

ENVIRONMENTAL NOISE ASSESSMENT

Quarry Place / Cobblestone – A Mixed-Use Planned Community Rocklin, California

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Introduction

RCH Group (RCH) has conducted this environmental noise assessment for Quarry Place / Cobblestone (project). The project is located on the southeast side of Pacific Street, northeast of Sunset Boulevard and southwest of the Walmart, in the City of Rocklin, California, and would consist of construction and operation of approximately 180 apartment units, 44 single family homes, and 9,700 square feet of commercial space. The site is approximately 15.22 acres and is an assemblage of six parcels consisting of a former Kmart and surrounding vacant parcels within an existing shopping center. There are multi-family residences south and southeast of the project site.

This report analyzes the noise impacts from the project and is prepared in a format to answer the noise issues identified in the Initial Study Environmental Checklist Form in Appendix G of the *CEQA Guidelines*. This report provides an overview of existing noise levels measured at the project site, local noise regulatory framework, and an analysis of potential noise impacts that would result from implementation of the project. Noise from the construction and operation of the project is evaluated.

Noise Evaluation

Noise impacts are evaluated by estimating noise levels in the area and determining the noise compatibility of the project. The analysis considers existing noise levels at the site and noise impacts of the project.

Noise Thresholds of Significance

Noise impacts would be significant if:

- Standards contained in the Noise Element or City Noise Ordinance would be exceeded.
- Operational changes would increase ambient noise levels (Ldn, CNEL, or hourly L_{eq}) by 5 dB or more¹.
- Construction would involve activities that could cause substantial vibration at sensitive structures.
- Construction would conflict with the City of Rocklin construction hours.
- The project would expose residents to excessive aircraft noise.

¹ The Federal Interagency Committee on Noise (FICON) developed noise guidance to be used for the assessment of project-generated increases in noise levels that take into account the ambient noise level. An increase of 5 dB or greater would typically be considered to result in increased levels of annoyance where existing noise levels are less than 60 dB. Within areas where the ambient noise level ranges from 60 to 65 dB, increased levels of annoyance would be anticipated at increases of 3 dB or greater (FICON, 2000).

Noise Analysis

CEQA Guidelines Appendix G Environmental Checklist

	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
NOISE -- Would the project 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) *Would the project expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?* **Less-than-Significant Impact.**

Noise Descriptors

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. Sound pressure level has become the most common descriptor used to characterize the “loudness” of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Decibels are measured using different scales, and it has been found that A-weighting of sound levels best reflects the human ear’s reduced sensitivity to low frequencies, and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. All references to decibels (dB) in this report will be A-weighted unless noted otherwise.

Several time-averaged scales represent noise environments and consequences of human activities. The most commonly used noise descriptors are the equivalent A-weighted sound level over a given time period (Leq)²; average day-night 24-hour average sound level (Ldn)³ with a nighttime increase of 10 dB to account for sensitivity to noise during the nighttime; and community noise equivalent level (CNEL)⁴, also a 24-hour average that includes both an evening and a nighttime sensitivity weighting.

Table 1 identifies decibel levels for common sounds heard in the environment.

TABLE 1 TYPICAL NOISE LEVELS

Noise Level (dB)	Outdoor Activity	Indoor Activity
90+	Gas lawn mower at 3 feet, jet flyover at 1,000 feet	Rock Band
80-90	Diesel truck at 50 feet	Loud television at 3 feet
70-80	Gas lawn mower at 100 feet, noisy urban area	Garbage disposal at 3 feet, vacuum cleaner at 10 feet
60-70	Commercial area	Normal speech at 3 feet
40-60	Quiet urban daytime, traffic at 300 feet	Large business office, dishwasher next room
20-40	Quiet rural, suburban nighttime	Concert hall (background), library, bedroom at night
10-20		Broadcast / recording studio
0	Lowest threshold of human hearing	Lowest threshold of human hearing

Source: (modified from Caltrans Technical Noise Supplement, 1998)

Noise Attenuation

Stationary point sources of noise, including construction equipment, attenuate (lessen) at a rate of 6 to 7.5 dB per doubling of distance from the source, depending on ground absorption. Soft sites attenuate at 7.5 dB per doubling because they have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. Hard sites have reflective surfaces (e.g., parking lots or smooth bodies of water) and therefore have less attenuation (6.0 dB per doubling). A street or roadway with moving vehicles (known as a “line” source), would typically attenuate at a lower rate, approximately 3 to 4.5 dB each time the distance doubles from the source, which also depends on ground absorption (CalTrans, 1998). Physical barriers located between a noise source and the noise receptor, such as berms or sound walls, will increase the attenuation that occurs by distance alone.

²The Equivalent Sound Level (Leq) is a single value of a constant sound level for the same measurement period duration, which has sound energy equal to the time-varying sound energy in the measurement period.

³Ldn is the day-night average sound level that is equal to the 24-hour A-weighted equivalent sound level with a 10-decibel penalty applied to night between 10:00 p.m. and 7:00 a.m.

⁴CNEL is the average A-weighted noise level during a 24-hour day, obtained by addition of 5 decibels in the evening from 7:00 to 10:00 p.m., and an addition of a 10-decibel penalty in the night between 10:00 p.m. and 7:00 a.m.

Regulatory Framework

State Guidelines

State Land Use Compatibility Standards for Community Noise are provided in the State of California General Plan Guidelines. The guidelines indicate that a Community Noise Exposure up to 65 (Ldn or CNEL) is Normally Acceptable for Multi-Family Residential, and a Community Noise Exposure up to 70 (Ldn or CNEL) is Conditionally Acceptable (City of Folsom, 2014).

