Native American Heritage Commission Request and Response Letters

APPENDIX F

August 16, 2017

Native American Heritage Commission
1550 Harbor Boulevard, Room 100
West Sacramento, CA 95691

Subj: **Phase I Cultural Resources Assessment of the Oakmont of Agoura Hills Project *(Envicom Project #56-635-101*)**

Greetings,

Envicom is requesting a record search of the NAHC database for cultural resources for the attached Project area, plus a **0.25-mile buffer**. We also request a list of Tribal Group representatives for the area in case we need to contact their offices.

The Project is located at:

USGS Quad – Thousand Oaks, CA

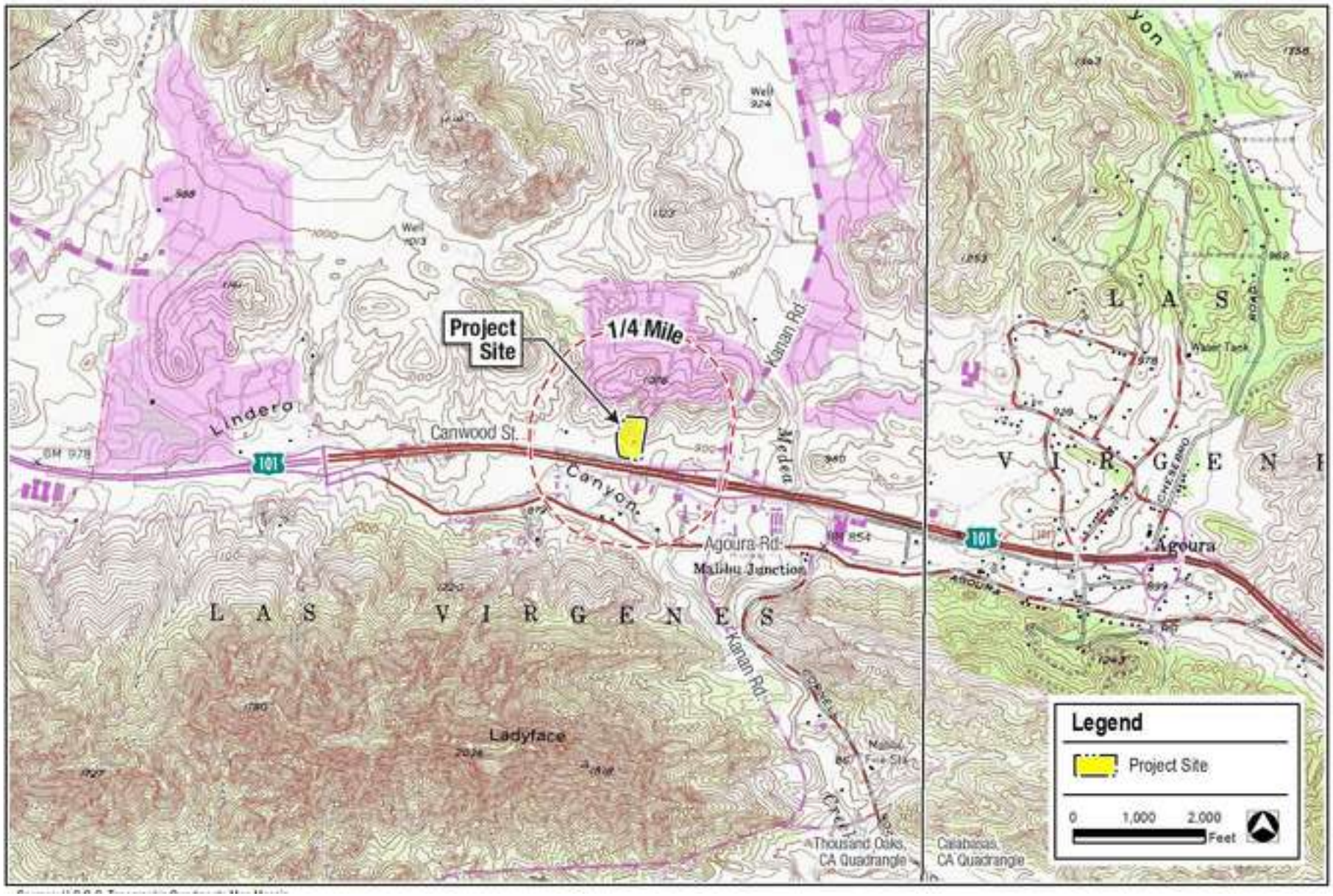
Please indicate if there are Native American cultural resources within the project area, or only in the project study area.

Envicom appreciates the NAHC's help with this request. For correspondence or questions regarding this Project, please contact Wayne Bischoff at 818-879-4700 (wbischoff@envicomcorporation.com).

Sincerely,

Dr. Wayne Bischoff
Director of Cultural Resources

Attachment:
Project vicinity map on 1:24,000 topographic map


Project Site
1/4 Mile
Kanan Rd.
Lindero
Canwood St.
101
Canyon
Agoura Rd.
Malibu Junction
Arden
L A S V I R G E N E S
Ladyface
Kanan Rd.
Thousand Oaks, CA Quadrangle
Calabasas, CA Quadrangle
Agoura
Legend
Project Site
0 1,000 2,000
Feet

NATIVE AMERICAN HERITAGE COMMISSION
Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

August 22, 2017

Dr. Wayne Bischoff
Envicom Corporation

Sent by E-mail: wbischoff@envicomcorporation.com
Cc: waynebischoff@gmail.com

RE: Proposed Oakmont of Agoura Hills Project, City of Agoura Hills; Thousand Oaks USGS Quadrangle, Los Angeles County, California

Dear Dr. Bischoff:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

Attached is a list of tribes culturally affiliated to the project area. I suggest you contact all of the listed Tribes. If they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

Native American Heritage Commission
Native American Contact List
Los Angeles County
8/23/2017

Barbareno/Ventureno Band of Mission Indians
Patrick Tumamait,
992 El Camino Corto — Chumash
Ojai, CA, 93023
Phone: (805) 216 - 1253

Barbareno/Ventureno Band of Mission Indians
Eleanor Arrellanes,
P. O. Box 5687 — Chumash
Ventura, CA, 93005
Phone: (805) 701 - 3248

Barbareno/Ventureno Band of Mission Indians
Julie Tumamait-Stenslie,
Chairperson
365 North Poli Ave — Chumash
Ojai, CA, 93023
Phone: (805) 640 - 6214
jtumamait@hotmail.com

Barbareno/Ventureno Band of Mission Indians
Randal Sanjuelas,
331 Mira Flores — Chumash
Camarillo, CA, 93012
Phone: (805) 427 - 0015

Coastal Band of the Chumash Nation
Mia Lopez, Chairperson
Phone: (805) 321 - 0195 — Chumash
cbcnribalchair@gmail.com

Fernandeno Tataviam Band of Mission Indians
Beverly Salazar, Councilmember
1931 Shady Brooks Drive — Tataviam
Thousand Oaks, CA, 91362
Phone: (805) 558 - 1154

Fernandeno Tataviam Band of Mission Indians
Kimia Fatehi, Tribal Historic and Cultural Preservation Officer
1019 Second Street, Suite 1 — Tataviam
San Fernando, CA, 91340
Phone: (818) 837 - 0794
Fax: (818) 837-0796
kfatehi@tataviam-nsn.us

Fernandeno Tataviam Band of Mission Indians
Alan Salazar, Chairman Elders Council
1019 Second St., Suite 1 — Tataviam
San Fernando, CA, 91340
Phone: (805) 423 - 0091

Fernandeno Tataviam Band of Mission Indians
Beverly Folkes, Elders Council
1019 Second St. Suite 1 — Tataviam
San Fernando, CA, 91340

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838 — Kitanemuk
Newhall, CA, 91322 — Serrano
Phone: (760) 885 - 0955 — Tataviam
tsen2u@hotmail.com

Santa Ynez Band of Mission Indians
Kenneth Kahn, Chairperson
P.O. Box 517 — Chumash
Santa Ynez, CA, 93460
Phone: (805) 688 - 7997
Fax: (805) 686-9578
kkahn@santaynezchumash.org

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

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Command Access Hills Project, Los Angeles County.

Geotechnical Investigation and Addenda and City Geotechnical Consultant Memo

APPENDIX G

CHJ Consultants
1355 E. Cooley Drive, Suite C, Colton, CA 92324 • Phone (909) 824-7311 • Fax (909) 503-1136
15345 Anacapa Road, Suite D, Victorville, CA 92392 • Phone (760) 243-0506 • Fax (760) 243-1225
77-564A Country Club Drive, Suite 122, Palm Desert, CA 92211 • Phone (760) 772-8234 • Fax (909) 503-1136

October 21, 2015

Oakmont Senior Living
9249 Old Redwood Highway, Suite 200
Windsor, California 95492
Attention: Mr. Wayne Sant, Vice President, Development

Job No. 15473-3

Dear Mr. Sant:

Attached herewith is the Geotechnical Investigation report prepared for the proposed Oakmont of Agoura Hills senior facility, to be located at 29353 Canwood Street, in the city of Agoura Hills, California.

This report was based upon a scope of services generally outlined in our proposal dated September 17, 2015, and other written and verbal communication.

We appreciate this opportunity to provide engineering geologic services for this project. If you have questions or comments concerning this report, please contact this firm at your convenience.

Respectfully submitted,
CHJ CONSULTANTS

Maihan Noorzay
Project Engineer, P.E.

MN:lb

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29353 CANWOOD STREET
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PREPARED FOR
OAKMONT SENIOR LIVING
JOB NO. 15473-3

GEOTECHNICAL INVESTIGATION
OAKMONT OF AGOURA HILLS
29353 CANWOOD STREET
AGOURA HILLS, CALIFORNIA
PREPARED FOR
OAKMONT SENIOR LIVING
JOB NO. 15473-3

INTRODUCTION

During October of 2015, this firm performed a geotechnical investigation for the proposed Oakmont of Agoura Hills senior facility, which is to be located at 29353 Canwood Street (APN 2053-001-005), in the city of Agoura Hills, California. The purposes of this investigation were to explore and evaluate the geotechnical engineering/engineering geologic conditions of the site and to provide appropriate geotechnical engineering recommendations for the design and construction of the subject project.

The approximate location of the site is shown on the attached Index Map (Enclosure "A-1"). To orient our investigation, a site plan prepared by Landesign Group, Inc., showing the building location was provided for our use. The plan was utilized as a base map for our Site Plan (Enclosure "A-2").

The results of our investigation, together with our conclusions and recommendations, are presented in this report.

SCOPE OF SERVICES

The scope of services provided during this investigation included the following:

- Review of published and unpublished geologic literature and maps
- Field reconnaissance of the subject site and surrounding area and geologic mapping of the site
- Marking of exploration locations in the field and notification of Underground Service Alert
- Placement of four exploratory borings within the building pad area

- Placement of seven exploratory trenches within the site area
- Double-ring infiltrometer testing at two locations on the site
- Logging and sampling of the exploratory borings and test pits for testing and evaluation
- Laboratory testing on selected samples
- Evaluation of geologic hazards
- Seismic design parameters according to the 2013 California Building Code (CBC)
- Evaluation of the geotechnical data to develop site-specific recommendations for suitable foundation recommendations, including allowable bearing pressures, ultimate and allowable passive earth resistance and base friction, lateral earth pressures and mitigation of potential geotechnical concerns and hazards, such as expansive soils, liquefaction and seismic settlement, if encountered
- Preparation of this report summarizing our findings, professional opinions and recommendations for the geotechnical aspects of project design and construction

PROJECT CONSIDERATIONS

The proposed two- and three-story senior facility will include more than 80 units and will be approximately 80,000 square feet in plan area. We anticipate that the facility will be of wood frame and stucco or masonry construction. Light to moderate foundations loads are typically associated with structures of the type proposed.

Our review of furnished plans indicates that the site elevation varies approximately 120 feet, with the highest elevation of approximately 1,000 feet at the northeast corner and the lowest of approximately 880 feet at the southwest corner. The northern portion of the building pad (2-story portion) will be at elevation 912 feet and the southern portion of the building pad (3-story portion) will be at elevation 902 feet. Based on this information, we anticipate that the building pad and foundations will be stepped. Per our conversation with the client, post-tension slab foundations are anticipated. We expect that the slope on the north side of the building pad will be cut to provide a level building pad and

that stepped retaining walls will be required for slope stability purposes. The slope cut will be on the order of 20 feet.

The final project grading plan should be reviewed by the geotechnical engineer to confirm that recommendations provided in this report have been properly implemented.

SITE DESCRIPTION

The site is located along a freeway frontage road on the north side of the 101 freeway, west of the Kanan Road off-ramp. At the time of our investigation, commercial buildings were located west of the site, and undeveloped land was located to the north and east. The site slopes up at a gentle grade north from Kanan Road to the toe of an approximately 2 horizontal (h) to 1 vertical (v) slope located north of the proposed building area. Debris and evidence of an abandoned structure and foundation area were present in the northeastern portion of the site.

Historic aerial imagery dating from 1947 was examined as part of this investigation. At the time of the 1947 aerial image, the site and surrounding area were undeveloped land. By the time of the 1959 aerial image, several structures were present on the north portion of the site. These structures remained on the site until the time of the 1980 aerial image, when the site appeared in its present condition, with debris in the northeastern portion of the site. Construction began on the commercial structures west of the site by the time of the image dated December 31, 2006, and was completed between the time of the image dated January 8, 2008, and May 24, 2009.

FIELD INVESTIGATION

Four exploratory borings were drilled to a maximum depth of 50-1/2 feet below the existing ground surface (bgs) using a limited-access (track mounted) hollow-stem auger drill rig equipped for soil sampling. In addition, seven trenches were excavated to depths ranging from 4 feet to 9-1/2 feet bgs. The exploratory trenches were used to evaluate the geologic structure of the bedrock. Two exploratory test pits were excavated in the proposed parking and driveway areas and were utilized to

perform double-ring infiltrometer tests. The approximate locations of our exploratory borings, trenches and test pits are indicated on the attached Site Plan (Enclosure "A-2").

Continuous logs of the subsurface conditions, as encountered within the exploratory borings, were recorded at the time of drilling by a staff geologist from this firm. Both a standard penetration test (SPT) sampler (2-inch outer diameter and 1-3/8 inch inner diameter) and a modified California sampler (3-1/4-inch outer diameter and 2-3/8-inch inner diameter) were utilized in our investigation. Relatively undisturbed samples were obtained by driving the modified California sampler (a split-spoon ring sampler) ahead of the borings at selected levels. The penetration resistance was recorded on the boring logs as the number of hammer blows used to advance the sampler in 6-inch increments (or less if noted). The sampler is driven with an automatic hammer that drops a 140-pound weight 30 inches for each blow. After the required seating, the sampler is advanced up to 18 inches, providing up to three sets of blowcounts at each sampling interval. The recorded blows are raw numbers without any corrections for hammer type (automatic vs. manual cathead) or sampler size (California sampler vs. standard penetration test sampler). Both relatively undisturbed and bulk samples of typical soil types obtained were returned to the laboratory in sealed containers for testing and evaluation.

Our exploratory boring logs, together with our in-place blowcounts per 6-inch increment, are presented in Appendix "B". The stratification lines presented on the boring logs represent approximate boundaries between soil types, which may include gradual transitions.

LABORATORY INVESTIGATION

Included in our laboratory testing program were field moisture content tests on all samples returned to the laboratory and field dry density tests on all relatively undisturbed ring samples. The results are included on the boring logs. An optimum moisture content - maximum dry density relationship was established for a representative soil type. A direct shear test was performed on a selected remolded sample in order to provide shear strength parameters for bearing capacity and earth pressure evaluations. No. 200 wash, sieve analysis, sand equivalent and plasticity index testing was

performed on selected samples in order to classify the subsurface soils encountered. Expansion index testing was performed on a selected sample to evaluate the expansion potential of the subsurface soils. Since the on-site soils are expansive, a sample was set up in the consolidation testing machine to determine expansive deformation strain and expansive pressure.

A selected sample of material was delivered to HDR for chemical/corrosivity testing.

Summaries of the laboratory test results appear in Appendix "C". Soil classifications provided in our geotechnical investigation are generally per the Unified Soil Classification System (USCS).

SITE GEOLOGY AND SUBSURFACE SOIL CONDITIONS

Regionally, the site is located in a valley within the Santa Monica Mountains of the Transverse Ranges geomorphic province. This province includes several discreet mountain ranges and intervening valleys including the Santa Monica, San Gabriel and San Bernardino Mountains and is so named because structural trends, such as the Simi-Santa Rosa fault zone, are oriented east-west in relation to the dominant northwest-southeast trend of adjoining provinces. The Transverse Ranges province extends from the Channel Islands eastward to the Eagle and Cottonwood Mountains of the Mojave Desert. As depicted on published geologic mapping, the site is underlain by the Upper Topanga formation, which is a Miocene-age sedimentary bedrock consisting of interbedded shale, siltstone and sandstone, and Miocene-age Conejo Volcanics (Dibblee, and Ehrenspeck, 1993, Enclosure "A-3").

As encountered in the explorations, the site is mantled by colluvial fill to depths from approximately 3 to 5 feet below ground surface. The fill materials encountered consisted of medium dense to dense clayey sand (SC) and stiff to hard fat clay (CH). The bedrock was encountered at depths of 3 to 10 feet bgs and consisted of Topanga Formation Siltstone recovered as silty and clayey sands (SM, SC), clays (CL, CH) and silt (ML).

Groundwater or seepage was not encountered in the explorations. Refusal was not encountered in the explorations to the maximum 50-1/2 foot depth. Caving was not encountered upon removal of the drilling augers.

More detailed descriptions of the subsurface soil conditions encountered are presented on the attached boring logs (Appendix "B").

FAULTING

The site does not lie within or immediately adjacent to an Alquist-Priolo Earthquake Fault Zone designated by the State of California to include traces of suspected active faulting. The closest known fault is a segment of the Chatsworth fault that is located approximately 4.5 miles to the northeast. The Malibu fault, Santa Monica fault, Sierra Madre fault zone and San Gabriel fault zone are the nearest known faults to the site and are located 7.6 miles south, 9.5 miles southeast, 14 miles northeast and 22.5 miles northeast of the site, respectively. No faults are shown on or in the immediate vicinity of the site on published geologic maps.

SEISMICITY

A map of recorded earthquake epicenters is included as Enclosure "A-4" (Epi Software, 2000). This map includes a database maintained by the Southern California Earthquake Center (University of Southern California) for earthquakes with magnitudes of 4.0 or greater from 1932 through 2012. The following table summarizes earthquakes that have occurred in the region of the site.

Summary of Historic Earthquakes				
Event ID	**Date**	**Magnitude**	**Distance from Site (miles)**	**Direction from Site**
Lake Matthews Area	4/21/1918	6.6	79	SE
Long Beach	3/10/1933	6.4	58	SE
Fish Creek Mountains	10/21/1942	6.6	178	SE
Borrego Mountain	4/9/1968	6.5	164	SE
West Hollywood	9/9/2001	5.9	21.5	SE
Whittier Narrows	10/1/1987	5.9	39	SE
Upland	2/28/1990	5.4	61	E
Sierra Madre	6/28/1991	5.8	46	NE
Mojave	7/11/1992	5.7	85	NE
Landers	6/28/1992	7.3	133	NE
Big Bear	6/28/1992	6.4	111	E
Northridge	1/17/1994	6.7	14	NE
Hector Mine	10/16/1999	7.1	147	NE
Fort Tejon	1/9/1857	7.9	134	NW
Chino Hills	7/29/2008	5.4	59	SE
Kern County (Tehachapi)	7/21/1952	7.3	62	NW
Inglewood	5/17/2009	4.7	28	SE
Upland	6/26/1988	4.8	60	E
Yorba Linda	9/3/1992	4.8	59	SE
Sylmar	2/9/1971	6.6	28	NE

SEISMIC DESIGN PARAMETERS

Based on the geologic setting and blowcount data from subsurface explorations, the soils underlying the site are classified as Site Class "C", according to the 2013 CBC.

The seismic design parameters in accordance with Section 1613A of 2013 CBC are presented in Table 2.1. These values were determined using the web-based application http:// earthquake.usgs.gov/designmaps/us/application.php and the site coordinates 34.1475, W118.7659. The deaggregated modal earthquake magnitude was determined from the USGS website http://geohazards.usgs.gov/deaggint/2008 for evaluation of soil effects due to earthquake ground shaking.

2013 CBC - Seismic Design Parameters	
Mapped Spectral Acceleration Parameters	S_s = 1.559 and S_1 = 0.600
Site Coefficients	F_a = 1.0 and F_v = 1.3
Adjusted Maximum Considered Earthquake Spectral Response Parameters	S_{MS} = 1.559 and S_{M1} = 0.780
Design Spectral Acceleration Parameters	S_{DS} = 1.039 and S_{D1} = 0.520
Geometric Mean Peak Ground Acceleration (PGA_M)	0.579g
Deaggregated Modal Magnitude	7.03

GROUNDWATER AND LIQUEFACTION

Depth-to-groundwater data from the State of California Water Resources Control Board (2015) and groundwater contour mapping by CGS (2000) were examined for the area of the site. These data are summarized in the following table.

Depth to Groundwater				
Well No./ID	**Date Measured**	**Depth to Water (feet)**	**Measuring Point Elevation (feet amsl)**	**Location**
T06037041688-W-05DD	8/25/2009	6	871	1/4 mile S
	1/22/2010	6		
T0603703142-MW-K	9/1/2002	12	900	1/3 mile E
	10/1/2006	8		
	7/6/2009	6		
	4//2012	11		
T-0603703449-W-14	1/14/2004	14	886	1/3 mile SE
	10/10/2006	16		
	12/27/2014	15		
Contour Mapping	Historic High	10	--	--

Groundwater was not encountered within the maximum 50-1/2-foot depth of the explorations. Based on historical data and a site elevation of 900 feet, the historic high depth to groundwater in the area of the site is estimated at approximately 10 feet bgs.

Liquefaction is a process in which strong ground shaking causes saturated soils to lose their strength and behave as a fluid. Ground failure associated with liquefaction can result in severe damage to structures. The geologic conditions for increased susceptibility to liquefaction are: 1) shallow groundwater (generally less than 50 feet in depth), 2) the presence of unconsolidated sandy alluvium, typically Holocene in age, and 3) strong ground shaking. All three of these conditions must be present for liquefaction to occur.

The site is not included in a State of California Seismic Hazard Zone for liquefaction or earthquake-induced landslide (CGS, 2000). Based on the composition of the underlying soils encountered in our geotechnical investigation and the relatively shallow depths of bedrock encountered at the site, liquefaction is not considered a potential hazard, and further investigation is not warranted.

SEISMIC SETTLEMENT

Severe seismic shaking may cause dry and saturated sands to densify, resulting in settlement expressed at the ground surface. Seismic settlement in dry soils generally occurs in loose sands and silty sands, with cohesive and fine-grained soils being less prone to significant settlement. For saturated soils, significant settlement is anticipated if the soils are liquefied during seismic shaking. Soil types susceptible to liquefaction include sand, silty sand, sandy silt and silt, as well as clayey soils with clay content less than 15 percent.

Topanga Formation siltstone was encountered at depths of 3 to 10 feet below the existing ground surface. Little to no alluvial sands were encountered in our investigation. Therefore, seismic settlement at the site is considered negligible.

STATIC SETTLEMENT

Potential static settlement was evaluated utilizing field and laboratory data and foundation load assumptions. We anticipate a total static settlement of less than 1 inch beneath foundations. Differential settlement is anticipated to be less than one-half the total settlement in 40 feet. Most of the potential static settlement should occur during construction.

HYDROCONSOLIDATION

Based on the relatively dense nature of the underlying near-surface soils encountered in our investigation, the minimum mandatory removal requirements as provided in the "Recommendations"

section of this report and the low potential for full saturation of the soil layers, it is our opinion that the potential for hydrocollapse settlement at the site is low.

SUBSIDENCE

The site is not located within an area identified by the State of California Seismic Hazard Zone as having a potential for subsidence. The potential for subsidence to affect the proposed structure is considered low.

SLOPE STABILITY AND LANDSLIDE POTENTIAL

Based on information provided by the project civil engineer, a finished floor elevation of approximately 912 feet above mean sea level (amsl) is estimated for the project. The slope located on the northern portion of the site consists of tight, well-bedded siltstone with sandstone interbeds. Bedding was measured to dip to the north. Landslides were not observed within the site. The site is not located within a State-designated area as having a potential for landslide, seismically induced landslide or lateral spreading (CGS, 2000). Therefore, the potential for landsliding or lateral spreading is considered low.

Grading of cut or fill slopes, if needed to achieve final site configurations, should be conducted in conformance with applicable grading codes. On-site soils may be considered Type "B" with regard to 2013 CAL/OSHA excavation standards.

FLOODING AND EROSION

The site is not located in an area designated by the Federal Emergency Management Agency (2008) as a flood hazard zone. A more accurate determination of the flood hazard to the site and the adequacy of existing flood and drainage improvements near the site is not within the scope of this investigation.

No large water storage facilities are known to exist within the area of the site. The site is not located within a coastal area; therefore, tsunami is not a potential hazard to the site.

EXPANSION POTENTIAL

ASTM D4829 test standard classifies expansion index (EI) of soils as follows:

Expansion Index	Expansion Potential
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Greater than 130	Very High

According to Section 1803.5.3 of the 2013 CBC, soils having an EI greater than 20 are considered "expansive" and require foundation design to mitigate these conditions as per Section 1808.6 of the 2013 CBC.

EI analysis according to the ASTM standard was performed by this firm. The result indicates EI values of 150 and 157 ("very high"). Based on these results, construction procedures and/or special structural design to specifically mitigate the effects of expansive soil movements are necessary. Recommendations to mitigate expansive soil conditions are provided in the "Expansive Soils" section of this report.

DOUBLE-RING INFILTROMETER TESTS

Two double-ring infiltrometer tests were performed to evaluate the infiltration potential of the site soils located within the proposed water retention area. The test locations are indicated on Enclosure "A-2". The tests were performed in general conformance with ASTM D3385 at depths of 3 and 5 feet below the existing ground surface utilizing a rubber-tire backhoe to excavate the test pits. Exploratory test pit logs are provided in Appendix "B".

The data collected were used to calculate the infiltration rate of the soil. The infiltration test was performed until a steady-state infiltration velocity was reached. The steady-state infiltration velocity is presented as the infiltration rate.

The infiltration rates are presented in the following table and do not include safety factors.

Test Number/Depth	Infiltration Rate	
	cm. / hr.	in. / hr.
P-1	0.13	0.05
P-2	0.07	0.03

The measured infiltration rates are within the applicable range of the test method. The measured infiltration rate to use in design is discussed in the "Storm Water Infiltration" section of this report. It should be noted that infiltration rates determined by testing are ultimate rates based on short-duration field test results. The infiltration tests utilized clear water, and infiltration rates can be affected by buildup of silt, debris, the degree of soil saturation and other factors. An appropriate safety factor should be applied to measured infiltration rates prior to use in design to accommodate potential subsoil inconsistencies, possible compaction related to site grading and potential silting of the percolating soils. A safety factor should be determined with consideration to other factors in the storm water

retention system design, particularly storm water volume estimates and the safety factors associated with those design components.

CONCLUSIONS

On the basis of our research and field and laboratory investigations, it is the opinion of this firm that the proposed project is feasible from a geological and geotechnical engineering standpoint, provided the recommendations contained in this report are implemented during design and construction.

As encountered in the explorations, the site is mantled by colluvial fill to depths from approximately 3 to 5 feet below ground surface. The fill materials encountered consist of medium dense to dense clayey sand (SC) and stiff to hard fat clay (CH). The bedrock was encountered at depths of 3 to 10 feet bgs and consisted of Topanga Formation Siltstone recovered as silty and clayey sands (SM, SC), clays (CL, CH) and silt (ML). Refusal to further advancement of the drilling augers was not experienced in the exploratory borings. Caving was not experienced within the exploratory borings utilized for this investigation.

The site does not lie within or immediately adjacent to an Alquist-Priolo Earthquake Fault Zone designated by the State of California to include traces of suspected active faulting.

Moderate to severe seismic shaking can be expected at the site.

Groundwater was not encountered within the maximum 50-1/2-foot depth of the explorations. Historic high groundwater is estimated to be at 10 feet bgs in the area of the site. Based on the composition of the underlying soils encountered in our geotechnical investigation and the relatively shallow depths of bedrock encountered at the site, liquefaction is not considered a potential hazard to the site.

Settlement resulting from seismic shaking is considered negligible. Hydroconsolidation potential is considered low for the site.

The potential for subsidence to affect the proposed structure is considered low.

The potential for landsliding or lateral spreading is considered low.

Expansion index testing yielded "very high" potential for expansion. Based on the EI test result, construction procedures and/or special structural design to specifically mitigate the effects of expansive soil movements are necessary.

Based on the classification, density and lack of significant soil cementation encountered in exploratory borings placed within the site, site grading and utility trenching are expected to be feasible with conventional heavy grading and trenching equipment, respectively.

RECOMMENDATIONS

The recommendations provided in this report assume that on-site expansive soils will be utilized and foundations and slabs-on-grade will be designed for expansive deformations and pressures provided herein. Retaining walls will require imported, very low expansive (EI<21), granular soils as backfill. If additional recommendations for use of imported soils or conventional foundations are required, this firm should be contacted.

GENERAL SITE GRADING:

It is imperative that no clearing and/or grading operations be performed without the presence of a representative of the geotechnical engineer. An on-site, pre-job meeting with the developer, the contractor and the geotechnical engineer should occur prior to all grading-related operations. Operations undertaken at the site without the geotechnical engineer present may result in exclusions of affected areas from the final compaction report for the project.

Grading of the subject site should be performed, at a minimum, in accordance with these recommendations and with applicable portions of the 2013 CBC. The following recommendations are presented for your assistance in establishing proper grading criteria.

INITIAL SITE PREPARATION:

All areas to be graded should be stripped or cleaned of significant vegetation, rocks greater than 6 inches in largest dimension and other deleterious materials. These materials should be removed from the site for disposal.

The cleaned soils may be reused as properly compacted fill if foundations, which include slabs-on-grade, are designed as indicated in the "Expansive Soils" section of this report.

If encountered, existing utility lines should be traced, removed and rerouted from areas to be graded.

Cavities created by removal of subsurface obstructions such as structures, individual effluent disposal systems and trees should be thoroughly cleaned of loose soil, organic matter and other deleterious materials, shaped to provide access for construction equipment, and backfilled as recommended for compacted fill.

MINIMUM MANDATORY REMOVAL AND RECOMPACTION OF EXISTING SOILS:

All areas to be graded should have at least the upper 5 feet of existing soils removed or expose siltstone bedrock, and the open excavation bottoms observed by our engineering geologist to verify and document in writing that all undocumented fill is removed prior to refilling with properly tested and documented compacted fill. The removed soils may only be used as compacted fill if foundations are designed as recommended in the "Expansive Soils" section of this report.

Further subexcavation may be necessary depending on the conditions of the underlying soils. The actual depth of removal should be determined at the time of grading by the project geotechnical engineer/geologist. The determination will be based on soil conditions exposed within the excavations.

Compaction tests may be taken in the removal bottom areas where appropriate to provide in-place moisture/density data for potential relative compaction evaluations and to help support and document the engineering geologist's decision. As such, all areas to be graded should have any undocumented

fill, topsoil or other unsuitable materials removed and replaced with properly compacted fill. Fill may consist of suitable on-site material, imported material or a combination thereof depending on foundation design.

PREPARATION OF FILL AREAS:

Prior to placing fill, and after the mandatory subexcavation operation with all loose native and/or undocumented fill removed, the surfaces of all areas to receive fill should be scarified to a depth of 6 inches or more. The scarified soils should be brought to between optimum moisture content and 2 percent above optimum moisture content and recompacted to a minimum relative compaction of 90 percent in accordance with ASTM D1557.

PREPARATION OF FOUNDATION AREAS:

For foundations designed for expansive soils as recommended in the "Expansive Soils" section of this report, the thickness of compacted fill underneath footings should be at least 3 feet and the removed soils may be used as compacted fill. In areas where the required thickness of compacted fill is not accomplished by site rough grading, mandatory subexcavation operation and the undocumented fill removal, the footing areas should be further subexcavated to a depth of at least 3 feet below the proposed footing base grade. The required overexcavation should extend at least 10 feet laterally beyond the footing lines, where possible. The bottom of this excavation should then be scarified to a depth of at least 6 inches, brought to between optimum moisture content and 2 percent above optimum moisture content and recompacted to a minimum of 90 percent relative compaction in accordance with ASTM D1557 prior to refilling the excavation to the required grade as properly compacted fill.

Thickness of compacted fill underneath foundations should not be allowed to vary by more than 50 percent or 4 feet, whichever is less, for a single foundation system. In areas where, by virtue of grading, the fill thickness will exceed this maximum allowable differential, the subexcavation depths should be increased as necessary to reduce the differential fill thickness. This deepening of the subexcavation may involve additional removals of native soils. A determination of specific structural areas that require additional subexcavation should be performed at the time of grading.

Foundation concrete should be placed in neat excavations with vertical sides, or the concrete should be formed and the excavations properly backfilled as recommended for compacted fill.

COMPACTED FILLS:

The on-site soils should provide adequate quality fill material provided they are free from organic matter and other deleterious materials and foundations and slabs-on-grade are designed for expansive soils as indicated in the "Expansive Soils" section of this report. Unless approved by the geotechnical engineer, rock or similar irreducible material with a maximum dimension greater than 8 inches should not be buried or placed in fills.

If utilized, import materials should be inorganic, very low-expansive (EI<21), granular soil free from rocks or lumps greater than 6 inches in maximum dimension. The contractor shall notify the geotechnical engineer of import sources sufficiently ahead of their use so that the sources can be observed and approved as to the physical characteristic of the import material. For all import material, the contractor shall also submit current verified reports from a recognized analytical laboratory indicating that the import has a "not applicable" (Class S0) potential for sulfate attack based upon current American Concrete Institute (ACI) criteria and is not corrosive to ferrous metal and copper. The reports shall be accompanied by a written statement from the contractor that the laboratory test results are representative of all import material that will be brought to the job.

Fill should be spread in near-horizontal layers, approximately 8 inches thick. Thicker lifts may be approved by the geotechnical engineer if testing indicates that the grading procedures are adequate to achieve the required compaction. Each lift should be spread evenly, thoroughly mixed during spreading to attain uniformity of the material and moisture in each layer, brought to between optimum moisture content and 2 percent above optimum moisture content, and compacted to a minimum relative compaction of 90 percent in accordance with ASTM D1557.

It is crucial that the geotechnical engineer or representative be present to observe the grading operations. Monitoring of the soil expansion potential by the geotechnical engineer during the

grading operation should be performed regularly. Further recommendations may be made in the field, depending on the actual conditions encountered.

SLOPE CONSTRUCTION:

Slopes should be constructed no steeper than 2(h):1(v). Fill slopes should be overfilled during construction and then cut back to expose fully compacted soil. A suitable alternative would be to compact the slopes during construction and then roll the final slopes to provide dense, erosion-resistant surfaces.

SLOPE PROTECTION:

Inasmuch as the native materials are susceptible to erosion by wind and running water, it is our recommendation that the slopes at the project be protected from erosion as soon as possible after completion. On permanent slopes the use of succulent ground covers, such as ice plant or sedum, is not recommended. If watering is necessary to sustain plant growth on slopes, then the watering operation should be monitored to assure proper operation of the water system and to prevent overwatering.

Measures should be provided to prevent surface water from flowing over slope faces.

FOUNDATION DESIGN:

Foundations and slabs-on-grades should be designed to resist the effects of expansive soils. Structural design measures including design of slab-on-grade foundations in accordance with "WRI/CRSI Design of Slab-On-Ground Foundations" or "PTI Standard Requirements for Design of Shallow Post-Tensioned Concrete Foundations of Expansive Soils" would be necessary. Foundations should also be designed to prevent uplift of the supported structure and resist forces exerted on the foundation due to soil volume change or shall be isolated from the expansive soil as indicated in Sections 1808.6.1 and 1808.6.2 of the 2013 California Building Code.

For foundations designed for expansive soils, bearing on a minimum of 3 feet of compacted fill, footings may be designed for a maximum safe soil bearing pressure of 1,000 pounds per square foot (psf) for dead plus live loads. The bearing values may be increased by one-third for wind or seismic loading.

For footings thus designed and constructed, we would anticipate a maximum static settlement of less than 1 inch. Differential static settlement between similarly loaded adjacent footings is expected to be approximately half the total settlement. Static settlement is expected to occur during construction or shortly after. Foundation concrete should be placed in neat excavations with vertical sides, or the concrete should be formed and the excavations properly backfilled as recommended for compacted fill.

LATERAL LOADING:

Resistance to lateral loads will be provided by passive earth pressure and cohesion. For footings bearing against on-site compacted fill, allowable passive earth pressure may be considered to be developed at a rate of 100 psf per foot of depth. Passive earth pressure only applies to level, properly drained backfill with no additional surcharge loadings. Cohesion may be computed as 130 psf. Cohesion and passive earth pressure may be combined without reduction.

Cohesion value is to be multiplied by the contact area, as limited by Section 1806.3.2 of the 2013 CBC. The lateral passive earth pressure and cohesion values are provided from Table 1806.2 of the 2013 CBC.

The resistance values provided do not consider expansive pressures of the on-site soils. Expansive pressures should be taken into account during design of foundations.

For preliminary retaining wall design, lateral active earth pressures indicated in the table below should be utilized for properly drained backfill with no additional surcharge loadings.

Lateral Active Earth Pressures	
Backfill Inclination	**Active (psf/ft)**
Level	40
3(h):1(v)	55
2(h):1(v)	65

For restrained conditions, an at-rest earth pressure of 65 psf per foot of depth should be utilized for level, properly drained backfill with no additional surcharge loadings.

The "at-rest" condition applies toward braced walls that are not free to tilt. The "active" condition applies toward unrestrained cantilevered walls where wall movement is anticipated. The structural designer should use judgment in determining the wall fixity and may utilize values interpolated between the "at-rest" and "active" conditions where appropriate.

The values for earth pressures are based on imported backfills consisting of inorganic, very low-expansive (EI<21), granular, compacted fill, and assume that soils will have a phi angle of 30 degrees and a unit weight of 120 pounds per cubic foot. These values should be verified by an engineer from this firm when import materials are selected. These values do not include a factor of safety other than conservative modeling of the soil strength parameters.

RETAINING WALL BACKFILL:

Backfill behind retaining walls should consist of a soil of sufficient granularity that the backfill will properly drain. The granular backfill shall extend from the bottom of the wall at a 1(h):1(v) plane to the surface. The granular soil should be classified per the USCS as GW, GP, SW, SP, SW-SM or SP-SM and should have a minimum phi angle of 30 degrees and a unit weight of 120 pounds per cubic

foot. Surface drainage should be provided to prevent ponding of water behind walls. A drainage system should be installed behind all retaining walls consisting of either of the following:

1. A 4-inch-diameter perforated PVC (Schedule 40) pipe or equivalent at the base of the stem encased in 2 cubic feet of granular drain material per linear foot of pipe or

2. Synthetic drains such as Enkadrain, Miradrain, Hydraway 300 or equivalent.

Perforations in the PVC pipe should be 3/8 inch in diameter. Granular drain material should be wrapped with filter cloth such as Mirafi 140 or equivalent to prevent clogging of the drains with fines. Walls should be waterproofed to prevent nuisance seepage. Water should outlet to an approved drain.

SEISMIC LATERAL EARTH PRESSURE (CANTILEVERED WALL):

The seismic earth pressure acting on a cantilevered retaining wall was calculated using the Mononobe-Okabe ("M-O") method (Okabe, 1926; Mononobe and Matsuo, 1929). According to AASHTO (LRFD Bridge Design Specifications, Sixth Edition, 2012, Section C11.8.6.2 and A11.3.2), the resulting pseudostatic horizontal seismic coefficient, k_h, could be reduced by 50 percent when 1.0 to 2.0 inches of permanent ground deformation is permitted during the design seismic event, i.e., the pseudostatic horizontal seismic coefficient (k_h) can be taken as equal to one-half of the PGA, which equates to 0.29g. The pseudostatic vertical seismic coefficient (k_v) is usually taken as 0.0g. For retaining walls with imported backfills consisting of inorganic, very low-expansive (EI<21), granular, compacted fill, a unit weight of 120 pounds per cubic foot (pcf) and a friction angle of 30 degrees were utilized in the calculation. These values should be verified prior to construction when the backfill materials and conditions have been determined and are applicable only to properly drained backfill with no additional surcharge loadings.

The total lateral active seismic earth pressures (including static active earth pressures) to be utilized for unrestrained conditions are provided in the following table.

Lateral Active Seismic Earth Pressures	
Backfill Inclination	**Active Seismic (psf/ft)**
Level	70
3(h):1(v)	125
2(h):1(v)	135

A triangular distribution of total seismic earth pressure should be used in the design (Atik and Sitar, 2010).

SLABS-ON-GRADE:

Slabs-on-grade should be designed to resist the expansive soils as provided in the "Expansive Soils" section of this report.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor retarder. We recommend that a vapor retarder be designed and constructed according to the American Concrete Institute 302.1R, Concrete Floor and Slab Construction, which addresses moisture vapor retarder construction. At a minimum, the vapor retarder/barrier should comply with ASTM E1745 and have a nominal thickness of at least 10 mils. The vapor retarder/barrier should be properly sealed, per the manufacturer's recommendations, and protected from punctures and other damage. Per the Portland Cement Association (www.cement.org/tech/cct_con_vapor_retarders.asp), for slabs with vapor-sensitive coverings, a layer of dry, granular material (sand) should be placed under the vapor retarder/barrier. For slabs in humidity-controlled areas, a layer of dry, granular material (sand) should be placed above the vapor retarder/barrier.

A modulus of vertical subgrade reaction of 100 kips per cubic foot can be utilized in the design of slabs-on-grade for the proposed project.

EXPANSIVE SOILS:

The expansion index testing performed for this report indicated a "very high" potential for expansion (EI of 150 and 157) in the upper soil layers. Based on these results, construction procedures and/or special structural design to specifically mitigate the effects of expansive soil movements are necessary, as recommended below.

Structural design measures, including design of slab-on-grade foundations in accordance with "WRI/CRSI Design of Slab-On-Ground Foundations" or "PTI Standard Requirements for Design of Shallow Post-Tensioned Concrete Foundations of Expansive Soils", should be taken into consideration for this project. Foundations should also be designed to prevent uplift of the supported structure and resist forces exerted on the foundation due to soil volume change or shall be isolated from the expansive soil as indicated in Sections 1808.6.1 and 1808.6.2 of the 2013 California Building Code.

The expansive potential deformation within the upper 5 feet of clayey soils is expected to be approximately 1-1/2 inches (expansive strain of 2.4%). An expansive pressure of 7,000 psf should be used in the design of the foundations and slab-on-grade.

Additional evaluation of soils for expansion potential should be conducted by the geotechnical engineer during grading in order to provide the geotechnical parameters required for the design. Utilities should also be designed for potential expansive deformation and pressure.

POTENTIAL EROSION AND DRAINAGE:

The potential for erosion should be mitigated by proper drainage design. The site should be graded in such a way that surface water flows away from structures. Water should not be allowed to flow over graded areas or natural areas so as to cause erosion. Graded areas should be planted or otherwise protected from erosion by wind or water.

STORM WATER INFILTRATION:

Based on the measured infiltration rates, we recommend that a design infiltration rate of 0.03 inches per hour be used for the design of the storm water disposal system(s) on site. An appropriate safety factor should be applied to the recommended infiltration rate prior to use in design to accommodate potential subsoil inconsistencies, possible compaction related to site grading and potential silting of the percolating soils. A safety factor should be determined with consideration to other factors in the storm water retention system design, particularly storm water volume estimates and the safety factors associated with those design components.

As the design infiltration rate is very low, alternative measures to storm water abatement should be considered.

TRENCH EXCAVATION:

The soils encountered within our exploratory borings are generally classified as a Type "B" soil in accordance with the CAL/OSHA excavation standards. Unless specifically evaluated by our engineering geologist, all the trench excavations should be performed following the recommendation of CAL/OSHA (State of California, 2013) for Type "B" soil. Based upon a soil classification of Type "B", the temporary excavation should not be inclined steeper than 1(h):1(v) for maximum trench depth of less than 20 feet. For trench excavation deeper than 20 feet or for conditions that differ from those described for Type "B" in the CAL/OSHA excavation standards, this firm should be contacted.

TRENCH BEDDING AND BACKFILLS:

Trench Bedding - Pipe bedding material should meet and be placed according to the current edition of the Standard Specifications for Public Works Construction "Greenbook" or other project specifications. Pipe bedding should be uniform, free-draining, granular material with a sand equivalent of at least 30. The pipe bedding material should be evaluated to confirm sand equivalent values by this firm prior to use as pipe bedding material.

Backfill - The on-site expansive soils may be utilized for trench backfill if utilities are designed to accommodate the expansive deformations and pressures provided in the "Expansive Soils" section of this report. Rock or similar irreducible material with a maximum dimension greater than 6 inches should not be buried or placed in backfills.

Fill to be compacted by heavy equipment should be spread in near-horizontal layers, approximately 8 inches in thickness. For fill to be compacted by hand-operated equipment, thinner lifts, 4 to 6 inches in thickness, should be utilized. Each lift should be spread evenly, brought to between optimum moisture content and 2 percent above optimum moisture content and compacted to a minimum relative compaction of 90 percent in accordance with ASTM D1557. To avoid pumping, backfill material should be mixed and moisture treated outside of the excavation prior to lift placement in the trench.

Soils required to be compacted to at least 95 percent relative compaction, such as pavement subgrade, should also be moisture treated to near optimum moisture content not exceeding 2 percent above optimum moisture content.

As an alternative, a controlled low-strength material (CLSM) could be considered to fill trenches, cavities, such as voids created by caving or undermining of soils beneath existing improvements or pavement to remain, or any other areas that would be difficult to properly backfill.

CHEMICAL/CORROSIVITY TESTING:

Selected samples of materials were delivered to HDR, Inc. for soil corrosivity testing. Laboratory testing consisted of pH, resistivity and major soluble salts commonly found in soils. The results of the laboratory tests performed by HDR, Inc. appear in Appendix "C".

These tests have been performed to screen the site for potentially corrosive soils. Values from the soil tested are considered "mildly corrosive" to ferrous metals at as-received moisture condition and "corrosive" at saturated condition. Specific corrosion control measures, such as coating of the pipe with non-corrosive material or alternative non-metallic pipe material, are considered necessary.

Ammonium and nitrate levels did not indicate a concern as to corrosion of buried copper.

Results of the soluble sulfate testing indicate a "not applicable" (Class S0) anticipated exposure to sulfate attack. Based on the criteria from Table 4.3.1. of the "American Concrete Institute Manual of Concrete Practice" (2011), no special measures, such as specific cement types or water-cement ratios, will be required.

The soluble chloride content of the soils tested was not at levels high enough to be of concern with respect to corrosion of reinforcing steel. The results should be considered in combination with the soluble chloride content of the hardened concrete in determining the effect of chloride on the corrosion of reinforcing steel.

CHJ Consultants does not practice corrosion engineering. If further information concerning the corrosion characteristics, or interpretation of the results submitted herein, is required, then a competent corrosion engineer could be consulted.

CONSTRUCTION OBSERVATION:

All grading operations, including site clearing and stripping, should be observed by a representative of the geotechnical engineer. The geotechnical engineer's field representative will be present to provide observation and field testing and will not supervise or direct any of the actual work of the contractor, his employees or agents. Neither the presence of the geotechnical engineer's field representative nor the observations and testing by the geotechnical engineer shall excuse the contractor in any way for defects discovered in his work. It is understood that the geotechnical engineer will not be responsible for job or site safety on this project, which will be the sole responsibility of the contractor.

LIMITATIONS

CHJ Consultants has striven to perform our services within the limits prescribed by our client and in a manner consistent with the usual thoroughness and competence of reputable geotechnical engineers and engineering geologists practicing under similar circumstances. No other representation, express or implied, and no warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the investigation, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject investigation, and the findings of this report may be invalidated fully or partially by changes outside of the control of CHJ Consultants. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between locations observed and/or sampled are similar to those encountered at the individual locations where observation and sampling was performed. However, conditions between these locations may vary significantly. Should conditions that appear different from those described herein be encountered in the field by the client or any firm performing services for the client or the client's assign, this firm should be contacted immediately in order that we might evaluate their effect.

If this report or portions thereof are provided to contractors or included in specifications, it should be understood by all parties that they are provided for information only and should be used as such.

The report and its contents resulting from this investigation are not intended or represented to be suitable for reuse on extensions or modifications of the project or for use on any other project.

CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this firm at your convenience.

Respectfully submitted,

CHJ CONSULTANTS

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James F. Cooke, G.E. 3012
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MN/JSM/JFC/RJJ:lb

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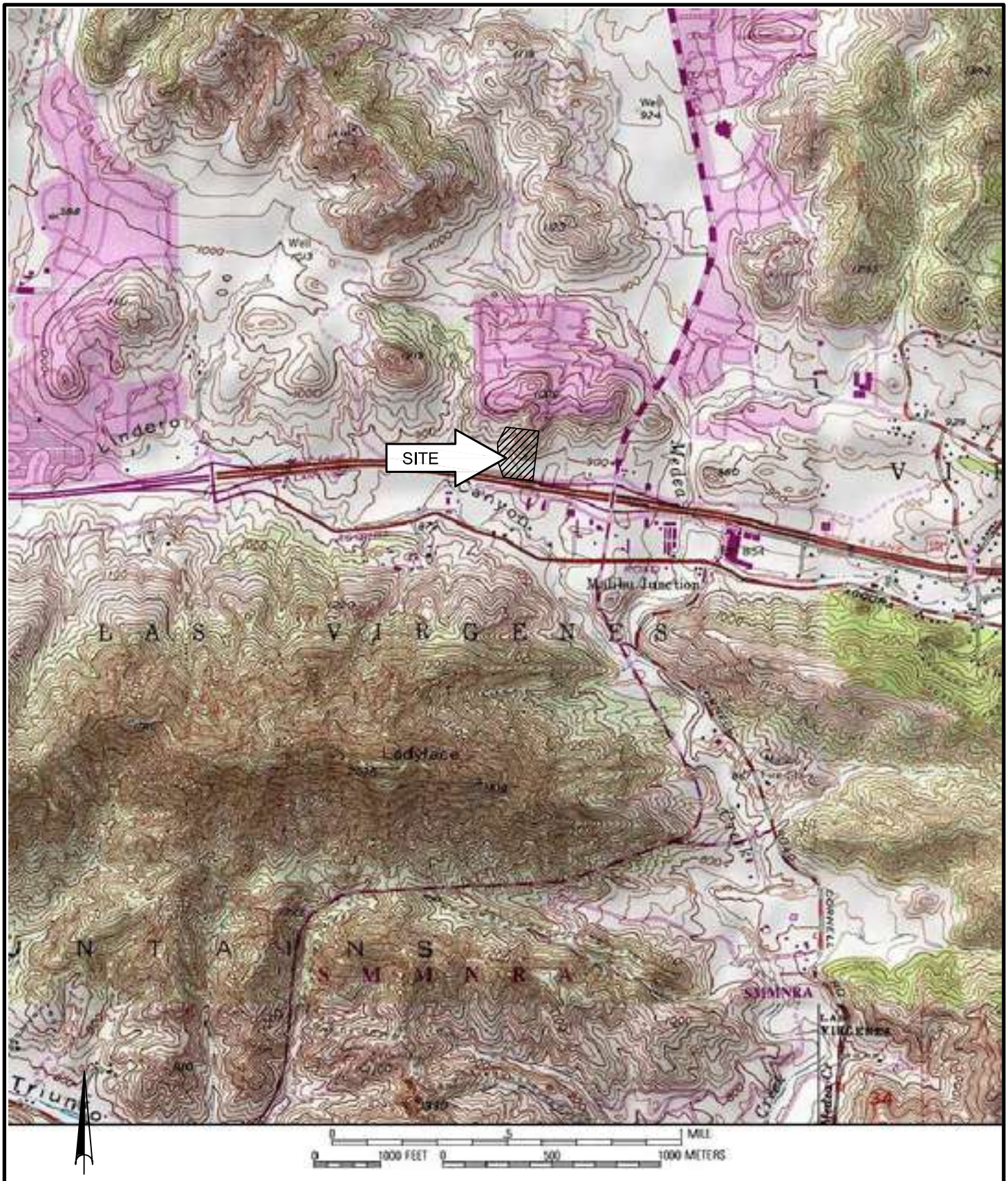
LIST OF AERIAL PHOTOGRAPHS

Google Earth web-based software application, aerial imagery dated July 17, 1989, May 31, 1994, June 9, 2002, December 21, 2005, March 15, 2006, December 31, 2006, August 31, 2007, January 8, 2008, May 24, 2009, July 23, 2014, and May 1, 2015.

Netroline, aerial imagery dated 1947, 1952, 1959, 1967, 1980 and 1989.

