KANAN ROAD AND AGOURA ROAD ROUNDABOUT PROJECT

Draft Initial Study and Mitigated Negative Declaration

February 2014

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Draft Initial Study/ Mitigated Negative Declaration

Prepared by:

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TABLE OF CONTENTS

Page

Introduction

Legal Authority and Findings 1
Impact Analysis and Significance Classification 2
Use of Environmental Documents in this Analysis 2

Initial Study

Project Title 4
Lead Agency and Contact Person 4
Project Proponent 4
Project Site Characteristics 4
Description of the Project 5
Public Agencies Whose Approval May Be Required For Subsequent Actions 8
Environmental Factors Affected 9
Determination 9

Evaluation of Environmental Impacts

Aesthetics 11
Air Quality 14
Biological Resources 23
Cultural Resources 37
Geology and Soils 40
Hazards and Hazardous Materials 42
Hydrology and Water Quality 41
Land Use and Planning 48
Mineral Resources 49
Noise 49
Population and Housing 54
Public Services 55
Recreation 57
Transportation/Traffic 57
Utilities and Service Systems 62
Greenhouse Gas Emissions 65
Mandatory Findings of Significance 69

References and Persons Contacted 71

List of Figures

Figure 1 – Project Location Map 72

Appendices

A. Project Plans
B. Air Quality and Greenhouse Gas Analysis
C. Biological Resources Assessment
D. Oak Tree Report and Memorandums
E. Geotechnical Review
F. Drainage Calculations
G. Traffic Impact Analysis
H. Memorandum from City Engineer/Public Works Director

INTRODUCTION

This document is a Draft Initial Study and Mitigated Negative Declaration (IS/MND) that addresses the potential environmental effects resulting from the construction of the Kanan Road and Agoura Road Roundabout in the City of Agoura Hills. The roundabout concept plan is a component of the Agoura Village Specific Plan (2008), and identified in the Program Final Environmental Impact Report (EIR) for the Agoura Village Specific Plan (2006).

LEGAL AUTHORITY AND FINDINGS

This IS/MND has been prepared in accordance with the *California Environmental Quality Act* (*CEQA) Guidelines* and relevant provisions of CEQA of 1970, as amended.

Initial Study. Section 15063(c) of the *CEQA Guidelines* defines an Initial Study as the proper preliminary method of analyzing the potential environmental consequences of a project. The purposes of an Initial Study are:

(1) To provide the Lead Agency with the necessary information to decide whether to prepare an Environmental Impact Report (EIR) or a Mitigated Negative Declaration;

(2) To enable the Lead Agency to modify a project, mitigating adverse impacts, thus avoiding the need to prepare an EIR; and

(3) To provide sufficient technical analysis of the environmental effects of a project to permit a judgment based on the record as a whole, that the environmental effects of a project have been adequately mitigated.

Negative Declaration or Mitigated Negative Declaration. Section 15070 of the *CEQA Guidelines* states that a public agency shall prepare a negative declaration or mitigated negative declaration for a project subject to CEQA when:

(a) The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment; or

(b) The Initial Study identifies potentially significant effects but:

1. Revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur; and

2. There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.

An IS/MND may be used to satisfy the requirements of CEQA when a proposed project would have no significant unmitigable effects on the environment. As discussed further in subsequent sections of this document, implementation of the proposed project would not result in any significant effects on the environment that cannot be reduced to below a level of significance with the mitigation measures included herein.

IMPACT ANALYSIS AND SIGNIFICANCE CLASSIFICATION

The following sections of this IS/MND provide discussions of the possible environmental effects of the proposed project for specific issue areas that have been identified in the CEQA Initial Study Checklist. For each issue area, potential effects are discussed and evaluated.

A "significant effect" is defined by Section 15382 of the *CEQA Guidelines* as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by a project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance." According to the *CEQA Guidelines*, "an economic or social change by itself shall not be considered a significant effect on the environment, but may be considered in determining whether the physical change is significant."

Following the evaluation of each environmental effect determined to be potentially significant is a list of mitigation measures and the residual effects or level of significance remaining after the implementation of the measures.

USE OF ENVIRONMENTAL DOCUMENTS IN THIS ANALYSIS

The following environmental analyses and technical studies were used as a basis for this document:

- *Air Quality Impact Analysis Kanan Road and Agoura Road Roundabout, City of Agoura Hills, California*, Giroux & Associates (March 2013)
- *Agoura Village Specific Plan Final EIR,* City of Agoura Hills (March 2006)
- *Agoura Village Specific Plan Updated Final Revised and Recirculated EIR,* City of Agoura Hills (August 2008)
- *Biological Resources Assessment and Impact Analysis – Kanan Road/Agoura Road Roundabout Project*, Envicom Corporation (March 2013)
- *A Cultural Resources Investigation for the Proposed Kanan Road-Agoura Road Roundabout Project in the City of Agoura Hills, Los Angeles County, California.* McKenna et al. (January 2013).
- *Drainage Calculations*, Kimley-Horn and Associates, Inc. (April 2013)
- *Geotechnical Study, Agoura Hills Roundabout, Agoura Hills, California*, Fugro West, Inc. (July 2008)
- *Oak Tree Report Agoura Road Roundabout*, L. Newman Design Group, Inc. (March 2013)

- *Traffic Analysis for Kanan Road and Agoura Road Roundabout*, Kimley-Horn and Associates, Inc. (February 11, 2013)

The Agoura Village Specific Plan Final EIR (2006) and the Agoura Village Specific Plan Updated Final Revised and Recirculated EIR (2008) are Program EIRs, as defined in the CEQA Guidelines Section 15168. The proposed roundabout was analyzed in these two EIRs, as a component of the Agoura Village Specific Plan (AVSP). The analysis was based on a conceptual layout for a roundabout. This IS/MND has considered the prior Program EIRs, and provides additional, site-specific analysis of the environmental issues corresponding to the current roundabout design.

INITIAL STUDY

PROJECT TITLE

Kanan Road and Agoura Road Roundabout
Case No. 13-OTP-010

LEAD AGENCY and CONTACT PERSON

City of Agoura Hills
30001 Ladyface Court
Agoura Hills, CA 91301
Contact: Allison Cook, Principal Planner (818) 597-7310

PROJECT PROPONENT

City of Agoura Hills

PROJECT SITE CHARACTERISTICS

Location: General area of the intersection of Kanan Road and Agoura Road, Agoura Hills, CA

Assessor Parcel Numbers: City right-of-way and portions of APNs 2061-033-016; 2061-031-020; 2061-006-052; 2061-006-008; 2061-004-034; 2061-004-031; and 2061-004-027.

Existing General Plan Designation: Planned Development

Existing Zoning: Planned Development District (Agoura Village Specific Plan)

Site Setting:

The site is located in the City of Agoura Hills, in the County of Los Angeles (refer to Figure 1 Project Location Map). The overall site is 5.8 acres and is located in the Agoura Village Specific Plan (AVSP) area. The site is currently a developed signalized intersection, with existing commercial retail developments with ornamental landscaping at the northwest and northeast corners of the intersection, and vacant lands at the southeast and southwest corners. The site consists of developed areas, such as paved roads and sidewalks, as well as undeveloped, disturbed areas that are barren or sparsely vegetated, or that contain non-native grasses and forbs and isolated shrubs, native oak trees, and non-native pepper trees.

The current lane configuration of the intersection is:

NB: one left turn lane, one through lane, and one shared through right lane

SB: one left turn lane, one through lane, and one right turn lane
EB: one left turn lane and one shared through right lane
WB: one left turn lane, one through lane, and one right turn lane

Surrounding Land Uses

The site is set within the Agoura Village Specific Plan (AVSP) area. Directly north and south of the site is Kanan Road, and directly west and east of the site is Agoura Road. At the northwest quadrant of the intersection is the Kanan Village shopping center; at the northeast quadrant is the USA Gasoline Station; at the southeast quadrant is vacant land; and at the southwest quadrant is vacant land that is being considered for a future mixed-use development project (although a formal application for development has not been filed with the City).

DESCRIPTION OF THE PROJECT

Background

The Agoura Village Specific Plan (AVSP or Plan) was adopted, and the accompanying Program Final Environmental Impact Report (EIR) certified, by the City Council in 2008. The AVSP is a plan to create a mixed-use (multi-family residential, office, retail, restaurant) village in an approximately 300-acre area along Agoura Road, generally between Kanan Road and Cornell Road. One of the components of the AVSP is a proposed roundabout at the intersection of Kanan Road and Agoura Road. A very conceptual plan of a single lane roundabout was created and analyzed in the AVSP Program EIR. The EIR determined that the roundabout would be a Level of Service A (LOS A) in the a.m. and p.m. peak hours in the cumulative+proposed project scenario.

The AVSP area has experienced little development since adoption of the Plan in 2008. The City is proposing to construct standard intersection improvements to Kanan Road/Agoura Road in the immediate future as part of the approved Agoura Road Widening Project. The immediate, or interim, intersection improvements include widening Kanan Road between Agoura Road and 500 feet north and 1,600 feet south of the intersection, and widening Agoura Road about 600 feet on either side of the intersection to allow for turning movements. Upon completion of the interim intersection improvements, the lane configuration would be:

NB: one left turn lane, one through lane, and one shared through right lane
SB: two left turn lanes, two through lanes, and one right turn lane
EB: two left turn lanes and one shared through right lane
WB: one left turn lane, one through lane, and one right turn lane

As part of the Agoura Road Widening Project, to the east of the intersection, Agoura Road will remain a two-lane roadway. To the west, it will be widened to four lanes. The Agoura Road Widening and Canwood Street Improvements Project Initial Study/Mitigated Negative Declaration was adopted by the City Council in December 2012. The City plans to begin

construction of the Agoura Road widening and the interim intersection improvements in late 2014, with construction requiring between 18- 24 months. Therefore, these improvements are assumed to be in place by the expected opening year of the proposed roundabout in Year 2020.

Project Elements

The ultimate plan for the Kanan Road/Agoura Road intersection is a roundabout. (See Appendix A - Project Plans). The proposed multi-lane roundabout consists of two travel lanes entering from each quadrant, and between one and two travel lanes exiting each quadrant of the roundabout. There is one bypass lane in the northeast quadrant. Assuming completion of the Agoura Road Widening Project, with the roundabout, Agoura Road would remain four lanes to the west, and two lanes to the east. The following would be the lane configuration with the roundabout:

NB: one shared left through lane and one shared through right lane
SB: one shared left through lane and one through lane and one right turn by pass lane
EB: one left turn lane and one shared left through/right lane
WB: one shared left through and one right turn lane

Agoura Road consists of a Class II bike lane. With the roundabout, under separate entrances on Agoura Road and Kanan Road, cyclists would share sidewalks with pedestrians before entering and exiting the roundabout area and rejoining the bike lane.

The roundabout would accommodate pedestrian crossings and sidewalks. Each leg of the roadways entering the roundabout contains pedestrian crosswalks with decorative paving, and sidewalks are incorporated along the exterior edges of the roundabout. The roundabout incorporates many elements, including the following: landscaped and cobblestone-paved splitter islands; landscaped center island with boulders, oak trees, a low (2’6” high) perimeter exterior stone wall, interior perimeter rail fencing of white painted redwood (four feet high) with stone veneer pilasters (five feet high), a band of interlocking pavers with directional markings around the base of the island, and a 3’9” – 6’3” high stone wall entry monument with the City of Agoura Hills logo as travelers enter the City heading northbound on Kanan Road; landscaped edges along the southwest and southeast quadrants; and additional landscape features in the northeast and northwest quadrants containing a bioswale and dry streambed feature with boulders, and a 3’8” high white painted redwood simulated bridge with stone veneer pilasters of 4’6” high.

The proposed plant palette includes coast live oak trees in the center island of the roundabout, as well as the following species along the perimeter of the roundabout, splitter island, and the roadway medians immediately adjacent to the roundabout: California sycamore, crape myrtle, western redbud, London plane tree, deer grass, cotoneaster blue fescue, rockrose, wild rye, carpet rose, Mexican sage bush, Japanese barberry, penstemon, creeping red fescue, sticky monkey flower, emerald carpet Manzanita, Douglas iris, California fuscia, compact Oregon

grape, and bush morning glory. The existing oak trees at the northwest quadrant of the project site are incorporated into the landscape plan.

Street lights are proposed along Agoura Road and Kanan Road in the area of the roundabout. These are the same light standards that would be installed along Agoura Road as part of the Agoura Road Widening Project, approved and scheduled to be constructed in late 2014. The light standards are 30 feet tall, fluted steel pole shafts of a Craftsman-like style, with shielded and downward-facing illumination. No lighting is proposed in the roundabout island or for landscaping purposes.

The roundabout is expected to improve circulation, reduce vehicle delay, facilitate large truck movements, and reduce conflict points when compared to a traditional intersection. While the original concept included a one-lane roundabout, further analysis indicated that to be fully functional, a multi-lane roundabout was needed.

Most of the project would be within existing City right-of-way; however, additional frontage area on private parcels bordering the intersection would be required, which would necessitate acquisition of the land area by the City. Construction of the roundabout would require private land acquisition on the vacant parcels bordering the roundabout on the southwest (APN 2061-031-016; 24,577 square feet) and southeast (APN 2061-033-020; 26,348 square feet) corners. Other parcels would be affected by the project for grading and driveway reconstruction, or accessed temporarily during construction. Existing driveways for the developed parcels at the northwest and northeast quadrants would be retained. The parcels to be affected, and the proposed actions on the parcels, are listed below.

Assessor Parcel Number	Proposed Action
2061-033-016	Right-of-way take of 0 .56 acre; grading
2061-031-020	Right-of-way take of 0.6 acre; grading
2061-006-052	Grading; two driveway reconstructions to match grades; loss of left turn access from driveway onto Agoura Road
2061-006-008	Two driveway reconstructions to match grades, with one of the two driveways changed to right in/right out only
2061-004-034	Possible grading; two driveway reconstructions to match grades
2061-004-031	Two driveway reconstructions to match grades
2061-004-027	Possible driveway reconstruction to match grades; retaining wall built as part of planned Agoura Road Widening Project potentially to be reconstructed

The project would involve an estimated 16,787 cubic yards of excavation, and twenty cubic yards of fill. The roundabout project is funded by the County's Measure R.

PUBLIC AGENCIES WHOSE APPROVAL MAY BE REQUIRED FOR SUBSEQUENT ACTIONS (e.g. permits, financing approval, or participation agreement):

The project requires a City Oak Tree Permit for the removal of oak trees and for the encroachment into the protected zone of oak trees. No other permits or approvals from other agencies are required.

ENVIRONMENTAL FACTORS AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that could be lessened to a level of insignificance through incorporation of mitigation.

X	Aesthetics		Hazards & Hazardous Materials		Public Services
	Air Quality		Hydrology/Water Quality		Recreation
X	Biological Resources		Land Use/Planning		Transportation/Traffic
X	Cultural Resources		Mineral Resources		Utilities/Service Systems
X	Geology/Soils	**X**	Noise		Mandatory Findings of Significance
	Greenhouse Gases		Population/Housing		

DETERMINATION

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	
I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	**X**
I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	
I find that the proposed project MAY have a "potential 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 in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards and (b) have been avoided or mitigated pursuant to an earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.	

Allison Cook
Principal Planner/Environmental Analyst
City of Agoura Hills

2-4-14
Date

EVALUATION OF ENVIRONMENTAL IMPACTS

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

DISCUSSION:

a),c) The project site is set along the fringe of an urban area adjacent to the foothills of Ladyface Mountain in the Santa Monica Mountains, an important scenic resource. Ladyface Mountain, located just south of the site, dominates the landscape in the City of Agoura Hills, and is visible from many vantage points in the City, including this site. Agoura Road, as well as Kanan Road (from Agoura Road south to the City limits), are considered valuable community scenic resources (Natural Resources Element, General Plan, 2010), primarily in that they provide scenic views of Ladyface Mountain and the greater Santa Monica Mountains.

The project involves constructing a traffic feature in an existing roadway intersection and on immediately adjacent vacant properties south of the site. The properties on the northwest and northeast corners are developed with commercial buildings. The properties on the southwest and southeast corners are ultimately proposed for development under the Agoura Village Specific Plan (AVSP). Construction of the roundabout would require using a portion of the land on these latter two properties that directly fronts Agoura Road, which is barren or sparsely vegetated with mostly non-native plant species.

The project would expand the current paved roadway area to encompass the roundabout dimensions, but there would also be a substantial increase in landscaping in the roadway area, since the roundabout includes a center island and splitter islands to

be planted with trees, shrubs and groundcovers. In particular, the center island would contain native oak trees. Landscape features, such as wood rail fencing and stone walls, and simulated dry creek beds, would provide a natural, decorative appearance to the intersection, which is a gateway to the City from the Santa Monica Mountains National Recreation Area and other points south. The AVSP specifies this entrance to Agoura Village (south entrance to Agoura Village on Kanan Road) as a "village monument," used to identify primary entrances into the village. The purpose of the village monument is to signify the boundaries of the area and enhance the identity of Agoura Village. In part, the AVSP calls for such village monuments to function as a visual anchor and reflect natural elements and materials found within the City and surrounding areas. Monuments, according to the AVSP, shall also be significant in scale to clearly identify the area as an important place and shall be easily legible to motorists. On one of the stone walls at the southern entry to the roundabout, the "City of Agoura Hills" and logo would be displayed.

The Natural Resources Element of the General Plan contains goals and policies to preserve significant visual resources through integration of natural features in a project, and the use of appropriate scale, materials and design to complement the surrounding natural landscape. Along scenic resources, such as Agoura Road and Kanan Road in the project area, the General Plan calls for protecting and enhancing the views and developing appropriate landscaping.

The proposed oak trees, additional landscaping in the right-of-way, and natural decorative hardscape features would likely enhance the appearance of the intersection, and denote the entry to the City, consistent with the AVSP. These features would not obstruct views to Ladyface Mountain and the Santa Monica Mountains, given their low stature and elevation of the site of 845-890 feet, and the comparative height of Ladyface Mountain, which rises to over 2,000 feet. Given the natural themes and materials in the landscape plan, the project could be seen as complementing the natural scenery.

The project also includes the encroachment into the protected zones of four coast live oak trees, and the removal of seven coast live oaks and twenty-three valley oaks (a total of 30 removals). (Refer to the Oak Tree Report by L. Newman Design Group, Inc., March 2013; and memorandums from the City's Oak Tree and Landscape Consultant dated April 2013 and January 2014 in Appendix D). Another project, the Agoura Road Widening Project, is expected to begin construction by the end of 2014 (see DESCRIPTION OF THE PROJECT). The Agoura Road Widening Project would widen the roadway in the areas leading up to and out of the roundabout. The Agoura Road Widening Project would result in the removal of oak trees in the general area of the roundabout. If the Agoura Road Widening Project occurs prior to the Roundabout Project, as expected, the Roundabout Project would result in only protected zone encroachment to four coast live oaks along Kanan Road, near the Kanan Village Plaza, as the Agoura Road Widening Project is expected to result in the removal of the same

seven coast live oaks and twenty three valley oaks identified for the Roundabout Project. A more complete discussion of oak tree impacts, as well as required mitigation measures, is found in Section III. BIOLOGICAL RESOURCES.

The design of the roundabout, particularly the need to consider proper design and safety issues, necessitated disturbance to these oak trees. The loss of these oak trees would adversely affect the natural character of the area. However, the proposed landscape plan indicates that native coast live oak trees would be planted in the center island of the roundabout. The remainder of the plant palette in the roundabout's landscaped areas consists of a mix of mostly native and native cultivars, and some non-native species that are drought tolerant and have low water usage. The AVSP identifies a recommended landscape palette in the Agoura Village area, consisting of native and non-native species that are of low water use and natural in appearance. The approved Agoura Road Widening Project includes landscape plantings along Agoura Road, particularly through Agoura Village just west of the intersection of Agoura Road with Kanan Road to its intersection with Cornell Road, which is based on the ASVP landscape plant palette. The Agoura Road Widening Project species include native plants and trees, and non-native, but natural looking species.

Because coast live oak trees are proposed as a focal point in the center island of the roundabout, and the remainder of the landscape plan for the project consists of a majority of native species or cultivars, although with some naturalistic non-natives that are drought tolerant, and more rustic appearing hardscape and fencing/wall features, the project's effects on a scenic vista and the existing visual character of the site and surrounding area would be considered **less than significant.**

The City's Oak Tree Ordinance and Guidelines address oak tree encroachments and removals, and would require an Oak Tree Permit and mitigation for the loss of any oak trees for the Roundabout Project. Please refer to Section III. BIOLOGICAL RESOURCES for further discussion of oak tree impacts, particularly from a habitat perspective, and for required mitigation measures (MM BIO – 4)

b) There are no state scenic highways within, or adjacent to, the City of Agoura Hills. In any case, there are no scenic resource trees, rock outcroppings or historic buildings that would be affected by the project. Therefore, there would be **no impact.**

d) Since the project includes paving, striping, landscape planting, and the construction of stone wall and wood fence features, there are no features or materials that could cause a substantial amount of glare at the site and surrounding areas. Currently at the intersection and along the Agoura Road and Kanan Road roadways, there are cobra head street lights (35 feet high). There are also parking lot lighting (an estimated 20-25 feet high) and light standards (an estimated 15-20 feet high) adjacent to buildings at the northwest corner of the intersection, including in front of the restaurant entrance directly at the corner of Agoura and Kanan Roads. Lighting at the gas station at the

northeast corner of the intersection is located mostly on the north side of the building, away from the intersection. There is no lighting currently at the two vacant parcels at the southwestern and southeastern corners. The proposed project would not add substantially to the existing lighting. The existing cobra head lights would be replaced with slightly less tall, and more decorative, roadway and intersection lighting of 30 feet in height, with shielded luminaires designed to minimize light overspill and glare onto adjacent areas. The light standards and luminaires are Craftsman-like in style. No landscape lighting is proposed at this time. However, because there is the possibility of some landscape lighting being incorporated into the landscape plan during final design or at a date in the future, with the exact locations and design unknown, there remains the potential for adverse impacts from lighting on adjacent areas, including open space habitat areas, during nighttime hours. A measure to ensure that these effects are minimized onsite (MM AES-1) is necessary. Impacts would be considered **less than significant with mitigation incorporated**.

MITIGATION MEASURES:

Upon incorporation of the following mitigation measure, impacts to aesthetics would be less than significant.

AES-1 Light Spillover and Glare. Lighting shall be sensitive to the natural character of the surrounding area, with lighting fixture shields, or, in the case of landscape lighting, lighting that is minimal and carefully directed to landscape features only, to avoid glare and light spillover onto adjacent properties and the natural environment. The lighting plan, including locations and specifications of the standards and fixtures, shall be submitted to the City Environmental Analyst for acceptance prior to the start of construction or issuance of a Grading Permit, whichever occurs first.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact

II. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X	

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	
d) Result in a temporary increase in the concentration of criteria pollutants (i.e., as a result of the operation of machinery or grading activities)?			X	
e) Expose sensitive receptors to substantial pollutant concentrations?			X	
f) Create objectionable odors affecting a substantial number of people?				X

DISCUSSION:

The following discussion and analysis is based on the *Air Quality Impact Analysis Kanan Road and Agoura Road Roundabout* (Giroux & Associates, February 2013), included as Appendix B.

The federal and state governments have authority under the federal and state Clean Air Acts to regulate emissions of airborne pollutants, and have established ambient air quality standards for the protection of public health. The Environmental Protection Agency (EPA) is the federal agency designated to administer air quality regulation, while the California Air Resources Board (ARB) is the state equivalent in California. Local air quality management is provided by the ARB through county-level or regional (multi-county) Air Pollution Control Districts (APCDs). The ARB establishes air quality standards and is responsible for the control of mobile emission sources, while the APCDs are responsible for enforcing standards and regulating stationary sources. The ARB has 14 air basins statewide. The City of Agoura Hills is within the South Coast Air Basin (Basin), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD is required to monitor air pollutant levels to ensure that air quality standards are met and, if they are not met, to develop strategies to meet the standards. Depending on whether the standards are met or exceeded, the local air basin is classified as being in “attainment” or “non-attainment.” The Basin is a non-attainment area for both the federal and state standards for ozone and respirable particulate matter (PM_{10}). The Basin is in attainment for the state and federal standards for nitrogen dioxide (NO_2), and for carbon monoxide (CO).

Under state law, the SCAQMD is required to prepare a plan for air quality improvement for pollutants for which there is non-compliance, referred to as the Air Quality Management Plan (AQMP). The SCQAMD updates the plan every three years. Each iteration of the SCAQMD’s AQMP is an update of the previous plan and has a 20-year horizon. The most recently adopted AQMP is the 2007 AQMP. However, a 2012 AQMP is currently in development. A draft final version of the 2012 AQMP was released in November 2012, but has not yet been formally adopted by the SCAQMD Board. The SCAQMD adopted the 2007 AQMP on June 1, 2007, and it was updated March 4, 2011 to include revisions to particulate matter ($PM_{2.5}$) and ozone.

Appendix B, Table 2 (Health Effects of Major Criteria Pollutants) lists the pollutants regulated by the ARB, the sources of the pollutants, and their primary effects.

a) A project may be inconsistent with the AQMP if it would generate population, housing or employment growth exceeding the forecasts used in the development of the AQMP. The 2007 AQMP, the most recent AQMP adopted by the SCAQMD, incorporates, in part, local city general plans and the Southern California Association of Government's (SCAG) Regional Transportation Plan socioeconomic forecast projections of regional population, housing and employment growth. The proposed project involves the construction of a transportation feature and would not result in the development of residential uses that would cause a direct increase in the City's population. Project construction would result in the need for temporary workers, but the operation of the roundabout would not cause an increase in employment. Therefore, the proposed project would be consistent with the AQMP, and impacts would be **less than significant**.

b-d) The SCAQMD has established the following significance thresholds for construction activities and ongoing project operations within the South Coast Air Basin:

TABLE II-1
SCAQMD SIGNIFICANCE THRESHOLDS FOR POLLUTANTS

Pollutant	Construction Activities (lbs./day)	Project Operations (lbs./day)
Reactive Organic Gases (ROG)	75	55
Nitrogen Dioxide (NOx)	100	55
Carbon Monoxide (CO)	550	550
Sulfur Dioxide (SOx)	NA	150
Respirable Particulate Matter (PM_{10})	150	150
Fine Particulate Matter ($PM_{2.5}$)	55	55

Construction Impacts

Project construction would consist of the use of the following equipment for a total estimated period of twelve months.

TABLE II-2
CONSTRUCTION ACTIVITY EQUIPMENT FLEET AND WORKDAYS

Pavement Removal and Excavation (3 months)	2 Dozers
	2 Loaders/Backhoes
	2 Concrete Saws
	1 Trencher
Paving and Roadway Improvements (9 months)	2 Pavers
	2 Paving Equipment Machines
	2 Rollers

In the analysis, it was assumed that construction activity would comply with SCAQMD Rule 403, which identifies measures to reduce fugitive dust, and is required to be implemented at all construction sites located in the Basin. These measures are included as MM AQ-1, listed below.

Table II-3 shows that peak daily emissions during project construction would not exceed SCAQMD regional thresholds. Therefore, impacts would be **less than significant**.

TABLE II-3
ESTIMATED MAXIMUM DAILY PROJECT CONSTRUCTION EMISSIONS

Construction Phase	**Maximum Emissions (lbs./day)**					
	ROG	**SO_2**	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Maximum Daily Construction Emissions	6.3	0.1	47.9	30.3	11.52	4.23
SCAQMD Regional Thresholds	*75*	*150*	*100*	*550*	*150*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Long-Term Operational Regional Impacts

The proposed project, being a transportation improvement, would not cause an increase in operational impacts and is not expected to generate additional vehicular trips, as compared to a no-project condition (without addition of the roundabout). Use of roundabouts commonly reduces queuing delays for vehicles awaiting green lights and allows for designated turning movements without stopping. Therefore, there is a tangible air quality benefit from reducing engine idling commonly associated with signalized intersections. The Kanan and Agoura Road intersection serves approximately 20,000 vehicles per day. Assuming an average vehicle delay of ten seconds, a total of about 55 idle-hours may be “saved” per day. At an idle emission rate of 0.38 pounds per hour of CO and 0.03 pounds per hour of NOx for passenger cars, the roundabout would

save around ten pounds of CO and one pound of NOx per day, a minor beneficial impact. Therefore, there would be **no impacts** that are adverse to air quality from ongoing operational activities.

Microscale Impacts

Carbon monoxide (CO) is a colorless, odorless, poisonous gas that is found in high concentrations near areas of high traffic volumes (often referred to as CO "hot spots"). The Basin is in attainment of state and federal CO standards, and has been for several years. Three major control programs have contributed to the reduced per-vehicle CO emissions: exhaust standards, cleaner burning fuels, and motor vehicle inspection and maintenance programs. The SCAQMD has demonstrated that there are no "hot spots," i.e., locations where emission concentrations expose individuals to elevated risks of adverse health effects, anywhere in the Basin.

Nonetheless, a CO screening analysis was performed at the Kanan Road and Agoura Road intersection utilizing turning movement data provided by the project traffic report (Kimley-Horn & Associates, 2013). The one-hour CO concentration was calculated on the edge of pavement adjacent to this intersection. The significance of localized project impacts depends on whether the project would cause substantial concentrations of CO. A project is considered to have significant impacts if project-related mobile-source emissions result in an exceedance of the California one-hour and eight-hour CO standards of parts per million (ppm), which are: 1-hour = 20 ppm; and 8-hour = 9 ppm.

Calculations were made for the existing traffic conditions time frame as well as future conditions for the morning and evening peak hours. The results of the microscale impact analysis are shown below in Tables II-4 and II-5.

TABLE II-4
ONE-HOUR CO CONCENTRATIONS (PPM)[1]

Kanan and Agoura Road Intersection	AM Peak Hour	PM Peak Hour
Existing Conditions	3.9	3.9
Year 2014 – Intersection Improvement	3.9	4.0
Year 2020 – Opening Year	3.7	3.8
Year 2035 – Buildout	3.6	3.7

[1] *Includes 3.2 ppm background concentration*

TABLE II-5
EIGHT-HOUR CO CONCENTRATIONS (PPM)[1]

Kanan and Agoura Road Intersection	AM Peak Hour
Existing Conditions	3.2
Year 2014 – Intersection Improvement	3.3
Year 2020 – Opening Year	3.1
Year 2035 – Buildout	3.1

[1] *Includes 2.8 ppm background concentration*

The existing peak one-hour local CO background level in 2011 in the project area vicinity was 3.2 ppm. With project implementation, in the existing time frame and inclusive of the background concentration, the maximum one-hour concentration is estimated to be 3.9 ppm, which is well below the one-hour standard of 20 ppm. The maximum ambient 8-hour CO concentration in 2011 was 2.8 ppm. The project's maximum 8-hour CO concentration of 3.2 (inclusive of the background concentration) is also substantially below the standard of 9 ppm. As such, project impacts from CO "hot spots" would be **less than significant**.

Localized Significance Thresholds

The SCAQMD has developed Localized Significance Thresholds (LSTs) in response to concern regarding the exposure of individuals to criteria pollutants in local communities. According to the SCAQMD's publication, *Final Localized Significance Thresholds (LST) Methodology*, the use of LSTs is voluntary, to be implemented at the discretion of local agencies. LSTs represent the maximum emissions from a project that will not cause or contribute to an air quality exceedance of the most stringent applicable federal or state ambient air quality standards at the nearest sensitive receptor, taking into consideration ambient concentrations in each source receptor area, project size, distance to a sensitive receptor, etc. LSTs are most often applicable for particulate matter exposure for sensitive receptors, which commonly include residences, schools, medical facilities, day care centers or other locations where children, chronically ill individuals or other sensitive persons could be exposed to air pollution. The worst case assumption is that the receptor remains outdoors for the duration of the exposure period because indoor air pollution levels, especially that for particulate matter, are much lower than outdoors. For the proposed project, the primary source of possible LST impact would be during construction. The residential caretaker units, one each at the Agoura Self Storage (29301 Agoura Road) and the Conejo Valley U-Store-It (29055 Agoura Road), are the closest sensitive receptors. The nearest caretaker unit, at Conejo Valley U-Stor It, is about 175 feet away from the closest project perimeter.

LST pollutant screening level concentration data is currently published for 1, 2 and 5 acre sites for varying distances. Construction emissions are based on the number of

equipment hours and the maximum daily soil disturbance activity possible for each piece of equipment, as shown below in Table II-6.

TABLE II-6
MAXIMUM DAILY DISTURBED ACREAGE PER EQUIPMENT TYPE

Equipment Type	Acres/8-Hr-Day
Crawler Tractor	0.5
Graders	0.5
Rubber Tired Dozers	0.5
Scrapers	1

For the LST analysis, based on this table, the proposed project would result in two disturbed acres daily during peak construction activity: 2 dozers x 0.5 + 2 tractors x 0.5 = 2.0 acres disturbed. LST screening tables are available for 25, 50, 100, 200 and 500 meter source-receptor distances. There are no sensitive uses with a potential 24-hours/day exposure immediately adjacent to the project site. The nearest residential use is approximately 175 feet from the closest project perimeter. Therefore, a conservative receptor distance of 50 meters was selected for analysis. The project site is located in Source Receptor Area 6 (SRA-6), which is designated by the SCAQMD as West San Fernando Valley and includes the City of Agoura Hills. LSTs have been developed for NOx, CO, PM_{10} and $PM_{2.5}$. Table II-7 shows LSTs for the nearest residential use compared to the maximum daily project construction activities, and indicates that projected emissions are below the LST for construction. Therefore, impacts would be **less than significant**.

TABLE II-7
LST AND PROJECT EMISSIONS (pounds/day)

LST 2.0 acres/50 meters	CO	NO_2	PM_{10}	$PM_{2.5}$
West San Fernando Valley	143	903	17	5
Max On-Site Emissions 2014	30	48	3	3

e) Air quality impacts are analyzed relative to those persons with the greatest sensitivity to air pollution exposure. Such persons are called “sensitive receptors.” Sensitive population groups include young children, the elderly and the acutely and chronically ill (especially those with cardio-respiratory disease). Residential areas are considered to be sensitive to air pollution exposure because they may be occupied for extended periods, and residents may be outdoors when exposure is highest. The nearest residential use is about 175 feet away from the closest project perimeter. As discussed in Items b)-d) above, however, the project would not exceed air quality standards during construction or operation of the project. Therefore, air quality impacts to nearby sensitive receptors would be **less than significant**.

f) Given the nature of the project being a transportation feature, the project is not expected to create or emit objectionable odors. The project would result in **no impact**.

MITIGATION MEASURES:

The following measures are to ensure that air quality impacts remain less than significant.

AQ-1 Dust Control Measures. During site preparation and grading, the following measures shall be implemented:

a. *Minimization of Disturbance*. Construction contractors shall minimize the area disturbed by clearing, grading, earth moving, or excavation operations to prevent excessive amount of dust.

b. *Soil Treatment*. Construction contractors shall treat all graded and excavated material, exposed soil areas, and active portions of the construction site, including unpaved on-site roadways to minimize fugitive dust. Treatment shall include, but not necessarily be limited to, periodic watering, application of environmentally safe soil stabilization materials, and/or roll compaction as appropriate. Watering shall be done as often as necessary, and at least twice daily, preferably in the late morning and after work is done for the day.

c. *Soil Stabilization*. Construction contractors shall monitor all graded and/or excavated inactive areas of the construction site at least weekly for dust stabilization. Soil stabilization methods, such as water and roll compaction, and environmentally safe dust control materials, shall be applied to portions of the construction site that are inactive for over four days. If no further grading or excavation operations are planned for the area, the area shall be seeded and watered until landscape growth is evident, or periodically treated with environmentally safe dust suppressants, to prevent excessive fugitive dust.

d. *No Grading During High Winds*. Construction contractors shall stop all clearing, grading, earth moving, and excavation operations during periods of high winds (20 miles per hour or greater, as measured continuously over a one-hour period).

e. *Street Sweeping*. Construction contractors shall sweep all onsite driveways and adjacent streets and roads at least once per day, preferably at the end of the day, if visible soil material is carried over to adjacent streets and roads.

f. *Stockpiling and Transporting Material*. If importation, exportation and stockpiling of fill material is involved, earth with five percent or greater silt

content that is stockpiled for more than two days shall be covered, kept moist, or treated with earth binders to prevent dust generation. Trucks transporting material shall be tarped from the point of origin or shall maintain at least two feet of freeboard. All material transported off-site shall be securely covered to prevent excessive amounts of dust.

AQ-2 NOx Control Measures.

a. *Electricity*. When feasible, electricity from temporary power poles on site shall be utilized rather than temporary diesel or gasoline generators.

b. *Mobile Equipment Fuel*. When feasible, on site mobile equipment shall be fueled by methanol or natural gas (to replace diesel-fueled equipment), or, propane or butane (to replace gasoline-fueled equipment).

c. *Diesel Fuel Vehicles*. Aqueous diesel fuel or biodiesel (B20 with retarded fuel injection timing), if available, shall be used in diesel fueled vehicles when methanol or natural gas alternatives are not available.

AQ-3 Ozone Precursor Control Measures.

a. Equipment engines shall be maintained in good condition and in proper tune as per manufacturer's specifications.

b. As feasible, schedule construction periods to occur over a longer time period (i.e., lengthen from 60 days to 90 days) during the smog season so as to minimize the number of vehicles and equipment operating simultaneously.

AQ-4 Decrease Emissions. Decrease emissions of diesel particulate matter during site grading by implementing *one of the following four* measures.

a. Construction contractors shall not operate more than two pieces of heavy-duty diesel-powered equipment within 600 feet of any residence at any time.

b. Construction contractors shall use biodiesel fuel in all on-site diesel-powered equipment. Biodiesel that is blended with low sulfur diesel fuel shall be used, if available.

c. Construction contractors shall use only Tier 2 diesel-powered earth moving equipment.

d. At least 80 percent of the diesel-fueled construction equipment in terms of brake-horsepower shall have diesel particulate filters (DPFs) installed, or all equipment shall be equipped with diesel oxidation catalysts.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact
III. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U. S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U. S. Wildlife Service?		X		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		X		
d) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?				X
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?		X		
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, other approved local, regional, or state habitat conservation plan?				X
g) Result in substantial damage to, loss of, or removal of native oak trees or other locally identified specimen trees of significance?		X		

DISCUSSION:

The following discussion and analysis is based on the *Biological Resources Assessment and Impact Analysis – Kanan Road/Agoura Road Roundabout Project* (Envicom, March 2013) found in Appendix C, including site reconnaissance field surveys conducted on February 20 and 21, 2013. It is also based on the *Oak Tree Report* prepared for the project (L. Newman Design Group, Inc., March 2013), and memorandums from the City's Landscape and Oak Tree Consultant dated April 2013 and January 2014, all found in Appendix D. A full listing of plant and wildlife species observed within the project area, and those that have the potential to occur in the project area, are included in the Appendices to the *Biological Resources Assessment and Impact Analysis – Kanan Road/Agoura Road Roundabout Project*.

Regulations

Federal and state statutes provide a regulatory structure that guides the protection of biological resources. The following discussion provides a summary of those laws that are most relevant to biological resources in the vicinity of the project site.

Federal Endangered Species Act

The Federal Endangered Species Act of 1973 (FESA) (16 U.S.C. 1531 et seq.) defines an endangered species as "any species that is in danger of extinction throughout all or a significant portion of its range..." (16 U.S.C. 1532(6)). Threatened species are defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (16 U.S.C. 1532(20)). Under provisions of Section 9(a)(1)(B) of the FESA, it is unlawful to "take" any listed species. "Take" is defined as actions that "...harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. 1532(19)). Further, the U.S. Fish and Wildlife Service (USFWS), through regulation, has interpreted the terms "harm" and "harass" to include certain types of habitat modification as forms of a "take" (40 Fed. Reg. 44412, 44416, 54748, 54750). For purposes of this assessment, the following acronyms are used for federal status species:

FE	Federal Endangered
FT	Federal Threatened
FPE	Federal Proposed Endangered
FPT	Federal Proposed Threatened
FC	Federal Candidate for Listing

Federal Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the U.S. and regulating quality standards for surface waters. Section 404 requires a permit for discharges of dredged or fill material into the navigable waters of the United States. Section 401 requires that any applicant for a federal permit for an activity that may result in any discharge into the navigable waters provide the permitting agency with a certification from the applicable state agency that such discharge will comply with state water quality requirements.

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) has authority to regulate activities that could discharge fill or dredge material or otherwise adversely modify wetlands or other "waters of the United States." Perennial and intermittent creeks are considered waters of the United States and are within the regulatory jurisdiction of the USACE. The USACE implements federal policy of Executive Order 11990, which is intended to result in no net loss of wetlands value or acres. In achieving the goals of the Clean Water Act, the USACE seeks to avoid adverse impacts and to offset unavoidable adverse impacts on existing aquatic resources. Any fill or adverse modification of wetlands may require a permit from the USACE

prior to the start of work. Permits from the USACE also require a CWA Section 401 water quality certification from the Regional Water Quality Control Board (RWQCB).

The State Water Resources Control Board (SWRCB) and the local Los Angeles Regional RWQCB have jurisdiction over "waters of the state," pursuant to the Porter-Cologne Water Quality Control Act, which are defined as any surface water or groundwater, including saline waters, within the boundaries of the state. The SWRCB has issued general Waste Discharge Requirements (WDRs) for discharges to "isolated" waters of the State. The Los Angeles RWQCB enforces actions under this general order for isolated waters not subject to federal jurisdiction, and is also responsible for the issuance of water quality certifications pursuant to Section 401 of the Clean Water Act for waters subject to federal jurisdiction.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird species listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21).

California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code, Sections 2050 et seq.) defines an endangered species as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease." The CESA defines a threatened species as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter." Any animal determined by the commission as rare on or before January 1, 1985 is a threatened species." Article 3, Sections 2080 through 2085, of the CESA addresses the taking of threatened or endangered species by stating "No person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts, except as otherwise provided..." Under the CESA, "take" is defined as "...hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Exceptions authorized by the CESA to allow "take" require "...permits or memorandums of understanding..." and can be authorized for "...endangered species, threatened species, or candidate species for scientific, educational, or management purposes." For the purposes of this assessment, the following acronyms are used for state species:

SE	State Endangered
ST	State Threatened
SCE	State Candidate Endangered
SCT	State Candidate Threatened

SFP	State Fully Protected
SP	State Protected
SR	State Rare
CSC	California Species of Special Concern

California Fish and Game Code

Some sensitive mammals and birds are protected as "fully protected mammals" or "fully protected birds," as described in Sections 4700 and 3511 of the California Fish and Game Code, respectively. California Species of Special Concern ("special" animals and plants) listings include special status species, including all state and federal protected and candidate species, Bureau of Land Management and U.S. Forest Service sensitive species, species considered to be declining or rare by the California Native Plant Society (CNPS) or National Audubon Society, and a selection of species that are considered to be under population stress but are not formally proposed for listing. This list is primarily a working document for the California Department of Fish and Wildlife's (CDFW, formerly CDFG) California Natural Diversity Database (CNDDB) project. Informally listed species are not protected, but warrant consideration in the preparation of biotic assessments. For some species, the CNDDB is only concerned with specific portions of the life history, such as roosts, rookeries, or nest sites.

Sections 3505, 3503.5, and 3800 of the California Fish and Game Code prohibit the take, possession, or destruction of certain bird species, their nests or eggs. Section 1602 Fish and Game Code requires a project proponent to notify the CDFW of any proposed activity that may substantially modify a river, stream, or lake.

Perennial and intermittent streams also fall under the jurisdiction of the CDFW, Section 1600 et seq. of the Fish and Game Code (Lake and Streambed Alteration Agreements). The CDFW has regulatory authority over work within the stream zone consisting of, but not limited to, the diversion or obstruction of the natural flow or changes in the channel, bed, or bank of any river, stream or lake.

California Native Plant Society

The California Native Plant Society (CNPS) is a private plant conservation organization dedicated to the monitoring and protection of sensitive plant species in California. This organization has compiled an inventory comprised of information focusing on geographic distribution and qualitative characterization of rare, threatened, or endangered vascular plant species of California. The inventory serves as CDFW's candidate list for designating plants as threatened and endangered. The CNPS has developed five categories of rarity:

List 1A	Presumed extinct in California
List 1B	Rare, threatened, or endangered throughout their range
List 2	Rare, threatened, or endangered in California, but more common in other states
List 3	Plant species for which additional information is needed before rarity can be

	determined
List 4	Species of limited distribution in California (i.e., naturally rare in the wild), but whose existence does not appear to be susceptible to threat

Within these categories, 0.1 is defined as seriously threatened in California (over 80 percent of occurrences threatened/high degree and immediacy of threat). 0.2 is defined as fairly threatened in California (20 to 80 percent occurrences threatened/moderate degree and immediacy of threat); and 0.3 is defined as not very threatened in California (fewer than 20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known).

City of Agoura Hills

The City's General Plan Natural Resources Element, Biological Resources Section, provides for goals and policies to protect open space and other natural areas, along with significant wildlife and vegetation, to ensure a sustainable environment. The City's Oak Tree Preservation Ordinance and Guidelines provide for the protection and replacement of oak species that are disturbed by development.

Site Setting

The site topography is generally flat to gradually sloped, except for an embankment along the south side of Agoura Road and a steep road cut to the east of Kanan Road. Elevations range from about 845 feet to 890 feet. The site consists of developed areas, including paved roads and sidewalks, as well as undeveloped, disturbed areas that are barren or sparsely vegetated, or that contain non-native grasses and forbs, and isolated shrubs, native oaks, and non-native pepper trees. A large unpaved, barren area to the southwest of the existing intersection is used seasonally for commercial activities. This area and additional barren areas to the southeast of the intersection are also used routinely by motor vehicles as turnarounds and temporary rest stops. Lindero Canyon Creek flows in a culvert beneath Agoura Road near the western end of the project site. The culvert discharges to an open channel lined with grouted rock riprap on the south side of Agoura Road. Areas to the north of the project site are built-up with commercial uses, while areas immediately south are undeveloped and generally disturbed. However, further to the south, beyond the project limits, the landscape transitions to extensive undisturbed native habitat.

Vegetation within the built-up and developed portion of the project site is mostly ornamental, although there are a few native valley oaks (*Quercus lobata*) and coast live oaks (*Quercus agrifolia*) along the northern side of Agoura Road, and some roadside areas that are not landscaped contain common urban weeds.

Within the naturally occurring vegetation in the undeveloped portions of the project site to the south of Agoura Road, the composition and condition of the vegetation indicates disturbance over a long period of time. The plant communities here include California Annual

Grassland/Herbaceous; disturbed California Buckwheat Shrubland; and disturbed Valley Oak /Annual Grass-herb Woodland. These communities are described more fully below.

California Annual Grassland/Herbaceous

The most prevalent plant community in this area is an herbaceous community dominated by non-native grasses and forbs, which is interspersed with a few native shrubs and native valley oaks and coast live oaks. Representative species include annual brome grasses, slender wild oat, hoary mustard, bur-clover, black mustard, tecolote, foxtail barley, and Italian thistle. Although primarily dominated by non-natives, a few native shrubs and herbs are also sparsely distributed, including California sand-aster, coyote bush, common fiddleneck, narrowleaf milkweed, slender tarplant, turkey mullein, American bird's-foot trefoil, and red maids.

Barren and sparsely vegetated areas also cover a significant proportion of the project site. Barren and sparsely vegetated areas are cleared, mowed, or otherwise disturbed on a routine basis. These areas generally lack native species. Representative species observed during the biological survey include red brome, foxtail barley, hoary mustard, bur-clover, small-flowered cheeseweed, Mediterranean grass, pineapple weed, red-stemmed filaree, and Peruvian pepper trees.

California Buckwheat Shrubland

A disturbed California buckwheat scrub community occurs on and in the vicinity of the steep road cut to the east of Kanan Road, in the southern portion of the site. This community is relatively common in the region on road cuts and in disturbed roadside areas. Representative species on the road cut include California buckwheat, want buckwheat, California aster, chalk live-forever, and a variety of non-native herbs.

Valley Oak /Annual Grass-herb Woodland

Mature native valley oaks, as well as a few smaller valley oaks and coast live oaks, are concentrated along the south side, and a few along the north side, of Agoura Road. The mature oaks to the south of Agoura Road appear to be a remnant of what was once a more extensive valley oak woodland or savanna. A few shrubs grow beneath the canopies and in the vicinity of the oak trees, including native chaparral honeysuckle, native blue elderberry, and the non-native horehound. The National Park Service (NPS) has identified these oak trees in its vegetation mapping of the Santa Monica Mountains and its environs as a part of a Valley Oak/Annual Grass-herb Woodland plant community.

a) During the site survey, 86 plants were observed, including 45 native, and 41 non-native plants. A full listing of plant species observed within the project area, and those that have the potential to occur in the project area, is included in the Appendices to the *Biological Resources Assessment and Impact Analysis – Kanan Road/Agoura Road Roundabout Project*. Note that ornamental species in landscaped areas were not surveyed and so are not

included on this list.

Special status plant species are those plants listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS under the Federal Endangered Species Act (FESA); those listed or proposed for listing as rare, threatened, or endangered by the CDFW under the California Endangered Species Act (CESA); and plants occurring on List 1B and List 2 of the CNPS Inventory of Rare and Endangered Plants. In Appendix B of the *Biological Resources Assessment and Impact Analysis – Kanan Road/Agoura Road Roundabout Project* is an analysis of the potential for occurrence of special-status plants, including an evaluation of growth form, blooming period, protected status, primary habitat associations, and an assessment of the potential for occurrence as high, moderate, low or none. Given the highly disturbed condition of the site and the results of the project survey and springtime botanical surveys of the southwestern portion of the site in prior years, special status plant species are believed to be absent, with no potential to occur onsite. Therefore, impacts to candidate, sensitive, and special status plant species are expected to be **less than significant.**

Wildlife observed during the biological survey of the site consisted of species common, or relatively common, to the region. As listed in Appendix C of the *Biological Resources Assessment and Impact Analysis – Kanan Road/Agoura Road Roundabout Project, t*he wildlife consisted of one reptile, 18 species of birds, and three mammals, and included the following: western fence lizard, acorn woodpecker, American crow, black phoebe, California towhee, Cassin's kingbird, dark-eyed junco, house finch, lesser goldfinch, mallard, northern flicker, oak titmouse, red-tailed hawk, Say's phoebe, song sparrow, western scrub jay, white-breasted nuthatch, white-crowned sparrow, yellow-rumped warbler, California ground squirrel, coyote, and desert cottontail.

No rare, threatened, or endangered wildlife species were identified during the site survey. An analysis of the potential for such species to occur at the site was also performed, and is included in Appendix D of the *Biological Resources Assessment and Impact Analysis – Kanan Road/Agoura Road Roundabout Project.* The potential for occurrence analysis was based on the reported range and distribution of the species and the type and extent of habitat available at the site.

The potential use of the site by special status wildlife species, although unlikely, is limited to one reptile, three bird, and five mammal species listed as California Species of Special Concern, and one bird listed as California Fully Protected [SFP]. No species listed as threatened or endangered under the FESA or the CESA are expected to be present at the site. The white-tailed kite [SFP] has moderate potential to forage on a temporary basis over the site and in the surrounding area. Special status wildlife species listed as Species of Special Concern with low potential to occur at the site include the coast horned lizard, loggerhead shrike, burrowing owl, Vaux's swift, pallid pat, spotted bat, Townsend's big-eared bat, western mastiff bat, and western red bat. All of these species are anticipated to only forage at the site or pass through or roost on a temporary basis and would not inhabit

or reproduce at the site. Also, as all special status wildlife species that may occur at the site would occur only rarely or occasionally, they would not be significantly affected by habitat loss that would result from development of the proposed project, as the impacted area would represent a very small proportion of the available habitat within their ranges. Although the white-tailed kite, loggerhead shrike, and Vaux's swift would be capable of escaping harm during project construction, the other species are slow moving or could be present in burrows or cavities and could be directly impacted by the project. Impacts to candidate, sensitive, and special status wildlife species are expected to be **less than significant with mitigation**, as listed below in MM BIO-1**.**

The native and non-native trees, shrubs, and dense herbaceous vegetation at the site and the native and non-native habitats in the surrounding area provide potential nesting/breeding habitat for birds, including raptors. Several bird species may nest at or in the vicinity of the proposed project site, and could therefore be subject to direct or indirect adverse impacts by the project. Grading and construction, if conducted during the nesting bird season (February 1 to September 15) would have the potential to result in the loss of trees, shrubs, and dense herbaceous vegetation that could contain active bird nests. In addition, grading and construction would occur within 500 feet of habitats, including bird species, which could be susceptible to indirect impacts due to construction activity and noise. Project activities that result in the loss of bird nests, eggs, and young, would be in violation of one or more of California Fish and Game Code sections 3503 (any bird nest), 3503.5 (birds of prey), or 3511 (Fully Protected birds). Also, removal or destruction of one or more active nests of any other birds listed by the federal Migratory Bird Treaty Act (MBTA), whether nest damage was due to vegetation removal or to other construction activities, would be considered a violation of the MBTA and Fish and Game Code Section 3511, and would be a significant impact. Therefore, impacts to nesting/breeding birds would be considered a **less than significant with mitigation**, as listed below in MM BIO-2.

b) The plant communities at the site and its surrounding area were compared with those plant communities included in the *Vegetation Classification of the Santa Monica Mountains Natural Recreation Area and Environs in Ventura and Los Angeles Counties, California* (CDFG/CNPS, June 2006) and the *List of Vegetation Alliances and Associations (Natural Communities List)* (CDFG, September 2010). These documents provide comprehensive lists of officially recognized plant communities occurring in the Santa Monica Mountains and environs and in the State of California, respectively. In these documents, each plant community is assigned a conservation status rank (also known as "rarity rank"), which is used to determine the sensitivity of the plant community. Plant communities with global or state status ranks of GI through G3, or S1 through S3, respectively, are considered to be sensitive, and are referred to as "natural communities of special concern." Sensitive plant communities are communities that are of limited distribution statewide or within a county or region, and are often vulnerable to environmental effects of projects. Plant communities are classified based on plant species composition and abundance, as well as slope and soil type conditions.

Of the plant communities at the site, the California Annual Grassland/Herbaceous is unranked, the disturbed California Buckwheat Shrubland is G5/S5, and the disturbed Valley Oak/Annual Grass-herb Woodland is G3/S3. Although the California Annual Grassland/Herbaceous plant community has not been assigned a conservation status rank, these areas are dominated by non-native grasses and forbs, and are not considered sensitive. The California Buckwheat Shrubland plant community found on and adjacent to the road cut along Kanan Road is also non-sensitive. Although the Valley Oak/Annual Grass-herb Woodland has a G3, S3 conservation status ranking, the woodland at the site lacks significant resource value due to its highly disturbed condition and very close proximity to existing development, and so provision of protected status for the woodland in this case is not warranted. Therefore, the project would have a **less than significant impact** on the sensitive natural communities within and adjacent to the site.

Riparian habitat is found south of the project site at Lindero Canyon Creek, at the western end of the project site. Just south of Agoura Road, Lindero Canyon Creek discharges from an underground culvert to an open channel that is lined with grouted rip-rap along its eastern bank. There is a cattail wetland along the margins of the open channel, and about 150 feet to the south of the site. the creek is surrounded by riparian willow woodland. Lindero Canyon Creek south of Agoura Road is within the regulatory jurisdiction of the USACE, CDFW, and RWQCB. The riparian habitat of the creek would not directly be impacted by the project, as no construction would occur within or directly adjacent to the creek. However, due to the close proximity of the creek to the project site, the creek could be subject to inadvertent encroachment during construction activities, which has the potential to result in the loss of, or damage to, riparian habitat. Mitigation Measure BIO-3 would be necessary to reduce the potential for encroachment into the creek. Therefore, impacts riparian habitat would be **less than significant with mitigation**.

c) As described in Item b) above, Lindero Canyon Creek is located adjacent to the project site. As well as containing riparian habitat, the creek is considered a jurisdictional feature (e.g. drainages, wetlands), and subject to regulation by the USACE and RWQCB. While the jurisdictional wetlands and open waters of Lindero Canyon Creek would not be directly impacted by the project, there is the potential they could be inadvertently damaged or removed as a result of nearby construction activity. As such, Mitigation Measure BIO-3 would be necessary to reduce the potential for encroachment into the creek. Therefore, impacts to jurisdictional habitat would be **less than significant with mitigation**.

d) The project site is not within a mapped wildlife corridor. The closest wildlife corridor is near Liberty Canyon, located about 2.5 miles east of the site (General Plan, 2010). The project site is situated within an existing City right-of-way that is currently developed as a road intersection, and adjacent developed and undeveloped properties along the perimeter of the intersection. The site is at the margin of the City's urban area, and the extensive natural habitats of the foothills to the south of the site are suitable for wildlife movement through the area. However, the project would not expand into the open spaces near the Ladyface Mountain hillside area. There are no known wildlife nursery sites within the City of Agoura

Hills or adjacent to the City. Therefore, there would be **no impact** to wildlife corridors, fish or wildlife movement, or wildlife nursery sites.

e,g) There are forty two (42) coast live oaks (*Quercus agrifolia*) and valley oaks (*Q. lobata*) within the general project area. The Oak Tree Report and memorandums from the City's Oak Tree Consultant indicate that the Roundabout Project has the potential to encroach within the protected zone of four (4) coast live oaks, and remove a total of thirty (30) oak trees (Oak Trees 105 through 123, 166 through 174, 207 and 257), one of which is a landmark oak tree (Oak Tree 113). Of these removals, seven (7) would be valley oaks, and twenty three (23) would be coast live oaks. Consequently, an Oak Tree Permit would be required, pursuant to the City's Oak Tree Preservation Ordinance and Guidelines.

The four (4) oaks to be encroached upon (Oak Trees 175, 182, 254, 255) are located on the west side of Kanan Road, adjacent to the Kanan Village Center. The two (2) oaks at the northwest quadrant of the roundabout directly adjacent to the north side of Agoura Road and also adjacent to the Kanan Village Center (Oak Trees 172, 173), would remain, and are incorporated into the project's landscape plan. Another oak tree further west of the roundabout on the north side of Agoura Road (Oak Tree 257) would also remain, and is incorporated into the landscape plan. Nonetheless, because of the proximity of construction activities to these three trees, the City's Oak Tree Consultant has determined that such construction work may accelerate the decline or death of the trees, and as a precautionary measure, the trees should be considered removals and their loss compensated.

As noted in the DESCRIPTION OF THE PROJECT and in Section I. AESTHETICS, the Agoura Road Widening Project (approved by City Council in December 2012) is expected to be completed prior to implementation of the roundabout. The Agoura Road Widening Project includes lane expansion of portions of the roadway segments leading into the roundabout, which would involve removal of pavement, grading, and paving. These activities would result in the loss of, and encroachment into the protected zone of, oak trees along Agoura Road and Kanan Road, including the removal of thirty (30) oaks. Oak tree mitigation measures, including planting of additional oak trees, were incorporated into the Agoura Road Widening Project IS/MND. They include replanting for the loss of the three oaks trees along Agoura Road, described in the prior paragraph, which would remain, but may be affected by construction work. Therefore, potential impacts from construction of the Roundabout Project are expected to be limited to encroaching into the protected zone of the four (4) coast live oaks along Kanan Road near the Kanan Village Plaza, assuming that existing oak trees to be removed would already be affected and mitigated for (mitigated outside of the Roundabout Project area) by the Agoura Road Widening Project. Upon construction of the Agoura Road Widening Project, the City's Oak Tree Consultant would verify the oak trees that were removed as part of the Agoura Road Widening Project, and any additional oak tree impacts resulting from the Roundabout Project would need to be mitigated. Upon approval of an Oak Tree Permit,

including necessary protective and mitigation measures, impacts to oak trees are expected to be less than significant. Therefore, impacts would be **less than significant with mitigation**.

Mitigation measures (MM BIO-4) consistent with the City's Oak Tree Preservation Ordinance and Guidelines would ensure protection of the oak trees to remain, and compensation for the loss of any oak trees. As long as the protective measures and compensation measures of replanting oaks are accomplished as part of the Oak Tree Permit, as necessary, the project would be consistent with the City's Oak Tree Preservation Ordinance and Guidelines.

f) There are no Habitat Conservation Plans, Natural Conservation Community Plans, other approved local, regional, or state habitat conservation plans in or near the project site. Consequently, there would be **no impact**.

MITIGATION MEASURES:

Upon implementation of the following measures, impacts to biological resources would be reduced to a less than significant level.

BIO-1 Special Status Wildlife. Prior to beginning ground or vegetation disturbing activities, a qualified biologist, acceptable to the City's Environmental Analyst, shall conduct two pre-project surveys for special status wildlife species. The first survey shall be conducted no more than seven (7) days prior to commencing project activities, and the second survey shall be conducted no more than three (3) days prior to commencing project activities. The pre-project survey shall incorporate methods to detect the special status wildlife species that could potentially occur at the site. Prior to beginning project construction, the methods and results of the surveys, which shall comply with CDFW protocol, shall be presented in a letter report to the City's Environmental Analyst. If a special status species is found, the appropriate regulatory agency (CDFW or USFWS) shall be notified by the City's Environmental Analyst. If avoidance is not feasible, appropriate measures to mitigate for the presence of the species onsite shall be determined in consultation with the City's Environmental Analyst, CDFW, and USFWS, if applicable, which may involve the capture and transfer of the species to an appropriate habitat and location where the species would not be harmed by project activities. The biologist shall hold the requisite permits for the capture and handling of the species, as required by the CDFW and/or USFWS, as applicable. If a special status species is found during pre-project surveys, a qualified biologist shall monitor all ground and vegetation disturbing project activities in that area. The biological monitor shall conduct ongoing searches for such special status species periodically throughout project activities and implement all required measures to avoid impacts to the species.