General Plan Noise Element

The Noise Element of the City of Rocklin General Plan contains criteria for stationary noise sources as well as transportation noise sources. The Noise Element contains an interior hourly maximum noise standard of 45 dB for enclosed sleeping areas of residences affected by stationary noise sources to ensure that stationary noise sources do not interfere with sleep. The exterior noise level design standards for new projects affected by or including stationary noise sources are shown in **Table 2**. The Noise Element restricts development of noise-sensitive land uses where the noise levels due to existing or planned stationary noise sources will exceed the exterior stationary noise level design standards contained in **Table 2**, unless effective noise mitigation measures have been incorporated into the project.

TABLE 2 EXTERIOR NOISE LEVEL DESIGN STANDARDS FOR NEW PROJECTS AFFECTED BY OR INCLUDING STATIONARY NOISE SOURCES

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)																						
Hourly Leq, dB	55 dBA	45 dBA																						
<p>The City can impose noise level standards that are more restrictive than those specified above based upon determination of existing low ambient noise levels.</p> <p>“Fixed” noise sources which are typically of concern include, but are not limited to the following:</p> <table border="0"> <tr> <td>HVAC Systems</td> <td>Cooling Towers/Evaporative Condensers</td> </tr> <tr> <td>Pump Stations</td> <td>Lift Stations</td> </tr> <tr> <td>Emergency Generators</td> <td>Boilers</td> </tr> <tr> <td>Steam Valves</td> <td>Steam Turbines</td> </tr> <tr> <td>Generators</td> <td>Fans</td> </tr> <tr> <td>Air Compressors</td> <td>Heavy Equipment</td> </tr> <tr> <td>Conveyor Systems</td> <td>Transformers</td> </tr> <tr> <td>Pile Drivers</td> <td>Grinders</td> </tr> <tr> <td>Drill Rigs</td> <td>Gas or Diesel Motors</td> </tr> <tr> <td>Welders</td> <td>Cutting Equipment</td> </tr> <tr> <td>Outdoor Speakers</td> <td>Blowers</td> </tr> </table> <p>The types of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities including pump stations, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, businesses using amplified sound systems, car washes, loading docks, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, schools, playgrounds, and athletic fields.</p> <p>Note: The point of measurement for noise levels is at a location at least 5 feet inside the property line of the receiving land use and at a point 5 feet above ground level. In the case of lots where the noise-sensitive use has a reasonable outdoor activity area for outdoor enjoyment, the stationary noise source criteria can be applied at a designated outdoor activity area (at the discretion of the City).</p>			HVAC Systems	Cooling Towers/Evaporative Condensers	Pump Stations	Lift Stations	Emergency Generators	Boilers	Steam Valves	Steam Turbines	Generators	Fans	Air Compressors	Heavy Equipment	Conveyor Systems	Transformers	Pile Drivers	Grinders	Drill Rigs	Gas or Diesel Motors	Welders	Cutting Equipment	Outdoor Speakers	Blowers
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Outdoor Speakers	Blowers																							

Source: City of Rocklin, 2012

The maximum allowable noise exposure limits contained in the Noise Element for transportation noise sources are shown in **Table 3** below. The Noise Element restricts development of noise-sensitive land uses in areas exposed to existing or projected levels of noise from transportation noise sources that exceed the noise level standards contained in **Table 3**, unless the project design includes effective mitigation that results in noise exposure which meets standards.

**TABLE 3 MAXIMUM ALLOWABLE NOISE EXPOSURE
TRANSPORTATION NOISE SOURCES**

Affected/Receiving Land Use	Outdoor Activity Areas ¹ Ldn/CNEL, dB	Interior Spaces	
		Ldn/CNEL, dB	Leq, dB ²
Residential	60 ³	45	--
Transient Lodging	65	45	--
Hospitals, Nursing Homes	60 ³	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Non-Commercial Places of Public Assembly	60 ³	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

Notes:

¹The outdoor activity area is generally considered to be the location where individuals may generally congregate for relaxation, or where individuals may require adequate speech intelligibility. Such places may include patios of residences, picnic facilities, or instructional areas.

Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.

At the discretion of the City, where no outdoor activity areas are provided or known, only the interior noise level criteria can be applied to the project.

² As determined for a typical worst-case hour during periods of use.

³ Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

Source: City of Rocklin, 2012

Noise Ordinance

The City of Rocklin has established a noise policy on all construction projects within or near residential areas. Construction noise is allowed from 7:00 a.m. to 7:00 p.m. on weekdays and 8:00 a.m. to 7:00 p.m. on weekends.

Based on these criteria, operational noise impacts would be significant if they result in exceedance of noise standards contained in the City of Rocklin General Plan Noise Element for stationary or transportation noise sources. Operational changes that would increase ambient noise levels 5 dB or more (Ldn, CNEL, or hourly Leq) would also result in a significant impact⁵. Impacts to residents of the project would be significant if residents are exposed to noise levels exceeding noise standards contained in the City of Rocklin General Plan Noise Element. Temporary construction noise impacts would be significant if construction conflicts with the City of Rocklin construction hours.

Existing Noise Sources and Levels

To quantify existing ambient noise levels, RCH group conducted three long-term (72-hour) and several short-term (5 to 15- minute) noise measurements at the project site. RCH also conducted short-term traffic noise measurements near Pacific Street and Sunset Boulevard. Noise measurements were made using Metrosonics db308 Sound Level Meters calibrated before and after the measurements. To measure existing 24-hour noise levels at the project site, noise meters were placed at three locations on the project site. One meter was placed 300 feet from Pacific Street (Site 1), the same distance from the street as the closest apartment building. One meter was placed on the central eastern edge of the project site (Site 2), and the third long-term meter was placed along the central southern edge of the project site (Site 3) within the proposed single-family lots. Traffic noise was measured 85 feet from the centerline of Sunset Boulevard (Site 4) and 85 feet from the centerline of Pacific Street (Site 5). Additional short-term measurements were conducted at the site to measure parking lot noise from the adjacent shopping center parking lot (Site 6) and noise from the recycling center at the central eastern edge of the project site (Site 7) and the northeastern corner of project site (Site 8).