APPENDIX "A"

GEOTECHNICAL MAPS



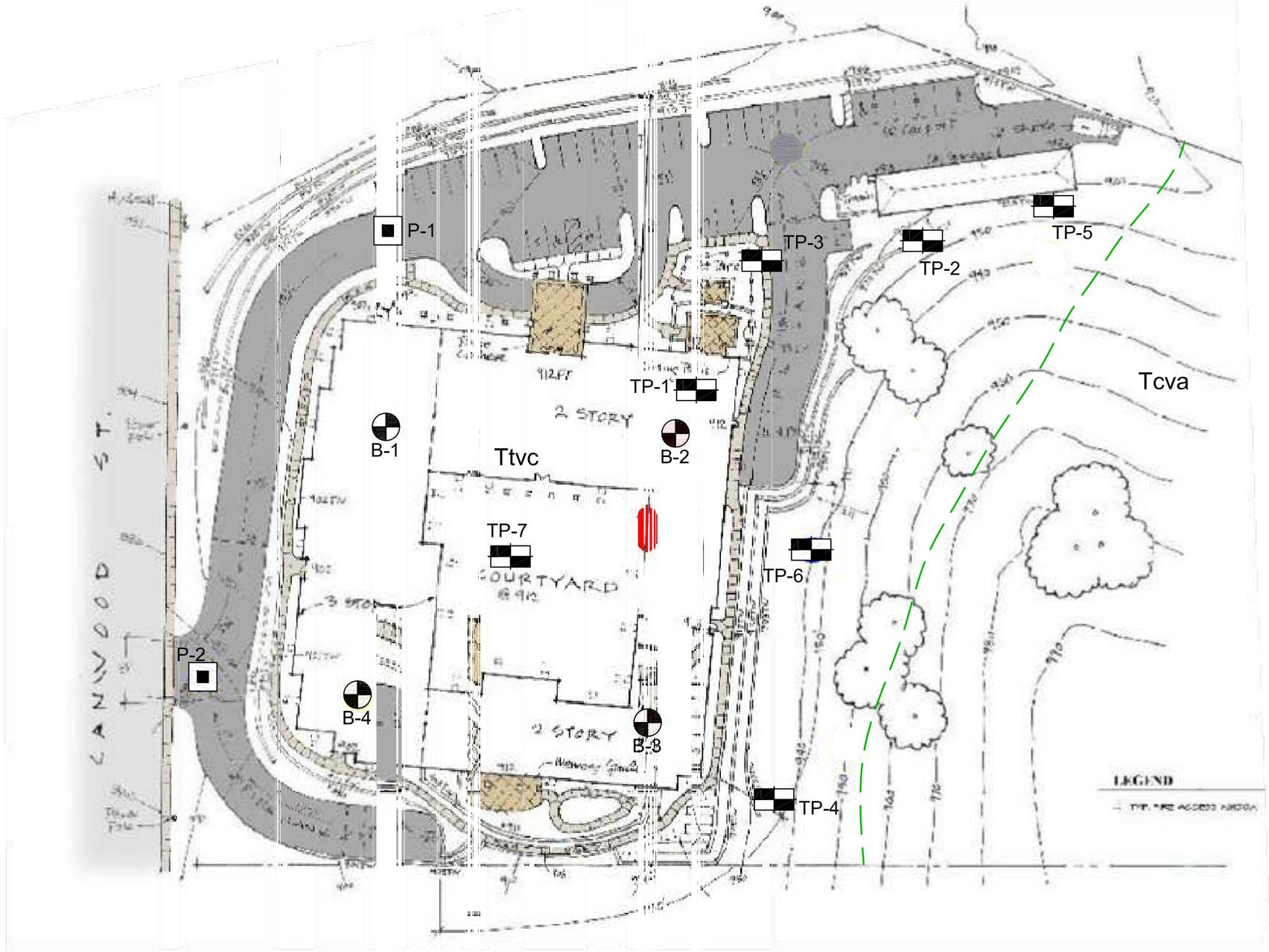
N

SCALE: 1" = 2000'

INDEX MAP

FOR: OAKMONT SENIOR LIVING	GEOTECHNICAL INVESTIGATION OAKMONT OF AGOURA HILLS SENIOR FACILITY APN 2053-001-005 29353 CANWOOD STREET AGOURA HILLS, CALIFORNIA	ENCLOSURE "A-1"
DATE: OCTOBER 2015		JOB NUMBER 15473-3

CHJ Consultants



GEOLOGIC UNITS:

Tcva - conejo volcanics

Ttvc - Topanga Formation clay shale & siltstone with sandstone interbeds overlain by ≈ 2 feet of colluvium (Qcol)

LEGEND:

B-2 Exploratory Boring

P-1 Double Ring Infiltrometer Test

TP-7 Exploratory Test Pit

Geologic Contact

N

SCALE: 1" = 80'

Base Map:

Site Plan
Oakmont Senior Living
Landesign Group
July 2015

SITE PLAN AND GEOLOGIC MAP

FOR: OAKMONT SENIOR LIVING

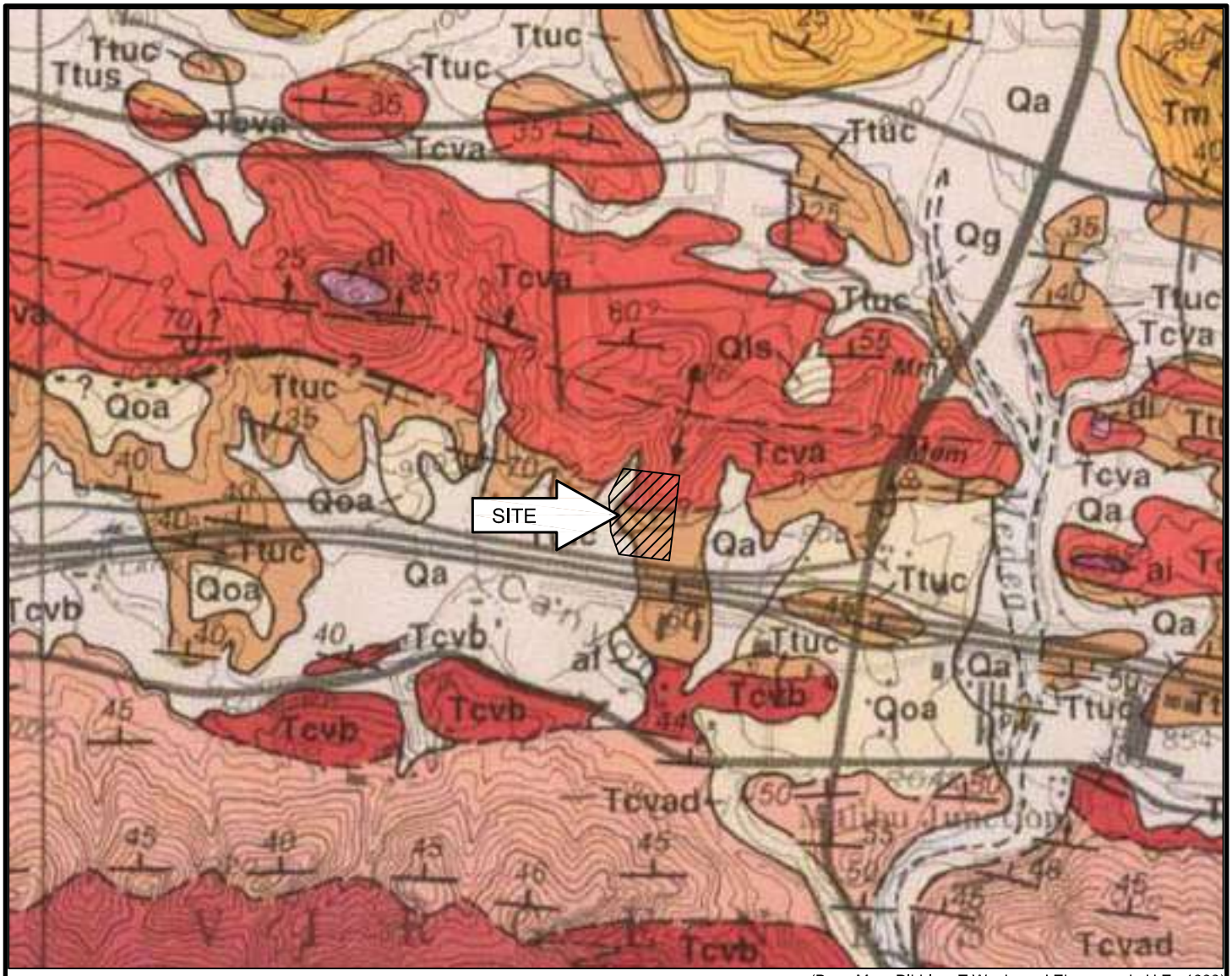
DATE: OCTOBER 2015

GEOTECHNICAL INVESTIGATION
OAKMONT OF AGOURA HILLS SENIOR FACILITY
APN 2053-001-005
29353 CANWOOD STREET
AGOURA HILLS, CALIFORNIA

ENCLOSURE "A-2"

JOB NUMBER 15473-3

CHJ Consultants



(Base Map: Dibblee, T.W., Jr. and Ehrenspeck, H.E., 1993)

GEOLOGIC UNITS:

Qa - alluvium

Qoa - older alluvium

Qls - landslide debris

Ttus - Topanga Formation - clay shale and siltstone.
Includes sandstone interbeds.

Tcva - Conejo Volcanics - andesitic flows and breccias

geologic contact

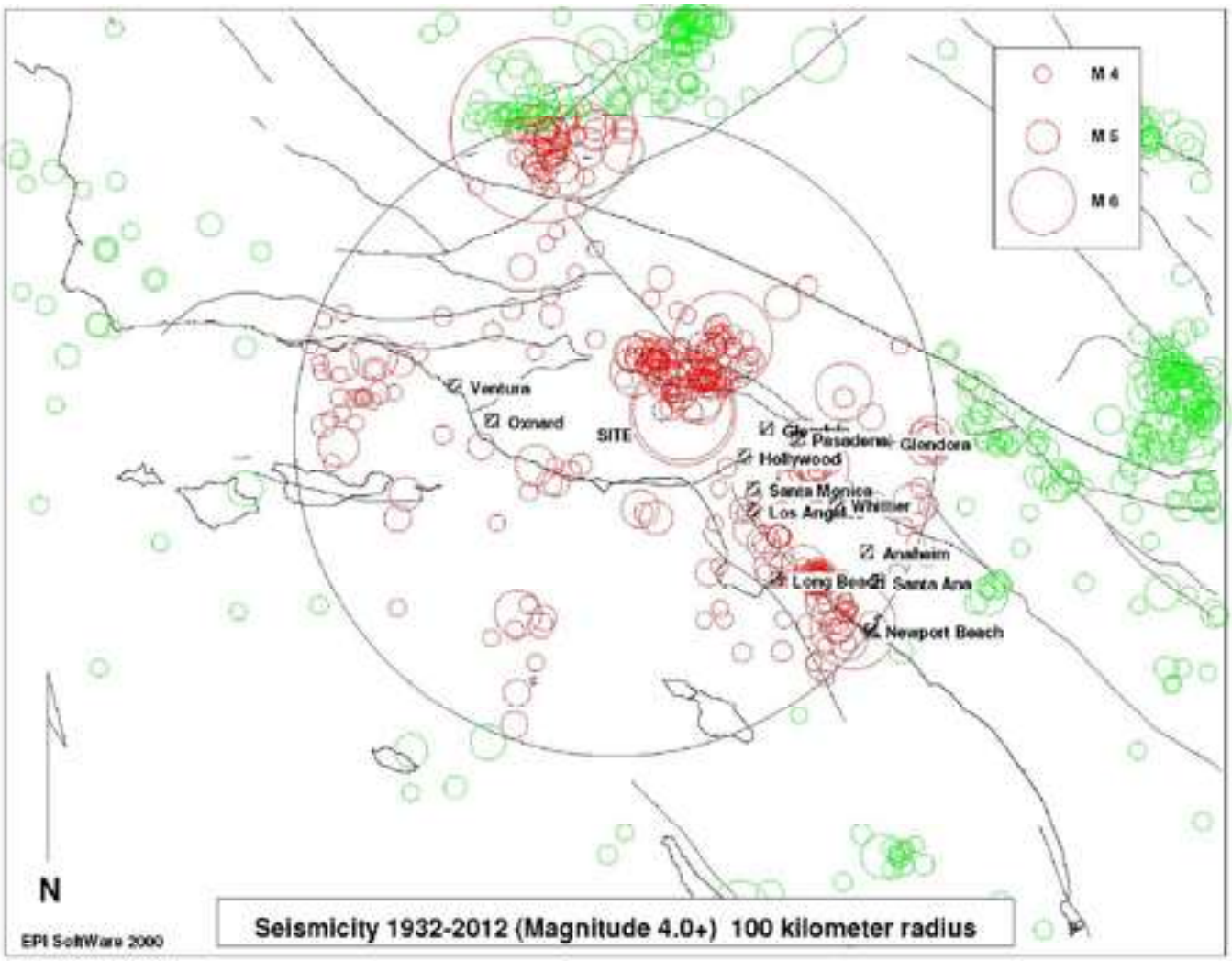
−N−

SCALE: 1" = Approx.1000'

GEOLOGIC INDEX MAP

FOR: OAKMONT SENIOR LIVING	GEOTECHNICAL INVESTIGATION OAKMONT OF AGOURA HILLS SENIOR FACILITY APN 2053-001-005 29353 CANWOOD STREET AGOURA HILLS, CALIFORNIA	ENCLOSURE "A-3"
DATE: OCTOBER 2015		JOB NUMBER 15473-3

CHJ Consultants



SITE LOCATION: 34.1475 LAT. -118.7659 LONG.

MINIMUM LOCATION QUALITY: C

TOTAL # OF EVENTS ON PLOT: 870

TOTAL # OF EVENTS WITHIN SEARCH RADIUS: 449

MAGNITUDE DISTRIBUTION OF SEARCH RADIUS EVENTS:

4.0- 4.9 : 398
5.0- 5.9 : 46
6.0- 6.9 : 4
7.0- 7.9 : 1
8.0- 8.9 : 0

0 50 100
KILOMETERS

CLOSEST EVENT: 4.4 ON SATURDAY, MAY 02, 2009 LOCATED APPROX. 14 KILOMETERS SOUTHWEST OF THE SITE

LARGEST 5 EVENTS:

7.5 ON MONDAY, JULY 21, 1952 LOCATED APPROX. 97 KILOMETERS NORTH OF THE SITE
6.7 ON MONDAY, JANUARY 17, 1994 LOCATED APPROX. 22 KILOMETERS EAST OF THE SITE
6.6 ON MONDAY, JANUARY 17, 1994 LOCATED APPROX. 22 KILOMETERS EAST OF THE SITE
6.6 ON TUESDAY, FEBRUARY 09, 1971 LOCATED APPROX. 44 KILOMETERS NORTHEAST OF THE SITE
6.4 ON SATURDAY, MARCH 11, 1933 LOCATED APPROX. 94 KILOMETERS SOUTHEAST OF THE SITE

EARTHQUAKE EPICENTER MAP

FOR: OAKMONT SENIOR LIVING	GEOTECHNICAL INVESTIGATION OAKMONT OF AGOURA HILLS SENIOR FACILITY APN 2053-001-005 29353 CANWOOD STREET AGOURA HILLS, CALIFORNIA	ENCLOSURE "A-4"
DATE: OCTOBER 2015		JOB NUMBER 15473-3

CHJ Consultants

APPENDIX "B"

EXPLORATORY LOGS

Enclosure "B" (1 of 2)
Job No. 15473-3

KEY TO LOGS

LEGEND OF LAB/FIELD TESTS:

Blows	A measure of the penetration resistance of soil expressed as the number of hammer blows required to advance the indicated sampler 6 inches (or less if noted). Samplers are driven with an automatic hammer that drops a 140-pound weight 30 inches for each blow. After the required seating, samplers are advanced up to 18 inches ahead of the boring, providing up to three sets of blows per drive.
Bulk	Indicates Bulk Sample
Consol.	Consolidation Test (ASTM D2435/4546)
Cor.	Chemical/Corrosivity Tests (ASTM G187, D4327, D4972)
Dist.	Indicates Disturbed Sample
DS	Direct Shear Test (ASTM D3080)
Exp.	Expansion Index (ASTM D4829)
MDC	Maximum Density Optimum Moisture Test (ASTM D1557)
Pass #200	Fines Content (ASTM C117)
PI	Plasticity Index (ASTM D4318)
Ring	Indicates Relatively Undisturbed Ring Sample. The number of blows per 6 inches required to drive a California sampler (3-1/4" O.D. and 2-3/8" I.D.) 18 inches using a 140-pound weight falling 30 inches was recorded.
SPT	Indicates Sample Obtained with an Unlined Standard Penetration Test Sampler (2" O.D. and 1-3/8" I.D.)

Enclosure "B" (2 of 2)
Job No. 15473-3

UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size)			
GRAVELS More than 50% of coarse fraction larger than No.4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No.4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA

GW $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3

GP Not meeting all gradation requirements for GW

GM Atterberg limits below "A" line or P.I. less than 4

GC Atterberg limits above "A" line with P.I. greater than 7

Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.

SW $C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3

SP Not meeting all gradation requirements for SW

SM Atterberg limits below "A" line or P.I. less than 4

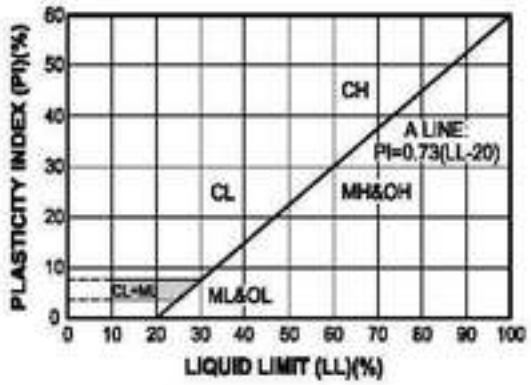
SC Atterberg limits above "A" line with P.I. greater than 7

Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size). Coarse-grained soils are classified as follows:

Less than 5 percent.....GW, GP, SW, SP
More than 12 percent.....GM, GC, SM, SC
5 to 12 percent.....Borderline cases requiring dual symbols

PLASTICITY CHART



EXPLORATORY BORING NO. 1

Date Drilled: 9/30/15 | Client: Oakmont Senior Living

Equipment: CME 75 Track Rig | Driving Weight / Drop / Sampler Size: 140lbs./30in./3.25" O.D.

Surface Elevation(ft): N/A | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SC) Clayey Sand, fine to coarse, with silt, dark brown	Fill	X		22 26 30	12.8	110	Ring
		(CH) Fat Clay, with silt and sand, fine, yellow			X		14.2		Exp., PI
5		(Ttuc) Topanga Formation Siltstone recovered as (SC) Clayey Sand, fine to medium, with silt, yellowish brown, interbedded sandstone lenses	Native Siltstone bedrock	X		28 50	13.9	Dist.	Ring
10		(Ttuc) Topanga Formation Siltstone recovered as (CL) Clay, with silt, yellowish brown, interbedded sandstone lenses		X		11 20 32	24.5	101	Ring
15				X		14 28 42	17.0	112	Ring
20				X		27 50/5"	19.9	Dist.	Ring
25				X		50	19.7	Dist.	Ring
		END OF BORING NO REFUSAL, NO CAVING NO GROUNDWATER, FILL TO 4' SILTSTONE BEDROCK AT 5'							
30									

10331-3 15473-3.GPJ CHJ.GDT 10/20/15

CHJ

OAKMONT OF AGOURA HILLS SENIOR FACILITY
29353 CANWOOD STREET, AGOURA HILLS, CALIFORNIA

Job No. 15473-3

Enclosure B-1

EXPLORATORY BORING NO. 2

Date Drilled: 9/30/15 | Client: Oakmont Senior Living

Equipment: CME 75 Track Rig | Driving Weight / Drop / Sampler Size: 140lbs./30in./3.25" O.D.

Surface Elevation(ft): N/A | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(CH) Fat Clay, with silt and sand, fine to medium, dark brown	Fill				14.6		
				X		11 15 18	13.7	Dist.	Consol., Ring
5		(Ttuc) Topanga Formation Siltstone, recovered as (CL) Clay, with silt and sand, fine, yellow, interbedded sandstone lenses	Native Siltstone bedrock	X		16 32 42	13.7	110	Ring
							14.6		
10				X		16 22 32	24.6	97	Ring
15				X		15 32 45	20.8	104	Ring
20				X		18 50	14.8	Dist.	Ring
25				X		20 50/3"	18.2	Dist.	Ring
		END OF BORING NO REFUSAL, NO CAVING NO GROUNDWATER, FILL TO 5' SILTSTONE BEDROCK AT 5'							
30									

10331-3 15473-3.GPJ CHJ.GDT 10/20/15

CHJ

OAKMONT OF AGOURA HILLS SENIOR FACILITY
29353 CANWOOD STREET, AGOURA HILLS, CALIFORNIA

Job No. 15473-3

Enclosure B-2

EXPLORATORY BORING NO. 3

Date Drilled: 9/30/15 | Client: Oakmont Senior Living

Equipment: CME 75 Track Rig | Driving Weight / Drop / Sampler Size: 140lbs./30in./3.25" O.D.

Surface Elevation(ft): N/A | Logged by: VJR | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SC) Clayey Sand, fine to coarse, with silt, brown	Fill				13.2		
				X		13 18 19	8.5	Dist.	Ring
5		(CH) Fat Clay, with silt and sand, fine, yellow	Native	X		10 9 12	15.8	104	Ring
							22.4		
10		(Ttuc) Topanga Formation Sandstone, recovered as (SM) Silty Sand, fine with medium, with clay, yellowish brown	Sandstone Bedrock	X		30 35 50/5"	13.3 10.3	Dist.	Ring
15				X		35 50/4"	7.8	Dist.	Ring
20		(Ttuc) Topanga Formation Siltstone, recovered as (CL) Clay, with silt and sand, fine, yellowish brown	Iron Oxide Staining	X		16 34 50/5"	14.7	Dist.	Ring
25				X		28 50/4"	15.0	Dist.	Ring
		END OF BORING							
		NO REFUSAL, NO CAVING NO GROUNDWATER, FILL TO 5' SANDSTONE BEDROCK AT 10' SILTSTONE BEDROCK AT 20'							
30									

10331-3 15473-3.GPJ CHJ.GDT 10/20/15

CHJ

OAKMONT OF AGOURA HILLS SENIOR FACILITY
29353 CANWOOD STREET, AGOURA HILLS, CALIFORNIA

Job No. 15473-3

Enclosure B-3

EXPLORATORY BORING NO. 4

Date Drilled: 9/30/15 Client: Oakmont Senior Living

Equipment: CME 75 Track Rig Driving Weight / Drop / Sampler Size: 140lbs./30in./2.0" O.D.

Surface Elevation(ft): N/A Logged by: VJR Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(CH) Fat Clay, with silt, dark brown	Fill				14.1		Cor., DS, Exp., MDC, PI Pass #200, SPT
						4 5 9			
		(Ttuc) Topanga Formation Siltstone, recovered as (CH) Fat Clay, with silt and sand, fine, yellowish brown	Native						
5			Iron Oxide Staining			7 14 15			Pass #200, SPT
							18.8		
10						5 12 14			SPT
15			Iron Oxide Staining			7 12 17			SPT
20		(Ttuc) Topanga Formation Siltstone, recovered as (ML) Sandy Silt, fine to medium, with clay, yellowish brown				14 16 19			Pass #200, SPT
25		(Ttuc) Topanga Formation Siltstone, recovered as (CH) Clay, with silt, gray	Carbonate Staining			12 24 34			Pass #200, SPT
			Siltstone bedrock						
30		(Ttuc) Topanga Formation Siltstone, recovered as (CL) Sandy Clay, fine to medium, with silt, gray, interbedded sandstone lenses	Carbonate Staining			14 27 40			Pass #200, SPT

10331-3 15473-3.GPJ CHJ.GDT 10/20/15

CHJ

OAKMONT OF AGOURA HILLS SENIOR FACILITY
29353 CANWOOD STREET, AGOURA HILLS, CALIFORNIA

Job No. 15473-3

Enclosure B-4a

EXPLORATORY BORING NO. 4

Date Drilled: 9/30/15 Client: Oakmont Senior Living

Equipment: CME 75 Track Rig Driving Weight / Drop / Sampler Size: 140lbs./30in./2.0" O.D.

Surface Elevation(ft): N/A Logged by: VJR Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(Ttuc) Topanga Formation Siltstone, recovered as (CL) Sandy Clay, fine to medium, with silt, gray, interbedded sandstone lenses		X		15 27 36			SPT
40				X		20 30 50/5"			SPT
45		(Ttuc) Topanga Formation Siltstone, recovered as (SM) Silty Sand, fine to medium, gray		X		13 29 36			Pass #200, SPT
50				X		50			SPT
		END OF BORING NO REFUSAL, NO CAVING NO GROUNDWATER, FILL TO 3' SILTSTONE BEDROCK AT 3'							
55									
60									
65									

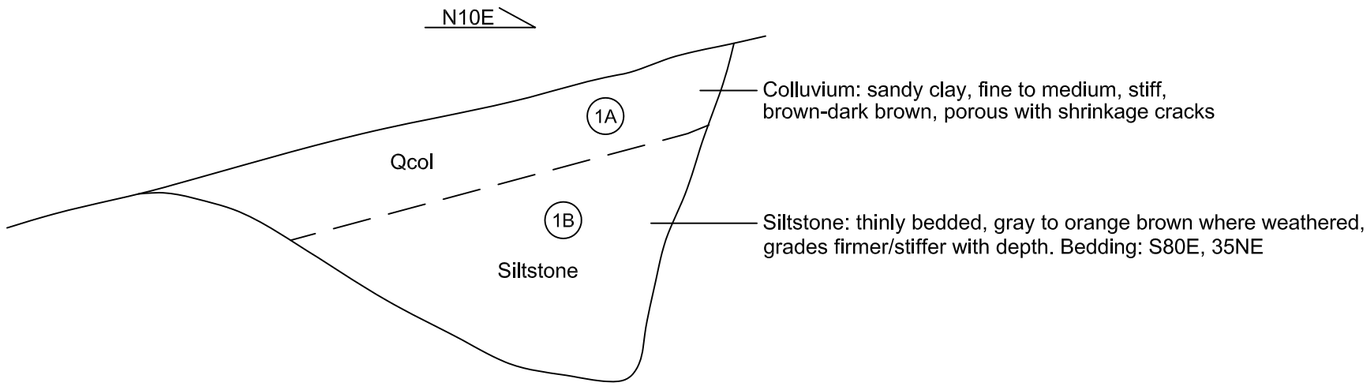
10331-3 15473-3.GPJ CHJ.GDT 10/20/15

CHJ

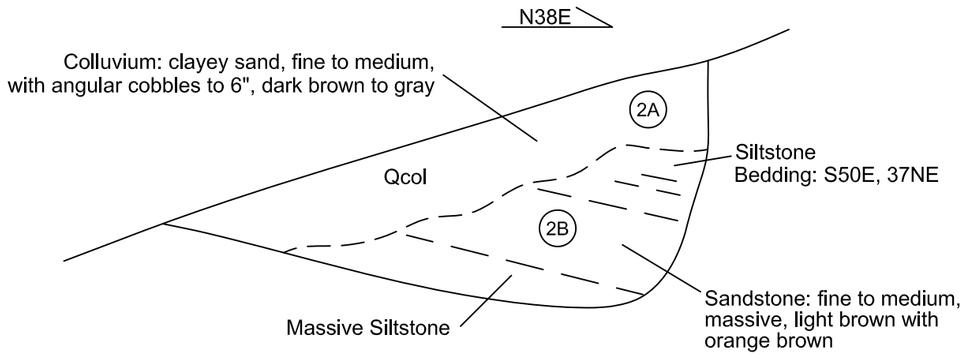
OAKMONT OF AGOURA HILLS SENIOR FACILITY
29353 CANWOOD STREET, AGOURA HILLS, CALIFORNIA

Job No. 15473-3

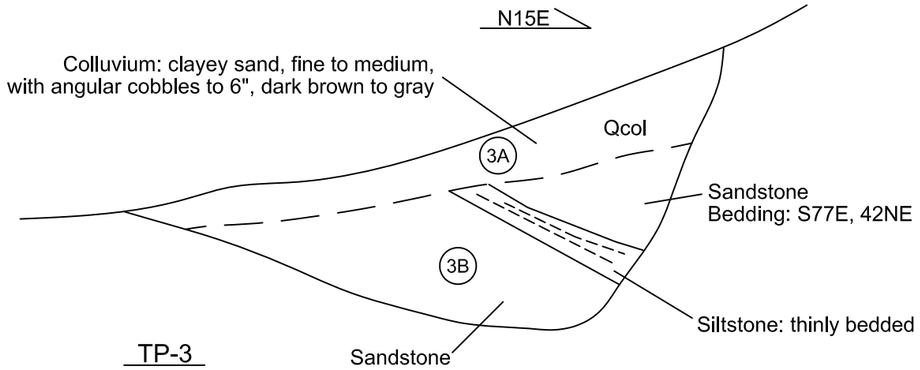
Enclosure B-4b



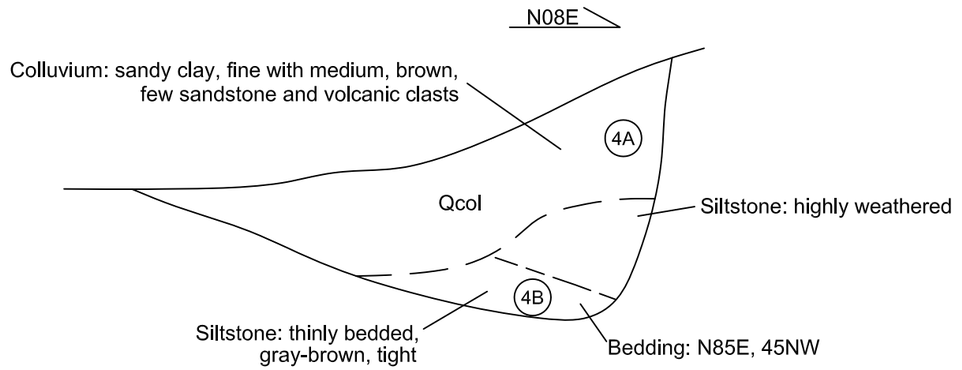
TP-1



TP-2



TP-3



TP-4

LEGEND:

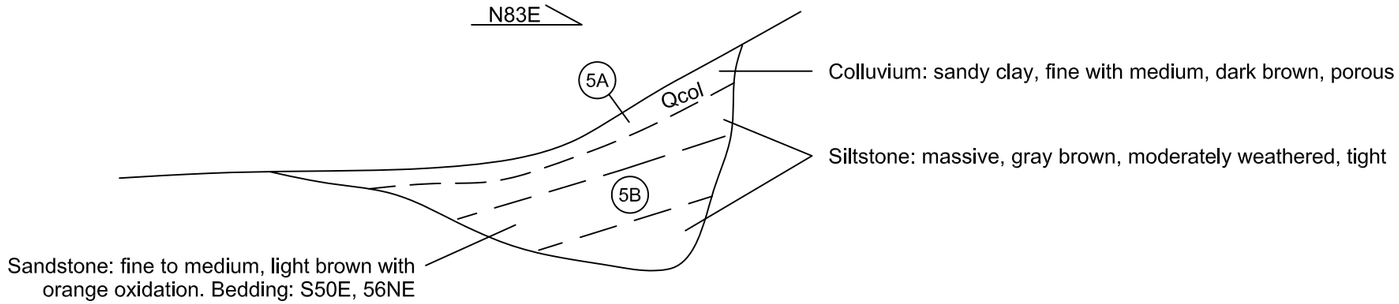
(7B) Location of bulk sample

SCALE: 1" = 5' H=V

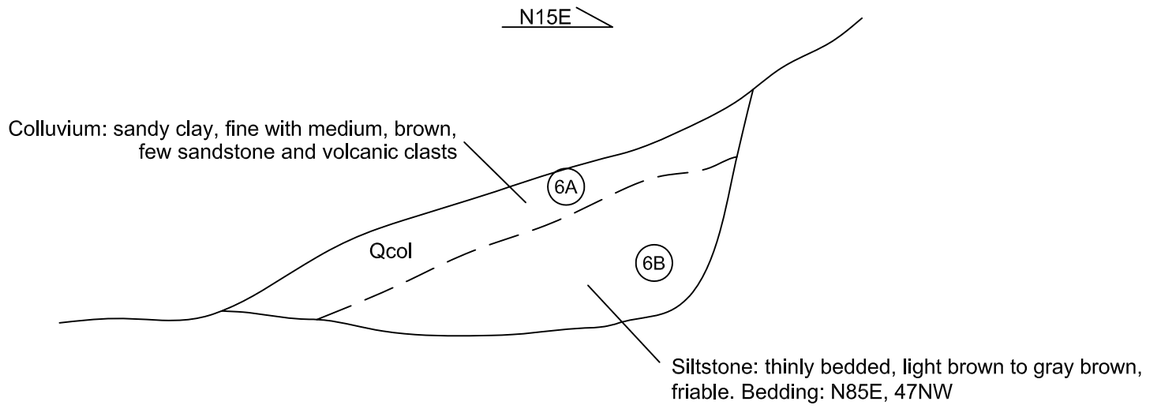
TRENCH LOGS

FOR: OAKMONT SENIOR LIVING	GEOTECHNICAL INVESTIGATION OAKMONT OF AGOURA HILLS SENIOR FACILITY APN 2053-001-005 29353 CANWOOD STREET AGOURA HILLS, CALIFORNIA	ENCLOSURE "B-5.1"
DATE: OCTOBER 2015		JOB NUMBER 15473-3

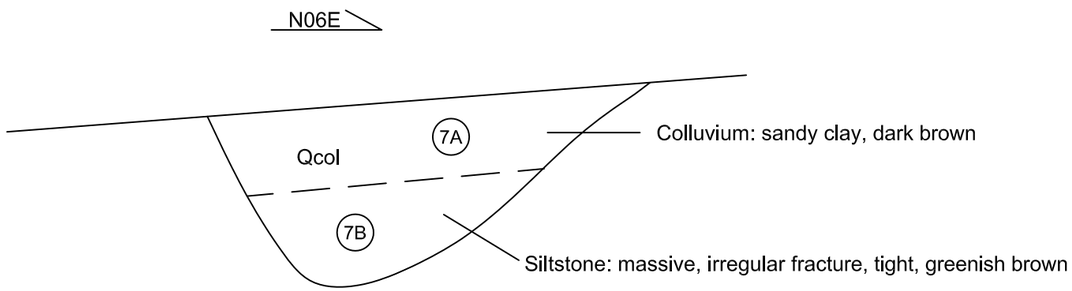
CHJ Consultants



TP-5



TP-6



TP-7

LEGEND:

7B Location of bulk sample

SCALE: 1" = 5' H=V

TRENCH LOGS

FOR: OAKMONT SENIOR LIVING	GEOTECHNICAL INVESTIGATION OAKMONT OF AGOURA HILLS SENIOR FACILITY APN 2053-001-005 29353 CANWOOD STREET AGOURA HILLS, CALIFORNIA	ENCLOSURE "B-5.2"
DATE: OCTOBER 2015		JOB NUMBER 15473-3

CHJ Consultants

EXPLORATORY TEST PIT NO. P-1

Date Excavated: 9/30/15 Client: Oakmont Senior Living

Equipment: Rubber-Tire Backhoe Bucket Size: 36" Bucket

Surface Elevation(ft): N/A Logged by: GA Station No.: N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DENSITY	SAMPLES: BULK	RELATIVE COMP. (%)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
1		(SC) Clayey Sand, fine to medium, dark brown, disturbed colluvium	Disturbed Native						
2									
3		Siltstone bedrock, weathered, brown	Siltstone bedrock						
4		END OF TEST PIT NO REFUSAL, NO CAVING NO GROUNDWATER NO FILL, SILTSTONE BEDROCK AT 2.5'							
5									
6									
7									
8									
9									

TEST PIT - 10 FT 15473-8.GPJ CHJ.GDT 10/20/15

CHJ

OAKMONT OF AGOURA HILLS SENIOR FACILITY
29353 CANWOOD STREET, AGOURA HILLS, CALIFORNIA

Job No. 15473-3

Enclosure B-6

EXPLORATORY TEST PIT NO. P-2

Date Excavated: 9/30/15 Client: Oakmont Senior Living

Equipment: Rubber-Tire Backhoe Bucket Size: 36" Bucket

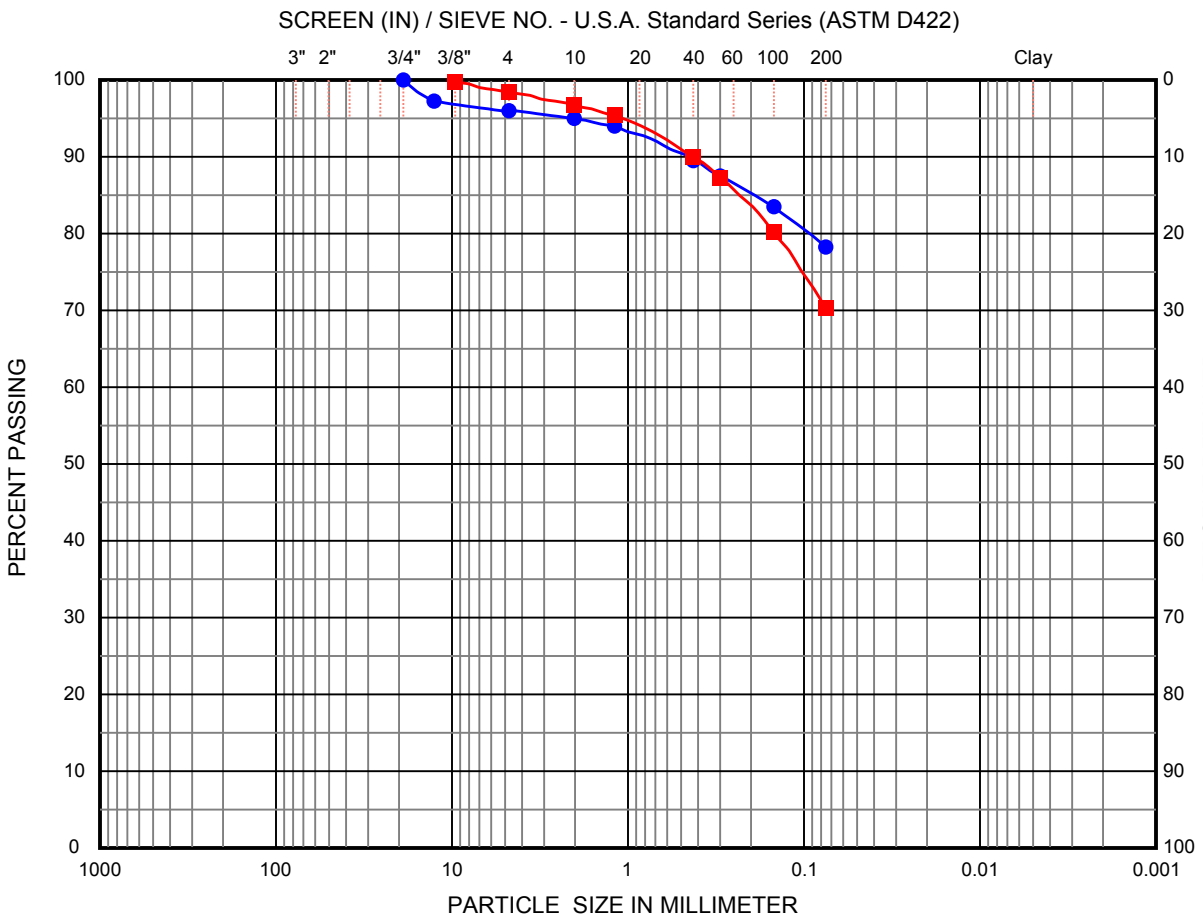
Surface Elevation(ft): N/A Logged by: GA Station No.: N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DENSITY	SAMPLES: BULK	RELATIVE COMP. (%)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SC) Clayey Sand, fine to medium, disturbed colluvium, dark brown	Disturbed Native						
1									
2									
3		Siltstone bedrock, weatered, brown	Siltstone bedrock						
4									
5		END OF TEST PIT NO REFUSAL, NO CAVING NO GROUNDWATER NO FILL, SILTSTONE BEDROCK AT 3'							
6									
7									
8									
9									

TEST PIT - 10 FT 15473-8.GPJ CHJ.GDT 10/20/15

APPENDIX "C"

LABORATORY TESTING



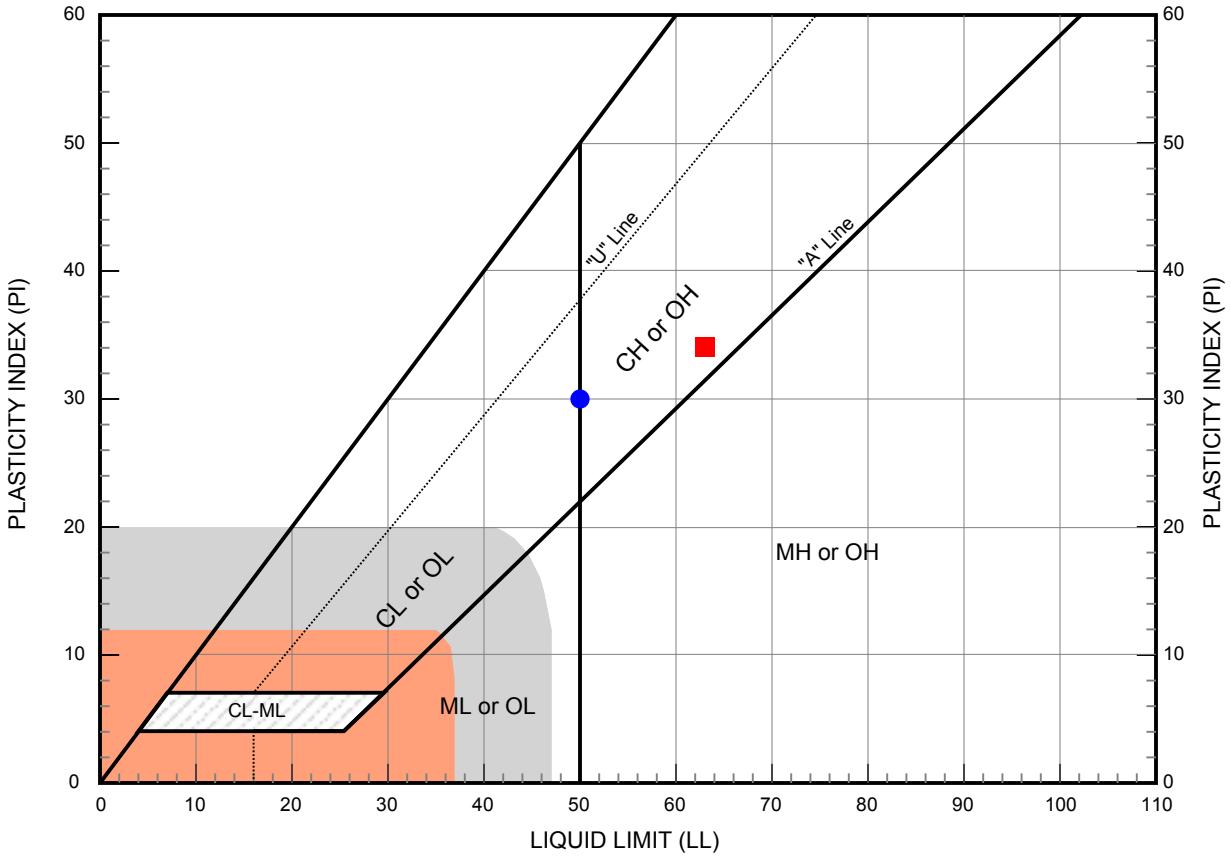
Cobbles & Boulders	Gravel		Sand			Silt	Clay
	Coarse	Fine	Coarse	Medium	Fine		

	Boring No.	Depth	Gravel	Sand	Fines	Clay	D_{10}	D_{30}	D_{50}	D_{60}	C_u	C_c
●	TP-1	0	4.0	17.8	78.2							
	(CL) Sandy Clay, fine (SE=13)											
■	TP-3	0	1.6	28.1	70.3							
	(CL) Sandy Clay, fine (SE=7)											

CHJ Consultants

PARTICLE SIZE DISTRIBUTION (ASTM D422)

Project:	Oakmont of Agoura Hills Senior Facility				
Location:	29353 Canwood Street, Agoura Hills, California				
Job Number:	15473-3	Engineer:	MNoorzay	Enclosure:	C-1



	Boring No.	Depth (ft)	USCS Classification	PL	LL	PI
●	1	4	(CH) Fat clay	20	50	30
■	4	0	(CH) Fat clay	29	63	34

CHJ Consultants

PLASTICITY CHART (ASTM D4318)

Project:	Oakmont of Agoura Hills Senior Facility				
Location:	29353 Canwood Street, Agoura Hills, California				
Job Number:	15473-3	Engineer:	MNoorzay	Enclosure:	C-2

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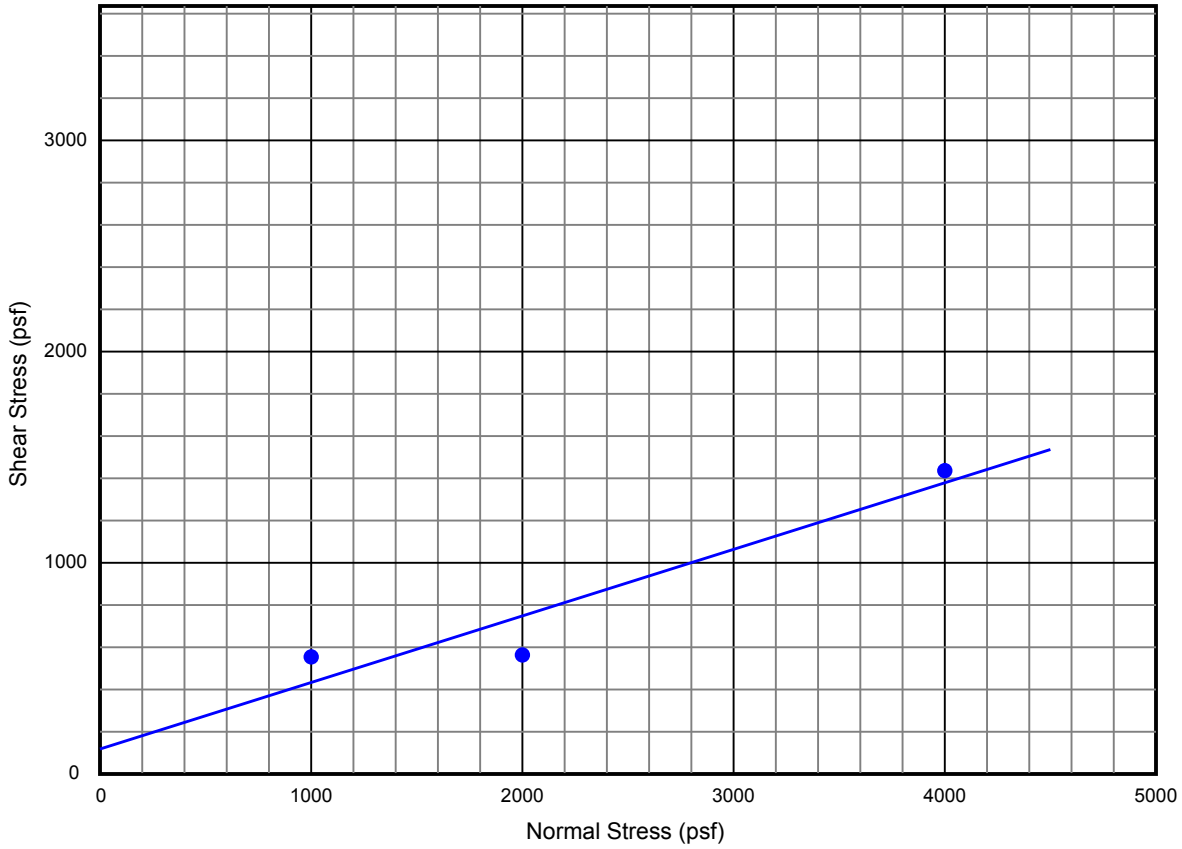

	Boring No.	Depth (ft)	γ_d (pcf)	w (%)	C_{pk} (psf)	ϕ_{pk} (°)	C_{rs} (psf)	ϕ_{rs} (°)
●	4	0	97.0	17.5	168.4	20.4	114.2	17.6
	(CH) Fat clay, Remolded to 90% R.C.							

CHJ Consultants

DIRECT SHEAR TESTS (ASTM D3080)

Project:	Oakmont of Agoura Hills Senior Facility				
Location:	29353 Canwood Street, Agoura Hills, California				
Job Number:	15473-3	Engineer:	MNoorzay	Enclosure:	C-3

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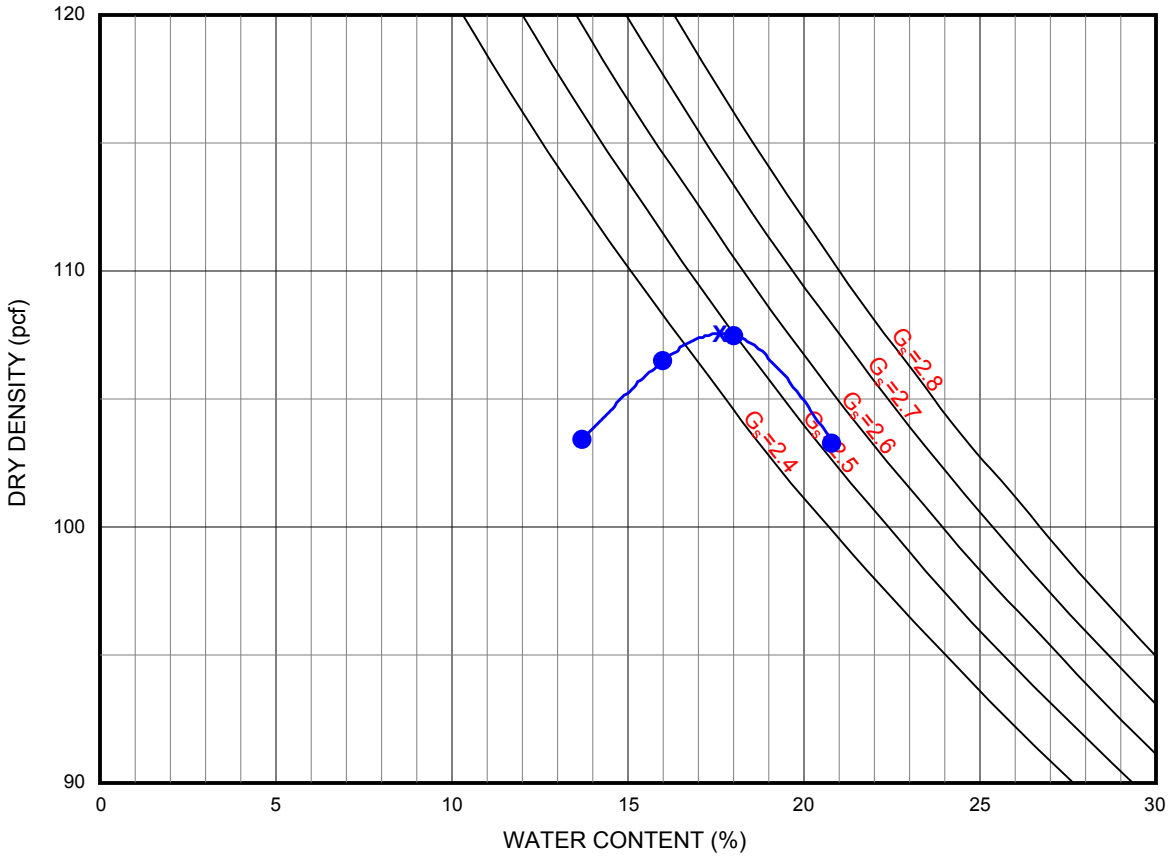

	Boring No.	Depth (ft)	USCS Classification	γ_{dmax} (pcf)	w_o (%)
●	4	0	(CH) Fat clay	107.5	17.5

CHJ Consultants

COMPACTION CURVES (ASTM D1557)

Project:	Oakmont of Agoura Hills Senior Facility				
Location:	29353 Canwood Street, Agoura Hills, California				
Job Number:	15473-3	Engineer:	MNoorzay	Enclosure:	C-4

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Prepared at 10/14/2015 11:52:30 AM

FINES CONTENT (ASTM C117)

Boring No.	4	4	4	4	4	4
Depth (ft)	2	5	20	25	30	45
Original Dry Mass	185	163.6	171.2	170.4	196.0	176.4
Dry Mass after Washing	23.9	13.1	27.6	4.7	90.3	92.6
Fine Contents (%)	87.1	92.0	83.9	97.2	53.9	47.5
Classification	CH	CH	ML	CH	CL	SM

EXPANSION INDEX (ASTM D 4829)

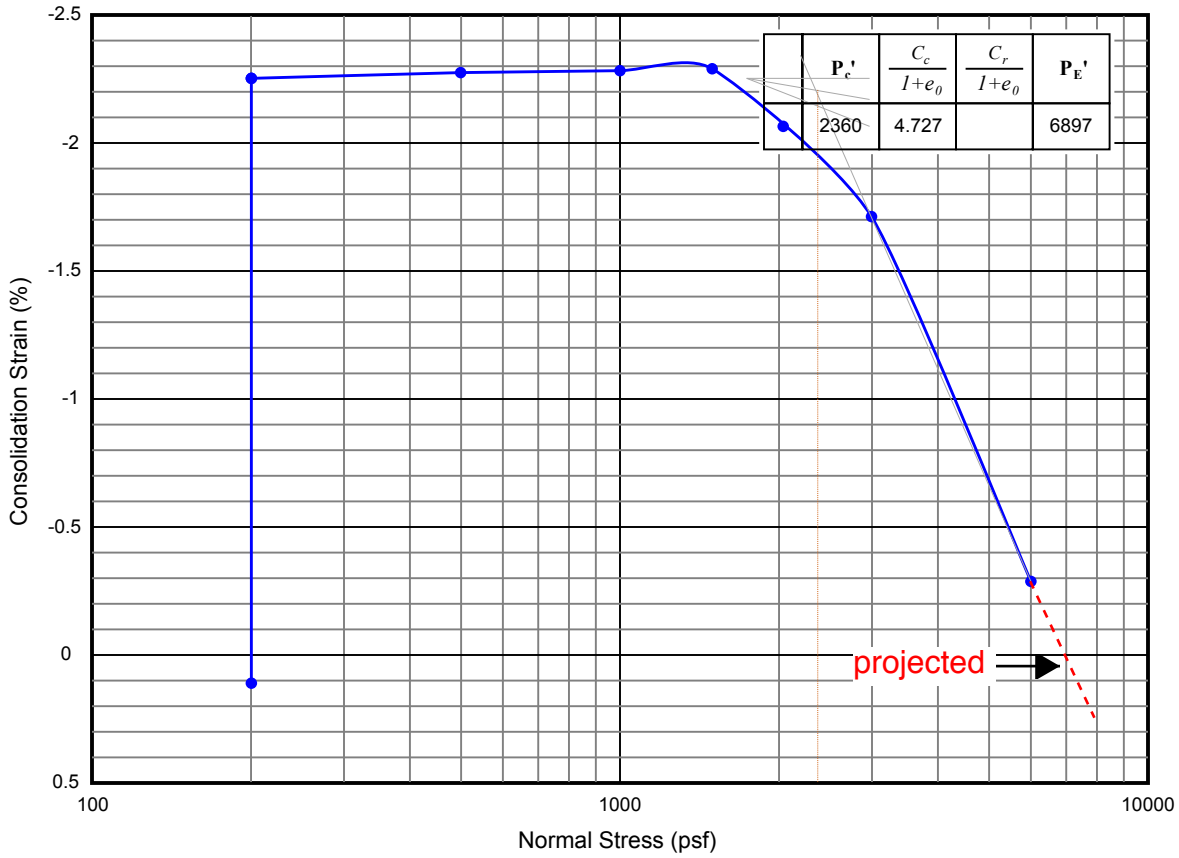
Sample No.	1A	4A
Depth (ft)	4	0
Initial Moisture (%)	14.7	15.3
Final Moisture (%)	26.2	30.5
Degree of Saturation (%)	52	48
Expansion Index	150	157
Expansion Potential	Very High	Very High

N:\Projects\Geotechnical\2015\15473-2&3 Oakmont SL Oakmont of Agoura Hills\LabSuite\LabSuite_15473-3.csv

CHJ Consultants

TEST DATA SUMMARY

Project:	Oakmont of Agoura Hills Senior Facility				
Location:	29353 Canwood Street, Agoura Hills, California				
Job Number:	15473-3	Engineer:	MNoorzay	Enclosure:	C-5



	Boring No.	Depth (ft)	USCS Classification	γ_d (pcf)	w (%)	HCS (%)
●	2	1	(CH) Fat Clay, with silt and sand	102.8	12.9	-2.4

CHJ Consultants

CONSOLIDATION TESTS (ASTM D2435/4546)

Project:	Oakmont of Agoura Hills Senior Facility				
Location:	29353 Canwood Street, Agoura Hills, California				
Job Number:	15473-3	Engineer:	MNoorzay	Enclosure:	C-6

Table 1 - Laboratory Tests on Soil Samples

CHJ Consultants
Oakment SL-Agoura Hills
Your #15473-3, HDR Lab #15-0788LAB
5-Oct-15

Sample ID			4A
Resistivity		**Units**	
as-received		ohm-cm	10,800
saturated		ohm-cm	1,160
pH			6.7
Electrical Conductivity		mS/cm	0.33
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	104
magnesium	Mg^{2+}	mg/kg	15
sodium	Na^{1+}	mg/kg	238
potassium	K^{1+}	mg/kg	15
Anions			
carbonate	CO_3^{2-}	mg/kg	ND
bicarbonate	HCO_3^{1-}	mg/kg	564
fluoride	F^{1-}	mg/kg	2.7
chloride	Cl^{1-}	mg/kg	56
sulfate	SO_4^{2-}	mg/kg	163
phosphate	PO_4^{3-}	mg/kg	ND
Other Tests			
ammonium	NH_4^{1+}	mg/kg	0.8
nitrate	NO_3^{1-}	mg/kg	21
sulfide	S^{2-}	qual	na
Redox		mV	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

431 West Baseline Road · Claremont, CA 91711
Phone: 909.962.5485 · Fax: 909.626.3316

CHJ Consultants
1355 E. Cooley Drive, Suite C, Colton, CA 92324 • Phone (909) 824-7311 • Fax (909) 503-1136
15345 Anacapa Road, Suite D, Victorville, CA 92392 • Phone (760) 243-0506 • Fax (760) 243-1225
77-564A Country Club Drive, Suite 122, Palm Desert, CA 92211 • Phone (760) 772-8234 • Fax (909) 503-1136

June 14, 2016

Oakmont Senior Living
9249 Old Redwood Highway, Suite 200
Windsor, California 95492
Attention: Mr. Wayne Sant, Vice President, Development

Job No. 15473-3A

Subject: Addendum to Geotechnical Investigation Report
Response to Geotechnical Review Sheet
Proposed Oakmont of Agoura Hills Senior Facility
29353 Canwood Street
Agoura Hills, California

References: See Attached References Sheet

Dear Mr. Sant:

As requested, we have examined the review comments by GeoDynamics, Incorporated, prepared on behalf of the City of Agoura Hills, and we provide our responses below. Several comments relate to updating information/recommendations based on plans provided for this response that were not completed at the time of our original investigation. The reviewer's comments appear below in italics followed by our response.