BIO-2 Nesting Season. To the extent feasible, the City of Agoura Hills shall not remove or otherwise disturb vegetation or conduct any other site preparation or construction related activities within the work areas to avoid impacts to breeding and/or nesting birds from February 1 through August 31, the recognized breeding, nesting and fledging season for raptor and bird species. If vegetation disturbance (including cutting or removal of oak trees), site preparation, or construction related activities in the work areas during the breeding and nesting season cannot be avoided, then prior to any ground or vegetation disturbing activities, the City shall have a qualified biologist/ornithologist acceptable to the City Environmental Analyst, conduct two (2) surveys of all breeding and nesting habitats within the work areas and vicinity. The extent of the survey buffer area surrounding the site shall be established by the biologist to ensure that direct and indirect effects to nesting/breeding birds are avoided. The first survey shall be conducted no more than two (2) weeks prior, and the second survey no more than three (3) days prior, to initiation of vegetation disturbance, site preparation, or construction related activities. A report discussing the results of the bird surveys shall be submitted for review by the City Environmental Analyst prior to any vegetation removal, site preparation or construction activity. If active nests are found within the survey area, activities within a 300-foot radius (500 feet for raptors) shall stop until an appropriate buffer can be established, and the buffer area shall be fenced off. Activities within the fenced area shall be postponed or halted, at the discretion of a biological monitor, until the nest is vacated and juveniles have fledged, as determined by the biologist, and there is no evidence of a second attempt at nesting. If a state or federally listed species is found, the CDFW and the USFWS, when applicable, shall be notified within 24 hours of the sighting, and construction work shall stop until concurrence has been received that operations may proceed. The biologist shall record the results of the recommended protective measures described above to document compliance with applicable state and federal laws pertaining to the protection of native birds, and provide the documentation to the City's Environmental Analyst.

BIO-3 Protective Fencing. Prior to all ground disturbing and construction activities, the City of Agoura Hills shall demarcate an appropriate buffer, as determined by a biologist and/or the City's Environmental Analyst, around the Lindero Canyon Creek jurisdictional areas adjacent to the project footprint with sturdy exclusionary fencing to prevent the encroachment of project activities into jurisdictional areas. The fencing shall be marked with high visibility tape and signage identifying the stream and associated wetland and riparian habitats as a "sensitive habitat area." The fencing shall be placed such that it does not interfere with the movement of wildlife within native habitats or along Lindero Canyon Creek. Prior to the start of ground disturbance or construction activities, a qualified biologist approved by the City's Environmental Analyst shall verify that the fencing has been correctly installed. The fencing shall be routinely

inspected and maintained in functional condition for the duration of the project.

BIO-4 Oak Trees. The following measures would compensate for the loss of oak trees, and would protect existing oak trees to remain.

a) If the Agoura Road Widening Project is constructed prior to the Roundabout Project, and the anticipated thirty (30) coast live oaks and valley oaks are removed (verified by City Oak Tree Consultant inspection after completion of the Agoura Road Widening Project), then the Roundabout Project shall not be required to compensate for the loss of such trees. If the Agoura Road Widening Project is not constructed prior to the Roundabout Project and the thirty (30) oak trees would be removed by the Roundabout Project, then the Roundabout Project shall be responsible for compensation for the oak tree removal as follows.

Compensation for the loss of thirty (30) coast live oak and valley oak trees shall include planting of at least four hundred fourteen (414) inches of trunk diameter of new oak trees within the landscape. The exact species, planting sizes and planting locations shall be subject to review and approval by the City Planning and Community Development Director and the City Oak Tree Consultant. At least one hundred eighteen (118) oak trees shall be planted, to include the following eighty-nine (89) trees:

- Twenty nine (29) thirty-six-inch (36”) box size trees.
- Fifty-eight (58) twenty-four-inch (24”) box size trees.
- Two (2) container-grown sixty-inch (60”) box size trees to mitigate for the removal of Oak Tree #113, a designated landmark tree.

Coast live and valley oak trees shall be incorporated into the landscape plans for the Roundabout Project as feasible (considering available planting areas). If it is determined that there is insufficient land available in the project area to plant the full number of mitigation trees, the City shall then replant and maintain the remainder of oak trees on land owned by the City or other entity within the City or its vicinity, which is retained for preservation. If sufficient lands are not available for oak tree restoration to complete the remainder of the plantings on available land, the City may pay an in-lieu fee for the remainder of the mitigation requirement. The exact amount of the fee is to be determined by the City’s Oak Tree Consultant, per the *Guide for Plant Appraisal* (9th edition) and based on the appraised value of the trees and/or the cost that would be normally associated with planting mitigation trees, and approved by the City Planning and Community Development Director. The in-lieu fee shall be paid to the City’s Oak Tree Mitigation Fund prior to issuance of a grading permit or commencement of project construction, whichever occurs sooner. The City’s Oak Tree Mitigation Fund is used to purchase open space

land and plant oak trees. Oak tree mitigation for the project using the in-lieu fee shall be implemented within five (5) years of completion of the project construction.

An Oak Tree Mitigation Plan shall be prepared by a qualified professional, satisfactory to the Director of Planning and Community Development, which complies with the tree replanting requirements listed herein, and which shall identify at least the following:

- Specific sites to be replanted, methods of planting and spacing, and quantities and sizes to be planted. Maintenance requirements, including weeding, watering, and replanting, as necessary.
- Monitoring requirements for at least a three (3) year period following installation, including required documentation to be submitted to the City's Environmental Analyst and City Oak Tree Consultant.
- Performance criteria and measures of success.

Mitigation sites shall be selected such that no sensitive species or habitat would be displaced or impacted by the restoration of oaks. The Oak Tree Mitigation Plan shall be submitted to the City's Environmental Analyst and City Oak Tree Consultant for review, and approved by the City Planning and Community Development Director, prior to issuance of a grading permit and/or initiation of project construction, whichever occurs first. Mitigation completion shall occur no later than one (1) year after the completion of the Roundabout Project.

If the Agoura Road Widening Project does not remove the full anticipated thirty (30) oak trees, but any of these remaining oaks are subsequently removed as a result of the Roundabout Project, then the compensation for oak tree loss shall be at the following ratios:

- Compensation for the loss of coast live oak and valley oak trees shall be at a ratio of 4:1, with at least two (2) 24-inch box specimens and one (1) 36-inch box specimen, with the remaining tree diameter dependent on the size of the individual tree to be removed, pursuant to the City's Oak Tree Ordinance and Oak Tree Preservation Guidelines. Compensation for the loss of one (1) landmark oak tree shall be two (2) container grown 60-inch box size trees.

b) The following measures are required for encroachment into the protected zone of four (4) oak trees (Oak Trees 175, 182, 254, 255) and to protect any other existing oak trees to remain:

- All excavation within the protected zones of Oak Tree #s 176, 182, 254, and

255 shall be performed using only hand tools under the direct observation of the City Oak Tree Consultant.

- No activities are permitted within the protected zones of Oak Tree #s 176 through 178, 256, 258, and 259. They are to be preserved in place with no direct impacts.

- No pruning of live wood shall be permitted unless specifically authorized by the City Oak Tree Consultant. Any authorized pruning shall be performed by a qualified tree worker under the direct observation of an International Society of Arboriculture (ISA) certified arborist. Pruning operations shall be consistent with *ANSI A300 Standards – Part I Pruning* and the most recent edition of the International Society of Arboriculture *Best Management Practices for Tree Pruning*.

- Prior to the start of any mobilization or construction activities on the site, oak trees shall be fenced at the edge of the protected zone in strict accordance with Article IX, Appendix A, Section V.C.1.1. of the City of Agoura Hills Oak Tree Preservation and Protection Guidelines. The City Oak Tree Consultant shall approve the fencing location subsequent to installation and prior to the start of any mobilization or work on the site.

- The contractor performing the work shall avoid damage to the oak trees from exhaust from heavy equipment by means of exhaust diversion devices to redirect or diffuse exhaust from being directed in a concentrated manner to tree limbs and foliage overhanging the street to further avoid damage to the oaks.

- No vehicles, equipment, materials, spoil or other items shall be used or placed within the protected zone of any oak tree at any time, except as specifically required to complete the approved work.

- No herbicides shall be used within one hundred feet (100') of the dripline of any oak tree unless the program is first reviewed and endorsed by the City Oak Tree Consultant.

- No planting or irrigation is permitted within the protected zone of any existing oak tree without approval from the City Oak Tree Consultant.

- Prior to completion of the project, each existing and new oak tree shall be mulched throughout the dripline with three inches (3") of approved organic mulch as needed to supplement natural leaf litter.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact

IV.CULTURAL RESOURCES. Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?		X		
c) Directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature?		X		
d) Disturb any human remains, including those interred outside of formal cemeteries?		X		
e) Result in physical disruption of an identified sacred place or other ethnographically documented location of significance to native Californians?			X	

DISCUSSION:

The following analysis is based on *A Cultural Resources Investigation for the Proposed Kanan Road-Agoura Road Roundabout Project in the City of Agoura Hills, Los Angeles County, California* prepared by Jeanette A. McKenna of McKenna et al on January 10, 2013 (Appendix E). The McKenna et al investigation involved an archaeological records search at California State University, Fullerton, South Central Coastal Information Center (SCCIC); historical land use search of Los Angeles County Assessor files; Native American consultation; review of paleontological overviews; and a field survey on November 25, 2012.

a) No California Point of Historical Interest, California Historical Landmarks, California Register of Historic Places listings, California Historical Resource Inventory listings, or National Register of Historic Places listings have been identified within one mile of the project area. No evidence of historic archaeological resources was identified in the project area. Nonetheless, the project area is considered moderately sensitive for historic archaeological resources, given its location along the previous alignment of the 1913 Highway 101 and possibly earlier road beds. A program of construction monitoring, as listed below (MM CR-1), would be required to ensure there are no significant impacts to historic archaeological resources. Therefore, impacts would be **less than significant with mitigation measures**.

b) The project area is ethnographically associated with the Ventureño, a subgroup of the wide-ranging and complex Chumash cultural group. A review of records showed that there are thirteen prehistoric archaeological sites within one mile of the project site. The most significant of these is CA-LAN-41, which extends into the project site. While no evidence of prehistoric archaeological resources was identified in the project area, research indicates that there is a relatively high potential for the presence of prehistoric resources associated with CA-LAN-41 beneath the existing roadways. Monitoring of ground disturbing activities by an archaeologist and Native American monitor, and the proper assessment of any resources, if found, are required to reduce potentially significant impacts to prehistoric

archaeological resources (MM CR-1). Therefore, impacts would be **less than significant with mitigation measures**.

c) The project area generally consists of Tertiary era Conejo Volcanic bedrock overlain by shallow deposits of terrestrial older and younger Quaternary Alluvium and streambed deposits. To the west is evidence of Miocene marine deposits of the Monterey and Topanga Formations. Fossil specimens from these formations have been recovered from Las Virgenes Canyon, East Las Virgenes Canyon, and near Mulholland Highway and Old Topanga Road. Excavations that extend into the older alluvium deposits may yield additional fossil specimens. The area is considered moderately sensitive for such specimens, as older alluvium deposits have been identified in trenches at relatively shallow depths. A program of construction monitoring, as listed below (MM CR-1), would be required to ensure there are no significant impacts to paleontological resources. Therefore, impacts would be **less than significant with mitigation measures**.

d) There are no known sites with human remains, including burial sites, on or within the immediate area of the project property. However, given the high sensitivity of the general area for archaeological resources, there is the potential for unknown sites with human remains to be encountered during construction. Mitigation Measure CR-2, involving monitoring during construction to ensure unexpected discovery of human remains would be handled appropriately, is required to address potentially significant impacts. Therefore, impacts are considered **less than significant with mitigation measures**, as listed below.

e) There are no other known or expected sacred places or other ethnographically documented locations of significance to native Californians within the project area. McKenna et al explains that the site is not sensitive for standing structures, ethnic or cultural landscape features. Therefore, there would be **no impact** to such cultural resources.

As noted in the DESCRIPTION OF THE PROJECT in this IS/MND, the Agoura Road Widening Project is expected to be completed prior to implementation of the Roundabout Project. The Agoura Road Widening Project includes lane expansion of portions of the roadway segments leading into the roundabout, which would involve removal of pavement, grading, and paving. These activities also have the potential to impact cultural resources, and mitigation measures, similar to those proposed below, were incorporated into the Agoura Road Widening and Canwood Street Improvements Project IS/MND. Therefore, potential impacts from construction of the roundabout may be less than noted above, assuming that existing cultural resources, if any, would be addressed as part of the Agoura Road Widening Project construction. Nonetheless, there still remains the potential that the roundabout project would encounter additional cultural resources, and so impacts would be considered significant, but mitigable, and mitigation measures required.

MITIGATION MEASURES:

With implementation of the following measures, impacts to cultural resources would be

reduced to a less than significant level.

CR-1 **Construction Monitoring**. Initial grading activities, demolition or other ground altering activities shall be periodically monitored by a qualified archaeologist and Native American monitor approved by the City's Environmental Analyst. If cultural resource remains are encountered during construction or land modification activities, the applicable procedures established under CEQA, the Los Angeles County Natural History Museum (as applicable), and the City of Agoura Hills General Plan shall be followed. The City Environmental Analyst shall be notified immediately, and work shall stop within a 100-foot radius until a qualified archaeologist or paleontologist (as applicable) has assessed the nature, extent, and potential significance of any remains. In the event that such remains are determined to be significant, appropriate actions to mitigate impacts to the remains shall be implemented. Depending on the nature of the find, mitigation could involve avoidance, documentation, or other appropriate actions to be determined by a qualified archaeologist and/or paleontologist (as applicable), consistent with CEQA (PRC Section 21083.2), in consultation with the City Environmental Analyst.

CR-2 **Discovery of Human Remains**. If human remains are unearthed, State Health and Safety Code Section 7050.5 requires that no further disturbances shall occur until the County Coroner has made the necessary findings regarding origin and disposition pursuant to Public Resources Code Section 5097.98. The City's Environmental Analyst shall be notified along with the County Coroner If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC will then identify the person(s) thought to be the Most Likely Descendent (MLD) of the deceased Native American, who will then help determine what course of action should be taken in dealing with the remains.

Issues and Supporting Information	**Potentially Significant Impact**	**Less Than Significant Impact with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
V.GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to substantial potential 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.		X		
(ii) Strong seismic ground shaking?		X		

(iii) Seismic-related ground failure, including liquefaction?		X		
(iv) Landslides?		X		
b) Result in substantial soil erosion or the loss of topsoil?		X		
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		X		
d) Be located on expansive soil, as defined in Table 18-a-B of the Uniform Building Code (1994), creating substantial risks to life or property?		X		
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?				X

DISCUSSION:

The following discussion is based, in part, on information contained in the *Geotechnical Study, Agoura Hills Roundabout, Agoura Hills, California* (Fugro West Inc., July 2008). This report is included in Appendix E. Earth materials encountered in subsurface boring explorations revealed varying thicknesses of artificial fill, alluvium, and highly weathered bedrock associated with the Upper Topanga Formation. Alluvium generally consists of medium dense to dense silty sand, dense clayey sand, and very stiff sandy silt. Bedrock materials encountered generally consist of sandy lean clay with weathered angular claystone fragments.

a, c) Agoura Hills is in a seismically active region prone to occasional damaging earthquakes. Earthquakes can cause fault-rupture and ground shaking, as well as the secondary effects of tsunami, liquefaction, settlement, and landslides. Although there are no faults within the site or in the immediate area of Agoura Hills (the nearest is the Simi-Santa Rosa Fault, about seven miles from Agoura Hills), the site will likely be subject to ground motion from occasional earthquakes in the region. Landslides are ground failures in which a large section of a slope detaches and slides downhill. The project site is not within a known area susceptible to seismic induced landsliding or liquefaction (State of California Seismic Hazard Zones, Thousand Oaks Quadrangle, November 2000). There are also no significant slopes in the project area. Given that the site is not near the ocean or other body of water, it would not be subject to a tsunami or seiche (oscillation wave within an enclosed body of water). Northwest of the site, Lake Lindero is the only sizeable body of water in the City, and is considered a low level hazard with respect to seismic induced inundation (Kleinfelder, 2012). From a geotechnical standpoint, the site is suitable for development of the proposed roundabout (Fugro West, Inc., 2008). Given the susceptibility to earthquakes, however, there is the potential for significant impacts from seismic activity. In order to minimize these potential impacts, all recommendations of the *Geotechnical Study, Agoura Hills Roundabout, Agoura Hills, California* (Fugro West, Inc., 2008) must be followed during final design and construction. Therefore, impacts would be **less than significant with mitigation**.

c) The elevations of adjacent areas surrounding the proposed roundabout footprint are several feet higher than the existing pavement surface. As such, grading for the roundabout would require an estimated 16,787 cubic yards of excavation and twenty cubic yards of fill soil. Significant impacts could occur from the grading if the project is not built to the recommendations of the *Geotechnical Study, Agoura Hills Roundabout, Agoura Hills, California* (Fugro West, Inc., 2008), which include measures to be employed during site preparation, subgrade preparation and stabilization, excavation, and fill placement and compaction, and for drainage and pavement design. In addition, an erosion control plan is necessary to ensure impacts to topsoil and erosion are not significant. Therefore, impacts would be **less than significant with mitigation**.

d) Expansive soils are characterized by their ability to undergo significant volume changes, such as shrink or swell, due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors. There is the potential for expansive soils at the project site. Significant impacts could occur if the project is not built to the recommendations of the *Geotechnical Study, Agoura Hills Roundabout, Agoura Hills, California* (Fugro West, Inc., 2008), which indicate that positive drainage away from the roundabout be developed and maintained, and that irrigation systems associated with the landscaped areas not be allowed to accumulate or pond water near the on-grade improvements. Impacts would be **less than significant with mitigation**.

e) Given that the roundabout is a transportation feature, there would be no wastewater service needed for the project. Therefore, there would be **no impact** with regard to soils and the location of septic tanks.

MITIGATION MEASURES:

With implementation of the following mitigation measures, impacts to geology and soils would be reduced to a less than significant level.

GEO-1 Geotechnical Recommendations. All recommendations of the *Geotechnical Study, Agoura Hills Roundabout, Agoura Hills, California* (Fugro West, Inc., 2008) shall be incorporated into the project final design and construction, as well as complied with during the life of the project. These measures shall be listed on the final construction drawings, which shall be reviewed and approved by the City's Environmental Analyst prior to construction.

GEO-1 Erosion Control Plan. A site-specific erosion control plan that incorporates best management practices shall be prepared prior to grading, and implemented during grading activities. Erosion control measures may include, but are not limited to, slope protection, such as netting and sandbagging; landscaping and possibly hydroseeding; and temporary drainage control facilities. The erosion

control plan shall be listed on the final construction drawings and reviewed and approved by the City's Environmental Analyst prior to construction.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact
VI. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?			X	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wild lands?			X	

DISCUSSION:

a-b) Given that the project is a transportation feature, it would not involve the routine use, storage, disposal, emission, release or generation of hazardous materials. Agoura Road and Kanan Road are designated truck routes, and so trucks carrying hazardous materials could potentially use the roundabout. However, these roadways and the intersection of Kanan Road/Agoura Road are existing uses and so are likely travelled by vehicles with

hazardous materials at the present time. Such vehicles are required to comply with applicable state and federal regulations associated with the transport of hazardous materials. Any accidental spills would also need to comply with federal, state and county regulations and protocol. The roundabout has been designed to sufficiently and safely accommodate large transport trucks. As such, impacts would be **less than significant**.

The project would involve grading and excavation of soils, and portions of the existing roadway would be demolished to construct the roundabout. During construction, there is the potential to encounter metals like aerially deposited lead (ADL), which are sometimes associated with older roadways. Agoura Road and Kanan Road may also have yellow pavement marking (thermoplastic and paint) that may potentially contain hazardous levels of lead chromate, which would be removed during construction. Also, residual concentrations of hydrocarbons (found naturally in crude oil) may have collected in roadway runoff. Demolition of the roadway could result in contact with, and disposal of, these materials. Assuming that the interim intersection improvements as part of the Agoura Road Widening Project are implemented prior to the roundabout, any potential hazardous metals in the roadway may be already removed by the Agoura Road Widening Project. Nevertheless, there is still the potential for finding additional hazardous metals with the Roundabout Project. However, required standard construction practices would be implemented to ensure that these materials are handled properly, to ensure there is no accidental release, and to ensure any such materials are disposed of properly, in accordance with county, state and federal regulations. As a result, impacts would be **less than significant**.

c) The project is not expected to emit hazardous substances or involve handling hazardous or acutely hazardous materials, substances, or waste. The project site is not within one-quarter mile of an existing or proposed school. The closest schools to the site are Agoura High School, located approximately three-quarters of a mile northeast of the site on Driver Avenue, and Willow Elementary School, located just over one mile north of the site off Kanan Road. Both schools are located across U.S. 101 from the project site. As such, the project would result in **no impact**.

d) The proposed roundabout site is not listed on any hazardous materials sites compiled pursuant to Government Code Section 65962.5 and listed with the California Department of Toxic Substances Control. Therefore, there would be **no impact**.

e, f) The site is not located within an airport land use plan, or in the vicinity of an airport or airstrip. The closest airport is the Van Nuys Airport, about 23 miles east of the project site. Therefore, there would be **no impact**.

g) There is no known specific adopted emergency response plan or emergency evacuation plan for the site or adjacent areas. The site is already developed as a roadway intersection, and the roundabout has been designed to accommodate emergency vehicles, including large trucks. Therefore, there would be **no impact**.

h) The City of Agoura Hills is classified as a Very High Fire Hazard Severity Zone, according to the Los Angeles County Fire Department and the City General Plan (2010). The project proposes no structures or occupancy by people that could pose fire hazards, as it is a transportation facility. During construction, the use of equipment with combustible engines could present a risk of fire. However, this type of equipment is typically fitted with appropriate control measures, such as spark arrestors, that would minimize this risk. Illegal disposal of flammable materials by roadway users would have the potential to ignite wildfires. However, operation of the project would not be expected to increase this risk of wildfire, since the site is an existing roadway facility and would continue to serve the same uses. The roundabout design includes new landscaped areas, but these areas would be irrigated, maintained, and would not consist of highly flammable materials. The roundabout has been designed to safely accommodate emergency vehicles, including fire trucks, in the event of a fire in the surrounding areas. Impacts would be **less than significant.**

MITIGATION MEASURES:

As impacts would be less than significant, no mitigation measures are required.

Issues and Supporting Information	**Potentially Significant Impact**	**Less Than Significant Impact with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
VII. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements?			X	
b) Degrade groundwater supplies or interfere 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)?			X	
c) Alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off site?			X	
d) Create or contribute runoff which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	
e) Otherwise degrade water quality?			X	
f) Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X

g) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X
h) Expose people or structures to risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			X	
i) Inundation by seiche, tsunami, or mudflow?			X	

DISCUSSION:

The following analysis is based, in part, on the drainage calculations and drainage plan prepared by Kimley-Horn and Associates, Inc. included in Appendix F. The project site is within the Malibu Creek Hydrologic Area (Malibu Creek Watershed) and the Lindero Canyon Hydrologic Subarea. The Malibu Creek Watershed is within the Santa Monica Bay Hydrologic Unit, which is within the South Coast Hydrologic Region. Near the site on the west is Lindero Canyon Creek; however, no work within or directly adjacent to the creek is expected.

a,e) Grading and other construction activities have the potential to cause soil erosion and to increase sediment loads in stormwater runoff. Also, spills, leakage or improper handling and storage of substances such as oils, fuels, chemicals, metals, and other substances from vehicles, equipment and materials used during construction could cause pollutants to be present in stormwater runoff and impact downstream water bodies. The City would be required to obtain a National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges associated with Construction and Disturbance Activities (Order No. 2009-0009-DWQ) (State Water Resources Control Board) (City of Agoura Hills Ordinance No. 97-272), which would require the preparation of a Storm Water Pollution Prevention Plan (SWPPP) that addresses potential pollutants during construction, and a Standard Urban Storm Water Mitigation Plan (SUSMP) to address pollutants during the life of the project. Components of a SWPPP typically include, but are not limited to, Best Management Practices (BMPs) like silt fences; erosion control blankets; soil stabilizers; proper handling and disposal of wastes; and anti-tracking pads at site exits to prevent the offsite transport of materials. A SUSMP typically includes BMPs for source prevention and treatment control, such as catch basin filters. Compliance with the required NPDES permit would ensure that potential impacts to water quality would be minimized. Therefore, impacts would **be less than significant.**

b) During the initial site evaluation for the geotechnical investigation, free groundwater was not observed in three of the borings (at the northwest, northeast and southwest corners of the project site), to a maximum depth explored of about 15 feet below the ground surface. At the boring in the southeast corner, groundwater was observed at about 12 ½ feet below the ground surface; however, this water surface is considered to be a local perched groundwater condition and is not representative of the static groundwater table in the area. The general area of the site is not a groundwater recharge area, nor is it used for groundwater supply. The site is already developed with an urban use, a roadway, and so there would be no loss of groundwater resources with the proposed project, even if such resources were to exist. Impacts, therefore, would **be less than significant.**

c,d) The site contains an existing storm drain system that will adequately serve the proposed project. Additional catch basins and storm drain pipes would be constructed in the roadway to convey storm water runoff from the pavement, which would connect to the existing drainage pipe in Agoura Road that outlets to Lindero Canyon Creek at the west end of the project boundary. The estimated runoff from the project site is just under eleven (11) cubic feet per second (cfs). The existing storm drain system is sufficient to accommodate the anticipated flow from a 50-year storm event. The City's standard practice to ensure acceptable storm water quality is to install sediment and pollutant filters in the storm drain system, particularly at catch basins. Such filters would be incorporated into the project. Therefore, impacts would be **less than significant.**

f-g) The project site and surrounding area is within Zone X "Other Flood Areas" of the Federal Emergency Management Agency's Flood Insurance Rate Map (Panel 1244 F). This category covers, "Areas of 0.2% annual chance of flood; areas of 1% annual chance of flood with average depths of less than 1 foot or with drainage less than 1 square mile." Consequently, the site is not within a 100-year flood hazard area or 100-year floodplain. The project does not include the development of housing, and no structures would be proposed within a 100-year floodplain. Therefore, there would be **no impact** regarding the placement of structures or housing in a 100-year floodplain.

h) As stated for Items f-g) above, the project site and surrounding area is within Zone X "Other Flood Areas" of the Federal Emergency Management Agency's Flood Insurance Rate Map (Panel 1244 F). This category covers, "Areas of 0.2% annual chance of flood; areas of 1% annual chance of flood with average depths of less than 1 foot or with drainage less than 1 square mile." Therefore, the site is not within a 100-year flood hazard area or 100-year floodplain. There are no dams or levees in the project area or surrounding areas that could cause damage or loss due to failure. Impacts from potential flooding would be **less than significant**.

i) Tsunamis are impulsively generated water waves that can cause damage to shoreline areas. A seiche is an oscillation wave within an enclosed water body. The site is not near the ocean or adjacent to a water body. Northwest of the site, Lake Lindero is the only sizeable body of water in the City, and is considered a low level hazard with respect to seismic induced inundation (Kleinfelder, 2012). Impacts would be **less than significant.**

MITIGATION MEASURES:

As there are either no adverse impacts or impacts are less than significant, no mitigation measures are required.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact
VIII. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?				X
b) Conflict with an applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c) Conflict with any applicable habitat conservation plan or natural communities conservation plan?				X

DISCUSSION:

a) The project site is currently developed with an urban use (roadway). The project would create a roundabout feature at the intersection of Agoura and Kanan Roads as part of the roadway. The roundabout is proposed to address traffic circulation and implement the Agoura Village Specific Plan, of which the roundabout is a component. The roundabout would serve as a gateway to the City of Agoura Hills and entry monument into Agoura Village from points west, north and south, helping to create a sense of place in this portion of the City. Therefore, the project would not be considered a new development that could physically divide an established community, and there would be **no impact**.

b) The site is zoned Planned Development (PD), according to the City's Zoning Code, and is designated as Planned Development in the Land Use Diagram of the City's General Plan (2010). The Planned Development district refers to the particular plan for the area, the Agoura Village Specific Plan (AVSP) (2008), for development and design regulations and allowed land uses. The roundabout is a component of the AVSP. The AVSP calls for the roundabout to function as a "primary gateway to the core [of Agoura Village]" (page 1-11). The AVSP lists the roundabout as a principle of the Plan, stating, "Construct roundabout at Kanan Road and Agoura Road to provide a better traffic flow, calm traffic, and provide visual interest to the area." (page 1-12). The AVSP indicates that the roundabout should be two lanes wide, any pedestrian crossings shall be clearly marked, and pedestrian refuge areas should be provided in the approach medians (page 3-28). The roundabout design includes these above-noted elements, and is consistent with the AVSP, and, in turn, the General Plan. Therefore, the project would have **no impact** with regard to consistency with applicable plans, policies and regulations.

c) The project site is not located within or near a habitat conservation plan or natural

communities conservation plan, so there would be **no impact**.

MITIGATION MEASURES:

As there are no impacts, no mitigation measures are required.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact
IX. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of known mineral resource that would be of value to the region and the residents of the state?			X	
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?			X	

DISCUSSION:

a-b) No significant mineral deposits are known to exist within the City of Agoura Hills (General Plan, 2010). Ladyface Mountain is classified by the California Conservation Department as "MRZ-3," which indicates an area containing mineral deposits, the significance of which cannot be evaluated from available data. With the exception of a small portion of Palo Comado Canyon and the Liberty Canyon area, the remainder of the City of Agoura Hills is considered "MRZ-1," indicating areas where adequate information indicates that no significant mineral deposits are present, or where there is little likelihood for their presence. There has been no known mining in the area of the project site. The project site has been previously graded and developed as a roadway. As the roundabout would be constructed within the roadway and adjacent vacant lands proposed for urban development, impacts to mineral resources would be **less than significant**.

MITIGATION MEASURES:

As there are no significant impacts, no mitigation measures are required.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact
X. NOISE. Would the project:				

a) Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			X	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
d) A substantial increase in ambient noise levels (including temporary or periodic) in the project vicinity above levels existing without the project?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

DISCUSSION:

Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound power levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz).

Noise is often reported as a noise equivalent level (Leq), which is essentially the average sound level over a given time period. Other indices often used to gauge noise include the Day-Night Level (Ldn) and the Community Noise Equivalent Level (CNEL). CNEL is similar to the Ldn except that it adds five additional dB to evening noise levels (7:00 p.m. to 10:00 p.m.). The City of Agoura Hills uses the CNEL for measuring noise levels.

a,c,d) Most noise in the project site vicinity derives from motor vehicles traveling along U.S. Highway 101 and along Agoura and Kanan Roads. Motor vehicle noise is of concern, as it is characterized by a high number of individual events that often create a sustained noise level, and due to its proximity to noise sensitive land uses. The General Plan (2010) defines noise sensitive land uses as those that have associated indoor and/or outdoor human activities that may be subject to stress and/or significant interference from noise produced by community sound sources. Such human activity typically occurs daily for continuous periods of 24 hours or is of such a nature that noise is significantly disruptive to activities that occur for short periods. The General Plan considers noise sensitive receptors to include schools, libraries and hospitals. There are no schools, libraries or

hospitals in the vicinity of the site. The closest sensitive receptor is the Agoura Hills Library (29901 Ladyface Court), which is located about one and one-quarter miles beyond the western of the edge of the project site.

Residential uses are also commonly considered sensitive noise receptors. The closest residential uses are two caretaker units, one each at two self-storage facilities on Agoura Road. The unit at Conejo Valley U-Stor It (29055 Agoura Road) is located about 175 feet from the edge of proposed construction, and the unit at Agoura Self Storage (29301 Agoura Road) is located approximately 500 feet from the edge of proposed construction.

As part of the Agoura Road Widening and Canwood Street Improvements Project IS/MND (November 2012), a noise study was conducted in June 2012 that monitored existing noise at the intersection of Agoura Road and Kanan Road, as well as locations further east and west on Agoura Road. There have been no changes in land use and development in this area that would result in a notable change in the ambient noise levels recorded in June 2012, therefore the current noise conditions are expected to be similar. The results are summarized in Table X-1 below.

TABLE X-1
EXISTING NOISE CONDITIONS

Roadway Segment	Noise Level[1]
Southwest Corner of Agoura Road /Kanan Road intersection	67 dBA

[1] Noise level 50 feet from centerline of nearest lane.
Source: Kimley-Horn and Associates, Inc. (June 2012), Noise Study Report for the Agoura Road Widening and Canwood Street Improvements Project IS/MND (November 2012).

Operational Noise

Operational noise is noise that would result from the everyday, ongoing operation of the roundabout once it is built, not including temporary construction noise. The General Plan includes a recommended noise/land use compatibility matrix that is designed to minimize noise/land use conflicts (Table N-1, General Plan). The matrix indicates whether specified land uses (e.g., commercial retail, commercial recreation, institutional, residential) are compatible in being located within areas of varying ambient levels of noise (e.g., CNEL 60-65, 65-70). A roadway is not a specified land use in the matrix. However, the location of a roundabout in an existing roadway intersection is considered a compatible land use, considering that it is an improvement to an existing traffic facility, and is not considered a change in use.

Development of the proposed roundabout alone is not expected to increase the number of vehicles that pass through the Kanan Road/Agoura Road intersection. Rather, the

roundabout is proposed to accommodate the projected volumes of vehicles that are anticipated to use the roadway facility in the near and long-term future. The roundabout would be located within the existing roadway and on portions of adjacent vacant parcels bordering the intersection on the south, and would not result in an expansion of roadway travel lanes along either Kanan Road or Agoura Road. As such, development of the roundabout is not expected to increase the level of motor vehicle noise in and around the project site beyond what would occur without the roundabout (assuming a traditional intersection is maintained). The roundabout development would not bring any roadway in closer proximity, and thereby bring traffic noise any closer, to the existing caretaker units.

Surrounding the project site are commercial uses of a retail and restaurant nature, a service station, industrial-type uses associated with an equipment rental facility, and open space. As noted above, near the site are two caretaker residences for self storage facilities. The General Plan Noise/Land Use Compatibility Matrix indicates that an ambient noise level of up to 80 CNEL is acceptable for retail and restaurant uses; beyond 80 CNEL is acceptable for service stations and industrial uses; up to 70 CNEL is acceptable for residential uses; and up to 75 CNEL is acceptable for open space. As indicated in Table X-1 above, the existing estimated ambient noise level in the area of the project site is 67 CNEL, which is well within the maximum CNEL considered compatible with the existing surrounding land uses, and the caretaker units. Additionally, the caretaker units are located further beyond the noise monitoring location (about 175 and 500 feet away) used to determine existing noise levels in the area of the project site; therefore, actual noise at the caretaker units is expected to be somewhat less. Development of a roundabout at the intersection is not expected to result in a significant increase in noise, given that it is within an existing roadway with no proposed expansion of lanes on roadways leading into the roundabout to increase the amount of vehicles that could result in subsequent noise increases. The project, then, would also not result in the surrounding land uses and nearby residential uses being within an area of incompatible noise levels.

Therefore, operational noise impacts from the project would be **less than significant**.

<u>Temporary Construction Noise</u>

Construction of the roundabout would consist of excavation, grading and paving, which would typically involve the use of a jackhammer, bobcat, sweeper, bulldozer, water truck, roller, concrete truck, curb pourer, and a concrete mixer. This heavy machinery would be the primary source of construction noise, which could intermittently generate high noise levels on and adjacent to the project site. Table X-2 shows typical noise levels from various types of equipment at construction sites.

TABLE X-2
TYPICAL NOISE LEVELS AT CONSTRUCTION SITES

Equipment	Typical Level (dBA) 50 feet from noise source	Typical Level (dBA) 200 feet from noise source	Typical Level (dBA) 800 feet from noise source
Air Compressor	81	69	57
Backhoe	85	73	61
Concrete Mixer	85	73	61
Jackhammer	88	76	64
Paver	89	77	65
Scraper	88	76	64
Truck	82	70	58

Source: EPA (1971), Noise from Construction Equipment and Operations, EPA PB 206 717.

The nearby residential caretaker unit at Agoura Self Storage is located an estimated 500 feet away from the closest edge of the project site. The Conejo Valley U-Stor It caretaker unit is 175 feet away from the project site. Per Table X-2, construction noise levels could be up to 89 dBA 50 feet from the noise source; 77 dBA at 200 feet from the source; and 65 dBA at 800 feet from the source. While the City of Agoura Hills has not adopted specific noise standards for construction activity, the City Noise Ordinance (AHMC Section 9656.4) prohibits construction on Sundays and legal holidays, between the hours of 8:00 p.m. and 7:00 a.m. Monday through Saturday. Required compliance with these time restrictions would limit construction noise to times when people are generally less sensitive to noise. Nonetheless, as project construction could be a substantial source of noise and would occur in general proximity to residential units, mitigation is recommended for construction activities associated with the project. So, while impacts would be **less than significant** for construction noise as construction impacts are of a temporary nature, mitigation (MM N-1 and N-2) is recommended to further reduce the less than significant impacts.

b) Groundborne noise is addressed above in Items a,c,d). Vibration is an oscillating motion that travels through the ground. Groundborne vibration may result during construction activities related to grading, pavement demolition and use of construction equipment onsite. No substantial earthwork, such as blasting and deep excavation, would occur with the project. Excavation for the road is expected to reach three feet below ground, while trenching for utilities in select areas may reach up to six feet underground. Groundborne vibrations would be similar to other typical roadway construction projects, and are expected to be **less than significant**.

e-f) The project site is not located within an Airport Land Use Plan or within the vicinity of an airport or airstrip. The nearest airport is the Van Nuys Airport, located about 23 miles

from the project site. Therefore, there would be **no impact** with regard to aircraft noise.

MITIGATION MEASURES:

The following measures are to further reduce less than significant impacts.

N-1 **Construction Timing.** Construction activities shall be limited to the hours between 7:00 AM and 8:00 PM, Monday through Saturday. Construction equipment maintenance shall be limited to the same hours.

N-2 **Construction Equipment.** To the extent practical, electrical power shall be used to run air compressors and similar power tools. Internal combustion engines shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project site without the manufacturer-recommended muffler. All diesel equipment shall be operated with closed engine doors and shall be equipped with factory-recommended mufflers. Additional noise attenuation techniques shall be employed as necessary to reduce noise levels. Such techniques may include, but are not limited to, the use of sound blankets on noise generating equipment.

Issues and Supporting Information	**Potentially Significant Impact**	**Less Than Significant Impact with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
XI. POPULATION AND HOUSING. Would the project:				
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)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

DISCUSSION:

a) The proposed project is a transportation improvement within an existing roadway facility and adjacent vacant areas. No roads would be extended or roadway travel lanes added on Agoura Road and Kanan Road as part of the project. Rather, the roundabout would replace the existing signalized traffic intersection. As such, the proposed project would not create additional population growth through extension of roads or other infrastructure or by creating a new use in the City. There would be **no impact**.

b) There is no housing on the proposed site. Therefore, there would be **no impact** regarding displacing substantial numbers of existing housing.

c) The proposed site is currently either occupied with a roadway intersection or is vacant. Therefore, no people would be displaced by the project, and there would be **no impact**.

MITIGATION MEASURES:

Since there are no impacts, no mitigation measures are required.

Issues and Supporting Information	**Potentially Significant Impact**	**Less Than Significant Impact with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
XII. PUBLIC SERVICES. Would the project result in adverse physical impacts associated with the provision or construction of new or physically altered government facilities in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services?				
a) Fire protection			X	
b) Police protection			X	
c) Schools				X
d) Parks				X

DISCUSSION:

a) The City of Agoura Hills is served by Los Angeles County Fire Department (LACFD) Stations #65, #89 and #125. Station #89, located at 29575 Canwood Street, north of the project site across U.S. 101, is the closest to the site. The station is staffed with a three-person engine company and a two-person paramedic squad. Given that the proposed roundabout would replace the existing signalized intersection at Kanan Road/Agoura Road, and the project is a traffic improvement with associated landscaping, there are not expected to be any notable changes in demand for fire protection services, as there would be for occupied buildings

and structures. During project construction, expected to last about one year, the project could change local traffic patterns and access to adjacent properties. Response times for fire protection services during construction, however, are not expected to be affected since traffic movement would be maintained throughout construction, and no temporary ramp or road closures, or detours, are anticipated. Following construction, it is expected that traffic flow would be improved, facilitating public service by improving access to facilities in the area. Therefore, there would be a **less than significant impact** to fire protection services**.**

b) The Los Angeles County Sheriff's Department provides law enforcement and protection services within the City of Agoura Hills, including the project site. The project would be served by Department's Lost Hills Station, located at 27050 Agoura Road in the City of Calabasas. The station patrols the cities of Agoura Hills, Calabasas, Hidden Hills, Westlake Village, and Malibu, as well as adjacent unincorporated areas. The Lost Hills Station participates in a reciprocal aid agreement with the nearby communities of Westlake Village and Calabasas, which enables these stations to be called upon for assistance, if necessary. The proposed roundabout would replace the existing signalized intersection at Kanan and Agoura Roads, and there would be no construction of buildings that may require additional police protection services. During project construction, expected to last about one year, the project could change local traffic patterns and access to adjacent properties. Response times for police protection services during construction, however, are not expected to be affected since traffic movement would be maintained throughout construction, and no temporary ramp or road closures, or detours, are anticipated. Following construction, it is expected that traffic flow would be improved, facilitating police protection service by improving access to facilities in the area. Therefore, impacts to expansion or construction of police protection facilities or services are expected to be **less than significant**.

c) The project does not include the construction of any facilities, such as housing, that would generate demand for school facilities and services. Consequently, there would be **no impact** to schools.

d) The proposed project, a transportation improvement, does not involve the provision of land uses, such as residential, that would generate population that would increase demand on park facilities. Therefore, there would be **no impact**.

MITIGATION MEASURES:

As impacts would be less than significant or there would be no impact, no mitigation measures are required.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact

XIII. RECREATION. Would the project:

a) Increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that could cause adverse impacts?				X

DISCUSSION:

a,b) The demand for local recreational facilities is generated primarily by local residents. To a lesser extent, daytime population within an area, e.g., workers and visitors, may also use local parks and recreational facilities. The project would not increase population or employment in the City. The project would improve traffic facilities at the Kanan Road/Agoura Road intersection, and would not affect the provision of recreation services or alter the demand for recreational facilities in the City. Therefore, the project would have **no impact** on contributing to the deterioration of existing parks or recreational facilities, or on causing adverse impacts from the construction of recreational facilities.

MITIGATION MEASURES:

As there are no impacts, no mitigation measures are required.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact

XIV. TRANSPORTATION/TRAFFIC. Would the project:

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

b) Result in temporary street or lane closures that would result in either a change of traffic patterns or capacity of the street system during construction activities (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			X	
c) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?				X
d) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in safety risks?				X
e) Substantially increase hazards related to existing intersections or roadway design features (e.g., sharp curves or dangerous intersections), or to incompatible uses (e.g., residential traffic conflicts with farm equipment)?			X	
f) Result in inadequate emergency access?			X	
g) Result in inadequate parking capacity?				X

DISCUSSION:

The following analysis is based, in part, on the *Traffic Analysis for Kanan Road and Agoura Road Roundabout* (Kimley-Horn and Associates, Inc., February 2013), which is included as Appendix G. Agoura Road is a primary west-east arterial, and Kanan Road is a primary north-south arterial. The closest U.S. Highway 101 access is provided via the Kanan Road interchange, just north of the project site.

a) Level of Service (LOS) is a term used to qualitatively describe the operating conditions of a roadway or intersection based on factors such as speed, travel time, maneuverability, delay, and safety. The LOS of a facility is designated with a letter, A to F, with A representing the best operating conditions and F the worst. The City of Agoura Hills Traffic Impact Analysis Guidelines indicate that a LOS C is the minimum acceptable level of service at intersections. Table XIV-1 lists LOS criteria.

TABLE XIV-1
LEVEL OF SERVICE CRITERIA

Delay in Seconds/Vehicle	LOS
≤10.0	A
<10.0 and <20.0	B
>20.0 and <35.0	C
>35.0 and <55.0	D
>55.0 and <80.0	E
>80.0	F

Source: Highway Capacity Manual (2000)

The current LOS at the intersection, without the interim intersection improvements to occur with the Agoura Road Widening Project and without the roundabout, is B for the AM and PM peak hours. Since the project is a transportation improvement, it is expected to improve LOS, and the installation of a roundabout would not generate new traffic trips. The main consideration in roundabout capacity analyses is the volume of the circulating traffic and the volume of the entering traffic on an approach. Traffic entering a roundabout will look for gaps in the circulating traffic in order to enter the roundabout. Table XIV-2 below shows the peak hour LOS if the roundabout was constructed at this time, at the current year. The result is an LOS A during the AM peak hour, and a LOS B during the PM peak hour. This is an improvement over the LOS for existing conditions without a roundabout (i.e., existing intersection configuration), noted above.

TABLE XIV-2
KANAN ROAD/AGOURA ROAD LOS FOR EXISTING CONDITIONS WITH ROUNDABOUT

Scenario	AM Peak Hour		PM Peak Hour	
	Delay	*LOS*	*Delay*	*LOS*
Existing Conditions	8.3	A	12.7	B

Source: Kimley-Horn and Associates, Inc. (February 2013)

Table XIV-3 presents the LOS for the peak hour roundabout operating conditions for future scenarios. These include Year 2020, when the roundabout is estimated to be implemented; and Year 2035, the General Plan buildout year. In both scenarios, the roundabout would operate at LOS B, except for the 2035 PM peak hour LOS of C. These levels of service are considered acceptable by the City of Agoura Hills (Traffic Impact Analysis Guidelines, City of Agoura Hills, 2011).

TABLE XIV-3
KANAN ROAD/AGOURA ROAD LOS FOR FUTURE SCENARIOS WITH ROUNDABOUT

Scenario	AM Peak Hour		PM Peak Hour	
	Delay	*LOS*	*Delay*	*LOS*
Year 2020 Conditions	12.3	B	14.6	B
Year 2035 Buildout Conditions	14.3	B	23.6	C

Source: Kimley-Horn and Associates, Inc. (February 2013)

Each scenario includes the effects of the project added to the existing traffic conditions, plus annual ambient growth plus cumulative projects in the immediate area. The Year 2035 also assumes development at full buildout of the City's General Plan, which includes buildout of the AVSP. Ambient growth is background growth in traffic trips, not associated with any particular development project. The growth rate is based on the growth rate factor published

in the Los Angeles County Congestion Management Program (CMP), which is 0.75 percent per year. For example, in the Year 2020 scenario, a growth factor of 0.75 percent each year from now through Year 2020 is applied to the existing traffic conditions. Cumulative projects are those that are planned in the vicinity of the project area, which could increase traffic near the project. All projects in the vicinity of the roundabout area that have been approved, but are not yet constructed, or are constructed, but not yet occupied, are included in the cumulative analysis. The list of cumulative projects is found in the *Traffic Analysis for Kanan Road and Agoura Road Roundabout* (Kimley-Horn and Associates, Inc., February, 2013), in Appendix G.

Table XIV-4 shows the peak hour LOS for the future conditions with the interim intersection improvements that are part of the Agoura Road Widening Project, but without implementation of the Roundabout Project. With the interim intersection improvements, the peak hour LOS would be C, considered acceptable, except for the PM peak hour in Year 2035, which would be LOS D, considered unacceptable. Therefore, the roundabout would realize additional traffic improvements, as compared to the interim intersection improvements (see Table XIV-3), that would achieve an LOS C in the AM and PM peak hours for both years.

TABLE XIV-4
KANAN ROAD/AGOURA ROAD LOS FOR FUTURE SCENARIOS WITH INTERIM INTERSECTION IMPROVEMENTS ONLY (NO ROUNDABOUT)

Scenario	AM Peak Hour		PM Peak Hour	
	Delay	***LOS***	***Delay***	***LOS***
Year 2020 Conditions	27.1	C	34.7	C
Year 2035 Buildout Conditions	29.0	C	42.7	D

Source: Kimley-Horn and Associates, Inc. (February 2013)

An analysis of impacts to the U.S. Highway 101 and other regional transportation facilities, including a cumulative traffic analysis, was not conducted since the implementation of the roundabout would not add trips to the roadway and freeway system. Rather, the roundabout is expected to improve traffic flow and reduce congestion, as discussed above.

The roundabout would not adversely affect the U.S. Highway 101 southbound ramps due to excessive vehicle queuing leading up to the ramp. The estimated queue length on the north approach to the roundabout is 336 feet, which his less than the distance between the study intersection and the 101 freeway southbound ramps, which is 600 feet.

Because the proposed roundabout project would not cause additional traffic trips, but improve traffic conditions, and because the intersection would operate under acceptable levels of service with the roundabout in each scenario year, including General Plan buildout in 2035, there would be **no impact** that is adverse to traffic load and the capacity of the street system. The implementation of the roundabout would likely have a beneficial impact to traffic flow and congestion.

b) Some lane closures would be required during construction. However, at least one lane would remain open at all times, and access would be maintained on Agoura Road and Kanan Road and at the intersection throughout the construction phase of the project for emergency vehicles, residents and businesses. During construction, roundabout work could result in temporary changes in traffic patterns if vehicles travel alternate routes to avoid construction. Some congestion along the roadways and at the intersection could occur on an intermittent, temporary basis. A traffic management plan is required by the City of Agoura Hills, and would be implemented to reduce these impacts. Following construction, the project would be expected to improve the performance of the intersection. As such, impacts would be **less than significant**.

c) The Los Angeles County Congestion Management Plan (CMP) is intended to address regional congestion by linking land use, transportation, and air quality decisions. The CMP requires that LOS E or better be maintained on the County's CMP Highway System. The U.S. Highway 101 is the nearest CMP facility in the study area. Analysis of the proposed project's impact on a freeway segment is required of any project that would add 150 trips or more in either direction during the AM or PM weekday peak hours. An analysis of CMP monitored intersections is also required if a project contributes 50 or more peak hour trips to the CMP monitored intersections. As described in Item a) above, the project would not add traffic trips to roads or highways, and so further analysis of CMP facilities is not required. There would be **no impacts** to CMP facilities.

d) The project site is not located within the vicinity of an airport or airstrip. The nearest airport is the Van Nuys Airport, located about 23 miles east of the project site. The project, being a transportation improvement, would not affect air traffic patterns. Therefore, there would be **no impact**.

e) In a memorandum dated January 7, 2014 from the City Engineer/Public Works Director (Appendix H), safety features of properly designed roundabouts are addressed. The roundabout has been designed to industry standards for roundabouts and with safety concerns in mind, and would accommodate large trucks, including emergency vehicles. The roundabout has also been designed to safely accommodate pedestrians and bicyclists travelling along Agoura or Kanan Roads. Splitter islands would provide temporary refuge for pedestrian crossings, and serve to safely separate and direct traffic in lanes. Special pavement markings to clearly identify crosswalks would be utilized. Cyclists would be instructed via signage and/or pavement markings to use the sidewalk and crosswalks for travel through the roundabout. All features within the central island, such as signs, walls, boulders and fences, would be constructed as "break-away" features so as to minimize the results of a vehicular impact. Landscaping in the center island would consist of oak trees and low growing annuals and perennials; the oak trees would be slightly elevated on mounded dirt so as to avoid or reduce the impact of any vehicle run-ins into the trees. The sign, wall, boulder and fences, as well as landscaping, features would also be designed and positioned so as not to cause restricted line-of-sight for drivers. Dense shrubs have been

avoided in the planting plan of the center island, and instead, oak trees that allow views from between branches, as well as low profile perennials and annuals, are proposed. Therefore, impacts would be **less than significant.**

f) As noted in Section XV. PUBLIC SERVICES, the proposed project would be required to comply with Los Angeles County Fire Department (LACFD) standards, including access design requirements. The roundabout has been designed to accommodate large trucks, including emergency vehicles, and may improve emergency access. Roundabouts can provide emergency vehicles the benefit of lower vehicle speeds, which may make roundabouts safer to negotiate than signalized crossings. Unlike signalized intersections, emergency vehicle drivers are often less likely to encounter through vehicles unexpectedly running the intersection and causing collisions. Therefore, impacts would be **less than significant**.

g) As the roundabout is a traffic improvement, the proposed project neither proposes nor requires vehicle parking. Therefore, there would be **no impact** to parking.

MITIGATION MEASURES:

As there are no significant impacts to transportation/traffic, no mitigation measures are required.

Issues and Supporting Information	**Potentially Significant Impact**	**Less Than Significant Impact with Mitigation Measures**	**Less Than Significant Impact**	**No Impact**
XV. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b) Require or result in construction of new water or wastewater treatment facilities or expansion of existing facilities that could cause significant environmental effects?				X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities that could cause significant environmental effects?			X	
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			X	
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	

g) Comply with federal, state, and local statues and regulations related to solid waste?			X	

DISCUSSION:

a,b,e) Wastewater generated in Agoura Hills is treated at the Tapia Water Reclamation Facility (TWRF), which is operated by the Las Virgenes Municipal Water District (LVMWD). Given that the project is a transportation facility, and does not include the construction of structures for human occupation, there would be no wastewater generated by the project. There would, as a result, be **no impact** to wastewater treatment requirements, capacity or facilities.

c) Please refer to Section VII. HYDROLOGY AND WATER QUALITY for a discussion of onsite runoff. Impacts to storm drain facilities would be **less than significant**.

d) The Las Virgenes Municipal Water District (LVMWD) supplies potable water in the City of Agoura Hills. The LVMWD obtains its potable water for the City of Agoura Hills entirely from the Metropolitan Water District of Southern California (MWDSC), which, in turn, receives water from the State Water Project to serve LVMWD customers.

The only expected use of potable water for the project is for landscape irrigation. Currently, LVMWD has no recycled water service in this area of the City. However, the LVMWD plans to install a recycled line within Agoura Road. Should recycled water be made available in the future, the City's policy is to use reclaimed water to irrigate street medians and landscaping of public facilities. Potable water demand from roundabout landscaping, which is limited in extent, is expected to be minimal.

Table XV-1 summarizes LVMWD's total water supply forecast through 2035 from the MWDSC. Table XV-2 shows water demand projections forecast through 2035 for the LVMWD.

TABLE XV-1
LVMWD CURRENT AND PROJECTED WATER SUPPLY

	Annual Supply (Acre Feet/Year)					
Supply Source	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Wholesaler (MWDSC)	20,212	26,613	27,542	28,483	29,380	30,237
Total	20,212	26,613	27,542	28,483	29,380	30,237

Source: LVMWD 2010 Urban Water Management Plan, June 2011

TABLE XV-2
LVMWD CURRENT AND PROJECTED WATER DEMAND

Annual Demand (Acre Feet/Year)					
2010	**2015**	**2020**	**2025**	**2030**	**2035**
25,958	23,951	22,034	22,787	23,504	24,190

Source: LVMWD 2010 Urban Water Management Plan, June 2011; does not include incorporation of water conservation measures.

Comparing the two tables, the anticipated water supply would meet the anticipated water demand in the LVMWD area. The reliability of the water supply is addressed in the LVMWD's Urban Water Management Plan (June 2011) and the MWDSC's 2010 Integrated Water Resources Plan Update, the Water Surplus and Drought Management Plan, the Water Supply Allocation Plan, the Long-Term Conservation Plan, and most recently the 2010 Regional Urban Water Management Plan. The MWDSC plans to meet its supply reliability goal through several planned projects that include implementing water management plans, water recycling projects, groundwater banking programs, surface water storage programs, water conservation, and ocean desalinization.

The landscape irrigation required of the roundabout project would be a nominal portion of the anticipated demand for potable water in the LVMWD area, which Table XV-2 indicates can be accommodated by the anticipated water supply. Moreover, most of the plant species are either native or drought tolerant non-natives, which would limit the need for water. Therefore, impacts would be **less than significant**.

f,g) The Calabasas Sanitary Landfill, operated by the Los Angeles County Sanitation Districts, is located at 5300 Lost Hills Road in Calabasas. The Simi Valley Landfill, privately operated, is located at 2801 Madera Road in Simi Valley. Both landfills serve the City of Agoura Hills. The total remaining capacity of the Calabasas Sanitary Landfill is 15.6 million cubic yards, or 7 million tons (Gwen Tantoco, February 2013). The facility is permitted to accept up to 3,500 tons per day. The average daily tonnage of waste received during the previous four quarters was 643 tons per day. The expected remaining life of the landfill is to 2048. The Simi Valley Landfill is permitted to accept up to 6,000 tons per day of refuse. It currently receives about 2,500 tons per day. The landfill has a remaining capacity of 120 million cubic yards (Mike Smith, February 2013), and a remaining life of an estimated 50 years.

During construction, some debris would be generated by the demolition of existing pavement and other materials. This material would either be recycled or disposed of. However, the amount of waste generated would not be expected to exceed the available capacity of the local landfills. It is City policy that construction wastes be recycled wherever possible, and the project would be subject to the requirements of the City's Construction and Demolition Debris Re-Use and Recycling Program to reduce the amount of waste entering landfills. Ongoing operation of the roundabout would not

require any solid waste disposal.

As both landfills have sufficient capacity for the next 35-50 years, and the proposed project's contribution to solid waste is expected to be minimal and construction related only, impacts from the Roundabout Project are anticipated to be **less than significant**.

MITIGATION MEASURES:

Impacts would be less than significant. Therefore, no mitigation measures are required.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact
XVI. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				X

DISCUSSION:

The following discussion and analysis is based on the *Air Quality Impact Analysis, Kanan Road and Agoura Road Roundabout, City of Agoura Hills, California* (Giroux & Associates, March 2013), included as Appendix B.

Greenhouse gases (GHGs) are emitted by both natural processes and human activities. Of these gases, carbon dioxide (CO_2) and methane (CH_4) are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and sulfur hexafluoride (SF_6). Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale, generally 100 years. Because GHGs absorb different amounts of heat, a common reference gas (Co_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2E), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a GWP of one. By contrast, CH_4 has a GWP of 21, meaning its global warming effect is 21 times greater than CO_2 on a molecule per molecule basis.

The vast majority of individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence on climate change; therefore, the issue of

climate change typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects.

As noted in this document in Section II. AIR QUALITY, the City of Agoura Hills is within the South Coast Air Basin, which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD has adopted a quantitative significance threshold for GHGs, which considers emissions of over 10,000 metric tons of CO_2E/year to be significant. However, the SCAQMD's threshold applies only to stationary sources, and is expressly intended to apply only when the SCAQMD is the CEQA lead agency. Although not formally adopted, the SCAQMD recommends a quantitative threshold for all land use types of 3,000 metric tons of CO_2E/year. For the purposes of this analysis, the significance threshold of 3,000 metric tons of CO_2E/year is used to determine if the project would result in a cumulatively considerable impact on greenhouse gases.

a) For the proposed project, GHGs are expected to be generated from construction activities. There are not anticipated to be any notable ongoing GHG emissions from operation of the project, considering that it is a transportation improvement and would not generate additional traffic trips. Construction of the project would generate temporary GHG emissions mostly due to the operation of construction equipment and trucks. Site preparation and grading typically generate the greatest amount of emissions due to the use of grading equipment and soil hauling. Based on SCAQMD guidance, the construction emissions are amortized over 30 years, which is considered to be the expected life of the project. Onsite operational emissions from the roundabout include those from the use of electricity for street lights, irrigation water, and landscape maintenance, and are expected to be nominal.

   Table XVI-1 below shows the construction GHG emission associated with the proposed project.

TABLE XVI-1
ANNUAL CONSTRUCTION EMISSIONS OF GREENHOUSE GASES
(Metric Tons CO_2E/Year)

Year 2014	349.2
30 Year Annual Amortized Rate	11.6
Significance Threshold	3,000

Source: Air Quality Impact Analysis, Kanan Road and Agoura Road Roundabout, City of Agoura Hills, California (Giroux & Associates, March 2013)

As indicated in the table, total GHG emissions would not exceed 3,000 metric tons of CO_2E per year, the significance threshold recommended by the SCAQMD. Consequently, impacts from GHG emissions would be **less than significant** and not cumulatively considerable.

b) The City of Agoura Hills General Plan (2010) identifies goals and policies related to sustainability and greenhouse gases. The relevant goals and policies are summarized in Table XVI-2 below. The project would be consistent with these items.