The noise measurements are summarized in **Table 4** below. The Noise Appendix includes 24-hour noise plots and additional sound level raw data. The main source of noise in the project vicinity during the noise measurements was traffic noise from Pacific Street. Additional noise sources included traffic on Sunset Boulevard, cars traveling through the parking lot from the adjacent shopping center, railway noise from nearby Union Pacific Railroad tracks, overhead aircraft, and noise from the recycling center northeast of the project site.

⁵ The Federal Interagency Committee on Noise (FICON) developed noise guidance to be used for the assessment of project-generated increases in noise levels that take into account the ambient noise level. An increase of 5 dB or greater would typically be considered to result in increased levels of annoyance where existing noise levels are less than 60 dB. Within areas where the ambient noise level ranges from 60 to 65 dB, increased levels of annoyance would be anticipated at increases of 3 dB or greater (FICON, 2000).

TABLE 4 EXISTING NOISE LEVELS IN THE PROJECT AREA

Location	Time Period	Noise Levels (dB)	Noise Sources
Site 1: 300 feet east of Pacific Street	May 10, 12:00 a.m. through May 12, 11:59 p.m., 2016 Tuesday - Thursday 72-hour measurement	Hourly Leq's ranged from 44-63 CNELs: 60, 60,60	Unattended noise measurements do not specifically identify noise sources
Site 1: 300 feet east of Pacific Street	Monday May 9, 2016 3:41 p.m. to 3:51 p.m.	5-minute Leq's: 55, 55	Traffic on Pacific Street is 55 dB. Cars driving nearby through parking lot are 56 to 59 dB. Convertible with loud music in parking lot is 55 dB. Wind in leaves of nearby tree is 52 to 53 dB. Truck turning into Sherwin Williams's parking lot is 62 dB.
Site 2: Central eastern edge of project site.	May 10, 12:00 a.m. through May 12, 11:59 p.m., 2016 Tuesday - Thursday 72-hour measurement	Hourly Leq's ranged from: 44-63 CNELs: 57, 58, 56	Unattended noise measurements do not specifically identify noise sources
Site 2: Central eastern edge of project site.	Tuesday February 14, 2017 10:06 a.m. to 10:16 a.m.	5-minute Leq's: 56, 56	Typical noise from the recycling center is 48-53 dB, 54-60 at medium volumes. Louder glass clanging is 67-71 dB. Periods of quiet are 46 dB.
Site 3: Central southern edge of project site, 400 feet north of Sunset Boulevard	May 10, 12:00 a.m. through May 12, 11:59 p.m., 2016 Tuesday - Thursday 72-hour measurement	Hourly Leq's ranged from: 43-57 CNELs: 58,58,57	Unattended noise measurements do not specifically identify noise sources
Site 3: Central southern edge of project site, 400 feet north of Sunset Boulevard	Tuesday February 14, 2017 8:29 a.m. to 8:39 a.m.	5-minute Leq's: 53, 58	Cars driving through the parking lot are 55-66 dB. Truck driving through the parking lot is 74 dB. Traffic on Pacific Street is 47-56 dB. Periods of quiet are 45 dB.
Site 4: 85 feet north of Sunset Boulevard centerline	Monday May 9, 2016 4:24 p.m. to 4:34 p.m.	5-minute Leq's: 57,59	Cars pulling out of nearby driveway onto Sunset Boulevard are 58 to 59 dB. Truck peeling out of driveway is 75 dB. Sirens on Pacific Street are 63 dB, overhead plane is 52-55 dB.

Site 4: 85 feet north of Sunset Boulevard centerline	Friday May 13, 2016 10:12 a.m. to 10:22 a.m.	5-minute Leq's 58, 55	Birds in trees are 52 to 53 dB. Passing station wagon is 65 dB.
Site 4: 85 feet north of Sunset Boulevard centerline	Tuesday February 14, 2017 8:07 a.m. to 8:17 a.m.	5-minute Leq's: 60, 61	Cars on Sunset Boulevard are 60-67 dB. Fire engine is 72 dB. Cars passing through the parking lot are 58-66 dB. Truck passing through the parking lot is 70 dB. Periods of quiet are 53-54 dB.
Site 5: 85 feet east of Pacific Street centerline	Monday May 9, 2016 4:42 p.m. to 4:57 p.m.	5-minute Leq's: 62,65,63	Car on Pacific Street is 53 dB. Truck pulling trailer is 71 dB. Big pickup truck is 70 dB and fast SUV is 66 dB.
Site 5: 85 feet east of Pacific Street centerline	Friday May 13, 2016 9:49 a.m. to 10:04 a.m.	5-minute Leq's 61,61,63	Large truck pulling trailer is 71 dB. Sirens on Sunset Boulevard are 65 to 67 dB. Police siren on Pacific Street is 76 dB. Loud pickup is 66 dB and semi-truck is 64 dB. Train horn is 69 dB.
Site 5: 85 feet east of Pacific Street centerline	Tuesday February 14, 2017 7:40 a.m. to 7:50 a.m.	5-minute Leq's: 64, 61	Traffic on Pacific Street is 57-63 dB. Motorcycles are 70-76 dB. A large truck is 71 dB. A pickup passing through the parking lot is 57 dB. Periods of quiet are 53 dB.
Site 6: Central northern edge of project site, near Walmart parking lot	Friday May 13, 9:17 a.m. to 9:27 a.m.	5-minute Leq's 54, 54	Car driving slowly through project parking lot is 56 dB. Motorcycle on Pacific Street is 60 dB. Sounds from shopping center
Site 6: Central northern edge of project site, near Walmart parking lot	Tuesday February 14, 2017 9:04 a.m. to 9:14 a.m.	5-minute Leq's: 57, 52	Truck at recycling center is 58-66 dB while loading, 52-54 dB while backing up, and 48-50 dB while idling. Cars driving through the parking lot are 54-62 dB. Traffic on Pacific Street is 49-52 dB. Periods of quiet are 49 dB.
Site 7: Central eastern edge of project site, 130 feet from Recycling Center	Friday May 13, 2016 10:17 a.m. to 10:22 a.m.	5-minute Leq: 55	Cans and bottle poured into bins is 55 to 61 dB. Dragging cans full of recycling across pavement is 55 dB.
Site 8: Northeastern corner of project site	Tuesday February 14, 2017 9:40 a.m. to 9:50 a.m.	5-minute Leq's: 54, 52	The recycling center is 45-53 dB. Traffic is as high as 64 dB. A helicopter is 56 dB and an airplane is 58 dB. Sirens in the neighborhood are 52 dB. Periods of quiet are 45 dB.