Planning/Feasibility Comments

1. *The consultant should provide an updated geologic map based on a legible copy of the latest development plan. The map should include all geologic data including contacts between all geologic units (including alluvial units if appropriate), structural information and a complete geologic legend. The consultant should discuss the basis for the location of the contact between Tcva and Ttuc (sic) indicated on the map.*

An updated geological and geotechnical map on the basis of the proposed grading plan, prepared by Huitt-Zollars, Inc., dated (last saved) April 16, 2016, is attached hereto.

2. *Brief discussions of each geologic unit noted on the map should be provided in the text of the report.*

Geologic maps for the site region include Yerkes and Showalter (1991) and Dibblee and Ehrenspeck (1993). The geologic units designated for this project include alluvium, colluvium, sedimentary bedrock and volcanic bedrock.

Fill (f) occurs in limited areas of the site to depths between 2 and 5 feet below ground surface. The thickest fill occurs near the area of the existing structure foundations in the east-central portion of the site. The fill is derived from local materials (colluvium and bedrock) and is considered unsuitable for support of proposed structures. Recommendations for removal of existing fill are presented in a later section of this report.

Alluvium (Qa) is present along the axis of Lindero Canyon south of the site boundary and is not within the area of the Site Plan and Geologic Map.

Colluvium (Qcol), derived as a product of weathering of underlying bedrock and gravity creep of soil residuum, is present as a mantle over bedrock units within the site. The thickness of colluvium varies depending on the steepness of the ground surface with thicker accumulations on flats and near the toes of slopes and thinner accumulations on steeper slope surfaces. The colluvium consists of gray-brown to dark brown fat sandy clay and contains scattered angular fragments of siltstone.

Sedimentary bedrock consisting of clay shale and siltstone with sandy interbeds was encountered beneath a soil mantle in the proposed building area and slope area of the site. This unit is mapped as Topanga Formation (Ttuc) by Dibblee and Ehrenspeck (1993) and Calabasas Formation by Yerkes and Showalter (1991). The depth to bedrock varies from 3 to 10 feet beneath the proposed building footprint and is shallow (less than 3 feet) in the slope area. Test pits for infiltrometer use revealed Ttuc at 2-1/2 and 3 feet below existing surface along Canwood Street. The Ttuc unit is yellow-brown to gray, bedded, and exhibits closely- spaced orthogonal joint sets that produce elongate, blocky rock fragments in spoils. Joint surfaces are commonly oxide stained orange-brown within 3 feet of the

surface. Gray, less-weathered bedrock with tight joints occurs approximately 3 feet below the surface. The siltstone unit is tight and competent and is considered relatively strong with regard to slope stability.

Andesitic (volcanic) flows and breccias (Tcva) form a second bedrock unit in the northern portion of the site. This unit is included with the Conejo Volcanics units described by Dibblee and Ehrenspeck (1993). The contact between Tcva and Ttuc is depicted by Dibblee and Ehrenspeck (1993) as a north-dipping fault west of the site and indeterminate at the site. The bedrock contact location included on the Site Plan and Geologic Map (A-2.1) is based on field observations of highest occurrence of surface clasts on slopes and limited outcrop exposures. This unit and/or its contact with siltstone does not underlie the portion of the site proposed for development and is not anticipated to be a concern with regard to slope stability or site development.

3. *Cross sections should be provided through the slope and proposed retaining walls along the north edge of the building pad.*

A cross section illustrating the relationship of existing grades and topography to the proposed building pad, retaining walls and recommended removal depth is attached hereto.

4. *The consultant should clarify whether the recommended removal depth is below finished or existing grade, and whether removal to bedrock is recommended in limited areas where bedrock may not be encountered within the recommended removal depth.*

In the report, we recommended that "All areas to be graded should have at least the upper 5 feet of existing soils removed or expose siltstone bedrock, and the open excavation bottoms observed by our engineering geologist to verify and document in writing that all undocumented fill is removed prior to refilling with properly tested and documented compacted fill." The recommended depth of initial removal is from existing ground surface. If the depth of bedrock is shallower than 5 feet, the initial removal depth only needs to expose bedrock. If shallow bedrock is encountered in footing areas, further removal is required (see Section PREPARATION OF FOUNDATION AREAS).

5. *Remnants of a previous structure are present on the site. Proposed grading appears likely to entirely remove this structure. Nonetheless, the consultant should review the current grading*

plan and discuss whether any elements of this previous construction need to be considered in the proposed construction. In particular, the consultant should consider whether components of an abandoned private sewage disposal system may be encountered during construction and provide appropriate recommendations for abandonment.

Abandoned septic tank systems and/or old drainage systems, if any, should be identified/delineated, removed and backfilled with recompacted materials or using sand slurry with a minimum 2 sack per cubic yard of cement.

If necessary, the abandonment of seepage pits will require that any existing effluent and water be pumped from the pits. Following the pumping, any loose and/or organic material that remains in the pits should be removed. The pits should then be backfilled with a one-sack sand slurry mixture to within approximately 6 feet of the finish grade elevation. Following the backfill, the area surrounding the seepage pits should be then excavated to a depth of approximately 6 feet below finish grade elevation. The excavation should include all loose material surrounding the pit. In addition, the excavation should allow access for compaction equipment. The excavation should then be backfilled to finish grade elevation as properly compacted fill.

6. *The consultant should discuss and evaluate as necessary the stability of all slopes that would impact the proposed development at the site. Mitigation measures should be recommended as necessary.*

The stability of the proposed cut slope was evaluated using a computer program, Slide 6.039 (Rocscience, 2016). Based on the grading plan, the highest cut slope is approximately 31.5 feet in total height. According to Seismic Hazard Zone Report 042 (Seismic Hazard Zone Report For The Thousand Oak 7.5-Minute Quadrangle, Ventura And Los Angeles Counties, California, California Geological Survey, 2000), the mean/medium frictional angle is of 33/31 degrees and the mean/medium cohesion strength is of 591 psf for Group Ttc2 (Ttuc for the subject site) material. We used a frictional angle of 31 degrees and cohesive strength of 590 psf in our slope stability calculations.

The results of static and seismic stability are shown in Enclosures "C-1" and "C-2". The results indicate factors of safety of 1.54 under a static condition and 1.19 under a seismic condition. Both satisfy the minimum values for required factors of safety.

The stability of the wall itself was not considered in our calculations. The design engineer should ensure the stability of walls.

7. *The consultant recommends on page 25 that a design infiltration rate of 0.03 inches (sic) per hour be used in the design of the storm water disposal system, and later concluded that the existing infiltration rate at the site is too slow and alternative measures should be considered. But, as per the County of Los Angeles Guidelines, a minimum infiltration rate of 0.5 inch per hour is required for on-site storm water disposal system. Any on-site storm water disposal system must comply with the County's guidelines and requirements, including testing and reporting procedures.*

As the measured infiltration rate is lower than the minimum infiltration rate required by County of Los Angeles Guidelines, on-site storm water infiltration may not be feasible. The designer engineer should consult with City of Agoura Hills for alternative storm water handling systems.

8. *The consultant should provide a 111 statement in accordance with the County of Los Angeles Guideline.*

Section 111 STATEMENT

Based on our field investigation and laboratory testing results, it is our opinion that the proposed development will be safe against hazards from landslide, settlement or slippage and the proposed construction will have no adverse effect on the geologic stability of the adjacent properties or future developments provided the recommendations presented in the our report dated October 21, 2015, as well as this addendum, are followed.

Report Review Comments

1. *The consultant should review development plans as they become available to verify compliance with recommendations in the above-referenced reports. A geotechnical map using the proposed grading plan as a base map should be included. Cross sections should be updated as necessary*

to reflect changes in the proposed grading relative to the current grading concept. Additional geotechnical recommendations should be provided as necessary.

An updated geological and geotechnical map on the basis of the proposed grading plan, prepared by Huitt-Zollars, Inc., dated (last saved) April 16, 2016, is attached hereto.

2. *The consultant should discuss and evaluate the potential for interaction between closely located retaining walls (example: stacked retaining walls) using appropriate method of analyses. Please note that the 1:1 criterion is not acceptable for lateral surcharge unless substantiated with analyses and/or references.*

See response to Planning/Feasibility Comments No. 6.

3. *The consultant recommends on page 22 that either a perforated PVC pipe encased in 2 cubic feet of granular drain materials (burrito drain) or a synthetic drains should be used as a backdrain system behind retaining walls. However, it seems that a combination of these two items, not either one of them would be needed to provide an effective backdrain system. For example: a burrito drain would be needed at the bottom of the synthetic drain in order to collect and transfer water coming out of the synthetic drain to an approved drainage course. Similarly, a synthetic or a gravel blanket would be needed to collect water for the backfill materials and transfer to the burrito drain. Please clarify and revise recommendations as necessary.*

Both a vertical and horizontal drain system should be installed behind all retaining walls. The burrito drain could be used for horizontal drain and synthetic drains could be sued for vertical drain.

4. *The consultant should provide recommendations for the foundation to slope setback in accordance with the City of Agoura Hills building ordinance.*

Foundations on or adjacent to slope surfaces shall be designed in accordance with 2013 CBC, Section 1808.7.2. The minimum setback from the slope surface is shown in Enclosure "B-1".

5. *The consultant should provide geotechnical input and soil parameters necessary for design of foundations and slabs-on-grade, with due considerations to the highly-expansive nature of on-site soils.*

In the report, we recommended slab-on-grade to be designed in accordance with WRI/CRSI Design of Slab-on-Ground Foundations or PTI Standard Requirements for Analysis of Shallow Concrete Foundations on Expansive Soils. The following parameters could be used in the design:

- Liquid limit: 63
- Plastic Index: 34
- Percent passing No. 200 screen: 78%
- Percent passing 2μ: 65%
- Edge Moisture Variation Distance e_m of approximately 8.0' for center lift and 4.5' for edge lift
- Differential Soil Movement y_m of approximately 1-1/8" for center lift and 1-1/4" for edge lift

6. *The consultant should provide recommendations for the minimum depth of embedment of footings below lowest adjacent grade, with due considerations to the highly expansive nature of on-site soils.*

Due to the high expansive nature of the on-site soils and the volume of expansive soil to be replaced, conventional spread foundation is not considered to be suitable footing type.

7. *Considering the highly-expansive soil conditions at the site, the consultant should discuss the need to pre-saturate the upper soils within footings and slabs-on-grade areas.*

Due to the high expansive nature of the on-site soils and the site condition, pre-saturation of the upper soil is not considered to be practical method for this site.

Plan-Check Comments

Acknowledged. Will be responded to by Building and Safety Plan Check.

This letter should be included with and considered part of the Geotechnical Investigation report for the project.

We appreciate this opportunity to provide geotechnical services for this project. If you should have any questions or comments concerning this letter, please do not hesitate to contact this firm at your convenience.

Respectfully submitted,

CHJ CONSULTANTS

John S. McKeown, C.E.G. 2396
Project Geologist

Fred Yi, Ph.D., G.E. 2967
Managing Engineer

Robert J. Johnson, G.E. 443
President

JSM/FY/RJJ:jsm/tlw

Enclosures: City of Agoura Hills - Geotechnical Review Sheet
Site Plan and Geologic Map
Geologic Cross Section A-A'
Building Setback Detail
Static and Seismic Stability Figures

REFERENCES

California Division of Mines and Geology (now California Geological Survey), 2000, Seismic Hazard Zone Report for the Thousand Oaks 7.5-Minute Quadrangle, Ventura and Los Angeles Counties, California.

CHJ Consultants, 2015, Geotechnical Investigation, Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, California, Report Prepared For Oakmont Senior Living, Job No. 15473-3, Dated October 21, 2015

GeoDynamics, Incorporated, City of Agoura Hills – Geotechnical Review Sheet, CUP-001231-2016, 29353 Canwood Street, Agoura Hills, California, Dated May 20, 2016.

Huitt-Zollars, Inc., 2016, Grading Plan, Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, CA 93101, Saved on April 18, 2016.

Los Angeles, County of, Department of Public Works, 2014, Low Impact Development Standards Manual.

Los Angeles, County of, 2014, Guidelines for Design, Investigation, and Reporting, Low Impact Development Storm Water Infiltration, G5200.1, dated June 30, 2014.

GeoDynamics, Inc.
Applied Earth Sciences
Geotechnical Engineering & Engineering Geology Consultants

Date: May 20, 2016
GDI #: 16.00103.0211

CITY OF AGOURA HILLS - GEOTECHNICAL REVIEW SHEET

SEND TO CHJ ALONG W/ OUR SITE PLAN + CIVIL SET

To:	Allison Cook
Project Location:	29353 Canwood Street, Agoura Hills, California.
Planning Case #:	CUP-001231-2016, SIGN-01232-2016, OAK-01233-2016
Building & Safety #:	None
Geotechnical Report:	CHJ Consultants (2015), "*Geotechnical Investigation, Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, California*" J. N. 15473-3, dated October 21, 2015.
Plans:	Ali Iqbal (2016), "Oakmont of Agoura Hills" Sheets A0, R1 to R3, A1.0 through A1.2, A2.1 through A2.3, A3, A4.1 through A4.3 and A5, dated April 30, 2106 LandDesign Group (2016), "Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, California", Sheets 1 through 5, dated April, 2016 Hultt-Zollars (undated), "Grading Plan, Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, CA 91301", Sheets 1 and 2 of 2. Hultt-Zollars (2016), "Conceptual LID/Drainage Report for Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, CA 91301" J.N. R305871.01, dated April 12, 2016.
Previous Reviews:	None.

FINDINGS

Planning/Feasibility Issues	Geotechnical Report
☐ Acceptable as Presented	☐ Acceptable as Presented
☒ Response Required	☒ Response Required

REMARKS

CHJConsultants (CHJ; consultant) prepared a geotechnical investigation for the proposed development at the site located at 29353 Canwood Street, in the City of Agoura Hills, California. According to the above-referenced report, the site will be developed with a two- to three-story, 80-unit, senior facility of approximately 80,000 square feet. Grading will be required to create the level building pad using series of stacked retaining walls to support fill along the south edge of the pad and bedrock cut along the north edge of the pad. Based on the grading plans included as part of the submittal package, the overall height of the retaining wall stacks will reach maximum heights of about 30 feet with individual walls as high as eight feet.

The City of Agoura Hills – Planning Department reviewed the referenced report from a geotechnical perspective for compliance with applicable codes, guidelines, and standards of practice. GeoDynamics, Inc. (GDI) performed the geotechnical review on behalf of the City. Based upon a review of the submitted report and plans, the consultant shall adequately respond to the following Planning/Feasibility comments prior to consideration by the Planning Commission of approval of Case Nos. CUP-001231-2016, SIGN-

01232-2016, OAK-01233-2016. The Consultant should respond to the following Report Review comments prior to Building Plan-Check Approval. Plan-Check comments should be addressed in Building & Safety Plan Check. A separate geotechnical submittal is not required for plan-check comments.

Note to the City: The consultant indicates that the proposed development includes the construction of high retaining walls (higher than 6 ft), which might not be consistent with the current City building code and zoning ordinances.

Planning/Feasibility Comments

1. The consultant should provide an updated geologic map based on a legible copy of the latest development plan. The map should include all geologic data including contacts between all geologic units (including alluvial units if appropriate), structural information and a complete geologic legend. The consultant should discuss the basis for the location of the contact between Tcva and Ttvc (sic) indicated on the map.
2. Brief discussions of each geologic unit noted on the map should be provided in the text of the report.
3. Cross Sections should be provided through the slope and proposed retaining walls along the north edge of the building pad.
4. The consultant should clarify whether the recommended removal depth is below finished or existing grade, and whether removal to bedrock is recommended in limited areas where bedrock may not be not be encountered within the recommended removal depth.
5. Remnants of a previous structure are present on the site. Proposed grading appears likely to entirely remove this structure. Nonetheless, the consultant should review the current grading plan and discuss whether any elements of this previous construction need to be considered in the proposed construction. In particular, the consultant should consider whether components of an abandoned private sewage disposal system may be encountered during construction and provide appropriate recommendations for abandonment.
6. The consultant should discuss and evaluate as necessary the stability of all slopes that would impact the proposed development at the site. Mitigation measures should be recommended as necessary.
7. The consultant recommends on page 25 that a design infiltration rate of 0.03 inches per hour be used in the design of the storm water disposal system, and later concluded that the existing infiltration rate at the site is too slow and alternative measures should be considered. But as per the County of Los Angeles Guidelines, a minimum infiltration rate of 0.5 inch per hour is required for on-site storm water disposal system. Any on-site storm water disposal system must comply with the County's guidelines and requirements, including testing and reporting procedures.
8. The consultant should provide a 111 statement in accordance with the County of Los Angeles Guideline.

Report Review Comments

1. The consultant should review development plans as they become available to verify compliance with recommendations in the above-referenced reports. A geotechnical map using the proposed grading plan as base map should be included. Cross-sections should be updated as necessary to reflect changes in the proposed grading relative to the current grading concept. Additional geotechnical recommendations should be provided as necessary.
2. The consultant should discuss and evaluate the potential for interaction between closely located retaining walls (example: stacked retaining walls) using an appropriate method of analyses. Please note that the 1:1 criterion is not acceptable for lateral surcharge unless substantiated with analyses and/or references.
3. The consultant recommends on page 22 that either a perforated PVC pipe encased in 2 cubic feet of granular drain materials (burrito drain) **or** a synthetic drains should be used as a backdrain system behind retai9ning walls. However, it seems that a combination of these two items, not either one of

them would be needed to provide an effective backdrain system. For example: a burrito drain would be needed at the bottom of the synthetic drain in order to collect and transfer water coming out of the synthetic drain to an approved drainage course. Similarly, a synthetic or a gravel blanket would be needed to collect water from the backfill materials and transfer it to the burrito drain. Please clarify and revise recommendations as necessary.

4. The consultant should provide recommendations for the foundation to slope setback in accordance with the City of Agoura Hills building ordinance.
5. The consultant should provide geotechnical input and soil parameters necessary for the design of foundations and slabs-on-grade for the highly expansive soils at the site.
6. The consultant should provide recommendations for the minimum depth of embedment of footings below lowest adjacent grade, with due considerations to the highly expansive nature of on-site soils.
7. Considering the highly expansive soil conditions at the site, the consultant should discuss the need to pre-saturate the upper soils within footings and slabs-on-grade areas.

Plan-Check Comments

1. The name, address, and phone number of the Consultant and a list of all the applicable geotechnical reports shall be included on the building/grading plans.
2. The grading plan should include the limits and depths of overexcavation as recommended by the Consultant.
3. The following note must appear on the grading and foundation plans: "*Excavations shall be made in compliance with CAL/OSHA Regulations.*"
4. The following note must appear on the foundation plans: "*All foundation excavations must be observed and approved, in writing, by the Project Geotechnical Consultant prior to placement of reinforcing steel.*"
5. Foundation plans and foundation details shall clearly depict the embedment material and minimum depth of embedment for the foundations.
6. Drainage plans depicting all surface and subsurface non-erosive drainage devices, flow lines, and catch basins shall be included on the building plans.
7. Final grading, drainage, and foundation plans shall be reviewed, signed, and wet stamped by the consultant.
8. Provide a note on the grading and foundation plans that states: "*An as-built report shall be submitted to the City for review. This report prepared by the Geotechnical Consultant must include the results of all compaction tests as well as a map depicting the limits of fill, locations of all density tests, outline and elevations of all removal bottoms, keyway locations and bottom elevations, locations of all subdrains and flow line elevations, and location and elevation of all retaining wall backdrains and outlets. Geologic conditions exposed during grading must be depicted on an as-built geologic map.*"

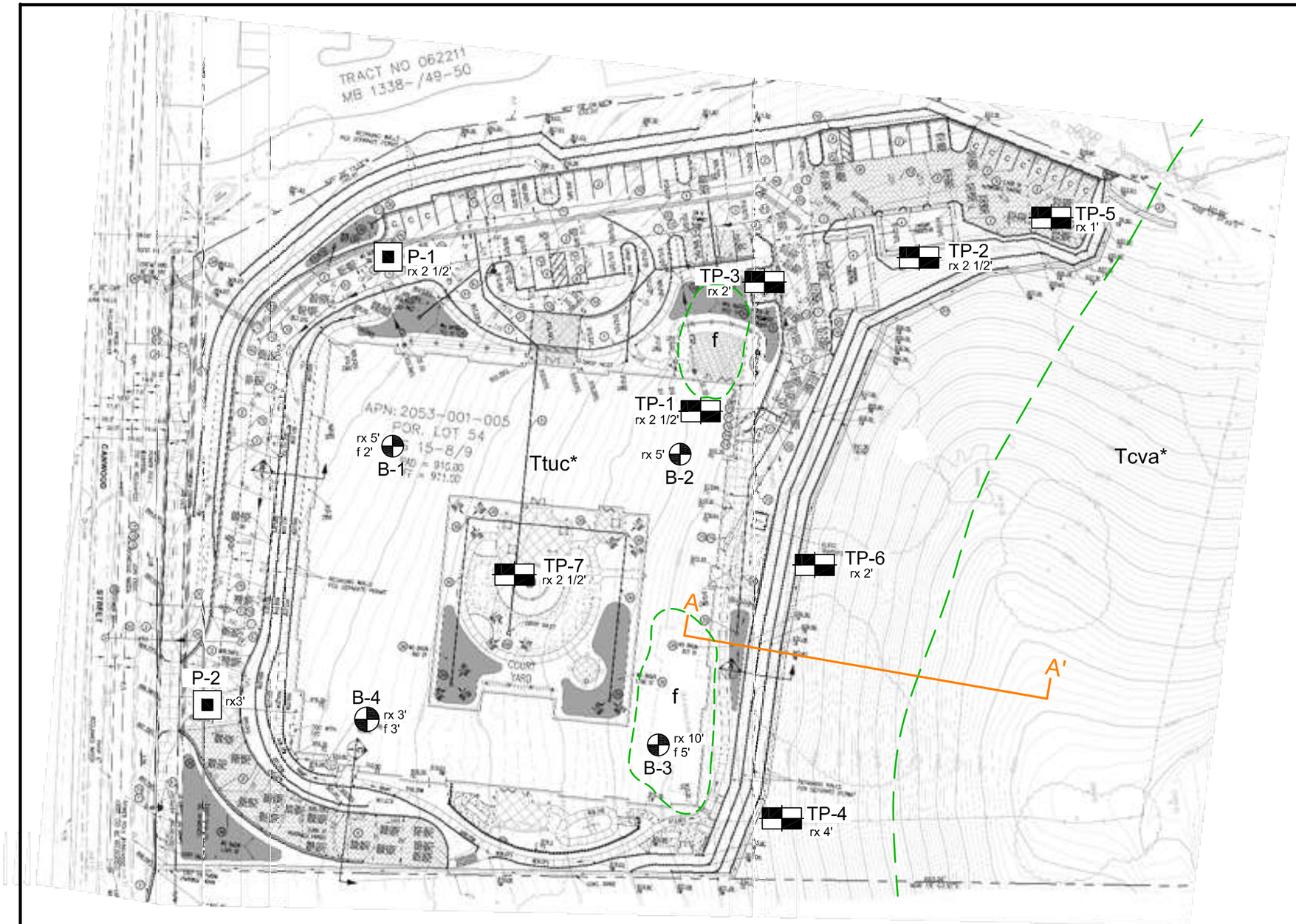
If you have any questions regarding this review letter, please contact GDI at (805) 496-1222.

Respectfully Submitted,

GeoDynamics, INC.

Ali Abdel-Haq
Geotechnical Engineering Reviewer
GE 2308 (exp. 12/31/17)

Christopher J. Sexton
Engineering Geologic Reviewer
CEG 1441 (exp. 11/30/16)



GEOLOGIC UNITS:

f - fill derived from Qcol

Tcva - conejo volcanics

Ttuc - Topanga Formation clay shale & siltstone with sandstone interbeds.

* bedrock overlain by mantle of colluvium (Qcol)

LEGEND:

B-2 — Exploratory Boring

P-1 — Double Ring Infiltrometer Test

TP-7 — Exploratory Test Pit

rx 2' — Depth to bedrock

f 5' — Depth of fill

Geologic Contact

A — A' Geologic Cross Section

Base Map:

Grading Plan
Oakmont of Agora Hills
Huitt-Zollars
Undated

SITE PLAN AND GEOLOGIC MAP

FOR: OAKMONT SENIOR LIVING

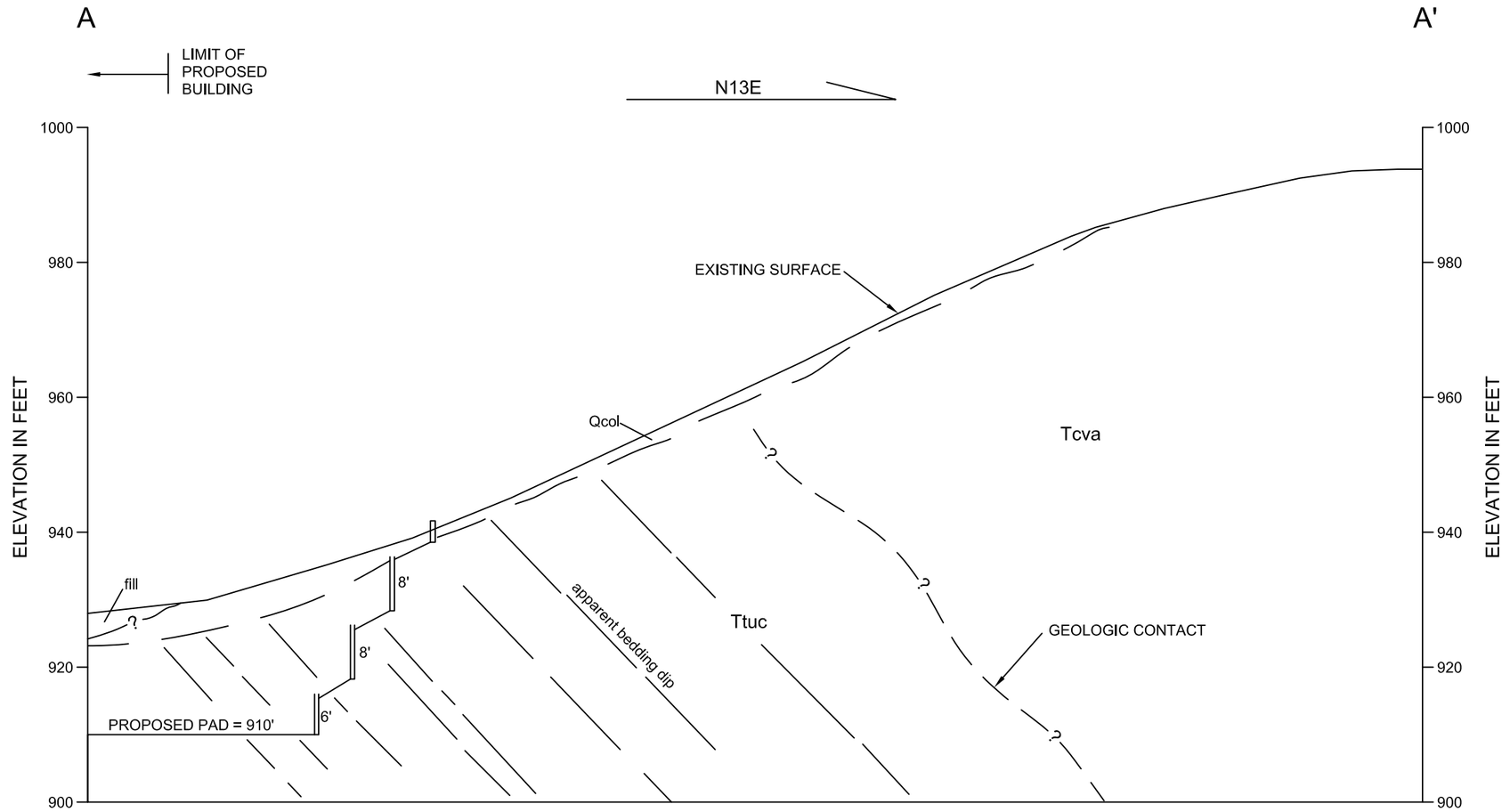
DATE: JUNE 2016

GEOTECHNICAL INVESTIGATION
OAKMONT OF AGOURA HILLS SENIOR FACILITY
APN 2053-001-005
29353 CANWOOD STREET
AGOURA HILLS, CALIFORNIA

ENCLOSURE "A-2.1"

JOB NUMBER 15473-3A

CHJ Consultants



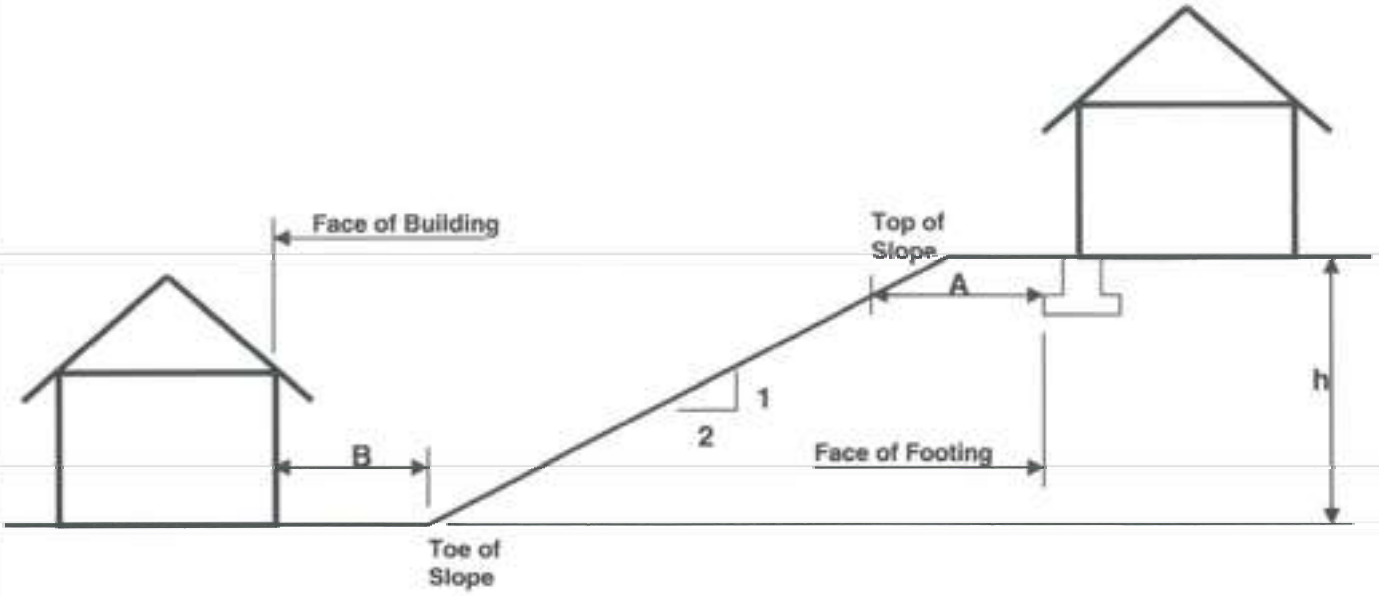
SCALE: 1" = 20'

GEOLOGIC CROSS SECTION A-A'

FOR: OAKMONT SENIOR LIVING	GEOTECHNICAL INVESTIGATION OAKMONT OF AGOURA HILLS SENIOR FACILITY APN 2053-001-005 29353 CANWOOD STREET AGOURA HILLS, CALIFORNIA	ENCLOSURE "A-2.2"
DATE: JUNE 2016		JOB NUMBER 15473-3A

CHJ Consultants

Building Setback Requirement
(Constructed Slopes)



TOP OF SLOPE

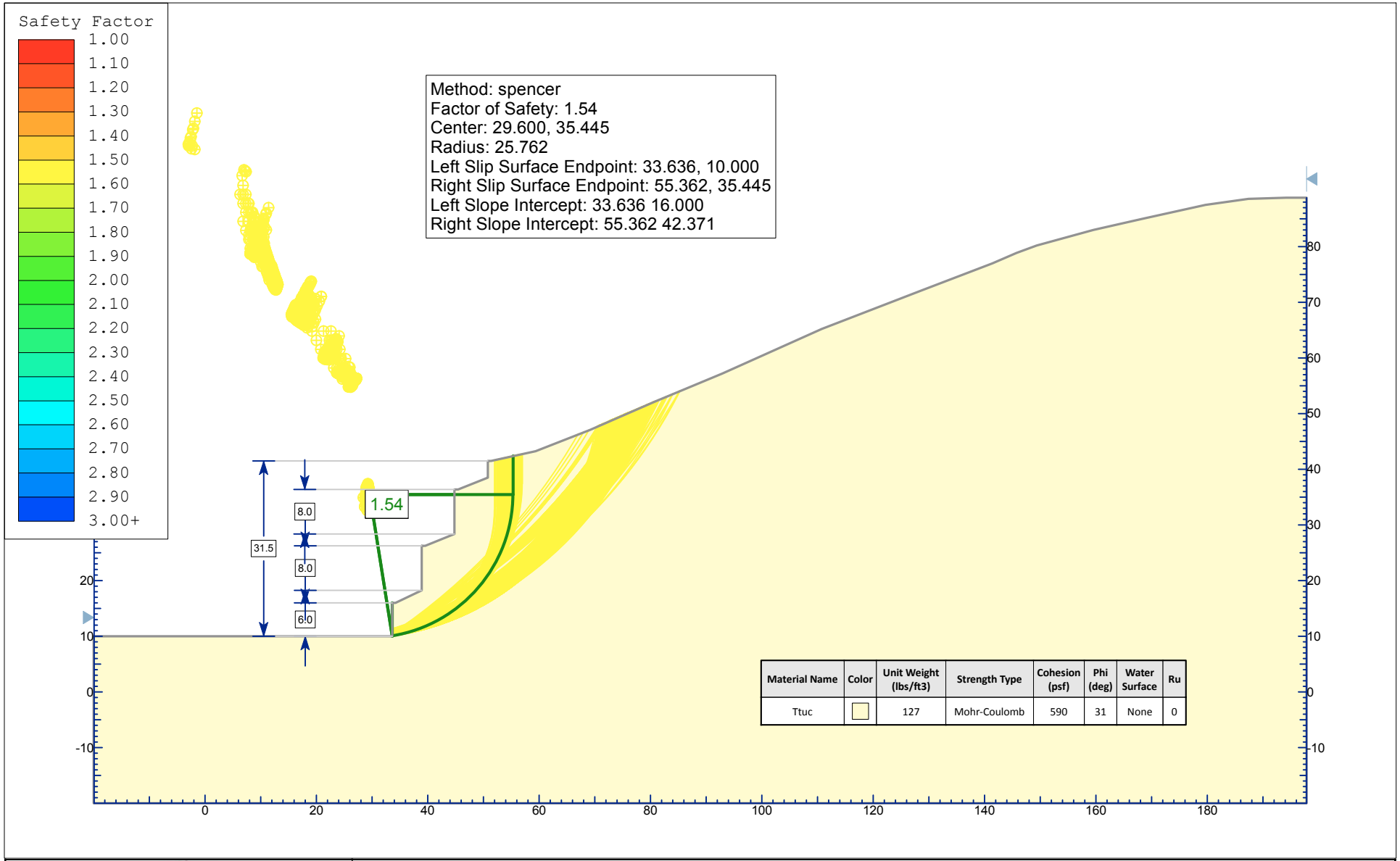
SLOPE HEIGHT (h) (feet)	SETBACK (A) (feet)
0-15'	5' min.
15'-120'	h/3 min.
120'+	40'*

TOE OF SLOPE

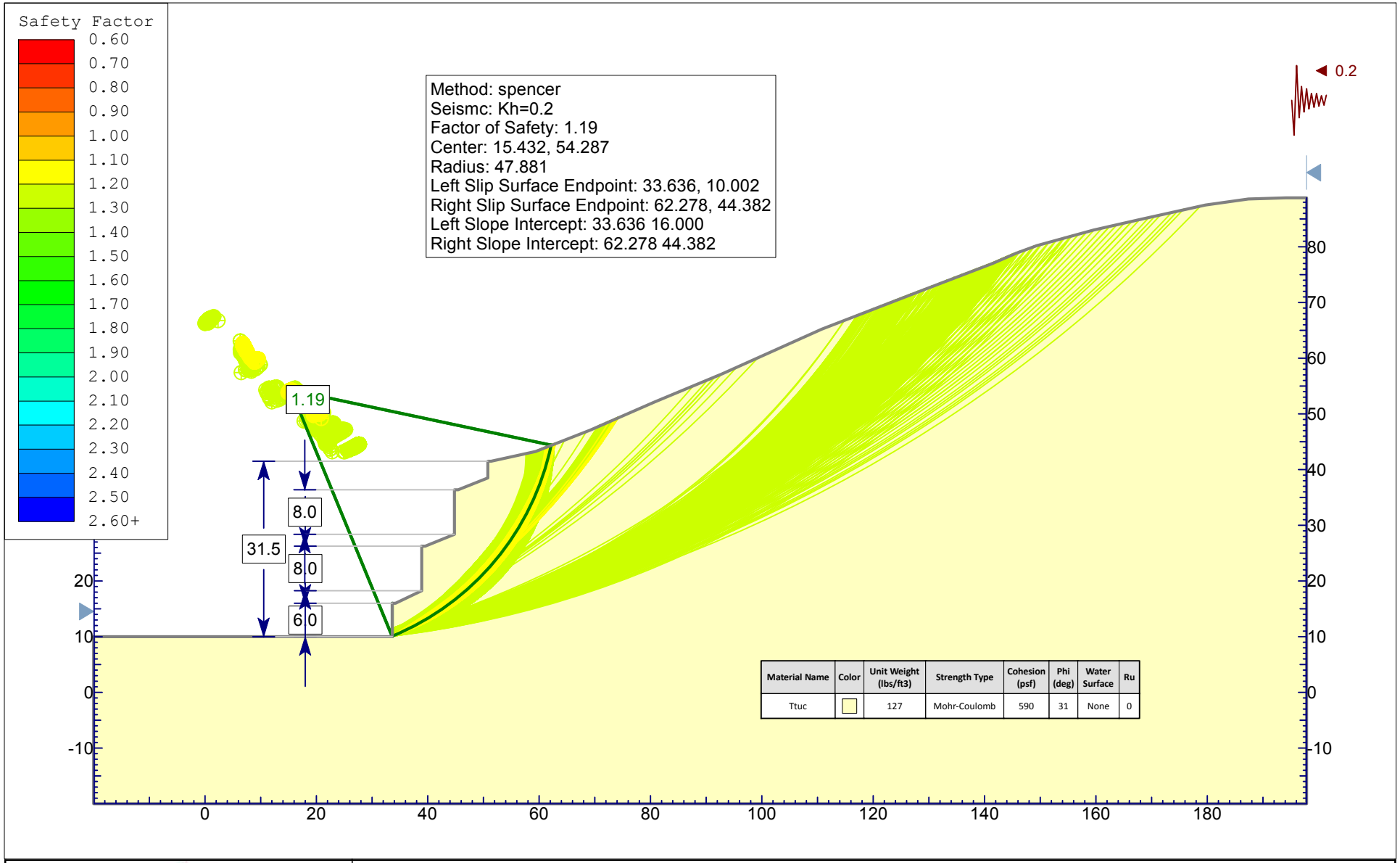
SLOPE HEIGHT (h) (feet)	SETBACK (B) (feet)
0-15'	5' min.
10'-30'	h/2 min.
30'+	15'

* or directed by project engineering geologist

BUILDING SETBACK DETAIL		
FOR: OAKMONT SENIOR LIVING	GEOTECHNICAL INVESTIGATION OAKMONT OF AGOURA HILLS SENIOR FACILITY APN 2053-001-005 29353 CANWOOD STREET AGOURA HILLS, CALIFORNIA	ENCLOSURE "B-1"
DATE: JUNE 2016		JOB NUMBER 15473-3A
		CHJ Consultants



SLIDEINTERPRET 6.039	Project: SLIDE - An Interactive Slope Stability Program			
	Analysis Description:			
	Drawn By: CHJ Consultants	Author: F.Yi	Scale: 1:300	
	File Name: 15473-3A Section D-D.slim	Date: 6/22/2016	Enclosure: C-1	



SLIDEINTERPRET 6.039	Project: SLIDE - An Interactive Slope Stability Program			
	Analysis Description:			
	Drawn By: CHJ Consultants	Author: F.Yi	Scale: 1:300	
	File Name: 15473-3A Section D-D.slim	Date: 6/22/2016	Enclosure: C-2	

CHJ Consultants
1355 E. Cooley Drive, Suite C, Colton, CA 92324 • Phone (909) 824-7311 • Fax (909) 503-1136
15345 Anacapa Road, Suite D, Victorville, CA 92392 • Phone (760) 243-0506 • Fax (760) 243-1225
77-564A Country Club Drive, Suite 122, Palm Desert, CA 92211 • Phone (760) 772-8234 • Fax (909) 503-1136

July 26, 2016

Oakmont Senior Living
9249 Old Redwood Highway, Suite 200
Windsor, California 95492
Attention: Mr. Wayne Sant, Vice President, Development

Job No. 15473-3A

Subject: Addendum to Geotechnical Investigation Report
Response to Geotechnical Review Sheet Dated July 11, 2016
Proposed Oakmont of Agoura Hills Senior Facility
29353 Canwood Street
Agoura Hills, California

References: See Attached References Sheet

Dear Mr. Sant:

As requested, we have examined the review comments by GeoDynamics, Incorporated, prepared on behalf of the City of Agoura Hills and dated July 11, 2016. We provide our responses below. This letter addresses only the Report Review Comments. The reviewer's comments appear below in italics, followed by our response.

Report Review Comments

1. *The consultant should review development plans as they become available to verify compliance with recommendations in the above-referenced reports. A geotechnical map using the proposed grading plan as base map should be included. Cross-sections should be updated as necessary to reflect changes in the proposed grading relative to the current grading concept. Additional geotechnical recommendations should be provided as necessary.*

Note: *The reviewers appreciate that the consultant addressed this comment, but this comment should be addressed during the design stage of the project, when final development plans become available. Note that ALL geologic data - bedding attitudes in particular - should be plotted on the geologic map..*

An updated geological and geotechnical map will be provided during the design stage of the project when final development plans become available.

2. *The consultant should discuss and evaluate the potential for interaction between closely located retaining walls (example: stacked retaining walls) using an appropriate method of analyses. Please note that the 1 :1 criterion is not acceptable for lateral surcharge unless substantiated with analyses and/or references.*

   Note: *Comment #6 of the Planning/Feasibility Comments does not address this comment. This comment is about the potential for lateral surcharge on the lower retaining wall due to the foundation load of the upper retaining wall.*

As mentioned in our previous response letter, the *cut slope* is self-stable and satisfies required minimum factor of safety values for both static and seismic conditions. Because of that, it is the opinion of this firm that it is not necessary in the design of the lower wall to consider the lateral surcharge from the upper wall. As mentioned in our previous response letter, "The design engineer should ensure the stability of walls."

If the wall will be built such that compacted fill will be used behind the wall, this firm should be contacted to provide further recommendations at the design stage when the wall type and a detailed cross section are available.

3. *The consultant should provide recommendations for the foundation to slope setback in accordance with the City of Agoura Hills building ordinance.*

   Note: *The consultant provided setback recommendations based on the California Building Code (CBC). But the City of Agoura Hills has more stringent recommendations for foundation to slope*

setback. As requested in the above comment, the consultant should provide recommendations for the foundation to slope setback in accordance with the City of Agoura Hills building ordinance.

Foundations on or adjacent to slope surfaces shall be designed in accordance with Section 1808.7.1 for building clearance from an ascending slope and Section 1808.7.2 for footing setback from a descending slope surface, in accordance with the City of Agoura Hills, Title 24 Adoption – Ordinance 10-381.

4. *The consultant should provide recommendations for the minimum depth of embedment of footings below lowest adjacent grade, with due considerations to the highly expansive nature of on-site soils.*

   Note: *the consultant responded to this comment by stating that "Due to the high expansive nature of the on-site soils and the volume of expansive soil to be replaced, conventional spread foundation is not considered to be suitable footing type." Thereupon, the consultant should provide recommendations for alternative foundation system..*

As recommended in the "Foundation Design" section of our report, "Structural design measures including design of slab-on-grade foundations in accordance with 'WRI/CRSI Design of Slab-On-Ground Foundations' or 'PTI Standard Requirements for Design of Shallow Post-Tensioned Concrete Foundations of Expansive Soils' would be necessary." Either way, the slab should be designed as a mat foundation.

This letter should be included with and considered part of the Geotechnical Investigation report for the project.

We appreciate this opportunity to provide geotechnical services for this project. If you should have any questions or comments concerning this letter, please do not hesitate to contact this firm at your convenience.

Respectfully submitted,

CHJ CONSULTANTS

Fred Yi, Ph.D., G.E. 2967
Chief Engineer

Robert J. Johnson, G.E. 443
President

FY/RJJ:fy/lb

Enclosures: City of Agoura Hills - Geotechnical Review Sheet Dated July 11, 2016

REFERENCES

CHJ Consultants, 2015, Geotechnical Investigation, Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, California, Report Prepared For Oakmont Senior Living, Job No. 15473-3, Dated October 21, 2015

CHJ Consultants, 2016, Addendum to Geotechnical Investigation Report, Response to Geotechnical Review Sheet, Proposed Oakmont of Agoura Hills Senior Facility, 29353 Canwood Street, Agoura Hills, California, Report Prepared for Oakmont Senior Living, Job No. 15473-3A, Dated June 14, 2016

City of Agoura Hills, Title 24 Adoption – Ordinance 10-381

GeoDynamics, Incorporated, City of Agoura Hills – Geotechnical Review Sheet, CUP-001231-2016, 29353 Canwood Street, Agoura Hills, California, Dated July 11, 2016

GeoDynamics, Inc.
Applied Earth Sciences
Geotechnical Engineering & Engineering Geology Consultants

Date: July 11, 2016
GDI #: 16.00103.0211

CITY OF AGOURA HILLS - GEOTECHNICAL REVIEW SHEET

To:	Allison Cook
Project Location:	29353 Canwood Street, Agoura Hills, California.
Planning Case #:	CUP-001231-2016, SIGN-01232-2016, OAK-01233-2016
Building & Safety #:	None
Geotechnical Report:	CHJ Consultants (2016), "*Addendum to Geotechnical Investigation Report, Response to Geotechnical Review Sheet, Proposed Oakmont of Agoura Hills Senior Facility, 29353 Canwood Street, Agoura Hills, California*" J. N. 15473-3A, dated June 14, 2016. CHJ Consultants (2015), "*Geotechnical Investigation, Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, California*" J. N. 15473-3, dated October 21, 2015.
Plans:	Ali Iqbal (2016), "Oakmont of Agoura Hills" Sheets A0, R1 to R3, A1.0 through A1.2, A2.1 through A2.3, A3, A4.1 through A4.3 and A5, dated April 30, 2106 LandDesign Group (2016), "Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, California", Sheets 1 through 5, dated April, 2016 Huitt-Zollars (undated), "Grading Plan, Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, CA 91301", Sheets 1 and 2 of 2. Huitt-Zollars (2016), "Conceptual LID/Drainage Report for Oakmont of Agoura Hills, 29353 Canwood Street, Agoura Hills, CA 91301" J.N. R305871.01, dated April 12, 2016.
Previous Reviews:	May 20, 2016.

FINDINGS

Planning/Feasibility Issues

- ☒ Acceptable as Presented
- ☐ Response Required

Geotechnical Report

- ☐ Acceptable as Presented
- ☒ Response Required

REMARKS

CHJ Consultants (CHJ; consultant) provided a response to the review letter by the city of Agoura Hills dated May 20, 2016 regarding the proposed development at the site located at 29353 Canwood Street, in the City of Agoura Hills, California. According to the above-referenced reports, the site will be developed with a two- to three-story, 80-unit, senior facility of approximately 80,000 square feet. Grading will be required to create the level building pad using series of stacked retaining walls to support fill along the south edge of the pad and bedrock cut along the north edge of the pad. Based on the grading plans included as part of the submittal package, the overall height of the retaining wall stacks will reach heights of about 30 feet with individual walls as high as eight feet.

The City of Agoura Hills – Planning Department reviewed the referenced report from a geotechnical perspective for compliance with applicable codes, guidelines, and standards of practice. GeoDynamics, Inc. (GDI) performed the geotechnical review on behalf of the City. Based upon a review of the submitted report, we recommend the Planning Commission consider approval of Case Nos. CUP-001231-2016, SIGN-01232-2016, OAK-01233-2016. The Consultant should respond to the following Report Review comments prior to Building Plan-Check Approval. Plan-Check comments should be addressed in Building & Safety Plan Check. A separate geotechnical submittal is not required for plan-check comments.

Note to the City: The consultant indicates that the proposed development includes the construction of high retaining walls (higher than 6 ft), which might not be consistent with the current City building code and zoning ordinances.

Report Review Comments

1. The consultant should review development plans as they become available to verify compliance with recommendations in the above-referenced reports. A geotechnical map using the proposed grading plan as base map should be included. Cross-sections should be updated as necessary to reflect changes in the proposed grading relative to the current grading concept. Additional geotechnical recommendations should be provided as necessary.

   Note: The reviewers appreciate that the consultant addressed this comment, but this comment should be addressed during the design stage of the project, when final development plans become available. Note that ALL geologic data – bedding attitudes in particular - should be plotted on the geologic map.

2. The consultant should discuss and evaluate the potential for interaction between closely located retaining walls (example: stacked retaining walls) using an appropriate method of analyses. Please note that the 1:1 criterion is not acceptable for lateral surcharge unless substantiated with analyses and/or references.

   Note: Comment #6 of the Planning/Feasibility Comments does not address this comment. This comment is about the potential for lateral surcharge on the lower retaining wall due to the foundation load of the upper retaining wall.

3. The consultant should provide recommendations for the foundation to slope setback in accordance with the City of Agoura Hills building ordinance.

   Note: The consultant provided setback recommendations based on the California Building Code (CBC). But the City of Agoura Hills has more stringent recommendations for foundation to slope setback. As requested in the above comment, the consultant should provide recommendations for the foundation to slope setback in accordance with the City of Agoura Hills building ordinance.

4. The consultant should provide recommendations for the minimum depth of embedment of footings below lowest adjacent grade, with due considerations to the highly expansive nature of on-site soils.

   Note: the consultant responded to this comment by stating that "*Due to the high expansive nature of the on-site soils and the volume of expansive soil to be replaced, conventional spread foundation is not considered to be suitable footing type.*" Thereupon, the consultant should provide recommendations for alternative foundation system.

Plan-Check Comments

1. The name, address, and phone number of the Consultant and a list of all the applicable geotechnical reports shall be included on the building/grading plans.

2. The grading plan should include the limits and depths of overexcavation as recommended by the Consultant.

3. The following note must appear on the grading and foundation plans: "*Excavations shall be made in compliance with CAL/OSHA Regulations.*"

4. The following note must appear on the foundation plans: *"All foundation excavations must be observed and approved, in writing, by the Project Geotechnical Consultant prior to placement of reinforcing steel."*

5. Foundation plans and foundation details shall clearly depict the embedment material and minimum depth of embedment for the foundations.

6. Drainage plans depicting all surface and subsurface non-erosive drainage devices, flow lines, and catch basins shall be included on the building plans.

7. Final grading, drainage, and foundation plans shall be reviewed, signed, and wet stamped by the consultant.

8. Provide a note on the grading and foundation plans that states: *"An as-built report shall be submitted to the City for review. This report prepared by the Geotechnical Consultant must include the results of all compaction tests as well as a map depicting the limits of fill, locations of all density tests, outline and elevations of all removal bottoms, keyway locations and bottom elevations, locations of all subdrains and flow line elevations, and location and elevation of all retaining wall backdrains and outlets. Geologic conditions exposed during grading must be depicted on an as-built geologic map."*

If you have any questions regarding this review letter, please contact GDI at (805) 496-1222.

Respectfully Submitted,

GeoDynamics, INC.

Ali Abdel-Haq
Geotechnical Engineering Reviewer
GE 2308 (exp. 12/31/17)

Christopher J. Sexton
Engineering Geologic Reviewer
CEG 1441 (exp. 11/30/16)

Fuel Modification Plan Approval Letter

APPENDIX H

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

626 N. ANGELENO AVENUE
AZUSA, CA 91702
(626) 969-5205

DARYL L. OSBY
FIRE CHIEF
FORESTER & FIRE WARDEN

July 20, 2017

Gregg Wanke
9240 Old Redwood Highway Suite 200
Windsor, CA 95492

Dear Mr. Wanke:

FUEL MODIFICATION PLAN – 29353 CANWOOD STREET, AGOURA HILLS
PARCEL #2053-001-005 - FM PROJECT #6300 - FFFM #201600423

The Revised Final Fuel Modification Plan has been reviewed and approved. Occupancy is subject to the on-site inspection and approval of required fuel modification. Inspections are to be performed by Forestry Division personnel.

Questions regarding this response should be directed to the Fuel Modification Unit. Office hours are Monday through Thursday, from 8:00 a.m. to 4:00 p.m. for plan submittal and general questions. Plan checkers are available 8:00 a.m. to 10:00 a.m. and by appointment. The Fuel Modification Unit may be reached at (626) 969-5205.