TABLE XVI-2
PROJECT CONSISTENCY WITH APPLICABLE
CITY OF AGOURA HILLS GENERAL PLAN GOALS AND POLICIES

Goal/Policy	Project Consistency
Community Conservation and Development	
LU-1.2 Development Locations. Prioritize future growth as infill of existing developed areas re-using and, where appropriate, increasing the intensity of development on vacant and underutilized properties, in lieu of expanded development outward into natural areas and open spaces. Allow for growth on the immediate periphery of existing development in limited designated areas, where this is guided by standards to assure seamless integration and connectivity with adjoining areas and open spaces.	**Consistent** The proposed project supports infill development, as it is an improvement of an existing roadway intersection.
LU-5.3 Heat Island Effect. Seek innovative ways to reduce the "heat island effect" by promoting such features as white roofs, light-colored hardscape paving, and shade structures and trees, and by reducing the extent of unshaded parking lots.	**Consistent** Shade from proposed center island, splitter island, and corner landscaping would minimize the heat island effect.
LU-5.4 Sustainable Land Development Practices. Promote land development practices that reduce energy and water consumption, pollution, greenhouse gas emissions, and waste, incorporating such techniques as: ▪ Concentration of uses and design of development to promote walking and use of public transit in lieu of the automobile ▪ Capture and re-use of stormwater on-site for irrigation ▪ Orientation of buildings to maximize opportunities for solar energy use, daylighting, and ventilation ▪ Use of landscapes that protect native soil, conserve water, provide for wildlife, and reduce green waste ▪ Use of permeable paving materials ▪ Shading of surface parking, walkways, and plazas ▪ Management of wastewater and use of recycled water	**Consistent** The roundabout would minimize idling of vehicle engines, thereby helping to improve air quality and reducing greenhouse gas emissions. Construction and demolition waste would be recycled. Shade from landscaping would minimize the heat island effect.
Infrastructure and Community Services	
M-8.1 Bikeway Linkages. Provide bikeway connectivity between residential areas and surrounding natural resource areas, parks, schools, employment centers, and other activity centers in the community.	**Consistent** The proposed project would ensure the continued use of Agoura Road as a Class II bikeway.
M-8.2 Continuous Bikeway Connectivity. Provide a bicycle network that is continuous, closes gaps in the existing system, and permits easy bicycle travel throughout the community and region.	**Consistent** The proposed project would ensure the continued use of Agoura Road as a Class II bikeway.
M-7.1 Walkability. Create a pedestrian environment accessible to all that is safe, attractive and encourages walking. Maintain and promote the walkability within	**Consistent** The roundabout ensures a safe and pleasant walking environment through wide sidewalks,

the City by identifying and completing deficient links within the sidewalk system.	clearly marked crosswalks, splitter islands for pedestrian refuge while crossing, and landscaped areas that provide shade.
Natural Resources	
NR-10.1 Climate Change. Comply with all state requirements regarding climate change and greenhouse gas reduction and review the progress toward meeting the emission reductions targets.	**Consistent** Project emissions would not exceed SCAQMD recommended thresholds.

The Southern California Association of Governments' (SCAG) *2012 Regional Transportation Plan/Sustainable Communities Strategy* (2012 RTP/SCS) includes a commitment to reduce emissions from transportation sources by promoting compact and infill development in order to comply with SB 375 (Sustainable Communities and Climate Protection Act of 2008). A goal of the SCS is to, "promote the development of better places to live and work through measures that encourage more compact development, varied housing options, bike and pedestrian improvements, and efficient transportation infrastructure." The proposed project would be consistent with the RTP/SCS and SB 375 since it consists of an efficient traffic improvement that minimizes vehicle idling within an existing roadway intersection that serves existing development and future planned development under the approved AVSP.

The California Environmental Protection Agency (CalEPA) created the state Climate Action Team (CAT). The 2006 CAT report identifies a recommended list of strategies that could be implemented by government entities to reduce passenger and light duty truck emissions; reduce idling times for diesel trucks; overall shipping technology/infrastructure, increase the use of alternative fuels; increase recycling; and increase landfill methane capture. Additionally, in 2008, the state's Attorney General set forth Greenhouse Gas Reduction Measures. The proposed project would be consistent with many of the provisions in both of these documents.

As the proposed project would be consistent with SB 375, applicable GHG reduction measures found in the General Plan, the Climate Action Team Report, and the Attorney General's Greenhouse Gas Reduction Measures, the project would have **no impact** on consistency with plans, policies and regulations relating to greenhouse gases.

MITIGATION MEASURES:

As there would be either no impact or less than significant impacts to greenhouse gases resulting from the project, no mitigation measures are required.

Issues and Supporting Information	Potentially Significant Impact	Less Than Significant Impact with Mitigation Measures	Less Than Significant Impact	No Impact

XVII. MANDATORY FINDINGS OF SIGNIFICANCE.

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?		X		
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 the past projects, the effects of other current projects, and the effects of probable future projects)?			X	
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X		

a) The project has the potential to impact avian species pursuant to the Federal Migratory Bird Treaty and California Fish and Game Code 3503, and to adversely affect oak tree species protected by the City of Agoura Hills Oak Tree Preservation Ordinance. With incorporation of mitigation measures, these impacts would be reduced to a level of less than significant. While the proposed site is not expected to have significant cultural resources, given its location within a general region of archaeological/paleontological significance, there remains the potential for such resources to be uncovered during construction activities. With the incorporation of mitigation measures, however, such impacts would be reduced to a level of less than significant. Impacts are therefore **less than significant with mitigation.**

b) Impacts relating to air quality are considered less than significant. Nonetheless, standard AQMD construction mitigation measures, namely Best Management Practices, have been included in this document to ensure that air quality impacts, including from a cumulative perspective, remain less than significant. Therefore, impacts are considered **less than significant.**

c) Impacts relating to aesthetics and geology and soils were found to be less than significant with incorporation of mitigation measures. Therefore, they would not cause substantial

adverse effects on humans, either directly or indirectly. Impacts are considered **less than significant with mitigation.**

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Las Virgenes Municipal Water District. *Final 2010 Urban Water Management Plan*. June 2011.

Los Angeles County Sanitation Districts. *Service Charge Loadings, Sewage Units, and Unit Rates, July 1, 2012-June 30, 2013.*

PERSONS CONTACTED

Smith, Mike, Waste Management/GI, February 2013
Tantoco, Gwen, Sanitation Districts of Los Angeles County, February 2013
Zhao, John, Las Virgenes Municipal Water District, February 2013

APPENDIX A
PROJECT PLANS

CITY OF AGOURA HILLS

PLANS FOR

KANAN ROAD AND AGOURA ROAD ROUNDABOUT

PUBLIC UTILITIES / SERVICES

WATER: LAS VIRGENES MUNICIPAL WATER DISTRICT
4232 LAS VIRGENES ROAD
CALABASAS, CA 91302
(818) 880-4110

ELECTRICAL: SOUTHERN CALIFORNIA EDISON
3589 FOOTHILL DRIVE
THOUSAND OAKS, CA 91361
(805) 494-7018

TELEPHONE: AT&T/SBC
16201 RAYMER STREET, #115
VAN NUYS, CA 91406
(818) 373-6888

GAS: SOUTHERN CALIFORNIA GAS
9400 OAKDALE AVENUE
CHATSWORTH, CA 91313
(818) 701-3324

SEWER: LA COUNTY, DEPT. OF PUBLIC WORKS
SEWER MAINTENANCE DIVISION
1000 S. FREMONT AVENUE, BLDG A9 EAST
ALHAMBRA, CA 91803
(626) 300-3308

STORM DRAINS: LA COUNTY, DEPT. OF PUBLIC WORKS
STORM DRAIN MAINTENANCE DIVISION
1000 S. FREMONT AVENUE, BLDG A9 EAST
ALHAMBRA, CA 91803
(626) 458-4146

TRAFFIC SIGNALS: LA COUNTY, DEPT. OF PUBLIC WORKS
TRAFFIC SIGNAL MAINTENANCE DIVISION
PETER CRUZ
1525 ALCAZAR STREET
LOS ANGELES, CA 90033
(626) 458-1704

CABLE: TIME WARNER CABLE
2323 TELLER ROAD
NEWBURY PARK, CA 91320
(805) 375-5213

CABLE: CHARTER COMMUNICATIONS
3806 CROSSCREEK ROAD
MALIBU, CA 90265
(310) 456-9010

CALTRANS: CALTRANS SIGNAL AND ELECTRICAL
5060 RESEDA BOULEVARD
TARZANA, CA 91356
(805) 388-1426

BENCH MARK

BM# Y 10004
RDBM TAG IN W CB 600MM H/O BCR @ NW
COR KANAN RD & AGOURA RD 19.5M N & 13M W/O C/L INT
ELEV=677.389 NAVD 88 DATUM

BASIS OF BEARINGS

THE BASIS OF BEARINGS SHOWN HEREON ARE BASED ON THE CALIFORNIA COORDINATE SYSTEM (CCS83), ZONE V, NAD83 USING NGS PUBLISHED COORDINATE VALUES FOR CONTINUOUS GPS STATION "TOST" (2004.0 EPOCH). ALL DISTANCES SHOWN ARE GRID, UNLESS OTHERWISE NOTED. TO OBTAIN GROUND DISTANCES DIVIDE GRID DISTANCE BY 0.9999406374.

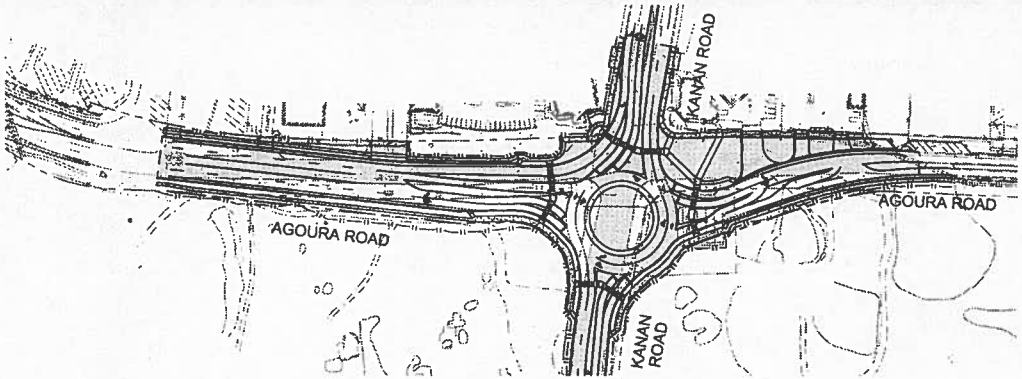
RIGHT-OF-WAY

THE EXISTING RIGHT OF WAY AS SHOWN ON THE PLANS IS BASED UPON INFORMATION AS PROVIDED BY AECOM, SEPTEMBER 2012. ALL RIGHT OF WAY LINES SHALL BE ASSUMED TO BE APPROXIMATE AND SHOULD BE FIELD VERIFIED. KIMLEY-HORN AND ASSOCIATES, INC. DOES NOT GUARANTEE ITS ACCURACY.

811 Know what's below. Call before you dig.

CALL 811
AT LEAST TWO DAYS BEFORE YOU DIG

UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA



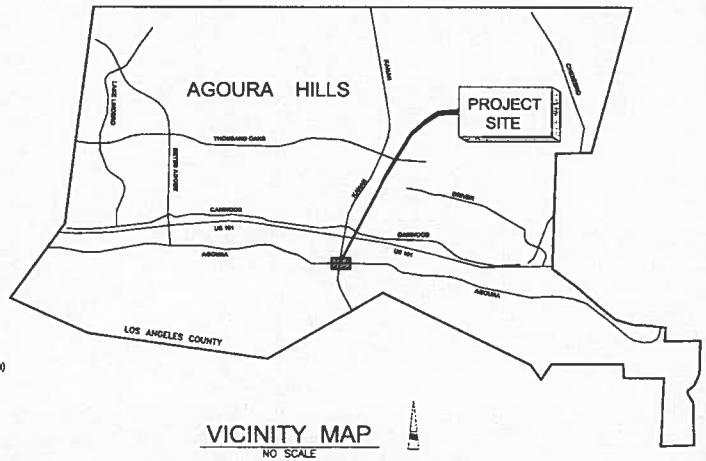
LOCATION MAP
SCALE: 1"=100'

LEGEND

	REMOVE EXIST. AC AND BASE TO ACCOMODATE THE PROPOSED IMPROVEMENTS
	CONCRETE S/W, CURB, GUTTER, CURB RAMP, DRIVEWAY
	TRUCK APRON, 6" STAMPED COLORED CONCRETE OVER 21" CLASS II AB
— —	SAWCUT/MATCH LINE
—II—	LIMITS OF GRADING
----	EXIST. R/W
----	PROP. R/W

ABBREVIATIONS

AB	AGGREGATE BASE	GV	GAS VALVE
AC	ASPHALT CONCRETE	ICV	IRRIGATION CONTROL VALVE
BC	BEGINNING OF CURVE	LT	LEFT
BCR	BEGIN CURB RETURN	MH	MANHOLE
BO	BY OTHERS	N	NORTHING
BOC	BOTTOM OF CURB	PB	PULL BOX
C&G	CURB AND GUTTER	PCC	PORTLAND CEMENT CONCRETE / POINT OF COMPLEX CURVATURE
CI	CURB INLET		
CL	CENTER LINE	PL	PROPERTY LINE
CLF	CHAIN LINK FENCE	PRC	POINT OF REVERSE CURVATURE
COMM	COMMUNICATIONS FACILITY	PROP	PROPOSED
DIP	DUCTILE IRON PIPE	RT	RIGHT
DWAY	DRIVEWAY	R/W	RIGHT OF WAY
E	EASTING	SD	STORM DRAIN
EC	END OF CURVE	SL	STREET LIGHT
ECR	END CURB RETURN	SPPWC	STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK CURRENT EDITION)
EG	EXISTING GROUND		
ELEC	ELECTRIC EQUIPMENT	SSMH	SANITARY SEWER MANHOLE
EP	EDGE OF PAVEMENT	S/W	SIDEWALK
FDC	FIRE DEPT CONNECTION	TC	TOP OF CURB
FG	FINISHED GRADE	TEL	TELEPHONE/COMMUNICATIONS UTILITY
FH	FIRE HYDRANT	TOF	TRAFFIC SIGNAL AND EQUIPMENT
FS	FINISHED SURFACE	TS	TOP OF FOOTING
FL	FLOWLINE	UP	UTILITY POLE
GB	GRADE BREAK	WM	WATER METER
GUY	GUY WIRE	WV	WATER VALVE



VICINITY MAP
NO SCALE

SHEET INDEX

DWG NO.	SHT NO.	SHEET TITLE
G-1	1	TITLE SHEET
G-2	2	NOTES AND CROSS SECTIONS
C-1	3	LAYOUT PLAN KANAN ROAD STA. 18+50.00 TO STA. 20+17.42 AGOURA ROAD STA. 16+04.05 TO STA. 19+65.00
C-2	4	LAYOUT PLAN AGOURA ROAD STA. 8+50.00 TO STA. 16+04.05
C-3	5	LAYOUT PLAN AGOURA ROAD STA. 19+65.00 TO STA. 25+00.00
C-4	6	LAYOUT PLAN KANAN ROAD STA. 13+00.00 TO STA. 18+50.00 KANAN ROAD STA. 20+17.42 TO STA. 24+00.00
C-5	7	GRADING AND PAVEMENT ELEVATION PLAN KANAN ROAD STA. 18+50.00 TO STA. 20+17.42 AGOURA ROAD STA. 16+04.05 TO STA. 19+65.00
C-6	8	GRADING AND PAVEMENT ELEVATION PLAN AGOURA ROAD STA. 8+50.00 TO STA. 16+04.05
C-7	9	GRADING AND PAVEMENT ELEVATION PLAN AGOURA ROAD STA. 19+65.00 TO STA. 25+00.00
C-8	10	GRADING AND PAVEMENT ELEVATION PLAN KANAN ROAD STA. 13+00.00 TO STA. 16+50.00 KANAN ROAD STA. 20+17.42 TO STA. 24+00.00
C-9	11	ROADWAY CENTER LINE PROFILES AGOURA ROAD STA. 8+50.00 TO 24+50.00
C-10	12	ROADWAY CENTER LINE PROFILES KANAN ROAD STA. 12+50.00 TO 22+00.00 TRUCK APRON BOTTOM OF CURB PROFILE
C-11	13	CIVIL DETAILS
C-12 C-18	14-18	DRAINAGE PLAN AND PROFILES
SN-1	19	SIGNING AND STRIPING PLAN
SL-1	20	STREET LIGHTING PLAN
SL-2	21	STREET LIGHTING DETAILS
LC-1- LC-3	22-24	LANDSCAPE CONSTRUCTION PLANS
LI-1- LI-4	25-28	IRRIGATION PLANS
LP-1- LP-3	29-31	PLANTING PLANS
LD-1- LD-3	32-34	LANDSCAPE CONSTRUCTION AND PLANTING DETAILS

100% DRAFT SUBMITTAL - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

REV	SYMBOL	DESCRIPTION OF CHANGE	RCE	DATE

PREPARED BY:
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BIRNATH CHAKRAVARTHY R.C.E. C73629 DATE

REGISTERED PROFESSIONAL ENGINEER BIRNATH CHAKRAVARTHY No. C73629 CIVIL STATE OF CALIFORNIA

REVIEWED BY:
CHAITANYA YAMBAO DATE
ASSOCIATE CIVIL ENGINEER
APPROVED BY:
RAMIRO ADEVA DATE
DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

CITY OF AGOURA HILLS

KANAN ROAD AND AGOURA ROAD ROUNDABOUT

TITLE SHEET G-1

DRAWN BY: BP/SC
CHECKED BY: RMA/BC F-1/SV
KHA JOB NUMBER 099083019
SHEET 1 OF 34

CURVE DATA TABLE

CURVE #	RADIUS	LENGTH	DELTA	REMARKS
C3	138.50'	8.35'	Δ=3°27'12"	4
C8	138.50'	214.43'	Δ=88°42'33"	4
C10	123.00'	60.46'	Δ=28°09'51"	3
C11	146.00'	60.24'	Δ=23°38'26"	3
C14	100.00'	28.95'	Δ=16°35'05"	4
C15	40.00'	25.87'	Δ=37°03'07"	4
C16	200.00'	20.35'	Δ=5°49'49"	4
C19	146.00'	32.48'	Δ=12°44'44"	3
C20	1.00'	2.83'	Δ=182°01'01"	3
C21	100.00'	43.35'	Δ=24°50'15"	4
C23	1118.00'	66.60'	Δ=3°24'48"	4
C26	100.00'	49.78'	Δ=28°31'23"	3
C27	509.00'	91.49'	Δ=10°17'53"	3
C29	3.00'	5.62'	Δ=107°17'39"	3
C30	98.00'	27.50'	Δ=16°04'48"	3
C31	1.00'	2.29'	Δ=131°08'05"	3
C32	100.00'	24.26'	Δ=13°53'54"	3
C34	11.00'	8.62'	Δ=34°27'50"	3
C35	110.00'	50.32'	Δ=26°12'36"	4
C38	110.00'	28.41'	Δ=14°47'47"	4
C39	50.00'	23.80'	Δ=27°16'34"	4
C40	188.00'	47.44'	Δ=14°27'33"	4
C43	188.00'	29.21'	Δ=8°54'04"	4
C44	1037.00'	17.47'	Δ=0°57'55"	4
C45	3.00'	6.00'	Δ=114°32'43"	3
C46	98.00'	25.13'	Δ=14°41'42"	3
C47	1.00'	2.29'	Δ=131°16'53"	3
C48	90.00'	19.14'	Δ=12°11'12"	3
C50	11.00'	8.08'	Δ=31°41'40"	3
C52	200.00'	14.02'	Δ=4°00'58"	3
C55	90.00'	35.89'	Δ=22°50'47"	3
C56	1009.00'	122.05'	Δ=6°55'50"	3
C57	200.00'	24.62'	Δ=7°03'10"	3
C58	115.00'	46.68'	Δ=23°15'19"	4
C61	115.00'	29.32'	Δ=14°36'28"	4
C62	50.00'	10.88'	Δ=12°27'51"	4
C63	98.50'	49.67'	Δ=28°53'40"	4
C64	58.50'	34.78'	Δ=34°03'52"	4
C65	598.50'	16.41'	Δ=1°34'18"	4
C66	598.50'	47.59'	Δ=4°33'22"	4
C69	50.00'	26.33'	Δ=30°10'24"	3
C70	141.00'	7.84'	Δ=3°11'04"	3
C73	120.00'	66.77'	Δ=31°52'48"	3
C75	3.00'	5.48'	Δ=104°34'16"	3
C76	98.00'	33.07'	Δ=19°19'54"	3
C77	1.00'	2.30'	Δ=132°02'48"	3
C78	120.00'	24.05'	Δ=11°29'05"	3
C80	11.00'	5.44'	Δ=28°20'22"	3
C81	113.00'	55.49'	Δ=28°08'04"	4
C84	113.00'	34.72'	Δ=17°36'07"	4
C85	50.00'	44.36'	Δ=50°50'15"	4
C86	319.50'	10.69'	Δ=1°55'03"	4
C89	319.50'	34.54'	Δ=6°11'36"	4

CURVE DATA TABLE

CURVE #	RADIUS	LENGTH	DELTA	REMARKS
C90	200.00'	33.99'	Δ=9°44'17"	4
C91	215.00'	27.20'	Δ=7°14'51"	3
C94	119.00'	37.75'	Δ=18°10'36"	3
C96	222.08'	31.27'	Δ=8°04'06"	3
C97	3.00'	6.26'	Δ=119°31'12"	3
C98	82.00'	38.52'	Δ=26°54'48"	3
C99	1.00'	2.46'	Δ=140°53'02"	3
C100	119.00'	38.98'	Δ=18°46'06"	3
C102	11.00'	4.30'	Δ=22°23'49"	3
C103	65.00'	408.40'	Δ=360°00'00"	1
C104	56.00'	351.85'	Δ=360°00'00"	3
C105	27.50'	49.28'	Δ=102°40'45"	3

CONSTRUCTION ALIGNMENT DATA TABLE

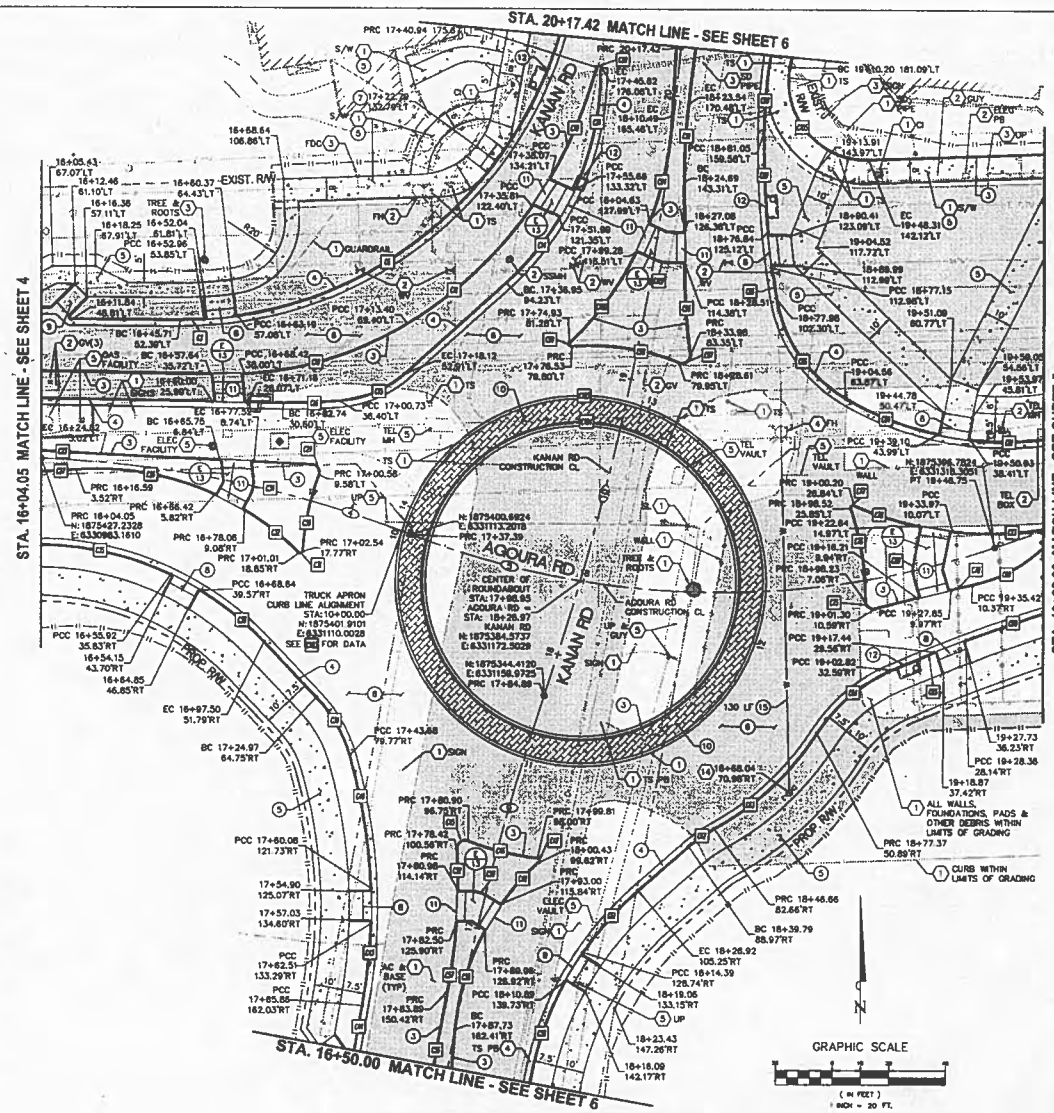
NO.	DELTA OR BRG	RADIUS	LENGTH	REMARKS
4	Δ=19° 05' 57"	400.00'	133.34'	
5	Δ=39° 59' 08"	300.00'	209.36'	
9	Δ=29° 14' 40"	950.00'	484.89'	
10	Δ=13° 19' 23"	1000.00'	232.53'	

DEMOLITION & UTILITY NOTES

1. REMOVE
2. ADJUST TO FINISHED GRADE
3. PROTECT IN PLACE
4. RELOCATE
5. EXISTING FACILITY TO BE RELOCATED BY OTHERS

CONSTRUCTION NOTES

1. CONSTRUCT MODIFIED B1-6 MOUNTABLE CURB PER SPPWC STD. PLAN 121-1, WITH 3" CURB HEIGHT
2. (NOT USED)
3. CONSTRUCT A1-8 CURB PER SPPWC STD. PLAN 120-1
4. CONSTRUCT A2-8 CURB AND GUTTER PER SPPWC STD. PLAN 120-1
5. CONSTRUCT 4" THICK CONCRETE SIDEWALK, CURB & SIDEWALK JOINTS PER SPPWC STD. PLAN 112-1
6. CONSTRUCT 5 1/2" AC OVER 21" CLASS II AB, OR ALTERNATIVE PER GEOTECH REPORT (TYPICAL)
7. CONSTRUCT TYPE 2 CURB RAMP PER SPPWC STD. PLAN 111-3
8. CONSTRUCT CURB RAMP PER DETAIL C/C-13
9. CONSTRUCT BICYCLE ACCESS RAMP PER B/C-13
10. CONSTRUCT 6" THICK STAMPED COLORED CONCRETE TRUCK APRON OVER 21" CLASS II AB
11. INSTALL 3'x10' WIDE YELLOW DETECTABLE WARNING SURFACE. REDI-MAT PRODUCT OR APPROVED EQUAL
12. STORM STRUCTURE PER STORM DRAIN PLANS
13. CONSTRUCT COMMERCIAL DRIVEWAY TYPE A PER SPPWC 110-1
14. CONSTRUCT COMMERCIAL DRIVEWAY TYPE B PER SPPWC 110-1
15. INSTALL 6" D.I.P.



REV	SYMBOL	DESCRIPTION OF CHANGE	RCE	DATE

PREPARED BY:

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SRIKANTH CHAKRAVARTHY R.C.E. C73629 DATE

REGISTERED PROFESSIONAL ENGINEER SRIKANTH CHAKRAVARTHY No. C73629 CIVIL STATE OF CALIFORNIA

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CHARMAINE YAMSAO DATE
ASSOCIATE CIVIL ENGINEER

APPROVED BY:

RAMIRO ADEVA DATE
DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

CITY OF AGOURA HILLS

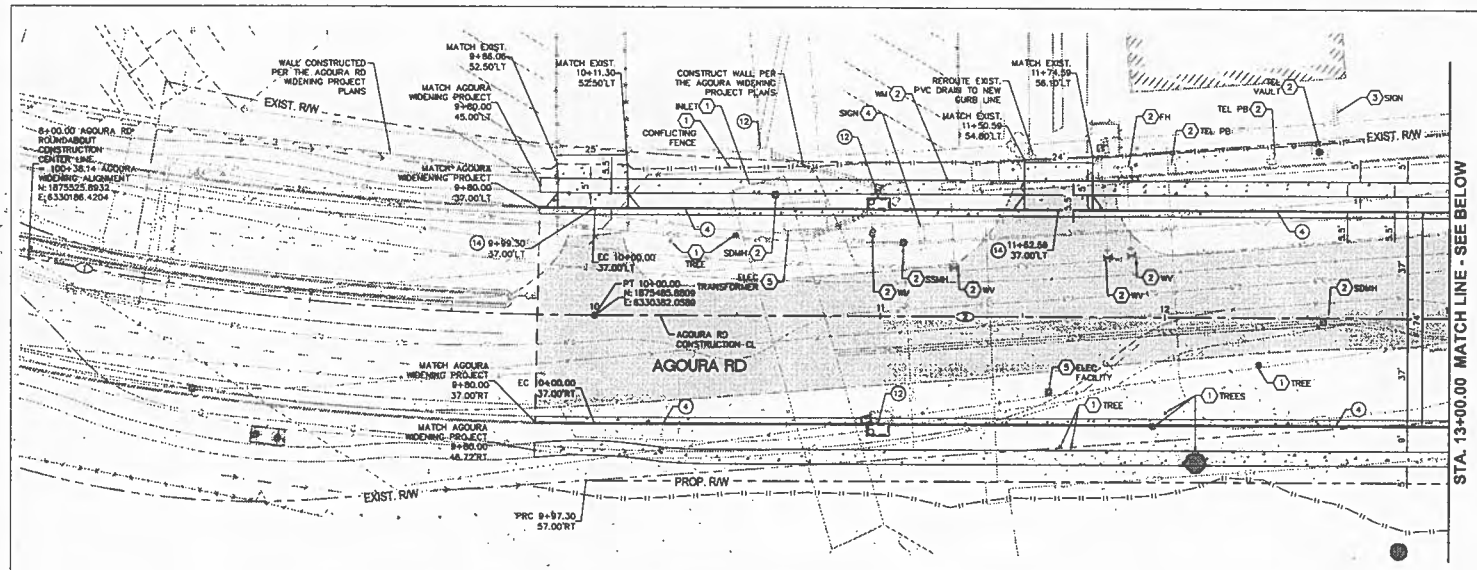
KANAN ROAD AND AGOURA ROAD ROUNDABOUT

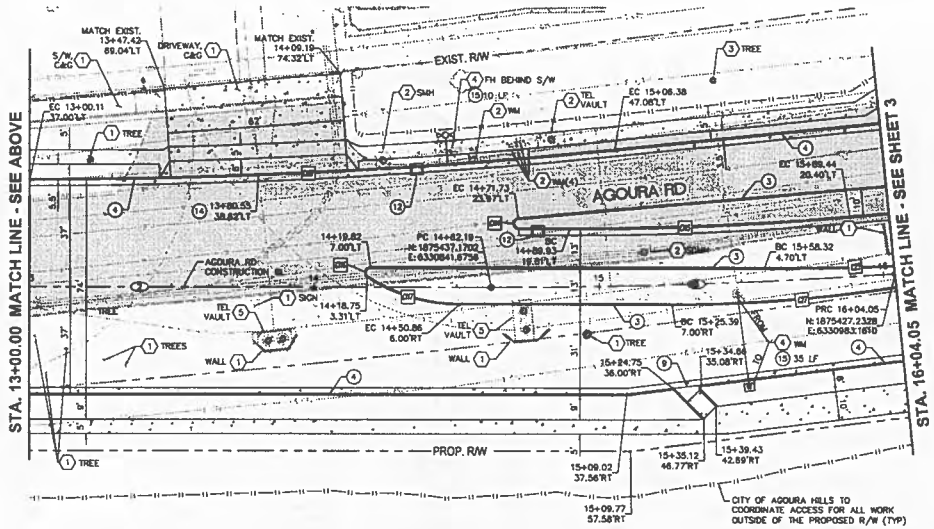
LAYOUT PLAN C-1

DRAWN BY: SP/SC | CHECKED BY: FH/SV | KHA JOB NUMBER 099083019

SHEET 3 OF 34

100% DRAFT SUBMITTAL - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS





CURVE DATA TABLE

CURVE #	RADIUS	LENGTH	DELTA	REMARKS
C23	1118.00'	86.60'	Δ=3°24'48"	3
C27	509.00'	91.49'	Δ=10°17'53"	3
C107	2000.00'	205.56'	Δ=5°53'22"	4
C114	2.00'	6.10'	Δ=174°52'03"	3
C115	1100.00'	98.54'	Δ=5°07'57"	4
C116	2.00'	5.15'	Δ=147°39'12"	3
C117	60.00'	33.87'	Δ=32°20'48"	3

CONSTRUCTION ALIGNMENT DATA TABLE

NO.	DELTA OR BRG	RADIUS	LENGTH	REMARKS
1	Δ=5° 33' 25"	1031.01'	100.00'	
2	S 83°57'01" E		462.19'	
3	Δ=4° 03' 51"	2000.00'	141.86'	

DEMOLITION & UTILITY NOTES

1. REMOVE
2. ADJUST TO FINISHED GRADE
3. PROTECT IN PLACE
4. RELOCATE
5. EXISTING FACILITY TO BE RELOCATED BY OTHERS

CONSTRUCTION NOTES

1. CONSTRUCT MODIFIED B1-8 MOUNTABLE CURB PER SPPWC STD. PLAN 121-1, WITH 3" CURB HEIGHT
2. (NOT USED)
3. CONSTRUCT A1-8 CURB PER SPPWC STD. PLAN 120-1
4. CONSTRUCT A2-8 CURB AND GUTTER PER SPPWC STD. PLAN 120-1
5. CONSTRUCT 4" THICK CONCRETE SIDEWALK, CURB & SIDEWALK JOINTS PER SPPWC STD. PLAN 112-1
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7. CONSTRUCT TYPE 2 CURB RAMP PER SPPWC STD. PLAN 111-3
8. CONSTRUCT CURB RAMP PER DETAIL C/C-13
9. CONSTRUCT BICYCLE ACCESS RAMP PER B/C-13
10. CONSTRUCT 6" THICK STAMPED COLORED CONCRETE TRUCK APRON OVER 21" CLASS II AB
11. INSTALL 3'x10' WIDE YELLOW DETECTABLE WARNING SURFACE, REDI-MAT PRODUCT OR APPROVED EQUAL
12. STORM STRUCTURE PER STORM DRAIN PLANS
13. CONSTRUCT COMMERCIAL DRIVEWAY TYPE A PER SPPWC 110-1
14. CONSTRUCT COMMERCIAL DRIVEWAY TYPE B PER SPPWC 110-1
15. INSTALL 6" D.I.P.

GRAPHIC SCALE

(IN FEET)
1 INCH = 20 FT.

100% DRAFT SUBMITTAL - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

REV	SYMBOL	DESCRIPTION OF CHANGE	RICE	DATE

PREPARED BY:

Kimley-Horn and Associates, Inc.

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ASSOCIATE CIVIL ENGINEER

APPROVED BY:

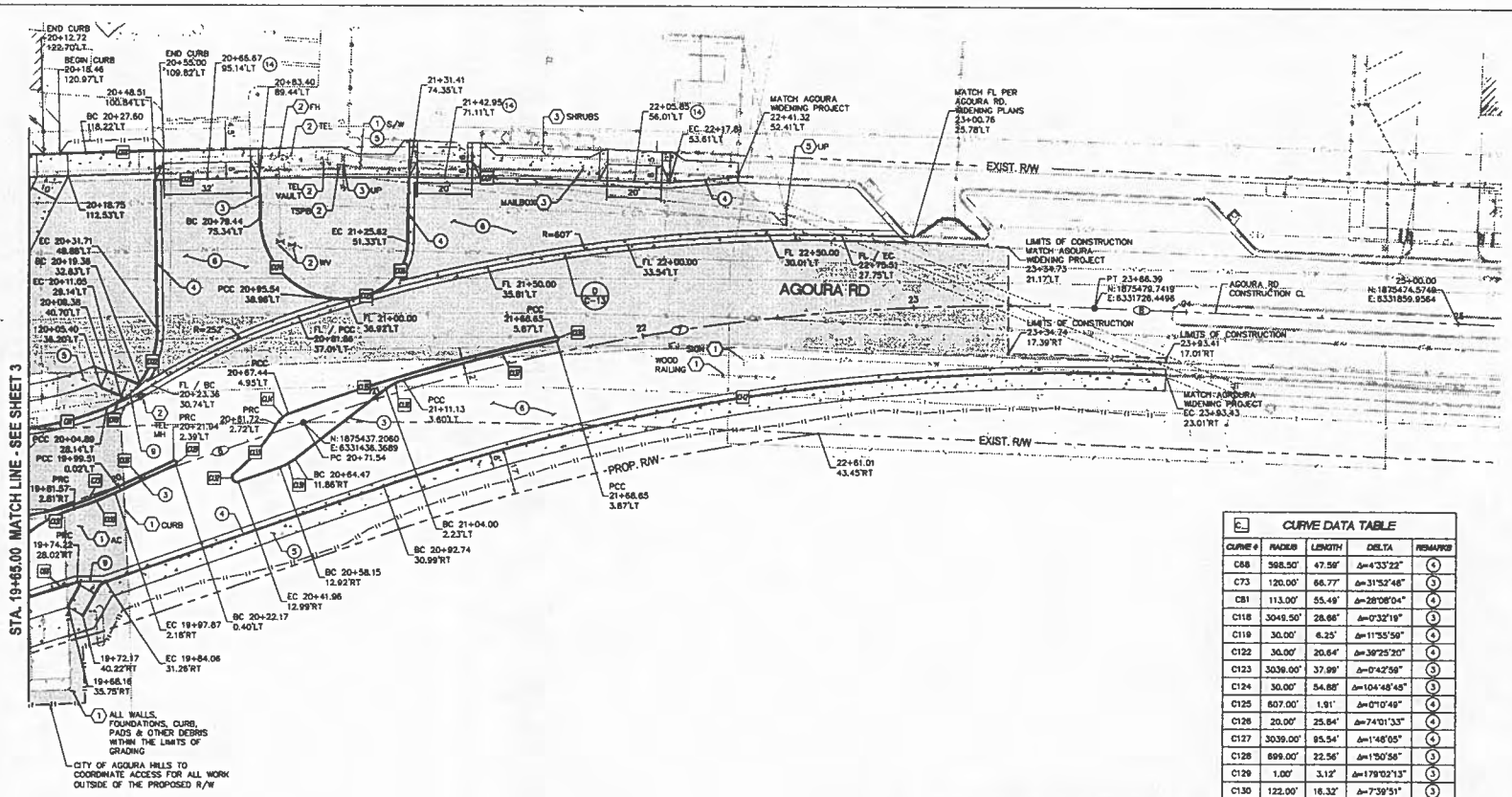
RAMIRO ADEVA DATE
DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

CITY OF AGOURA HILLS

KANAN ROAD AND
AGOURA ROAD ROUNDABOUT

LAYOUT PLAN C-2

DRAWN BY: SP/SC
CHECKED BY: KHA JOB NUMBER 099083C19
F-1/SW
SHEET 4 OF 34



DEMOLITION & UTILITY NOTES

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CONSTRUCTION NOTES

1. CONSTRUCT MODIFIED B1-6 MOUNTABLE CURB PER SPPWC STD. PLAN 121-1, WITH 3" CURB HEIGHT
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15. INSTALL 6" D.I.P.

CURVE DATA TABLE

CURVE #	RADIUS	LENGTH	DELTA	REMARKS
C68	568.50'	47.59'	Δ=4°33'22"	4
C73	120.00'	66.77'	Δ=31°52'46"	3
C81	113.00'	55.49'	Δ=28°08'04"	4
C118	3049.50'	28.66'	Δ=0°32'19"	3
C119	30.00'	6.25'	Δ=11°55'59"	4
C122	30.00'	20.64'	Δ=39°25'20"	4
C123	3039.00'	37.99'	Δ=0°42'59"	3
C124	30.00'	54.88'	Δ=104°48'45"	3
C125	607.00'	1.91'	Δ=0°10'49"	4
C126	20.00'	25.84'	Δ=74°01'33"	4
C127	3039.00'	95.54'	Δ=1°48'05"	4
C128	899.00'	22.56'	Δ=1°50'58"	3
C129	1.00'	3.12'	Δ=179°02'13"	3
C130	122.00'	16.32'	Δ=7°39'51"	3
C131	50.00'	21.26'	Δ=24°21'50"	3
C132	2.00'	5.63'	Δ=161°20'47"	3
C133	61.00'	23.74'	Δ=22°18'00"	3
C134	9.00'	6.26'	Δ=39°52'16"	3
C135	899.00'	101.90'	Δ=6°21'09"	3
C136	1.00'	3.14'	Δ=180°00'00"	3
C137	697.00'	57.79'	Δ=4°45'03"	3
C138	20.00'	7.32'	Δ=20°58'07"	3
C139	20.00'	6.44'	Δ=18°26'58"	3
C142	782.50'	291.48'	Δ=21°20'33"	4

CONSTRUCTION ALIGNMENT DATA TABLE

NO.	DELTA OR BRG	RADIUS	LENGTH	REMARKS
6	N 71°05'58" E		124.79'	
7	Δ=21° 07' 01"	800.00'	294.85'	
8	S 87°47'01" E		133.61'	

GRAPHIC SCALE

(IN FEET)
1 INCH = 20 FT.

100% DRAFT SUBMITTAL - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

REV	SYMBOL	DESCRIPTION OF CHANGE	RCE	DATE

PREPARED BY:

Kimley-Horn and Associates, Inc.

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SRIKANTH CHAKRAVARTHY R.C.E. C73629 DATE

REGISTERED PROFESSIONAL ENGINEER SRIKANTH CHAKRAVARTHY No. C73629 CIVIL STATE OF CALIFORNIA

REVIEWED BY:

CHAITANYA YAMBAO DATE
ASSOCIATE CIVIL ENGINEER

APPROVED BY:

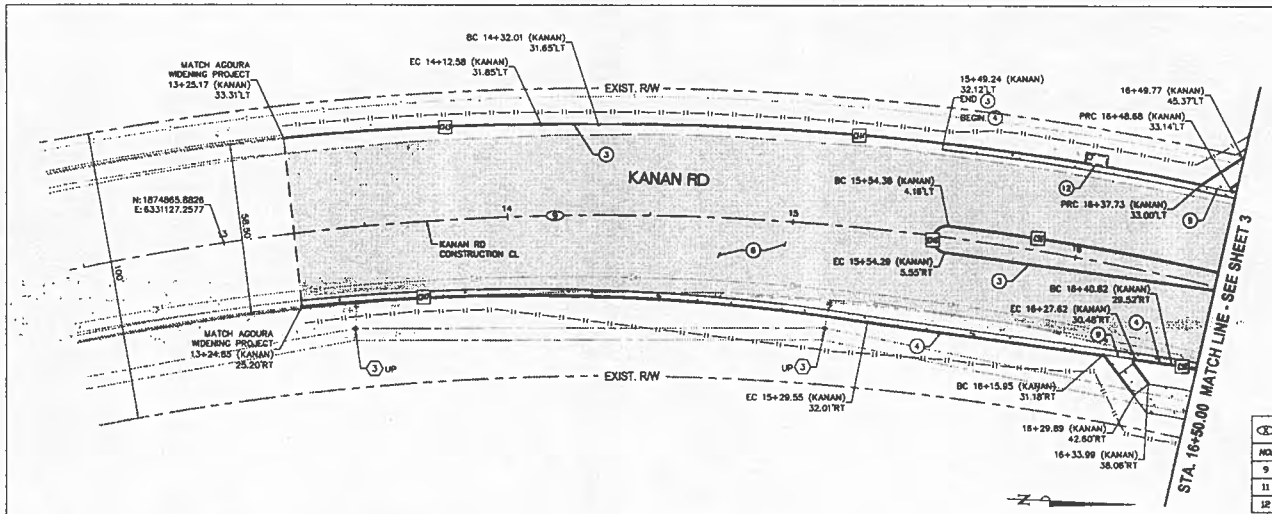
RAMIRO ADEVA DATE
DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

CITY OF AGOURA HILLS

KANAN ROAD AND
AGOURA ROAD ROUNDABOUT

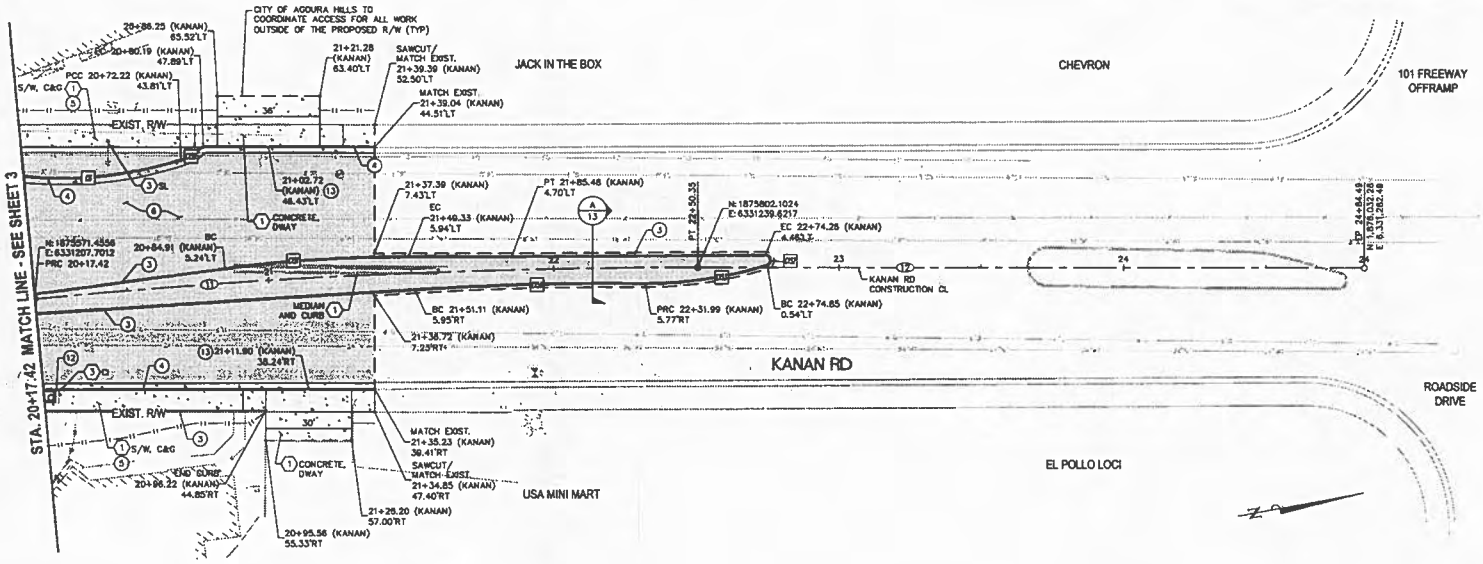
LAYOUT PLAN C-3

DRAWN BY: SP/SC
CHECKED BY: FH/SW
KHA JOB NUMBER 099063019
SHEET 5 OF 34



CURVE DATA TABLE				
CURVE #	RADIUS	LENGTH	DELTA	REMARKS
C8	138.50'	214.43'	Δ=88°42'33"	4
C56	1009.00'	122.05'	Δ=6°55'50"	3
C58	115.00'	48.68'	Δ=23°15'19"	4
C143	900.00'	90.43'	Δ=5°45'24"	3
C144	1037.00'	212.68'	Δ=11°45'04"	4
C146	4.85'	15.24'	Δ=180°00'00"	3
C147	774.00'	198.82'	Δ=14°43'03"	4
C150	20.00'	9.18'	Δ=26°15'15"	4
C151	498.00'	64.62'	Δ=7°26'04"	3
C152	2.00'	5.71'	Δ=163°33'47"	3
C153	149.00'	43.45'	Δ=16°42'24"	3
C154	1112.00'	80.70'	Δ=4°09'30"	3

CONSTRUCTION ALIGNMENT DATA TABLE				
NO.	DELTA OR BRG	RADIUS	LENGTH	REMARKS
9	Δ=29° 14' 40"	950.00'	484.89'	
11	Δ=5° 20' 18"	2500.00'	232.93'	
12	N 10°32'55" E		149.65'	



DEMOLITION & UTILITY NOTES

1. REMOVE
2. ADJUST TO FINISHED GRADE
3. PROTECT IN PLACE
4. RELOCATE
5. EXISTING FACILITY TO BE RELOCATED BY OTHERS

CONSTRUCTION NOTES

1. CONSTRUCT MODIFIED B1-6 MOUNTABLE CURB PER SPPWC STD. PLAN 121-1, WITH 3" CURB HEIGHT
2. (NOT USED)
3. CONSTRUCT A1-6 CURB PER SPPWC STD. PLAN 120-1
4. CONSTRUCT A2-6 CURB AND GUTTER PER SPPWC STD. PLAN 120-1
5. CONSTRUCT 4" THICK CONCRETE SIDEWALK, CURB & SIDEWALK JOINTS PER SPPWC STD. PLAN 112-1
6. CONSTRUCT 5 1/2" AC OVER 21" CLASS II AB, OR ALTERNATIVE PER GEOTECH REPORT (TYPICAL)
7. CONSTRUCT TYPE 2 CURB RAMP PER SPPWC STD. PLAN 111-3
8. CONSTRUCT CURB RAMP PER DETAIL C/C-13
9. CONSTRUCT BICYCLE ACCESS RAMP PER B/C-17
10. CONSTRUCT 6" THICK STAMPED COLORED CONCRETE TRUCK APRON OVER 21" CLASS II AB
11. INSTALL 3'x10' WIDE YELLOW DETECTABLE WARNING SURFACE. REDI-MAT PRODUCT OR APPROVED EQUAL
12. STORM STRUCTURE PER STORM DRAIN PLANS
13. CONSTRUCT COMMERCIAL DRIVEWAY TYPE A PER SPPWC 110-1
14. CONSTRUCT COMMERCIAL DRIVEWAY TYPE B PER SPPWC 110-1
15. INSTALL 6" D.I.P.

GRAPHIC SCALE

(IN FEET)
1 inch = 20 FT.

100% DRAFT SUBMITTAL - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

REV	SYMBOL	DESCRIPTION OF CHANGE	RCE	DATE

PREPARED BY:

Kimley-Horn and Associates, Inc.

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Tel (818) 227-2750 Fax (916) 608-0885

BIRKANTH CHAKRAVARTHY R.C.E. C73629 DATE

REGISTERED PROFESSIONAL ENGINEER BIRKANTH CHAKRAVARTHY No. C73629 CIVIL STATE OF CALIFORNIA

REVIEWED BY:

CHAITMANJE YAMBAO DATE
ASSOCIATE CIVIL ENGINEER

APPROVED BY:

RAMIRO ADEVA DATE
DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

CITY OF AGOURA HILLS

KANAN ROAD AND AGOURA ROAD ROUNDABOUT

LAYOUT PLAN C-4

DRAWN BY: TP/SC
CHECKED BY: KHA/FJ/SW
KHA JOB NUMBER 099083019

SHEET 6 OF 34

GENERAL NOTES (STREET LIGHTING ONLY)

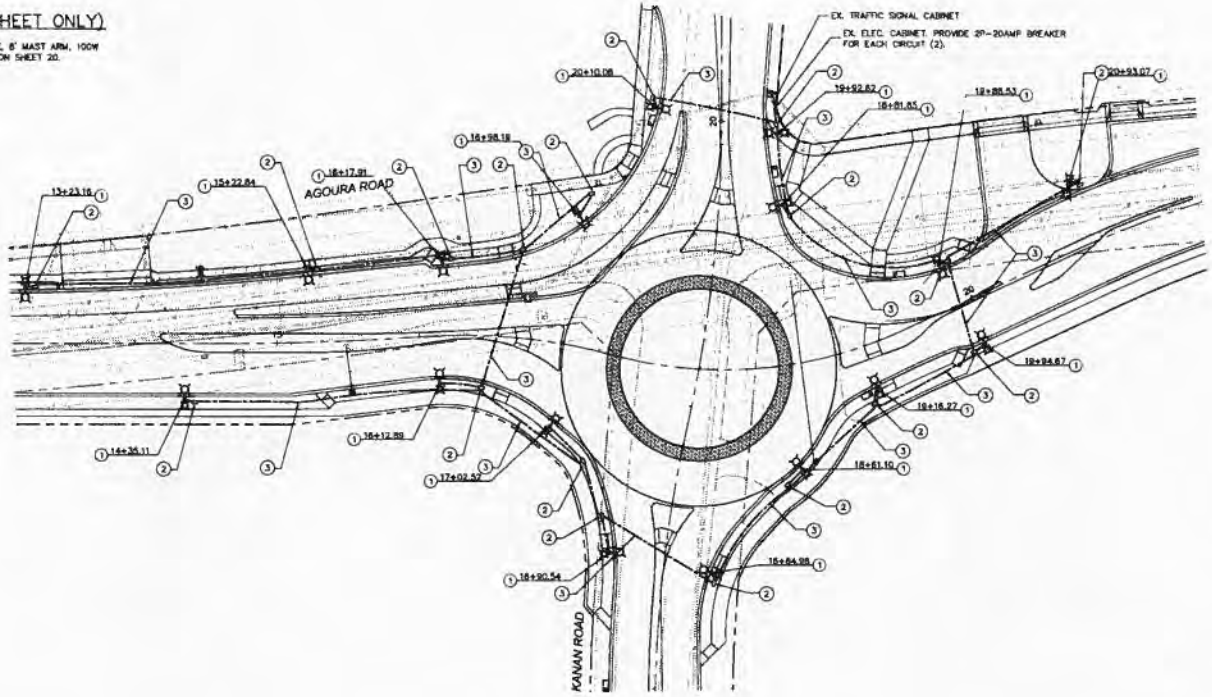
1. ALL CONDUIT SHALL BE PLACED BEHIND CURB EXCEPT AT INTERSECTIONS.
2. ALL INSTALLATION SHALL CONFORM TO THE GENERAL NOTES IN THE CITY OF AGOURA HILLS STANDARD PLANS.

ELECTRICAL CONSTRUCTION NOTES (THIS SHEET ONLY)

(1) CONSTRUCT DECORATIVE STREET LIGHT AND FOUNDATION WITH 30' HEIGHT POLE, 8' MAST ARM, 100W 16000 SERIES LUMINAIRE AND 70W PENDANT LUMINAIRE PER DETAILS "A"-"D" ON SHEET 20.

(2) CONSTRUCT #5 PULL BOX (25" X 15").

(3) FURNISH AND INSTALL 2" SLM 40 PVC CONDUIT -2#8 AND 1#10 GROUND.



GRAPHIC SCALE

(IN FEET)
1 INCH = 30 FT.

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RAMIRO ACEVA DATE
DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

CITY OF AGOURA HILLS

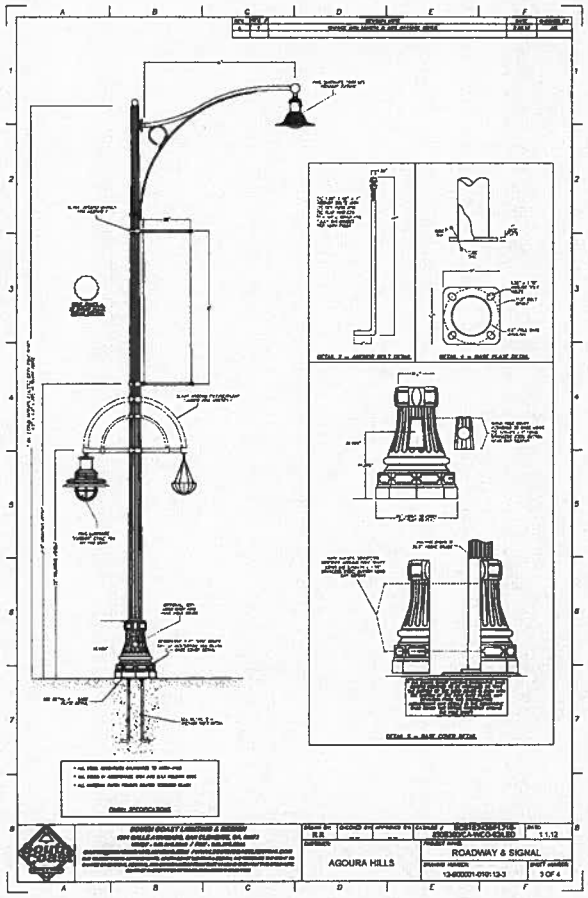
KANAN ROAD AND AGOURA ROAD ROUNDABOUT

STREET LIGHTING PLAN S_-1

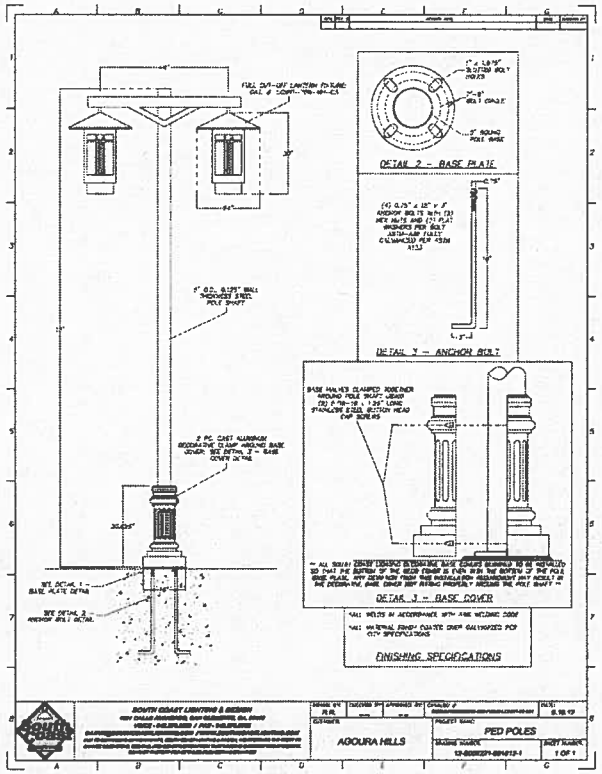
DRAWN BY: RP/SC | CHECKED BY: FH/SM | KHA JOB NUMBER 099083019

SHEET 20 OF 34

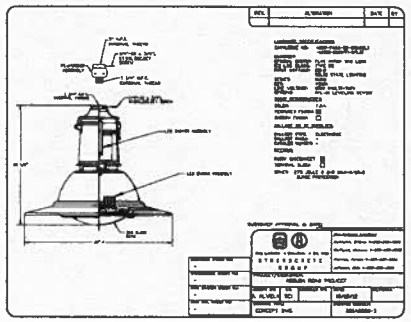
100% DRAFT SUBMITTAL - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS



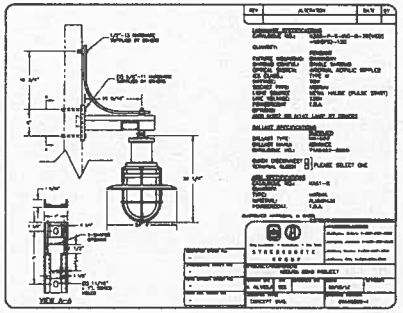
DETAIL "A"
100W LUMINAIRE
(No Scale)



DETAIL "B"
70W LUMINAIRE
(No Scale)



100W LUMINAIRE - DETAIL "C"



70W LUMINAIRE - DETAIL "D"

100% DRAFT SUBMITTAL - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

REV	SYMBOL	DESCRIPTION OF CHANGE	RCE	DATE

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SRIKANTH CHAKRAVARTHY R.C.E. 073829 DATE

REGISTERED PROFESSIONAL ENGINEER SRIKANTH CHAKRAVARTHY No. C73829 CIVIL STATE OF CALIFORNIA

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CHARMAINE YAMBAO DATE
ASSOCIATE CIVIL ENGINEER

APPROVED BY:

RAMIRO ACEVA DATE
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CITY OF AGOURA HILLS

KANAN ROAD AND
AGOURA ROAD ROUNDABOUT

STREET LIGHTING DETAIL SL-2

DRAWN BY: RT/SC
CHECKED BY: FH/SM
CHA JOB NUMBER 099083019

SHEET 21 OF 34

FOR CONSTRUCTION - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

LIMIT OF LANDSCAPE WORK- STA. 14+00

AGOURA ROAD

KANAN ROAD

MATCHLINE - SEE SHEET LC-3

MATCHLINE - SEE SHEET LC-2

MATCHLINE - SEE BELOW RIGHT

MATCHLINE - SEE LEFT

PILASTER (TYP.) — WITH STONE VENEER AND PRECAST CAP — C LD-2

DRY STREAMBED WITH BOULDERS — E LD-1

LOW STONE WALL — G LD-2

RAIL FENCE / PILASTER (TYP.) — WITH STONE VENEER AND PRECAST CAP — E LD-2

BOULDERS - VARIOUS SIZES (TYP.) — F LD-1

TREE #132 TO BE REMOVED- BY OTHERS (REFER TO OVERALL TREE REPORT)

REFER TO AGOURA ROAD STREET PLANS FOR THIS AREA

TRUNCATED DOMES- PER CIVIL DRAWINGS

COBBLE PAVING — @ MEDIAN NOSES — G LD-1

TREE GRATE (TYP.) — K LD-1

CONCRETE CURB AND GUTTER- TYPICAL PER CIVIL DRAWINGS

TREE WELLS (TYPICAL)

SIGNAGE - PER CIVIL DRAWINGS (TYPICAL)

PERIMETER SIDEWALKS- PER CIVIL DRAWINGS

FLAGSTONE PAVING — TYPICAL AT MEDIANS — C LD-1

ROLLED CURB- PER CIVIL DRAWINGS

DIRECTIONAL ARROWS (CHEVRONS) ON CONCRETE BASE

INTERLOCKING PAVERS — ON CONCRETE BASE — D LD-1

CONCRETE SIDEWALK, CURB AND GUTTER- TYPICAL (5'-0" OTHERS)

ENTRY SIGNAGE WALL — W/ STONE VENEER, BOULDERS, ADOBE CAP & CITY SIGNAGE W/ LOGO — E LD-2

CONTOURED MOUNDING IN CENTER OF ROUNDABOUT ISLAND- PER CIVIL DRAWINGS

CONCRETE BANDS (TYP.) — B LD-1

ORNAMENTAL LIGHTING- PER CIVIL DRAWINGS (TYP.)