Source: RCH Group, 2017

Existing Sensitive Receptors

Noise sensitive receptors (land uses associated with indoor and/or outdoor activities that may be subject to stress and/or significant interference from noise) typically include residential dwellings, hotels, motels, hospitals, nursing homes, educational facilities, and libraries. The nearest sensitive receptors to the project site are multi-family residences south and southeast of the project site. Lyn Roc Senior Apartments are 20 feet south of the project boundary, Quarry Oaks Apartments are 60 feet east, single family residences are 150 feet to the south, and Sutter Ridge Apartments are 300 feet southeast of the project boundary.

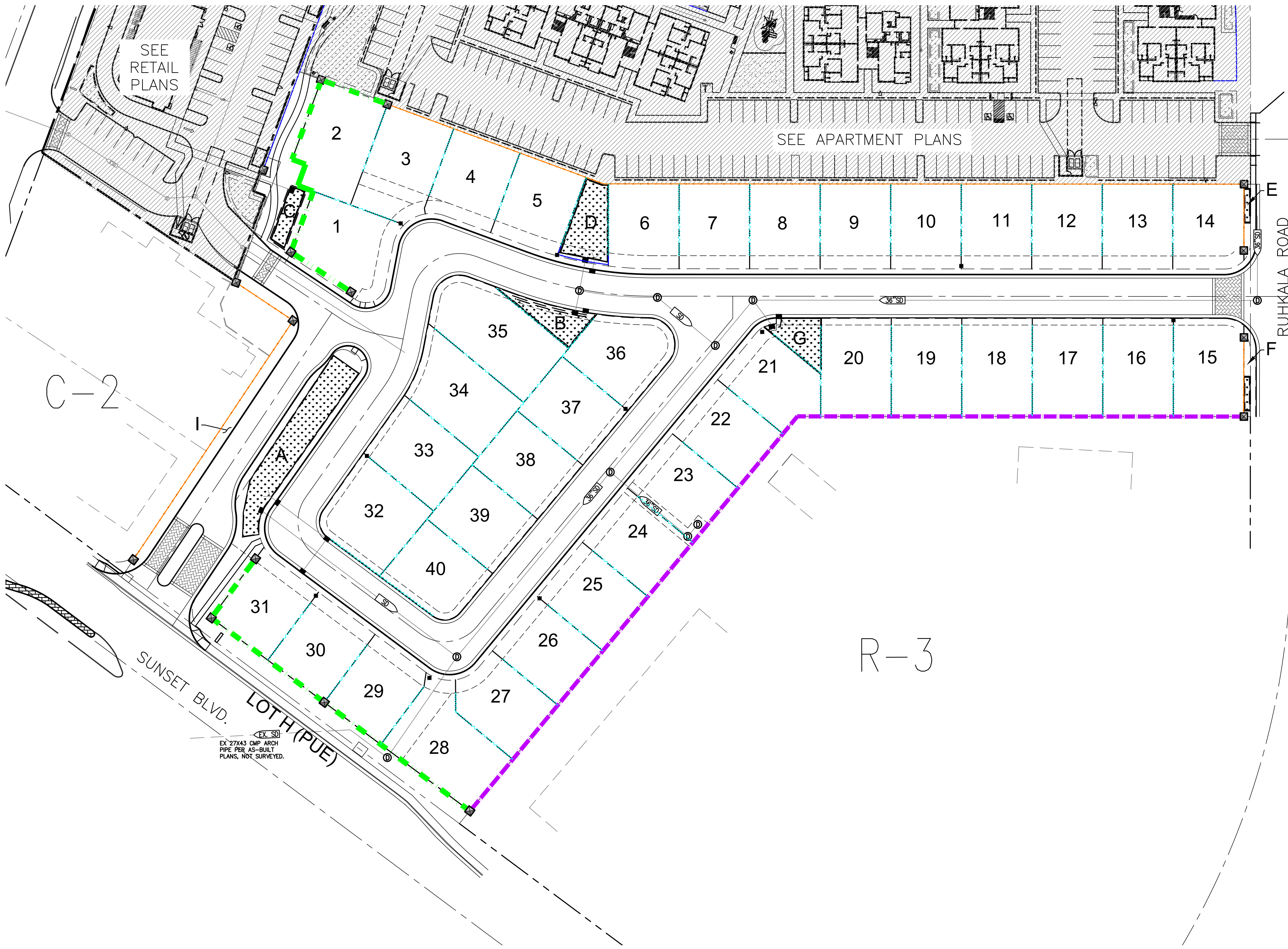
Impacts of Existing Noise Levels on Future Residents

As discussed above, existing noise sources at the project site include traffic noise, noise from the adjacent shopping center, and noise from the recycling center northeast of the project site. Noise from the recycling center will not be discussed because parking for the project would replace the recycling center. The average noise level measured near the parking lot of the adjacent shopping center (Site 6) was 54 dB near the central northern property line of the project site, however this noise level also included traffic noise from Pacific Street. Parking lot sounds are intermittent, and would not be anticipated to exceed the hourly noise limits for stationary noise sources contained in the City of Rocklin General Plan at the project site.