Very truly yours,

FOR KTJ

KEVIN T. JOHNSON, ASSISTANT CHIEF, FORESTRY DIVISION
PREVENTION SERVICES BUREAU

KTJ:lp

Conceptual Low Impact Development/ Drainage Report

APPENDIX I

Conceptual LID/Drainage Report
for

Oakmont of Agoura Hills

29 353 Canwood Street
Agoura Hills, CA 91301

April 12, 2016
Revised June 24, 2016

Prepared for:

Oakmont Senior Living
9240 Old Redwood Highway
Suite 200
Windsor, CA 95492

Prepared by:

HUITT-ZOLLARS

Huitt-Zollars, Inc. Thousand Oaks
90 E. Thousand Oaks Blvd, Suite 201
Thousand Oaks, CA 91360
Phone (805) 418-1502 Fax (805) 418-1619

REGISTERED PROFESSIONAL ENGINEER
JEREMY EPLEY
No. 057241
CIVIL
STATE OF CALIFORNIA

J. Epley

06-24-2016

Jeremy Epley, P.E.
HZ Job No. R305871.01

Date

Table of Contents

Introduction

This report has been prepared to provide an analysis of drainage patterns and improvements related to the development of the proposed Oakmont of Agoura Hills located at 29353 Canwood Street. The project site is bounced by Canwood Street and the 101 Northbound Freeway to the south, by a medical office building to the west, vacant land to the east, and single family residential homes to the north. The project is located in in the City of Agoura Hills and therefore falls under City and Los Angeles County jurisdiction.

The lot is currently vacant. It has not been previously graced nor have utilities connections been installed. When complete, this project will contain a two-story 75,000 square-feet assisted living and memory care senior building with 55 parking spaces.

Runoff from this project will be collected by onsite storm drain infrastructure. The proposed storm drain infrastructure will convey onsite flows in a southerly direction. Onsite runoff will ultimately be treated by biofiltration systems and be discharged to the existing 36" Canwood Street CMP. Overall, the drainage patterns are characterized by steep gradients from north to south, and will largely remain unchanged upon project completion. Onsite flows will be controlled and placed in underground storm drain infrastructure.

Objectives

The objective of this report is to perform a conceptual evaluation of proposed stormwater flow rates based on conceptual project grading and infrastructure changes resulting from development. This report will address the following items:

- **Drainage Concept** – This report will discuss the proposed drainage concept for the site. Compliance with the existing drainage patterns will be demonstrated in the Final Drainage Report.
- **Detention** – Peak and volume mitigations, if necessary, will be addressed in the Final Drainage Report.
- **Low Impact Development** – This report will determine the guiding factors in implementing LID design on the project to comply with the requirements of the current MS4 Permit.

Methodology

This hydrology study was prepared using the design criteria and methodology developed by the Los Angeles County Department of Public Works and is in accordance with the 2006 Hydrology Manual. Calculations presented within this study were determined using the LA County HydroCalc program to determine time of concentration (TC) and onsite flows. The 50-year, 24-hour rainfall depth for the site is approximately 7.37 inches. The project site is located within the Debris Production Area 6. Since the watershed is already urbanized and has an imperviousness higher than 15%, and project slopes will be maintained, sediment production is not taken into consideration in both existing and proposed hydrology computations. No fire and bulking effects were considered when computing the peak discharges.

Drainage Concept

The proposed drainage concept for this site involves intercepting upstream slope flow (north) with area drains located behind the proposed retaining walls and routing offsite runoff in swales that bypass the site on both eastern (Drainage Area 2A) and western (Drainage Area 1A) boundaries of the project site. This flow will not be combined with onsite flow collected from parking areas and roof drains, and will not require water quality treatment. Onsite runoff from parking areas and roof drains will ultimately be conveyed in underground storm drain infrastructure that discharges into the existing 36" Carwood Street CMP. This system is part of PD 1645. Stormwater quality treatment is proposed for all onsite drainage areas.

Prior to discharge, flows will be biotreated in biofiltration systems. Further discussed in the LID portion of this report, the system will divert first flush flows into the biofiltration units while maintaining the ability of large storm flows to bypass the unit.

The proposed slope areas are engineered slopes that will be maintained by the property owner. In addition, there is no substantial offsite area that is tributary to this project. As a result, a burned and bulked factor will not be applied to the peak discharge computations.

Hydrology

Due to the nature of this site, the existing flow calculation (using the HydroCalc program) generates a 5-minute time of concentration. As a result, for existing flow purposes, no routing will be performed for site areas as subarea times of concentration will be less than that value and would produce an overly conservative result. The overall site area will be used as a comparison point for existing and proposed flow.

The proposed drainage concept for this site involves intercepting upstream slope flow (north) with area drains located behind the proposed retaining walls and routing offsite runoff in swales that bypass the site on both eastern (Drainage Area 2A) and western (Drainage Area 1A) boundaries of the project site. Runoff from Drainage Area 1A (3.29 acres) is collected by a proposed concrete swale that flows westerly and discharges into a natural, unimproved, vegetated swale that drains along the western boundary of the project site in a southerly direction. The natural, unimproved, vegetated swale collects runoff from the unimproved, pervious slopes of Drainage Area 5A (0.30 acres) and discharges to a downstream inlet located at node 104. Runoff from Drainage Area 2A (0.71 acres) is collected by a concrete swale that flows successively along the northern boundary and the eastern boundary of the project site. All runoff is then collected by an inlet and conveyed through an underground storm drain pipe to node 104. Runoff from Drainage Areas 1A, 2A, and 5A will not be combined with onsite flow collected from parking areas and roof drains, and will not require water quality treatment.

Onsite drainage patterns are designed to allow all onsite runoff to gravity drain to required biofiltration systems for adequate water quality treatment. Walkways and landscape areas located on the northern side of the project (Drainage Areas 3A and 4A) drain westerly and runoff is conveyed upon biotreatment through onsite storm drain infrastructure. Parking areas located on the western side of the project (Drainage Areas 4A and 6A) drain southerly and runoff is conveyed upon biotreatment through onsite storm drain infrastructure. Driveways and walkway areas located on both southern and eastern sides of the project drain southerly to a biofiltration system located at the southeast corner of the project site. Runoff from the building itself (Drainage Area 7A) is captured and discharged through roof drains into localized biofiltration areas before connecting to the onsite storm drain infrastructure. All runoff from the project area is ultimately conveyed through onsite storm drain infrastructure to Node 104, where it connects to the existing 36" Carnwood Street CMP.

Seven biofiltration treatment systems will be installed throughout the project site to meet the requirements set forth in the 2012 MS4 Permit. The water quality treatment devices are designed to provide adequate treatment to the water quality flows and volumes generated by the 85-th percentile storm event. The treatment systems are also designed to bypass higher flows.

Maintenance of the onsite storm drain facilities, including cleaning of the catch basins and conveyance systems, will be of the responsibility of the owner.

FEMA Flood Insurance Rate Map #06037C1244F (dated September 26, 2008) identifies that the project site is not located within a floodplain.

Hydraulics

The County of Los Angeles Hydraulic Design Manual requires that storm drain systems in sump conditions be designed to a 50-year storm event. Other drains are required to be designed for a storm frequency of not less than 10-year.

Analysis of the proposed drainage facilities will be provided in the Final Drainage Report. Analysis will include the following:

Storm drain pipe sizing – The 10-year HGL will be developed using County-approved WSPG computer software and compared to the proposed finished surface in the final drainage report. The 10-year ultimate flow rates from HydroCalc will be used in the analysis of the proposed in-tract storm drain.

Catch basin or Drop inlet sizing – The 10-year and 50-year ultimate HydroCalc flow rates will be utilized in both flow-by and sump conditions in the final report, respectively. Calculations for capture flow rates will be performed using the County approved HydroCalcs computer software in the final report.

LID

The project triggers the LID requirements for New Development Projects over 5,000 square-feet, as established in the 2012 Los Angeles Regional MS4 Permit.

The project site is not subject to the hydromodification requirements, as defined in Section 8 of the LADPW Low Impact Development Standards Manual (February 2014). A review of the downstream channel on the Los Angeles County Storm Drain System Inventory (http://dpw.lacounty.gov/fcd/stormdrain/index.cfm) identified that runoff from the project is initially conveyed through a series of concrete-lined and engineered channels that are not susceptible to hydromodification impacts. A summary of the successive conveyance systems is provided in Table 1.

Table 1 – Downstream Channels & Susceptibility to Hydromodification

System	Material	Engineered?
PD1645	30" RCP	Yes
PD1605	60" RCP	Yes
Lindero Canyon Channel	126" RCB	Yes

Runoff from the upstream adjacent native slopes is collected by concrete swales, bypasses the project site, and is ultimately discharged at the downstream receiving point #104. Because the offsite flows are being bypassed and not combined with onsite flows, those undisturbed and natural areas are exempt from the LID requirements do not need to be treated.

The project site, once developed, will contain asphalt paving, concrete walks, rooftops and other impervious constructions. Several planters that can incorporate biofiltration systems are included in the design. These impervious areas will be directed to seven individual biofiltration systems that are laid out per the LID site design principles to meet the requirements of the 2012 MS4 Permit.

Consistent with the 2014 LID Standard Manual, the Stormwater Quality Design Volume (SWQDv) was computed for each tributary drainage area using Hydrocalc. Runoff rates and volumes for the 85th percentile storm event are summarized in Appendix C. Table 2 identifies the SWQDv for each drainage area.

Table 2 – Storm Water Quality Design Volume

Subarea ID	Footprint (ac)	Imperviousness (%)	LID-85th percentile	
			Q (cfs)	Volume (cu-ft)
Offsite Areas				
1A	3.29	1.0%	n/a	n/a
2A	0.71	1.0%	n/a	n/a
5A	0.30	1.0%	n/a	n/a
Total	**4.30**	**1.0%**	**n/a**	**n/a**
Onsite Areas				
3A	0.39	9.0%	0.01	53
4A	0.69	51.0%	0.10	1,199
6A	0.46	68.0%	0.11	1,013
7A	1.13	64.0%	0.45	2,393
8A	0.71	40.0%	0.09	1,520
Total	**3.08**	**61.9%**	**0.76**	**6,268**

Infiltration-based retention systems were ruled out by the geotechnical engineer because of the presence of colluvial fill and bedrock at the project site. Onsite geotechnical explorations revealed the presence of bedrock encountered at depths of 3 to 10 feet below existing ground, and the presence of medium dense to dense clayey sand (SC) to stiff to hard fat clay (CH) at depths 3 to 5 feet below ground surface. A copy of the geotechnical findings, along with the NRCS Soil Survey Report, is provided in Appendix D. Since infiltration is deemed infeasible onsite, onsite biofiltration systems were sized to treat 1.5 times the SWQDv volume consistent with the design guidelines

defined in Appendix E of the 2014 LA County LID Standard Manual. Table 3 summarizes the treatment capacity of each of the seven distributed biofiltration systems.

Table 3 – Biofiltration Systems Treatment Capacity

Subarea ID	Footprint (ac)	SWQDv (cu-ft)	Minimum Facility Surface Area (sq.ft)*	Surface Area Provided (sq.ft)
3A	0.09	53	5,504	350
4A	0.69	1,189		950
6A	0.46	1,013		1,000
7A	1.13	2,963		2,050
8A	0.71	1,020		1,300
Total	***3.08***	***6,268***		***5,650***

** Assumes a 1-hour routing time and media design infiltration rate of 2.5 inch per hour.*

The seven biofiltration systems meet the requirements and treat the water quality volume to the maximum extent practicable.

Appendix

Appendix A. Existing Conditions Q_{50} Hydrology Calculations
Appendix B. Proposed Conditions Q_{50} Hydrology Calculations
Appendix C. Proposed Conditions Q_{10} Hydrology Calculations
Appendix D. Proposed Conditions SWQDv Hydrology Calculations
Appendix E. Geotechnical Explorations
Appendix F. Existing Conditions Hydrology Map
Appendix G. Proposed Condition Hydrology Map
Appendix H. Proposed Water Quality Map

Appendix A

Existing Conditions Q_{50} Hydrology Calculations

Peak Flow Hydrologic Analysis

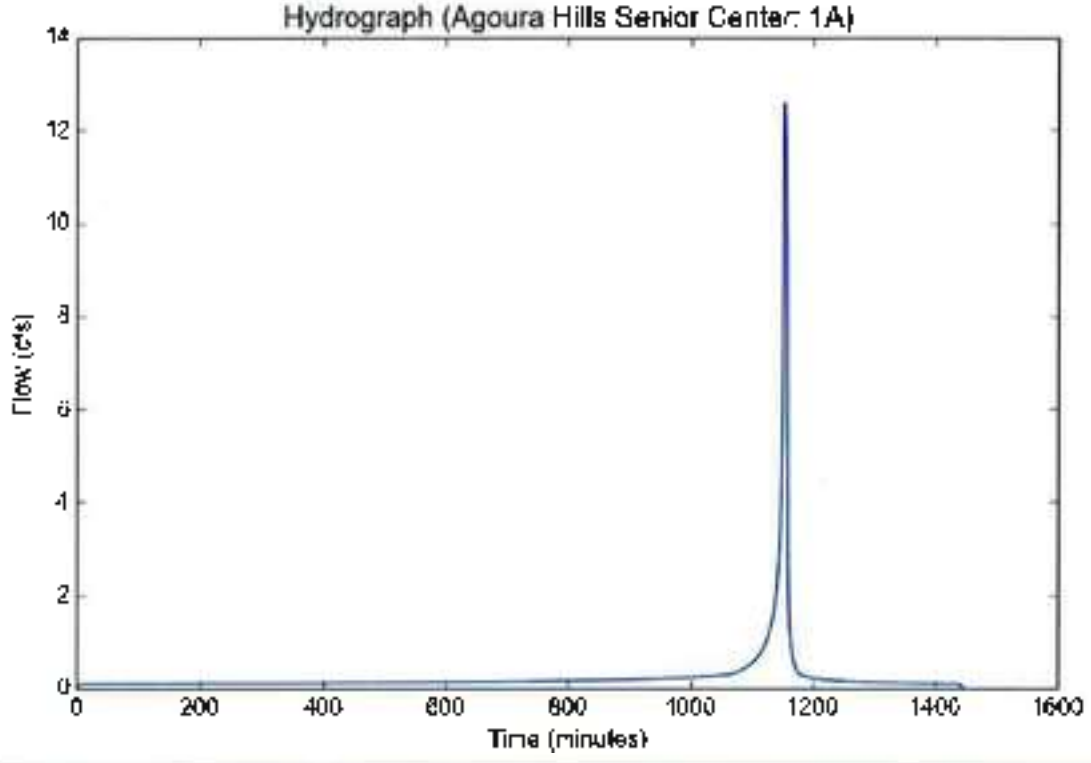
File location: I:\7305871.01 - Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.50Ex.pdf
Version: HydroCalc 0.5.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	1A
Area (ac)	5.09
Flow Path Length (ft)	952.0
Flow Path Slope (vft/hft)	0.098
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	3.754
Undeveloped Runoff Coefficient (Cu)	0.656
Developed Runoff Coefficient (Cd)	0.6585
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	12.582
Burned Peak Flow Rate (cfs)	12.582
24-Hr Clear Runoff Volume (ac-ft)	0.5101
24-Hr Clear Runoff Volume (cu-ft)	22219.0502



Peak Flow Hydrologic Analysis

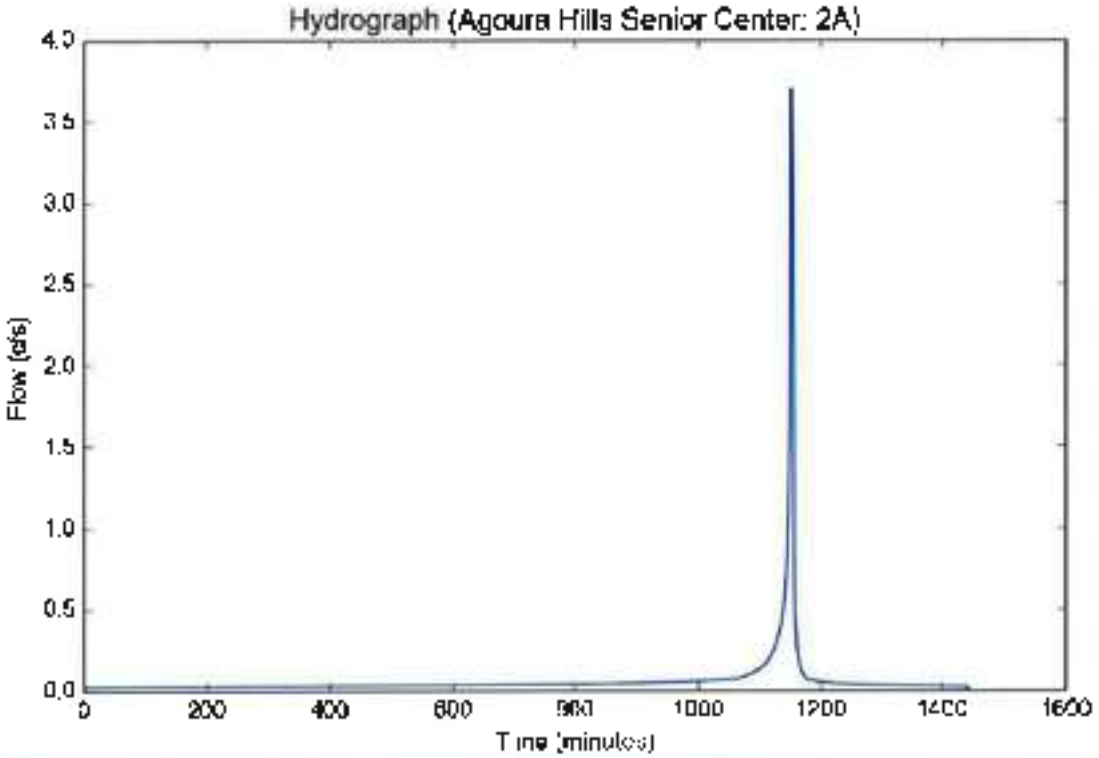
File location: R:\P30567*.01 - Agoura Senior Village\10 CADD\10 1 AutoCAD-Hydrology\Agoura Hills Senior Center Report.50Ck.cdl
Version: HydroCalc 0.3.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	2A
Area (ac)	1.21
Flow Path Length (ft)	584.0
Flow Path Slope (vft/hft)	0.204
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	4.3971
Undeveloped Runoff Coefficient (Cu)	0.692
Developed Runoff Coefficient (Cd)	0.6941
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.693
Burned Peak Flow Rate (cfs)	3.693
24-Hr Clear Runoff Volume (ac-ft)	0.1216
24-Hr Clear Runoff Volume (cu-ft)	5297.4869



Peak Flow Hydrologic Analysis

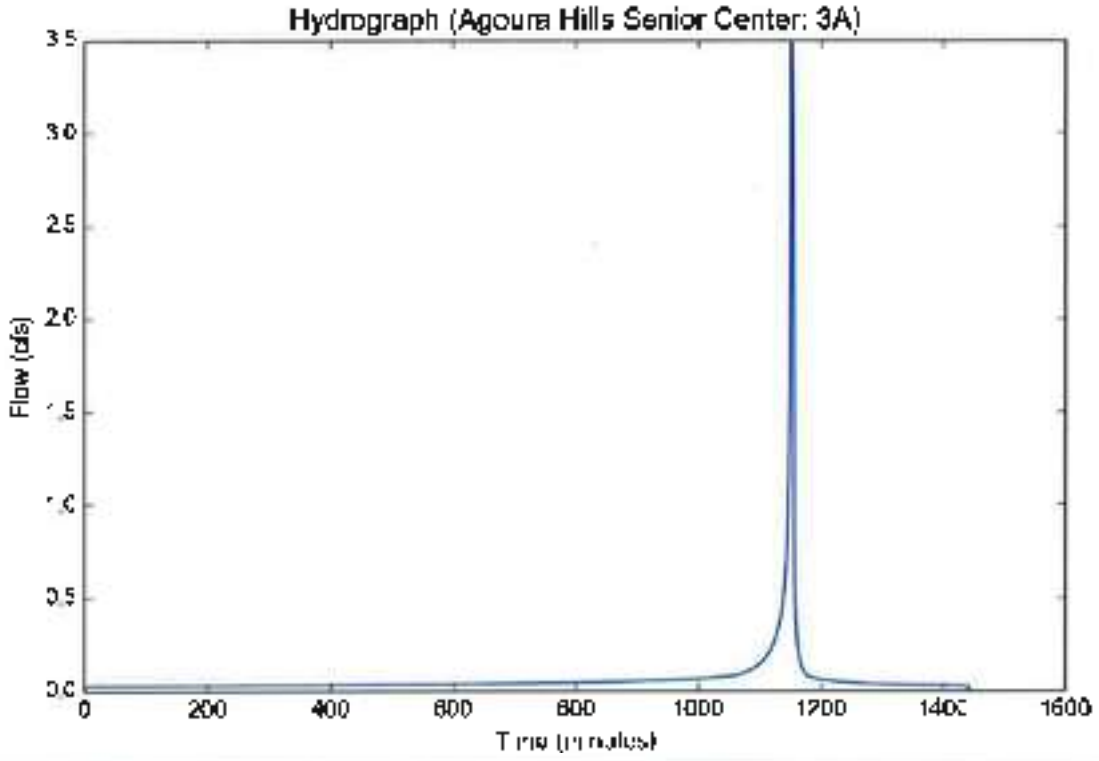
File location: R:/7305871.01 - Agoura Senior Village/10 CADD/10.* AutoCAD\Hydrology\Agoura Hills Senior Center Report.50Cx.prf
Version: HydroCalc 0.5.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	3A
Area (ac)	1.13
Flow Path Length (ft)	489.0
Flow Path Slope (vft/hft)	0.217
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.04
Soil Type	28
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	4.3971
Undeveloped Runoff Coefficient (Cu)	0.692
Developed Runoff Coefficient (Cd)	0.7003
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.4798
Burned Peak Flow Rate (cfs)	3.4798
24-Hr Clear Runoff Volume (ac-ft)	0.1289
24-Hr Clear Runoff Volume (cu-ft)	5614.9918



Appendix B

Proposed Conditions Q_{50} Hydrology Calculations

Peak Flow Hydrologic Analysis

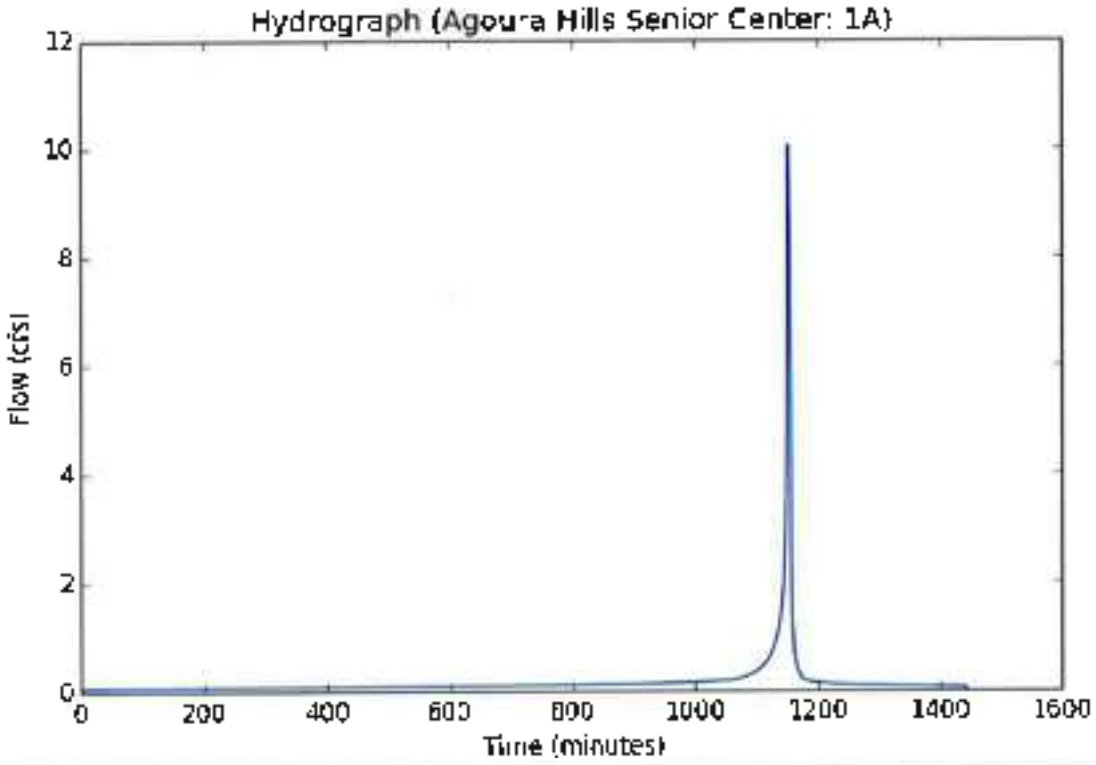
File location: N:/R305871.01 - Agoura Senior Village/10 CADD/10.1 AutoCAD/Hydrology/Agoura Hills Senior Center Report 50.pdf
Version: HydroCalc 0.8.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	1A
Area (ac)	3.29
Flow Path Length (ft)	386.0
Flow Path Slope (vft/hft)	0.111
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	4.3971
Undeveloped Runoff Coefficient (Cu)	0.692
Developed Runoff Coefficient (Cd)	0.6941
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	10.0413
Burned Peak Flow Rate (cfs)	10.0413
24-Hr Clear Runoff Volume (ac-ft)	0.3307
24-Hr Clear Runoff Volume (cu-ft)	14403.9108



Peak Flow Hydrologic Analysis

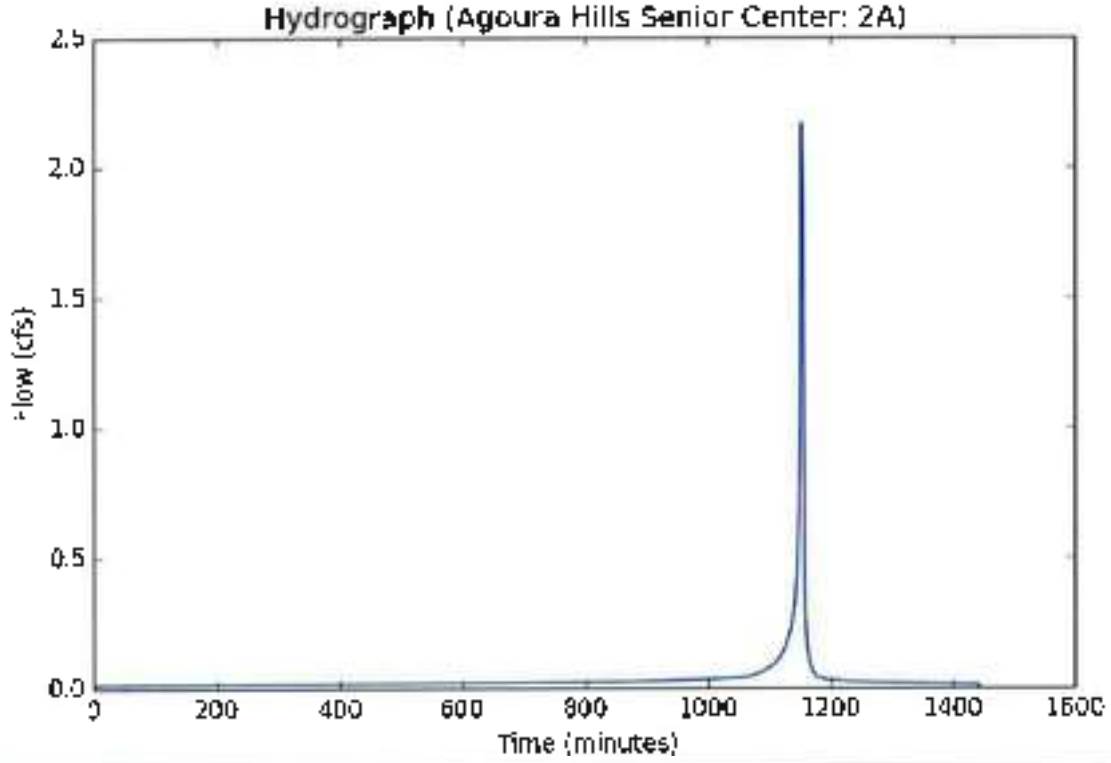
File location: R:\R305671.01 - Agoura Senior Village\10 CAD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.50.pdf
Version: HydroCalc 0.3.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	2A
Area (ac)	0.71
Flow Path Length (ft)	219.0
Flow Path Slope (vft/hft)	0.304
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	4.3971
Undeveloped Runoff Coefficient (Cu)	0.692
Developed Runoff Coefficient (Cd)	0.6941
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.167
Burned Peak Flow Rate (cfs)	2.167
24-Hr Clear Runoff Volume (ac-ft)	0.0714
24-Hr Clear Runoff Volume (cu-ft)	3108.4427



Peak Flow Hydrologic Analysis

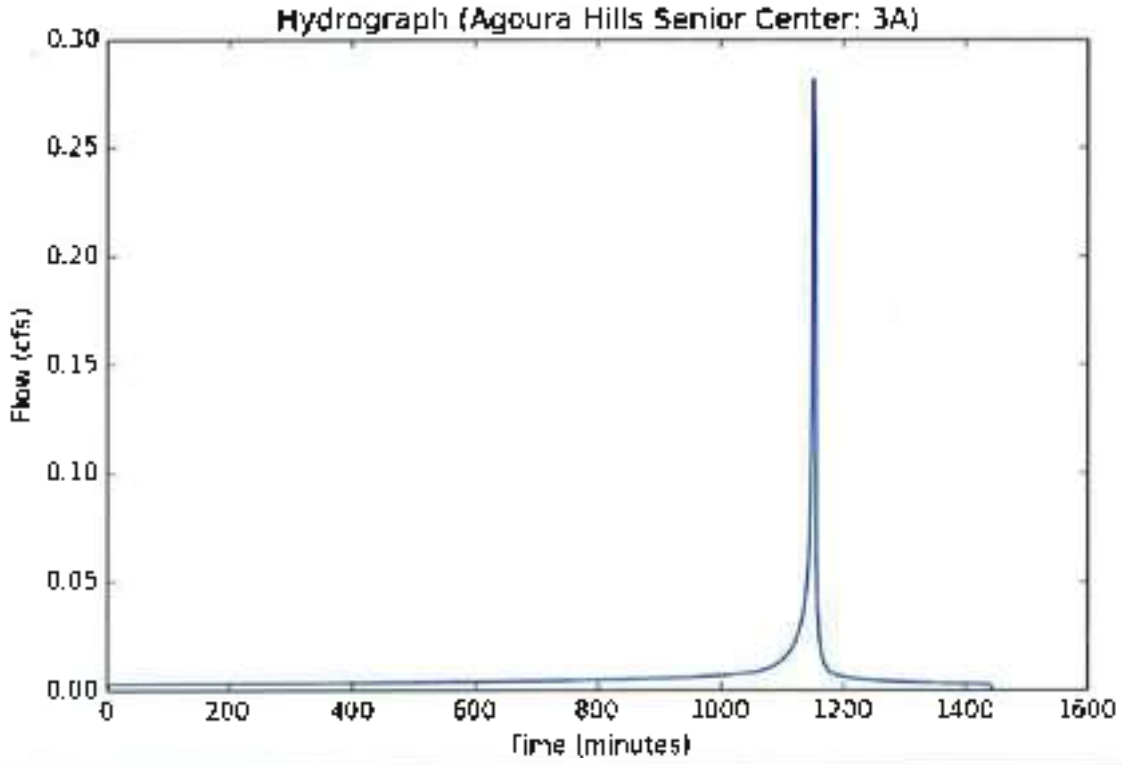
File location: R:\R306871.01 - Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report50.pdf
Version: HydroCalc 0.8.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	3A
Area (ac)	0.09
Flow Path Length (ft)	88.0
Flow Path Slope (vft/hft)	0.087
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.09
Soil Type	28
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	4.3971
Undeveloped Runoff Coefficient (Cu)	0.692
Developed Runoff Coefficient (Cd)	0.7107
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.2813
Burned Peak Flow Rate (cfs)	0.2813
24-Hr Clear Runoff Volume (ac-ft)	0.0123
24-Hr Clear Runoff Volume (cu-ft)	535.8514



Peak Flow Hydrologic Analysis

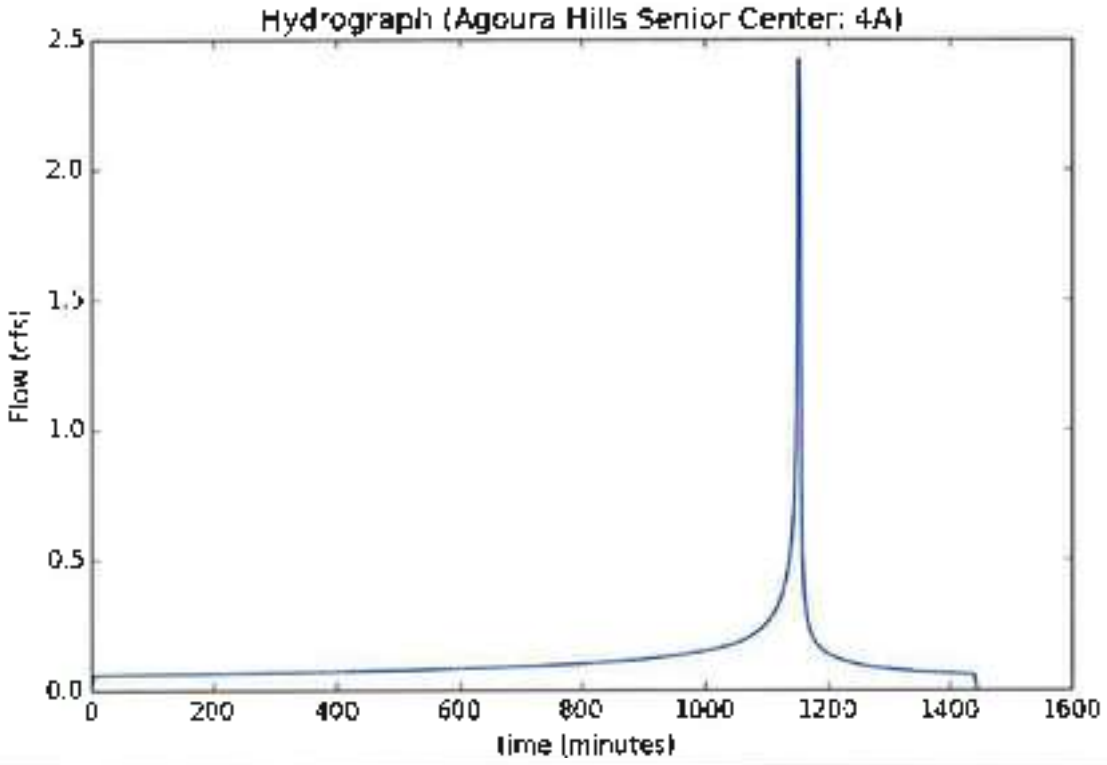
File location: R:\R305871.01 - Agoura Senior Village\IS CADD\IS_ AutoCAD\Hydrology\Agoura Hills Senior Center Report.50.sdl
Version: HydroCalc 0.3.* beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	4A
Area (ac)	0.69
Flow Path Length (ft)	231.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.51
Soil Type	28
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	4.3971
Undeveloped Runoff Coefficient (Cu)	0.692
Developed Runoff Coefficient (Cd)	0.7981
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.4214
Burned Peak Flow Rate (cfs)	2.4214
24-Hr Clear Runoff Volume (ac-ft)	0.2254
24-Hr Clear Runoff Volume (cu-ft)	9816.5861



Peak Flow Hydrologic Analysis

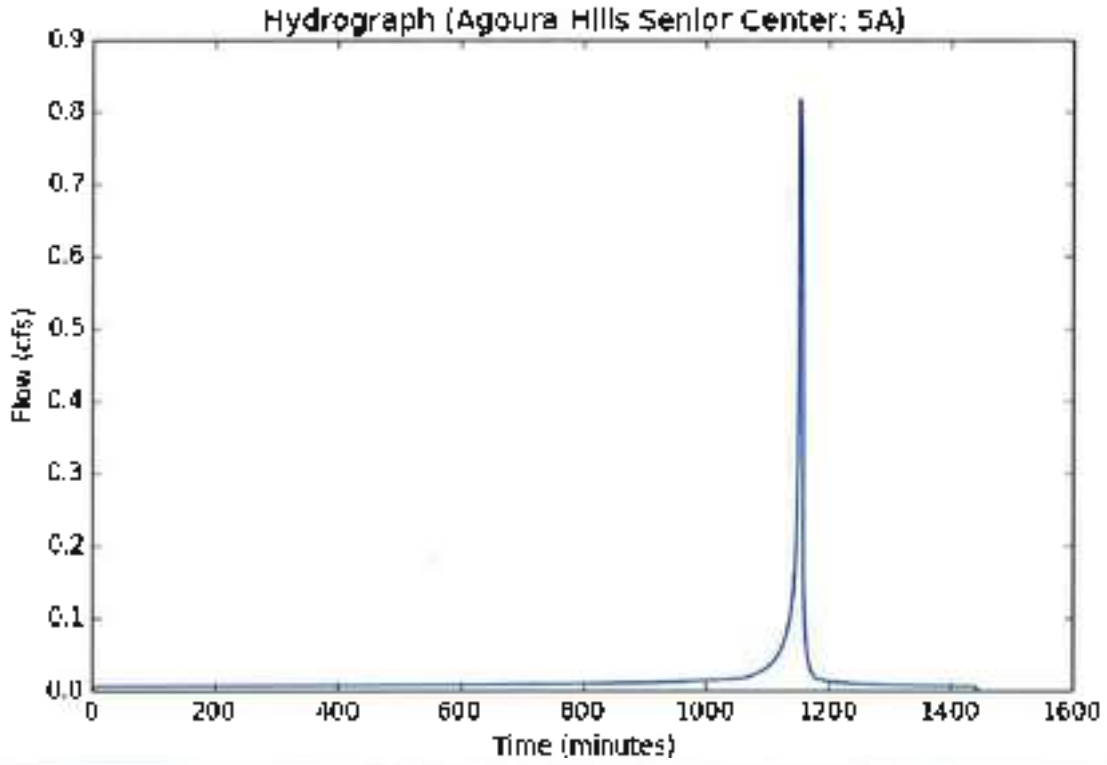
File location: R:\R305871.01 - Agoura Senior Village\90 CADD\90.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.50.pdf
Version: HydroCalc 1.0.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	5A
Area (ac)	0.3
Flow Path Length (ft)	599.0
Flow Path Slope (vft/hft)	0.076
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	4.036
Undeveloped Runoff Coefficient (Cu)	0.6718
Developed Runoff Coefficient (Cd)	0.6741
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.8162
Burned Peak Flow Rate (cfs)	0.8162
24-Hr Clear Runoff Volume (ac-ft)	0.0301
24-Hr Clear Runoff Volume (cu-ft)	1311.3344



Peak Flow Hydrologic Analysis

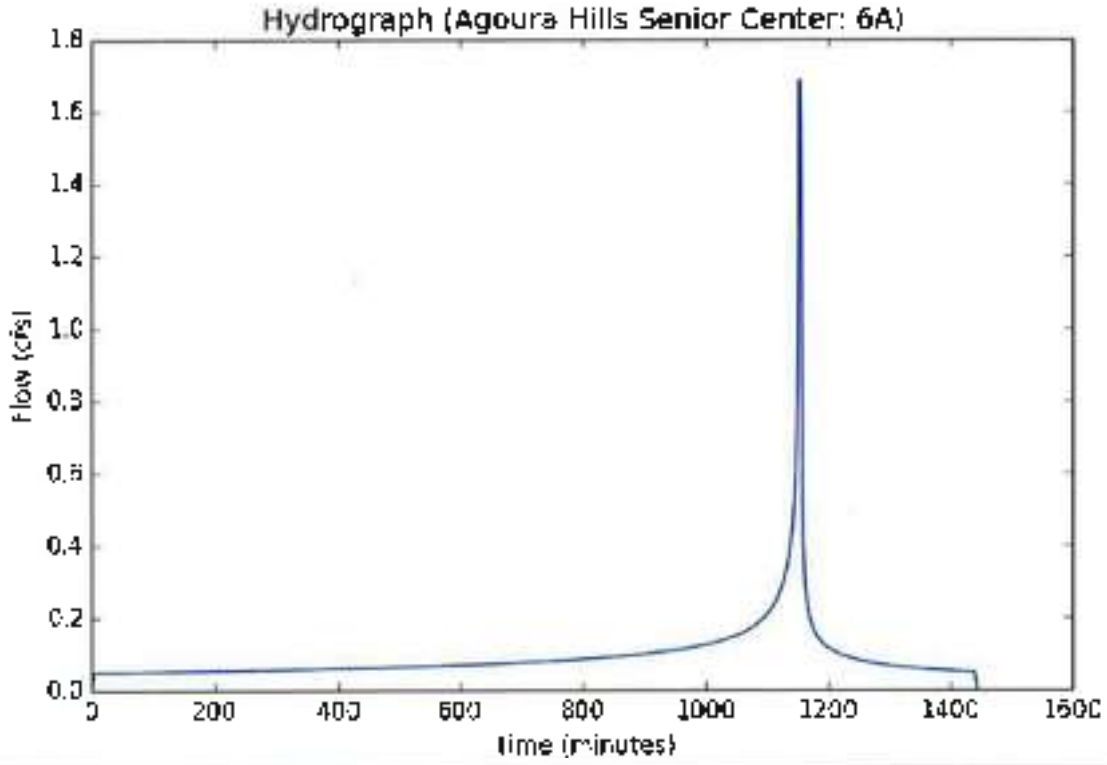
File location: R:\R305871.01 - Agoura Senior Village\10 CAD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report50.pdf
Version: HydroCalc 0.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	6A
Area (ac)	0.46
Flow Path Length (ft)	162.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.68
Soil Type	28
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	4.3971
Undeveloped Runoff Coefficient (Cu)	0.692
Developed Runoff Coefficient (Cd)	0.8334
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.6858
Burned Peak Flow Rate (cfs)	1.6858
24-Hr Clear Runoff Volume (ac-ft)	0.1856
24-Hr Clear Runoff Volume (cu-ft)	8084.7506



Peak Flow Hydrologic Analysis

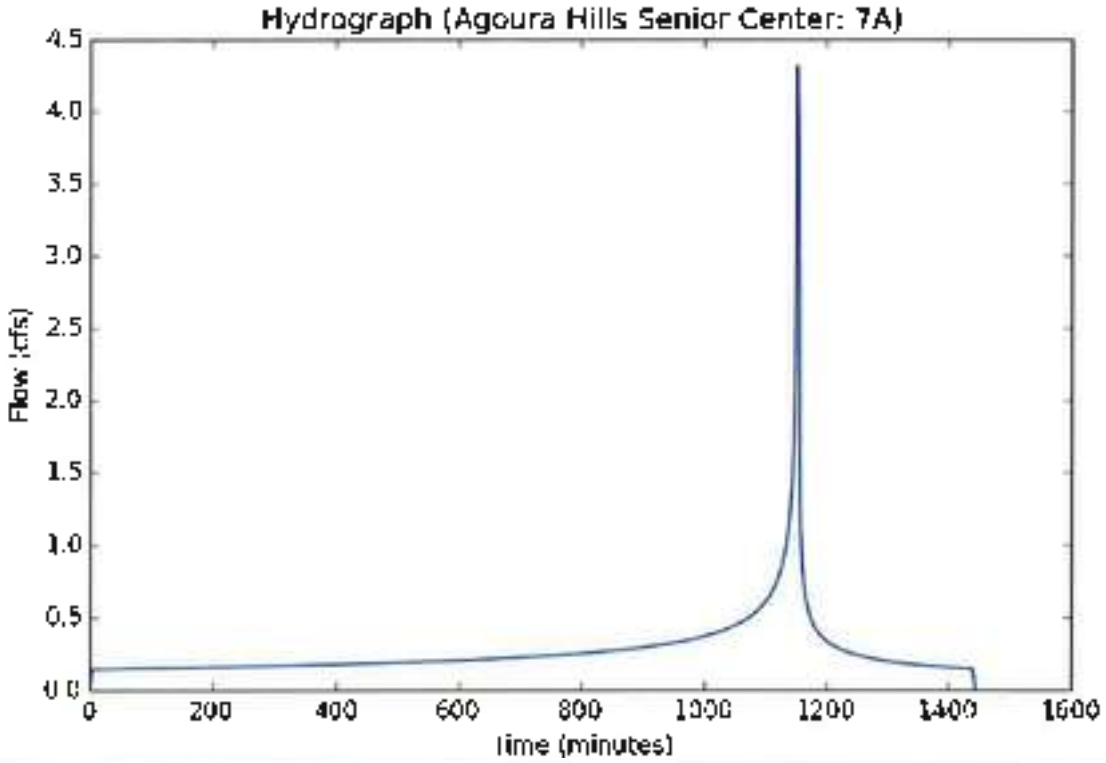
File location: R:\R305871.01 - Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report 50.prj
Version: HydroCalc 0.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	7A
Area (ac)	1.13
Flow Path Length (ft)	44.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.84
Soil Type	28
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	4.3971
Undeveloped Runoff Coefficient (Cu)	0.692
Developed Runoff Coefficient (Cd)	0.8667
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.3066
Burned Peak Flow Rate (cfs)	4.3066
24-Hr Clear Runoff Volume (ac-ft)	0.5377
24-Hr Clear Runoff Volume (cu-ft)	23421.709



Peak Flow Hydrologic Analysis

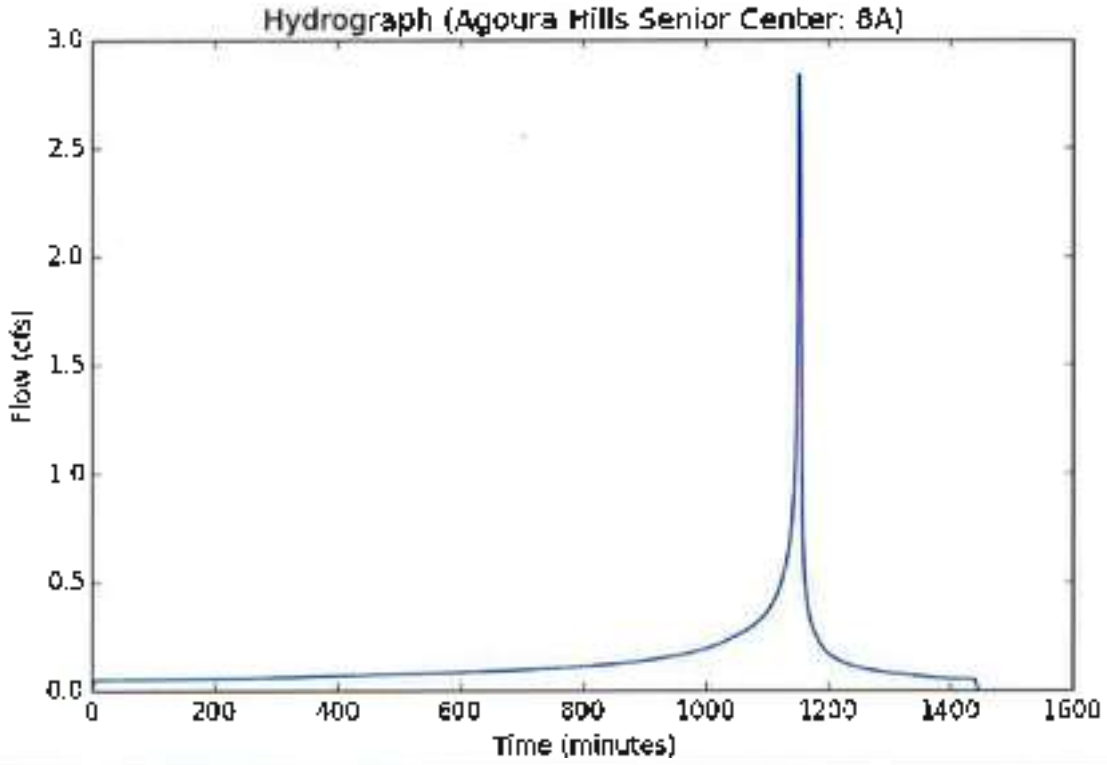
File location: R:\R005871.01 - Agoura Senior Village\10 CADD\10.* AutoCAD\Hydrology\Agoura Hills Senior Center Report 50.pdf
Version: HydroCalc 0.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	8A
Area (ac)	0.71
Flow Path Length (ft)	296.0
Flow Path Slope (vft/hft)	0.148
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.4
Soil Type	29
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.37
Peak Intensity (in/hr)	4.3971
Undeveloped Runoff Coefficient (Cu)	0.9147
Developed Runoff Coefficient (Cd)	0.9088
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.8373
Burned Peak Flow Rate (cfs)	2.8373
24-Hr Clear Runoff Volume (ac-ft)	0.2579
24-Hr Clear Runoff Volume (cu-ft)	11233.7288



Appendix C

Proposed Conditions Q_{10} Hydrology Calculations

Peak Flow Hydrologic Analysis

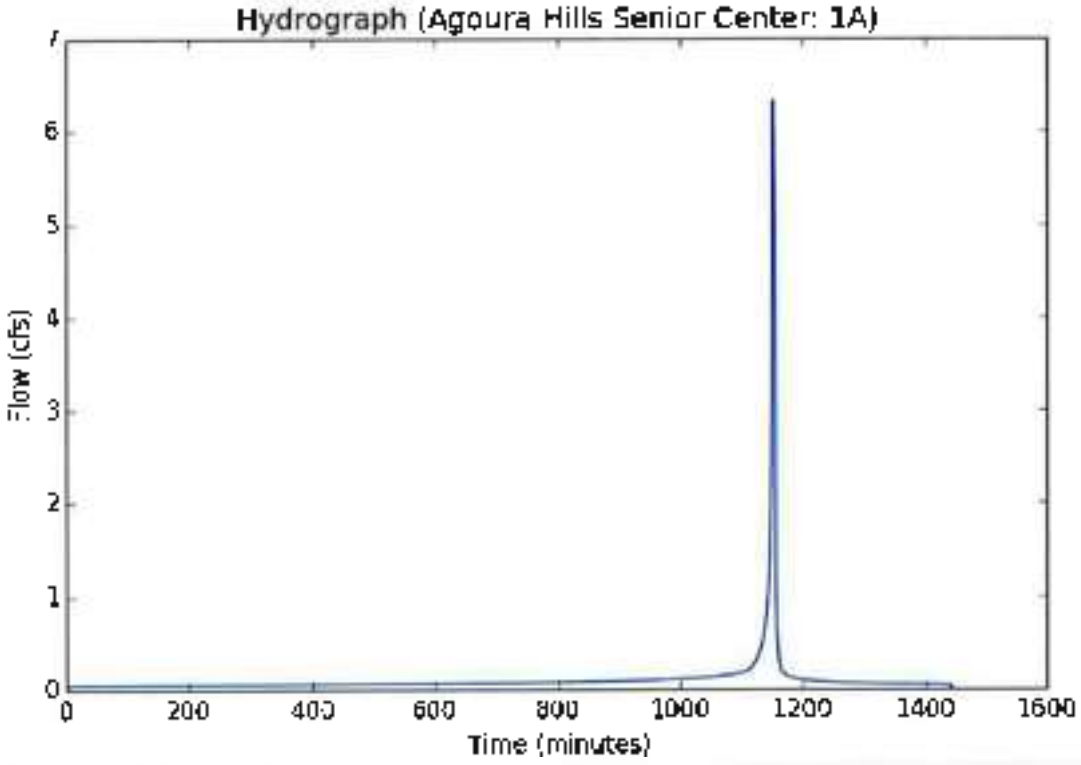
File location: R:\R3\05871.01 - Agoura Senior Village\10 CADD\10 1 AutoCAD\Hydrology\Agoura Hills Senior Center Report 10.pdf
Version: HydroCalc 0.3.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	1A
Area (ac)	3.29
Flow Path Length (ft)	386.0
Flow Path Slope (vft/hft)	0.111
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.2622
Peak Intensity (in/hr)	3.1396
Undeveloped Runoff Coefficient (Cu)	0.6094
Developed Runoff Coefficient (Cd)	0.6123
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.3243
Burned Peak Flow Rate (cfs)	6.3243
24-Hr Clear Runoff Volume (ac-ft)	0.2089
24-Hr Clear Runoff Volume (cu-ft)	9097.718



Peak Flow Hydrologic Analysis

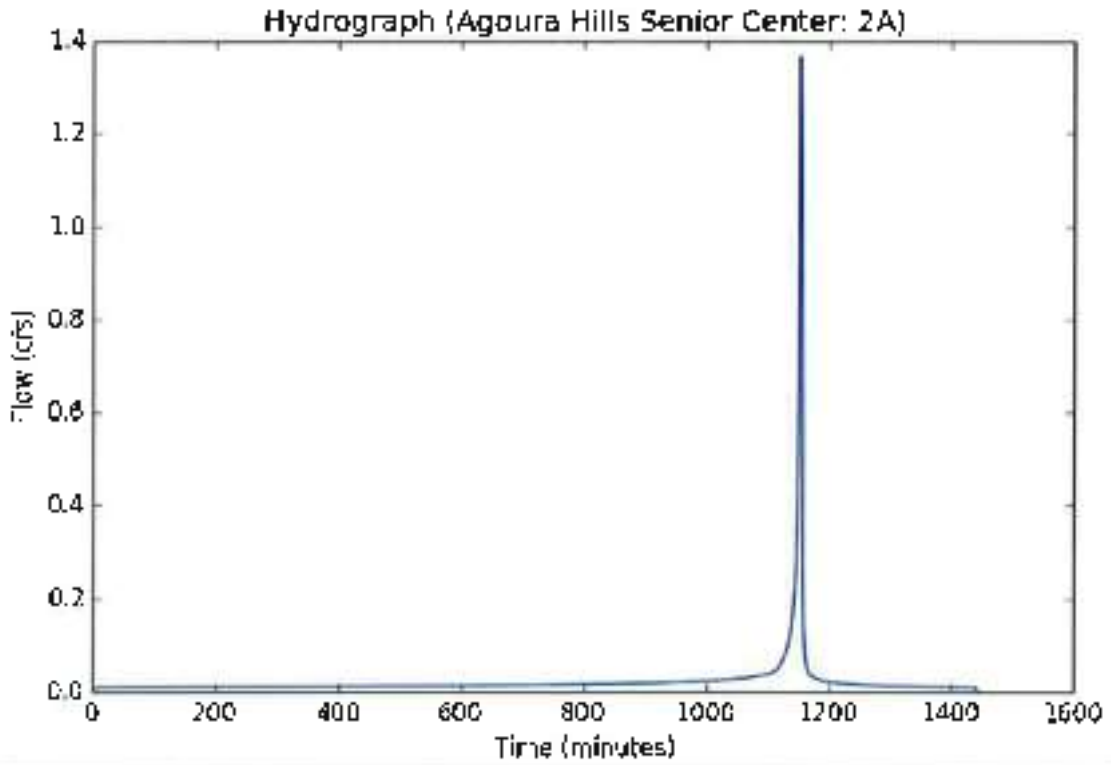
File location: R:\R3058\71.01 - Agoura Senior Village\10 CADD\10.1 AutoCAD Hydrology\Agoura Hills Senior Center Report 10.pdf
Version: HydroCalc 0.3.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	2A
Area (ac)	0.71
Flow Path Length (ft)	219.0
Flow Path Slope (vft/hft)	0.304
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.2622
Peak Intensity (in/hr)	3.1396
Undeveloped Runoff Coefficient (Cu)	0.6094
Developed Runoff Coefficient (Cd)	0.6123
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.3648
Burned Peak Flow Rate (cfs)	1.3648
24 Hr Clear Runoff Volume (ac-ft)	0.0451
24 Hr Clear Runoff Volume (cu-ft)	1963.3373



