

NORTH

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Scale (Feet)

Figure 1
Regional and Vicinity Maps

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A2: Initial Study

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City of Pacifica
Planning and Economic Department
INITIAL STUDY AND CHECKLIST

Date: June 29, 2006

California Environmental Quality Act (CEQA) Requirements

This report has been prepared pursuant to the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et esq.) and the CEQA *Guidelines*.

Project Title: The Prospects Residential Project (34 Residential Units at 801 Fassler Avenue)

Project Location: 801 Fassler Avenue
Pacifica, California 94044

Lead Agency: City of Pacifica
Planning Department
1800 Francisco Boulevard
Pacifica, CA 94044
Contact: Kathryn Farbstein
(650) 738-7341

Project Applicant: Rick Lee, Managing Member
Pacifica Quarry Homes, LLC
P.O. Box 260
Pacifica, CA 94044

Project Location: 801 Fassler Avenue (APN 022-083-020 and 022-083-030)

General Plan Designation/Zoning Classification: The General Plan designation for approximately 7.6 acres of the westerly portion of the project site is Open Space Residential and the remaining 3.6 acres has a General Plan designation of Low-Density Residential. The entire proposed project site is zoned Planned Development (P-D) District with Hillside Preservation District (HPD) overlay.

Site Description: The approximately 11.2-acre project site is located in the southwest portion of the City in the Rockaway Neighborhood and is bounded by Fassler Avenue on the west and south, and vacant land to the north and east. The project site consists of the following two parcels (identified by the Assessor's Parcel Numbers [APNs]): 022-083-020 and 022-083-030. The proposed project site consists of hilly terrain and generally slopes from a peak in the southeast portion (approximately 440 feet above mean sea level [msl]) of the site to a low point

in the northwest region (240 feet above msl) of the project site. The average slope from the highest to lowest point on the project site is approximately 17.7 percent. An approximately 50-foot high ridge exists in the middle portion of the property, roughly parallel to Fassler Avenue.

Project Description: The project applicant (Pacifica Quarry Homes, LLC) proposes to construct 34 residential units, a subterranean parking garage, and associated amenities in the western 2 acres of the proposed project site. The proposed site plan is shown in Figure 1. Half (17) of the proposed units would be detached single-family residences and the remaining half (17) of the proposed units would be attached in the form of duplexes and triplexes. The detached units would be designed as cottage-style two- to three-bedroom units. Two of the detached units and three of the attached units would be designated as affordable. In addition to the proposed residential units the proposed project would include gardens, open space areas, an amphitheatre (the amphitheatre would used for recreational purposes to be determined by the residents of the proposed development), a community center, and promenades/pedestrian walkways. The development would be sited below the ridgeline and, therefore, would be visible from Fassler Avenue. The gardens and open space areas would be sited east of the residential units. The proposed hiking trail would extend throughout the entire project site. The subterranean garage would consist of approximately 26,000 square feet (sf) and would provide 112 parking spaces. Three additional surface parking spaces (including one handicapped space) would be provided near the entrance to the proposed project site.

The 17 attached units would be sited above the subterranean parking garage. The detached units would generally be sited around the attached units, with the attached units making up the center portion of the developed area. Two access roads would serve as promenades, pedestrian walkways, and emergency access roads, and would provide connectivity among the units. One roadway would be sited along the western boundary of the attached units and the other would be located to the south, providing links between attached and detached units.

The detached units would consist of two stories and attached units would be two and three stories. The building height varies throughout the site. The attached units above the parking garage would be a maximum of 38’3” above grade, which would also be the maximum building height on the project site.

The total proposed developed area would be 210,279 sf, approximately 43 percent of the total site area, of which the recreational portion would consist of approximately 123,932 sf. The recreational portion of the project site would cover approximately 25.5 percent of the total site area. The residential portion of the proposed project would consist of 86,347 sf and would cover approximately 17.8 percent of the total site area.

An existing asphalt road along the northern boundary of the project site would be demolished and removed to accommodate a proposed nature trail. The material from the demolition of the asphalt road would be recycled and reused for materials in new construction of the proposed project.

Additionally, rainwater would be collected from roofs and other impermeable areas on the proposed project site and would be stored in several retention basins including an upper level pond, a cistern beneath the parking garage, and in the amphitheatre. In total, these basins would have a capacity of 200,000 gallons. It is proposed that this water be used for irrigation purposes. Finally, the proposed amphitheatre area would be designed to serve as storm water storage with the capacity to store all tributary runoff corresponding with a 100-year storm event. The storage site would have an overflow outlet as a safety factor so that in the event of a severe storm that exceeds capacity, excess runoff would be discharged into the existing storm drainage facilities along Fassler Avenue.

Other public agency approval(s) required:

- General Plan Amendment
- Rezoning to P-D with a Development Plan
- Height, Land Coverage Control, and Parking Variances
- Specific Plan (future application)
- Other discretionary permits may be required
- Ministerial approvals including grading, foundation and building permits, utility connections permits and any other ministerial actions or approvals may be required.

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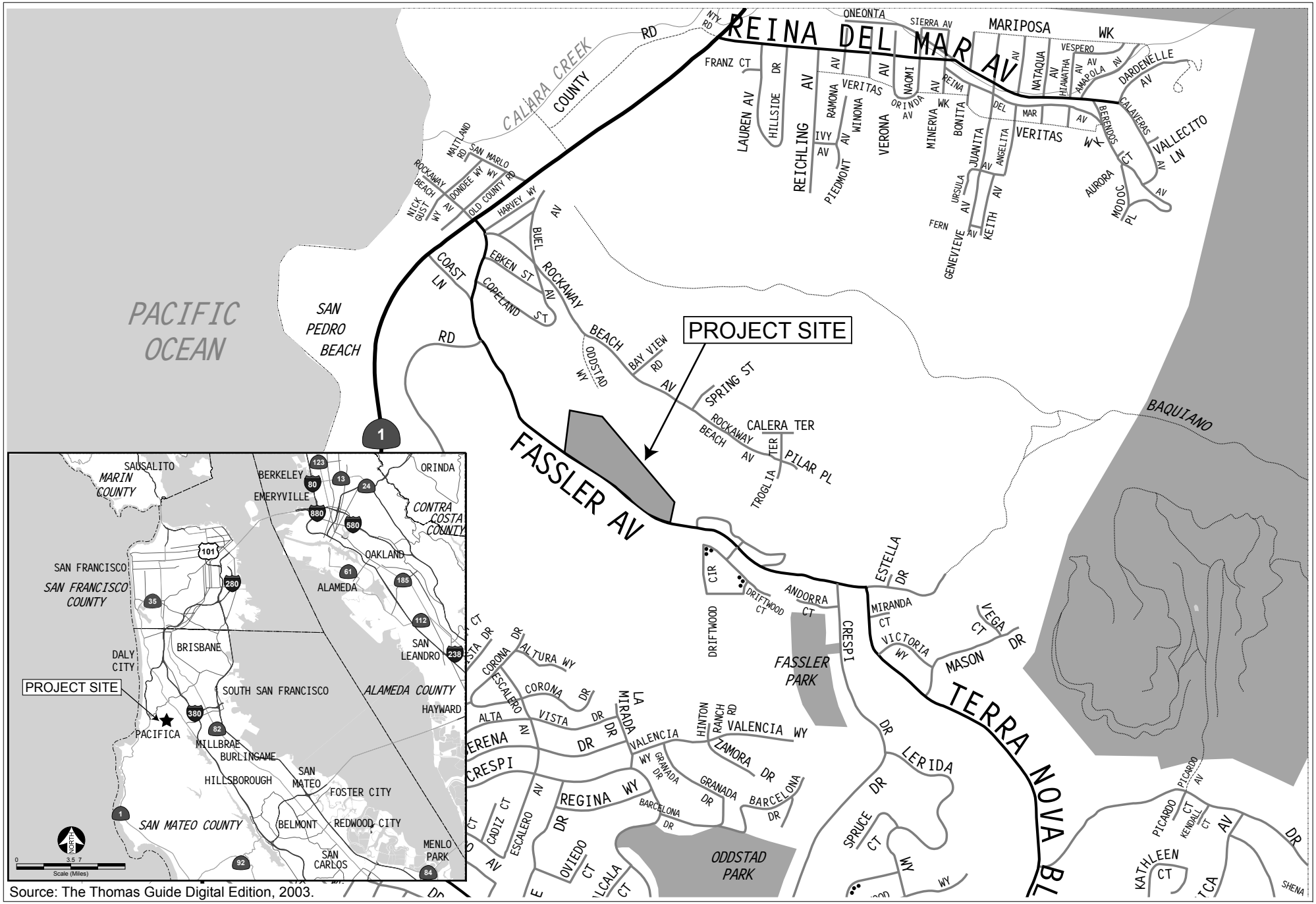

Source: The Thomas Guide Digital Edition, 2003.

CHRISTOPHER A. JOSEPH & ASSOCIATES
Environmental Planning and Research

NORTH

0 600 1200 1800 2400
Scale (Feet)

Figure 1
Regional and Vicinity Maps

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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 pages below.

✓	1.	Aesthetics		7.	Hazards & Hazardous Materials		13. Public Services
	2.	Agricultural Resources		8.	Hydrology & Water Quality		14. Recreation
	3.	Air Quality		9.	Land Use & Planning	✓	15. Transportation/Traffic
✓	4.	Biological Resources		10.	Mineral Resources		16. Utilities & Service Systems
✓	5.	Cultural Resources		11.	Noise		
	6.	Geology & Soils		12.	Population & Housing		

Determination

	I find that the proposed project COULD NOT have a significant effect on the environment and a NEGATIVE DECLARATION should 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 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.

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 in 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 "Earlier Analysis," as described in (5) below, 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 pursuant to 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 which 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 significant.

Signature: _____ Date: _____

Kathryn Farbstein
Assistant Planner
City of Pacifica

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Environmental Analysis

1. **Aesthetics.** Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?	✓			
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	✓			
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	✓			
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	✓			

Discussion:

a) *Potentially Significant Impact.* The proposed project could impede views of the Pacific Ocean to the west or ridge views to the north. The portion of Fassler Avenue located northwest of the project site is identified as an area with unique visual characteristics in the City's General Plan.[1] This impact is considered potentially significant and will be further evaluated in the EIR.

b) *Potentially Significant Impact.* The proposed project is not within the viewing corridor of a state scenic highway.[2] According to the City's General Plan, the City proposes to designate the Linda Mar Boulevard – Oddstad – Terra Nova Boulevard – Fassler Avenue loop as a scenic highway.[3] It is possible; therefore, that implementation of the proposed project could cause substantial damage to scenic resources this roadway. This impact is considered potentially significant and will be further analyzed in the EIR.

c) *Potentially Significant Impact.* Implementation of the proposed project would involve development of 34 residential units, a subterranean parking structure, and associated amenities on a currently vacant site. The proposed residential units would have solar panels installed on the roofs of each unit. Additionally, the project site would be graded to accommodate the proposed project. These characteristics of project development could alter the visual character or quality of the site and the surroundings. This impact is considered potentially significant and will be further addressed in the EIR.

d) *Potentially Significant Impact.* Implementation of the proposed project would introduce new sources of light and glare, including interior and exterior building lighting and vehicle headlights, reflective surfaces, such as windows and light-colored paint in an area that is currently vacant. Therefore, the potential for the

[1] *City of Pacifica, General Plan Community Design Element, March 1978.*

[2] *California Department of Transportation, "The California Scenic Highway System: A List of Eligible and Officially Designated Routes," http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm, Accessed May 18, 2006.*

[3] *City of Pacifica, General Plan Scenic Highway Element, February 1978.*

project to create a new source of substantial light or glare which would adversely affect day or nighttime views. This impact is considered potentially significant and will be further addressed in the EIR.

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
2. **Agricultural Resources.** In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				✓
b. Conflict with existing zoning for agricultural use, or a Williamson Act Contract?				✓
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?				✓

Discussion:

a) *No Impact.* The Farmland Mapping and Monitoring Program (FMMP) designates the site as Urban and "Built-Up Land".[4] Therefore, the project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses. No impact would result and no further analysis of this issue is required.

b) *No Impact.* The project site is zoned P-D District with an HPD overlay. The project site is not under Williamson Act Contract. No impact would result and no further analysis of this issue is required.

c) *No Impact.* No agricultural land uses are located on or in close proximity to the project site.[5] No impact would result and no further analysis of this issue is required.

[4] *California Division of Land Resource Protection, Farmland Mapping and Monitoring Program Overview, website: http://www.consrv.ca.gov/dlrp/FMMP/overview/survey_area_map.htm, Accessed May 18, 2006.*

[5] *Christopher A. Joseph & Associates, Site Visit, May 25, 2006.*

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
3. **Air Quality.** The significance criteria established by the Bay Area Air Quality Management District (BAAQMD) may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?			✓	
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			✓	
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 which exceed quantitative thresholds for ozone precursors)?			✓	
d. Expose sensitive receptors to substantial pollutant concentrations?			✓	
e. Create objectionable odors affecting a substantial number of people?			✓	

Discussion:

a) *Less-Than-Significant Impact.* A significant impact may occur if the proposed project is not consistent with the applicable air quality plan. In the case of projects proposed within the Bay Area, the applicable plan is the Air Quality Management Plan (AQMP) that is prepared by the Bay Area Air Management District (BAAQMD). The BAAQMD is the agency principally responsible for comprehensive air pollution control in the Basin. To that end, the BAQMD, a regional agency, works directly with the Association of Bay Area Governments (ABAG), county transportation commissions, local governments, and cooperates actively with all State and federal government agencies. The BAAQMD develops rules and regulations, establishes permitting requirements, inspects emissions sources, and enforces such measures though educational programs or fines, when necessary.

The BAAQMD is directly responsible for reducing emissions from stationary (area and point), mobile, and indirect sources. It has responded to this requirement by preparing a series of AQMPs. Bay Area plans are prepared with the cooperation of the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG). Currently, there are three plans for the Bay Area. These are:

- The *Ozone Attainment Plan for the 1-Hour National Ozone Standard* (ABAG, 2001) developed to meet Federal ozone air quality planning requirements;

- The *Bay Area 2000 Clean Air Plan* (BAAQMD, 2000) developed to meet planning requirements related to the State ozone standard; and

- The *1996 Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas*, developed by the air districts with jurisdiction over the ten planning areas including the

BAAQMD to ensure continued attainment of the Federal carbon monoxide standard. In June 1998, the EPA approved this plan and designated the ten areas as attainment. The maintenance plan was revised in October 1998.

The Bay Area 2001 Ozone Attainment Plan was prepared as a proposed revision to the Bay Area part of California's plan to achieve the national ozone standard. The plan was prepared in response to US EPA's partial approval and partial disapproval of the Bay Area's 1999 Ozone Attainment Plan and finding of failure to attain the national ambient air quality standard for ozone. The Revised Plan was adopted by the Boards of the co-lead agencies and approved by the ARB in 2001. On July 7, 2003, EPA signed a rulemaking proposing to approve the Plan. EPA also made an interim final determination that the Plan corrects deficiencies identified in the 1999 Plan. However, in April 2004, US EPA made a final finding that the Bay Area has attained the national 1-hour ozone standard. Because of this finding, the previous planning commitments in the 2001 Ozone Attainment Plan are no longer required. The region must submit to EPA a redesignation request and a maintenance plan to show that the region will continue to meet the 1-hour ozone standard. The recent designation of the Bay Area as nonattainment for the Federal 8-hour ozone standard now triggers the need for an attainment plan.

For State air quality planning purposes, the Bay Area is classified as a marginal non-attainment area for the national 8-hour ozone standard. The serious classification triggers various plan submittal requirements and transportation performance standards. One such requirement is that the Bay Area update the Clean Air Plan (CAP) every three years to reflect progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emission inventory data. The Bay Area's record of progress in implementing previous measures must also be reviewed. The most recent revision to the CAP was completed in 2000. The 2000 CAP applied control measures to stationary sources, mobile sources, and transportation control measures (TCMs).

Projects that are consistent with the projections of employment and population forecasts identified by ABAG are considered consistent with the Plans growth projections, since the Growth Management Chapter forms the basis of the land use and transportation control portions of the Plan. The Plan also assumes that general development projects will include feasible strategies (i.e., mitigation measures) to reduce emissions generated during construction and operation.

The proposed project consists of 17 attached single-family homes and 17 detached single-family homes. New residential uses would increase the City population. Using an existing average household size of 2.728, the proposed project would be expected to accommodate approximately 93 (2.728 x 34) residents. According to ABAG, by the date of the project's completion in the fall of 2008, the City's projected population would be 38,840. Assuming that all residents generated by the proposed project are new to the City, they would make up 0.24 percent of the baseline population (2006) and 0.24 percent of the projected population for the year 2008. Because the proposed project would not exceed the City's population projections, impacts would be less than significant.

b) *Less-Than-Significant Impact.* The proposed project would involve the construction of 34 residential units, a subterranean parking garage, and associated amenities in the westernmost two acres of the proposed project site. During the construction phase of development of the proposed project, on-site stationary sources, heavy-duty construction vehicles, construction worker vehicles, and energy use would generate emissions. In addition to construction vehicle emissions, fugitive dust would also be generated during grading and construction activities. Dust is generated when grading equipment breaks down surface materials. The resulting dust, which includes PM_{10}, is subsequently entrained into the air by wind and

vehicle tires. Although much of this airborne dust would settle out on or near the project site, smaller particles would remain in the atmosphere, increasing existing particulate levels within the surrounding area. Sensitive receptors that could be affected by construction include the existing residential areas near the project site.

Construction/Demolition Emissions

According to the BAAQMD CEQA Guidelines, PM_{10} is the pollutant of greatest concern with respect to construction activities. Construction emissions of PM_{10} can vary greatly depending upon the level of activity, construction equipment, local soils, and weather conditions, among other factors. As a result, the BAAQMD CEQA Guidelines specifies, "[t]he District's approach to CEQA analyses of construction impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions." Therefore, the determination of significance with respect to construction emissions should be based on a consideration of the control measures to be implemented. If all the applicable control measures for PM_{10} indicated in the BAAQMD CEQA Guidelines would be implemented, then air pollutant emissions from construction activities would be considered less than significant. If a project would not implement all applicable control measures, construction emissions would be considered a significant impact.

While the BAAQMD does not implement specific thresholds for construction emissions, without implementation of specific dust control measures, impacts related to construction emissions would be significant. Therefore, as recommended by the BAAQMD, the following control measures would be required during construction activities.[6] These measures include:[7]

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials *or* require all trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at the construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at the construction sites.
- Sweep public streets adjacent to construction sites daily (with water sweepers) if visible soil material is carried onto the streets.

With inclusion of these control measures, impacts would be less than significant and no further analysis of this issue is required.

Operational Emissions

The BAAQMD recommends that individual project's impacts involving direct and/or indirect operational emissions that exceed the following thresholds be considered significant:

[6] *Bay Area Air Quality Management District, CEQA Air Quality Handbook, December 1999.*

[7] *As indicated by the BAAQMD, enhanced control measures are recommended for sites larger than four acres in size. Although the total project site is greater than four acres, almost all construction would take place on a portion less than four acres. For this reason, the project would integrate the BAAQMD's "Basic Control Measures"*

- 80 pounds per day (ppd) of ROG
- 80 ppd of NO_x
- 80 ppd of PM_{10}

Direct emissions are those that are emitted on a site and include stationary sources and on-site mobile equipment. Examples of land uses and activities that generate direct emissions are industrial operations and sources subject to an operating permit by the BAAQMD. Indirect emissions come from mobile sources that access the project site but generally emit off site. For many types of land-use development projects, the principal sources of air pollutant emissions are the motor vehicle trips generated by the project.

Regional Emissions – Daily Emissions of ROG, NOx, and PM_{10}

Operational emissions associated with the ultimate development and operation of the proposed project would result primarily from increased vehicular trips to and from the commercial development. Other sources of emissions associated with the project would include area source emissions, such as the use of natural gas for water heaters and cooking appliances. The predicted mobile source and area source emissions associated with project operation were calculated using the URBEMIS 2002 computer model distributed for use by the CARB and recommended for use by the BAAQMD. The average daily indirect and direct emissions associated with the proposed project are presented in Table 1 and are compared with the BAAQMD project-specific recommended thresholds of significance for the sources of pollutants. As shown in Table 1, the project would not generate average daily direct and indirect emissions of ROG, NO_x, or PM_{10} that would exceed BAAQMD-recommended thresholds. Therefore, regional emissions associated with the proposed project would be less than significant.

Table 1
Air Pollutant Emissions from Project Operations (lbs/day)

Operational Activity	**ROG**	**NO_x**	**PM_{10}**
Project Operational Emissions	2.23	2.21	2.27
Significance Threshold	80	80	80
Significant Impact?	**No**	**No**	**No**

Source: URBEMIS 2002. Christopher A. Joseph & Associates, 2006.

Toxic Air Contaminants

Diesel particulate emissions, a known toxic air contaminant, would occur from trucks picking up garbage and recyclable materials, and making deliveries to the project site. To address diesel particulate emissions, statewide programs and regulations are presently being developed and implemented by the California Air Resources Board and the U.S. EPA to reduce the risks of exposure to diesel exhaust. These programs include emission control requirements along with subsidies for upgrading older diesel engines to low-emissions models. In light of the available information, the effects of the toxic emissions from future vehicle operations at the project site are not expected to be substantial.

Toxic or carcinogenic air pollutants are not expected to occur in any meaningful amounts in conjunction with operation of the proposed land uses at the project site. Only small quantities of common forms of

hazardous or toxic substances, such as cleaning agents, which are typically used or stored in conjunction with residential uses, would be present. Most uses of such substances would occur indoors. Based on the common uses expected on the site, any emission would be minor.

With integration of the control measures listed above, and because of the reasons discussed in this analysis, impacts are considered less than significant and no further analysis is necessary.

c) *Less-Than-Significant Impact.* A significant impact may occur if a project would add a considerable cumulative contribution to federal or state non-attainment pollutant. For State air quality planning purposes, the Bay Area is classified as a marginal non-attainment area for the national 8-hour ozone standard. With regard to determining the significance of the proposed project contribution, the BAAQMD neither recommends quantified analyses of construction and/or operational emissions from multiple development projects nor provides methodologies or thresholds of significance to be used to assess the cumulative emissions generated by multiple cumulative projects. Instead, the BAAQMD recommends that a project's potential contribution to cumulative impacts should be assessed utilizing the same significance criteria as those for project specific impacts. Therefore, this analysis assumes that individual development projects that generate construction or operational emissions that exceed the BAAQMD recommended daily thresholds for project-specific impacts would also cause a cumulatively considerable increase in emissions for those pollutants for which the Basin is in non-attainment.

As discussed above, daily emissions associated with project development and operation of the proposed project would generate operational emissions that do not exceed the BAAQMD's recommended thresholds. The construction-related and operational emissions associated with the proposed project would, therefore, not be cumulatively considerable. Impacts are less than significant and no further analysis is required.

d) *Less-Than-Significant Impact.* A significant impact may occur if the operation of a project exceeds an Ambient Air Quality Standard at a sensitive receptor location. BAAQMD protocol utilizes localized CO concentrations to determine pollutant concentration potential. Sensitive receptors are populations that are more susceptible to the effects of air pollution than are the population at large. The BAAQMD identifies the following as sensitive receptors: long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, child care centers, and athletic facilities.

For this analysis, CO concentrations were calculated based on a simplified CALINE4 screening procedure developed by the BAAQMD. This methodology assumes worst-case conditions (i.e., wind direction is parallel to the primary roadway, 90° to the secondary road; wind speed of less than one meter per second; and a high level of atmospheric stability or lack of change) and provides a screening of maximum, worst-case CO concentrations.

Motor vehicles are the primary source of pollutants in the project vicinity. Traffic-congested roadways and intersections have the potential to generate localized high levels of CO. The BAAQMD recommends that CO modeling be performed for projects in which traffic would affect intersections or roadway segments operating at LOS D, E, or F, or would cause a decline to LOS D, E, or F. As a result, CO modeling was performed for the following three roadway intersections:

- SR1 /Reina del Mar Avenue
- SR1/Fassler Avenue
- Fassler Avnue/Project Access

The results of these calculations are presented in Table 2. As shown therein, future CO concentrations near the study intersections would not exceed national or State ambient air quality standards with operation of the proposed project. Therefore, CO hotspots would not occur near these intersections in the future with operation of the Proposed Project. Therefore, impacts related to local CO concentrations at these intersections would be less than significant and no further analysis is required.

Table 2
Future (2015) Localized Carbon Monoxide Concentrations

Intersection	CO Concentrations in Parts per Million[a,b]					
	25 Feet		50 Feet		100 Feet	
	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour
1. SR1 & Reina del Mar Avenue	3.7	3.2	3.4	3.0	3.1	2.8
2. SR1 & Fassler Avenue	3.5	3.2	3.2	3.0	3.0	2.8
3. Project Access & Fassler Avenue	2.6	2.6	2.5	2.5	2.5	2.4

[a] *National 1-hour standard is 35.0 parts per million. State 1-hour standard is 20.0 parts per million.*
[b] *National 8-hour standard is 9.5 parts per million. State 8-hour standard is 9.1 parts per million.*
Source: Christopher A. Joseph and Associates 2006.
Traffic Information Source: Dowling Associates, Inc. 2005.

e) *Less-Than-Significant Impact.* According to the *BAAQMD CEQA Guidelines*, the types of projects that commonly result in odor impacts include: wastewater treatment plant, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing, fiberglass manufacturing, auto body shops, rendering plants, and coffer roasters.[8] The proposed project does not include any of these uses and would not create objectionable odors that would affect a substantial number of people. Therefore, project impacts related to odors would be less than significant, and no further analysis of this issue is required.

[8] *Bay Area Air Quality Management District, CEQA Air Quality Handbook, December 1999.*

4. Biological Resources. Would the project::	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	✓			
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in the City or regional plans, policies, regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	✓			
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, 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?	✓			
e. Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?			✓	
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?				✓

Discussion:

a) *Potentially Significant Impact*. Implementation of the proposed project could result in a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service. A Biological Resources Assessment (BRA) will be prepared for the proposed project and will analyze potential impacts related to habitat modification. Impacts could be potentially significant and will be further analyzed in the EIR.

b) *Potentially Significant Impact*. The proposed project could have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in the City or regional plans, policies, regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service. A BRA will be prepared for the proposed project and will analyze potential impacts to riparian habitats or other

sensitive natural communities should they be present on the project site. Impacts are considered potentially significant and will be further analyzed in the EIR.

c) *Potentially Significant Impact.* The proposed project could have a substantial adverse effect on federally protected wetlands. A BRA will be prepared for the proposed project and will analyze potential impacts to wetlands should they be present on the project site. Impacts are considered potentially significant and will be further analyzed in the EIR.

d) *Potentially Significant Impact.* The project site is completely developed and contains no onsite waterways. Although the project site contains no onsite waterways, the project site includes and is adjacent to areas of open space. Additionally, there could be native wildlife nurseries in the project area. A BRA will be prepared for the proposed project and will analyze potential impacts related to substantial interference with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, or the use of native wildlife nursery sites. Impacts are considered potentially significant and will be further analyzed in the EIR.

e) *Less-Than-Significant Impact.* The City has a Heritage Tree ordinance which defines a heritage tree as any tree within the City of Pacifica, with the exception of eucalyptus, which has a trunk with a circumference of 50 inches or greater, approximately 16 inches in diameter or more when measured two feet above natural grade.[9] In addition, the City Council may designate any tree or grove of trees of special historical, environmental, or aesthetic value as a heritage tree. Heritage trees may not be removed, destroyed, or damaged beyond repair without a Heritage Tree Permit. Development projects involving heritage trees which require Planning Commission approval must be accompanied by a tree protection plan. The proposed project would involve the removal of two Heritage Trees. As required by the ordinance, the applicant would submit a Heritage Tree Permit and a Tree Protection Plan along with planning permits and, therefore, would be in compliance. No other local policies related to biological resources would apply to the proposed project. Impacts would be less than significant and no further analysis is required.

f) *No Impact.* The project site is not subject to a Habitat Conservation Plan, Natural Community Conservation Plan, or any other habitat plan. Therefore, development of the proposed project would not conflict with any habitat conversion plan. Thus, no further analysis of the issue is required.

5. <u>Cultural Resources</u>. Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?			✓	
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	✓			
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			✓	
d. Disturb any human remains, including those interred outside of formal cemeteries?			✓	

[9] *Christopher Campbell Tree Design, RE: Two Cupressus macrocarpa (Monterey Cypress), February 2006.*

Discussion:

a) *Less-Than-Significant Impact.* The proposed project site does not contain a structure or resource of historical significance as defined in §15064.5.[10] Impacts would be less than significant and no further analysis is required.

b) *Potentially Significant Impact.* There are no known archaeological resources on the project site.[11] However, based on the topographic setting of the project site, there is a moderate possibility that unrecorded Native American cultural resources are present.[12] This impact is considered potentially significant. The EIR will provide further analysis of this issue and, if applicable, present appropriate mitigation measures.

c) *Less-Than-Significant Impact.* There are no known paleontological resources or unique geological features on the proposed project site.[13,14] This impact is considered less than significant and no further analysis is required.

d) *Less-Than-Significant Impact.* Although it is believed that no human remains are known to have been found on the project site, it is possible that unknown resources could be encountered during project construction, particularly during ground-disturbing activities such as excavation and grading. However, as required by State law, if human remains are discovered at the project site during construction, work at the specific construction site at which the remains have been uncovered shall be suspended, and the appropriate City and County agencies immediately notified. If the remains are determined by the County coroner to be Native American, the Native American Heritage Commission (NAHC) shall be notified within 24 hours, and the guidelines of the NAHC shall be adhered to in the treatment and disposition of the remains. Therefore, project impacts to unknown human remains would be less than significant. No further analysis of this issue is required.

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
6. Geology & Soils. Would the project:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
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.			✓	

[10] *City of Pacifica, General Plan, Historic Preservation Element. April 1978.*
[11] *California Historical Resources Information System, Northwest Information Center, Written Correspondence, June 13, 2006.*
[12] *Ibid.*
[13] *University of California at Berkeley, University of Paleontology, http://www.ucmp.berkeley.edu/index.html, Accessed May 18, 2006.*
[14] *Christopher A. Joseph & Associates, Site Visit, May 25, 2006*

6. Geology & Soils. Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
ii. Strong seismic ground shaking?			✓	
iii. Seismic-related ground failure, including liquefaction?			✓	
iv. Landslides?			✓	
b. Result in substantial soil erosion or the loss of topsoil?			✓	
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?			✓	
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?			✓	
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				✓

Discussion:

a.i) *Less-Than-Significant Impact*. The potential for rupture of a seismically active fault at the project site is negligible. Although the site is located within a zone of regional seismic activity, no known active faults are identified as traversing the site or adjacent properties. Under the Alquist-Priolo Earthquake Fault Zoning Act (A-PEZA), the State Geologist is required to identify and map earthquake faults which have evidence of ground surface rupture having occurred in the last 11,000 years. Such faults are considered "active" or having the potential to generate significant earthquakes. The mapping of active faults indicates that the project site is located between two regional active faults within the San Andreas Fault System (SAFS). The San Gregorio Fault is located approximately 4.2 miles west of the project site and lies within the Pacific Ocean. The San Andreas Fault is located approximately 2.7 miles east of the project site. The distance of these faults from the project site reduces the potential for fault rupture at the proposed project site during earthquakes on these faults to a negligible level.

The site is located approximately 1.0 miles north of the mapped trace of the Pilarcitos Fault. This fault is not zoned as an 'active' fault under the A-PEZA. The location, trend, and other characteristics of the fault suggest that the Pilarcitos Fault may be an ancestral trace of the San Andreas Fault. Seismicity in the area

of the fault indicates that the fault may be potentially active.[15] However, due to distance of the proposed project site from the fault, it is unlikely that an earthquake on the fault could produce fault rupture at the project site. Impacts are considered less than significant and no further analysis is required.

a.ii) *Less-Than-Significant Impact*. The coastal region of California is located at the margin of two lithospheric plates of the earth's crust, the Pacific plate to the west and the North American plate to the east. The movement of the Pacific plate northward relative to the North American plate results in the accumulation of stress along the margin of the plates. Earthquakes result as the strain is released by the rupture of the earth. The plate motion has resulted in the development of the SAFS, a series of northwest-southeast trending active faults. The SAFS includes the San Andreas, San Gregorio, Hayward-Rodgers Creek, Calaveras, and other active faults. All of these active regional faults are capable of generating damaging earthquakes. The U.S. Geological Survey has estimated that there was a 62 percent probability that between 2003 and 2032, a 6.7 or greater magnitude earthquake will occur within the San Francisco Bay Region.[16] The probability of a 6.7 magnitude or greater earthquake occurring along individual faults was estimated to be 21 percent along the San Andreas Fault, ten percent along the San Gregorio Fault, 27 percent along the Hayward-Rodgers Creek Fault, and eleven percent along the Calaveras Fault.

During a regional earthquake within the SAFS, the level of groundshaking at the proposed project site would be dependent on the magnitude of the earthquake and the distance from the site to the epicenter of the earthquake. The "intensity" of ground shaking during an earthquake is a subjective measure of the perceptible effects of seismic energy at a given point and varies with distance from the epicenter and local geologic conditions. The Modified Mercalli Intensity Scale (MMI) is the most commonly used scale for measurement of the subjective effects of earthquake intensity. This scale uses the observations of the people who experienced an earthquake to estimate its intensity. Regional analysis by the Association of Bay Area Governments (ABAG) of estimated groundshaking during expected earthquakes within the SAFS indicate that during an earthquake similar to the 1906 (M 7.9) event on the San Andreas Fault ground shaking in the vicinity of the project site would be "very strong" (MMI-VIII) to "violent" (MMI-IX). During an M 7.2 earthquake on the San Gregorio Fault, ABAG estimates that the intensity of shaking at the site would be 'strong' (MMI-VII).

Intensity can also be quantitatively measured using accelerometers (strong motion seismographs) that record ground acceleration at a specific location, a measure of force applied to a structure under seismic shaking. Acceleration is measured as a fraction or percentage of the acceleration under gravity (g). Estimates of the peak ground acceleration have been made for the project area based on probabilistic models that account for multiple seismic sources. Under these models, consideration of the probability of expected seismic events is incorporated into the determination of the level of ground shaking at a particular location. Recent seismic hazards evaluations have been conducted to determine probabilistic estimates for seismic shaking levels throughout California. The California Geological Survey estimates that the expected peak horizontal acceleration (i.e., with a 10 percent chance of being exceeded in the next 50 years) from any of the known seismic sources potentially affecting vicinity of the site to be 0.6 to 0.7g.[17]

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[15] *Brabb, E.E., and Olson, J.A., 1998, Maps Showing Faults and Earthquake epicenters in San Mateo County, California, United States Geological Survey, Miscellaneous Investigations Series Map I-1257-F.*

[16] *United State Geologic Survey, 2003, website: http://geopubs.wr.usgs.gov/fact-sheet/fs039-03*

[17] *California Division of Mines and Geology (CDMG), 1996. Probabilistic Seismic Hazard Map for California, CDMG Open-File Report 96-08.*

Current geologic and seismic evidence, as summarized above indicates that strong seismic shaking is expected at the project site. The geotechnical investigation prepared for the proposed project [18] references and applies the seismic design provisions of the Uniform Building Code (UBC) for the recommendations for the design of structures at the proposed project. The UBC (with modifications presented in the California Building Code [CBC]) is the accepted standard for the seismic design of structures. The propsed project is required to comply with the UBC and the CBC. However, these standards provide protection against collapse of structure but do not prevent potential significant damage (including non-structural damage such as falling objects, broken windows, and interior and exterior damage) during seismic shaking. Therefore, the potential for significant damage and associated human injury during earthquakes remains significant at the site after compliance with the seismic design provisions of the UBC. The risk of such damage and injury at the site is similar to the risk presented throughout much of the San Francisco Bay area. This risk has been found to be acceptable within the planning community and by regional governments. As such, impacts are considered less than significant and no further analysis is required.

a.iii) *Less-Than-Significant Impact*. Moderate to strong groundshaking during earthquakes can result in collateral types of ground failure, including liquefaction. Liquefaction is a phenomenon in which saturated, granular sediment lose strength as the result of increased pore water pressures caused by seismic shaking. The soils transform nearly instantaneously from a solid to a liquid state. Geologic conditions, site-specific investigation, and regional mapping[19] indicate that the likelihood of the presence of saturated, granular deposits is very low. As such, the susceptibility of materials to liquefaction is very low. Impacts are considered less than significant and no further analysis is required.

a.iv) *Less-Than-Significant Impact*. The proposed project would be sited in an area of the project site that is underlain by sandstone bedrock of the Franciscan Assemblage. Regional mapping and characterization of slope stability indicates that the slopes developed on this type of bedrock in the vicinity of the proposed project site are moderately to highly stable.[20] The expected susceptibility of these slopes to failure during seismic shaking is generally characterized as very low.[21] Portions of the area proposed for development have been excavated during previous quarrying activities, forming a relatively flat bench on the ridgetop.

However, steep slopes vicinity of the proposed project site are susceptible to the development of debris slides, particularly during period of intense or prolonged rainfall. Debris flows usually develop within the unconsolidated slope deposits (colluvium) and are initiated during high rainfall events when groundwater levels are elevated. For example, in January, 1982 a series of severe rainstorms resulted in over 18,000 landslides in the Bay Area, most of which were debris flows.[22] Although these types of failures are relatively small as compared to deep-seated rotational landslides or earthflows, their occurrence can cause significant damage to structures at the failure location or within the path of the slide mass.

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[18] *Bay Area Geotechnical Group (BAGG), 2005, Geotechnical Engineering Investigation, Proposed Residential Development, Fassler Avenue, Pacifica, California, consulting report prepared for Home Pride Construction, 24 p., Figures and Appendices, April.*

[19] *Association of Bay Area Governments (ABAG), 2005, http://www.abag.ca.gov/bayarea/eqmaps*

[20] *Wentworth, C.M., Ellen, S., Frizzell, V.A., and Schlocker, J., 1985, Map of Hillside Materials and Description of Their Engineering Character, San Mateo County, California, United States Geological Survey, Miscellaneous Investigations Series, Map I-1257D, 1:62,500.*

[21] *Wieczorek, G.F., Wilson, R.C., and Harp, E.L.,1985, Map of Showing Slope Stability During Earthquakes in San Mateo County, California, United States Geological Survey, Miscellaneous Investigations Series, Map I-1257E, 1:62,500.*

[22] *Ellen, S.D. and Wieczorek, G.F., 1988, Landslides, Floods, and Marine Effects of the Storm of January 3-5, 1982, in the San Francisco Bay Region, California, U.S. Geological Survey Professional Paper 1434, 310 p. + maps.*

The Geotechnical Investigation prepared for the proposed project did not identify evidence of slope failure or unstable slopes with the proposed project area. However, the investigation did identify evidence of a landslide on the north-facing slope north of the area of proposed development. The geometry of the slide suggests that it is a relatively shallow, rotational landslide. The recommendations for the investigation included provisions to divert surface water drainage away from this feature to reduce the potential for headward (upslope) migration of the top of the slide and erosion of the slide mass. The Geotechnical Investigation includes mitigation measures that would that ensure that impacts resulting from adverse effects of landslides remain at a less-than-significant level. As a condition of approval in the City of Pacifica, the project applicant must comply with these mitigation measures. As such, impacts would be less than significant and no further analysis is required.

b) *Less-Than-Significant Impact*. Project implementation would include residential development in a portion of the site that is relatively flat and has thinly developed soils. During operation of the proposed project, much of the developed portion of the proposed project site would be covered by structures, pavement, and managed landscaped areas. These conditions would generally limit the potential for erosion in the developed portion of the proposed project site. Conditions in the portions of the site that would be dedicated to recreation and open space would remain unchanged relative to existing conditions. Therefore, under developed conditions, the project would not result in substantial increases in erosion or loss of topsoil.

However, during the construction phase of the proposed project, grading would result in the removal of vegetation and disturbance of surface soil. Exposure of disturbed soils to rainfall and runoff present the potential for significant erosion during the construction phase of the project. However, the project would be required to meet State regulations for the control of runoff and associated erosion during construction. The State regulations are implemented by the San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP). Compliance with the STOPPP provisions is required of the project and would ensure that impacts related to erosion during construction and operation would remain less than significant. No further analysis is required.

c) *Less-Than-Significant Impact*. The Geotechnical Investigation prepared for the proposed project identified areas of fill presumably placed during former quarrying operations at the project site. The most obvious filled area is along the outer margin of the bench (referred to also as the 'terrace') in the central portion of the proposed project site along the outside of the existing asphalt road. The method of placement of and materials used in the fill are not accurately known. Other mounds of fill and woody debris are located on the 'terrace'. The following mitigation measures which include provisions for the removal of identified existing fills (including test pits excavated as part of the investigation) and replacement with structural (engineered) fills, as identified in the Geotechnical Investigation, would reduce potential impacts to a les-than-significant level. As a condition of approval, the project applicant would comply with the mitigation measures outlined in the Geotechnical Investigation. As such, impacts would be less than significant and no further analysis is required.

d) *Less-Than-Significant Impact*. Expansive soils were not identified as a limiting construction problem by the Geotechnical Investigation prepared for the proposed project site.[23] Barnabe-Candlestick complex soils mapped at the site are characterized as being well-drained with bedrock at shallow depths. Exploratory borings and test pits confirm regional soil mapping description of the shallow nature of the soils. The recommendations contained in the Geotechnical Investigation include provisions which would limit the

[23] *GAGG, 2005, op.cit.*

potential impacts of shrinking and swelling of expansive soils to a less-than-significant level. As a condition of approval, the project applicant would be required to adhere to the mitigation measures in the Geotechnical Investigation. As such, impacts would be less than significant and nor further analysis is required.

e) *No Impact*. The proposed project does not propose on-site septic tanks or alternative waste water disposal systems; the project would be connected to the existing sanitary sewer system. For informational purposes, the Orthents and Barnabe-Candlestick complex soils mapped at the site present significant limitations to the operation of septic tank/leachfield systems due to the shallow depth to bedrock.[24] No impact would occur and no further analysis is required.

7. Hazards & Hazardous Materials. Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			✓	
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?			✓	
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				✓
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				✓
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?				✓
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?				✓
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			✓	

[24] *USDA, 1991, op.cit.*

7. **Hazards & Hazardous Materials.** Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			✓	

Discussion:

a) *Less-Than-Significant Impact.* The proposed project includes development of residential and recreational uses. The types of hazardous materials associated with routine, day-to-day operation of the proposed project would include landscaping chemicals that would be used in quantities typical for landscaped residential developments and typical cleaning solvents used for household purposes. The transport, use, and disposal of these materials would not pose a significant hazard to the public or the environment. Therefore, project impacts related to this issue would be less than significant, and no further analysis of this issue is required.

b) *Less-Than-Significant Impact.* The proposed project would be a residential development, and as such is not expected to generate or use high levels of hazardous materials. In addition, onsite handling and storage of hazardous materials would be done according to all applicable local, State, and federal regulations. No upset or accident conditions resulting in the release of hazardous material into the environment can be reasonably expected to occur under these circumstances. Therefore, impacts would be less than significant and no further analysis is required.

c) *No Impact.* The project site is not within ¼ mile from an existing or proposed school. No impact would occur and no further analysis is required.

d) *No Impact.* The proposed project site is not included on the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.[25,26] Therefore, the project would not result in impacts related to being located on a site that is included on a list of hazardous materials sites. Thus, no further analysis of this issue is required.

e) *No Impact.* The project site is not within two miles of a public airport or public use airport. Therefore, the project would not expose persons to a safety hazard related to airports. No further analysis of this issue is required.

f) *No Impact.* The project site is not located within the vicinity of a private airstrip. Therefore, the project would not result in a safety hazard associated with a private airstrip. No further analysis of this issue is required.

[25] *California Department of Toxic Substances Control, Hazardous Waste and Substances Sites, www.dtsc.ca.gov/database/Calsites/Cortese_List.cfm, June 6, 2006.*

[26] *U.S. Environmental Protection Agency, http://www.epa.gov/superfund/sites/npl/ca.htm#, June 6, 2006.*

g) *Less-Than-Significant Impact.* The proposed project is consistent with the policies of the City of Pacifica's General Plan's Safety Element and would not obstruct emergency evacuation routes.[27] The proposed project is also consistent with the objectives of the Local Hazard Mitigation Plan Annex for the City of Pacifica.[28] A less-than-significant impact would occur, and no further analysis of this issue is necessary.

h) *Less-Than-Significant Impact*. A significant impact may occur if the project is located in proximity to wildland areas and poses a potential fire hazard, which could affect persons or structures in the area in the event of fire. The project site is located in a largely undeveloped area of Pacifica with a residential neighborhood adjacent to the east of the site. Three criteria are used by the California Department of Forestry and Fire Protection to evaluate the potential fire hazard in wildland areas: fuel loading (vegetation), fire weather (winds, temperatures, humidities and fuel moisture contents) and topography (degree of slope). According to the City of Pacifica General Plan fire hazards map, the project site is located in a low fire hazard area.[29] Therefore, the project would not expose people or structures to a significant risk of loss associated with wildland fires. A less-than-significant impact would occur, and no further analysis of this issue is required.

8. Hydrology & Water Quality. Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Violate any water quality standards or waste discharge requirements?			✓	
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 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 which would result in substantial erosion or siltation on- or off-site?			✓	
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?			✓	
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?			✓	

[27] *City of Pacifica General Plan, Safety Element. 1983.*

[28] *City of Pacifica, Local Hazard Mitigation Plan Annex, November 7, 2005.*

[29] *City of Pacifica General Plan, Safety Element. 1983.*

8. Hydrology & Water Quality. Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
f. Otherwise substantially degrade water quality?			✓	
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?				✓
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				✓
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			✓	
j. Inundation by seiche, tsunami or mudflow?			✓	

Discussion:

a) *Less-Than-Significant Impact*. Operation of the proposed project would not include activities which would result in point source discharges of contaminants to surface or subsurface waters. However, the construction of the project would require significant grading which would expose surface soils to erosion and potentially result in sediment discharges to surface water. Potential adverse effects of non-point source (i.e., diffuse) sediment discharges include increases in suspended sediment load of streams draining the project. Increased sediment loads could possibly degrade habitat within the streams or cause sedimentation which may affect hydraulic conditions (e.g., flood capacity or erosion hazards). However, as further discussed below under 8f, impacts would be less than significant and no further analysis is required.

b) *Less-Than-Significant Impact*. The design and hydrogeologic setting of the proposed project would limit the potential adverse effects of construction and operation of the proposed project on the rate or quantity of groundwater at or in the vicinity of the project site. The portion of the project site that would be developed is located on a topographic 'bench' on a relatively narrow ridge. The bench was apparently created as the result of quarrying of bedrock. Therefore, the portion of the site that would be developed is underlain directly or at shallow depth by Franciscan sandstone bedrock. This type of bedrock has relatively low primary permeability (i.e., ability to transmit water through the rock mass) but fractures in the rock provide a secondary permeability. In this setting, groundwater would be expected to occur in fractures within the bedrock but this groundwater resource is not typically regarded as an aquifer. Additionally, the site is located on the steep south margin of a stream valley. The valley provides a discharge boundary for groundwater contained in the fractured bedrock. Subsurface investigation of the site included drilling and sampling of five exploratory borings and excavation of nine test pits. The depths of investigation at the borings ranged from 23.8 to 29.5 feet and up to 13 feet in the test pits. Groundwater was encounter in only one of the borings at a depth of approximately 20 feet below the ground surface.[30]

[30] *Bay Area Geotechnical Group (GAGG), Geotechnical Engineering Investigation, Proposed Residential Development, Fassler Avenue, Pacifica, California, consulting report prepared for Home Pride Construction, 24 p., Figures and Appendices, April.*

Construction and operation of the proposed project would incrementally reduce the potential for infiltration into the fractured bedrock through construction of impervious surfaces (i.e., buildings and pavement). However, this groundwater resource does not provide a viable or reliable water supply. Therefore, minor changes to the quantity of infiltration and flow characteristics of the bedrock would not be a significant impact of the project. No further analysis is required.

c) *Less-Than-Significant Impact*. The proposed project site occupies a topographic bench on a ridge. There are no streams traversing the project site. Runoff from the site would be controlled and directed into the proposed drainage basin ("the amphitheater"). According to hydraulic analysis prepared for the project[31], this storm water detention feature would provide approximately 7,463 cubic feet of temporary storage for runoff generated at the developed site. The detained runoff would be used as a supplemental irrigation supply. The storage exceeds the expected volume (7,030 cubic feet) of runoff during a 60-minute duration 100-year storm event. The drainage basin would include an outlet that would provide for flow to the existing storm drain system under more extreme runoff events. Due to the topography of the site and proposed storm water management facilities, the project would not substantially change the existing drainage pattern or alter the course of a stream. Impacts are considered less than significant and no further analysis is required.

d) *Less-Than-Significant Impact*. As described in 8c above, implementation of the project would not alter the existing drainage features at the proposed project site. The construction of the proposed project would, however, increase impervious cover at the project site. Under existing conditions, the permeability of the area of the project site is relatively low. The site was excavated by quarrying operations and is directly underlain by bedrock; there is limited unconsolidated material (i.e., soil or sediments) to provide pervious cover. The project would increase the area of impervious cover at the site from 24,078 square feet (approximately 9.5 percent) to 60,840 square feet (approximately 23.3 percent). However, the proposed project includes a detention basin (described in 8c, above) which would provide temporary storage of runoff generated by the developed site. Therefore, runoff from the project would not result in substantial flooding on- or off-site. Impacts are considered less than significant and no further analysis is required.

e) *Less-Than-Significant Impact*. As described in 8c and 8d, the proposed project would include the construction of a detention basin to provide storage for runoff generated by the project. The basin would have the capacity to store runoff generated during a 60-minute duration, 100-year storm event. In the event of more intense runoff, the basin design would include an outlet which would drain to the existing storm water drain along Fassler Avenue. However, the detention basin would delay the discharge of runoff to the storm drain system relative to the peak of flow within the existing drain system. The design of the project would not be expected to result in exceedance of the capacity of the existing drainage system. As such, impacts are considered less than significant and no further analysis is required.

f) *Less-Than-Significant Impact*. Implementation of the proposed project would result in the potential for an increase in pollutants related to urban runoff. The potential pollutants include sediment caused by erosion of soils, leaks or spills of petroleum hydrocarbons, leaching or runoff of pesticides used for landscaping or other pest control, and metals related to wear of automobile parts. The control of urban runoff pollutants is controlled through State stormwater regulations. Runoff water quality is regulated by the National Pollutant Discharge Elimination System (NPDES) Nonpoint Source Program (established through the Clean Water Act); the NPDES program objective is to control and reduce pollutants to water bodies from nonpoint discharges. The NPDES program is administered by the California Regional Water Quality

[31] *Pacifica Quarry Homes (PQH), 2005, Notes, Appendix B "Hydrology and Storm Water Analysis", November.*

Control Boards (RWQCB). The proposed project site is under the jurisdiction of the San Francisco RWQCB. The San Mateo Countywide STOPPP maintains compliance with the NPDES Storm Water Discharge Permit and promotes stormwater pollution prevention within that context. Compliance with the NPDES Permit is mandated by State and federal statutes and regulations and the STOPPP requirements are outlined in the Stormwater Management Plan (SWMP).

Compliance with the requirements of the STOPPP SWMP by the proposed project would provide measures by which the potential discharge of pollutants in urban runoff would be reduced. Information presented with the application for the proposed project indicates that '(t)he condominium Home Owner Association …will address, require and make provisions for responsible handling, disposal and recycling of all wastes, including toxic materials..".[32] Additionally, the information required for the NPDES Data Collection Worksheet will be presented "at the point of Building Permit issuance". The specifics of the best management practices (BMPs) for the control of non-point source pollutants were not submitted with the project application and, therefore, could not be specifically evaluated in this Initial Study. However, compliance with the STOPPP requirements for control and treatment of urban runoff generated at the site would reduce the potential impact of pollutant releases from the site. Impacts are, therefore, considered less than significant and no further analysis is required.

g) *No Impact*. The project site is not located within or adjacent to a 100-year flood hazard zone identified by the Federal Emergency Management Agency's Flood Insurance Rate Mapping program.[33] The elevation and topographic setting of the project reduce the potential for any flooding. Therefore, no housing would be constructed within a 100-year flood hazard area. No impact would occur and no further analysis is required.

h) *No Impact*. As described in 8g, the project is not within or adjacent to a 100-year flood hazard zone. Therefore, not structures proposed by the project would impede or redirect flood flows within such zones. No impact would occur and no further analysis is required.

i) *Less-Than-Significant Impact*. The project is not within a drainage basin which has dams or levees. Therefore, the risk of flooding resulting from levees or dams is negligible.[34] Impacts are considered less than significant and no further analysis is required.

j) *Less-Than-Significant Impact*. The risk of inundation of the site by a seiche, tsunami, or mudflow is negligible due to the physiographic location of the project site. Tsunamis are potentially large waves generated in the ocean as the result of large-scale displacements of the ocean floor. Such displacements are typically caused by earth movements during earthquakes but can also be caused by large submarine landslides. The proposed project would be located at an elevation of over 400 feet above sea level and could not be inundated by tsunamis. A seiche is a wave generated in a standing body of water by oscillations in the earth (typically caused by earthquakes) or extreme variations in barometric pressure. The proposed project is not located near or proposed development of standing water bodies capable of generating significant seiches. The detention basin proposed for the project is relatively small and would only store water temporarily, reducing the potential for inundation of structures to a negligible level. The project is located near the crest of a ridge and the potential for the development of mudslides upslope of the

[32] *PQH, 2005, op. cit.*

[33] *Federal Emergency Management Agency (FEMA), 1987. Flood Insurance Rate Map (FIRM), City of Pacifica, San Mateo County, California, Community Panel Numbers 060323 0004D. 19 February.*

[34] *Governor's Office of Emergency Services, 2006. Dam Inundation Maps, GIS Unit.*

site is low. The slopes above the site are of limited length. The slope south of the site is separated by the site by a topographic bench and the Fassler Avenue roadway. These surfaces would abate the movement of any mudflow generated on the slope. The slope east of the proposed development has been excavated during quarrying activities, effectively removing earth materials in which a mudflow could develop. Impacts are considered less than significant and no further analysis is required.

9. Land Use and Planning. Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Physically divide an established community?				✓
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?			✓	
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?				✓

Discussion:

a) *No Impact.* The project site is currently vacant and the surrounding area is primarily open space. There are residential uses to the east of the project site and across Fassler Avenue. The proposed project would not divide an established community and no further analysis is necessary.

b) *Less-Than-Significant Impact.* CEQA requires consideration be given to whether a proposed project may conflict with any applicable land use plans, policies, or regulations including, but not limited to, the General Plan, Specific Plan, or Zoning Ordinance. This environmental determination differs from the larger policy determination of whether a proposed project is consistent with a jurisdiction's General Plan. The former determination (that intended for consideration in a CEQA document) is limited to a review and analysis, and is made by the preparers of the CEQA document. The later determination by comparison, is made by the decision-making body of the jurisdiction and is based on a jurisdiction's broad discretion to assess whether a proposed project conforms to the policies and objectives of its General Plan as a whole.

The proposed project site lies within the P-D zoning designation, which allows diversification of the relationships of various buildings, structures and open spaces in planned building groups, while ensuring compliance with district regulations. The proposed project site is also within an HPD overlay. It is the intent of the HPD overlay to place controls on proposed development within hillside areas of the City in order to preserve and enhance their use as a prime resource, help protect people and property from all potentially hazardous conditions particular to hillsides, assure that any development be economically sound, and encourage innovative design solutions. The proposed project would require a general plan amendment, a rezoning, and other City approvals. However, zoning or General Plan conflicts in an of themselves are not considered environmental impacts pursuant to CEQA Guidelines Section 15126.2(a), which only requires the identification of physical environmental impacts, of which none are expected to

result from changes to any applicable land use plan, policy or regulation. Impacts are considered less than significant and no further analysis is required.

g) *No Impact.* The project site is not subject to a Habitat Conservation Plan, Natural Community Conservation Plan, or any other habitat plan. Therefore, development of the proposed project would not conflict with any habitat conversion plan. Thus, no further analysis of the issue is required.

10. Mineral Resources. Would the project:	**Potentially Significant Impact**	**Potentially Significant Unless Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Result in the loss or availability of a known mineral resource that would be of value to the region and the residents or the state?				✓
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?				✓

Discussion:

a) *No Impact.* There are no known mineral resources at or near the project site. Although the project site previously operated as a quarry, it is not the location of an area of a known mineral resource of regional significance. The Pacifica Quarry and Mori Point were designated in 1987 as an area of regional mineral significance.[35] This is the only area of the City with such a designation, and it is not located on or near the project site. Thus, the proposed project would not result in the loss or availability of a known mineral resource that would be of value to the region and the residents or the state. No further analysis of this issue is required.

b) *No Impact.* See answer to 10a above.

11. Noise. Would the project result in:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
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?			✓	
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			✓	
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			✓	

[35] *City of Pacifica General Plan, Conservation Element, March 1978.*

11. Noise. Would the project result in:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
d. A substantial temporary or periodic increase in ambient noise levels in the 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?				✓
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?				✓

Discussion:

a) *Less-Than-Significant Impact.* Project development would require the use of heavy equipment for site grading and excavation, installation of utilities, paving, and building fabrication. Development activities would also involve the use of smaller power tools, generators, and other sources of noise. During each stage of development there would be a different mix of equipment operating and noise levels would vary based on the amount of equipment in operation and the location of the activity.

The U.S. EPA has compiled data regarding the noise generating characteristics of specific types of construction equipment and typical construction activities. The data is presented Tables 3 and 4. These noise levels would diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 84 dBA measured at 50 feet from the noise source to the receptor would reduce to 78 dBA at 100 feet from the source to the receptor, and reduce by another 6 dBA to 72 dBA at 200 feet from the source to the receptor.

During construction, two basic types of activities would be expected to occur and generate noise. First, the development site would be prepared, excavated, and graded to accommodate building foundations and the proposed subterranean parking structure. Second, the proposed residential uses would be constructed and readied for use.

The nearest and most notable sensitive receptor to the project site is the multi-family development building located approximately 500 feet to the north of the proposed project site. Based on the information presented in Tables 3 and 4, and the rule that noise from stationary or point source is reduced by about 6 dBA for every doubling of distance, construction equipment noise levels could exceed 79 dBA L_{eq} when construction activities occur outdoors, if pile driving is not used. As shown in Table 4, the use of mufflers on construction equipment could reduce their noise levels by an average of 3 dBA. The resulting noise levels could exceed 75 dBA L_{eq} at the nearby residential structures. However, because the City of Pacifica has no existing Noise Ordinance with regards to construction activity this impact would be less than significant.

Table 3
Noise Range of Typical Construction Equipment

Construction Equipment	Noise Levels in dBA L_{eq} at 50 feet[1]
Front Loader	73–86
Trucks	82–95
Cranes (moveable)	75–88
Cranes (derrick)	86–89
Vibrator	68–82
Saws	72–82
Pneumatic Impact Equipment	83–88
Jackhammers	81–98
Pumps	68–72
Generators	71–83
Compressors	75–87
Concrete Mixers	75–88
Concrete Pumps	81–85
Back Hoe	73–95
Pile Driving (peaks)	95–107
Tractor	77–98
Scraper/Grader	80–93
Paver	85–88

1. *Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.*

***Source**: U.S. EPA 1971*

Table 4
Typical Outdoor Construction Noise Levels

Construction Phase	Noise Levels at 50 Feet			
	dBA L_{eq}		dBA CNEL[a]	
	Standard	With Mufflers	Standard	With Mufflers
Ground Clearing	84	82	79	77
Excavation & Grading	89	86	84	81
Foundations	78	77	73	72
Structural	85	83	80	78
Finishing	89	86	84	81

[a] *Based on eight hours of daytime construction activities.*

Source: U.S. EPA, 1971 and Christopher A. Joseph & Associates, 2006.

b) *Less-Than-Significant Impact*. A significant impact might occur if the Proposed Project were to generate or expose people to excessive groundborne vibration or groundborne noise levels. Noise-sensitive land uses generally include residential uses, hospitals, schools, and religious institutions. Thresholds identified by the Federal Railway Administration (FRA) state that those vibration levels which exceed 80 VdB during recognized sleep hours may constitute a significant impact. Construction of the proposed project would have the potential to generate low levels of groundborne vibration in the surrounding neighborhood. However, construction activities would be limited to between the hours of 7:00 AM and 6:00 PM on Monday through Friday and from 9:00 AM and 5:00 PM on Saturdays in accordance with the County of San Mateo Noise Ordinance. As such, impacts related to excessive groundborne vibration and noise levels would be less than significant. No further analysis is required.

c) *Less-Than-Significant Impact***.** A significant impact may occur if the operation of the proposed project would introduce substantial new sources of noise or would significantly add to existing sources of noise within the vicinity of the proposed project site. Operational impacts could be significant if traffic attributable to the proposed project were to increase the ambient noise level along any roadway segment by an audible amount (3 dBA or more) and cause the noise levels to move from an acceptable range to unacceptable range. According to the traffic study prepared for the proposed project, operation of the proposed project is only expected to result in a slight increase in traffic due to the relatively small size of the proposed project. Ambient operational noise levels would not substantially increase resulting in a less than significant impact. No further analysis is required.

d) *Less-Than-Significant Impact***.** A significant impact may occur if the proposed project were to introduce substantial new sources of noise or substantially add to existing sources of noise within or in the vicinity of the proposed project site during construction of the proposed project or on a periodic basis during the operation of the proposed project.

Temporary or periodic increases in ambient noise levels may occur from the heating, ventilation, and air conditioning (HVAC) systems which may be installed for the residential development. Residential HVAC systems would result in noise levels that average between 45 and 55 dBA L_{eq} at 50 feet from the equipment. However, project development, while contributing to an overall increase in ambient noise levels in the project area, would result in land uses that are consistent with the General Plan land use designation for the project site and would generate noise levels that are similar to surrounding land uses. Therefore, impacts associated with noise generated as a result of the operation of the proposed project would be less than significant. No further analysis is required.

e) *No Impact*. As discussed above in answer to question 7e, the project site is not located within two miles of a public airport or public use airport. Therefore, the proposed project would not expose persons to excessive noise levels associated with a public airport or public use airport. No further analysis of this issue is required.

f) *No Impact*. As discussed above in answer to question 7f above, the project site is not located within the vicinity of a private airstrip. Therefore, the proposed project would not expose persons to excessive noise levels associated with a private airstrip. No further analysis of this issue is required.

12. Population and Housing. Would the project:	**Potentially Significant Impact**	**Potentially Significant Unless Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Induce substantial population growth in an area, either directly (for example, by 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?				✓
c. Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?				✓

Discussion:

a) *Less-Than-Significant Impact.* The proposed project consists of 34 residential units. New residential uses would increase the City population. Using an existing persons-per-household size of 2.728[36], the proposed project would be expected to accommodate approximately 93 (2.728 x 34) residents. According to Association of Bay Area Governments, by the date of the project's completion in the fall of 2008, the City's projected population would be 38,840.[37] Assuming that all residents generated by the proposed project are new to the City, these residents would account for 0.24 percent of the 2006 baseline population (38,739) and 0.24 percent of the projected population for the year 2008.[38] Because the proposed project would not exceed the City's population projections, impacts would be less than significant. No further analysis is required.

b) *No Impact.* There are no existing housing units on the project site. Therefore, the proposed project would not displace substantial numbers of existing housing, and no further discussion of this issue is required.

c) *No Impact*. See answer to question 12b above.

[36] *Projected population for the year 2006 can be found at: California Department of Finance, Demographic Research Unit, website: http://www.dof.ca.gov/HTML/DEMOGRAP/E-1text.asp, June 13, 2006.*

[37] *Using ABAG's Projections 2005, this number was arrived at by taking the difference between 2010 and 2005 population projections and dividing that number by five to receive the increase in population per year.*

[38] *Projected population for the year 2006 can be found at: California Department of Finance, Demographic Research Unit, website: http://www.dof.ca.gov/HTML/DEMOGRAP/E-1text.asp, June 13, 2006.*

13. Public Services.	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
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:				
i. Fire protection?			✓	
ii. Police protection?			✓	
iii. Schools?			✓	
iv. Parks?			✓	
v. Other public facilities?				✓

Discussion:

a.i) *Less-Than-Significant Impact*. Fire protection services to the project site and area are provided by the North County Fire Authority (NCFA). The NCFA is a Joint Powers Authority that serves the communities of Pacifica, Daily City, and Brisbane. There are two fire stations in the project area. Station 71 is located at 616 Edgemar Avenue and is staffed by a three person Type I Paramedic-Engine Company and a Battalion Chief. Station 72 is located at 1100 Linda Mar Boulevard and is staffed by a three person Type I Paramedic-Engine Company. It is not anticipated that implementation of the proposed project would necessitate the expansion of construction of fire-protection facilities. However, if new facilities were required, their expansion or construction would be subject to CEQA review. Therefore, project impacts related to fire protection services would be less then significant.

a.ii) *Less-Than-Significant Impact*. The proposed project site would be served by the Pacifica Police Department.[39] The Pacifica Police Department (PPD) operates out of the main station located at 2075 Pacific Coast Highway and currently has authorized 37 sworn and 5.5 non-sworn employees for a total of 42.5 employees. According to the Pacifica PPD, the department is adequately staffed with the current levels although the PPD is authorized for six additional officers. The PPD anticipates that an increase in traffic at the intersection of Fassler Avenue and SR 1 would increase traffic-related incidents thereby increasing demand on the department. However, the PPD has also indicated that such increases in demand would not necessitate the construction of a new facility. Impacts are, therefore, less than significant and no further analysis is required.

[39] *Chief Saunders, Pacifica Police Department, Memorandum, Subject; Attached Input Request for Project on Fassler Avenue. Written Correspondence. June 1, 2006.*

a.iii) *Less-Than-Significant Impact*. The project site is served by the Pacifica School District (PSD). PSD operates elementary schools (grades K through 5th) and middle schools (grades 6th through 8th). Laguna Salada Union High School District and Jefferson Union High School District operate high school (grades 9th through 12th) facilities for the residents of Pacifica. The estimated number of students the proposed project would generate is derived by multiplying the number of students per dwelling unit (the student yield factor) by the number of dwelling units in the project (34 units). The California State Allocation Board Office of Public School Construction reports that the statewide student yield factor per dwelling unit is 0.5 students for grades K through 6th and 0.2 students for grades 7th through 12th.[40] The statewide average student yield factor may be broken down as 0.071 students in each grade year K through 6th and 0.033 students in each grade year 7th through 12th. To calculate project impacts on the PSD, the statewide average student yield factor per dwelling unit may be expressed as 0.43 elementary school students and 0.14 middle school students, and 0.13 high school students. Applying the statewide average student yield factor, the project would generate 25 students – approximately 15 elementary school students, 5 middle school students, and 5 high school students.