As shown in **Table 4** above, 24-hour noise levels at the project site ranged from 56 to 60 dB CNEL dB. The 24-hour traffic noise level at Site 1, located the same distance from Pacific Street as the closest apartment facades of the project, was 60 dB CNEL. The 24-hour noise level at the central eastern edge of the project site (Site 2) ranged from 56 to 58 dB CNEL. The 24-hour noise level measured at the central south edge of the project site, 400 feet from Sunset Boulevard (Site 3), was 57 to 58 dB CNEL. Short-term peak hour noise measurements were conducted 85 feet north of the centerline of Sunset Boulevard to estimate existing noise levels at the proposed single family lots adjacent to Sunset Boulevard. The average of the peak hour noise measurements recorded at this location was 59 dB Leq. According to the California Department of Transportation Technical Noise Supplement (1998), the rule of thumb is that Ldn is within +/- 2 dBA of the peak hour Leq under normal traffic conditions, yielding an estimated 57 to 61 dB Ldn at this location. The project would construct a six to eight foot wall along Sunset Boulevard adjacent to the closest single-family lots (see **Figure 1**), which would reduce existing noise levels by at least 5 dB⁶. The project would also construct a six to eight foot wall parallel with Pacific Street separating the proposed commercial parking lot and the single-family lots (see **Figure 1**), which would also reduce existing noise levels by at least 5 dB. Accounting for the 5 dB reduction from the proposed six to eight foot wall, noise levels at the project site would be approximately 55 dB CNEL at the closest receptors to Pacific Street and approximately 56 dB Ldn at the closest receptors to Sunset Boulevard. Based upon noise levels measured at the project site and the proposed walls to be constructed, existing traffic noise levels at the outdoor areas of the project would not exceed the 60 dB Ldn/CNEL exterior noise limit for transportation noise contained in the City of Rocklin General Plan Noise Element.

Figure 1 also shows the location of enhanced 6-foot wood fences (1) to the east of the C-2 parcel at the southeast corner of Sunset Blvd. and Pacific Street (2) to the east of the single-family lots 14 and 5 on Ruhkala Road, and (3) north of single-family lots 2-14. These wood fences would provide approximately 5 decibels of noise reduction from traffic movements adjacent to the fences. The wood fence north of single-family lots 3-14 would attenuate noise going towards or going from the back yards of the single family lots.

⁶ A barrier can achieve a 5 dB noise level reduction, when it is tall enough to break the line-of site between a receiver and a noise source (FHWA, 2000)



FENCING LEGEND

SYMBOL	DESCRIPTION
	6' TO 8' CMU SPLIT FACE, SCORED FACE/COMBED WALL HEIGHTS PER SOUND STUDY
	6' OPEN METAL FENCE
	6' ENHANCED WOOD FENCE
	6' WOOD GOOD NEIGHBOR FENCE
	28" SQUARE PILASTER - LOCATION AS SHOWN ON PLAN
	ENTRY MONUMENT SIGN
	EXISTING CONCRETE RETAINING WALL
	EXISTING CMU WALL

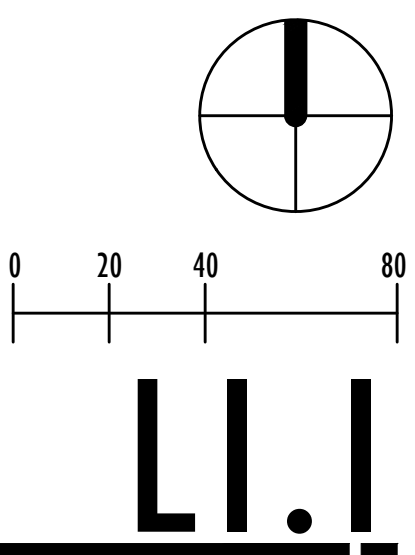
NOTE:
WHEN 6' OPEN METAL FENCE IS ABUTTING THE ADJACENT RETAIL PROPERTIES - CMU PILASTERS WILL BE INSTALLED AT 30' O.C.

COBBLESTONE
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PRELIMINARY FENCING PLAN
ROCKLIN, CA
KTGY # 2016-0189

- 02.10.2017
- 06.16.2017 2nd SUBMITTAL
- 08.30.2017 3rd SUBMITTAL
- 01.05.2018 4th SUBMITTAL
- 10.22.2018 5th SUBMITTAL
- 01.22.2019 6th SUBMITTAL
- 05.10.2019 7th SUBMITTAL

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The Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-11-108) with the Calveno vehicle noise emission curves was used to predict future traffic noise levels at the project site. RCH utilized the FHWA Model with traffic volume predictions provided by KD Anderson & Associates, Inc. (KD Anderson, 2017). To calibrate the FHWA Model for local site conditions, RCH performed concurrent traffic counts as well as verified traffic speeds and vehicle mix during the short-term traffic noise measurements conducted at the project site on May 9 and May 13, 2016.

RCH compared short-term noise measurements at the project site to the noise levels modeled by the FHWA Model. The FHWA Model was found to over-predict traffic noise levels from Pacific Street at the measurement site by 4 dB. As a result, -4 dB calibration adjustment was applied to the FHWA Model for traffic on Pacific Street. The FHWA Model was found to over-predict traffic noise levels from Sunset Boulevard at the measurement site by less than 1 dB. As a result, no calibration adjustment was applied to the FHWA Model for traffic on Sunset Boulevard.

The predicted future noise levels at the outdoor areas of the project closest to Pacific Street and Sunset Boulevard are shown in **Table 5**.

Future traffic noise levels at the project site were estimated using the existing long-term noise measurements from Site 1 (Pacific Street) and peak hour noise measurements at Site 4 (Sunset Boulevard) and the increase from future traffic noise. The existing noise levels measurements are shown in **Table 4** and the increase from future traffic noise was calculated using the FHWA Noise Model.