GRAPHIC SCALE

(IN FEET)
1 INCH = 20 FT.

FOR CONSTRUCTION NOTES REFER TO SHEET LC-3
FOR DETAILS REFER TO SHEETS LD-1 - LD-2

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Landscape Architecture • Planning • Horticulture • Biological Restoration
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CITY OF AGOURA HILLS

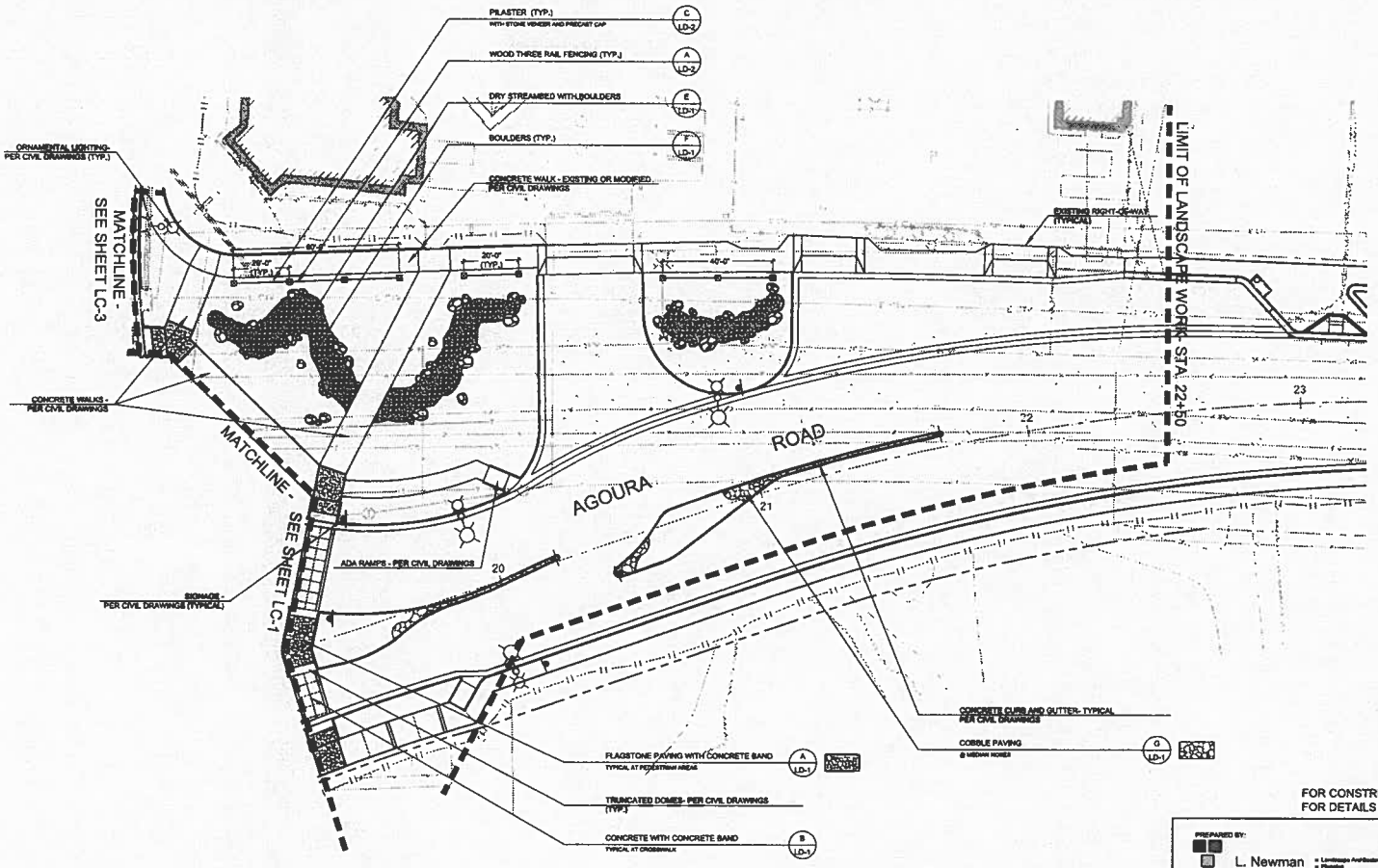
KANAN ROAD AND AGOURA ROAD ROUNDABOUT

CONSTRUCTION PLAN

LC-1 OF 3

DRAWN BY: ML | CHECKED BY: BB/RJB | KHA JOB NUMBER 099083019

SHEET 22 OF 34



FOR CONSTRUCTION - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

FOR CONSTRUCTION NOTES REFER TO SHEET LC-3
FOR DETAILS REFER TO SHEETS LD-1 - LD-2

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CHARMAINE YAMBAO DATE
ASSOCIATE CIVIL ENGINEER

APPROVED BY:
RAMIRO ADEVA DATE
DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

CITY OF AGOURA HILLS

KANAN ROAD AND
AGOURA ROAD ROUNDABOUT

CONSTRUCTION PLAN

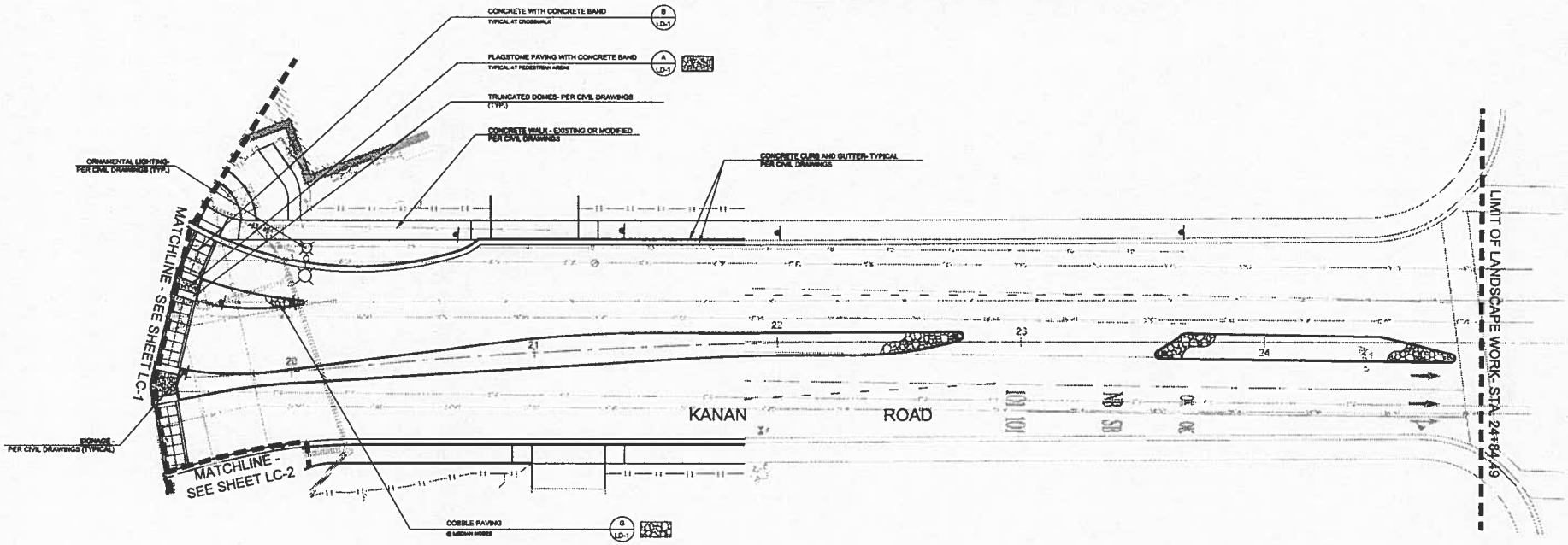
LC-2 OF 3

DRAWN BY: ML | CHECKED BY: BB/RJB | KHA JOB NUMBER 099083019

FOR CONSTRUCTION - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

CONSTRUCTION NOTES

1. ALL LAYOUT DIMENSIONS, CONCRETE PATTERNS, STONE PAVING, AND COLORS TO BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. CONTRACTOR TO NOTIFY LANDSCAPE ARCHITECT OF ALL PLAN DISCREPANCIES AS THEY RELATE TO FIELD CONDITIONS.
3. CONTRACTOR TO PROVIDE POSITIVE DRAINAGE AWAY FROM ALL STRUCTURES. ALL HARDSCAPE SURFACES TO HAVE A MIN. 1.5% TO MAX. 2% CROSS SLOPE.
4. CONCRETE: MINIMUM COMPRESSIVE STRENGTH OF 2500 P.S.I. AT TWENTY-EIGHT (28) DAYS.
5. CEMENT: CONFORM TO A.S.T.M. C150.
6. CONSTRUCTION TO BE PLUMB AND TRUE UNLESS OTHERWISE NOTED OR INDICATED.
7. PRIOR TO LAYOUT OF UNDERGROUND IMPROVEMENTS, REFER TO PLANTING PLANS FOR TREE LOCATIONS. STAKE TREES AND OUTLINE SPECIFIED BOX SIZE. ROUTE UNDERGROUND DRAINAGE, ELECTRICAL, AND IRRIGATION PIPING OUTSIDE EXCAVATION REQUIRED FOR TREES.
8. CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR AND REPLACE ALL DAMAGE TO CURB GUTTER AND UTILITIES IN THE CONSTRUCTION AREAS.
9. CONTRACTOR TO ALLOW FOR LABOR AND MATERIALS IN HIS CONTRACT FOR ANY ADDITIONAL DRAINAGE MATERIAL DEEMED NECESSARY AT TIME OF INSTALLATION. THIS SHALL INCLUDE DRAINS, PIPE, CURB, WIRING, ETC.
10. WRITTEN DIMENSIONS AND DETAILS TAKE PRECEDENCE OVER SCALED DIMENSIONS.
11. CONFORM TO LATEST UNIFORM BUILDING CODE AND APPLICABLE GOVERNING AGENCY CODES AND ORDINANCES. NO PART OF THE CONTRACT DOCUMENTS ARE INTENDED TO BE IN VIOLATION OF CODES. IF DISCREPANCIES EXIST, NOTIFY LANDSCAPE ARCHITECT.
12. COORDINATE AND COOPERATE WITH CONTRACTORS OF ATTACHED, ADJOINING AND INTERFACING WORK OF OTHER TRADES.
13. EXISTING UTILITIES SHOWN ON PLANS REPRESENT LOCATIONS OF UTILITIES THAT MAY OR MAY NOT HAVE BEEN INSTALLED. CONTRACTOR TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK.
14. ALL MATERIALS: CONCRETE FINISHES, POURED-IN-PLACE CAPS, VENEERS, CONCRETE BLOCK, PRECAST CONCRETE CAPS, IRON FENCING, CONCRETE RAIL FENCING, ETC. - TO BE APPROVED BY THE LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION. CONTRACTOR SHALL PROVIDE (2) FRAMED 2' X 2' CONCRETE SAMPLES (FROM SEPARATE BATCHES) OF EACH CONCRETE FINISH TO THE LANDSCAPE ARCHITECT AND OWNER FOR APPROVAL PRIOR TO STARTING CONSTRUCTION. ALL CONCRETE SAMPLES SHALL BE POURED 72 HOURS PRIOR TO SUBMITTAL.
15. CONTRACTOR TO NOTIFY LANDSCAPE ARCHITECT OF ALL PLAN DISCREPANCIES AS THEY RELATE TO FIELD CONDITIONS.
16. ALL WALL AND FENCE LAYOUTS TO BE SURVEYED, CHALKED AND THEN STAKED BY THE ENGINEERS SURVEY CREW. ALL LAYOUTS SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO STARTING CONSTRUCTION.
17. ALL GRADING AND DRAINAGE RELATING TO ROADWAYS, MANUFACTURED SLOPES, ETC. - PER THE CIVIL ENGINEERING DRAWINGS. (NOT A PART OF THIS DOCUMENT)
18. ALL LIGHTING PER CIVIL DRAWINGS.
19. ALL GRADING AND DRAINAGE PER CIVIL DRAWINGS.
20. DEMOLITION OF ADDITIONAL NON-OAK TREES (BY OTHERS).



FOR CONSTRUCTION NOTES REFER TO SHEET LC-3
FOR DETAILS REFER TO SHEETS LD-1 - LD-2

GRAPHIC SCALE
(IN FEET)
1 INCH = 20 FT.

PREPARED BY:
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• 31555 Via Colinas • Suite 101 • Westlake Village, CA 91362-3924
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Tel (818) 227-2790 Fax (916) 608-0665
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REVIEWED BY:
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ASSOCIATE CIVIL ENGINEER

APPROVED BY:
RAMIRO ADEVA DATE
DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

CITY OF AGOURA HILLS

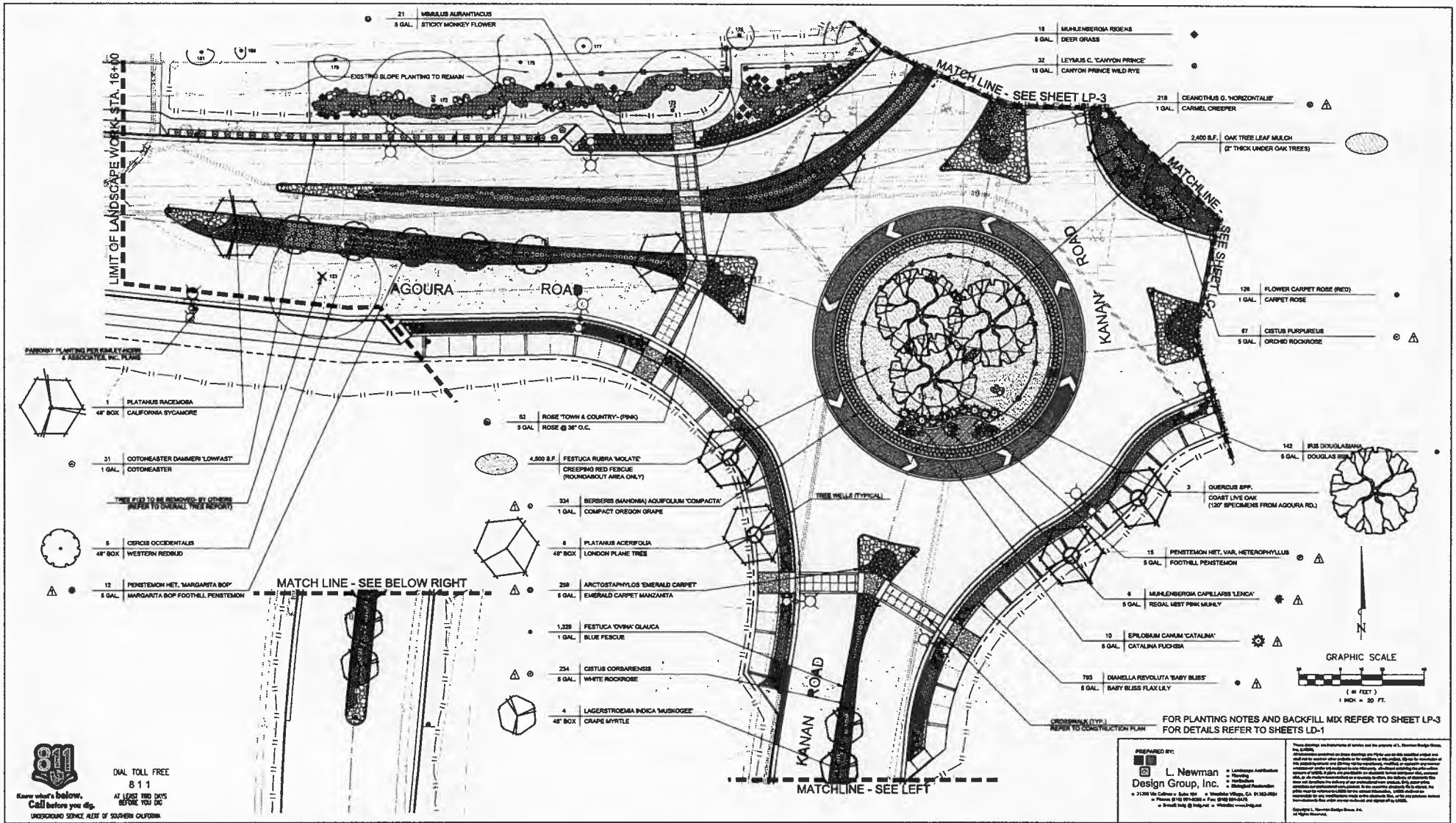
KANAN ROAD AND
AGOURA ROAD ROUNDABOUT

CONSTRUCTION PLAN

LC-3 OF 3

DRAWN BY: ML | CHECKED BY: BB/RJB | KHA JOB NUMBER 099083019

SHEET 24 OF 34



FOR PLANTING NOTES AND BACKFILL MIX REFER TO SHEET LP-3
FOR DETAILS REFER TO SHEETS LD-1

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REV	SYMBOL	DESCRIPTION OF CHANGE	RCE	DATE
01-31-14	1	PLANT VARIETY / QUANTITIES UPDATE - PER CITY COMMENTS		

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Tel (818) 227-2790 Fax (916) 806-0885
BRIAN CHAMBERLAIN R.C.E. 67353 DATE

REVIEWED BY:
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CITY OF AGOURA HILLS

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KANAN ROAD AND
AGOURA ROAD ROUNDABOUT

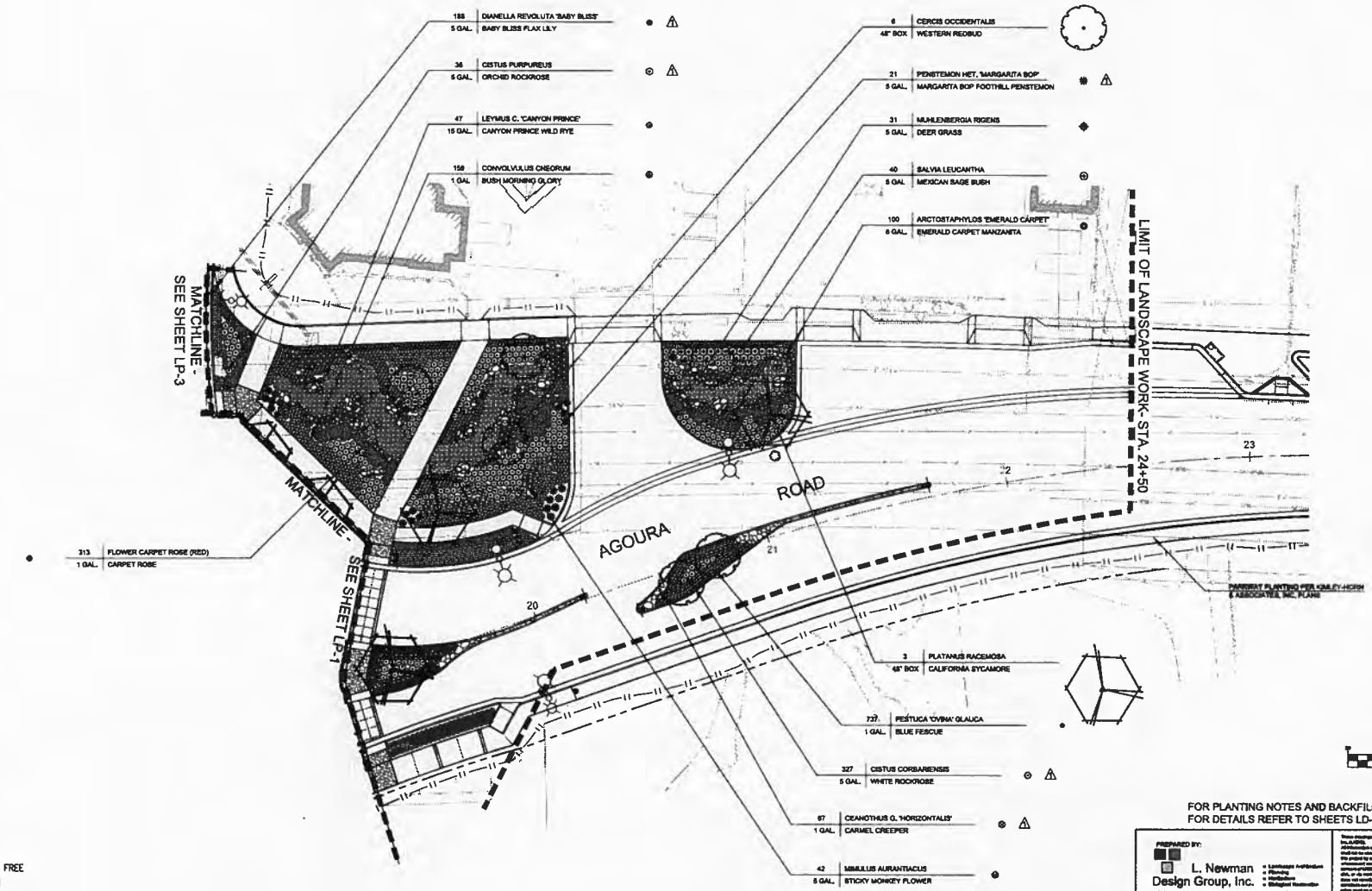
PLANTING PLAN

LP-1 OF 3

DRAWN BY: ML | CHECKED BY: BB/RJB | IDA JOB NUMBER: 099083019

SHEET 29 OF 34

FOR CONSTRUCTION - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS



FOR PLANTING NOTES AND BACKFILL MIX REFER TO SHEET LP-3
FOR DETAILS REFER TO SHEETS LD-1

FOR CONSTRUCTION - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

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REV	SYMBOL	DESCRIPTION OF CHANGE	RCE	DATE
01-31-14	1	PLANT VARIETY / QUANTITIES UPDATE - PER CITY COMMENTS		

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APPROVED BY:
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CITY OF AGOURA HILLS

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KANAN ROAD AND
AGOURA ROAD ROUNDABOUT

PLANTING PLAN

LP-2 OF 3

DRAWN BY: ML | CHECKED BY: BG/RJB | KHA JOB NUMBER 099083019

SHEET 30 OF 34

FOR CONSTRUCTION - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

SOIL PREPARATION SPECIFICATIONS

PREPLANT SOIL AMENDMENTS AND FERTILIZERS

- 3 CU. YDS. AGROMIND
- 20 LBS. 8-8-4 FERTILIZER
- ROTOTILL TO 8" DEPTH

A. TURF AND GROUNDCOVER

1. SOIL AMENDMENTS — APPLY PER 1000 sq. ft
   - ORGANIC (WELL-COMPOSTED) NITROLIZER/ REDWOOD SHAVINGS — 2.00 cu. yds.
2. FERTILIZERS — APPLY PER 1000 sq. ft.
   - PHOSPHORUS (P2 O5) — 1.35 lbs
   - POTASSIUM (K2O — 2.55 lbs
   - SOIL SULPHUR — 25.0 lbs
   - IRON (Fe) — 0.50 lbs
   - ZINC (Zn) — 3.00 lbs

ALL TURF AND GROUNDCOVER AREAS SHALL RECEIVE THESE AMENDMENTS WELL BLENDED AND FILLED INTO THE TOP 4"-6". AFTER INCORPORATION THE ABOVE SOIL PREPARATION INTO THE SITE SPREAD 35 LBS OF GYPSUM AND 25 LBS OF SOIL SULPHUR TO THE TOP.

B. TREE AND SHRUB BACKFILL MIX

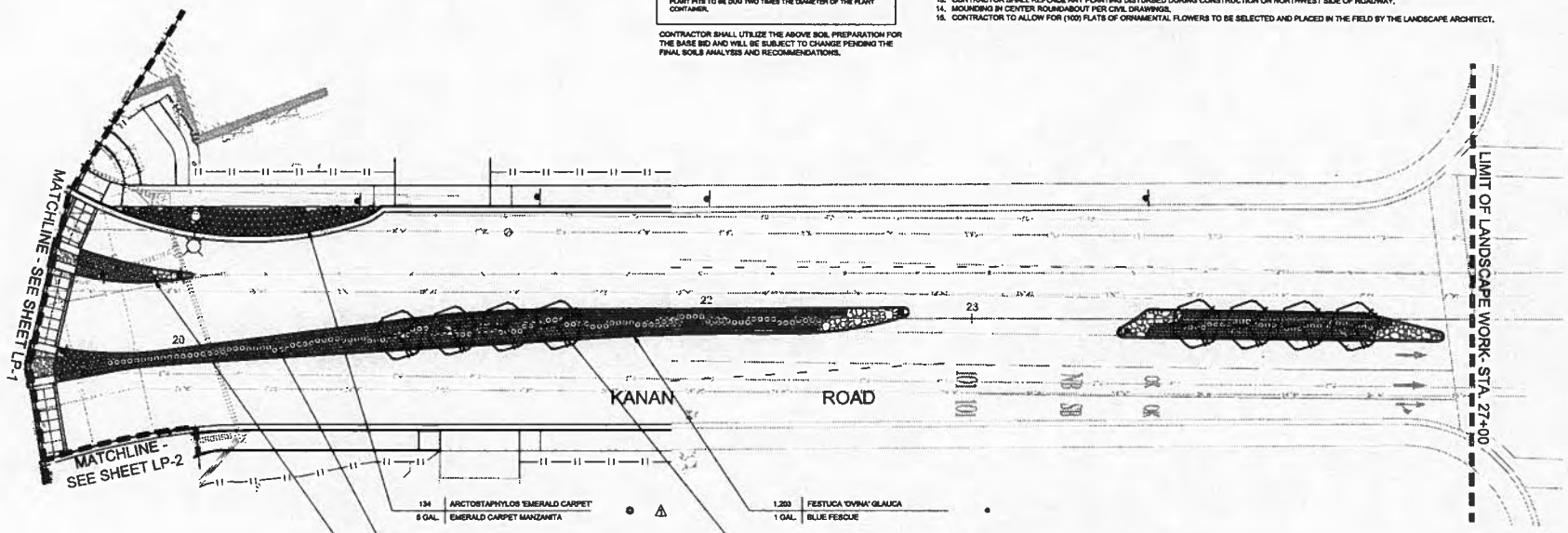
1. NATIVE (SITE) SOIL — 67%
2. NITROGEN FERTILIZED ORGANIC MATERIAL — 33%
3. COMMERCIAL FERTILIZER (8-8-4) — 1 lb. / cu. yd.
4. IRON — 2 oz. / cu. yd.
5. ZINC — 1 lb. / cu. yd.
6. MANGANESE — 1 lb. / cu. yd.

THESE MATERIALS SHALL BE THOROUGHLY BLENDED AND PLACED IN PLANT PITS.
PLANT PITS TO BE DUG TWO TIMES THE DIAMETER OF THE PLANT CONTAINER.

CONTRACTOR SHALL UTILIZE THE ABOVE SOIL PREPARATION FOR THE BASE BID AND WILL BE SUBJECT TO CHANGE PENDING THE FINAL SOILS ANALYSIS AND RECOMMENDATIONS.

PLANTING NOTES

1. ALL PLANT MATERIAL SHALL BE OF THE HIGHEST QUALITY AVAILABLE, EQUAL TO "NORMAN'S NURSERY" OR AS APPROVED BY THE LANDSCAPE ARCHITECT.
2. ALL PLANTS SHALL BE OF A-A QUALITY. THEY SHALL BE SYMMETRICAL, FILL THE CONTAINER, THEY SHALL NOT BE ROOT BOUND. THEY SHALL NOT BE RECENTLY PLANTED FROM ONE CONTAINER SIZE TO THE SPECIFIED SIZE AND THEY WILL BE HEALTHY REPRESENTATIVE SPECIMENS.
3. ALL PLANT MATERIAL TO BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO DELIVERY.
4. ALL PLANTING BEDS SHALL BE GRADED, AND HAVE AMENDMENTS ADDED PRIOR TO PLANTING. REFER TO GENERAL SOIL PREPARATION SPECIFICATIONS THIS SHEET.
5. FINAL LOCATION OF ALL TREES, SHRUBS TO BE VERIFIED IN THE FIELD BY THE LANDSCAPE ARCHITECT AND APPROVED PRIOR TO INSTALLATION. TREE & SHRUB PLANTING PER PLANTING DETAILS.
6. DO NOT PLANT TREES WITHIN 10' OF DRAINS, CATCH BASINS, DRIVEWAYS, UTILITY POLES AND STREET LIGHTS, 5' FROM WATER METERS, OR 4' FROM CURBS.
7. PLANT ALL TREES AND SHRUBS OUT OF THE LINE OF ANY INVERTS, ETC.
8. LOCATE ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
9. LOCATIONS AND COUNTS ARE PROVIDED FOR CONVENIENCE ONLY. CONTRACTOR TO VERIFY ALL TREE AND SHRUB COUNTS. CONTRACTOR TO PROMPTLY NOTIFY LANDSCAPE ARCHITECT OF ANY DISCREPANCY IN PLANT OR TREE COUNTS. CONTRACTOR IS SOLELY RESPONSIBLE FOR PLANTING PER PLAN. NO EXTRAS SHALL BE ALLOWED FOR PLANT COUNT DISCREPANCIES.
10. CONTRACTOR TO SUPPLY ONLY THE PLANT MATERIALS SPECIFIED ON THE PLANS. CONTRACTOR SHALL NOT SUBSTITUTE ANY PLANT MATERIAL WITHOUT THE EXPRESS CONSENT OF THE OWNER AND THE LANDSCAPE ARCHITECT. ALL PLANT MATERIALS DELIVERED TO THE SITE SHALL HAVE PLANT TAGS FROM PROVIDING NURSERY IDENTIFYING THE PLANT BY GENUS AND SPECIES. PLANTS WITHOUT TAGS SHALL BE REJECTED.
11. NO PLANTING SHALL TAKE PLACE UNTIL AN IRRIGATION COVERAGE TEST HAS BEEN COMPLETED AND APPROVED BY THE LANDSCAPE ARCHITECT.
12. ALL SHRUB PLANTING BEDS TO RECEIVE 1" OF AGROMIN E32 OR EQUAL AS APPROVED BY LANDSCAPE ARCHITECT AT TIME OF PLANTING. AN ADDITIONAL 1"OF AGROMIN E32 SHALL BE INSTALLED PRIOR TO END OF 90 DAY MAINTENANCE . ALL EXISTING AND TRANSPLANTED OAK TREES TO RECEIVE A 2" LAYER OF AGROMIN E32, AS NOTED ON PLANTING PLAN.
10. 13. ALL EXISTING TURF AREAS TO REMAIN WILL BE REPLACED WITH NEW SOD, AS NOTED.
11. ALL TREES PLANTED WITHIN 10'-0" OF HARDSCAPE TO RECEIVE ROOT BARRIERS.
12. CONTRACTOR TO REMOVE TREES, AS NOTE, STUMP GRIND AND DISPOSE OF OFF-SITE TO AN APPROVED RECYCLE LANDFILL GREENWASTE.
13. CONTRACTOR SHALL REPLACE ANY PLANTING DISTURBED DURING CONSTRUCTION ON NORTHWEST SIDE OF ROADWAY.
14. MOUNDING IN CENTER ROUNDABOUT PER CIVIL DRAWINGS.
15. CONTRACTOR TO ALLOW FOR (100) FLATS OF ORNAMENTAL FLOWERS TO BE SELECTED AND PLACED IN THE FIELD BY THE LANDSCAPE ARCHITECT.



134	ARCTOSTAPHYLOS 'EMERALD CARPET'	1,203	FESTUCA 'OVINA' GLAUCA
5 GAL.	EMERALD CARPET MANZANITA	1 GAL.	BLUE FESCUE
140	CISTUS CORSARIENSIS	8	LAGERSTROEMIA INDICA 'MUSKOGEE'
5 GAL.	WHITE ROCKROSE	48" BOX	CRAPE MYRTLE
50	DIANELLA REVOLUTA 'BABY BLISS'		
5 GAL.	BABY BLISS FLAX LILY		

GRAPHIC SCALE
(IN FEET)
1 INCH = 20 FT.

FOR PLANTING NOTES AND BACKFILL MIX REFER TO SHEET LP-3
FOR DETAILS REFER TO SHEETS LD-1

811 Know what's below. Call before you dig.
DIAL TOLL FREE 811 AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

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REV	SYMBOL	DESCRIPTION OF CHANGE	RCE	DATE
01-31-14	1	PLANT VARIETY / QUANTITIES UPDATE - PER CITY COMMENTS		

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APPROVED BY:
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DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

CITY OF AGOURA HILLS

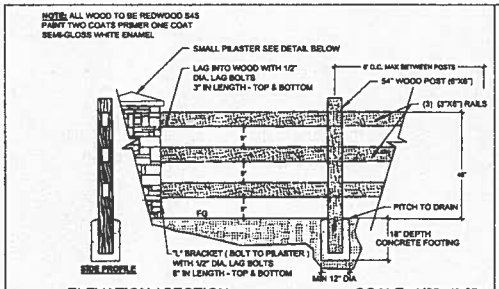
KANAN ROAD AND
AGOURA ROAD ROUNDABOUT

PLANTING PLAN

LP-3 OF 3

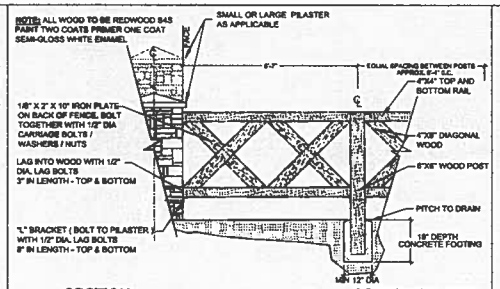
DRAWN BY: ML | CHECKED BY: BB/RJB | KHA JOB NUMBER 099083019

SHEET 31 OF 34



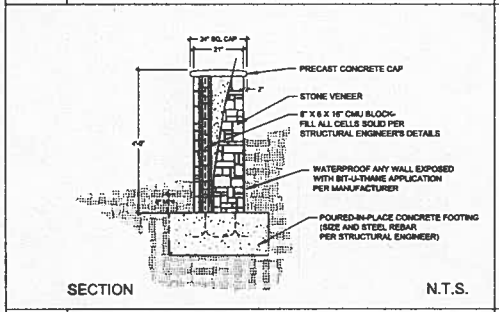
ELEVATION / SECTION SCALE: 1/2"=1'-0"

A WOOD THREE RAIL FENCING



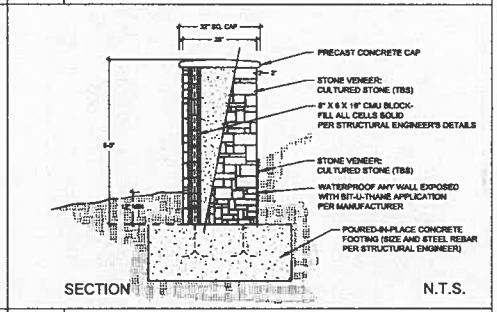
SECTION SCALE: 1/2"=1'-0"

B WOOD RAIL AT ROUNDABOUT



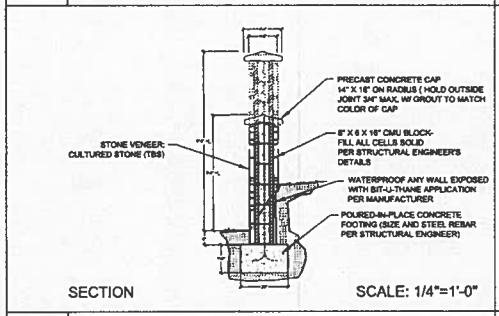
SECTION N.T.S.

C STONE PILASTER W/ CAP @ ROUNDABOUT PERIMETER



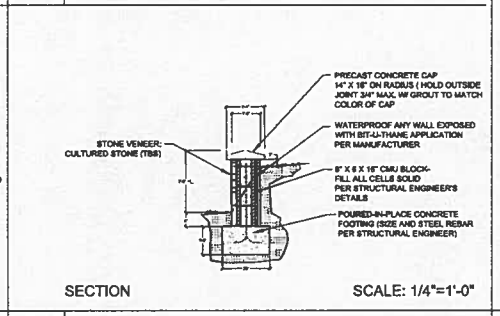
SECTION N.T.S.

D STONE PILASTER W/ CAP @ SIGNAGE WALL



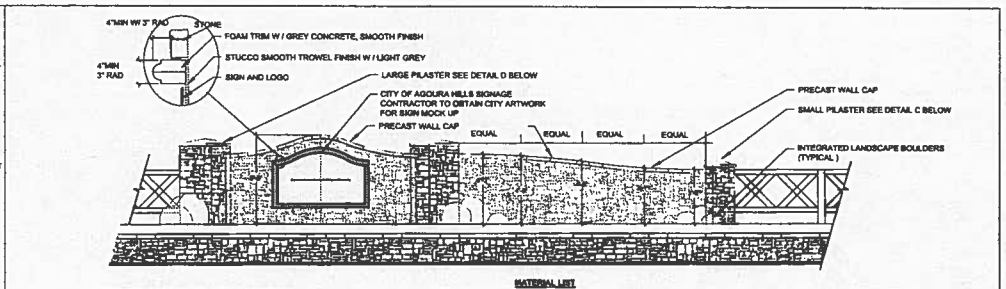
SECTION SCALE: 1/4"=1'-0"

F ENTRY STONE WALL W/ CAP

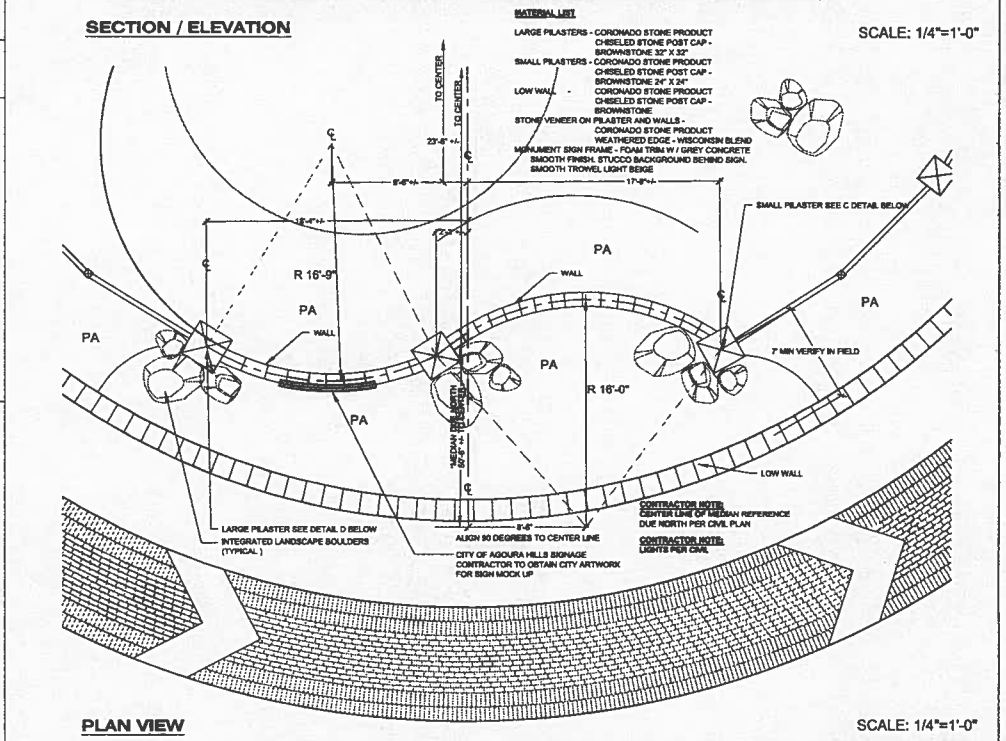


SECTION SCALE: 1/4"=1'-0"

G LOW STONE WALL W/ CAP



SECTION / ELEVATION SCALE: 1/4"=1'-0"



PLAN VIEW SCALE: 1/4"=1'-0"

E ENTRY MONUMENT AND SIGNAGE

FOR CONSTRUCTION - KANAN ROAD AND AGOURA ROAD ROUNDABOUT - CITY OF AGOURA HILLS

REV	SYMBOL	DESCRIPTION OF CHANGE	RCE	DATE

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KANAN ROAD AND AGOURA ROAD ROUNDABOUT

CONSTRUCTION DETAILS

LD-2 OF 3

DRAWN BY: ML | CHECKED BY: BB/RJB | KHA JOB NUMBER 099083019

SHEET 33 OF 34

APPENDIX B
AIR QUALITY AND GREENHOUSE GAS ANALYSIS

AIR QUALITY IMPACT ANALYSIS

KANAN ROAD AND AGOURA ROAD ROUNDABOUT

CITY OF AGOURA HILLS, CALIFORNIA

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Date:

March 15, 2013

Project No.: P12-046 AQ

CLIMATE AND METEOROLOGY

REGIONAL CLIMATE

The North Pacific high-pressure cell is the dominant climatic influence over the eastern North Pacific Ocean, particularly during the summer months. This high-pressure cell produces a predominantly northwesterly flow of maritime air over the California coastal waters. During the winter, the Pacific High weakens and moves south, resulting in weaker and less persistent northwesterly winds along the California coast than in the warmer half of the year.

As the air mass approaches the coast of California, this large-scale circulation pattern is modified by local influences. The differential heating between the desert and the adjacent Pacific Ocean modifies the prevailing winds, enhancing them during the warmer half of the year and weakening the winds during the colder portion. On a local and sub-regional basis, the airflow in California is channeled by its mountain ranges and valley. The coastal mountain ranges limit the flow of maritime air into the interior of California. This transition from a cool and damp marine environment to a dry and warm continental climate therefore occurs over a fairly short distance.

SOUTH COAST AIR BASIN

The South Coast Air Basin (SCAB) is a 6,600 square mile coastal plain bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The SCAB includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. Basin-wide conditions are characterized by warm summers, mild winters, infrequent rainfall, moderate onshore daytime breezes, and moderate humidity levels.

All seasons generally exhibit onshore flows during the day and offshore flows at night, after the land cools below the temperature of the ocean. The likelihood of strong offshore flows, including Santa Ana winds, is greater during winter than during summer (California Air Resources Board [ARB] 1984).

The topography and climate of Southern California combine to produce unhealthful air quality in the SCAB. Low temperature inversions, light winds, shallow vertical mixing, and extensive sunlight, in conjunction with topographical features such as adjacent mountain ranges that hinder dispersion of air pollutants, combine to create degraded quality, especially in inland valleys of the basin.

AIR QUALITY SETTING

AMBIENT AIR QUALITY STANDARDS (AAQS)

In order to gauge the significance of the air quality impacts of the proposed Kanan Road and Agoura Road Roundabout project, those impacts, together with existing background air quality levels, must be compared to the applicable ambient air quality standards. These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those people most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise, called "sensitive receptors." Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Recent research has shown, however, that chronic exposure to ozone (the primary ingredient in photochemical smog) may lead to adverse respiratory health even at concentrations close to the ambient standard.

National AAQS were established in 1971 for six pollution species with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 was extended several times in air quality problem areas like Southern California. In 2003, the Environmental Protection Agency (EPA) adopted a rule which extended and established a new attainment deadline for ozone for the year 2021. Because the State of California had established AAQS several years before the federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology, there is considerable difference between state and national clean air standards. Those standards currently in effect in California are shown in Table 1. Sources and health effects of various pollutants are shown in Table 2.

The Federal Clean Air Act Amendments (CAAA) of 1990 required that the U.S. Environmental Protection Agency (EPA) review all national AAQS in light of currently known health effects. EPA was charged with modifying existing standards or promulgating new ones where appropriate. EPA subsequently developed standards for chronic ozone exposure (8+ hours per day) and for very small diameter particulate matter (called "PM-2.5"). New national AAQS were adopted in 1997 for these pollutants.

Planning and enforcement of the federal standards for PM-2.5 and for ozone (8-hour) were challenged by trucking and manufacturing organizations. In a unanimous decision, the U.S. Supreme Court ruled that EPA did not require specific congressional authorization to adopt national clean air standards. The Court also ruled that health-based standards did not require preparation of a cost-benefit analysis. The Court did find, however, that there was some inconsistency between existing and "new" standards in their required attainment schedules. Such attainment-planning schedule inconsistencies centered mainly on the 8-hour ozone standard. EPA subsequently agreed to downgrade the attainment designation for a large number of communities to "non-attainment" for the 8-hour ozone standard.

Table 1

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[8]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[9]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence: Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[9]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[9]	—	
Lead[10,11]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[11]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[12]	8 Hour	See footnote 12	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[10]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page ...

For more information please call ARB-PIO at (916) 322-2990

California Air Resources Board (6/7/12)

Table 1 (continued)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

8. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

9. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

   Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

10. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

11. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

12. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Table 2
Health Effects of Major Criteria Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.
Fine Particulate Matter (PM-10)	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardio respiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Fine Particulate Matter (PM-2.5)	• Fuel combustion in motor vehicles, equipment, and industrial sources. • Residential and agricultural burning. • Industrial processes. • Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	• Increases respiratory disease. • Lung damage. • Cancer and premature death. • Reduces visibility and results in surface soiling.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board, 2002.

Evaluation of the most current data on the health effects of inhalation of fine particulate matter prompted the California Air Resources Board (ARB) to recommend adoption of the statewide PM-2.5 standard that is more stringent than the federal standard. This standard was adopted in 2002. The State PM-2.5 standard is more of a goal in that it does not have specific attainment planning requirements like a federal clean air standard, but only requires continued progress towards attainment.

Similarly, the ARB extensively evaluated health effects of ozone exposure. A new state standard for an 8-hour ozone exposure was adopted in 2005, which aligned with the federal 8-hour standard. The California 8-hour ozone standard of 0.07 ppm is more stringent than the federal 8-hour standard of 0.075 ppm. The state standard, however, does not have a specific attainment deadline. California air quality jurisdictions are required to make steady progress towards attaining state standards, but there are no hard deadlines or any consequences of non-attainment. During the same re-evaluation process, the ARB adopted an annual state standard for nitrogen dioxide (NO_2) that is more stringent than the corresponding federal standard, and strengthened the state one-hour NO_2 standard.

As part of EPA's 2002 consent decree on clean air standards, a further review of airborne particulate matter (PM) and human health was initiated. A substantial modification of federal clean air standards for PM was promulgated in 2006. Standards for PM-2.5 were strengthened, a new class of PM in the 2.5 to 10 micron size was created, some PM-10 standards were revoked, and a distinction between rural and urban air quality was adopted. In December, 2012, the federal annual standard for PM-2.5 was reduced from 15 $\mu g/m^3$ to 12 $\mu g/m^3$ which matches the California AAQS. The severity of the basin's non-attainment status for PM-2.5 may be increased by this action.

In response to continuing evidence that ozone exposure at levels just meeting federal clean air standards is demonstrably unhealthful, EPA had proposed a further strengthening of the 8-hour standard. Draft standards were published. The proposed future 8-hour standard was 0.065 ppm. Environmental organizations generally praised this proposal. Most manufacturing, transportation or power generation groups opposed the new standard as economically unwise in an uncertain fiscal climate. In response to these concerns, the revision to the 8-hour federal ozone standard was placed on indefinite hold.

A new federal one-hour standard for nitrogen dioxide (NO_2) has also recently been adopted which is more stringent than the existing state standard. Despite the additional stringency of the federal NO_2 standard, air quality monitoring data in the SCAB suggests that this standard is met in the region. The federal primary standard for sulfur dioxide (SO_2) were similarly modified in 2010. Because California requires use of lower sulfur fuel and burns negligible amounts of sulfur-bearing coal, SO_2 is not a problem pollutant in the State.

BASELINE AIR QUALITY

Existing levels of ambient air quality and historical trends and projections in the project area are well documented from measurements made by the South Coast Air Quality Management District (SCAQMD). Although the Thousand Oaks air monitoring station on Moorpark Road is technically located within the South Central Coast Air Basin (Ventura County Air Pollution Control District [VCAPCD]), it is the closest air monitoring station to the proposed project site and is therefore the most representative of project area air quality. Carbon monoxide (CO) and nitrogen dioxide (NO_2) is not monitored at the Thousand Oaks station; therefore this data was obtained from the SCAQMD monitoring station located on Gault Street in Reseda. Neither the Thousand Oaks nor the Reseda station monitors PM-10. Therefore PM-10 data was obtained from the Simi Valley air monitoring station. Table 3 is a 6-year summary of monitoring data for the major air pollutants compiled from the aforementioned air monitoring stations. Findings are summarized below:

a. Photochemical smog (ozone) levels occasionally exceed standards. The 8-hour state ozone standard has been exceeded an average of three percent of all days in the past six years near Thousand Oaks while the 1-hour state standard has been violated an less than one percent of all days. Years 2010 and 2011 were the cleanest years in the recent past. While ozone levels are still high, they are much lower than 10 to 20 years ago.

b. Measurements of carbon monoxide are very low baseline levels in comparison to the most stringent one- and eight-hour standards.

c. Respirable dust (PM-10) levels has only exceeded the state standard on 8 days in the last six years of measurement days, while the less stringent federal PM-10 standard has never been violated.

d. The federal ultra-fine particulate (PM-2.5) standard of 35 $\mu g/m^3$ has been not been exceeded on any measurement day in the last six years.

Although complete attainment of every clean air standard is not yet imminent, extrapolation of the steady improvement trend suggests that such attainment could occur within the reasonably near future.

Table 3
Air Quality Monitoring Summary (2006-2011)
(Number of Days Standards Were Exceeded, and Maximum Levels During Such Violations)
(Entries shown as ratios = samples exceeding standard/samples taken)

Pollutant/Standard	2006	2007	2008	2009	2010	2011
Ozone						
1-Hour > 0.09 ppm (S)	2	2	1	4	2	0
8-Hour > 0.07 ppm (S)	9	8	13	9	9	7
8- Hour > 0.075 ppm (F)	5	2	6	5	6	1
Max. 1-Hour Conc. (ppm)	0.096	0.112	0.103	0.109	0.104	0.093
Max. 8-Hour Conc. (ppm)	0.083	0.102	0.084	0.086	0.091	0.079
Carbon Monoxide						
1-hour > 20. ppm (S)	0	0	0	0	0	0
8- Hour > 9. ppm (S,F)	0	0	0	0	0	0
Max 1-hour Conc. (ppm)	4.8	3.7	3.9	3.7	3.3	3.2
Max 8-hour Conc. (ppm)	3.5	2.8	2.9	3.3	2.9	2.8
Nitrogen Dioxide						
1-Hour > 0.18 ppm (S)	0	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.073	0.081	0.091	0.070	0.075	0.069
Inhalable Particulates (PM-10)						
24-hour > 50 $\mu g/m^3$ (S)	1/60	4/60	2/61	1/59	0/59	0/61
24-hour > 150 $\mu g/m^3$ (F)	0/60	0/60	0/61	0/59	0/59	0/61
Max. 24-Hr. Conc. ($\mu g/m^3$)	56.	117.	80.	77.	35.	46.
Ultra-Fine Particulates (PM-2.5)						
24-Hour > 35 $\mu g/m^3$ (F)	0/118	0/91	0/62	0/62	0/61	0/61
Max. 24-Hr. Conc. ($\mu g/m^3$)	28.4	31.5	27.8	21.7	21.7	19.7

S=State, F= Federal
Source:
Ventura County Air Pollution Control District, Moorpark Thousand Oaks Monitoring Station: Ozone, PM-2.5
South Coast Air Quality Management District, Reseda Monitoring Station: CO, NO_2
Ventura County Air Pollution Control District, Simi Valley Monitoring Station: PM-10
DATA: www.arb.ca.gov/adam/

AIR QUALITY PLANNING

The Federal Clean Air Act (1977 Amendments) required that designated agencies in any area of the nation not meeting national clean air standards must prepare a plan demonstrating the steps that would bring the area into compliance with all national standards. The SCAB could not meet the deadlines for ozone, nitrogen dioxide, carbon monoxide, or PM-10. In the SCAB, the agencies designated by the governor to develop regional air quality plans are the SCAQMD and the Southern California Association of Governments (SCAG). The two agencies first adopted an Air Quality Management Plan (AQMP) in 1979 and revised it several times as earlier attainment forecasts were shown to be overly optimistic.

The 1990 Federal Clean Air Act Amendment (CAAA) required that all states with air-sheds with "serious" or worse ozone problems submit a revision to the State Implementation Plan (SIP). Amendments to the SIP have been proposed, revised and approved over the past decade. The most current regional attainment emissions forecast for ozone precursors (ROG and NOx) and for carbon monoxide (CO) and for particulate matter are shown in Table 4. Substantial reductions in emissions of ROG, NOx and CO are forecast to continue throughout the next several decades. Unless new particulate control programs are implemented, PM-10 and PM-2.5 are forecast to slightly increase.

The Air Quality Management District (AQMD) adopted an updated clean air "blueprint" in August 2003. The 2003 Air Quality Management Plan (AQMP) was approved by the EPA in 2004. The AQMP outlined the air pollution measures needed to meet federal health-based standards for ozone by 2010 and for particulates (PM-10) by 2006. The 2003 AQMP was based upon the federal one-hour ozone standard which was revoked late in 2005 and replaced by an 8-hour federal standard. Because of the revocation of the hourly standard, a new air quality planning cycle was initiated.

With re-designation of the air basin as non-attainment for the 8-hour ozone standard, a new attainment plan was developed. This plan shifted most of the one-hour ozone standard attainment strategies to the 8-hour standard. As previously noted, the attainment date was to "slip" from 2010 to 2021. The updated attainment plan also includes strategies for ultimately meeting the federal PM-2.5 standard.

Because projected attainment by 2021 requires control technologies that do not exist yet, the SCAQMD requested a voluntary "bump-up" from a "severe non-attainment" area to an "extreme non-attainment" designation for ozone. The extreme designation will allow a longer time period for these technologies to develop. If attainment cannot be demonstrated within the specified deadline without relying on "black-box" measures, EPA would have been required to impose sanctions on the region had the bump-up request not been approved. In April 2010, the EPA approved the change in the non-attainment designation from "severe-17" to "extreme." This reclassification sets a later attainment deadline, but also requires the air basin to adopt even more stringent emissions controls.

Table 4

South Coast Air Basin Emissions Forecasts (Emissions in tons/day)

Pollutant	2008[a]	2010[b]	2015[b]	2020[b]
NOx	917	836	667	561
ROG	632	596	545	525
CO	3,344	3,039	2,556	2,281
PM-10	308	314	328	340
PM-2.5	110	110	111	113

[a]2008 Base Year.
[b]With current emissions reduction programs and adopted growth forecasts.

Source: California Air Resources Board, California Emissions Projection Analysis Model, 2009

In other air quality attainment plan reviews, EPA has disapproved part of the SCAB PM-2.5 attainment plan included in the AQMP. EPA has stated that the current attainment plan relies on PM-2.5 control regulations that have not yet been approved or implemented. It is expected that a number of rules that are pending approval will remove the identified deficiencies. If these issues are not resolved within the next several years, federal funding sanctions for transportation projects could result. The 2012 AQMP update currently in public review is expected to remedy identified PM-2.5 planning deficiencies.

The currently still applicable AQMP was adopted in June 2007, after extensive public review. The 2007 AQMP recognizes the interaction between photochemical processes that create both ozone and the smallest airborne particulates (PM-2.5). The 2007 AQMP is therefore a coordinated plan for both pollutants. Key emissions reductions strategies in the updated air quality plan include:

- Ultra-low emissions standards for both new and existing sources (including on-and-off-road heavy trucks, industrial and service equipment, locomotives, ships and aircraft).
- Accelerated fleet turnover to achieve benefits of cleaner engines.
- Reformulation of consumer products.
- Modernization and technology advancements from stationary sources (refineries, power plants, etc.)

Projects such as the proposed Kanan Road and Agoura Road Roundabout do not directly relate to the AQMP in that there are no specific air quality programs or regulations governing roadway

improvement projects. Conformity with adopted plans, forecasts and programs relative to population, housing, employment and land use is the primary yardstick by which impact significance of planned growth is determined. The SCAQMD, however, while acknowledging that the AQMP is a growth-accommodating document, does not favor designating regional impacts as less-than-significant just because the proposed development is consistent with regional growth projections. Air quality impact significance for the proposed project has therefore been analyzed on a project-specific basis.

AIR QUALITY IMPACT

STANDARDS OF SIGNIFICANCE

Air quality impacts are considered "significant" if they cause clean air standards to be violated where they are currently met, or if they "substantially" contribute to an existing violation of standards. Any substantial emissions of air contaminants for which there is no safe exposure, or nuisance emissions such as dust or odors, would also be considered a significant impact.

Appendix G of the California CEQA Guidelines offers the following five tests of air quality impact significance. A project would have a potentially significant impact if it:

a. Conflicts with or obstructs implementation of the applicable air quality plan.

b. Violates any air quality standard or contributes substantially to an existing or projected air quality violation.

c. Results in a cumulatively considerable net increase of any criteria pollutants 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. Exposes sensitive receptors to substantial pollutant concentrations.

e. Creates objectionable odors affecting a substantial number of people.

Primary Pollutants

Air quality impacts generally occur on two scales of motion. Near an individual source of emissions or a collection of sources such as a crowded intersection or parking lot, levels of those pollutants that are emitted in their already unhealthful form will be highest. Carbon monoxide (CO) is an example of such a pollutant. Primary pollutant impacts can generally be evaluated directly in comparison to appropriate clean air standards. Violations of these standards where they are currently met, or a measurable worsening of an existing or future violation, would be considered a significant impact. Many particulates, especially fugitive dust emissions, are also primary pollutants. Because of the non-attainment status of the South Coast Air Basin (SCAB) for PM-10, an aggressive dust control program is required to control fugitive dust during project construction.

Secondary Pollutants

Many pollutants, however, require time to transform from a more benign form to a more unhealthful contaminant. Their impact occurs regionally far from the source. Their incremental regional impact is minute on an individual basis and cannot be quantified except through complex photochemical computer models. Analysis of significance of such emissions is based

upon a specified amount of emissions (pounds, tons, etc.) even though there is no way to translate those emissions directly into a corresponding ambient air quality impact.

Because of the chemical complexity of primary versus secondary pollutants, the SCAQMD has designated significant emissions levels as surrogates for evaluating regional air quality impact significance independent of chemical transformation processes. Projects with daily emissions that exceed any of the following emission thresholds are recommended by the SCAQMD to be considered significant under CEQA guidelines.

Table 5
Daily Emissions Significance Thresholds

Pollutant	Construction
ROG	75
NOx	100
CO	550
PM-10	150
PM-2.5	55
SOx	150
Lead	3

Source: SCAQMD CEQA Air Quality Handbook, November, 1993 Rev.

Additional Indicators

In its CEQA Handbook, the SCAQMD also states that additional indicators should be used as screening criteria to determine the need for further analysis with respect to air quality. The additional indicators are as follows:

- Project could interfere with the attainment of the federal or state ambient air quality standards by either violating or contributing to an existing or projected air quality violation

- Project could result in population increases within the regional statistical area which would be in excess of that projected in the AQMP and in other than planned locations for the project's build-out year.

- Project could generate vehicle trips that cause a CO hot spot.

In recognizing that emissions-based thresholds shown above are more applicable in a regional basis, the SCAQMD has developed a supplemental analysis protocol to evaluate primary pollutant impacts on a local basis. These criteria are called local significance thresholds (LST). They are deigned to evaluate the possibility of making measurably worse existing violations of local particulate standards violations or of creating new violations of standards for CO or NO_2. Although LSTs were designed for protecting socioeconomically disadvantaged minority

communities from disproportionate levels of additional air pollution, their use has become commonplace in the CEQA analysis process.

The SCAQMD CEQA Handbook also identifies various secondary significance criteria related to toxic, hazardous or odorous air contaminants. Except for the small diameter particulate matter ("PM-2.5") fraction of diesel exhaust generated by heavy construction equipment, there are no secondary impact indicators associated with project construction and maximum occupancy.

For PM-2.5 exhaust emissions, recently adopted policies require the gradual conversion of delivery fleets to diesel alternatives, or the use of "clean" diesel if their emissions are demonstrated to be as low as those from alternative fuels. Because health risks from toxic air contaminants (TAC's) are cumulative over an assumed 70-year lifespan, measurable off-site public health risk from diesel TAC exposure would occur for only a brief portion of a project lifetime, and only in dilute quantity.

SENSITIVE RECEPTORS

Air quality impacts are analyzed relative to those persons with the greatest sensitivity to air pollution exposure. Such persons are called "sensitive receptors." Sensitive population groups include young children, the elderly and the acutely and chronically ill (especially those with cardio-respiratory disease).

Possible residential areas in proximity to the proposed site are considered to be sensitive to air pollution exposure because they may be occupied for extended periods, and residents may be outdoors when exposure is highest. There are no sensitive receptors immediately adjacent to the project site. There are commercial uses (restaurants, gas stations, etc.) to the north and undeveloped land to the south of the Kanan/Agoura Road intersection. However, the residential caretaker units at Agoura Self Storage (29301 Agoura Road) and Conejo Valley Self Storage (29055 Agoura Road) would be considered the closest sensitive receptors relative to the roundabout site.