Peak Flow Hydrologic Analysis

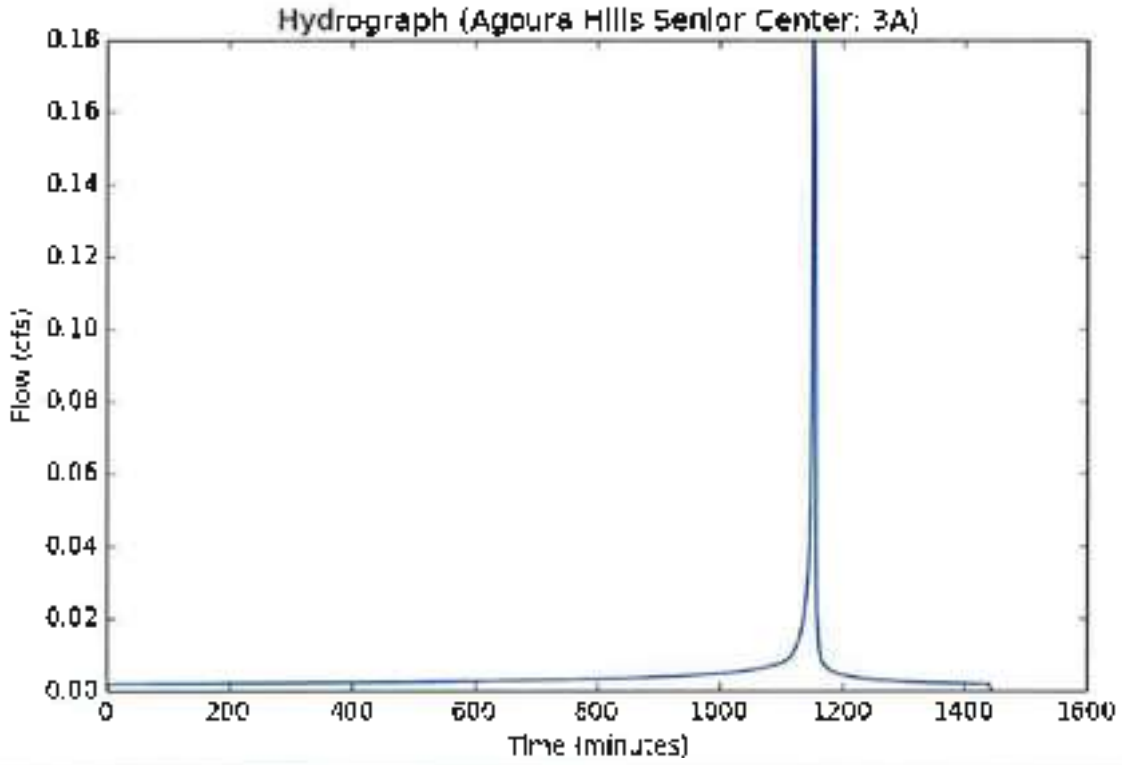
File location: R:\T3058\71.0\ - Agoura Senior Village\10 CADD\10 1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.10.pdf
Version: HydroCalc 0.3 1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	3A
Area (ac)	0.09
Flow Path Length (ft)	88.0
Flow Path Slope (vft/hft)	0.087
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.09
Soil Type	28
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.2622
Peak Intensity (in/hr)	3.1396
Undeveloped Runoff Coefficient (Cu)	0.6094
Developed Runoff Coefficient (Cd)	0.6355
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1796
Burned Peak Flow Rate (cfs)	0.1796
24-Hr Clear Runoff Volume (ac-ft)	0.0081
24-Hr Clear Runoff Volume (cu-ft)	352.7589



Peak Flow Hydrologic Analysis

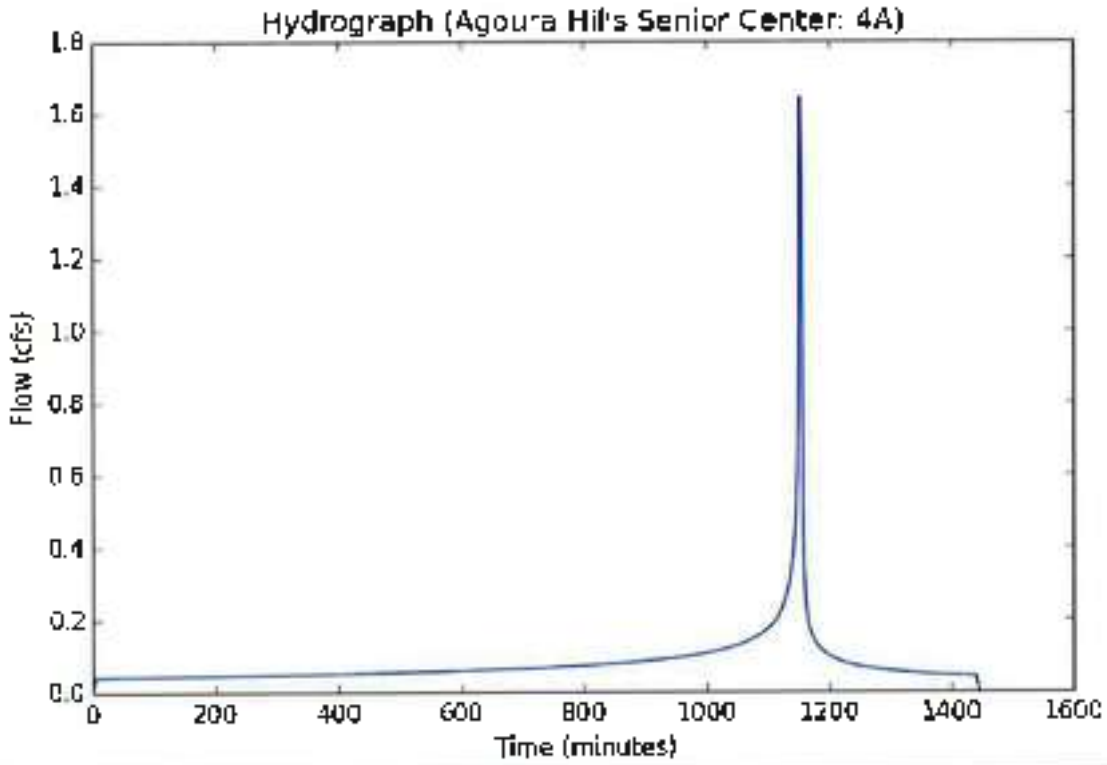
File location: R:\R005871.01 - Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.10.pdf
Version: HydroCalc 0.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	4A
Area (ac)	0.69
Flow Path Length (ft)	231.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.51
Soil Type	28
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.2622
Peak Intensity (in/hr)	3.1396
Undeveloped Runoff Coefficient (Cu)	0.6094
Developed Runoff Coefficient (Cd)	0.7576
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.6412
Burned Peak Flow Rate (cfs)	1.6412
24-Hr Clear Runoff Volume (ac-ft)	0.1581
24-Hr Clear Runoff Volume (cu-ft)	6885.961



Peak Flow Hydrologic Analysis

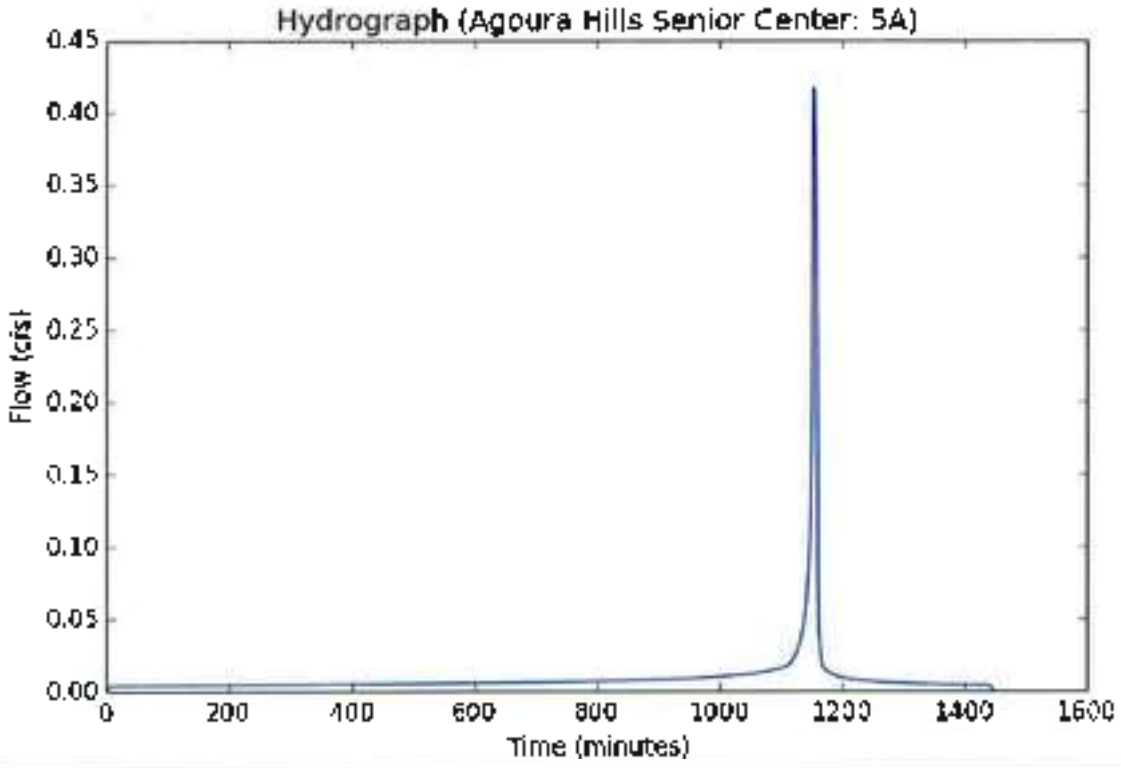
File location: R:\R005671.01 - Agoura Senior Village\7.0 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.10.pdf
Version: HydroCalc 3.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	5A
Area (ac)	0.3
Flow Path Length (ft)	599.0
Flow Path Slope (vft/hft)	0.076
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.2622
Peak Intensity (in/hr)	2.5173
Undeveloped Runoff Coefficient (Cu)	0.5485
Developed Runoff Coefficient (Cd)	0.5521
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.4169
Burned Peak Flow Rate (cfs)	0.4169
24-Hr Clear Runoff Volume (ac-ft)	0.0189
24-Hr Clear Runoff Volume (cu-ft)	822.3781



Peak Flow Hydrologic Analysis

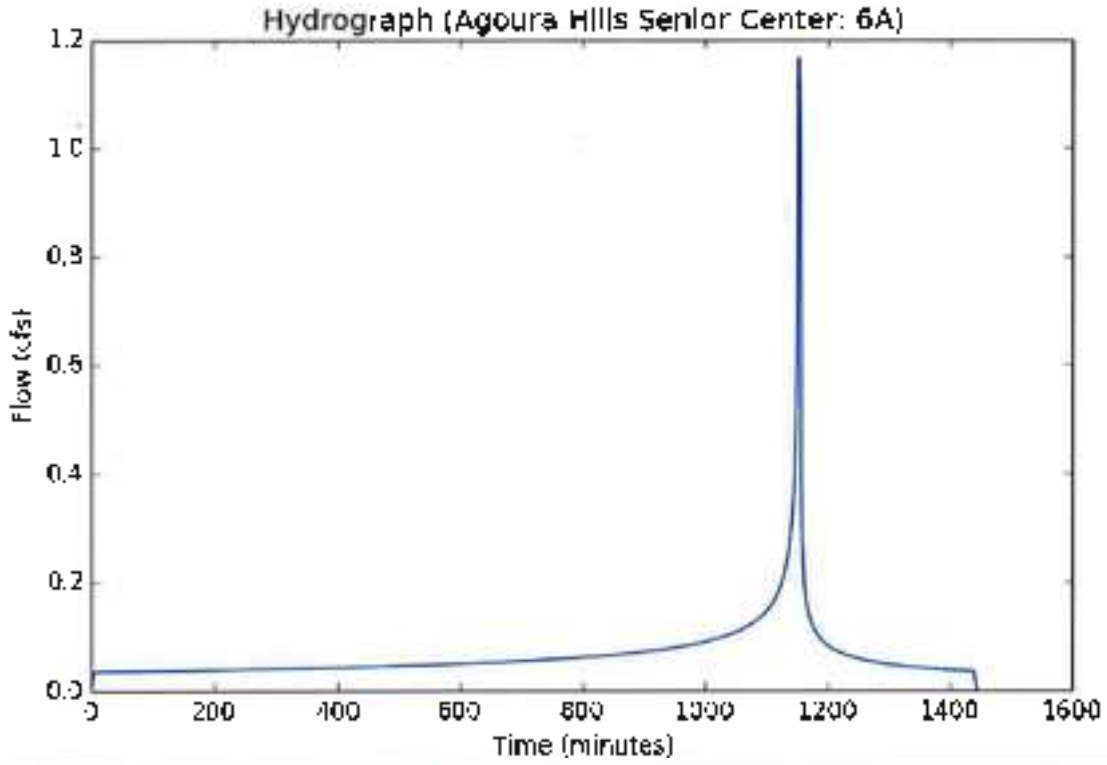
File location: R:\R335871.01 - Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.10.cdt
Version: HydroCalc 0.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	6A
Area (ac)	0.46
Flow Path Length (ft)	162.0
Flow Path Slope (vft/hft)	0.021
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.68
Soil Type	28
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.2622
Peak Intensity (in/hr)	3.1396
Undeveloped Runoff Coefficient (Cu)	0.6094
Developed Runoff Coefficient (Cd)	0.807
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.1655
Burned Peak Flow Rate (cfs)	1.1655
24-Hr Clear Runoff Volume (ac-ft)	0.1313
24-Hr Clear Runoff Volume (cu-ft)	5718.8819



Peak Flow Hydrologic Analysis

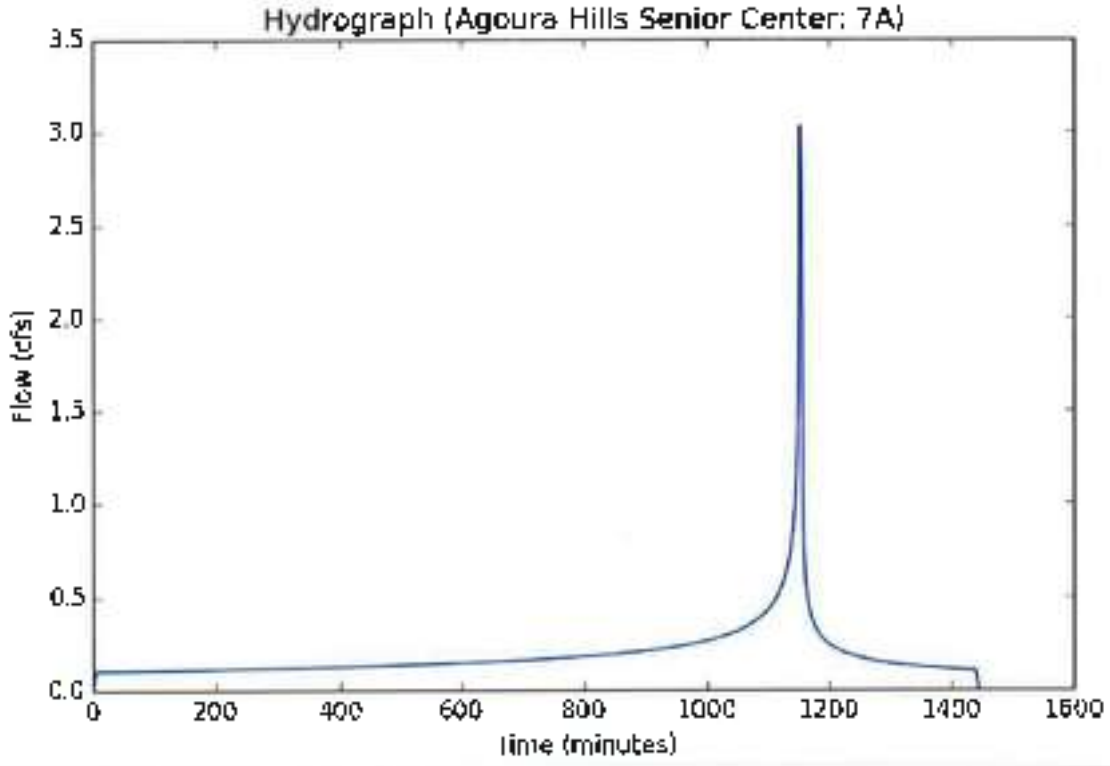
File location: R:\R305871.01 - Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura hills Senior Center Report.10.sdf
Version: HydroCalc 0.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	7A
Area (ac)	1.13
Flow Path Length (ft)	44.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.84
Soil Type	28
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.2622
Peak Intensity (in/hr)	3.1396
Undeveloped Runoff Coefficient (Cu)	0.6094
Developed Runoff Coefficient (Cd)	0.8535
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.028
Burned Peak Flow Rate (cfs)	3.028
24-Hr Clear Runoff Volume (ac-ft)	0.3624
24-Hr Clear Runoff Volume (cu-ft)	16657.2285



Peak Flow Hydrologic Analysis

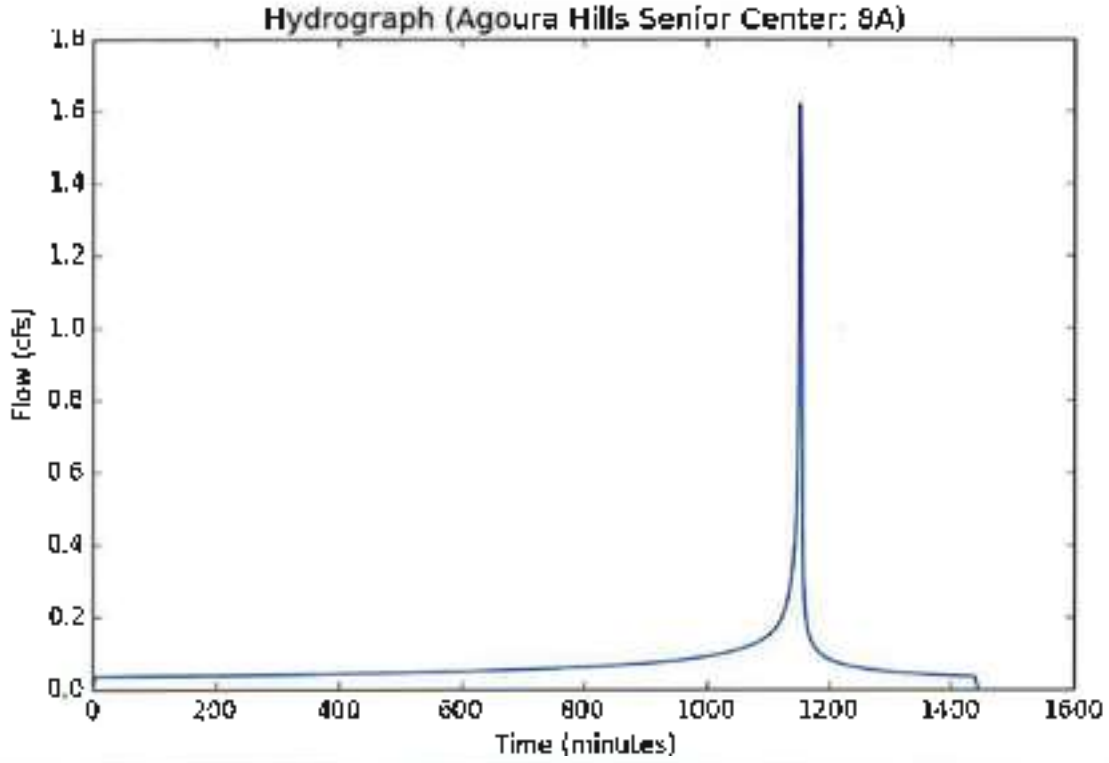
File location: R:\R0156171.01 Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report 10.psf
Version: HydraCalc 0.0.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	8A
Area (ac)	0.71
Flow Path Length (ft)	296.0
Flow Path Slope (vft/hft)	0.148
50-yr Rainfall Depth (in)	7.37
Percent Impervious	0.4
Soil Type	28
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.2622
Peak Intensity (in/hr)	3.1396
Undeveloped Runoff Coefficient (Cu)	0.6094
Developed Runoff Coefficient (Cd)	0.7256
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.6175
Burned Peak Flow Rate (cfs)	1.6175
24-Hr Clear Runoff Volume (ac-ft)	0.1368
24-Hr Clear Runoff Volume (cu-ft)	5958.5861



Appendix D

Proposed Conditions SWQDv Hydrology Calculations

Peak Flow Hydrologic Analysis

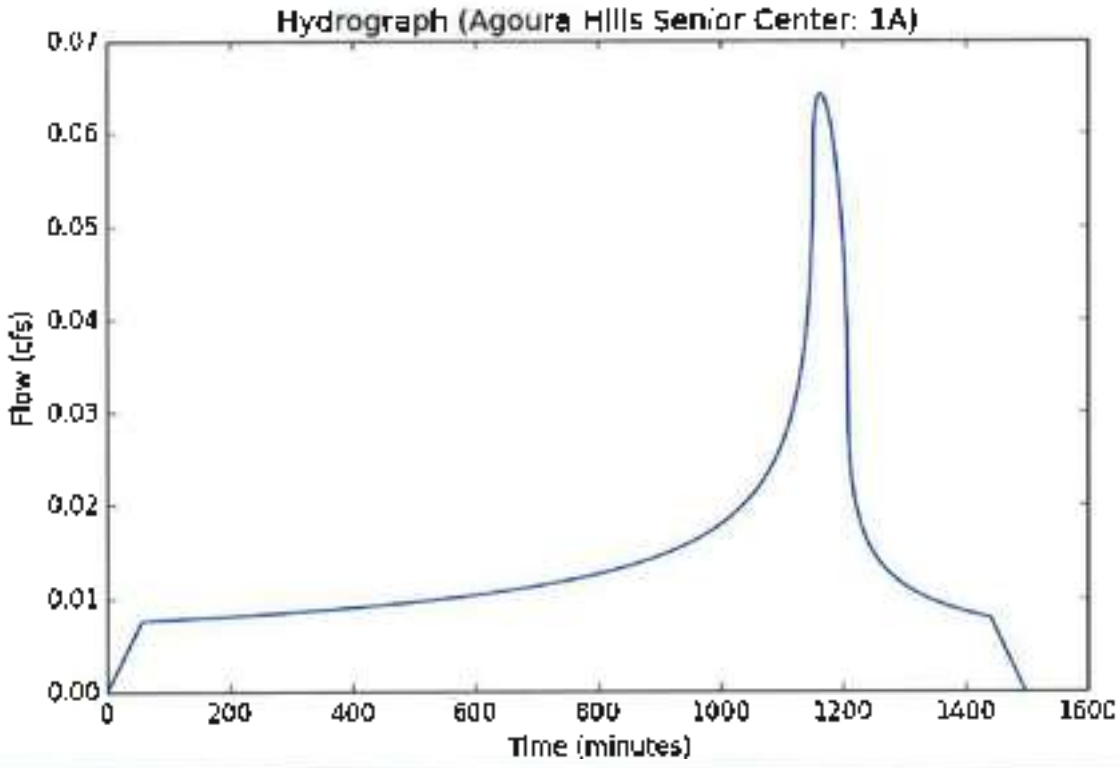
File location: H:\R\0587.01 - Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.WQ.pdf
Version: HydroCalc 0.3.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	1A
Area (ac)	3.29
Flow Path Length (ft)	386.0
Flow Path Slope (vft/hft)	0.111
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.1806
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	57.0
Clear Peak Flow Rate (cfs)	0.0642
Burned Peak Flow Rate (cfs)	0.0642
24-Hr Clear Runoff Volume (ac-ft)	0.0279
24-Hr Clear Runoff Volume (cu-ft)	1215.2457



Peak Flow Hydrologic Analysis

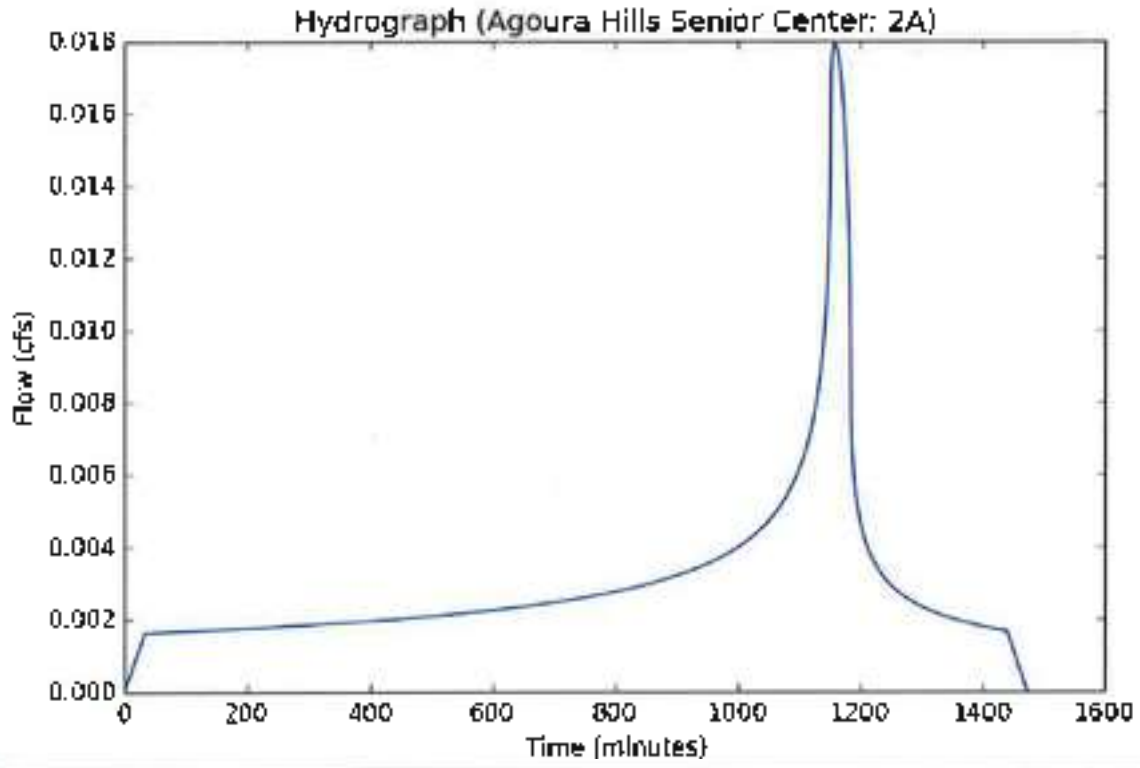
File location: R:\R9358.01 Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report WQ.pdf
Version: HydroCalc 0.3.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	2A
Area (ac)	0.71
Flow Path Length (ft)	219.0
Flow Path Slope (vft/hft)	0.304
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.2335
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	33.0
Clear Peak Flow Rate (cfs)	0.0179
Burned Peak Flow Rate (cfs)	0.0179
24-Hr Clear Runoff Volume (ac-ft)	0.006
24-Hr Clear Runoff Volume (cu-ft)	262.2493



Peak Flow Hydrologic Analysis

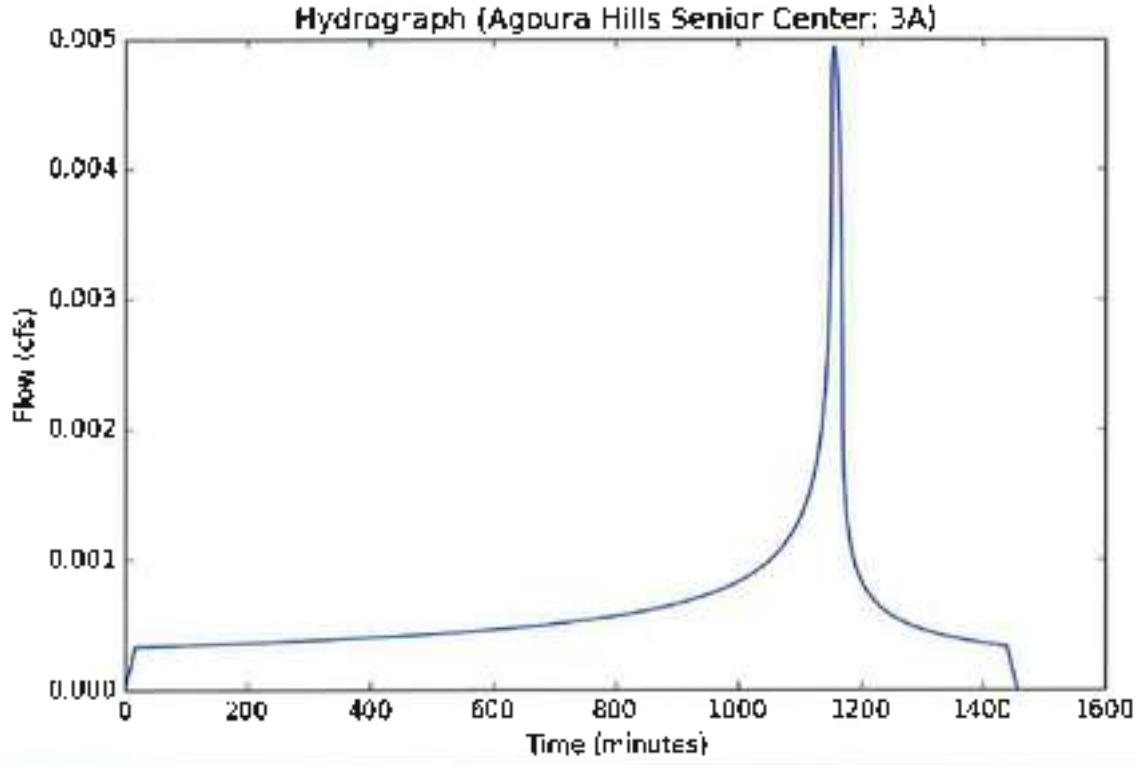
File location: R:\F305871.01 - Agoura Senior Village\10 CADD\ 0.1 Arch\CADM lyc\rology\Agoura Hills Senior Center Tesort.WQ.pdf
Version: HydroCalc 0.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	3A
Area (ac)	0.09
Flow Path Length (ft)	88.0
Flow Path Slope (vft/hft)	0.087
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.09
Soil Type	28
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3189
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.172
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	0.0049
Burned Peak Flow Rate (cfs)	0.0049
24-Hr Clear Runoff Volume (ac ft)	0.0012
24-Hr Clear Runoff Volume (cu ft)	52.9418



Peak Flow Hydrologic Analysis

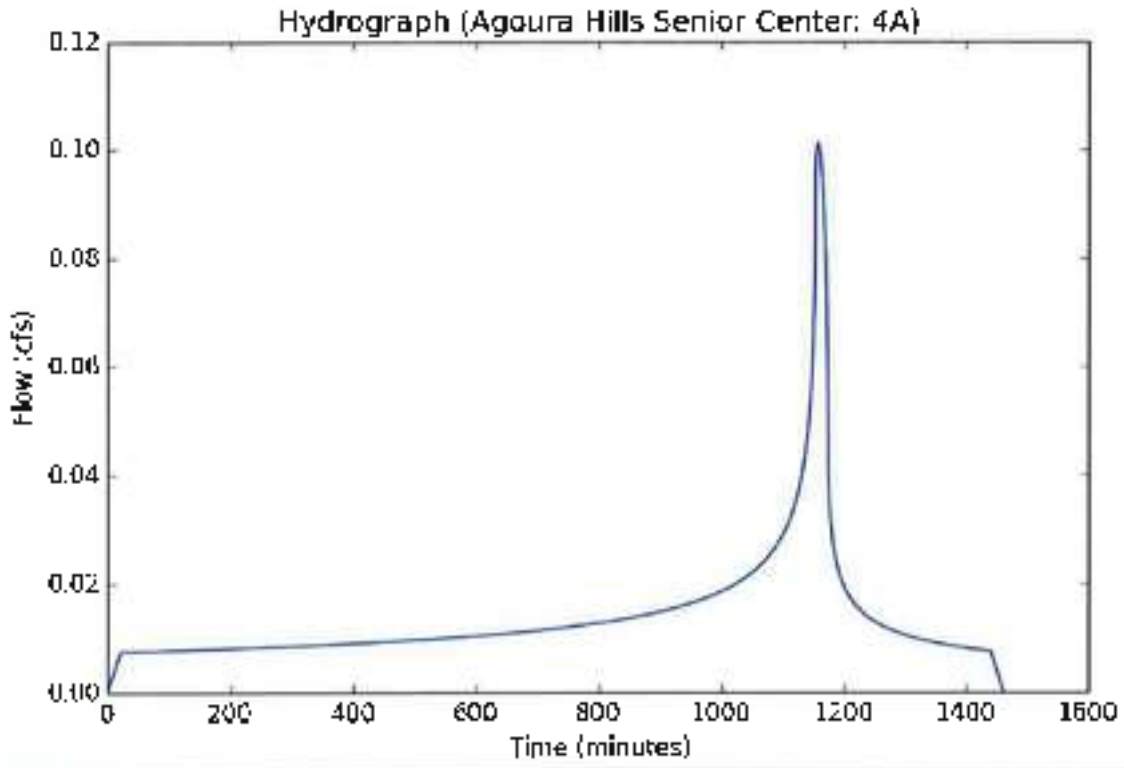
File location: P:\R305871.01 Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report WQ.pdf
Version: HydroCalc 0.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	4A
Area (ac)	0.69
Flow Path Length (ft)	231.0
Flow Path Slope (vft/hft)	0.013
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.51
Soil Type	28
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.2887
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.508
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	0.1012
Burned Peak Flow Rate (cfs)	0.1012
24-Hr Clear Runoff Volume (ac ft)	0.0275
24-Hr Clear Runoff Volume (cu ft)	1198.7851



Peak Flow Hydrologic Analysis

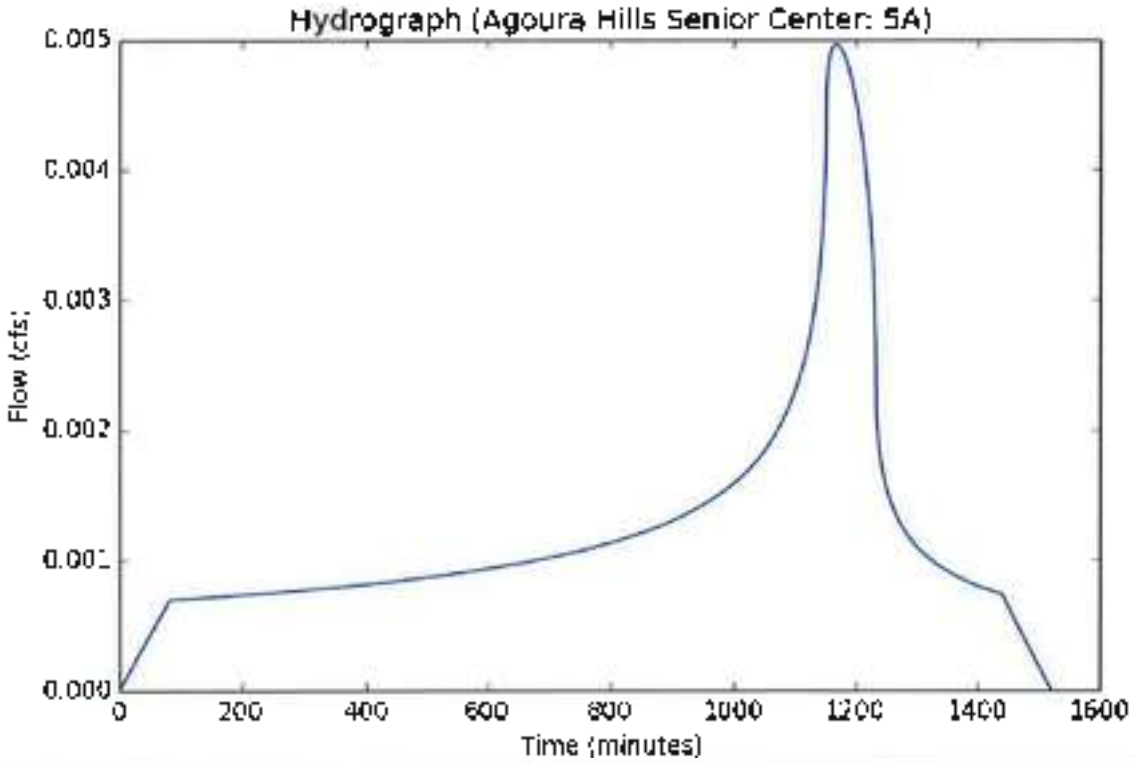
File location: R:/7305871.01 - Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report WQ.pdf
Version: HydroCalc 0.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	5A
Area (ac)	0.3
Flow Path Length (ft)	599.0
Flow Path Slope (vft/hft)	0.076
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.01
Soil Type	28
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.1531
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	81.0
Clear Peak Flow Rate (cfs)	0.005
Burned Peak Flow Rate (cfs)	0.005
24-Hr Clear Runoff Volume (ac-ft)	0.0025
24-Hr Clear Runoff Volume (cu-ft)	110.8176



Peak Flow Hydrologic Analysis

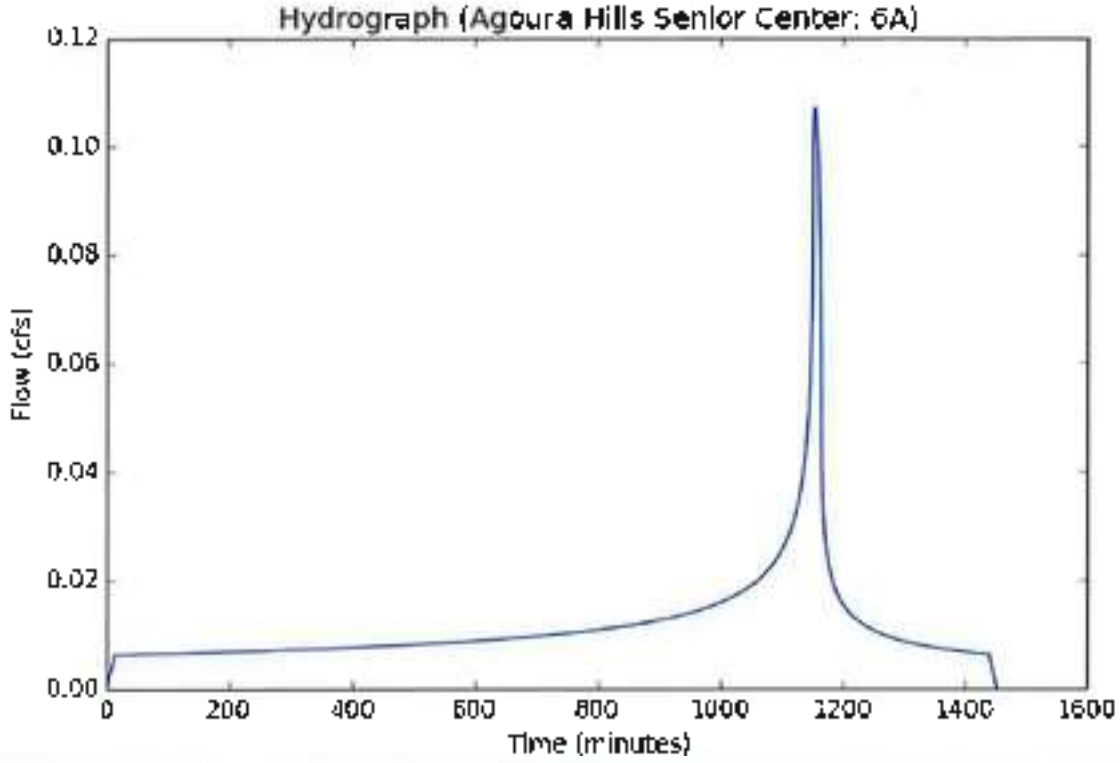
File location: R:\P005871.01 - Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.WQ.pdf
Version: HydroCalc 0.3.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	6A
Area (ac)	0.46
Flow Path Length (ft)	162.0
Flow Path Slope (vft/hft)	0.021
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.68
Soil Type	28
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3617
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.644
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	0.1072
Burned Peak Flow Rate (cfs)	0.1072
24-Hr Clear Runoff Volume (ac-ft)	0.0233
24-Hr Clear Runoff Volume (cu-ft)	1013.143



Peak Flow Hydrologic Analysis

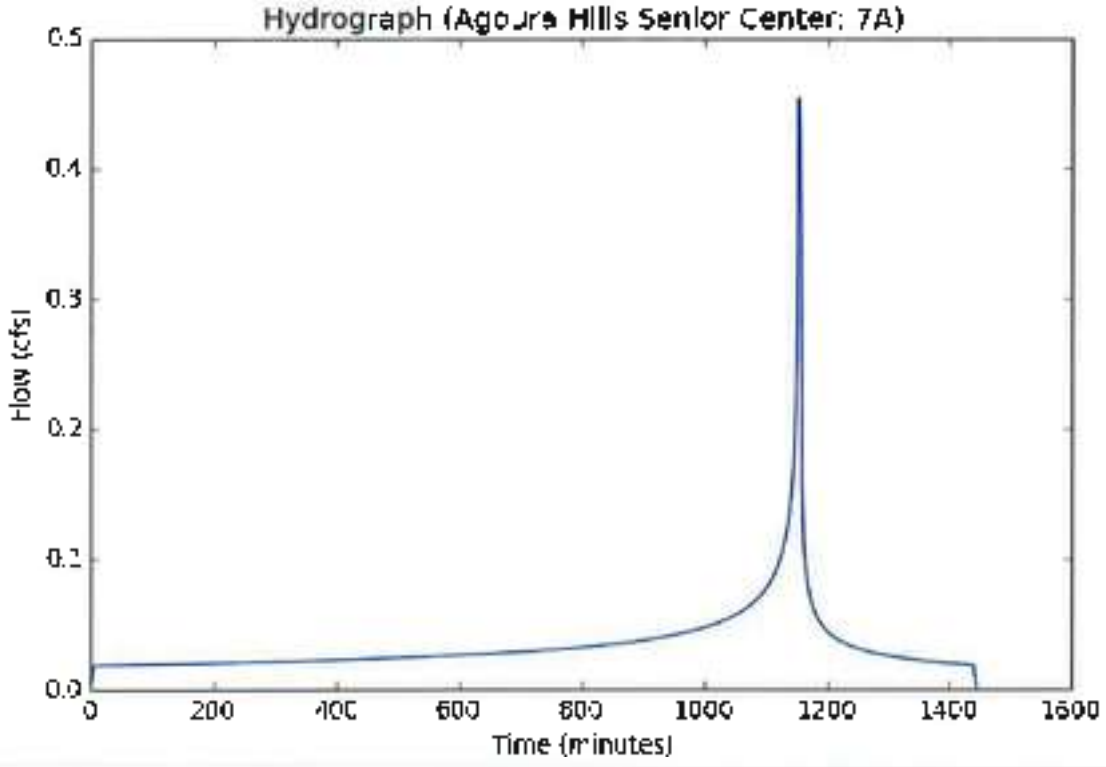
File location: R:\R205871.01 - Agoura Senior Villas\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.WQ.pdf
Version: HydroCalc 0.3.1 beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	7A
Area (ac)	1.13
Flow Path Length (ft)	44.0
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.84
Soil Type	28
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5202
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.772
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.4538
Burned Peak Flow Rate (cfs)	0.4538
24-Hr Clear Runoff Volume (ac-ft)	0.0685
24-Hr Clear Runoff Volume (cu-ft)	2983.4725



Peak Flow Hydrologic Analysis

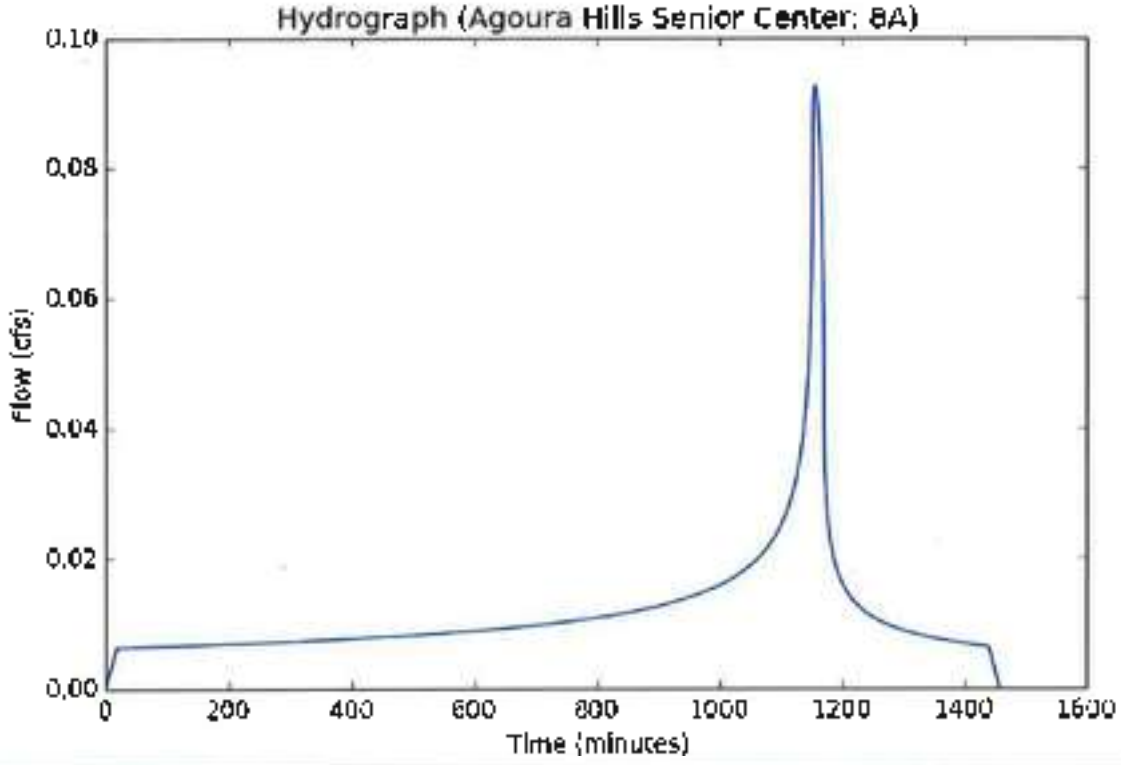
File location: R:\R3056\10 01 Agoura Senior Village\10 CADD\10.1 AutoCAD\Hydrology\Agoura Hills Senior Center Report.WQ.txt
Version: HydroCalc 0.3.1-beta

Input Parameters

Project Name	Agoura Hills Senior Center
Subarea ID	8A
Area (ac)	0.71
Flow Path Length (ft)	296.0
Flow Path Slope (vft/hft)	0.148
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.4
Soil Type	28
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3104
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.42
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	0.0926
Burned Peak Flow Rate (cfs)	0.0926
24-Hr Clear Runoff Volume (ac-ft)	0.0234
24-Hr Clear Runoff Volume (cu-ft)	1019.8482



Appendix E

Geotechnical Explorations

GEOTECHNICAL INVESTIGATION
OAKMONT OF AGOURA HILLS
29353 CANWOOD STREET
AGOURA HILLS, CALIFORNIA
PREPARED FOR
OAKMONT SENIOR LIVING
JOB NO. 15473-3

GEOTECHNICAL INVESTIGATION
OAKMONT OF AGOURA HILLS
29353 CANWOOD STREET
AGOURA HILLS, CALIFORNIA
PREPARED FOR
OAKMONT SENIOR LIVING
JOB NO. 15473-3

INTRODUCTION

During October of 2015, this firm performed a geotechnical investigation for the proposed Oakmont of Agoura Hills senior facility, which is to be located at 29353 Canwood Street (APN 2053-001-005), in the city of Agoura Hills, California. The purposes of this investigation were to explore and evaluate the geotechnical engineering/engineering geologic conditions of the site and to provide appropriate geotechnical engineering recommendations for the design and construction of the subject project.

The approximate location of the site is shown on the attached Index Map (Enclosure "A-1"). To orient our investigation, a site plan prepared by Landesign Group, Inc., showing the building location was provided for our use. The plan was utilized as a base map for our Site Plan (Enclosure "A-2")

The results of our investigation, together with our conclusions and recommendations, are presented in this report.

SCOPE OF SERVICES

The scope of services provided during this investigation included the following:

- Review of published and unpublished geologic literature and maps
- Field reconnaissance of the subject site and surrounding area and geologic mapping of the site
- Marking of exploration locations in the field and notification of Underground Service Alert
- Placement of four exploratory borings within the building pad area

- Placement of seven exploratory trenches within the site area
- Double-ring infiltrometer testing at two locations on the site
- Logging and sampling of the exploratory borings and test pits for testing and evaluation
- Laboratory testing on selected samples
- Evaluation of geologic hazards
- Seismic design parameters according to the 2013 California Building Code (CBC)
- Evaluation of the geotechnical data to develop site-specific recommendations for suitable foundation recommendations, including allowable bearing pressures, ultimate and allowable passive earth resistance and base friction, lateral earth pressures and mitigation of potential geotechnical concerns and hazards, such as expansive soils, liquefaction and seismic settlement, if encountered
- Preparation of this report summarizing our findings, professional opinions and recommendations for the geotechnical aspects of project design and construction

PROJECT CONSIDERATIONS

The proposed two- and three-story senior facility will include more than 80 units and will be approximately 80,000 square feet in plan area. We anticipate that the facility will be of wood frame and stucco or masonry construction. Light to moderate foundations loads are typically associated with structures of the type proposed.

Our review of furnished plans indicates that the site elevation varies approximately 120 feet, with the highest elevation of approximately 1,000 feet at the northeast corner and the lowest of approximately 880 feet at the southwest corner. The northern portion of the building pad (2-story portion) will be at elevation 912 feet and the southern portion of the building pad (3-story portion) will be at elevation 902 feet. Based on this information, we anticipate that the building pad and foundations will be stepped. Per our conversation with the client, post-tension slab foundations are anticipated. We expect that the slope on the north side of the building pad will be cut to provide a level building pad and

that stepped retaining walls will be required for slope stability purposes. The slope cut will be on the order of 20 feet.

The final project grading plan should be reviewed by the geotechnical engineer to confirm that recommendations provided in this report have been properly implemented.

SITE DESCRIPTION

The site is located along a freeway frontage road on the north side of the 101 freeway, west of the Kanan Road off-ramp. At the time of our investigation, commercial buildings were located west of the site, and undeveloped land was located to the north and east. The site slopes up at a gentle grade north from Kanan Road to the toe of an approximately 2 horizontal (h) to 1 vertical (v) slope located north of the proposed building area. Debris and evidence of an abandoned structure and foundation area were present in the northeastern portion of the site.

Historic aerial imagery dating from 1947 was examined as part of this investigation. At the time of the 1947 aerial image, the site and surrounding area were undeveloped land. By the time of the 1959 aerial image, several structures were present on the north portion of the site. These structures remained on the site until the time of the 1980 aerial image, when the site appeared in its present condition, with debris in the northeastern portion of the site. Construction began on the commercial structures west of the site by the time of the image dated December 31, 2006, and was completed between the time of the image dated January 8, 2008, and May 24, 2009.

FIELD INVESTIGATION

Four exploratory borings were drilled to a maximum depth of 50-1/2 feet below the existing ground surface (bgs) using a limited-access (track mounted) hollow-stem auger drill rig equipped for soil sampling. In addition, seven trenches were excavated to depths ranging from 4 feet to 9-1/2 feet bgs. The exploratory trenches were used to evaluate the geologic structure of the bedrock. Two exploratory test pits were excavated in the proposed parking and driveway areas and were utilized to

perform double-ring infiltrometer tests. The approximate locations of our exploratory borings, trenches and test pits are indicated on the attached Site Plan (Enclosure "A-2").

Continuous logs of the subsurface conditions, as encountered within the exploratory borings, were recorded at the time of drilling by a staff geologist from this firm. Both a standard penetration test (SPT) sampler (2-inch outer diameter and 1-3/8 inch inner diameter) and a modified California sampler (3-1/4-inch outer diameter and 2-3/8-inch inner diameter) were utilized in our investigation. Relatively undisturbed samples were obtained by driving the modified California sampler (a split-spoon ring sampler) ahead of the borings at selected levels. The penetration resistance was recorded on the boring logs as the number of hammer blows used to advance the sampler in 6-inch increments (or less if noted). The sampler is driven with an automatic hammer that drops a 140-pound weight 30 inches for each blow. After the required seating, the sampler is advanced up to 18 inches, providing up to three sets of blowcounts at each sampling interval. The recorded blows are raw numbers without any corrections for hammer type (automatic vs. manual cathead) or sampler size (California sampler vs. standard penetration test sampler). Both relatively undisturbed and bulk samples of typical soil types obtained were returned to the laboratory in sealed containers for testing and evaluation.

Our exploratory boring logs, together with our in-place blowcounts per 6-inch increment, are presented in Appendix "B". The stratification lines presented on the boring logs represent approximate boundaries between soil types, which may include gradual transitions.

LABORATORY INVESTIGATION

Included in our laboratory testing program were field moisture content tests on all samples returned to the laboratory and field dry density tests on all relatively undisturbed ring samples. The results are included on the boring logs. An optimum moisture content - maximum dry density relationship was established for a representative soil type. A direct shear test was performed on a selected remolded sample in order to provide shear strength parameters for bearing capacity and earth pressure evaluations. No. 200 wash, sieve analysis, sand equivalent and plasticity index testing was

performed on selected samples in order to classify the subsurface soils encountered. Expansion index testing was performed on a selected sample to evaluate the expansion potential of the subsurface soils. Since the on-site soils are expansive, a sample was set up in the consolidation testing machine to determine expansive deformation strain and expansive pressure.

A selected sample of material was delivered to TIDR for chemical/corrosivity testing.

Summaries of the laboratory test results appear in Appendix "C". Soil classifications provided in our geotechnical investigation are generally per the Unified Soil Classification System (USCS).

SITE GEOLOGY AND SUBSURFACE SOIL CONDITIONS

Regionally, the site is located in a valley within the Santa Monica Mountains of the Transverse Ranges geomorphic province. This province includes several discreet mountain ranges and intervening valleys including the Santa Monica, San Gabriel and San Bernardino Mountains and is so named because structural trends, such as the Simi-Santa Rosa fault zone, are oriented east-west in relation to the dominant northwest-southeast trend of adjoining provinces. The Transverse Ranges province extends from the Channel Islands eastward to the Eagle and Cottonwood Mountains of the Mojave Desert. As depicted on published geologic mapping, the site is underlain by the Upper Topanga formation, which is a Miocene-age sedimentary bedrock consisting of interbedded shale, siltstone and sandstone, and Miocene-age Conejo Volcanics (Dibblee, and Ehrenspeck, 1993, Enclosure "A-3").

As encountered in the explorations, the site is mantled by colluvial fill to depths from approximately 3 to 5 feet below ground surface. The fill materials encountered consisted of medium dense to dense clayey sand (SC) and stiff to hard fat clay (CH). The bedrock was encountered at depths of 3 to 10 feet bgs and consisted of Topanga Formation Siltstone recovered as silty and clayey sands (SM, SC), clays (CL, CH) and silt (ML).