From facades closest to Pacific Street (single-family lots east of proposed retail) the calculation was an existing average noise level of 60 dB, Ldn minus 5 dB for the proposed wall, plus an increase of 2 dB from increases in future traffic noise; for a total of 57 dB, Ldn. With a conservative reduction of 20 dB from the building structure the interior noise levels would be 37 dB, Ldn. It should be noted that the traffic from the project would only increase the traffic noise by 0.2 dB; most of the maximum 2.4 dB increase was from cumulative traffic increases not related to the project. The exterior noise level would be acceptable (less than 60 dB, Ldn/CNEL) and the interior noise level would be below 45 dB. The permanent increases in noise levels would be less than significant.

From facades closest to Sunset Boulevard (single-family lots adjacent to Sunset Boulevard) the calculation was an existing maximum noise level of 61 dB, Ldn minus 5 dB for the proposed wall, plus an increase of 1 dB from increases in future traffic noise; for a total of 57 dB, Ldn. With a conservative reduction of 20 dB from the building structure the interior noise levels would be 37 dB, Ldn. It should be noted that the future traffic noise levels would increase less than 1 dB along Sunset Boulevard (including both cumulative and project traffic). The exterior level would be acceptable (less than 60 dB, Ldn/CNEL) and the interior noise level would be below 45 dB. The permanent increases in noise levels would be less than significant.

TABLE 5 PREDICTED FUTURE NOISE LEVELS AT OUTDOOR AREAS

Location	Distance to Road Centerline (Feet)	Exterior Noise Level (dB, Ldn)	Interior Noise Level (dB, Ldn)
Residential Facades Closest to Pacific Street	225	57	37
Residential Facades Closest to Sunset Boulevard.	85	57	37

Source: RCH Group, 2017

Outdoor Activity Areas

Noise standards for transportation noise sources are met in the single family backyards and pool area. According to the General Plan Noise Element, the maximum allowable noise exposure for transportation noise sources is 60 dB CNEL for outdoor activity areas in residential land uses.

(1) Single Family Backyards: As discussed above, existing noise levels in the single family backyards would be approximately 55 dB CNEL at the closet lots to Pacific Street and approximately 56 dB Ldn at the closest lots to Sunset Boulevard. Future noise levels in the single family backyards would be approximately 57 dB CNEL at the closet lots to Pacific Street and approximately 57 dB Ldn at the closest lots to Sunset Boulevard. Given this, the 60 dB Ldn/CNEL standard is not exceeded.

(2) Pool Area: The pool area would be approximately 300 feet east of Pacific Street. Noise levels in the backyards of the closest single family lots 225 feet east of Pacific Street were estimated to be 55 dB CNEL (existing) and 57 dB CNEL (future). The pool would be approximately 75 feet farther away from Pacific Street than the closest single family lots and would benefit from additional noise attenuation from intervening structures constructed by the project. Given this, the 60 dB Ldn/CNEL standard would not be exceeded.

Construction

Construction activities would include demolition of the existing building on the project site and construction of the project. Demolition is expected to occur for a duration of one month and construction of the project would occur for approximately 16 months. Construction and demolition activities would require the use of numerous pieces of noise-generating equipment, such as excavating machinery (e.g., backhoes, excavators, front loaders, etc.) and other construction equipment (e.g., compactors, pavers, concrete mixers, trucks, etc.).

The noise levels generated by construction equipment would vary greatly depending upon factors such as the type and specific model of the equipment, the operation being performed, the condition of the equipment and the prevailing wind direction. The maximum noise levels for various types of construction equipment that could be used during project construction are provided in **Table 6**. Maximum noise levels generated by construction equipment used for the project would range from 74 to 89 dB Lmax at a distance of 50 feet. **Table 7** displays average typical construction activity noise levels at 50 feet.

Project construction would result in a temporary increase in ambient noise levels in the project vicinity. The closest sensitive receptors to the project site are approximately 20 feet from the closest location where construction would occur on the project site. There is an existing 6 to 8 foot concrete block wall between the project site and the closest sensitive receptors that would act as a noise barrier between

construction activities and these receptors, reducing construction noise levels by 5 dB⁷. Construction noise levels would fluctuate throughout the day because equipment would not be in use at one location for an extended period of time.

TABLE 6 TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT (Lmax)

Construction Equipment	Noise Level (dB, Lmax at 50 feet)
Dump Truck	76
Air Compressor	78
Backhoe	78
Dozer	82
Compactor (ground)	83
Crane	81
Excavator	81
Flat Bed Truck	74
Paver	77
Grader	85
Compressor (Air)	78
Generator	81
Roller	80
Vibratory Concrete Mixer	80
Concrete Mixer Truck	79
Jackhammer	89
Front End Loader	79

Notes: Lmax = maximum sound level

Source: *Federal Highway Administration (FHWA) Roadway Construction Noise Model User's Guide*, 2006.

TABLE 7 TYPICAL CONSTRUCTION ACTIVITIES NOISE LEVELS

Construction Phase	Noise Level (dB Leq at 50 feet)
Ground Clearing	83
Excavation	88
Foundations	81
Erection	81
Finishing	88

Notes: Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

Leq = equivalent sound level

Source: U.S. Environmental Protection Agency, Legal Compilation, 1973

Project construction would comply from with the City of Rocklin construction noise guidelines that allow construction noise from 7:00 a.m. to 7:00 p.m. on weekdays and 8:00 a.m. to 7:00 p.m. on weekends. Construction activities and associated worker trips would occur within the allowable hours contained in

⁷ A barrier can achieve a 5 dB noise level reduction, when it is tall enough to break the line-of site between a receiver and a noise source (FHWA, 2000)

the City of Rocklin construction noise guidelines. Since project construction activities would comply with the City of Rocklin construction hours, construction noise would result in a less-than-significant impact.

Operation of Residential Component

After construction, impacts from the project would include any noise generated by the residences that would affect surrounding land uses. In general, residences are one of the quietest land uses (other than open space), and noise from the residences would be considered compatible with the surrounding residences. Any permanent increase in ambient noise levels in the project vicinity would not be substantially greater than existing levels without the project and would result in a less-than-significant noise increase.