CONSTRUCTION ACTIVITY IMPACTS

Dust is typically the primary concern during construction of new buildings. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions." Emission rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). These parameters are not known with any reasonable certainty prior to project development and may change from day to day. Any assignment of specific parameters to an unknown future date is speculative and conjectural.

Because of the inherent uncertainty in the predictive factors for estimating fugitive dust generation, regulatory agencies typically use one universal "default" factor based on the area disturbed assuming that all other input parameters into emission rate prediction fall into midrange average values. This assumption may or may not be totally applicable to site-specific

conditions on the proposed project site. As noted previously, emissions estimation for project-specific fugitive dust sources is therefore characterized by a considerable degree of imprecision.

Average daily PM-10 emissions during site grading and other disturbance are shown in the CalEEMod2011.1.1 computer model to be about 10 pounds per acre. This estimate presumes the use of reasonably available control measures (RACMs). The SCAQMD requires the use of best available control measures (BACMs) for fugitive dust from construction activities.

Current research in particulate-exposure health suggests that the most adverse effects derive from ultra-small diameter particulate matter comprised of chemically reactive pollutants such as sulfates, nitrates or organic material. A national clean air standard for particulate matter of 2.5 microns or smaller in diameter (called "PM-2.5") was adopted in 1997. A limited amount of construction activity particulate matter is in the PM-2.5 range. PM-2.5 emissions are estimated to comprise 10-20 percent of PM-10.

In addition to fine particles that remain suspended in the atmosphere semi-indefinitely, construction activities generate many larger particles with shorter atmospheric residence times. This dust is comprised mainly of large diameter inert silicates that are chemically non-reactive and are further readily filtered out by human breathing passages. These fugitive dust particles are therefore more of a potential soiling nuisance as they settle out on parked cars, outdoor furniture or landscape foliage rather than any adverse health hazard.

CalEEMod was developed by the SCAQMD to provide a model by which to calculate both construction emissions and operational emissions from a residential or commercial land use project. It calculates both the daily maximum and annual average emissions for criteria pollutants as well as total or annual greenhouse gas (GHG) emissions.

Although exhaust emissions will result from on and off-site heavy equipment, the exact types and numbers of equipment will vary among contractors such that such emissions cannot be quantified with certainty. The CalEEMod2011.1.1 computer model was used to calculate emissions from the prototype construction equipment fleet and schedule as indicated in Table 6. The off-road equipment emissions load factors were adjusted in CalEEMod to account for a 33 percent reduction attributable to overestimation of load factors, which CARB has indicated to be appropriate.[1]

[1] In September 2010, the CARB announced that its methods used to estimate the load factor for off-road equipment were incorrect and led to an overestimate of emissions by a factor of 33 percent. CARB is currently revising their emissions model, OFFROAD which has not yet been released. CalEEMod is based on OFFROAD.

Table 6

CalEEMod Construction Activity Equipment Fleet and Workdays

Pavement Removal and Excavation (3 month)	2 Dozers
	2 Loader/Backhoes
	2 Concrete Saws
	1 Trencher
Paving and Roadway Improvements (9 moths)	2 Pavers
	2 Paving Equipment
	2 Rollers

Utilizing the indicated equipment fleet shown in Tables 6 the following worst case daily construction emissions are calculated by CalEEMod and are listed in Table 7.

Table 7

Construction Activity Emissions
Maximum Daily Emissions (pounds/day)

Maximal Construction Emissions	ROG	NOx	CO	SO_2	PM-10	PM-2.5	CO_2 (e)
2014	6.3	47.9	30.3	0.1	2.8	2.6	5,448.0
SCAQMD Thresholds	75	100	550	150	150	55	-

Source: CalEEMod.2011.1.1 output in appendix

Peak daily construction activity emissions are below their respective SCAQMD CEQA significance thresholds.

LOCALIZED SIGNIFICANCE THRESHOLDS

The SCAQMD has developed analysis parameters to evaluate ambient air quality on a local level in addition to the more regional emissions-based thresholds of significance. These analysis elements are called Localized Significance Thresholds (LSTs). LSTs were developed in response to Governing Board's Environmental Justice Enhancement Initiative 1-4 and the LST methodology was provisionally adopted in October 2003 and formally approved by SCAQMD's Mobile Source Committee in February 2005.

Use of an LST analysis for a project is optional. For the proposed project, the primary source of possible LST impact would be during construction. LSTs are most commonly applicable for particulate matter exposure for sensitive receptors which include residences, schools, medical facilities, day care centers or other locations where children, chronically ill individuals or other sensitive persons could be exposed to air pollution. LSTs include shorter exposure periods for NO_2 and CO. The worst-case assumption is that the receptor remains outdoors for the duration of the exposure period because indoor air pollution levels, particularly for particulate matter, are much lower than outdoors. For the proposed project site, the residential caretaker units at Agoura Self Storage (29301 Agoura Road) and Conejo Valley Self Storage (29055 Agoura Road) are the closest residential sensitive receptors relative to the roundabout site. The residential caretaker

unit at the Agoura Self Storage facility is approximately 175 feet from the nearest edge-of-pavement project roadway construction area while the caretaker unit at Coneja Valley Self Storage is more than 500 feet from the nearest construction activity.

LST screening tables are available for 25, 50, 100, 200 and 500 meter source-receptor distances. There are no sensitive uses with a potential 24-hours/day exposure immediately adjacent to the project site. The nearest residential use is more than 175 feet from the closest project perimeter and therefore a conservative receptor distance of 50 meters was selected for analysis.

The SCAQMD has issued guidance on applying CalEEMod to LSTs. LST pollutant screening level concentration data is currently published for 1, 2 and 5 acre sites for varying distances. Since CalEEMod calculates construction emissions based on the number of equipment hours and the maximum daily soil disturbance activity possible for each piece of equipment, the following tables should be used to determine the maximum daily disturbed-acreage for comparison to LSTs.

Table 8
Maximum Daily Disturbed Acreage per Equipment Type

Equipment Type	Acres/8-hr-day
Crawler Tractor	0.5
Graders	0.5
Rubber Tired Dozers	0.5
Scrapers	1

Based on this table, the proposed project will result in 2 disturbed daily acres during peak construction grading activity:

(2 dozer x 0.5 + 2 tractors x 0.5= 2.0 acres disturbed).

The following thresholds and emissions in Table 9 are determined (pounds per day).

Table 9
LST and Project Emissions (pounds/day)

LST 2.0 acres/50 meters	CO	NO_2	PM-10	PM-2.5
West San Fernando Valley	143	903	17	5
Max On-Site Emissions 2014	30	48	3	3

CalEEMod Output in Appendix

LSTs for the nearest residential use were compared to the maximum daily construction activities. As seen above, all emissions are below the LST thresholds for construction.

Commercial facilities are not included in the definition of sensitive receptor because employees do not typically remain on site for a full 24 hours, but are present for shorter periods of time, such as eight hours. However, an LST threshold for pollutants with shorter averaging periods, such as NO_2 and CO LSTs could also be applied to these receptors since it is reasonable to

assume that a worker at these sites could be present for periods of one to eight hours. There are several commercial facilities with proximity to the proposed site. Therefore, comparing LSTs for CO and NOx for a source receptor distance of 25 meters would provide the comparison (pounds per day) shown in Table 10:

Table 10
LST and Project Emissions Commercial Uses (pounds/day)

LST 2.0 acres/25 meters	CO	NOx
West San Fernando Valley	644	147
Max On-Site Emissions 2014	30	48

CalEEMod Output in Appendix (maximum mitigated emissions from on-site construction)

LSTs were compared to the maximum daily construction activities. As seen in Table 10, LST impacts are less-than-significant for adjacent commercial uses.

OPERATIONAL IMPACTS

The proposed project would not cause an increase in operational impacts and is not expected to generate additional vehicular trips as compared to a no-project condition. There are no project associated operational impacts.

Use of roundabouts reduces queuing delays for vehicles awaiting green lights and allows for designated turning movements without stopping. Because vehicular emission control programs have substantially reduced idling emissions over the last several decades, the idling "penalty" is not as dramatic as it used to be. Nevertheless, there is a tangible air quality benefit from idle reduction at signalized intersections.

The Kanan and Agoura Road intersection serves approximately 20,000 vehicles per day. Assuming an average vehicle delay of 10 seconds, a total of about 55 idle-hours are created. A roundabout has minor delay if the line of traffic is occupied, but perhaps 30 idle-hours may be saved per day. At an idle emission rate of 0.38 pounds per hour of CO and 0.03 pounds per hour of NOx (EMFAC2011 Computer Model) for passenger cars, the roundabout would "save" around 10 pounds of CO and around 1 pound of NOx per day. Such a benefit is not necessarily significant, but definitely positive.

MICROSCALE IMPACT ANALYSIS

There is a direct relationship between traffic/circulation congestion and CO impacts since exhaust fumes from vehicular traffic are the primary source of CO. CO is a localized gas that dissipates very quickly under normal meteorological conditions. Therefore, CO concentrations decrease substantially as distance from the source (intersection) increases. The highest CO concentrations are typically found in areas directly adjacent to congested roadway intersections. These areas of vehicle congestion have the potential to create pockets of elevated levels of CO which are called "hot spots ".

Micro-scale air quality impacts have traditionally been analyzed in environmental documents when the air basin was a non-attainment area for carbon monoxide (CO). However, the SCAQMD has demonstrated in the CO attainment redesignation request to EPA that there are no "hot spots", i.e., locations where emission concentrations expose individuals to elevated risks of adverse health effects, anywhere in the SCAB.

To verify this conclusion, a CO screening analysis was performed at Kanan Road and Agoura Road intersection utilizing turning movement data provided by the project traffic report. The one-hour CO concentration was calculated on the edge of pavement adjacent to this intersection. The significance of localized project impacts depends on whether the project would cause substantial concentrations of CO. A project is considered to have significant impacts if project-related mobile-source emissions result in an exceedance of the California one-hour and eight-hour CO standards, which are:

- 1-hour = 20 ppm
- 8-hour = 9 ppm

Calculations were made for existing traffic time frame as well as future conditions for the morning and evening peak hours. The results of the microscale impact analysis are shown below.

Table 11
One-Hour CO Concentrations (ppm) *

Kanan and Agoura Road Intersection	AM Peak Hour	PM Peak Hour
Existing Conditions	3.9	3.9
Year 2014 - Intersection Improvement	3.9	4.0
Year 2020 - Opening Year	3.7	3.8
Year 2035 - Buildout	3.6	3.7

*including 3.2 ppm background concentration

Eight-Hour CO Concentrations (ppm) *

Intersections	8-Hour
Existing Conditions	3.2
Year 2014 - Intersection Improvement	3.3
Year 2020 - Opening Year	3.1
Year 2035 - Buildout	3.1

*including 2.8 ppm background concentration

The existing peak one-hour local CO background level in 2011 in the project area vicinity was 3.2 ppm. With project implementation, in the existing time frame, inclusive of the local concentration, maximum one-hour concentration is estimated to be 3.9 ppm, which is well below the one-hour standard of 20 ppm. The maximum ambient 8-hour CO concentration in 2011 was 2.8 ppm. Maximum with project 8-hour CO concentration of 3.2 (inclusive of the background concentration) were compared to the 9 ppm significance threshold. Micro-scale air quality impacts are not significant.

As previously noted, there may be a very small CO benefit near the intersection/roundabout from idle time reduction. Because impacts even without any consideration of associated air benefits air negligible, no quantification of any additional benefit was attempted.

CONSTRUCTION EMISSIONS MITIGATION

Construction activities are not anticipated to cause dust emissions to exceed SCAQMD CEQA thresholds. Nevertheless, mitigation through enhanced dust control measures is recommended for use because of the non-attainment status of the air basin and because of the proximity of existing homes. Recommended mitigation includes:

Fugitive Dust Control

- Apply soil stabilizers or moisten inactive areas.
- Prepare and implement a high wind dust control plan.
- Stabilize previously disturbed areas if subsequent construction is delayed.
- Water exposed surfaces as needed to avoid visible dust leaving the construction site (typically 3 times/day).
- Cover all stock piles with tarps at the end of each day or as needed.
- Provide water spray during loading and unloading of earthen materials.
- Minimize in-out traffic from construction zone
- Cover all trucks hauling dirt, sand, or loose material or require all trucks to maintain at least two feet of freeboard
- Sweep streets daily if visible soil material is carried out from the construction site

Similarly, ozone precursor emissions (ROG and NOx) are calculated to be below SCAQMD CEQA thresholds during construction. However, because of the non-attainment for photochemical smog, the use of reasonably available control measures for diesel exhaust is recommended. Recommended combustion emissions control includes:

Exhaust Emissions Control

- Utilize well-tuned off-road construction equipment.
- Establish a preference for contractors using Tier 3-rated or better heavy equipment.
- Enforce 5-minute idling limits for both on-road trucks and off-road equipment.

GREENHOUSE GAS EMISSIONS

"Greenhouse gases" (so called because of their role in trapping heat near the surface of the earth) emitted by human activity are implicated in global climate change, commonly referred to as "global warming." These greenhouse gases contribute to an increase in the temperature of the earth's atmosphere by transparency to short wavelength visible sunlight, but near opacity to outgoing terrestrial long wavelength heat radiation in some parts of the infrared spectrum. The principal greenhouse gases (GHGs) are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. For purposes of planning and regulation, Section 15364.5 of the California Code of Regulations defines GHGs to include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. Fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of GHG emissions, accounting for approximately half of GHG emissions globally. Industrial and commercial sources are the second largest contributors of GHG emissions with about one-fourth of total emissions.

California has passed several bills and the Governor has signed at least three executive orders regarding greenhouse gases. GHG statues and executive orders (EO) include AB 32, SB 1368, EO S-03-05, EO S-20-06 and EO S-01-07.

AB 32 is one of the most significant pieces of environmental legislation that California has adopted. Among other things, it is designed to maintain California's reputation as a "national and international leader on energy conservation and environmental stewardship." It will have wide-ranging effects on California businesses and lifestyles as well as far reaching effects on other states and countries. A unique aspect of AB 32, beyond its broad and wide-ranging mandatory provisions and dramatic GHG reductions are the short time frames within which it must be implemented. Major components of the AB 32 include:

- Require the monitoring and reporting of GHG emissions beginning with sources or categories of sources that contribute the most to statewide emissions.
- Requires immediate "early action" control programs on the most readily controlled GHG sources.
- Mandates that by 2020, California's GHG emissions be reduced to 1990 levels.
- Forces an overall reduction of GHG gases in California by 25-40%, from business as usual, to be achieved by 2020.
- Must complement efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminants.

Statewide, the framework for developing the implementing regulations for AB 32 is under way. Maximum GHG reductions are expected to derive from increased vehicle fuel efficiency, from greater use of renewable energy and from increased structural energy efficiency. Additionally, through the California Climate Action Registry (CCAR now called the Climate Action Reserve), general and industry-specific protocols for assessing and reporting GHG emissions have been

developed. GHG sources are categorized into direct sources (i.e. company owned) and indirect sources (i.e. not company owned). Direct sources include combustion emissions from on-and off-road mobile sources, and fugitive emissions. Indirect sources include off-site electricity generation and non-company owned mobile sources.

Greenhouse Gas Emissions Significance Thresholds

In response to the requirements of SB97, the State Resources Agency developed guidelines for the treatment of GHG emissions under CEQA. These new guidelines became state laws as part of Title 14 of the California Code of Regulations in March, 2010. The CEQA Appendix G guidelines were modified to include GHG as a required analysis element. A project would have a potentially significant impact if it:

- Generates GHG emissions, directly or indirectly, that may have a significant impact on the environment, or,

- Conflicts with an applicable plan, policy or regulation adopted to reduce GHG emissions.

Section 15064.4 of the Code specifies how significance of GHG emissions is to be evaluated. The process is broken down into quantification of project-related GHG emissions, making a determination of significance, and specification of any appropriate mitigation if impacts are found to be potentially significant. At each of these steps, the new GHG guidelines afford the lead agency with substantial flexibility.

Emissions identification may be quantitative, qualitative or based on performance standards. CEQA guidelines allow the lead agency to "select the model or methodology it considers most appropriate." The most common practice for transportation/combustion GHG emissions quantification is to use a computer model such as CalEEMod, as was used in the ensuing analysis.

The significance of those emissions then must be evaluated; the selection of a threshold of significance must take into consideration what level of GHG emissions would be cumulatively considerable. The guidelines are clear that they do not support a zero net emissions threshold. If the lead agency does not have sufficient expertise in evaluating GHG impacts, it may rely on thresholds adopted by an agency with greater expertise.

On December 5, 2008 the SCAQMD Governing Board adopted an Interim quantitative GHG Significance Threshold for industrial projects where the SCAQMD is the lead agency (e.g., stationary source permit projects, rules, plans, etc.) of 10,000 Metric Tons (MT) CO_2 equivalent/year. In September 2010, the Working Group released revisions which recommended a threshold of 3,000 MT CO_2e for all land use types. This 3,000 MT/year recommendation has been used as a guideline for this analysis.

Construction Activity GHG Emissions

The build-out timetable is estimated by CalEEMod to be less than 2 years if the entire project were built-out at once. During project construction, the CalEEMod computer model predicts that the construction activities will generate the annual $CO_2(e)$ emissions identified in Table 12. Because the SCAQMD GHG emissions policy from construction activities is to amortize emissions over a 30-year lifetime, the amoritized annual total is also presented.

Table 12
Construction Emissions (Metric Tons $CO_2(e)$)

Year 2014	349.2
30 Year Annual Amoritized Rate	11.6
Significance Threshold	3,000

*CalEEMod Output provided in appendix

GHG impacts from construction are considered less-than-significant.

APPENDIX

CALEEMOD2011.1.1 COMPUTER MODEL OUTPUT

- Daily Emissions (lbs per day)
- Annual Emissions (tons per year)

Agoura Roundabout

South Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Other Asphalt Surfaces	6.3	Acre

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Utility Company**	Southern California Edison
Climate Zone	8	**Precipitation Freq (Days)**	31		

1.3 User Entered Comments

Project Characteristics -

Land Use - Roadway Improvements

Construction Phase - Pavement Removal and Demo: 3 month
Paving: 9 months

Off-road Equipment - Pavement Removal and Excavation: 2 Concrete Saws, 2Loader/Backhoes, 2 Dozers, 1 Trencher

Off-road Equipment - Paving: 2 Pavers, 2 Paving Equipment, 2 Rollers

Trips and VMT - 15-18 workers per day

Construction Off-road Equipment Mitigation -

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	0.56	3.65	2.41	0.00	0.03	0.26	0.29	0.00	0.26	0.26	0.00	348.28	348.28	0.04	0.00	349.22
Total	**0.56**	**3.65**	**2.41**	**0.00**	**0.03**	**0.26**	**0.29**	**0.00**	**0.26**	**0.26**	**0.00**	**348.28**	**348.28**	**0.04**	**0.00**	**349.22**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	0.56	3.65	2.41	0.00	0.03	0.26	0.29	0.00	0.26	0.26	0.00	348.28	348.28	0.04	0.00	349.22
Total	**0.56**	**3.65**	**2.41**	**0.00**	**0.03**	**0.26**	**0.29**	**0.00**	**0.26**	**0.26**	**0.00**	**348.28**	**348.28**	**0.04**	**0.00**	**349.22**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.31	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.31	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Pavement Removal and Excavation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.19	1.48	0.91	0.00		0.08	0.08		0.08	0.08	0.00	147.50	147.50	0.02	0.00	147.83
Total	**0.19**	**1.48**	**0.91**	**0.00**		**0.08**	**0.08**		**0.08**	**0.08**	**0.00**	**147.50**	**147.50**	**0.02**	**0.00**	**147.83**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	5.02	5.02	0.00	0.00	5.03
Total	**0.00**	**0.00**	**0.03**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**5.02**	**5.02**	**0.00**	**0.00**	**5.03**

3.2 Pavement Removal and Excavation - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.19	1.48	0.91	0.00		0.08	0.08		0.08	0.08	0.00	147.50	147.50	0.02	0.00	147.83
Total	**0.19**	**1.48**	**0.91**	**0.00**		**0.08**	**0.08**		**0.08**	**0.08**	**0.00**	**147.50**	**147.50**	**0.02**	**0.00**	**147.83**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	5.02	5.02	0.00	0.00	5.03
Total	**0.00**	**0.00**	**0.03**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**5.02**	**5.02**	**0.00**	**0.00**	**5.03**

3.3 Paving - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.34	2.10	1.35	0.00		0.18	0.18		0.18	0.18	0.00	173.21	173.21	0.03	0.00	173.80
Paving	0.01					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.35**	**2.10**	**1.35**	**0.00**		**0.18**	**0.18**		**0.18**	**0.18**	**0.00**	**173.21**	**173.21**	**0.03**	**0.00**	**173.80**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.01	0.06	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	9.51	9.51	0.00	0.00	9.51
Worker	0.01	0.01	0.08	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	13.03	13.03	0.00	0.00	13.05
Total	**0.02**	**0.07**	**0.12**	**0.00**	**0.02**	**0.00**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**22.54**	**22.54**	**0.00**	**0.00**	**22.56**

3.3 Paving - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.34	2.10	1.35	0.00		0.18	0.18		0.18	0.18	0.00	173.21	173.21	0.03	0.00	173.80
Paving	0.01					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.35**	**2.10**	**1.35**	**0.00**		**0.18**	**0.18**		**0.18**	**0.18**	**0.00**	**173.21**	**173.21**	**0.03**	**0.00**	**173.80**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.01	0.06	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	9.51	9.51	0.00	0.00	9.51
Worker	0.01	0.01	0.08	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	13.03	13.03	0.00	0.00	13.05
Total	**0.02**	**0.07**	**0.12**	**0.00**	**0.02**	**0.00**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**22.54**	**22.54**	**0.00**	**0.00**	**22.56**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity Unmitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
Other Asphalt Surfaces	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
Other Asphalt Surfaces	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.31	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	1.31	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.32					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.99					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.31**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.32					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.99					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.31**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
Other Asphalt Surfaces	0 / 0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
Other Asphalt Surfaces	0 / 0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Other Asphalt Surfaces	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Other Asphalt Surfaces	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

9.0 Vegetation

Agoura Roundabout

South Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Other Asphalt Surfaces	6.3	Acre

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Utility Company**	Southern California Edison
Climate Zone	8	**Precipitation Freq (Days)**	31		

1.3 User Entered Comments

Project Characteristics -

Land Use - Roadway Improvements

Construction Phase - Pavement Removal and Demo: 3 month
Paving: 9 months

Off-road Equipment - Pavement Removal and Excavation: 2 Concrete Saws, 2Loader/Backhoes, 2 Dozers, 1 Trencher

Off-road Equipment - Paving: 2 Pavers, 2 Paving Equipment, 2 Rollers

Trips and VMT - 15-18 workers per day

Construction Off-road Equipment Mitigation -

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	0.56	3.65	2.41	0.00	0.03	0.26	0.29	0.00	0.26	0.26	0.00	348.28	348.28	0.04	0.00	349.22
Total	**0.56**	**3.65**	**2.41**	**0.00**	**0.03**	**0.26**	**0.29**	**0.00**	**0.26**	**0.26**	**0.00**	**348.28**	**348.28**	**0.04**	**0.00**	**349.22**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	0.56	3.65	2.41	0.00	0.03	0.26	0.29	0.00	0.26	0.26	0.00	348.28	348.28	0.04	0.00	349.22
Total	**0.56**	**3.65**	**2.41**	**0.00**	**0.03**	**0.26**	**0.29**	**0.00**	**0.26**	**0.26**	**0.00**	**348.28**	**348.28**	**0.04**	**0.00**	**349.22**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.31	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.31	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Pavement Removal and Excavation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.19	1.48	0.91	0.00		0.08	0.08		0.08	0.08	0.00	147.50	147.50	0.02	0.00	147.83
Total	**0.19**	**1.48**	**0.91**	**0.00**		**0.08**	**0.08**		**0.08**	**0.08**	**0.00**	**147.50**	**147.50**	**0.02**	**0.00**	**147.83**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	5.02	5.02	0.00	0.00	5.03
Total	**0.00**	**0.00**	**0.03**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**5.02**	**5.02**	**0.00**	**0.00**	**5.03**

3.2 Pavement Removal and Excavation - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.19	1.48	0.91	0.00		0.08	0.08		0.08	0.08	0.00	147.50	147.50	0.02	0.00	147.83
Total	**0.19**	**1.48**	**0.91**	**0.00**		**0.08**	**0.08**		**0.08**	**0.08**	**0.00**	**147.50**	**147.50**	**0.02**	**0.00**	**147.83**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	5.02	5.02	0.00	0.00	5.03
Total	**0.00**	**0.00**	**0.03**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**5.02**	**5.02**	**0.00**	**0.00**	**5.03**

3.3 Paving - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.34	2.10	1.35	0.00		0.18	0.18		0.18	0.18	0.00	173.21	173.21	0.03	0.00	173.80
Paving	0.01					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.35**	**2.10**	**1.35**	**0.00**		**0.18**	**0.18**		**0.18**	**0.18**	**0.00**	**173.21**	**173.21**	**0.03**	**0.00**	**173.80**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.01	0.06	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	9.51	9.51	0.00	0.00	9.51
Worker	0.01	0.01	0.08	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	13.03	13.03	0.00	0.00	13.05
Total	**0.02**	**0.07**	**0.12**	**0.00**	**0.02**	**0.00**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**22.54**	**22.54**	**0.00**	**0.00**	**22.56**

3.3 Paving - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.34	2.10	1.35	0.00		0.18	0.18		0.18	0.18	0.00	173.21	173.21	0.03	0.00	173.80
Paving	0.01					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.35**	**2.10**	**1.35**	**0.00**		**0.18**	**0.18**		**0.18**	**0.18**	**0.00**	**173.21**	**173.21**	**0.03**	**0.00**	**173.80**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.01	0.06	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	9.51	9.51	0.00	0.00	9.51
Worker	0.01	0.01	0.08	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	13.03	13.03	0.00	0.00	13.05
Total	**0.02**	**0.07**	**0.12**	**0.00**	**0.02**	**0.00**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**22.54**	**22.54**	**0.00**	**0.00**	**22.56**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity Unmitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
Other Asphalt Surfaces	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
Other Asphalt Surfaces	0					0.00	0.00	0.00	0.00
Total						0.00	0.00	0.00	0.00

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.31	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	1.31	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.32					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.99					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.31**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.32					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.99					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.31**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
Other Asphalt Surfaces	0 / 0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
Other Asphalt Surfaces	0 / 0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Other Asphalt Surfaces	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Other Asphalt Surfaces	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

9.0 Vegetation

APPENDIX C
BIOLOGICAL RESOURCES ASSESSMENT

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Environmental Analysis & Compliance

Urban Planning & Design

Real Estate Development & Entitlement

Environmental Restoration

Real Estate Economics & Valuation

28328 Agoura Road
Agoura Hills, California 91301

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March 21, 2013

City of Agoura Hills
Department of Planning and Community Development Services
30001 Ladyface Court
Agoura Hills, CA 91301

Attn: Ms. Allison Cook, Principal Planner

Subj: Biological Resources Assessment and Impact Analysis - Kanan Road/Agoura Road Roundabout Project

Dear Ms. Cook:

Envicom Corporation has prepared this biological resource assessment and impact analysis for the Kanan Road/Agoura Road Roundabout Project site (hereinafter the "site") located in western Los Angeles County within the City of Agoura Hills, California. The City of Agoura Hills plans to construct a roundabout at the intersection of Kanan Road and Agoura Road and to widen Agoura Road on each side of the intersection. Construction of the roundabout and roadway improvements would affect developed and undeveloped, disturbed areas surrounding Kanan Road and Agoura Road.

This report provides an assessment of baseline biological conditions and an impact analysis for use in preparation of a CEQA document for the proposed project. The analysis is based on a project plan provided by Kimley-Horn and Associates, Inc. on January 22, 2013, which is attached to this report. This report first covers literature reviewed and the field survey conducted to characterize the biological resources at the site, followed by an analysis of impacts to sensitive plant communities, special-status plant species, protected trees, jurisdictional areas, special-status wildlife, and wildlife movement. Recommended mitigation measures to offsite project impacts are provided. Lists of plant and wildlife species observed, and an analysis of the potential for special-status plant and wildlife species to occur at the site are provided as attachments to the report.

Methods

A literature review was performed in preparation for field surveys that included information available in peer reviewed journals, standard biological references, and relevant lists and databases pertaining to the status and known occurrences of sensitive and special-status biological resources. Other sources of information included aerial photographs, topographic maps, soil survey maps, relevant policy and planning documents, and previous biological studies of the site. The following sources were among those reviewed in preparation for field surveys, or that were consulted during preparation of this report:

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- Biogeographic Information and Observation System (BIOS), California Department of Fish and Wildlife (CDFW), formerly the California Department of Fish and Game (CDFG), data as of March 1, 2013;
- California Natural Diversity Database (CNDDB) Rarefind 4 report for the 7.5' USGS Thousand Oaks quadrangle and eight surrounding quadrangles, CDFW, data as of March 1, 2013;
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California report for the 7.5' USGS Calabasas quadrangle and eight surrounding quadrangles, CNPS, data as of March 1, 2013;
- FWS Critical Habitat Mapper for Threatened and Endangered Species, U.S. Fish and Wildlife Service (USFWS), data as of March 1, 2013;
- List of Special Vascular Plants, Bryophytes, and Lichens, CDFW, January 2013;
- List of Vegetation Alliances and Associations (Natural Communities List), CDFG, September 2010;
- Special Animals, CDFG, January 2011;
- City of Agoura Hills General Plan Natural Resources Element, City of Agoura Hills, March 2010;
- Agoura Hills Specific Plan, City of Agoura Hills, October 22, 2008; and,
- Agoura Hills Specific Plan Updated Final Revised and Recirculated Environmental Impact Report, City of Agoura Hills, August 2008.

A biological survey of the site was conducted on February 20 and February 21, 2013 by Jim Anderson, biologist at Envicom Corporation. The survey involved a search for protected and regulated biological resources, including rare, threatened, and endangered plant and wildlife species, special habitats, sensitive natural communities, jurisdictional Waters of the United States, jurisdictional streambed and riparian habitat, and locally protected resources, as well as an evaluation of the importance of the site for wildlife movement. The survey area included the project site as well as a 50-foot buffer around the site. The entire survey area was accessible. The survey was conducted on February 20 between the hours of 2:15 p.m. and 6 p.m. in cool conditions (mid to upper 50s °F) with no clouds and very light wind, and on February 21 between the hours of 12:15 p.m. and 1:30 p.m. in warm conditions (low to mid-60s °F) with 35% cloud cover and winds of ~5 m.p.h. The survey was performed by slowly walking transects across the site and by investigating particular areas thoroughly, as necessary. The survey methodology resulted in an investigation of all plant communities and habitats on the property. A complete inventory of vascular plants and wildlife observed at the site was recorded, with all species identified to the taxonomic level necessary to determine their status. Vascular plant species determinations were made using Flora of the Santa Monica Mountains, California, 2nd edition and The Jepson Manual: Vascular Plants of California, 2nd edition. Vertebrate wildlife species observed at and in the vicinity of the site were identified by direct observation, sign (e.g., tracks, scat, or burrows), or

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vocalization. Wildlife species identification relied upon Reid (2006), Sibley (2009), and Stebbins (2003). Species nomenclature conforms to Baldwin. B. et al. (2012) for vascular plants, American Ornithologists' Union (2011) for birds, Baker et al. (2003) for mammals, and Stebbins (2003) for reptiles.

EXISTING CONDITIONS

Setting/Site Condition

The site consists of developed areas such as paved roads and sidewalks as well as undeveloped, disturbed areas that are barren or sparsely vegetated, or that contain non-native grasses and forbs and isolated shrubs, native oak trees, and non-native pepper trees. The site topography is generally flat to gradually sloped except for an embankment along the south side of Agoura Road and a steep roadcut to the east of Kanan Road. Elevations range from approximately 845 feet to 890 feet. According to a recent Natural Resources Conservation Service soil map of the Santa Monica Mountains, soils at the site are predominately comprised of fill materials. Soils in the southern portion of the site surrounding Kanan Road are clay loams (Wasner, A., 2006). A large unpaved, barren area to the southwest of the existing intersection is used seasonally for commercial activities. This area and additional barren areas to the southeast of the intersection are also used routinely by motor vehicles as turnarounds and as temporary rest stops. Lindero Canyon Creek flows in a culvert beneath Agoura Road near the western end of the project site. The culvert discharges to an open channel lined with grouted rock riprap on the south side of Agoura Road. Areas to the north of the project site are built-up, while areas immediately south are undeveloped and generally disturbed, although farther to the south the landscape transitions to extensive undisturbed native habitat.

Vegetation and Plant Communities

Vegetation within the built-up and developed portion of the project site is predominately ornamental, although there are a few native valley oaks (*Quercus lobata*) and coast live oaks (*Quercus agrifolia*) along the northern side of Agoura Road, and some roadside areas that are not landscaped contain common urban weeds.

The focus of this section is the naturally occurring vegetation within the undeveloped portions of the project site to the south of Agoura Road. The composition and condition of the vegetation in these areas reflects a long history of disturbance.

The most prevalent plant community within undeveloped areas of the site is an herbaceous community dominated by non-native grasses and forbs, which is interspersed with a few native shrubs and native valley oaks and coast live oaks. Representative species include annual brome grasses (*Bromus madritensis* ssp. *rubens, Bromus hordaceous, Bromus diandrus*), slender wild oat (*Avena barbata*), hoary mustard (*Hirschfeldia incana*), bur-clover (*Medicago polymorpha*), black mustard (*Brassica nigra*), tecolote (*Centaurea melitensis*),

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foxtail barley (*Hordeum murinum*), and Italian thistle (*Carduus pycnocephalus*). Although strongly dominated by non-natives, a few native shrubs and herbs are also sparsely distributed in these areas, such as California sand-aster (*Corethrogyne filaginifolia*), coyote bush (*Baccharis pilularis*), common fiddleneck (*Amsinckia menziesii* var. *intermedia*), narrowleaf milkweed (*Asclepias fascicularis*), slender tarplant (*Deinandra fasciculata*), turkey mullein (*Croton setiger*), American bird's-foot trefoil (*Acmispon americanus*), and red maids (*Calandrinia ciliata*).

Barren and sparsely vegetated areas also cover a significant proportion of the project site. Barren and sparsely vegetated areas are cleared, mowed, or otherwise disturbed on a routine basis. Representative species observed in these areas during the biological survey include red brome, foxtail barley, hoary mustard, bur-clover, small-flowered cheeseweed (*Malva parviflora*), Mediterranean grass (*Schismus* sp.), pineapple weed (*Matricaria discoidea*), red-stemmed filaree (*Erodium cicutarium*), and Peruvian pepper trees (*Schinus molle*). These areas generally lack native species.

A disturbed California buckwheat scrub community occurs on and in the vicinity of the steep roadcut to the east of Kanan Road in the southern portion of the project site. This community is relatively common in the region on roadcuts and in disturbed roadside areas. Representative species on the roadcut include California buckwheat (*Erigonum fasciculatum*), wand buckwheat (*Eriogonum elongatum*), California aster (*Corethrogyne filaginifolia*), chalk live-forever (*Dudleya pulverulenta*), and a variety of non-native herbs.

Mature native valley oaks as well as a few smaller valley oaks and coast live oaks are concentrated along the south side and, as previously mentioned, along the north side of Agoura Road. The mature oaks to the south of Agoura Road appear to be a remnant of what was a more extensive valley oak woodland or savanna that occurred in the area prior to suburban development. A few shrubs grow beneath the canopies and in vicinity of the oak trees, including native chaparral honeysuckle (*Lonicera subspicata*), native blue elderberry (*Sambucus nigra* ssp. *caerulea*), and the non-native horehound (*Marrubium vulgare*). The National Park Service (NPS) has identified these oak trees in their recent vegetation map of the Santa Monica Mountains and environs as a part of a Valley Oak/Annual Grass-herb Woodland plant community (Aerial Information Systems, Inc., May 23, 2007).

The plant communities at the site were correlated with those plant communities included in the Vegetation Classification of the Santa Monica Mountains Natural Recreation Area and Environs in Ventura and Los Angeles Counties, California (CDFG/CNPS, January 2006) and the List of Vegetation Alliances and Associations (Natural Communities List) (CDFG, September 2010). These documents provide comprehensive lists of officially recognized plant communities occurring in the Santa Monica Mountains and environs and in the State of California, respectively. In these documents, each plant community is

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assigned a conservation status rank (also known as "rarity rank"), which is used to determine the sensitivity of the plant community. Plant communities with global or state status ranks of G1 through G3, or S1 through S3, respectively, are considered to be sensitive, and are referred to as "natural communities of special concern." Sensitive plant communities are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. Plant communities are classified based on plant species composition and abundance, as well as the underlying abiotic conditions of the stand, such as slope, aspect, or soil type.

The plant communities at the site include California Annual Grassland/Herbaceous (unranked), disturbed California Buckwheat Shrubland [G5S5], and disturbed Valley Oak Woodland/Annual Grass-herb Woodland [G3S3]. Although the California Annual Grassland/Herbaceous plant community has not been assigned a conservation status rank, these areas are dominated by non-native grasses and forbs and are clearly not sensitive. The California Buckwheat Shrubland plant community found on and adjacent to the roadcut along Kanan Road is also non-sensitive. The Valley Oak Woodland/Annual Grass-herb plant community is assigned a G4S4 rank by the Santa Monica Mountains vegetation classification, i.e., a non-sensitive ranking (CDFG/CNPS, January 2006). However, the CDFW Natural Communities List, which is a more recent document, assigns the same community type a G3S3 rank, indicating the Valley Oak Woodland/Annual Grass-herb plant community is vulnerable and at moderate risk of extinction (CDFG, September 2010). Although the valley oak woodland does receive a G3S3 conservation status rank, site investigation reveals that the woodland in this case lacks significant resource value due to its highly disturbed condition and very close proximity to existing development and, therefore, provision of protected status for the woodland in this case is not warranted.

The project would not have a substantial adverse effect on a sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service, and impacts to sensitive plant communities would therefore be less than significant.

Plant Species Observed

A total of 86 vascular plant taxa were identified during the survey of the site and a 50-foot buffer around the site, including 68 dicots and 18 monocots. Forty-five (45) of the plants observed were native and 41 were non-native, representing relatively low diversity of native species and a significant percentage of non-natives. A complete list of the vascular plant species observed within the survey area is attached to this report. Ornamental species in landscaped areas were not surveyed and are thus are not included in this list.

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Special-Status Plant Species

Special-status plant species either have unique biological significance, limited distribution, restricted habitat requirements, particular susceptibility to human disturbance, or a combination of these factors. For the purposes of this assessment, special-status plant species are those plants listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS under the Federal Endangered Species Act (FESA); those listed or proposed for listing as rare, threatened, or endangered by the CDFW under the California Endangered Species Act (CESA); and plants occurring on List 1B (which includes rare, threatened, or endangered species in California and elsewhere) and on List 2 (plants considered rare, threatened, or endangered in California, but more common elsewhere) of the CNPS Inventory of Rare and Endangered Plants.

No plant species listed as rare, threatened, or endangered were found during the biological survey. Prior to the field survey, the California Natural Diversity Database (CNDDB) (CDFW 2013) was reviewed for reported occurrences of special-status "elements" on the Thousand Oaks quadrangle and eight adjacent quadrangles to assess which special-status plant species could potentially occur at the site. Special-status species not reported by the CNDDB that are anticipated to occur in the region were also considered. The analysis of the potential for occurrence of special-status plants is attached to this report, which includes growth form, blooming period, protected status, primary habitat associations, and an assessment of the potential for occurrence as high, moderate, low, or none. Given the highly disturbed condition of the site and the results of this survey and prior springtime botanical surveys of the southwestern portion of the site by Envicom Corporation in 2006, 2008, and 2009, special-status plant species are considered to be absent.

The project would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service, and therefore impacts to special-status plant species would be less than significant.

Protected Oak Trees

Oak trees and scrub oak habitat (species in the genus *Quercus*) within the City of Agoura Hills are protected by the City's Oak Tree Ordinance. There are valley oaks and coast live oaks of ordinance size on the property, as well as a few oak trees that likely do not meet criteria for protection under the ordinance. Although the presence of protected trees on the property was confirmed during the biological survey that was conducted to prepare this report, documentation of the species, location, and condition of protected trees that would require protection pursuant to the City's ordinance was outside the scope of this study. Refer to the oak tree study by L. Newman Design Group (in preparation), for a study of the trees on the property with respect to their protection under the City's oak tree protection ordinance.

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It is presumed that mitigation would be necessary for the loss of individual oak trees at the site pursuant to the City's Oak Tree Ordinance. The replacement oak trees could be planted, if practicable, within the area identified as valley oak woodland by NPS, which extends approximately 200 feet to the south of the project site along the eastern side of Lindero Canyon Creek in order to preserve what remains of a remnant of valley oak woodland in the area. This is suggested in the context that significant acreage of valley oak woodland has been lost to agricultural and urban development such that a low percentage of the historical distribution of this sensitive woodland community remains in the area. In addition, the City of Agoura Hills is near the southernmost extent of the range of valley oak woodland in the State.

Jurisdictional Areas

The only jurisdictional feature (e.g., drainages, wetlands) within the project site is perennial Lindero Canyon Creek, a United States Geological Survey (USGS) "blue-line" stream, which flows in a culvert beneath the project site and Agoura Road. A short distance to the south of the project limits the culvert discharges to an open channel, which is lined with grouted rip-rap along its eastern bank. There is a cattail wetland (*Typha angustifolia*; *Typha latifolia*) along the margins of the open channel and approximately 150 feet to the south of the site the creek is surrounded by riparian willow woodland (*Salix lasiolepis, Salix laevigata*). Lindero Canyon Creek falls under the regulatory jurisdiction of the Army Corps of Engineers (ACOE), the CDFW, and the Regional Water Quality Control Board (RWQCB).

The jurisdictional wetlands, open waters, and riparian habitats of Lindero Canyon Creek would not be directly impacted by the project. However, due to the close proximity of the creek to the project site, the creek could be subject to inadvertent encroachment, which has the potential to result in the discharge of fill material and other materials to the creek or the loss or damage to wetland and riparian habitats, which would be a significant impact. The following mitigation measure would reduce the potential for significant impacts to jurisdictional areas along Lindero Canyon Creek to a less than significant level.

Jurisdictional Areas

Prior to all ground disturbing and construction activities, the City of Agoura Hills shall demarcate an appropriate buffer around the jurisdictional areas adjacent to the project footprint with sturdy exclusionary fencing to prevent encroachment of project activities into jurisdictional areas and to dissuade wildlife from entering the construction area. The fencing shall be marked with high visibility tape and signage identifying the stream and associated wetland and riparian habitats as a "sensitive habitat area." The fencing shall be placed such that it does not interfere with the movement of wildlife within native habitats or along Lindero Canyon Creek. A qualified biologist approved by the City's Environmental Analyst shall verify that the fencing has been correctly installed prior to the start of ground disturbance or construction activities. The

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fencing shall be routinely inspected and maintained in functional condition for the duration of the project.

Wildlife Observed

Wildlife species observed during the biological survey of the site were species common or relatively common to the region. Wildlife observed during the survey consisted of one (1) reptile, 18 species of birds, and three (3) mammals, including the western fence lizard (*Sceloporus occidentalis*), acorn woodpecker (*Melanerpes formicivorus*), American crow (*Corvus brachyrhynchos*), black phoebe (*Sayornis nigricans*), California towhee (*Pipilo crissalis*), Cassin's kingbird (*Tyrannus vociferans*), dark-eyed junco (*Junco hyemalis*), house finch (*Carpodacus mexicanus*), lesser goldfinch (*Carduelis psaltria*), mallard (*Anas platyrhynchos*), northern flicker (*Colaptes auratus*), oak titmouse (*Baeolophus inornatus*), red-tailed hawk (*Buteo jamaicensis*), Say's phoebe (*Sayornis saya*), song sparrow (*Melospiza melodia*), western scrub jay (*Apehelocoma californica*), white-breasted nuthatch (*Sitta carolinensis*), white-crowned sparrow (*Zonotrichia leucophrys*), yellow-rumped warbler (*Dendroica coronata*), California ground squirrel (*Spermophilus beecheyi*), coyote (*Canis latrans ochropus*), and desert cottontail (*Sylvilagus audubonii sanctidiegi*). This list represents only a sample of the wildlife species that can be expected to forage or occur temporarily at the site. Furthermore, in general, this list includes species that are more easily detected during daytime surveys. Some species (e.g., some common reptiles, birds, and small mammals) may reproduce at the site, and several larger or more mobile species can be expected to utilize the site's resources routinely or occasionally, including numerous species of birds, foraging raptors, and medium to large-sized mammals that are often found at the urban-wildland interface (e.g., raccoon, skunk, and coyote). Bird species observed during the survey consisted primarily of year-round and winter residents, and potential migrants. Some species of birds could nest at the site in trees, shrubs, or dense herbaceous vegetation, and several species of birds undoubtedly nest in the vicinity of the site in any given year.

Special-Status Wildlife

No rare, threatened, or endangered wildlife species were identified during the biological survey of the site. As a single daytime biological survey cannot verify the presence/absence of the wildlife species that use a site, an analysis of the potential for rare, threatened, and endangered wildlife species to occur at the property was also performed. The potential for occurrence analysis was based on the reported range and distribution of the species and the type and extent of habitat available at the site. Considered in the analysis were rare, threatened, and endangered wildlife species with recorded observations in the region, based on CNDDB records from the USGS 7.5' Thousand Oaks and eight adjacent quadrangles. For the purposes of the analysis, a "rare, threatened, or endangered wildlife species" is a species that is listed, proposed for listing, or meets the criteria for listing as endangered, threatened, or rare under the FESA or CESA, or is listed on the CDFW Special Animals list with a designation of CSC (California

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Species of Special Concern) or CFP (California Fully Protected). The potential for occurrence analysis, which includes the species protected status, primary habitat associations, and potential for occurrence (high, moderate, low, none), is attached to this report.

The use of the site by special-status vertebrate wildlife species, although unlikely, is limited to one (1) reptile, three (3) species of birds, and five (5) species of mammals listed as California Species of Special Concern, as well as one (1) bird listed as California Fully Protected. No species listed as threatened or endangered under the FESA or the CESA have any reasonable potential to occur at the site. The white-tailed kite (*Elanus leucurus*) [CFP] has moderate potential to forage on a temporary basis over the site and in the surrounding area. Special-status wildlife species listed as Species of Special Concern with low potential to occur at the site include the coast horned lizard (*Phrynosoma blainvillii*), loggerhead shrike (*Lanius ludovicianus*), burrowing owl (*Athene cunicularia*), Vaux's swift (*Chaetura vauxi*), pallid bat (*Antrozous pallidus*), spotted bat (*Euderma maculatum*), Townsend's big-eared bat (*Corynorhinus townsendii*), western mastiff bat (*Eumops perotis californicus*), and western red bat (*Lasiurus blossevillii*). All of these species are anticipated to only forage at the site or pass through or roost on a temporary basis and would not inhabit or reproduce at the site. Also, as all special-status wildlife species that may occur at the site would occur only rarely or occasionally, they would not be significantly affected by habitat loss that would result from development of the proposed project, as the impacted area would represent an exceedingly small proportion of the available habitat within their ranges. Although the white-tailed kite, loggerhead shrike, and Vaux's swift would be capable of escaping harm by the project, the other species are slow moving or could be present in burrows or cavities and could be directly impacted by the project. Direct impacts to a special-status species would be a significant impact.

Implementation of the following mitigation measure would reduce potential impacts to special-status wildlife species to a less than significant level:

Special-Status Wildlife

Prior to commencement of ground or vegetation disturbing activities, a qualified biologist shall conduct two pre-project surveys for special-status wildlife species. The first survey shall be conducted no more than seven (7) days prior to commencement of project activities and the second survey shall be conducted no more than three (3) days prior to the commencement of project activities. The pre-project survey shall incorporate methods to detect the special-status wildlife species that could potentially occur at the site. Prior to commencement of the proposed activity, the methods and results of the surveys shall be presented in a letter report to the City and CDFW. If a state special-status species is found, the measures to be employed to avoid impacts to the species shall be outlined in the letter report to the City and CDFW for review and concurrence. Should a federally listed species be found, the United States Fish and Wildlife Service (USFWS) shall be notified. If avoidance is

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not feasible, appropriate measures to mitigate for the presence of the species onsite shall be determined in consultation with the City, CDFW, and USFWS, if applicable, which may involve the capture and transfer of the species to an appropriate habitat and location where the species would not be harmed by project activities. The biologist shall hold the requisite permits for the capture and handling of the species. If a special-status species is found during pre-project surveys, a qualified biologist shall monitor all ground and vegetation disturbing project activities in that area. The biological monitor shall conduct ongoing searches for special-status species throughout project activities and implement all agreed upon measures to avoid impacts to the species.

Nesting Birds

The native and non-native trees, shrubs, and dense herbaceous vegetation at the site and the native and non-native habitats in the surrounding area provide potential nesting/breeding habitat for birds, including raptors. Several bird species may potentially nest at or in the vicinity of the proposed project site, and could therefore be subject to direct or indirect adverse impacts by the project. Grading and construction if conducted during the nesting bird season (February 1 to September 15) would have the potential to result in the loss of trees, shrubs, and dense herbaceous vegetation that could contain active bird nests. In addition, grading and construction would occur within 500 feet of habitats, including riparian habitats, that could contain active nests of raptors and other sensitive bird species, which could be susceptible to indirect impacts due to construction activities and noise. Project activities that result in the loss of bird nests, eggs, and young, would be in violation of one or more of California Fish and Game Code sections 3503 (any bird nest), 3503.5 (birds-of-prey), or 3511 (Fully Protected birds). In addition, removal or destruction of one or more active nests of any other birds listed by the federal Migratory Bird Treaty Act of 1918 (MBTA), whether nest damage was due to vegetation removal or to other construction activities, would be considered a violation of the MBTA and California Fish and Game Code Section 3511, and therefore would be a significant, but mitigable impact.

Implementation of the following mitigation measure would reduce potential impacts to nesting/breeding birds to a less than significant level:

Nesting Birds

To the extent feasible, the City of Agoura Hills shall not remove or otherwise disturb vegetation or conduct any other site preparation or construction related activities within the work areas to avoid impacts to breeding/nesting birds from February 1 to August 31, the recognized breeding, nesting and fledging season for raptor and bird species. If vegetation disturbance (e.g., disturbance, cutting, or removal of oak trees), site preparation, or construction related activities in the work areas during the breeding/nesting season cannot be avoided, then prior initiation of the activities, the City shall have a qualified biologist survey all breeding/nesting habitats with the work areas and vicinity. Between February 1 and August 31, prior to the initiation of any disturbance to

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vegetation, site preparation, or constructed related activities, two surveys shall be conducted. The first survey shall be conducted no more than two weeks prior and the second survey no more than three days prior to initiation of vegetation disturbance, site preparation, or construction activities. If active nests are found within the survey area, activities within a 300-foot radius (500 feet for raptors) shall stop until an appropriate buffer can be established. Activities within the fenced area shall be postponed or halted, at the discretion of a biological monitor, until the nest is vacated and juveniles have fledged, as determined by the biologist, and there is no evidence of a second attempt at nesting. If a state or federally listed species is found, the CDFW and the USFWS, when applicable, shall be notified within 24 hours of the sighting, and the Applicant shall not proceed with construction activities until concurrence has been received that operations may proceed.

Wildlife Movement

The term wildlife movement corridor is used to describe physical connections that allow wildlife to move between patches of suitable habitat in both undisturbed landscapes as well as environments fragmented by urban development to access essential habitat for water, foraging, breeding, and cover. Wildlife movement corridors are also necessary for dispersal and migration, to ensure the mixing of genes between populations, and so wildlife can respond and adapt to environmental stress. Examples of barriers or impediments to movement include housing and other urban development, roads, fencing, unsuitable habitat, or open areas with little vegetative cover. Wildlife crossings are generally small, narrow areas allowing wildlife to pass through an obstacle or barrier, such as a roadway to reach another patch of habitat. These can be critical at both the local and regional level. Wildlife crossings include culverts, drainage pipes, underpasses, tunnels, and, more recently, crossings created specifically for wildlife movement over highways.

To assess the project's potential to impact wildlife movement, the Santa Monica Mountains National Recreation Area (SMMNRA) Land Protection Plan (March 1998) and the South Coast Missing Linkages Project: A Linkage Design for the Santa Monica Mountains-Sierra Madre Connection (Penrod, K. et. al., 2006) were reviewed to determine if the project site is within an area that has been identified as an important wildlife corridor or an important linkage necessary for maintaining connectivity between large areas of core natural habitat. The project site was also evaluated in conjunction with surrounding habitats for its potential importance to wildlife movement, and for its potential to create impediments or barriers to wildlife movement at regional and local scales.

The SMMNRA Land Protection Plan and the South Coast Missing Linkages Project do not identify the project site as part of an important wildlife corridor or an important linkage necessary for maintaining connectivity between large areas of core natural habitat.

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The upland areas at the project site are clearly not important to wildlife movement. The project site is at the margin of the City's urban footprint and the extensive natural habitats in the foothills to the south of project site are suitable for wildlife movement through the area. Also, the culvert beneath Agoura Road is not expected to be important to wildlife movement, despite that creeks and riparian habitat are typically wildlife movement corridors and can facilitate movement through urban areas, and culverts beneath busy roads are often important wildlife crossings. This is because Lindero Canyon Creek is culverted for long distances between Lake Lindero and Agoura Road and, furthermore, the perennial flow of water through the culvert is a barrier to the movement of most species. Anadromous fishes such as the federally Endangered southern steelhead (*Oncorhynchus mykiss irideus*) cannot migrate along Lindero Canyon Creek due to barriers to their upstream movement located far downstream from the project site (e.g., the Rindge Dam in the lower reaches of Malibu Creek). Regardless, the culvert would not be affected by the project, and the project would not create a barrier or impediment to wildlife movement along Lindero Canyon Creek. As the project would not interfere substantially with the movement of wildlife, impacts to wildlife movement would be less than significant.

CONCLUSION

The proposed project would not significantly impact special-status plant species or interfere substantially with the movement of wildlife. The proposed project could result with low probability in direct impacts to potentially occurring special-status wildlife species. The proposed project would not directly impact areas under the jurisdiction of the ACOE, CDFW, or RWQCB. However, due to the proximity of the project site to jurisdictional wetlands, waters and riparian habitat, the project could result in incidental encroachment into these areas, which would be a significant impact. Also, nesting birds, nearly all of which are protected by State and Federal regulations, have potential to be harmed or disturbed by the project. Implementation of the identified mitigation measures for jurisdictional areas, special-status wildlife species, and nesting birds would reduce the anticipated project impacts to biological resources to a less than significant level.

Should you have any questions regarding the information provide herein, please do not hesitate to give me a call.

Sincerely,

Jim Anderson
Senior Biologist

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Attachments:

Appendix A - Vascular Plant Species Observed February 20 & February 21, 2013
Appendix B - Potential for Occurrence of Special-Status Vascular Plant Species
Appendix C - Vertebrate Wildlife Species Observed, February 20 & 21, 2013
Appendix D - Potential for Occurrence of Special-Status Wildlife Species
Appendix E - References
Appendix F - Project Plan, Kimley-Horn and Associates, Inc., received January 21, 2013

APPENDIX A

Vascular Plants Species Observed
February 20 & February 21, 2013

* indicates a non-native or introduced species

GROUP **Family** ***Scientific Name***	**Common Name**
CONIFERS	
Pinaceae	
**Pinus* sp.	pine
FLOWERING PLANTS-DICOTS	
Adoxaceae	
Sambucus nigra ssp. *caerulea*	blue elderberry
Anacardiaceae	
**Schinus molle*	Peruvian peppertree
Apiaceae	
**Conium maculatum*	poison hemlock
**Foeniculum vulgare*	sweet fennel
Apocynaceae	
Asclepias fascicularis	narrowleaf milkweed
Amaranthaceae	
**Amaranthus albus*	tumbleweed
Asteraceae	
Ambrosia psilostachya	western ragweed
Baccharis pilularis	coyote bush
**Carduus pycnocephalus*	Italian thistle
**Centauria melitensis*	tocalote
Corethrogyne filaginifolia	California aster
Deinandra fasciculata	fascicled tarweed
Erigeron canadensis	Canadian horseweed
Heterotheca grandiflora	telegraph weed
**Lactuca serriola*	prickly lettuce
Lasthenia coronaria	crowned goldfields
Matricaria discoidea	pineapple weed
**Senecio vulgaris*	common groundsel
**Sonchus asper*	prickly sowthistle
Stephanomeria virgata	virgate wire-lettuce
Boraginaceae	
Amsinckia menziesii var. *intermedia*	common fiddleneck
Brassicaceae	
Athysanus pusillus	dwarf sandweed
**Brassica nigra*	black mustard
**Hirschfeldia incana*	hoary mustard
Lepidium sp.	lepidium
Nasturtium officinale	white watercress
**Sisymbrium irio*	London rocket
Thysanocarpus laciniatus	narrowleaf fringepod
Caprifoliaceae	
Lonicera subspicata	chaparral honeysuckle
Chenopodiaceae	
**Atriplex semibaccata*	Australian saltbush
Chenopodium sp.	goosefoot
**Salsola tragus*	Russian thistle

GROUP **Family** ***Scientific Name***	**Common Name**
Crassulaceae	
Crassula connata	pygmy weed
Dudleya pulverulenta	chalk liveforever
Cucurbitaceae	
Marah macrocarpus	wild cucumber
Euphorbiaceae	
Croton setiger	turkey mullein
Fabaceae	
Acmispon americanus	Pursh's lotus
Lupinus sp.	lupine
**Medicago polymorpha*	bur-clover
**Melilotus indicus*	annual yellow sweetclover
**Vicia* sp.	vetch
Fagaceae	
Quercus agrifolia	coast live oak
Quercus lobata	valley oak
Geraniaceae	
**Erodium botrys*	long beaked filaree
**Erodium cicutarium*	red-stem filaree
**Erodium moschatum*	white-stem filaree
Lamiaceae	
**Lamium amplexicaule*	henbit
**Marrubium vulgare*	horehound
Salvia mellifera	black sage
Stachys albens	white hedge nettle
Trichostema lanceolatum	vinegar bluecurls
Malvaceae	
**Malva parviflora*	small-flowered cheeseweed
Montiaceae	
Calandrinia ciliata	red maids
Myrsinaceae	
**Anagallis arvensis*	scarlet pimpernel
Onagraceae	
Clarkia sp.	clarkia
Epilobium ciliatum	willow herb
Plantaginaceae	
**Plantago lanceolata*	English plantain
Polemoniaceae	
Linanthus dianthiflorus	ground pink linanthus
Polygonaceae	
Eriogonum elongatum	wand buckwheat
Eriogonum fasciculatum	California buckwheat
**Polygonum aviculare* ssp. *depressum*	prostrate knotweed
**Rumex crispus*	curly dock
Salicaceae	
Salix lasiolepis	arroyo willow

GROUP **Family** ***Scientific Name***	**Common Name**
Scrophulariaceae	
**Verbascum virgatum*	wand mullein
Solanaceae	
**Nicotiana glauca*	tree tobacco
Solanum xanti	purple nightshade
Verbenaceae	
Verbena lasiostachys	western verbena
FLOWERING PLANTS-MONOCOTS	
Arecaceae	
**Washingtonia* sp.	fan palm
Cyperaceae	
Eleocharis sp.	spikerush
Poaceae	
**Avena barbata*	slender oat
**Avena fatua*	fat oat
**Bromus diandrus*	ripgut grass
**Bromus hordeaceus*	soft-chess
**Bromus madritensis* ssp. *rubens*	red brome
**Cynodon dactylon*	Bermuda grass
**Festuca myuros*	rattail fescue
**Hordeum murinum*	foxtail barley
**Poa annua*	annual bluegrass
**Schismus* sp.	Mediterranean grass
Stipa lepida	foothill needlegrass
**Stipa miliacea*	smilo grass
Stipa pulchra	purple needlegrass
Themidaceae	
Dichelostemma capitatum	blue dicks
Typhaceae	
Typha angustifolia	narrow-leaf cattail
Typha latifolia	broad-leaf cattail

APPENDIX B

Potential for Occurrence of Special-Status Vascular Plant Species

Common Name (*Scientific Name*)	**Form**	**Blooming Period**	**Primary Habitat Associations**	**Status (Federal/State/ CNPS)**	**Potential to Occur** (high, moderate, low, none)
Agoura Hills dudleya (*Dudleya cymosa* ssp. *agourensis*)	perennial herb	May - June	Rocky, volcanic breccia in chaparral and cismontane woodland at elevations between 200 to 500 meters.	FT/1B.2	No potential to occur. Suitable habitats are absent.
Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)	perennial herb	April - June	Open, rocky slopes; often in shallow clays over serpentine or in rocky areas with little soil; coastal bluff scrub, chaparral, coastal scrub, and valley and foothill grassland at elevations between 5 an 450 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Braunton's milkvetch (*Astragalus brauntonii)*	perennial herb	January - August	Recent burns or disturbed areas, usually sandstone with carbonate layers in closed-cone coniferous forest, chaparral, coastal scrub, and valley and foothill grassland at elevations between 4 and 640 meters. A soil specialist in saline, somewhat alkaline soils high in calcium, manganese, with some potassium.	FE/1B.1	No potential to occur. Suitable substrates are absent.
California orcutt grass (*Orcuttia californica*)	annual herb	April - August	Vernal pools at elevations between 15 an 660 meters.	FE/CE/1B.1	No potential to occur. Suitable seasonal wetland habitats are absent.