Pursuant to California Education Code Section 17620(a)(1), the governing board at any school district is authorized to levy a fee, charge, dedication, or other requirement against any construction within the boundaries of the district, for the purpose of funding the construction or reconstruction of school facilities. As such, the project applicant would be required to pay the required developer fees to PSD and the two high school districts to offset any impacts the project could have to schools. Provided in Section 65996 of the California Government Code, the payment of such fees is deemed to fully mitigate the impacts of new development on schools services. Therefore, project impacts related to school services would be less than significant. No further analysis of this issue is required.

a.iv) *Less-Than-Significant Impact*. Project implementation would result in increased use of the City's parks, beaches, and recreational facilities. However, recreational uses would be provided onsite and it is anticipated that the residents of the proposed project would largely utilize the onsite facilities. Nonetheless, any increase in use of existing facilities would be minimal since the project is anticipated to increase the City's population only by 93 residents. Any additional needs would be served by existing facilities. Impacts would be less than significant and no further analysis is required.

a.v) *No Impact*. No other public facilities have been identified that could be substantially adversely affected by the project. No further analysis of this issue is necessary.

14. Recreation.	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
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?			✓	
b. Does the project include recreational facilities or require the construction or expansion on recreational facilities	✓			

[40] *Title 2, Cal. Code Regs., § 1859.2; California State Allocation Board Office of Public School Construction, "Enrollment Certification Projection," (Form SAB 50-01, rev. Jan. 2003)* http://www.opsc.dgs.ca.gov/SAB+Forms/Default.htm.

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
14. Recreation. which might have an adverse physical effect on the environment?				

Discussion:

a) *Less-Than-Significant Impact.* Project implementation would result in increased use of the City's parks, beaches, and recreational facilities. However, recreational uses would be provided onsite and it is anticipated that the residents of the proposed project would largely utilize the onsite facilities. Nonetheless, any increase in use of existing facilities would be minimal since the project is anticipated to increase the City's population by only 93 residents. Implementation of the proposed project would not, therefore, cause substantial physical deterioration of existing facilities. Impacts would be less than significant and no further analysis is required.

b) *Potentially Significant Impact.* Implementation of the proposed project includes the construction of recreational facilities. These facilities would be constructed on land that is currently vacant containing three different habitat types: coastal scrub, perennial grassland, and willow scrub.[41] The project site may contain other important habitats which could be adversely impacted as a result of development of the recreational facility of the proposed project. This impact is considered potentially significant. This issue will be further analyzed in the Biological Resources section of the Draft EIR.

15. Transportation/Traffic. Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause an increase in traffic which 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)?	✓			
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	✓			
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?				✓
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	✓			
e. Result in inadequate emergency access?			✓	

[41] *Thomas Reed Associates, Revised Biotic Assessment Report for Fassler Avenue Property, Pacifica, CA. April 27, 2005.*

15. Transportation/Traffic. Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
f. Result in inadequate parking capacity?			✓	
g. Conflict with adopted policies, plans or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	✓			

Discussion:

a) *Potentially Significant Impact.* Implementation of the proposed project would create new vehicle trips traveling to and from the project site. Therefore, the EIR will address the potential for the project to cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

b) *Potentially Significant Impact.* Implementation of the proposed project and other reasonably-foreseeable development in the project area would create new vehicle trips traveling to and from the project site. Therefore, the EIR will address the potential for the project to exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.

c) *No Impact.* Due to the nature and scope of the proposed project, implementation of the project would not have the potential to result in a change in air traffic patterns at any airport in the area. Therefore, no further analysis of this issue is required.

d) *Potentially Significant Impact.* The proposed project would alter access to the project site. In addition, roadway and/or intersection improvements may be required in order to mitigate any potentially significant traffic impacts that could be identified in the EIR. Without proper design, the project could result in traffic hazards. Therefore, the EIR will address the potential for the project to substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections). No agricultural land uses are located in proximity to the project site. Therefore, the project would not result in traffic hazards associated with incompatible uses, such as farm equipment. No further analysis related to this specific issue is required.

e) *Less-Than-Significant Impact.* Emergency access is not expected to be significantly impacted by the proposed project. Throughout construction activities, the streets surrounding the proposed project would be open, allowing adequate access for emergency vehicles. All access routes to the subterranean parking facility would be required by California Building Code (CBC) to meet the minimum width requirement of 50 feet for emergency access. Therefore, emergency access is not expected to be significantly impacted. No further analysis is required.

f) *Less-Than-Significant Impact.* The City of Pacifica Zoning Code (Article 22.5, Sec. 9-4.2259) requires all single-family detached units to provide two covered and two uncovered parking spaces per unit and all single-family attached units to provide two covered and one-half uncovered parking spaces per unit. In addition, it is also required that a minimum of one guest space be provided for every ten units. With 17 single-family detached units and 17 single-family attached units, the proposed project meets the required 115 parking spaces by providing 112 covered parking spaces and three uncovered parking spaces.

Therefore, the potential for the project to result in inadequate parking capacity is less than significant. No further analysis is required.

g) *Potentially Significant Impact.* Traffic generated by the proposed project could exceed level-of-service standards. The applicant has proposed a shuttle for students that could potentially serve to reduce vehicle trips. At this time it is not known the extent to which this would occur. Therefore, the EIR will address the potential for the proposed project to conflict with adopted policies, plans, or programs supporting alternative transportation.

16. Utilities & Service Systems. Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			✓	
b. Require or result in the construction of a new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			✓	
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			✓	
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			✓	
e. Result in a determination by the wastewater treatment provider which 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?			✓	
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			✓	
g. Comply with federal, state, and local statutes and regulations related to solid waste?				✓

Discussion:

a) *Less-Than-Significant Impact.* Wastewater from the project site would therefore be treated according to the wastewater treatment requirements enforced by the City and the Regional Water Quality Control Board for disposal in the City of Pacifica municipal sewer system. Therefore, project impacts related to exceeding wastewater treatment requirements would be less than significant, and no further analysis of this issue is required.

b) *Less-Than-Significant Impact.* The primary water treatment facility that would serve the project site is the San Francisco Public Utility Commission's (SFPUC) Harry Tracy Water Treatment Plant (HTWTP).[42] Currently, the HTWTP is undergoing an expansion to increase capacity to 160 million gallons per day (mgd).[43] According to standard water-usage rates[44], the proposed project would generate a water demand of approximately 10,362 gallons per day. This would represent approximately a 0.01 percent increase of the HTWTP's capacity upon completion of the expansion project. The City of Pacifica's Caldera Creek Water Recycling Plant (CCWRP) treats wastewater within the City and currently has a capacity of 20 mgd. The CCWRP currently treats approximately 4.0 mgd.[45] As such, adequate capacity is available at the CCWRP to serve the increase in demand resulting from the proposed project. It is, therefore, anticipated that the increase in demand for water and wastewater treatment would adequately met. Impacts would be less than significant and no further analysis of this issue is required.

c) *Less-Than-Significant Impact.* Refer to answer to question 8d.

d) *Less-Than-Significant Impact*. Water service at the project site and in the project area is provided through the North Coast County Water District (NCCWD). The water supply provided to NCCWD is subject to an agreement with the SFPUC. The most recent Urban Water Management Plan (UWMP) prepared by the NCCWD indicates that under the current terms of the contract with the SFPUC, the NCCWD's maximum supply (maximum wholesale allocation) is 3.84 mgd (4,301.04 acre feet per year). This existing allocation is sufficient to meet the NCCWD's needs from present time through 2030.[46] Changes in water demand presented as discussed in the UWMP are based on growth projections set forth in the City's General Plan. According to the UWMP, approximately 44 new connections per year, 220 new water connections by 2010, and approximately 1,100 by 2030 would result. Since the proposed project is consistent with the land use designations set forth in the City of Pacifica General Plan, it has been accounted for in the NCCWD's UWMP and could be adequately served by existing water entitlements. Impacts are, therefore, less than significant and no further analysis of this issue is required.

e) *Less-Than-Significant Impact.* Refer to answer to 16a.

f) *Less-Than-Significant Impact*. Solid waste generated by users at the project site and surrounding area is disposed of at the Ox Mountain Sanitary Landfill.[47] The most recently reported closure date and remaining capacity for the landfill is January 2018 and 44,646,148 cubic yards, respectively. Using standard solid waste generation rates[48], the proposed project would generate approximately 416 lbs/day and approximately 152,000 lbs per year of solid waste. This translates to a generation rate of approximately 0.19 ton of solid waste per day and 68.95 tons of solid waste per year for the proposed project. The Ox Mountain facility currently has a permitted maximum disposal of 3,598 tons/day.[49] The solid waste generated by the proposed project would represent 0.005 percent of the allowed daily capacity. Because the

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[42] *Weiss, Bert. Project Manager, North Coast County Water District, Written Communication, June 12, 2006.*
[43] *San Francisco Public Utilities Commission, website: http://sfwater.org/Project.cfm/PRJ_ID/145, Accessed June 13, 2006.*
[44] *Single family residential unit = 379.5 gallons/day/unit & Residential 2 bedroom condo = 230 gallons/day/unit*
[45] *Martinez, Brian. City of Pacifica Department of Public Works, Personal Communication, June 22, 2006.*
[46] *North Coast County Water District, Urban Water Management, 2006-2010, December 2005.*
[47] *Martinez, Brian. City of Pacifica Department of Public Works, Personal Communication, June 22, 2006.*
[48] *Using most conservative estimate from the CIWMB of 12.23 lbs/household/day for residential land uses. "Estimated Solid Waste Generation Rates for Residential Developments", website accessed June 26, 2006.*
[49] *California Integrated Waste Management Board, Jurisdiction Landfill Overview, California Waste Stream Profiles, http://www.ciwmb.ca.gov/Profiles/Facility/Landfill/LFProfile1.asp?COID=41&FACID=41-AA-0002, Accessed June 26, 2006.*

landfill is not operating at capacity it is anticipated that this increase would result in a less-than-significant impact. No further analysis of this issue is required.

g) *No Impact.* The construction and operation of the proposed project would be required to adhere to all applicable federal, State, and local statues and regulations related to solid waste. Therefore, no impact would result with regard to compliance with federal, state, and local statutes and regulations related to solid waste, and no further analysis of this issue is required.

17. Mandatory Findings of Significance.	**Yes**	**No**
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	✓	
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)?	✓	
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	✓	

Discussion:

a) *Yes.* As noted throughout this Initial Study, implementation of the proposed project could potentially degrade the quality of the environment.

b) *Yes*. As noted in this Initial Study, the proposed project could contribute to cumulative environmental impacts.

c) *Yes*. As noted throughout this Initial Study, implementation of the proposed project could cause substantial adverse effects on human beings, either directly or indirectly.

A3: Responses to the NOP

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STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Sean Walsh
Director

Notice of Preparation

June 29, 2006

To: Reviewing Agencies

Re: The Prospects Residential Project (34 Residential Units at 801 Fassler Ave)
SCH# 2006062150

Attached for your review and comment is the Notice of Preparation (NOP) for the The Prospects Residential Project (34 Residential Units at 801 Fassler Ave) draft Environmental Impact Report (EIR).

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

Please direct your comments to:

Kathryn Farbstein
City of Pacifica
1800 Francisco Boulevard
Pacifica, CA 94044

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

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

Sincerely,

J. Diemeyer

for Scott Morgan
Project Analyst, State Clearinghouse

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Attachments
cc: Lead Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2006062150
Project Title The Prospects Residential Project (34 Residential Units at 801 Fassler Ave)
Lead Agency Pacifica, City of

Type NOP Notice of Preparation

Description The project applicant proposes to construct 34 residential units, a subterranean parking garage, and associated amenities in the western acres of the proposed project site. Half (17) of the proposed units would be detached single-family residences and the remaining half (17) of the proposed units would be attached in the form of duplexes and triplexes. In addition, the proposed project would include gardens, open space areas, an amphitheatre, a community center, and promenades/pedestrian walkways.

Lead Agency Contact

Name Kathryn Farbstein
Agency City of Pacifica
Phone (650) 738-7443 **Fax**
email
Address 1800 Francisco Boulevard
City Pacifica **State** CA **Zip** 94044

Project Location

County San Mateo
City Pacifica
Region
Cross Streets Fassler Avenue and Roberts Road
Parcel No. 022-083-020, 030
Township **Range** **Section** **Base**

Proximity to:

Highways SR-1
Airports
Railways
Waterways Pacific Ocean
Schools
Land Use Z: Planned Development District with a Hillside Preservation District overlay.
GP: Open Space Residential and Low-Density Residential

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Cumulative Effects; Drainage/Absorption; Flood Plain/Flooding; Geologic/Seismic; Landuse; Minerals; Noise; Population/Housing Balance; Public Services; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife

Reviewing Agencies Resources Agency; Regional Water Quality Control Board, Region 2; Department of Parks and Recreation; Native American Heritage Commission; Department of Health Services; Office of Historic Preservation; Department of Fish and Game, Region 3; Department of Water Resources; California Highway Patrol; California Coastal Commission; Caltrans, District 4; Department of Toxic Substances Control

Date Received 06/29/2006 **Start of Review** 06/29/2006 **End of Review** 07/28/2006

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

NOP Distribution List

County: San Mateo

SCH# 2006062150

Resources Agency

- [x] Resources Agency
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- [ ] Dept. of Boating & Waterways
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- [x] California Coastal Commission
  Elizabeth A. Fuchs
- [ ] Colorado River Board
  Gerald R. Zimmerman
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- [ ] State Lands Commission
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- [ ] Tahoe Regional Planning Agency (TRPA)
  Cherry Jacques

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  Sandy Hesnard
- [ ] Caltrans - Planning
  Terri Pencovic
- [x] California Highway Patrol
  Shirley Kelly
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  Lisa Nichols
  Housing Policy Division

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  San Diego Region (9)

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Last Updated on 04/28/06

Jul 13 06 07:59a MIS Division (650) 359-5807 P.4

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STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Sean Walsh
Director

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CITY OF PACIFICA

Notice of Preparation

August 18, 2006

To: Reviewing Agencies

Re: The Prospects Residential Project (34 Residential Units at 801 Fassler Ave)
SCH# 2006062150

Attached for your review and comment is the Notice of Preparation (NOP) for the The Prospects Residential Project (34 Residential Units at 801 Fassler Ave) draft Environmental Impact Report (EIR).

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Please direct your comments to:

Kathryn Farbstein
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1800 Francisco Boulevard
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with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

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

Sincerely,

Scott Morgan
Senior Planner, State Clearinghouse

Attachments
cc: Lead Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
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Lead Agency Contact

Name Kathryn Farbstein
Agency City of Pacifica
Phone (650) 738-7443 **Fax**
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Address 1800 Francisco Boulevard
City Pacifica **State** CA **Zip** 94044

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County San Mateo
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Parcel No. 022-083-020, 030
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Date Received 08/18/2006 **Start of Review** 08/18/2006 **End of Review** 09/18/2006

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- ☐ RWQCB 6
  Lahontan Region (6)
  - ☐ RWQCB 6V
    Lahontan Region (6)
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  Santa Ana Region (8)
- ☐ RWQCB 9
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- ☐ Other _____

Last Updated on 04/28/06

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STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P. O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5505
FAX (510) 286-5559
TTY (800) 735-2929

Flex your power!
Be energy efficient!

July 20, 2006

SM001349
SCH#2006062150

Ms. Kathryn Farbstein
City of Pacifica
1800 Francisco Boulevard
Pacifica, CA 94044

Dear Ms. Farbstein:

PROSPECTS RESIDENTIAL – NOTICE OF PREPARATION

Thank you for including the California Department of Transportation (Department) in the early stages of the environmental review process for the Prospects Residential project. The following comments are based on the Notice of Preparation.

Traffic Analysis
Please include the information detailed below in the Traffic Study to ensure that project-related impacts to State roadway facilities are thoroughly assessed. We encourage the City to coordinate preparation of the study with our office, and we would appreciate the opportunity to review the scope of work. The Department's *"Guide for the Preparation of Traffic Impact Studies"* should be reviewed prior to initiating any traffic analysis for the project; it is available at the following website:
http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf

The Traffic Study should include:

1. Site plan clearly showing project access in relation to nearby state roadways. Ingress and egress for all project components should be clearly identified. State right-of-way (ROW) should be clearly identified.

2. Project-related trip generation, distribution, and assignment. The assumptions and methodologies used to develop this information should be detailed in the study, and should be supported with appropriate documentation.

3. Average Daily Traffic, AM and PM peak hour volumes and levels of service (LOS) on all significantly affected roadways, including crossroads and controlled intersections, for existing, existing plus project, cumulative and cumulative plus project scenarios. Calculation of cumulative traffic volumes should consider all traffic-generating developments, both

existing and future, that would affect study area roadways and intersections. *The analysis should clearly identify the project's contribution to area traffic and degradation to existing and cumulative levels of service. Lastly, the Department's LOS threshold, which is the transition between LOS C and D, and is explained in detail in the Guide for Traffic Studies, should be applied to all state facilities.*

4. Schematic illustration of traffic conditions including the project site and study area roadways, trip distribution percentages and volumes as well as intersection geometrics, i.e., lane configurations, for the scenarios described above.

5. The project site building potential as identified in the General Plan. The project's consistency with both the Circulation Element of the General Plan and the San Mateo City/County Association of Government's Congestion Management Plan should be evaluated.

6. *Mitigation should be identified for any roadway mainline section or intersection with insufficient capacity to maintain an acceptable LOS with the addition of project-related and/or cumulative traffic.* The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should also be fully discussed for all proposed mitigation measures.

7. Special attention should be given to the following trip-reducing measures:
   - Encouraging mixed-use,
   - Maximizing density through offering bonuses and/or credits,
   - Coordinating with SamTrans, Caltrain and BART to increase transit/rail use by expanding routes and emphasizing express service to regional rail stations, and by providing bus shelters with seating at any future bus pullouts,
   - Providing transit information to all future project residents, employees and patrons, and
   - Encouraging bicycle- and pedestrian-friendly design.

While the 2000 Highway Capacity Manual (HCM) may not be the preferred level of service methodology, it should be used for analyzing impacts to state facilities, particularly where previous analysis employing alternative methodologies has identified impacts. The residual level of service, assuming mitigation has been implemented, should also be analyzed with HCM 2000.

Cultural Resources

The Draft Environmental Impact Report must include documentation of a current archaeological record search from the Northwest Information Center (NIC) of the California Historical Resources Information System (CHRIS) if construction activities are proposed within State ROW. Current searches must be no more than five years old. The Department requires the records search, and if warranted, a cultural resource study by a qualified, professional archaeologist, to ensure compliance with CEQA, Section 5024.5 of the California Public Resources Code, and Volume 2 of the Department's Environmental Handbook. Work subject to these requirements includes, but is not limited to: lane widening, channelization, auxiliary lanes, and/or modification of existing features such as slopes, drainage features, curbs, sidewalks and driveways within or adjacent to State ROW. These requirements, including applicable mitigation, must be fulfilled before an encroachment permit can be issued for project-related work in State

ROW. See the website link below for more information regarding the CHRIS – NIC (Click on IC Roster).
http://ohp.parks.ca.gov

Encroachment Permit
Please be advised that work that encroaches onto the State ROW requires an encroachment permit that is issued by the Department. To apply, a completed encroachment permit application, environmental documentation, and five (5) sets of plans, clearly indicating State ROW, must be submitted to the address below. Traffic-related mitigation measures will be incorporated into the construction plans during the encroachment permit process. See the following website link for more information:
http://www.dot.ca.gov/hq/traffops/developserv/permits/

Rudy Dantes, Permits Branch Chief
California DOT, District 4
P.O. Box 23660
Oakland, CA 94623-0660

Please forward a copy of the environmental document, along with the Traffic Study, including Technical Appendices, and staff report to the address below as soon as they are available.

Patricia Maurice, Associate Transportation Planner
Community Planning Office, Mail Station 10D
California DOT, District 4
P.O. Box 23660
Oakland, CA 94623-0660

Please feel free to call or email Patricia Maurice of my staff at (510) 622-1644 or patricia_maurice@dot.ca.gov with any questions regarding this letter.

Sincerely,

Timothy C. Sable

TIMOTHY C. SABLE
District Branch Chief
IGR/CEQA

c: Ms. Terry Roberts, State Clearinghouse

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STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P. O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5505
FAX (510) 286-5559
TTY (800) 735-2929

Flex your power!
Be energy efficient!

September 21, 2006

SEP 26 2006

SM001349
SM-001-42.14
SCH#2006062150

Ms. Kathryn Farbstein
City of Pacifica
1800 Francisco Boulevard
Pacifica, CA 94044

Dear Ms. Farbstein:

PROSPECTS RESIDENTIAL – NOTICE OF PREPARATION

Thank you for including the California Department of Transportation (Department) in the early stages of the environmental review process for the Prospects Residential project. The following comments are based on the Notice of Preparation.

Traffic Analysis
Please include the information detailed below in the Traffic Study to ensure that project-related impacts to State roadway facilities are thoroughly assessed. We encourage the City to coordinate preparation of the study with our office, and we would appreciate the opportunity to review the scope of work. The Department's *"Guide for the Preparation of Traffic Impact Studies"* should be reviewed prior to initiating any traffic analysis for the project; it is available at the following website:
http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf

The Traffic Study should include:

1. Site plan clearly showing project access in relation to nearby state roadways. Ingress and egress for all project components should be clearly identified. State right-of-way (ROW) should be clearly identified.

2. Project-related trip generation, distribution, and assignment. The assumptions and methodologies used to develop this information should be detailed in the study, and should be supported with appropriate documentation.

3. Average Daily Traffic, AM and PM peak hour volumes and levels of service (LOS) on all significantly affected roadways, including crossroads and controlled intersections for existing, existing plus project, cumulative and cumulative plus project scenarios. Calculation

of cumulative traffic volumes should consider all traffic-generating developments, both existing and future, that would affect study area roadways and intersections. *The analysis should clearly identify the project's contribution to area traffic and degradation to existing and cumulative levels of service. Lastly, the Department's LOS threshold, which is the transition between LOS C and D, and is explained in detail in the Guide for Traffic Studies, should be applied to all state facilities.*

4. Schematic illustration of traffic conditions including the project site and study area roadways, trip distribution percentages and volumes as well as intersection geometrics, i.e., lane configurations, for the scenarios described above.

5. The project site building potential as identified in the General Plan. The project's consistency with both the Circulation Element of the General Plan and the San Mateo City/County Association of Government's Congestion Management Plan should be evaluated.

6. *Mitigation should be identified for any roadway mainline section or intersection with insufficient capacity to maintain an acceptable LOS with the addition of project-related and/or cumulative traffic.* The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should also be fully discussed for all proposed mitigation measures.

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   - Providing transit information to all future project residents, employees and patrons, and
   - Encouraging bicycle- and pedestrian-friendly design.

While the 2000 Highway Capacity Manual (HCM) may not be the preferred level of service methodology, it should be used for analyzing impacts to state facilities, particularly where previous analysis employing alternative methodologies has identified impacts. The residual level of service, assuming mitigation has been implemented, should also be analyzed with HCM 2000.

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Rudy Dantes, Permits Branch Chief
California DOT, District 4
P.O. Box 23660
Oakland, CA 94623-0660

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Patricia Maurice, Associate Transportation Planner
Community Planning Office, Mail Station 10D
California DOT, District 4
P.O. Box 23660
Oakland, CA 94623-0660

Please feel free to call or email Patricia Maurice of my staff at (510) 622-1644 or patricia_maurice@dot.ca.gov with any questions regarding this letter.

Sincerely,

TIMOTHY C. SABLE
District Branch Chief
IGR/CEQA

c: Ms. Terry Roberts, State Clearinghouse

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'170 Santa Monica

PHONE NUMBERS

NAME AND ADDRESS	TELEPHONE
1060 Terra Nova #104A Pacifica 94044	

July 4, 2006

Dear Ms. Farbstein,

I will be out of town on July 12 & am writing to oppose the Development at 801 Fassler on Crew. Poor duly on my way to Highway One.

This development would be in violation of the Hillside Preservation Ord and create less more traffic congestion on Fassler & Crew already crowded Highway One. The Crew is home to deer, foxes, snakes, birds and other wildlife that would be killed or displaced by this development.

So, for the reasons of violation of the Hillside Preservation Ordinance, pollution and protection of wildlife, I oppose this development.

Ismael Rodriguez

RECEIVED
JUL 10 2006
BY FAX

PHONE NUMBERS

NAME AND ADDRESS	TELEPHONE

City of Pacifica
Planning and Economic Development
170 Santa Maria Avenue
Pacifica, CA 94044

Scenic Pacifica

OAKLAND CA 946
29 JUN 2006 PM 3 L

RECEIVED
JUL 5 2006
CITY OF PACIFICA

Carol A Fregly
727 Rockaway Beach Ave.
Pacifica, CA 94044

94044+3232

Late: I cannot come to meeting Wed night but I am concerned about the predistrate possibility the hill behind 724 Rockaway is eroding
Carol Fregly

To Dave Carbone
Planning Dept
c/o Kathryn Farbstein

Scenic Pacifica

Mailed 7/7

NOTICE OF PUBLIC SCOPING MEETING

TO: Neighbors and Interested Parties

FROM: City of Pacifica, Planning and Economic Development Department

SUBJECT: **Notice of a Public Scoping Meeting related to the preparation of an Environmental Impact Report (EIR) for the Prospects Residential Project (34 Residential Units at 801 Fassler Avenue)**

Neighboring property owners, residents, tenants, and interested parties are invited to attend to offer their views as to the scope and content of the EIR on the proposed project described below. The Scoping Meeting will take place on Wednesday July 12, 2006, at 6:00 p.m. in the Council Chambers, 2212 Beach Boulevard, Pacifica. Questions regarding this project and meeting may be directed to Kathryn Farbstein, Assistant Planner at (650) 738-7443. You may submit comments or questions in writing to Ms. Farbstein, at the City of Pacifica, Planning and Economic Development, 170 Santa Maria Avenue, Pacifica CA 94044.

PROJECT LOCATION: The Prospects Residential Project site is located at 801 Fassler Avenue on approximately 11.2 acres of vacant land and is bounded by Fassler Avenue on the west and south, and vacant land to the north and east.

PROJECT DESCRIPTION: The project applicant proposes to construct 34 residential units, a subterranean parking garage, and associated amenities in the western two acres of the proposed project site. Half (17) of the proposed units would be detached single-family residences and the remaining half (17) of the proposed units would be attached in the form of duplexes and triplexes. In addition, the proposed project would include gardens, open space areas, an amphitheatre, a community center, and promenades/pedestrian walkways.

Implementation of the proposed project would require the City's approval of the following:

- General Plan Amendment
- Rezoning to P-D with a Development Plan
- Height, Land Coverage Control, and Parking Variances
- Specific Plan (future application)
- Other discretionary permits may be required
- Ministerial approvals including grading, foundation and building permits, utility connections permits and any other ministerial actions may be required.
- Other permits may also be required and/or other issues may arise as the project moves through the environmental review process.

PROJECT APPLICANT: Pacifica Quarry Homes, LLC

PROPERTY OWNER: Pacifica Quarry Homes, LLC

Date of Notice: June 29, 2006

Kathryn Farbstein
Assistant Planner

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Faxed to Erin 7/24 2:15

RECEIVED
JUL 24 2006
CITY OF PACIFICA

July 23, 2006

Dear Kathryn Farbstein, City of Pacifica Planning Dept.

I (and some of my neighbors) would like to express our opposition to the proposed 'Prospects' development off Fassler Avenue. The location of this project is so ill advised we cannot support it. For one thing, and critically, Fassler has become a major conduit of traffic especially during commuter hours. More traffic than already exists would overly tax the street's ability to support it, and during the rainy months (or in heavy fog) this down stretch of Fassler is unsafe. Another roadside residential development here is doing what may be a good thing in a bad place. We are not opposed to having more residents share our city, but this location is the wrong place to do it. Even for Fassler Avenue, this is the worst location.

We oppose rezoning this area for this project. There are enough new "green" developments like that already on Fassler, and they all intrude or ruin the valuable views. Pacifica must protect its unique hillside scenery. I lived in Malibu for seven years and saw the desecration of those splendid hills and beaches by expensive residential houses, "trophy" houses for the rich. Please don't let this happen to Pacifica. Already these developments snake across the hillside ridges robbing Pacificans of the natural beauty that has been our greatest heritage. The value of Pacifica property has increased steadily due to this unique beauty, long supported by local residents and criticized by developers who would exploit it for profit.

Red Tailed and other hawks perch & hunt from the street lights in this part of Fassler. Development of this area, now wild, would destroy a major food source for these esteemed creatures; they would disappear from their perches. We speak for these and other wild animals that can't speak for themselves, and voice our own sense of loss when they are forced away from this area on Fassler, so important to their existence and our pleasure in sharing their lives. We don't want to lose them.

Other problems include potential for erosion at this site and the effect on the large drainage basin above Rockaway, not only a wild life habitat but critical to rain run off that occurs naturally there. Those hills with their natural drainage can't be guaranteed against damage that might occur by this development. We, who live here, oppose this proposed project. Short term profits leave frequently long term degradation; a loss of quality of life. This is neither in the tradition or best interest of Pacifica.

Jack Dodson
1140 Fassler Ave.
Pacifica, CA. 94044
phone # 355-1452
email: jackalo@sbcglobal.net

Hans R. Huhn

HANS R. HUHN
1136 FASSLER AVE.
PACIFICA, CA 94044

Jack L. Dodson

P.S. I've seen the detailed plans twice at the planning Dept.

We, the undersigned, agree basically with Mr. Dodson's position on the proposed 'Prospects' development on Fassler Avenue. Please note we're opposed to it.

Lilli Hahn
1136 Fassler Ave
7-23-06

Bea Davis
1137 Fassler ave
7/23/06

Thomas E Davis
THOMAS E DAVIS
1137 FASSLER AVE
7/23/06

806 St. Lawrence Dr.
Pacifica, CA 94044

RECEIVED
JUL 10 2006
CITY OF PACIFICA

July 7, 2006

Kathryn Farbstein
City of Pacifica
Planning and Economic Development
170 Santa Maria Avenue
Pacifica, CA 94044

Re: The Prospects Residential Project

Dear Ms. Farbstein:

I read the article regarding "Pacificans invited to scoping meeting on EIR for proposed 'Green' residential project on Fassler" in the July 5, 2006 *Pacifica Tribune* which prompted my letter to you.

I have lived in Pacifica for 34 years and during those years I have had the enjoyment of the view while driving up and down Fassler Avenue six days a week going to and from work and running errands.

When I read that article I had to write. Under no circumstances am I for the building of the "residential project" and I am forever grateful for two very, very intelligent people, namely Bob Pilgrim and Julie Weisman, to speak up against the project. I agree with them wholeheartedly and I too express my concerns that the development would adversely affect traffic, bring in more pollution, the large impact it would have on Highway One and most importantly, the Hillside Preservation District and open space. The beauty of seeing the open space on the Fassler hillside ridge is something I enjoy seeing every day. We do not need more housing.

The idea that Rick Lee would give each of the original owners who bought in that development a new electric vehicle is so repulsive. It sounds like bribery to me. Lee's suggestion that "the new community could produce 18 cars during the peak of rush hour." How does he know how many cars there will be during rush hour. In today's world both parents work so there will be more than 18 cars during peak rush hour and a community center and other features of the project would likely draw more than 18 cars, too.

Under no, and I mean no, circumstances do I want that area to be built up. We need our hillsides and open space to be preserved. We are losing land every single day to development and it is about time, we stand our ground and say no.

So indicate on your score card my answer is **NO, NO, NO** to the residential project!! As to the rest of the members on the Planning Commission, shame, shame on you for even allowing this project to even be suggested.

Sincerely,

Barbara Parker

Kathryn Farbstein
City Of Pacifica Planning Dept
1800 Francisco Blvd.
Pacifica, CA 94044

RECEIVED
JUL 27 2006

James P. Rodriguez
919 Fassler Ave
Pacifica, CA 94044

Dear Kathryn Farbstein,

I have concerns regarding the proposed Project on the 801 Fassler Ave site. I live and travel up and down the hill of Fassler Ave each day to and from everywhere. The landscape on Fassler has the natural beauty of Nature, Undisturbed! I would feel hurt if this beauty were to be disrupted.

This area the developer has picked out is not the place for it or any type of development. There would be much change to the beauty of the hillside, trees, wildlife, and ecosystem. If he wants a place for his project, how about the old sanitation area near Rockaway Beach, on Riana Del Mar just west of Highway 1. I know that's a better place than to disrupt Fassler Ave.

The article in the Tribune had some opinions of what to do about traffic on Fassler if the project went through. Someone suggested dropping the speed limit in the new area to 20 or 25 mph; well the grade of the hill would never ever make for a smooth and logical solution.

Coming down the hill from Seacrest Town homes I have trouble keeping my speed below 40mph on the downgrade, and I know it would be practically impossible to slow a vehicle down 25, let lone 20, NOT POSSIBLE. Going uphill one needs a least 40mph to get the RPM's and Horsepower to climb the grade, I know this!

Please make the voices of all the commuters of Fassler Ave heard LOUD! that we are Totally Against this Project, especially on Fassler on the proposed site. I have lived in this area for 5.5 years and love it, for the beauty and quiet.

Any impact you can make for us homeowners will be greatly appreciated!

Thank You,

Sincerely,

James P. Rodriguez

James P. Rodriguez

a Scoping Meeting 7/12/86

Karen Rosenstein

Most Comprehensive EIR available
Traffic Impact on Hiway 1
    Hiway One
    Rockaway Beach
    Park Pacifica/Terra Nova, Crespi
More CO2 emissions--Pacifica is already having problems meeting clean air standards
Reconfiguing Fassler Ave for private property use of public right of way
Possible blasting on site
Subterranean garage
    access into garage
    construction
    car lift
    water storage area
    buildings on top possible EQ hazard
Flooding downill into Rockaway if water storage system should breech
HPD variance
rezoning of open space residential to allow this "green complex"
height variances
parking variances
What is the purpose of the amphitheatre?
    no parking for events at amphitheatre
    NOISE from events at amphitheatre will echo thruout Rockaway Canyon
Community garden--is that strictly for residents or open to the public? If open to the public, where are they expected to park??

Impact on Rockaway Creek-- this project will divert water away from the creek and hillside below thus changing that ecosystem.

Impact on the ecosystem of the proposed site

2nd Circulation

Kathryn Farbstein
Assistant Planner
City of Pacifica
Planning Department
1800 Francisco Blvd.
Pacifica, CA 94044
August 19, 2006

RECEIVED
AUG 23 2006

Dear Ms. Farbstein,

We are writing in response to the Notice of Preparation concerning the Pacifica Quarry Homes,LLC which you sent to us.

Our primary concern is the solution to the ingress and egress to the homes. We called Rick Lee to ask about his plans for access to the property. He explained the need for additional lanes on Fassler which will be accommodated by using some of the south side of his property. Any additional thing, such as blinking lights, to caution motorists, will be determined by your department.

In reviewing the features to be included in this development, we were impressed with the number of items that contribute to sustainable development such as:

- Using grey water for irrigation. The sink and toilet water is separated from the rest of the used water in the home, putting less demand on the City's sewer system.
- Using recognized healthy indoor materials to create a non-toxic environment.
- Including complete solar systems throughout the homes because of placement advantageous for maximum solar reception.
- Using landscaping plants that require no irrigation system.
- Using materials selected for their environmental value.

We have known Rick Lee and his family for about eight years. He has remodeled two bathrooms and built an outstanding front fence. During all of these projects, Rick always asked our opinion about design decisions: he called if he was going to be late; he never "abandoned" his work for us by not showing up for a week or so (as other contractors have done); he always cleaned up each day before he left our home; his workmanship is excellent. How many customers can testify this positively for their contractors?

We realize our personal experience with and endorsement of Rick Lee, one of the owners of this development, may not directly relate to an EIR. However, veracity should definitely be considered a necessary component of a developer's character, in our view.

Sincerely, Dale Emde Enid Emde

Dale and Enid Emde
1327 Crespi Drive
Pacifica, CA 94044

Farbstein, Kathryn

From: Jack [jackalo@sbcglobal.net]
Sent: Monday, September 18, 2006 9:56 PM
To: Farbstein, Kathryn
Subject: [Fwd: 'THE PROSPECTS' TIME LINE]

KATHRYN, I'M FORWARDING MY INITIAL EMAIL TO YOU ON AUG. 28. I GOT YOURS TODAY, THANK YOU. ONE POINT I'D LIKE TO MAKE (THAT I HAVEN'T) IS A FALLACY IN ASSUMING THAT BECAUSE THE OTHER "WALLED DEVELOPMENTS" WERE APPROVED & BUILT ON FASSLER, IT'S LOGICAL TO ALLOW 'THE PROSPECTS.'

I'LL KEEP IN TOUCH ON THIS PROJECT AND AM GRATEFUL TO YOU FOR BOTH TIMES I MET YOU, YOUR GENEROSITY & HELPFULNESS. THANKS, JACK DODSON

-------- Original Message --------
Subject:'THE PROSPECTS' TIME LINE
Date: Mon, 28 Aug 2006 10:44:21 -0700
From: Jack <jackalo@sbcglobal.net>
To:farbsteink@ci.pacifica.ca.us

DEAR KATHRYN, JACK DODSON HERE, WITH A FRIENDLY REQUEST, NOT AN EMERGENCY BUT AT YOUR CONVENIENCE. I HAND DELIVERED TO YOU A LETTER LISTING THREE CRITICAL REASONS WHY I OPPOSE THIS PROJECT. YOU WERE KIND TO RECEIVE IT & GIVE SOME TIME EXPLAINING DETAILS. THANKS.

I ASK YOU NOW FOR A TIME LINE OF PUBLIC EVENTS REGARDING THIS PROJECT. I PLAN TO DISTRIBUTE A FLYER TO MANY FASSLER RESIDENTS GIVING THEM THE OPPORTUNITY TO EITHER SIGN MY LETTER TO YOU OR RESPOND WITH THEIR VIEWS ON THE SUBJECT, REGARDLESS OF MY AGENDA. I THINK FASSLER RESIDENTS WILL CARE.

IT WOULD BE HELPFUL FOR ME IN THIS PUBLIC APPEAL IF I HAD SOME PERTINENT INFORMATION ABOUT HOW THEY COULD MAKE THEIR OPINIONS KNOWN, AND WHEN.

IF THIS IS TOO MUCH TO EMAIL I'LL DROP BY YOUR OFFICE & PICK UP ANY MATERIAL THAT CAN HELP.

THANKS, JACK DODSON, 1140 FASSLER AVE., PACIFICA, 94044, 355-1452

EMAIL: **jackalo@sbcglobal.net**

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A4: Comments from the NOP Scoping Session

City Of Pacifica
City Council Regular Meeting

Name Bob Pilgrim (Please Print) Date 7-12-06

Address 408 DONALDSON AVE Phone No. 359 4248

No. of Item on Agenda or Subject
SCOPING ON DRAFT
COMMENTS —

Request for additional information or assistance from City staff

City Of Pacifica
City Council Regular Meeting

Name Noel Blincoe (Please Print) Date 7 / 06

Address 648 Edgemar Ave Phone No. 359 3312

No. of Item on Agenda or Subject
Aesthe Views

Request for additional information or assistance from City staff

DRAFT ENVIRONMENTAL IMPACT REPORT
SCOPING MEETING
COMMENT CARD

(Please note that this document will be part of the public record.)

Date: Wednesday, July 12, 2006 (6:00 to 8:00 PM)
Location: City of Pacifica Council Chambers
2212 Beach Boulevard, Pacifica California
Project: The Prospects Residential Project

Comments may be submitted at the Scoping Meeting or may be sent to:

Attn: Kathryn Farbstein
City of Pacifica
Planning and Economic Development Department
170 Santa Maria Avenue
Pacifica, CA 94044
Phone: (650) 738-7443 or FAX: (650) 738-7341
farbsteink@ci.pacifica.ca.us

Comments must be received no later than 5:00 p.m. on Friday, July 28, 2006.

Name (Please Print): Karen Rosenstein ✓

Mailing Address: 200 Troglia P 94044

Resident, Business, Organization, etc.: self

Comment (s): see attached

Completing and signing this document is voluntary. The City of Pacifica may use this information for statistical purposes, to notify you of any future meetings, or to assist in providing you with further information. This document is a public record and may be subject to inspection and copying by other members of the public.

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Pacifica, CA 94044
Phone: (650) 738-7443 or FAX: (650) 738-7341
farbsteink@ci.pacifica.ca.us

Comments must be received no later than 5:00 p.m. on Friday, July 28, 2006.

Name (Please Print): Catherine Taylor-Skarica ✓

Mailing Address: 1044 Fassler Ave.

Resident, Business, Organization, etc.: residence

Comment (s): All traffic projections should account for projections of increased Highway One traffic when the tunnel is opened (tunnel from Pacifica south on Highway One).

Completing and signing this document is voluntary. The City of Pacifica may use this information for statistical purposes, to notify you of any future meetings, or to assist in providing you with further information. This document is a public record and may be subject to inspection and copying by other members of the public.

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Planning and Economic Development Department
170 Santa Maria Avenue
Pacifica, CA 94044
Phone: (650) 738-7443 or FAX: (650) 738-7341
farbsteink@ci.pacifica.ca.us

Comments must be received no later than 5:00 p.m. on Friday, July 28, 2006.

Name (Please Print): GINA COX

Mailing Address: 909 FASSLER AVE, PACIFICA 94044

Resident, Business, Organization, etc.: RESIDENT

Comment (s):

SPEED LIMIT (CURRENT 40 MPH)

CROSS WALKS

TURN LANES

Completing and signing this document is voluntary. The City of Pacifica may use this information for statistical purposes, to notify you of any future meetings, or to assist in providing you with further information. This document is a public record and may be subject to inspection and copying by other members of the public.

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170 Santa Maria Avenue
Pacifica, CA 94044
Phone: (650) 738-7443 or FAX: (650) 738-7341
farbsteink@ci.pacifica.ca.us

Comments must be received no later than 5:00 p.m. on Friday, July 28, 2006.

Name (Please Print): Silvia M. Buendia ✓

Mailing Address: 480 Copeland St.

Resident, Business, Organization, etc.: Resident

Comment (s): Geology & Soils:
Concerned that issues that will have less than significant impact.

Completing and signing this document is voluntary. The City of Pacifica may use this information for statistical purposes, to notify you of any future meetings, or to assist in providing you with further information. This document is a public record and may be subject to inspection and copying by other members of the public.

DRAFT ENVIRONMENTAL IMPACT REPORT
SCOPING MEETING
COMMENT CARD

(Please note that this document will be part of the public record.)

Scenic Pacifica

Date: Wednesday, July 12, 2006 (6:00 to 8:00 PM)
Location: City of Pacifica Council Chambers
2212 Beach Boulevard, Pacifica California
Project: The Prospects Residential Project

Comments may be submitted at the Scoping Meeting or may be sent to:

Attn: Kathryn Farbstein
City of Pacifica
Planning and Economic Development Department
170 Santa Maria Avenue
Pacifica, CA 94044
Phone: (650) 738-7443 or FAX: (650) 738-7341
farbsteink@ci.pacifica.ca.us

Comments must be received no later than 5:00 p.m. on Friday, July 28, 2006.

Name (Please Print): Leanne Chapman

Mailing Address: 21 Driftwood Ct

Resident, Business, Organization, etc.:

Comment (s):
I would like to speak about traffic issues off Fassler

Completing and signing this document is voluntary. The City of Pacifica may use this information for statistical purposes, to notify you of any future meetings, or to assist in providing you with further information. This document is a public record and may be subject to inspection and copying by other members of the public.

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Comments must be received no later than 5:00 p.m. on Friday, July 28, 2006.

Name (Please Print): ANDREJ SKARICA ✓

Mailing Address: 1044 FASSLER AVE

Resident, Business, Organization, etc.: - RESIDENT -

Comment (s):

1. TRAFFIC CUMULATIVE EFFECT. ON CITY STREETS BEYOND FASSLER.
2. STORM RUNOFFS AND USE OF EXISTING ~~BY~~ THE EXISTING STORM DRAINAGE.

Completing and signing this document is voluntary. The City of Pacifica may use this information for statistical purposes, to notify you of any future meetings, or to assist in providing you with further information. This document is a public record and may be subject to inspection and copying by other members of the public.

SUMMARY OF RESPONSES	Project Description	Aesthetics	Air Quality	Alternatives	Biological Resources	Construction Impacts	Cultural Resources	Geology & Soils	Hazards & Hazardous Materials	Hydrology and Water Quality	Land Use & Planning	Noise	Population and Housing	Public Services & Utilities	Recreation	Transportation/Traffic	Other	NOTES
ORAL RESPONSES RECEIVED AT THE EIR SCOPING MEETING DATED July 12, 2006																		
Gina Cox 909 Fassler Ave Pacifica 94044																●		☐ Commenter asked whether the existing speed limit of 40 mph is addressed in the study and stated that speed limit should be 25 mph along Fassler where residential uses are present. ☐ Commenter expressed concern over the lack of crosswalk or sidewalk on Fassler from Highway 1 up to Terra Nova Blvd., issue of pedestrian safety
Silvia M Buendis 480 Copland St						●		●	●	●								☐ Commenter noted that this is her 1st time seeing map and site plan. ☐ Commenter noted that in the geology/soils section of the Initial Study p.21-less than significant impacts for all thresholds and stated that the project site is close to San Andreas fault and other nearby faults ☐ Commenter asked if the proposed subterranean structure will be sited over the old quarry and whether construction of the garage will construction require dynamite. If so, would be liable for property damage resulting from construction of project? ☐ Commenter referred to safety issues and soil disturbance related to potential blasting ☐ Run off by increasing impervious surfaces ☐ Commenter asked if the project required a geologic report due to its location in a seismically active area. ☐ Commenter requested that the geologic report be available to the public.

SUMMARY OF RESPONSES	Project Description	Aesthetics	Air Quality	Alternatives	Biological Resources	Construction Impacts	Cultural Resources	Geology & Soils	Hazards & Hazardous Materials	Hydrology and Water Quality	Land Use & Planning	Noise	Population and Housing	Public Services & Utilities	Recreation	Transportation/Traffic	Other	**NOTES**
Leanne Chapman 21 Driftwood Ct						●		●	●							●		☐ Commenter stated that she has lived in city for 19 years, and has concerns related to traffic and geology and soils. ☐ Commenter has reviewed traffic study and pointed out that no accidents/fatalities were mentioned. ☐ Commenter stated that many animals live near the project site and increased traffic is a hazard to them. ☐ Commenter noted that near the project site, the speed limit is reduced to 20 mph but most motorists do not abide by this. ☐ Commenter stated that proposing additional turning lane will remove merging along Fassler, causing a hazardous condition. ☐ Commenter noted that the area is very congested and that the discussion in the traffic study regarding LOS C in P.M. doesn't mention impacts related to Terra Nova high school. ☐ Commenter noted that the traffic study does not address the extra construction trucks that would be necessary. ☐ Commenter mentioned the Reina del Mar/Highway 1 Vanpool Mitigation program that is presented in the traffic study. ☐ Commenter noted that a project nearby included measures to mitigate impacts and that they were never implemented. As such, the vanpool might not work

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Noel Blincoe 648 Edgemar Ave		●		●							●							☐ Commenter stated that aesthetics are an important issue. ☐ Commenter stated that EIR should address two parcels. If the project were built on one parcel, zoning is consistent but if on other parcels, changes to zoning would be necessary. ☐ Commenter stated that there are concerns regarding reviews on the hillside areas. ☐ Commenter said that the EIR should compare the project with zoning and discuss consistencies and inconsistencies. Views should be compared under the two zoning scenarios. The EIR should also outline the HPD ordinance because development on HPD should compliment hillside. ☐ Commenter acknowledged that the builder is sensitive to these issues but they need to be addressed in EIR.
Bob Pilgrim 408 Donaldson Ave			●	●							●		●			●	●	☐ Commenter discussed the structure of EIR on behalf of Sierra Club and used the Pacifica Village Center EIR as an example. This document was certified 4 years ago and should not have been because the Sierra Club attorneys found it to be deficient. This was the last EIR in this area. ☐ Commenter explained that CEQA allows 8 or 9 different types of EIRs and went through each one but stated that a Program EIR is not good option for this project. ☐ Commenter stated that Royce Property and Robinson Road should be considered in the cumulative analysis and that all developments together should be considered. Potentially significant impacts could occur related to Land Use, Population and Housing, Air Quality, and Traffic. ☐ Commenter stated that EIR should compare/contrast, and explain methodology. ☐ Commenter stated that the land use plan/policies should be discussed in the EIR.

SUMMARY OF RESPONSES	Project Description	Aesthetics	Air Quality	Alternatives	Biological Resources	Construction Impacts	Cultural Resources	Geology & Soils	Hazards & Hazardous Materials	Hydrology and Water Quality	Land Use & Planning	Noise	Population and Housing	Public Services & Utilities	Recreation	Transportation/Traffic	Other	**NOTES**
Karen Rosenstein 200 Troglia Pl			●		●	●				●	●	●				●		☐ Commenter stated the EIR for the proposed project should be the most comprehensive EIR available and provided a list of issues that should be included in the document (attached).
Andrem Skarica (city planner/engineer) 1044 Fassler Ave									●	●						●		☐ Commenter expressed concern with cumulative effects of traffic. ☐ Commenter asked if the city continues developing parcels, how much of the City will be developed. There are more projects being constructed across Fassler Avenue and the commenter stated that we can't level all terrain to make more houses. ☐ Commenter stated that effects could possibly be mitigated by identifying routes other than Fassler Avenue. ☐ Commenter stated that Highway 1, which would experience more traffic with project, is at a standstill during the day. Fassler Ave would be affected by this traffic. The portion of Highway 1 near Fassler is most important portion of roadway in city. ☐ Commenter stated that with regard to runoff, developments could be designed in such a way to control runoff. The statements in the initial study are not possible. ☐ Commenter stated that disasters occur when water is out of control.

SUMMARY OF RESPONSES	Project Description	Aesthetics	Air Quality	Alternatives	Biological Resources	Construction Impacts	Cultural Resources	Geology & Soils	Hazards & Hazardous Materials	Hydrology and Water Quality	Land Use & Planning	Noise	Population and Housing	Public Services & Utilities	Recreation	Transportation/Traffic	Other	**NOTES**
Joseph Davis 893 Colara		●						●	●	●								• Commenter stated that Page 2 of the Initial Study compares runoff impacts to the possibility of a 100 year storm event, but didn't consider that 2006 was the rainiest year in 100 years. • Commenter stated that hillsides are the City's asset-problems both environmentally and visually • Commenter expressed concern over Item #6 in Geology and Soils section of the Initial Study and explained that many landslides occur in the project vicinity, especially in Rockaway area. There have been many landslides near the project site. Why are landslides not identified as an environmental impact? • Commenter requested clarification on Item #C, in Geology and Soils regarding unstable units as to how was the conclusion of less than significant reached.
Bob Sherman Hope Street								●	●		●							• Commenter has been resident of city for more than 20 years and his house would be the first hit in the event of a landslide from the project site. • Commenter explained that the HPD ordinance took away a lot of property rights and that the PUD came into effect to resolve this issue, but it is still not resolved. • Commenter expressed his approval for the project.
Gina Cox 909 Fassler					●				●							●		• Commenter asked how for the breakdown of duplexes and triplexes and explained that the breakdown is needed to accurately determine trip generation. • Commenter suggested that if project were reduced to less than 20 single family residences, fewer traffic impacts might occur. • Commenter stated that EIR should address fatalities and animal kill on roads because fatalities occur directly adjacent to the site-just east of Robert Road. EIR should also consider animal control because there is an Endangered Spotted Owl

SUMMARY OF RESPONSES	Project Description	Aesthetics	Air Quality	Alternatives	Biological Resources	Construction Impacts	Cultural Resources	Geology & Soils	Hazards & Hazardous Materials	Hydrology and Water Quality	Land Use & Planning	Noise	Population and Housing	Public Services & Utilities	Recreation	Transportation/Traffic	Other	NOTES
																		present on site.
Phil Harris Fassler Ave																●		• Commenter stated that the closure of Devils slide could cause the traffic impact analysis to be inaccurate if counts were taken prior to closure.
Marilyn G Weeks 987 Fassler Ave. Pacifica, CA 94044												●						• Commenter asked where the sound would go that is generated from the proposed amphitheatre. The proposed location of the project site adjacent to the valley could cause the sound to magnify.
Unnamed Commenter												●						• Commenter asked of what materials will amphitheatre be constructed.
Dale Emdy																	●	• Commenter has been a resident of the city since 1957. • Commenter stated that he knows the applicant and that he's an honest, straightforward developer. However, commenter said that complaints from residents are legitimate that he encourages residents to go to the applicant with concerns.
Unnamed Commenter									●	●								• Commenter asked if the design of the amphitheatre would allow H2O to accumulate. If so, this could pose a safety hazard.
Catherine Taylor-Skarica 1044 Fassler Ave																●		• Commenter asked if traffic report took into account the tunnel and whether the report is considering development that would take place five years out.
Unnamed Commenter		●																• Commenter stated that the EIR should contain 3D-model because the current graphics are difficult to see.
Steven Gil No address given		●																• Commenter asked about Aesthetics Item #1 in the Initial Study and stated that materials and design is a big concern. There are many ugly, deteriorating projects in Pacifica. Since this project will also deteriorate, this issue should be included in EIR • Commenter stated that the durability of construction materials should be addressed in the EIR.

SUMMARY OF RESPONSES	Project Description	Aesthetics	Air Quality	Alternatives	Biological Resources	Construction Impacts	Cultural Resources	Geology & Soils	Hazards & Hazardous Materials	Hydrology and Water Quality	Land Use & Planning	Noise	Population and Housing	Public Services & Utilities	Recreation	Transportation/Traffic	Other	**NOTES**
Unnamed Commenter																	•	• Commenter requested more information on the proposed community center such as who will maintain the center and who will have access to it?

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APPENDIX B
BIOLOGICAL REPORTS

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B1: Revised Biological Assessment, Thomas Reid Associates (4-23-04)

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RECEIVED
OCT 10 2005

REVISED
Biological Assessment Report
for Fassler Avenue Property
Pacifica, California
APN 022-083-020
APN 022-083-030

For compliance with San Mateo County
Local Coastal Program Policies

Prepared for:
Rick Lee
Pacific Quarry Homes
716 Corona Drive
Pacifica, California 94044

Prepared by:
Thomas Reid Associates
545 Middlefield Road, Suite 200
Menlo Park, CA 94025
(650) 327-0429

Revised
April 27, 2005

1. Project location (include USGS Township, Range and Section)

The property is approximately 11 acres in size, and is located on Fassler Avenue in Pacifica, San Mateo County, California. The site is located at Lat. 37.622349° 37:37:20.456N, Long.-122.485175 122:29:6.630W, approximately 0.13 miles east of the Pacific Ocean (see Figure 1). The site is outside of Township and Range designation numbers.

2. Assessor's Parcel Number and any applicable Planning Permit numbers

The property includes two parcels, with the designations APN 022-083-020 and APN 022-083-030 in San Mateo County.

3. Owner/Applicant: Pacific Quarry Homes, LLC
Address: 716 Corona Dr., California 94044
Phone: (650) 359-3827

4. Principal Investigators (attach a qualification summary to the report)

This report was prepared by Kerri Davis and Taylor Peterson of Thomas Reid Associates. See Appendix A for qualification summaries.

5. Report summary (briefly state the results of the report, habitat type, rare, endangered, or unique species present, anticipated impacts, and proposed mitigation measures)

This report is consistent with the format required by the County of San Mateo for biological reports in the coastal zone (Local Coastal Program, San Mateo County, 1998). The report documents the existing biological resources at APN 022-083-020 and APN 022-083-030 in Pacifica, California. The report also analyzes the impact on the existing biological resources of constructing 18 single family homes and 8 duplexes on the site, and includes recommended mitigation measures to offset potentially adverse impacts.

The 11-acre site was surveyed for biological resources on April 23, 2004 by Thomas Reid Associates biologists Kerri Davis, Tay Peterson and Patrick Kobernus. All potentially sensitive habitats and areas to be impacted were surveyed for the purposes of this report. The property is primarily composed of a former quarry site dating back to 1946. The quarry ceased operation sometime in the 1950's, when vegetation started to grow back over the disturbed pad and quarry paved roads. The vegetation communities present on parts of the site and in the surrounding areas are Coastal Scrub, Willow Scrub and Perennial Grassland (*Coastal Prairie*) (Sawyer, 1995). The majority of the site was disturbed during the previous quarry development and by the old alignment of Fassler Avenue. In more recent years the site has been used for illegal dumping of residential yard clippings and debris, and this has resulted in an invasion of exotic and horticultural plants into the site.

The proposed location of the project is within the disturbed footprint of the previous quarry operations, in areas that are currently vegetated with coastal scrub and coastal prairie. The

project will use the existing paved road at the site (R. Lee, personal communication). The proposed footprint of development will not exceed 85,000 square feet (18 percent) of the 11-acre property (R. Lee, personal communication).

No state or federally-listed threatened or endangered species were found to occur on the site. The site does support a colony of dusky-footed woodrat (suspected to be *Neotoma fuscipes annectens*), which is a California species of special concern. The site lies about 1.0 mile south of a known location of San Francisco garter snake (federal endangered; S. J. Barry 1994), and between two creeks that provide breeding habitat for California red-legged frog (CNDDB; see response to Question 10., below). The U.S. Fish and Wildlife Service recommends a buffer zone of 300 to 500 feet or greater between development and potential breeding habitat for CRLF and SFGS (J. Browning, personal communication). Although the project lies well outside of this buffer zone and will not adversely impact the breeding habitat of these species, it is possible that migrating individuals could move through the site. Although significant impact is not expected, mitigation is recommended to prevent take of these species.

The following mitigation measures recommended for the project:

1) The construction site shall be monitored for CRLF and/or SFGS that could disperse through the project site. During the construction phase of the project, a trained biologist or a trained on-site monitor (such as the construction foreman) shall check the site in the morning and in the evening for the presence of CRLF and SFGS. This includes checking holes, under vehicles and under boards left on the ground. If any CRLF or SFGS are found, construction shall be halted until they disperse naturally, and the monitor shall immediately notify the biologist in charge and the US Fish and Wildlife Service. Subsequent recommendations made by the USFWS shall be followed. The monitor shall not handle or otherwise harass the animal. The biologist in charge and the on-site monitor shall be aware of all terms and conditions set by USFWS and CDFG on the project. The biologist in charge shall train the on-site monitor in how to identify CRLF and SFGS. The biologist in charge shall visit the site at least once a week during construction and confer with the trained on-site monitor.

2) Construction workers shall be informed of the potential presence of CRLF and SFGS, that these species are to be avoided, and that the foreman must be notified if they are seen. Harassment of these species is a violation of federal law.

3) During construction, all holes shall be covered at night to prevent CRLF or SFGS from becoming trapped in holes on the construction site.

4) Best management practices and appropriate erosion control methods shall be used to keep exposed soils from being washed offsite. This may include using silt fencing, hay bales, or other appropriate methods.

5) Design and implement appropriate storm water pollution control measures both during construction and for subsequent residential use to avoid increasing the rate or volume of storm water leaving the site. If more than one acre of ground will be disturbed by

grading, the project is required by the Regional Water Quality Control Board to have a Stormwater Pollution Prevention Plan (SWPPP).

6) Native and non-invasive species shall be used in landscaping in order to prevent negative impacts on nearby native habitats. A list of native plant species found on the project site is in Table 1. No species included in the 1999 California Exotic Pest Plant List shall be used for landscaping (CalEPPC 1999).

7) In accordance with LCP Policy 7.49, the project shall protect or transplant any native California Wild strawberry plants (*Fragaria chiloensis*) that would be removed by construction.

8) Project design shall avoid the colony of dusky-footed woodrat nests. If occupied nests cannot be avoided, then an alternative mitigation of trapping and moving the woodrats and their nests shall be developed before demolition and/or grading begins. Trapping shall not occur during the spring/summer breeding season.

6. Project and property description (describe the proposed project and property, including the size, topographic characteristics, water resources, soil types, and land uses on the property and in the vicinity up to a radius of one-quarter mile. Include a map of the area from the USGS 7.5 minute quadrangle series.)

The property is 11 acres in size and has several zoning designations. One parcel is Low Density Residential, and the other is Open Space Residential. Both have a Hillside Preservation District overlay, and a Planned Development (PD) permit is required for development. The property is a gradually sloped terrace with north and west facing slopes. The elevations range from 230 feet above sea level in the northwest corner to 440 feet above sea level near the southeast corner. The property is bounded by Fassler Avenue to the south and undeveloped land to the north. The northern property boundary is about 200 feet upslope of an unnamed drainage that flows through Rockaway Beach and into the Pacific Ocean just south of the mouth of Calera Creek. It is located east of Highway 1, and about 0.3 miles east of the Pacific Ocean (Figure 1).

Other than the unnamed drainage to the north of the project site, water resources include Calera Creek, about 0.8 mile to the north, and San Pedro Creek, about 1.2 miles to the south (Figure 1). Urban development separates the site from both Calera and San Pedro Creeks. The project site is not subject to flooding.

As listed in the San Mateo County Soil Survey (USDA, 1991), soils on the property include Orthents, cut and fill, on 0 to 15 percent slopes, and Orthents, cut and fill-Urban land complex, 5 to 75 percent slopes. These soils formed in residuum derived from sandstone, and are shallow to very deep, well drained soils on uplands . The unit consists of soils that have been cut and filled for urban development, in this case that refers to the quarry. They vary greatly in thickness and in the texture of the surface layer. The soil material in the steeper areas generally has been cut or removed for the construction of building foundations and roadways, and bedrock commonly is exposed. The areas of fill generally have slopes of less than 30 percent.

The proposed project is the construction of 18 single family homes and 8 duplexes. The total square footage of the homes will range between 1000- 1500 square feet. The total project impact of roads and structures should not exceed 85,000 square feet, or 18 percent of the 11- acre site. The existing roadway on the project site will be restored or used (approximately 30,000 sq. ft.). (R. Lee, personal communication).

7. Methodology (briefly describe the survey methods used in preparing the report and show on an appropriately scaled map the location of sample points, transects, and any additional areas surveyed in the vicinity of the project.)

The property was surveyed for biological resources by Thomas Reid Associates biologists Kerri Davis, Tay Peterson and Patrick Kobernus, on April 23, 2004. The site was walked for approximately two hours. Each habitat type on the property was inspected, including any potentially sensitive areas. A search was conducted using the California Natural Diversity Database (CNDDB) to identify sensitive species and communities that could potentially be present in the area of the proposed project site (see the response to Question 10).

8. Results (at length, describe the botanical and zoological resources of the project site. To the extent possible, describe the food chain of the habitat and how the proposed project will impact those resources. Use both common and scientific names and please indicate references used.)

Plant and animal species observed on the site are listed in Table 1 and Table 2. The property includes four different habitat types: disturbed land, coastal scrub, perennial grassland, and willow scrub.

Most of the property has been used for quarry, and the property is dominated by highly disturbed soils and ruderal vegetation ("disturbed land"). Ruderal species include European annual grasses such as Italian wild rye (*Lolium multiflorum*) and rip-gut brome (*Bromus diandrus*). The disturbed footprint also has dense infestations of Bermuda buttercup (*Oxalis pes-caprea*), bristly ox-tongue (*Picris echioides*), and field mustard (*Brassica rapa*). The proposed building sites for the houses, landscaping and parking areas are within the weedy disturbed quarry footprint. Coastal scrub dominates the lower slopes of the site, between the area proposed for development and the drainage to the north. Perennial grassland occurs on the crest of the site, above Fassler Avenue. A small patch of willow scrub vegetation occurs between the disturbed land and the perennial grassland. The colony of woodrat nests is located downslope and southwest of the willow scrub vegetation (Figure 2).

<u>Food chain resources</u>

The coastal shrubs and native grasslands on the site provide foraging resources for wildlife. Species that likely reside in the fields include the California vole (*Microtus californicus*) and deer mouse (*Peromyscus maniculatus*). The open fields may also be used for foraging by birds that are common in disturbed or cultivated areas such as the house sparrow (*Passer domesticus*), California gull (*Larus californicus*) and American crow (*Corvus brachyrhynchos*). Raptors that likely prey on small mammals include the white-tailed kite

(*Elanus caeruleus*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*) and northern harrier (*Circus cyanus*), (Zeiner et al, vol. II, 1990).

Small mammals and birds take cover in the low vegetation around the property edges and in the coastal scrub area, and use the open fields and grassland for foraging. These include brush rabbit (*Sylvilagus bachmani*) and California quail (*Callipepla californica*) (Zeiner et al, vol. III, 1990). Coyote (*Canis latrans*) probably forages on the property, as well as other large mammals such as Black-tailed deer (*Odocoileus hemionus*), (a deer skeleton was found on the project site), raccoon (*Procyon lotor*), bobcat (*Lynx rufus*) and in rare instances, mountain lion (*Felis concolor*).

The coastal scrub area and native vegetation provide cover for nesting birds and small mammals. Songbirds including song sparrow (*Melospiza melodia*) and white-crowned sparrow (*Zonotrichia leucophrys*) use this habitat.

A variety of amphibians, reptiles, birds and mammals could potentially use the unnamed drainage on the adjacent property to the north of the site as a water source and for feeding. These animals are likely to disperse into and through the property when moving between habitats.

Project Impact upon Food Chain Resources

The proposed project would impact approximately 2 acres of the 11-acre property.

The proposed project would result in the development of approximately 18 percent of the two parcels (2 acres), all of which is formerly disturbed and has been invaded with exotic plant species. Some native coastal grasses and shrubs occur within the development area. One Monterey cypress tree will be impacted by the project, and because of its circumference, this tree qualifies as a heritage tree under local ordinance. Because of their value to the City of Pacifica, heritage trees (any tree, except Eucalyptus, with a circumference of 50 inches or greater), may not be removed, destroyed, or damaged beyond repair without a Heritage Tree Permit. Thus, a permit from the City of Pacifica will be required to remove this tree. The other two trees on the site (Monterey pine) will be avoided.

Wildlife movement will not be adversely restricted by the project because most of the site will remain open, and connections will be maintained through the site with adjoining open land. Considering the size of the project and the availability of open space habitats surrounding the property, the impact to foraging, cover and nesting habitats, and wildlife movement will not be significant. The proposed project could benefit wildlife by removing mainly exotic non-native vegetation, and landscaping with native plants and shrubs.

9. List all direct and indirect impacts of the proposed project on the habitat. Include within the discussion an evaluation of the perceived cumulative biological impacts associated with the project.

Potential Impacts of Project

1) The project could impact potential dispersal habitat for the California red-legged frog and San Francisco garter snake if dispersing frogs or snakes are killed or disturbed during the construction phase of the project. These animals are protected under the federal endangered species act. The federal Endangered Species Act prohibits "take," which is defined as: "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a federally listed, endangered species of wildlife, or to attempt to engage in such conduct." Appropriate precautions must be taken to prevent take of these animals.

2) The project could have an indirect negative impact on the unnamed drainage north of the property, from sediment runoff during construction, unless appropriate erosion control measures are used.

3) The project could have an indirect negative impact upon the unnamed drainage north of the property, through increased rate or volume of storm water pollution from construction materials and residential activities, unless appropriate storm water controls are used.

4) The project could have a negative impact on adjacent native habitats if invasive non-native plant species are used in the landscaping plan. In contrast, the project could have beneficial impact on the native habitat if native plants suitable to the site and region are used and exotic species are removed from the property.

5) The project could result in the destruction of a colony of the San Francisco dusky-footed woodrat, a California Species of Special Concern.

6) The project will impact approximately 11 acres of highly disturbed, former quarry land. No cumulative negative impacts are expected from this project.