The primary source of operational noise from the project would be new vehicle trips from residents and retail customers of the project. Project generated traffic could result in noise increases along roadway segments in the project area. As indicated in the discussion of **Table 5**, traffic from the project would increase noise levels less than 1 dB in all locations on Pacific Street and Sunset Boulevard (and less than 2 dB on Woodside Drive). Persons would not be exposed to noise levels in excess of applicable standards. The noise impacts would be less than significant.

Operation of Commercial Component

After construction, impacts from the project would include any noise generated by the commercial retail component that would affect surrounding land uses. The commercial component would include an approximately 3,500 SF building with a drive-thru window and an approximately 6,200 SF building. The commercial component would be accessed off of Pacific Street via a separate parking lot with 50 spaces. Vehicles, including trucks (primarily expected for egress), could use the roadway connection to Sunset Boulevard. Noise sources at the commercial buildings would include a speaker box for the drive-thru component, parking lot noise and any unloading/loading activities.

A drive-thru speaker box would have a maximum noise level of approximately 67 dB at 10 feet.⁸ The maximum noise level from the speaker box at the closest single family lots approximately 150 feet east would be 44 dB. However, the drive-thru building is designed to have the speaker box pointing towards the other proposed commercial building or Pacific Street. Noise from the speaker box would be directed away from the residences and the drive-thru building would also act as a noise barrier. Furthermore, a six foot wall would separate the commercial component from the single family lots, which would reduce noise levels from the speaker box by approximately 5 dB⁹ to 39 dB Lmax. Therefore, noise from the speaker box would be below the City of Rocklin General Plan design standards of 55 dB Leq (daytime) and 45 dB Leq (nighttime) for stationary noise sources.

Parking lot noise and loading/unloading activities would be expected to have a similar noise level as parking lot and loading/unloading activities at the Walmart parking lot adjacent to the project site. Noise measurements conducted at the edge of the Walmart parking lot ranged from 52 to 57 dB Leq during daytime hours. With a 5 dB noise reduction from the six foot wall that would separate the commercial component from the closet single-family lots, noise levels from commercial operations would be approximately 47 to 52 dB Leq during daytime hours. Noise levels at the closest single family lots are estimated to be approximately 55 dB CNEL (existing) and 57 dB CNEL (future) with a 5 dB reduction from the six foot wall. Therefore, parking lot noise and loading/unloading activities would be similar to or less than existing noise sources such as traffic noise on Pacific Street and outdoor activity areas associated

⁸ Bollard Acoustical Consultants. Environmental Noise Analysis, Drive-Thru Parcel-19 Shops Building. October 25, 2016.

⁹ A barrier can achieve a 5 dB noise level reduction, when it is tall enough to break the line-of site between a receiver and a noise source (FHWA, 2000)

with the single family lots, and parking lot noise would be below the 60 dB Ldn/CNEL standard. Noise impacts from the commercial component would be less than significant.

*b) Would the project expose persons to or generate excessive groundborne vibration or groundborne noise levels? **Less-than-Significant Impact***

Construction operations have the potential to result in varying degrees of temporary ground vibration, depending on the specific construction equipment used and operations involved. The ground vibration levels associated with various types of construction equipment are summarized in **Table 8**. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. The effects of ground vibration may be imperceptible at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels.

At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage. For most structures, a peak particle velocity (ppv) threshold of 0.5 inch per second or less is sufficient to avoid structural damage. The Federal Transit Administration recommends a threshold of 0.5 ppv for residential and commercial structures, 0.25 ppv for historic buildings and archaeological sites, and 0.2 ppv for non-engineered timber and masonry buildings (FTA 2006).

**TABLE 8
REPRESENTATIVE VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT**

Equipment		Peak Particle Velocity at 25 Feet (in/sec)	Peak Particle Velocity at 20 feet
Pile Driver (impact)	upper range	1.518	2.121
	typical	0.644	0.900
Pile Driver (sonic)	upper range	0.734	1.026
	typical	0.170	0.238
Vibratory Roller		0.210	0.293
Large Bulldozer		0.089	0.124
Loaded Trucks		0.076	0.106
Jackhammer		0.035	0.049
Small Bulldozer		0.003	0.004

Source: Federal Transit Administration, 2006.

Note: Vibration levels at 20 feet were calculated using the equation provided by FTA that may be used to estimate vibration at different distances based on a reference ppv at 25 feet for various construction equipment.

The project would not involve the use of any equipment or processes that would result in potentially significant levels of ground vibration (i.e., pile drivers that could be above 0.5 ppv). The closest structures to the project site are 20 feet from project construction. As shown in **Table 8**, the predicted vibration levels from vibratory rollers, bulldozers, loaded trucks, and jackhammers at a distance of 20 feet would not exceed the 0.5 ppv threshold for residential and commercial structures. Vibrational impacts for demolition and construction would be **less than significant**.

c) *Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?* **Less-than-Significant Impact**

As discussed in a) above, the primary source of noise affecting the area would be from cumulative traffic increases not related to the project. Traffic from the project would increase noise levels less than 1 dB in all locations. Permanent noise impacts would be **less than significant**.

d) *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?* **Less-than-Significant Impact**

As discussed in a) above, project construction activities would result in a temporary increase of noise levels in the project area during the construction period. Construction activities would result in an increase of ambient noise levels in the project vicinity, resulting in a potentially significant impact. However, with implementation of the City's noise construction guidelines, and considering that construction noise impacts are temporary in nature, the impact of the project would be less than significant.

e) *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?* **No Impact**

The project site is not located within an area covered by an airport land use plan or within two miles of a public or public use airport. Development on the site would not expose people working or residing in the project area to excessive airport noise levels and **no impact** would occur.

f) *For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?* **No Impact**

There are no private airstrips located near the project site. The project would not increase onsite exposure to aircraft noise. Thus, **no impact** would occur.