Common Name (*Scientific Name*)	**Form**	**Blooming Period**	**Primary Habitat Associations**	**Status (Federal/State/ CNPS)**	**Potential to Occur** (high, moderate, low, none)
Chaparral nolina (*Nolina cismontana*)	perennial evergreen shrub	May - July	Sandstone or gabbro substrates in chaparral and coastal scrub at elevations between 140 and 1275 meters.	1B.2	No potential to occur. Suitable habitats are absent.
Chaparral ragwort (*Senecio aphanactis*)	annual herb	January - April	Chaparral, cismontane woodland, and coastal scrub habitats at elevations between 15 and 800 meters, sometimes on alkaline soils.	2.2	No potential to occur. The disturbed condition of the site and the results of prior springtime surveys in 2006, 2008, and 2009 by Envicom Corporation are sufficient to verify absence, although there is some marginally suitable habitat at the project site.
Conejo buckwheat (*Eriogonum crocatum*)	perennial herb	April - July	Conejo volcanic outcrops in rocky chaparral, coastal scrub, and valley and foothill grassland habitats at elevations between 50 and 580 meters.	CR/1B.2	No potential to occur. Suitable rocky volcanic substrates are absent. Project site is outside the known range of the species.
Conejo dudleya (*Dudleya parva*)	perennial herb	May - June	Rocky or gravelly areas on clay or volcanic substrates in coastal scrub and valley and foothill grassland habitats at elevations between 60 and 450 meters.	FT/1B.2	No potential to occur. Suitable habitats are absent. Project site is outside of the known range of the species.
Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)	annual herb	February - June	Found in coastal salt marshes and swamps, playas, and vernal pools at elevations between 1 and 1220 meters.	1B.1	No potential to occur. Suitable habitats are absent.

Common Name (*Scientific Name*)	**Form**	**Blooming Period**	**Primary Habitat Associations**	**Status (Federal/State/ CNPS)**	**Potential to Occur** (high, moderate, low, none)
Coulter's saltbush (*Atriplex coulteri*)	perennial herb	March - October	Alkaline or clay soils in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland habitats at elevations between 3 and 460 meters.	1B.2	No potential to occur. Suitable habitats are absent.
Davidson's saltscale (*Atriplex serenana* var. *davidsonii*)	annual herb	April - October	Alkaline soils in coastal bluff scrub and coastal scrub at elevations between 10 and 200 meters.	1B.2	No potential to occur. Suitable habitats are absent.
Decumbent goldenbush (*Isocoma menziesii* var. *decumbens*)	perennial shrub	April - November	Chaparral and sandy soils in coastal scrub at elevations between 10 and 135 meters. Often in disturbed areas.	1B.2	No potential to occur. Based on Consortium of California Herbaria records, the project site is outside known range of this species.
Dune larkspur (*Delphinium parryi* ssp. *blochmaniae*)	perennial herb	April - May	Maritime chaparral and coastal dunes at elevations between 0 and 200 meters.	1B.2	No potential to occur. Suitable habitats are absent. Based on Consortium of California Herbaria records, the project site is outside known range of this species.
Hubby's phacelia (*Phacelia hubbyi*)	annual herb	April - June	Gravelly, rocky habitats, including talus, in chaparral, coastal scrub, and valley and foothill grassland at elevations between 0 and 1000 meters.	4.2	No potential to occur. Suitable habitats are absent.

Common Name (*Scientific Name*)	**Form**	**Blooming Period**	**Primary Habitat Associations**	**Status (Federal/State/ CNPS)**	**Potential to Occur** (high, moderate, low, none)
Late-flowered mariposa lily (*Calochortus fimbriatus*)	perennial bulbiferous herb	June - August	Chaparral, cismontane woodland, and riparian woodland at elevations between 275 and 1905 meters. Often found on serpentinite.	1B.3	No potential to occur. Suitable habitats are absent. Also, based on Consortium of California Herbaria records, the project site is outside the known range of this species.
Lyon's pentachaeta (*Pentachaeta lyonii*)	annual herb	March - August	Rocky, clay substrates in coastal scrub, valley and foothill grassland, and openings in chaparral at elevations between 30 and 630 meters.	FE/CE/1B.1	No potential to occur. There is some marginally suitable habitat at the site, and known occurrences in close vicinity to the site to the south and west. However, the site's disturbed condition and negative results of prior springtime surveys of the site by Envicom in 2006, 2008, and 2009 are sufficient to verify absence.
Malibu baccharis (*Baccharis malibuensis*)	perennial deciduous shrub	August	Chaparral, cismontane woodland, coastal scrub, and riparian woodland at elevations between 150 and 305 meters.	1B.1	No potential to occur. Suitable habitats are absent. Also, site surveys adequate to confirm absence of perennial shrubs.
Many-stemmed dudleya (*Dudleya multicaulis*)	perennial herb	April - July	Chaparral, coastal scrub, and valley and foothill grassland at elevations between 15 and 790 meters, in heavy, often clayey soils or grassy slopes.	1B.2	No potential to occur. Suitable habitats are absent. Also, based on Consortium of California Herbaria records, the project site is outside the known range of this species.

Common Name (*Scientific Name*)	**Form**	**Blooming Period**	**Primary Habitat Associations**	**Status (Federal/State/ CNPS)**	**Potential to Occur** (high, moderate, low, none)
Marcescent dudleya (*Dudleya cymosa* ssp. *marcescens*)	perennial herb	April - July	On sheer rock surfaces and rocky volcanic cliffs in chaparral at elevations between 150 and 520 meters.	FT/CR/1B.2	No potential to occur. Suitable habitats are absent.
Mesa horkelia (*Horkelia cuneata* var. *puberula)*	perennial herb	February - September	Sandy or gravelly soils in maritime chaparral, cismontane woodland, and coastal scrub at elevations between 70 and 810 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Norris' beard moss (*Didymodon norrisii*)	moss	--	Intermittently mesic, rock in cismontane woodland and lower montane coniferous forest.	2.2	No potential to occur. Suitable habitats are absent.
Ojai navarretia (*Navarretia ojaiensis*)	annual herb	May - July	Valley and foothill grassland and openings in chaparral and coastal scrub at elevations between 275 and 620 meters.	1B.1	No potential to occur. There is some marginally suitable habitat at the site, and known occurrences in the close vicinity to the site to the south and west. However, the site's disturbed condition and negative results of prior springtime surveys of the site by Envicom in 2006, 2008, and 2009 are sufficient to verify absence.

Common Name (*Scientific Name*)	**Form**	**Blooming Period**	**Primary Habitat Associations**	**Status (Federal/State/ CNPS)**	**Potential to Occur** (high, moderate, low, none)
Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*)	annual herb	January - August	Coastal dunes and sandy soils in coastal bluff scrub at elevations between 0 and 100 meters.	1B.1	No potential to occur. Suitable habitats are absent. Also, based on Consortium of California Herbaria records, the project site is outside the known range of this species.
Palmer's grapplinghook (*Harpagonella palmeri*)	annual herb	March - May	Clay soils in chaparral, coastal scrub, and valley and foothill grassland at elevations between 20 and 955 meters.	4.2	No potential to occur. Based on Consortium of California Herbaria records, the project site is outside the known range of this species. Not known to occur in Santa Monica Mountains.
Parry's spineflower (*Chorizanthe parryi* var. *parryi*)	annual herb	April - June	Sandy or rocky openings in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland at elevations between 40 and 1705 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Plummer's mariposa lily (*Calochortus plummerae*)	perennial bulbiferous herb	May - July	Occurs on rocky or sandy sites, usually of granitic or alluvial material in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland at elevations between 100 and 1700 meters.	1B.2	No potential to occur. Suitable habitats are absent.

Common Name (*Scientific Name*)	**Form**	**Blooming Period**	**Primary Habitat Associations**	**Status (Federal/State/ CNPS)**	**Potential to Occur** (high, moderate, low, none)
Red-sand verbena (*Abronia maritima*)	perennial herb	February - November	Coastal dune habitats at elevations between 0 and 100 meters.	4.2	No potential to occur. Suitable habitats are absent. Also, a coastal species; project site is outside range.
Round-leaved filaree (*California macrophylla*)	annual herb	March - May	Cismontane woodland and valley and foothill grassland on clay soils at elevations between 15 and 1200 meters.	1B.1	No potential to occur. The disturbed condition of the site and the negative results of several springtime surveys of the site by Envicom (2006, 2008, 2009) is sufficient to verify absence, although there is some marginally suitable habitat at the project site.
San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)	annual herb	April - July	Sandy soils in coastal scrub and valley and foothill grassland at elevations between 3 and 1035 meters.	FC/CE/1B.1	No potential to occur. Known from only three occurrences. Suitable habitats are absent.
Santa Monica dudleya (*Dudleya cymosa* ssp. *ovatifolia*)	perennial herb	March - June	Volcanic or sedimentary, rocky substrates in chaparral and coastal scrub at elevations between 150 and 1675 meters.	FT/1B.2	No potential to occur. Suitable habitats are absent.
Santa Susana tarplant (*Deinandra minthornii)*	perennial deciduous shrub	July - November	Rocky sandstone habitats in chaparral and coastal scrub at elevations between 280 and 760 meters.	CR/1B.2	No potential to occur. Suitable rocky sandstone habitats are absent.

Common Name (***Scientific Name***)	**Form**	**Blooming Period**	**Primary Habitat Associations**	**Status (Federal/State/ CNPS)**	**Potential to Occur** (high, moderate, low, none)
Slender mariposa-lily (*Calochortus clavatus* var. *gracilis*)	perennial bulbiferous herb	March - June	Shaded foothill canyons in chaparral, coastal scrub, and valley and foothill grassland at elevations between 320 and 1000 meters.	1B.2	No potential to occur. Disturbed site condition and results of several springtime surveys of the site by Envicom (2006, 2008, 2009) adequate to confirm absence.
Slender-horned spineflower (*Dodecahema leptoceras*)	annual herb	April - June	Flood deposited terraces and washes in chaparral, cismontane woodland, and coastal scrub (alluvial fan sage scrub) at elevations between 200 and 760 meters.	FE/CE/1B.1	No potential to occur. Suitable habitats are absent.
Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*)	perennial rhizomatous herb	January - September	Meadows and seeps along streams and seepage areas at elevations between 50 and 610 meters.	2.2	No potential to occur. Suitable habitats are absent.
Southern tarplant (*Centromadia parryi* ssp. *australis*)	annual herb	May - November	Margins of marshes and swamps, vernally mesic valley and foothill grassland, and sometimes on vernal pools at elevations between 0 and 425 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Verity's dudleya (*Dudleya verityi*)	perennial herb	May - June	Volcanic, rocky substrates in chaparral, cismontane woodland, and coastal scrub at elevations between 60 and 120 meters.	FT/1B.1	No potential to occur. Suitable habitats are absent. Project site is outside known range of species.

Common Name (*Scientific Name*)	Form	Blooming Period	Primary Habitat Associations	Status (Federal/State/ CNPS)	Potential to Occur (high, moderate, low, none)
Western spleenwort (*Asplenium vespertinum*)	perennial rhizomatous herb	February - June	Rocky habitats in chaparral, cismontane woodland, and coastal scrub at elevations between 180 and 1000 meters.	4.2	No potential to occur. Suitable habitats are absent.
White-rabbit tobacco (*Pseudognaphalium leucocephalum*)	perennial herb	July - December	Sandy and gravelly soils in chaparral, cismontane woodland, coastal scrub and riparian woodland at elevations between 0 and 2100 meters.	2.2	No potential to occur. Suitable habitats are absent.
White-veined monardella (*Monardella hypoleuca* spp. *hypoleuca*)	herb	April - December	Chaparral and cismontane woodland at elevations between 50 and 1525 meters.	1B.3	No potential to occur. Suitable habitats are absent.

Federally Protected Species
FE (Federal Endangered): A species that is in danger of extinction throughout all or a significant portion of its range.
FT (Federal Threatened): A species that is likely to become endangered in the foreseeable future.
FC (Federal Candidate): A species for which USFWS has sufficient information on its biological status and threats to propose it as endangered or threatened under the Endangered Species Act (ESA), but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

State Protected Species
CE (California Endangered): A native species or subspecies which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.
CT (California Threatened): A native species or subspecies that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as "rare" on or before January 1, 1985, is a "threatened species."
CR (California Rare): A species, subspecies, or variety of plant is rare under the Native Plant Protection Act when, although not presently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens. Animals are no longer listed as rare; all animals listed as rare before 1985 have been listed as threatened.

California Native Plant Society (CNPS) Rare Plant Rank
CNPS List 1A: Plants presumed extinct in California.
CNPS List 1B: Plants Rare, Threatened, or Endangered in California and elsewhere.
CNPS List 2: Plants Rare, Threatened, or Endangered in California but more common elsewhere.
CNPS List 3: A review list for plants for which there is inadequate information to assign them to one of the other lists or to reject them.

Common Name (*Scientific Name*)	**Form**	**Blooming Period**	**Primary Habitat Associations**	**Status (Federal/State/ CNPS)**	**Potential to Occur** (high, moderate, low, none)
CNPS List 4: A watch list for plants that are of limited distribution in California. <u>CNPS Threat Rank</u> The CNPS Threat Rank is an extension added onto the California Rare Plant Rank and designates the level of endangerment, as follow: • 0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat) • 0.2-Fairly threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat) • 0.3-Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)					

APPENDIX C

Vertebrate Wildlife Species Observed*
February 20 & 21, 2013

* by direct observation, sign, or vocalization

Common Name	*Scientific Name*
REPTILES	
western fence lizard	*Sceloporus occidentalis*
BIRDS	
acorn woodpecker	*Melanerpes formicivorus*
American crow	*Corvus brachyrhynchos*
black phoebe	*Sayornis nigricans*
California towhee	*Pipilo crissalis*
Cassin's kingbird	*Tyrannus vociferans*
dark-eyed junco	*Junco hyemalis*
house finch	*Carpodacus mexicanus*
lesser goldfinch	*Carduelis psaltria*
mallard	*Anas platyrhynchos*
northern flicker	*Colaptes auratus*
oak titmouse	*Baeolophus inornatus*
red-tailed hawk	*Buteo jamaicensis*
Say's phoebe	*Sayornis saya*
song sparrow	*Melospiza melodia*
western scrub jay	*Apehelocoma californica*
white-breasted nuthatch	*Sitta carolinensis*
white-crowned sparrow	*Zonotrichia leucophrys*
yellow-rumped warbler	*Dendroica coronata*
MAMMALS	
California ground squirrel	*Spermophilus beecheyi*
coyote	*Canis latrans ochropus*
desert cottontail	*Sylvilagus audubonii sanctidiegi*

APPENDIX D

Potential for Occurrence of Special-Status Wildlife Species

Common Name (*Scientific Name*)	**Status Federal/State/Other**	**Primary Habitat Associations**	**Status on Site or Potential to Occur** (high, moderate, low, none)
Fish			
There is no potential for occurrence of special-status fishes due to lack of suitable habitat.			
Amphibians			
There is no potential for occurrence of special-status amphibians due to lack of suitable habitat.			
Reptiles			
Coast horned lizard (*Phrynosoma blainvillii*)	--/CSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Microhabitat requirements include open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Low potential to occur.
Birds			
Bank swallow (*Riparia riparia*)	--/CT	Very uncommon spring transient and rare fall transient, and casual winter transient along the coast, formerly a fairly common summer resident, now virtually extirpated as a breeder in the region (Garrett and Dunn 1981).	No potential to occur.
Black swift (*Cypseloides niger*)	--/CSC	Rare and irregular transient through coastal district, nesting at a few steep waterfall locations in the San Gabriel, San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981). Breeds very locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mts., and in coastal bluffs and mountains from San Mateo Co. south probably to San Luis Obispo Co. Nests in moist crevice or caves on sea cliffs above the surf, or on cliffs behind, or adjacent to, waterfalls in deep canyons. Forages widely over many habitats (Zeiner et al. 1990b).	No potential to occur.

Common Name (*Scientific Name*)	**Status Federal/State/Other**	**Primary Habitat Associations**	**Status on Site or Potential to Occur** (high, moderate, low, none)
Burrowing owl (*Athene cunicularia*) (burrow sites and some wintering sites)	--/CSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel. Now extirpated from most of the coastal slope of the Los Angeles region (Garrett et al 2006). Now occurs mainly as a transient and winter visitor to coastal southern California.	Low potential to occur as a transient; not wintering or nesting.
Coastal California gnatcatcher (*Polioptila californica californica*)	FT/CSC	Obligate, permanent resident of coastal sage scrub below 2,500 feet in southern California. Low, coastal sage scrub in arid washes and on mesas and slopes.	No potential to occur.
Golden eagle (*Aquila chrysaetos*) (nesting and wintering)	--/CFP	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	No potential to occur.
Grasshopper sparrow (*Ammodramus savannarum*)	--/CSC	Uncommon and very local summer resident on grassy slopes and mesas west of the deserts; noted only rarely in migration and in winter. For breeding, grasshopper sparrows require fairly continuous native grassland with occasional taller weedy stems or shrubs for singing perches (Garrett and Dunn 1981). Reported as casual in winter, uncommon spring and summer, and rare in fall in the Santa Monica Mountains.	No potential to occur.
Loggerhead shrike (*Lanius ludovicianus*) (nesting)	--/CSC	Very rare in open areas on the coastal slope of southern California; rare to uncommon in migration and winter. Only a few pairs of this once-abundant predator are still found in our coastal lowlands; small numbers of migrants augment this population from July to March in the Los Angeles region (Garrett et al. 2006). Prefers open habitats with scattered	Low potential to occur as a transient; not nesting.

Common Name (*Scientific Name*)	**Status Federal/State/Other**	**Primary Habitat Associations**	**Status on Site or Potential to Occur** (high, moderate, low, none)
		shrubs, trees, posts, fences, utility lines, or other perches.	
Northern harrier (*Circus cyaneus*) (nesting)	--/CSC	Uncommon migrant and winter visitor (mid-September to early April) to extensive open freshwater and saltwater marshes, grasslands and agricultural fields. Breeding populations have been virtually extirpated from the coastal lowlands in the Los Angeles area (Garrett et al. 2006).	No potential to occur.
Olive-sided flycatcher (*Contopus cooperi*)	--/CSC	Summer resident (May to early September) mainly in conifer, mixed, and canyon woodlands of San Gabriel Mtns., and very locally closer to coast where tall pines and eucalyptus augment native trees in the Los Angeles region (Garrett et al 2006).	No potential to occur.
Short-eared owl (*Asio flammeus*)	--/CSC	Uncommon and local winter visitant along the coast, where it formerly nested. Wintering locations include Point Mugu, Sepulveda basin (Garrett and Dunn 1981). Usually found in open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands (Zeiner et al. 1990b).	No potential to occur.
Vaux's swift (*Chaetura vauxi*)	--/CSC	Common migrant from mid-April to mid-May, and again from late August to early October; small flocks sometimes winter in coastal lowlands, but absent from the Los Angeles region from early June to early August (Garrett et al 2006). There is moderate high potential for this species to occur at any of the components, transient only, and not nesting.	Low potential to forage over the site as a transient; not nesting.
White-tailed kite (*Elanus leucurus*) (nesting)	--/CFP	Uncommon resident in open grasslands, valley oak savannas, marshes, and agricultural areas throughout the lowlands of the Los	Moderate potential to forage infrequently over the site; not nesting.

Common Name (*Scientific Name*)	**Status Federal/State/Other**	**Primary Habitat Associations**	**Status on Site or Potential to Occur** (high, moderate, low, none)
		Angeles region (Garrett et al. 2006).	
Mammals			
Pallid bat (*Antrozous pallidus*)	--/CSC	Deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Low potential to occur while foraging, but not reproducing, hibernating, or roosting at the site.
Spotted bat (*Euderma maculatum*)	--/CSC	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests. Feeds over water and along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting.	Low potential to occur while foraging, but not reproducing, hibernating, or roosting at the site.
Townsend's big-eared bat (*Corynorhinus townsendii*)	--/CSC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Low potential to occur while foraging, but not reproducing, hibernating, or roosting at the site.
Western mastiff bat (*Eumops perotis californicus*)	--/CSC	Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	Low potential to occur while foraging or roosting temporarily in trees at the site, but not reproducing or hibernating.
Western red bat (*Lasiurus blossevillii*)	--/CSC	Roosts primarily in trees, 2-40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	Low potential to occur while foraging or roosting temporarily in trees at the site, but not reproducing or hibernating.
American badger (*Taxidea taxus*)	--/CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	No potential to occur.
San Diego black-tailed hare (*Lepus californicus bennetii*)	--/CSC	Intermediate canopy stages of shrub habitats and open shrub / herbaceous and tree / herbaceous edges. Coastal sage scrub habitats in southern	No potential to occur.

Common Name (*Scientific Name*)	**Status Federal/State/Other**	**Primary Habitat Associations**	**Status on Site or Potential to Occur** (high, moderate, low, none)
		California.	
San Diego desert woodrat (*Neotoma lepida intermedia*)	--/CSC	Coastal scrub of southern California from San Diego County to San Luis Obispo County. Moderate to dense canopies preferred. Particularly abundant in rock outcrops and rocky cliffs and slopes.	No potential to occur.

Federally Protected Species

FE (Federal Endangered): A species that is in danger of extinction throughout all or a significant portion of its range.
FT (Federal Threatened): A species that is likely to become endangered in the foreseeable future.
FC (Federal Candidate): A species for which USFWS has sufficient information on its biological status and threats to propose it as endangered or threatened under the Endangered Species Act (ESA), but for which development of a proposed listing regulation is precluded by other higher priority listing activities.
FSC (Federal Species of Concern): A species under consideration for listing, for which there is insufficient information to support listing at this time. These species may or may not be listed in the future, and many of these species were formerly recognized as "Category-2 Candidate" species.

State Protected Species

CE (California Endangered): A native species or subspecies which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.
CT (California Threatened): A native species or subspecies that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as "rare" on or before January 1, 1985, is a "threatened species."
CSC (California Species of Special Concern): Animals that are not listed under the California Endangered Species Act, but which nonetheless 1) are declining at a rate that could result in listing, or 2) historically occurred in low numbers and known threats to their persistence currently exist.
CFP (California Fully Protected): This designation originated from the State's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, mammals, amphibians, reptiles, and birds. Most fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations. California Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.

APPENDIX E

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APPENDIX F

Project Plan
Kimley-Horn and Associates, Inc.,
received January 21, 2013

Kanan Road and Agoura Road Roundabout Project Plan

The project plan was provided by Kimley Horn and Associates, Inc. as an ArcGIS shapefile on January 22, 2013. Aerial photograph: Google Earth, August 27, 2012.

APPENDIX D
OAK TREE REPORT AND MEMORANDUMS

OAK TREE REPORT

SUBJECT
Agoura Road Roundabout
Agoura Hills

PREPARED FOR
Envicom Corporation
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Agoura Hills, CA 91301

PREPARED BY

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Date: March 25, 2013

LNDG Project No.: 2078-04

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PROJECT LOCATION

The subject project is a traffic roundabout at the intersection of Kanan Road and Agoura Road in the City of Agoura Hills.

OBJECTIVE

The objective of this report is to qualify the present condition of the site's oak trees and to discuss the potential encroachments to them and the effect on the health of the trees and to discuss the possibility of preserving existing trees. This involved:

1. Determining the general condition of the protected oak trees;
2. Ascertaining the impacts that will occur due to the proposed traffic roundabout (see **PRELIMINARY OAK TREE LOCATION MAP**);
3. Providing guidance to minimize any encroachments of the saved oak trees.

METHOD OF STUDY

Qualifying the oak trees was accomplished by the use of our standard visual survey as completed by **L. NEWMAN DESIGN GROUP, INC. (LNDG)** in February of 2013. In the course of fieldwork, we performed the following tasks:

1. The trees were tagged with numbered, metal tags. These tags are affixed to the sides of the trees and correspond to the numbers on the **PRELIMINARY OAK TREE LOCATION MAP.** Tree tags that were used for the Agoura road widening tree report were used for this report. Four additional trees were tagged that continue the numbering sequence used for the road widening project.
2. Live tree trunks were measured at 3½' above mean natural grade and, if they measured at least 2 inches in diameter, were assessed for health and aesthetic quality. Trees included are within the project boundaries (right of way) or are within 50 feet of the right of way;
3. Driplines (the outermost edge of the tree's canopy) were field measured at the eight compass directions equidistant around the circumference of the tree. Most of the trees were land surveyed by Kimley-Horn and Associates and placed on a topographic map/street improvement plan (scale: 1" = 40') prepared by Kimley-Horn and Associates. Refer to the **PRELIMINARY OAK TREE LOCATION MAP** included herein for the oak tree locations. Specific encroachments were assessed in the field referencing site features and the roundabout site plan.

OAK SPECIES

The 43 oak trees referenced in this report consist of 19 *Quercus agrifolia* (coast live oak) and 24 *Quercus lobata* (valley oaks).

OAK TREE ORDINANCE

Oak trees of the genus *Quercus* within the City of Agoura Hills are protected by law. City Council Resolution #374 makes the cutting, moving and/or removal of an oak tree without a permit a misdemeanor.

The major thrust of the oak tree policy approved by the Agoura Hills City Council is to establish a theoretical protected zone in regard to the aerial portion of an oak tree. It is felt by the City that this protected zone shall be

defined as follows: "Using the dripline as a point of reference, the "Protected Zone" shall commence at a point 5' outside the dripline and extend inward to the trunk of the tree. In no case shall the "Protected Zone" trace a circumference less than 15' from the trunk of the oak tree."

RESULTS of STUDY

1. **Physiological Condition of the Oaks**

The trees are in generally good condition. The physiological condition of each tree is detailed in the **SUMMARY of FIELD OBSERVATIONS** contained within this report. All recommendations made on our field forms relate only to the specific dates of our fieldwork.

2. **Summary of Data/Plan Review**

A. The 43 oaks that are included in the tree inventory are within the right-of way or 50 feet beyond and within the limit of grading. 27 are proposed to be removed. Most of the trees are located along the edge of the existing roadway and therefore must be removed for the proposed road improvements. The following table summarizes the reasons for each of the 27 removals:

Tree Number	Reason for Removal (per current Agoura Road Roundabout site plan).
105, 106, 107, 108, 109, 110	This small grove of 6 trees is between the proposed curb and sidewalk.
111, 112	These 2 trees are located on the proposed curb.
113	Located in the proposed sidewalk, potential hazard.
114	Located in the eastbound lane of the proposed roadway.
115, 116, 117, 207	This small grove of 4 trees is between the proposed curb and sidewalk.
118, 119, 120, 121, 122, 174	These 6 trees are located in the eastbound lane of the proposed roadway.
123	Located in the eastbound lane of the proposed roadway.
166, 167, 168, 169, 170	These 5 trees are located in the westbound lane of the proposed roadway.
171	Located in proposed sidewalk.

B. The following 7 encroachments are proposed:

Tree Number	Reason for Encroachment (per current Agoura Road Roundabout site plan).
172	Located 10 feet from edge of proposed sidewalk.
173	Located 6 feet from edge of proposed sidewalk.
175	Located 7 feet from edge of proposed sidewalk.
182	Located 13 feet from edge of ROW and new driveway pavement.
254	Located 10 feet from edge of proposed sidewalk.
255	Located 14 feet from edge of proposed sidewalk.

257	Located at edge of ROW and 2 feet from edge of proposed grading and 5 feet from edge of proposed sidewalk.

C. There are three landmark trees. Tree 113 will be removed and trees 172 and 173 will be significantly encroached.

D. Three trees (179, 180, and 181) were addressed in the Agoura Road Widening tree report. These trees were located just outside of the right-of-way. Trees 180 and 181 were small, planted trees and died due to poor health. Tree 179 no longer exists and was removed for unknown reasons.

3. **Tree Replacement Program**

A. The mitigation of the removal trees shall be determined

B. Replacement trees shall be properly maintained for a period of 2 years and replaced if fatality occurs during that period.

C. The irrigation system (i.e., drip system or comparable) to water these newly planted trees shall be compatible with the watering requirement of the project's indigenous oak trees. The irrigation system maintenance program should water these trees for the first 2 years to establish the trees. Thereafter, watering should be done only in the winter months during periods of severe drought.

4. **Mitigation Recommendations**

A. For some trees, fencing shall be placed to prevent damage to the trees and compaction of the topsoil within the protected zones of the trees. All trees to be saved in place shall be protected with a fence outside of the protected zone or at the limit of the approved grading or construction.

B. Any City approved work within the protected zones of the saved oak trees, including branch removals, shall be under the direct inspection/observation of the City arborist.

C. Copies of the oak tree report and the oak tree permit and the City approved street improvement plans, and landscape and irrigation plans shall be kept on site during all site construction.

OAK TREE PRESERVATION PROGRAM

As development occurs around the saved oak trees, they will become dependent upon the future residents for their care and preservation. All construction activities shall follow our established **PRESERVATION PROGRAM**. This program was developed to control the impacts to each tree and to protect them from any unnecessary and unscheduled damage.

Consideration of disease and pest control will play a major role in such a program and for the most part will be long range. The best protection against any problem is to build up the tree's natural defenses and to avoid wounding whenever possible. The proper mitigation measures will encourage vigorous growth within the trees, so that their compartmentalization can effectively control disease.

All oak tree mitigation techniques shall be inspected/observed on-site by the City arborist. The City shall be notified 48 hours prior to any work that is planned within the protected zone of any oak tree. The following list of

Trees 176 173 177 175

Tree 175

Tree 177

Tree 178

Tree 182

Tree 254

Tree 255 256

Tree 256

Tree 257

Trees 258 259

SUMMARY of FIELD OBSERVATIONS

INSPECTION NOTICE

The following information was observed on the date(s) indicated herein, and should only be considered true at the time of field inspection.

LNDG Job No. 2078-04

Date 3-25-2013

SUMMARY OF FIELD OBSERVATIONS

	TREE NUMBER	105	106	107	108	109	110	111	112	113	114
SPECIES	*Quercus agrifolia*										
	Quercus lobata	X	X	X	X	X	X	X	X	X	X
	Quercus berberidifolia										
FORM	TREE HEIGHT (EST.)	25'	18'	15'	7'	6'	12'	40'	35'	30'	30'
	LEAN										
	TRUNK DIAMETERS	11"	7"	3"	2"	2"	3"	26"	13"	52"	25"
PHYSICAL CONDITION	TRUNK CAVITY			X	X			X	X		
	TRUNK EXUDATION										
	BURIED ROOT COLLAR										
	EXPOSED ROOTS										
	TRUNK DAMAGE				X					X	
	WEAK CROTCH(ES)										
	DISEASE									X	
	INSECT/MITE DAMAGE	X	X	X	X	X	X	X	X	X	X
	RECENT FIRE DAMAGE										
	BRANCH CAVITIES	X						X	X	X	X
	MAINSTEM DIEBACK				X					X	
	TWIG/BRANCH DIEBACK		X	X	X	X	X	X	X	X	X
	EPICORMIC GROWTH				X						
	THIN FOLIAGE				X	X				X	
	VIGOR (GOOD/MOD/POOR)	G	G	G	M	G	G	G	G	G	G
	TERRAIN - SLOPED/LEVEL	S	F	F	F	F	F	F	F	S	F
RATING	HERITAGE							X			
	HEALTH	A	A	A	C	A	A	A	A	C-	A
	AESTHETICS/COMFORMITY	A	A	A	C	C	C	A	B	C-	B
TREAT-MENT	REMOVE DEADWOOD										
	INSECT/DISEASE TREAT										
	REMARKS:										

LNDG Job No. 2078-04

Date 3-25-2013

SUMMARY OF FIELD OBSERVATIONS

	TREE NUMBER	115	116	117	118	119	120	121	122	123	166
SPECIES	*Quercus agrifolia*						X				X
	Quercus lobata	X	X	X	X	X		X	X	X	
	Quercus berberidifolia										
FORM	TREE HEIGHT (EST.)	18'	15'	12'	20'	25'	12'	25'	15'	25'	18'
	LEAN										
	TRUNK DIAMETERS	4"	3"	3"	11"	11" 9" 6"	3" 3"	15"	10"	28"	8"
PHYSICAL CONDITION	TRUNK CAVITY				X						
	TRUNK EXUDATION										
	BURIED ROOT COLLAR										
	EXPOSED ROOTS					X					
	TRUNK DAMAGE										
	WEAK CROTCH(ES)										
	DISEASE										
	INSECT/MITE DAMAGE	X	X	X	X	X	X	X	X	X	X
	RECENT FIRE DAMAGE										
	BRANCH CAVITIES				X	X		X	X	X	
	MAINSTEM DIEBACK										
	TWIG/BRANCH DIEBACK	X	X	X	X	X	X	X	X	X	X
	EPICORMIC GROWTH										
	THIN FOLIAGE										
	VIGOR (GOOD/MOD/POOR)	G	G	G	G	G	G	G	G	G	G
	TERRAIN - SLOPED/LEVEL	S	S	S	S	S	S	S	S	S	S
RATING	HERITAGE									X	
	HEALTH	B	B	B	B	B	A	B	B	B	A
	AESTHETICS/COMFORMITY	A	A	A	A	A	A	B	C	B	B
TREAT-MENT	REMOVE DEADWOOD	Galls	Galls	Galls	Galls	Galls		Galls	Galls	Galls	
	INSECT/DISEASE TREAT										
	REMARKS:										

LNDG Job No. 2078-04

Date 3-25-2013

SUMMARY OF FIELD OBSERVATIONS

	TREE NUMBER	167	168	169	170	171	172	173	174	175	176
SPECIES	*Quercus agrifolia*	X	X	X	X					X	X
	Quercus lobata					X	X	X	X		
	Quercus berberidifolia										
FORM	TREE HEIGHT (EST.)	18'	18'	25'	30'	40'	40'	35'	7'	15'	15'
	LEAN		S								NE
	TRUNK DIAMETERS	9"	5"	11"	15"	24"	34"	34"	1" 1" 1"	6"	5"
PHYSICAL CONDITION	TRUNK CAVITY										
	TRUNK EXUDATION							X			
	BURIED ROOT COLLAR										
	EXPOSED ROOTS										
	TRUNK DAMAGE										
	WEAK CROTCH(ES)										
	DISEASE										
	INSECT/MITE DAMAGE	X	X		X	X	X	X	X		
	RECENT FIRE DAMAGE										
	BRANCH CAVITIES						X	X			
	MAINSTEM DIEBACK										
	TWIG/BRANCH DIEBACK	X	X	X	X	X	X	X	X	X	X
	EPICORMIC GROWTH							X			
	THIN FOLIAGE										
	VIGOR (GOOD/MOD/POOR)	G	G	G	G	G	G	G	G	G	G
	TERRAIN - SLOPED/LEVEL	S	S	F	F	F	S	S	S	S	S
RATING	HERITAGE						X	X			
	HEALTH	A	A	A	A	A	A	A	B	A	B
	AESTHETICS/COMFORMITY	B	B	B	A	A	B	A	B	A	B
TREAT-MENT	REMOVE DEADWOOD										
	INSECT/DISEASE TREAT					Galls	Galls	Galls			
	REMARKS:										

LNDG Job No. 2078-04

Date 3-25-2013

SUMMARY OF FIELD OBSERVATIONS

	TREE NUMBER	177	178	179	180	181	182	207	254	255	256
SPECIES	*Quercus agrifolia*	X		X	X	X	X		X	X	X
	Quercus lobata		X					X			
	Quercus berberidifolia										
FORM	TREE HEIGHT (EST.)	10'	30'				35'	25'	20'	10'	12'
	LEAN	E									
	TRUNK DIAMETERS	5"	9"				27"	6"	9"	4"	6"
PHYSICAL CONDITION	TRUNK CAVITY						X				
	TRUNK EXUDATION										
	BURIED ROOT COLLAR										
	EXPOSED ROOTS										
	TRUNK DAMAGE										
	WEAK CROTCH(ES)										
	DISEASE										
	INSECT/MITE DAMAGE		X				X				
	RECENT FIRE DAMAGE										
	BRANCH CAVITIES										
	MAINSTEM DIEBACK										
	TWIG/BRANCH DIEBACK	X	X				X				
	EPICORMIC GROWTH						X				
	THIN FOLIAGE										
	VIGOR (GOOD/MOD/POOR)	G	G				G	G	G	G	G
	TERRAIN - SLOPED/LEVEL	S	S				S	L	L	L	L
RATING	HERITAGE										
	HEALTH	B	B	F	F	F	B	B	B	B	B
	AESTHETICS/COMFORMITY	B	B	F	F	F	B	B	B	B	B
TREAT-MENT	REMOVE DEADWOOD										
	INSECT/DISEASE TREAT										
	REMARKS:		REMARKS:	REMARKS: NO LONGER EXISTS	REMARKS: NO LONGER EXISTS	REMARKS: NO LONGER EXISTS	REMARKS:	REMARKS: BETWEEN 116 AND 117	REMARKS:	REMARKS:	REMARKS:

LNDG Job No. 2078-04

Date 3-25-2013

SUMMARY OF FIELD OBSERVATIONS

	TREE NUMBER	257	258	259
SPECIES	*Quercus agrifolia*	X	X	X
	Quercus lobata			
	Quercus berberidifolia			
FORM	TREE HEIGHT (EST.)	35'	20'	20'
	LEAN			
	TRUNK DIAMETERS	15"	8"	7"
PHYSICAL CONDITION	TRUNK CAVITY			
	TRUNK EXUDATION			
	BURIED ROOT COLLAR			
	EXPOSED ROOTS			
	TRUNK DAMAGE			
	WEAK CROTCH(ES)			
	DISEASE			
	INSECT/MITE DAMAGE		X	
	RECENT FIRE DAMAGE			
	BRANCH CAVITIES			
	MAINSTEM DIEBACK			
	TWIG/BRANCH DIEBACK			
	EPICORMIC GROWTH			
	THIN FOLIAGE			
	VIGOR (GOOD/MOD/POOR)	G	G	G
	TERRAIN - SLOPED/LEVEL	L	L	L
RATING	HERITAGE			
	HEALTH	B	C	B
	AESTHETICS/COMFORMITY	B	C	B
TREAT-MENT	REMOVE DEADWOOD			
	INSECT/DISEASE TREAT			
	REMARKS:		REMARKS:	

DRIP LINE MEASUREMENTS

INSPECTION NOTICE

The following information was observed on the date(s) indicated herein, and should only be considered true at the time of field inspection.

LNDG Job No. 2247-02

Date11/10/10

DRIPLINE MEASUREMENTS

TREE NO.	DRIPLINE	N	NE	E	SE	S	SW	W	NW
105	HORIZ.	18'	18'	10'	18'	18'	18'	18'	18'
	VERT.	12'	12'	7'	7'	6'	6'	7'	8'
106	HORIZ.	3'	3'	15'	10'	18'	12'	0'	0'
	VERT.	8'	8'	4'	10'	6'	12'	0'	0'
107	HORIZ.	1'	2'	4'	5'	10'	8'	2'	0'
	VERT.	7'	7'	8'	8'	6'	5'	6'	0'
108	HORIZ.	0'	0'	1'	5'	5'	3'	1'	0'
	VERT.	0'	0'	7'	5'	5'	5'	5'	0'
109	HORIZ.	0'	6'	10'	0'	0'	0'	0'	0'
	VERT.	0'	5'	3'	0'	0'	0'	0'	0'
110	HORIZ.	6'	10'	12'	6'	0'	1'	1'	5'
	VERT.	6'	5'	3'	7'	0'	5'	5'	6'
111	HORIZ.	35'	30'	30'	30'	25'	25'	25'	35'
	VERT.	5'	8'	8'	8'	0'	3'	3'	15'
112	HORIZ.	15'	5'	18'	0'	8'	18'	8'	18'
	VERT.	6'	6'	3'	0'	2'	10'	6'	7'
113	HORIZ.	8'	25'	25'	25'	15'	15'	15'	0'
	VERT.	12'	10'	10'	3'	7'	0'	18'	0'
114	HORIZ.	20'	20'	35'	30'	20'	20'	15'	20'
	VERT.	15'	10'	4'	1'	0'	6'	4'	15'

LNDG Job No. 2247-02

Date11/10/10

DRIPLINE MEASUREMENTS

TREE NO.	DRIPLINE	N	NE	E	SE	S	SW	W	NW
115	HORIZ.	4'	4'	4'	6'	6'	5'	5'	4'
	VERT.	0'	0'	0'	0'	0'	0'	0'	0'
116	HORIZ.	3'	0'	0'	2'	6'	4'	4'	3'
	VERT.	0'	0'	0'	0'	0'	0'	0'	0'
117	HORIZ.	3'	3'	5'	5'	5'	3'	3'	3'
	VERT.	0'	0'	0'	0'	0'	0'	0'	0'
118	HORIZ.	8'	8'	6'	10'	10'	10'	10'	8'
	VERT.	4'	0'	0'	0'	0'	0'	1'	7'
119	HORIZ.	15'	15'	15'	15'	15'	15'	15'	15'
	VERT.	8'	15'	20'	15'	8'	10'	8'	15'
120	HORIZ.	6'	6'	6'	6'	6'	6'	4'	4'
	VERT.	1'	1'	1'	1'	1'	1'	1'	1'
121	HORIZ.	18'	18'	20'	15'	15'	15'	0'	12'
	VERT.	12'	8'	0'	0'	0'	0'	0'	15'
122	HORIZ.	0'	18'	18'	18'	0'	0'	0'	0'
	VERT.	0'	0'	0'	0'	0'	0'	0'	0'
123	HORIZ.	25'	25'	28'	28'	28'	28'	28'	25'
	VERT.	6'	5'	0'	0'	0'	0'	0'	6'
166	HORIZ.	8'	8'	10'	10'	10'	10'	8'	8'
	VERT.	8'	8'	8'	8'	2'	8'	8'	8'

LNDG Job No. 2247-02

Date11/10/10

DRIPLINE MEASUREMENTS

TREE NO.	DRIPLINE	N	NE	E	SE	S	SW	W	NW
167	HORIZ.	8'	8'	10'	10'	8'	10'	10'	8'
	VERT.	8'	8'	4'	4'	0'	6'	8'	8'
168	HORIZ.	0'	0'	4'	6'	8'	6'	3'	0'
	VERT.	0'	0'	8'	6'	6'	6'	8'	0'
169	HORIZ.	15'	10'	6'	12'	8'	6'	12'	12'
	VERT.	5'	7'	5'	6'	4'	8'	5'	5'
170	HORIZ.	15'	15'	15'	15'	18'	15'	12'	15'
	VERT.	7'	8'	4'	4'	6'	4'	5'	8'
171	HORIZ.	20'	20'	20'	20'	20'	20'	20'	20'
	VERT.	10'	12'	8'	8'	10'	18'	12'	18'
172	HORIZ.	25'	25'	35'	30'	25'	20'	30'	30'
	VERT.	4'	2'	0'	10'	20'	12'	6'	6'
173	HORIZ.	30'	30'	30'	30'	25'	25'	25'	25'
	VERT.	6'	8'	10'	15'	15'	15'	10'	7'
174	HORIZ.	3'	3'	3'	3'	3'	3'	3'	3'
	VERT.	0'	0'	0'	0'	0'	0'	0'	0'
175	HORIZ.	10'	9'	9'	11'	12'	10'	9'	9'
	VERT.	5'	5'	5'	5'	5'	5'	5'	5'
176	HORIZ.	8'	8'	8'	6'	6'	6'	6'	6'
	VERT.	3'	3'	3'	3'	3'	3'	3'	3'

LNDG Job No. 2247-02

Date11/10/10

DRIPLINE MEASUREMENTS

TREE NO.	DRIPLINE	N	NE	E	SE	S	SW	W	NW
177	HORIZ.	4'	4'	4'	4'	4'	4'	4'	4'
	VERT.	3'	3'	3'	3'	3'	3'	3'	3'
178	HORIZ.	15'	15'	15'	15'	15'	15'	10'	15'
	VERT.	4'	4'	4'	4'	4'	4'	4'	4'
179	HORIZ.	2'	2'	6'	8'	10'	10'	10'	3'
	VERT.	3'	3'	3'	3'	3'	3'	3'	3'
180	HORIZ.								
	VERT.								
181	HORIZ.								
	VERT.								
182	HORIZ.								
	VERT.								
207	HORIZ.	6	6	6	6	6	6	6	6
	VERT.	3	3	3	3	3	3	3	3
254	HORIZ.	10'	9'	9'	9'	10'	10'	10'	10'
	VERT.	4'	4'	4'	4'	4'	4'	4'	4'
255	HORIZ.	5'	5'	5'	5'	5'	5'	5'	5'
	VERT.	3'	3'	3'	3'	3'	3'	3'	3'
256	HORIZ.	5'	5'	7'	7'	8'	8'	6'	6'
	VERT.	4'	4'	4'	4'	4'	4'	4'	4'

LNDG Job No. 2247-02

Date11/10/10

DRIPLINE MEASUREMENTS

TREE NO.	DRIPLINE	N	NE	E	SE	S	SW	W	NW
257	HORIZ.	20'	22'	20'	20'	23'	10'	6'	20'
	VERT.	15'	6'	10'	10'	15'	15'	15'	15'
258	HORIZ.	8'	9'	9'	9'	8'	8'	8'	8'
	VERT.	5'	5'	5'	5'	5'	5'	5'	5'
259	HORIZ.	7'	7'	8'	8'	8'	9'	8'	8'
	VERT.	5'	5'	5'	5'	5'	5'	5'	5'
	HORIZ.								
	VERT.								
	HORIZ.								
	VERT.								
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DEFINITIONS

SUMMARY of FIELD OBSERVATIONS DEFINITIONS

INTRODUCTION

Familiarity with the following definitions is necessary to the basic understanding of the oak tree ordinance and this tree report and of the procedures used to evaluate the oak trees and site conditions. There are numerous diseases and insects that frequently attack oak trees. A long discourse in plant pathology or entomology is not a prerequisite to develop a basic understanding of the effects of disease and insects upon living plant tissue. A basic knowledge of disease and insects should include an understanding of the following definitions:

FORM

1. **Tree Number** - each tree in the field required by the ordinance to be protected has been assigned a number that corresponds to a tree location on the oak tree location map.

2. **Species** - is the specific type of tree that is being evaluated.

3. **Number of Trunks** - as measured in accordance with the tree ordinance.

4. **Diameter of Trunks** - as measured at 3½' above mean natural grade.

5. **Tree Height** – is the estimated height of the tree.

6. **Leaning** – is the direction the tree is inclined, applied to those trees with extreme leaning position.

PHYSICAL CONDITION

1. **Trunk Cavity/Damage** - A **Cavity** is a hollow area in the trunk, usually due to wood decay. **Damage** is a damaged area on the trunk, usually due to an external force on the tree.

2. **Exposed Roots** - roots exposed near tree often associated with location on bank of creek.

3. **Exfoliating Bark** - the flaking off of bark from trunk and/or branches, usually caused by insect activity.

4. **Water Pocket** - pockets formed at branch crotches that can hold water and possibly weaken the tree's structure (possible hazard).

5. **Exudation** - the issuance or expelling of liquid, usually from wounds.

6. **Fruiting Bodies** - are the external signs (i.e. mushrooms, conks) of internal wood decay.

7. **Insect/Mite Damage** - is some form of damage to the parts of the tree caused by insects or mites (i.e. scale, caterpillars, weevils, borers, mites, etc.).

8. **Galls/Oak Pit Scale** - **Galls** are abnormal growth (tumors) on the tree, which may be caused by insects, mites, bacteria, etc. **Oak Pit Scale** has a severe weakening effect on the twigs, frequently resulting in their death. When the scale settles on the twig, a swelling of the twig tissue occurs so the insect in effect is in a pit; hence, the name.

9. **Fire Damage** - each tree is rated on the amount of burn it has received. These are:

Category	Percent of Tree Burned
Slight (S)	0% - 25%
Moderate (M)	26% - 75%
Heavy (H)	76% - 100%
Complete (C)	Burned to the ground

A. A check mark only, indicates a sign of past fire damage;

B. The trees with slight damage have an excellent chance of recovering to their original form. Trees with moderate damage have a good chance of recovery with alterations in form. Heavy percentage of burn on trees will significantly alter their form and lower their probability of survival to half;

C. The complete category are those trees, which burned to the ground.

10. **Mainstem Dieback** - death of healthy mainstems from the growing tip back.

11. **Branch Cavities** - hollow areas in the trunk or limbs in the upper tree, usually due to the decay of wood.

12. **Weak Crotches** - poorly formed branch attachments.

13. **Twig/Branch Dieback** - death of unhealthy twigs from the growing tip back.

14. **Exocormic Growth** - excessive growth along main limbs, rather than on twigs.

15. **Thin Foliage** - defoliation and twig dieback throughout the canopy.

16. **Vigor** - is the capacity of a tree for growth and survival. A vigorous tree will more easily ward off disease and/or insect attacks, and should recover from impacts more quickly than a weak tree. The following are the ratings:

Good (G) - New tip growth; good leaf color; relatively smooth bark free from cracks/decay;
OK (OK) - Some new tip growth; medium leaf color; some dead wood; thinning crown;
Poor (P) - No new tip growth; poor leaf color; abnormal bark; much dead wood; heavily thinned crown.
A vigorous tree will more easily ward off disease and/or insect attacks, and should recover from impacts more quickly than a weak tree.

17. **Terrain** - refers to "lay" of the land where the tree is found.

18. **Potential Hazard** - any tree may be a hazard to humans, depending on its location and/or health.

RATINGS

1. The **Health** of the trees was visually determined from a macroscopic inspection of signs and symptoms of disease. The following describes our system:

A. **Outstanding** - A healthy and vigorous tree characteristic of its species and free of any visible signs of disease or pest infestation;

B. **Above Average** - A healthy and vigorous tree. However, there are minor visible signs of disease and pest infestation;

C. **Average** - Although healthy in overall appearance, there is a normal amount of disease and/or pest infestation;

D. **Below Average/Poor*** - This tree is characterized by exhibiting a greater degree of disease and/or pest infestation or structural instability than normal and appears to be in a state of decline. This tree also exhibits extensive signs of dieback;

E. **Dead*** - This tree exhibits no signs of life whatsoever at the time of field evaluation.

* A tree rating of "D" and lower is in low of vigor and naturally a meaningful level of recovery is doubtful. Removal should be considered if it is within the proposed development.

2. The **Aesthetic/Conformity** quality of the trees was visually determined from an overall inspection of appearance. The following describes our system:

A. **Outstanding** - The tree is visually symmetrical, having the ideal form and appearance for the species;
B. **Average** - The tree, though non-symmetrical, has an appealing form for the species with very little dieback of foliage or twigs/branches;
C. **Below Average** - The tree is non-symmetrical for the species with an unappealing form and/or has much dieback of foliage and twigs/branches;
D. **Poor** - The tree has few, if any, positive characteristics and may detract from the beauty of the landscape.

TREATMENT

1. **Remove Dead Wood** - if noticeable dead wood is within the canopy, it should be removed.

2. **Remove Wire, etc.** - if anything has been attached to the tree, it should be removed.

3. **Insect/Disease Treatment** - see the TREE PRESERVATION PROGRAM within this report for explanation.

4. **Cable/Brace** - can extend the time the tree remains healthy and practically hazard free.

5. **None** - no treatment is recommended.

6. **Remove Tree** - if the tree cannot be saved through any type of treatment, it should be removed.

REMARKS (Some other terms that may be used)

1. **Basal Growth** - is leaf growth generating from around base of trunk.

2. **Exposed Buttress Roots** - is when soil absent, either all or partial, at basal portion of tree.

3. **Powdery Mildew** - are leaves that are covered by a white powdery growth generally when new growth becomes wet for long periods of time; leaves may be distorted, stunted and drop too soon.

4. **Cankers** - are rough swellings with depressed centers resulting in death of tissue, which later cracks open and exposes the wood underneath in twigs, branches, and/or trunks.

5. **Chlorotic Leaves** - leaf veins remain normally green, but the tissue between veins becomes yellow, which is usually caused by nutrient deficiencies.

6. **Bark Beetle Frass** - are wood fragments mixed in the insect's excrement.

7. **Mistletoe** - is a leafy evergreen perennial parasite with dark green leathery leaves that occur as bunches on the branches.

8. **Crowded** - is a tree within the canopy of an adjacent tree or canopy.

9. **Shading Out** - is the defoliation and twig dieback inside the canopy due to the lack of sunlight.

OAK TREE LOCATION MAP

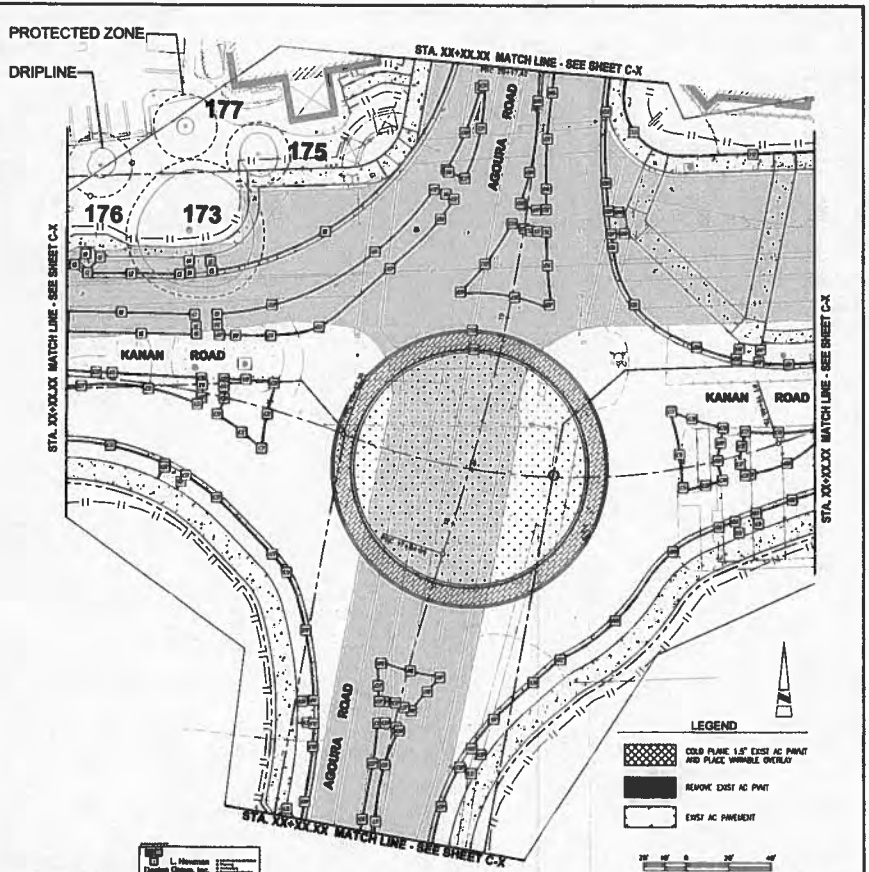
LINE DATA TABLE			
LINE #	LENGTH	BEARING	REMARKS
L13	9.13	S17°37'40.06"W	
L14	7.80	S80°14'50.94"E	
L16	20.41	N87°31'49.30"W	
L18	5.87	N6°46'20.30"E	
L19	41.59	S87°31'49.30"E	
L16	6.83	N6°46'20.30"E	
L17	4.36	S26°17'34.23"W	
L25	6.98	N89°54'01.80"W	
L27	4.98	S16°42'22.17"W	
L29	3.61	N89°54'01.80"W	
L31	6.38	N82°38'47.15"W	
L30	6.33	N89°51'58.30"W	
L5	6.87	N6°46'20.30"E	
L2	8.98	S13°06'36.75"W	
L3	36.31	S86°38'23.25"E	
L4	6.96	N81°02'20.30"W	
L1	11.74	N43°06'36.75"E	
L9	8.81	S86°51'58.24"E	
L10	46.94	S46°02'06.85"W	
L11	12.49	N89°54'37.06"W	

LINE DATA TABLE			
LINE #	LENGTH	BEARING	REMARKS
L12	8.37	N6°46'20.30"W	
L8	7.08	S89°54'37.06"E	
L7	6.08	N6°46'20.30"W	
L6	106.88	N89°54'37.06"W	
L28	4.37	S89°54'01.80"E	
L30	6.24	S26°12'22.17"E	
L31	108.27	S26°06'00.80"W	
L38	8.66	S22°37'23.02"E	
L36	7.00	S17°05'32.76"E	
L40	82.12	S3°06'43.04"W	
L48	6.43	S66°14'52.26"E	
L47	5.24	S89°36'47.15"E	
L46	17.00	N87°16'39.43"W	
L45	152.98	N8°06'73.03"E	
L43	6.63	N86°36'47.15"W	
L42	8.96	N81°16'11.66"E	
L40	12.37	N11°13'14.66"E	
L39	14.15	S75°36'34.46"W	
L34	6.97	S89°54'01.80"E	
L23	26.80	N43°06'36.75"W	

LINE DATA TABLE			
LINE #	LENGTH	BEARING	REMARKS
L21	6.96	S26°17'24.23"W	
L20	6.96	S26°17'24.23"W	
L35	13.12	S11°13'14.66"W	
L37	6.92	S17°05'07.76"E	
L33	6.96	S26°12'22.17"E	
L35	6.94	N17°06'07.76"W	
L34	23.95	S49°03'59.13"W	
L33	6.96	S26°12'22.17"E	
L52	67.37	S87°52'30.02"W	
L44	7.17	N88°36'47.15"W	
L41	6.94	S11°13'14.66"W	

CURVE DATA TABLE				
CURVE #	RADIUS	LENGTH	DELTA	REMARKS
C1	1.00'	0.79'	Δ=45°26'06"	
C2	1.00'	2.36'	Δ=135°06'06"	
C3	120.00'	6.35'	Δ=3°17'13"	
C4	1.00'	1.53'	Δ=87°53'36"	
C5	1.00'	1.61'	Δ=92°11'17"	
C6	120.00'	214.43'	Δ=98°12'33"	
C7	1.00'	1.46'	Δ=82°5'43"	
C8	1.00'	1.66'	Δ=97°09'21"	
C9	1.00'	1.53'	Δ=87°06'16"	
C10	133.00'	66.46'	Δ=28°06'5"	
C11	146.00'	60.54'	Δ=23°36'36"	
C12	1.00'	1.37'	Δ=78°28'29"	
C13	1.00'	1.71'	Δ=97°13'06"	
C14	103.00'	28.95'	Δ=16°23'06"	
C15	48.00'	23.87'	Δ=37°03'07"	
C16	208.00'	30.25'	Δ=8°46'46"	
C17	1.00'	1.46'	Δ=82°5'43"	
C18	1.00'	1.66'	Δ=96°21'23"	
C19	146.00'	32.46'	Δ=12°44'44"	
C20	1.00'	2.63'	Δ=162°06'06"	

CURVE DATA TABLE				
CURVE #	RADIUS	LENGTH	DELTA	REMARKS
C21	100.00'	43.25'	Δ=24°36'15"	
C22	1.00'	1.96'	Δ=90°16'05"	
C23	1110.00'	66.00'	Δ=3°21'46"	
C24	1.00'	1.43'	Δ=81°17'24"	
C25	1.00'	1.66'	Δ=96°36'05"	
C26	100.00'	49.76'	Δ=28°36'23"	
C27	300.00'	81.49'	Δ=16°11'33"	
C28	1.00'	1.72'	Δ=98°46'36"	
C29	3.00'	6.63'	Δ=127°17'39"	
C30	96.00'	27.50'	Δ=16°36'46"	
C31	1.00'	2.26'	Δ=134°36'05"	
C32	100.00'	24.26'	Δ=13°36'34"	
C33	1.00'	1.53'	Δ=87°17'13"	
C34	11.00'	6.63'	Δ=34°27'06"	
C35	110.00'	50.32'	Δ=26°12'36"	
C36	1.00'	1.53'	Δ=87°06'26"	
C37	1.00'	1.63'	Δ=93°06'26"	
C38	110.00'	28.41'	Δ=14°47'47"	
C39	96.00'	23.82'	Δ=27°46'24"	
C40	100.00'	47.44'	Δ=14°27'33"	



VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

PRELIMINARY OAK TREE LOCATION MAP

SHEET 1 OF 4

REVISION #	SYMBOL	DESCRIPTION OF CHANGE	APPROVED	DATE

AS PLANT

Hedrick Brown Consultants, Inc.
Consulting Civil Engineers, Land Surveyors
2000 Commercial Avenue
P.O. Box 1
Oxnard, CA 93030-0230
T 805-483-4160
www.hedrick-brown.com

PREPARED BY
PROJECT ENGINEER
DATE

L. Newman Design Group, Inc.
4165 East Thousand Oaks Blvd., Suite 290
Westlake Village, CA 91362
(805) 495-7991 FAX (805) 495-7991
www.lndesigngroup.com
Landscape Architecture • Land Planning • Water Management • Environmental Planning

CITY OF AGOURA HILLS APPROVAL

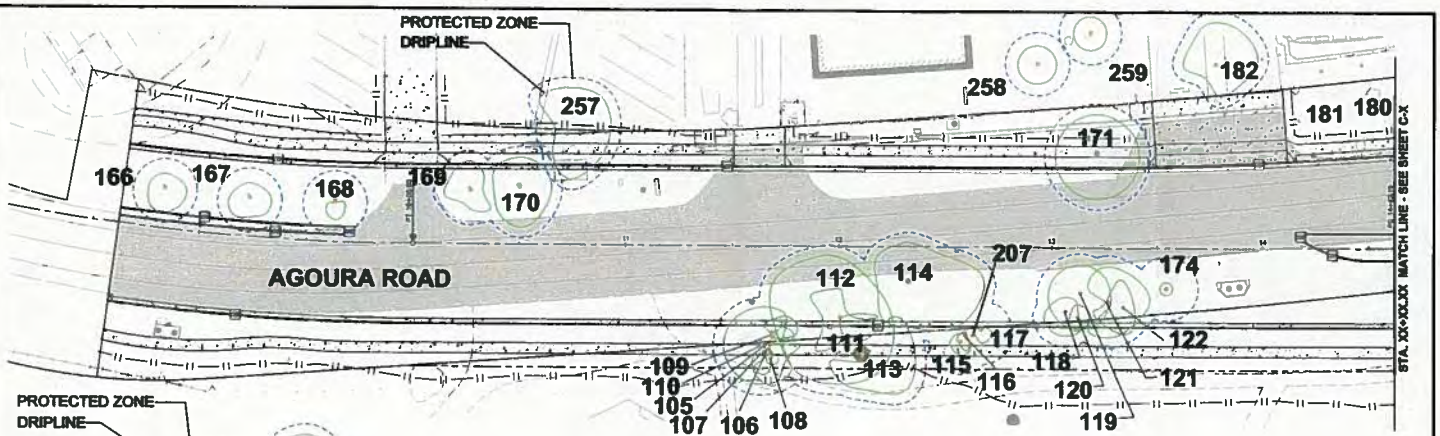
REVIEWED BY — DATE
RAMIRO ADEVA III, CITY ENGINEER — DATE
RCE NO. — EXP DATE

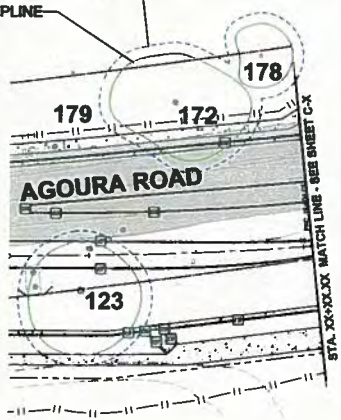
CITY OF AGOURA HILLS

KANAN ROAD AND AGOURA ROAD ROUNDABOUT

DWG NO.
SHEET ___ OF 37

CITY OF AGOURA HILLS DWG NO.