7) The project could result in the removal of California wild strawberry. Strawberry plants were observed on the site, but were not mapped or identified to species. Policy 7.49 of the LCP states,

"Require any development, within one-half mile of the coast, to mitigate against the destruction of any California wild strawberry in one of the following ways:

a. Prevent any development, trampling, or other destructive activity which would destroy the plant, or

b. After determining specifically if the plants involved are of particular value, successfully transplant them or have them successfully transplanted to some other suitable site. Determination of the importance of the plants can only be made by a professional doing work in strawberry breeding."

10. List and discuss all probable impacts to threatened, rare, endangered or unique species either listed or proposed by the Local Coastal Program, a Federal or State agency, or the California Native Plant Society, both on-site and within an area of one-quarter mile radius from the project location.

A search of the California Natural Diversity Database (CNDDB) revealed that several special status species have been recorded within 5 miles of the project site:

Special Status Species Listed on the USGS 7.5' Montara Mountain Quadrangle

Plants	Status
Hickman's cinquefoil (*Potentilla hickmanii*)	SE, FE
White-rayed pentachaeta (*Pentachaeta bellidiflora*)	SE, FE, CNPS List 1B
Montara manzanita (*Arctostaphylos montaraensis*)	CNPS List 1B
San Francisco Bay spineflower (*Chorizanthe cuspidata cuspidata*)	CNPS List 1B
San Francisco gumplant (*Grindelia hirsutula maritima*)	CNPS List 1B
Coast yellow linanthus (*Linanthus croceus*)	CNPS List 1B
Rose linanthus (*Linanthus rosaceus*)	CNPS List 1B
Northern maritime chaparral	
Animals	
Mission blue butterfly (*Icarioides missionensis*)	FE
San Bruno elfin butterfly (*Incisalia mossii bayensis*)	FE
Steelhead (Central California Coast ESU) (*Onchorynchus mykiss*)	FT
California red-legged frog (*Rana aurora draytonii*)	FT, Csc
San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)	SE, FE
San Francisco dusky-footed Woodrat (*Neotoma fuscipes annectens*)	Csc
Myrtle's silverspot (*Speyeria zerene myrtieae*)	FE
California clapper rail (*Rallus longirostris obsoletus*)	SE, FE
Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)	Csc

Abbreviations:
FE=Federally Endangered
FT=Federally Threatened
FC= Federal candidate species
SE=State Endangered
ST=State Threatened
Csc= California species of special concern

CNPS List 2= Plants rare, threatened, or endangered in California, but more common elsewhere
CNPS List 1B= California Native Plant Society listing of plants rare, threatened, or endangered in California and elsewhere.

A discussion of these species, and the likelihood of occurrence on the project site is provided below.

Plants

Hickman's cinquefoil is found in open pine forests in marshy areas and on coastal bluffs and grassy meadows (Corelli and Chandik 1995). This plant was not found during the April survey

and it is not expected to be present on the property based on habitat requirements.

White-rayed pentachaeta is found in valley and foothill grasslands. It prefers open dry rocky slopes and grassy areas, often on soils derived from serpentine bedrock. 35-620m. (CNDDB, 2003). It is only known from one occurrence near Edgewood Road and I-280 in San Mateo County. The project site does not contain serpentine soils, and this species is not expected to occur there.

Montara manzanita occurs on slopes and ridges in maritime chaparral and coastal scrub on decomposed granitic soil. No species of manzanita were found to occur on the site during the April survey.

San Francisco Bay spineflower occurs in sandy places in coastal bluff, terrace, scrub, dunes and prairie. It blooms from April to July. It is known from the Mori Point area, about 1.5 miles north of the project site. Spineflower was not found on the project site during the April survey, and the project site does not contain the sandy soils that would support this species.

San Francisco gumplant occurs on sandy or ultramafic (e.g., serpentine) slopes on coastal bluffs, in coastal scrub and grassland habitat. The project site does not contain suitable soils for this species. No species of gumplant were observed at the site during the April field survey.

Coast yellow linanthus occurs in coastal bluff scrub and coastal prairie, and is known only from one occurrence near Moss Beach, several miles south of the site. No species of linanthus were found on the project site during the site survey in April.

Rose linanthus occurs in coastal scrub, and is known from only one location near Pacifica (CNPS, 2001). No species of linanthus were found on the project site during the site survey in April 2004.

Northern maritime chaparral is a plant community that is dominated by manzanita and ceanothus, and includes buckwheat, coffeeberry, sagebrush, chamise, coyote brush, poison oak and toyon. The project site contains coastal scrub, but does not contain northern maritime chaparral. No species of manzanita were observed on site.

Animals

California red-legged frog

The California red-legged frog (CRLF) uses a variety of habitats depending on the life stage and season, but usually occurs within one mile of the breeding site. The breeding season extends from November through March in sites including coastal lagoons, marshes, permanent and semi-permanent natural ponds, ponded and backwater portions of streams, as well as artificial impoundments (stock ponds, irrigation ponds, siltation ponds). The frogs usually lay eggs in loose masses attached to emergent vegetation such as bulrush (*Scirpus* sp.) or cattail (*Typha* sp.).

Juvenile CRLF are generally closely associated with a water source. However, older frogs may take refuge in small mammal burrows or in moist, dense vegetation in the surrounding area. During dry periods, CRLF typically remain near water sources, but during wet weather they have been known to travel up to one mile via upland habitats throughout the course of the rainy season (USFWS, 2000). When CRLF travel, they do so at night and in a direct fashion, without following corridors through habitats (USFWS, 2000).

The project site does not contain a water source for CRLF to use as either breeding habitat or non-breeding shelter habitat. No evidence of CRLF was observed during the site survey, and CRLF is not expected to be present on the property based on it's habitat requirements. However it is possible that CRLF could disperse through the project site.

The closest known breeding location for CRLF is near the mouth of Calera Creek, upstream of the Rockaway Quarry, about one mile north of the project site. The unnamed drainage that is located just north of the project site is shown as a perennial drainage on the USGS topographic map, and this drainage flows from northwest of the project site to the Pacific Ocean. The mouth of the drainage is south of the community of Rockaway Beach. There is urban development between the breeding site and the unnamed drainage. The CRLF is also known to occur in San Pedro Creek, which is a little more than a mile south of the project site. Urban development in Pacifica lies between the project site and San Pedro Creek. There are no other breeding ponds in the vicinity of the project.

Although there is significant urban development between known breeding locations and the project site, it is feasible that CRLF could occasionally be found to migrate across the project site.

San Francisco garter snake

San Francisco garter snakes are secretive residents of wetlands and/or moist grasslands near ponds, marshes, and sloughs and are likely to retreat into water when disturbed (SUNRI 2001). They are usually found around ponds and marshes that support large populations of Pacific chorus frogs and California red-legged frogs, both of which serve as prime food sources. The SFGS is also known to disperse through a variety of habitat types between breeding pond locations and they may spend some time in upland areas, especially during the rainy season.

The SFGS is known to occur near the mouth of Calera Creek (Barry, 1994), about one mile north of the project site. The project site and the unnamed drainage to the north do not provide suitable marsh, pond, wetland or slough habitat for SFGS. There are no reported sightings of SFGS south of the site around Pacifica. The likelihood is low, but it is feasible that SFGS could be found dispersing through the project site.

San Francisco dusky-footed woodrat

The Dusky-footed woodrat occurs in a variety of brushy and wooded areas. This

mammal builds stick houses up to 2 meters long and a meter in height for nesting. The San Francisco dusky-footed woodrat, a California Species of Special Concern, is the subspecies that occurs in the Santa Cruz Mountains and in the east bay (Hooper, 1944). During the field survey several woodrat nests were found on the project site. These nests are shown on Figure 2. The project could impact the main colony of woodrats found on the site.

Monarch butterfly

Monarch butterflies use the San Mateo Coast for roosting during fall and winter migrations through California. They are especially common within 0.5 miles of the coast. Although the project site is within the optimum migration corridor for this species, the property contains marginally suitable trees for roosting habitat. Only three small trees are located on the property, two small Monterey Pines and one Monterey Cypress. Preferred roosts are in groves of trees in protected locations. Monarch butterflies are not expected to roost at the project site.

California central coast steelhead

Only one central coast steelhead stream, San Pedro Creek, is located a little over 1 mile south of the project site. Neither the unnamed drainage nor Calera Creek are steelhead streams. The project will not adversely impact steelhead.

Salt marsh common yellowthroat

The Saltmarsh common yellowthroat is a bird that inhabits emergent wetlands. According to the CNDDB, this bird occurs in suitable habitat a mile or more north of the project site. The project site does not contain emergent wetland habitat that would support Salt marsh common yellowthroat.

11. Tabulate by significant impact all feasible mitigation measures proposed to reduce the level of impact and explain how such measures will be successful.

Mitigation Measure	Effect
1) During the construction phase of the project, a trained biologist or a trained on-site monitor (such as the construction foreman) shall check the site in the morning and in the evening for the presence of CRLF and SFGS. This includes checking holes, under vehicles and under boards left on the ground. If any CRLF or SFGS are found, construction shall be halted until they disperse naturally, and the monitor shall immediately notify the biologist in charge and the US Fish and Wildlife Service. Subsequent recommendations made by the USFWS shall be followed. The monitor shall not handle or otherwise harass the animal. The biologist in charge and the on-site monitor shall be aware of all terms and conditions	SFGS and CRLF are protected from harm during construction.

Mitigation Measure	Effect
set by USFWS and CDFG on the project. The biologist in charge shall train the on-site monitor in how to identify CRLF and SFGS. The biologist in charge shall visit the site at least once a week during construction and confer with the trained on-site monitor.	
2) Construction workers shall be informed of the potential presence of CRLF and SFGS, that these species are to be avoided, and that the foreman must be notified if they are seen. Harassment of these species is a violation of federal law.	SFGS and CRLF are protected from harm during construction.
3) During construction, all holes shall be covered at night to prevent CRLF or SFGS from becoming trapped in holes on the construction site.	SFGS and CRLF are protected from potential entrapment on the project site.
4) Best management practices and appropriate erosion control methods shall be used to keep exposed soils from being washed offsite. This may include using silt fencing, hay bales, or other appropriate methods.	Surrounding watershed is protected from siltation which could affect water quality and sensitive species habitat.
5) Design and implement appropriate storm water pollution control measures both during construction and for subsequent residential use to avoid increasing the rate or volume of storm water leaving the site. If more than one acre of ground will be disturbed by grading, the project is required by the Regional Water Quality Control Board to have a Stormwater Pollution Prevention Plan (SWPPP).	Surrounding watershed is protected from storm water pollution and increased runoff.
6) Native and non-invasive species shall be used in landscaping in order to prevent negative impacts on nearby native habitats. A list of native plant species found on the project site is in Table 1. No species included in the 1999 California Exotic Pest Plant List shall be used for landscaping (CalEPPC 1999).	The native vegetation on the property and in surrounding areas will not be threatened by invasive exotic plants emanating from this project.
7) In accordance with LCP Policy 7.49, the project shall protect or transplant any native California Wild strawberry plants (*Fragaria chiloensis*) that would be removed by construction.	Will assure compliance with Policy 7.49, and protection of genetic material important to the local agriculture industry
8) Project design shall avoid the colony of dusky-footed woodrat nests. If occupied nests cannot be avoided, then an alternative mitigation of trapping and moving the woodrats and their nests shall be developed before demolition and/or grading begins. Trapping and moving shall not occur during the spring/summer breeding season.	Destruction of any SF DFWR individuals or nests will be avoided.

12. **Certification**. I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation to the best of my ability, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

This biological evaluation was completed to the best of Thomas Reid Associates' ability, using current data and regulatory information. The facts, statements, and information presented are correct to the best of our knowledge at the time of the survey. It should be acknowledged that there are limitations inherent in single-season site visits. Biological resources are dynamic, and site conditions could change at any time in the future. Similarly, regulatory requirements also change. Such changes could affect the statements and conclusions in this report, and would require re-evaluation.

Date: 4/27/05

Signed: Patrick Kobernus

Patrick Kobernus
Thomas Reid Associates
Phone: (650) 327-0429 x89
Kobernus@traenviro.com

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Personal Communications:
Jim Browning US Fish and Wildlife Service biologist, March, 2003
Rick Lee, Land owner, May, 2004

Table 1. Plant Species Found on the Project Site (Fassler Avenue Property)

Common Name	**Scientific Name**
Native Species	
Indian Thistle	*Cirsium brevistylum*
Monterey Pine (tree)	*Pinus radiata*
common California Aster	*Aster chilensis*
California Sagebrush	*Artemisia californica*
Coyote brush	*Baccharis pilularis*
Common yarrow	*Achillea millefolium L.*
Poison oak	*Toxicodendron diversilobum*
Monterey Cypress (tree) *rare	*Cupressus macrocarpa*
California coffeeberry	*Rhamnus californica*
Indian paintbrush	*Castilleja affinis*
Bedstraw	*Galium sp.*
California bee plant	*Scrophularia californica ssp. floribunda*
Twinberry	*Lonicera involucrata*
Blue-eyed grass	*Sisyrinchium bellum*
Mexican rush	*Juncus mexicanus*
Cow parsnip	*Heracleum lanatum*
Snakeroot	*Sanicula bipinnatifida*
Thimbleberry	*Rubus parviflorus*
Coast wild cucumber	*Marah fabaceus*
Bracken-fern	*Pteridium aquilinum var. pubescens*
Sticky monkeyflower	*Mimulus aurantiacus*
Beach strawberry	*Fragaria chiloensis*
California blackberry	*Rubus ursinus*
California wax-myrtle	*Myrica californica*

Common Name	**Scientific Name**
Toyon	*Heteromeles arbutifolia*
Clover	*Trifolium spp.*
Fescue	*Vulpia spp.*
Coast buckwheat	*Eriogonum latifolium*
Pacific sanicle	*Sanicula crassicaulis*
Oceanspray	*Holodiscus discolor*
Oniongrass	*Mellica imperfecta*
Sitka willow	*Salix sitchensis*
Common cinquefoil	*Potentilla glandulosa sp.*
English plantain	*Plantago erecta*
Cudweed	*Gnaphalium sp.*
Lizard tail	*Eriophyllum staechadifolium*
Purple needle grass	*Nassella pulchra*
California fuschia	*Epilobium canum ssp. canum*
Hairy cat's ear (succulent lupine)	*Lupinus succulentus*
Pearly everlasting	*Anaphalis margaritacea*
Mugwort	*Artemisia douglasiana*
Sun cups	*Camissonia ovata*
Non-native species	
French broom	*Genista monspessulana*
Wild teasel	*Dipsacus fullonum L.*
Bristly Ox-tongue	*Picris echioides L.*
Fennel	*Foeniculum vulgare*
Ripgut brome	*Bromus diandrus*
Wild oat	*Avena fatua*
Yellow sorrel	*Oxalis corniculata L.*

Sow thistle	*Sonchus asper*
Aloe	*Aloe saponaria X striata*
Common mustard	*Brassica rapa L.*
Bull thistle	*Cirsium vulgare*
Scarlet pimpernel	*Anagallis arvensis L.*
Pampas grass	*Cortaderia selloana*
Dove's-foot geranium	*Geranium molle*
Poison hemlock	*Conium maculatum*
Soft chess	*Bromus hordeaceus*
Cut-leaf plantain	*Plantago coronopus*
Red valerian	*Centranthus ruber*
Fumitory	*Fumaria officinalis*
Small-flowered flax	*Linum bienne*
Garden burnet	*Sanguisorba minor ssp. muricata*
Red-stemmed filaree	*Erodium cicutarium*
Common wild geranium	*Geranium dissectum*
Cotoneaster	*Cotoneaster ssp.*
Periwinkle	*Vinca major*
German Ivy (cape ivy)	*Senecio mikanioides*
Prickly lettuce	*Lactuca serriola*

Table 2. Animal Species Observed Directly or by Sign at the Project Site (Fassler Avenue Property).

Common Name	Scientific Name
Western fence lizard	*Sceloporus occidentalis*
Red-tailed hawk	*Buteo jamaicensis*
California quail	*Callipepla californica*
Anna's hummingbird	*Calypte anna*
Bushtit	*Psaltriparus minimus*
American goldfinch	*Carduelis tristis*
California gull	*Larus californicus*

American crow	*Corvus brachyrynchos*
California towhee	*Pipilo crissalis*
Spotted towhee	*Pipilo maculatus*
Black-tailed deer	*Odocoileus hemionus*
Bobcat	*Lynx rufus*

Table 2, continued

Common Name	Scientific Name
California vole	*Microtus californicus*
Deer mouse	*Peromyscus maniculatus*
brush rabbit	*Sylvilagus bachmani*
raccoon	*Procyon lotor*

Appendix A. Qualifications

Kerri Davis, Associate

Kerri Davis joined TRA in 2003. Prior to TRA, Ms. Davis worked at the U.S. Fish and Wildlife Service, Carlsbad Ecological Services Office in Southern California where she was a Fish and Wildlife Biologist. She worked on various endangered species issues including ESA Section 7 and 10 Consultations, CEQA and NEPA review.

Ms. Davis brings to TRA more than 7 years of field biology and analysis related to endangered species in California and throughout the United States. Ms. Davis's expertise is in Wildlife Conservation, Endangered Species Management, Watershed Science, Geographic Information Systems (GIS) Analysis, Ecosystem Management and Wildlife-Habitat relationships. Ms. Davis has a strong background in research methods and survey protocols with various Federal agencies. She has worked with the National Park Service in Everglades National Park and Cape Cod National Seashore, with the U.S. Fish and Wildlife Service in Maine, Massachusetts and California, and with the U.S. Forest Service in Sequoia and Kings Canyon National Parks.

Most recently, her work as a Fish and Wildlife Biologist in southern California provided skills working on Endangered Species Act (ESA) consultations with multiple agencies and stakeholders. She has written Biological Opinions for multiple Habitat Conservation Plans (HCP), CEQA documents, Natural Communities Conservation Plans (NCCP), Watershed Management Plans, residential and commercial construction projects, landfills, transportation (CalTrans) projects, utilities, and municipalities.

In addition to her work with endangered species, Ms. Davis has worked proficiently with GIS ArcView, ArcGIS as well as extensive computer modeling. While a graduate research assistant at the University of Massachusetts Amherst, Ms. Davis was a GIS Project Manager for various projects with the Office of Geographical Information and Analysis (OGIA) where she co-headed a team to develop analytical models to predict future growth trends for two counties in the states of Washington and South Carolina for the American Farmland Trust organization. Another project was the Connecticut River Economic Development Administration Project where data were collected and analyzed to identify economic development potential and associated environmental concerns in target communities along the Connecticut River. Ms. Davis takes pride in devising solutions for complex ecological conflicts, achieving both conservation and land use goals.

Educational Background
M.S. Wildlife and Fisheries Conservation with a Professional Degree in Watershed Science and Management, University of Massachusetts Amherst, 2002.
B.S. Wildlife and Fisheries Biology, University of Massachusetts Amherst, 1996.

Professional Affiliations
Member of The Wildlife Society since 1990.

Patrick Kobernus - Associate

Mr. Kobernus has a Master's degree in Ecology from California State University, Hayward, and has been an Associate with Thomas Reid Associates (TRA) since 1995. He is familiar with the status and range of many state and federally protected wildlife species, and with biological data sources such as the California Natural Diversity Database (CNDDB).

Mr. Kobernus has conducted biological assessments and surveys for the Mission blue butterfly, Callippe silverspot butterfly, San Bruno elfin butterfly, Smith's blue butterfly, monarch butterfly, steelhead, California tiger salamander, California red-legged frog, burrowing owl, and serpentine grassland species.

As a staff biologist for TRA, Mr. Kobernus has conducted endangered species surveys and biological impact assessments for several clients in the San Francisco Bay Area. He has conducted biological surveys in San Mateo, Alameda, Contra Costa, Marin, Santa Cruz, Monterey, and Santa Clara Counties. He has particular expertise conducting biological assessments for projects located on the San Mateo County coast within the County's Local Coastal Program area. He has worked on projects for San Mateo County Parks and Recreation, Santa Clara Valley Water District, Kaufman and Broad, Cal-Trans, Canada Woods East project in Carmel, Stone Valley Oaks project in Alamo, as well as several others. Mr. Kobernus often works closely with developers, public utilities, government agencies, and individual homeowners in modifying projects to avoid or minimize biological impacts to sensitive species and the environment.

As a project manager for TRA, Mr. Kobernus manages the implementation of the San Bruno Mountain Habitat Conservation Plan. He supervises field crews on the mountain conducting endangered species monitoring for the endangered Mission blue, Callippe silverspot, and San Bruno elfin butterflies. He also oversees the habitat management and grassland restoration program and has assisted in developing volunteer stewardship with the Friends of San Bruno Mountain.

Mr. Kobernus has a diverse biological background with a focus in stream ecology. As a graduate student at California State University, Hayward, he conducted his Master's degree research on assessing steelhead trout presence and habitat in San Lorenzo Creek. He also assisted with a study on heavy metal accumulation within urban creeks, (Vegetated Channels Study, 1992), and performed a study testing the toxicity of storm water on macroinvertebrates and fish (DUST Marsh toxicity study, 1993) for Alameda County Water Resources Department. As a wildlife biologist for Gualala Redwoods in 1996 (Gualala, CA), he conducted surveys for northern spotted owls and conducted independent research on carnivores which use riparian habitat. Mr. Kobernus developed and directed a program that provided hands-on experience to children and teens in stream ecology from 1996-1997 (San Lorenzo Creek Wildlife Hikes). Mr. Kobernus currently leads hikes for volunteer and school groups on San Bruno Mountain.

Educational Background
M.S. Ecology, California State University, Hayward, CA
B.A. English, Sonoma State University, Rohnert Park, CA

Taylor Peterson

Ms. Peterson is a TRA Senior Associate and Project Manager. Since joining the firm in 1980, Ms. Peterson has applied her technical expertise and management skills in assessing the impacts of a wide range of projects including sanitary landfills, materials recovery and transfer stations,

quarries, housing developments, wastewater treatment, plant expansion, water well development, and high-voltage transmission line alignments.

Ms. Peterson was Case Manager for numerous projects including the initial study for the Arastradero Preserve Trails Management Plan, the Mitigation Plan for Burrowing Owl for the Alza Corporation Charleston Road Project, the Guadalupe Landfill Supplemental EIR, the Lands of Platt subdivision Initial Study, and the Valensin Ranch biological constraints analysis. Ms. Peterson also managed the Pacheco Pass Landfill Initial Study, the Pescadero Water Supply Alternatives Environmental Assessment, Tamarack Estates EIR (San Carlos), Owens-Corning Disposal Site Expansion General Plan Amendment EIR and subsequent Project EIR (San Jose), Sunnyvale Waste-to-Energy Plant Feasibility Study, the EIR for the Sunnyvale Materials Recovery and Transfer Station, and the Guadalupe Disposal Site Expansion EIR (San Jose).

In her capacity as Case Manager, Ms. Peterson directs TRA staff in the technical analysis and preparation of environmental documents, prepares her own technical sections, and maintains contact with the client, project engineers, and the lead agency. As such, she is familiar with every aspect of the preparation of environmental documents that must comply with CEQA. Several of the projects which she has managed have been controversial in nature, and she has extensive experience in responding to public concerns and comment.

Ms. Peterson has a background in biology and has been a long-time observer of California's natural history. She has conducted numerous biological surveys to assess the potential impacts of landfill projects, golf course development, hotel resort development, quarrying, and housing development. She is experienced in identification of plant and animal species, in mapping plant communities, in mark/release/recapture work with butterflies, and in survey methods for the endangered San Joaquin kit fox. She is familiar with special habitats such as vernal pools, serpentine grassland, and riparian zones, and she is a practitioner of the US Army Corps of Engineers Method used to delineate wetlands. She has had much practice in the use of biological data sources such as the California Natural Diversity Database, the California Native Plant Society, agency and local contacts, and numerous field guides and floras.

Ms. Peterson was a contributing author of the Habitat Conservation Plan for San Bruno Mountain, in which she applied the principles of the Plan in order to develop the specific activities required for each administrative parcel on the mountain. She was also a principal author of the Kirby Canyon Landfill Bay Checkerspot Butterfly Conservation Plan, and now oversees the implementation of the revegetation program outlined in the plan. This work will eventually result in a long-term program that the landfill operator can implement to restore serpentine grassland habitat in finished landfill areas.

Educational Background
A.B. Human Biology, Stanford University, Stanford, CA

Figure 1. Project Location

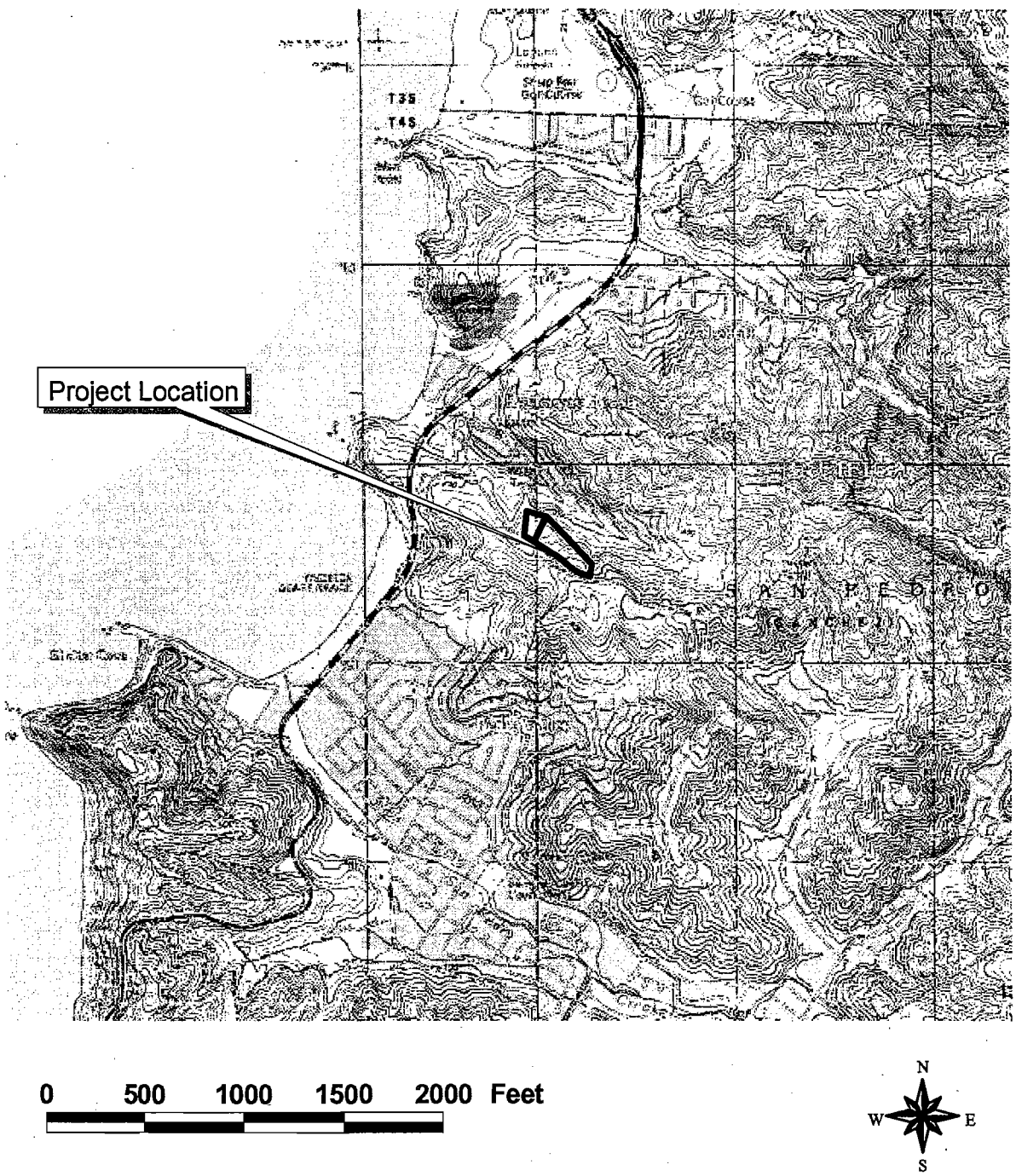

Figure 2. Aerial photo of Fassler Avenue Property, Pacifica, California.

Willow Scrub Habitat
Individual WoodRat Nest Locations
Dusky Footed Woodrat Nest Complex
Lee Property Parcels

0 50 100 150 200 Feet

N
W E
S

B2: Natural Habitat Restoration Proposal, Go Native (10-6-2004)

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GO NATIVE

* Ecological Restoration
* Wildland Weed Management
* Native Plant Nursery
* Erosion Control

LIC# 812740

NATURAL HABITAT RESTORATION PROPOSAL
for the
Fassler Avenue Property
Pacifica, California
APN 022-083-020 & 030

OCT 29

Prepared for:
Rick Lee
Pacifica Quarry Homes
1201 Danmann Avenue
Pacifica, CA 94944

Prepared by:
Go Native Nursery
PO Box 370103
Montara CA 94037
650 996 8996

October 6, 2004

PROPERTY DESCRIPTION

The property consists of 2 parcels totaling approximately 11.16 acres along the north side of Fassler Avenue in Pacifica, approximately 0.3 miles east of Highway 1. As described in the development application, the proposed housing and associated development will be clustered on the western 2.4 acre disturbed former quarry area, with the remainder to be maintained as natural open space and trails – refer to June 4, 2004 Development Application and associated materials including June 3, 2004 Biological Assessment Report from Thomas Reid Associates, and maps 1 and 2 of this document. This proposal is for the remaining 8.76 acre restoration area.

The restoration area (map 2) consists of a 1050 ft long ridge rising along the length the property in a easterly direction, parallel to Fassler Avenue. The remnants of the old alignment of the road runs along the top of this ridge.

The north side of the ridge, approximately 4.1 acres, slopes sharply down towards the unnamed drainage described in the Biological Assessment Report, and supports a very healthy, mature coastal scrub plant community, including a significant stand of toyon (*Heteromeles arbutifolia*) and a number of wood-rat nests. Along its length, several drainage channels from the old roadbed drain onto this slope.

The south side of the ridge, approximately 1.78 acres, is an area of cut and fill from the new alignment of Fassler Avenue, and consists of non-native and native grasses, weeds, and native scrub plants.

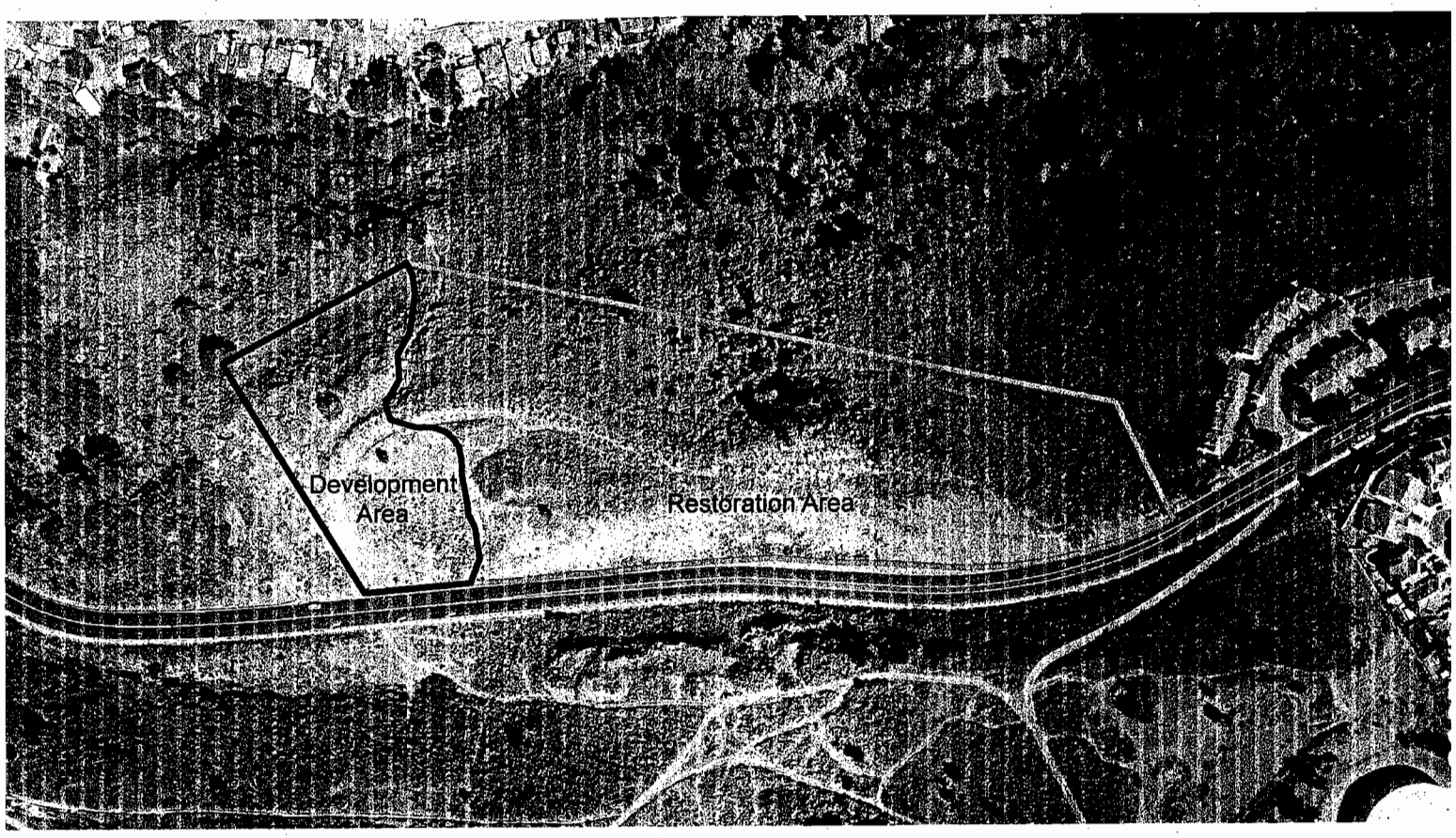
The top of the ridge, approximately 2.68 acres, is most significantly impacted by the remnant of the old road alignment that runs along its length. The area has large colonies of invasive non-native plants, most noticeably jubata (commonly called Pampas) grass (*Cortaderia jubata*), poison hemlock (*Conium maculatum*), wild teasel (*Dipsacus fullonum*) and fennel (*Foeniculum vulgare*). At the west end of this area, a significant drainage runs down towards the area of proposed development, supporting a large stand of willow riparian vegetation.

The remaining 0.2 acres constitute the old quarry face and bench cuts that lead down to the area of proposed development.

Site inspections were conducted during September and October of 2004. This report addresses 5 key issues:

- Removal of Invasive Plant Species
- Reclamation of the Old Roadway Area
- Erosion Control and Soil Stabilization
- Restoration of Appropriate Coastal Native Habitat
- Interface of Preservation Areas with Proposed Development

Although listed as discrete areas of work, these areas are inter-related to the restoration of the area. Successful implementation of this plan requires that all recommended actions be followed and completed as described.



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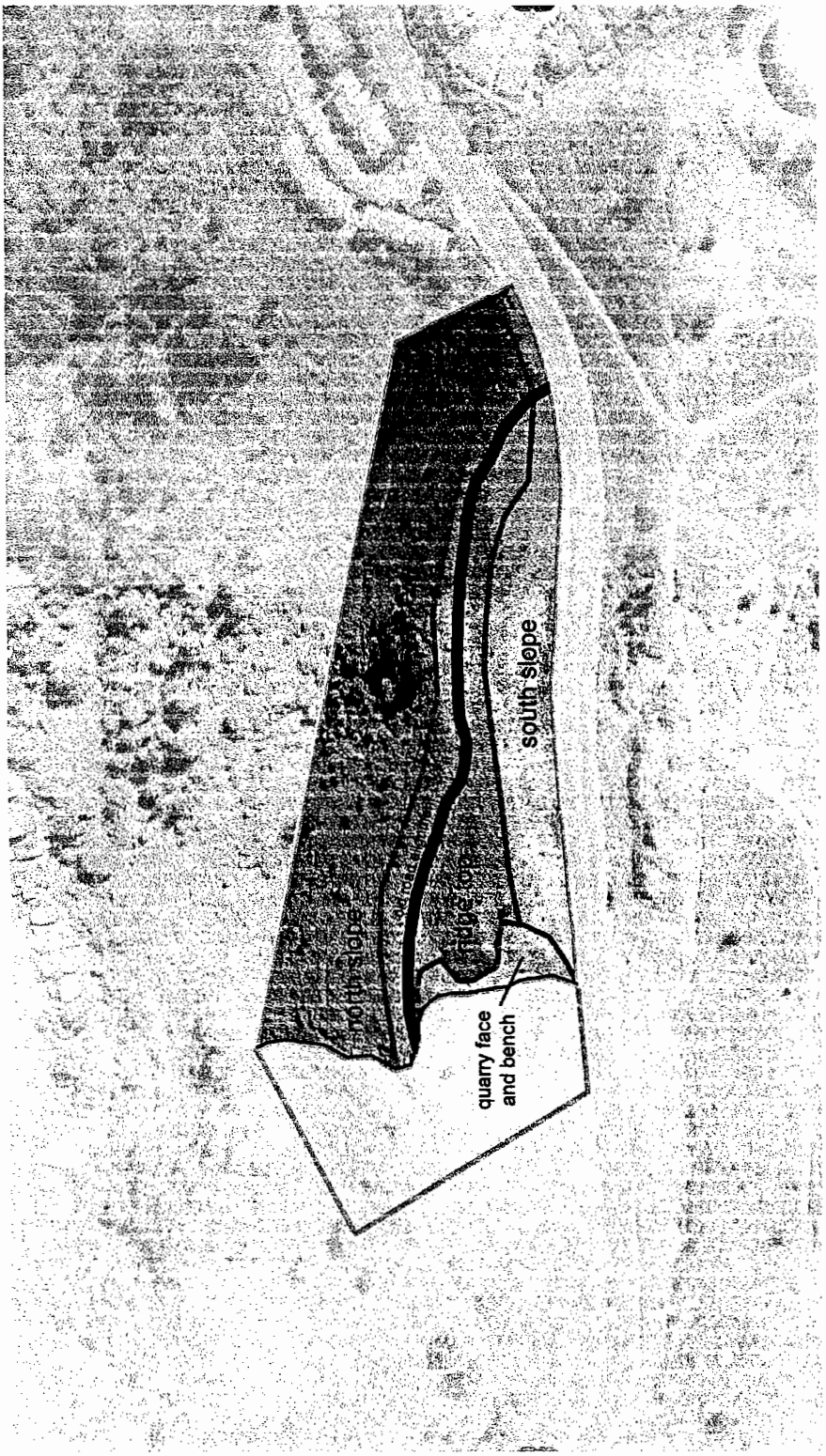
Fassler Avenue Restoration Project
Map 1 - Development and Restoration Areas

All boundaries approximate
not a survey document



All boundaries approximate
not a survey document

Fassler Avenue Restoration Project
Map 2 - Restoration Area Sections

1. Removal of Invasive Plant Species

pampas grass along old road alignment

Refer to Map 3. Heavy infestations of jubata grass (*Cortaderia jubata*), poison hemlock and fennel (*Foeniculum vulgare*) are concentrated along the old road way in the ridgetop section. Thick stands of wild teasel (*Dipsacus fullonum*) have formed on ridgetop area away from the road, and along the quarry face and bench. Stands of French broom (*Genista monspessulana*), bristly ox-tongue (*Picris echioides*), mustard (*Brassica rapa*), bull thistle (*Cirsium vulgare*), cotoneaster (*Cotoneaster sp.*) and cape ivy (*Senecio mikanioides*) are also prevalent throughout the ridgetop, along with other invasives listed in the Biological Assessment Report.

The north slope area, as noted, maintains a healthy native plant population, with spot infestations of jubata grass and French broom. The south slope area, aside from the non-native grasses, is relatively free of invasives aside from an occasional jubata grass or cotoneaster. Invasive removal in these areas would consist of hand removal of scattered individual plants using the techniques described below.

Jubata grass that is in the midst of or immediately adjacent to existing native vegetation should be removed by hand tools . Plants should be dug out with the root ball, and overturned into the area of exposed earth. Plants in large stands may be treated with a 2% solution of glyphosate with a non-ionic surfactant (RoundUp© or equivalent), which should be applied in late summer just before the plants begin developing their flower stalks. Any removed mature flower stalks of the plant should be bagged and transported to a proper landfill disposal site.

teasel infestation on quarry bench

Teasel stands should be chopped down and any seed heads bagged and transported to a proper disposal landfill. The young plants should be treated when they first sprout with a 1% solution of glyphosate with a non-ionic surfactant (RoundUp© or equivalent) in the early fall and again in the spring.

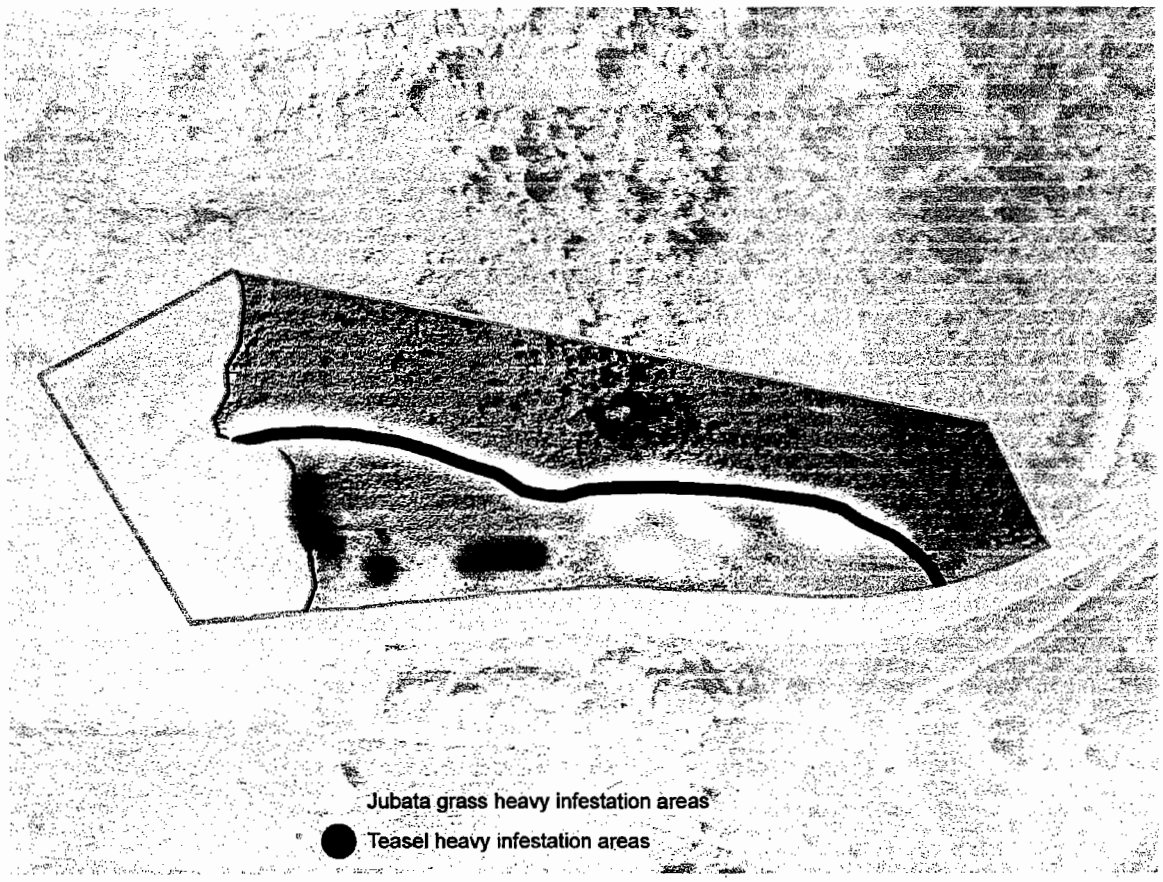
French broom and fennel should be removed by hand tools, being sure to completely remove the tap roots and bulbs. These plants should be removed by late spring before seeds begin to set. Poison hemlock, thistles, bristly ox-tongue, and mustard should be treated with a 2% solution of glyphosate with a non-ionic surfactant (RoundUp© or equivalent) in the spring before the plants begin to flower.

Infestations of Cape Ivy should be treated over a two year period with a mixture of foliar-sprayed 0.5% glyphosate (RoundUp© or equivalent) and 0.5% triclopyr (Garlon 4© or equivalent) + 0.1% silicone surfactant (as Silwit© or equivalent) in water, applied as a foliar spray at 6.4 liters/ha. Applications must be done in late spring when the plant is photosynthesizing actively but is past flowering. Any removed pieces of the plant should be bagged and transported to a proper landfill disposal site.

Cotoneaster plants should be cut down to the ground and exposed stump wood immediately painted with a full strength solution of glyphosate with a non-ionic surfactant (RoundUp© or equivalent) in the early fall after the plant has formed it's seeds. Any removed pieces of the plant with mature seed should be bagged and transported to a proper landfill disposal site.

All areas should be monitored for new plants and re-sprouts, and further removal as needed should be continued for a period of at least three years.

All areas of exposed earth should be re-seeded with an appropriate seed mix (see part 4) and covered with either straw or erosion control material (see part 3)



N

Fassler Avenue Restoration Project
Map 3 - Non-native Infestation Areas

All boundaries approximate
not a survey document

2. Reclamation of the Old Roadway Area

After removal of the invasive plant species (Part 1) is accomplished, the old roadway area should be surveyed to determine its area and condition. From site inspections done for this report, it was estimated that the roadway runs for 1200 linear feet through the restoration area, with a width of 25 feet, resulting in at least 30,000 sq ft of old asphalt to be removed. **Because of the impervious surface of the old asphalt, it is not recommended that any existing section of this roadway pavement be used for planned trails.**

native and non-native vegetation growing on and through the old roadbed

The existing roadbed is cracked and broken throughout, allowing both invasive and native vegetation to grow through the pavement surface. In areas toward the east end, sediment flow has deposited a thin layer of soil on the surface, enough to allow some significant vegetation to grow.

Removal of the invasive species should clear enough of the roadway to assess the health and condition of native vegetation growing through the cracked asphalt. An experienced native plant specialist should make the determination whether specific individual specimens could be saved by careful removal of the old asphalt surrounding them.

Removal of the roadbed should be accomplished by appropriate machinery and transported to the west end of the parcel for staging, to either be recycled for construction fill or removed to an appropriate disposal landfill. Soil beneath the roadbed layer should be scrapped off an additional 6 inches to remove any oil contaminated soils.

Top soil from any excavation of natural, non-infested areas on the site should be stockpiled and used to refill the excavation area of the old roadbed. An experienced expert should make the determination that top soil is free of invasive plants and seeds before use in this application. Commercial topsoil, free of any weed seed, should be used for the balance of the fill for the road excavation. **None of the recycled diggings from the roadbed excavation should be used to refill the excavation, except as base for planned trails that would remain free of vegetation.**

old roadbed showing through jubata grass and native vegetation

Excavation work should be scheduled for no later than late summer, so that excavated areas can be covered and stabilized for the winter season, as described in Part 3.

3. Erosion Control and Soil Stabilization

Cleared and excavated areas

After removal of the invasive species (Part 1) and excavation of the old roadbed (Part 2), it is expected there will be approximately 45,000 sq ft of exposed earth. If the soil is to be exposed for more than 1 week during the dry season, it should be temporarily covered with rice straw or light-weight straw mat erosion control material to prevent any infestation from non-native seeds.

If the soil is to remain exposed during the winter rain season (Oct 15 – April 15), the areas should be seeded with Regreen© (triticum x agropyron – a fast growing, sterile wheat grass hybrid) and covered with medium-heavy-weight erosion control (EC) material.

Other areas of concern

A number of drainage channels had been established to drain water runoff from the old roadbed onto the north slope. These channels should be cleared to the point of native vegetation, seeded as above, and covered with EC material. Drainage from the excavated and cleared roadway area should be directed towards these channels, and appropriate runoff control and absorption devices (retention basins, drainfields, baffles from straw wattles or bales) installed to prevent any erosion and sedimentation to the existing undisturbed north slope area.

The bank of the quarry face and bench area should be re-graded and filled to cut back to at least a 1.5:1 slope, 2:1 preferred. Base fill soil should be compacted to stabilized hillside standards, and 8" of semi-compacted topsoil should be added. The finished new grade should be then treated as the **cleared and excavated areas** described above: If the soil is to be exposed for more than 1 week during the dry season, it should be temporarily covered with rice straw or light-weight straw mat EC material to prevent any infestation from non-native seeds. If the soil is to remain exposed during the winter rain season (Oct 15 – April 15), the areas should be seeded with Regreen© and covered with medium-heavy-weight EC material.

The central drainage that comes off the slope towards the development area should be protected in a manner similar to the road drainage channels – any newly cleared or excavated area that would flow runoff into this drainage should be seeded as above, and covered with EC material. Appropriate runoff control and absorption devices (retention basins, drainfields, baffles from straw wattles or bales) should be installed to prevent any erosion and sedimentation to the existing undisturbed areas in and adjacent to this drainage.

ridge drainage system

4. Restoration of Appropriate Coastal Native Habitat

As noted in the Biological Resources Report, the vegetation community on the property is primarily Coastal Scrub, with components of Perennial Grassland (Coastal Prairie) and Willow Scrub. The bulk of the restoration effort will be along the area of the excavated roadway, which is almost all coastal scrub, but significant work will be needed in the grassland areas. No work is contemplated for the willow scrub area unless the development plan changes and adversly affects it. The following applies to all restoration work on the site:

- A qualified native plant specialist should conduct surveys to delineate the different plant communities and determine the percentages of the different species within the communities. This data and the plant list in the Biological Assessment Report will be used to determine an appropriate mix of rooted nursery stock plants to install and supplementary seed mixes to be prepared. The re-graded slope of the quarry face should be restored as coastal scrub.

- Seed collection should be accomplished the summer before the work starts. Seed should be site-specific: collected on-site or within a 5 mile radius of the project site.

- Plants used at the site should be site-specific: grown from material collected on-site or within a 5 mile radius of the project site.

- All remaining debris and trash should be removed from the site.

- Appropriate irrigation (drip or sprinkler) will be supplied for a period of time encompassing the first two rainy seasons after the restoration or however longer needed to establish the new growth.

- All areas will be monitored and maintained for 5 years after initial planting. Maintenance will include weeding of non-native species, replacement of failed plantings, further seed collection as needed, and continued irrigation as needed.

The following procedures detail the restoration procedure for each of the communities.

Coastal Scrub

- Cleared and prepared areas should be lightly tilled and seeded with the appropriate seed mix.

- Planting should be of 1 gallon specimens or equivalent, at a ratio of species as prescribed by the required surveys. Planting density should be no less than 1 plant every 1 foot for the accumulative planting of shrubs, woody species, grasses, forbs and annuals.

coastal scrub community on north slope of property

- All planted and seeded areas will be mulched with rice straw to a loft thickness of no less than 4 inches.

- Appropriate irrigation (drip or sprinkler) will be supplied for a period of time encompassing the first two rainy seasons after the restoration or however longer needed to establish the new growth.

Perennial Grassland (Coastal Prairie)

grassland area on ridetop

- Cleared and prepared areas should be lightly tilled and seeded with the appropriate seed mix.

- In the fall of the work season, all other areas designated grassland should be lightly raked and supplemented with an appropriate mix of native seeds.

- Planting should be of 1 gallon specimens or equivalent, at a ratio of species as prescribed by the required surveys. Planting density should be no less than 1 plant every 1 foot for the accumulative planting of grasses, shrubs, woody species, forbs and annuals.

- All planted and seeded areas will be mulched with rice straw to a loft thickness of no less than 4 inches.

- Appropriate irrigation (drip or sprinkler) will be supplied for a period of time encompassing the first two rainy seasons after the restoration or however longer needed to establish the new growth.

Assuming from the scope of work described in Parts 1 –3, there will be approximately 50-60,000 sq ft of exposed area to be restored. For purposes of rough estimation, this will require 50-60,00 plants at a species ratio to be determined, and approximately 5 –6 lbs of collected seeds.

5. Interface of Preservation Areas with Proposed Development

Landscaping for the development should be (as described in the Development Permit Application) based on native plant species. Care should be taken that no introduced, non-native garden or landscaping plants be allowed to establish near or in the restoration areas. Garden plants, yard plants, and landscaping material should be restricted to those species and varieties that do not pose any threat to the recovering natural areas. This does not limit the selection to only native plants, but rather restricts any aggressively spreading cultivated species from being introduced onto the site. This restriction should be made a term of occupancy for the development.

B3: Tree Design, Christopher Campbell (2-16-06)

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Christopher Campbell
Tree Design
45 Encline Court
San Francisco, CA 94127

Certified Arborist #WE-6488A
California Contractors License #707545
Member of Bay Area Arborist Cooperative, Inc.

Phone/Fax: (415) 239-6100 Cell. Phone: (415) 902-8826 E-Mail: tree_design@hotmail.com

RECEIVED
FEB 1 6 2006
CITY OF PACIFICA

Client: The Prospects
P.O. Box 260
Pacifica, Ca 94044
C/O: Rick Lee

RE: Two (2) Cupressus macrocarpa (Monterey Cypress)

Location: 801 Fassler Avenue Pacifica, Ca 94044

Assignment

1. Report intent of client for scope of project regarding trees.
2. Report facts regarding site and trees in question.

Intent of Client:
The intent of my client, and their project as I understand it, is to develop a two acre portion of an eleven acre site. By using green building methods, such as solar heating, hot water and electricity, homes can be created that produce more energy than they use. Low impact development uses site-design principles, latest technology and materials to best manage storm water. This could lower the demand on the cities storm system.

Site and Existing trees:
The location of the two Monterey Cypress trees can be viewed on the aerial site map of this report on page 4. The two trees have grown very close together and essentially form one canopy. The approximate height is 30'- 38' tall with a 30'+ spread. If looking at the trees while facing west, the tree on the right has a trunk circumference of 67" inches at 24" inches off the ground. The tree to the left measured in the same way has a circumference between 53" inches and 56" inches. The trees appear to be healthy other than minor storm damage and lack of structural pruning.

The site was reported to be an old rock quarry that was mined, heavily graded and back-filled. The client engaged a biologist to identify existing plant and animal life on site, both native and non-native. Responsively, they intend to remove the non-native species of plants (Pampas grass, etc.) and re-introduce native vegetation to restore the natural habitat as recommended by biologist. The green shaded area of the site map on page 4 represents the area the client is proposing to plant at least 200 new trees. The new trees would be a combination of Coastal redwoods, Douglas Firs, Incense Cedars and Monterey Cypress trees. The new trees would act as a buffer between the property and Fassler Avenue. The trees would also help with erosion and help retain the slope in this area that has been heavily graded in the past. The new trees would also be an aesthetic improvement to passer bys and an investment in the future landscape.

Keeping the design elements in mind, the two Cypress trees need to be removed because they are located where the development makes the most sense. By locating the homes on the lower portion of the property they can leave the upper ridge portion of the property undeveloped. My clients showed interest in exploring tree transplanting so I recommended contacting Tree Movers to consult if the trees are movable. Tree Movers states these trees would not be good candidates for transplanting.

This project makes me hopeful that more bay area cities will begin seeing the value in green building design. Not just in the construction of the homes we build, but in having the forethought to do major plantings of trees for the generations to come. Because of this type of planning in the late in the 1800's and early 1900's, we can now enjoy places like San Francisco's Golden Gate Park, The Presidio and many other neighborhoods and open spaces around the Bay Area. Let us leave new forests and green areas to be managed for future generations.

Two (2) Monterey cypress trees forming one canopy at 801 Fassler Avenue in Pacifica.

AERIAL VIEW OF SITE

PACIFICA QUARRY HOMES
By LegacyQuest, Inc.

DATE: 7-22-2004

NO. SCALE

APPENDIX C
CULTURAL RESOURCES MATERIALS

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C1: California Historical Resources Information System, Northwest Information Center, June 13, 2006

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CALIFORNIA
HISTORICAL
RESOURCES
INFORMATION
SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLARA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
1303 Maurice Avenue
Rohnert Park, California 94928-3609
Tel: 707.664.0880 • Fax: 707.664.0890
E-mail: leigh.jordan@sonoma.edu

June 13, 2006

NWIC File No.: 05-1155

Erin Efner
Christopher A. Joseph & Associates
610 16th Street, Suite 514
Oakland, CA 94612

Re: Record search results for the proposed Residential Project at 801 Fassler Avenue, Pacifica, San Mateo County, CA.

Dear Ms. Efner:

Per your request received by our office on May 26, 2006, a records search was conducted for the above referenced project by reviewing pertinent Northwest Information Center (NWIC) data maps, historic-period maps, and literature for San Mateo County on file at this office. Review of this information indicates that the proposed project area contains no recorded Native American or historic-period archaeological resources. This office has no record of any archaeological studies of the project area. State and federal inventories list no historic properties within the proposed project area.

At the time of Euroamerican contact the Native Americans that lived in the area were speakers of the Ramaytush language, part of the Costanoan language family (Levy 1978:485). There are no Native American resources in or adjacent to the proposed project area referenced in the ethnographic literature.

Based on an evaluation of the environmental setting and features associated with known sites, Native American cultural resources in this part of San Mateo County have been found on ridges, midslope terraces and adjacent to seasonal and perennial watercourses. The Residential Project at 801 Fassler Avenue contains terraces adjacent to a ridgeline. Given the similarity of these environmental factors, there is a moderate likelihood that unrecorded Native American cultural resources exist in the proposed Residential Project at 801 Fassler Avenue.

Review of historical literature and maps indicated one historic-period archaeological resources immediately adjacent to the the project area. The 1956 Montara Mountain 7.5' quad indicated a Quarry on Fassler Avenue. With this in mind, there is a moderate to high possibility possibility of identifying historic-period archaeological resources.

RECOMMENDATIONS:

1) There is a moderate possibility of identifying Native American sites and a moderate to high possibility of identifying historic-period archaeological resources in the project area. We recommend a qualified archaeologist conduct further archival and field study to identify cultural resources. Field study may include, but is not limited to, pedestrian survey, auguring, monitoring construction activities as well as other common methods used to identify the presence of archaeological resources.

2) Review for possible historic structures has included only those sources listed in the attached bibliography and should not be considered comprehensive. The Office of Historic Preservation has determined that buildings, structures, and objects 45 years or older may be of historical value. ***If the area of potential effect contains such properties not noted in our research, it is recommended that they be assessed by an architectural historian before commencement of project activities.***

3) If cultural resources are encountered **during the project,** avoid altering the materials and their context until a cultural resource consultant has evaluated the situation. Project personnel should not collect cultural resources. Prehistoric resources include chert or obsidian flakes, projectile points, mortars, and pestles; and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic-period resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits or bottle dumps, often located in old wells or privies.

4) It is recommended that any identified cultural resources be recorded on DPR 523 historic resource recordation forms, available online from the Office of Historic Preservation's website: http://ohp.parks.ca.gov/default.asp?page_id=1069.

Thank you for using our services. Please contact this office if you have any questions, (707) 664-0880.

Sincerely,

Jillian E. Guldenbrein

Jillian E. Guldenbrein
Researcher I

C2: Native American Heritage Commission, Sacred Lands File Records Check letter, October 3, 2006

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STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390
Web Site www.nahc.ca.gov

October 3, 2006

Erin Efner
Christopher A. Joseph Associates

Sent by Fax: 510-452-5202
Number of Pages: 2

RE: Proposed Prospects Residential project, San Mateo County

Dear Ms. Efner:

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

Sincerely,

for: Debbie Pilas-Treadway
Environmental Specialist III

Native American Contacts
San Mateo County
October 3, 2006

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(209) 892-2435 - Fax
Ohlone/Costanoan

Muwekma Ohlone Indian Tribe of the SF Bay Area
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408-434-1673
Ohlone / Costanoan

Amah/Mutsun Tribal Band
Michelle Zimmer, Cultural Resource Coordinator
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Ohlone/Costanoan

The Ohlone Indian Tribe
Andrew Galvan
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(510) 882-0527 - Cell
(510) 687-9393 - Fax
Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Amah/MutsunTribal Band
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(650) 851-7489 - Fax
Ohlone/Costanoan

Trina Marine Ruano Family
Ramona Garibay, Representative
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Lathrop , CA 95330
510-300-5971 - cell
Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister , CA 95024
Ohlone/Costanoan

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Prospects Residential project, San Mateo County.

APPENDIX D
GEOTECHNICAL REPORT

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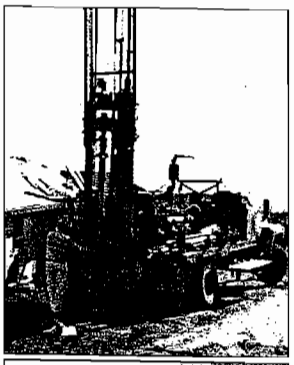

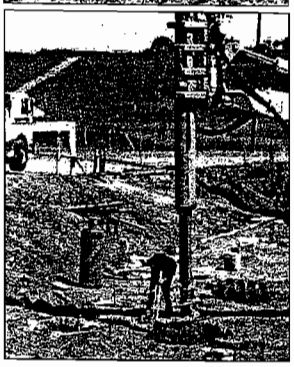

REPORT

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
FASSLER AVENUE
PACIFICA, CALIFORNIA

For Home Trade Construction

April 21, 2005

BAGG

BAY AREA GEOTECHNICAL GROUP

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BAY AREA GEOTECHNICAL GROUP
950 Industrial Avenue • Palo Alto California 94303-4911
(650)852-9133 • fax (650)852-9138 • bagg@bayareageotechnical.com

April 21, 2005
BAGG Job No. PACIQ-01-00

Home Pride Construction Inc.
1201 Danmann Avenue
Pacifica, California

Attention: Mr. Rick Lee

Geotechnical Engineering Investigation
Proposed Residential Development,
APN 022-083-20 and 30 (11 Acres)
Fassler Avenue
Pacifica, California

Dear Mr. Lee,

Transmitted herewith is our geotechnical investigation report for the proposed residential development at APN 022-083-20 and 30, Fassler Avenue in Pacifica, California. The report includes the results of our subsurface exploration program and laboratory testing and presents our recommendations for site grading, retaining wall construction, building foundations, utility trench backfilling, and on-site pavements.

We thank you for the opportunity to perform these services. Should you have any questions or comments please contact our office.

Very truly yours,

BAY AREA GEOTECHNICAL GROUP

Ajay Singh
Senior Engineer

Jason Van Zwol
Chief Engineer

AS/JVZ/rjb
Distribution: 6 copies addressee

REPORT

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
APN 022-083-20 AND 30 (11 ACRES)
FASSLER AVENUE, PACIFICA, CALIFORNIA
For Home Pride Construction

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ASFE document titled "Important Information About Your Geotechnical Engineering Report"

BAY AREA GEOTECHNICAL GROUP
950 Industrial Avenue • Palo Alto California 94303-4911
(650)852-9133 • fax (650)852-9138 • bagg@bayareageotechnical.com

REPORT

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
APN 022-083-20 AND 30 (11 ACRES)
PACIFICA, CALIFORNIA
For Home Pride Construction

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation performed for the proposed residential development at APN 022-083-20 and 30 (11 acres) in Pacifica, California. The attached Plate 1, Vicinity Map, shows the general location of the site. Plate 2, Site Plan, shows the site topography and the approximate locations of our exploratory borings drilled and test pits excavated for this investigation. These services were performed in accordance with the scope of services outlined in our Proposal No. 05-121, dated February 15, 2005.

2.0 PROJECT DESCRIPTION

The proposed residential development will include construction of 34 new homes in the western portion of the subject 11-acre hilly site. Seventeen of these homes (Units 13 through 29) will be constructed on the top of an underground parking garage, the remaining 17 homes will be constructed in the areas around the underground parking garage. Each of the proposed homes will have a 700 square foot building footprint. The homes proposed to be constructed above the underground parking garage will have a 400 square foot yard, whereas the homes around the parking garage will have a 1200 square foot yard area. A community room and picnic area will be constructed near the entrance and a small paved play area is planned for the area adjacent to the northern edge of the parking garage.

Preliminary plans indicate the lower floor elevation within the proposed parking structure will be at about 298 feet in the west and 295 feet in the eastern half. The parking level in the eastern half of the garage will be raised to elevation 303 feet, with the lower area in the eastern half of the garage used for service areas, ventilation ducts, and water tanks. The upper deck (or roof) of the garage structure, where 17 living units will be constructed, will also be split level, at elevation 308 feet in the west and 316 feet in the eastern half.

The floor elevations and grading details for the detached homes around the parking garage are not known at this time; however, it is anticipated that all existing fill will either be removed and/or reconstructed as engineered fill.

The entrance to the homes constructed on the parking garage deck slab will be via a main access road connecting the parking garage to Fassler Avenue. The access to the homes on the western side of the parking garage will be by a road connecting to the main access road, whereas access to the residential units to the east of the parking garage will be by another road parallel to the western road but at an uphill location. Additional development at the site will include construction of community gardens, a play area, and picnic area.

The proposed site development will involve relatively deep cuts to accommodate the parking garage and up to 13 foot high retaining walls. The actual cut and fill volumes were not available at the time this report was issued. The new residential structures around the parking garage will most likely be supported on a drilled, cast-in-place reinforced concrete pier and grade beam type foundation system. The parking garage structure will likely be constructed on a concrete structural mat slab.

3.0 PURPOSE

The purpose of this investigation was to obtain pertinent information regarding the geologic features and the soil conditions at the subject site in order to develop geotechnical recommendations for the design and construction of the proposed residential development. Based on our understanding of the project, this report presents our conclusions, opinions, and recommendations regarding:

- Site history, regional geology, and site geology including any landslides, undocumented fills, etc.,
- Specific soil conditions discovered by our borings (such as loose, expansive, creeping, or collapsible surface soils) that may require special mitigation or impose restrictions on the project, including the type, consistency, and suitability of any on-site soils,
- Evaluation of stability of existing slopes and proposed cut and fill slopes,
- Recommendations for site grading and pavement design of new roads and driveways.
- Retaining wall options and design recommendations,
- Recommendations for the most appropriate foundation type necessary to support the vertical and lateral loads associated with the proposed structures.
- Recommendations for utility trench backfilling,
- Estimates of post-construction settlement under the anticipated loads,
- Provisions for surface and subsurface drainage.

4.0 SCOPE OF SERVICES

The scope of our services consisted of the following specific tasks:

- Visit the site and mark the boring locations at least 72 hours in advance of the planned explorations and notify Underground Service Alert (USA) to mark the known utilities entering to the building and/or within the site.
- Review published geologic maps and reports pertinent to the site area regarding the seismic and geologic history of the site.
- Drill, log, and sample 5 exploratory borings and excavate up to 10 test pits to evaluate subsurface soil and groundwater conditions. The soil borings were drilled to depths of 24 to 29½ feet, as shown on Plates 12 through 16, with a track mounted rig equipped with hollow stem augers. The borings were drilled under the supervision of one of our engineers who directed the exploration and obtain samples of

the subsurface materials for visual classification and laboratory testing. The BAGG engineer also recorded the penetration resistance values and the type of sampler used for collection. He also measured the depth to groundwater in the boreholes, as encountered. At the completion of drilling activities, the boreholes were backfilled with neat cement.

- In addition to the soil borings, 9 test pits were excavated at the site at the locations shown on Plate 2, Site Plan. The subsurface soil conditions encountered at the test pit locations were logged by a certified engineering geologist and are shown on Plates 16 through 19. The test pits were loosely backfilled with the soil previously excavated from the pits.