Groundwater or seepage was not encountered in the explorations. Refusal was not encountered in the explorations to the maximum 50-1/2 foot depth. Caving was not encountered upon removal of the drilling augers.

More detailed descriptions of the subsurface soil conditions encountered are presented on the attached boring logs (Appendix "B").

FAULTING

The site does not lie within or immediately adjacent to an Alquist-Priolo Earthquake Fault Zone designated by the State of California to include traces of suspected active faulting. The closest known fault is a segment of the Chatsworth fault that is located approximately 4.5 miles to the northeast. The Malibu fault, Santa Monica fault, Sierra Madre fault zone and San Gabriel fault zone are the nearest known faults to the site and are located 7.6 miles south, 9.5 miles southeast, 14 miles northeast and 22.5 miles northeast of the site, respectively. No faults are shown on or in the immediate vicinity of the site on published geologic maps.

SEISMICITY

A map of recorded earthquake epicenters is included as Enclosure "A-4" (Epi Software, 2000). This map includes a database maintained by the Southern California Earthquake Center (University of Southern California) for earthquakes with magnitudes of 4.0 or greater from 1932 through 2012. The following table summarizes earthquakes that have occurred in the region of the site.

Summary of Historic Earthquakes				
Event ID	**Date**	**Magnitude**	**Distance from Site (miles)**	**Direction from Site**
Lake Matthews Area	4/21/1918	6.6	79	SE
Long Beach	3/10/1933	6.4	58	SE
Fish Creek Mountains	10/21/1942	6.6	178	SE
Borrego Mountain	4/9/1968	6.5	164	SE
West Hollywood	9/9/2001	5.9	21.5	SE
Whittier Narrows	10/1/1987	5.9	39	SE
Upland	2/28/1990	5.4	61	E
Sierra Madre	6/28/1991	5.8	46	NE
Mojave	7/11/1992	5.7	85	NE
Landers	6/28/1992	7.3	133	NE
Big Bear	6/28/1992	6.4	111	E
Northridge	1/17/1994	6.7	14	NE
Hector Mine	10/16/1999	7.1	147	NE
Fort Tejon	1/9/1857	7.9	134	NW
Chino Hills	7/29/2008	5.4	59	SE
Kern County (Tehachapi)	7/21/1952	7.3	62	NW
Inglewood	5/17/2009	4.7	28	SE
Upland	6/26/1988	4.8	60	E
Yorba Linda	9/3/1992	4.8	59	SE
Sylmar	2/9/1971	6.6	28	NE

SEISMIC DESIGN PARAMETERS

Based on the geologic setting and blowcount data from subsurface explorations, the soils underlying the site are classified as Site Class "C", according to the 2013 CBC.

The seismic design parameters in accordance with Section 1613A of 2013 CBC are presented in Table 2.1. These values were determined using the web-based application http://earthquake.usgs.gov/designmaps/us/application.php and the site coordinates 34.1475, W118.7659. The deaggregated modal earthquake magnitude was determined from the USGS website http://geohazards.usgs.gov/deaggint/2008 for evaluation of soil effects due to earthquake ground shaking.

2013 CBC - Seismic Design Parameters	
Mapped Spectral Acceleration Parameters	$S_s = 1.559$ and $S_1 = 0.600$
Site Coefficients	$F_a = 1.0$ and $F_v = 1.3$
Adjusted Maximum Considered Earthquake Spectral Response Parameters	$S_{MS} = 1.559$ and $S_{M1} = 0.780$
Design Spectral Acceleration Parameters	$S_{DS} = 1.039$ and $S_{D1} = 0.520$
Geometric Mean Peak Ground Acceleration (PGA_M)	0.579g
Deaggregated Modal Magnitude	7.03

GROUNDWATER AND LIQUEFACTION

Depth-to-groundwater data from the State of California Water Resources Control Board (2015) and groundwater contour mapping by CGS (2000) were examined for the area of the site. These data are summarized in the following table.

Depth to Groundwater				
Well No./ID	**Date Measured**	**Depth to Water (feet)**	**Measuring Point Elevation (feet amsl)**	**Location**
T06037041688-W-05DD	8/25/2009	6	871	1/4 mile S
	1/22/2010	6		
T0603703142-MW-K	9/1/2002	12	900	1/3 mile E
	10/1/2006	8		
	7/6/2009	6		
	4//2012	11		
T-0603703449-W-14	1/14/2004	14	886	1/3 mile SE
	10/10/2006	16		
	12/27/2014	15		
Contour Mapping	Historic High	10	--	--

Groundwater was not encountered within the maximum 50-1/2-foot depth of the explorations. Based on historical data and a site elevation of 900 feet, the historic high depth to groundwater in the area of the site is estimated at approximately 10 feet bgs.

Liquefaction is a process in which strong ground shaking causes saturated soils to lose their strength and behave as a fluid. Ground failure associated with liquefaction can result in severe damage to structures. The geologic conditions for increased susceptibility to liquefaction are: 1) shallow groundwater (generally less than 50 feet in depth), 2) the presence of unconsolidated sandy alluvium, typically Holocene in age, and 3) strong ground shaking. All three of these conditions must be present for liquefaction to occur.

The site is not included in a State of California Seismic Hazard Zone for liquefaction or earthquake-induced landslide (CGS, 2000). Based on the composition of the underlying soils encountered in our geotechnical investigation and the relatively shallow depths of bedrock encountered at the site, liquefaction is not considered a potential hazard, and further investigation is not warranted.

SEISMIC SETTLEMENT

Severe seismic shaking may cause dry and saturated sands to densify, resulting in settlement expressed at the ground surface. Seismic settlement in dry soils generally occurs in loose sands and silty sands, with cohesive and fine-grained soils being less prone to significant settlement. For saturated soils, significant settlement is anticipated if the soils are liquefied during seismic shaking. Soil types susceptible to liquefaction include sand, silty sand, sandy silt and silt, as well as clayey soils with clay content less than 15 percent.

Topanga Formation siltstone was encountered at depths of 3 to 10 feet below the existing ground surface. Little to no alluvial sands were encountered in our investigation. Therefore, seismic settlement at the site is considered negligible.

STATIC SETTLEMENT

Potential static settlement was evaluated utilizing field and laboratory data and foundation load assumptions. We anticipate a total static settlement of less than 1 inch beneath foundations. Differential settlement is anticipated to be less than one-half the total settlement in 40 feet. Most of the potential static settlement should occur during construction.

HYDROCONSOLIDATION

Based on the relatively dense nature of the underlying near-surface soils encountered in our investigation, the minimum mandatory removal requirements as provided in the "Recommendations"

section of this report and the low potential for full saturation of the soil layers, it is our opinion that the potential for hydrocollapse settlement at the site is low.

SUBSIDENCE

The site is not located within an area identified by the State of California Seismic Hazard Zone as having a potential for subsidence. The potential for subsidence to affect the proposed structure is considered low.

SLOPE STABILITY AND LANDSLIDE POTENTIAL

Based on information provided by the project civil engineer, a finished floor elevation of approximately 912 feet above mean sea level (amsl) is estimated for the project. The slope located on the northern portion of the site consists of tight, well-bedded siltstone with sandstone interbeds. Bedding was measured to dip to the north. Landslides were not observed within the site. The site is not located within a State-designated area as having a potential for landslide, seismically induced landslide or lateral spreading (CGS, 2000). Therefore, the potential for landsliding or lateral spreading is considered low.

Grading of cut or fill slopes, if needed to achieve final site configurations, should be conducted in conformance with applicable grading codes. On-site soils may be considered Type "B" with regard to 2013 CAL/OSHA excavation standards.

FLOODING AND EROSION

The site is not located in an area designated by the Federal Emergency Management Agency (2008) as a flood hazard zone. A more accurate determination of the flood hazard to the site and the adequacy of existing flood and drainage improvements near the site is not within the scope of this investigation.

No large water storage facilities are known to exist within the area of the site. The site is not located within a coastal area; therefore, tsunami is not a potential hazard to the site.

EXPANSION POTENTIAL

ASTM D4829 test standard classifies expansion index (EI) of soils as follows:

Expansion Index	Expansion Potential
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Greater than 130	Very High

According to Section 1803.5.3 of the 2013 CBC, soils having an EI greater than 20 are considered "expansive" and require foundation design to mitigate these conditions as per Section 1808.6 of the 2013 CBC.

EI analysis according to the ASTM standard was performed by this firm. The result indicates EI values of 150 and 157 ("very high"). Based on these results, construction procedures and/or special structural design to specifically mitigate the effects of expansive soil movements are necessary. Recommendations to mitigate expansive soil conditions are provided in the "Expansive Soils" section of this report.

DOUBLE-RING INFILTROMETER TESTS

Two double-ring infiltrometer tests were performed to evaluate the infiltration potential of the site soils located within the proposed water retention area. The test locations are indicated on Enclosure "A-2". The tests were performed in general conformance with ASTM D3385 at depths of 3 and 5 feet below the existing ground surface utilizing a rubber tire backhoe to excavate the test pits. Exploratory test pit logs are provided in Appendix "B".

The data collected were used to calculate the infiltration rate of the soil. The infiltration test was performed until a steady-state infiltration velocity was reached. The steady-state infiltration velocity is presented as the infiltration rate.

The infiltration rates are presented in the following table and do not include safety factors.

Test Number/Depth	Infiltration Rate	
	cm. / hr.	In. / hr.
P-1	0.13	0.05
P-2	0.07	0.03

The measured infiltration rates are within the applicable range of the test method. The measured infiltration rate to use in design is discussed in the "Storm Water Infiltration" section of this report. It should be noted that infiltration rates determined by testing are ultimate rates based on short-duration field test results. The infiltration tests utilized clear water, and infiltration rates can be affected by buildup of silt, debris, the degree of soil saturation and other factors. An appropriate safety factor should be applied to measured infiltration rates prior to use in design to accommodate potential subsoil inconsistencies, possible compaction related to site grading and potential silting of the percolating soils. A safety factor should be determined with consideration to other factors in the storm water

retention system design, particularly storm water volume estimates and the safety factors associated with those design components.

CONCLUSIONS

On the basis of our research and field and laboratory investigations, it is the opinion of this firm that the proposed project is feasible from a geological and geotechnical engineering standpoint, provided the recommendations contained in this report are implemented during design and construction.

As encountered in the explorations, the site is mantled by colluvial fill to depths from approximately 3 to 5 feet below ground surface. The fill materials encountered consist of medium dense to dense clayey sand (SC) and stiff to hard fat clay (CH). The bedrock was encountered at depths of 3 to 10 feet bgs and consisted of Topanga Formation Siltstone recovered as silty and clayey sands (SM, SC), clays (CL, CH) and silt (ML). Refusal to further advancement of the drilling augers was not experienced in the exploratory borings. Caving was not experienced within the exploratory borings utilized for this investigation.

The site does not lie within or immediately adjacent to an Alquist-Priolo Earthquake Fault Zone designated by the State of California to include traces of suspected active faulting.

Moderate to severe seismic shaking can be expected at the site.

Groundwater was not encountered within the maximum 50-1/2-foot depth of the explorations. Historic high groundwater is estimated to be at 10 feet bgs in the area of the site. Based on the composition of the underlying soils encountered in our geotechnical investigation and the relatively shallow depths of bedrock encountered at the site, liquefaction is not considered a potential hazard to the site.

Settlement resulting from seismic shaking is considered negligible. Hydroconsolidation potential is considered low for the site.

The potential for subsidence to affect the proposed structure is considered low.

The potential for landsliding or lateral spreading is considered low.

Expansion index testing yielded "very high" potential for expansion. Based on the EI test result, construction procedures and/or special structural design to specifically mitigate the effects of expansive soil movements are necessary.

Based on the classification, density and lack of significant soil cementation encountered in exploratory borings placed within the site, site grading and utility trenching are expected to be feasible with conventional heavy grading and trenching equipment, respectively.

RECOMMENDATIONS

The recommendations provided in this report assume that on-site expansive soils will be utilized and foundations and slabs-on-grade will be designed for expansive deformations and pressures provided herein. Retaining walls will require imported, very low expansive (EI<21), granular soils as backfill. If additional recommendations for use of imported soils or conventional foundations are required, this firm should be contacted.

GENERAL SITE GRADING:

It is imperative that no clearing and/or grading operations be performed without the presence of a representative of the geotechnical engineer. An on-site, pre-job meeting with the developer, the contractor and the geotechnical engineer should occur prior to all grading-related operations. Operations undertaken at the site without the geotechnical engineer present may result in exclusions of affected areas from the final compaction report for the project.

Grading of the subject site should be performed, at a minimum, in accordance with these recommendations and with applicable portions of the 2013 CBC. The following recommendations are presented for your assistance in establishing proper grading criteria.

INITIAL SITE PREPARATION:

All areas to be graded should be stripped or cleared of significant vegetation, rocks greater than 6 inches in largest dimension and other deleterious materials. These materials should be removed from the site for disposal.

The cleared soils may be reused as properly compacted fill if foundations, which include slabs-on-grade, are designed as indicated in the "Expansive Soils" section of this report.

If encountered, existing utility lines should be traced, removed and rerouted from areas to be graded.

Cavities created by removal of subsurface obstructions such as structures, individual effluent disposal systems and trees should be thoroughly cleaned of loose soil, organic matter and other deleterious materials, shaped to provide access for construction equipment, and backfilled as recommended for compacted fill.

MINIMUM MANDATORY REMOVAL AND RECOMPACTION OF EXISTING SOILS:

All areas to be graded should have at least the upper 5 feet of existing soils removed or expose siltstone bedrock, and the open excavation bottoms observed by our engineering geologist to verify and document in writing that all undocumented fill is removed prior to refilling with properly tested and documented compacted fill. The removed soils may only be used as compacted fill if foundations are designed as recommended in the "Expansive Soils" section of this report.

Further subexcavation may be necessary depending on the conditions of the underlying soils. The actual depth of removal should be determined at the time of grading by the project geotechnical engineer/geologist. The determination will be based on soil conditions exposed within the excavations.

Compaction tests may be taken in the removal bottom areas where appropriate to provide in-place moisture/density data for potential relative compaction evaluations and to help support and document the engineering geologist's decision. As such, all areas to be graded should have any undocumented

fill, topsoil or other unsuitable materials removed and replaced with properly compacted fill. Fill may consist of suitable on-site material, imported material or a combination thereof depending on foundation design.

PREPARATION OF FILL AREAS:

Prior to placing fill, and after the mandatory subexcavation operation with all loose native and/or undocumented fill removed, the surfaces of all areas to receive fill should be scarified to a depth of 6 inches or more. The scarified soils should be brought to between optimum moisture content and 2 percent above optimum moisture content and recompacted to a minimum relative compaction of 90 percent in accordance with ASTM D1557.

PREPARATION OF FOUNDATION AREAS:

For foundations designed for expansive soils as recommended in the "Expansive Soils" section of this report, the thickness of compacted fill underneath footings should be at least 3 feet and the removed soils may be used as compacted fill. In areas where the required thickness of compacted fill is not accomplished by site rough grading, mandatory subexcavation operation and the undocumented fill removal, the footing areas should be further subexcavated to a depth of at least 3 feet below the proposed footing base grade. The required overexcavation should extend at least 10 feet laterally beyond the footing lines, where possible. The bottom of this excavation should then be scarified to a depth of at least 6 inches, brought to between optimum moisture content and 2 percent above optimum moisture content and recompacted to a minimum of 90 percent relative compaction in accordance with ASTM D1557 prior to refilling the excavation to the required grade as properly compacted fill.

Thickness of compacted fill underneath foundations should not be allowed to vary by more than 50 percent or 4 feet, whichever is less, for a single foundation system. In areas where, by virtue of grading, the fill thickness will exceed this maximum allowable differential, the subexcavation depths should be increased as necessary to reduce the differential fill thickness. This deepening of the subexcavation may involve additional removals of native soils. A determination of specific structural areas that require additional subexcavation should be performed at the time of grading.

Foundation concrete should be placed in neat excavations with vertical sides, or the concrete should be formed and the excavations properly backfilled as recommended for compacted fill.

COMPACTED FILLS:

The on-site soils should provide adequate quality fill material provided they are free from organic matter and other deleterious materials and foundations and slabs-on-grade are designed for expansive soils as indicated in the "Expansive Soils" section of this report. Unless approved by the geotechnical engineer, rock or similar irreducible material with a maximum dimension greater than 8 inches should not be buried or placed in fills.

If utilized, import materials should be inorganic, very low-expansive (EI<21), granular soil free from rocks or lumps greater than 6 inches in maximum dimension. The contractor shall notify the geotechnical engineer of import sources sufficiently ahead of their use so that the sources can be observed and approved as to the physical characteristic of the import material. For all import material, the contractor shall also submit current verified reports from a recognized analytical laboratory indicating that the import has a "not applicable" (Class S0) potential for sulfate attack based upon current American Concrete Institute (ACI) criteria and is not corrosive to ferrous metal and copper. The reports shall be accompanied by a written statement from the contractor that the laboratory test results are representative of all import material that will be brought to the job.

Fill should be spread in near-horizontal layers, approximately 8 inches thick. Thicker lifts may be approved by the geotechnical engineer if testing indicates that the grading procedures are adequate to achieve the required compaction. Each lift should be spread evenly, thoroughly mixed during spreading to attain uniformity of the material and moisture in each layer, brought to between optimum moisture content and 2 percent above optimum moisture content, and compacted to a minimum relative compaction of 90 percent in accordance with ASTM D1557.

It is crucial that the geotechnical engineer or representative be present to observe the grading operations. Monitoring of the soil expansion potential by the geotechnical engineer during the

grading operation should be performed regularly. Further recommendations may be made in the field, depending on the actual conditions encountered.

SLOPE CONSTRUCTION:

Slopes should be constructed no steeper than 2(h):1(v). Fill slopes should be overfilled during construction and then cut back to expose fully compacted soil. A suitable alternative would be to compact the slopes during construction and then roll the final slopes to provide dense, erosion-resistant surfaces.

SLOPE PROTECTION:

Inasmuch as the native materials are susceptible to erosion by wind and running water, it is our recommendation that the slopes at the project be protected from erosion as soon as possible after completion. On permanent slopes the use of succulent ground covers, such as ice plant or sedum, is not recommended. If watering is necessary to sustain plant growth on slopes, then the watering operation should be monitored to assure proper operation of the water system and to prevent overwatering.

Measures should be provided to prevent surface water from flowing over slope faces.

FOUNDATION DESIGN:

Foundations and slabs-on-grades should be designed to resist the effects of expansive soils. Structural design measures including design of slab-on-grade foundations in accordance with "WRI/CRSI Design of Slab-On-Ground Foundations" or "PTI Standard Requirements for Design of Shallow Post-Tensioned Concrete Foundations of Expansive Soils" would be necessary. Foundations should also be designed to prevent uplift of the supported structure and resist forces exerted on the foundation due to soil volume change or shall be isolated from the expansive soil as indicated in Sections 1808.6.1 and 1808.6.2 of the 2013 California Building Code.

For foundations designed for expansive soils, bearing on a minimum of 3 feet of compacted fill, footings may be designed for a maximum safe soil bearing pressure of 1,000 pounds per square foot (psf) for dead plus live loads. The bearing values may be increased by one-third for wind or seismic loading.

For footings thus designed and constructed, we would anticipate a maximum static settlement of less than 1 inch. Differential static settlement between similarly loaded adjacent footings is expected to be approximately half the total settlement. Static settlement is expected to occur during construction or shortly after. Foundation concrete should be placed in neat excavations with vertical sides, or the concrete should be formed and the excavations properly backfilled as recommended for compacted fill.

LATERAL LOADING:

Resistance to lateral loads will be provided by passive earth pressure and cohesion. For footings bearing against on-site compacted fill, allowable passive earth pressure may be considered to be developed at a rate of 100 psf per foot of depth. Passive earth pressure only applies to level, properly drained backfill with no additional surcharge loadings. Cohesion may be computed as 130 psf. Cohesion and passive earth pressure may be combined without reduction.

Cohesion value is to be multiplied by the contact area, as limited by Section 1806.3.2 of the 2013 CBC. The lateral passive earth pressure and cohesion values are provided from Table 1806.2 of the 2013 CBC.

The resistance values provided do not consider expansive pressures of the on-site soils. Expansive pressures should be taken into account during design of foundations.

For preliminary retaining wall design, lateral active earth pressures indicated in the table below should be utilized for properly drained backfill with no additional surcharge loadings.

Lateral Active Earth Pressures	
Backfill Inclination	**Active (psf/ft)**
Level	40
3(h):1(v)	55
2(h):1(v)	65

For restrained conditions, an at-rest earth pressure of 65 psf per foot of depth should be utilized for level, properly drained backfill with no additional surcharge loadings.

The "at-rest" condition applies toward braced walls that are not free to tilt. The "active" condition applies toward unrestrained cantilevered walls where wall movement is anticipated. The structural designer should use judgment in determining the wall fixity and may utilize values interpolated between the "at-rest" and "active" conditions where appropriate.

The values for earth pressures are based on imported backfills consisting of inorganic, very low-expansive (EI<21), granular, compacted fill, and assume that soils will have a phi angle of 30 degrees and a unit weight of 120 pounds per cubic foot. These values should be verified by an engineer from this firm when import materials are selected. These values do not include a factor of safety other than conservative modeling of the soil strength parameters.

RETAINING WALL BACKFILL:

Backfill behind retaining walls should consist of a soil of sufficient granularity that the backfill will properly drain. The granular backfill shall extend from the bottom of the wall at a 1(h):1(v) plane to the surface. The granular soil should be classified per the USCS as GW, GP, SW, SP, SW-SM or SP-SM and should have a minimum phi angle of 30 degrees and a unit weight of 120 pounds per cubic

foot. Surface drainage should be provided to prevent ponding of water behind walls. A drainage system should be installed behind all retaining walls consisting of either of the following:

1. A 4-inch-diameter perforated PVC (Schedule 40) pipe or equivalent at the base of the stem encased in 2 cubic feet of granular drain material per linear foot of pipe or

2. Synthetic drains such as Enkadrain, Miradrain, Hydraway 300 or equivalent.

Perforations in the PVC pipe should be 3/8 inch in diameter. Granular drain material should be wrapped with filter cloth such as Mirafi 140 or equivalent to prevent clogging of the drains with fines. Walls should be waterproofed to prevent nuisance seepage. Water should outlet to an approved drain.

SEISMIC LATERAL EARTH PRESSURE (CANTILEVERED WALL):

The seismic earth pressure acting on a cantilevered retaining wall was calculated using the Mononobe-Okabe ("M-O") method (Okabe, 1926; Mononobe and Matsuo, 1929). According to AASHTO (LRFD Bridge Design Specifications, Sixth Edition, 2012, Section C11.8.6.2 and A11.3.2), the resulting pseudostatic horizontal seismic coefficient, k_h, could be reduced by 50 percent when 1.0 to 2.0 inches of permanent ground deformation is permitted during the design seismic event, i.e., the pseudostatic horizontal seismic coefficient (k_h) can be taken as equal to one-half of the PGA, which equates to 0.29g. The pseudostatic vertical seismic coefficient (k_v) is usually taken as 0.0g. For retaining walls with imported backfills consisting of inorganic, very low-expansive (EI<21), granular, compacted fill, a unit weight of 120 pounds per cubic foot (pcf) and a friction angle of 30 degrees were utilized in the calculation. These values should be verified prior to construction when the backfill materials and conditions have been determined and are applicable only to properly drained backfill with no additional surcharge loadings.

The total lateral active seismic earth pressures (including static active earth pressures) to be utilized for unrestrained conditions are provided in the following table.

Lateral Active Seismic Earth Pressures	
Backfill Inclination	**Active Seismic (psf/ft)**
Level	70
3(h):1(v)	125
2(h):1(v)	135

A triangular distribution of total seismic earth pressure should be used in the design (Atik and Sitar, 2010).

SLABS-ON-GRADE:

Slabs-on-grade should be designed to resist the expansive soils as provided in the "Expansive Soils" section of this report.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor retarder. We recommend that a vapor retarder be designed and constructed according to the American Concrete Institute 302.1R, Concrete Floor and Slab Construction, which addresses moisture vapor retarder construction. At a minimum, the vapor retarder/barrier should comply with ASTM E1745 and have a nominal thickness of at least 10 mils. The vapor retarder/barrier should be properly sealed, per the manufacturer's recommendations, and protected from punctures and other damage. Per the Portland Cement Association (www.cement.org/tech/cct_con_vapor_retarders.asp), for slabs with vapor-sensitive coverings, a layer of dry, granular material (sand) should be placed under the vapor retarder/barrier. For slabs in humidity-controlled areas, a layer of dry, granular material (sand) should be placed above the vapor retarder/barrier.

A modulus of vertical subgrade reaction of 100 kips per cubic foot can be utilized in the design of slabs-on-grade for the proposed project.

EXPANSIVE SOILS:

The expansion index testing performed for this report indicated a "very high" potential for expansion (EI of 150 and 157) in the upper soil layers. Based on these results, construction procedures and/or special structural design to specifically mitigate the effects of expansive soil movements are necessary, as recommended below

Structural design measures, including design of slab-on-grade foundations in accordance with "WRI/CRSI Design of Slab-On-Ground Foundations" or "PTI Standard Requirements for Design of Shallow Post-Tensioned Concrete Foundations of Expansive Soils", should be taken into consideration for this project. Foundations should also be designed to prevent uplift of the supported structure and resist forces exerted on the foundation due to soil volume change or shall be isolated from the expansive soil as indicated in Sections 1808.6.1 and 1808.6.2 of the 2013 California Building Code.

The expansive potential deformation within the upper 5 feet of clayey soils is expected to be approximately 1-1/2 inches (expansive strain of 2.4%). An expansive pressure of 7,000 psf should be used in the design of the foundations and slab-on-grade.

Additional evaluation of soils for expansion potential should be conducted by the geotechnical engineer during grading in order to provide the geotechnical parameters required for the design. Utilities should also be designed for potential expansive deformation and pressure.

POTENTIAL EROSION AND DRAINAGE:

The potential for erosion should be mitigated by proper drainage design. The site should be graded in such a way that surface water flows away from structures. Water should not be allowed to flow over graded areas or natural areas so as to cause erosion. Graded areas should be planted or otherwise protected from erosion by wind or water.

STORM WATER INFILTRATION:

Based on the measured infiltration rates, we recommend that a design infiltration rate of 0.03 inches per hour be used for the design of the storm water disposal system(s) on site. An appropriate safety factor should be applied to the recommended infiltration rate prior to use in design to accommodate potential subsoil inconsistencies, possible compaction related to site grading and potential silting of the percolating soils. A safety factor should be determined with consideration to other factors in the storm water retention system design, particularly storm water volume estimates and the safety factors associated with those design components.

As the design infiltration rate is very low, alternative measures to storm water abatement should be considered.

TRENCH EXCAVATION:

The soils encountered within our exploratory borings are generally classified as a Type "B" soil in accordance with the CAL/OSHA excavation standards. Unless specifically evaluated by our engineering geologist, all the trench excavations should be performed following the recommendation of CAL/OSHA (State of California, 2013) for Type "B" soil. Based upon a soil classification of Type "B", the temporary excavation should not be inclined steeper than 1(h):1(v) for maximum trench depth of less than 20 feet. For trench excavation deeper than 20 feet or for conditions that differ from those described for Type "B" in the CAL/OSHA excavation standards, this firm should be contacted.

TRENCH BEDDING AND BACKFILLS:

Trench Bedding - Pipe bedding material should meet and be placed according to the current edition of the Standard Specifications for Public Works Construction "Greenbook" or other project specifications. Pipe bedding should be uniform, free-draining, granular material with a sand equivalent of at least 30. The pipe bedding material should be evaluated to confirm sand equivalent values by this firm prior to use as pipe bedding material.

Backfill - The on-site expansive soils may be utilized for trench backfill if utilities are designed to accommodate the expansive deformations and pressures provided in the "Expansive Soils" section of this report. Rock or similar irreducible material with a maximum dimension greater than 6 inches should not be buried or placed in backfills

Fill to be compacted by heavy equipment should be spread in near-horizontal layers, approximately 8 inches in thickness. For fill to be compacted by hand-operated equipment, thinner lifts, 4 to 6 inches in thickness, should be utilized. Each lift should be spread evenly, brought to between optimum moisture content and 2 percent above optimum moisture content and compacted to a minimum relative compaction of 90 percent in accordance with ASTM D1557. To avoid pumping, backfill material should be mixed and moisture treated outside of the excavation prior to lift placement in the trench.

Soils required to be compacted to at least 95 percent relative compaction, such as pavement subgrade, should also be moisture treated to near optimum moisture content not exceeding 2 percent above optimum moisture content.

As an alternative, a controlled low-strength material (CLSM) could be considered to fill trenches, cavities, such as voids created by caving or undermining of soils beneath existing improvements or pavement to remain, or any other areas that would be difficult to properly backfill.

CHEMICAL/CORROSIVITY TESTING:

Selected samples of materials were delivered to HDR, Inc. for soil corrosivity testing. Laboratory testing consisted of pH, resistivity and major soluble salts commonly found in soils. The results of the laboratory tests performed by HDR, Inc. appear in Appendix "C".

These tests have been performed to screen the site for potentially corrosive soils. Values from the soil tested are considered "mildly corrosive" to ferrous metals at as-received moisture condition and "corrosive" at saturated condition. Specific corrosion control measures, such as coating of the pipe with non-corrosive material or alternative non-metallic pipe material, are considered necessary.

Ammonium and nitrate levels did not indicate a concern as to corrosion of buried copper.

Results of the soluble sulfate testing indicate a "not applicable" (Class S0) anticipated exposure to sulfate attack. Based on the criteria from Table 4.3.1. of the "American Concrete Institute Manual of Concrete Practice" (2011), no special measures, such as specific cement types or water-cement ratios, will be required.

The soluble chloride content of the soils tested was not at levels high enough to be of concern with respect to corrosion of reinforcing steel. The results should be considered in combination with the soluble chloride content of the hardened concrete in determining the effect of chloride on the corrosion of reinforcing steel.

CHJ Consultants does not practice corrosion engineering. If further information concerning the corrosion characteristics, or interpretation of the results submitted herein, is required, then a competent corrosion engineer could be consulted.

CONSTRUCTION OBSERVATION:

All grading operations, including site clearing and stripping, should be observed by a representative of the geotechnical engineer. The geotechnical engineer's field representative will be present to provide observation and field testing and will not supervise or direct any of the actual work of the contractor, his employees or agents. Neither the presence of the geotechnical engineer's field representative nor the observations and testing by the geotechnical engineer shall excuse the contractor in any way for defects discovered in his work. It is understood that the geotechnical engineer will not be responsible for job or site safety on this project, which will be the sole responsibility of the contractor.

LIMITATIONS

CHJ Consultants has striven to perform our services within the limits prescribed by our client and in a manner consistent with the usual thoroughness and competence of reputable geotechnical engineers and engineering geologists practicing under similar circumstances. No other representation, express or implied, and no warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the investigation, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject investigation, and the findings of this report may be invalidated fully or partially by changes outside of the control of CHJ Consultants. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between locations observed and/or sampled are similar to those encountered at the individual locations where observation and sampling was performed. However, conditions between these locations may vary significantly. Should conditions that appear different from those described herein be encountered in the field by the client or any firm performing services for the client or the client's assign, this firm should be contacted immediately in order that we might evaluate their effect.

If this report or portions thereof are provided to contractors or included in specifications, it should be understood by all parties that they are provided for information only and should be used as such.

The report and its contents resulting from this investigation are not intended or represented to be suitable for reuse on extensions or modifications of the project or for use on any other project.

CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this firm at your convenience.

Respectfully submitted,

CHJ CONSULTANTS

Maihan Noorzay, R.C.E. 77901
Project Engineer

John S. McKeown, C.E.G. 2396
Project Geologist

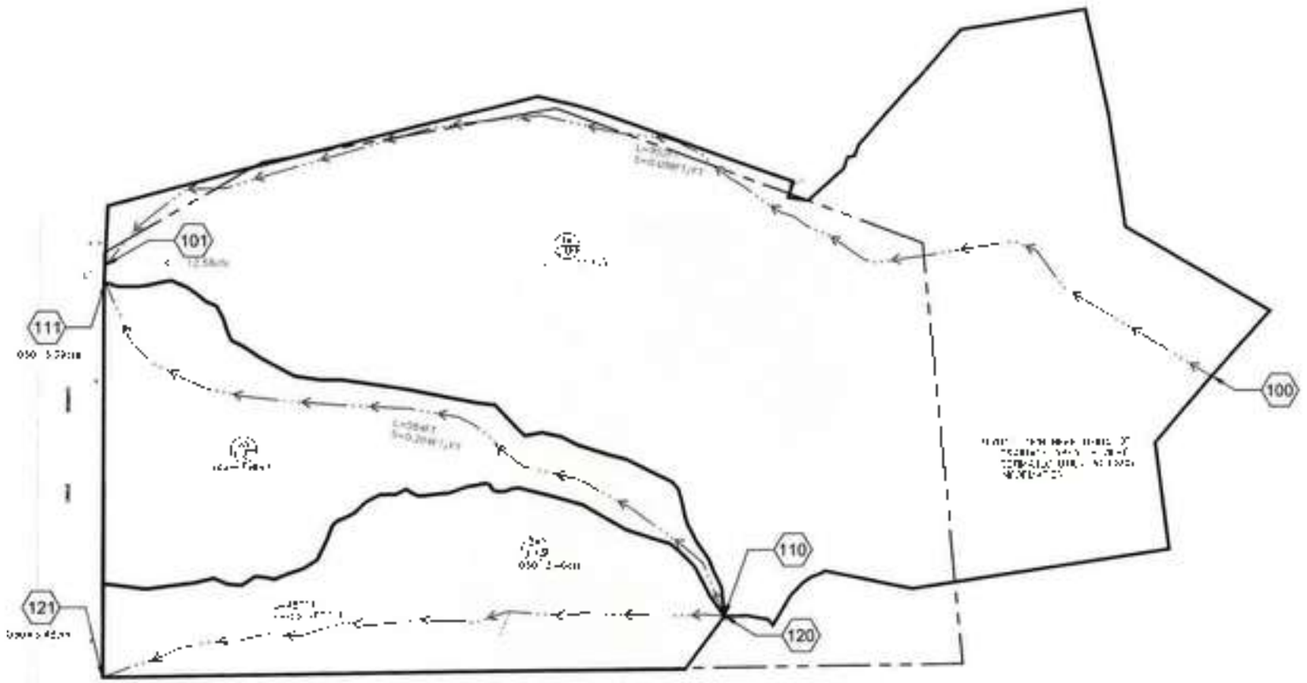
James F. Cooke, G.E. 3012
Managing Engineer

Robert J. Johnson, P.E.
President

MN/JSM/JFC/RJJ:lb

Appendix F

Existing Conditions Hydrology Map



LEGEND

HYDROLOGIC DESIGN DATA

INPUT FOR HYDROCAD

VICINITY MAP

REGISTERED PROFESSIONAL ENGINEER
JEREMY EPLEY
No. 57241
CIVIL
STATE OF CALIFORNIA

EXISTING HYDROLOGY MAP

HUTT-SOLIMAN

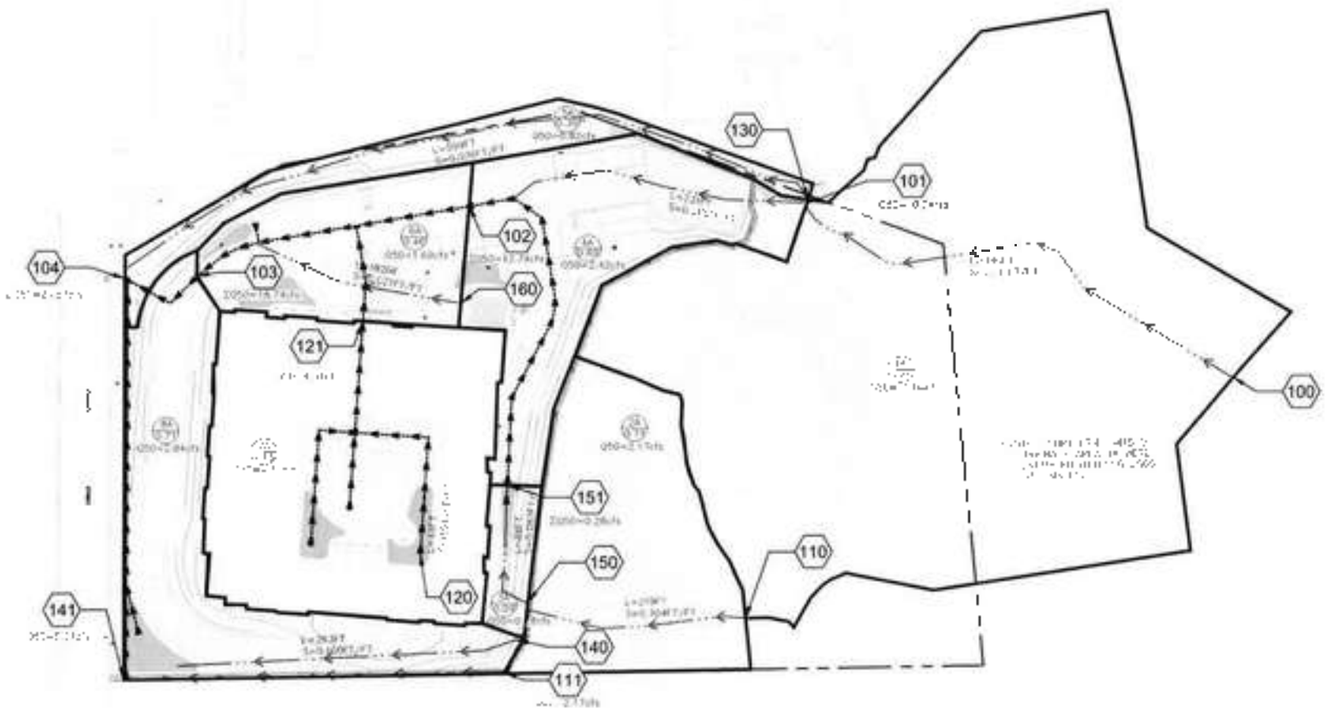
CITY OF AGOURA HILLS APPROVAL

AGOURA HILLS

OAKMONT OF AGOURA HILLS

Appendix G

Proposed Conditions Hydrology Map



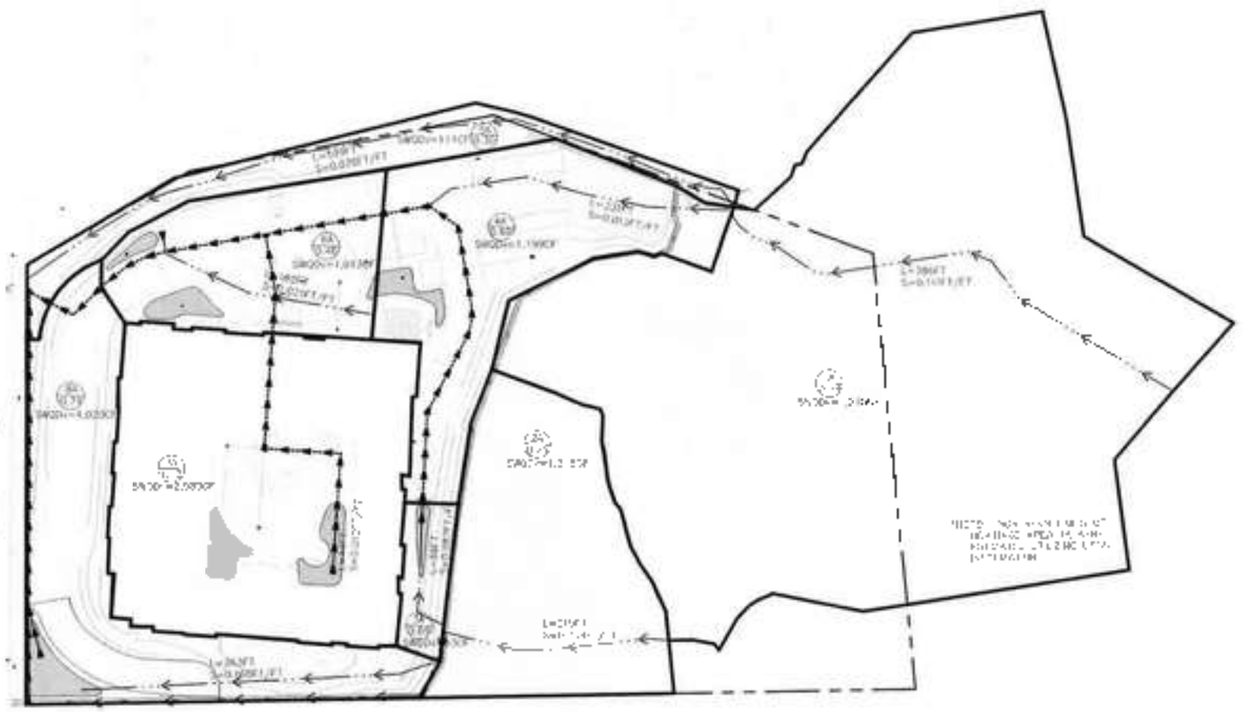
VICINITY MAP

PROPOSED HYDROLOGY MAP

DARMONT OF AGOURA HILLS
29813 CANWOOD STREET
AGOURA HILLS, CA 91301

Appendix H

Proposed Water Quality Map



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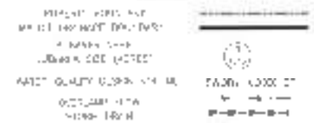

HYDROLOGIC DESIGN DATA

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[illegible]
[illegible]

VICINITY MAP

WATER QUALITY MAP

REVISION #	SYMBOL	DESCRIPTION OF CHANGE	APPROVED	DATE

PREPARED BY: HUITT-ZOLLARS

CITY OF AGOURA HILLS APPROVAL

REVIEWED BY _____ DATE _____

PATRICK KAMAR
CITY ENGINEER _____ DATE _____ RCE _____ EXPIRATION _____

AGOURA HILLS

OAKMONT OF AGOURA HILLS
29053 CANWOOD STREET
AGOURA HILLS, CA 91301 SHEET ___ OF ___

DRAWING NO. _____

APPENDIX J

Noise Impact Analysis

FIRSTCARBONSOLUTIONS™

Noise Impact Analysis
Oakmont of Agoura Hills
City of Agoura Hills, Los Angeles County, California

Prepared for:
Oakmont Senior Living
8779 Soothing Court
Corona, CA 92883

Contact: Wayne Sant

Prepared by:
FirstCarbon Solutions
11755 Wilshire Boulevard, Suite 1600
Los Angeles, CA 90025

Contact: Jason Brandman, Project Director

Date: August 3, 2017

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Table of Contents

List of Tables

List of Exhibits

ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
FCS	FirstCarbon Solutions
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
OSHA	Occupational Safety and Health Administration
PPV	peak particle velocity
RMS	root mean square
SEL	Single Event Level
VdB	Vibration level at 1 microinch per second

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SECTION 1: INTRODUCTION

1.1 - Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared by FirstCarbon Solutions (FCS) to determine the off-site and on-site noise impacts associated with the proposed Oakmont Assisted Living Facility project. The following is provided in this report:

- A description of the study area, project site, and proposed project
- Information regarding the fundamentals of noise and vibration
- A description of the local noise guidelines and standards
- A description of the existing noise environment
- An analysis of the potential short-term, construction-related noise and vibration impacts from the proposed project
- An analysis of long-term, operations-related noise and vibration impacts from the proposed project

1.2 - Project Summary

1.2.1 - Site Location

The Oakmont Assisted Living Facility Project (project) is located within the City of Agoura Hills (Exhibit 1). The project site is located at 29353 Canwood Street, Agoura Hills, California, just north of Canwood Street and west of the intersection of US 101 and Kanan Road (Exhibit 2a and Exhibit 2b). The site is bordered by an existing, single-family residential development to the north, by commercial office land use to the west, and by a vacant undeveloped parcel to the east. US 101 is immediately south of Canwood Street with commercial and light industrial uses located beyond.

1.2.2 - Project Description

Oakmont of Agoura Hills submitted an application to the City of Agoura Hills to develop an assisted living and memory care community at 29353 Canwood Street in Agoura Hills. The proposed project site is bounded by existing single-family residential development to the north, by commercial office land use to the west, and by a vacant, undeveloped parcel to the east. US 101 is immediately south of Canwood Street with commercial and light industrial uses located beyond (Exhibit 3). The project site is located adjacent to noise-sensitive residential land uses that could be impacted by project's construction and operational noise sources. Therefore, the City has required a noise study.

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Source: Census 2000 Data, The CaSIL, FCS GIS 2013.

FIRSTCARBON SOLUTIONS

5 2.5 0 5 Miles

Exhibit 1
Regional Location Map

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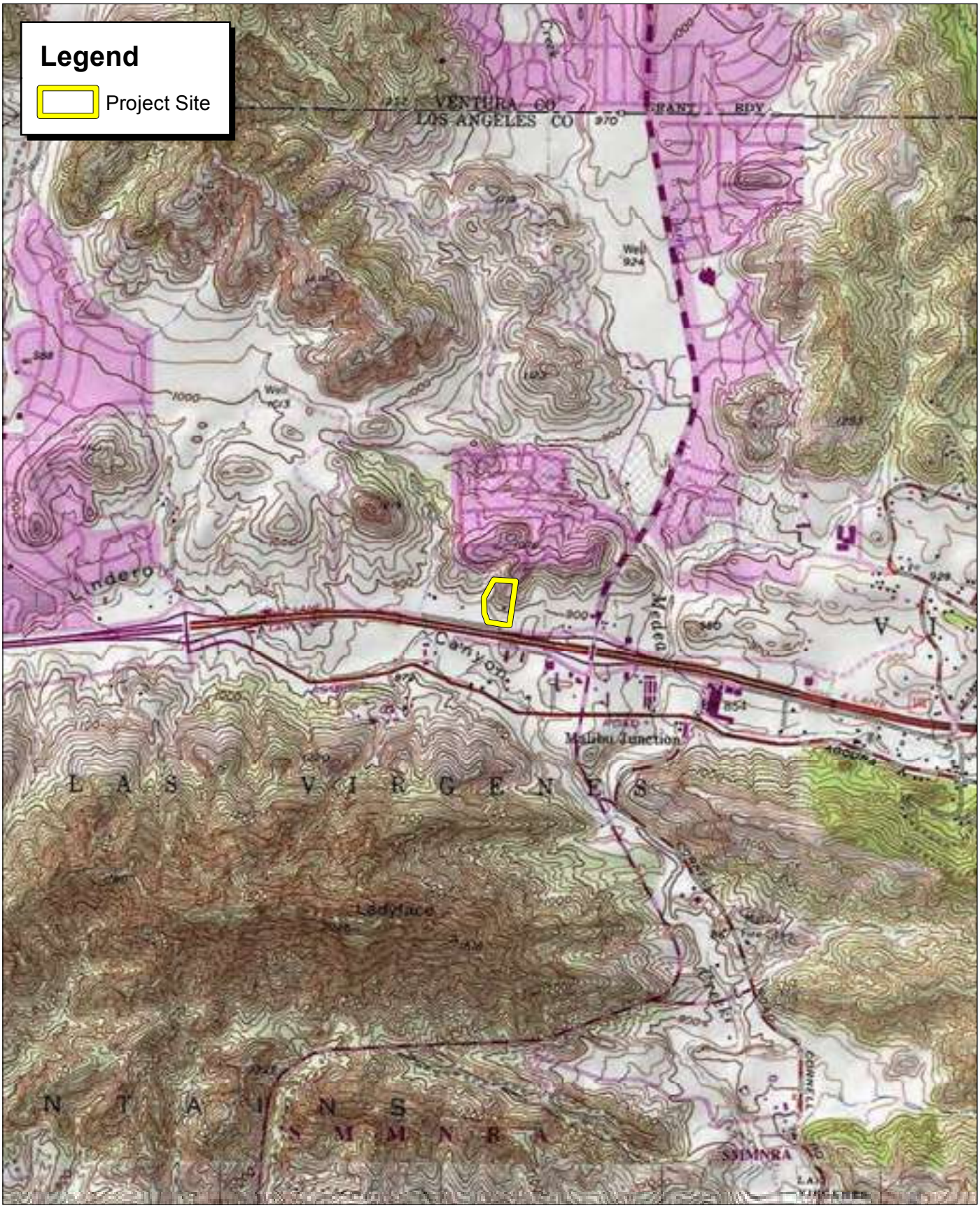

Source: USGS Thousand Oaks (1981) 7.5' Quadrangle

FIRSTCARBON SOLUTIONS

2,000 1,000 0 2,000 Feet

Exhibit 2a
Local Vicinity Map
Topographic Base

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Source: ESRI Imagery, 2014

FIRSTCARBON SOLUTIONS

850 425 0 850
Feet

Exhibit 2b
Local Vicinity Map
Aerial Base

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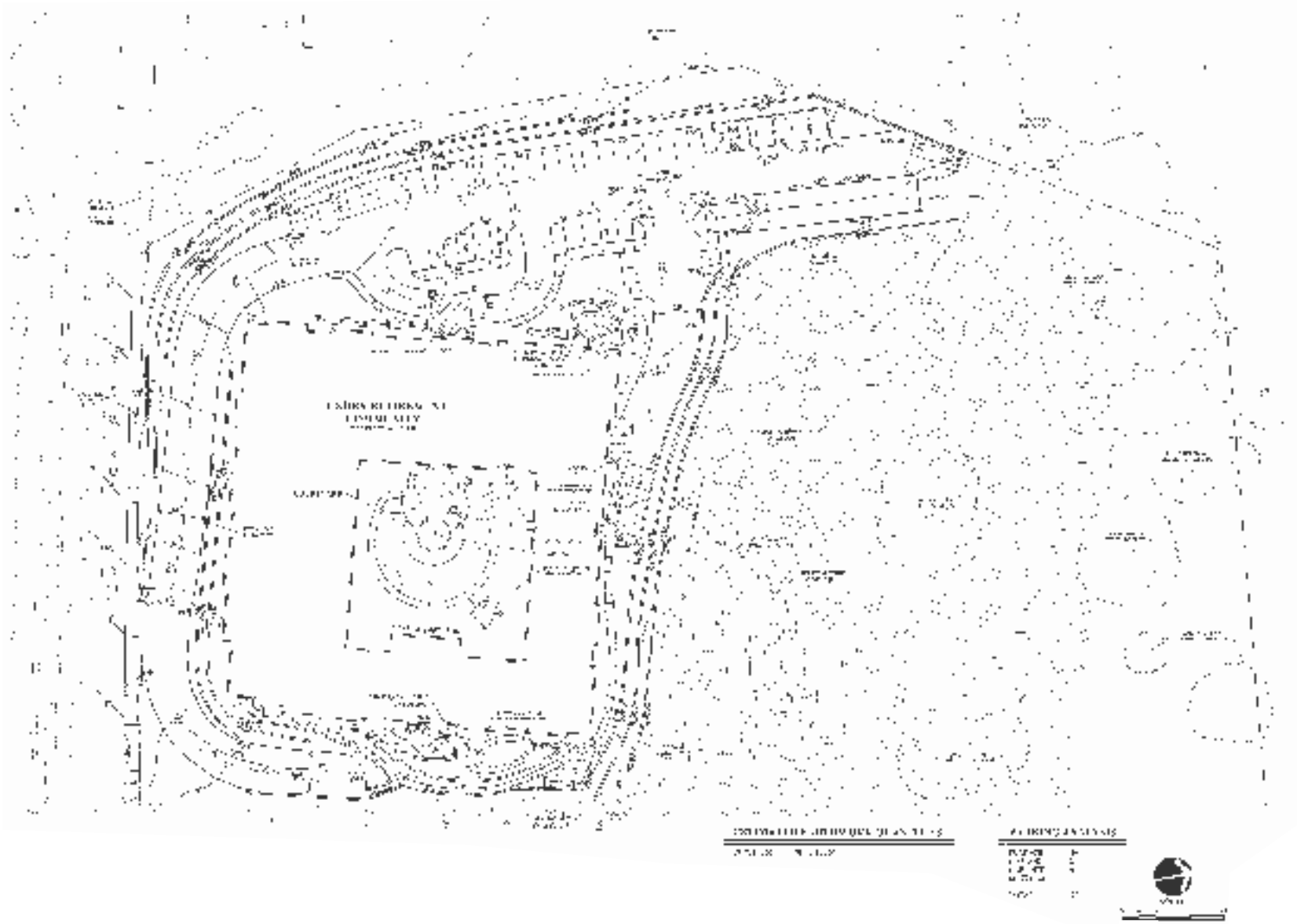

Source: Landesign Group, 2016

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Exhibit 3
Site Plan

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SECTION 2: NOISE AND VIBRATION FUNDAMENTALS

2.1 - Characteristics of Noise

Noise is generally defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

Several noise measurement scales exist which are used to describe noise in a particular location. A *decibel* (dB) is a unit of measurement that indicates the relative intensity of a sound. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3.0 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3.0 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, 30 dB is 1,000 times more intense. Each 10-dB increase in sound level is perceived as approximately a doubling of loudness. Sound intensity is normally measured through the A-weighted sound level (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive.

Noise impacts can be described in three categories. The first is audible impacts, which refers to increases in noise levels noticeable to humans. An audible increase in noise levels generally refers to a change of 3.0 dB or greater, since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1.0 and 3.0 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise level of less than 1.0 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level would be. Geometric spreading causes the sound level to attenuate or be reduced, resulting in a 6-dB reduction in the noise level for each doubling of distance from a single point source of noise to the noise-sensitive receptor of concern. A long, closely spaced continuous line of vehicles along a roadway becomes a line source and produces a 3 dBA decrease in sound level for each doubling of distance. However, experimental evidence has shown that where sound from a highway propagates close to “soft” ground (e.g., plowed farmland, grass, crops, etc.), the most suitable dropoff rate to use is not 3 dBA but rather 4.5 dBA per distance doubling. There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The predominant rating scales for human communities in the State of California are the L_{eq} and community noise equivalent level (CNEL) or the day-night average level (L_{dn}) based on A-weighted decibels (dBA). Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. CNEL is the time-varying noise over a 24-hour period, with a 5-dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10-dBA weighting factor

applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within one dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of maximum levels denoted by L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

Common sources of noise in urban environments include mobile sources, such as traffic, and stationary sources, such as mechanical equipment or construction operations.

Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on each construction site and, therefore, would change the noise levels as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 1 shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment. Construction-period noise levels are higher than background ambient noise levels, but eventually cease once construction is complete.

Table 1: Typical Construction Equipment Maximum Noise Levels, L_{max}

Category	Impact Device? (Yes/No)	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Pickup Truck	No	55
Pumps	No	77
Air Compressors	No	80
Backhoe	No	80
Front-End Loaders	No	80
Portable Generators	No	82
Dump Truck	No	84
Tractors	No	84
Auger Drill Rig	No	85
Concrete Mixer Truck	No	85
Cranes	No	85
Dozers	No	85
Excavators	No	85

Table 1 (cont.): Typical Construction Equipment Maximum Noise Levels, L_{max}

Type of Equipment	Impact Device? (Yes/No)	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Graders	No	85
Jackhammers	Yes	85
Man Lift	No	85
Paver	No	85
Pneumatic Tools	No	85
Rollers	No	85
Scrapers	No	85
Concrete/Industrial Saws	No	90
Impact Pile Driver	Yes	95
Vibratory Pile Driver	No	95
Source: FHWA, 2006.		