LINE DATA TABLE

LINE #	ABSORBED	BEARING	REMARKS
L61	135.33	S83°57'00.10"E	
L62	74.74	N83°57'00.10"W	
L63	300.12	S83°57'00.10"E	
L64	66.00	S89°59'22.23"E	
L8	72.00	S89°59'57.00"E	
L6	100.00	N89°59'57.00"W	
L60	17.00	S83°57'00.10"E	
L57	14.31	N30°57'00.10"W	
L58	10.10	S89°23'28.85"W	
L55	100.00	N83°57'00.10"W	
L56	0.00	N30°57'00.10"W	
L10	66.00	N89°23'28.85"E	

CURVE DATA TABLE

CURVE #	RADIUS	LENGTH	DELTA	REMARKS
C23	1100.00'	66.00'	Δ=3°37'48"	
C27	300.00'	94.40'	Δ=18°17'53"	
C106	1033.00'	133.23'	Δ=7°36'23"	
C107	2000.00'	203.30'	Δ=5°53'22"	
C108	1077.00'	143.00'	Δ=7°36'23"	
C109	1.00'	0.00'	Δ=83°59'30"	
C110	1.00'	2.23'	Δ=127°53'30"	
C111	1033.00'	103.00'	Δ=5°53'44"	
C112	2.00'	0.00'	Δ=105°59'00"	
C113	1037.00'	106.02'	Δ=5°36'23"	
C114	2.00'	6.10'	Δ=174°53'53"	
C116	1100.00'	90.34'	Δ=5°07'57"	
C116	2.00'	5.03'	Δ=147°28'12"	
C117	60.00'	33.07'	Δ=32°20'46"	

LEGEND

- COLD PLANE 1.5" EXIST AC PVMT AND PLACE VARIABLE OVERLAY
- REMOVE EXIST AC PVMT
- EXIST AC PAVEMENT

10' 10' 0 20' 40'
SCALE IN FEET

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

PRELIMINARY OAK TREE LOCATION MAP

SHEET 2 OF 4

REVISIONS	SYMBOL	DESCRIPTION OF CHANGE	APPROVED	DATE

PREPARED BY
PROJECT ENGINEER DATE

CITY OF AGOURA HILLS APPROVAL
REVIEWED BY DATE
APPROVED AS TO CITY ENGINEER DATE

AGOURA HILLS

KANAN ROAD MIN AGOURA ROAD IMPROVEMENT

DWG NO.
SHEET ___ OF 17

CITY OF AGOURA HILLS DWG. NO.

NO OAK TREES THIS SHEET

LEGEND

COLD PLANE 1.5" EXIST AC PVMT AND PLACE VARIABLE OVERLAY

REMOVE EXIST AC PVMT

EXIST AC PAVEMENT

SCALE IN FEET

SHEET 3 OF 4

PRELIMINARY OAK TREE LOCATION MAP

VERIFY SCALES

REVISION #	SYMBOL	DESCRIPTION OF CHANGE	APPROVED	APPROVAL DATE

PREPARED BY

PROJECT ENGINEER DATE

REVIEWED BY DATE

CITY OF AGOURA HILLS APPROVAL

DATE

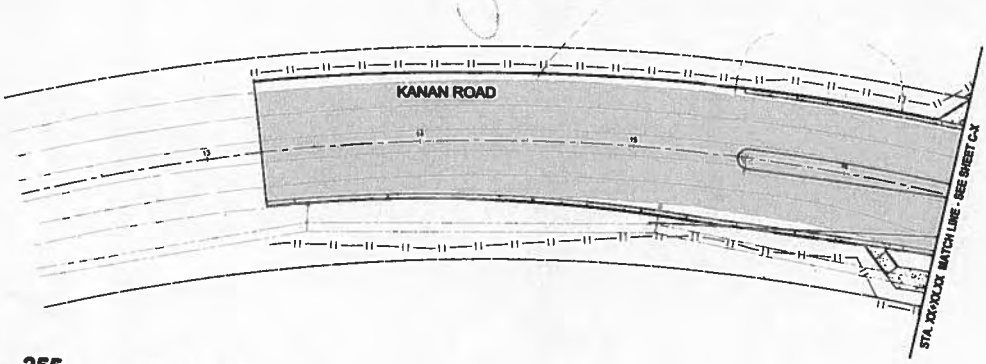
AGOURA HILLS

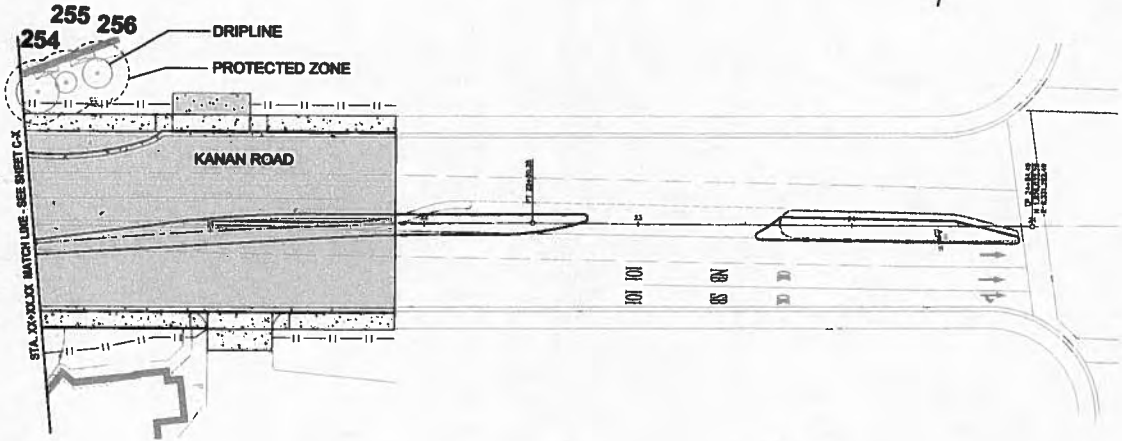
KANAN ROAD AND AGOURA ROAD ROUNDABOUT

DWG NO.

SHEET ___ OF 17

CITY OF AGOURA HILLS DWG NO.





N

LEGEND

COLD PLANE 1.5" EXIST AC PAVMT AND PLACE VARIABLE OVERLAY

REMOVE EXIST AC PVMT

EXIST AC PAVEMENT

SCALE IN FEET

VERIFY SCALES

PRELIMINARY OAK TREE LOCATION MAP

SHEET 4 OF 4

REVISION #	SYMBOL	DESCRIPTION OF CHANGE	APPROVED	DATE

PREPARED BY

PROJECT ENGINEER DATE

REVIEWED BY DATE

CITY OF AGOURA HILLS APPROVAL

AMMARO ABSWA III, CITY ENGINEER DATE

RCE NO. EXP DATE

AGOURA HILLS

KANAN ROAD AND AGOURA ROAD ROUNDABOUT

DWG NO.

SHEET ___ OF 17

CITY OF AGOURA HILLS DWG. NO.

Kay J. Greeley

Memo

To: Allison Cook, City of Agoura Hills

From: Ann Burroughs for Kay Greeley, Oak Tree and Landscape Consultant

Date: April 9, 2013

Re: 13-OTP-010 - Kanan Road and Agoura Road Roundabout

As requested, we reviewed the Draft Oak Tree Report prepared by L. Newman Design Group, Inc. dated March 25, 2013 for the above project. The Oak Tree Report includes a total of forty-three (43) oak trees. Two (2) of these oak trees are dead. Ann Burroughs performed a field observation on April 4, 2013 to verify the oak tree report.

You also requested that we compare the oak trees to be removed and encroached upon for this project with the trees to be removed and encroached upon within the same area for the proposed Agoura Road Widening Project Design.

If the roundabout plans as shown in the above Oak Tree Report is implemented as a standalone project thirty (30) oak trees for a total of four hundred fourteen inches (414") of trunk diameter would require removal and encroachment within the protected zones of four (4) oak trees would be required. Nine (9) oak trees would be preserved with no encroachment. Widening of Agoura Road within this same area would require the removal of thirty-two (32) oak trees for a total of four hundred twenty-eight inches (428") and encroachment within the protected zone of one (1) oak tree. Ten (10) oak trees would be preserved with no encroachment. If the Kanan and Agoura Roundabout is implemented subsequent the widening of Agoura Road the incremental impacts would include no additional removals, and encroachment into the protected zones of three (3) oak trees.

We have the following comments:

1. All project plans must be amended to indicate the tag number, trunk location, exact canopy spread and protected zone of all oak trees as indicated on the Oak Tree Map, including the grading and landscape plans.

2. Page 5 of the Oak Tree Report states that pruning is anticipated for clearance over the roadway for vehicular traffic for some trees. The Report must indicate which trees will require pruning as well as the extent of pruning required for each tree.

3. The impact analysis contained in the Report is preliminary. Impacts are described in a general fashion and no comments or conclusions are provided with respect to the quantitative nature of the impacts. A full, quantitative impact analysis will need to be performed to enable a full assessment of all direct impacts, including pruning.

4. A mitigation plan for the proposed oak tree impacts, including specific quantities, sizes, species and planting locations will be required.

5. Thirty (30) oak trees for a total of three hundred forty-six inches (414") of trunk diameter would require removal if the roundabout plans as proposed in the undated 95% submittal prepared by L. Newman Design Group, Inc. were to be implemented as a standalone project.

6. Tree Number 172 would experience grading and construction within ten feet (10') of its trunk. This exceeds the recommended distance of construction impacts from a mature valley oak by the most recent edition of the ISA BMP for Managing Trees during Construction. However because of the tree's proximity to the existing roadway it may be possible for the tree to be preserved. We recommend that prior to commencement of grading a trench be hand-excavated at the limit of grading adjacent to the tree to evaluate the impacts to the supporting roots. At that time a determination can be made as to whether or not the tree can remain in place.

7. Tree Number 173 would experience grading and construction within six feet (6') its trunk. This exceeds the recommended distance of construction impacts from a mature valley oak by the most recent edition of the ISA BMP for Managing Trees during Construction. However because of the tree's proximity to the existing roadway it may be possible for the tree to be preserved. We recommend that prior to commencement of grading a trench be hand-excavated at the limit of grading adjacent to the tree to evaluate the impacts to the supporting roots. At that time a determination can be made as to whether or not the tree can remain in place.

8. Tree Number 257 would experience an approximately fifty percent (50%) encroachment within its protected zone for the construction of the new street alignment and sidewalk, with grading coming within two feet (2') of its trunk. This exceeds both the percentage of encroachment permitted by the City of Agoura Hills Oak Tree Ordinance and the distance from the trunk for a mature valley oak (*Q. lobata*) recommended by the most recent edition of the ISA BMP for Managing Trees during Construction. Based on our analysis it is our opinion this tree would require removal to implement the project.

   The applicant's oak tree consultant has stated that this tree could remain with the above encroachment. If they are still believe the tree can remain we request that they provide additional information, including drawn cross sections to support their opinion.

Additional analysis will be required once the above issues are addressed. Please contact us should you have any questions at this time.

Kanan and Agoura Road Roundabout Oak Tree Impact Analysis			
Tree Number	**Standalone Project**	**Agoura Road Widening**	**Incremental Impacts**
105 through 123, 166 through 174	Remove	Remove	None
175	≈ 4% encroachment	≈ 10% encroachment	None
176	Preserve	Remove	None
177	Preserve	Preserve	None
178	Preserve	Remove	None
179	Preserve	Preserve	None
180	Preserve	Preserve	None
181	Preserve	Preserve	None
182	≈ 5% encroachment	Preserve	≈ 5% encroachment
207	Remove	Remove	None
254	≈ 20% encroachment	Preserve	≈ 20% encroachment
255	≈ 4% encroachment	Preserve	≈ 4% encroachment
256	Preserve	Preserve	None
257	Remove	Remove	None
258	Preserve	Preserve	None
259	Preserve	Preserve	None

Kay J. Greeley

Memo

To: Allison Cook, City of Agoura Hills

From: Ann Burroughs for Kay Greeley, Oak Tree and Landscape Consultant

Date: January 28, 2014

Re: 13-OTP-010 - Kanan Road and Agoura Road Traffic Roundabout

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As requested, we reviewed the Revised Oak Tree Map prepared by L. Newman Design Group, Inc. using Kimley-Horn and Associates, Inc. 95% submittal Layout Plan, undated and received by the City of Agoura Hills June 18, 2013.

The City of Agoura Hills Public Works Department plans to construct a traffic roundabout at the intersection of Agoura and Kanan Roads. The project extends approximately 850 feet west and 450 feet east of Kanan Road. West of the intersection Agoura Road will be widened to the north and south. Widening of this street east of the intersection will occur on the south side. There are a total of forty (40) coast live oak (*Quercus agrifolia*) and valley oak (*Q. lobata*) trees located within the project site, a number of which are mature specimens.

Construction of the project as proposed would impact thirty-four (34) of the 40 oak trees. Seven (7) coast live oak and twenty-three (23) valley oak trees, a total of four hundred fourteen inches (414") of trunk diameter, would be removed to accommodate the roundabout. In addition, four (4) coast live oak trees would experience construction encroachment within their protected zones, but are expected to survive. The percentages of these encroachments vary from a low of four percent (4%) to a high of twenty percent (20%). Six (6) of the existing oak trees would be retained with no direct impacts.

The Oak Tree Report states that encroachment into the protected zones of Trees Number 172 and 173 will not necessitate their removal. However root pruning in excess of that recommended for mature valley oaks by the most recent edition of the International Society of Arboriculture (ISA) Best Management Practices (BMP) for Managing Trees during Construction would occur, and may be significant enough to cause the trees to experience premature decline and death. Because of the trees' proximity to the existing roadway it may be possible to preserve them. We recommend that prior to commencement of grading a trench be hand-excavated at the limit of grading adjacent to the trees to evaluate the impacts to the supporting roots. At that time a determination can be made as to whether or not the trees can remain in place. At this time we recommend that mitigation be required for these two trees.

The Oak Tree Report states that encroachment into the protected zone of Tree Number 257 will not necessitate its removal. However this tree would experience an approximately fifty percent (50%) encroachment within its protected zone for the construction of the new street alignment and sidewalk, with grading coming within two feet (2') of its trunk. This exceeds both the percentage of encroachment permitted by the City of Agoura Hills Oak Tree Ordinance and the distance from the trunk for this work for a mature valley oak (*Q. lobata*) recommended by the above-mentioned BMP. Based on our analysis it is our opinion this tree would require removal to implement the project. We therefore recommend that mitigation be required for Tree Number 257.

The Oak Tree Ordinance limits overall oak tree removal to a maximum of ten percent (10%) of the protected zone of the oak resources overall. Based on our analysis the proposed development would result

in an impact to eighty-three percent (83%) of the oak tree canopy resource on the site. The proposed overall impact therefore exceeds the impact permitted by the Zoning Code.

Mitigation for the removal of oak trees is typically addressed through the replanting of new oak trees. Section 9657.5.C.3.c(c) of the Agoura Hills Municipal Code states that no fewer than four (4) native oaks shall be provided for any healthy oak tree removed. In the case of landmark trees, trees whose diameter exceeds forty-eight (48") inches at three and one-half feet (3'-6") above grade, the Code states that at least two (2) sixty-inch (60") box trees shall be provided. The remaining tree diameter required to be planted is dependent on the size of the individual trees to be removed.

The landscape plans for the site are currently undergoing revisions and a final analysis of the project has not yet been possible. We will perform a final reconciliation of oak trees and impacts upon completion of the project.

Planting is also subject to final site layout and site conditions such as rocky and/or excessively steep slope conditions. In situations where there is not sufficient space to plant the total number of required mitigation oak trees on the subject site, equivalent alternative mitigation is required through planting of mitigation trees off-site and/or the establishment of an in-lieu fee. If an in-lieu fee is required to satisfy the remaining portion of the required oak tree mitigation the amount of the fee is based upon tree appraisal standards contained in the 9th Edition of the Guide for Plant Appraisal and the fee is paid to the City of Agoura Hills Oak Tree Mitigation Fund. Funds in the City's Oak Tree Mitigation Fund are to be used to plant oak trees within the City of Agoura Hills if suitable planting space is available or to purchase and set aside open space within the City.

As a separate project widening of Agoura Road is proposed within this same area and would require the removal of a number of oak trees. If the Agoura Road Widening project is implemented prior to implementation of the Agoura and Kanan Road roundabout, no additional oak trees would require removal. Encroachment within the protected zone of four (4) oak trees would be required.

Following are our recommended conditions of approval with respect to oak trees if the subject project is to move forward as proposed.

Oak Trees

1. All project plans must be amended to indicate the tag number, trunk location, exact canopy spread and protected zone of all oak trees, including the grading and landscape plans.
2. The applicant is permitted to remove thirty (30) oak trees in order to complete the approved site development program as follows: Trees Number 105 through 123, 166 through 174, 207, and 257.
3. To mitigate the removal of the thirty (30) oak trees listed above, the landscape plan shall include at least four hundred fourteen inches (414") of trunk diameter of new oak trees within the landscape. The exact species, planting sizes and planting locations shall be subject to review and approval by the City Oak Tree Consultant. The applicant shall plant at least one hundred eighteen (118) oak trees within the site, to include the following eighty-nine (89) trees:
   a. Twenty-nine (29) thirty-six-inch (36") box size trees
   b. Fifty-eight (58) twenty-four-inch (24") box size trees
   c. Two (2) container-grown sixty-inch (60") box size trees to mitigate for the removal of Tree Number 113 designated a landmark tree.
4. Should the Director and the City Oak Tree Consultant determine that the required number of oak trees cannot be planted either on the subject site in a practical fashion or off-site in a location acceptable to the Director, equivalent alternative mitigation shall be established through the establishment of an equivalent in-lieu fee which the applicant shall pay into the City Oak Tree Mitigation Fund for the deficit. The amount of the in-lieu fee shall be based upon tree appraisal standards contained in the 9th Edition of the Guide for Plant Appraisal.
5. The encroachment within the protected zones of Trees Number 173 and 174 is likely to be significant, but the possibility exists that the trees can remain in place for some additional years. Mitigation for these trees is included in the 414 inches of trunk diameter of new oak trees required. During construction the City Landscape and Oak Tree Consultant will inspect the hand-excavated trenches

adjacent to the trees and determine whether or not mitigation for these trees can be reduced or eliminated.

6. The encroachment within the protected zone of Tree Number 257 is likely to be significant, but the possibility exists that the tree can remain in place for some additional years. Mitigation for this tree is included in the 414 inches of trunk diameter of new oak trees required. During final field staking the City Landscape and Oak Tree Consultant will inspect the encroachment and determine whether or not mitigation for this tree can be reduced or eliminated.

7. The planting locations, species and quality of all mitigation oak trees are subject to the approval of the City Oak Tree Consultant.

8. The mitigation oak trees shall be maintained in perpetuity. Should any of the mitigation oak trees decline or die, they shall be replaced in accordance with the provisions of the Oak Tree Preservation and Protection Guidelines.

9. The applicant is permitted to encroach within the protected zones of the following four (4) oak trees in order to complete the approved site development program: Trees Number 175, 182, 254, and 255.

10. All excavation within the protected zone of Oak Trees Number 175, 182, 254, and 255 shall be performed using only hand tools under the direct observation of the City of Agoura Hills Landscape and Oak Tree Consultant.

11. No activities are permitted within the protected zones of Trees Number 176 through 178, 256, 258, and 259. They are to be preserved in place with no direct impacts.

12. No pruning of live wood shall be permitted unless specifically authorized by the City Oak Tree Consultant. Any authorized pruning shall be performed by a qualified tree-worker under the direct observation of an ISA certified arborist. Pruning operations shall be consistent with ANSI A300 Standards – Part 1 Pruning and the most recent edition of the International Society of Arboriculture Best Management Practices for Tree Pruning.

13. Prior to the start of any mobilization or construction activities on the site, oak trees shall be fenced at the edge of the protected zone in strict accordance with Article IX, Appendix A, Section V.C.1.1 of the City of Agoura Hills Oak Tree Preservation and Protection Guidelines. The City Oak Tree Consultant shall approve the fencing location subsequent to installation and prior to the start of any mobilization or work on the site.

14. The applicant shall provide forty-eight (48) hour notice prior to the start of any approved work within the protected zone of any oak tree.

15. The contractor performing the work shall avoid damage to the oak trees from exhaust from heavy equipment by means of exhaust diversion devices to redirect or diffuse exhaust from being directed in a concentrated manner to tree limbs and foliage. The contractor shall not stop or idle equipment directly under oak limbs and foliage overhanging the street to further avoid damage to the oaks.

16. No vehicles, equipment, materials, spoil or other items shall be used or placed within the protected zone of any oak tree at any time, except as specifically required to complete the approved work.

17. No herbicides shall be used within one hundred feet (100') of the dripline of any oak tree unless the program is first reviewed and endorsed by the City Oak Tree Consultant.

18. No planting or irrigation is permitted within the protected zone of an existing oak tree without approval from the City of Agoura Hills Landscape and Oak Tree Consultant.

19. Prior to completion of the project, each existing and new oak tree shall be mulched throughout the dripline with three inches (3") of approved organic mulch as needed to supplement natural leaf litter.

20. Within ten (10) calendar days of the completion of work and prior to removal of the protective fencing, the applicant shall contact the City Oak Tree Consultant to perform a final inspection. The applicant shall proceed with any remedial measures the City Oak Tree Consultant deems necessary to protect or preserve the health of the subject oak trees at that time.

Please contact us should you have any questions at this time.

APPENDIX E
GEOTECHNICAL REVIEW

FUGRO WEST, INC.

4820 McGrath Street, Suite 100
Ventura, California 93003-7778
Tel: (805) 650-7000
Fax: (805) 650-7010

July 25, 2008
Project No. 3044.071

Boyle Engineering Corporation
5851 Thille Street, Suite 201
Ventura, California 93003

Attention: Mr. Michael Ip, P.E.

Subject: Geotechnical Study, Agoura Hills Roundabout, Agoura Hills, California

Dear Mr. Ip:

1.0 INTRODUCTION

Fugro West, Inc. is pleased to present this letter report summarizing results of the geotechnical study for the proposed Agoura Hills Roundabout to be located at the intersection of Kanan Road and Agoura Road in Agoura Hills, California.

Services for this study were performed in general accordance with our proposal dated December 21, 2007, and authorized by Boyle Engineering Corporation's (BEC) Professional Service Agreement, dated March 28, 2008.

2.0 SITE DESCRIPTION

The project site is located at the intersection of Kanan Road and Agoura Road, roughly 650 feet south of the U.S. Highway 101/Kanan Road Interchange, as shown on Plate 1 - Vicinity Map. Agoura Road is a 2-lane road running east and west with one lane in each direction. Kanan Road is a 4-lane main artery running north and south, with two lanes in each direction divided by a center median/turning lane.

In the vicinity of the existing intersection, Agoura Road slopes moderately down from east to west at roughly 1v:30h (vertical to horizontal), and Kanan Road slopes slightly down from north to south at roughly 1v:75h.

Commercial businesses are located at the northeast and northwest corners of the intersection, an abandoned parking lot at the southeast corner, and an empty dirt lot at the southwest corner of the intersection. Concrete sidewalks flank the north side of Agoura Road. Wide dirt and gravel shoulders are present on the west side of Kanan Road and the south side of Agoura Road.

3.0 PROJECT DESCRIPTION

The project consists of converting the existing intersection into a roundabout for the purpose of improving traffic flow to the U.S. Highway 101, and enhancing the aesthetic of the intersection. We understand that the presence of existing structures located at the northeast and northwest corners of the intersection will require the roundabout to be centered roughly 50 feet south of the center of the existing intersection. The alignment of the proposed roundabout relative to the existing intersection is shown on Plate 2 - Site Layout and Exploration Plan.

4.0 WORK PERFORMED

Our scope of services for the proposed project was described in our proposal dated December 21, 2007. Work performed for this study included the following:

- Drilled and sampled four hollow-stem-auger borings to depths of about 15 feet within the limits of the proposed roundabout alignment, as shown on Plate 2. Boring logs are presented in Appendix A;
- Conducted laboratory testing on selected soil samples obtained from the exploratory drill holes. Laboratory tests are presented in Appendix B;
- Evaluated field and laboratory tests, assessed and organized data, and performed engineering evaluations; and
- Preparation of this written report with graphics.

On the basis of the data obtained from the site, our geotechnical opinions and recommendations are presented regarding:

- Soil and groundwater conditions;
- Site preparation, grading, and compaction recommendations for fill placement;
- Subgrade stabilization;
- Recommendations for material selection and evaluating the suitability of onsite soils for use as compacted fill;
- Asphalt concrete (AC) and base thicknesses for flexible pavement sections;
- Expansion potential of near-surface on-site soil; and
- Utility trench backfill.

5.0 SURFACE CONDITIONS

Drill holes performed for this study were advanced within the limits of the proposed roundabout alignment, but outside of the existing intersection's paved right-of-way, as shown on Plate 2. Elevations and locations of borings were estimated based on the electronic topography plan provided by BEC.

Utilities were located by Underground Service Alert (USA) of Southern California and Westex Company (Westex) of Oxnard, California (a private utility locator), then checked against the utility plan provided by BEC (unnamed and undated plan). Several utility lines marked by USA and Westex, specifically in the vicinity of DH-2 and DH-4, were not indicated on BEC's utility plan.

DH-1 is located in the southeast quadrant of the intersection at the west end of an abandoned paved parking lot. The existing AC pavement, measured at about 1-3/4-inches thick, was in poor condition, with frequent heaving, cracking, and rutting. The parking lot is located several feet higher than the adjacent intersection, bounded on the east and north by small retaining walls and some mature trees. Access to the parking lot can be from either Kanan Road or Agoura Road via paved driveways. DH-2 is also located in the southeast quadrant, on the dirt shoulder of Agoura Road.

DH-3 is located in the northwest quadrant of the intersection, in a paved area that has been separated from the travelled right-of-way by a metal guardrail. The small paved area is bounded by a concrete sidewalk to the north, the guardrail to the east and south, and a large mature tree to the west. The AC pavement measured in DH-3 was about 3-3/4-inches thick and was underlain by no base materials.

DH-4 is located in the southwest quadrant of the intersection at the corner of a large dirt field.

6.0 SUBSURFACE CONDITIONS

Earth materials encountered in explorations advanced for the Agoura Hills Roundabout Project consisted of varying thicknesses of artificial fill, alluvium, and highly weathered bedrock. Descriptions of soil conditions presented herein are based on visual classification of samples obtained from our field exploration in combination with the results of subsequent laboratory testing.

6.1 ARTIFICIAL FILL

Artificial fill was encountered in all four borings, ranging in thickness from about 3 feet in DH-2, 5 to 5.5 feet in DH-1 and DH-3, and up to about 10 feet in DH-4. Artificial fill consisted of stiff to very stiff sandy lean clay and loose to dense clayey sand with varying amounts of fine gravel.

Artificial fill can be difficult to identify, and fill thicknesses and composition summarized herein may be highly variable between exploration locations. Locally, previous grading for the existing Agoura Road/Kanan Road intersection and adjacent site improvements have likely affected the extent of artificial fill encountered in the borings. Deeper artificial fill soils encountered in DH-4 may be attributable to localized trench backfill associated with several marked utilities observed in the immediate vicinity of this boring.

Artificial fill indicated on boring logs appears to be material derived from the onsite formation materials, likely placed during grading for the existing intersection and/or utilities.

6.1.1 Engineering Properties of Artificial Fill (af)

Dry density measurements on samples of sandy lean clay artificial fill ranged from about 100 pounds per cubic feet (pcf) to 121 pcf, with measured moisture contents ranging from about 7 percent to 18 percent. Dry density measurements on samples of clayey sand artificial fill ranged from about 102 pcf to 114 pcf, with measured moisture contents ranging from about 10 to 16 percent.

Field blow counts (adjusted for sample type) ranged from 4 to 20 blows per foot (bpf) in sandy soils, and 14 to 24 bpf in clayey soils, indicating loose to medium dense conditions in sandy soils and stiff to very stiff conditions in clayey soils.

Fines contents (percent passing the No. 200 sieve) measured on artificial fill samples ranged from 50 to 61 percent for clayey soils, and 22 to 48 percent for sandy soils.

An Expansion Index (EI) of 62 was measured from a sample of sandy lean clay artificial fill obtained from a depth of 3 feet in DH-1, indicating moderate expansion potential. An EI of 11 was measured from a sample of clayey sand artificial fill obtained from a depth of 3.5 feet in DH-4, indicating low expansion potential.

6.2 ALLUVIUM

Alluvium was encountered beneath the artificial fill soils in DH-1 and DH-2, and generally consisted of medium dense to dense silty sand, dense clayey sand, and very stiff sandy silt.

6.2.1 Engineering Properties of Alluvium (Qal)

Dry density measurements on samples of silty sand ranged from about 104 pcf to 108 pcf, with measured moisture contents ranging from about 12 to 20 percent. Dry density measurements of samples of clayey sand and sandy silt were about 114 pcf to 107 pcf, respectively, with measured moisture contents from about 10 to 19 percent, respectively.

Field blow counts (adjusted for sample type) ranged from 19 to 32 bpf in sandy soils and about 20 bpf in silty soils, indicating medium dense to dense conditions in sandy soils and very stiff conditions in silty soils.

Fines contents measured on samples of sandy alluvium ranged from 33 to 46 percent. One sample of sandy silt measured 58 percent passing the No. 200.

6.3 UPPER TOPANGA FORMATION

Highly weathered bedrock associated with the Upper Topanga Formation (Ttuc) was encountered in DH-2, DH-3, and DH-4. The Upper Topanga Formation is mapped at the project site in Dibblee (1976), and consists of marine clastic of middle Miocene age, characterized by

bedded claystone with ellipsoidal fractures. Bedrock materials encountered generally consisted of sandy lean clay with weathered angular claystone fragments.

6.3.1 Engineering Properties of the Upper Topanga Formation (Ttuc)

One dry density measured on a sample of the Upper Topanga Formation resulted in a dry density of 106 pcf with a moisture content of 20 percent.

Field blow counts (adjusted for sample type) ranged from 30 to refusal (more than 50 blows for 6 inches), indicating very stiff to hard conditions.

6.4 GROUNDWATER

Free groundwater was not observed in three of the borings (DH-1, DH-3, and DH-3), to the maximum depth explored of about 15-feet below the ground surface. Groundwater was observed in DH-4 at about 12.5-feet below the ground surface; however, this water surface probably indicates a local perched groundwater condition and is not representative of the static groundwater table in the area.

7.0 RECOMMENDATIONS

7.1 SITE PREPARATION

Proposed roadway areas should be cleared of existing pavements, debris, organics, or other unsuitable materials, and discarded offsite. Depressions or disturbed areas left from the removal of such material should be replaced with approved compacted fill, as described subsequently.

Based on the topography provided by BEC and observations during field exploration, elevations of adjacent surroundings are several feet higher than the existing pavement surface. Therefore, we estimate that grading for the proposed roundabouts will consist of fills in the existing roadway areas and cuts in the adjacent surroundings to balance the site. We anticipate cuts and fills to be on the order of 1 to 3 feet.

7.2 SUBGRADE PREPARATION

Upon completion of site preparation, existing soils should be scarified to a depth of 12 inches, moisture-conditioned to within 2 percent of optimum moisture and compacted to at least 90 percent of the maximum dry density as determined from ASTM D1557 (relative compaction), prior to placing fill (if applicable). The upper 12 inches of pavement subgrade should be compacted to at least 95 percent relative compaction.

7.3 SUBGRADE STABILIZATION

Stabilization measures may be needed during site grading if soft or pumping subgrade conditions develop. Whether those conditions develop depends on weather, depth to perched groundwater, contractor's equipment, means and methods, the types of soils exposed in the

subgrade, and other possible factors. Plans and specifications should be developed to allow for use of stabilization methods, as-needed. We recommend that unit costs for stabilization be included in the contract documents.

Based on our experience, it will likely be more effective to repair smaller localized soft or pumping areas using geotextiles and gravel backfill. Stabilization of larger areas of the project site can likely be more effectively achieved using lime stabilization. The contractor can decide which method of stabilization to implement, if necessary.

7.3.1 Geotextile and Gravel or Base Backfill

One commonly used method of stabilization consists of placing a geotextile (such as Mirafi 600X, or the equivalent) on the excavation bottom, followed by 18 inches of 6-inch minus rock followed by 6 inches of 3/4-inch crushed gravel and "set" with a few passes of lightweight vibratory equipment. The top of the gravel should be covered with filter fabric, such as Mirafi 180N, or equivalent, prior to placing fill or base materials.

The actual thickness of stabilization material (e.g., base or gravel) cannot be readily estimated ahead of time, because the needed thickness depends on the severity of soft and pumping subgrade conditions from construction activities. Therefore, some increase or decrease in the recommended material quantities may be warranted depending on the actual field conditions at the time of construction.

Scarification, moisture-conditioning, and recompaction of soils exposed after excavation of the additional subgrade soils should not be implemented, as those activities might aggravate development of soft or pumping conditions.

7.3.2 Lime Stabilization

Alternatively, mixing lime into the upper 12 to 18 inches of pavement subgrade material could be implemented to help stabilize subgrade materials. A lime mixture of about 4 to 6 percent by weight should be anticipated for estimating purposes. Lime treatment of the subgrade materials should be performed in accordance with Section 301 of the "Greenbook" (2006). The contract documents should include unit costs for lime stabilization.

7.4 EXCAVATION CONSIDERATIONS

Based on the subsurface conditions encountered during the field exploration program, we estimate that grading and excavation can be performed with conventional heavy-duty earthmoving equipment in good working order.

Utility locations and depths should be considered during grading. The extent and depth of overexcavation during grading or during implementation of subgade stabilization measures should consider the possible presence of existing shallow utilities.

7.5 FILL PLACEMENT AND COMPACTION

Onsite soils used as compacted fill should conform to the specifications of the "General Fill" section of this report. We recommend that, unless otherwise noted, fill materials be placed at a moisture content within 2 percent of the optimum moisture content and compacted to at least 90 percent relative compaction, based on the maximum dry density determined from ASTM D1557. Each layer should be spread evenly and should be thoroughly blade-mixed during the spreading to provide relative uniformity of material within each layer. Soft or yielding materials should be removed and be replaced with properly compacted fill material prior to placing the next layer.

Rock, gravel, and other oversized material (greater than 4 inches in diameter) should be removed from the fill material being placed. Rock less than 4 inches in diameter should not be nested, and voids caused by inclusion of rock in the fill should be filled with sand or other approved material.

When the moisture content of the fill material is below that sufficient to achieve the recommended compaction, water should be added to the fill. While water is being added, the soil should be bladed and mixed to provide relatively uniform moisture content throughout the material. When the moisture content of the fill material is excessive, the fill material should be aerated by blading or other methods. Fill should be spread in lifts no thicker than about 8 inches prior to being compacted. Fill materials may need to be placed in thinner lifts to achieve the recommended compaction depending on the equipment being used.

7.6 MATERIALS

7.6.1 Onsite Soils

Onsite soils encountered in the upper 5 feet of the drill holes, consisting predominantly of sandy lean clay and clayey sand, are suitable material for general fill. There is a potential that clayey onsite soils could be sensitive to changes in moisture content. Careful control of moisture content and compaction layer thickness will likely be necessary to achieve the recommended compaction.

7.6.2 General Fill

General fill should be free of organics (i.e. roots), oversize material (i.e., rocks greater than 4 inches in diameter), trash and debris, and other deleterious material. General fill materials should be no more expansive than existing onsite soils tested during this investigation, which should be verified during grading. General fill may be used beneath pavement and base materials.

7.6.3 Aggregate Base

Aggregate base should consist of imported material conforming to Caltrans Standard Specifications for Class 2 Aggregate Base, Section 26-1.02A (Caltrans, 2006) or Section 200-2.5 of the Greenbook (2006) for Processed Miscellaneous Base (PMB).

7.6.4 Aggregate Subbase

Aggregate subbase should consist of imported material conformity to Caltrans Standard Specifications for Class 2 Aggregate Subbase, Section 25-1.02A (Caltrans, 2006).

7.6.5 Imported Fill

Imported fill to be used as general should meet the requirements of general fill, and designated stockpiles should be observed and tested by Fugro prior to being brought to the site.

7.7 DRAINAGE

Positive drainage away from the roundabout should be developed and maintained. Irrigation systems associated with the planter areas and landscape areas in the medians should not be allowed to accumulate or pond water near the on-grade improvements.

7.8 UTILITY TRENCHES

Utility trenches should be braced or sloped in accordance with the requirements of the State of California, Division of Occupational Safety and Health. Backfill should consist of "General Fill" and be placed within 2 percent of optimum moisture content and compacted to at least 90 percent relative compaction, based on ASTM D1557.

Rock larger than 4 inches in maximum dimension should be excluded from backfill. Flooding or jetting of trench backfill materials should not be permitted.

Backfill materials and compaction should meet the requirements of the local governing agency or the recommendations of this report, whichever are more stringent.

7.9 FLEXIBLE PAVEMENT DESIGN

7.9.1 Existing Pavement Sections

Per our discussion with Mr. Michael Ip of BEC, drill holes were advanced out of the paved right-of-way to avoid costs associated with permitting and traffic control. However, because the drill holes were advanced outside of the paved right-of-way, existing pavement section thicknesses could not measured. Thus, the existing pavement section thicknesses and composition for the existing Agoura Road/Kanan Road intersection were not available to Fugro at the time this report was prepared.

Based on conversations with Mr. Jay Patil of the City of Agoura Hills, we understand that nearby pavement sections on Kanan Road consist of about 6 inches of asphalt concrete (A.C) over about 12.5 inches of 1-sack sand-cement slurry and a bike lane on Agoura Road consists of about 4 inches of A.C. over 15" aggregate base materials (A.B). Pavement sections measured in DH-3, located in the shoulder area, are not likely representative of the pavement section thicknesses at the existing intersection, based on the information provided by Mr. Patil and Fugro's experience in the project area.

During our field exploration program, we observed the existing pavement in the vicinity of the Agoura Road/Kanan Road intersection to be in good condition, with no obvious rutting, significant cracking or raveling observed.

7.9.2 Design Basis

A Traffic Index (T.I.) of 9.0 was provided by Mr. Michael Ip of Boyle for use in developing new pavement sections. Resistance-value (R-value) tests performed on bulk samples of selected subsurface material obtained from the upper 5 feet of DH-1 and DH-3 resulted in R-values of 4 and 13, respectively. Flexible pavement sections tabulated below were developed using the Caltrans method of flexible pavement design based on a 20-year design life. These values do not allow for construction traffic after the pavement is placed.

If design TI values are different from the assumed values, Fugro should be notified accordingly for reevaluation of pavement section thickness. R-value tests should be performed on on-site subgrade materials near the completion of rough grading and on potential import soils prior to transporting to the project site in order to confirm pavement design sections. The samples for the confirmatory R-value tests should be obtained from the upper 3 feet of pavement subgrade soils.

7.9.3 Recommended Pavement Sections

Three options for new pavement section thicknesses are presented in Table 1 below: 1) asphalt concrete over aggregate base, 2) asphalt concrete over aggregate base over aggregate sub-base, and 3) asphalt concrete over aggregate base over lime treated subgrade.

Table 1 - Summary of Minimum Pavement Sections

Option	Traffic Index	R-Value	Asphalt Concrete (inches)	Aggregate Base (inches)	Aggregate Sub-Base (inches)	Depth of Lime Treated Subgrade (inches)
1	9.0	4	5.5	21	--	--
2	9.0	4	5.5	8	14	--
3	9.0	4	5.5	6	--	12

7.9.4 Aggregate Base

Aggregate base materials should conform to the recommendations in Section 7.6.3 of this report. Aggregate base materials underlying asphalt concrete pavements should be compacted in lifts not exceeding 6 to 8 inches in thickness, to at least 95 percent relative compaction within 2 percent of the optimum moisture content as determined by ASTM D1557.

7.9.5 Aggregate Subbase

Aggregate subbase materials should consist of granular soil with an R-value of at least 50 and should conform to the recommendations in Section 7.6.4 of this report. Aggregate subbase materials should be compacted in lifts not exceeding 6 to 8 inches in thickness, to at least 95 percent relative compaction, and within 2 percent of the optimum moisture content as determined by ASTM D1557.

7.9.6 Pavement Subgrade

The upper 12 inches of pavement subgrade should be compacted to at least 95 of the maximum dry density as determined by ASTM D1557. As-compacted moisture contents for the upper 12 inches of pavement subgrade should be within 2 percent of the optimum moisture, as determined by ASTM D1557.

7.9.7 Lime Treated Pavement Subgrade

As stated above, the upper 12 inches of pavement subgrade can be lime treated to reduce the amount of aggregate base and eliminate the aggregate subbase, and also provide a stable surface for constructing the pavement.

Specifications for lime treatment, including method of application and percent lime, should be developed by the contractor. Lime treatment shall be performed in accordance with Section 24 of Caltrans Standard Specifications (Caltrans, 2006).

8.0 ADDITIONAL SERVICES

The design and construction phases of the project require a continuation of the observation of site conditions to confirm the recommendations of this report. In order to provide this continued service, the geotechnical engineer of record should be retained to interpretations, respond to requests for information, and observe the contractor's implementation of the design.

The purpose of such services is to observe compliance with the initial development concept, the specifications, and the geotechnical recommendations. The observation and testing services can allow for changes in the recommendations in the event that subsurface conditions differ from those anticipated prior to construction.

9.0 LIMITATIONS

Fugro prepared the conclusions and professional opinions presented in this report according to generally accepted geotechnical engineering principles and practices at the time and location this report was prepared. This statement is in lieu of all warranties, express or implied.

This report has been prepared for the exclusive use of Boyle Engineering Corporation and their authorized agents for the proposed roundabout in Agoura Hills, California. It may not contain sufficient information for other parties or other uses. If any changes are made to the

project that differ from those described in this report, the conclusions and recommendations contained in this report may become invalid. Fugro should review any changes in the project, and provide modifications, if necessary, to the recommendations presented in this report. This report and the drawings contained in this report are intended for design-input purposes; they are not intended to act as construction drawings or specifications.

Soil and rock deposits vary in type, strength, and other geotechnical properties between points of observations and exploration. Additionally, groundwater and soil moisture conditions also can vary seasonally or for other reasons. Therefore, we do not and cannot have a complete knowledge of the subsurface conditions underlying the site. The conclusions and recommendations presented in this report are based upon the findings at the points of exploration, interpolation and extrapolation of information between and beyond the points of observation, and are subject to confirmation based on the conditions revealed by construction.

Please call if you have any questions or require additional information about this study. We appreciate the opportunity to provide our services to you.

Sincerely,

FUGRO WEST, INC.

REGISTERED PROFESSIONAL ENGINEER
JON M. EVERETT
No. 2531
Exp 6-30-09
GEOTECHNICAL
STATE OF CALIFORNIA

Jamie E. Hutchins
Staff Engineer

Jon M. Everett, G.E.
Principal Engineer

Attachments: Plate 1 - Vicinity Map
Plate 2 - Site Layout and Exploration Plan
Appendix A - Field Exploration
Appendix B - Laboratory Testing

Copies Submitted: (3) Addressee and 1-CD

REFERENCES

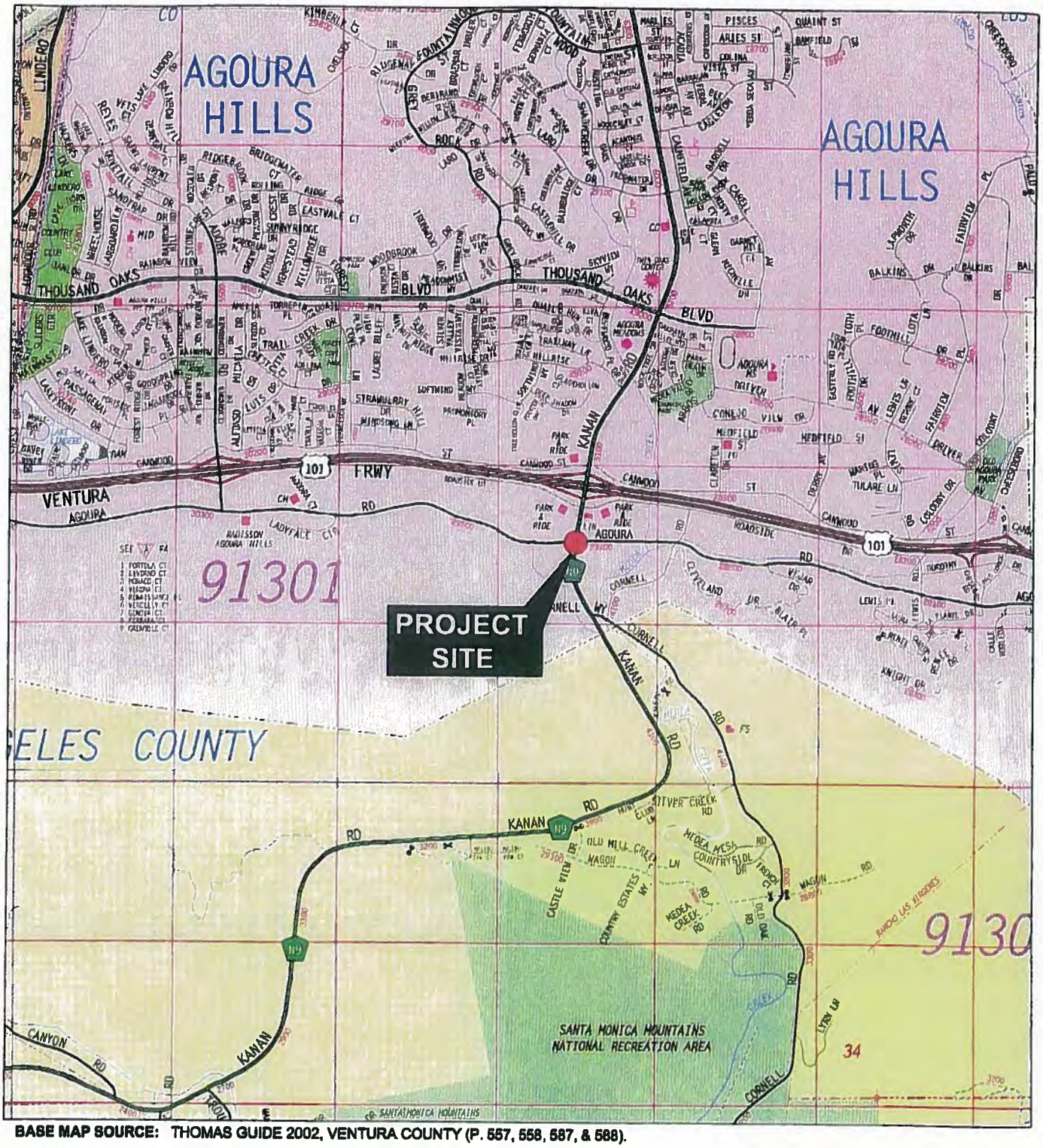
California State Department of Transportation (2001), Highway Design Manual, Chapter 630.

_____ (2006), *Caltrans Standard Specifications.*

Dibblee (1976), Geologic Map of the Calabasas Quadrangle, Map No. DF-37, published by the Diblee Geologic Foundation.

"Greenbook" *Standard Specifications for Public Works Construction* (2006), published by BNI Building News, Los Angeles, California.

PLATES



BASE MAP SOURCE: THOMAS GUIDE 2002, VENTURA COUNTY (P. 557, 558, 587, & 588).

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NORTH

0 1200 2400

FEET

VICINITY MAP
Agoura Hills Roundabout
Agoura Hills, California

PLATE 1

APPENDIX A
FIELD EXPLORATION

LOCATION: Approximately 75 feet south of SE corner of intersection, see Plate 2.

SURFACE EL: 880.5 ft +/-

ELEVATION, ft	DEPTH, ft	SAMPLE NO.	SAMPLER	SAMPLER BLOW COUNT	MATERIAL DESCRIPTION	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S_u, ksf
880		Bulk			1-3/4" asphalt-concrete over no base materials							
					ARTIFICIAL FILL (af) Sandy Lean CLAY (CL): very stiff, dark brown, slightly moist, moderate plasticity, fine sand; trace roots, trace fine gravel							
878		1		(40)		129	121	7	61			p 4.0+
876	5	2		16	- fine to medium sand							p 4.0+
					ALLUVIUM (Qal) Clayey SAND (SC): dense, light brown, slightly moist, fine to medium sand							
874		3		(54)								
872						126	114	10	33			
870	10	4		19	Silty SAND (SM): medium dense to dense, light brown, slightly moist, very fine sand							
868		5		(54)								
866						125	104	20	42			
	15											
864												
862												
860	20											
858												
856	25											
854												
852												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 14.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings
DRILLING DATE: May 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Icon Drilling
LOGGED BY: J. Hutchins
CHECKED BY: J. Everett, G.E.

LOG OF BORING NO. DH-1

Agoura Hills Roundabout
Agoura Hills, California

PLATE A-1

LOCATION: SE corner of intersection, see Plate 2.

SURFACE EL: 879.5 ft +/-

ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	MATERIAL DESCRIPTION	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S_u, ksf
878			1		(29)	**ARTIFICIAL FILL (af)** Sandy Lean CLAY (CL) / Clayey SAND (SC): dense, dark brown, slightly moist, fine sand; trace fine gravel	127	119	7	50			p 4.0+
876			2		15	Clayey SAND (SC): medium dense, orange-brown mottled, moist, fine to medium sand; trace fine angular gravel							
874	5		3		(34)	**ALLUVIUM (Qal)** Silty SAND (SM): medium dense, light brown, slightly moist, fine sand	121	108	12	46			
872													
870	10		4		(34)	Sandy SILT (ML): very stiff, light brown, moist, fine sand, trace medium sand	127	107	19	59			
868													
866			5		67	**UPPER TOPANGA FORMATION (Ttuc)** Highly Weathered; Sandy Lean Clay with Bedrock Fragments: hard, gray with dark brown mottled, moist, weathered rock fragments, fine to medium sand							p 4.0+
864	15												
862													
860	20												
858													
856													
854	25												
852													
850													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 14.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings
DRILLING DATE: May 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Icon Drilling
LOGGED BY: J. Hutchins
CHECKED BY: J. Everett, G.E.

LOG OF BORING NO. DH-2

Agoura Hills Roundabout
Agoura Hills, California

PLATE A-2

LOCATION: Approximately 30 feet west of NW corner of intersection, see Plate 2.

SURFACE EL: 873.5 ft +/-

ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	MATERIAL DESCRIPTION	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S_u, ksf
			Bulk			3-3/4" asphalt-concrete over no base materials							
872			1		(24)	**ARTIFICIAL FILL (af)** Sandy Lean CLAY (CL): stiff, dark reddish brown, moist, fine to coarse sand; trace fine to coarse angular gravel - clayey sand layer at 2.5'	118	100	18	22			
870													
868	5		2		57	**UPPER TOPANGA FORMATION (Ttuc)** Highly Weathered; Sandy Lean Clay with Bedrock Fragments: hard, dark reddish brown, moist, angular weather bedrock fragments; fine to medium sand							p 4.0+
866													
			3		85/11"		127	106	20				
864	10												
862			4		59								
860													
			5		50/4"								
858	15												
856													
854	20												
852													
850													
848	25												
846													
844													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 15.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings
DRILLING DATE: May 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Icon Drilling
LOGGED BY: J. Hutchins
CHECKED BY: J. Everett, G.E.

LOG OF BORING NO. DH-3

Agoura Hills Roundabout
Agoura Hills, California

LOCATION: SW corner of intersection, see Plate 2.

SURFACE EL: 875.5 ft +/-

ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	MATERIAL DESCRIPTION	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S_u, ksf
874			1		15	**ARTIFICIAL FILL (af)** Clayey SAND (SC): medium dense, brown, dry, fine sand, trace fine gravel							
872			2		(33)	- dark reddish brown, moist, fine to coarse sand, with gravel, at 3'	117	102	14	42			
870	5		3		4	- loose below 5'							
868			4		(7)		121	104	16	38			
866	10					- no sample recovery at 10'							
864						- perched groundwater at 13.5'							
862			5		30	**UPPER TOPANGA FORMATION (Ttuc)** Highly Weathered; Sandy Lean Clay with Bedrock Fragments: very stiff, reddish brown and dark gray mottled, wet, weathered bedrock fragments, fine to medium sand							
860	15												
858													
856	20												
854													
852													
850	25												
848													
846													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

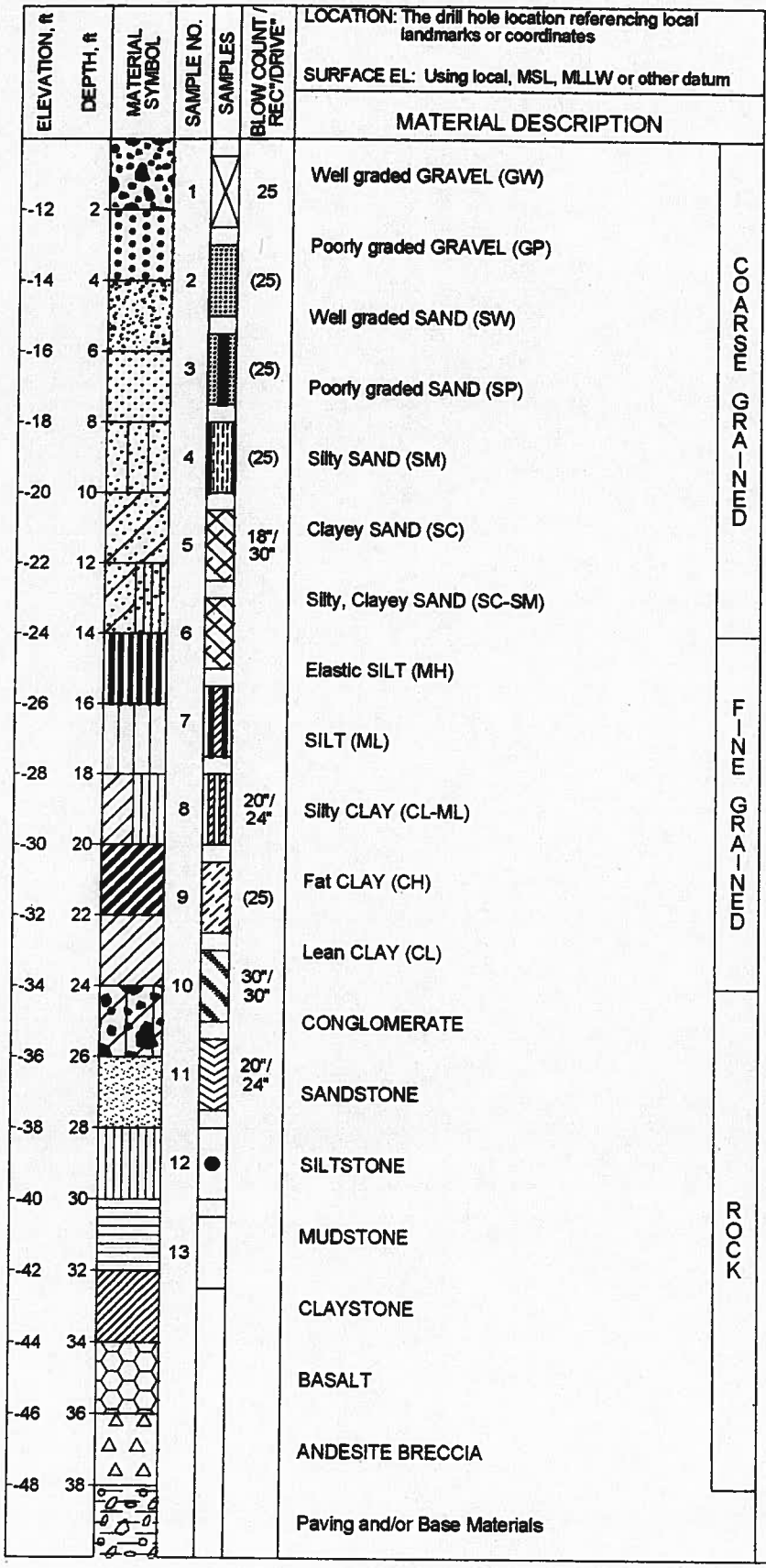
COMPLETION DEPTH: 15.0 ft
DEPTH TO WATER: 12.5 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: May 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Icon Drilling
LOGGED BY: J. Hutchins
CHECKED BY: J. Everett, G.E.

LOG OF BORING NO. DH-4

Agoura Hills Roundabout
Agoura Hills, California

PLATE A-4



General Notes

Soil Texture Symbol

Sloped line in symbol column indicates transitional boundary

Samplers and sampler dimensions
(unless otherwise noted in report text) are as follows:

Symbol for:

1	SPT Sampler, driven 1-3/8" ID, 2" OD
2	CA Liner Sampler, driven 2-3/8" ID, 3" OD
3	CA Liner Sampler, disturbed 2-3/8" ID, 3" OD
4	Thin-walled Tube, pushed 2-7/8" ID, 3" OD
5	Bulk Bag Sample (from cuttings)
6	CA Liner Sampler, Bagged
7	Hand Auger Sample
8	CME Core Sample
9	Pitcher Sample
10	Lexan Sample
11	Vibracore Sample
12	No Sample Recovered
13	Sonic Soil Core Sample

Sampler Driving Resistance

Number of blows with 140 lb. hammer, falling 30" to drive sampler 1 ft. after seating sampler 6"; for example,

Blows/ft	Description
25	25 blows drove sampler 12" after initial 6" of seating
86/11"	After driving sampler the initial 6" of seating, 36 blows drove sampler through the second 6" interval, and 50 blows drove the sampler 5" into the third interval
50/6"	50 blows drove sampler 6" after initial 6" of seating
Ref/3"	50 blows drove sampler 3" during initial 6" seating interval

Blow counts for California Liner Sampler shown in ( )

Length of sample symbol approximates recovery length

Classification of Soils per ASTM D2487 or D2488

Geologic Formation noted in bold font at the top of interpreted interval

Strength Legend

Q = Unconfined Compression
u = Unconsolidated Undrained Triaxial
t = Torvane
p = Pocket Penetrometer
m = Miniature Vane

Water Level Symbols

▽ Initial or perched water level
▼ Final ground water level
∿ Seepages encountered

Rock Quality Designation (RQD) is the sum of recovered core pieces greater than 4 inches divided by the length of the cored interval.