- Perform a laboratory testing program on the collected soil samples to evaluate some of the index properties and engineering characteristics of the subsurface materials. Tests included direct shear strength, Plasticity Index, and moisture-density measurements.

- Perform engineering analyses based on the results of the tasks listed above and oriented towards the above-described purpose of the investigation.

- Prepare six copies of a report describing the geologic and seismic setting of the site, procedures and results of the subsurface exploration program, results of the laboratory testing program, subsurface soil and groundwater conditions, and geotechnical engineering recommendations for the proposed development.

5.0 SITE DESCRIPTION AND HISTORY

The subject site is located on the eastern side of Fassler Avenue near Roberts Road, in Pacifica, California. The subject 11-acre site has a hilly terrain with site elevations ranging from roughly 440 feet above mean sea level (MSL) in the southeastern portion to about 240 feet in the northwest corner. The western portion of the site will be developed for the proposed residential buildings. About 50 foot high ridge exists in approximately the middle portion of the property, roughly parallel to the Fassler Avenue.

The parcel and adjoining land is vacant and contains thickets of brush and shrubs of chaparral varieties. Access is at the southern edge of the site from Fassler Avenue. Remnants of an old road were noticed along the northern boundary of the site. It is our understanding that a quarry once

existed at the subject site. Comparison of a series of aerial photographs dating back to 1943 indicates that the site area was graded and filled as part of the lower staging or loading area for a local quarrying operation that was active about 50 years ago.

The property occupies part of a broad ridge that extends downward in a northwesterly direction toward the coast from residential development within the higher reaches of Fassler Avenue, which follows the ridge crest in this area. A short distance southeast of the site, Fassler Avenue is bounded by steep, high cuts that were originally excavated by the quarry operation. The lower portion of the quarry land in the site area was graded and terraced into its present topography as a result of excavations and fills from those operations. Fills form steep banks around the outer edges of the terrace. Various low mounds of fills and boulders exist across the center of the site, which has been used in the recent past for dumping of logs, stumps, wood and other debris.

Fassler Avenue originally climbed from Highway 1 and terminated in the lower portion of the quarry land at the site area. After the quarry was abandoned, the road was extended through the central area of the property to access the upland areas to the east. That old, paved road is now abandoned, but is still visible on site. The present alignment of Fassler Avenue now forms the south boundary of the site project and extends uphill through an old quarry cut toward residential developments to the east.

The following stereo-paired aerial photographs were reviewed at the U.S. Geological Survey in Menlo Park, California:

Photo Nos	**Date**	**Scale**
DDB-2B-197 and 198	10/11/43	1:20,000
DDB-1R-8 and 9	5/27/56	1:20,000
GS-VBZJ-1-6 and7	4/16/68	1:30,000
7-24 and 25	6/7/74	1:20,000

6.0 FIELD EXPLORATION AND LABORATORY TESTING

To address the geotechnical aspects of the subject project, we conducted a subsurface exploration program at the site which consisted of drilling 5 soil borings and excavating 9 test pits. The soil borings were generally placed within and around the proposed underground parking garage. The test pits were excavated in the areas around the parking garage. The total depths of the soil borings and the test pits are shown on the attached logs of soil borings and test pits. Bulk, Standard Penetration Test, and undisturbed samples of the subsurface materials were obtained at 3- to 5-foot-intervals from the borings as necessary for visual classification and laboratory testing. A laboratory testing program was then designed and conducted on the samples collected from the borings to evaluate some of the index and strength properties of the subsurface materials encountered in the soil borings.

The materials encountered in the borings, and the results of laboratory tests are shown on the boring logs included in this report as Plates 12 through16. The test pit logs are shown on Plates 17 through 19. The legends for the symbols used on the boring logs and other soil/rock terminology on the boring logs are shown on Plates 5 through 9.

Selected undisturbed samples were tested in direct shear to evaluate the strength characteristics of the foundation soils. Tests were performed at natural moisture contents and under various surcharge pressures. The moisture content and dry density of undisturbed samples were measured to aid in correlating their engineering properties. The results of our laboratory strength tests and moisture-density data are summarized on the boring logs.

7.0 GEOLOGIC SETTING

The proposed residential development is situated atop a northwest-trending ridge that extends into the ocean at a rocky point located about 2/3 of a mile west of the project, between Rockaway Beach and San Pedro Valley within the City of Pacifica in northwestern San Mateo County, California. The site is at an average elevation of about 300 at the top edge of the steep-sided northern wall of

an unnamed local valley that drains the project parcel area and upland regions to the northeast into the mouth of Clara Valley and the Pacific Ocean at Rockaway Beach.

This locality is within a system of steep-sided ridges that form the rugged northern terminus of the Santa Cruz Mountains. Geologic maps of the region (Pampeyan, 1994 and Brabb and Pampeyan, 1983) indicate the ridge of the site vicinity to be composed almost entirely of Franciscan Assemblage sheared rocks of the of Jurassic to Cretaceous age (150 million years). Outcrops and inclusions of sandstone, greenstone and limestone exist throughout the area. Residual soils, colluvium and slope wash materials that are derived from weathering and mass-wasting of the underlying bedrock, mantle much of the hillside areas below the site. A unit of manmade debris and poorly consolidated fill, primarily spoils from past quarrying operations in the vicinity, is within the site area. Some local landslide deposits exist within colluvium-filled ravines below the site. Plate 3, Site Geology Map, shows the locations of various geologic features mapped at the site and the locations of the geologic cross-sections are the geologic cross-sections are included herein as Plate 4.

Hillsides flanking the deeply incised valleys in the area are moderately dissected by erosion and display numerous well-developed drainages and more subtle linear swales that extend down the slopes. Landslides and debris flows originating in colluvium-filled swales and drainages are a recognized hazard in the Pacifica area. An exceptionally heavy storm in January, 1982 triggered hundreds of such slope failures in the steep terrain of Pacifica.

The structural grain of this region is influenced by the northwest-trending San Andreas fault, one of the major, active strike-slip faults of the world. The fault slices northwesterly through San Mateo County and crosses the northern edge of the City of Pacifica before going offshore in the vicinity of Mussel Rock. The northwest-trending Pilarcitos Fault, considered a pre-historic trace of the San Andreas, enters the ocean at San Pedro Valley on the southern edge of Pacifica. Several short fault segments have been mapped in Franciscan Assemblage rocks in the mountainous region between the San Andreas and Pilarcitos faults, but none have been mapped, or are known to exist, within the site area.

8.0 SEISMICITY

The site locality, on the northern San Francisco Peninsula, is within one of the more seismically active areas of the world. Numerous earthquakes, generated by any of a number of active faults in the region have been recorded during the short historical record of the area. Recent studies indicate that there is a 62 percent probability that one or more earthquakes of magnitude 6.7, or greater, will occur before the year 2032 on a fault segment in the San Francisco Bay region (Working Group, 2003).

The regional stress field of the San Andreas fault, a northwesterly-trending, major earthquake-producing feature located about 2.7 miles northeast of the site, extends inland from the Pacific Coast for a distance of about 60 miles and includes several active faults and branches thereof. The San Andreas fault generated the great San Francisco Earthquake of 1906, which caused considerable damage throughout the region. In 1957, a Magnitude 5.3 earthquake occurred on the fault near Pacifica, causing local landsliding and some structural damage.

The northern end of the San Gregorio fault zone, considered active in southern San Mateo County, lies in the ocean about 2.4 miles southwest of the site. The Pilarcitos fault, thought to be an ancestral trace of the San Andreas fault and possibly seismically active based on seismic evidence near its southern end (Brabb and Olson, 1986) is approximately one mile to the south. Several other faults in the region, including the Hayward and Calaveras faults, which have generated large earthquakes in historic time, are somewhat more distant, but have the potential for generating earthquakes that could impact the subject site.

Due to its historic activity and proximity to the site, the San Andreas fault is considered the primary seismic hazard from an earthquake-generating standpoint. Maps of shaking intensity that have been modeled for a magnitude 7.2 earthquake on the Peninsula - Golden Gate segment of the San Andreas fault have been made available by the Association of Bay Area Governments (ABAG, 2004). They indicate that the site area would likely experience "very strong to violent" shaking (Modified Mercalli Intensity VII to IX) during such an event.

The conclusions of the Working Group on California Earthquake Probabilities (2003) assign a 21 percent probability for one or more a major earthquakes (magnitude 6.7 or greater) on the peninsula segment of the San Andreas fault by 2032. The probability for a similar scenario on the San Gregorio fault is 10 percent. The major fault features of the San Francisco Bay area, in relation to the site, are illustrated on the attached Regional Fault Map, Plate 5.

9.0 SITE CONDITIONS

9.1 Subsurface Conditions

Plate 2, Site Plan shows the approximate locations of the soil borings and the test pits. The materials encountered during our subsurface exploration were generally consistent with the materials mapped on the referenced Geology Map.

Our site area reconnaissance and subsurface explorations have determined that benches graded for old roads, trails and cuts in the areas proposed for development in the northern area of the property have several feet of manmade fills that were constructed or cast over the outer, downslope side of the benches. The fills generally appear to be unengineered, poorly sorted, gravelly silts and clays derived from old quarry debris. Locally, some fills appear to be remnants of old quarry stockpiles. Others may represent berms that were placed at the edges of graded areas for runoff control. Exploration in the southern half of the development encountered some areas of relatively deep fills underlain by residual soils and bedrock, and other areas of near-surface bedrock in locations of apparent cuts or natural ground.

Bedrock is rarely exposed at the surface. However, our subsurface exploration indicates that the site is entirely underlain by bedrock of the Franciscan Assemblage. The rock appears to be a mix of sandstone, siltstone or shale and greenstone. In most cases the bedrock was deeply weathered and could be excavated or drilled relatively easily in at least the upper 10 or 15 feet. Other than man-made fills, surficial deposits on the site consist of residual soils developed in place by disintegration of the underlying rock, or colluvial materials deposited by surface runoff and erosion toward the base of slopes and in downslope swales around the north and west-facing perimeter of the property.

The soil borings indicate the presence of top soil over intensely weathered, soft, closely bedded, sandstone (bedrock). The depth of the bedrock varied across the site. At the location of Boring B-1, the depth to bedrock was estimated to be about 20 feet. The depth to bedrock ranged from approximately 4 feet at B-2 to 12 feet at B-5. The varying depth to bedrock observed in the borings may be related to the old quarry operation. It is possible that some of the old quarry cuts were backfilled with top soil when the quarry operation was halted. The details of the subsurface materials encountered at the site are shown on the boring and the test pit logs included in this report as Plates 11 through 19. The geologic conditions encountered at the site are shown on Plates 3 and 7.

9.2 Groundwater

Free groundwater was not encountered in the borings drilled for this investigation, except at the location of Boring B-1 where it was encountered at about 20 feet below the existing ground surface in Boring B-1. It should be noted that groundwater levels will fluctuate as a result of seasonal changes and perched water may develop in the rainy season, particularly in the bedrock fractures.

10.0 DISCUSSION AND RECOMMENDATIONS

10.1 General

Based on the subsurface exploration conducted at the subject site and the results obtained from our laboratory testing program, it is our opinion that the proposed residential development is feasible from a geotechnical engineering standpoint, provided the recommendations presented in this report are incorporated into the project design and implemented during construction. When the final development plans become available, they should be submitted to BAGG for a review prior to construction. The purpose of the plan review is to evaluate whether the project foundation and grading plans meet the intent of our recommendations, as well as evaluate that our recommendations properly address the project in its final form.

Although an exceptional rainstorm in January, 1982 caused mobilization of almost 500 landslides within the City of Pacifica (Howard-Donley and Associates, 1982), no recent slope failures are in evidence on the subject site. Our examination of morphological features utilizing stereo-paired aerial photographs taken in 1943, before the natural topography was obscured by manmade alterations of the area, did not indicate any gross slope instabilities in the site area. There are, however some apparent areas of local landsliding at the head of a broad, colluvium-filled ravine that extends downslope from the northern edge of the site property. These could be potential sources of future debris-flow activity below the upper edges of the northern side of the site. Under adverse drainage conditions, the heads of these features could eventually encroach upward, toward the outer edges of the proposed development.

The final site grades were not available at the time this report was issued. BAGG will evaluate the stability of the proposed site slopes once the site grading plan becomes available.

Based on the results of our field exploration and laboratory tests, it is our opinion that the proposed foundation loads of the parking structure may be supported on structural mat foundations. Prior to placing the concrete mat, it will be necessary to remove all the loose fill soil from within the slab area, and place it back as properly compacted fill. The residential structures around the parking structure may be supported on drilled cast-in-place, reinforced concrete piers with interconnecting grade beams.

The site development will include construction of relatively high retaining walls. The retaining walls associated with the parking garage may be constructed as cantilever-type walls. The retaining wall foundations may be combined with the structural mat slab. The retaining wall design recommendations are included in the following sections of the report.

The site could experience very strong ground shaking from future earthquakes during the anticipated lifetime of the project. The intensity of the ground shaking will depend on the magnitude of the earthquake, distance to the epicenter, and the response characteristics of the native soils and bedrock materials. While it is not possible to totally preclude damage to structures during major earthquakes, strict adherence to good engineering design and construction practices will help reduce the risk of

damage to the proposed development. The Uniform Building Code defines the minimum standards of good engineering practice.

The subject site is located in a hilly area. Therefore, it is important that the project Civil Engineer familiarizes himself with the topography of the site and the vicinity area to design a surface water control system to minimize future erosion. The cut and fill slopes should be no steeper than 2 to 1 (horizontal to vertical) without the approval of the project Geotechnical Engineer.

10.2 Site Grading

Site grading will involve major cuts and fills to create room for the underground parking lot. The on-site slopes are fairly steep, therefore, we do not recommend placement of fills on the existing steep slopes at the site without following the recommendations included in the sections below or without properly retaining it with walls designed to withstand the lateral loads.

As used in this report, the term "compact" and its derivatives mean that all on-site soils and bedrock materials should be compacted to at least 90 percent of maximum dry density, as determined by ASTM Test Method D1557-01, while at a moisture content that is slightly over optimum. In the slab and pavement areas, the top 6-inches of the subgrade, including aggregate base, should be compacted to at least 95 percent of the maximum dry density.

The following grading procedures should be followed in the building areas.

- Remove brush, trees, roots, and debris from the areas proposed for development. The trees and roots should be removed to a minimum depth of 6 inches below the existing grade.
- Existing utilities where known should be located on the grading plan so that the project engineer could evaluate the necessity of removing abandoned pipes during site grading
- Holes/depressions created by the removal of brush, roots, existing utilities, or old foundations should be backfilled with engineered fill placed in thin lifts not exceeding 8-inches in loose thickness compacted to a minimum of 90 percent relative compaction at above optimum moisture content.

- The test pits excavated for this study were backfilled with loosely placed soil cuttings previously removed from the pits. Prior to construction, the loosely placed material in the test pits should be removed and placed back as compacted fill.

- Acceptable structural fill at the site should be essentially non-expansive (Plasticity Index of less than 15), free of debris, organic and deleterious material, have a maximum rock size of 4-inches in diameter, and have fines content of between 15 and 65 percent. On-site material free of organics and debris is likely to meet the requirements of acceptable structural fill. A sample of the import fill, if planned, should be delivered to the Geotechnical Engineer for testing and approval prior to importing to the site.

- The fills placed on sloping ground must be keyed into firm, native materials. Keyway depths and locations will be determined by the Geotechnical Engineer. A typical keyway schematic is Shown on Plate 21. The keyway should be approximately 15 feet wide (1½ times the width of the equipment). The bottom of the keyway should be inclined towards the slope. Subsurface drainage should be installed in the keyway. The typical construction details of a subdrain are shown on Plate 21. Subdrains should be connected at their low points to storm drain system or other approved drainage facilities. Subdrain outlets should be protected from erosion and siltation.

10.3 1997 Uniform Building Code Site Characterization

The Structural Engineering Design Provisions in Chapter 16 of the 1997 Uniform Building Code (UBC) introduced substantial changes to earthquake design for new buildings (International Conference of Building Officials, 1997). The new code considers local (near source) seismic affects. It uses "near-source factors" to account for the fact that recorded near-fault ground motions and load requirements on structures have frequently exceeded those specified in earlier editions of the UBC. Based on our geologic research, including published maps of known active fault zones prepared for the 1997 UBC and the distance to the seismic sources, the seismic design parameters per Chapter 16 of the 1997 UBC are listed below. The seismic design parameters per 2001 California Building Code are similar to those listed below.

UBC 1997 defines Type A faults as Faults which are capable of producing large magnitude events and that have a high rate of seismic activity (slip rate greater than 5 mm/year) (Table 16-U - Seismic Source Type). Type C faults are defined as faults that are not capable of producing large magnitude earthquakes and that have a relatively low rate of seismic activity. Type B faults are defined vaguely as all faults other than Type A and Type C faults.

Soil Profile S_C is defined as "very dense soil and soft rock" with an average shear wave velocity of 1200 to 2500 feet per second, average Standard Penetration Test (N) values greater than 50, and average undrained shear strength greater than 2000 psf for the top 100 feet of the profile (UBC 1997 - Table 16-J).

The location of the subject site relative to the nearby Type A and B faults is shown on Plate 4, Regional Fault Map. The seismic design parameters per UBC 1997 are listed below. Please note, that these values represent the minimum design standards.

TABLE 1

SEISMIC DESIGN PARAMETERS PER UBC 1997

UBC, 1997	Site Parameter
Figure 16-2, Seismic Zone Map of the U.S.	Zone 4
Table 16-I, Seismic Zone Factor Z	0.4
Table 16-Q, Seismic Coefficient C_a	0.53
Table 16-R, Seismic Coefficient C_v	0.98
Table 16-J, Soil Profile Type	S_C, Soft Rock
Closest Type A Fault	San Gregorio
Distance to Closest Type A Fault	3.8 kilometer
Table 16-S, Near-Source Factor, N_a	1.3
Table 16-T, Near-Source Factor, N_v	1.8

10.4 Pier and Grade Beam Foundations

The residential structures proposed to be constructed around the parking garage may be adequately supported on a drilled, cast-in-place, reinforced concrete friction pier and grade beam foundation system. The drilled piers should have a minimum diameter of 18 inches. The end bearing capacity of the piers should be ignored in the design of the piers. The foundation piers should extend past the surface soils and a minimum of 8 feet into competent bedrock, as determined by the Geotechnical Engineer in the field. The pier depth, diameter, and reinforcement should be determined by the project structural engineer; however, we recommend each pier should be reinforced with a minimum of four #5 bars. The piers may be sized using an allowable skin friction value of 600 pounds per square foot (psf) within the bedrock for downward as well as the uplift forces. Where the drilled piers are located horizontally within 5 feet of the existing slope face, the allowable skin friction value

should be ignored in the upper 3.0 feet, and the piers should be designed to withstand creep load of 50 pcf acting on the embedded portions of the grade beams and piers. The skin friction values provided above may be increased by one-third for short-term seismic and transient loads. The bottom of the piers should be cleaned of all loose soil cuttings before placement of reinforcing steel.

A passive resistance of 300 pcf, up to a maximum of 3,000 pcf, over two times the diameter of the pier could be used to resist lateral loads. Since in many cases, the ground surface against the piers will be sloping, the passive resistance from the top 3.0 feet of the pier should be ignored, unless the ground surface extending 5 feet beyond the pier is flat.

Loads between piers should be supported on grade beams that are designed to span between the piers with the assumption that they obtain no vertical support from soils beneath them. It is recommended that the exterior grade beams be established a minimum of 12 inches below final grade. Pier and grade beams should be reinforced appropriately and the reinforcement should be properly tied together to enable the entire system to act as a unit. Design of the grade-beams, including the size, spacing, and shape of the reinforcement should be determined by the project Structural Engineer responsible for the foundation design.

The bottom of pier and grade beam excavations should be firm, clean, and relatively free of any loose or disturbed soils and bedrock materials. There is a small possibility that groundwater may be encountered in some of the pier excavations. Where encountered, the groundwater should be pumped out immediately before pouring concrete, or the concrete should be tremied into the hole. The end of the tremie pipe should be kept near the bottom of the hole at the beginning and kept a minimum of 2 feet below the top of concrete as the concrete is being placed in the hole. The concrete placement operation should only be terminated when the mixture of water and sloughage is completely removed. The area around the pier hole should be cleaned and the concrete spilled around the pier hole should be removed.

10.5 Concrete Mat Foundation

The proposed parking garage loads may be supported on a concrete mat foundation system constructed on a prepared building pad consisting of undisturbed native materials and/or properly compacted and tested fill soils. The mat foundation system could be designed for an allowable

bearing pressure value of 2,000 psf. This value may be increased by one-third for short term loads such as wind and seismic loads. The mat slab should be sufficiently thick to uniformly spread all concentrated loads. The mat slab should be designed for a modulus of subgrade reaction value of 200 psi per inch. This value is for one-foot square area and the size of the mat has not been taken into consideration.

Lateral resistance may be provided by friction between the concrete mat slab and the underlying soil and passive pressure between the foundation and the adjacent soil. The base friction may be calculated using a coefficient of friction value of 0.35. The passive pressure may be calculated using an equivalent fluid weight of 350 pcf, up to a maximum of 3,500 psf.

10.6 Settlements

We have estimated that the total post construction, static settlements of the proposed structures supported on properly constructed pier and grade beam foundations will be negligible. The total settlement of the parking garage structure supported on concrete mat foundation will be less than 1-inch with differential settlement of less than ½-inch.

10.7 Retaining Walls

Retaining walls should be designed to resist lateral earth pressures from natural materials and backfills. Restrained walls for the parking garage, supporting native materials or compacted fill soils should be designed to resist at rest lateral pressures taken as an equivalent fluid pressure of 60 pounds per cubic foot (pcf) for level backfill. The unrestrained retaining walls across the site should be designed to resist an active lateral pressure taken as an equivalent fluid pressure of 45 pounds per cubic foot for level backfill. These pressures should be increased by 3 pcf for every 5 degrees increase in backfill slope.

The above lateral pressures do not include hydrostatic pressures resulting from groundwater, seepage water, or infiltration of natural rainfall and/or irrigation water behind the walls. Therefore all walls over 3 feet in height should be provided with a drainage blanket behind the wall. The drainage blanket should consist of a pre-manufactured drainage panel or one foot thick blanket of Caltrans Class 2 Permeable rock or free-draining gravel or drain rock encapsulated by a suitable filter fabric. A 12-inch cap of relatively impermeable soil should be placed at the top of the drainage blanket to

minimize infiltration of surface water. The cap material should be compacted to 90 percent relative compaction. A 4-inch diameter perforated PVC pipe should be installed at the base of the drainage blanket to facilitate removal of water collected behind the wall. A schematic showing fill placement behind retaining walls is presented herein as plate 22.

The retaining walls for the parking garage may be supported on the mat foundation. Retaining walls in other portions of the site should be supported on drilled, cast-in-place, reinforced concrete piers designed as recommended above for foundations, except that the depth of the retaining wall piers should be determined using the UBC flagpole formula. However, as a minimum the piers should extend 8 feet into bedrock type material.

The retaining walls may be backfilled with on-site material free of debris, organics, and deleterious materials. The backfill material should be compacted to a minimum of 90 percent relative compaction while at above optimum moisture content.

BAGG should be retained to review the design calculation and the final retaining wall design plans to evaluate compliance with the intent of the recommendations included in this letter report. BAGG should be retained to provide observations and soil compaction testing services during pier drilling, and placement of backfill materials.

The surcharge loads behind the retaining wall may be treated as uniform loads (rectangular distribution) over the entire depth of the wall with pressure equal to one-half the vertical surcharge load for restrained conditions and one-third the surcharge load for unrestrained condition.

Permanent tiebacks may be used to resist lateral forces associated with the retaining walls. The tiebacks should extend a minimum of 5 feet beyond a plane inclined at an angle of 30 degrees from the back side of the wall. The tiebacks may be designed using an allowable skin friction value of 1,000 psf. The tiebacks should be installed in clean holes with a minimum diameter of 8-inches. The tiebacks should be grouted in two stages. The first portion of the grout should extend from the bottom of the hole to the assumed failure plane. At this point, the tiebacks should be tested to at least 150 percent of the design loads. The design load should be held for a minimum of 10 minutes. The tiebacks should be located off at 110 percent of the design load capacity. If the design load

capacity is not obtained, additional tiebacks should be installed at the locations approved by the Geotechnical Engineer. After testing the tieback to the design load, grout should be pumped into the remaining length of the hole.

The holes drilled for tiebacks should be dry and free of loose cuttings. If during drilling, wet or caving ground is encountered, adequate casing should be provided by the contractor. This casing should be removed in an approved satisfactory manner while the grout is being placed in the hole. We recommend that high strength grout be used in conjunction with clean, corrosion protected reinforcing bars.

10.7.1 Block-type Retaining Walls

Gravity retaining walls such as keystone walls, or Alan Block walls may be used in certain portions of the site to retain the lateral loads. The gravity retaining walls provide resistance to lateral loads through a combination of friction between the geogrid and the surrounding soil , and the frictional resistance between the blocks themselves. In general, the block type retaining walls are economical in situations where no additional cuts are required to accommodate the geogrid material behind the walls. The block type retaining walls are generally not very practical in the situations where a steep slope exists near the toe of the wall. In these cases, because of the lack of passive resistance, the foundation portion of the walls has to be extended deeper thus loosing the economical advantage. Since the site slopes are relatively steep, it is our opinion that block type retaining walls will only be suitable for only very small portions of the site. BAGG can evaluate the suitability of a block-type retaining wall at any particular location and perform design analysis for the retaining wall, if requested.

10.8 Slabs-on-Grade and Exterior Flatwork

Concrete slabs and flat work to be constructed at or near the ground surface should be supported on a 12-inch thick layer of reworked on-site soils and/or engineered fill that has been prepared and compacted as recommended under "Site Grading." The subgrade soils should be maintained at a moisture content of slightly over optimum, and should be approved by the Geotechnical Engineer immediately before the slab is poured.

It is recommended that the exterior slabs may be placed directly over compacted, and smooth-rolled soil subgrade. In moisture sensitive areas, the slabs should be underlain by 4 inches of compacted clean, crushed rock covered with a plastic vapor barrier with a minimum thickness of 10 mils. To aid in curing the concrete and to protect the membrane during construction, the vapor barrier should be covered with a 2-inch-thick layer of curing sand that should be wetted prior to pouring the slab.

10.9 Drainage

Because of the slope around the site, drainage measures to control and collect surface run-off should be considered an integral part of the proposed development. The ground surface adjacent to all sides of the proposed buildings should be sloped to drain away from the foundations. Unpaved and landscaped areas should slope at least 5 percent for a distance of at least 5 feet away from the face of the building. Surface drainage swales at the site should slope at least 1 percent toward a suitable discharge point. Runoff should not be allowed to flow over graded or natural slopes, and any area where surface run-off becomes concentrated should be provided with a catch basin. The run-off from building roofs should be collected in closed, non-perforated pipes and discharged to the local storm drain system, or discharged in a manner that will not allow ponding adjacent to foundations or erosion on native or graded slopes.

Surface and subsurface drainage facilities and catchment areas should be checked frequently and cleaned or maintained throughout the project life, as necessary.

10.10 On-Site Pavements

Design of new pavement sections are provided below. We have also included deep-lift asphalt sections for the new roadway and parking area pavements. The design is based on an R-value of 10 for the subgrade, an R-value of 78 for Class 2 aggregate base. We recommend that additional R-value tests should be conducted to confirm the R-value of the soil subgrade prior to construction of the roadway. The pavement design recommendations tabulated below are based on Traffic Indices of 4.5, 6.0, and 7.0. A Traffic Index of 6.0 is usually appropriate where the pavement will be subject to frequent use by vans or light delivery trucks with only occasional heavy truck traffic, and 7.0 for frequent use of the roadway by heavy trucks. A Traffic Index of 4.5 can be used for areas accommodating light automobile parking only.

TABLE 2
FLEXIBLE PAVEMENT SECTIONS
(Subgrade R-value=10)*

Pavement Component	TI = 4 .5		TI=6.0		TI=7.0	
Asphaltic Concrete (AC)	7	2.5	10	3.5	12	4
Imported Class II Aggregate Base (R_{Min}=78)	-	9.5	-	12.5	-	15.5
Total Thickness in Inches	7	12	9	16	12	19.5

*Will require confirmational R-Value testing during construction.

The alternative pavement sections presented above were calculated using the design method described in the Caltrans Highway Design Manual (Topic 608, July 1, 1995) with the safety factors included. The method characterizes the subgrade soil conditions with laboratory R-value tests, and characterizes the traffic loading conditions with a Traffic Index.

10.11 Utility Trenches

Vertical trenches deeper than 5 feet will require temporary shoring to protect workers in the trench. Where shoring is not used, the sides should be sloped or benched, with a maximum slope of 1:1 (horizontal : vertical). The trench spoils should not be placed closer than 3 feet (or one-half of the trench depth) from the trench sidewalls. All work associated with trenching must conform to the State of California, Division of Industrial Safety requirements. In our opinion, the soils at the upper 10 feet of the site should be classified as "Type B Soil."

Trench backfill materials and compaction should conform to the following:

- In general, soils used for trench backfill shall be free of debris, roots and other organic matter, debris, and rocks or lumps exceeding 3 inches in greatest dimension.
- Compaction shall be performed to a minimum of 90% relative compaction in accordance with ASTM D1557-01, at slightly above optimum moisture content. In pavement areas, the upper 12 inches of the backfill (below the pavement subgrade) shall be compacted to 95% of the maximum dry density.
- Jetting shall not be allowed.

10.12 Plan Review

It is recommended that BAGG be retained to review the final grading and foundation plans. This review is to assess general suitability of the earthwork and foundation recommendations contained in this report and to verify the appropriate implementation of our recommendations into the project plans and specifications.

10.13 Observation and Testing

It is recommended that BAGG be retained to provide observation and testing services during the grading, excavation, backfilling, and foundation construction phases of work. This is to verify that the work in the field is performed as recommended and in accordance with the approved plans and specifications, and more importantly, to verify that subsurface conditions encountered during construction are similar to those anticipated during the design phase.

11.0 CLOSURE

This report has been prepared in accordance with generally-accepted engineering practices for the strict use of Home Pride Construction and other professionals associated with the specific project described in this report. The conclusions and recommendations contained in this report are based on subsurface conditions revealed by widely spaced borings and test pits. It is not uncommon for unanticipated conditions to be encountered during site grading and/or foundation installation, and it is not possible for all such variations to be found by a field exploration program appropriate for this type of project. The recommendations contained in this report are therefore contingent upon the review of the final grading, drainage, and foundation plans by this office, and upon geotechnical observation and testing by BAGG of all pertinent aspects of construction including clearing, site grading, foundation excavations, placement of fills or backfills, and preparation of subgrades.

Surface conditions and standards of practice change with time. Therefore, we should be consulted to update this report, if the construction does not commence within 18 months from the date this report is submitted. Additionally, the recommendations of this report are only valid for the proposed development as described herein. If the proposed project is modified, our recommendations should be reviewed and approved or modified by this office in writing.

The following plates are attached and complete this report:

Attached Plates:

Plate 1	Vicinity Map
Plate 2	Site Plan
Plate 3	Site Geology Map
Plate 4	Geologic Cross-Sections
Plate 5	Regional Fault Map
Plate 6	Unified Soil Classification System
Plate 7	Soil Terminology
Plate 8	Rock Terminology
Plate 9	Boring Log Notes
Plate 10	Key to Symbols
Plate 11 through 15	Logs of Borings B-1 through B-5
Plate 16 through 19	Logs of Test Pits P-1 through P-9
Plate 20	Plasticity Chart
Plate 21	Schematic Showing Fill Placement on Sloping Ground
Plate 22	Schematic Showing Fill Placement Behind Retaining Walls

ASFE document titled "Important Information About Your Geotechnical Engineering Report"

12.0 REFERENCES

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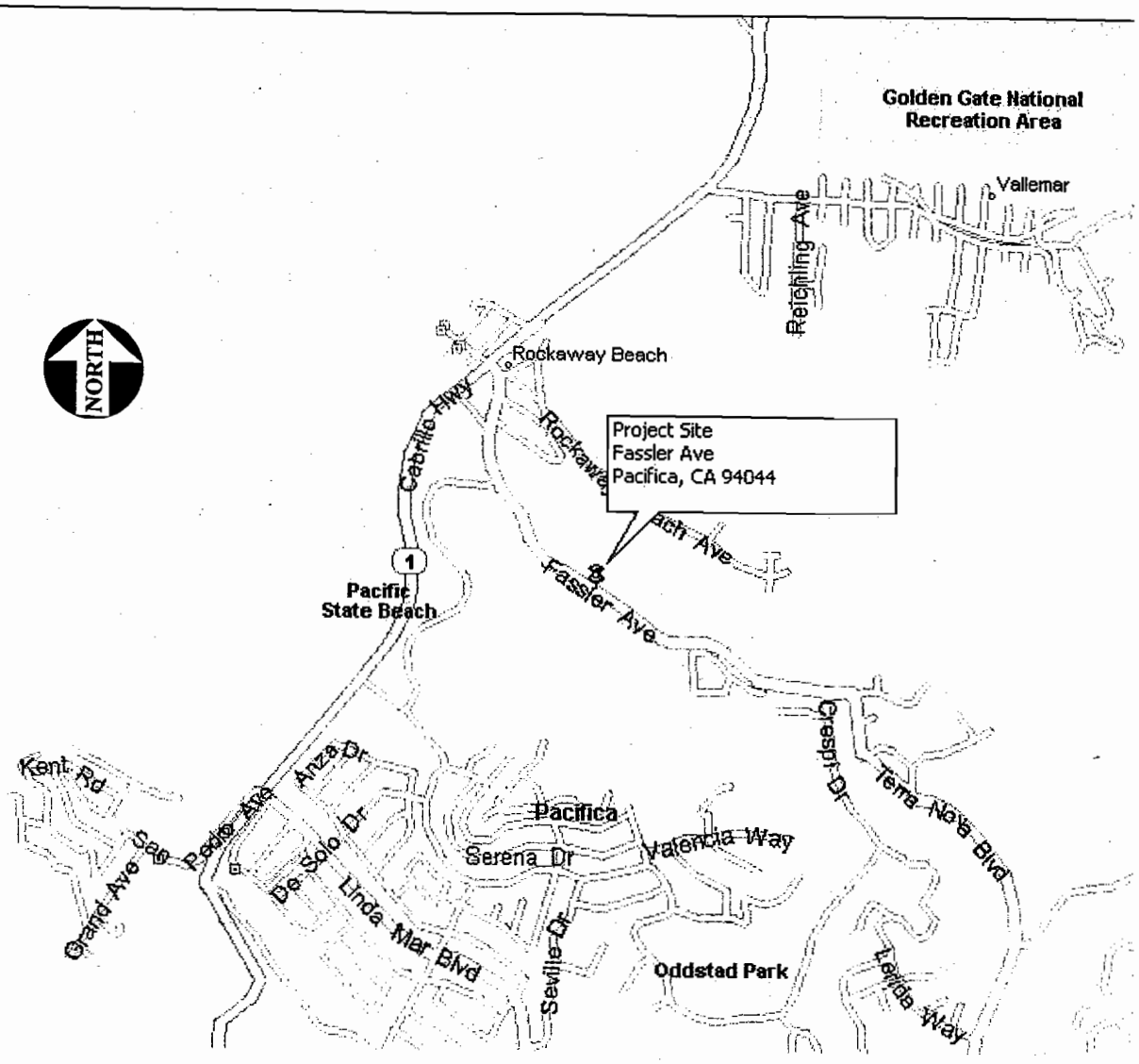
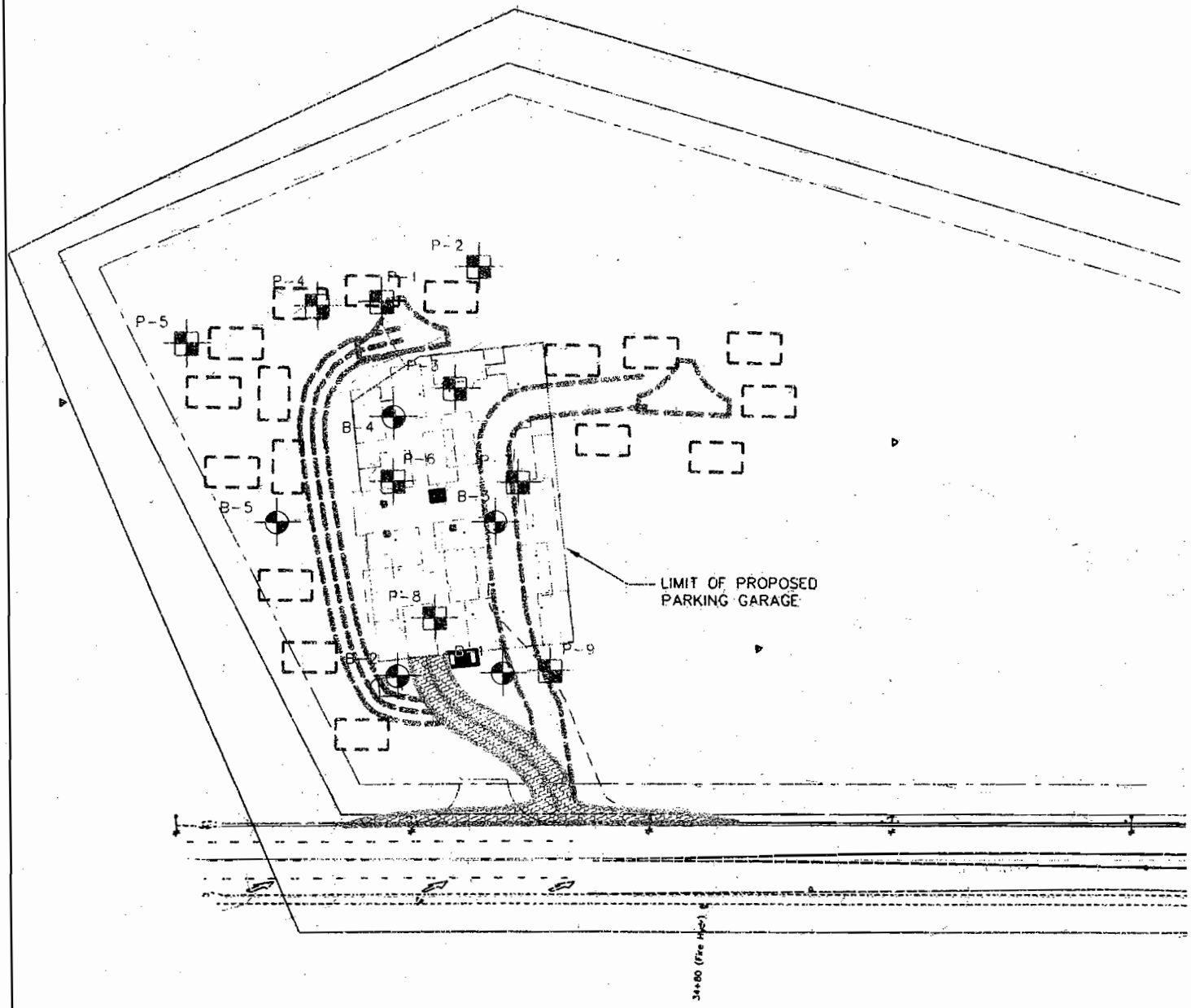


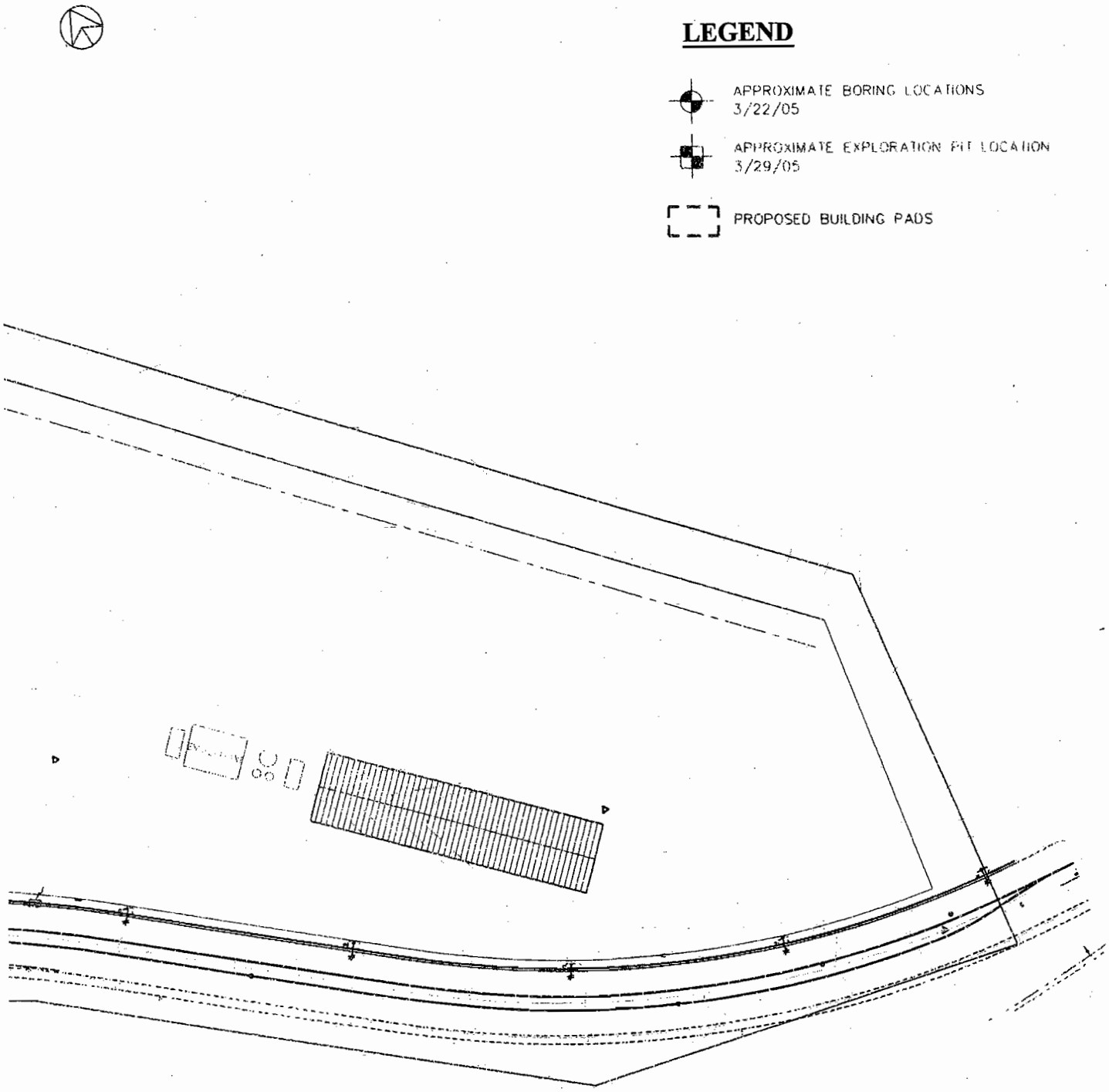
PROPOSED RESIDENTIAL DEVELOPMENT FASSLER AVENUE PACIFICA, CALIFORNIA	VICINITY MAP		
	JOB NO. PACIQ-01-00	DATE April 2005	PLATE 1



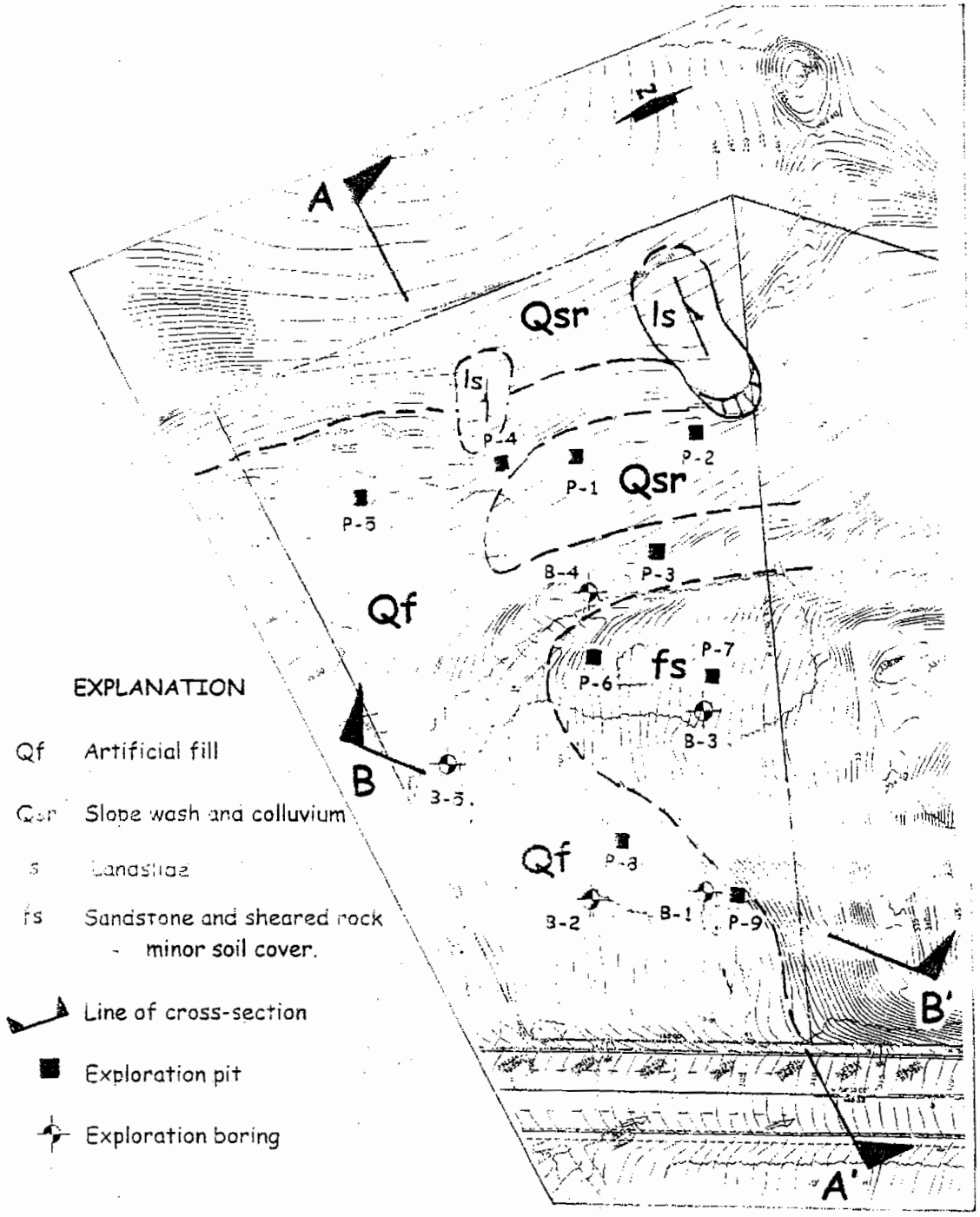
SCALE: 1"=100'

SOURCE: HOME PRIDE CONSTRUCTION

PROPOSED RESIDENTIAL DEVELOPMENT
FASSLER AVENUE
PACIFICA, CALIFORNIA

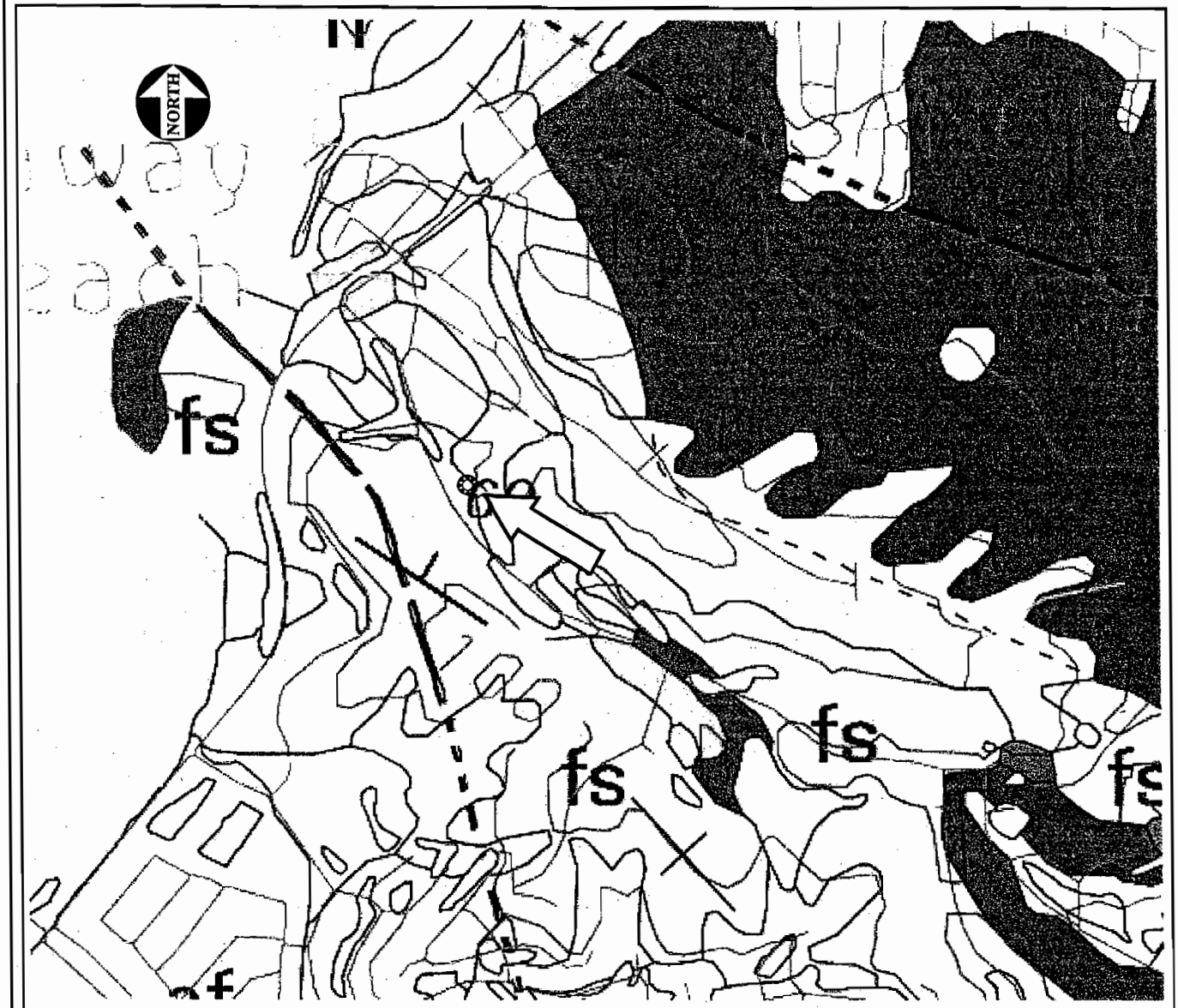


SAGE	SITEPLAN		
	JOB NO. PACIQ-01-00	DATE 4/21/2005	PLATE 2



PROPOSED RESIDENTIAL DEVELOPMENT FASSLER AVENUE PACIFICA, CALIFORNIA	SITE GEOLOGY MAP			
	JOB NO. PACIQ-01-00	SCALE 1" = 100'	DATE April 2005	PLATE 3

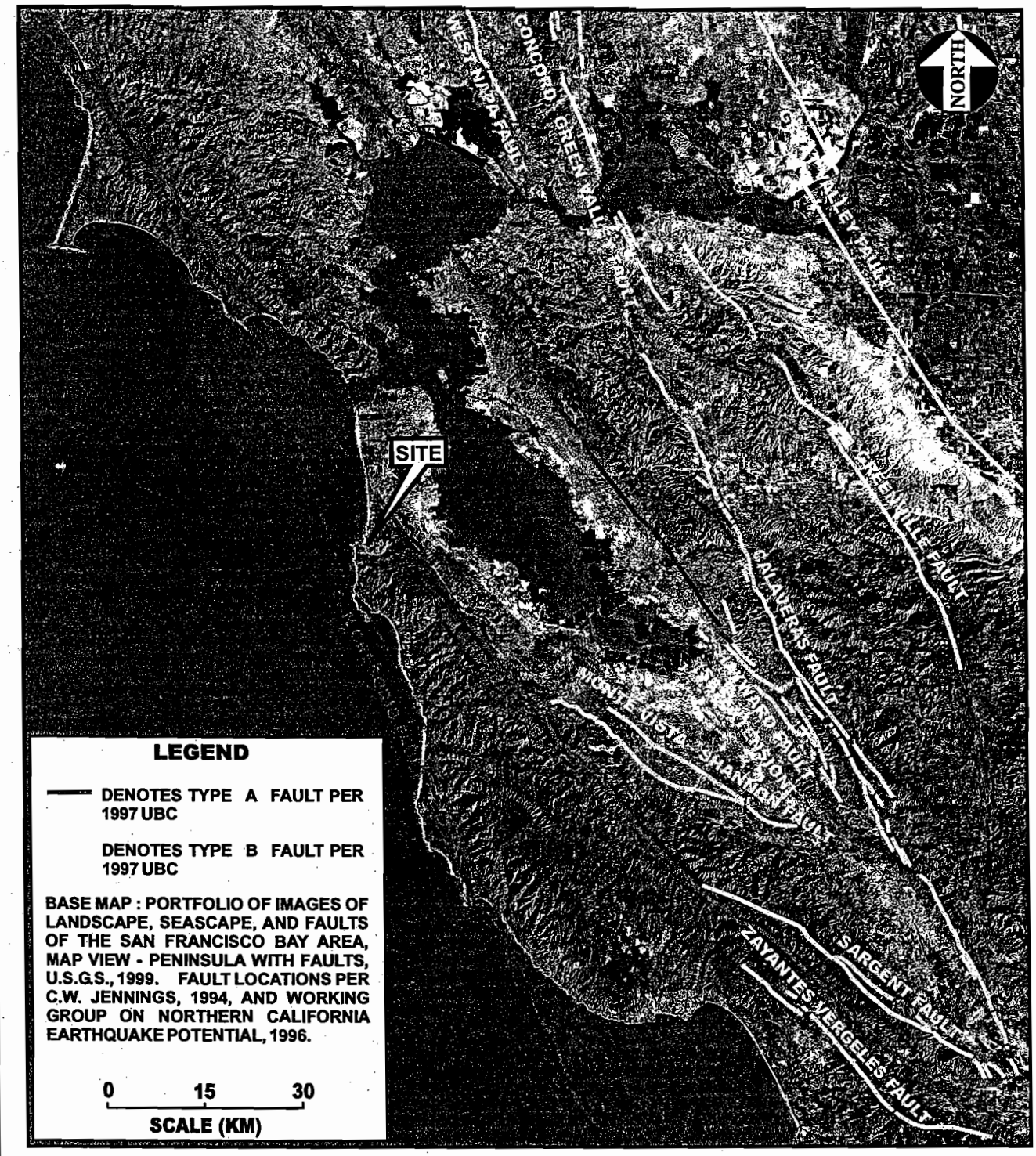
BAGG



Fs Sandstone - Greenish-gray to buff, fine- to coarse-grained sandstone (graywacke), with interbedded siltstone and shale. Siltstone and shale interbeds constitute less than 20 percent of unit, but in places form sequences as much as several tens of meters thick. In many places shearing has obscured bedding relations; rock in which shale has been sheared to gouge constitutes about 10 percent of unit. Gouge is concentrated in zones that are commonly less than 30m wide but in places may be as much as 150 m wide. Total thickness of unit is unknown but is probably at least many hundreds of meters.

Reference: U.S. Department of Interior PamphletDerived from Digital Map of 98-197 Geology of Onshore Part of San Mateo County, California: A Digital Database, by E.E. Brabb, R.W. Graymer and D.L. Jones, U.S. Geologic Survey, 1998.

PROPOSED RESIDENTIAL DEVELOPMENT FASSLER AVEUE PACIFICA, CALIFORNIA	**REGIONAL GEOLOGY MAP**		
	JOB NO. PACIQ-01-00	DATE April 2005	PLATE 4



PROPOSED RESIDENTIAL DEVELOPMENT FASSLER AVENUE PACIFICA, CALIFORNIA	REGIONAL FAULT MAP		
	JOB NO. PACIQ-01-00	DATE April 2005	PLATE 5

BAGG

COARSE-GRAINED SOILS
LESS THAN 50% FINES*

GROUP SYMBOLS	ILLUSTRATIVE GROUP NAMES	MAJOR DIVISIONS
GW	Well graded gravel Well graded gravel with sand	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size
GP	Poorly graded gravel Poorly graded gravel with sand	
GM	Silty gravel Silty gravel with sand	
GC	Clayey gravel Clayey gravel with sand	
SW	Well graded sand Well graded sand with gravel	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
SP	Poorly graded sand Poorly graded sand with gravel	
SM	Silty sand Silty sand with gravel	
SC	Clayey sand Clayey sand with gravel	

NOTE: Coarse-grained soils receive dual symbols if:
(1) their fines are CL-ML (e.g. SC-SM or GC-GM) or
(2) they contain 5-12% fines (e.g. SW-SM, GP-GC, etc.)

FINE-GRAINED SOILS
MORE THAN 50% FINES*

GROUP SYMBOLS	ILLUSTRATIVE GROUP NAMES	MAJOR DIVISIONS
CL	Lean clay Sandy lean clay with gravel	SILTS AND CLAYS liquid limit less than 50
ML	Silt Sandy silt with gravel	
OL	Organic clay Sandy organic clay with gravel	
CH	Fat clay Sandy fat clay with gravel	SILTS AND CLAYS liquid limit more than 50
MH	Elastic silt Sandy elastic silt with gravel	
OH	Organic clay Sandy organic clay with gravel	
PT	Peat Highly organic silt	HIGHLY ORGANIC SOIL

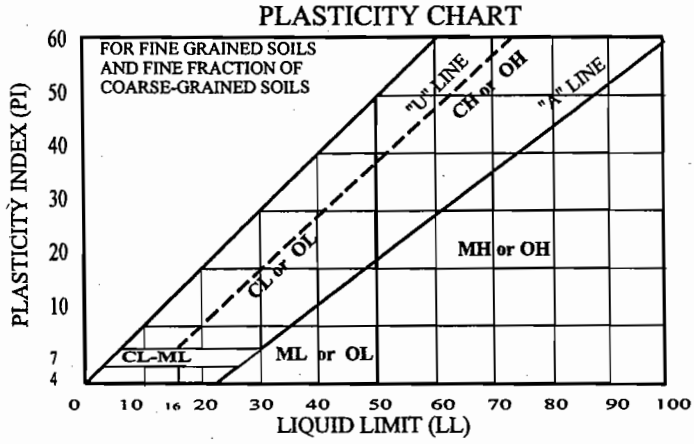
NOTE: Fine-grained soils receive dual symbols if their limits plot in the hatched zone on the Plasticity Chart (CL-ML).

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	ABOVE 12 in.
COBBLES	3 in. to 12 in.
GRAVEL	No. 4 to 3 in.
Coarse	¾ in to 3 in.
Fine	No. 4 to ¾ in.
SAND	No. 200 to No.4
Coarse	No. 10 to No. 4
Medium	No. 40 to No. 10
Fine	No. 200 to No. 40
*FINES:	BELOW No. 200

NOTE: Classification is based on the portion of a sample that passes the 3-inch sieve.

PLASTICITY CHART



Reference: ASTM D 2487-98, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

GENERAL NOTES: The tables list 30 out of a possible 110 Group Names, all of which are assigned to unique proportions of constituent soils. Flow charts in ASTM D 2487 aid assignment of the Group Names. Some general rules for fine grained soils are: less than 15% sand or gravel is not mentioned; 15% to 25% sand or gravel is termed "with sand" or "with gravel;" and 30% to 49% sand or gravel is termed "sandy" or "gravelly." Some general rules for coarse-grained soils are: uniformly-graded or gap-graded soils are "Poorly" graded (SP or GP); 15% or more sand or gravel is termed "with sand" or "with gravel;" 15% to 25% clay and silt is termed clayey and silty and any cobbles or boulders are termed "with cobbles" or "with boulders."

UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL TYPES (Ref 1)

Boulders: particles of rock that will not pass a 12-inch screen.
Cobbles: particles of rock that will pass a 12-inch screen, but not a 3-inch sieve.
Gravel: particles of rock that will pass a 3-inch sieve, but not a #4 sieve.
Sand: particles of rock that will pass a #4 sieve, but not a #200 sieve.
Silt: soil that will pass a #200 sieve, that is non-plastic or very slightly plastic, and that exhibits little or no strength when dry.
Clay: soil that will pass a #200 sieve, that can be made to exhibit plasticity (putty-like properties) within a range of water contents, and that exhibits considerable strength when dry.

MOISTURE AND DENSITY

Moisture Condition: an observational term; dry, moist, wet, or saturated.
Moisture Content: the weight of water in a sample divided by the weight of dry soil in the soil sample, expressed as a percentage.
Dry Density: the pounds of dry soil in a cubic foot of soil.

DESCRIPTORS OF CONSISTENCY (Ref 3)

Liquid Limit: the water content at which a soil that will pass a #40 sieve is on the boundary between exhibiting liquid and plastic characteristics. The consistency feels like soft butter.
Plastic Limit: the water content at which a soil that will pass a #40 sieve is on the boundary between exhibiting plastic and semi-solid characteristics. The consistency feels like stiff putty.
Plasticity Index: the difference between the liquid limit and the plastic limit, i.e. the range in water contents over which the soil is in a plastic state.

MEASURES OF CONSISTENCY OF COHESIVE SOILS (CLAYS) (Ref's 2 & 3)

Very Soft	N=0-1*	C=0-250 psf	Squeezes between fingers
Soft	N=2-4	C=250-500 psf	Easily molded by finger pressure
Medium Stiff	N=5-8	C=500-1000 psf	Molded by strong finger pressure
Stiff	N=9-15	C=1000-2000 psf	Dented by strong finger pressure
Very stiff	N=16-30	C=2000-4000 psf	Dented slightly by finger pressure
Hard	N>30	C>4000 psf	Dented slightly by a pencil point

*N=blows per foot in the Standard Penetration Test. In cohesive soils, with the 3-inch-diameter ring sampler, 140-pound weight, divide the blow count by 1.2 to get N (Ref 4).

MEASURES OF RELATIVE DENSITY OF GRANULAR SOILS (GRAVELS, SANDS, AND SILTS) (Ref's 2 & 3)

Very Loose	N=0-4**	RD=0-30	Easily push a ½-inch reinforcing rod by hand
Loose	N=5-10	RD=30-50	Push a ½-inch reinforcing rod by hand
Medium Dense	N=11-30	RD=50-70	Easily drive a ½-inch reinforcing rod
Dense	N=31-50	RD=70-90	Drive a ½-inch reinforcing rod 1 foot
Very Dense	N>50	RD=90-100	Drive a ½-inch reinforcing rod a few inches

**N=Blows per foot in the Standard Penetration Test. In granular soils, with the 3-inch-diameter ring sampler, 140-pound weight, divide the blow count by 2 to get N (Ref 4).

xxxx

WEATHERING DESCRIPTORS

Fresh No discoloration, not oxidized, no separation, hammer rings when crystalline rocks are struck.

Slight Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull, no visible separation, hammer rings when crystalline rocks are struck, body of rock not weakened.

Moderate Discoloration extends from fractures, usually throughout ;Fe-Mg materials are "rusty", feldspar crystals are "cloudy", all fractures are discolored or oxidized, partial separation of boundaries visible, texture generally preserved, hammer dose not ring when rock is struck, body of rock is slightly weakened.

Intense Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation, all fracture surfaces are discolored or oxidized, surfaces friable, partial separation, texture altered by chemical disintegration, dull sound when struck with hammer, rock is significantly weakened.

Decomposed Discolored or oxidized throughout, but resistant mineral such as quartz may be unaltered, all feldspars and Fe-Mg minerals are completely altered to clay, complete separation of grain boundaries, resembles a soil, partial or complete remnant of rock structure may be preserved, can be granulated by hand, resistant minerals such as quartz may be present as "stringers" or "dykes".

BEDDING FOLIATION AND FRACTURE SPACING DESCRIPTORS

Millimeters	Feet	Bedding	Fracture Spacing
>10	<0.03	Laminated	Very Close
10-30	0.03-0.1	Very Thin	Very Close
30-100	0.1-0.3	Thin	Close
100-300	0.3-1	Moderate	Moderate
300-1000	1-3	Thick	Wide
1000-3000	3-10	Very Thick	Very Wide
>3000	>10	Massive	Extremely Wide

ROCK HARDNESS/STRENGTH DESCRIPTORS*

Extremely Hard Core, fragment, or exposure cannot be scratched with knife or sharp pick; can only be chipped with repeated heavy hammer blows.

Very Hard Cannot be scratched with knife or sharp pick. Core or fragment breaks with repeated heavy hammer blows.

Hard Can be scratched with knife or sharp pick with difficulty (heavy pressure). Heavy hammer blow required to break specimen.

Moderately Hard Can be scratched with knife or sharp pick with light or moderate pressure. Core or fragment breaks with moderate hammer blow.

Moderately Soft Can be grooved $^{1}/_{16}$ inch (2mm) deep by knife or sharp pick with moderate or heavy pressure. Core fragment breaks with light hammer blow or heavy manual pressure.

Soft Can be grooved or gouged easily by knife or sharp pick with light pressure, can be scratched with fingernail. Breaks wit light to moderate manual pressure.

Very Soft Can be readily indented, grooved, or gouged with fingernail, or carved with a knife. Breaks with light manual pressure.

*Note: Although "sharp pick" is included in those definitions, descriptions of ability to be scratched, grooved, or gouged by a knife is the preferred criteria.

xxxx

GENERAL NOTES FOR BORING LOGS:

The boring logs are intended for use only in conjunction with the text, and for only the purposes the text outlines for our services. The Plate "Soil Terminology" defines common terms used on the boring logs.

The plate "Unified Soil Classification System," illustrates the method used to classify the soils. The soils were visually classified in the field; the classifications were modified by visual examination of samples in the laboratory, supported, where indicated on the logs, by tests of liquid limit, plasticity index, and/or gradation. In addition to the interpretations for sample classification, there are interpretations of where stratum changes occur between samples, where gradational changes substantively occur, and where minor changes within a stratum are significant enough to log.

There may be variations in subsurface conditions between borings. Soil characteristics change with variations in moisture content, with exchange of ions, with loosening and densifying, and for other reasons. Groundwater levels change with seasons, with pumping, from leaks, and for other reasons. Thus boring logs depict interpretations of subsurface conditions only at the locations indicated, and only on the date(s) noted.

SPECIAL FIELD NOTES FOR THIS REPORT:

1. The five borings were drilled on March 22, 2005, with a track-mounted drilling rig utilizing 4½-inch-diameter (outside) solid stem flight augers. The boring s were sealed with cement and capped with soil immediately after the last soil sample was collected.

2. The boring locations were approximately located by pacing from known points on the site. The elevations were approximated using the site plans and parcel map provided by the client, with the elevation datum as shown on Plate 2, Site Plan.

3. The soils' Group Names [e.g. SANDY LEAN CLAY] and Group Symbols [e.g. (CL)] were determined or estimated per ASTM D 2487-00, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System, see Plate 5). Other soil and rock engineering terms used on the boring logs are defined on Plate 6, Soil Terminology, and Plate 7, Rock Terminology.