2.2 - Characteristics of Groundborne Vibration

Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings.

Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. When assessing annoyance from groundborne vibration, vibration is typically expressed as root mean square (rms) velocity in units of decibels of 1 micro-inch per second. To distinguish vibration levels from noise levels, the unit is written as "VdB."

In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Common sources of groundborne vibration include construction activities such as blasting, pile driving and operating heavy earthmoving equipment. However, construction vibration impacts on building structures are generally assessed in terms of peak particle velocity (PPV). For purposes of this analysis, project related impacts are expressed in terms of PPV. Typical vibration source levels from construction equipment are shown in Table 2.

Table 2: Vibration Levels of Construction Equipment

Construction Equipment	PPV at 25 Feet (inches/second)	RMS Velocity in Decibels (VdB) at 25 Feet
Water Trucks	0.001	57
Scraper	0.002	58

Table 2 (cont.): Vibration Levels of Construction Equipment

Construction Equipment	PPV at 25 Feet (inches/second)	RMS Velocity in Decibels (VdB) at 25 Feet
Bulldozer—small	0.003	58
Jackhammer	0.035	79
Concrete Mixer	0.046	81
Concrete Pump	0.046	81
Paver	0.046	81
Pickup Truck	0.046	81
Auger Drill Rig	0.051	82
Backhoe	0.051	82
Crane (Mobile)	0.051	82
Excavator	0.051	82
Grader	0.051	82
Loader	0.051	82
Loaded Trucks	0.076	86
Bulldozer—Large	0.089	87
Caisson drilling	0.089	87
Vibratory Roller (small)	0.101	88
Compactor	0.138	90
Clam shovel drop	0.202	94
Vibratory Roller (large)	0.210	94
Pile Driver (impact-typical)	0.644	104
Pile Driver (impact-upper range)	1.518	112
Source: Compilation of scientific and academic literature, generated by FTA and FHWA.		

Propagation of vibration through soil can be calculated using the vibration reference equation:

PPV= PPV ref * (25/D)^n (in/sec)

Where:

PPV=reference measurement at 5 feet from vibration source
D=distance from equipment to property line
n=vibration attenuation rate through ground

According to Chapter 12 of the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment manual (2006), an “n” value of 1.5 is recommended to calculate vibration propagation through typical soil conditions.

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SECTION 3: REGULATORY SETTING

3.1 - Federal Regulations

3.1.1 - United States Environmental Protection Agency (EPA)

In 1972, Congress enacted the Noise Control Act. This act authorized the EPA to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels) categories, as shown in Table 3. The EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to an $L_{eq(24)}$ of 70 dBA. The "(24)" signifies an L_{eq} duration of 24 hours. The EPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

Table 3: Summary of EPA Recommended Noise Levels to Protect Public Welfare

Effect	Level	Area
Hearing loss	$L_{eq}(24) \leq 70$ dB	All areas
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use
	$L_{eq}(24) \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq 45$ dB	Indoor residential areas
	$L_{eq}(24) \leq 45$ dB	Other indoor areas with human activities such as schools, etc.
Source: EPA, 1974.		

3.1.2 - Federal Transit Administration

The FTA has established industry accepted standards for vibration impact criteria and impact assessment. These guidelines are published in its Transit Noise and Vibration Impact Assessment document (FTA 2006). The FTA guidelines include thresholds for construction vibration impacts for various structural categories as shown in Table 4.

Table 4: Federal Transit Administration Construction Vibration Impact Criteria

Building Category	PPV (in/sec)	Approximate VdB
I. Reinforced—Concrete, Steel or Timber (no plaster)	0.5	102
II. Engineered Concrete and Masonry (no plaster)	0.3	98
III. Non Engineer Timber and Masonry Buildings	0.2	94
IV. Buildings Extremely Susceptible to Vibration Damage	0.12	90

Note:
VdB = velocity in decibels
Source: FTA, 2006.

3.2 - State Regulations

The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard," it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor-ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

The State has also established land use compatibility guidelines for determining acceptable noise levels for specified land uses. The City of Agoura Hills has adopted and modified the State's land use compatibility guidelines, as discussed below.

3.3 - Local Regulations

The project site is located within the City of Agoura Hills. The City of Agoura Hills addresses noise in the Noise section of the Community Safety Element of its General Plan (City of Agoura Hills 2035 General Plan Update, March 2010) and in the City of Agoura Hills Municipal Code (City of Agoura Hills 2016).

The City has established noise and land use compatibility standards for residential land use development, as shown in Figure N-2 of the Noise Element. The closest type of land use category listed in the land use compatibility standards to the proposed assisted living type land use is the

City's multiple-family residential land use category. According to the policies of the General Plan, noise environments up to 60 dBA CNEL are considered "clearly compatible" for new multi-family residential land use developments. Environments with ambient noise levels from 60 dBA to 70 dBA CNEL are considered "normally compatible" for new multi-family residential land use developments; as such, development may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features are included in the project design. Conventional construction, but with closed windows and a fresh air supply system or air conditioning, will normally suffice as a noise insulation feature for these conditionally acceptable environments.

The other primary method of noise control is through enforcement of the City's Municipal Noise Ordinance. The ordinance is designed to control unnecessary, excessive and annoying sounds generated on one piece of property from impacting an adjacent property, and to protect residential areas from noise sources other than transportation sources. The Noise Ordinance is designed to protect sensitive areas from intruding noise across property lines. For example, it limits noise at residential properties to 55 dBA L_{eq} from 7:00 a.m. to 10:00 p.m. and to 50 dBA L_{eq} from 10:00 p.m. to 7:00 a.m. Furthermore, it is unlawful for any person to create noise, when measured on any residential property, which causes the sound level to exceed:

1. The noise standard for a cumulative period of more than fifteen minutes in any hour; or
2. The noise standard plus 5 dBA for a cumulative period of more than ten minutes in any hour; or
3. The noise standard plus 5 dBA for a cumulative period of more than five minutes in any hour; or
4. The noise standard plus 15 dBA for a cumulative period of more than one minute in any hour; or
5. The noise standard plus 20 dBA for any period of time.

Interior noise standards in residential dwellings are limited to 45 dBA L_{eq} from 7:00 a.m. to 10:00 p.m. and to 45 dBA L_{eq} from 10:00 p.m. to 7:00 a.m. Furthermore, it is unlawful for any person to create noise, when measured on any residential property, which causes the sound level to exceed:

1. The noise standard for a cumulative period of more than five minutes in any hour;
2. The noise standard plus 5 dBA for a cumulative period of more than one minute in any hour; or
3. The noise standard plus 10 dBA for any period of time

In the event the ambient noise level exceeds either of the first two noise limit categories above, the cumulative period applicable to said category shall be increased to reflect the ambient noise level. In the event the ambient noise level exceeds the third noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

The City provides certain exemptions from these operational noise standards, including noise associated with construction activities. Noise sources associated with construction, repair, remodeling, or grading of any real property, provided said activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a legal holiday.

Other noise sources that are listed as being exempt from the noise performance standards of the Municipal Code include:

- Noise sources associated with the maintenance of real property provided said activities take place between the hours of 7:00 a.m. and 8:00 p.m. on any day except Sunday or a legal holiday, or between the hours of 9:00 a.m. and 8:00 p.m. on Sunday or a legal holiday.
- Activities conducted on the grounds of any public or private nursery, elementary, intermediate or secondary school or college.
- Public dances, provided said events are conducted pursuant to a permit issued by the city.
- Activities conducted on any authorized park or playground provided such park or playground is owned and operated by a public entity.
- Any mechanical device, apparatus or equipment used, related to or connected with any emergency machinery, vehicle or work.

Additionally, It is unlawful for any person to create any noise which causes the noise level at any school, hospital or church while the same is in use, to exceed the noise limits as specified in Section 9656.2, prescribed for the assigned noise zone in which the school, hospital or church is located, or which noise level unreasonably interferes with the use of such institution or which unreasonably disturbs or annoys patients in a hospital provided conspicuous signs are displayed in three (3) separate locations within one-tenth of a mile of the institution indicating the presence of a school, church or hospital.

SECTION 4: EXISTING NOISE CONDITIONS

The following section describes the existing ambient noise environment of the project vicinity.

4.1 - Existing Noise Sources

The project site is located in the City of Agoura Hills, California. The proposed project site is bounded by existing single-family residential development to the north, by commercial office land use to the west, and by a vacant, undeveloped parcel to the east. US 101 is immediately south of Canwood Street with commercial and light industrial uses located beyond.

4.2 - Existing Ambient and Traffic Noise Levels

The existing noise levels on the project site were documented through a noise monitoring effort taken on the project site.

A short-term noise measurement was taken on Monday, March 7, 2016 starting at 4:50 p.m., during the afternoon peak noise hour. The measurement was taken in the northwest corner of the project site near the closest residential receptor with a direct line of sight to portions of the project site. The resulting measurement showed that ambient noise levels at this location averaged 72.8 dBA L_{eq}. As was observed by the technician at the time of the noise measurement, the dominant noise source in the project vicinity was traffic on US 101.

A long-term noise measurement was also taken on Tuesday, June 27, 2017 beginning at approximately 12:00 p.m. and ending on Wednesday, July 28, 2017 at 12:00 p.m. The noise measurements data sheet is provided in Appendix A of this document. The noise measurements were taken near the closest residential receptor property line. The average hourly ambient noise levels were measured to be 58.6 dBA L_{eq}, with a maximum reading of 77.5 dBA L_{max} and a minimum reading of 38.8 dBA L_{min}. The 24-hour weighted day-night average noise level for the project site is 63.7 dBA CNEL. Also, the daytime hourly average noise levels at this location were 59.6 dBA L_{eq}.

The long-term noise measurement captured noise from all noise sources in the project vicinity, including parking lot and other operational noise sources associated with commercial facilities adjacent to the project site, as well as traffic noise on local roadways.

The existing noise levels were also modeled using SoundPlan. The existing traffic noise contours for the project vicinity are shown in Exhibit 4. The SoundPlan assumptions and modeling data are provided in Appendix A.

4.3 - Existing Stationary Source Noise Levels

Commercial land uses in the project vicinity generate noise from truck deliveries, loading/unloading activities, and typical parking lot activities. Typical medium truck (step-van type with roll-doors) loading and unloading activities in the project vicinity result in maximum noise levels from 70 dBA to 80 dBA L_{max} at 50 feet. Representative parking activities, such as people conversing or doors slamming, generate approximately 60 dBA to 70 dBA L_{max} at 50 feet. These activities are potential point sources of noise that contribute to the existing ambient noise environment in the project vicinity.

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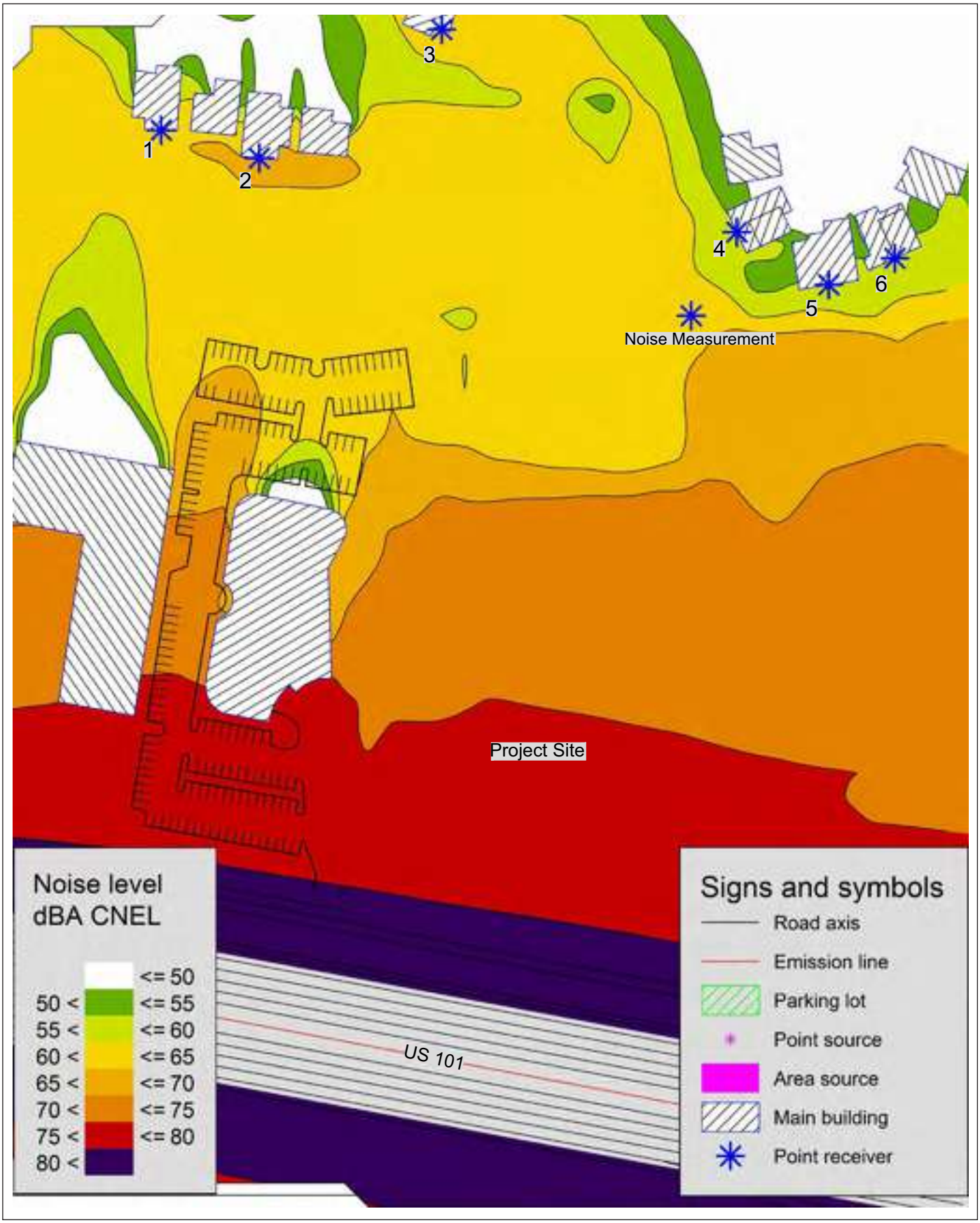

Source: SountPlan Version 7.4

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Exhibit 4
Existing Noise Contour Map

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SECTION 5: THRESHOLDS OF SIGNIFICANCE AND IMPACT ANALYSIS

5.1 - Thresholds of Significance

This report analyzes potential project impacts according to the following criteria of significance. The proposed project would result in a significant impact if the project would result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

b) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

c) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or

d) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

5.2 - Methodology

FirstCarbon Solutions evaluated the proposed project's noise impacts through modeling of project noise impacts detailed below.

5.2.1 - SoundPlan Noise Modeling Software

SoundPlan's road noise algorithms are based on the FHWA Traffic Noise Model (FHWA TNM Model). The SoundPlan Model requires the input of roadway geometries and traffic volumes. Stationary noise sources with associated frequency spectrums, sound barriers, terrain contour lines, building placement, and specific ground coverage zones may be incorporated as well. The site plan and aerial photos were used to determine the placement of the terrain contours, roadways and existing structures. The default temperature of 20 degrees Celsius (68 degrees Fahrenheit) and default humidity of 50 percent, which can vary the propagation of noise, were used in the analysis and represent reasonable assumptions, since they are near the averages experienced in the project vicinity.

5.2.2 - Existing Noise Sources

US 101 Assumptions

The SoundPlan model analyzed the noise impacts from US 101 on the project vicinity. US 101 was analyzed based on a single-lane-equivalent noise source combining both directions of travel. The roadway parameters used for the SoundPlan modeling are presented in Table 5. The roadway classification is based on the City of Agoura Hills General Plan Circulation Element. The roadway speed is based on the posted speed limits and the existing and average daily traffic were obtained from Caltrans (Caltrans, 2016).

Table 5: SoundPlan Model Road Parameters

Roadway	General Plan Classification	Vehicle Speed (miles per hour)	Average Daily Traffic (ADT)
US 101	Freeway	65	175,000
Source: City of Agoura Hills, 2010; Caltrans, 2016.			

Table 6 presents the hourly traffic flow distributions (vehicle mix) used in this analysis. The vehicle mix was obtained from 2015 Annual Average Daily Truck Traffic on the California State Highway System (Caltrans, 2016). The vehicle mix provides the hourly distribution percentages of automobiles, medium trucks, and heavy trucks for input into the SoundPLAN Model.

Table 6: US 101 Vehicle Mix

Vehicle Type	Percent of Hourly Distribution			
	Day (7:00 a.m. to 7 p.m.)	Evening (7 p.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Overall
Automobiles	65.8	13.5	15.8	95.1
Medium Trucks	2.1	0.4	1.0	3.4
Heavy Trucks	0.9	0.1	0.5	1.5
Source: FirstCarbon Solutions, 2017.				

Modeling Calibration

A receiver was placed at the location of the long-term noise measurement site in order to assist in the calibration of the noise sources inputted into the model, as well as to verify the accuracy of the SoundPlan model. Table 7 provides a summary of the calculated results, and a comparison with the measured results.

Table 7: SoundPlan Model Calibration to Noise Measurement

Site No.	Site Description	Calculated Noise Level[1] (dBA CNEL)	Measured Noise Level[2] (dBA CNEL)	Difference
1	North of project site, on power pole near closest homes to project site.	63.0	63.7	-0.7
Note: [1] Noise Level calculated from SoundPlan Version [2] Average noise level (L_{eq}) from entire measurement. Source: FirstCarbon Solutions, 2017.				

Table 7 shows the model calibration accuracy to the long-term noise measurement and found that the model is within 0.7 dBA of the measured noise level, which is within the range of allowed tolerances as described in Section 4.4.1, Routine Model Calibration, of the TeNS (Caltrans, 2013). Therefore, based on the field noise measurements, the SoundPlan Model provides an accurate representation of the project area noise levels.

With Project Noise Sources

In order to determine the noise impacts from the proposed on-site noise sources on the nearby sensitive receptors, the SoundPlan modeling software was utilized. Each of the following details anticipated on-site noise sources associated with operation of the proposed project.

With Project Parking Lot Assumptions

The SoundPlan model analyzed the noise impacts from the proposed project's parking lot. The parking lot emission source is based on the different tonal contents typically created from parking lots and is primarily from engine and tire noise, slamming of doors, pedestrians, and street sweepers. The proposed project's parking lot would provide 49 parking spaces. The movement per parking space per hour was calculated from the ITE Trip Generation Report which found that Assisted Living Facilities can generate up to 2.74 daily trips per unit, which results in up to 206 daily trips or parking movements generated from the proposed project. From observations of other assisted living communities, it was determined that 80 percent of the trips occurred between 7:00 a.m. and 10:00 p.m. and 20 percent of the trips occurred between 10:00 p.m. and 7:00 a.m. The parking lot was modeled based on 0.22 movements per space per hour between 7:00 a.m. and 10:00 p.m. and 0.09 movements per space per hour between 10:00 p.m. and 7:00 a.m.

With Project Rooftop Mechanical Equipment

The SoundPlan model analyzed the noise impacts from the proposed rooftop mechanical equipment on the proposed assisted living community structure. In order to determine noise created from the proposed rooftop mechanical equipment, a noise measurement was taken of an HVAC unit on a similar building. The noise measurement found that the HVAC units create noise levels of 66.6 dBA L_{eq} at 10 feet from the HVAC unit. Since the locations of the rooftop mechanical equipment is not yet known, in order to provide a worst-case analysis, a unit was placed at every 20 feet around the perimeter of the roof. Each unit was modeled as a point source in the SoundPlan model located 3 feet above the elevation of the roof and calibrated to 66.6 dBA at 10 feet. The HVAC units were modeled as being operational 50 percent of the time between 7:00 a.m. and 10:00 p.m. and 25 percent of the time between 10:00 p.m. and 7:00 a.m., which is based on observations of operational units while obtaining the reference noise measurement.

With Project Truck Loading Area

The SoundPlan model analyzed the noise impacts from the proposed truck loading area on the north side of the proposed structure. In order to determine the noise created from the truck loading area a field noise measurement was taken approximately 30 feet from a vendor truck unloading at a commercial center, which measured a noise levels of 54.8 dBA L_{eq}. The entire vendor truck visit lasted for approximately 10 minutes. The vendor truck loading area was modeled as an area source located 3 feet above ground level and was calibrated to the measured 54.8 dBA L_{eq} at 30 feet. The

1/3 octave center frequency sound pressure levels from the reference noise measurement was inputted into the SoundPlan Model, in order for the Model to calculate the appropriate sound attenuation rates. It is anticipated that the proposed project would receive up to two deliveries per day. This resulted in the truck loading area being active for 2 percent of the time between 7:00 a.m. and 10:00 p.m.

With Project Diesel Back-up Generator

The SoundPlan model analyzed the noise impacts from the proposed diesel back-up generator for the proposed project. Since the exact location of the back-up generator has not yet been determined, this analysis utilized a worst-case assumption of it being located in the northernmost area of the project site, adjacent to the proposed parking lot. Since the exact generator has not yet been chosen, the generator noise level was based on the CAT XQ800, which is a 795 kW generator that produces a noise level of 74 dB at 7 meters (23 feet). The generator was modeled in the SoundPlan model as an area source placed 4 feet above ground level and was calibrated to 74 dB at 7 meters. It is anticipated that under regular operations, the back-up generator would cycle for 30 minutes once per week during the daytime. This resulted in the generator being active for 3 percent of the time between 7:00 a.m. and 10:00 p.m.

5.3 - Exceedance of Noise Standards Impacts

5.3.1 - Construction Noise Impacts

Two types of short-term noise impacts could occur during the construction of the proposed project. First, construction crew commutes and the transport of construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the project site. Although there would be a relatively high single-event noise exposure potential causing intermittent noise nuisance, the effect on longer-term (hourly or daily) ambient noise levels would be small. Therefore, short-term construction-related impacts associated with worker commute and equipment transport to the project site would be less than significant.

The second type of short-term noise impact is related to noise generated during construction on the project site. Construction is completed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and, therefore, the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction related noise ranges to be categorized by work phase. Table 1 lists typical construction equipment noise levels, based on a distance of 50 feet between the equipment and a noise receptor. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings. Impact equipment such as pile drivers are not expected to be used during construction of this project.

The site preparation and grading phase of the project is expected to require the use of rubber tired dozers, tractors, front-end loaders, backhoes, excavators, and graders. The building construction

phase is expected to require the use of cranes, forklifts, portable generators, tractors, front-end loaders, backhoes, and welder torches.

The Federal Highway Administration's (FHWA) Roadway Construction Noise Model was used to calculate construction noise levels at nearby sensitive receptors surrounding the project site during each phase of construction. The modeled receptor locations represent the closest residential units to the west, south, east, and north of the project site. The modeled construction phases included the site preparation and grading phase and the building construction phase. A worst-case scenario was modeled assuming each piece of modeled equipment would operate simultaneously at the nearest reasonable locations to each modeled receptor. Overall average daily project construction noise levels would be much lower than this reasonable worst-case scenario as all equipment would not always operate simultaneously and would also be lower as the equipment operates toward the center of the project site further from off-site receptors. A summary of the modeling results are shown in Table 8. The construction noise modeling assumptions and outputs are provided in Appendix A of this report.

Table 8: Construction Noise Model Results Summary (dBA)

Receptor Location	Site Preparation/Grading Phase		Building Construction Phase	
	L_{eq}	L_{max}	L_{eq}	L_{max}
R-1: Commercial building west of site	85.8	85.9	71.3	73.4
R-2: Residential use to northwest	63.0	62.0	59.7	61.1
R-3: Residential use to northeast	61.3	59.8	58.0	59.1

The City of Agoura Hills' Municipal Code outlines the City's standards for noise-producing construction activities. Construction activities that would produce noise levels in excess of the noise performance standards are restricted to the hours of 7:00 a.m. and 8:00 p.m., on weekdays, including Saturday, and are not permitted at any time on Sunday or a legal holiday. Therefore, restricting construction activities to these stated time periods, as well as implementing the best management noise reduction techniques and practices outlined in Mitigation Measure (MM) NOI-1, would ensure that potential short-term construction noise impacts on sensitive receptors in the project vicinity would be reduced to less than significant.

Mitigation Measures

MM NOI-1 Implementation of the following multi-part mitigation measure is required to reduce potential construction period noise impacts:

- The construction contractor shall ensure that all equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.
- The construction contractor shall ensure that unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes) is prohibited.

- The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.
- At all times during project grading and construction, the construction contractor shall ensure that stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from adjacent residences.
- The construction contractor shall ensure that the construction staging areas shall be located to create the greatest feasible distance between the staging area and noise-sensitive receptors nearest the project site.
- All on-site demolition and construction activities, including deliveries and engine warm-up, shall be restricted to the hours of 7:00 a.m. and 8:00 p.m., Monday through Saturday. No such activities shall be permitted on Sundays or federal holidays.

5.3.2 - Operational Noise Impacts

Section 9656.2 of the Municipal Code limits the exterior noise level at the nearby homes to 55 dBA between 7:00 a.m. and 10:00 p.m. and to 50 dBA between 10:00 p.m. and 7:00 a.m. Section 9656.3 of the Municipal Code limits the interior noise level at the nearby homes to 45 dBA 24 hours per day. Since a typical home provides 15 dB of attenuation with the windows open, only the exterior noise levels have been analyzed, since it is not possible for an interior noise impact to occur without an exterior noise impact occurring as well.

In order to determine if the proposed project would exceed the City's operational noise performance standards, the on-site noise sources with development of the proposed project were modeled in the SoundPlan model based on the parameters detailed above in Section 5.2. The results are summarized in Table 9 for the With Project On-site Only noise impacts, and the SoundPlan printouts are provided in Appendix D.

Table 9: With Project On-site Only Noise Sources Noise Impacts at Nearby Homes

Receiver[(1)]	Description	Noise Level (dBA L_{eq})	
		7:00 a.m.–10:00 p.m.	10:00 p.m.–7:00 a.m.
1	Single-family home northwest of project site	36.9	33.6
2	Single-family home northwest of project site	37.6	34.2
3	Single-family home north of project site	34.9	31.6
4	Single-family home northeast of project site	28.3	25.2
5	Single-family home northeast of project site	27.1	24.0
6	Single-family home northeast of project site	26.4	23.4
City of Agoura Hills Residential Exterior Noise Standard[1]		**55**	**50**

Note:
[1] From Section 9659.2 of the City of Agoura Hills Municipal Code.
Source: SoundPLAN Version 7.4; FirstCarbon Solutions, 2017.

Table 9 shows that the on-site non-transportation noise levels with development of the proposed project would be below the City's daytime and nighttime non-transportation operational noise performance standards for receiving residential properties. Therefore, operational noise impacts on nearby residential land uses would be less than significant.

Combined Off-site Roadway and On-site Noise Impacts to Nearby Homes

Even though the above analysis of the on-site noise sources demonstrated that the noise generated on-site would be within City noise standards at the nearby homes, it is possible that the combined on-site noise with the off-site roadway noise may still exceed these standards. Section 9656.2 of the Municipal Code limits the exterior noise level at the nearby homes to 55 dBA between 7:00 a.m. and 10:00 p.m. and to 50 dBA between 10:00 p.m. and 7:00 a.m. Section 9656.2 of the Municipal Code also provides an exemption for situations where the ambient noise currently exceeds these noise standards, and for those cases the ambient noise level then becomes the noise standard.

The proposed project's potential combined roadway and on-site noise impacts have been calculated through a comparison between the existing without-project scenario and the existing with project scenario. The results of this comparison are shown in Table 10 and the SoundPlan printouts are provided in Appendix A. Exhibit 5 shows the combined with project noise contours.

Table 10: Combined Off-site Roads and On-site Noise Level Contributions

Receiver[1]	Daytime (7:00 a.m.–10:00 p.m.)			Nighttime (10:00 p.m.–7:00 a.m.)		
	No Project (dBA L_{eq})	With Project (dBA L_{eq})	Increase	No Project (dBA L_{eq})	With Project (dBA L_{eq})	Increase
1	59.6	57.4	-2.2	55.8	53.7	-2.1
2	60.7	59.7	-1.0	57.0	55.9	-1.1
3	58.4	58.0	-0.4	54.6	54.2	-0.4
4	49.0	48.7	-0.3	45.7	45.3	-0.4
5	49.5	49.4	-0.1	46.0	45.9	-0.1
6	52.9	53.1	0.2	49.4	49.4	0.0
Threshold		55	—	—	50	—

Notes:
[1] Locations of Receivers shown in Exhibit 5
Source: SoundPLAN Version 7.4; FirstCarbon Solutions, 2017.

Table 10 shows that for the combined conditions, noise level contributions from the proposed project to the analyzed receivers would range from -2.2 dBA to 0.2 dBA L_{eq}. The reduction of noise would be created from the shielding that the proposed structure would provide from US 101, which is the primary noise source in the project vicinity. The only increase in noise would occur at Receiver 6 for the Daytime condition, where the noise level would increase by 0.2 dBA to 53.1 dBA L_{eq}. Since the with-project daytime noise level at Receiver 6 is within the City's 55 dBA residential exterior

noise standard, a less than significant noise impact would occur from operation of the proposed project.

5.3.3 - On-site Traffic Noise Impacts

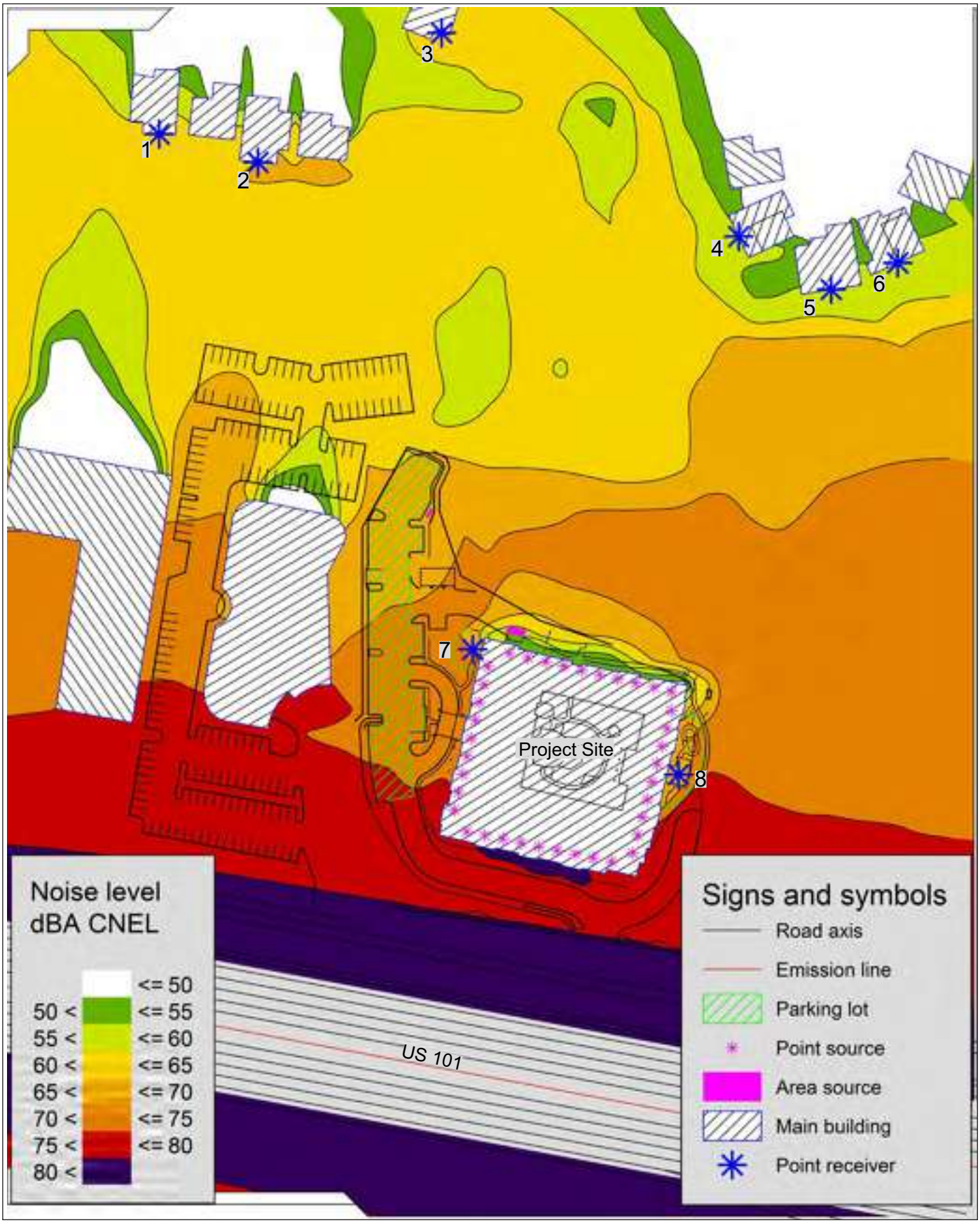
A significant impact would occur for the proposed senior assisted living type land use development if the project would be exposed to transportation noise levels in excess of the City's "clearly compatible" or "normally compatible" land use compatibility standards of 60 dBA or 70 dBA CNEL, respectively. The exterior noise level standard applies at outdoor activity areas for such uses.

Traffic noise levels for the adjacent segment of US Highway 101 were calculated using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). Site-specific information is entered, such as roadway traffic volumes, roadway active width, source-to-receiver distances, travel speed, noise source and receiver heights, and the percentages of automobiles, medium trucks, and heavy trucks that the traffic is made up of throughout the day, amongst other variables. The model inputs and outputs are provided in Attachment A of this report. The traffic noise model results show that traffic noise levels along this highway segment range up to 86 dBA CNEL at 50 feet from the centerline of the outermost travel lane. The exterior active use area of the project is located approximately 240 feet from the centerline of the outermost travel lane. The project includes outdoor active use areas in an interior courtyard area, and a couple of patio areas on the west and east sides of the building. For the interior patio area, the additional shielding of the two-story structure would provide a minimum reduction of 18 dBA. Thus, noise from traffic would be below 58.7 dBA CNEL at the outdoor active use area of the project. This is below the City's "clearly compatible" land use compatibility standard of 60 dBA CNEL.

The exterior patio area on the east side of the building (the memory care garden patio) would be exposed to traffic noise levels up to 66.3 dBA CNEL. This is within the City's "normally compatible" land use compatibility standard of 70 dBA CNEL for this type of land use development. This standard permits development to occur assuming that conventional construction, but with closed windows and a fresh air supply system or air conditioning, will normally suffice as a noise insulation feature to meet the City's interior noise level standards for these conditionally acceptable environments. Interior noise exposure impacts are discussed below. Therefore, these noise levels for this outdoor active use area would be considered acceptable and a less than significant impact.

However, the exterior patio area on the west side of the building (a dining patio) could be exposed to traffic noise levels of up to 72.2 dBA CNEL. This would exceed the City's "normally compatible" standard of 70 dBA CNEL. This would be a significant impact. The project proposes construction of a 3.5-foot high wall around this patio. However, with implementation of a 6-foot high wall on the south and west-facing portions of this patio area, the resulting traffic noise levels would be reduced to below 66.6 dBA CNEL at this outdoor active use area.

A significant impact would also occur for the proposed senior assisted living type land use development if the project would be exposed to noise that would result in an exceedance of the interior noise exposure standard of 45 dBA CNEL for the proposed land use. According to the City's policies, the interior noise level standard is typically satisfied with windows in the closed position and the supply of mechanical ventilation that conform to Uniform Building Code (UBC) requirements.



Source: SountPlan Version 7.4

FIRSTCARBON SOLUTIONS™

Exhibit 5
With Project Noise Contour Map

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Based on the EPA's Protective Noise Levels (EPA 550/9-79-100, November 1978), with a combination of walls, doors, and windows, standard construction for northern California residential buildings would provide approximately 25 dBA in exterior to interior noise reduction with windows closed and approximately 15 dBA with windows open. The project would include mechanical ventilation that conforms to the UBC requirements for multi-family dwellings that would permit windows to remain closed for prolonged periods of time. The nearest façade is approximately 165 feet from the centerline of the outermost travel lane of US 101. At this distance traffic noise levels would range up to 79.2 dBA CNEL.

Therefore, even with windows closed, resulting interior noise levels could exceed the interior noise standard of 45 dBA CNEL (79.2 dBA–25 dBA = 54.2 dBA). Therefore, the project must incorporate upgraded wall assemblies to reduce this impact to less than significant. Therefore, all project wall assemblies (windows, doors, and wall combinations) that are directly exposed to US 101 should be upgraded to have a combined minimum standard transmission class (STC) rating of STC-40. All wall assemblies that are indirectly exposed (i.e., perpendicular to the roadway) to the centerline of US 101 should be upgraded to have a combined minimum rating of STC-36.

The wall assemblies of these indicated façades should be upgraded to perform at the indicated minimum STC ratings in order to provide the necessary exterior to interior noise attenuation within a reasonable margin of safety. Quality control must be exercised in construction to ensure all air-gaps and penetrations of the building shell are controlled and sealed.

Mitigation Measures

MM NOI-2a All project wall assemblies (windows, doors, and wall combinations) that are directly exposed to US 101 should be upgraded to have a combined minimum standard transmission class (STC) rating of STC-40. All wall assemblies that are indirectly exposed (i.e., perpendicular to the roadway) to the centerline of US 101 should be upgraded to have a combined minimum rating of STC-36.

MM NOI-2b A 6-foot high wall shall be constructed on the west and south-facing sides of the dining patio (located on the west side of the building) in place of the proposed 3.5-foot high wall.

5.4 - Substantial Permanent Increase Impacts

As noted in the characteristics of noise discussion, audible increases in noise levels generally refer to a change of 3 dBA or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. A change of 5 dBA is considered to be the minimum change considered readily perceptible to the human ear in outdoor environments. Therefore, for purposes of this analysis, an increase of 5 dBA or greater would be considered a substantial permanent increase in ambient noise levels. Another characteristic of noise is that a doubling of sound sources with equal strength is required to result in even a perceptible increase (defined to be a 3 dBA or greater increase) in noise level.

Implementation of the project would not result in a doubling of traffic volumes along any roadway segment in the project vicinity. The proposed project would generate fewer than 10 percent of the daily average trips of the adjacent Canwood Street; thus, implementation of the project is not expected to result in even a perceptible increase (defined to be a 3-dBA or greater increase) in traffic noise levels on any of the local roadways in the project vicinity. Therefore, project-related traffic noise impacts on off-site receptors would be less than significant.

Additionally, as shown in the impact discussion Section 5.3.2—Operational Noise Impacts, the proposed project would not include any stationary noise sources that would result in permanent increases in ambient noise levels in the project vicinity above levels existing without the project. Therefore, potential permanent operational noise increase impacts resulting from implementation of the proposed project would be less than significant.

5.5 - Substantial Temporary or Periodic Increase Impacts

5.5.1 - Temporary Construction Noise Impacts

As is noted in the previous discussion, for purposes of this analysis, an increase of 5 dBA or greater would be considered a substantial increase. Implementation of the project would result in short-term increases in ambient noise levels due to demolition and construction activities. Construction noise impacts were analyzed in the impact discussion Section 5.3.1,—Construction Noise Impacts, above. As was documented in the ambient noise monitoring effort, the daytime hourly average noise level at the nearest residential property line is 59.6 dBA L_{eq}. Modeled project-related construction activities could result in high intermittent noise levels of up to approximately 63.0 dBA L_{eq} at the closest noise-sensitive land uses. These reasonable worst-case construction noise levels would represent a maximum increase of approximately 3 dBA above existing conditions at the nearest residential receiving property line. This temporary increase is less than a 5 dBA increase that would be considered substantial. Therefore, construction-related temporary increases would be considered less than significant.

It should also be noted that the maximum noise levels from construction activities as measured at the nearest residential property lines would range up to 62.0 dBA L_{max}. However, as documented in the ambient noise monitoring effort, existing maximum noise levels at the nearest residential property line range up to 77.5 dBA L_{max}. Therefore, construction related maximum noise levels would not exceed maximum noise levels already experienced at the nearest residential property line.

In addition, compliance with the City's permissible hours of construction and implementation of MM NOI-1 requiring standard construction noise reduction measures (including required use of approved mufflers on equipment) would further reduce short-term construction impacts on sensitive receptors in the project vicinity. Therefore, construction-related temporary increases would be considered less than significant.

5.5.2 - Periodic Increase Noise Impacts

As stated in the City's noise ordinances, emergency vehicle noise is exempt from the noise performance standards of the Municipal Code. However, implementation of the project is anticipated to result in an increase in emergency vehicle responses to the project site compared to existing conditions. This would result in periodic increases in the ambient noise levels when emergency medical service response vehicles, such as ambulances, use sirens when approaching the project site.

Currently, there is no way to predict medical emergencies that require visits of emergency vehicles that could create an additional source of noise in the project vicinity. However, FCS has documented reference noise levels of emergency vehicle sirens. The loudest noise level measured for emergency vehicle siren noise was 89.5 dBA L_{max} at a distance of 130 feet from the emergency vehicle. In addition, FCS has also previously documented average numbers of emergency vehicle responses for other assisted living type land uses when analyzing public services impacts within environmental impact reports. Therefore, assuming a similar average response rate on a per-bed ratio, an average ambient noise level from emergency response vehicle siren noise can be calculated.

The emergency vehicle response data was obtained from the County of Los Angeles Fire Department for the year 2016 for the Oakmont of Santa Clarita and the Meadowbrook Senior Living facility in Agoura Hills. For Oakmont of Santa Clarita, an 86 bed facility, there was a total of 79 EMS response calls in the year 2016. At Meadowbrook Senior Living, a 160 bed facility, there was a total of 176 EMS response calls in the year 2016. Specific details on what portion of the calls resulted in a vehicle responding to the sites with sirens sounding were not available. However, on a per bed ratio, these communities generated approximately 0.9 and 1.1 EMS response calls per bed per year, respectively.

The proposed project would contain approximately 75 residential units with a total of 86 beds. By utilizing the higher of the two emergency service response call rates calculated above (1.1 EMS calls per bed per year), the proposed project could potentially generate up to approximately 94 emergency medical service vehicle response calls per year. This would average approximately 1.8 response calls per week.

However, in order to calculate a reasonable worst-case scenario, a calculation can be made by assuming three emergency response calls being made in a single hour. This analysis assumes that the maximum siren noise would occur for up to one minute on the project driveway, and that the closest residential property line is located 650 feet from the project driveway. All the modeling assumptions for calculating the resulting average hourly noise levels for this worst-case emergency response vehicle siren noise are provided in Appendix A. Based on this worst-case scenario, the resulting hourly average noise level as measured at the nearest residential property line would be 52 dBA L_{eq}. The existing average hourly noise level at this location, as documented by the long-term ambient noise measurement is 59.6 dBA L_{eq}. Therefore, when added to the existing background noise levels, the combined hourly average noise level would be approximately 60 dBA L_{eq}. This would represent an increase of less than 1 dBA compared to conditions existing without the project as measured at the closest residential property line.

It should further be noted that many of the emergency response calls to similar assisted living facilities do not use sirens when approaching the facility. Therefore, the above analysis provides the most conservative analysis that could be anticipated for this project.

As this worst-case scenario would result in a less than 1 dBA increase in the average hourly noise level as measured at the nearest residential property line, project-related periodic increases due to emergency response vehicles responding to the project site would be less than significant.

5.6 - Excessive Groundborne Vibration Impacts

Project-related construction and operational groundborne vibration impacts are analyzed separately below.

5.6.1 - Short-term Construction Vibration Impacts

Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings.

Of the variety of equipment used during construction, the vibratory rollers that are anticipated to be used in the site preparation phase of construction would produce the greatest groundborne vibration levels. Impact equipment such as pile drivers is not expected to be used during construction of this project. Large vibratory rollers produce groundborne vibration levels ranging up to 0.210 inch per second (in/sec) peak particle velocity (PPV) at 25 feet from the operating equipment.

The nearest off-site receptor is the commercial land use located immediately west of the project site, approximately 55 feet from the nearest construction footprint where heavy construction equipment would potentially operate. At this distance groundborne vibration levels could range up to 0.064 PPV from operation of a large vibratory roller. This is below the industry standard construction vibration damage criteria of 0.2 PPV for this type of structure, a building of non-engineered timber and masonry construction (see Table 4).

The nearest residential land uses are located over 315 feet to the north of the project site. At this distance, construction-related groundborne vibration would attenuate to below 0.005 PPV. This is well below the industry standard construction vibration damage criteria of 0.2 PPV for these types of structures, buildings of non-engineered timber and masonry construction (see Table 4). Therefore, construction-related groundborne vibration impacts would be less than significant.

5.6.2 - Operational Vibration Impacts

Implementation of the project would not include any permanent sources that would expose persons in the project vicinity to groundborne vibration levels that could be perceptible without instruments at any existing sensitive land use in the project vicinity. In addition, there are no existing significant permanent sources of groundborne vibration in the project vicinity to which the proposed project would be exposed. Therefore, project operational groundborne vibration level impacts would be considered less than significant.

SECTION 6: REFERENCES

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United States Environmental Protection Agency. 1978. Protective Noise Levels, EPA 550/9-79-100. November.

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Appendix A:
Noise Monitoring and Modeling Data

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Summary				
Filename	LxT_Data.204			
Serial Number	4228			
Model	SoundTrack LxT®			
Firmware Version	2.206			
User				
Location				
Job Description				
Note				
Measurement Description				
Start	27/06/2017 12:09:06			
Stop	28/06/2017 12:09:07			
Duration	1 Day 00:00:00.8			
Run Time	1 Day 00:00:00.8			
Pause	0:00:00.0			
Pre Calibration	27/06/2017 12:05:37			
Post Calibration	None			
Calibration Deviation	---			
Overall Settings				
RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Linear			
Overload	145.7 dB			
	A	**C**	**Z**	
Under Range Peak	**101.9**	98.9	103.9	dB
Under Range Limit	**37.9**	35.9	43.9	dB
Noise Floor	25.3	25.8	33.1	dB
Results				
LAeq	58.6 dB			
LAE	107.9 dB			
EA	6.918 mPa²h			
EA8	2.306 mPa²h			
EA40	11.529 mPa²h			
LApeak (max)	27/06/2017 12:14:42	107.0 dB		
LASmax	28/06/2017 11:22:19	77.5 dB		
LASmin	28/06/2017 03:08:53	38.8 dB		
SEA	-99.9 dB			
LAS > 85.0 dB (Exceedence Counts / Duration)	0	0.0 s		
LAS > 115.0 dB (Exceedence Counts / Duration)	0	0.0 s		
LApeak > 135.0 dB (Exceedence Counts / Duration)	0	0.0 s		
LApeak > 137.0 dB (Exceedence Counts / Duration)	0	0.0 s		
LApeak > 140.0 dB (Exceedence Counts / Duration)	0	0.0 s		

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**
	63.2	59.6	56.1	63.7	59.6	59.6	56.1
LCeq	64.7 dB						
LAeq	58.6 dB						
LCeq - LAeq	6.2 dB						
LAleq	59.6 dB						
LAeq	58.6 dB						
LAleq - LAeq	1.1 dB						
# Overloads	0						
Overload Duration	0.0 s						

Dose Settings			
Dose Name	OSHA-1	OSHA-2	
Exch. Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Project Number: 3316.0016 Sheet ___ of ___
Project Name: Agoura Hills
Test Personnel: Connor Tindall

* Take Photos

Noise Measurement Survey

Site Number: _____ Date: 6/27/17 Time: From _____ To _____

Site Location: Near residential backyard on hill in Agoura hills.