KEY TO TERMS & SYMBOLS USED ON LOGS

BORING LOG KEY VENTURA N:\PROJECTS\3044_BOYLEENGR\3044-071_AGOURA_ROUNDABOUT\EXPLORATIONS\INT\2006\3044-071.GPJ 7/24/06 0:58 p

APPENDIX B
LABORATORY TESTING

Boyle Engineering Corporation
Project No. 3044.071

DRILL HOLE	DEPTH, ft	SAMPLE NUMBER	MATERIAL DESCRIPTION	UWW pcf	UDW pcf	MC %	FINES %	ATTERBERG LIMITS		COMPACTION TEST		DIRECT SHEAR		COMPRESSIVE STRENGTH TESTS		CORROSIVITY TESTS				R-VALUE	EXPANSION INDEX	SAND EQUIVALENT (SE)	SPECIFIC GRAVITY
								LL	PI	MAX DD pcf	OPT MC %	C ksf	PHI deg	Qu, ksf	S_u (Cell Prs.) ksf	R	pH	Cl	So_4 (%)				
DH-1	3.0	1	Sandy Lean CLAY (CL) [af]	129	121	7	61													4	62		
DH-1	4.5	2	Sandy Lean CLAY (CL) [af]																				
DH-1	8.0	3	Clayey SAND (SC) [Qal]	126	114	10	33																
DH-1	14.0	5	Silty SAND (SM) [Qal]	125	104	20	42																
DH-2	1.5	1	Sandy Lean CLAY (CL) / Clayey SAND (SC) [af]	127	119	7	50																
DH-2	3.5	2	Clayey SAND (SC) [af]																				
DH-2	6.0	3	Silty SAND (SM) [Qal]	121	108	12	46																
DH-2	9.0	4	Sandy SILT (ML) [Qal]	127	107	19	58																
DH-2	14.0	5	Upper Topanga Formation [Ttuc]																				
DH-3	2.5	1	Sandy Lean CLAY (CL) [af]	118	100	18	22													13			
DH-3	5.5	2	Upper Topanga Formation [Ttuc]																				
DH-3	8.5	3	Upper Topanga Formation [Ttuc]	127	106	20																	
DH-3	11.5	4	Upper Topanga Formation [Ttuc]																				
DH-3	14.0	5	Upper Topanga Formation [Ttuc]																				
DH-4	1.0	1	Clayey SAND (SC) [af]																				
DH-4	3.5	2	Clayey SAND (SC) [af]	117	102	14	42														11		
DH-4	5.0	3	Clayey SAND (SC) [af]																				
DH-4	7.5	4	Clayey SAND (SC) [af]	121	104	16	38																
DH-4	13.5	5	Upper Topanga Formation [Ttuc]																				

SUMMARY OF LABORATORY TEST RESULTS

Agoura Hills Roundabout
Agoura Hills, California

LAB SUMMARY TABLE VENTURA_N:\PROJECTS\3044_BOYLEENGR\3044-071_AGOURA_ROUNDABOUT\EXPLORATIONS\INT\20083044.071.GPJ_ 7/24/08 03:39 PM-cab

-R- VALUE TEST RESULT

PROJECT NO: 3044.071

PROJECT NAME: AGOURA HILLS ROUNDABOUTS

SAMPLE NO. DH-1 @ 0 - 5' SOURCE: Onsite

DESCRIPTION: Dark brown lean CLAY with sand (CL)

TESTED BY: GB DATE: 5/20/08

ATTENTION: Jamie Hutchins

COPY TO: N/A

* * * * * * RESISTANCE VALUE DATA SUMMARY * * * * * *

INITIAL MOISTURE CONTENT: 16 %

DRY DENSITY (pcf)	WATER CONTENT (%)	EXUDATION PRESSURE (psi)	EXPANSION PRESSURE (psf)	* R * VALUE
101.3	20.6	223	0	2
101	19.5	334	0	5
106.2	18.4	493	0	12

AT EXUDATION PRESSURE OF 300 PSI:

101.9	19.9	300	0	4

-R- VALUE TEST RESULT

PROJECT NO: 3044.071

PROJECT NAME: AGOURA HILLS ROUNDABOUTS

SAMPLE NO. DH-3 @ 0 - 5' SOURCE: Onsite

DESCRIPTION: Brown sandy lean CLAY (CL)

TESTED BY: AB DATE: 5/20/08

ATTENTION: Jamie Hutchins

COPY TO: N/A

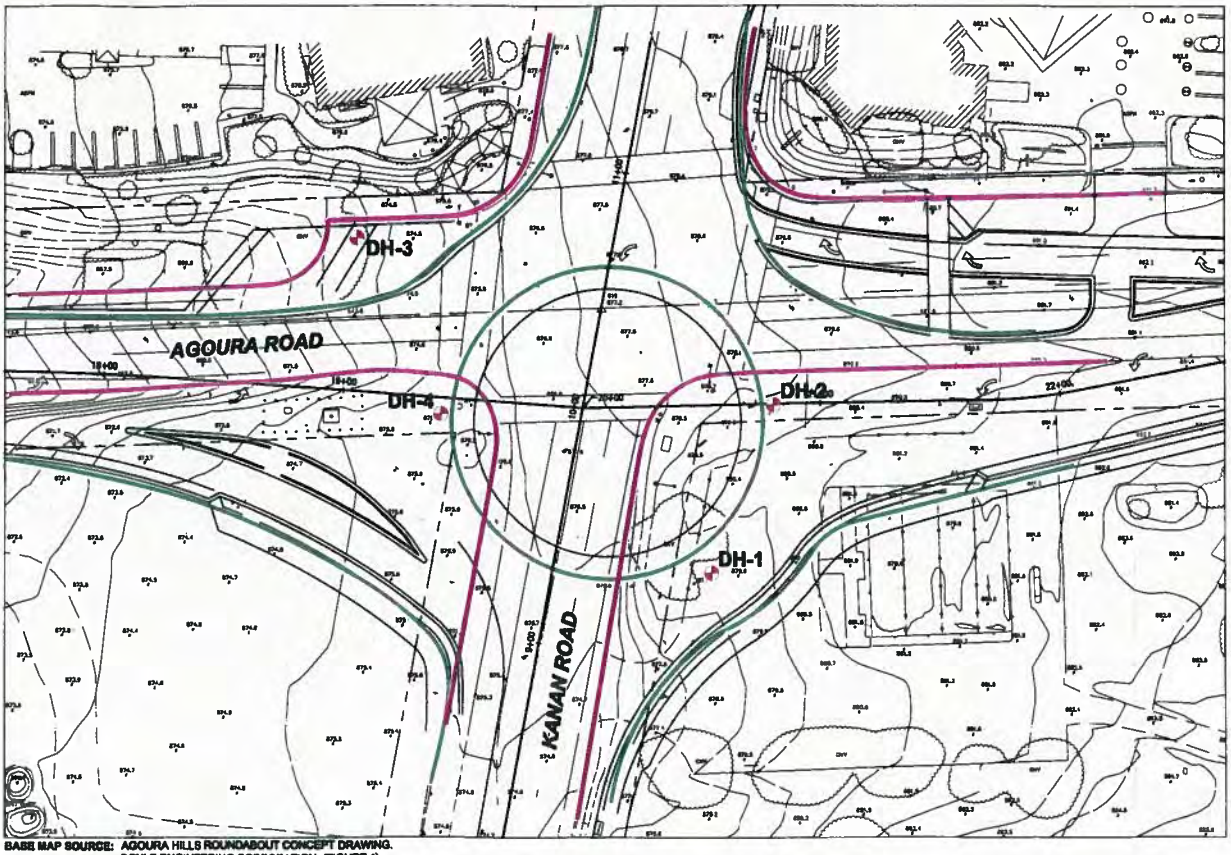
* * * * * * RESISTANCE VALUE DATA SUMMARY * * * * * *

INITIAL MOISTURE CONTENT: 18 %

DRY DENSITY (pcf)	WATER CONTENT (%)	EXUDATION PRESSURE (psi)	EXPANSION PRESSURE (psf)	* R * VALUE
99.2	22.2	191	0	6
102.6	21.1	270	0	11
104.4	19.9	358	0	17

AT EXUDATION PRESSURE OF 300 PSI:

102.9	20.7	300	0	13



BASE MAP SOURCE: AGOURA HILLS ROUNDABOUT CONCEPT DRAWING. BOYLE ENGINEERING CORPORATION. (FIGURE 1).

LEGEND

DH-4 Approximate boring location

Existing roads

Proposed alignment

NORTH

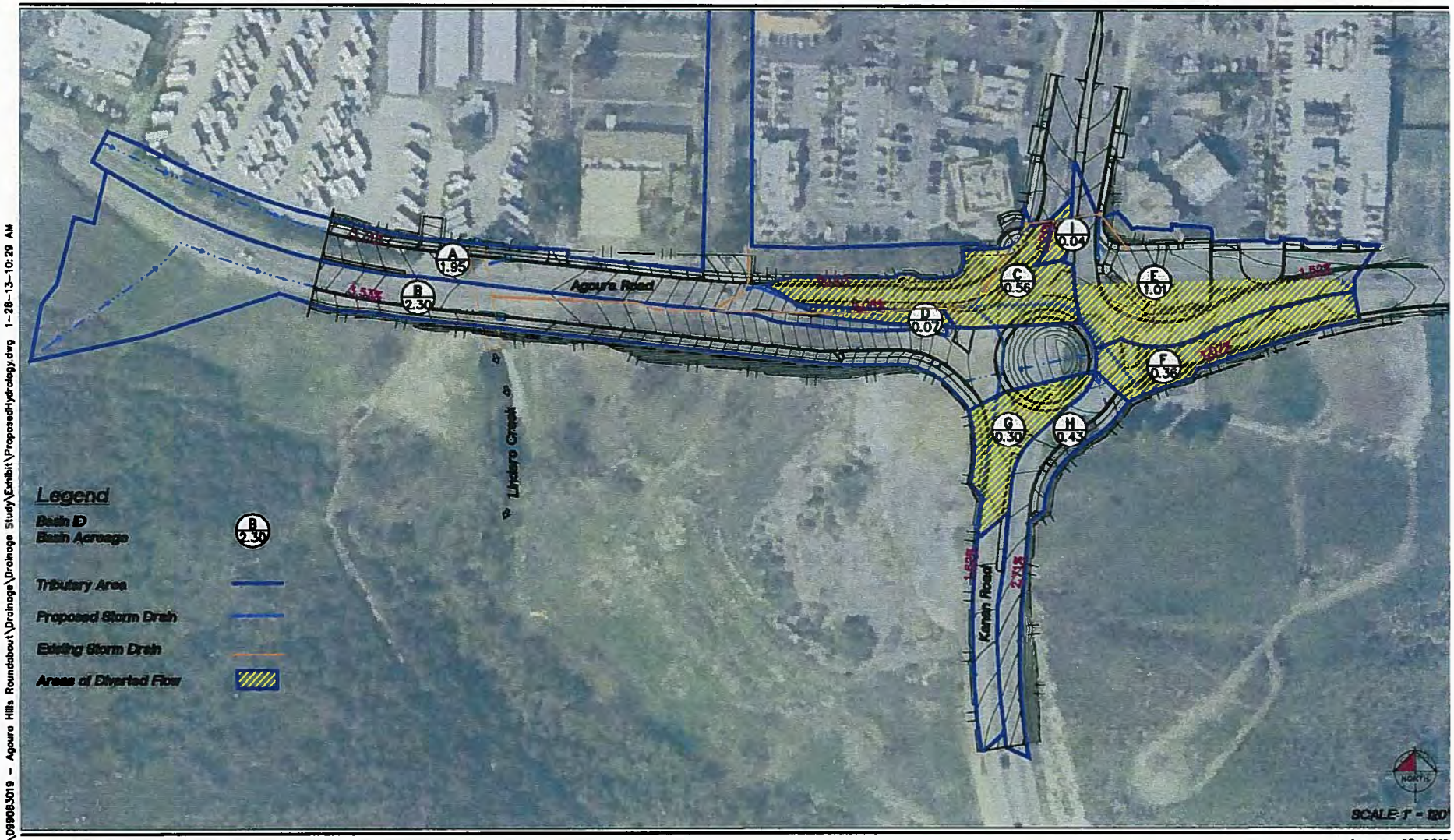
0 40 80

FEET

SITE LAYOUT AND EXPLORATION PLAN
Agoura Hills Roundabout
Agoura Hills, California

PLATE 2

APPENDIX F
DRAINAGE CALCULATIONS



Kimley-Horn and Associates, Inc.

January 28, 2013

City of Agoura Hills
Proposed Catch Basin Watershed Exhibit

K:\SND_LDEV\099063019 - Agoura Hills Roundabout\Drainage\Drainage Study\Exhibit\Proposedhydrology.dwg 1-28-13-10:29 AM

Project	Subarea	Area (acres)	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (i	Cu	Cd	Flow rate (cfs)
Agoura Roundabout	A	1.95	84	50	28	536	0.037	7.4	5	4.42	0.69	0.9	7.76
Agoura Roundabout	B	2.3	54	50	28	641	0.035	7.4	6	4.05	0.67	0.9	8.38
Agoura Roundabout	C	0.56	83	50	28	366	0.06	7.4	5	4.42	0.69	0.9	2.23
Agoura Roundabout	D	0.07	100	50	28	192	0.06	7.4	5	4.42	0.69	0.9	0.28
Agoura Roundabout	E	1.01	73	50	28	392	0.015	7.4	5	4.42	0.69	0.9	4.02
Agoura Roundabout	F	0.36	85	50	28	304	0.011	7.4	5	4.42	0.69	0.9	1.43
Agoura Roundabout	G	0.3	82	50	28	578	0.0181	7.4	6	4.05	0.67	0.9	1.09
Agoura Roundabout	H	0.43	92	50	28	527	0.02	7.4	5	4.42	0.69	0.9	1.71
Agoura Roundabout	I	0.04	100	50	28	89	0.0171	7.4	5	4.42	0.69	0.9	0.16

APPENDIX G
TRAFFIC IMPACT ANALYSIS

Kimley-Horn
and Associates, Inc.

TECHNICAL MEMORANDUM

Date: February 11, 2013

To: Allison Cook,
Principal Planner, City of Agoura Hills, CA

From: Sri Chakravarthy, P.E., T.E.
Vikas Sharma
Kimley-Horn and Associates, Inc.

Subject: Traffic Analysis for Kanan Road and Agoura Road Roundabout

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MEMORANDUM OVERVIEW

This memorandum documents the updated traffic analysis that was completed as part of the environmental document for a proposed multi-lane roundabout at Kanan Road and Agoura Road intersection in the City of Agoura Hills, California. The analysis supplements the traffic analysis work and is based on the methodology consistent with the previous *Traffic Operational Analysis Summary* prepared by *Kittelson & Associates* (July 2008) and *Capacity Analyses – Three Different Types of Right Turn Lanes on North Approach* prepared by *Alternate Street Design* (February 2009).

The intersection of Kanan Road and Agoura Road is currently signalized and a multi-lane roundabout with two lanes per approach and a right-turn slip lane in the southbound direction is proposed for improving operational efficiency in the near future. As per discussions with the City staff, the proposed roundabout is expected to be fully operational by the year 2020. This memorandum identifies the roundabout Level-of-Service (LOS) conditions for both morning (AM) and evening (PM) peak hour conditions under existing and future conditions. The analysis was performed using SIDRA 5.1 software and utilized the proposed right turn slip lane configuration on the north approach.

ANALYSIS METHODOLOGY

Analysis Scenarios

Weekday AM and PM peak period analysis was completed for both existing conditions and future conditions. The following scenarios were analyzed:

- Existing (2012) Conditions
- Opening Year (2020) for roundabout completion (including cumulative projects in the area and background growth factor) with and without roundabout. The "2020 without roundabout" scenario includes Kanan Road/Agoura Road interim intersection improvement that is part of Agoura Road Widening Project. The intersection improvements include installation of protective

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left-turn phasing for eastbound and westbound movements, an additional left-turn lane for eastbound and westbound movements, and an additional through lane for southbound movement

- Build-Out 2035 Conditions

Traffic Data

Existing traffic count data was collected during weekday morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak periods on September 26, 2012. The traffic counts collected in September 2012 are included in **Appendix A** of this memo.

This analysis used the growth rates published in the Los Angeles County Congestion Management Program (CMP). The CMP indicates an annual ambient growth rate of 0.75% per year for future traffic projections.

The year 2020 scenario includes ambient growth 0.75% per year, plus traffic attributed to approved and pending developments (cumulative projects) in the immediate area was added to the existing 2012 traffic volumes. Information about cumulative projects (approved and pending projects) in the Agoura Hills area was obtained from the City of Agoura Hills. A list of related projects is provided in **Appendix B.**

The ambient traffic growth rate of 0.75% per year was applied to the year 2020 traffic volumes to develop traffic projections for the build-out (2035) conditions.

Figure 1 depicts the existing and future traffic conditions for the proposed roundabout.

Analysis Tools

SIDRA 5.1 was used to analyze the operations of the proposed multi-lane roundabout for all the study scenarios. The analysis was performed using SIDRA standard analysis methodology to be consistent with the analyses that were completed previously in 2008 and 2009.

Measures of Effectiveness

The following measures of effectiveness were computed from SIDRA roundabout model:

- Level of Service (LOS)
- Average delay in seconds

LOS Criteria

The predominant consideration in roundabout capacity analyses is the volume of the circulating traffic and the volume of the entering traffic on an approach. Traffic entering a roundabout will look for gaps in the circulating traffic in order to enter the roundabout. This behavior is called gap seeking. Both the traffic signal and the modern roundabout capacity analyses are based on the general principles and performance measuring criteria identified in the Transportation Research Board's Highway Capacity Manual. 2000 Level of service (LOS) for a roundabout is determined by the computed or measured control delay. To be consistent with the previous analyses, HCM 2000 methodology was utilized for this roundabout operational analysis. HCM 2000 LOS criteria are presented in **Table 1**.

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Table 1: Level of Service (LOS) Criteria

HCM (seconds/vehicle)	Level of Service (LOS)
≤10.0	A
<10.0 and <20.0	B
>20.0 and <35.0	C
>35.0 and <55.0	D
>55.0 and <80.0	E
>80.0	F

Source: HCM 2000

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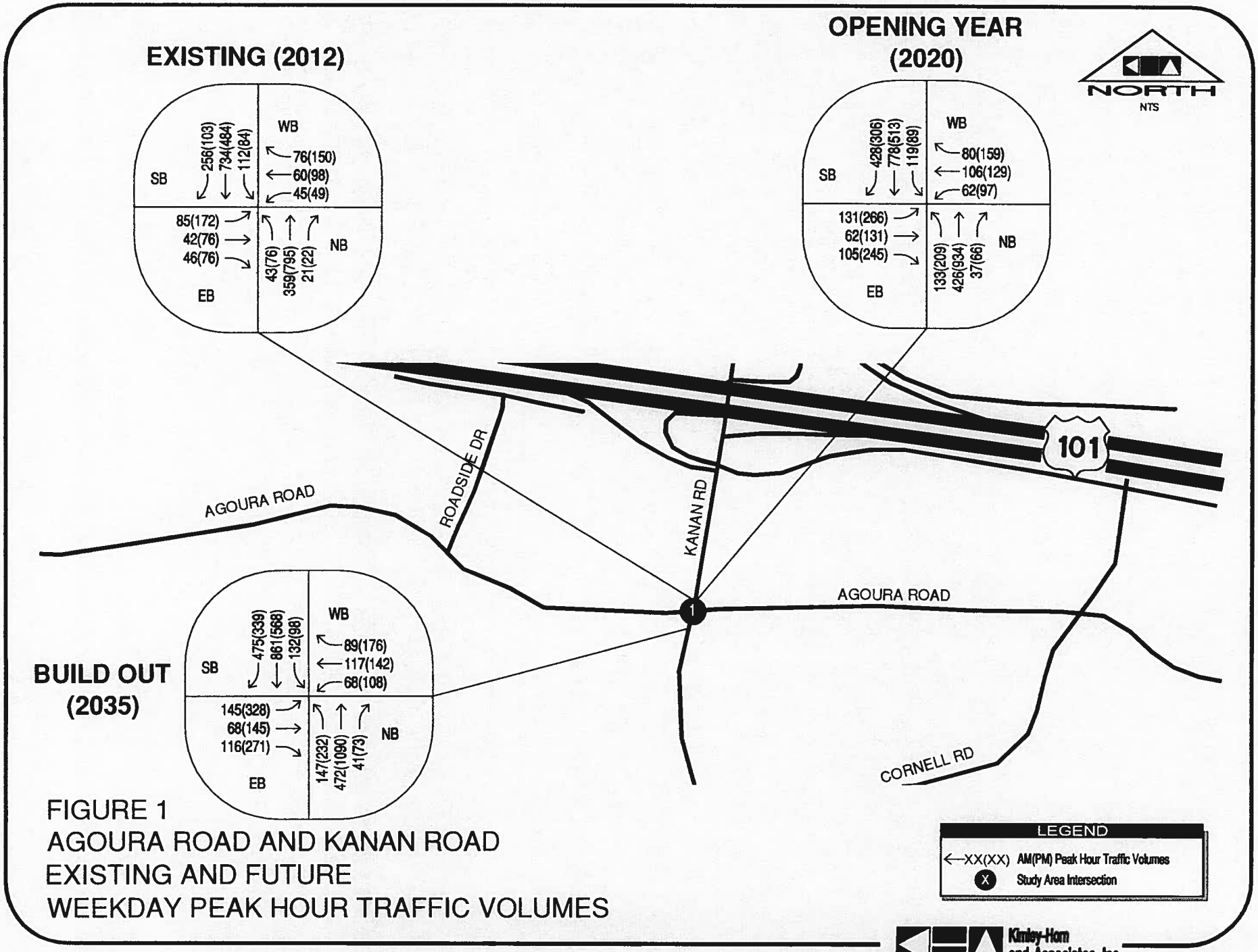

FIGURE 1
AGOURA ROAD AND KANAN ROAD
EXISTING AND FUTURE
WEEKDAY PEAK HOUR TRAFFIC VOLUMES

PROPOSED ROUNDABOUT CONFIGURATION

The roundabout will have two circulating lanes and two approach lanes from east, west and south direction. The north approach has three approach lanes which includes a right-turn slip lane in southbound direction. **Figure 2** depicts the roundabout configuration that was utilized for this analysis.

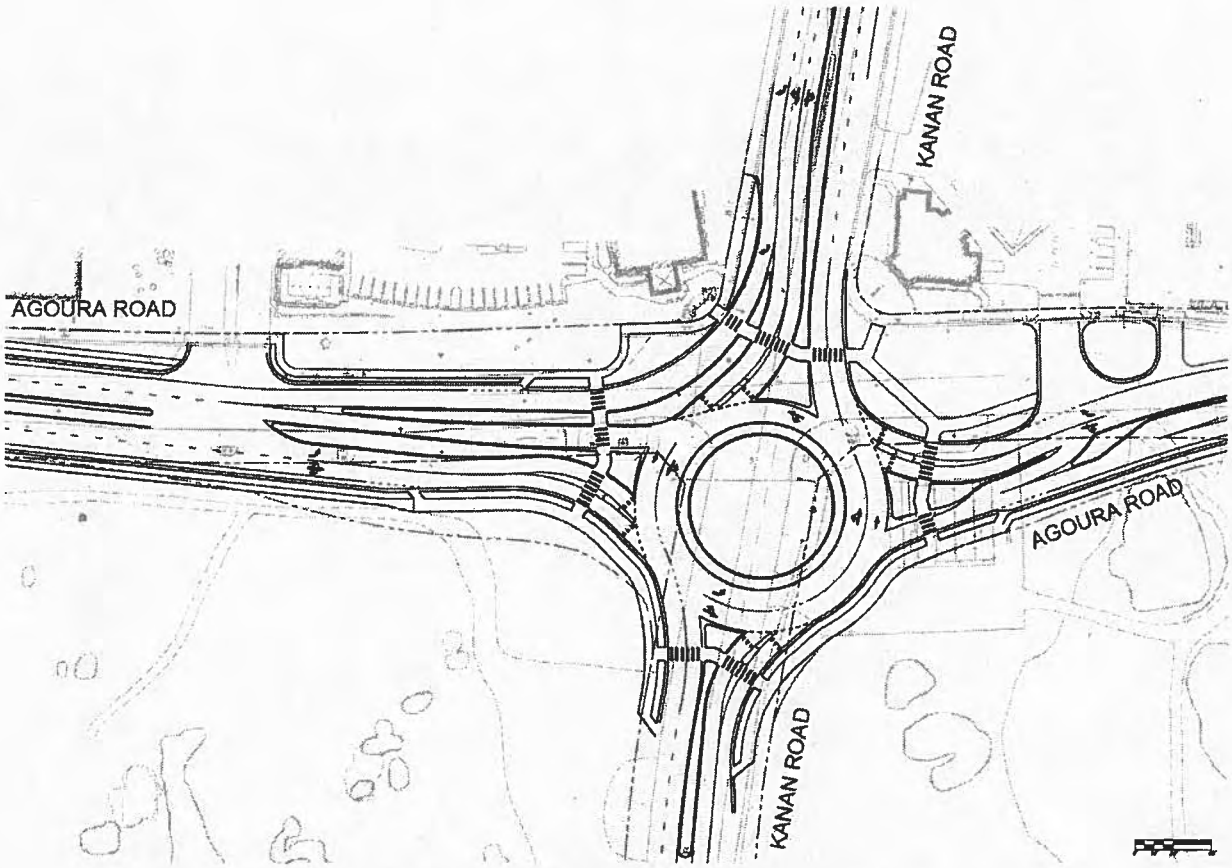

Figure 2: Proposed Roundabout Configuration

TRAFFIC ANALYSIS RESULTS

The City of Agoura Hills Traffic Impact Analysis guidelines indicate that a LOS "C" is the minimum acceptable level-of-service at intersections.

Existing Conditions

Weekday AM and PM peak-hour traffic volumes collected in September 2012 were analyzed using SIDRA standard roundabout methodology. **Table 2** presents the Existing peak-hour intersection operating conditions.

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Table 2: Roundabout LOS Summary for Existing Conditions

Scenario	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
Existing Conditions	8.3	**A**	12.7	**B**

Table 2 indicates that the roundabout would operate at a Level-of-Service B or better for both peak-hours using HCM methodology. SIDRA analysis worksheets for this scenario are provided in the **Appendix C** at the end of this memorandum.

Future Conditions

Table 3 presents the peak-hour roundabout operating conditions for future analysis scenarios.

Table 3: Future LOS Summary – With Roundabout Conditions

Scenario	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
Year 2020 Conditions	12.3	**B**	14.6	**B**
2035 Build-Out Conditions	14.3	**B**	23.6	**C**

Table 3 indicates that the proposed roundabout would operate at Level-of-Service C or better during both AM and PM peak hours for both future year scenarios based upon HCM methodology. SIDRA analysis worksheets for future scenarios are included in **Appendix C** at the end of this memorandum. The analysis worksheets indicate that the 95th percentile queue length on the north approach is 336 ft., which is less than the distance between the study intersection and 101 southbound freeway ramp (600 ft.). This indicates that even during the peak hours of operation of Build-Out conditions, the southbound movement on the roundabout will not cause excessive queuing leading up to the freeway ramp.

Table 4 shows the peak-hour LOS for future analysis for interim intersection configuration scenarios without a roundabout.

Table 4: Future LOS Summary - Without Roundabout Conditions for Interim Intersection

Scenario	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
Year 2020 Conditions	27.1	**C**	34.7	**C**
2035 Build-Out Conditions	29.0	**C**	42.7	**D**

As shown in **Table 4,** the intersection of Agoura Road and Kanan Road would continue to operate with an acceptable LOS C or better for the 2020 AM and PM peak conditions as well as 2035 AM peak conditions and an unacceptable LOS D for 2035 PM peak conditions. Synchro analysis worksheets are included in **Appendix D** at the end of this memorandum.

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CONCLUSIONS

Kimley-Horn has completed a traffic analysis of the proposed multi-lane roundabout (with two lanes per approach) at the intersection of Kanan Road and Agoura Road in the City of Agoura Hills. The analysis indicates that the roundabout would operate at an acceptable Level-of-Service C or better for existing and future conditions during both morning and evening peak periods of operation.

For without roundabout conditions, the intersection of Kanan Road and Agoura Road will continue to operate at a minimum acceptable Level-of-Service C or better for 2020 AM and PM peak conditions as well as 2035 AM peak conditions. The Level-of-Service will deteriorate to an unacceptable level D for 2035 PM peak conditions.

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Appendix A – September 2012 Traffic Counts

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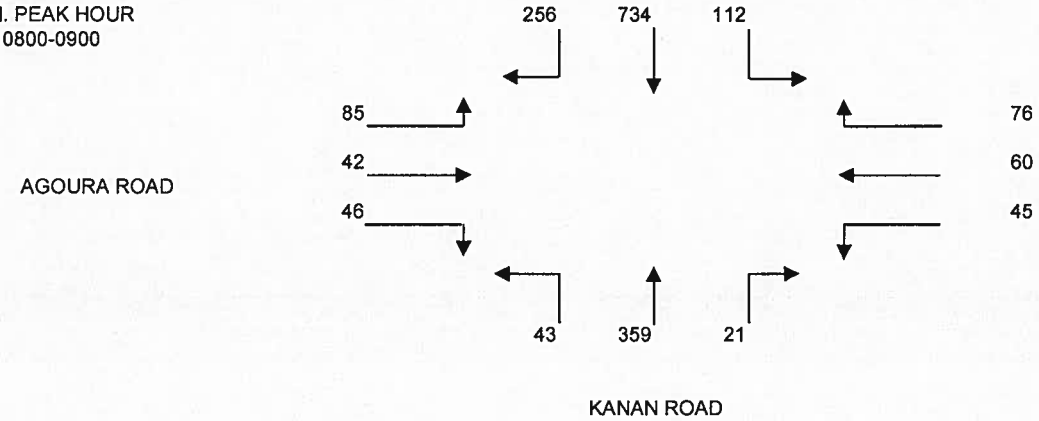
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY-HORN & ASSOCIATES, INC.
PROJECT: CITY OF AGOURA
DATE: WEDNESDAY, SEPTEMBER 26, 2012
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S KANAN ROAD
E/W AGOURA ROAD
FILE NUMBER: 3-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
0700-0715	42	178	14	16	8	12	2	43	2	4	3	2
0715-0730	34	175	10	9	12	11	2	57	7	9	7	6
0730-0745	30	186	10	14	9	6	3	91	4	14	6	15
0745-0800	65	182	18	13	17	12	5	84	8	19	6	17
0800-0815	55	174	20	17	14	8	4	86	9	15	13	24
0815-0830	79	200	35	17	16	11	6	79	13	10	7	21
0830-0845	65	188	30	24	13	13	4	95	13	13	8	20
0845-0900	57	172	27	18	17	13	7	99	8	8	14	20

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
0700-0800	171	721	52	52	46	41	12	275	21	46	22	40	1499
0715-0815	184	717	58	53	52	37	14	318	28	57	32	62	1612
0730-0830	229	742	83	61	56	37	18	340	34	58	32	77	1767
0745-0845	264	744	103	71	60	44	19	344	43	57	34	82	1865
0800-0900	256	734	112	76	60	45	21	359	43	46	42	85	1879

A.M. PEAK HOUR
0800-0900



THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE
626.446.2877 FAX
trafsolutn@aol.com

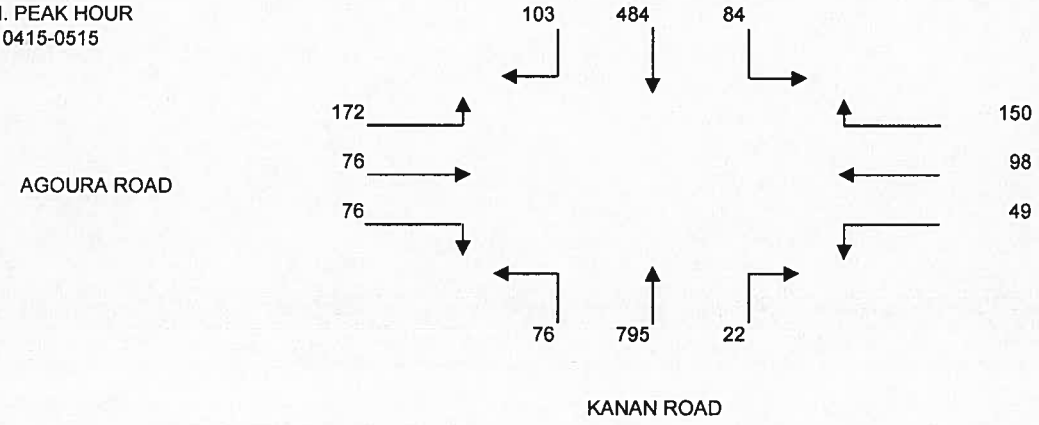
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY-HORN & ASSOCIATES, INC.
PROJECT: CITY OF AGOURA HILLS
DATE: WEDNESDAY, SEPTEMBER 26, 2012
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S KANAN ROAD
E/W AGOURA ROAD
FILE NUMBER: 3-PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
0400-0415	31	108	26	41	31	11	4	182	23	17	29	44
0415-0430	32	111	21	30	31	11	3	195	15	13	23	48
0430-0445	31	125	20	42	20	12	4	210	17	18	19	38
0445-0500	23	126	21	34	24	14	9	191	26	21	14	41
0500-0515	17	122	22	44	23	12	6	199	18	24	20	45
0515-0530	15	108	26	32	22	16	11	158	15	20	24	43
0530-0545	18	114	20	31	31	10	13	192	18	25	20	48
0545-0600	20	121	24	22	30	8	10	188	19	16	24	55

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
0400-0500	117	470	88	147	106	48	20	778	81	69	85	171	2180
0415-0515	103	484	84	150	98	49	22	795	76	76	76	172	2185
0430-0530	86	481	89	152	89	54	30	758	76	83	77	167	2142
0445-0545	73	470	89	141	100	52	39	740	77	90	78	177	2126
0500-0600	70	465	92	129	106	46	40	737	70	85	88	191	2119

P.M. PEAK HOUR
0415-0515



Appendix B – List of Cumulative Projects

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SURROUNDING PROJECTS TRIP GENERATION SUMMARY

Project Number	ITE Land Use	Units	Project Generated Trips						
			Daily	AM Peak Hour			PM Peak Hour		
				In	*Out*	*Total*	*In*	*Out*	*Total*
1	251 (Senior Adult Housing-Detached)	50 units	186	4	7	11	9	5	14
2*	750 (Office Park)	90,300 Sf	1032	137	17	154	19	115	134
3*	710 (General Office Building)	71,844 Sf	792	98	13	111	18	89	107
4	710 (General Office Building)	12,700 Sf	1032	137	17	154	19	115	134
5**	710 (General Office Building)	49,597 Sf	548	68	9	77	13	61	74
5**	820 (Shopping Center)	49,597 Sf	2130	31	19	50	91	94	185
6***	220 (Apartment)	107 units	712	11	44	55	43	23	66
6***	820 (Shopping Center)	167,000 sf	7172	102	65	167	305	318	623
7	820 (Shopping Center)	26,650 Sf	1146	16	11	27	49	50	99
TOTAL NET TRIPS GENERATED [1]			**14750**	**604**	**202**	**806**	**566**	**870**	**1436**

Source: City of Agoura Hills
Source: ITE Trip Generation Manual, 9th Edition, 2012.
**Completed before 2014*
***Higher trip generation land-uses were assumed to represent a conservative scenario*
****Part of one project*

Appendix C – SIDRA 5.1 Analysis Worksheets

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MOVEMENT SUMMARY

Site: Rou 4-way 2-Lane US - Existing 2012 AM Peak Conditions

Roundabout with 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-6
Roundabout Guide (TRB 2010) example number: A-7
Roundabout
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Kanan Road											
3	L	65	2.0	0.341	15.8	LOS B	1.8	44.7	0.53	0.88	31.4
8	T	546	2.0	0.341	7.4	LOS A	1.8	44.7	0.53	0.61	33.5
18	R	32	2.0	0.341	9.8	LOS A	1.8	44.7	0.53	0.73	33.9
Approach		644	2.0	0.341	8.4	LOS A	1.8	44.7	0.53	0.64	33.2
East: Agoura Road											
1	L	68	2.0	0.208	16.7	LOS B	0.9	22.7	0.59	0.93	30.7
6	T	91	2.0	0.208	9.4	LOS A	0.9	22.7	0.59	0.70	33.4
16	R	116	2.0	0.169	9.9	LOS A	0.7	17.6	0.59	0.78	32.6
Approach		275	2.0	0.208	11.4	LOS B	0.9	22.7	0.59	0.79	32.3
North: Kanan Road											
7	L	170	2.0	0.588	14.0	LOS B	4.4	111.0	0.58	0.81	28.2
4	T	1117	2.0	0.588	6.5	LOS A	4.4	111.2	0.58	0.57	29.9
14	R	390	2.0	0.245	4.5	X	X	X	X	0.42	31.2
Approach		1677	2.0	0.588	6.8	LOS A	4.4	111.2	0.44	0.56	30.0
West: Agoura Road											
5	L	129	2.0	0.261	17.4	LOS B	1.2	30.0	0.74	0.93	28.2
2	T	64	2.0	0.261	11.3	LOS B	1.2	30.0	0.75	0.84	32.7
12	R	70	2.0	0.261	12.4	LOS B	1.2	30.0	0.75	0.90	32.6
Approach		263	2.0	0.261	14.6	LOS B	1.2	30.0	0.75	0.90	30.3
All Vehicles		**2859**	**2.0**	**0.588**	**8.3**	**LOS A**	**4.4**	**111.2**	**0.51**	**0.63**	**30.9**

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: Rou 4-way 2-Lane US - Existing 2012 PM Peak Conditions

Roundabout with 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-6
Roundabout Guide (TRB 2010) example number: A-7
Roundabout
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Kanan Road											
3	L	116	2.0	0.793	21.6	LOS C	8.9	226.6	0.88	1.12	28.4
8	T	1210	2.0	0.793	13.1	LOS B	8.9	227.0	0.88	1.06	30.3
18	R	33	2.0	0.793	15.5	LOS B	8.9	227.0	0.88	1.08	30.9
Approach		1359	2.0	0.793	13.9	LOS B	8.9	227.0	0.88	1.07	30.1
East: Agoura Road											
1	L	75	2.0	0.627	26.5	LOS C	3.8	95.8	0.89	1.08	25.9
6	T	149	2.0	0.627	19.3	LOS B	3.8	95.8	0.89	1.04	27.7
16	R	228	2.0	0.552	16.4	LOS B	3.3	84.0	0.88	1.02	28.3
Approach		452	2.0	0.627	19.0	LOS B	3.8	95.8	0.89	1.03	27.6
North: Kanan Road											
7	L	128	2.0	0.460	14.5	LOS B	2.9	74.3	0.61	0.85	27.9
4	T	737	2.0	0.460	7.0	LOS A	2.9	74.3	0.61	0.61	29.8
14	R	157	2.0	0.098	4.5	X	X	X	X	0.42	31.2
Approach		1021	2.0	0.460	7.6	LOS A	2.9	74.3	0.52	0.61	29.7
West: Agoura Road											
5	L	262	2.0	0.380	16.4	LOS B	1.9	48.2	0.71	0.94	28.8
2	T	116	2.0	0.380	10.6	LOS B	1.9	48.2	0.71	0.81	32.8
12	R	116	2.0	0.380	11.8	LOS B	1.9	48.2	0.71	0.88	32.9
Approach		493	2.0	0.380	14.0	LOS B	1.9	48.2	0.71	0.90	30.6
All Vehicles		**3325**	**2.0**	**0.793**	**12.7**	**LOS B**	**8.9**	**227.0**	**0.75**	**0.90**	**29.7**

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: Rou 4-way 2-Lane US - 2014
AM Peak Conditions

Roundabout with 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-6
Roundabout Guide (TRB 2010) example number: A-7
Roundabout
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Kanan Road											
3	L	193	2.0	0.494	17.0	LOS B	3.2	80.0	0.66	0.92	30.6
8	T	621	2.0	0.494	8.6	LOS A	3.2	80.0	0.66	0.72	32.6
18	R	53	2.0	0.494	10.9	LOS B	3.2	80.0	0.66	0.83	33.4
Approach		867	2.0	0.494	10.6	LOS B	3.2	80.0	0.66	0.77	32.1
East: Agoura Road											
1	L	90	2.0	0.385	18.6	LOS B	2.0	51.3	0.75	0.99	29.8
6	T	154	2.0	0.385	11.3	LOS B	2.0	51.3	0.75	0.86	32.6
16	R	117	2.0	0.248	12.1	LOS B	1.1	27.2	0.71	0.86	31.2
Approach		361	2.0	0.385	13.4	LOS B	2.0	51.3	0.73	0.90	31.4
North: Kanan Road											
7	L	173	2.0	0.733	19.1	LOS B	8.2	208.7	0.85	1.04	26.0
4	T	1132	2.0	0.733	11.7	LOS B	8.2	208.8	0.85	0.97	28.1
14	R	624	2.0	0.392	4.6	X	X	X	X	0.42	31.2
Approach		1930	2.0	0.733	10.0	LOS B	8.2	208.8	0.57	0.80	28.7
West: Agoura Road											
5	L	190	2.0	0.490	20.2	LOS C	2.6	66.1	0.84	1.00	26.7
2	T	90	2.0	0.527	14.0	LOS B	3.1	77.6	0.86	0.98	31.0
12	R	152	2.0	0.527	15.1	LOS B	3.1	77.6	0.86	1.00	30.7
Approach		432	2.0	0.527	17.1	LOS B	3.1	77.6	0.85	1.00	28.8
All Vehicles		**3590**	**2.0**	**0.733**	**11.4**	**LOS B**	**8.2**	**208.8**	**0.64**	**0.83**	**29.7**

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: Rou 4-way 2-Lane US - 2014
PM Peak Conditions

Roundabout with 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-6
Roundabout Guide (TRB 2010) example number: A-7
Roundabout
Design Life Analysis (Practical Capacity): Results for 2 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Kanan Road											
3	L	226	2.0	0.836	23.7	LOS C	10.4	263.3	0.94	1.17	27.2
8	T	1065	2.0	0.836	15.2	LOS B	10.4	264.1	0.94	1.15	28.8
18	R	71	2.0	0.836	17.5	LOS B	10.4	264.1	0.94	1.16	29.6
Approach		1362	2.0	0.836	16.7	LOS B	10.4	264.1	0.94	1.15	28.5
East: Agoura Road											
1	L	105	2.0	0.662	28.9	LOS C	4.6	116.7	0.93	1.11	24.9
6	T	139	2.0	0.662	21.6	LOS C	4.6	116.7	0.93	1.08	26.4
16	R	172	2.0	0.579	21.6	LOS C	3.4	86.4	0.90	1.04	25.4
Approach		416	2.0	0.662	23.5	LOS C	4.6	116.7	0.92	1.07	25.6
North: Kanan Road											
7	L	96	2.0	0.384	15.2	LOS B	2.3	57.5	0.65	0.89	27.6
4	T	555	2.0	0.384	7.7	LOS A	2.3	57.5	0.65	0.67	29.6
14	R	331	2.0	0.208	4.5	X	X	X	X	0.42	31.2
Approach		982	2.0	0.384	7.4	LOS A	2.3	57.5	0.43	0.61	29.9
West: Agoura Road											
5	L	320	2.0	0.474	16.7	LOS B	2.6	67.3	0.72	0.95	28.5
2	T	141	2.0	0.549	11.4	LOS B	3.5	88.0	0.75	0.90	32.6
12	R	265	2.0	0.549	12.6	LOS B	3.5	88.0	0.75	0.95	32.5
Approach		726	2.0	0.549	14.2	LOS B	3.5	88.0	0.74	0.94	30.6
All Vehicles		**3486**	**2.0**	**0.836**	**14.4**	**LOS B**	**10.4**	**264.1**	**0.75**	**0.95**	**28.9**

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: Rou 4-way 2-Lane US - 2020
AM Peak Conditions

Roundabout with 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-6
Roundabout Guide (TRB 2010) example number: A-7
Roundabout
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Kanan Road											
3	L	202	2.0	0.525	17.4	LOS B	3.6	90.3	0.69	0.94	30.3
8	T	648	2.0	0.525	9.0	LOS A	3.6	90.3	0.69	0.76	32.4
18	R	56	2.0	0.525	11.4	LOS B	3.6	90.3	0.69	0.86	33.3
Approach		907	2.0	0.525	11.0	LOS B	3.6	90.3	0.69	0.81	31.9
East: Agoura Road											
1	L	94	2.0	0.420	19.1	LOS B	2.3	58.5	0.77	1.01	29.5
6	T	161	2.0	0.420	11.9	LOS B	2.3	58.5	0.77	0.91	32.4
16	R	122	2.0	0.269	12.4	LOS B	1.2	29.9	0.73	0.87	30.9
Approach		377	2.0	0.420	13.8	LOS B	2.3	58.5	0.76	0.92	31.1
North: Kanan Road											
7	L	181	2.0	0.782	20.8	LOS C	9.9	252.6	0.91	1.11	25.3
4	T	1184	2.0	0.782	13.4	LOS B	10.0	252.9	0.91	1.06	27.2
14	R	651	2.0	0.409	4.6	X	X	X	X	0.42	31.2
Approach		2016	2.0	0.782	11.2	LOS B	10.0	252.9	0.61	0.86	28.1
West: Agoura Road											
5	L	199	2.0	0.559	21.8	LOS C	3.1	79.0	0.87	1.03	25.9
2	T	94	2.0	0.597	15.5	LOS B	3.7	93.0	0.89	1.01	29.9
12	R	160	2.0	0.597	16.7	LOS B	3.7	93.0	0.89	1.03	29.7
Approach		453	2.0	0.597	18.7	LOS B	3.7	93.0	0.88	1.02	28.0
All Vehicles		**3754**	**2.0**	**0.782**	**12.3**	**LOS B**	**10.0**	**252.9**	**0.68**	**0.87**	**29.2**

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: Rou 4-way 2-Lane US - 2020
PM Peak Conditions

Roundabout with 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-6
Roundabout Guide (TRB 2010) example number: A-7
Roundabout
Design Life Analysis (Practical Capacity): Results for 0 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Kanan Road											
3	L	227	2.0	0.843	24.0	LOS C	10.6	270.1	0.94	1.18	27.1
8	T	1070	2.0	0.843	15.5	LOS B	10.7	271.0	0.94	1.16	28.6
18	R	72	2.0	0.843	17.8	LOS B	10.7	271.0	0.94	1.17	29.4
Approach		1368	2.0	0.843	17.0	LOS B	10.7	271.0	0.94	1.16	28.3
East: Agoura Road											
1	L	105	2.0	0.673	29.4	LOS C	4.7	119.8	0.94	1.12	24.7
6	T	140	2.0	0.673	22.1	LOS C	4.7	119.8	0.94	1.09	26.2
16	R	173	2.0	0.589	22.1	LOS C	3.5	88.4	0.90	1.04	25.2
Approach		418	2.0	0.673	23.9	LOS C	4.7	119.8	0.92	1.08	25.4
North: Kanan Road											
7	L	97	2.0	0.387	15.2	LOS B	2.3	58.1	0.65	0.89	27.6
4	T	558	2.0	0.387	7.8	LOS A	2.3	58.1	0.65	0.67	29.6
14	R	333	2.0	0.209	4.5	X	X	X	X	0.42	31.2
Approach		987	2.0	0.387	7.4	LOS A	2.3	58.1	0.43	0.61	29.9
West: Agoura Road											
5	L	322	2.0	0.478	16.8	LOS B	2.7	68.3	0.72	0.96	28.5
2	T	142	2.0	0.555	11.5	LOS B	3.5	89.5	0.75	0.91	32.6
12	R	266	2.0	0.555	12.7	LOS B	3.5	89.5	0.75	0.95	32.4
Approach		730	2.0	0.555	14.3	LOS B	3.5	89.5	0.74	0.95	30.6
All Vehicles		3504	2.0	0.843	14.6	LOS B	10.7	271.0	0.75	0.95	28.8

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
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Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: Rou 4-way 2-Lane US - Build-Out AM Peak Conditions

Roundabout with 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-6
Roundabout Guide (TRB 2010) example number: A-7
Roundabout
Design Life Analysis (Practical Capacity): Results for 17 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Kanan Road											
3	L	214	2.0	0.570	18.1	LOS B	4.2	106.2	0.73	0.97	30.0
8	T	687	2.0	0.570	9.6	LOS A	4.2	106.2	0.73	0.83	32.2
18	R	60	2.0	0.570	12.0	LOS B	4.2	106.2	0.73	0.90	33.1
Approach		961	2.0	0.570	11.7	LOS B	4.2	106.2	0.73	0.87	31.7
East: Agoura Road											
1	L	99	2.0	0.467	19.9	LOS B	2.7	68.7	0.80	1.02	29.0
6	T	170	2.0	0.467	12.7	LOS B	2.7	68.7	0.80	0.94	31.8
16	R	130	2.0	0.302	13.0	LOS B	1.4	34.8	0.75	0.89	30.5
Approach		399	2.0	0.467	14.6	LOS B	2.7	68.7	0.78	0.94	30.6
North: Kanan Road											
7	L	192	2.0	0.850	24.2	LOS C	13.2	335.0	0.99	1.22	24.0
4	T	1254	2.0	0.850	16.7	LOS B	13.2	336.0	0.99	1.22	25.6
14	R	692	2.0	0.434	4.6	X	X	X	X	0.42	31.2
Approach		2138	2.0	0.850	13.5	LOS B	13.2	336.0	0.67	0.96	26.8
West: Agoura Road											
5	L	211	2.0	0.671	25.7	LOS C	4.0	102.1	0.91	1.07	24.1
2	T	99	2.0	0.706	19.5	LOS B	4.7	120.0	0.93	1.07	27.6
12	R	169	2.0	0.706	20.7	LOS C	4.7	120.0	0.93	1.08	27.5
Approach		479	2.0	0.706	22.7	LOS C	4.7	120.0	0.92	1.07	25.9
All Vehicles		**3978**	**2.0**	**0.850**	**14.3**	**LOS B**	**13.2**	**336.0**	**0.72**	**0.95**	**28.1**

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: Rou 4-way 2-Lane US - Build-Out PM Peak Conditions

Roundabout with 2-lane approaches and circulating road
MUTCD (FHWA 2009) example number: 3C-6
Roundabout Guide (TRB 2010) example number: A-7
Roundabout
Design Life Analysis (Practical Capacity): Results for 0 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Kanan Road											
3	L	252	2.0	0.985	40.1	LOS D	21.8	553.6	1.00	1.54	21.1
8	T	1185	2.0	0.985	31.5	LOS C	22.0	559.0	1.00	1.54	21.2
18	R	79	2.0	0.985	33.7	LOS C	22.0	559.0	1.00	1.54	22.2
Approach		1516	2.0	0.985	33.0	LOS C	22.0	559.0	1.00	1.54	21.2
East: Agoura Road											
1	L	117	2.0	0.889	51.1	LOS D	8.6	218.4	0.99	1.31	18.3
6	T	154	2.0	0.889	43.9	LOS D	8.6	218.4	0.99	1.31	18.7
16	R	191	2.0	0.795	37.9	LOS D	5.7	143.7	0.96	1.17	19.3
Approach		463	2.0	0.889	43.3	LOS D	8.6	218.4	0.98	1.25	18.8
North: Kanan Road											
7	L	107	2.0	0.450	16.0	LOS B	2.9	74.8	0.71	0.93	27.3
4	T	617	2.0	0.450	8.6	LOS A	2.9	74.8	0.71	0.76	29.3
14	R	368	2.0	0.231	4.5	X	X	X	X	0.42	31.2
Approach		1092	2.0	0.450	8.0	LOS A	2.9	74.8	0.47	0.67	29.7
West: Agoura Road											
5	L	357	2.0	0.569	18.1	LOS B	3.6	90.4	0.78	1.00	27.7
2	T	158	2.0	0.653	13.1	LOS B	4.7	120.0	0.82	0.99	31.5
12	R	295	2.0	0.653	14.3	LOS B	4.7	120.0	0.82	1.01	31.3
Approach		809	2.0	0.653	15.7	LOS B	4.7	120.0	0.81	1.00	29.7
All Vehicles		**3880**	**2.0**	**0.985**	**23.6**	**LOS C**	**22.0**	**559.0**	**0.81**	**1.15**	**24.3**

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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Appendix D – SYNCHRO 8.0 Analysis Worksheets

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	131	62	105	62	106	80	133	426	37	119	778	428
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width	12	12	12	12	12	12	12	12	12	12	12	16
Total Lost time (s)	2.5	4.0		2.5	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2891	1421		1490	1569	1333	1490	2945		2891	2980	1511
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2891	1421		1490	1569	1333	1490	2945		2891	2980	1511
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)	131	62	105	62	106	80	133	426	37	119	778	428
RTOR Reduction (vph)	0	56	0	0	0	66	0	5	0	0	0	228
Lane Group Flow (vph)	131	111	0	62	106	14	133	458	0	119	778	200
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4						6
Actuated Green, G (s)	9.1	17.5		7.3	15.7	15.7	12.8	51.3		8.0	46.5	46.5
Effective Green, g (s)	10.6	19.0		8.8	17.2	17.2	11.8	52.3		7.0	47.5	47.5
Actuated g/C Ratio	0.10	0.19		0.09	0.17	0.17	0.12	0.51		0.07	0.47	0.47
Clearance Time (s)	4.0	5.5		4.0	5.5	5.5	3.0	5.0		3.0	5.0	5.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	1.5	5.0		1.5	5.0	5.0
Lane Grp Cap (vph)	301	265		129	265	225	173	1515		199	1393	706
v/s Ratio Prot	0.05	c0.08		c0.04	0.07		c0.09	0.16		0.04	c0.26	
v/s Ratio Perm						0.01						0.13
v/c Ratio	0.44	0.42		0.48	0.40	0.06	0.77	0.30		0.60	0.56	0.28
Uniform Delay, d1	42.7	36.4		44.2	37.6	35.4	43.6	14.2		45.9	19.5	16.6
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	1.0	2.2		2.8	2.1	0.2	16.7	0.5		3.2	1.6	1.0
Delay (s)	43.7	38.7		47.0	39.7	35.7	60.3	14.7		49.1	21.1	17.6
Level of Service	D	D		D	D	D	E	B		D	C	B
Approach Delay (s)		40.9			40.2			24.9			22.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	101.6	Sum of lost time (s)	14.5
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	266	131	245	97	129	159	209	934	66	89	513	306
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width	12	12	12	12	12	12	12	12	12	12	12	16
Total Lost time (s)	2.5	4.0		2.5	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2891	1415		1490	1569	1333	1490	2951		2891	2980	1511
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2891	1415		1490	1569	1333	1490	2951		2891	2980	1511
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)	266	131	245	97	129	159	209	934	66	89	513	306
RTOR Reduction (vph)	0	75	0	0	0	126	0	6	0	0	0	215
Lane Group Flow (vph)	266	301	0	97	129	33	209	994	0	89	513	91
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4						6
Actuated Green, G (s)	12.6	23.6		5.3	16.3	16.3	15.2	36.0		3.8	24.6	24.6
Effective Green, g (s)	14.1	25.1		6.8	17.8	17.8	14.2	37.0		2.8	25.6	25.6
Actuated g/C Ratio	0.16	0.29		0.08	0.21	0.21	0.16	0.43		0.03	0.30	0.30
Clearance Time (s)	4.0	5.5		4.0	5.5	5.5	3.0	5.0		3.0	5.0	5.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	1.5	5.0		1.5	5.0	5.0
Lane Grp Cap (vph)	472	412		117	323	275	245	1266		93	885	448
v/s Ratio Prot	c0.09	c0.21		c0.07	0.08		c0.14	c0.34		0.03	0.17	
v/s Ratio Perm						0.02						0.06
v/c Ratio	0.56	0.73		0.83	0.40	0.12	0.85	0.79		0.96	0.58	0.20
Uniform Delay, d1	33.2	27.5		39.1	29.6	27.8	35.0	21.2		41.6	25.7	22.7
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	1.5	7.9		36.1	1.7	0.4	23.1	4.9		77.9	2.8	1.0
Delay (s)	34.8	35.4		75.3	31.3	28.2	58.1	26.1		119.6	28.5	23.7
Level of Service	C	D		E	C	C	E	C		F	C	C
Approach Delay (s)		35.1			41.1			31.7			35.8	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	86.2	Sum of lost time (s)	14.5
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	68	116	68	117	89	147	472	41	132	861	475
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width	12	12	12	12	12	12	12	12	12	12	12	16
Total Lost time (s)	2.5	4.0		2.5	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2891	1420		1490	1569	1333	1490	2945		2891	2980	1511
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2891	1420		1490	1569	1333	1490	2945		2891	2980	1511
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)	145	68	116	68	117	89	147	472	41	132	861	475
RTOR Reduction (vph)	0	55	0	0	0	72	0	5	0	0	0	266
Lane Group Flow (vph)	145	129	0	68	117	17	147	508	0	132	861	209
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4						6
Actuated Green, G (s)	8.7	18.7		8.1	18.1	18.1	13.9	49.4		8.5	44.0	44.0
Effective Green, g (s)	10.2	20.2		9.6	19.6	19.6	12.9	50.4		7.5	45.0	45.0
Actuated g/C Ratio	0.10	0.20		0.09	0.19	0.19	0.13	0.49		0.07	0.44	0.44
Clearance Time (s)	4.0	5.5		4.0	5.5	5.5	3.0	5.0		3.0	5.0	5.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	1.5	5.0		1.5	5.0	5.0
Lane Grp Cap (vph)	288	280		139	300	255	188	1452		212	1312	665
v/s Ratio Prot	c0.05	c0.09		0.05	0.07		c0.10	0.17		0.05	c0.29	
v/s Ratio Perm						0.01						0.14
v/c Ratio	0.50	0.46		0.49	0.39	0.07	0.78	0.35		0.62	0.66	0.31
Uniform Delay, d1	43.6	36.2		44.0	36.1	33.8	43.3	15.9		46.0	22.5	18.6
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	1.4	2.5		2.7	1.8	0.2	17.5	0.7		4.1	2.6	1.2
Delay (s)	45.0	38.7		46.7	37.8	34.0	60.8	16.5		50.0	25.1	19.8
Level of Service	D	D		D	D	C	E	B		D	C	B
Approach Delay (s)		41.5			38.8			26.4			25.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	102.2	Sum of lost time (s)	14.5
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: Kanan Road & Agoura Road

4/12/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	328	145	271	108	142	176	232	1090	73	98	568	339
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Width	12	12	12	12	12	12	12	12	12	12	12	16
Total Lost time (s)	2.5	4.0		2.5	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2891	1415		1490	1569	1333	1490	2952		2891	2980	1511
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2891	1415		1490	1569	1333	1490	2952		2891	2980	1511
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)	328	145	271	108	142	176	232	1090	73	98	568	339
RTOR Reduction (vph)	0	61	0	0	0	139	0	4	0	0	0	231
Lane Group Flow (vph)	328	355	0	108	142	37	232	1159	0	98	568	108
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases						4						6
Actuated Green, G (s)	15.7	28.4		8.0	20.7	20.7	19.9	47.2		5.8	33.1	33.1
Effective Green, g (s)	17.2	29.9		9.5	22.2	22.2	18.9	48.2		4.8	34.1	34.1
Actuated g/C Ratio	0.16	0.28		0.09	0.21	0.21	0.18	0.45		0.04	0.32	0.32
Clearance Time (s)	4.0	5.5		4.0	5.5	5.5	3.0	5.0		3.0	5.0	5.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	1.5	5.0		1.5	5.0	5.0
Lane Grp Cap (vph)	465	395		132	325	276	263	1331		129	950	481
v/s Ratio Prot	c0.11	c0.25		c0.07	0.09		c0.16	c0.39		0.03	0.19	
v/s Ratio Perm						0.03						0.07
v/c Ratio	0.71	0.90		0.82	0.44	0.13	0.88	0.87		0.76	0.60	0.22
Uniform Delay, d1	42.5	37.0		47.9	36.9	34.5	42.9	26.5		50.5	30.6	26.7
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	4.8	23.6		31.0	2.0	0.5	26.7	8.0		20.1	2.8	1.1
Delay (s)	47.3	60.6		78.8	38.9	35.0	69.6	34.5		70.6	33.4	27.8
Level of Service	D	E		E	D	C	E	C		E	C	C
Approach Delay (s)		54.7			47.4			40.4			35.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	106.9	Sum of lost time (s)	14.5
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX H
MEMORANDUM FROM PUBLIC WORKS DIRECTOR

CITY OF

AGOURA HILLS

INTEROFFICE MEMORANDUM

DATE: **January 7, 2014**

TO: **Allison Cook, Senior Planner**

FROM: **Ramiro Adeva, Public Works Director/City Engineer**

BY: **Charmaine Yambao, Associate Civil Engineer**
Sri Chakravarthy, P.E., T.E. – Kimley-Horn and Associates, Inc.

SUBJECT: **Kanan Road and Agoura Road Roundabout Project**
Landscape and Hardscape Considerations

The City requested Kimley-Horn and Associates (KHA) to evaluate the proposed landscape and hardscape elements for conformity to current standards and guidelines for roundabout design. KHA is the design consultant for the Roundabout Project.

In this memo, reference is made to FHWA guidelines for the design of the central island, both landscape and hardscape elements, and recommendations are based upon these guidelines.

Design Considerations & Recommendations:

The FHWA publication, "Roundabouts: An Informational Guide" June 2000 edition, lists "single vehicle loss of control at entry" as one of the types of vehicle collisions associated with roundabouts. To reduce the severity of single vehicle crashes, special attention should be accorded to improving visibility, avoiding or removing any hard obstacles on the central island, and guiding the vehicles into the appropriate lanes through appropriate design of splitter islands to avoid vehicle run-ins into the central island.

KHA recommends that the City consider revising the hardscape and landscape features to conform to the roundabout design guidelines. KHA recommends that all hardscape features be designed and constructed as "break-away" to minimize the results of a vehicular impact. The proposed entry sign wall, fences, and boulders can be constructed in this fashion and should be defined in the technical specifications for the project. Any landscaping features in the central island such as trees that vehicles can directly run into should be planted on a slightly elevated grade without affecting the driver line of sight and to avoid or reduce the impact of any vehicle run-ins into the landscape features.

Conclusion:

Final Plans have been revised to conform to recommendations provided by KHA. Hardscape features have been designed as "break-away," all landscaping features in central island are at elevated grade and splitter islands have been designed and placed to guide vehicles away from straight run-ins into central island.