4. The "Blow Count" Column on the boring logs indicates the number of blows required to drive the sampler below the bottom of the boring, and the blow counts given are for each 6 inches of sampler penetration.

5. Groundwater was encountered during drilling, at the depths and locations as shown on the boring logs.

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5. Groundwater was encountered during drilling, at the depths and locations as shown on the boring logs.

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Lean clay
	Sandy lean clay
	Clayey gravel
	Lean clay with gravel
	Sandstone
	Clayey sand
	High plasticity organic clay
Misc. Symbols	
	Boring continues
	Water first encountered during drilling
	Water level at completion of boring
Soil Samplers	
	Modified California Sampler: 2.375" ID by 3" OD, split-barrel sampler driven w/ 140-pound hammer falling 30" (ASTM D 3550-01)

Symbol	Description
	Standard Penetration Test: 1 3/8" ID by 2" OD, split-spoon sampler driven with 140-pound hammer falling 30" (ASTM D 1586-99)
Line Types	
———	Denotes a sudden, or well identified strata change
- - - -	Denotes a gradual, or poorly identified strata change
Laboratory Tests	
DS	Denotes direct shear test performed at field moisture content (ASTM D2166-00).
DSm	Denotes the second half of a multi-phase direct shear test performed on a DS sample (ASTM D2166-00).
LL	Denotes Liquid Limit per ASTM D4318-00
PI	Denotes Plasticity Index per ASTM D4318-00

BORING LOG

JOB NAME: Proposed Residential Development
CLIENT: LegacyQuest, Inc.
LOCATION: APN 022-083-20 & -30, Fassler Ave., Pacifica
DRILLER: Britton Exploration
DRILL METHOD: Track Mounted CME-75 w/ 4½" flight augers

JOB NO.: PACIQ-01-00
DATE DRILLED: 03/22/05
ELEVATION: 319± feet
LOGGED BY: MT
CHECKED BY:

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0		CL	LEAN CLAY WITH SAND, brown, moist, very stiff, medium plasticity	
						3	7, 11, 13		increasing sand content	
									SANDY LEAN CLAY, brown, moist to wet, very stiff, medium plasticity	
DS DSm	1000 2000	Nat. Nat.	930 1700	14.3	118	6	7, 11, 11		increasing gravel content	LL = 43 PI = 22
								GC	CLAYEY GRAVEL WITH SAND, brown, moist, medium dense	
				19.3	107	9	5, 9, 8		dark brown, with coarser gravels	
				6.2	125	12	10, 17, 20			
						15			increasing fines content	
								CL	GRAVELLY LEAN CLAY, brown, moist, stiff, medium plasticity	
DS	1500	Nat.	560	30.9	91	18	7, 4, 8		gravels coarse grained, subangular to angular	

BORING LOG

JOB NAME: Proposed Residential Development

JOB NO.: PACIQ-01-00

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
									increasing gravel content	
						21		ROCK	SANDSTONE, red-brown and brown, moist, intensely weathered, soft, very close bedded, friable at seams	Bedrock
						24	6, 10, 17			
						27	20, 30, 25			
						30			Boring terminated at 29.5 feet. Tremie grouted with neat cement.	
						33				
						36				
						39				

BORING LOG

JOB NAME: Proposed Residential Development
CLIENT: LegacyQuest, Inc.
LOCATION: APN 022-083-20 & -30, Fassler Ave., Pacifica
DRILLER: Britton Exploration
DRILL METHOD: Track Mounted CME-75 w/ 4½" flight augers

JOB NO.: PACIQ-01-00
DATE DRILLED: 03/22/05
ELEVATION: 301± feet
LOGGED BY: MT
CHECKED BY:

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0		CL	LEAN CLAY, brown, moist, medium stiff, medium plasticity	
								GC	CLAYEY GRAVEL, orange brown, wet, medium dense	
				14.7	114	3	7, 15, 23		increasing sand and fines content	
								ROCK	SANDSTONE, orange brown, moist, decomposed, very soft	
DS DSm	1000 2000	Nat. Nat.	1100 2000	13.9	119	6	25, 50		very soft to soft, portions clayey	
				11.7	121	9	25, 50			
				12.3	122	12	20, 30, 50		with claystone/siltstone portions	
						15				
						18	50-5"			

BORING LOG

JOB NAME: Proposed Residential Development

JOB NO.: PACIQ-01-00

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						21				
							30 50-4"			
						24			Boring terminated at 23.8 feet. Backfilled with neat cement and capped with soil.	No groundwater encountered.
						27				
						30				
						33				
						36				
						39				

BORING LOG

JOB NAME: Proposed Residential Development
CLIENT: LegacyQuest, Inc.
LOCATION: APN 022-083-20 & -30, Fassler Ave., Pacifica
DRILLER: Britton Exploration
DRILL METHOD: Track Mounted CME-75 w/ 4½" flight augers

JOB NO.: PACIQ-01-00
DATE DRILLED: 03/22/05
ELEVATION: 314± feet
LOGGED BY: MT
CHECKED BY:

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0		CL	SANDY LEAN CLAY, orange brown, moist, very stiff to hard, medium plasticity	
DS DSm	1000 2000	Nat. Nat.	1300 2500	15.3	111	3	21 25 25			
				12.3	116	6	17 50-3"	ROCK	SANDSTONE, orange brown, moist, decomposed, soft, very thin bedded	Bedrock
DS DSm	1500 2500	Nat. Nat.	2000 3000	8.8	123	9	30 50			
				14.5	116	12	26 35 50			
				16.1	114	15 18	15 50		with decomposed, sandy portions	

BORING LOG

JOB NAME: Proposed Residential Development

JOB NO.: PACIQ-01-00

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						21				
							25 / 50			
						24			Boring terminated at 24.0 feet. Backfilled with neat cement and capped with soil.	No groundwater encountered.
						27				
						30				
						33				
						36				
						39				

BORING LOG

JOB NAME: Proposed Residential Development
CLIENT: LegacyQuest, Inc.
LOCATION: APN 022-083-20 & -30, Fassler Ave., Pacifica
DRILLER: Britton Exploration
DRILL METHOD: Track Mounted CME-75 w/ 4½" flight augers

JOB NO.: PACIQ-01-00
DATE DRILLED: 03/22/05
ELEVATION: 304± feet
LOGGED BY: MT
CHECKED BY:

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0		GC	CLAYEY GRAVEL WITH SAND, orange brown, moist, loose	
						3	5, 7, 6		brown	
DS DSm	1000 2000	Nat. Nat.	1050 2250	15.0	117	6	4, 6, 5		increasing sand content	
DS	1500	Nat.	1300	17.0	115	9	3, 4, 3	SC	CLAYEY SAND WITH GRAVEL, brown, moist, loose	
						12		ROCK	SANDSTONE, orange brown, moist, decomposed, very soft to soft, very thin beded	
DS DSm	1500 2500	Nat. Nat.	1500 2500	16.8	115		10, 25, 25		with claystone/siltstone portions	
						15				
						18	15, 25, 35		sandstone friable - consistency like clayey sand	

BORING LOG

JOB NAME: Proposed Residential Development

JOB NO.: PACIQ-01-00

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						21				
DS DSm	2000 3000	Nat. Nat.	3000 4000	9.0	135	24	10 25 30			
									Boring terminated at 24.5 feet. Backfilled with neat cement and capped with soil.	No groundwater encountered.
						27				
						30				
						33				
						36				
						39				

BORING LOG

JOB NAME: Proposed Residential Development
CLIENT: LegacyQuest, Inc.
LOCATION: APN 022-083-20 & -30, Fassler Ave., Pacifica
DRILLER: Britton Exploration
DRILL METHOD: Track Mounted CME-75 w/ 4½" flight augers

JOB NO.: PACIQ-01-00
DATE DRILLED: 03/22/05
ELEVATION: 292± feet
LOGGED BY: MT
CHECKED BY:

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0		SC	CLAYEY SAND WITH GRAVEL, orange brown, moist, loose	
DS DSm	1000 2000	Nat. Nat.	1000 1800	17.2	113	3	8, 6, 7			
								OH CL	ORGANIC FAT CLAY, dark gray brown/black, moist, soft to medium stiff, high plasticity	
DS DSm	1000 2000	Nat. Nat.	1300 2100	20.2	106	6	6, 14, 15		LEAN CLAY WITH FINE SAND, brown, moist, stiff, medium plasticity increasing sand content	
								SC	CLAYEY SAND, trace gravels, orange brown, moist, very dense	
				8.8	125	9	14, 30, 45			
						12		ROCK	SANDSTONE, orange brown, moist, decomposed to intensely weathered, very thin bedded	Bedrock
				10.1	125		14, 50			
						15			dry, intensely weathered	
						18	7, 45, 40			

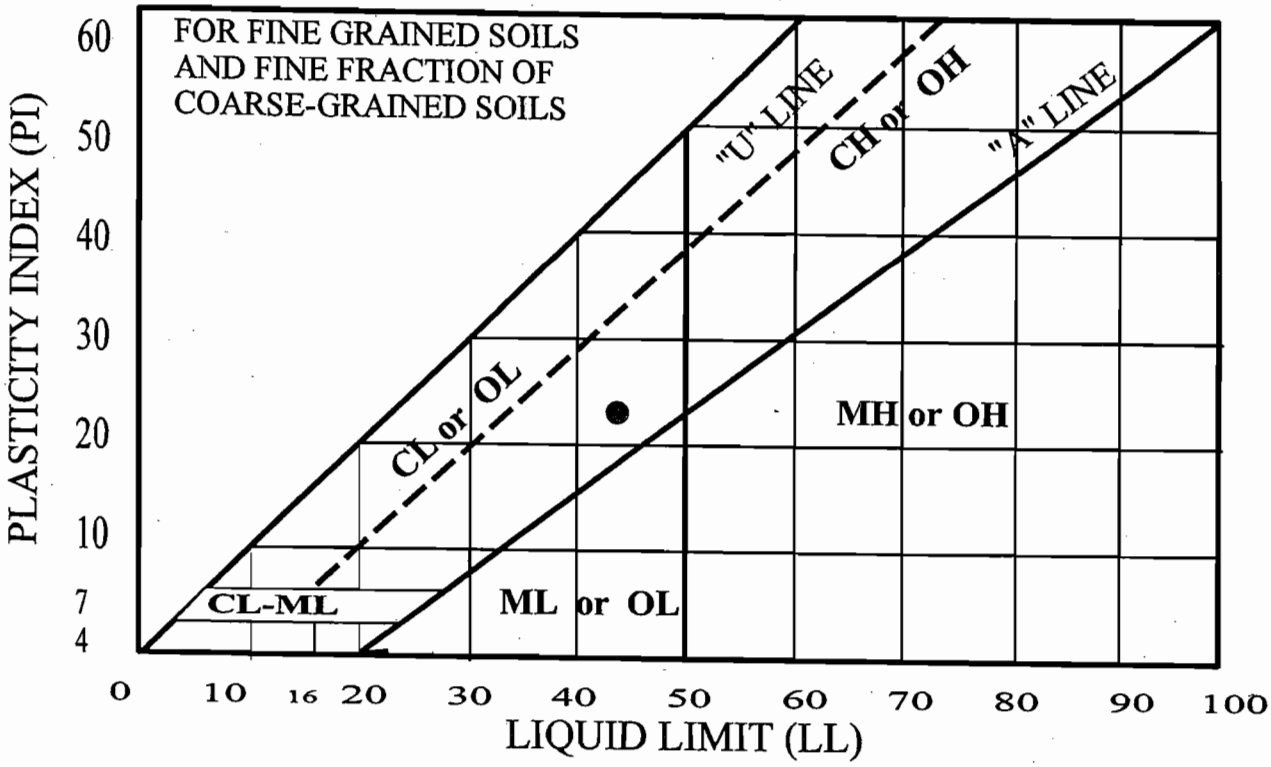
BORING LOG

JOB NAME: Proposed Residential Development

JOB NO.: PACIQ-01-00

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						21	30 50		friable, consistency like cemented sand	
						24			Boring terminated at 24.0 feet. Backfilled with neat cement and capped with soil.	No groundwater encountered.
						27				
						30				
						33				
						36				
						39				

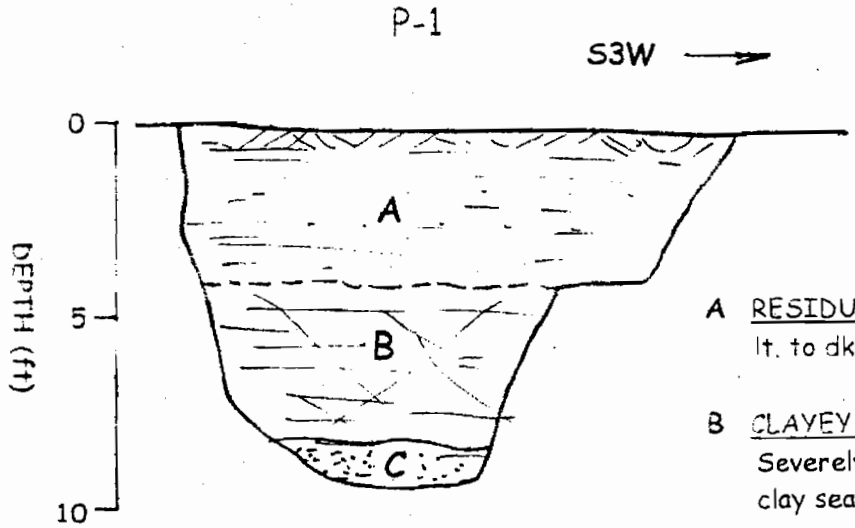
PLASTICITY CHART



SYMBOL	SAMPLE SOURCE	DEPTH (FEET)	NATURAL WATER CONTENT W[%]	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SOIL DESCRIPTION
●	B-1	5½	14.3	43	21	22	Brown SANDY LEAN CLAY (CL)

PROPOSED RESIDENTIAL DEVELOPMENT FASSLER AVENUE PACIFICA, CALIFORNIA	PLASTICITY DATA		
	Job No. PACIQ-01-00	Date April 2005	Plate 17

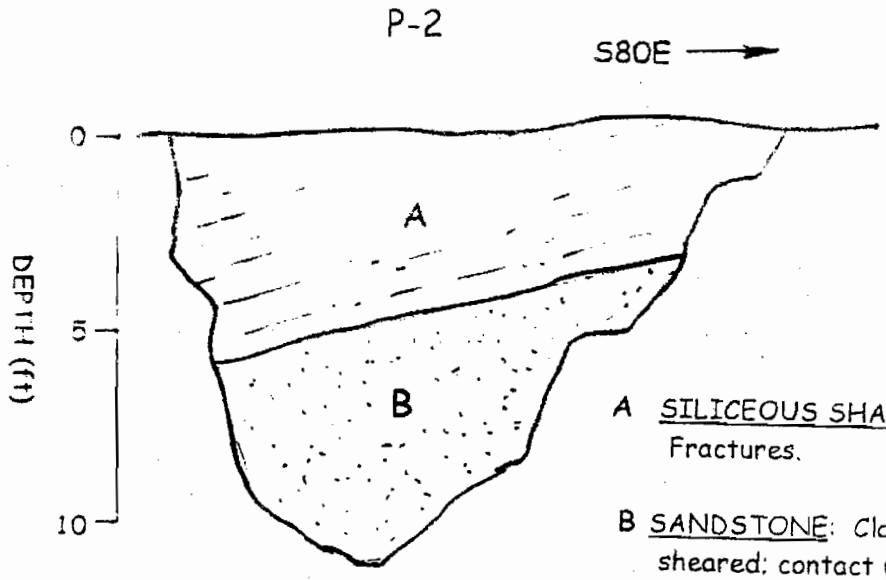
BAGG



A RESIDUAL SOIL: Gravelly Clay; lt. to dk. yel. orange; moist.

B CLAYEY SILTSTONE: Very Severely weathered; fractured; clay seams; digs easily to 8'

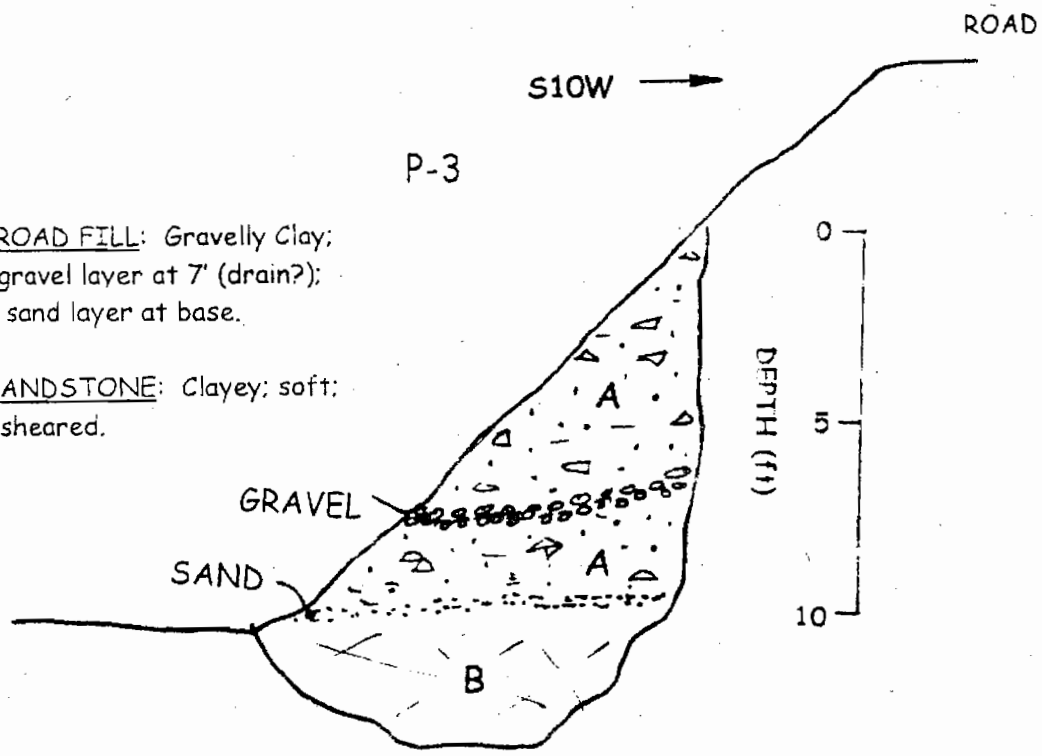
C SANDSTONE w/calcite seams: Refusal at 9'.

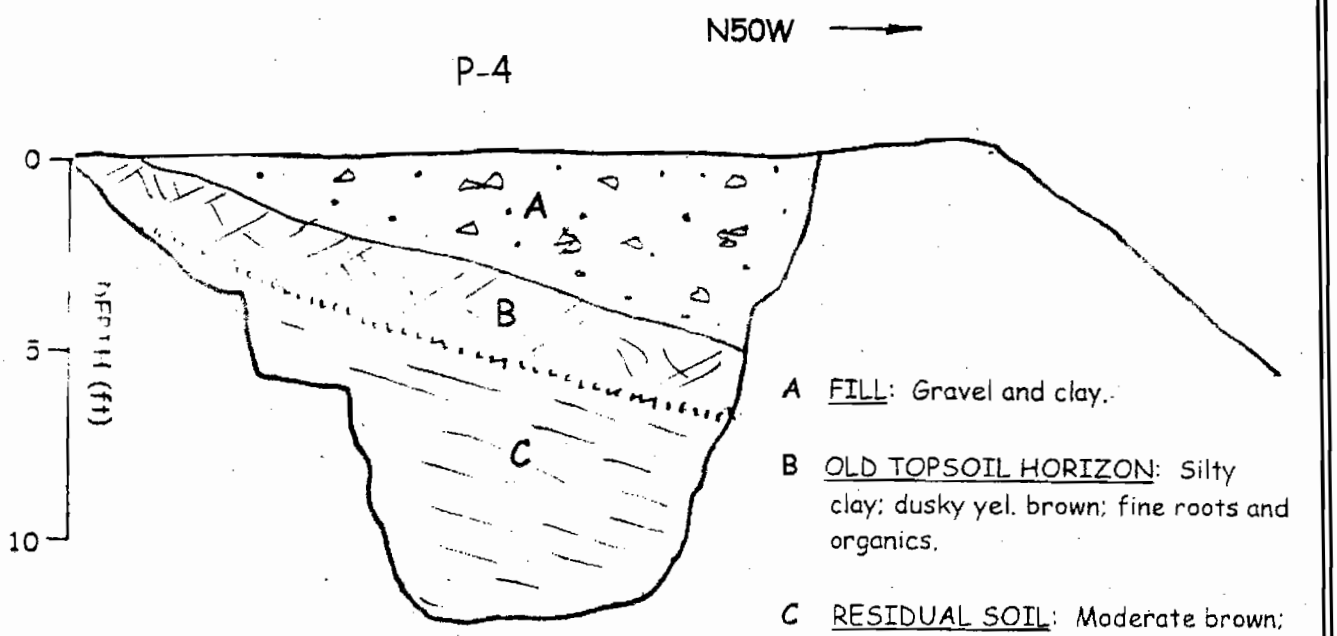


A SILICEOUS SHALE: Calcite in Fractures.

B SANDSTONE: Clayey; soft; sheared; contact w/shale dips 15 deg. NE.

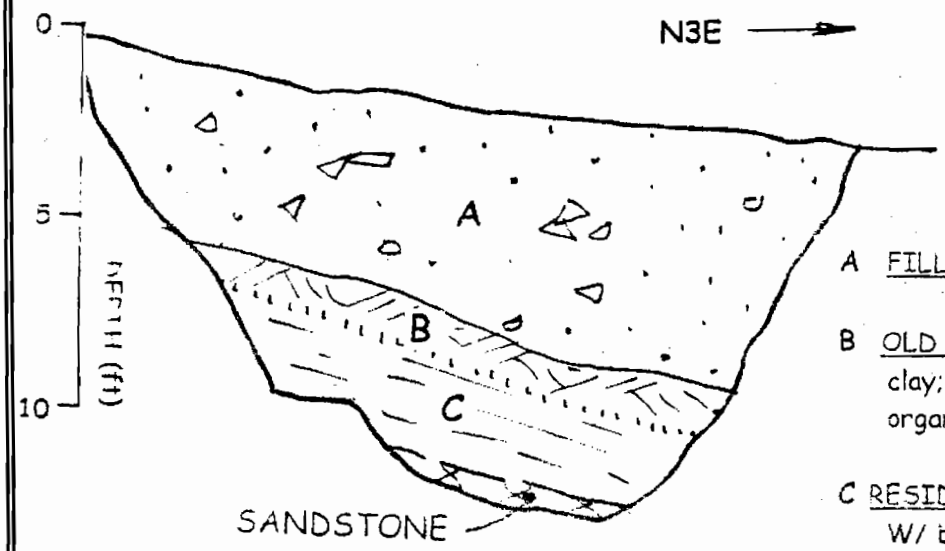
PROPOSED RESIDENTIAL DEVELOPMENT FASSLER AVENUE PACIFICA, CALIFORNIA	TEST PIT LOGS			
	JOB NO. PACIQ-01-00	SCALE 1" = 5'	DATE April 2005	PLATE 18





PROPOSED RESIDENTIAL DEVELOPMENT FASSLER AVENUE PACIFICA, CALIFORNIA	TEST PIT LOGS			
	JOB NO. PACIQ-01-00	SCALE 1" = 5'	DATE April 2005	PLATE 19

P-5

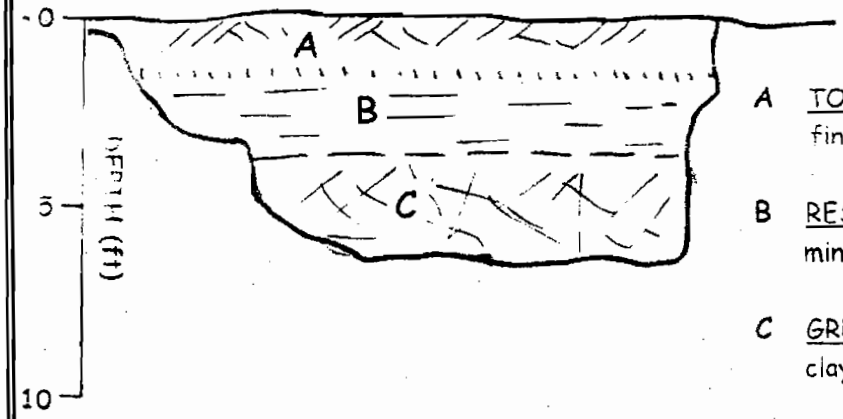


A FILL: Gravel and clay.

B OLD TOPSOIL HORIZON: Silty clay; dusky yel. brown; fine roots and organics.

C RESIDUAL SOIL: Clay: mod. brn. W/ black mottling; soft ss gravel.

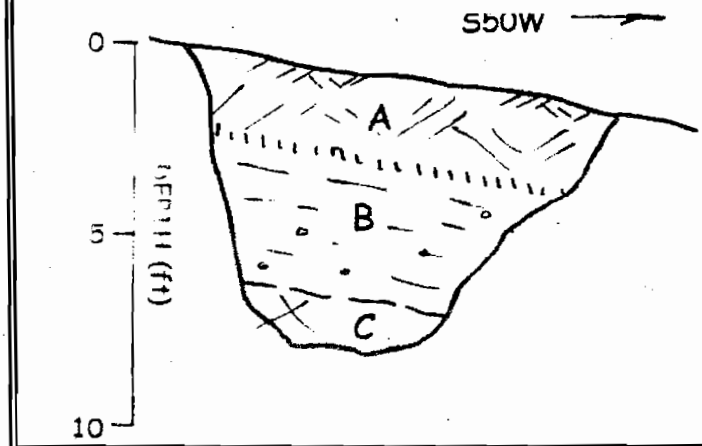
P-6



A TOPSOIL: Silty clay; dusky yel. brown; fine roots and organics.

B RESIDUAL SOIL: Clay; mod. yel. orange; minor soft gravel; moist.

C GREENSTONE: Moderately weathered; clayey; fractured.

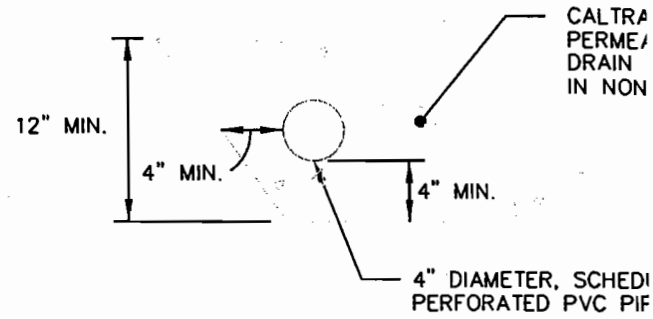


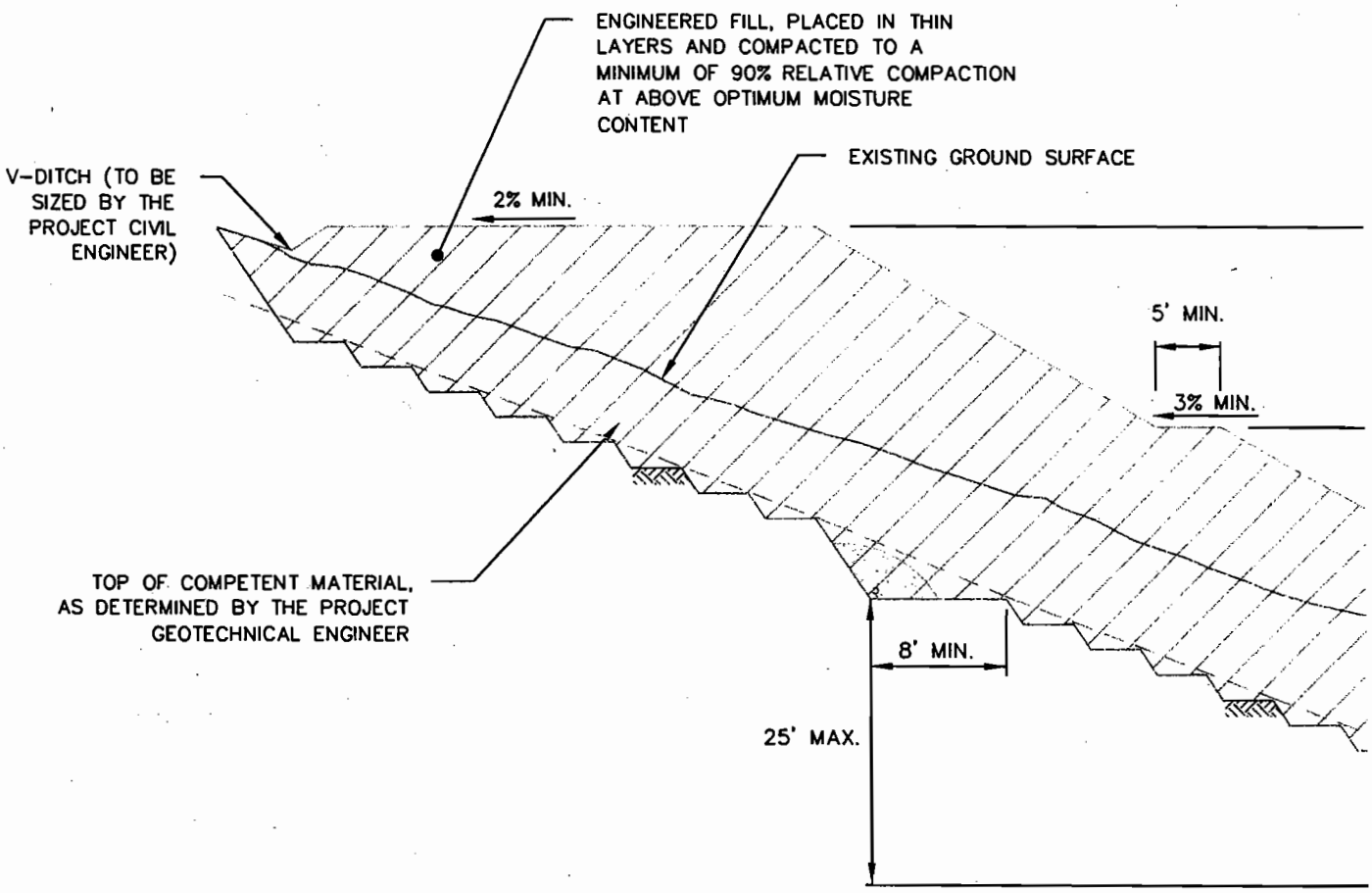
A TOPSOIL: Silty clay; dusky yel. brown; fine roots and organics.

B RESIDUAL SOIL: Gravelly, silty clay; dk. yel. brown; moist.

C SILTSTONE: Clayey; fractured; weak.

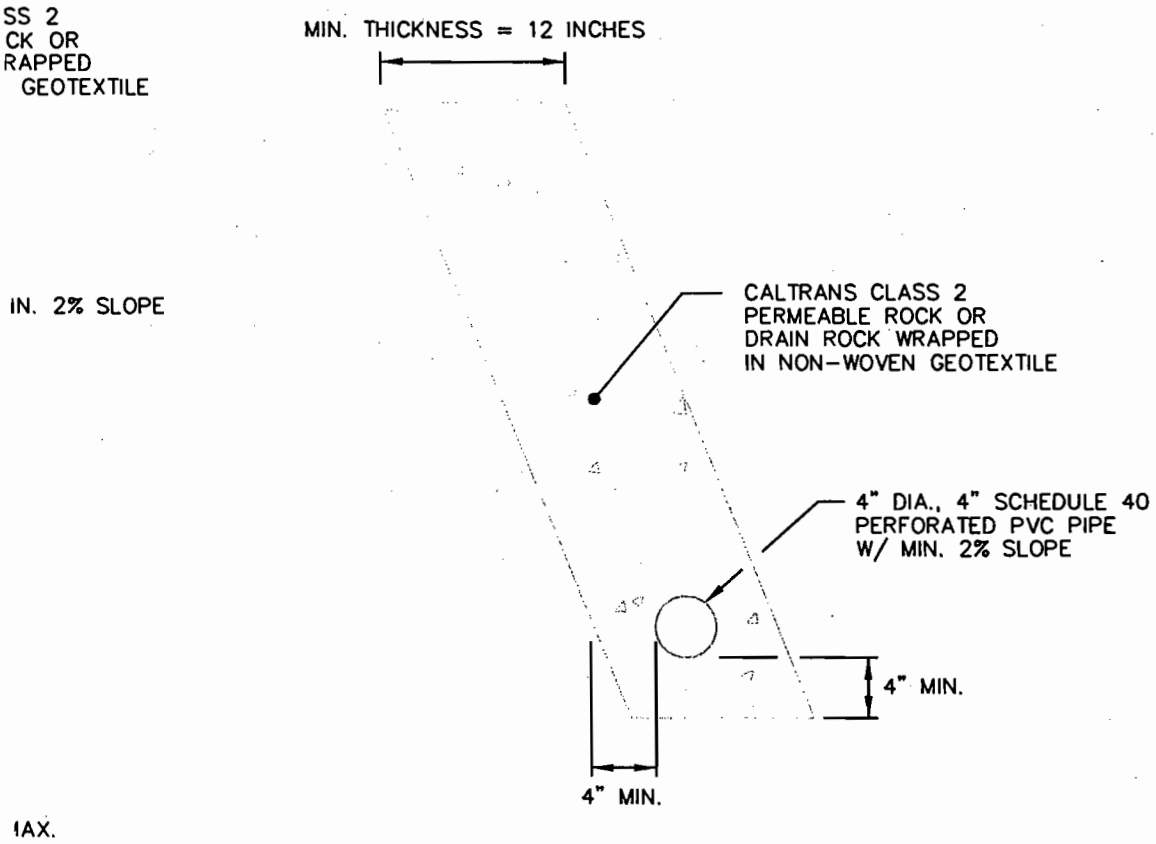
PROPOSED RESIDENTIAL DEVELOPMENT FASSLER AVENUE PACIFICA, CALIFORNIA	TEST PIT LOGS			
	JOB NO. PACIQ-01-00	SCALE 1" = 5'	DATE April 2005	PLATE 20

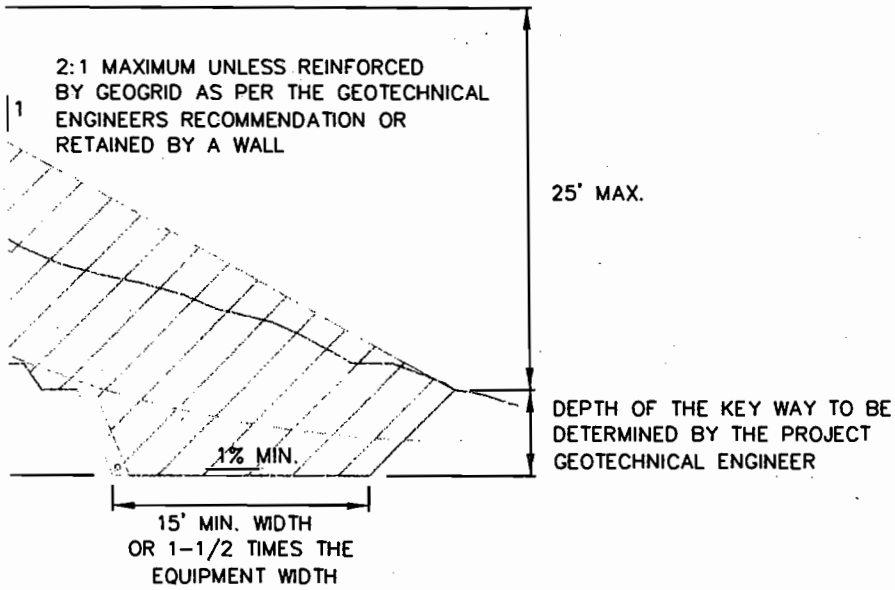




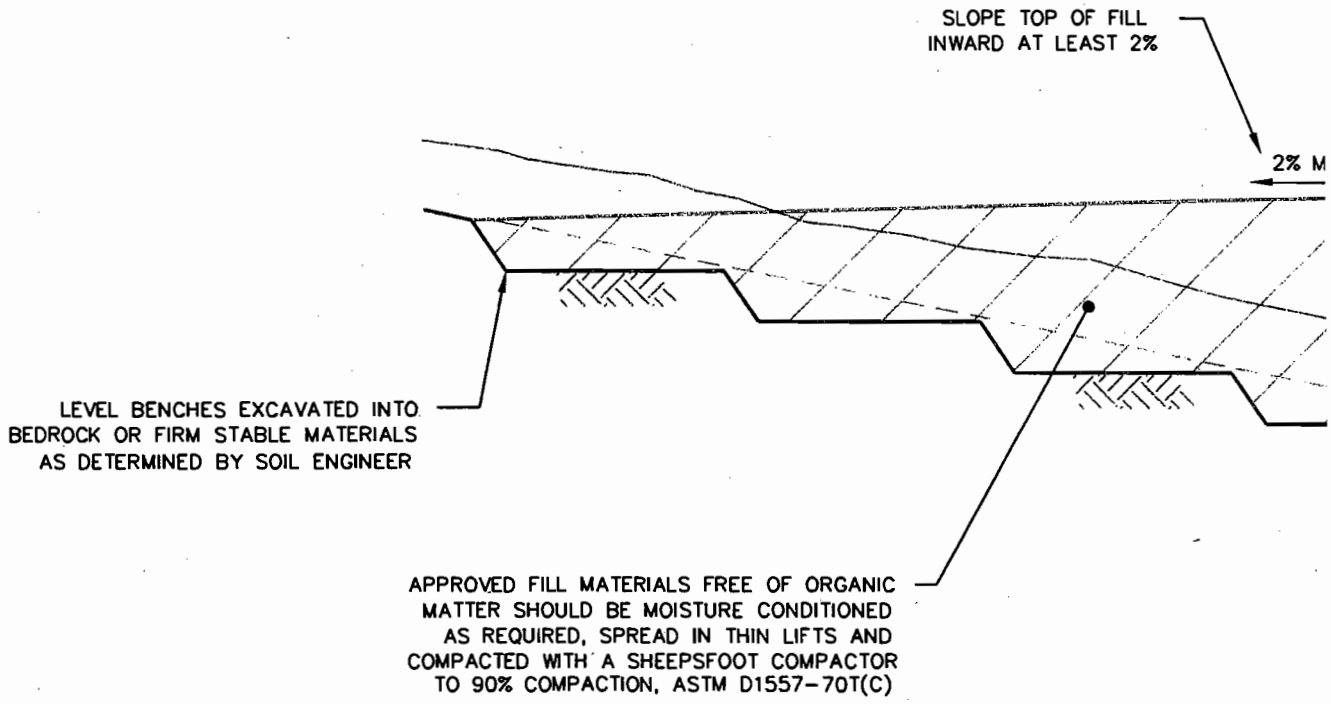
SCALE: N.T.S.

PROPOSED RESIDENTIAL DEVELOPMENT
FASSLER AVENUE
PACIFICA, CALIFORNIA



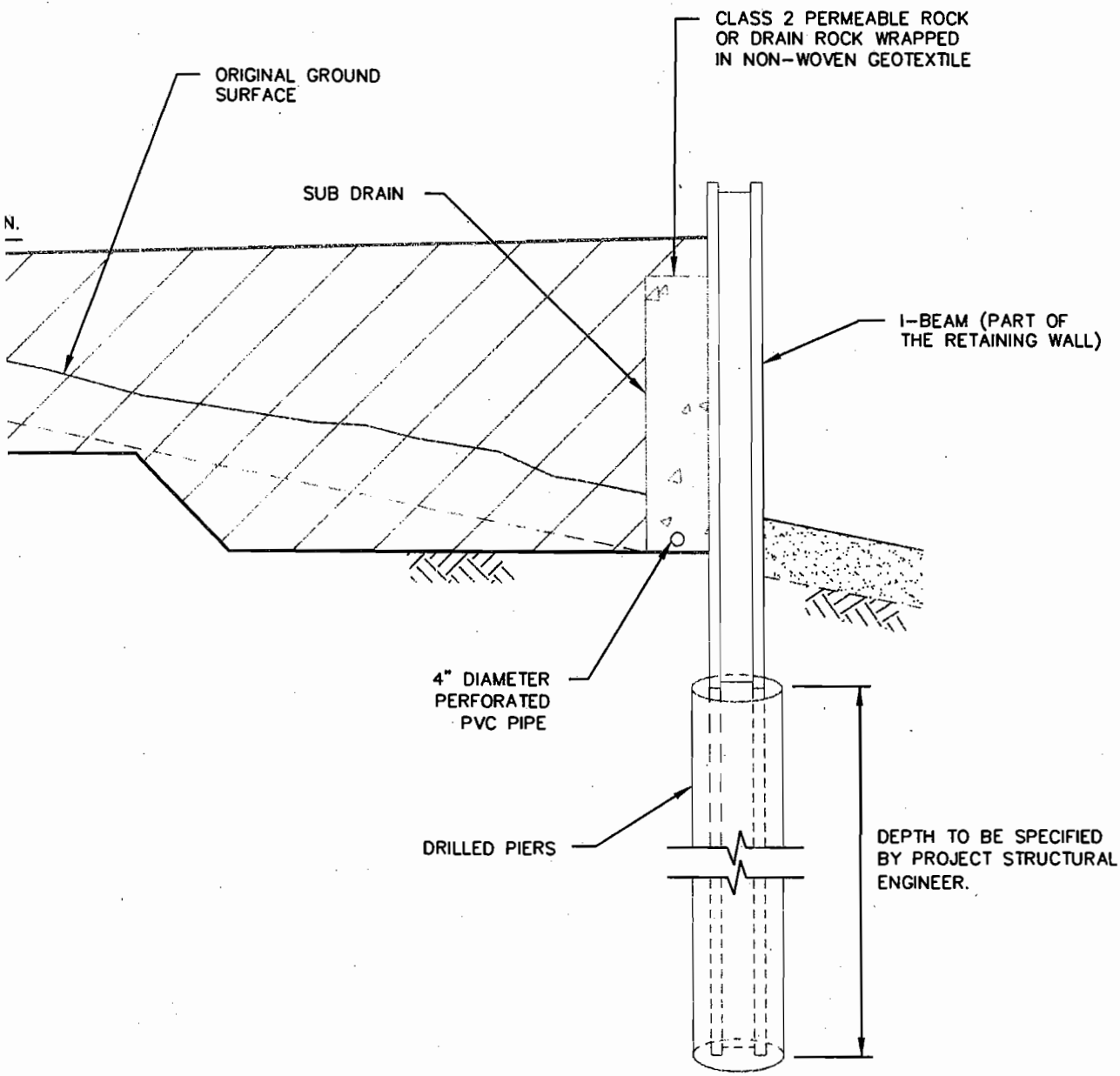


GAEG	**SCHEMATIC FOR FILL PLACEMENT ON SLOPING GROUND**		
	JOB NO. PACIQ-01-00	**DATE** 4/21/2005	**PLATE 21**



SCALE: N.T.S.

PROPOSED RESIDENTIAL DEVELOPMENT
FASSLER AVENUE
PACIFICA, CALIFORNIA



RETAINING WALL BACKFILL

JOB NO.	DATE	PLATE 22
PACIQ-01-00	4/21/2005	

APPENDIX E
TRAFFIC AND TRANSPORTATION TECHNICAL REPORTS

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E1: Dowling Associates, Inc., Fassler Avenue Residential Project Traffic Study, July 28, 2005

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Dowling Associates, Inc.
Transportation Engineering • Planning • Research • Education

July 28, 2005

Mr. Rick Lee
Home Pride Construction, Inc.
716 Corona Drive
Pacifica, CA 94044

Subject: Fassler Ave. Residential Project – Traffic Study

Dear Rick:

Dowling Associates, Inc. is pleased to present this final report documenting our traffic impact study efforts. We conducted the analysis consistent with methodology and assumptions discussed with City staff. The report incorporates changes made to accommodate concerns expressed in three comment letters, and specific responses to those comments are included in Appendix A.

We found that there would be a traffic impact to the State Route 1 / Reina del Mar Avenue intersection under Cumulative conditions, with or without the project. We have highlighted your proposal to start a vanpool program as the best way to mitigate new trips generated by the development, but, in order to be consistent with the CEQA process, we identified more traditional mitigation measures for the intersection that would reduce the impact to less-than-significant.

I have enjoyed working with you on this project, and will be glad to assist you if you have any further needs related to our traffic analysis.

Sincerely,
Dowling Associates, Inc.

Marty Beene, P.E.
Vice President

180 Grand Avenue • Suite 250 • Oakland, CA 94612 • (510) 839-1742 • Fax (510) 839-0871
www.dowlinginc.com

Final Report for:

Traffic Impact Study
Fassler Avenue Project

Prepared for:
Home Pride Construction

Submitted by:

Dowling Associates, Inc.
Transportation Engineering • Planning • Research • Education
180 Grand Avenue, Suite 250
Oakland, CA 94612
Phone: (510) 839-1742; Fax: (510) 839-0871
www.dowlinginc.com
Contact: Marty Beene, P.E.

July 28, 2005

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Appendix B – Level of Service Calculation Output

Introduction

The purpose of this report is to document traffic impact analysis for a proposed project in Pacifica, California. This report may or may not be used in formal environmental analysis documentation that would be conducted under California Environmental Quality Act (CEQA) regulations. Further studies might be necessary later to satisfy that process. The proposed project would be located along the north side of Fassler Avenue, between Roberts Road and Driftwood Circle. Figure 1 shows the location of the proposed project.

Map created with TOPO! © 2004 National Geographic

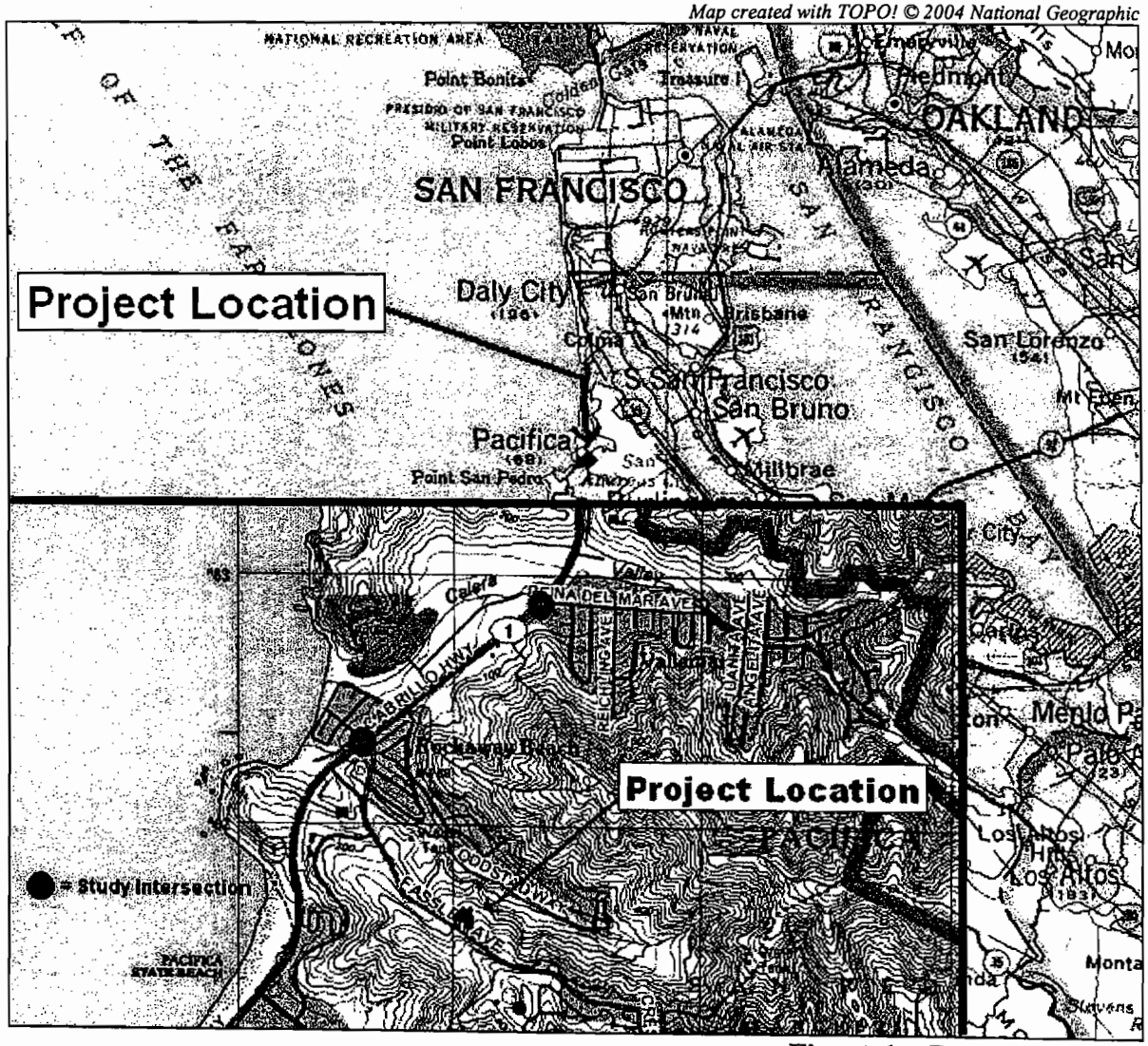

Figure 1 – Project Location

In order to evaluate traffic impacts, three intersections were studied: the proposed intersection on Fassler Avenue that would serve the project; and two intersections along State

Route 1 (SR1), SR1/Fassler Avenue, and SR1/Reina del Mar Avenue. The two SR1 intersections are both signalized and are indicated in Figure 1 with green circles.

Setting and Existing Conditions

Roadways

Fassler Avenue serves as a collector street for several residential developments east of State Route 1 (SR1). In the vicinity of the proposed project, approximately 0.6 miles from SR1, Fassler Avenue transitions from four lanes to two lanes. The speed limit on Fassler Avenue is 35 mph. There is a relatively steep grade of about 9% on Fassler Avenue in the vicinity of the proposed project – it drops approximately 300 feet from Driftwood Circle to Roberts Road, a distance of 0.6 miles. On the west side of SR1, Fassler Avenue serves a commercial area that borders the Pacific Ocean.

State Route 1 (SR1) is an arterial roadway in the project vicinity that serves the communities along the Pacific Ocean south of San Francisco. In the project vicinity, it consists of four lanes, and has a speed limit of 45 mph. There are two signalized intersections in the project vicinity, both of which were studied for this analysis.

SR1/Reina del Mar Ave.

- SR1/Reina del Mar Avenue is a four-legged intersection with protected left-turn phasing (left-turning traffic is served by separate, protected phases) for the north-south directions and split phasing (left, through, and right movements all proceed together, separate from the opposite direction) for the east-west directions. This intersection has single left-turn lanes for the northbound and southbound SR1 approaches. On the westbound approach, there are two lanes, a right-turn lane and a shared left-through-right lane. Pedestrians are prohibited from crossing the north leg of the intersection.

SR1/Fassler Ave.

- SR1/Fassler Avenue is a four-legged intersection with the same basic signal configuration as SR1/Reina del Mar Avenue. There are two left-turn lanes for the southbound SR1 approach, and two right-turn lanes for the westbound Fassler Avenue approach. These two right-turn lanes are served by an "overlap" phase in which they receive a green right arrow during the time when the southbound approach left-turns have a green light. Eastbound

approach right-turn traffic (heading toward southbound SR1) is not technically controlled by the traffic signal – that movement is subject to a yield sign near the intersection. Pedestrians are prohibited from crossing the north and west legs of the intersection. There is an unsignalized intersection (serving Harvey Way) very close to this intersection, just to the east – there is "KEEP CLEAR" text on the pavement to keep the access to Harvey Way from being blocked by queues.

Reina del Mar Avenue is another collector street that serves a small area than Fassler Avenue, and one which includes some commercial uses and Vallemar School, in addition to residential areas. It consists of two lanes and has a speed limit of 25 mph. On the west side of SR1, it ends a short distance from the State Route at a parking lot which serves as a staging area for a recreational path. There is also a driveway that leads to a solid waste handling facility.

Transit

Several SamTrans bus routes serve the area. Routes CX, DX, 16, 110, 112, and 140 all travel along SR1. Routes 16 and 140 also travel along Fassler Avenue. There are bus stops near both the SR1/Fassler and SR1/Reina del Mar intersections, including a shelter for northbound travel just north of Reina del Mar. Routes CX, DX, and 16 operate only during weekday commute periods with headways approximately 20-30 minutes apart. Routes 110 and 112 generally operate on 60-minute headways during the week, while Route 140 operates on 20-30 minute headways.

Vehicular Traffic

Peak period vehicular traffic in the area tends to be very directional, since much of the area in the project vicinity is residential: people generally drive to their jobs in the morning and return to their homes in the evening. Most of the jobs in the region that people might travel to are located to the north of the study area, toward San Francisco.

Peak period traffic counts were conducted at the two existing study intersections on a weekday during a week without a major holiday. A mechanical count was also conducted near the location of the proposed project. The results of the counts are shown in Figure 2.

Level of service analysis for the signalized intersections was conducted using the *Highway Capacity Manual (HCM)* methodology in Synchro software. TRAFFIX software was used to calculate the *HCM*-based level of service for the proposed unsignalized intersection that would serve the project. Level of service is a grading system used to describe overall traffic operations at intersections, with LOS A being the best results and LOS F being the worst. LOS D is usually considered to be the worst acceptable result for signalized intersections. The level of service is calculated by entering several inputs, such as traffic volumes and intersection lane geometry, into formulas that yield an average delay for vehicles at the intersection. For unsignalized intersections, such as what is anticipated at the access intersection for the proposed project, similar calculations are performed, but the reported

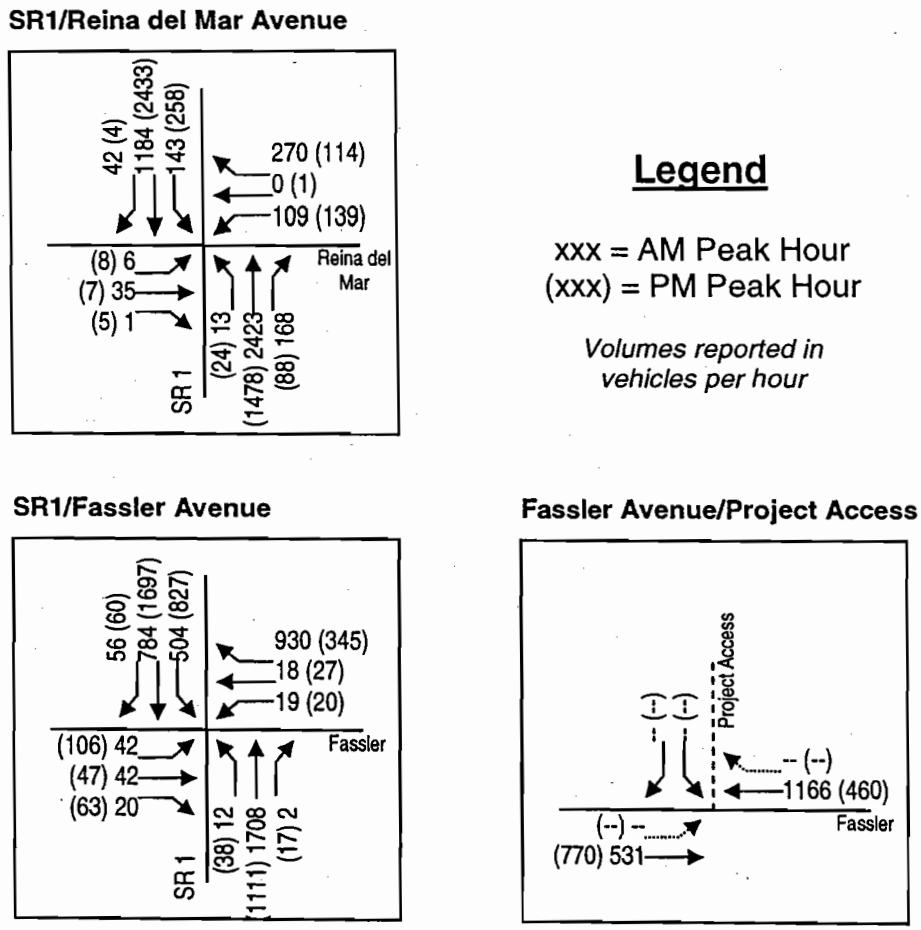

Figure 2
Existing Traffic Volumes

result is the worst operating approach. For unsignalized intersections, LOS E is usually considered the worst acceptable result. This study uses LOS D and LOS E as the standards of significance for signalized and unsignalized intersections, respectively.

Both of the signalized study intersections were found to operate at LOS D during the AM peak hour and LOS C during the PM peak hour. The calculated average delay for vehicles at the SR1/Fassler intersection is 35.5 seconds per vehicle during the AM peak hour and 33.5 seconds per vehicle during the PM peak hour. For SR1/Reina del Mar, the calculated delays are 39.3 for AM and 24.1 for PM conditions. Average delay greater than 55.0 seconds per vehicle would be LOS E.

Project Analysis

The proposed project would consist of 34 single family homes. In order to analyze the potential traffic impact of the project, trip generation, distribution, and assignment was conducted. Trip generation is a calculated estimate of the number of vehicle trips that would occur during the peak hour of traffic. Trip distribution is an estimate of the general origins and destinations of the new trips. Trip assignment is assigning the individual vehicle trips to study intersections based on the estimated trip distribution. The estimates of trip generation used the Institute of Transportation Engineers' (ITE) *Trip Generation* manual, which documents field studies of many different types of land uses. Trip distribution was estimated based on existing travel patterns documented by the traffic counts. The trip assignment was relatively straightforward for this analysis because there are not many alternate routes for travelers – indeed, the trips were assigned using only the most logical travel routes, given the estimated trip distribution.

Based on the data from *Trip Generation*, the proposed project would generate an estimated 33 trips during the AM peak hour (8 inbound, 25 outbound) and 41 trips during the PM peak hour (26 inbound, 15 outbound). Figure 3 shows the project trip assignment for the study intersections and Figure 4 shows the Existing plus Project traffic volumes.

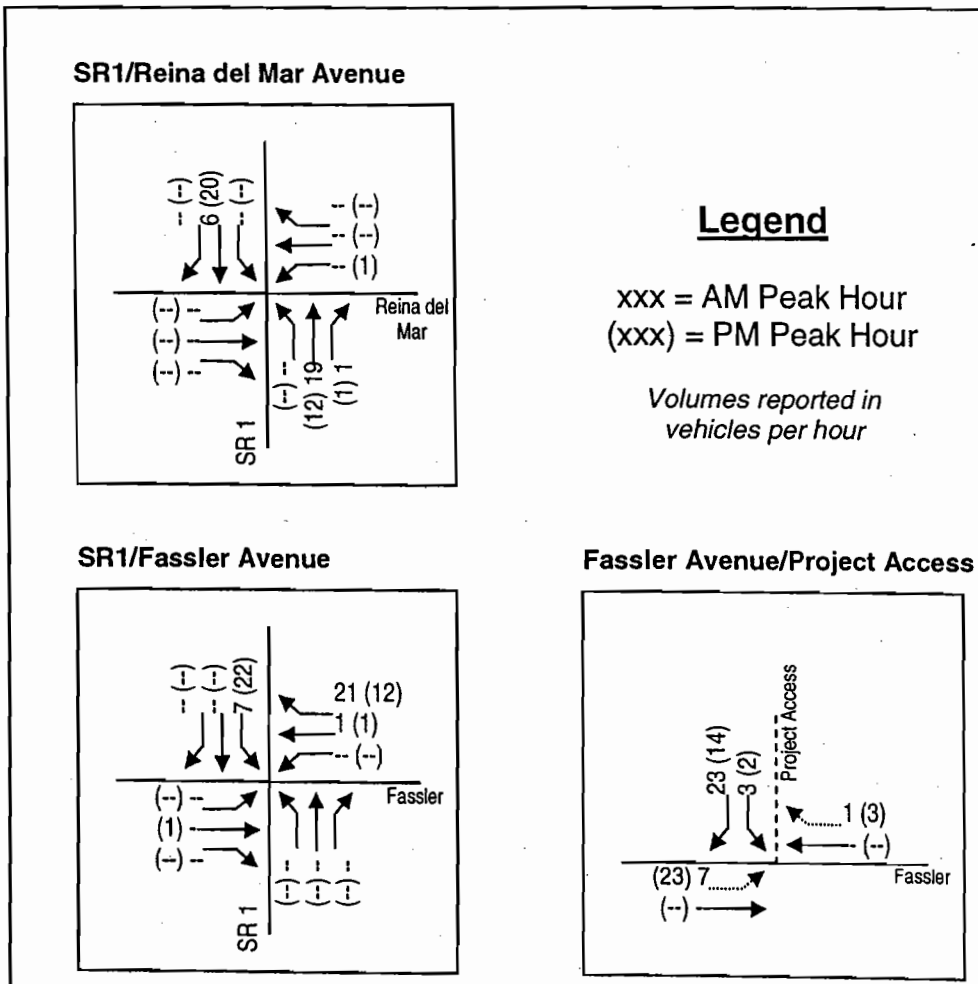

Figure 3
Project Trip Assignment

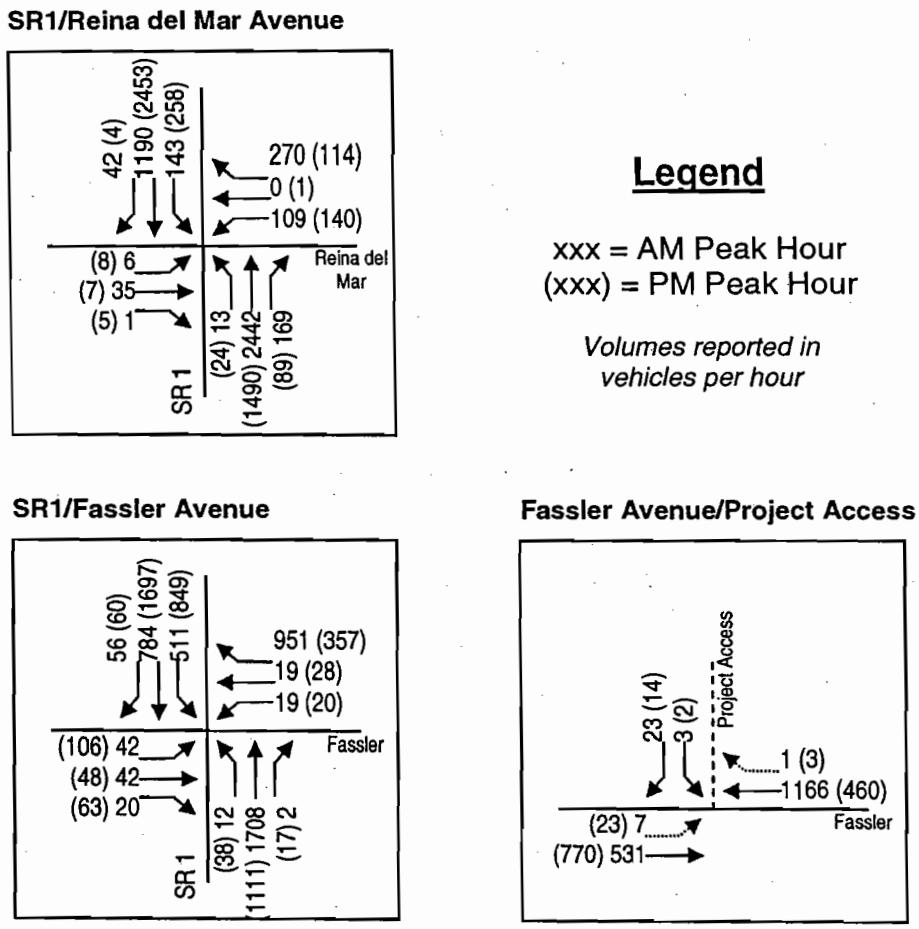

Figure 4
Existing plus Project Traffic Volumes

Level of service analysis was conducted for Existing plus Project conditions to determine if there would be any short-term traffic impacts to the study intersections. Vehicles at both signalized intersections would experience slightly higher average delay, but would remain at the same level of service, so there would be no short-term traffic impact. At the intersection that would serve the proposed project, the worst approach level of service would be LOS D during the AM peak hour and LOS B during the PM peak hour.

Cumulative Conditions

CEQA regulations demand that future traffic conditions be evaluated and that mitigation measures be identified where there are significant impacts, whether or not the project contributes significantly to the impact. Mitigation measures, if any, should be reasonably feasible. In order to do so, even though the project is not currently undergoing formal CEQA-related studies, traffic volumes were estimated using methodology agreed upon in consultation with City staff. The existing volumes were grown to a future year level, and known nearby projects were also included. For this analysis, the existing counts were subjected to a 1% per year growth rate for 10 years (to 2015). This growth rate is typical for areas which are not completely built out, and is consistent with growth of jobs and households projected by the Association of Bay Area Governments (ABAG) for Pacifica in their latest publication of land use projections, *Projections 2005*.

City staff provided information for one nearby proposed project to be included in the Cumulative scenarios, informally referred to as "The Rock," because of its location near a rock formation southeast of the SR1/Fassler intersection. Often, only approved projects are included in this type of analysis, but staff asked that it be included in this study, even though it is not yet approved. Based on information provided by City staff, that development was assumed to be 63 condominium units and 24,000 square feet of retail space, and, using the trip rate sources provided by City staff that were included in the traffic study for it, would generate 82 trips during the AM peak hour and 158 trips during the PM peak hour. These trips were distributed using the same information as for the proposed project. The result of the background growth and the trips from The Rock are the Cumulative without Project traffic volumes.

The trips from the proposed project were then added to the Cumulative without Project volumes to result in the Cumulative with Project volumes, which are shown in Figure 5. Level of service calculations were then conducted, just as for the Existing scenario. The intersection serving the project was found to operate at the same levels of service as under the Existing plus Project case (LOS D AM and LOS B PM).

The SR1/Fassler intersection would operate at LOS D during the AM peak hour, while the SR1/Reina del Mar intersection would operate at LOS E during the AM peak hour, with or without the proposed project. During the PM peak hour, with or without the proposed project, both intersections would operate at LOS D. The LOS E result for SR1/Reina del Mar during the AM peak hour constitutes a traffic impact for which mitigation measures must be researched.