Primary Noise Sources: Freeway noise, birds, Construction across freeway

Measurement Results

	dBA
Leq	
Lmax	
Lmin	
Lpeak	
L5	
L10	
L50	
L90	
STL	

Observed Noise Sources/Events

Time	Noise Source/Event	dBA

Comments: _____

Equipment: _____
Settings: A-Weighted☐ Other☐ _____

Measured Difference: 0.05 dBA
Slow☐ Fast☐ Windscreen☐

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature (F)	Relative Humidity (%)	
6 mph	5 mph	90°F	26%	
Comments:				

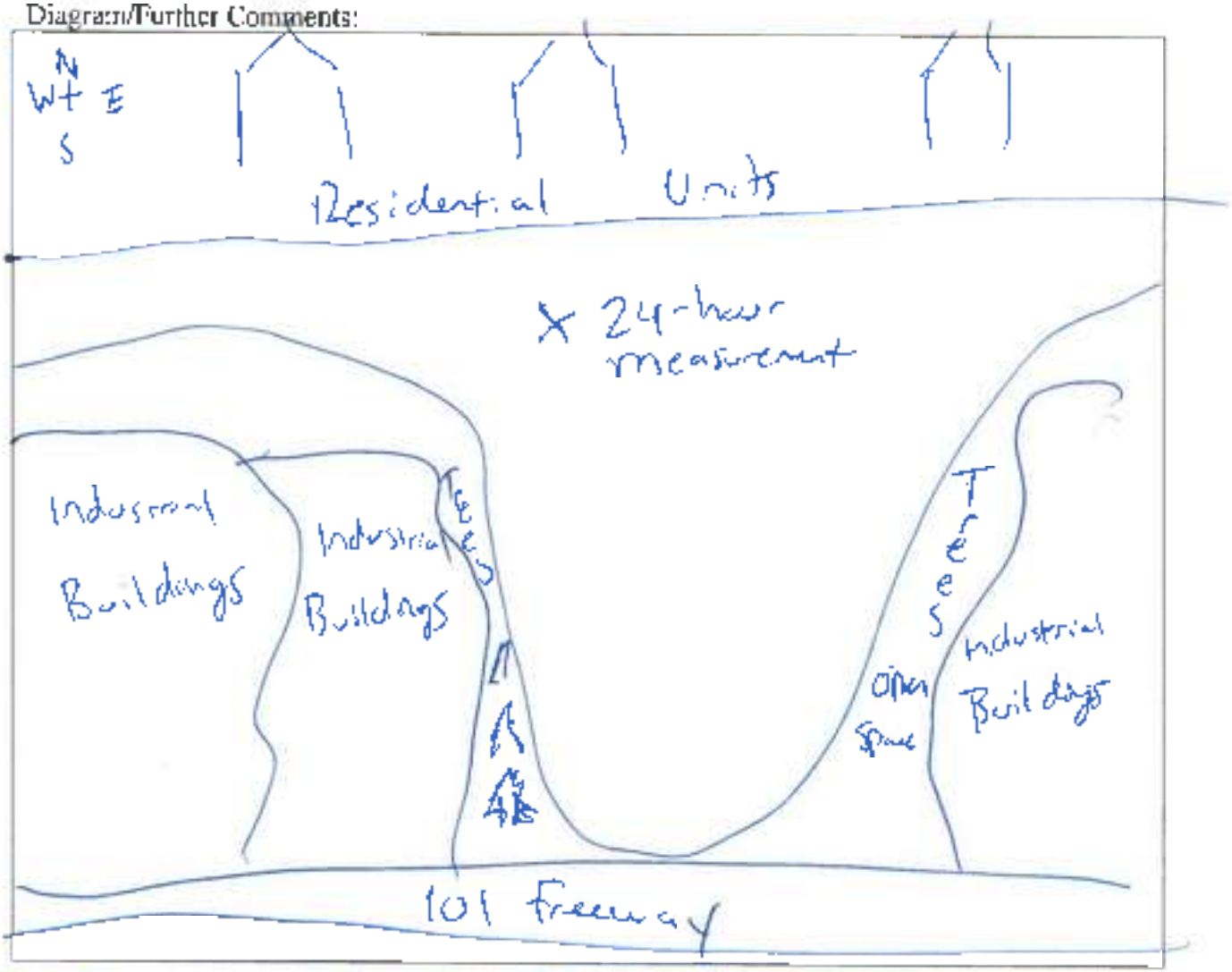
Photos Taken:

Photo Number	Location/Description

Traffic Description:

Roadway	# Lanes	Posted Speed	Average Speed	NB/EB Counts	SB/WB Counts

Diagram/Further Comments:



Photograph 1. Residential properties to the north

Photograph 2: Buildings and freeway to the south

Photograph 3: Residential units to the West

Photograph 4: Trees and power lines to the east

Oakmont of Agoura Hills
Assessed receiver levels - Existing Noise Levels

Name	Usage	Floor	Dir	Ldn dB(A)	Leq,d dB(A)	Leq,e dB(A)	Leq,n dB(A)	
1	RS	G	S	63.4	59.6	58.5	55.8	
2	RS	G	S	64.5	60.7	59.7	57.0	
3	RS	G	S	62.1	58.4	57.3	54.6	
4	RS	G	SW	53.1	49.0	47.9	45.7	
5	RS	G	S	53.4	49.5	48.4	46.0	
6	RS	G	SE	56.8	52.9	51.9	49.4	
Noise Measurement	RA	G		63.0	59.2	58.2	55.4	

Oakmont of Agoura Hills
Source level road - Existing Noise Levels

MSVges Night Veh/h	MSVges Evening Veh/h	Pavement type	MSVges Day Veh/h	Road	KM km	ADT Veh/24h	Gradient %	
3373.79	8146.04	Average (of DGAC and PCC)	10016.48	US 101	0.000	175000	0.2	

Oakmont of Agoura Hills
Assessed receiver levels - With Project Onsite Only

Name	Usage	Floor	Dir	Ldn dB(A)	Leq,d dB(A)	Leq,e dB(A)	Leq,n dB(A)	
1	RS	G	S	41.2	36.9	36.9	33.6	
2	RS	G	S	41.8	37.6	37.6	34.2	
3	RS	G	S	39.1	34.9	34.9	31.6	
4	RS	G	SW	32.7	28.3	28.3	25.2	
5	RS	G	S	31.5	27.1	27.1	24.0	
6	RS	G	SE	30.9	26.4	26.4	23.4	

Oakmont of Agoura Hills
Octave spectra of the sources in dB(A) - With Project Onsite Only

Name	Source	X	Y	Z	I or A	L'w	Lw	KI	KT	Day histogram	Spectrum	8Hz	16Hz	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
		m	m	m	m,m²	dB(A)	dB(A)	dB	dB			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Generator	Area	204.3	248.3	282.0	3.72	90.7	96.4	0.0	0.0	Generator	C4.76 Diesel				88.8	92.9	83.4	85.8	88.0	84.2	81.0	70.9	
HVAC 1	Point	223.6	197.7	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 2	Point	222.2	191.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 3	Point	220.8	185.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 4	Point	219.5	179.9	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 5	Point	218.1	174.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 6	Point	216.7	168.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 7	Point	215.3	162.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 8	Point	213.9	156.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 9	Point	212.6	150.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 10	Point	216.6	143.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 11	Point	222.6	141.9	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 12	Point	228.6	140.7	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 13	Point	234.5	139.4	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 14	Point	240.5	138.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 15	Point	246.5	137.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 16	Point	252.4	135.7	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 17	Point	258.4	134.5	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 18	Point	264.4	133.2	286.2		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 19	Point	271.4	136.0	285.4		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 20	Point	273.0	141.9	285.7		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 21	Point	274.6	147.8	285.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 22	Point	276.2	153.7	286.3		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 23	Point	277.8	159.6	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 24	Point	279.4	165.5	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 25	Point	281.0	171.3	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 26	Point	282.6	177.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 27	Point	284.2	183.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 28	Point	284.3	189.4	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 29	Point	278.3	190.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 30	Point	272.4	192.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 31	Point	266.5	193.6	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 32	Point	260.5	195.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 33	Point	254.6	196.4	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8

Oakmont of Agoura Hills
Octave spectra of the sources in dB(A) - With Project Onsite Only

Name	Source	X	Y	Z	l or A	L'w	Lw	KI	KT	Day histogram	Spectrum	8Hz	16Hz	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
		m	m	m	m,m²	dB(A)	dB(A)	dB	dB			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
HVAC 34	Point	248.7	197.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 35	Point	242.7	199.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 36	Point	236.8	200.6	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 37	Point	230.9	202.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
Truck Loading	Area	232.9	209.3	283.0	15.25	68.5	80.3	0.0	0.0	Truck Loading	Truck Loading		27.06	49.3	61.1	68.4	71.9	73.9	74.6	72.7	70.3	60.0	46.0
Parking	Parking	193.3	210.9	276.9	1714.24	55.6	87.9	0.0	0.0	Parking Lot								87.9					

Oakmont of Agoura Hills
Source level parking lots - With Project Onsite Only

Parking lot	PPT	KPA	KI	KD	TL	KStrO	Unit B0	Size B	f	
Parking	Visitors and	0.00	4.00	4.01	1	0.00	1 parking	49.00	1.00	

Oakmont of Agoura Hills
Assessed receiver levels - With Project Combined Onsite and Offsite Road Noise

Name	Usage	Floor	Dir	Ldn dB(A)	Leq,d dB(A)	Leq,e dB(A)	Leq,n dB(A)	
1	RS	G	S	61.4	57.6	56.5	53.8	
2	RS	G	S	63.6	59.8	58.8	56.0	
3	RS	G	S	61.7	58.0	56.9	54.2	
4	RS	G	SW	53.4	49.4	48.3	45.9	
5	RS	G	S	53.1	49.2	48.1	45.7	
6	RS	G	SE	56.9	53.0	51.9	49.4	
Dining Patio	RS	G		72.2	68.4	67.4	64.6	
Memory Care	RS	G		66.3	62.4	61.4	58.8	

Oakmont of Agoura Hills
Source level road - With Project Combined Onsite and Offsite Road Noise

MSVges Night Veh/h	MSVges Evening Veh/h	Pavement type	MSVges Day Veh/h	Road	KM km	ADT Veh/24h	Gradient %	
3373.79	8146.04	Average (of DGAC and PCC)	10016.48	US 101	0.000	175000	0.2	

Oakmont of Agoura Hills
Octave spectra of the sources in dB(A) - With Project Combined Onsite and Offsite Road Noise

Name	Source type	X	Y	Z	l or A	L'w	Lw	KI	KT	Day histogram	Spectrum	8Hz	16Hz	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
		m	m	m	m,m²	dB(A)	dB(A)	dB	dB			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Generator	Area	204.3	248.3	282.0	3.72	90.7	96.4	0.0	0.0	Generator	C4.76 Diesel				88.8	92.9	83.4	85.8	88.0	84.2	81.0	70.9	
HVAC 1	Point	223.6	197.7	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 2	Point	222.2	191.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 3	Point	220.8	185.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 4	Point	219.5	179.9	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 5	Point	218.1	174.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 6	Point	216.7	168.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 7	Point	215.3	162.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 8	Point	213.9	156.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 9	Point	212.6	150.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 10	Point	216.6	143.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 11	Point	222.6	141.9	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 12	Point	228.6	140.7	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 13	Point	234.5	139.4	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 14	Point	240.5	138.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 15	Point	246.5	137.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 16	Point	252.4	135.7	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 17	Point	258.4	134.5	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 18	Point	264.4	133.2	286.2		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 19	Point	271.4	136.0	285.4		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 20	Point	273.0	141.9	285.7		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 21	Point	274.6	147.8	285.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 22	Point	276.2	153.7	286.3		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 23	Point	277.8	159.6	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 24	Point	279.4	165.5	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 25	Point	281.0	171.3	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 26	Point	282.6	177.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 27	Point	284.2	183.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 28	Point	284.3	189.4	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 29	Point	278.3	190.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 30	Point	272.4	192.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 31	Point	266.5	193.6	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 32	Point	260.5	195.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 33	Point	254.6	196.4	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8

Oakmont of Agoura Hills
Octave spectra of the sources in dB(A) - With Project Combined Onsite and Offsite Road Noise

Name	Source type	X	Y	Z	l or A	L'w	Lw	KI	KT	Day histogram	Spectrum	8Hz	16Hz	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
		m	m	m	m,m²	dB(A)	dB(A)	dB	dB			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
HVAC 34	Point	248.7	197.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 35	Point	242.7	199.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 36	Point	236.8	200.6	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 37	Point	230.9	202.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
Truck Loading	Area	232.9	209.3	283.0	15.25	68.5	80.3	0.0	0.0	Truck Loading	Truck Loading		27.06	49.3	61.1	68.4	71.9	73.9	74.6	72.7	70.3	60.0	46.0
Parking	Parking lot	193.3	210.9	276.9	1714.24	55.6	87.9	0.0	0.0	Parking Lot								87.9					

Oakmont of Agoura Hills
Source level parking lots - With Project Combined Onsite and Offsite Road Noise

Parking lot	PPT	KPA	KI	KD	TL	KStrO	Unit B0	Size B	f	
Parking	Visitors and staff	0.00	4.00	4.01	1	0.00	1 parking	49.00	1.00	

Oakmont of Agoura Hills
Assessed receiver levels - Mitigated With Project Combined Onsite and Offsite Road Noise

Name	Usage	Floor	Dir	Ldn dB(A)	Leq,d dB(A)	Leq,e dB(A)	Leq,n dB(A)	
1	RS	G	S	61.4	57.6	56.5	53.9	
2	RS	G	S	63.6	59.8	58.8	56.0	
3	RS	G	S	61.7	58.0	56.9	54.2	
4	RS	G	SW	53.4	49.4	48.3	45.9	
5	RS	G	S	53.1	49.2	48.1	45.7	
6	RS	G	SE	56.9	53.0	51.9	49.4	
Dining Patio	RS	G		66.6	62.8	61.7	59.1	
Memory Care Garden	RS	G		66.3	62.4	61.4	58.8	

Oakmont of Agoura Hills
Source level road - Mitigated With Project Combined Onsite and Offsite Road Noise

MSVges Night Veh/h	MSVges Evening Veh/h	Pavement type	MSVges Day Veh/h	Road	KM km	ADT Veh/24h	Gradient %	
3373.79	8146.04	Average (of DGAC and PCC)	10016.48	US 101	0.000	175000	0.2	

Oakmont of Agoura Hills
Octave spectra of the sources in dB(A) - Mitigated With Project Combined Onsite and Offsite Road Noise

Name	Source	X	Y	Z	l or A	L'w	Lw	KI	KT	Day	Spectrum	8Hz	16Hz	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
		m	m	m	m,m²	dB(A)	dB(A)	dB	dB			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Generator	Area	204.3	248.3	282.0	3.72	90.7	96.4	0.0	0.0	Generator	C4.76 Diesel				88.8	92.9	83.4	85.8	88.0	84.2	81.0	70.9	
HVAC 1	Point	223.6	197.7	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 2	Point	222.2	191.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 3	Point	220.8	185.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 4	Point	219.5	179.9	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 5	Point	218.1	174.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 6	Point	216.7	168.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 7	Point	215.3	162.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 8	Point	213.9	156.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 9	Point	212.6	150.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 10	Point	216.6	143.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 11	Point	222.6	141.9	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 12	Point	228.6	140.7	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 13	Point	234.5	139.4	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 14	Point	240.5	138.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 15	Point	246.5	137.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 16	Point	252.4	135.7	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 17	Point	258.4	134.5	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 18	Point	264.4	133.2	286.2		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 19	Point	271.4	136.0	285.4		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 20	Point	273.0	141.9	285.7		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 21	Point	274.6	147.8	285.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 22	Point	276.2	153.7	286.3		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 23	Point	277.8	159.6	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 24	Point	279.4	165.5	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 25	Point	281.0	171.3	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 26	Point	282.6	177.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 27	Point	284.2	183.1	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 28	Point	284.3	189.4	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 29	Point	278.3	190.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 30	Point	272.4	192.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 31	Point	266.5	193.6	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 32	Point	260.5	195.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8
HVAC 33	Point	254.6	196.4	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8

Oakmont of Agoura Hills
Octave spectra of the sources in dB(A) - Mitigated With Project Combined Onsite and Offsite Road Noise

Name	Source	X	Y	Z	l or A	L'w	Lw	KI	KT	Day	Spectrum	8Hz	16Hz	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz	
		m	m	m	m,m²	dB(A)	dB(A)	dB	dB			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	
HVAC 34	Point	248.7	197.8	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8	
HVAC 35	Point	242.7	199.2	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8	
HVAC 36	Point	236.8	200.6	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8	
HVAC 37	Point	230.9	202.0	286.9		88.0	88.0	0.0	0.0	HVAC	HVAC	15.67	31.18	44.6	68.5	74.5	77.7	84.1	82.9	77.6	72.2	64.8	58.8	
Truck Loading	Area	232.9	209.3	283.0	15.25	68.5	80.3	0.0	0.0	Truck	Truck Loading		27.06	49.3	61.1	68.4	71.9	73.9	74.6	72.7	70.3	60.0	46.0	
Parking	Parking lot	193.3	210.9	276.9	1714.	55.6	87.9	0.0	0.0	Parking Lot								87.9						

Oakmont of Agoura Hills
Source level parking lots - Mitigated With Project Combined Onsite and Offsite Road Noise

Parking lot	PPT	KPA	KI	KD	TL	KStrO	Unit B0	Size B	f	
Parking	Visitors and staff	0.00	4.00	4.01	1	0.00	1 parking	49.00	1.00	

General Information

Serial Number	02509
Model	831
Firmware Version	2.112
Filename	831_Data.005
User	GT
Job Description	Northwest Fresno Walmart Relocation
Location	Rooftop HVAC Unit
Measurement Description	
Start Time	Saturday, 2013 July 27 18:31:43
Stop Time	Saturday, 2013 July 27 18:41:44
Duration	00:10:01.1
Run Time	00:10:01.1
Pause	00:00:00.0
Pre Calibration	Saturday, 2013 July 27 17:53:07
Post Calibration	None
Calibration Deviation	---

Note

Located 10 feet southeast of rooftop HVAC Unit 14 located on western side of roof
94 F, 30% Hu., 29.45 in Hg, no wind, partly cloudy

Overall Data

LAeq		66.6	dB
LASmax	2013 Jul 27 18:33:16	67.6	dB
LApeak (max)	2013 Jul 27 18:32:17	81.6	dB
LASmin	2013 Jul 27 18:41:08	65.8	dB
LCeq		75.8	dB
LAeq		66.6	dB
LCeq - LAeq		9.2	dB
LAIeq		67.2	dB
LAeq		66.6	dB
LAIeq - LAeq		0.6	dB
Ldn		66.6	dB
LDay 07:00-23:00		66.6	dB
LNight 23:00-07:00		---	dB
Lden		66.6	dB
LDay 07:00-19:00		66.6	dB
LEvening 19:00-23:00		---	dB
LNight 23:00-07:00		---	dB
LAE		94.4	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	67.0	dBA
LAS10.00	66.9	dBA
LAS33.30	66.7	dBA
LAS50.00	66.6	dBA
LAS66.60	66.5	dBA
LAS90.00	66.3	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	1 / 601.1	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.2	dB
Under Range Peak	75.8	dB
Noise Floor	17.1	dB
Overload	143.4	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	70.9	64.4	61.4	74.2	68.2	64.9	66.3	61.7	55.1	49.9	44.3	44.0
LZSmax	83.8	78.9	70.0	78.4	72.3	66.1	67.8	63.1	56.9	53.2	46.7	45.4
LZSmin	53.2	56.5	56.7	67.7	66.1	63.5	65.0	60.7	53.9	48.4	43.2	43.7

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	68.1	65.7	63.2	61.0	58.0	59.3	56.0	57.8	55.8	69.7	72.0	59.3
LZSmax	82.3	79.5	78.7	77.2	72.8	72.3	67.9	63.5	64.0	74.2	76.1	72.0
LZSmin	41.9	46.3	48.8	48.7	46.5	49.7	50.1	51.8	41.2	63.9	67.9	54.5

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	61.6	63.7	64.5	59.0	58.7	60.9	63.2	60.8	59.9	59.2	56.1	54.6
LZSmax	71.3	68.0	67.3	61.6	61.7	64.1	65.5	64.2	62.0	60.7	57.6	58.6
LZSmin	52.9	60.0	57.2	45.1	56.0	58.9	61.1	58.4	58.4	57.1	54.9	53.3

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	52.0	49.8	48.4	46.4	45.4	42.8	41.1	38.6	38.5	38.4	39.0	40.2
LZSmax	54.4	52.3	51.2	50.2	49.7	45.7	45.4	41.6	40.4	40.4	41.4	41.3
LZSmin	50.9	48.4	46.9	45.0	43.7	41.4	39.6	37.5	37.9	38.0	38.7	39.9

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	27 Jul 2013 17:53:07	-25.9
PRM831	27 Jul 2013 13:36:08	-25.6
PRM831	28 Apr 2013 15:34:24	-25.9
PRM831	23 Apr 2013 10:17:33	-25.0
PRM831	27 Feb 2013 19:15:30	-25.7
PRM831	24 Jan 2013 12:00:16	-25.6
PRM831	15 Jan 2013 07:50:44	-26.2
PRM831	04 Jan 2013 13:47:46	-26.5

File Translated: V:\Vista Env\2010\10022-Fresno Walmart\Noise Measurements\LD\15.slmdl
Model/Serial Number: 824 / A3176
Firmware/Software Revs: 4.283 / 3.120
Name:
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup/Setup Descr: slm&rta.ssa / SLM & Real-Time Analyzer
Location: 30' N of vendor truck loading area for Fresno Walmart
Note1: Approx 70' S of Locust Ave CL
Note2: 52F, 29.57 in Hg, 67% Humid., no wind, clear sky

Overall Any Data
Start Time: 19-May-2011 07:05:53
Elapsed Time: 00:08:30.5

	A Weight		C Weight		Flat	
Leq:	54.8 dBA		65.1 dBC		66.1 dBF	
SEL:	81.9 dBA		92.2 dBC		93.2 dBF	
Peak:	85.2 dBA		85.8 dBC		86.0 dBF	
	19-May-2011	07:09:58	19-May-2011	07:09:52	19-May-2011	07:09:52
Lmax (slow):	67.9 dBA		73.2 dBC		73.8 dBF	
	19-May-2011	07:09:50	19-May-2011	07:13:57	19-May-2011	07:13:57
Lmin (slow):	43.7 dBA		60.0 dBC		61.6 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:52	19-May-2011	07:06:51
Lmax (fast):	70.7 dBA		75.5 dBC		75.7 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (fast):	43.1 dBA		57.8 dBC		58.9 dBF	
	19-May-2011	07:11:17	19-May-2011	07:09:10	19-May-2011	07:09:10
Lmax (impulse):	72.1 dBA		76.8 dBC		77.1 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (impulse):	43.6 dBA		61.1 dBC		62.4 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:51	19-May-2011	07:09:10

Spectra

Date	Time	Run Time
19-May-2011	07:05:53	00:08:30.5

Hz	Leq1/3	Leq1/1	Max1/3	Max1/1	Min1/3	Min1/1	Hz	Leq1/3	Leq1/1	Max1/3	Max1/1	Min1/3	Min1/1
12.5	50.2		56.3		35.5		630	46.5		61.4		31.0	
16.0	50.9	55.5	56.1	61.5	37.1	41.8	800	45.4		60.8		30.5	
20.0	51.0		57.6		38.0		1000	44.5	49.3	56.1	63.9	31.7	35.6
25.0	55.8		57.5		41.1		1250	43.5		59.4		30.2	
31.5	57.7	61.6	57.1	63.3	46.2	49.9	1600	42.6		56.3		28.1	
40.0	56.7		60.3		46.3		2000	41.1	46.1	56.4	61.9	24.9	30.4
50.0	56.8		57.9		44.0		2500	40.0		58.4		21.7	
63.0	55.7	61.0	56.5	62.1	45.9	49.1	3150	40.2		60.8		19.4	
80.0	56.2		57.4		42.2		4000	39.5	43.8	58.6	63.4	18.7	24.1
100	55.6		55.1		42.3		5000	36.7		54.4		19.7	
125	54.3	59.2	59.0	63.8	40.7	45.7	6300	32.8		50.2		21.5	
160	52.8		61.0		39.4		8000	30.2	35.2	57.7	58.5	21.2	25.9
200	51.1		57.3		35.5		10000	25.4		41.5		20.5	
250	51.4	55.2	70.6	71.0	34.6	39.0	12500	22.9		32.2		19.4	
315	48.2		58.2		32.0		16000	20.8	26.5	27.4	33.9	19.1	24.4
400	47.0		59.0		30.1		20000	21.2		23.8		20.3	
500	47.0	51.6	64.3	66.9	30.4	35.3							

Ln Start Level: 15 dB

L1.00	0.0 dBA	L50.00	0.0 dBA	L95.00	0.0 dBA
L5.00	0.0 dBA	L90.00	0.0 dBA	L99.00	0.0 dBA

Detector: Slow
Weighting: A
SPL Exceedance Level 1: 85.0 dB Exceeded: 0 times
SPL Exceedance level 2: 120 dB Exceeded: 0 times
Peak-1 Exceedance Level: 105 dB Exceeded: 0 times
Peak-2 Exceedance Level: 100 dB Exceeded: 0 times
Hysteresis: 2
Overloaded: 0 time(s)
Paused: 0 times for 00:00:00.0

File Translated: V:\Vista Env\2010\10022-Fresno Walmart\Noise Measurements\LD\15.slmdl
Model/Serial Number: 824 / A3176

Current Any Data
Start Time: 19-May-2011 07:05:53
Elapsed Time: 00:08:30.5

	A Weight		C Weight		Flat	
Leq:	54.8 dBA		65.1 dBC		66.1 dBF	
SEL:	81.9 dBA		92.2 dBC		93.2 dBF	
Peak:	85.2 dBA		85.8 dBC		86.0 dBF	
	19-May-2011	07:09:58	19-May-2011	07:09:52	19-May-2011	07:09:52
Lmax (slow):	67.9 dBA		73.2 dBC		73.8 dBF	
	19-May-2011	07:09:50	19-May-2011	07:13:57	19-May-2011	07:13:57
Lmin (slow):	43.7 dBA		60.0 dBC		61.6 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:52	19-May-2011	07:06:51
Lmax (fast):	70.7 dBA		75.5 dBC		75.7 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (fast):	43.1 dBA		57.8 dBC		58.9 dBF	
	19-May-2011	07:11:17	19-May-2011	07:09:10	19-May-2011	07:09:10
Lmax (impulse):	72.1 dBA		76.8 dBC		77.1 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (impulse):	43.6 dBA		61.1 dBC		62.4 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:51	19-May-2011	07:09:10

Calibrated: 18-May-2011 13:09:02 Offset: -48.2 dB
Checked: 19-May-2011 06:46:08 Level: 113.9 dB
Calibrator not set Level: 114.0 dB
Cal Records Count: 0

Interval Records: Disabled Number Interval Records: 0
History Records: Disabled Number History Records: 0
Run/Stop Records: Number Run/Stop Records: 2

XQ800 RENTAL

STANDBY 795 kW
PRIME 725 kW
POWER MODULE
50 Hz 1500 rpm
60 Hz 1800 rpm

Frequency	Voltage	Standby kW (kVA)	Prime kW (kVA)
60 Hz	480/277V	795 (994)	725 (906)
60 Hz	240/139V	795 (994)	725 (906)
60 Hz	208/120V	795 (994)	725 (906)
60 Hz	600V	795 (994)	725 (906)
50 Hz	400V	660 (825)	600 (750)

FEATURES

FUEL/EMISSIONS STRATEGY
- EPA Tier 4 Interim

DESIGN CRITERIA
- Accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response
- CSA Approved

SINGLE-SOURCE SUPPLIER
- Factory designed and fully prototype tested with certified torsional vibration analysis available
- ISO 9001:2000 compliant facility

WORLDWIDE PRODUCT SUPPORT
- Cat® dealers provide extensive post sale support including maintenance and repair agreements
- Cat dealers have over 1600 dealer branch stores operating in 200 countries
- The Cat S•O•S℠ program effectively detects internal engine component condition, even the presence of unwanted fluids and combustion byproducts

CAT C27 ATAAC DIESEL ENGINE
- Utilizes ACERT™ Technology
- Reliable, rugged, durable design
- Four-stroke diesel engine combines consistent performance and excellent fuel economy with minimum weight
- Electronic engine control

CAT GENERATOR
- Matched to the performance and output characteristics of Cat engines
- Single point access to accessory connections
- UL 1446 Recognized Class H insulation

CAT EMCP 4.4 CONTROL PANEL
- Simple user friendly interface and navigation
- Integrated, automatic genset paralleling facilitates multi-unit systems meeting a wide range of customer applications
- Integrated Control System and Communications Gateway

CAT DIGITAL VOLTAGE REGULATOR (CAT DVR)
- Three-phase sensing
- Adjustable volts-per-hertz regulation
- Provides precise control, excellent block loading, and constant voltage in the normal operating range

SOUND ATTENUATED CONTAINER
- Provides ease of transportation and protection
- Meets 74 dB(A) at 7 meters per SAE J1074 measurement procedure at 110% prime load

ENVIRONMENTALLY FRIENDLY
- 110% spill containment of onboard engine fluids

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 7/5/2017
Case Descr Site Preparation and Grading Phase

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
R1 - comm	Commercia	59.6	59.6	56.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	40	0
Tractor	No	40	84		40	0
Front End Loader	No	40		79.1	60	0
Backhoe	No	40	80		60	0
Excavator	No	40		80.7	80	0
Grader	No	40	85		80	0
Dozer	No	40		81.7	180	0
Tractor	No	40	84		180	0
Front End Loader	No	40		79.1	280	0
Backhoe	No	40		77.6	280	0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	85.9	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	77.5	73.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	78.4	74.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	76.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	80.9	76.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	70.5	66.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	72.9	68.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	64.1	60.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	62.6	58.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.9	85.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
R2 - reside	Residential	59.6	59.6	56.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	315	6
Tractor	No	40	84		315	6
Front End Loader	No	40		79.1	415	6
Backhoe	No	40	80		415	6
Excavator	No	40		80.7	515	6
Grader	No	40	85		515	6
Dozer	No	40		81.7	615	6
Tractor	No	40	84		615	6
Front End Loader	No	40		79.1	715	6
Backhoe	No	40		77.6	715	6

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	59.7	55.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	62	58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	54.7	50.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	55.6	51.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	54.5	50.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	58.7	54.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	53.9	49.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	56.2	52.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	50	46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	48.5	44.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Total	62	63	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

	Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
R3 - resdie	Residential	59.6	59.6	56.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	405	6
Tractor	No	40	84		405	6
Front End Loader	No	40		79.1	505	6
Backhoe	No	40	80		505	6
Excavator	No	40		80.7	605	6
Grader	No	40	85		605	6
Dozer	No	40		81.7	705	6
Tractor	No	40	84		705	6
Front End Loader	No	40		79.1	705	6
Backhoe	No	40		77.6	705	6

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	57.5	53.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	59.8	55.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	53	49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	53.9	49.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	53.1	49.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	57.3	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	52.7	48.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	55	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	50.1	46.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	48.6	44.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.8	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 7/5/2017
Case Descr Building Construction Phase

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
R1 - comm	Commercia	59.6	59.6	56.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	170	0
Tractor	No	40	84		170	0
Generator	No	50		80.6	270	0
Man Lift	No	20		74.7	270	0
Front End Loader	No	40		79.1	370	0
Backhoe	No	40		77.6	370	0
Welder / Torch	No	40		74	370	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	69.9	62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	73.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	66	63	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	60.1	53.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	61.7	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	60.2	56.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	56.6	52.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	73.4	71.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
R2 - reside	Residential	59.6	59.6	56.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	350	6
Tractor	No	40	84		350	6
Generator	No	50		80.6	450	6
Man Lift	No	20		74.7	450	6
Front End Loader	No	40		79.1	550	6
Backhoe	No	40		77.6	550	6
Welder / Torch	No	40		74	550	6

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	57.6	49.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	61.1	57.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	55.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	49.6	42.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	52.3	48.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	50.7	46.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	47.2	43.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	61.1	59.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
R3 - reside	Residential	59.6	59.6	56.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)

Crane	No	16		80.6	440	6
Tractor	No	40	84		440	6
Generator	No	50		80.6	540	6
Man Lift	No	20		74.7	540	6
Front End Loader	No	40		79.1	640	6
Backhoe	No	40		77.6	640	6
Welder / Torch	No	40		74	540	6

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	55.7	47.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	59.1	55.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	54	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	48	41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	51	47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	49.4	45.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	47.3	43.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.1	58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Emergency Vehicle Siren

Receptor: Closest residential property line

		Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
		Reference (dBA) 50 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
No.	**Equipment Description**	**Lmax**	**Quantity**	**factor***	**Receptor**	**Effect**	**(dBA)**	**Lmax**	**Leq**	**Energy**
1	Emergency Vehicle Siren	98	1	1.7	650	0.5	5	70.7	47.5	55666.06734
2	Emergency Vehicle Siren	98	1	1.7	650	0.5	5	70.7	47.5	55666.06734
3	Emergency Vehicle Siren	98	1	1.7	650	0.5	5	70.7	47.5	55666.06734
4										
5										
6										
7										
8										
9										
10										
Notes:									**Leq**	**52**

* Percentage of time during an hour that the maximum siren sound would occur.

Assumptions:

1) Maximum siren noise levels would occur for up to one minute on the project site.
2) Ground effect accounts for soft-surface of grass hillside.
3) Shielding accounts for minimum shielding that the proposed buidling and existing terrain woud provide.

Trip Generation and Parking Letter

APPENDIX K

CRANE TRANSPORTATION GROUP

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San Francisco Bay Area Office:
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(510) 236-1091 *fax*

June 24, 2016

Mr. Wayne Sant
Vice President, Development
Oakmont Senior Living
9240 Old Redwood Hwy #200
Windsor, CA 95492

RE: TRIP GENERATION AND PARKING -- PROPOSED OAKMONT ASSISTED LIVING FACILITY – AGOURA HILLS, CALIFORNIA

Dear Mr. Sant:

At your request, Crane Transportation Group has prepared this letter to address weekday vehicle trip generation and parking demand for Oakmont's proposed 72-unit (87 bed count) assisted living facility. The facility is proposed to be located on a 6.05-acre site fronting on Canwood Street, which runs along the north side of the U.S. 101 freeway. The address is 29353 Canwood Street, Agoura Hills, California. The site is currently undeveloped. The Oakmont Assisted Living Facility would construct a new facility to serve individuals in need of living assistance, and/or memory care. The issues specifically addressed in this letter is as follows:

> Trip Generation: The proposed assisted care facility would accommodate 72 units and 87 beds; a very few residents may drive. Projected trips are shown for daily and weekday peak hour conditions, based on Institute of Transportation Engineers (ITE) rates.
>
> Parking Demand: Parking demand anticipated for the proposed assisted care facility is detailed by the employee shift schedule and anticipated visitor parking. Parking demand is also addressed in the context of surveys conducted for Oakmont's existing Cardinal Point I and II assisted living facilities in July 2013, and the City of Oxnard parking code.

I. SETTING

The project site will be accessed via a driveway intersection with Canwood Street. Neighboring land use north of the site is vacant land and a single family residential neighborhood; east of the site is a vacant 8-acre parcel; south of the site is Canwood Street and the U.S. 101 freeway, and west of the site is a medical office building.

II. SITE PLAN

Automobile access would be via two-way driveway connection to Canwood Street. The two-way drive would provide access to parking throughout the site, including front door drop-off/pick-up and two surface-level handicapped parking spaces convenient to the building's front door. Fifty-four (54) at-grade automobile parking spaces – including Oakmont's shuttle van space - would be provided on the site. Six of the 54 parking spaces would be in garages and 6 would be in carports. On-site circulation is shown on the site plan.

III. TRIP GENERATION

Trip rates utilized in this evaluation are from the traffic engineering profession's standard source of trip rate data: *Trip Generation – An ITE Informational Report*, 9th Edition, by the Institute of Transportation Engineers, 2012. Although occupancy is typically closer to 95 percent than 100 percent, the higher percentage is used in this evaluation to present a conservative analysis. Table 1 shows projected trip generation.

As shown in **Table 1**, the proposed 72-unit, 87-bed facility would be expected to generate 238 daily two-way trips (119 inbound and 119 outbound), with 11 inbound and 5 outbound trips during the ambient commute AM peak hour, and 13 inbound and 12 outbound trips during the ambient commute PM peak hour. This type of land use typically results in very low levels of trip generation.

Table 1
TRIP GENERATION

USE	# BEDS	DAILY 2-WAY TRIPS		AM PEAK HOUR VOLUMES				PM PEAK HOUR VOLUMES			
				IN		OUT		IN		OUT	
		RATE	VOL	RATE	VOL	RATE	VOL	RATE	VOL	RATE	VOL
Assisted Living Facility	87 beds	2.74	238	.12	11	.06	5	.15	13	.14	12

Trip Rate Source: *Trip Generation*, 9th Edition, by the Institute of Transportation Engineers 2012, rate per occupied bed – assumes 100 % occupancy.
Compiled by: Crane Transportation Group

III. PARKING DEMAND

The facility would provide assisted living services that are personalized to the individual needs of those who require help with all activities of daily living, such as bathing, dressing, eating, toileting, mobility, and medication management. In assisted living, residents receive three meals a day, housekeeping services, and weekly laundry of linens and personal clothing. Specialized recreational and social programs would be provided. Twenty-six (26) of the 72 units would serve up to 33 memory care residents requiring 24-hour assistance.

A typical assisted living resident needs help with at least three or more activities of daily living, and residents who are living in memory care need help with all activities. Also, in a dedicated assisted living and memory care building the social, recreational and dining programs are structured to meet the resident's needs, as residents are less mobile and must make use of more adaptive devices. Oakmont's staff is licensed in a wide range of care-giving, and requires few specialty caregivers over and above the Oakmont staff. [1]

Oakmont staff would comprise the primary daily parking demand. **Table 2** provides the details of staffing per shift, while **Table 3** provides a *sampling* of three weekday time periods when parking demand would likely be greatest.

Note: the morning and afternoon non-administrative staff shift changes *will not* coincide with the weekday ambient AM and PM commute peak traffic hours. Shift changes at Oakmont facilities have been observed to occur gradually, with employees arriving and departing over a ½ hour period, rather than in a highly concentrated peak.

Basis of Parking Supply and Demand

The facility will be in operation on a 24-hour basis, seven days per week. Many residents would require high levels of care, with some requiring memory care assistance. Few of the residents would drive; very few would be expected to require a parking space for car storage. The non-administrative staff shift schedule would be 6:00 AM - 2:00 PM (morning shift), 2:00 PM – 10:00 PM (afternoon shift) and 10:00 PM - 6:00 AM (night shift). Non-administrative staff would total 17 for the morning shift, 16 for the afternoon shift, and 5 for the night shift. Eleven (11) administrative staff would follow an 8:00 AM – 5:00 PM schedule. Not all staff would be expected to drive to work – some may use transit, and others may combine public transit and walking or bicycle riding.

It is expected that many would be dropped off at work (this was observed at Cardinal Point I), and others would rideshare to and from work. July 2013 surveys of Oakmont's Cardinal Point I facility revealed that 33 percent of morning shift staff used alternative modes of travel to and from work.

The facility would provide car service for its residents, and at any given time, a vehicle would be parked on-site, with a driver on call, as needed. Oakmont will provide a 20+ passenger bus for large group trips and a smaller vehicle for local trips.

Services Provided

- Dining – 3 daily meals, plus beverages and snacks
- Housekeeping, laundry linens
- Chauffeured transportation
- 24-hour emergency response
- Wellness and personal care, medication management

[1] Wayne Sant, Vice-President Development, Oakmont Senior Living, personal communication with Crane Transportation Group, November 4, 2015.

- Utilities included
- Exercise programs
- Musical performances, lectures
- Full social activity calendar
- Religious services

Deliveries and Visitors

- Daily deliveries - produce, bread, milk
- Weekly or monthly deliveries - staples, paper goods, nursing supplies, office supplies, cleaning supplies
- Deliveries are spread throughout the day, from 8:00 AM to 5:00 PM.
- There would be no restrictions on visiting hours; visitors arrive and depart throughout the day. Although most medical and therapeutic services would be available through the Oakmont staff, a few residents would have in-house visits from aids or therapists, and these would generally occur between 10:00 AM and 2:00 PM. Weekday and weekend visits would occur at anytime, with few predictable patterns.

TABLE 2

Oakmont Senior Living of Agoura Hills				
Budgeted Staffing & Shift Requirements				
Oct-15				
	Units	**Residents**		
Asst. Living	46	54		
Alzheimer's	26	33		
	72	87		
	AM Shift	**Day Shift**	**PM Shift**	**Night Shift**
	6am-2:00pm	**8am-5pm**	**2pm-10:00pm**	**10pm-6:00am**
Staffing-FTE's				
Executive Director		1		
Marketing Director		1		
Marketing Associate		1		
Activity Director		1		
Activity Assistant		1		
Health Services Director		1		
Business Office Manager		1		
Concierge		1		
Culinary Director		1		
Cook	2		2	
Kitchen Staff	2		1	
Meal Servers	1		3	
Housekeeping	2		1	
Maintenance Director	1			
Maintenance Assistant			1	
AL Caregivers	4		3	3
Bus Driver		1		
Traditions Director		1		
Traditions Caregivers	5		5	2
	17	11	16	5
Total FTE's	49			
Total Employees	60			

Source: Oakmont Senior Living, October 2015

TABLE 3
TYPICAL DAY MAXIMUM WEEKDAY PARKING DEMAND
DURING THREE SAMPLE TIME PERIODS

STAFF	7:30-8:30 AM	2:30-3:30 PM	5:30-6:30 PM
Administrative	11	11	0
Morning Shift * (6 AM - 2 PM}	14*	0	0
Afternoon Shift * (2 PM – 10 PM)	0	13*	13*
Visitors (including visiting health professionals)	5	5	7
Oakmont Service Car (on-call service for all residents)	1	1	1
TOTAL	31	30	21

* Based upon surveys conducted by Crane Transportation Group in July 2013 for the Cardinal Point I and II Senior and Assisted Living facilities in Alameda, California, 33 percent of employees used modes of travel to work other than a single-occupant vehicle. The modes observed included walking, bicycle, public transit, rideshare and drop-off. To present a conservative analysis, the morning and afternoon shifts are reduced in this table by only 20 percent.

Compiled by: Crane Transportation Group, January, 2016

IV. PARKING REQUIREMENT

The project would be expected to have sufficient parking with its proposed 54 on-site parking spaces, and would not depend upon any off-site, on-street parking spaces.

The City of Agoura Hills requires 1 parking space per every 5 beds.[2] For a 87 bed facility the City would require 18 automobile parking spaces.

For informational purposes, a sampling of parking requirements for residential care facilities and similar land uses for a number of other California cities are provided in **Table 4**.

[2] City of Agoura Hills Parking Standards for Institutional, Convalescent Hospitals, Nursing Homes, and Homes for the Aged, Article IX - Zoning Chapter 6 - Regulatory Provisions Part 2. Special Regulations.

TABLE 4
A SAMPLING OF ASSISTED CARE PARKING REQUIREMENTS
IN CALIFORNIA CITIES/COUNTIES*

Jurisdiction	Facility Type	Parking Requirements**
City of Alameda	Residential Care Facility	0.34 spaces per bed
	With 87 beds:	**30 spaces required**
City of Corte Madera	Convalescent hospital or rest home	0.33 spaces per bed
	With 87 beds:	**29 spaces required**
City of Danville	Convalescent Home, Rest Home, Nursing Home,	0.33 spaces per bed
	With 87 beds:	**29 spaces required**
City of Novato	Residential Care	0.33 spaces per bed
	With 87 beds:	**29 spaces required**
City of San Francisco	Group Housing (of any kind)	0.33 spaces per bed + 1 space for manager
	With 87 beds:	**30 spaces required**
City of Concord	Residential Care Facility	0.41 spaces per bed*
	With 87 beds:	**36 spaces required**
County of San Bernardino	Residential Care Facility	0.41 spaces per bed*
	With 87 beds:	**36 spaces required**
City of Carmichael	Residential Care Facility	0.34 spaces per bed*
	With 87 beds:	**30 spaces required**
City of Thousand Oaks	Residential Care Facility	0.29 spaces per bed*
	With 87 beds:	**25 spaces required**

Table 4, cont'd

City of Pleasant Hill	Residential Care Facility	0.37 spaces per bed*
	With 87 beds:	**32 spaces required**
City of Moraga	Residential Care Facility	0.33 spaces per bed*
	With 87 beds:	**29 spaces required**
City of Petaluma	Residential Care Facility	0.39 spaces per bed*
	With 87 beds:	**34 spaces required**

*Calculated based upon actual Use Permit approvals.
** Rounded up or down to the nearest 1.0.

As can be seen from the above data, the proposed 54 automobile parking spaces would exceed the number of spaces required by the cities listed above for various types of assisted care facilities.

According to the study *Assisted Living Residences: A Study of Traffic and Parking Implications*, prepared by the American Seniors Housing Association, parking demand is low to moderate compared to other housing types. The study cites a parking demand for assisted living facilities as low as 0.22 per unit (the equivalent of 19 spaces for a 103-bed facility – see **Table 5**). The reason cited for this comparatively low parking requirement is: residents generally do not drive, and visitors typically arrive and depart during all hours of the day rather than concentrating during a specific period of the day.

Table 5
Assisted Living Residences: A Study of Traffic and Parking Implications by the American Seniors Housing Association

American Seniors Housing Association	Residential Care Facility	0.22 spaces per bed*
	With 87 beds:	**19 spaces required**

*Calculated based upon rates provided in *Assisted Living Residences: A Study of Traffic and Parking Implications by the American Seniors Housing Association*

V. CONCLUSIONS

The proposed project would not result in a significant impact on the roadway network serving the site, would exceed City code parking requirements, and would provide more than sufficient parking for typical day activities.

We hope this information is responsive to your needs. Please call if questions arise.

Sincerely,

Carolyn Cole, AICP
Principal

This Report is intended for presentation and use in its entirety, together with all of its supporting exhibits, schedules, and appendices. Crane Transportation Group will have no liability for any use of the Report other than in its entirety, such as providing an excerpt to a third party or quoting a portion of the Report. If you provide a portion of the Report to a third party, you agree to hold CTG harmless against any liability to such third parties based upon their use of or reliance upon a less than complete version of the Report.

City Tribal Consultation Letters

APPENDIX L

CITY OF

AGOURA HILLS

"Gateway to the Santa Monica Mountains National Recreation Area"

June 5, 2017

Kimia Fatehi
Tribal Historic and Cultural Preservation Officer
Fernandeno Tataviam Band of Mission Indians
1019 2nd Street
San Fernando CA 91340

SUBJECT: AB 52 CONSULTATION WITH NATIVE AMERICAN TRIBES

Dear Ms. Fatehi:

We are writing to you pursuant to AB 52's requirement for consultation with Native American tribes. Please let us know within 30 days of the receipt of this letter if you wish to initiate consultation pursuant to AB 52 and California Public Resource Code Section 21080.3.1(a) and 65352.4 regarding the following project. If so, please let us know if you would be your tribe's lead contact person, or provide the name and contact information for another lead tribal representative with whom we can coordinate.

Oakmont of Agoura Hills

- 71,020 square feet of senior assisted living and memory care facility on 5.7 acres.
- 29353 Canwood Street, Agoura Hills (APN 2053-001-005)
- 25,100 cubic yards of grading with no net import or export of soil
- Hillside lot of about 16 percent slope
- Steeper hillside portion of lot to remain ungraded and as open space
- All oak trees to be preserved

The City of Agoura Hills has determined that an Initial Study/Mitigated Negative Declaration (IS/MND) is the appropriate document to be prepared for the project, pursuant to the California Environmental Quality Act (CEQA). Attached is a written project description, site plan, and plan cover sheet.

If you have any questions, or need further information, please let me know. I can be reached at (818) 597-7310 or at acook@ci.agoura-hills.ca.us. Thank you.

Sincerely,

Allison Cook, AICP
Assistant Planning Director

Attachments

CITY OF

AGOURA HILLS

"Gateway to the Santa Monica Mountains National Recreation Area"

June 5, 2017

Anthony Morales, Chief
San Gabrieleno Band of Mission Indians
P.O. Box 693
San Gabriel, CA 91778

SUBJECT: AB 52 CONSULTATION WITH NATIVE AMERICAN TRIBES

Dear Chief Morales:

We are writing to you pursuant to AB 52's requirement for consultation with Native American tribes. Please let us know within 30 days of the receipt of this letter if you wish to initiate consultation pursuant to AB 52 and California Public Resource Code Section 21080.3.1(a) and 65352.4 regarding the following project. If so, please let us know if you would be your tribe's lead contact person, or provide the name and contact information for another lead tribal representative with whom we can coordinate.

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Sincerely,

Allison Cook, AICP
Assistant Planning Director

Attachments

CITY OF

AGOURA HILLS

"Gateway to the Santa Monica Mountains National Recreation Area"

June 5, 2017

Julie Tumamait-Stenslie
Barbareno/Ventureno Band of Mission Indians
365 North Poli Avenue
Ojai, CA 93023

SUBJECT: AB 52 CONSULTATION WITH NATIVE AMERICAN TRIBES

Dear Ms. Temamai-Stensilie:

We are writing to you pursuant to AB 52's requirement for consultation with Native American tribes. Please let us know within 30 days of the receipt of this letter if you wish to initiate consultation pursuant to AB 52 and California Public Resource Code Section 21080.3.1(a) and 65352.4 regarding the following project. If so, please let us know if you would be your tribe's lead contact person, or provide the name and contact information for another lead tribal representative with whom we can coordinate.

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Sincerely,

Allison Cook, AICP
Assistant Planning Director

Attachments

30001 Ladyface Court, Agoura Hills, CA 91301-2583 • Telephone (818) 597-7300 • Fax (818) 597-7352
e-mail: ci.agoura-hills.ca.us

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PROJECT NOTES

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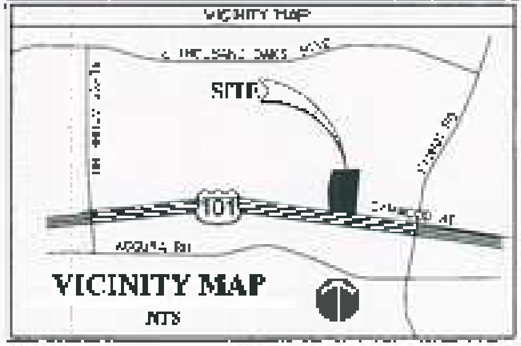

UNIT SUMMARY

ASSISTED LIVING

MEMORY CARE

LICENSING

CONSULTANTS

OWNER

CIVIL ENGINEER

GEOTECHNICAL ENGINEER

DEVELOPER

LANDSCAPE ARCHITECT

SITE DESIGN

OAKMONT

TITLE SHEET

OAKMONT OF AGOURA HILLS

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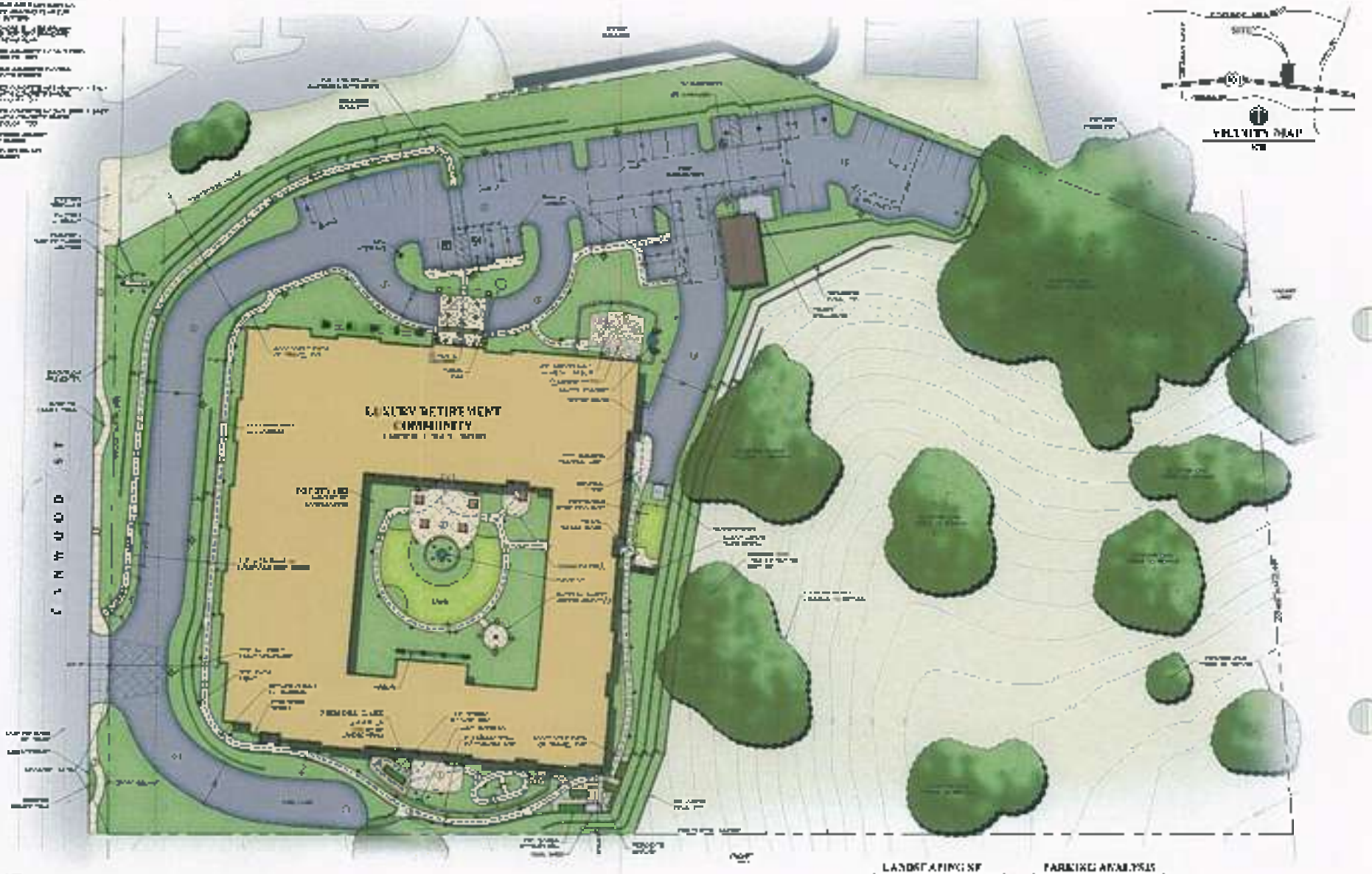


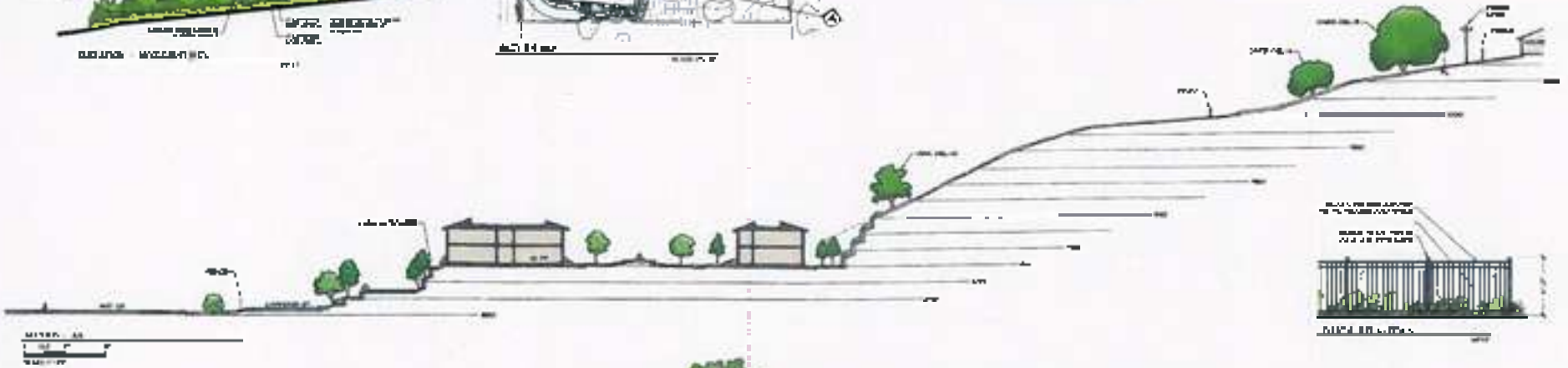
LANDSCAPING SF

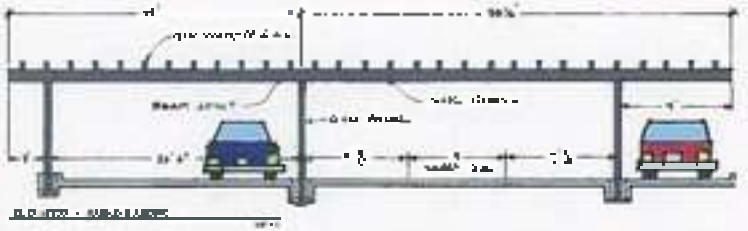
PARKING ANALYSIS

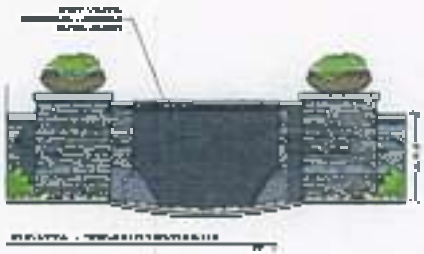
OAKMONT OF AGOURA HILLS

SITE PLAN

1







OAKMONT OF AGOURA HILLS

NTS PLANS

OAKMONT OF AGOURA HILLS

OAKMONT of AGOURA HILLS
PROJECT DESCRIPTION
6/1/17

Oakmont Senior Living is submitting an application to develop a 75-unit assisted living and memory care community in the City of Agoura Hills at 29353 Canwood Street, on the north side of the 101 Freeway. We believe this 5.748-acre site will be an ideal location for our residents to enjoy close proximity to all the amenities that the City of Agoura Hills has to offer.

Surrounding Land Uses
To the east of the site is a vacant parcel and an office building. To the west is an office building. To the south is Canwood Street which fronts on the 101 Freeway. To the north is vacant land and a single family residential neighborhood.

Services and Amenities
This two story structure will be designed architecturally from the ground up to provide for the special needs of our seniors. All the resident rooms will be supplemented with common areas to promote friendships and create a sense of open community. The proposed project will offer a wide range of services within a gracious and secure environment.

This community will provide amenities such as private and formal dining rooms, a café, entertainment and activity rooms, beauty salon, library, outside courtyard and more. There will be an in-house fitness center, and a private surround-sound theater. Luxurious comfort will be defined by the fine woodwork, elegant furnishings, artwork, fireplaces, and fresh flowers. Conversation areas are strategically located throughout the building to promote socializing.

In this fully licensed residential care community, residents will receive healthy meals in our dining room, housekeeping, assistance from knowledgeable staff, an emergency response system, programs and health screening. The dining room and exhibition kitchen will be operated like a restaurant directed by a chef. Breakfast will be served from 7 to 9:30 AM, lunch from 11:30 AM to 1:30 PM, and dinner from 5 to 8 PM.

Progressive care needs of the residents will be addressed by providing high levels of assisted living in their individual units. This will fulfill our aging-in-place philosophy allowing our residents to stay in their chosen unit. At move-in, the majority of our residents are in their early to mid-80's. They utilize a myriad of assisted living services offered within the community such as medication management, our in house concierge doctor program and diabetes management.

In addition, twenty six (26) of the units are set aside for memory care. The memory care program will be offered in a specifically designed area for residents with Alzheimer's disease and other forms of dementia.

Being that few residents drive, we take care of their transportation needs by providing a 20+ passenger bus with a qualified driver along with a smaller vehicle for local trips. Our staff will take residents to shop, doctor appointments and other community activities.

Housekeeping services, residential and grounds maintenance, and 24-hour on-site management are among the many amenities that provide peace-of-mind to residents and their families. In addition to our personal service philosophy, we promote intergenerational opportunities and work closely with the community to develop ongoing programs.

Resident Leases.
All residents are on a month to month lease agreement. There is no mandated length of stay for our residents. Depending on their physical condition when they move in, the length of our resident's stay could be as short as a few months to over 10 years

Licensing and Age Restrictions
All of the units will be licensed by the State of California Department of Social Services as a Residential Care Facility for the Elderly, classified as "Assisted Living." The California definition of a Residential Care Facility for the Elderly from Title 22 mentions people 60 and above. However, there is a qualifier that operators cannot restrict entry of those under 60 if they have similar health conditions as a typical resident and require the services we have to offer. (See language below) So if a resident is 52 and in the early stages of Alzheimer's disease, by statute, they would meet the requirements as a potential resident.

"Residential Care Facilities for the Elderly (RCFE) provide care, supervision and assistance with activities of daily living, such as bathing and grooming. They may also provide incidental medical services under special care plans. The facilities provide services to persons 60 years of age and over and persons under 60 with compatible needs. RCFEs may also be known as assisted living facilities, retirement homes and board and care homes. The facilities can range in size from six beds or less to over 100 beds. The residents in these facilities require varying levels of personal care and protective supervision. Because of the wide range of services offered by RCFEs, consumers should look closely at the programs of each facility to see if the services will meet their needs."

Employees
Being that this is a licensed facility, the property will be open and operating on a 24-hour basis, seven days a week. The number of employees will fluctuate throughout the day from a high of 28 employees during the morning and

afternoon and 4-6 employees through the evening and night shift. The morning shift starts at approx. 6 AM, the afternoon shift will start around 2:00 PM and the night shift at 10PM. We are proud to say that at most of our communities over fifty percent of the employees are residents of the local community. The following summarizes our proposed staffing at the community:

Oakmont Senior Living of Agoura Hills				
Budgeted Staffing & Shift Requirements				
Jun-17				
	Units	**Residents**		
Asst. Living	48	52		
Alzheimer's	27	34		
	75	86		
	AM Shift 6am-2:00pm	**Day Shift 8am-5pm**	**PM Shift 2pm-10:00pm**	**Night Shift 10pm-6:00am**
Staffing-FTE's				
Executive Director		1		
Marketing Director		1		
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Bus Driver		1		
Traditions Director		1		
Traditions Caregivers	5		5	2
	17	11	16	5
Total FTE's	49			
Total Employees	60			

Neighborhood Impacts

The proposed facility will have little or no negative impacts on the surrounding community with regard to:

- Traffic: Low impact, with minimal effect on the AM/PM peak commute times.
- Schools: All residents are senior citizens; therefore schools are not affected.
- Noise: Similar to other residential uses.
- Parking: Our current site plan includes 54 parking spaces, which exceeds the number required by ordinance.

Socially and economically, our proposal provides much needed high quality services for seniors, full time jobs for the local community and will support the local economy.