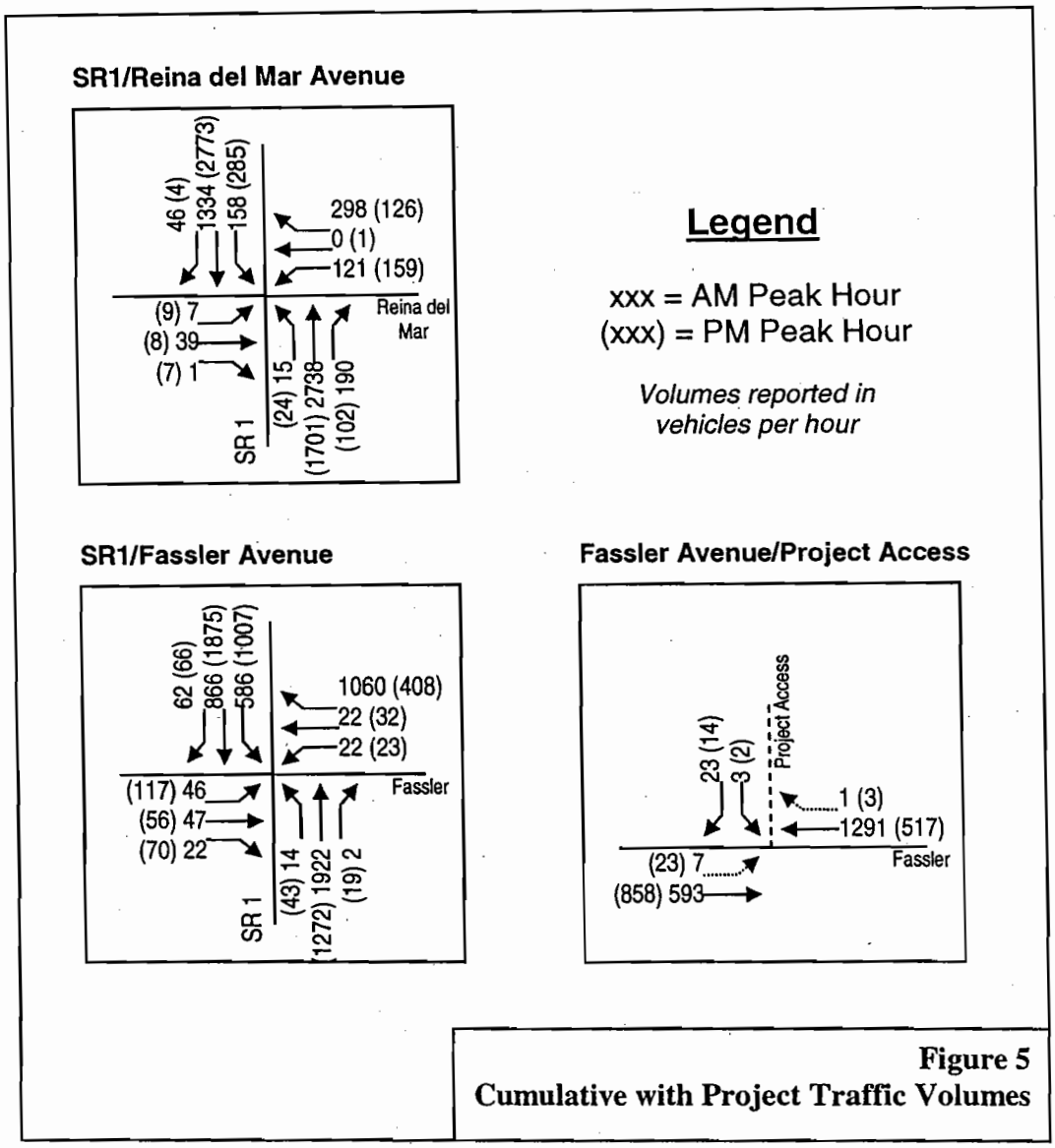

Figure 5
Cumulative with Project Traffic Volumes

Mitigation Measures

The project applicant has proposed to contribute to a vanpool program serving schoolchildren in the neighborhood of the proposed project. A significant number of trips during the AM peak hour are related to families in this neighborhood traveling up SR1 to Reina del Mar, dropping their children off at the school on that street, then returning to the neighborhood. If 20-30 families took advantage of the vanpool, there would be approximately zero trips added to the roadway network during the AM peak hour. It is even possible that there could be a net reduction in AM peak hour trips if the vanpool is more successful than anticipated. City staff have indicated that they are receptive to this concept. The concept, while not a traditional kind of mitigation measure for intersection level of service impacts, is actually a more direct

way of addressing increasing traffic: reducing the number of trips generated. Indeed, hypothetically, if every project were to treat impacts of trip-generating projects like this, traffic would not grow as much, and levels of service would be more likely to stay within the acceptable range of values.

Because this proposed project will likely undergo a CEQA-governed environmental evaluation process of some kind, and because the vanpool concept may not qualify as a sufficient mitigation measure under CEQA regulations, a more traditional kind of mitigation measure has been identified. This mitigation measure may or may not ever be constructed, but general feasibility has been considered.

For the SR1/Reina del Mar intersection, two modifications would be needed to mitigate the Cumulative (with or without the project) level of service impact to a less-than-significant level: a second southbound left-turn lane, and addition of a right-turn overlap for the westbound approach right-turn movement, similar to the one at Fassler Avenue. If lane and shoulder widths for the roadway are to remain the same, some widening (approximately 400 feet long, six feet at the widest point, tapering to match the existing roadway and path) of SR1 would be required. Widening of the roadway would be possible by obtaining permits from various agencies – a process that could prove lengthy but that does exist. Addition of a second lane on eastbound Reina del Mar to receive the second left-turn lane would likely require some right-of-way purchase and construction. Also, the westbound approach would need to be re-striped so that the left lane is a shared left-through (not left-through-right) and the right lane would remain an exclusive right-turn lane.

Mitigation Measure Cost

Due to widely varying costs of potential environmental mitigations related to the mitigation measures identified above, it is beyond the scope of this study to calculate an estimated cost for them. The final determination of how the project will address its share of responsibility for this (or any other) mitigation measure will be made during the formal CEQA process.

APPENDIX A

Comment Letters and Responses

STATE OF CALIFORNIA—THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER GOVERNOR

CALIFORNIA COASTAL COMMISSION
NORTH CENTRAL COAST DISTRICT
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5260
FAX (415) 904-5400

May 23, 2005

Kathryn Farbstein
City Hall
170 Santa Maria Avenue
Pacifica, CA 94044-2506

RE: Fassler Avenue Residential Development

Dear Ms. Farbstein:

The purpose of this letter is to provide some preliminary comments on the proposed residential development at Fassler Avenue (APNs 022083020 and 022083030). According to the April 27, 2005 Traffic Impact Study, the proposed development would result in cumulative adverse impacts at the Highway 1 intersection at Reina del Mar, lowering the Level of Service to E during the AM peak hours. The recommended mitigation for these impacts includes a second southbound left-turn lane and addition of a right-turn overlap for the westbound approach right-turn movement. The report states that "addition of the second southbound left-turn lane would likely require some construction beyond additional striping for the eastbound direction of Reina del Mar in order to have sufficient width to receive two lanes of left-turning traffic." At this point, it is unclear what the exact traffic mitigation measures would entail, specifically with respect to any road expansion at the intersection of Highway 1 and Reina del Mar. We hope that a detailed description of any proposed roadwork on Highway 1 along with a comprehensive analysis of environmental impacts will be made available soon for project review.

While the specifics of Highway 1 expansion at Reina del Mar are not before us, there are some general concerns regarding development at this site, detailed in previous Commission staff letters to the City addressing the Pacifica Village, Calera Parkway, and Thalapaneni projects that we would like to reiterate:

- Coastal Commission Permit Jurisdiction. Any widening of Highway 1 at Reina del Mar would require a coastal development permit from the Coastal Commission as the site is within an area of deferred certification in the City of Pacifica's LCP. The application should be submitted directly to the Commission and the standard of review would be Chapter 3 policies of the Coastal Act.
- ESHA and Wetlands. The section of Highway 1 that would be expanded as traffic mitigation for the proposed residential development on Fassler Avenue is part of the Pacifca Quarry site, which contains wetland, stream, and riparian habitats that host San Francisco garter snake, California red-legged frog, western pond turtle and other special-status species. The area supports one of the few remaining breeding habitats for the San Francisco garter snake and is thus critical for the long-term viability of this endangered

species. Due to the presence of the special-status species and the function of the site as San Francisco garter snake breeding habitat, the Pacifica Quarry area is an environmentally sensitive habitat area (ESHA) under the California Coastal Act. Roadway expansion projects resulting in wetland fill or adverse impacts to ESHA would conflict with Sections 30233 and 30240 of the California Coastal Act. As confirmed by the California Court of Appeal, both the relocation of environmentally sensitive habitat areas and filling of wetlands for roadway expansion projects are prohibited under the California Coastal Act (*Bolsa Chica Land Trust v. Superior Court* (1999) 83 Cal.Rptr. 850.)

While the exact impacts of this particular traffic mitigation measure for the proposed development are currently unclear, we hope that the City would take into consideration the concerns we have expressed above as project review progresses. I hope that you find these preliminary comments helpful. Please contact me at (415) 904-5267 if you have any questions concerning these comments or the Coastal Commission's role in permitting this project.

Sincerely,

Yinlan Zhang
Coastal Program Analyst
North Central Coast District

cc: Michael Crabtree, City of Pacifica Planning Director
Scott Holmes, City of Pacifica Public Works Director
Rick Lee, Pacifica Quarry Homes, LLC

What about our van-pool mitigation?
It is a net positive solution.

— Traffic —

Pick

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P. O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5505
FAX (510) 286-5559
TTY (800) 735-2929

Flex your power!
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JUN 15 2005
CITY OF PACIFICA

June 10, 2005

SM001335
SM-1-42.01

City of Pacifica
Planning & Economic Development Department
Pacifica, CA 94044

Dear Planning Staff

Pacifica Quarry Homes, LLC – Fassler Avenue Project – Traffic Impact Study

The California Department of Transportation (Department) has received a copy of the draft report for the Pacifica Quarry Homes, LLC – Fassler Avenue Project – Traffic Impact Study from Dowling Associates, Inc. We have reviewed the report and have the following comments to offer:

It is not clear as to whether the traffic counts at the intersections are output counts of the intersection or demand counts for the intersection. The traffic demand that wants to use the intersection should be the volume used in the intersection analysis. Output counts of the intersections do not take into account the queues upstream of the intersections that are not getting through the intersections.

On Page 5, Project Analysis, second paragraph, the trip numbers contain some errors. The addition of these numbers do not match that in Figure 3.

On Page 7, Cumulative Conditions, fourth paragraph, first sentence, the SR1/Fassler intersection would operate at Level of Service (LOS) D during the AM peak hour.... According to the Connemara project, which is a mixed-use condominium/retail development project, the AM peak hour level of service for the existing plus project condition at the SR1/Fassler intersection was LOS E (not including this subject project). Please clarify and explain.

Connemara is a error. Probably referring to Thalapeni Mixed-use development.

The intersection analysis should include the 50th and 95th percentile queue lengths in the intersection analysis output sheets for each scenario. Please provide this for our review.

In the intersection analysis for Reina del Mar/SR 1, Existing PM, the northeast left-turn volume does not match what is shown on Figure 2.

In the intersection analysis for Reina del Mar/SR 1, Existing + Project PM, the northeast left-turn volume does not match what is shown on Figure 4.

In the intersection analysis for Reina del Mar/SR 1, Cumulative + Project PM, the southwest through volume does not match what is shown on Figure 5.

Cumulative conditions should include existing conditions plus other approved and pending projects.

On Page 9, Mitigation Measure Cost, the Department concurs that the developer should provide a fair share of any future improvement towards any mitigation measures deemed necessary.

Should you require further information or have any questions regarding this letter, please call Alice Jackson of my staff at (510) 286-5988.

Sincerely,

Timothy C. Sable

TIMOTHY C. SABLE
District Branch Chief
IGR/CEQA

The City of Pacifica has an in-lieu fee Schedule that should apply. We don't want to be obligated to a percentage of future improvements.

Upon receipt of the requested information, the City will determine within 30 days whether your application is now complete. Please note that as the City processes your application, it may determine additional information is necessary to clarify, amplify, correct or supplement the information required for a complete application. For example, staff noticed that the traffic counts in the traffic report were lower than other similar studies in the area. Therefore, during environmental review of the traffic impacts, you will be asked to supplement or correct the information contained in the traffic study.

Appeal

You may appeal staff's determination that the application is incomplete to the Planning Commission within 10 days of the date of the determination as stated in Sections 9-4.3804 and 9-4304(d). Such appeals must be in writing and shall be filed with the Planning Director (Zoning Administrator). Upon receipt thereof, the Planning Director will forward the appeal, together with the record of the matter, to the Planning Commission. The Commission shall give notice of a public hearing as set forth in Section 9-4.3302.

Specific Plan

In addition to a Development ect as proposed. Thus, all the information requi lans: Submission (PD) will be required. Please ments to comply with this Section of the Code.

To:
Marty Beene

Other Comments

Attached is a letter from the derstand that the California Coastal Commissio s to your project. The Chief Building Official h quire peer review such as geotechnical, structur ant Fire Marshall noted that the fire access road ed to DOT bridge standards to support the weig will be required. Engineering staff noticed that r and Hwy 1, and Fassler Avenue and Hwy 1 i with other traffic studies recently done. Duri will need to be addressed and peer review ma

From:
Rick Lee

Environmental Issues

As we discussed previously, an Initial Study will be completed within 30 days of determining that the application is complete. The Initial Study will determine the type of environmental document to be prepared for the project.

Future Fees

It should be noted here that Zoning Code Sections 9-4.2205 (c) (1) and (c) (2) require the payment of planned drainage facilities fees if appropriate and the dedication of park and

Responses to Comments Made on April 27, 2005 Report

Letter from California Coastal Commission (May 23, 2005)

"...the proposed development would result in cumulative adverse impacts at the Highway 1 intersection at Reina del Mar..."

There was a level of service impact identified at this intersection under cumulative conditions. It is important to reiterate, as stated in the report, that this impact is expected to occur even if the project is not constructed.

"We hope that a detailed description of any proposed roadwork...will be made available soon..."

It is not likely the proposed project will be responsible for constructing this mitigation, if it ever is constructed. This mitigation measure, as noted above, is to address a cumulative level of service impact that would occur at some point in the future, even without this proposed project. Discussions with City staff have indicated that they are satisfied that the project developer's plan to assist in starting a van pool to serve school children will result in a net change of virtually zero AM peak hour trips.

There will be no comprehensive evaluation of environmental impacts until a project to construct the mitigation is actually proposed. However, some evaluation of the feasibility of the potential mitigation measure has been conducted in order to assess its general feasibility. Figure A-1 shows the existing and modified lane striping and roadway/path limits if the additional left-turn lane were constructed. It was assumed that the existing shoulder widths near the intersection would be adequate for a modification to the intersection (i.e., even if they would not meet current Caltrans standards, which it appears may be the case, there are processes by which the standards can be relaxed). Using standard 12-foot (3.6m) lane widths, and an 8-foot width for the paved path on the west side of State Route 1, and assuming that the northbound lanes would be left as existing (instead of shifting them to the east), the widest point of the modified edge of the west-side path is only 6 feet from its existing location. The total area for which the path would need to be widened is approximately 1,300 square feet.

It is also possible that narrower lane widths could be incorporated into a design such that widening beyond the existing path edge would not be required. This would require exceptions from Caltrans design standards, for which a procedure exists.

"Any widening...would require a coastal development permit..."

If a project to construct this potential mitigation measure were to proceed, the organization(s) responsible would obtain the necessary permits.

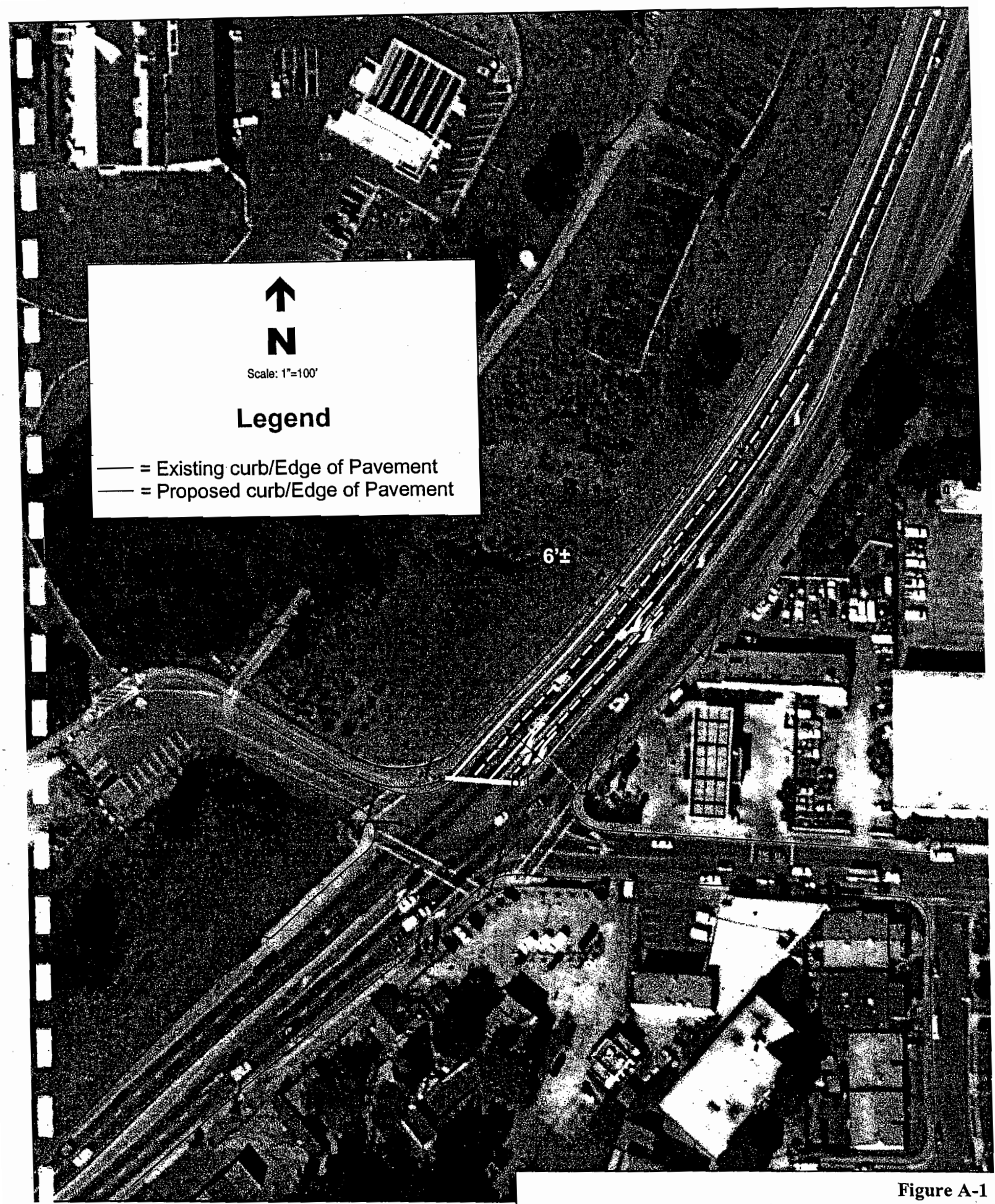
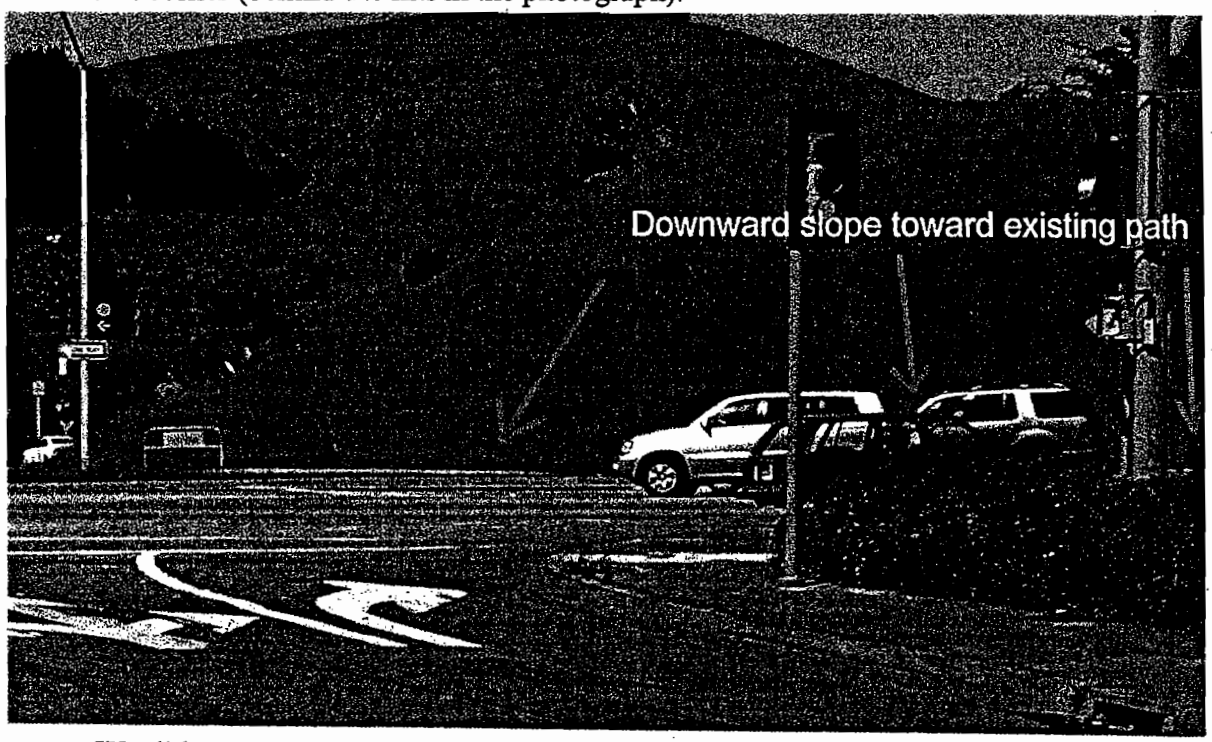


Figure A-1
State Route 1 / Reina del Mar Intersection Mitigation
Southbound State Route 1 Widening Shown Only

"ESHA and Wetlands"

Environmental experts have not conducted any field observations of the area where potential widening may occur, in order to determine whether the ground surface should be considered "wetland" or not, or if it constitutes habitat for any wildlife. However, while we are not wetlands or wildlife habitat professionals, perhaps our lay observations during our traffic-related field visit may be helpful.

- The ground surface is not flat at that location – it slopes toward the existing path – so it does not appear obvious that the 1,300 square feet would be part of a wetland. The specific location of the potential construction appears to have been graded as part of the road construction and/or as part of the construction of the industrial complex on that corner (behind the hill in the photograph).



- We did not observe any obvious signs of wildlife in this area during our (traffic-oriented) field visit. The area immediately to the west of the edge of the existing path appears to include gravel deposited as part of its construction. Whether such a gravel surface is conducive to wildlife habitat or not would be a determination of a wildlife expert.

It appears that there are viable procedures that a widening project could be subject to that would make the potential mitigation measure feasible.

Letter from Caltrans (June 10, 2005)

"It is not clear as to whether the traffic counts at the intersections are output counts of the intersection or demand counts for the intersection."

The counts reported for the existing conditions analysis are output counts. While it is known that queuing does occur during peak periods, it appears from reviewing the counts that the full demand is probably accounted for, as the hourly totals beginning each 15 minutes do rise, then fall, during the count period.

"On Page 5,..., the trip numbers contain some errors...."

This is the result of rounding. For the AM peak hour, it is stated that there are 25 outbound trips, yet Figure 3 shows 23 turning right and 3 turning left. An example of how this could occur is the following: The trip generation calculations could result in between 22.5 and 22.75 outbound right-turning trips and between 2.5 and 2.75 left-turning outbound trips. The right-turns would be rounded to 23, the left-turns would be rounded to 3, and the sum, which would be between 25.0 and 25.5, would be rounded to 25.

"...According to the Connemara project, ...the AM peak hour level of service...was LOS E..."

The Connemara analysis (or any other analysis done in the area), which we have not reviewed, likely used different assumptions. Traffic counts can increase and decrease over time, depending on seasonal, economic, and/or other factors. Since the future volumes are based on counts, it is expected that different study efforts will produce different results. The analysis for this project was conducted using new traffic counts and an agreed-upon methodology for calculating the future traffic. The other study likely did the same only with different assumptions and/or methodology.

"...50th and 95th percentile queue lengths...."

These will be added to the level of service calculation appendix.

[Three locations where the volume in the figure does not match the output sheet.]

These have been corrected. None had an effect on the level of service results.

"Cumulative conditions should include existing conditions plus other approved and pending projects."

This was included as part of the methodology.

"...the Department concurs that the developer should provide a fair share..."

The report does not state that the developer should provide a share of cost of mitigation measure, but instead states that such a determination (whether payment of funds or some other method is used) would be made during the formal CEQA process. Additionally, the developer is already expected to participate in an in-lieu fee program that the City administers.

Letter from City of Pacifica (June 9, 2005)

"...staff noticed that the traffic counts in the traffic report were lower than other similar studies in the area...."

Traffic counts can increase and decrease over time, depending on seasonal, economic, and/or other factors. While the City certainly reserves the right to require additional analyses for any development, it is important to note that the analysis for this project was conducted using new traffic counts and an agreed-upon methodology for calculating the future traffic.

APPENDIX B

Level of Service Calculation Output

EXISTING AM

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

4/27/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		1.00			0.96	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1844			1638	1504	1770	3539	1583	1770	3521	
Flt Permitted		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1844			1638	1504	1770	3539	1583	1770	3521	
Volume (vph)	6	35	1	109	0	270	13	2423	168	143	1184	42
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	6	36	1	111	0	276	13	2472	171	146	1208	43
RTOR Reduction (vph)	0	1	0	0	9	108	0	0	13	0	2	0
Lane Group Flow (vph)	0	42	0	0	143	127	13	2472	158	146	1249	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	1
Permitted Phases						8			2			
Actuated Green, G (s)		3.2			12.0	12.0	2.0	98.5	98.5	12.0	108.5	
Effective Green, g (s)		3.2			12.0	12.0	2.0	98.5	98.5	12.0	108.5	
Actuated g/C Ratio		0.02			0.08	0.08	0.01	0.70	0.70	0.08	0.77	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		42			139	127	25	2460	1100	150	2696	
v/s Ratio Prot		c0.02			c0.09		0.01	c0.70		c0.08	0.35	
v/s Ratio Perm						0.08			0.10			
v/c Ratio		1.00			1.03	1.00	0.52	1.00	0.14	0.97	0.46	
Uniform Delay, d1		69.2			64.8	64.8	69.4	21.6	7.3	64.7	6.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		139.0			83.9	79.2	18.1	19.3	0.3	65.0	0.6	
Delay (s)		208.3			148.7	144.1	87.5	40.9	7.6	129.7	6.6	
Level of Service		F			F	F	F	D	A	F	A	
Approach Delay (s)		208.3			145.9			39.0			19.5	
Approach LOS		F			F			D			B	

Intersection Summary			
HCM Average Control Delay	43.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	141.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	103.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Existing AM

HCM Signalized Intersection Capacity Analysis
6: Fassler Ave. & Hwy 1

4/27/2005

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1835	1553		1816	2787	1770	3539	1538	3433	3539	1583
Flt Permitted		0.98	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1835	1553		1816	2787	1770	3539	1538	3433	3539	1583
Volume (vph)	42	42	20	19	18	930	12	1708	2	504	784	56
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	45	45	21	20	19	989	13	1817	2	536	834	60
RTOR Reduction (vph)	0	0	19	0	0	423	0	0	0	0	0	11
Lane Group Flow (vph)	0	90	2	0	39	566	13	1817	2	536	834	49
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		11.3	11.3		5.1	25.3	0.7	57.0	57.0	16.2	72.5	72.5
Effective Green, g (s)		11.3	11.3		5.1	25.3	0.7	57.0	57.0	16.2	72.5	72.5
Actuated g/C Ratio		0.11	0.11		0.05	0.24	0.01	0.54	0.54	0.15	0.69	0.69
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		196	166		88	668	12	1910	830	527	2430	1087
v/s Ratio Prot		c0.05			0.02	c0.20	0.01	c0.51		c0.16	0.24	
v/s Ratio Perm			0.00						0.00			0.03
v/c Ratio		0.46	0.01		0.44	0.85	1.08	0.95	0.00	1.02	0.34	0.04
Uniform Delay, d1		44.3	42.2		48.9	38.3	52.4	23.0	11.2	44.7	6.8	5.4
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.0		3.5	9.8	289.8	11.9	0.0	43.6	0.4	0.1
Delay (s)		46.0	42.2		52.4	48.1	342.3	34.9	11.2	88.3	7.2	5.4
Level of Service		D	D		D	D	F	C	B	F	A	A
Approach Delay (s)		45.3			48.2			37.1			37.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	105.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

EXISTING PM

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

7/28/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1765			1686	1504	1770	3539	1583	1770	3538	
Flt Permitted		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1765			1686	1504	1770	3539	1583	1770	3538	
Volume (vph)	8	7	5	139	1	114	24	1478	88	258	2433	4
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	8	7	5	143	1	118	25	1524	91	266	2508	4
RTOR Reduction (vph)	0	5	0	0	0	108	0	0	14	0	0	0
Lane Group Flow (vph)	0	15	0	0	144	10	25	1524	77	266	2512	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		1.5			9.0	9.0	1.5	57.8	57.8	17.8	74.1	
Effective Green, g (s)		1.5			9.0	9.0	1.5	57.8	57.8	17.8	74.1	
Actuated g/C Ratio		0.01			0.09	0.09	0.01	0.57	0.57	0.17	0.73	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		26			149	133	26	2003	896	309	2568	
v/s Ratio Prot		c0.01			c0.09		0.01	0.43		c0.15	c0.71	
v/s Ratio Perm						0.01			0.05			
v/c Ratio		0.58			0.97	0.08	0.96	0.76	0.09	0.86	0.98	
Uniform Delay, d1		50.0			46.4	42.7	50.3	16.9	10.1	40.9	13.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		27.7			63.0	0.3	159.0	2.8	0.2	21.0	13.3	
Delay (s)		77.6			109.4	43.0	209.3	19.7	10.3	61.9	26.6	
Level of Service		E			F	D	F	B	B	E	C	
Approach Delay (s)		77.6			79.5			22.0			30.0	
Approach LOS		E			E			C			C	

Intersection Summary

HCM Average Control Delay	30.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	102.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

EXISTING PM

4/27/2005

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1818	1553		1823	2787	1770	3539	1538	3433	3539	1583
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1818	1553		1823	2787	1770	3539	1538	3433	3539	1583
Volume (vph)	106	47	63	20	27	345	38	1111	17	827	1697	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	51	68	22	29	375	41	1208	18	899	1845	65
RTOR Reduction (vph)	0	0	42	0	0	242	0	0	3	0	0	7
Lane Group Flow (vph)	0	166	26	0	51	133	41	1208	15	899	1845	58
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		16.3	16.3		4.0	38.1	3.2	41.1	41.1	30.1	68.0	68.0
Effective Green, g (s)		16.3	16.3		4.0	38.1	3.2	41.1	41.1	30.1	68.0	68.0
Actuated g/C Ratio		0.15	0.15		0.04	0.35	0.03	0.38	0.38	0.28	0.63	0.63
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		276	235		68	988	53	1353	588	961	2239	1001
v/s Ratio Prot		c0.09			c0.03	0.05	0.02	c0.34		c0.26	0.52	
v/s Ratio Perm			0.02						0.01			0.04
v/c Ratio		0.60	0.11		0.75	0.13	0.77	0.89	0.03	0.94	0.82	0.06
Uniform Delay, d1		42.6	39.4		51.3	23.5	51.8	31.1	20.7	37.8	15.2	7.5
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.7	0.2		36.6	0.1	49.7	9.3	0.1	15.7	2.6	0.0
Delay (s)		46.2	39.6		87.8	23.6	101.5	40.4	20.8	53.4	17.8	7.6
Level of Service		D	D		F	C	F	D	C	D	B	A
Approach Delay (s)		44.3			31.3			42.1			28.9	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	33.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	107.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

EXIST. + PROJECT AM

4/27/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		1.00			0.96	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1844			1638	1504	1770	3539	1583	1770	3521	
Flt Permitted		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1844			1638	1504	1770	3539	1583	1770	3521	
Volume (vph)	6	35	1	109	0	270	13	2442	169	143	1190	42
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	6	36	1	111	0	276	13	2492	172	146	1214	43
RTOR Reduction (vph)	0	1	0	0	9	108	0	0	13	0	2	0
Lane Group Flow (vph)	0	42	0	0	143	127	13	2492	159	146	1255	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		3.2			12.0	12.0	2.0	98.5	98.5	12.0	108.5	
Effective Green, g (s)		3.2			12.0	12.0	2.0	98.5	98.5	12.0	108.5	
Actuated g/C Ratio		0.02			0.08	0.08	0.01	0.70	0.70	0.08	0.77	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		42			139	127	25	2460	1100	150	2696	
v/s Ratio Prot		c0.02			c0.09		0.01	c0.70		c0.08	0.36	
v/s Ratio Perm						0.08			0.10			
v/c Ratio		1.00			1.03	1.00	0.52	1.01	0.14	0.97	0.47	
Uniform Delay, d1		69.2			64.8	64.8	69.4	21.6	7.3	64.7	6.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		139.0			83.9	79.2	18.1	21.4	0.3	65.0	0.6	
Delay (s)		208.3			148.7	144.1	87.5	43.0	7.6	129.7	6.6	
Level of Service		F			F	F	F	D	A	F	A	
Approach Delay (s)		208.3			145.9			41.0			19.4	
Approach LOS		F			F			D			B	

Intersection Summary			
HCM Average Control Delay	44.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	141.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

EXIST. + PROJECT AM

HCM Signalized Intersection Capacity Analysis
6: Fassler Ave. & Hwy 1

4/27/2005

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1835	1553		1817	2787	1770	3539	1544	3433	3539	1583
Flt Permitted		0.98	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1835	1553		1817	2787	1770	3539	1544	3433	3539	1583
Volume (vph)	42	42	20	19	19	951	12	1708	2	511	784	56
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	45	45	21	20	20	1012	13	1817	2	544	834	60
RTOR Reduction (vph)	0	0	19	0	0	423	0	0	0	0	0	11
Lane Group Flow (vph)	0	90	2	0	40	589	13	1817	2	544	834	49
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		11.3	11.3		5.1	25.3	0.7	57.0	57.0	16.2	72.5	72.5
Effective Green, g (s)		11.3	11.3		5.1	25.3	0.7	57.0	57.0	16.2	72.5	72.5
Actuated g/C Ratio		0.11	0.11		0.05	0.24	0.01	0.54	0.54	0.15	0.69	0.69
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		196	166		88	668	12	1910	833	527	2430	1087
v/s Ratio Prot		c0.05			0.02	c0.21	0.01	c0.51		c0.16	0.24	
v/s Ratio Perm			0.00						0.00			0.03
v/c Ratio		0.46	0.01		0.45	0.88	1.08	0.95	0.00	1.03	0.34	0.04
Uniform Delay, d1		44.3	42.2		48.9	38.7	52.4	23.0	11.2	44.7	6.8	5.4
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.0		3.7	13.1	289.8	11.9	0.0	47.7	0.4	0.1
Delay (s)		46.0	42.2		52.6	51.8	342.3	34.9	11.2	92.4	7.2	5.4
Level of Service		D	D		D	D	F	C	B	F	A	A
Approach Delay (s)		45.3			51.8			37.1			39.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	41.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	105.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

EXIST. + PROJECT PM

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

7/28/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1765			1686	1504	1770	3539	1583	1770	3538	
Flt Permitted		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1765			1686	1504	1770	3539	1583	1770	3538	
Volume (vph)	8	7	5	140	1	114	24	1490	89	258	2453	4
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	8	7	5	144	1	118	25	1536	92	266	2529	4
RTOR Reduction (vph)	0	5	0	0	0	108	0	0	14	0	0	0
Lane Group Flow (vph)	0	15	0	0	145	10	25	1536	78	266	2533	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		1.5			9.0	9.0	1.5	57.8	57.8	17.8	74.1	
Effective Green, g (s)		1.5			9.0	9.0	1.5	57.8	57.8	17.8	74.1	
Actuated g/C Ratio		0.01			0.09	0.09	0.01	0.57	0.57	0.17	0.73	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		26			149	133	26	2003	896	309	2568	
v/s Ratio Prot		c0.01			c0.09		0.01	0.43		c0.15	c0.72	
v/s Ratio Perm						0.01			0.05			
v/c Ratio		0.58			0.97	0.08	0.96	0.77	0.09	0.86	0.99	
Uniform Delay, d1		50.0			46.4	42.7	50.3	17.0	10.1	40.9	13.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		27.7			65.2	0.3	159.0	2.9	0.2	21.0	14.8	
Delay (s)		77.6			111.6	43.0	209.3	19.9	10.3	61.9	28.3	
Level of Service		E			F	D	F	B	B	E	C	
Approach Delay (s)		77.6			80.8			22.2			31.5	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	102.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c - Critical Lane Group			

EXIST. + PROJECT PM

4/27/2005

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1819	1553		1824	2787	1770	3539	1538	3433	3539	1583
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1819	1553		1824	2787	1770	3539	1538	3433	3539	1583
Volume (vph)	106	48	63	20	28	357	38	1111	17	849	1697	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	52	68	22	30	388	41	1208	18	923	1845	65
RTOR Reduction (vph)	0	0	42	0	0	247	0	0	3	0	0	7
Lane Group Flow (vph)	0	167	26	0	52	141	41	1208	15	923	1845	58
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		16.3	16.3		4.0	39.1	3.2	40.1	40.1	31.1	68.0	68.0
Effective Green, g (s)		16.3	16.3		4.0	39.1	3.2	40.1	40.1	31.1	68.0	68.0
Actuated g/C Ratio		0.15	0.15		0.04	0.36	0.03	0.37	0.37	0.29	0.63	0.63
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		276	235		68	1014	53	1320	574	993	2239	1001
v/s Ratio Prot		c0.09			c0.03	0.05	0.02	c0.34		c0.27	0.52	
v/s Ratio Perm			0.02						0.01			0.04
v/c Ratio		0.61	0.11		0.76	0.14	0.77	0.92	0.03	0.93	0.82	0.06
Uniform Delay, d1		42.6	39.4		51.3	22.9	51.8	32.1	21.3	37.1	15.2	7.5
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.7	0.2		39.2	0.1	49.7	11.3	0.1	14.4	2.6	0.0
Delay (s)		46.3	39.6		90.5	23.0	101.5	43.4	21.4	51.5	17.8	7.6
Level of Service		D	D		F	C	F	D	C	D	B	A
Approach Delay (s)		44.4			31.0			45.0			28.5	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	33.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	107.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

CUMULATIVE AM

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

4/27/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		1.00			0.96	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.99			0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1844			1634	1504	1770	3539	1583	1770	3521	
Flt Permitted		0.99			0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1844			1634	1504	1770	3539	1583	1770	3521	
Volume (vph)	7	39	1	121	0	298	15	2719	189	158	1328	46
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	39	1	121	0	298	15	2719	189	158	1328	46
RTOR Reduction (vph)	0	1	0	0	10	97	0	0	12	0	1	0
Lane Group Flow (vph)	0	46	0	0	161	151	15	2719	177	158	1373	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		4.0			13.0	13.0	2.0	107.4	107.4	12.0	117.4	
Effective Green, g (s)		4.0			13.0	13.0	2.0	107.4	107.4	12.0	117.4	
Actuated g/C Ratio		0.03			0.09	0.09	0.01	0.70	0.70	0.08	0.77	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		48			139	128	23	2494	1116	139	2712	
v/s Ratio Prot		c0.02			0.10		0.01	c0.77		c0.09	0.39	
v/s Ratio Perm						c0.10			0.11			
v/c Ratio		0.96			1.16	1.18	0.65	1.09	0.16	1.14	0.51	
Uniform Delay, d1		74.1			69.7	69.7	74.9	22.5	7.5	70.2	6.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		113.1			125.0	135.9	50.9	48.0	0.3	117.8	0.7	
Delay (s)		187.2			194.7	205.6	125.8	70.5	7.8	188.0	7.3	
Level of Service		F			F	F	F	E	A	F	A	
Approach Delay (s)		187.2			201.2			66.7			25.9	
Approach LOS		F			F			E			C	

Intersection Summary			
HCM Average Control Delay	66.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	152.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

CUMULATIVE AM

4/27/2005

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1836	1553		1816	2787	1770	3539	1538	3433	3539	1583
Flt Permitted		0.98	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1836	1553		1816	2787	1770	3539	1538	3433	3539	1583
Volume (vph)	46	47	22	22	21	1039	14	1922	2	579	866	62
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	47	22	22	21	1039	14	1922	2	579	866	62
RTOR Reduction (vph)	0	0	20	0	0	419	0	0	0	0	0	12
Lane Group Flow (vph)	0	93	2	0	43	620	14	1922	2	579	866	50
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		11.4	11.4		5.1	25.3	1.5	56.2	56.2	16.2	70.9	70.9
Effective Green, g (s)		11.4	11.4		5.1	25.3	1.5	56.2	56.2	16.2	70.9	70.9
Actuated g/C Ratio		0.11	0.11		0.05	0.24	0.01	0.54	0.54	0.15	0.68	0.68
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		200	169		88	672	25	1896	824	530	2392	1070
v/s Ratio Prot		c0.05			0.02	c0.22	0.01	c0.54		c0.17	0.24	
v/s Ratio Perm			0.00						0.00			0.03
v/c Ratio		0.47	0.01		0.49	0.92	0.56	1.01	0.00	1.09	0.36	0.05
Uniform Delay, d1		43.9	41.7		48.6	38.8	51.4	24.4	11.3	44.4	7.3	5.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.0		4.2	18.3	25.6	24.1	0.0	66.7	0.4	0.1
Delay (s)		45.6	41.8		52.9	57.1	77.0	48.5	11.3	111.0	7.7	5.8
Level of Service		D	D		D	E	E	D	B	F	A	A
Approach Delay (s)		44.9			57.0			48.6			47.3	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	50.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	104.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

CUMULATIVE P/M

4/27/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1756			1686	1504	1770	3539	1583	1770	3538	
Flt Permitted		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1756			1686	1504	1770	3539	1583	1770	3538	
Volume (vph)	9	8	7	158	1	126	24	1689	101	285	2753	4
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	8	7	158	1	126	24	1689	101	285	2753	4
RTOR Reduction (vph)	0	7	0	0	0	114	0	0	13	0	0	0
Lane Group Flow (vph)	0	17	0	0	159	12	24	1689	88	285	2757	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		2.3			11.0	11.0	2.3	67.1	67.1	21.4	86.2	
Effective Green, g (s)		2.3			11.0	11.0	2.3	67.1	67.1	21.4	86.2	
Actuated g/C Ratio		0.02			0.09	0.09	0.02	0.57	0.57	0.18	0.73	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		34			157	140	35	2016	902	322	2589	
v/s Ratio Prot		c0.01			c0.09		0.01	0.48		c0.16	c0.78	
v/s Ratio Perm						0.01			0.06			
v/c Ratio		0.50			1.01	0.08	0.69	0.84	0.10	0.89	1.06	
Uniform Delay, d1		57.2			53.4	48.8	57.4	20.9	11.6	47.0	15.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		11.3			75.2	0.3	43.6	4.4	0.2	23.8	38.0	
Delay (s)		68.5			128.6	49.1	101.0	25.2	11.8	70.8	53.8	
Level of Service		E			F	D	F	C	B	E	D	
Approach Delay (s)		68.5			93.4			25.5			55.4	
Approach LOS		E			F			C			E	

Intersection Summary			
HCM Average Control Delay	47.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	117.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	107.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

CUMULATIVE PM

4/27/2005

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1819	1553		1824	2787	1770	3539	1538	3433	3539	1583
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1819	1553		1824	2787	1770	3539	1538	3433	3539	1583
Volume (vph)	117	55	70	23	31	396	43	1272	19	985	1875	66
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	55	70	23	31	396	43	1272	19	985	1875	66
RTOR Reduction (vph)	0	0	41	0	0	252	0	0	3	0	0	7
Lane Group Flow (vph)	0	172	29	0	54	144	43	1272	16	985	1875	59
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		16.5	16.5		4.0	39.1	3.2	40.1	40.1	31.1	68.0	68.0
Effective Green, g (s)		16.5	16.5		4.0	39.1	3.2	40.1	40.1	31.1	68.0	68.0
Actuated g/C Ratio		0.15	0.15		0.04	0.36	0.03	0.37	0.37	0.29	0.63	0.63
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		279	238		68	1012	53	1318	573	991	2234	999
v/s Ratio Prot		c0.09			c0.03	0.05	0.02	c0.36		c0.29	0.53	
v/s Ratio Perm			0.02						0.01			0.04
v/c Ratio		0.62	0.12		0.79	0.14	0.81	0.97	0.03	0.99	0.84	0.06
Uniform Delay, d1		42.6	39.3		51.4	23.0	51.9	33.1	21.4	38.2	15.6	7.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.0	0.2		45.6	0.1	59.7	17.7	0.1	26.9	4.0	0.1
Delay (s)		46.7	39.6		97.0	23.1	111.6	50.9	21.5	65.2	19.6	7.7
Level of Service		D	D		F	C	F	D	C	E	B	A
Approach Delay (s)		44.6			32.0			52.4			34.6	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	39.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	107.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Cumu. + Project AM

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

4/27/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		1.00			0.96	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.99			0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1844			1634	1504	1770	3539	1583	1770	3522	
Flt Permitted		0.99			0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1844			1634	1504	1770	3539	1583	1770	3522	
Volume (vph)	7	39	1	121	0	298	15	2738	190	158	1334	46
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	39	1	121	0	298	15	2738	190	158	1334	46
RTOR Reduction (vph)	0	1	0	0	10	97	0	0	12	0	1	0
Lane Group Flow (vph)	0	46	0	0	161	151	15	2738	178	158	1379	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		4.0			13.0	13.0	2.0	107.4	107.4	12.0	117.4	
Effective Green, g (s)		4.0			13.0	13.0	2.0	107.4	107.4	12.0	117.4	
Actuated g/C Ratio		0.03			0.09	0.09	0.01	0.70	0.70	0.08	0.77	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		48			139	128	23	2494	1116	139	2713	
v/s Ratio Prot		c0.02			0.10		0.01	c0.77		c0.09	0.39	
v/s Ratio Perm						c0.10			0.11			
v/c Ratio		0.96			1.16	1.18	0.65	1.10	0.16	1.14	0.51	
Uniform Delay, d1		74.1			69.7	69.7	74.9	22.5	7.5	70.2	6.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		113.1			125.0	135.9	50.9	51.0	0.3	117.8	0.7	
Delay (s)		187.2			194.7	205.6	125.8	73.5	7.8	188.0	7.3	
Level of Service		F			F	F	F	E	A	F	A	
Approach Delay (s)		187.2			201.2			69.5			25.8	
Approach LOS		F			F			E			C	

Intersection Summary			
HCM Average Control Delay	68.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	152.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	113.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Cumu. + Project AM

HCM Signalized Intersection Capacity Analysis
6: Fassler Ave. & Hwy 1

4/27/2005

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1836	1553		1817	2787	1770	3539	1538	3433	3539	1583
Flt Permitted		0.98	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1836	1553		1817	2787	1770	3539	1538	3433	3539	1583
Volume (vph)	46	47	22	22	22	1060	14	1922	2	586	866	62
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	47	22	22	22	1060	14	1922	2	586	866	62
RTOR Reduction (vph)	0	0	20	0	0	419	0	0	0	0	0	12
Lane Group Flow (vph)	0	93	2	0	44	641	14	1922	2	586	866	50
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		11.4	11.4		5.1	25.3	1.5	56.2	56.2	16.2	70.9	70.9
Effective Green, g (s)		11.4	11.4		5.1	25.3	1.5	56.2	56.2	16.2	70.9	70.9
Actuated g/C Ratio		0.11	0.11		0.05	0.24	0.01	0.54	0.54	0.15	0.68	0.68
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		200	169		88	672	25	1896	824	530	2392	1070
v/s Ratio Prot		c0.05			0.02	c0.23	0.01	c0.54		c0.17	0.24	
v/s Ratio Perm			0.00						0.00			0.03
v/c Ratio		0.47	0.01		0.50	0.95	0.56	1.01	0.00	1.11	0.36	0.05
Uniform Delay, d1		43.9	41.7		48.7	39.2	51.4	24.4	11.3	44.4	7.3	5.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.0		4.4	23.8	25.6	24.1	0.0	71.3	0.4	0.1
Delay (s)		45.6	41.8		53.1	63.0	77.0	48.5	11.3	115.6	7.7	5.8
Level of Service		D	D		D	E	E	D	B	F	A	A
Approach Delay (s)		44.9			62.6			48.6			49.4	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	52.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	104.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Cumu. + Project PM

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

7/28/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1756			1686	1504	1770	3539	1583	1770	3538	
Flt Permitted		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1756			1686	1504	1770	3539	1583	1770	3538	
Volume (vph)	9	8	7	159	1	126	24	1701	102	285	2773	4
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	8	7	159	1	126	24	1701	102	285	2773	4
RTOR Reduction (vph)	0	7	0	0	0	114	0	0	13	0	0	0
Lane Group Flow (vph)	0	17	0	0	160	12	24	1701	89	285	2777	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		2.3			11.0	11.0	2.3	67.1	67.1	21.4	86.2	
Effective Green, g (s)		2.3			11.0	11.0	2.3	67.1	67.1	21.4	86.2	
Actuated g/C Ratio		0.02			0.09	0.09	0.02	0.57	0.57	0.18	0.73	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		34			157	140	35	2016	902	322	2589	
v/s Ratio Prot		c0.01			c0.09		0.01	0.48		c0.16	c0.78	
v/s Ratio Perm						0.01			0.06			
v/c Ratio		0.50			1.02	0.08	0.69	0.84	0.10	0.89	1.07	
Uniform Delay, d1		57.2			53.4	48.8	57.4	21.0	11.6	47.0	15.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		11.3			76.9	0.3	43.6	4.5	0.2	23.8	40.9	
Delay (s)		68.5			130.3	49.1	101.0	25.5	11.8	70.8	56.7	
Level of Service		E			F	D	F	C	B	E	E	
Approach Delay (s)		68.5			94.5			25.8			58.0	
Approach LOS		E			F			C			E	

Intersection Summary			
HCM Average Control Delay	48.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	117.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	108.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Cumu. + Project PM

HCM Signalized Intersection Capacity Analysis
6: Fassler Ave. & Hwy 1

4/27/2005

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1820	1553		1825	2787	1770	3539	1538	3433	3539	1583
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1820	1553		1825	2787	1770	3539	1538	3433	3539	1583
Volume (vph)	117	56	70	23	32	408	43	1272	19	1007	1875	66
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	56	70	23	32	408	43	1272	19	1007	1875	66
RTOR Reduction (vph)	0	0	41	0	0	256	0	0	3	0	0	7
Lane Group Flow (vph)	0	173	29	0	55	152	43	1272	16	1007	1875	59
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		16.6	16.6		4.0	40.1	3.2	39.1	39.1	32.1	68.0	68.0
Effective Green, g (s)		16.6	16.6		4.0	40.1	3.2	39.1	39.1	32.1	68.0	68.0
Actuated g/C Ratio		0.15	0.15		0.04	0.37	0.03	0.36	0.36	0.30	0.63	0.63
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		280	239		68	1037	53	1284	558	1022	2232	999
v/s Ratio Prot		c0.10			c0.03	0.05	0.02	c0.36		c0.29	0.53	
v/s Ratio Perm			0.02						0.01			0.04
v/c Ratio		0.62	0.12		0.81	0.15	0.81	0.99	0.03	0.99	0.84	0.06
Uniform Delay, d1		42.6	39.3		51.5	22.5	52.0	34.2	22.1	37.6	15.6	7.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.0	0.2		48.6	0.1	59.7	23.0	0.1	24.4	4.0	0.1
Delay (s)		46.7	39.5		100.2	22.5	111.7	57.2	22.2	62.0	19.6	7.7
Level of Service		D	D		F	C	F	E	C	E	B	A
Approach Delay (s)		44.6			31.8			58.4			33.8	
Approach LOS		D			C			E			C	

Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	107.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

MITIGATED
CUMU. + PROJECT AM

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

4/27/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1844			1770	1583	1770	3539	1583	3433	3522	
Flt Permitted		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1844			1770	1583	1770	3539	1583	3433	3522	
Volume (vph)	7	39	1	121	0	298	15	2738	190	158	1334	46
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	39	1	121	0	298	15	2738	190	158	1334	46
RTOR Reduction (vph)	0	1	0	0	0	35	0	0	15	0	2	0
Lane Group Flow (vph)	0	46	0	0	121	263	15	2738	175	158	1378	0
Turn Type	Split			Split		pt+ov	Prot		Perm	Prot		
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		3.2			9.0	19.0	2.0	87.5	87.5	6.0	91.5	
Effective Green, g (s)		3.2			9.0	19.0	2.0	87.5	87.5	6.0	91.5	
Actuated g/C Ratio		0.03			0.07	0.16	0.02	0.72	0.72	0.05	0.75	
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		48			131	247	29	2544	1138	169	2648	
v/s Ratio Prot		c0.02			0.07	c0.17	0.01	c0.77		0.05	c0.39	
v/s Ratio Perm									0.11			
v/c Ratio		0.96			0.92	1.06	0.52	1.08	0.15	0.93	0.52	
Uniform Delay, d1		59.2			56.0	51.4	59.4	17.1	5.4	57.7	6.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		113.1			55.5	74.9	14.7	42.4	0.3	50.1	0.7	
Delay (s)		172.3			111.5	126.2	74.1	59.5	5.7	107.8	6.9	
Level of Service		F			F	F	E	E	A	F	A	
Approach Delay (s)		172.3			122.0			56.1			17.3	
Approach LOS		F			F			E			B	

Intersection Summary

HCM Average Control Delay	50.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	121.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Dowling Associates, Inc.

50th and 95th Percentile Queues
from Synchro Output (in feet)

State Route 1 / Reina del Mar

	EB L-T-R		WB L-T-R		WBR		NBL		NBT (2)		NBR		SBL		SBT-R (2)	
Scenario	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
AM Peak Hour																
Existing	39	116	142	302	117	307	12	36	1251	1376	37	64	135	276	155	258
Existing + Project	39	116	142	302	117	307	12	36	1271	1395	37	64	135	276	156	261
Cumulative	46	136	192	358	181	375	15	41	1580	1693	44	72	177	329	188	306
Cumulative + Project	46	136	192	358	181	375	15	41	1600	1713	44	73	177	329	190	308
			L-T Only		Overlap								(2 lanes)			
Cumu. + Project Mitigated	36	108	95	212	221	403	12	35	1259	1386	30	54	63	131	156	280
PM Peak Hour																
Existing	9	35	93	235	0	56	15	45	342	521	15	43	152	294	349	1088
Existing + Project	9	35	93	238	0	56	15	45	347	528	15	44	152	294	359	1104
Cumulative	13	43	138	286	0	62	19	51	579	696	25	54	213	348	1275	1402
Cumulative + Project	13	43	140	288	0	62	19	51	587	706	26	54	213	348	1292	1420

State Route 1 / Fassler Avenue

	EBL-T		EBR		WBL-T		WBR (2)		NBL		NBT (2)		NBR		SBL (2)		SBT (2)		SBR	
Scenario	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
AM Peak Hour																				
Existing	55	101	0	21	25	78	163	374	8	32	1017	1355	6	2	177	367	84	244	4	29
Existing + Project	55	101	0	21	25	79	175	397	8	32	562	1017	1	6	180	374	84	244	4	29
Cumulative	57	104	0	22	27	87	192	425	9	34	696	1105	1	6	210	404	90	256	4	30
Cumulative + Project	57	104	0	22	28	90	203	445	9	34	696	1105	1	6	215	411	90	256	4	30
PM Peak Hour																				
Existing	107	172	11	49	34	119	0	37	28	96	393	661	5	24	300	517	461	878	11	38
Existing + Project	107	173	11	49	35	120	0	37	28	96	400	673	6	24	306	526	463	878	11	38
Cumulative	111	178	12	51	37	125	0	38	29	101	436	728	6	25	337	579	482	904	11	38
Cumulative + Project	112	179	12	51	38	128	0	37	29	101	444	741	6	26	342	586	484	904	11	38

Fassler Avenue Homepride Construction Development
Existing Conditions
AM Peak Hour

Trip Generation Report
Forecast for AM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Proposed Pro	34.00	Residential -	0.24	0.73	8	25	33	100.0
	Zone 1 Subtotal					8	25	33	100.0
TOTAL						8	25	33	100.0

Trip Distribution Report
Percent Of Trips Base
To Gates

Zone	1	2	3	4	5	6	7
1	77.0	5.0	10.0	1.0	2.0	4.0	1.0

Turning Movement Report
AM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Fassler/Project													
Base	0	0	0	0	0	0	0	531	0	0	1166	0	1698
Added	0	0	0	3	0	23	7	0	0	0	0	1	34
Total	0	0	0	3	0	23	7	531	0	0	1166	1	1732
#7 Hwy 1/Fassler Ave.													
Base	12	1708	2	504	784	56	42	42	20	19	18	930	4137
Added	0	0	0	7	0	0	0	0	0	0	1	21	29
Total	12	1708	2	511	784	56	42	42	20	19	19	951	4166
#9 Hwy 1/Reina del Mar													
Base	13	2423	168	143	1184	42	6	35	1	109	0	270	4394
Added	0	19	1	0	6	0	0	0	0	0	0	0	26
Total	13	2442	169	143	1190	42	6	35	1	109	0	270	4420

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Fassler/Project	A	0.0	0.000	D	33.3	0.000	+33.271 D/V
# 7 Hwy 1/Fassler Ave.	E	55.1	1.042	E	57.5	1.051	+ 2.438 D/V
# 9 Hwy 1/Reina del Mar	D	42.9	1.031	D	44.0	1.037	+ 1.086 D/V

Fassler Avenue Homepride Construction Development
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 Fassler/Project

Average Delay (sec/veh): 0.5 Worst Case Level Of Service: D[33.3]

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	T	T	R	L	T	T	R	L	T	T	R	L	T	T	R
Control:	Stop Sign				Stop Sign				Uncontrolled				Uncontrolled			
Rights:	Include				Channel				Include				Include			
Lanes:	0	0	0	0	0	0	1!	0	1	0	1	0	0	0	0	1
Volume Module: >> Count Date: 10 Mar 2005 <<																
Base Vol:	0	0	0		0	0	0		0	481	0		0	1056	0	
Growth Adj:	1.10	1.10	1.10		1.10	1.10	1.10		1.10	1.10	1.10		1.10	1.10	1.10	
Initial Bse:	0	0	0		0	0	0		0	531	0		0	1166	0	
Added Vol:	0	0	0		3	0	23		7	0	0		0	0	1	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	0	0	0		3	0	23		7	531	0		0	1166	1	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	0.87	0.87	0.87		0.87	0.87	0.87		0.87	0.87	0.87		0.87	0.87	0.87	
PHF Volume:	0	0	0		3	0	26		8	611	0		0	1341	1	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Final Vol.:	0	0	0		3	0	26		8	611	0		0	1341	1	
Critical Gap Module:																
Critical Gp:	xxxxx	xxxx	xxxxx		6.4	xxxx	6.2		4.1	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
FollowUpTim:	xxxxx	xxxx	xxxxx		3.5	xxxx	3.3		2.2	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
Capacity Module:																
Cnflict Vol:	xxxx	xxxx	xxxxx		1968	xxxx	1341		1342	xxxx	xxxxx		xxxx	xxxx	xxxxx	
Potent Cap.:	xxxx	xxxx	xxxxx		70	xxxx	188		520	xxxx	xxxxx		xxxx	xxxx	xxxxx	
Move Cap.:	xxxx	xxxx	xxxxx		69	xxxx	188		520	xxxx	xxxxx		xxxx	xxxx	xxxxx	
Volume/Cap:	xxxx	xxxx	xxxx		0.05	xxxx	0.14		0.02	xxxx	xxxx		xxxx	xxxx	xxxx	
Level Of Service Module:																
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx			0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx		
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx			12.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx		
LOS by Move:	*	*	*	*	*	*			B	*	*	*	*	*		
Movement:	LT	LTR	RT	LT	LTR	RT			LT	LTR	RT	LT	LTR	RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	157	xxxxx			xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx		
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.7	xxxxx			xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx		
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	33.3	xxxxx			xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx		
Shared LOS:	*	*	*	*	D	*			*	*	*	*	*	*		
ApproachDel:	xxxxxx				33.3				xxxxxx				xxxxxx			
ApproachLOS:	*				D				*				*			

Fassler Avenue Homepride Construction Development
Existing Conditions
PM Peak Hour

Trip Generation Report

Forecast for PM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Proposed Pro	34.00	Residential -	0.75	0.44	26	15	41	100.0
	Zone 1 Subtotal					26	15	41	100.0
TOTAL						26	15	41	100.0

Trip Distribution Report

Percent Of Trips Base

To Gates

Zone	1	2	3	4	5	6	7
1	77.0	5.0	10.0	1.0	2.0	4.0	1.0

Turning Movement Report

PM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Fassler/Project													
Base	0	0	0	0	0	0	0	770	0	0	460	0	1230
Added	0	0	0	2	0	14	23	0	0	0	0	3	42
Total	0	0	0	2	0	14	23	770	0	0	460	3	1272
#7 Hwy 1/Fassler Ave.													
Base	38	1111	17	827	1697	60	106	47	63	20	27	345	4358
Added	0	0	0	22	0	0	0	1	0	0	1	12	36
Total	38	1111	17	849	1697	60	106	48	63	20	28	357	4394
#9 Hwy 1/Reina del Mar													
Base	21	1478	88	258	2433	4	8	7	5	139	1	114	4556
Added	0	12	1	0	20	0	0	0	0	1	0	0	34
Total	21	1490	89	258	2453	4	8	7	5	140	1	114	4590

Impact Analysis Report

Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Fassler/Project	A	0.0	0.000	B	13.0	0.000	+12.951 D/V
# 7 Hwy 1/Fassler Ave.	C	23.4	0.821	C	23.7	0.830	+ 0.344 D/V
# 9 Hwy 1/Reina del Mar	C	26.9	0.921	C	27.4	0.928	+ 0.454 D/V

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Fassler Avenue Homepride Construction Development
Existing Conditions
PM Peak Hour

Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #1 Fassler/Project

****

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: B[13.0]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Channel			Include			Include		
Lanes:	0 0 0 0 0			0 0 1! 0 0			1 0 1 0 0			0 0 0 1 0		
Volume Module: >> Count Date: 10 Mar 2005 <<												
Base Vol:	0	0	0	0	0	0	0	770	0	0	460	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	770	0	0	460	0
Added Vol:	0	0	0	2	0	14	23	0	0	0	0	3
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	2	0	14	23	770	0	0	460	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	2	0	14	23	770	0	0	460	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	2	0	14	23	770	0	0	460	3
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1278	xxxx	462	463	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	185	xxxx	604	1109	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	182	xxxx	604	1109	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.01	xxxx	0.02	0.02	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	469	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	13.0	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			13.0			xxxxxx			xxxxxx		
ApproachLOS:	*			B			*			*		

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Fassler Avenue Homepride Construction Development
Cumulative Conditions
AM Peak Hour

Trip Generation Report

Zone #	Subzone	Amount	Units	Forecast for AM Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Proposed Pro	34.00	Residential -	0.24	0.73	8	25	33	100.0
	Zone 1 Subtotal					8	25	33	100.0
TOTAL						8	25	33	100.0

Trip Distribution Report

Percent Of Trips Base To Gates

Zone	1	2	3	4	5	6	7
1	77.0	5.0	10.0	1.0	2.0	4.0	1.0

Turning Movement Report
AM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Fassler/Project													
Base	0	0	0	0	0	0	0	593	0	0	1291	0	1884
Added	0	0	0	3	0	23	7	0	0	0	0	1	34
Total	0	0	0	3	0	23	7	593	0	0	1291	1	1918
#7 Hwy 1/Fassler Ave.													
Base	14	1922	2	579	866	62	46	47	22	22	21	1039	4642
Added	0	0	0	7	0	0	0	0	0	0	1	21	29
Total	14	1922	2	586	866	62	46	47	22	22	22	1060	4671
#9 Hwy 1/Reina del Mar													
Base	15	2719	189	158	1328	46	7	39	1	121	0	298	4921
Added	0	19	1	0	6	0	0	0	0	0	0	0	26
Total	15	2738	190	158	1334	46	7	39	1	121	0	298	4947

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Fassler/Project	A	0.0	0.000	D	30.1	0.000	+30.078 D/V
# 7 Hwy 1/Fassler Ave.	E	70.4	1.098	E	73.1	1.106	+ 2.700 D/V
# 9 Hwy 1/Reina del Mar	E	65.9	1.130	E	67.3	1.136	+ 1.448 D/V

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Fassler Avenue Homepride Construction Development
Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 Fassler/Project

Average Delay (sec/veh): 0.5 Worst Case Level Of Service: D[30.1]

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Stop Sign				Stop Sign				Uncontrolled				Uncontrolled			
Rights:	Include				Channel				Include				Include			
Lanes:	0	0	0	0 0	0	0	1!	0 0	1	0	1	0 0	0	0	0	1 0
Volume Module:																
Base Vol:	0	0	0		0	0	0		0	593	0		0	1291	0	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	0	0	0		0	0	0		0	593	0		0	1291	0	
Added Vol:	0	0	0		3	0	23		7	0	0		0	0	1	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	0	0	0		3	0	23		7	593	0		0	1291	1	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	0	0	0		3	0	23		7	593	0		0	1291	1	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Final Vol.:	0	0	0		3	0	23		7	593	0		0	1291	1	
Critical Gap Module:																
Critical Gp:	xxxxx	xxxx	xxxxx		6.4	xxxx	6.2		4.1	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
FollowUpTim:	xxxxx	xxxx	xxxxx		3.5	xxxx	3.3		2.2	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
Capacity Module:																
Cnflict Vol:	xxxx	xxxx	xxxxx		1899	xxxx	1292		1292	xxxx	xxxxx		xxxx	xxxx	xxxxx	
Potent Cap.:	xxxx	xxxx	xxxxx		77	xxxx	201		543	xxxx	xxxxx		xxxx	xxxx	xxxxx	
Move Cap.:	xxxx	xxxx	xxxxx		76	xxxx	201		543	xxxx	xxxxx		xxxx	xxxx	xxxxx	
Volume/Cap:	xxxx	xxxx	xxxx		0.04	xxxx	0.11		0.01	xxxx	xxxx		xxxx	xxxx	xxxx	
Level Of Service Module:																
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx			0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx		
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx			11.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx		
LOS by Move:	*	*	*	*	*	*			B	*	*	*	*	*		
Movement:	LT - LTR - RT			LT - LTR - RT					LT - LTR - RT				LT - LTR - RT			
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	169	xxxxx			xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx	
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.5	xxxxx			xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	30.1	xxxxx			xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
Shared LOS:	*	*	*	*	D	*			*	*	*		*	*	*	
ApproachDel:	xxxxxx				30.1				xxxxxx				xxxxxx			
ApproachLOS:	*				D				*				*			

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Fassler Avenue Homepride Construction Development
Cumulative Conditions
PM Peak Hour

Trip Generation Report
Forecast for PM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Proposed Pro	34.00	Residential -	0.75	0.44	26	15	41	100.0
	Zone 1 Subtotal					26	15	41	100.0
TOTAL						26	15	41	100.0

Trip Distribution Report

Percent Of Trips Base To Gates

Zone	1	2	3	4	5	6	7
1	77.0	5.0	10.0	1.0	2.0	4.0	1.0

Turning Movement Report
PM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Fassler/Project													
Base	0	0	0	0	0	0	0	858	0	0	517	0	1375
Added	0	0	0	2	0	14	23	0	0	0	0	3	42
Total	0	0	0	2	0	14	23	858	0	0	517	3	1417
#7 Hwy 1/Fassler Ave.													
Base	43	1272	19	985	1875	66	117	55	70	23	31	396	4952
Added	0	0	0	22	0	0	0	1	0	0	1	12	36
Total	43	1272	19	1007	1875	66	117	56	70	23	32	408	4988
#9 Hwy 1/Reina del Mar													
Base	24	1689	101	285	2753	4	9	8	7	158	1	126	5165
Added	0	12	1	0	20	0	0	0	0	1	0	0	34
Total	24	1701	102	285	2773	4	9	8	7	159	1	126	5199

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Fassler/Project	A	0.0	0.000	B	14.0	0.000	+13.980 D/V
# 7 Hwy 1/Fassler Ave.	C	25.7	0.876	C	26.1	0.884	+ 0.458 D/V
# 9 Hwy 1/Reina del Mar	D	38.4	1.011	D	39.5	1.018	+ 1.079 D/V

Fassler Avenue Homepride Construction Development
Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 Fassler/Project

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: B[14.0]

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Stop Sign						Stop Sign						Uncontrolled						Uncontrolled					
Rights:	Include						Channel						Include						Include					
Lanes:	0	0	0	0	0		0	0	1!	0	0		1	0	1	0	0		0	0	0	1	0	
Volume Module:																								
Base Vol:	0	0	0				0	0	0				0	858	0				0	517	0			
Growth Adj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
Initial Bse:	0	0	0				0	0	0				0	858	0				0	517	0			
Added Vol:	0	0	0				2	0	14				23	0	0				0	0	3			
PasserByVol:	0	0	0				0	0	0				0	0	0				0	0	0			
Initial Fut:	0	0	0				2	0	14				23	858	0				0	517	3			
User Adj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
PHF Adj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
PHF Volume:	0	0	0				2	0	14				23	858	0				0	517	3			
Reduct Vol:	0	0	0				0	0	0				0	0	0				0	0	0			
Final Vol.:	0	0	0				2	0	14				23	858	0				0	517	3			
Critical Gap Module:																								
Critical Gp:	xxxxx	xxxx	xxxxx				6.4	xxxx	6.2				4.1	xxxx	xxxxx				xxxxx	xxxx	xxxxx			
FollowUpTim:	xxxxx	xxxx	xxxxx				3.5	xxxx	3.3				2.2	xxxx	xxxxx				xxxxx	xxxx	xxxxx			
Capacity Module:																								
Cnflict Vol:	xxxx	xxxx	xxxxx				1423	xxxx	518				520	xxxx	xxxxx				xxxx	xxxx	xxxxx			
Potent Cap.:	xxxx	xxxx	xxxxx				151	xxxx	561				1056	xxxx	xxxxx				xxxx	xxxx	xxxxx			
Move Cap.:	xxxx	xxxx	xxxxx				149	xxxx	561				1056	xxxx	xxxxx				xxxx	xxxx	xxxxx			
Volume/Cap:	xxxx	xxxx	xxxx				0.01	xxxx	0.02				0.02	xxxx	xxxx				xxxx	xxxx	xxxx			
Level Of Service Module:																								
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx							0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx						
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx							8.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx						
LOS by Move:	*	*	*	*	*	*							A	*	*	*	*	*						
Movement:	LT - LTR - RT						LT - LTR - RT						LT - LTR - RT						LT - LTR - RT					
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	417	xxxxx							xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx						
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx							xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx						
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	14.0	xxxxx							xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx						
Shared LOS:	*	*	*	*	B	*							*	*	*	*	*	*						
ApproachDel:	xxxxxx				14.0								xxxxxx						xxxxxx					
ApproachLOS:	*				B								*						*					

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E2: Hexagon Transportation Consultants, Inc., Peer Review of the Fassler Avenue Residential Traffic Impact Study in the City of Pacifica, August 22, 2006

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HEXAGON TRANSPORTATION CONSULTANTS, INC.

August 22, 2006

Ms. Erin Efner
Christopher Joseph & Associates
610 16th Street, Suite 514
Oakland, CA 94612

Subject: Peer Review of the Fassler Avenue Residential Traffic Impact Study in the City of Pacifica

Dear Ms. Efner:

This letter report presents the results of Hexagon's peer review of the traffic impact study prepared for the Fassler Avenue Residential project in Pacifica, California. The purpose of this review is to ensure that the traffic report conforms to City of Pacifica standards, to confirm that accepted traffic study methods were used, and to ensure that the recommendations contained in the report adequately address project impacts. The project site is located on the north side of Fassler Avenue, between Roberts Road and Driftwoood Circle. The project description contained in the Initial Study and Checklist for the project indicates that 34 residential condominium units are proposed.

A final traffic impact study, dated July 28, 2005 was prepared by Dowling Associates, Inc. for the project that evaluated the traffic impacts associated with developing the residential project on the site. The draft traffic study was completed April 27, 2005. After receiving comments on the draft study, revisions were made as necessary, and the final traffic impact study was prepared.

This peer review consists of a technical evaluation of the following document:

- Fassler Avenue Project Traffic Impact Study (Final Report), prepared by Dowling Associates, Inc. (July 28, 2005),

Other documents associated with the project were not evaluated for technical content, but were briefly reviewed to gain background knowledge of the project. These include the Initial Study and Checklist (dated January 13, 2006) prepared by the City of Pacifica, Caltrans' Comment Letter on the Final Traffic Study (November 7, 2005), Caltrans' Additional Comments (November 23, 2005), various other comments letters, and information provided to the City by the project applicant.

The key findings of our peer review of the traffic report are presented in the following sections.

SCOPE OF REVIEW

The following issues were reviewed in the traffic study as part of the peer review:

1. Existing Traffic Count Data
2. Site Traffic Projections
3. Trip Distribution Pattern
4. Project Trip Assignment
5. Adequacy of Study Area
6. Level of Service Calculations
7. Review Proposed Driveway Design

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REVIEW RESULTS

Each of the key issues of the peer review is discussed below along with the results of the peer review.

Existing Traffic Count Data

The original traffic count data used in the traffic study were obtained from Dowling Associates, Inc. to be included in this peer review. The traffic count data for the project were collected at both intersections on Thursday, March 10, 2005. A review of the count data does not indicate any obvious flaws in the data and the turning movements recorded appear to match traffic patterns observed in the field. Caltrans' comment letter (dated November 23, 2005) questions whether the traffic count data reflected demand counts or output counts. This letter further states that field observations conducted by Caltrans staff in the past have indicated LOS F conditions at the intersection during the AM peak hour. The Caltrans letter does not state whether the LOS F conditions observed pertain only to particular high-delay movements or to the overall average intersection level of service.

Field observations were conducted by Hexagon at the two study intersections during the AM peak hour to observe traffic conditions to determine whether the existing count data adequately represent existing conditions. However, at the time that field observations were made, Highway 1 was closed south of Pacifica at Devils Slide. The reduction in traffic volume on Highway 1 in Pacifica as a result of the closure is likely responsible for improved traffic operations at the study intersections over what was studied in the traffic study and reported by Caltrans in the November 23, 2005 comment letter. The field observations conducted by Hexagon did not identify unacceptable delays at the study intersections and both intersections appeared to be operating with overall intersection delays in the LOS C or better range. Because current traffic conditions, with the highway closure at Devils Slide, are not representative of normal conditions on this segment of Highway 1, Hexagon cannot independently determine, from field observations, whether the traffic counts used in the traffic study are skewed due to unmet demand at the intersections.

The original traffic count data were further analyzed in an effort to draw some conclusion about traffic operations on Highway 1 from inspection of the count data. This analysis focused on traffic volumes in the northbound through movement at each intersection during the AM peak commute period (7:00 AM to 9:00 AM). During the AM peak-hour the northbound through movement at each intersection is the critical movement and the movement that most likely would experience a breakdown in operations if demand exceeded capacity during the peak hour. The traffic volume counts in the northbound through movement for each 15-minute period during the AM peak commute period were evaluated at both intersections. This procedure found that both intersections have roughly the same traffic profile. Traffic volumes gradually increase and peak at 7:30, then the volumes slowly decrease until about 8:15 or 8:30 when another smaller peak occurs (likely due to school traffic). The traffic volume profiles are relatively flat over the course of the AM peak commute period at both intersections; with relatively minor high and low points. Based on this review, the 15-minute count data do not provide strong evidence to indicate whether the traffic counts reflect demand volume or output volume.

The results of Hexagon's review of the traffic count data, based on the available information, were inconclusive.

Recommendation

Field observations and/or new traffic counts should be conducted after traffic conditions have normalized in the area with Highway 1 reopened at Devils Slide and with area schools back in session. A reasonable time to conduct field observations would be at least one month after the highway was opened and at least two weeks after all public and private schools are back in session. The field observations or new traffic count data could be used to calibrate the level of service calculations to accurately reflect field conditions.

Site Traffic Projections

A review of the trip generation estimates contained in the traffic report was conducted to verify that they are accurate, that representative land uses were chosen, and that the rates are based on the appropriate land-use data as published by the Institute of Transportation Engineers (ITE).

A review of the site traffic projections finds that the trip generation rates used in the July 28, 2005 traffic study correspond to the ITE land use category for single-family detached housing. Although the project description indicates that condominiums would be built, the trip generation analysis contained in the traffic study is sufficient. This is so because the trip generation rates for single-family detached housing are higher than those for residential condominiums. Additionally, the trip generation calculations in the traffic study are based on the "fitted-curve equation", as published by ITE, which results in higher trip generation values than when the average trip rates are used. Thus, trip generation analysis contained in the traffic study provides for a conservative analysis of the trip generation potential of the project.

Trip Distribution Pattern

The directional distribution of project traffic was reviewed for consistency with existing travel patterns and the relative locations of complementary land uses.

The trip distribution pattern for the proposed project is reasonable and is consistent with existing traffic patterns in the area and the relative locations of complementary land uses.

Project Trip Assignment

The assignment of site-generated traffic on the local roadway network was reviewed for accuracy and consistency with the trip distribution pattern contained in the traffic report.

The assignment of project traffic is consistent with the trip distribution pattern contained in the traffic report.

Adequacy of Study Area

The study area and study facilities included in the traffic impact study were reviewed to ensure that potential project impacts on the local transportation system are accurately identified.

The list of study intersections considered in the traffic analysis covers a sufficiently wide geographic area to accurately identify the potentially significant project impacts associated with the proposed project.

Level of Service Calculations

The Synchro and Traffix level of service calculation output pages were reviewed for accuracy.

The results of the review indicate that the level of service calculations are consistent with the traffic volume data presented in the report and that correct geometry assumptions were used.

However, level of service results for existing conditions reported in the report are not consistent with the level of service calculation pages contained in the appendix. The report text indicates that the SR 1/Fassler Avenue intersection operates at LOS D with 35.5 seconds of delay during the AM peak hour and at LOS C with 33.5 seconds of delay during the PM peak hour. However, the level of service calculation pages indicate that the existing levels of

service for the SR 1/Fassler Avenue intersection are LOS D (40.0 seconds) during the AM peak hour and LOS C (33.4 seconds) during the PM peak hour. Similarly, at the SR 1/Reina del Mar intersection, the report text indicates existing levels of service of LOS D (39.3 second) for the AM peak hour and LOS C (24.1 seconds) for the PM peak hour, whereas the level of service calculation pages indicate LOS D (43.8 seconds) and LOS C (30.2 seconds) during the AM and PM peak hours, respectively. This error in reporting the calculated intersection delays for existing conditions does not affect the conclusions of the traffic study.

For the "existing plus project" and "cumulative" study scenarios, delay values were not reported, but level of service grades were. The level of service grades report in the report text for these study scenarios are consistent with the level of service calculation pages.

Overall, the level of service calculations appear to be accurate and consistent with the traffic data presented in the traffic report.

Proposed Site Driveway Design

The Initial Study and Checklist prepared for the project indicates that City of Pacifica staff are concerned with the design of the project access driveways on Fassler Avenue.

The project site would have two driveways on Fassler Avenue. The westernmost driveway would be the primary access point for vehicular traffic. The easternmost driveway would provide access only for bicycles, pedestrians, and emergency vehicles. According to the site plan, a 6-inch raised curb would be built along the sidewalk in front of the emergency access driveway, which would prevent this driveway from being used by auto traffic associated with the project.

According to the site plan, the main project driveway would be designed with a left-turn pocket for traffic entering the site from the west and an exclusive right-turn lane for traffic entering the site from the east. Additionally, a median acceleration/refuge lane would be provided on eastbound Fassler Avenue for traffic making a left turn out of the project driveway. An acceleration lane also is proposed on westbound Fassler Avenue for traffic making a right turn out of the project site.

The throat of the main driveway flares substantially at the curb line of Fassler Avenue. This provides enough space for the outbound lane to split into two lanes – one for outbound right turns and one for left turns. The two lanes are separated by a triangular island. Because the driveway tapers considerably as it flares out where it intersects Fassler Avenue, the outbound right-turn lane is situated at a relatively extreme angle to Fassler Avenue. This would require drivers making a right turn out of the project site to look over their shoulder and behind them to see oncoming traffic in the westbound lane on Fassler Avenue. This could lead to a potential safety problem in which it may be difficult for drivers making the outbound right-turn movement to clearly see oncoming traffic on Fassler Avenue.

Except for the alignment of the outbound right-turn lane, the design of the project driveway on Fassler Avenue appears to be acceptable.

City of Pacifica staff has indicated that Fassler Avenue, in the vicinity of the project driveway, should be designed such that the potential to restripe the facility with two westbound travel lanes is maintained. This would require eliminating the proposed westbound right-turn pocket into the project site and the proposed westbound acceleration lane for outbound right-turn traffic. With this change, westbound Fassler Avenue would have one wide lane in front of the project driveway. Right turns into the site would be made from this lane and right turns out of the site would have to merge into this lane. Hexagon believes that this design would operate effectively since the sight distance to

the east is sufficient for outbound right-turning traffic to clearly see approaching vehicles far enough in advance to safely turn onto Fassler Avenue. Additionally, the volume of traffic turning right into the project site from westbound Fassler Avenue would be very low and would not cause a disruption to through traffic if right-turn traffic and through traffic have to share a single westbound travel lane.

Recommendations
It is recommended that the project driveway be modified such that there is only one outbound lane at the point where the driveway meets Fassler Avenue. This lane would accommodate outbound left- and right-turning traffic, and should be aligned at a right angle to Fassler Avenue to provide for good visibility in both directions on Fassler Avenue.

Additionally, if the design of the project driveway is to allow for two westbound travel lanes on Fassler Avenue in the future, then the right-turn lane into the site and the westbound acceleration lane for outbound right-turn traffic should be eliminated. In the vicinity of the project driveway, Fassler Avenue should have one wide travel lane in the westbound direction. The shoulder hatching to the east of the driveway and the painted turn islands in front of the driveway should be eliminated.

Identification of Project Impacts

The results of the traffic study were reviewed to ensure that project impacts are properly identified.

The City of Pacifica uses a level of service standard of LOS D for all intersections in the City. The traffic study does not indicate the threshold of significance for determining intersection impacts. Other traffic studies in the City of Pacifica have considered project impacts to be significant when project traffic is added to any intersection that currently operates at an unacceptable level of service (LOS E or worse), or if the additional of project traffic causes the intersection to degrade from acceptable conditions (LOS D or better) to unacceptable conditions.

Based on the level of service standard and impact threshold identified above, the traffic study correctly characterizes the project impact as less-than-significant at both study intersections, assuming that the traffic count data used in the traffic study reflect demand volumes. However, if the traffic counts used in the traffic study where affected by jammed traffic conditions and do only reflect output volumes, then it is likely that the level of service at the Highway 1/Reina del Mar intersection would be LOS E under existing plus project conditions during the AM peak hour. This would be considered a significant project impact. It is important to note that the project would only change the delay by a very small about (about 1 second) and the number of project trips added to the intersection constitutes about 0.6% of the existing traffic volume at the intersection. Nevertheless, the significance criteria for determining significant intersection impacts is met. As discussed above, with the information that is currently available, this peer review cannot independently determine whether the count data used in the traffic study reflect demand counts or output counts.

Mitigation Measures
Regardless of how the impact is characterized, the analysis indicates that the project's contribution would be relatively minor. Hexagon believes that both mitigation measures proposed in the traffic study to offset cumulative project impacts at Highway 1 and Reina del Mar would be successful in mitigating the project's impact (whether under cumulative conditions or under existing plus project conditions). At Highway 1 and Reina del Mar, the change in delay between existing conditions and existing plus project conditions caused by the addition of project traffic would be 1.1 seconds during the AM peak hour and 1.0 second during the PM peak hour. The mitigation measures contained in the traffic study are discussed below, along with an alternative mitigation measure proposed by Hexagon.

Elementary School Vanpool – The traffic study indicates that that the project applicant has proposed to contribute to a vanpool for school children in the neighborhood of the proposed project. It is recommended that the vanpool program plan/strategy be developed by the project applicant in consultation with the City of Pacifica. Additionally, in order to truly offset the project's impact, the project applicant should agree to fund and operate the program (or to fund a City-operated program) for an indefinite period of time or until physical improvements at the Reina del Mar intersection are implemented. Additionally, the vanpool would have to serve more neighborhoods than just the proposed project to be effective in offsetting the projects impact. It is recommended that the vanpool serve the proposed project and the existing neighborhoods on Fassler Avenue and the south part of Pacifica.

Second Southbound Left-Turn Lane at Highway 1 and Reina del Mar Avenue – Hexagon concurs that this mitigation measure would mitigate the project impact and likely would restore intersection operations to acceptable levels (LOS C or better). As discussed in the traffic study, this improvement would require some widening on southbound Highway 1 to accommodate the additional turn lane and likely would require right-of-way acquisition on the east leg of the intersection (Reina del Mar Avenue) to accommodate a second eastbound receiving lane for the additional southbound left-turn lane. The receiving lane would need to extend for several hundred feet in order to be effective. Therefore, the right-of-way acquisition could be extensive. The improvement also includes modifying the signal operation to provide overlap phasing for the westbound right-turn movement from Reina del Mar. In terms of offsetting the projects impact, it is possible that implementing only the right-turn overlap phasing would provide enough additional capacity for the westbound right-turn movement to reduce the overall delay at the intersection enough to mitigate the impact attributable to the project.

Eastbound and Westbound Signal Phasing Modifications (Alternate Mitigation) – Currently, the eastbound and westbound movements at the Highway 1/Reina del Mar intersection operation with split signal phasing (i.e., each approach gets a separate green phase). Additionally, there is an east-west crosswalk that currently has relatively heavy pedestrian volumes during the AM peak hour. Although split phasing is safer for pedestrian movements than compared to permitted phasing, it is less efficient in terms of traffic operations. During the AM peak hour, the eastbound vehicular volumes on Reina del Mar at Highway 1 are relatively light, requiring very little green time. However, the east-west pedestrian volume is relatively heavy (the pedestrian phase is called on most signal cycles). The east-west pedestrian phase occurs with the eastbound vehicular movements. Since the amount of green time required to serve the east-west pedestrian phase is significantly longer than the green time required to serve the eastbound vehicular volume, there is a significant amount of wasted green time at the intersection. A more efficient method for handling the east-west pedestrian phase at the intersection would be to have it run concurrently with the westbound vehicular movements. However, the only safe way for this to occur is if the eastbound and westbound left-turn movements were converted to protected left-turn phasing. On the east approach, this would require restriping the shared left-turn/through/right-turn lane to a dedicated left-turn lane and restriping the exclusive right-turn lane as a shared through/right-turn lane. On the west approach, an additional eastbound lane would be needed, which would require widening the approach and potentially could include acquiring right-of-way. The widening would allow for an exclusive eastbound left-turn lane and a shared through/right-turn lane. It is recommended that this mitigation measure be considered and that the affect on level of service be evaluated by the applicant's traffic engineer as an alternative to the intersection improvement described in the traffic study.

CONCLUSION AND RECOMMENDATIONS

Our review of the traffic study identified the following issues:

1) Hexagon's review of the traffic count data, based on the available information, was inconclusive.

2) The level of service results for existing conditions reported in the report are not consistent with the level of service calculation pages contained in the appendix. This error in reporting the calculated intersection delays for existing conditions does not affect the conclusions of the traffic study.
3) Except for the alignment of the outbound right-turn lane, the design of the project driveway on Fassler Avenue appears to be acceptable. The throat of the main driveway flares substantially at the curb line of Fassler Avenue and puts outbound right-turn drivers at an awkward angle in terms of their ability to view traffic approaching on westbound Fassler Avenue.
4) Based on the level of service standard and impact threshold identified above, the traffic study correctly characterizes the project impact as less-than-significant at both study intersections, assuming that the traffic count data used in the traffic study reflect demand volumes. However, if the traffic counts used in the traffic study where affected by jammed traffic conditions and do only reflect output volumes, then it is likely that the project would cause a significant level of service impact at the Highway 1/Reina del Mar intersection under existing plus project conditions during the AM peak hour.

Recommendations

Traffic Count Data. Field observations and/or new traffic counts should be conducted after traffic conditions have normalized in the area (at least one month after Highway 1 was reopened and at least two weeks after schools are back in session). The field observations or new traffic count data could be used to calibrate the level of service calculations to accurately reflect field conditions.

Driveway Design. It is recommended that the project driveway be modified such that there is only one outbound lane at the point where the driveway meets Fassler Avenue. This lane would accommodate outbound left- and right-turning traffic, and should be aligned at a right angle to Fassler Avenue to provide for good visibility in both directions on Fassler Avenue. Additionally, if the design of the project driveway is to allow for two westbound travel lanes on Fassler Avenue in the future, then the right-turn lane into the site and the westbound acceleration lane for outbound right turns should be eliminated. Fassler Avenue should have one wide travel lane in the westbound direction in the vicinity of the project driveway and the shoulder hatching to the east of the driveway and painted turn islands in front of the driveway should be eliminated.

Mitigation Measures. Hexagon believes that the following mitigation measures would be successful in mitigating the project's impact (whether under cumulative conditions or under existing plus project conditions):

- <u>Elementary School Vanpool</u> – It is recommended that the vanpool program plan/strategy be developed by the project applicant in consultation with the City of Pacifica. Additionally, in order to truly offset the project's impact, the project applicant should agree to fund and operate the program (or to fund a City-operated program) for an indefinite period of time or until physical improvements at the Reina del Mar intersection are implemented. Additionally, the vanpool would have to serve more neighborhoods than just the proposed project to be effective in offsetting the projects impact.
- <u>Second Southbound Left-Turn Lane at Highway 1 and Reina del Mar Avenue</u> – This improvement would require some widening on southbound Highway 1 to accommodate the additional turn lane and likely would require right-of-way acquisition on the east leg of the intersection (Reina del Mar Avenue) to accommodate a second eastbound receiving lane for the additional southbound left-turn lane. The receiving lane would need to extend for several hundred feet in order to be effective. The improvement also includes modifying the signal operation to provide overlap phasing for the westbound right-turn movement from Reina del Mar.
- <u>Eastbound and Westbound Signal Phasing Modifications (Alternate Mitigation)</u> – The eastbound and westbound left-turn movements should be converted to protected left-turn phasing. On the east approach, this would require restriping the shared left-turn/through/right-turn lane to a dedicated left-turn lane and restriping the exclusive

right-turn lane as a shared through/right-turn lane. On the west approach, a dedicated eastbound left-turn lane would be needed, which would require widening the approach and potentially could include acquiring right-of-way. It is recommended that this mitigation measure be considered and that the effect on level of service be evaluated by the applicant's traffic engineer as an alternative to the intersection improvement described in the traffic study.

Please feel free to call if you have any questions or would like to discuss the results of the analysis.

Sincerely,

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Jeffrey A. Elia, P.E.
Senior Associate

E3: Dowling Associates, Inc. Final Report Traffic Impact Study – Fassler Avenue Project, October 20, 2006

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Final Report for:

Traffic Impact Study
Fassler Avenue Project

Prepared for:

Pacifica Quarry Homes, LLC

Submitted by:

Dowling Associates, Inc.

Transportation Engineering • Planning • Research • Education

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October 20, 2006

Dowling Associates, Inc.
Transportation Engineering • Planning • Research • Education

October 20, 2006

Mr. Rick Lee
Pacifica Quarry Homes, LLC
704 Corona Drive
Pacifica, CA 94044

Subject: Fassler Avenue Residential Project – Traffic Report

Dear Rick:

Dowling Associates, Inc. is pleased to present this report documenting our updated traffic impact study efforts. We conducted the analysis consistent with methodology and assumptions discussed with City staff, including new traffic counts and field observations that were recently requested. The report incorporates new results, based on the new data, as well as the relevant information from our previous report (July, 2005).

We found that the existing levels of service were worse than reported last year. Because the traffic demands are higher than we realized last year, the impact of the trips that would be added by the project is actually less (same number of project trips added to a higher volume than before). Based on our understanding of the level of service criteria, we found there would be no traffic impacts caused by the project under Existing conditions. Under Cumulative conditions, the conclusion is similar, but, consistent with the usual CEQA practice to identify mitigation measures even if they are not caused by a project, we have identified some potential mitigation measures.

We have highlighted your proposal to start a vanpool program as the best way to mitigate new trips generated by the development. We also identified more traditional mitigation measures for the intersections that would reduce the impacts to less-than-significant, in order to be consistent with the CEQA process.

I have enjoyed working with you on this project, and will be glad to assist you if you have any further needs related to our traffic analysis.

Sincerely,
Dowling Associates, Inc.

Marty Beene, P.E.
Vice President

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APPENDICES

Appendix A – Comments and Responses related to 2005 Draft Report
Appendix B – Level of Service Calculation Output

Introduction

The purpose of this report is to document traffic impact analysis for a proposed project in Pacifica, California. This report includes additional information that supplements a report from July, 2005 for this same proposed project. The original report was conducted in the context that it may or may not have been used in formal environmental analysis documentation that would be conducted under California Environmental Quality Act (CEQA) regulations. The new information and analysis, which is now likely to be used during formal environmental review, was prepared because of comments and requests generating during reviews by City and Caltrans staff, as well as a peer review by another consultant. This report is updated where applicable with the new information (traffic volumes and associated level of service calculations, etc.). The proposed project would be located along the north side of Fassler Avenue, between Roberts Road and Driftwood Circle. Figure 1 shows the location of the proposed project.

Map created with TOPO! © 2004 National Geographic

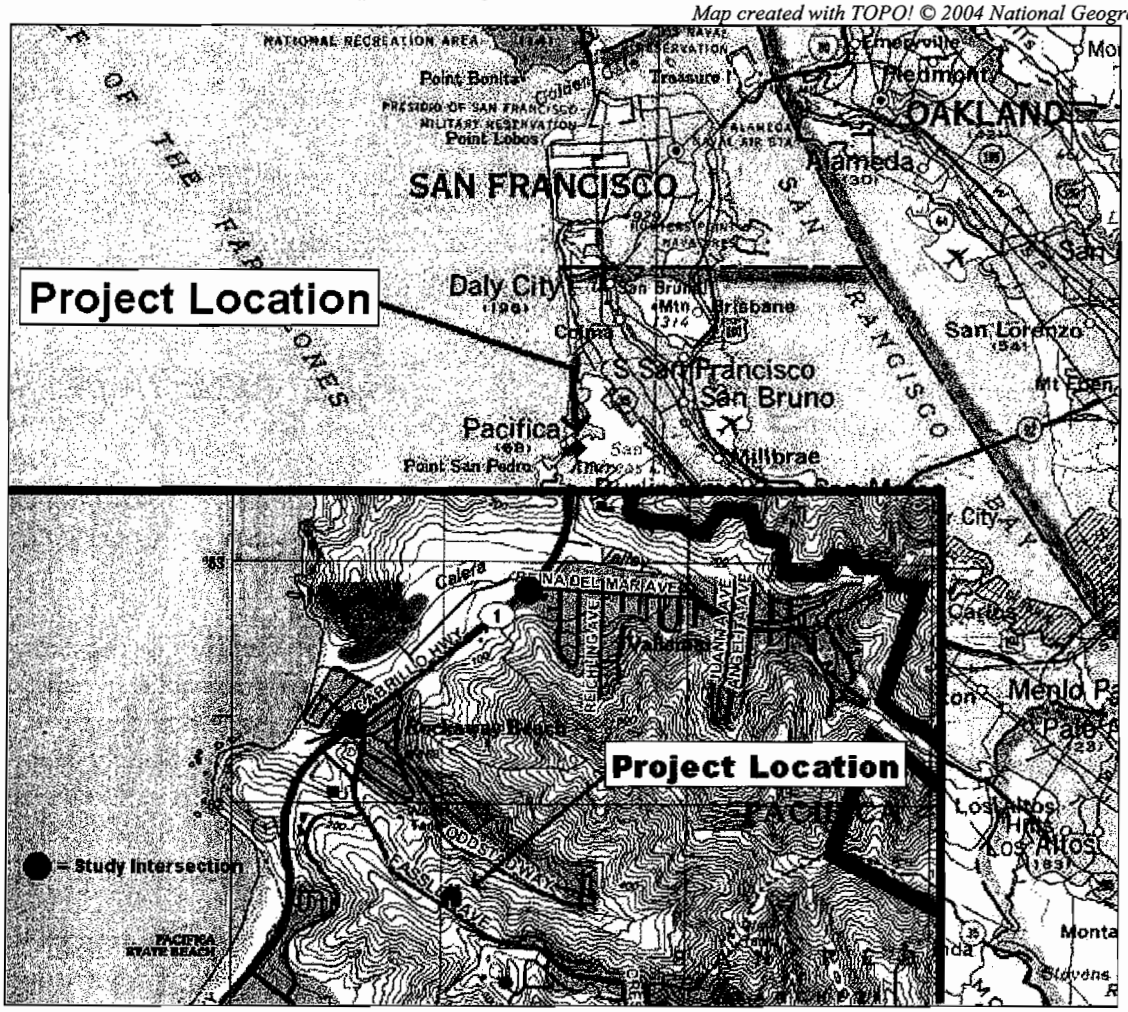


Figure 1 – Project Location

In order to evaluate traffic impacts, three intersections were studied: the proposed intersection on Fassler Avenue that would serve the project; and two intersections along State Route 1 (SR1), SR1/Fassler Avenue, and SR1/Reina del Mar Avenue. The two SR1 intersections are both signalized and are indicated in Figure 1 with green circles.

Methodology and Significance Criteria

Level of service analysis for the signalized intersections was conducted using the *Highway Capacity Manual (HCM)* methodology in Synchro software. TRAFFIX software was used to calculate the *HCM*-based level of service for the proposed unsignalized intersection that would serve the project. Level of service is a grading system used to describe overall traffic operations at intersections, with LOS A being the best results and LOS F being the worst. LOS D is usually considered to be the worst acceptable result for signalized intersections. The level of service is calculated by entering several inputs, such as traffic volumes and intersection lane geometry, into formulas that yield an average delay for vehicles at the intersection. For unsignalized intersections, such as what is anticipated at the access intersection for the proposed project, similar calculations are performed, but the reported result is the worst operating approach. For unsignalized intersections, LOS E is usually considered the worst acceptable result.

Since the two signalized study intersections lie on a State Route, a Caltrans document titled "Guide for the Preparation of Traffic Impact Studies" (December, 2002) was consulted regarding the State's intersection level of service standard. The relevant sentences from that document are shown below:

> *Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" (see Appendix "C-3") on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained.*

When operating conditions are already at unacceptable operating conditions, there are different methods for determining whether a project causes a traffic impact requiring mitigation. Some jurisdictions use a percent increase in delay – this method can be troublesome because delays above LOS F levels can increase disproportionately to increases in traffic volumes. Other jurisdictions use the percent of increase in traffic volumes caused by a project or the percent of increase in volume above the LOS D/E or E/F threshold. If a percent of delay or volume is used, it is typically defined as a value from 3-5%.

This study uses LOS D and LOS E as the standards of significance for signalized and unsignalized intersections, respectively. For signalized intersections already operating at LOS E, a degradation to LOS F would be considered a significant impact, as well as an

intersection already operating at LOS F, where calculated delay is increased by more than 3%.

Setting and Existing Conditions

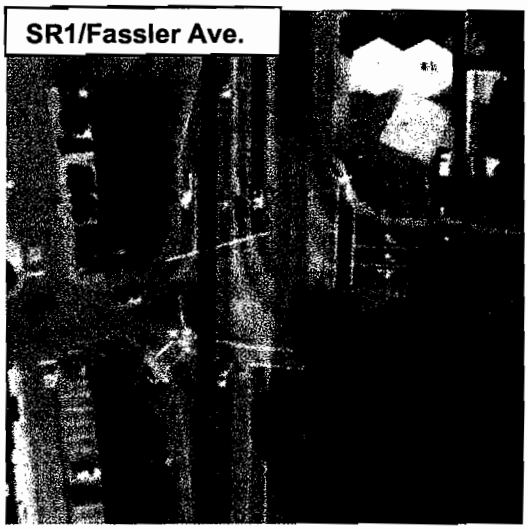
Roadways

Fassler Avenue serves as a collector street for several residential developments east of State Route 1 (SR1). In the vicinity of the proposed project, approximately 0.6 miles from SR1, Fassler Avenue transitions from four lanes to two lanes. The speed limit on Fassler Avenue is 35 mph. There is a relatively steep grade of about 9% on Fassler Avenue in the vicinity of the proposed project – it drops approximately 300 feet from Driftwood Circle to Roberts Road, a distance of 0.6 miles. On the west side of SR1, Fassler Avenue serves a commercial area that borders the Pacific Ocean.

SR1/Reina del Mar Ave.

State Route 1 (SR1) is an arterial roadway in the project vicinity that serves the communities along the Pacific Ocean south of San Francisco. In the project vicinity, it consists of four lanes, and has a speed limit of 45 mph. There are two signalized intersections in the project vicinity, both of which were studied for this analysis.

- SR1/Reina del Mar Avenue is a four-legged intersection with protected left-turn phasing (left-turning traffic is served by separate, protected phases) for the north-south directions and split phasing (left, through, and right movements all proceed together, separate from the opposite direction) for the east-west directions. This intersection has single left-turn lanes for the northbound and southbound SR1 approaches. On the westbound approach, there are two lanes, a right-turn lane and a shared left-through-right lane. Pedestrians are prohibited from crossing the north leg of the intersection.


SR1/Fassler Ave.

- SR1/Fassler Avenue is a four-legged intersection with the same basic signal configuration as SR1/Reina del Mar Avenue. There are two left-turn lanes for the southbound SR1 approach, and two right-turn lanes for the westbound Fassler Avenue approach. These two right-turn lanes are served by an "overlap" phase in which they receive a green right arrow during the time when the southbound approach left-turns have a green light. Eastbound approach right-turn traffic (heading toward southbound SR1) is not technically controlled by the traffic signal – that

movement is subject to a yield sign near the intersection. Pedestrians are prohibited from crossing the north and west legs of the intersection. There is an unsignalized intersection (serving Harvey Way) very close to this intersection, just to the east – there is "KEEP CLEAR" text on the pavement to keep the access to Harvey Way from being blocked by queues.

Reina del Mar Avenue is another collector street that serves a small area than Fassler Avenue, and one which includes some commercial uses and Vallemar School, in addition to residential areas. It consists of two lanes and has a speed limit of 25 mph. On the west side of SR1, it ends a short distance from the State Route at a parking lot which serves as a staging area for a recreational path. There is also a driveway that leads to a solid waste handling facility.

Transit

Several SamTrans bus routes serve the area. Routes CX, DX, 16, 110, 112, and 140 all travel along SR1. Routes 16 and 140 also travel along Fassler Avenue. There are bus stops near both the SR1/Fassler and SR1/Reina del Mar intersections, including a shelter for northbound travel just north of Reina del Mar. Routes CX, DX, and 16 operate only during weekday commute periods with headways approximately 20-30 minutes apart. Routes 110 and 112 generally operate on 60-minute headways during the week, while Route 140 operates on 20-30 minute headways.

Vehicular Traffic

Peak period vehicular traffic in the area tends to be very directional, since much of the area in the project vicinity is residential: people generally drive to their jobs in the morning and return to their homes in the evening. Most of the jobs in the region that people might travel to are located to the north of the study area, toward San Francisco.

Peak period traffic counts were conducted at the two existing study intersections on a weekday during a week without a major holiday in 2005 for the original version of this report. A mechanical count was also conducted near the location of the proposed project in 2005. In order to address comments and questions on that report, new counts were conducted at the two signalized intersections in October, 2006 on a similar day as for the 2005 counts.

Additionally, field observations were conducted during peak periods on a non-holiday weekday in October, primarily to determine if there was unserved existing demand that would indicate a worse level of service than reflected in the calculations using the 2005 counts. During the AM peak period, nearly every vehicle arriving during the peak hour made it through the intersection. There were some vehicles that did not make it through the intersections during the peak hour, but only about 10-20 at each intersection. However, there were several individual cycles within the peak hour in which many more vehicles were not served by the traffic signals – this condition did cause relatively long queues and delays. As noted above, these long queues did not last for more than a few minutes beyond the peak

hour – i.e., they completely cleared the intersections only a few minutes beyond an hour after they began to build (i.e., at that point in time, vehicles arriving at the intersection were able to proceed through the intersection on the next available green indication). These conditions indicate that, while virtually all of the vehicles desiring to proceed through the intersections during the peak hour were able to do so, there is a peak period of less than an hour within the peak hour during which demand exceeds capacity and excess vehicles store in queues. This relatively brief peak period is then followed by a period of time in which the demand is less than the service rate, which allows the queue to eventually shrink back to nothing at about the end of the hour.

The *Highway Capacity Manual (HCM)* level of service methodology attempts to capture this kind of condition by the use of a Peak Hour Factor (PHF). The PHF is calculated by taking the highest 15-minute volume, multiplying that volume by four, then dividing that result into the peak 60-minute volume. A typical PHF in an urban area is between 0.90 and 0.95. While this is the standard methodology to calculate the peak "hour" level of service, it is somewhat mis-named, as it is actually calculating delay during the peak 15-minute period.

In order to develop volumes that reflect the existing traffic demand, the sum of the volumes from the beginning of the count period to the end of each 15-minute counting period were examined, along with the 15-minute counts. The 15-minute counts during the peak hour were modified such that the summed adjusted volumes at the time the queues completely cleared from the intersection were the same as those that were counted. For example, at SR1/Fassler, the total volume of northbound through traffic from 6:30 AM through 9:00 AM was 4,208 vehicles, so the goal was to identify 15-minute volumes that added to that total. The unserved volume was also checked to determine if it was consistent with the queues appearing during that time.

For each intersection, the adjustments described above meant that there would be a different demand profile arriving downstream of the bottleneck intersection. Adjustments were made to account for this, and they are included in the existing volumes.

The result of these adjustments was that the resulting volumes used in the level of service calculations were not notably different from the previous analysis volumes or even the recent raw counts, but the PHF was considerably different. The lower PHF results in delay and level of service results that reflect worse operating conditions that were reported in the original report for this study.

Table 1 shows the counted and adjusted volumes for the two movements and one approach that required adjustment: the northbound through and westbound right movements at SR1/Fassler during the AM peak period and the southbound approach at SR1/Reina del Mar during the PM peak period.

Figure 2 shows the resulting existing counts/volumes for the study intersections.

Table 1
Volume Adjustments

SR1/Fassler Avenue – AM Peak Period					SR1/Reina del Mar – PM Peak Period		
	Northbound Thrus		Westbound Rights			Southbound Approach	
Time Ending	Counted	Adjusted	Counted	Adjusted	Time Ending	Counted	Adjusted
6:45	312	312	156	156	3:15	523	523
7:00	357	357	170	170	3:30	526	526
7:15	426	426	224	224	3:45	493	493
7:30	444	444	213	**240**	4:00	609	609
7:45	519	**530**	205	**220**	4:15	523	523
8:00	452	**596**	232	**215**	4:30	588	588
8:15	510	**460**	210	**210**	4:45	674	674
8:30	435	**450**	235	**205**	5:00	700	700
8:45	400	**353**	152	**147**	5:15	679	**850**
9:00	353	**320**	142	142	5:30	742	**750**
9:15	285	285	117	117	5:45	790	**725**
9:30	310	310	93	93	6:00	726	**700**
9:45	270	270	75	75	6:15	654	**650**
10:00	298	298	88	88	6:30	587	**503**
					6:45	480	480
Totals thru 9:00	4,208	4,208	1,929	1,929	7:00	425	425
Totals	5,371	5,371	2,302	2,302			
					Totals thru 6:30	8,814	8,814
					Totals	9,719	9,719

Both of the signalized study intersections were found to operate at LOS F during the AM peak hour. For the PM peak hour, the SR1/Fassler intersection was found to operate at LOS D, and the SR1/Reina del Mar intersection was found to operate at LOS F. (Table 2, shown later in this report, summarizes the level of service results for all of the scenarios.) The calculated average delay for vehicles at the SR1/Fassler intersection is 96.0 seconds per vehicle during the AM peak hour and 37.3 seconds per vehicle during the PM peak hour. For SR1/Reina del Mar, the calculated delays are 124.6 for AM and 81.7 for PM conditions. Average delay greater than 55.0 seconds per vehicle would be LOS E, while average delay greater than 80.0 seconds per vehicle would be LOS F. Caution should be used with the LOS F delays because small changes in volumes or timings can result in large changes in delay. Delays when LOS F conditions are apparent are often reported as simply greater than 80 seconds per vehicle.

At both signalized intersections, the pedestrian crossings are set to coincide with the same signal phase as for the lowest vehicular volume approach. While this configuration is the safest for pedestrians, it is also usually the least efficient for vehicles. During the AM peak

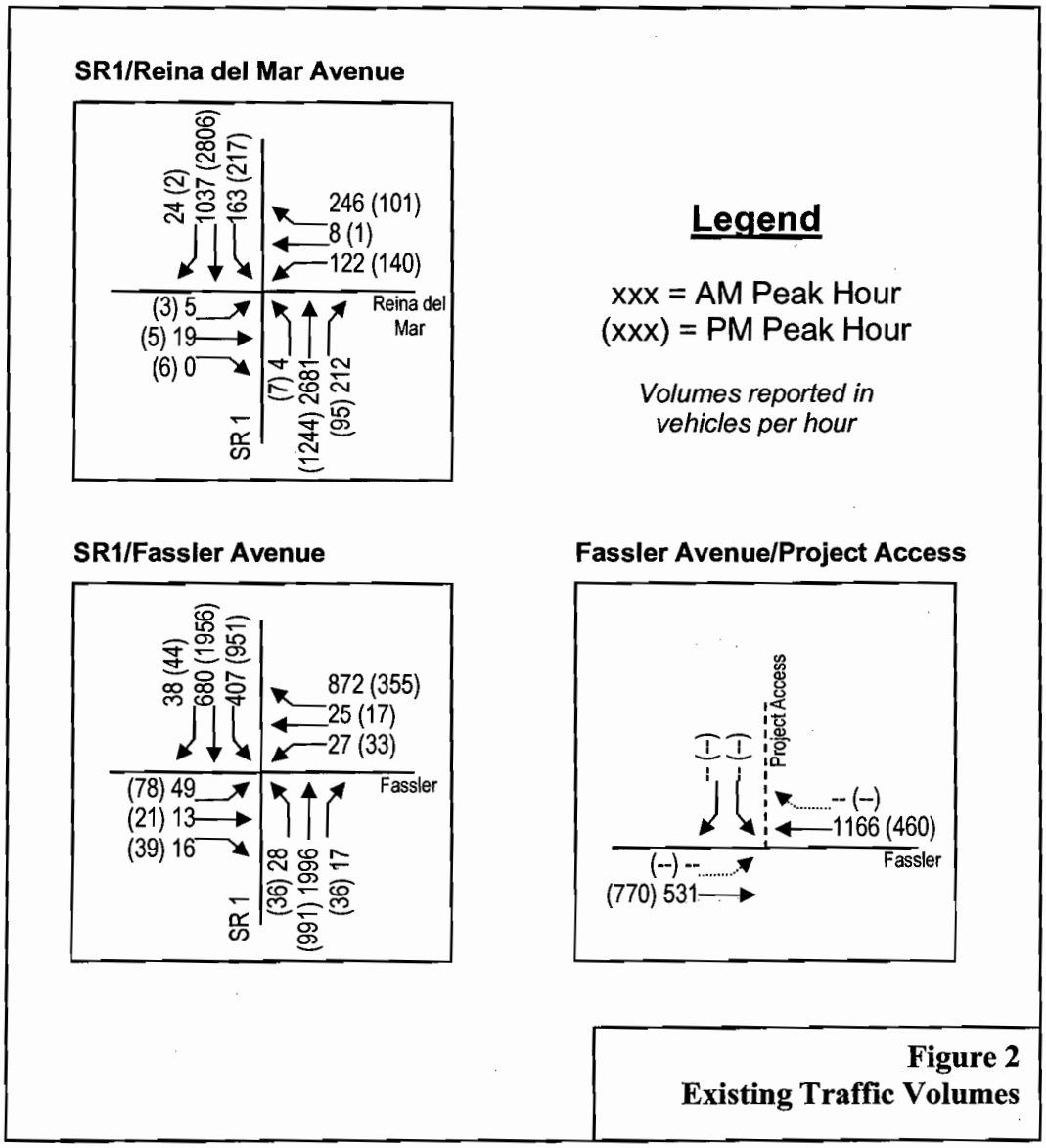


Figure 2
Existing Traffic Volumes

hour, there were no pedestrians crossing SR1 at Fassler Avenue on the day of the field observations, but there were pedestrians crossing on almost every cycle at Reina del Mar. These pedestrians appeared to be high school students crossing to reach the southbound bus stop. During the PM peak hour, there were a few pedestrians crossing at both intersections. Additionally, the SR1/Fassler Avenue signal appeared to be malfunctioning at times, giving a green indication to the eastbound approach when there were neither vehicles nor pedestrians present to have activated the signal. This did not occur on every cycle, but did waste some of the available green time by allocating it to a completely unused approach.

Based on field observations, the delays that result from the LOS calculations appear to be consistent with actual operating conditions.

Project Analysis

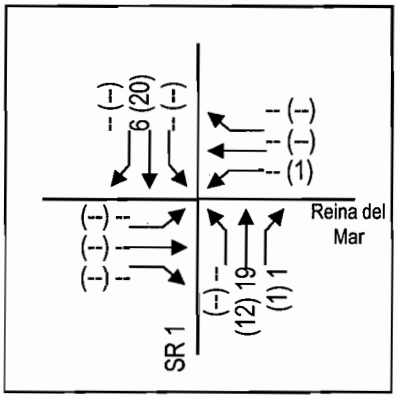
The proposed project would consist of 34 residences, including a mix of single family homes and multi-family units (e.g., duplexes, triplexes). In order to analyze the potential traffic impact of the project, trip generation, distribution, and assignment was conducted. Trip generation is a calculated estimate of the number of vehicle trips that would occur during the peak hour of traffic. Trip distribution is an estimate of the general origins and destinations of the new trips. Trip assignment is assigning the individual vehicle trips to study intersections based on the estimated trip distribution. The estimates of trip generation used the Institute of Transportation Engineers' (ITE) *Trip Generation* manual, which documents field studies of many different types of land uses. The project was evaluated assuming all units were single family detached units, which represents a slightly conservative analysis. Trip distribution was estimated based on existing travel patterns documented by the traffic counts. The trip assignment was relatively straightforward for this analysis because there are not many alternate routes for travelers – indeed, the trips were assigned using only the most logical travel routes, given the estimated trip distribution.

Based on the data from *Trip Generation*, the proposed project would generate an estimated 33 trips during the AM peak hour (8 inbound, 25 outbound) and 41 trips during the PM peak hour (26 inbound, 15 outbound). Figure 3 shows the project trip assignment for the study intersections and Figure 4 shows the Existing plus Project traffic volumes.

Level of service analysis was conducted for Existing plus Project conditions to determine if there would be any short-term traffic impacts to the study intersections. Vehicles at both signalized intersections would experience slightly higher average delay, ranging from about ½ second per vehicle at SR1/Fassler (PM peak) to about 3 seconds per vehicle at SR1/Fassler (AM peak).

At the intersection that would serve the proposed project, the worst approach level of service would be LOS D during the AM peak hour and LOS B during the PM peak hour.

SR1/Reina del Mar Avenue

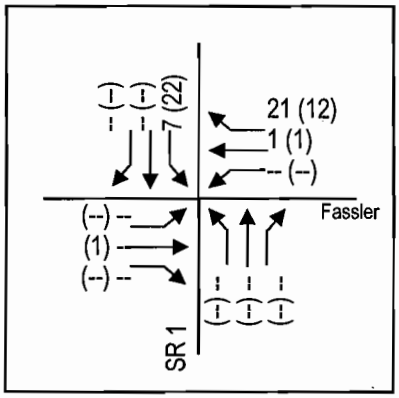


Legend

xxx = AM Peak Hour
(xxx) = PM Peak Hour

Volumes reported in vehicles per hour

SR1/Fassler Avenue



Fassler Avenue/Project Access

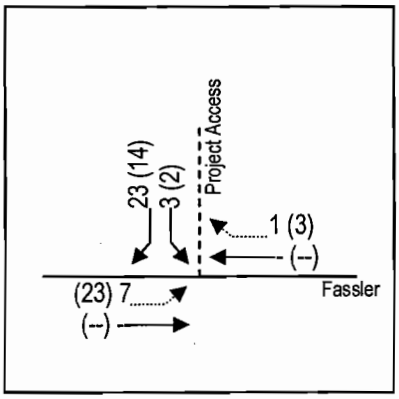


Figure 3
Project Trip Assignment

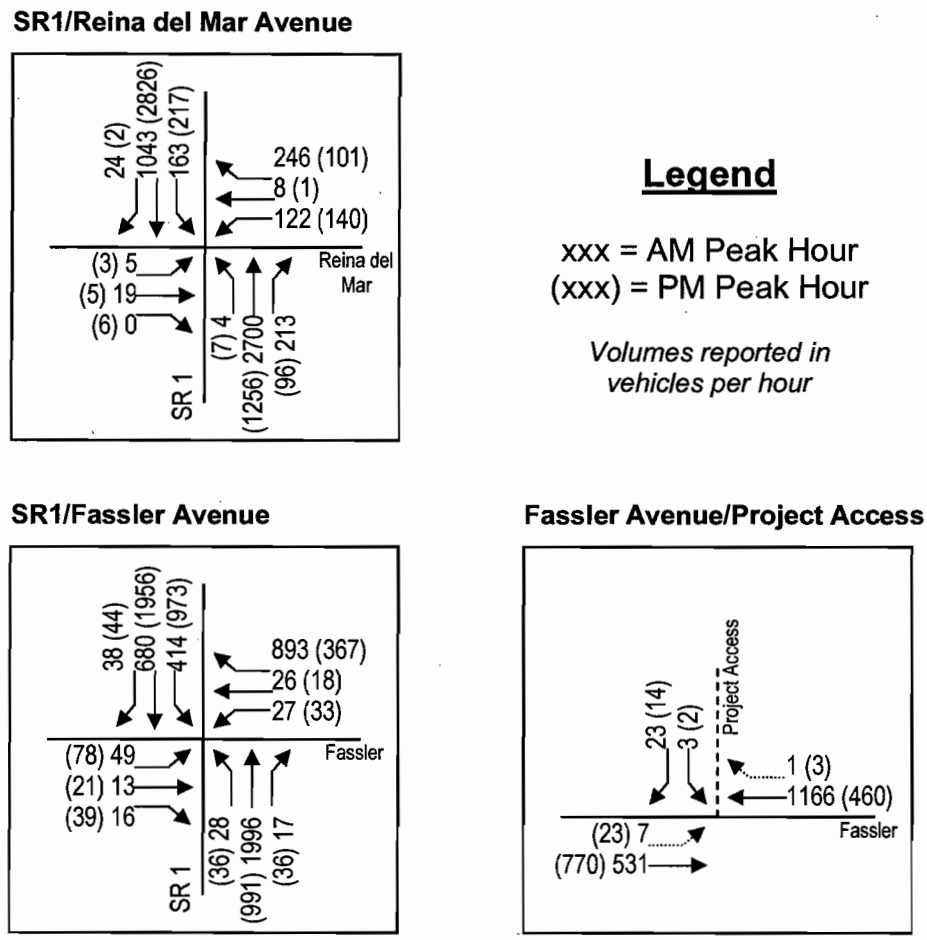


Figure 4
Existing plus Project Traffic Volumes

Cumulative Conditions

CEQA regulations demand that future traffic conditions be evaluated and that mitigation measures be identified where there are significant impacts, whether or not the project contributes significantly to the impact. Mitigation measures, if any, should be reasonably feasible. In order to do so, traffic volumes were estimated using methodology agreed upon in consultation with City staff. The existing volumes were grown to a future year level, and known nearby projects were also included. For this analysis, the existing counts were subjected to a 1% per year growth rate for 10 years (to 2015). This growth rate is typical for areas which are not completely built out, and is consistent with growth of jobs and households projected by the Association of Bay Area Governments (ABAG) for Pacifica in their latest publication of land use projections, *Projections 2005*.

City staff provided information for one nearby proposed project to be included in the Cumulative scenarios, informally referred to as "The Rock," because of its location near a rock formation southeast of the SR1/Fassler intersection. Often, only approved projects are included in this type of analysis, but staff asked that it be included in this study, even though it is not yet approved. Based on information provided by City staff, that development was assumed to be 63 condominium units and 24,000 square feet of retail space, and, using the trip rate sources provided by City staff that were included in the traffic study for it, would generate 82 trips during the AM peak hour and 158 trips during the PM peak hour. These trips were distributed using the same information as for the proposed project. The result of the background growth and the trips from The Rock are the Cumulative without Project traffic volumes.

The trips from the proposed project were then added to the Cumulative without Project volumes to result in the Cumulative with Project volumes, which are shown in Figure 5. Level of service calculations were then conducted, just as for the Existing scenario. The Fassler Avenue intersection serving the project was found to operate at the same levels of service as under the Existing plus Project case (LOS D AM and LOS B PM).

Both signalized study intersections would operate at LOS F under Cumulative conditions during the AM peak hour, with or without the project. During the PM peak hour, the SR1/Fassler intersection would operate at LOS D, while the SR1/Reina del Mar intersection would operate at LOS F, with or without the proposed project.

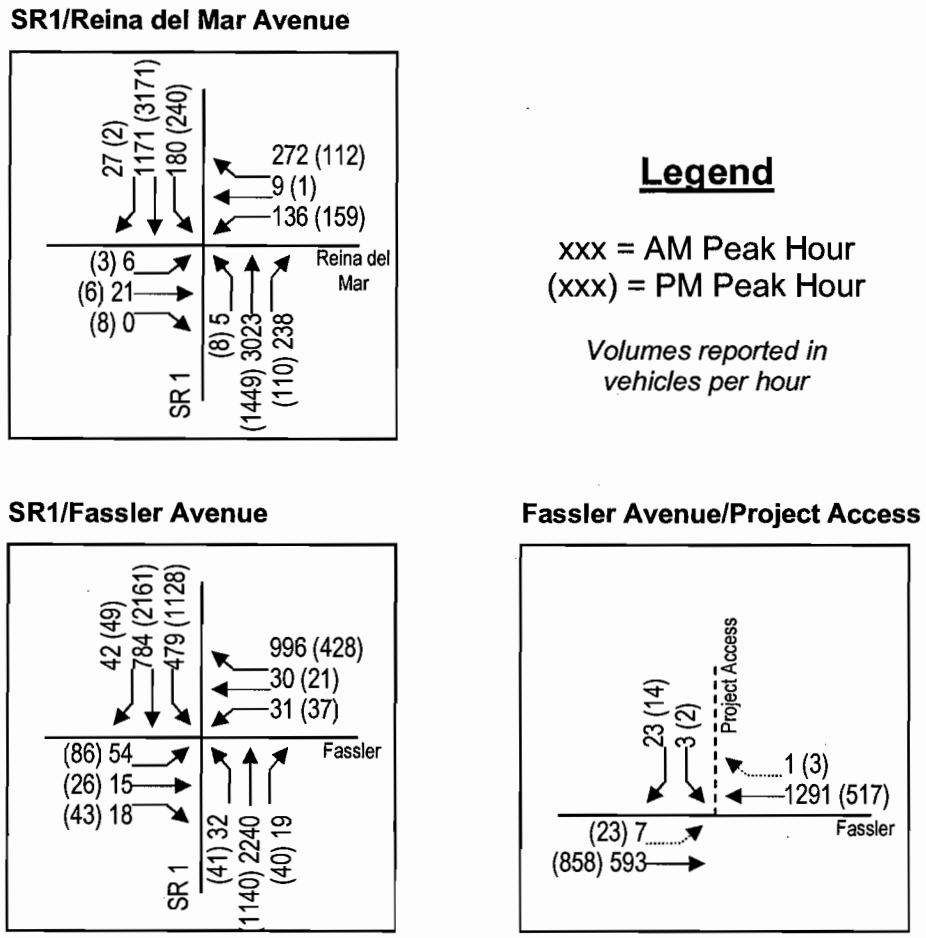


Figure 5
Cumulative with Project Traffic Volumes

Summary of Traffic Impacts

Table 2 summarizes the intersection level of service calculations for the study intersections. Under Existing conditions, both signalized intersections operate at LOS F during the AM peak hour, and the SR1/Reina del Mar intersection operates at LOS F during the PM peak hour. Because of the minor increases in delay to the intersections, it does not appear that the project causes any significant traffic impact to the study intersections. Potential mitigation measures will be discussed in the next section for informational purposes.

Under Cumulative conditions, the results are essentially the same, and it does not appear that the project itself causes any significant traffic impacts. However, as for the Existing scenario, potential mitigation measures will be discussed in the next section because the project would contribute some traffic to the study intersections that are expected to continue to operate poorly in the future.

Table 2
Level of Service Results

	Signalized Intersections *Overall Average Delay (seconds per vehicle) Reported*				Unsignalized Intersection *Worst Approach Reported*	
	SR1/Fassler Avenue		SR1/Reina del Mar		Fassler Avenue/Project Access	
	AM	PM	AM	PM	AM	PM
Existing	96.0/F	37.3/D	124.6/F	81.7/F	--	--
Existing + Project	98.9/F	37.8/D	127.0/F	83.9/F	LOS D	LOS B
Cumulative with Project	115.2/F	44.8/D	135.8/F	106.8/F	LOS D	LOS B

Mitigation Measures

In the previous sections, it was concluded that the project itself would not cause significant traffic impacts to any of the study intersections. However, it would contribute traffic to intersections which already operate at LOS F and are expected to do so in the future. While it is usually not expected that proposed projects must solve existing traffic problems, when projects contribute traffic to facilities that are expected to operate worse than LOS thresholds in the future, mitigation measures should be identified.

In order to reduce its contribution to future traffic volumes, the project applicant has proposed to contribute to a vanpool program serving schoolchildren in the neighborhood of the proposed project. A significant number of existing trips during the AM peak hour are related to families in this neighborhood traveling up SR1 to Reina del Mar, dropping their children off at the school on that street, then returning to the neighborhood. If 20-30 families (existing residents and/or future residents of the project) took advantage of the vanpool, there would be approximately zero trips added to the roadway network during the AM peak hour. It is even possible that there could be a net reduction in AM peak hour trips if the vanpool is more successful than anticipated. City staff have indicated that they are receptive to this concept. The concept, while not a traditional kind of mitigation measure for intersection level of service impacts, is actually a more direct way of addressing increasing traffic: reducing the number of trips generated.

Because this proposed project is undergoing a CEQA-governed environmental evaluation process (Environmental Impact Report, or EIR), and because the vanpool concept may not qualify as a sufficient mitigation measure under CEQA regulations, more traditional mitigation measures have been identified, even though it appears that the project itself would not contribute enough traffic to be considered to be the cause of the impact. These mitigation measures may or may not ever be constructed, but general feasibility has been considered.

For the SR1/Reina del Mar intersection, there are a few combinations of modifications that would be needed if it was desired to improve the level of service from its current LOS F to LOS D or better. The combination requiring modifications to the fewest approaches would be the following: widen SR1 near the intersection to include three northbound through lanes and three southbound through lanes, and provide a right-turn overlap phase for the westbound approach right-turn (Potential Mitigation "A"). Less widening would be needed on the north leg of the intersection than for the south leg (about six feet versus about 20 feet). Because of environmental concerns, widening of the roadway would require permits from various agencies – a process that could prove lengthy but that does exist. These modifications, plus conversion of the east-west approaches to permitted left-turn phasing (Potential Mitigation "B"), would allow for LOS D or better operations under cumulative conditions.

Alternatively, since Caltrans' traffic impact analysis guidelines state that maintaining the existing operational status of an intersection already operating poorly is acceptable, the project's AM peak hour impact, even though minor, could be mitigated by adding a westbound approach right-turn overlap with appropriate lane striping (Potential Mitigation "C"). That is, while the level of service would remain at LOS F, the calculated Existing plus Project delay, with the overlap phase added, would be about 3 seconds per vehicle less than the Existing delay. This mitigation would halve the project's (small) added delay under PM peak hour conditions.

For the SR1/Fassler Avenue intersection, conversion of the two-lane signalized westbound approach right-turn to a single-lane free right-turn (Potential Mitigation "D") would be sufficient to attain LOS D operating conditions for both the Existing and Cumulative scenarios, with or without the project. Some widening of the northbound direction of SR1 to the east would probably be needed in order to accommodate the free right-turn's receiving lane for an appropriate distance.

Table 3 shows the effect on intersection operations of the potential mitigation measures.

Table 3
Level of Service Results with Potential Mitigations

	Signalized Intersections *Overall Average Delay (seconds per vehicle) Reported*			
	SR1/Fassler Avenue		SR1/Reina del Mar	
	AM	PM	AM	PM
Existing	96.0/F	37.3/D	124.6/F	81.7/F
Ex. + Project	98.9/F	37.8/D	127.0/F	83.9/F
w/Mit. C	n/a	n/a	119.7/F	82.7/F
w/Mit's. A,D	36.5/D	36.0/D	49.1/D	22.1/C
Cumulative with Project	115.2/F	44.8/D	135.8/F	106.8/F
w/Mit's. A,B,D	44.3/D	44.8/D	37.3/D	21.2/C

Mitigation Measure Cost

Due to widely varying costs of potential environmental mitigations related to the mitigation measures identified above, it is beyond the scope of this study to calculate an estimated cost for them. The final determination of how the project will address its share of responsibility for this (or any other) mitigation measure will be made during the formal CEQA process.

APPENDIX A

Comments and Responses Related to 2005 Draft Report

Responses to Comments Made on April 27, 2005 Report

Letter from California Coastal Commission (May 23, 2005)

"...the proposed development would result in cumulative adverse impacts at the Highway 1 intersection at Reina del Mar..."

There was a level of service impact identified at this intersection under cumulative conditions. It is important to reiterate, as stated in the report, that this impact is expected to occur even if the project is not constructed.

"We hope that a detailed description of any proposed roadwork...will be made available soon..."

[Note (10/20/06):This comment and the response below refer to the mitigation measure identified in the 2005 report. The potential mitigation measure currently identified is different, so the figure showing the previous mitigation is no longer included in this report.]

It is not likely the proposed project will be responsible for constructing this mitigation, if it ever is constructed. This mitigation measure, as noted above, is to address a cumulative level of service impact that would occur at some point in the future, even without this proposed project. Discussions with City staff have indicated that they are satisfied that the project developer's plan to assist in starting a van pool to serve school children will result in a net change of virtually zero AM peak hour trips.

There will be no comprehensive evaluation of environmental impacts until a project to construct the mitigation is actually proposed. However, some evaluation of the feasibility of the potential mitigation measure has been conducted in order to assess its general feasibility. Figure A-1 shows the existing and modified lane striping and roadway/path limits if the additional left-turn lane were constructed. It was assumed that the existing shoulder widths near the intersection would be adequate for a modification to the intersection (i.e., even if they would not meet current Caltrans standards, which it appears may be the case, there are processes by which the standards can be relaxed). Using standard 12-foot (3.6m) lane widths, and an 8-foot width for the paved path on the west side of State Route 1, and assuming that the northbound lanes would be left as existing (instead of shifting them to the east), the widest point of the modified edge of the west-side path is only 6 feet from its existing location. The total area for which the path would need to be widened is approximately 1,300 square feet.

It is also possible that narrower lane widths could be incorporated into a design such that widening beyond the existing path edge would not be required. This would require exceptions from Caltrans design standards, for which a procedure exists.

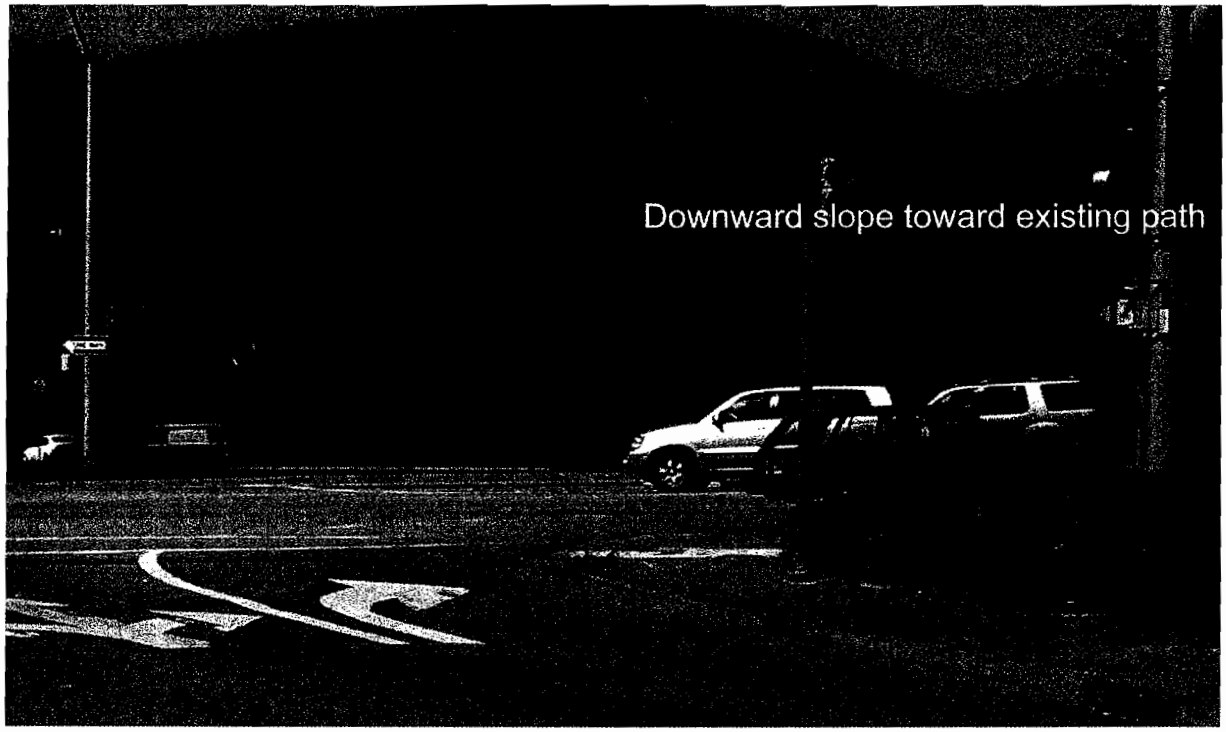
"Any widening...would require a coastal development permit..."

If a project to construct this potential mitigation measure were to proceed, the organization(s) responsible would obtain the necessary permits.

"ESHA and Wetlands"

Environmental experts have not conducted any field observations of the area where potential widening may occur, in order to determine whether the ground surface should be considered "wetland" or not, or if it constitutes habitat for any wildlife. However, while we are not wetlands or wildlife habitat professionals, perhaps our lay observations during our traffic-related field visit may be helpful.

- The ground surface is not flat at that location – it slopes toward the existing path – so it does not appear obvious that the 1,300 square feet would be part of a wetland. The specific location of the potential construction appears to have been graded as part of the road construction and/or as part of the construction of the waste handling facility on that corner (behind the hill in the photograph).



- We did not observe any obvious signs of wildlife in this area during our (traffic-oriented) field visit. The area immediately to the west of the edge of the existing path appears to include gravel deposited as part of its construction. Whether such a gravel surface is conducive to wildlife habitat or not would be a determination of a wildlife expert.

It appears that there are viable procedures that a widening project could be subject to that would make the potential mitigation measure feasible.

Letter from Caltrans (June 10, 2005)

"It is not clear as to whether the traffic counts at the intersections are output counts of the intersection or demand counts for the intersection."

The counts reported for the existing conditions analysis are output counts. While it is known that queuing does occur during peak periods, it appears from reviewing the counts that the full demand is probably accounted for, as the hourly totals beginning each 15 minutes do rise, then fall, during the count period.

"On Page 5,..., the trip numbers contain some errors...."

This is the result of rounding. For the AM peak hour, it is stated that there are 25 outbound trips, yet Figure 3 shows 23 turning right and 3 turning left. An example of how this could occur is the following: The trip generation calculations could result in between 22.5 and 22.75 outbound right-turning trips and between 2.5 and 2.75 left-turning outbound trips. The right-turns would be rounded to 23, the left-turns would be rounded to 3, and the sum, which would be between 25.0 and 25.5, would be rounded to 25.

"...According to the Connemara project, ...the AM peak hour level of service...was LOS E..."

The Connemara analysis (or any other analysis done in the area), which we have not reviewed, likely used different assumptions. Traffic counts can increase and decrease over time, depending on seasonal, economic, and/or other factors. Since the future volumes are based on counts, it is expected that different study efforts will produce different results. The analysis for this project was conducted using new traffic counts and an agreed-upon methodology for calculating the future traffic. The other study likely did the same only with different assumptions and/or methodology.

"...50th and 95th percentile queue lengths...."

These will be added to the level of service calculation appendix.

[Three locations where the volume in the figure does not match the output sheet.]

These have been corrected. None had an effect on the level of service results.

"Cumulative conditions should include existing conditions plus other approved and pending projects."

This was included as part of the methodology.

"...the Department concurs that the developer should provide a fair share..."

The report does not state that the developer should provide a share of cost of mitigation measure, but instead states that such a determination (whether payment of funds or some other method is used) would be made during the formal CEQA process. Additionally, the developer is already expected to participate in an in-lieu fee program that the City administers.

Letter from City of Pacifica (June 9, 2005)

"...staff noticed that the traffic counts in the traffic report were lower than other similar studies in the area...."

Traffic counts can increase and decrease over time, depending on seasonal, economic, and/or other factors. While the City certainly reserves the right to require additional analyses for any development, it is important to note that the analysis for this project was conducted using new traffic counts and an agreed-upon methodology for calculating the future traffic.

APPENDIX B

Level of Service Calculation Output

Fassler Avenue/Project Access
State Route 1 / Reina del Mar
State Route 1 / Fassler Avenue

Fassler Avenue Homepride Construction Development
Existing Conditions
AM Peak Hour

Trip Generation Report
Forecast for AM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Proposed Pro	34.00	Residential -	0.24	0.73	8	25	33	100.0
	Zone 1 Subtotal					8	25	33	100.0
TOTAL						8	25	33	100.0

Trip Distribution Report
Percent Of Trips Base
To Gates

Zone	1	2	3	4	5	6	7
1	77.0	5.0	10.0	1.0	2.0	4.0	1.0

Turning Movement Report
AM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Fassler/Project													
Base	0	0	0	0	0	0	0	531	0	0	1166	0	1698
Added	0	0	0	3	0	23	7	0	0	0	0	1	34
Total	0	0	0	3	0	23	7	531	0	0	1166	1	1732
#7 Hwy 1/Fassler Ave.													
Base	12	1708	2	504	784	56	42	42	20	19	18	930	4137
Added	0	0	0	7	0	0	0	0	0	0	1	21	29
Total	12	1708	2	511	784	56	42	42	20	19	19	951	4166
#9 Hwy 1/Reina del Mar													
Base	13	2423	168	143	1184	42	6	35	1	109	0	270	4394
Added	0	19	1	0	6	0	0	0	0	0	0	0	26
Total	13	2442	169	143	1190	42	6	35	1	109	0	270	4420

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Fassler/Project	A	0.0	0.000	D	33.3	0.000	+33.271 D/V
# 7 Hwy 1/Fassler Ave.	E	55.1	1.042	E	57.5	1.051	+ 2.438 D/V
# 9 Hwy 1/Reina del Mar	D	42.9	1.031	D	44.0	1.037	+ 1.086 D/V

Fassler Avenue Homepride Construction Development
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 Fassler/Project

Average Delay (sec/veh): 0.5 Worst Case Level Of Service: D[33.3]

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Stop Sign						Stop Sign						Uncontrolled						Uncontrolled					
Rights:	Include						Channel						Include						Include					
Lanes:	0	0	0	0	0		0	0	1!	0	0		1	0	1	0	0		0	0	0	1	0	
Volume Module: >> Count Date: 10 Mar 2005 <<																								
Base Vol:	0	0	0	0	0	0	0	481	0	0	1056	0												
Growth Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10												
Initial Bse:	0	0	0	0	0	0	0	531	0	0	1166	0												
Added Vol:	0	0	0	3	0	23	7	0	0	0	0	1												
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0												
Initial Fut:	0	0	0	3	0	23	7	531	0	0	1166	1												
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00												
PHF Adj:	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87												
PHF Volume:	0	0	0	3	0	26	8	611	0	0	1341	1												
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0												
Final Vol.:	0	0	0	3	0	26	8	611	0	0	1341	1												
Critical Gap Module:																								
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
Capacity Module:																								
Cnflict Vol:	xxxx	xxxx	xxxxx	1968	xxxx	1341	1342	xxxx	xxxxx	xxxx	xxxx	xxxxx												
Potent Cap.:	xxxx	xxxx	xxxxx	70	xxxx	188	520	xxxx	xxxxx	xxxx	xxxx	xxxxx												
Move Cap.:	xxxx	xxxx	xxxxx	69	xxxx	188	520	xxxx	xxxxx	xxxx	xxxx	xxxxx												
Volume/Cap:	xxxx	xxxx	xxxx	0.05	xxxx	0.14	0.02	xxxx	xxxx	xxxx	xxxx	xxxx												
Level Of Service Module:																								
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	12.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
LOS by Move:	*	*	*	*	*	*	B	*	*	*	*	*												
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT												
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	157	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx												
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.7	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	33.3	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
Shared LOS:	*	*	*	*	D	*	*	*	*	*	*	*												
ApproachDel:	xxxxxx				33.3		xxxxxx				xxxxxx													
ApproachLOS:	*				D		*				*													

Fassler Avenue Homepride Construction Development
Existing Conditions
PM Peak Hour

Trip Generation Report

Forecast for PM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Proposed Pro	34.00	Residential -	0.75	0.44	26	15	41	100.0
	Zone 1 Subtotal					26	15	41	100.0
TOTAL						26	15	41	100.0

Trip Distribution Report
Percent Of Trips Base
To Gates

Zone	1	2	3	4	5	6	7
1	77.0	5.0	10.0	1.0	2.0	4.0	1.0

Turning Movement Report
PM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Fassler/Project													
Base	0	0	0	0	0	0	0	770	0	0	460	0	1230
Added	0	0	0	2	0	14	23	0	0	0	0	3	42
Total	0	0	0	2	0	14	23	770	0	0	460	3	1272
#7 Hwy 1/Fassler Ave.													
Base	38	1111	17	827	1697	60	106	47	63	20	27	345	4358
Added	0	0	0	22	0	0	0	1	0	0	1	12	36
Total	38	1111	17	849	1697	60	106	48	63	20	28	357	4394
#9 Hwy 1/Reina del Mar													
Base	21	1478	88	258	2433	4	8	7	5	139	1	114	4556
Added	0	12	1	0	20	0	0	0	0	1	0	0	34
Total	21	1490	89	258	2453	4	8	7	5	140	1	114	4590

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Fassler/Project	A	0.0	0.000	B	13.0	0.000	+12.951 D/V
# 7 Hwy 1/Fassler Ave.	C	23.4	0.821	C	23.7	0.830	+ 0.344 D/V
# 9 Hwy 1/Reina del Mar	C	26.9	0.921	C	27.4	0.928	+ 0.454 D/V

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Fassler Avenue Homepride Construction Development
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 Fassler/Project

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: B[13.0]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Channel			Include			Include		
Lanes:	0 0 0	0 0		0 0	1! 0	0	1 0	1 0	0	0 0	0 1	0
Volume Module: >> Count Date: 10 Mar 2005 <<												
Base Vol:	0	0	0	0	0	0	0	770	0	0	460	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	770	0	0	460	0
Added Vol:	0	0	0	2	0	14	23	0	0	0	0	3
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	2	0	14	23	770	0	0	460	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	2	0	14	23	770	0	0	460	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	2	0	14	23	770	0	0	460	3
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1278	xxxx	462	463	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	185	xxxx	604	1109	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	182	xxxx	604	1109	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.01	xxxx	0.02	0.02	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	469	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	13.0	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			13.0			xxxxxx			xxxxxx		
ApproachLOS:	*			B			*			*		

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Fassler Avenue Homepride Construction Development
Cumulative Conditions
AM Peak Hour

Trip Generation Report

Forecast for AM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Proposed Pro	34.00	Residential -	0.24	0.73	8	25	33	100.0
	Zone 1 Subtotal					8	25	33	100.0
TOTAL						8	25	33	100.0

Trip Distribution Report

Percent Of Trips Base To Gates

Zone	1	2	3	4	5	6	7
1	77.0	5.0	10.0	1.0	2.0	4.0	1.0

Turning Movement Report
AM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Fassler/Project													
Base	0	0	0	0	0	0	0	593	0	0	1291	0	1884
Added	0	0	0	3	0	23	7	0	0	0	0	1	34
Total	0	0	0	3	0	23	7	593	0	0	1291	1	1918
#7 Hwy 1/Fassler Ave.													
Base	14	1922	2	579	866	62	46	47	22	22	21	1039	4642
Added	0	0	0	7	0	0	0	0	0	0	1	21	29
Total	14	1922	2	586	866	62	46	47	22	22	22	1060	4671
#9 Hwy 1/Reina del Mar													
Base	15	2719	189	158	1328	46	7	39	1	121	0	298	4921
Added	0	19	1	0	6	0	0	0	0	0	0	0	26
Total	15	2738	190	158	1334	46	7	39	1	121	0	298	4947

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Fassler/Project	A	0.0	0.000	D	30.1	0.000	+30.078 D/V
# 7 Hwy 1/Fassler Ave.	E	70.4	1.098	E	73.1	1.106	+ 2.700 D/V
# 9 Hwy 1/Reina del Mar	E	65.9	1.130	E	67.3	1.136	+ 1.448 D/V

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Fassler Avenue Homepride Construction Development
Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 Fassler/Project

Average Delay (sec/veh): 0.5 Worst Case Level Of Service: D[30.1]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Channel			Include			Include		
Lanes:	0 0 0	0 0		0 0	1! 0	0	1 0	1 0	0	0 0	0 1	0
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	593	0	0	1291	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	593	0	0	1291	0
Added Vol:	0	0	0	3	0	23	7	0	0	0	0	1
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	3	0	23	7	593	0	0	1291	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	3	0	23	7	593	0	0	1291	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	3	0	23	7	593	0	0	1291	1
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1899	xxxx	1292	1292	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	77	xxxx	201	543	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	76	xxxx	201	543	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.04	xxxx	0.11	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	11.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	B	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	169	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	30.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	D	*	*	*	*	*	*	*
ApproachDel:	xxxxxx				30.1		xxxxxx			xxxxxx		
ApproachLOS:	*				D		*			*		

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Fassler Avenue Homepride Construction Development
Cumulative Conditions
PM Peak Hour

Trip Generation Report
Forecast for PM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Proposed Pro	34.00	Residential -	0.75	0.44	26	15	41	100.0
	Zone 1 Subtotal					26	15	41	100.0
TOTAL						26	15	41	100.0

Trip Distribution Report

Percent Of Trips Base To Gates

Zone	1	2	3	4	5	6	7
1	77.0	5.0	10.0	1.0	2.0	4.0	1.0

Turning Movement Report
PM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Fassler/Project													
Base	0	0	0	0	0	0	0	858	0	0	517	0	1375
Added	0	0	0	2	0	14	23	0	0	0	0	3	42
Total	0	0	0	2	0	14	23	858	0	0	517	3	1417
#7 Hwy 1/Fassler Ave.													
Base	43	1272	19	985	1875	66	117	55	70	23	31	396	4952
Added	0	0	0	22	0	0	0	1	0	0	1	12	36
Total	43	1272	19	1007	1875	66	117	56	70	23	32	408	4988
#9 Hwy 1/Reina del Mar													
Base	24	1689	101	285	2753	4	9	8	7	158	1	126	5165
Added	0	12	1	0	20	0	0	0	0	1	0	0	34
Total	24	1701	102	285	2773	4	9	8	7	159	1	126	5199

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Fassler/Project	A	0.0	0.000	B	14.0	0.000	+13.980 D/V
# 7 Hwy 1/Fassler Ave.	C	25.7	0.876	C	26.1	0.884	+ 0.458 D/V
# 9 Hwy 1/Reina del Mar	D	38.4	1.011	D	39.5	1.018	+ 1.079 D/V

Fassler Avenue Homepride Construction Development
Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 Fassler/Project

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: B[14.0]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Channel			Include			Include		
Lanes:	0 0	0 0	0	0 0	1! 0	0	1 0	1 0	0	0 0	0 1	0
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	858	0	0	517	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	858	0	0	517	0
Added Vol:	0	0	0	2	0	14	23	0	0	0	0	3
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	2	0	14	23	858	0	0	517	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	2	0	14	23	858	0	0	517	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	2	0	14	23	858	0	0	517	3
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1423	xxxx	518	520	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	151	xxxx	561	1056	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	149	xxxx	561	1056	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.01	xxxx	0.02	0.02	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	417	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	14.0	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	*	*	*	*	*	*
ApproachDel:	xxxxxx				14.0		xxxxxx			xxxxxx		
ApproachLOS:	*				B		*			*		

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

10/20/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1844			1690	1504	1770	3539	1583	1770	3527	
Flt Permitted		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1844			1690	1504	1770	3539	1583	1770	3527	
Volume (vph)	5	19	0	122	8	246	4	2681	212	163	1037	24
Peak-hour factor, PHF	0.50	0.50	0.50	0.78	0.78	0.78	0.90	0.90	0.90	0.94	0.94	0.94
Adj. Flow (vph)	10	38	0	156	10	315	4	2979	236	173	1103	26
RTOR Reduction (vph)	0	0	0	0	0	215	0	0	14	0	1	0
Lane Group Flow (vph)	0	48	0	0	166	100	4	2979	222	173	1128	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		12.4			10.1	10.1	0.8	88.7	88.7	10.1	98.0	
Effective Green, g (s)		12.4			10.1	10.1	0.8	88.7	88.7	10.1	98.0	
Actuated g/C Ratio		0.09			0.07	0.07	0.01	0.65	0.65	0.07	0.71	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		167			124	111	10	2286	1023	130	2517	
v/s Ratio Prot		c0.03			c0.10		0.00	c0.84		c0.10	0.32	
v/s Ratio Perm						0.07			0.14			
v/c Ratio		0.29			1.34	0.90	0.40	1.30	0.22	1.33	0.45	
Uniform Delay, d1		58.3			63.6	63.1	68.0	24.3	10.0	63.6	8.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.0			196.8	55.4	24.2	139.7	0.5	192.0	0.6	
Delay (s)		59.3			260.4	118.5	92.2	164.0	10.5	255.6	8.8	
Level of Service		E			F	F	F	F	B	F	A	
Approach Delay (s)		59.3			167.5			152.7			41.6	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM Average Control Delay	124.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	137.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	112.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1810	1548		1816	2787	1770	3539	1533	3433	3539	1583
Flt Permitted		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1810	1548		1816	2787	1770	3539	1533	3433	3539	1583
Volume (vph)	49	13	16	27	25	872	28	1996	16	407	680	38
Peak-hour factor, PHF	0.81	0.81	0.81	0.93	0.93	0.93	0.84	0.84	0.84	0.96	0.96	0.96
Adj. Flow (vph)	60	16	20	29	27	938	33	2376	19	424	708	40
RTOR Reduction (vph)	0	0	19	0	0	9	0	0	2	0	0	11
Lane Group Flow (vph)	0	76	1	0	56	929	33	2376	17	424	708	29
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		8.6	8.6		15.1	40.2	3.5	86.0	86.0	21.1	103.6	103.6
Effective Green, g (s)		8.6	8.6		15.1	40.2	3.5	86.0	86.0	21.1	103.6	103.6
Actuated g/C Ratio		0.06	0.06		0.10	0.27	0.02	0.59	0.59	0.14	0.71	0.71
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		106	91		187	763	42	2073	898	493	2498	1117
v/s Ratio Prot		c0.04			0.03	c0.33	0.02	c0.67		0.12	0.20	
v/s Ratio Perm			0.00						0.01			0.02
v/c Ratio		0.72	0.01		0.30	1.22	0.79	1.15	0.02	0.86	0.28	0.03
Uniform Delay, d1		67.9	65.1		61.0	53.3	71.3	30.4	12.7	61.4	7.9	6.5
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		20.5	0.1		0.9	109.4	62.3	72.0	0.0	14.2	0.3	0.0
Delay (s)		88.4	65.2		61.9	162.7	133.5	102.4	12.8	75.6	8.2	6.5
Level of Service		F	E		E	F	F	F	B	E	A	A
Approach Delay (s)		83.6			157.1			102.1			32.5	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM Average Control Delay	96.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	146.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1732			1686	1504	1770	3539	1583	1770	3539	
Flt Permitted		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1732			1686	1504	1770	3539	1583	1770	3539	
Volume (vph)	3	5	6	140	1	101	7	1244	95	217	2806	2
Peak-hour factor, PHF	0.70	0.70	0.70	0.92	0.92	0.92	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	4	7	9	152	1	110	8	1430	109	244	3153	2
RTOR Reduction (vph)	0	9	0	0	0	92	0	0	12	0	0	0
Lane Group Flow (vph)	0	11	0	0	153	18	8	1430	97	244	3155	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		5.9			9.1	9.1	0.7	74.2	74.2	20.2	93.7	
Effective Green, g (s)		5.9			9.1	9.1	0.7	74.2	74.2	20.2	93.7	
Actuated g/C Ratio		0.05			0.07	0.07	0.01	0.59	0.59	0.16	0.75	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		81			122	109	10	2094	937	285	2644	
v/s Ratio Prot		c0.01			c0.09		0.00	0.40		c0.14	c0.89	
v/s Ratio Perm						0.01			0.06			
v/c Ratio		0.14			1.25	0.17	0.80	0.68	0.10	0.86	1.19	
Uniform Delay, d1		57.3			58.2	54.6	62.3	17.5	11.1	51.2	15.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8			164.9	0.7	169.7	1.8	0.2	21.5	91.0	
Delay (s)		58.1			223.0	55.3	232.0	19.4	11.4	72.6	106.8	
Level of Service		E			F	E	F	B	B	E	F	
Approach Delay (s)		58.1			152.9			19.9			104.4	
Approach LOS		E			F			B			F	

Intersection Summary			
HCM Average Control Delay	81.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	125.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1810	1550		1804	2787	1770	3539	1535	3433	3539	1583
Flt Permitted		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1810	1550		1804	2787	1770	3539	1535	3433	3539	1583
Volume (vph)	78	21	39	33	17	355	36	991	36	951	1956	44
Peak-hour factor, PHF	0.65	0.65	0.65	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	120	32	60	38	20	413	39	1077	39	1081	2223	50
RTOR Reduction (vph)	0	0	34	0	0	226	0	0	6	0	0	4
Lane Group Flow (vph)	0	152	26	0	58	187	39	1077	33	1081	2223	46
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		17.0	17.0		5.0	53.2	3.1	45.0	45.0	44.2	86.1	86.1
Effective Green, g (s)		17.0	17.0		5.0	53.2	3.1	45.0	45.0	44.2	86.1	86.1
Actuated g/C Ratio		0.13	0.13		0.04	0.42	0.02	0.35	0.35	0.35	0.68	0.68
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		242	207		71	1166	43	1252	543	1193	2396	1072
v/s Ratio Prot		c0.08			c0.03	0.07	0.02	0.30		c0.31	c0.63	
v/s Ratio Perm			0.02						0.02			0.03
v/c Ratio		0.63	0.13		0.82	0.16	0.91	0.86	0.06	0.91	0.93	0.04
Uniform Delay, d1		52.1	48.6		60.6	23.1	61.9	38.2	27.1	39.5	17.9	6.8
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.0	0.3		49.3	0.1	100.7	7.9	0.2	9.9	6.9	0.0
Delay (s)		57.1	48.8		109.9	23.1	162.6	46.0	27.3	49.4	24.8	6.9
Level of Service		E	D		F	C	F	D	C	D	C	A
Approach Delay (s)		54.8			33.8			49.3			32.5	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	37.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	127.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1844			1690	1504	1770	3539	1583	1770	3527	
Flt Permitted		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1844			1690	1504	1770	3539	1583	1770	3527	
Volume (vph)	5	19	0	122	8	246	4	2700	213	163	1043	24
Peak-hour factor, PHF	0.50	0.50	0.50	0.78	0.78	0.78	0.90	0.90	0.90	0.94	0.94	0.94
Adj. Flow (vph)	10	38	0	156	10	315	4	3000	237	173	1110	26
RTOR Reduction (vph)	0	0	0	0	0	215	0	0	14	0	1	0
Lane Group Flow (vph)	0	48	0	0	166	100	4	3000	223	173	1135	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		12.4			10.1	10.1	0.8	88.7	88.7	10.1	98.0	
Effective Green, g (s)		12.4			10.1	10.1	0.8	88.7	88.7	10.1	98.0	
Actuated g/C Ratio		0.09			0.07	0.07	0.01	0.65	0.65	0.07	0.71	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		167			124	111	10	2286	1023	130	2517	
v/s Ratio Prot		c0.03			c0.10		0.00	c0.85		c0.10	0.32	
v/s Ratio Perm						0.07			0.14			
v/c Ratio		0.29			1.34	0.90	0.40	1.31	0.22	1.33	0.45	
Uniform Delay, d1		58.3			63.6	63.1	68.0	24.3	10.0	63.6	8.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.0			196.8	55.4	24.2	143.8	0.5	192.0	0.6	
Delay (s)		59.3			260.4	118.5	92.2	168.1	10.5	255.6	8.9	
Level of Service		E			F	F	F	F	B	F	A	
Approach Delay (s)		59.3			167.5			156.5			41.5	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM Average Control Delay	127.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	137.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1810	1548		1817	2787	1770	3539	1533	3433	3539	1583
Flt Permitted		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1810	1548		1817	2787	1770	3539	1533	3433	3539	1583
Volume (vph)	49	13	16	27	26	893	28	1996	16	414	680	38
Peak-hour factor, PHF	0.81	0.81	0.81	0.93	0.93	0.93	0.84	0.84	0.84	0.96	0.96	0.96
Adj. Flow (vph)	60	16	20	29	28	960	33	2376	19	431	708	40
RTOR Reduction (vph)	0	0	19	0	0	9	0	0	2	0	0	11
Lane Group Flow (vph)	0	76	1	0	57	951	33	2376	17	431	708	29
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		8.6	8.6		15.1	40.2	3.5	86.0	86.0	21.1	103.6	103.6
Effective Green, g (s)		8.6	8.6		15.1	40.2	3.5	86.0	86.0	21.1	103.6	103.6
Actuated g/C Ratio		0.06	0.06		0.10	0.27	0.02	0.59	0.59	0.14	0.71	0.71
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		106	91		187	763	42	2073	898	493	2498	1117
v/s Ratio Prot		c0.04			0.03	c0.34	0.02	c0.67		0.13	0.20	
v/s Ratio Perm			0.00						0.01			0.02
v/c Ratio		0.72	0.01		0.30	1.25	0.79	1.15	0.02	0.87	0.28	0.03
Uniform Delay, d1		67.9	65.1		61.0	53.3	71.3	30.4	12.7	61.6	7.9	6.5
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		20.5	0.1		0.9	121.5	62.3	72.0	0.0	15.7	0.3	0.0
Delay (s)		88.4	65.2		61.9	174.8	133.5	102.4	12.8	77.3	8.2	6.5
Level of Service		F	E		E	F	F	F	B	E	A	A
Approach Delay (s)		83.6			168.5			102.1			33.4	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM Average Control Delay	98.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	146.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1732			1686	1504	1770	3539	1583	1770	3539	
Flt Permitted		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1732			1686	1504	1770	3539	1583	1770	3539	
Volume (vph)	3	5	6	141	1	101	7	1256	96	217	2826	2
Peak-hour factor, PHF	0.70	0.70	0.70	0.92	0.92	0.92	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	4	7	9	153	1	110	8	1444	110	244	3175	2
RTOR Reduction (vph)	0	9	0	0	0	91	0	0	12	0	0	0
Lane Group Flow (vph)	0	11	0	0	154	19	8	1444	98	244	3177	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		5.9			9.1	9.1	0.7	74.2	74.2	20.2	93.7	
Effective Green, g (s)		5.9			9.1	9.1	0.7	74.2	74.2	20.2	93.7	
Actuated g/C Ratio		0.05			0.07	0.07	0.01	0.59	0.59	0.16	0.75	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		81			122	109	10	2094	937	285	2644	
v/s Ratio Prot		c0.01			c0.09		0.00	0.41		c0.14	c0.90	
v/s Ratio Perm						0.01			0.06			
v/c Ratio		0.14			1.26	0.18	0.80	0.69	0.10	0.86	1.20	
Uniform Delay, d1		57.3			58.2	54.6	62.3	17.7	11.1	51.2	15.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8			167.9	0.8	169.7	1.9	0.2	21.5	94.6	
Delay (s)		58.1			226.1	55.4	232.0	19.5	11.4	72.6	110.5	
Level of Service		E			F	E	F	B	B	E	F	
Approach Delay (s)		58.1			155.0			20.1			107.8	
Approach LOS		E			F			C			F	

Intersection Summary			
HCM Average Control Delay	83.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	125.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	108.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1811	1550		1805	2787	1770	3539	1535	3433	3539	1583
Flt Permitted		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1811	1550		1805	2787	1770	3539	1535	3433	3539	1583
Volume (vph)	78	22	39	33	18	367	36	991	36	973	1956	44
Peak-hour factor, PHF	0.65	0.65	0.65	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	120	34	60	38	21	427	39	1077	39	1106	2223	50
RTOR Reduction (vph)	0	0	33	0	0	226	0	0	7	0	0	4
Lane Group Flow (vph)	0	154	27	0	59	201	39	1077	32	1106	2223	46
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		17.1	17.1		5.0	54.2	3.1	44.0	44.0	45.2	86.1	86.1
Effective Green, g (s)		17.1	17.1		5.0	54.2	3.1	44.0	44.0	45.2	86.1	86.1
Actuated g/C Ratio		0.13	0.13		0.04	0.43	0.02	0.35	0.35	0.36	0.68	0.68
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		243	208		71	1187	43	1223	531	1219	2394	1071
v/s Ratio Prot		c0.09			c0.03	0.07	0.02	0.30		c0.32	c0.63	
v/s Ratio Perm			0.02						0.02			0.03
v/c Ratio		0.63	0.13		0.83	0.17	0.91	0.88	0.06	0.91	0.93	0.04
Uniform Delay, d1		52.1	48.5		60.7	22.6	62.0	39.2	27.8	39.1	17.9	6.9
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.3	0.3		53.3	0.1	100.7	9.3	0.2	9.8	7.0	0.0
Delay (s)		57.5	48.8		114.1	22.7	162.6	48.4	28.1	48.9	24.9	6.9
Level of Service		E	D		F	C	F	D	C	D	C	A
Approach Delay (s)		55.0			33.8			51.6			32.5	
Approach LOS		E			C			D			C	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	127.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

10/20/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1844			1779	1583	1770	3539	1583	1770	3527	
Flt Permitted		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1844			1779	1583	1770	3539	1583	1770	3527	
Volume (vph)	5	19	0	122	8	246	4	2700	213	163	1043	24
Peak-hour factor, PHF	0.50	0.50	0.50	0.78	0.78	0.78	0.90	0.90	0.90	0.94	0.94	0.94
Adj. Flow (vph)	10	38	0	156	10	315	4	3000	237	173	1110	26
RTOR Reduction (vph)	0	0	0	0	0	151	0	0	14	0	1	0
Lane Group Flow (vph)	0	48	0	0	166	164	4	3000	223	173	1135	0
Turn Type	Split			Split		pt+ov	Prot		Perm	Prot		
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		12.4			9.0	23.1	0.8	89.7	89.7	10.1	99.0	
Effective Green, g (s)		12.4			9.0	23.1	0.8	89.7	89.7	10.1	99.0	
Actuated g/C Ratio		0.09			0.07	0.17	0.01	0.65	0.65	0.07	0.72	
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		167			117	267	10	2314	1035	130	2545	
v/s Ratio Prot		c0.03			c0.09	0.10	0.00	c0.85		c0.10	0.32	
v/s Ratio Perm									0.14			
v/c Ratio		0.29			1.42	0.62	0.40	1.30	0.22	1.33	0.45	
Uniform Delay, d1		58.3			64.1	52.9	68.0	23.7	9.6	63.5	7.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.0			231.0	4.2	24.2	136.7	0.5	192.0	0.6	
Delay (s)		59.2			295.1	57.1	92.2	160.5	10.0	255.6	8.4	
Level of Service		E			F	E	F	F	B	F	A	
Approach Delay (s)		59.2			139.2			149.4			41.1	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM Average Control Delay	119.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	137.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

10/20/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844			1779	1583	1770	5029		1770	5068	
Flt Permitted		0.99			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844			1779	1583	1770	5029		1770	5068	
Volume (vph)	5	19	0	122	8	246	4	2700	213	163	1043	24
Peak-hour factor, PHF	0.50	0.50	0.50	0.78	0.78	0.78	0.90	0.90	0.90	0.94	0.94	0.94
Adj. Flow (vph)	10	38	0	156	10	315	4	3000	237	173	1110	26
RTOR Reduction (vph)	0	0	0	0	0	150	0	6	0	0	1	0
Lane Group Flow (vph)	0	48	0	0	166	165	4	3231	0	173	1135	0
Turn Type	Split			Split		pt+ov	Prot			Prot		
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.4			11.1	27.2	0.8	85.7		12.1	97.0	
Effective Green, g (s)		12.4			11.1	27.2	0.8	85.7		12.1	97.0	
Actuated g/C Ratio		0.09			0.08	0.20	0.01	0.62		0.09	0.71	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		167			144	314	10	3139		156	3580	
v/s Ratio Prot		c0.03			c0.09	0.10	0.00	c0.64		c0.10	0.22	
v/s Ratio Perm												
v/c Ratio		0.29			1.15	0.53	0.40	1.03		1.11	0.32	
Uniform Delay, d1		58.3			63.1	49.3	68.0	25.8		62.6	7.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0			121.9	1.6	24.2	24.2		104.3	0.2	
Delay (s)		59.3			185.0	50.9	92.2	50.0		166.9	7.9	
Level of Service		E			F	D	F	D		F	A	
Approach Delay (s)		59.3			97.2			50.0			28.9	
Approach LOS		E			F			D			C	

Intersection Summary			
HCM Average Control Delay	49.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	137.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1732			1775	1583	1770	3539	1583	1770	3539	
Flt Permitted		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1732			1775	1583	1770	3539	1583	1770	3539	
Volume (vph)	3	5	6	141	1	101	7	1256	96	217	2826	2
Peak-hour factor, PHF	0.70	0.70	0.70	0.92	0.92	0.92	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	4	7	9	153	1	110	8	1444	110	244	3175	2
RTOR Reduction (vph)	0	9	0	0	0	81	0	0	12	0	0	0
Lane Group Flow (vph)	0	11	0	0	154	29	8	1444	98	244	3177	0
Turn Type	Split			Split		pt+ov	Prot		Perm	Prot		
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		5.9			9.1	33.3	0.7	74.2	74.2	20.2	93.7	
Effective Green, g (s)		5.9			9.1	33.3	0.7	74.2	74.2	20.2	93.7	
Actuated g/C Ratio		0.05			0.07	0.27	0.01	0.59	0.59	0.16	0.75	
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		81			129	420	10	2094	937	285	2644	
v/s Ratio Prot		c0.01			c0.09	0.02	0.00	0.41		c0.14	c0.90	
v/s Ratio Perm									0.06			
v/c Ratio		0.14			1.19	0.07	0.80	0.69	0.10	0.86	1.20	
Uniform Delay, d1		57.3			58.2	34.5	62.3	17.7	11.1	51.2	15.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8			140.5	0.1	169.7	1.9	0.2	21.5	94.6	
Delay (s)		58.1			198.7	34.5	232.0	19.5	11.4	72.6	110.5	
Level of Service		E			F	C	F	B	B	E	F	
Approach Delay (s)		58.1			130.3			20.1			107.8	
Approach LOS		E			F			C			F	

Intersection Summary			
HCM Average Control Delay	82.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	125.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	106.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.91		1.00	0.91	
Frt		0.94			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1732			1775	1583	1770	5031		1770	5085	
Flt Permitted		0.99			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1732			1775	1583	1770	5031		1770	5085	
Volume (vph)	3	5	6	141	1	101	7	1256	96	217	2826	2
Peak-hour factor, PHF	0.70	0.70	0.70	0.92	0.92	0.92	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	4	7	9	153	1	110	8	1444	110	244	3175	2
RTOR Reduction (vph)	0	9	0	0	0	77	0	5	0	0	0	0
Lane Group Flow (vph)	0	11	0	0	154	33	8	1549	0	244	3177	0
Turn Type	Split			Split		pt+ov	Prot			Prot		
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		5.9			12.1	36.7	0.7	67.4		20.6	87.3	
Effective Green, g (s)		5.9			12.1	36.7	0.7	67.4		20.6	87.3	
Actuated g/C Ratio		0.05			0.10	0.30	0.01	0.55		0.17	0.72	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		84			176	476	10	2779		299	3639	
v/s Ratio Prot		c0.01			c0.09	0.02	0.00	0.31		c0.14	c0.62	
v/s Ratio Perm												
v/c Ratio		0.14			0.88	0.07	0.80	0.56		0.82	0.87	
Uniform Delay, d1		55.6			54.2	30.5	60.6	17.7		48.9	13.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			35.0	0.1	169.7	0.8		15.6	3.2	
Delay (s)		56.4			89.2	30.5	230.3	18.5		64.5	16.4	
Level of Service		E			F	C	F	B		E	B	
Approach Delay (s)		56.4			64.7			19.6			19.8	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	122.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6: Fassler Ave. & Hwy 1

10/20/2006

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1810	1548		1817	1583	1770	3539	1533	3433	3539	1583
Flt Permitted		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1810	1548		1817	1583	1770	3539	1533	3433	3539	1583
Volume (vph)	49	13	16	27	26	893	28	1996	16	414	680	38
Peak-hour factor, PHF	0.81	0.81	0.81	0.93	0.93	0.93	0.84	0.84	0.84	0.96	0.96	0.96
Adj. Flow (vph)	60	16	20	29	28	960	33	2376	19	431	708	40
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	2	0	0	9
Lane Group Flow (vph)	0	76	1	0	57	960	33	2376	17	431	708	31
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		Free	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			Free			2			6
Actuated Green, G (s)		8.6	8.6		5.0	146.8	3.5	99.1	99.1	18.1	113.7	113.7
Effective Green, g (s)		8.6	8.6		5.0	146.8	3.5	99.1	99.1	18.1	113.7	113.7
Actuated g/C Ratio		0.06	0.06		0.03	1.00	0.02	0.68	0.68	0.12	0.77	0.77
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		106	91		62	1583	42	2389	1035	423	2741	1226
v/s Ratio Prot		0.04			0.03		0.02	c0.67		c0.13	0.20	
v/s Ratio Perm			0.00			c0.61			0.01			0.02
v/c Ratio		0.72	0.01		0.92	0.61	0.79	0.99	0.02	1.02	0.26	0.03
Uniform Delay, d1		67.9	65.1		70.7	0.0	71.3	23.6	7.8	64.4	4.7	3.8
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		20.5	0.1		84.9	1.7	62.3	17.2	0.0	48.6	0.2	0.0
Delay (s)		88.4	65.2		155.6	1.7	133.5	40.8	7.9	113.0	4.9	3.8
Level of Service		F	E		F	A	F	D	A	F	A	A
Approach Delay (s)		83.6			10.4			41.8			44.4	
Approach LOS		F			B			D			D	

Intersection Summary			
HCM Average Control Delay	36.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	146.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1811	1550		1805	1583	1770	3539	1535	3433	3539	1583
Flt Permitted		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1811	1550		1805	1583	1770	3539	1535	3433	3539	1583
Volume (vph)	78	22	39	33	18	367	36	991	36	973	1956	44
Peak-hour factor, PHF	0.65	0.65	0.65	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	120	34	60	38	21	427	39	1077	39	1106	2223	50
RTOR Reduction (vph)	0	0	33	0	0	0	0	0	7	0	0	4
Lane Group Flow (vph)	0	154	27	0	59	427	39	1077	32	1106	2223	46
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		Free	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			Free			2			6
Actuated Green, G (s)		17.0	17.0		5.0	126.8	3.1	44.1	44.1	44.7	85.7	85.7
Effective Green, g (s)		17.0	17.0		5.0	126.8	3.1	44.1	44.1	44.7	85.7	85.7
Actuated g/C Ratio		0.13	0.13		0.04	1.00	0.02	0.35	0.35	0.35	0.68	0.68
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		243	208		71	1583	43	1231	534	1210	2392	1070
v/s Ratio Prot		c0.09			c0.03		0.02	0.30		c0.32	c0.63	
v/s Ratio Perm			0.02			0.27			0.02			0.03
v/c Ratio		0.63	0.13		0.83	0.27	0.91	0.87	0.06	0.91	0.93	0.04
Uniform Delay, d1		52.0	48.4		60.5	0.0	61.7	38.8	27.6	39.2	17.9	6.9
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.3	0.3		53.3	0.4	100.7	8.8	0.2	10.6	7.1	0.0
Delay (s)		57.3	48.7		113.8	0.4	162.4	47.6	27.8	49.8	25.0	6.9
Level of Service		E	D		F	A	F	D	C	D	C	A
Approach Delay (s)		54.9			14.2			50.8			32.8	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM Average Control Delay	36.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	126.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1842			1690	1504	1770	3539	1583	1770	3527	
Flt Permitted		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1842			1690	1504	1770	3539	1583	1770	3527	
Volume (vph)	6	21	0	136	9	272	5	3023	238	180	1171	27
Peak-hour factor, PHF	0.75	0.75	0.75	0.89	0.89	0.89	0.95	0.95	0.95	0.97	0.97	0.97
Adj. Flow (vph)	8	28	0	153	10	306	5	3182	251	186	1207	28
RTOR Reduction (vph)	0	0	0	0	0	218	0	0	13	0	1	0
Lane Group Flow (vph)	0	36	0	0	163	88	5	3182	238	186	1234	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		10.7			10.1	10.1	0.7	88.9	88.9	10.1	98.3	
Effective Green, g (s)		10.7			10.1	10.1	0.7	88.9	88.9	10.1	98.3	
Actuated g/C Ratio		0.08			0.07	0.07	0.01	0.65	0.65	0.07	0.72	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		145			126	112	9	2317	1036	132	2553	
v/s Ratio Prot		c0.02			c0.10		0.00	c0.90		c0.11	0.35	
v/s Ratio Perm						0.06			0.15			
v/c Ratio		0.25			1.29	0.79	0.56	1.37	0.23	1.41	0.48	
Uniform Delay, d1		58.8			62.9	61.8	67.4	23.5	9.5	62.9	8.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.9			178.7	29.9	58.1	170.8	0.5	222.9	0.7	
Delay (s)		59.7			241.5	91.7	125.5	194.3	10.0	285.7	8.6	
Level of Service		E			F	F	F	F	B	F	A	
Approach Delay (s)		59.7			143.8			180.7			44.9	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM Average Control Delay	140.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	135.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	123.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1811	1548		1817	2787	1770	3539	1533	3433	3539	1583
Flt Permitted		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1811	1548		1817	2787	1770	3539	1533	3433	3539	1583
Volume (vph)	54	15	18	31	30	996	32	2240	19	479	784	42
Peak-hour factor, PHF	0.90	0.90	0.90	0.96	0.96	0.96	0.92	0.92	0.92	0.98	0.98	0.98
Adj. Flow (vph)	60	17	20	32	31	1038	35	2435	21	489	800	43
RTOR Reduction (vph)	0	0	19	0	0	9	0	0	2	0	0	11
Lane Group Flow (vph)	0	77	1	0	63	1029	35	2435	19	489	800	32
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		8.6	8.6		15.1	40.2	4.8	85.2	85.2	21.1	101.5	101.5
Effective Green, g (s)		8.6	8.6		15.1	40.2	4.8	85.2	85.2	21.1	101.5	101.5
Actuated g/C Ratio		0.06	0.06		0.10	0.28	0.03	0.58	0.58	0.14	0.70	0.70
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		107	91		188	767	58	2065	895	496	2460	1101
v/s Ratio Prot		c0.04			0.03	c0.37	0.02	c0.69		0.14	0.23	
v/s Ratio Perm			0.00						0.01			0.02
v/c Ratio		0.72	0.01		0.34	1.34	0.60	1.18	0.02	0.99	0.33	0.03
Uniform Delay, d1		67.5	64.7		60.8	52.9	69.7	30.4	12.8	62.3	8.8	6.9
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		20.6	0.1		1.1	162.6	16.4	86.0	0.0	36.4	0.4	0.0
Delay (s)		88.1	64.8		61.8	215.5	86.1	116.4	12.9	98.7	9.1	7.0
Level of Service		F	E		E	F	F	F	B	F	A	A
Approach Delay (s)		83.3			206.7			115.1			41.9	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	115.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	113.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			0.95	0.95	1.00	0.95	1.00	1.00	0.95	
Frt		0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1730			1686	1504	1770	3539	1583	1770	3539	
Flt Permitted		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1730			1686	1504	1770	3539	1583	1770	3539	
Volume (vph)	3	6	8	159	1	112	8	1449	110	240	3171	2
Peak-hour factor, PHF	0.87	0.87	0.87	0.96	0.96	0.96	0.93	0.93	0.93	0.94	0.94	0.94
Adj. Flow (vph)	3	7	9	166	1	117	9	1558	118	255	3373	2
RTOR Reduction (vph)	0	9	0	0	0	89	0	0	12	0	0	0
Lane Group Flow (vph)	0	10	0	0	167	28	9	1558	106	255	3375	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		6.0			10.1	10.1	0.7	74.7	74.7	20.6	94.6	
Effective Green, g (s)		6.0			10.1	10.1	0.7	74.7	74.7	20.6	94.6	
Actuated g/C Ratio		0.05			0.08	0.08	0.01	0.59	0.59	0.16	0.74	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		81			134	119	10	2075	928	286	2628	
v/s Ratio Prot		c0.01			c0.10		0.01	0.44		c0.14	c0.95	
v/s Ratio Perm						0.02			0.07			
v/c Ratio		0.13			1.25	0.23	0.90	0.75	0.11	0.89	1.28	
Uniform Delay, d1		58.2			58.6	55.0	63.3	19.5	11.7	52.3	16.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.7			158.4	1.0	226.0	2.6	0.2	27.3	130.9	
Delay (s)		58.9			217.0	56.0	289.3	22.0	11.9	79.6	147.3	
Level of Service		E			F	E	F	C	B	E	F	
Approach Delay (s)		58.9			150.7			22.7			142.6	
Approach LOS		E			F			C			F	

Intersection Summary			
HCM Average Control Delay	106.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	127.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	118.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1812	1550		1805	2787	1770	3539	1535	3433	3539	1583
Flt Permitted		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1812	1550		1805	2787	1770	3539	1535	3433	3539	1583
Volume (vph)	86	26	43	37	21	428	41	1140	40	1128	2161	49
Peak-hour factor, PHF	0.82	0.82	0.82	0.93	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	105	32	52	40	23	460	43	1188	42	1200	2299	52
RTOR Reduction (vph)	0	0	32	0	0	241	0	0	7	0	0	4
Lane Group Flow (vph)	0	137	20	0	63	219	43	1188	35	1200	2299	48
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		16.3	16.3		5.0	54.1	4.0	44.2	44.2	45.1	85.3	85.3
Effective Green, g (s)		16.3	16.3		5.0	54.1	4.0	44.2	44.2	45.1	85.3	85.3
Actuated g/C Ratio		0.13	0.13		0.04	0.43	0.03	0.35	0.35	0.36	0.67	0.67
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		233	200		71	1191	56	1236	536	1223	2384	1067
v/s Ratio Prot		c0.08			c0.03	0.08	0.02	0.34		c0.35	c0.65	
v/s Ratio Perm			0.01						0.02			0.03
v/c Ratio		0.59	0.10		0.89	0.18	0.77	0.96	0.07	0.98	0.96	0.05
Uniform Delay, d1		52.0	48.7		60.5	22.5	60.8	40.4	27.5	40.3	19.2	6.9
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.8	0.2		68.6	0.1	46.0	17.8	0.2	21.2	11.2	0.0
Delay (s)		55.7	48.9		129.1	22.6	106.9	58.2	27.7	61.5	30.5	7.0
Level of Service		E	D		F	C	F	E	C	E	C	A
Approach Delay (s)		53.9			35.4			58.8			40.6	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM Average Control Delay	44.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	126.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Reina del Mar & Hwy 1

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1842			1779	1583	1770	5030		1770	5068	
Flt Permitted		0.93			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1736			1405	1583	1770	5030		1770	5068	
Volume (vph)	6	21	0	136	9	272	5	3023	238	180	1171	27
Peak-hour factor, PHF	0.75	0.75	0.75	0.89	0.89	0.89	0.95	0.95	0.95	0.97	0.97	0.97
Adj. Flow (vph)	8	28	0	153	10	306	5	3182	251	186	1207	28
RTOR Reduction (vph)	0	0	0	0	0	1	0	6	0	0	2	0
Lane Group Flow (vph)	0	36	0	0	163	305	5	3427	0	186	1233	0
Turn Type	Perm			Perm		pt+ov	Prot			Prot		
Protected Phases		4			8	8 1	5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		19.0			19.0	38.0	0.8	97.2		15.0	111.4	
Effective Green, g (s)		19.0			19.0	38.0	0.8	97.2		15.0	111.4	
Actuated g/C Ratio		0.13			0.13	0.27	0.01	0.68		0.10	0.78	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		230			186	420	10	3414		185	3943	
v/s Ratio Prot						c0.19	0.00	c0.68		c0.11	0.24	
v/s Ratio Perm		0.02			c0.12							
v/c Ratio		0.16			0.88	0.73	0.50	1.00		1.01	0.31	
Uniform Delay, d1		55.0			60.9	47.9	71.0	23.0		64.1	4.7	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			33.8	6.2	34.4	16.3		67.6	0.2	
Delay (s)		55.3			94.7	54.0	105.4	39.3		131.7	4.9	
Level of Service		E			F	D	F	D		F	A	
Approach Delay (s)		55.3			68.2			39.4			21.5	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM Average Control Delay	37.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	143.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1811	1548		1817	1583	1770	3539	1533	3433	3539	1583
Flt Permitted		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1811	1548		1817	1583	1770	3539	1533	3433	3539	1583
Volume (vph)	54	15	18	31	30	996	32	2240	19	479	784	42
Peak-hour factor, PHF	0.90	0.90	0.90	0.96	0.96	0.96	0.92	0.92	0.92	0.98	0.98	0.98
Adj. Flow (vph)	60	17	20	32	31	1038	35	2435	21	489	800	43
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	2	0	0	10
Lane Group Flow (vph)	0	77	1	0	63	1038	35	2435	19	489	800	33
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		Free	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			Free			2			6
Actuated Green, G (s)		8.6	8.6		5.0	146.0	5.6	98.3	98.3	18.1	110.8	110.8
Effective Green, g (s)		8.6	8.6		5.0	146.0	5.6	98.3	98.3	18.1	110.8	110.8
Actuated g/C Ratio		0.06	0.06		0.03	1.00	0.04	0.67	0.67	0.12	0.76	0.76
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		107	91		62	1583	68	2383	1032	426	2686	1201
v/s Ratio Prot		0.04			0.03		0.02	c0.69		c0.14	0.23	
v/s Ratio Perm			0.00			c0.66			0.01			0.02
v/c Ratio		0.72	0.01		1.02	0.66	0.51	1.02	0.02	1.15	0.30	0.03
Uniform Delay, d1		67.5	64.7		70.5	0.0	68.9	23.8	7.9	64.0	5.5	4.3
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		20.6	0.1		118.9	2.1	6.4	24.2	0.0	90.6	0.3	0.0
Delay (s)		88.1	64.8		189.4	2.1	75.3	48.0	7.9	154.6	5.8	4.4
Level of Service		F	E		F	A	E	D	A	F	A	A
Approach Delay (s)		83.3			12.9			48.1			60.4	
Approach LOS		F			B			D			E	

Intersection Summary			
HCM Average Control Delay	44.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.91		1.00	0.91	
Frt		0.94			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1730			1775	1583	1770	5032		1770	5085	
Flt Permitted		0.96			0.71	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1680			1330	1583	1770	5032		1770	5085	
Volume (vph)	3	6	8	159	1	112	8	1449	110	240	3171	2
Peak-hour factor, PHF	0.87	0.87	0.87	0.96	0.96	0.96	0.93	0.93	0.93	0.94	0.94	0.94
Adj. Flow (vph)	3	7	9	166	1	117	9	1558	118	255	3373	2
RTOR Reduction (vph)	0	8	0	0	0	13	0	5	0	0	0	0
Lane Group Flow (vph)	0	11	0	0	167	104	9	1671	0	255	3375	0
Turn Type	Perm			Perm		pt+ov	Prot			Prot		
Protected Phases		4			8	8 1	5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		19.9			19.9	47.4	0.8	79.7		23.5	102.4	
Effective Green, g (s)		19.9			19.9	47.4	0.8	79.7		23.5	102.4	
Actuated g/C Ratio		0.15			0.15	0.35	0.01	0.59		0.17	0.76	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		247			196	555	10	2969		308	3854	
v/s Ratio Prot						0.07	0.01	0.33		c0.14	c0.66	
v/s Ratio Perm		0.01			c0.13							
v/c Ratio		0.05			0.85	0.19	0.90	0.56		0.83	0.88	
Uniform Delay, d1		49.4			56.2	30.5	67.1	17.0		53.8	11.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			28.2	0.2	226.0	0.8		16.5	3.1	
Delay (s)		49.5			84.4	30.6	293.1	17.8		70.4	14.9	
Level of Service		D			F	C	F	B		E	B	
Approach Delay (s)		49.5			62.2			19.3			18.8	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM Average Control Delay	21.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	135.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1812	1550		1805	2787	1770	3539	1535	3433	3539	1583
Flt Permitted		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1812	1550		1805	2787	1770	3539	1535	3433	3539	1583
Volume (vph)	86	26	43	37	21	428	41	1140	40	1128	2161	49
Peak-hour factor, PHF	0.82	0.82	0.82	0.93	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	105	32	52	40	23	460	43	1188	42	1200	2299	52
RTOR Reduction (vph)	0	0	32	0	0	241	0	0	7	0	0	4
Lane Group Flow (vph)	0	137	20	0	63	219	43	1188	35	1200	2299	48
Confl. Peds. (#/hr)			5						5			
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split		Perm	Split		pt+ov	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)		16.3	16.3		5.0	54.1	4.0	44.2	44.2	45.1	85.3	85.3
Effective Green, g (s)		16.3	16.3		5.0	54.1	4.0	44.2	44.2	45.1	85.3	85.3
Actuated g/C Ratio		0.13	0.13		0.04	0.43	0.03	0.35	0.35	0.36	0.67	0.67
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		233	200		71	1191	56	1236	536	1223	2384	1067
v/s Ratio Prot		c0.08			c0.03	0.08	0.02	0.34		c0.35	c0.65	
v/s Ratio Perm			0.01						0.02			0.03
v/c Ratio		0.59	0.10		0.89	0.18	0.77	0.96	0.07	0.98	0.96	0.05
Uniform Delay, d1		52.0	48.7		60.5	22.5	60.8	40.4	27.5	40.3	19.2	6.9
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.8	0.2		68.6	0.1	46.0	17.8	0.2	21.2	11.2	0.0
Delay (s)		55.7	48.9		129.1	22.6	106.9	58.2	27.7	61.5	30.5	7.0
Level of Service		E	D		F	C	F	E	C	E	C	A
Approach Delay (s)		53.9			35.4			58.8			40.6	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM Average Control Delay	44.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	126.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

E4: Hexagon Transportation Consultants, Inc., Peer Review of the Revised Fassler Avenue Residential Traffic Impact Study in the City of Pacifica, December 12, 2006

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HEXAGON TRANSPORTATION CONSULTANTS, INC.

December 12, 2006

Ms. Erin Efner
Christopher Joseph & Associates
610 16th Street, Suite 514
Oakland, CA 94612

Subject: Peer Review of the Revised Fassler Avenue Residential Traffic Impact Study in the City of Pacifica

Dear Ms. Efner:

This letter report presents the results of Hexagon's peer review of the revised traffic impact study prepared for the Fassler Avenue Residential project in Pacifica, California. The purpose of this review is to ensure that the revised traffic report conforms to City of Pacifica standards, to confirm that accepted traffic study methods were used, and to ensure that the recommendations contained in the report adequately address project impacts. The project site is located on the north side of Fassler Avenue, between Roberts Road and Driftwoood Circle. The project description contained in the Initial Study and Checklist for the project indicates that 34 residential condominium units are proposed.

Hexagon prepared a peer review in August 2006 of the original traffic impact study (dated July 28, 2005) prepared by Dowling Associates, Inc. Subsequently, new traffic count data were collected on Highway 1 at the request of the City of Pacifica. A revised traffic study was prepared by Dowling Associates (dated October 20, 2006), which incorporates the updated traffic count data. This peer review consists of a technical evaluation of the updated Fassler Avenue Project Traffic Impact Study (Final Report), prepared by Dowling Associates, Inc. (October 20, 2006). Additionally, the peer review includes and evaluation of the level of service calculation sheets for cumulative without project conditions, which were not included in the traffic study, but were provided by Dowling Associates for use in the peer review.

The key findings of our peer review of the traffic report are presented in the following sections.

SCOPE OF REVIEW

The following issues were reviewed in the traffic study as part of the peer review:

1. Existing Traffic Count Data
2. Site Traffic Projections
3. Trip Distribution Pattern
4. Project Trip Assignment
5. Adequacy of Study Area
6. Level of Service Calculations
7. Identification of Project Impacts

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REVIEW RESULTS

Each of the key issues of the peer review is discussed below along with the results of the peer review.

Existing Traffic Count Data

The traffic count data used in the traffic study were obtained from Dowling Associates, Inc. to be included in this peer review. The traffic count data for the project were collected at the following intersections in October 2006:

1. Highway 1 and Reina del Mar Avenue
2. Highway 1 and Fassler Avenue

A review of the count data does not indicate any obvious flaws in the data and the turning movements recorded appear to match traffic patterns observed in the field.

Field observations were conducted by Hexagon at the study intersections during the AM and PM peak hours to observe traffic conditions to determine whether the existing count data and resulting calculated levels of service adequately represent existing conditions. Regional traffic demand on Highway 1 through Pacifica is a significant source of traffic congestion at the intersections in the study area. This is evident in the fact that traffic conditions on Highway 1 in the study area were noticeably improved (LOS C operations or better) during the time when Highway 1 was closed at Devils Slide south of Pacifica. Field observations, conducted after the highway was reopened, showed that traffic flow on northbound Highway 1 during the AM peak hour is very heavy in the study area, particularly north of Crespi Drive. Also, westbound Reina del Mar Avenue and westbound Fassler Avenue both carry significant traffic volumes at their intersections with Highway 1 during the AM peak hour. As a result, the overall vehicle demand at these two intersections exceeds the capacities of those intersections during the AM peak hour. This leads to long northbound vehicle queues that back up beyond Crespi Drive during the busiest part of the AM peak hour. Similarly, during the PM peak hour, long southbound vehicle queues build up at the Reina del Mar intersection because this is the first signal-controlled intersection on the SR 1 after it transitions from a freeway to a highway.

Caltrans' comment on the original traffic study for this project was that traffic counts conducted under these congested conditions would not reflect the true traffic demand at the intersections (demand counts), but instead reflect only the vehicles that were able to make it through the intersections during the peak hour (output counts). Based on field observations, Hexagon agrees with Caltrans' findings, in that, more traffic would flow through the intersections during the peak hours in the absence of restrictive traffic control than is actually counted during the congested conditions that occur today. There is no practical way of counting the true traffic demand at the Highway 1/Fassler Avenue and Highway 1/Reina del Mar Avenue intersections because the backup on Highway 1 is so extensive. Therefore, calculated delays (and levels of service) based on traffic counts at the intersections will tend to be somewhat better than actual field conditions. Moreover, the intersection level of service methodologies contained in the 2000 Highway Capacity Manual (HCM) cannot accurately calculate delays at locations where traffic congestion at an adjacent location causes increased delays at the study location.

Existing Level of Service Calculations

To overcome the limitation in count data discussed above, the revised traffic study relied on traffic volumes that were adjusted based on observations of traffic conditions in the field. By basing the analysis on the adjusted traffic volumes, the calculated levels of service would more closely match actual field conditions. The level of service results for existing conditions contained in the traffic study were compared to field conditions observed by Hexagon to determine if existing traffic operations are accurately modeled. The results of this comparison are summarized below.

AM Peak-Hour Levels of Service

A review of the AM peak-hour level of service calculations under existing conditions indicates that the delays calculated for the various turn movements at the study intersections appear to accurately reflect field conditions. The level of service results indicate that both study intersections currently operate at level of service F during the AM peak hour.

PM Peak-Hour Levels of Service

A review of the PM peak-hour level of service calculations under existing conditions indicates that the delays calculated for the study intersections appear to accurately reflect field conditions. During the PM peak hour, the Highway 1/Reina del Mar intersection is shown to operate at level of service F and the Highway 1/Fassler Avenue intersection is shown to operate at LOS D.

Site Traffic Projections

A review of the trip generation estimates contained in the traffic report was conducted to verify that they are accurate, that representative land uses were chosen, and that the rates are based on the appropriate land-use data as published by the Institute of Transportation Engineers (ITE).

A review of the site traffic projections finds that the trip generation rates used in the October 20, 2006 traffic study correspond to the ITE land use category for single-family detached housing. Although the project description indicates that condominiums would be built, the trip generation analysis contained in the traffic study is sufficient. This is so because the trip generation rates for single-family detached housing are higher than those for residential condominiums. Additionally, the trip generation calculations in the traffic study are based on the “fitted-curve equation”, as published by ITE, which results in higher trip generation values than when the average trip rates are used. Thus, trip generation analysis contained in the traffic study provides for a conservative analysis of the trip generation potential of the project.

Trip Distribution Pattern and Project Trip Assignment

The directional distribution of project traffic was reviewed for consistency with existing travel patterns and the relative locations of complementary land uses.

The trip distribution pattern for the proposed project is reasonable and is consistent with existing traffic patterns in the area and the relative locations of complementary land uses. The assignment of project traffic is consistent with traffic patterns in the study area.

Adequacy of Study Area

The study area and study facilities included in the traffic impact study were reviewed to ensure that potential project impacts on the local transportation system are accurately identified.

The list of study intersections considered in the traffic analysis covers a sufficiently wide geographic area to accurately identify the potentially significant project impacts associated with the proposed project.

Level of Service Calculations

The Synchro and Traffix level of service calculation output pages were reviewed for accuracy.

The results of the review indicate that the level of service calculations are consistent with the traffic volume data presented in the report and that correct geometry assumptions were used.

The level of service calculations appear to be accurate except in one instance. The cumulative level of service results for the Highway 1/Reina del Mar intersection discussed in the report are not consistent with the level of service calculation pages contained in the appendix. The report text indicates that the Highway 1/Reina del Mar intersection would operates at LOS F with 135.8 seconds of delay during the AM peak hour under cumulative conditions. However, the level of service calculation pages indicate that the calculated delay for this intersection under cumulative conditions is 140.7 seconds (LOS F). This error in reporting the calculated intersection delays for cumulative conditions does not affect the conclusions of the traffic study.

Identification of Project Impacts

The results of the traffic study were reviewed to ensure that project impacts are properly identified.

The traffic study uses a level of service standard of LOS D for signalized intersections. The thresholds of significance used in the traffic study indicate that the addition of project traffic would cause a significant impact if: (1) the addition of project traffic causes an intersection to degrade from LOS D or better to LOS E or F, or (2) if an intersection operating at LOS E degrades to LOS F, or (3) if the delay increases by more than 3 percent at an intersection already operating at LOS F.

The City of Pacifica currently uses a level of service standard of LOS D for all intersections in the City. The City does not have formally adopted thresholds of significance for determining intersection impacts. The City currently is in the process of studying and developing a formal set of thresholds of significance for intersection analyses. Until formal thresholds are adopted, the City has identified a set of interim thresholds. These interim thresholds were developed based on a survey of the thresholds used in traffic studies in other cities in San Mateo County. The interim thresholds of significance were recommended in a technical memorandum from Hexagon Transportation Consultants to the City of Pacifica titled “Interim Level of Service Standards and Thresholds of Significance Recommendations”. The City of Pacifica interim level of service standard and thresholds of significance are described below.

For signalized intersections in Pacifica, the project is said to create a significant adverse impact on traffic conditions at the intersection if for any peak hour:

1. The level of service at the intersection degrades from an acceptable LOS D or better under background conditions to an unacceptable LOS E or F under project conditions, or

2. If the intersection is already operating at an unacceptable LOS E and the addition of project traffic causes both the critical-movement delay at the intersection to increase by two (2) or more seconds and the demand-to-capacity ratio (V/C) to increase by more than 0.010, or

3. If the intersection is already operating at an unacceptable LOS F and the addition of project traffic causes both the critical-movement delay at the intersection to increase by one (1) or more seconds and the demand-to-capacity ratio (V/C) to increase by more than 0.010.

An exception to this rule applies when the addition of project traffic reduces the amount of average delay for critical movements (i.e., the change in average delay for critical movements is negative). In this case, the threshold of significance is an increase in the critical V/C value of more than 0.010.

The traffic study concludes that the project would only increase delays minimally and therefore would not cause any significant impacts to the study intersections. A level of service summary table (see Table 1) was prepared by Hexagon for the project so that project impacts could be evaluated using the City's interim thresholds of significance. Note that because the City's thresholds of significance require the volume-to-capacity (v/c) ratio to be calculated to three significant digits, Hexagon re-calculated the v/c ratios since the Synchro level of service calculation sheets provide v/c results only to two significant digits. This procedure was carried out by using the output results from the Synchro level of service calculation sheets and Equation 16-8 for calculating the critical v/c ratio for an intersection, as prescribed in the 2000 Highway Capacity Manual (HCM) signalized intersection level of service methodology.

The level of service results indicate that the addition of project traffic at the study intersections would result in delay increases at both study intersections that exceed the City's interim thresholds of significance. However, the volume-to-capacity ratio increases caused by the project would fall below the City's interim thresholds of significance. Based on the City's interim level of service standard and thresholds of significance, the project would not cause a significant impact under near-term conditions or under cumulative conditions. Therefore, project mitigation measures are not required.

CONCLUSIONS

1. A review of the traffic count data does not indicate any obvious flaws in the data and the turning movements recorded appear to match traffic patterns observed in the field.
2. The existing level of service calculations appear to accurately reflect field conditions.
3. A review of the site traffic projections finds that the trip generation rates used in the traffic study correspond to the appropriate land use and that the trip generation analysis is accurate.
4. The trip distribution pattern and assignment of project traffic are reasonable and consistent with existing traffic patterns in the area and the relative locations of complementary land uses.
5. The cumulative level of service results for Highway 1/Reina del Mar intersection reported in the traffic study are not consistent with the level of service calculation pages contained in the appendix. This error in reporting the calculated delay for cumulative conditions is minor and does not affect the conclusions of the traffic study.
6. The level of service results indicate that the addition of project traffic at the study intersections would result in delay increases at both study intersections that exceed the City's interim thresholds of significance. However, the volume-to-capacity ratio increases caused by the project would fall below the City's interim thresholds of significance. Based on the City's interim level of service standard and thresholds of significance, the project would not cause a significant impact under near-term conditions or under cumulative conditions. Therefore, project mitigation measures are not required.

Please feel free to call if you have any questions or would like to discuss the results of the analysis.

Sincerely,

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Jeffrey A. Elia, P.E.
Senior Associate

Table 1
Intersection Level of Service Summary

		Existing			Project					Cumulative w/o Project			Cumulative w/ Project				
Intersection Name	Peak Hour	Avg. Delay	LOS	HCM Crit. v/c [1]	Avg. Delay	LOS	HCM Crit. v/c [1]	Avg. Delay Change [2]	Crit. v/c Change [2]	Avg. Delay	LOS	HCM Crit. v/c [1]	Avg. Delay	LOS	HCM Crit. v/c [1]	Avg. Delay Change [3]	Crit. v/c Change [3]
Hwy. 1 and Reina del Mar	AM	124.6	**F**	1.204	127.0	**F**	1.211	**+2.4**	+0.007	138.4	**F**	1.263	140.7	**F**	1.270	**+2.3**	+0.007
	PM	81.7	**F**	1.291	83.9	**F**	1.299	**+2.2**	+0.008	106.3	**F**	1.373	106.8	**F**	1.375	+0.5	+0.002
Hwy. 1 and Fassler Avenue	AM	96.0	**F**	1.140	98.9	**F**	1.148	**+2.9**	+0.008	111.9	**F**	1.190	115.2	**F**	1.198	**+3.3**	+0.008
	PM	37.3	D	0.846	37.8	D	0.848	+0.5	+0.002	44.7	D	0.866	44.8	D	0.867	+0.1	+0.001

Notes:
1 Highway Capacity Manual (HCM) critical volume-to-capacity (v/c) ratio is calculated using Synchro output values and Equations 16-7 and 16-8 of the signalized intersection level of service methodology contained in the 2000 Highway Capacity Manual. This approach to calculating intersection critical v/c ratios in some cases may not match the v/c results obtained with the Synchro software but provides a close approximation. This is so because the Synchro software calculates adjusted total lost times and critical volumes at the intersection when some intersection movements overlap each other and run concurrently, whereas the HCM method uses a more simplified approach, which does not necessarily account for overlapping critical movements.
2 Changes in average delay and critical v/c under project conditions are measured relative to existing conditions.
3 Changes in average delay and critical v/c under cumulative with project conditions are measured relative to cumulative without project conditions.
Values shown in **bold** indicate conditions that exceed the City's level of service standard and/or interim thresholds of significance.