References

- Bollard Acoustical Consultants. Environmental Noise Analysis, Drive-Thru Parcel-19 Shops Building. October 25, 2016.
- California Department of Transportation (Caltrans), Technical Noise Supplement, 1998.
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https://www.rocklin.ca.us/depts/develop/housing/code_enforcement/construction_noise_guidelines.asp. Accessed on May 5, 2016.
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- Federal Highway Administration (FHWA), 2006. *Roadway Construction Noise Model User's Guide*, 2006.
- Federal Interagency Committee on Noise (FICON), 2000. *Discussion of Methodologies of Measuring Noise Impact*, October 22, 2000.
- Federal Transit Administration (FTA), 2006. *Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)*, 2006.
- KD Anderson & Consultants, Inc., 2017, Daily Traffic volumes for Noise Analysis, June 15, 2017.
- U.S. Environmental Protection Agency, 1973. *Legal Compilation*, 1973.

Quarry Place / Cobblestone
A Mixed-Use Planned Community
Rocklin, California
Noise Appendix

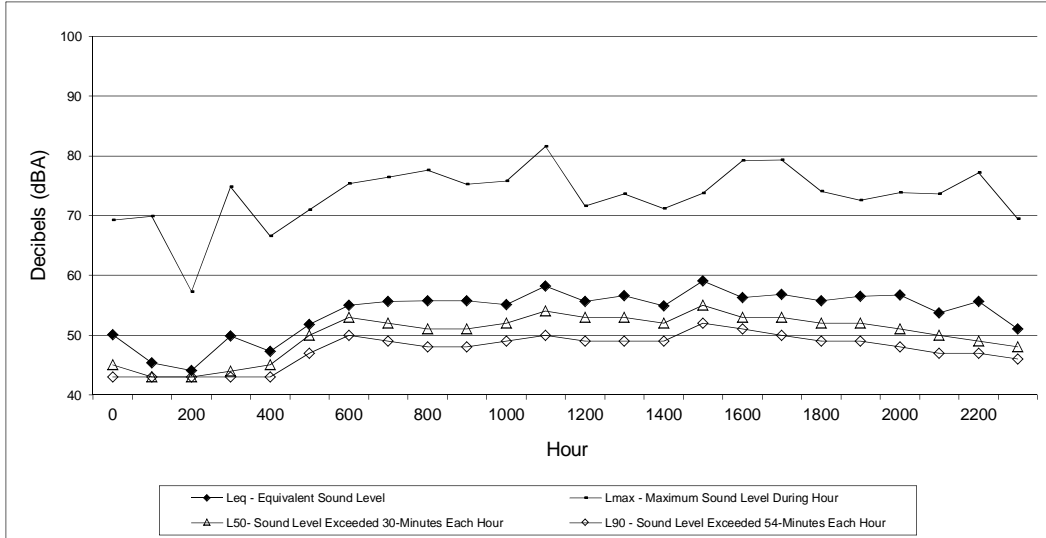
Site 1: 300 feet east of Pacific Street- 24 hour noise plots

Site 2: Northeastern corner of Project site – 24-hour noise plots

Site 3: 400 feet north of Sunset Boulevard- 24-hour noise plots

Traffic Noise Level Calculations

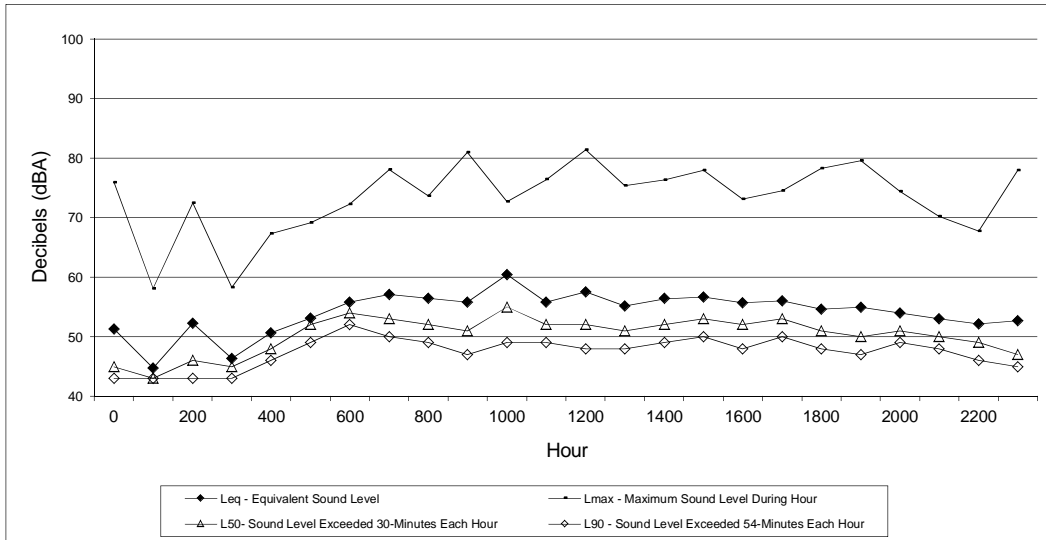
Noise Measurement Locations



Site 1. 300 feet east of Pacific Street
 Tuesday May 10, 2016

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L50 - Sound Level Exceeded 30-Minutes Each Hour	L90 - Sound Level Exceeded 54-Minutes Each Hour
0	50	69	45	43
100	45	70	43	43
200	44	57	43	43
300	50	75	44	43
400	47	67	45	43
500	52	71	50	47
600	55	75	53	50
700	56	76	52	49
800	56	78	51	48
900	56	75	51	48
1000	55	76	52	49
1100	58	82	54	50
1200	56	72	53	49
1300	57	74	53	49
1400	55	71	52	49
1500	59	74	55	52
1600	56	79	53	51
1700	57	79	53	50
1800	56	74	52	49
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2000	57	74	51	48
2100	54	74	50	47
2200	56	77	49	47
2300	51	70	48	46

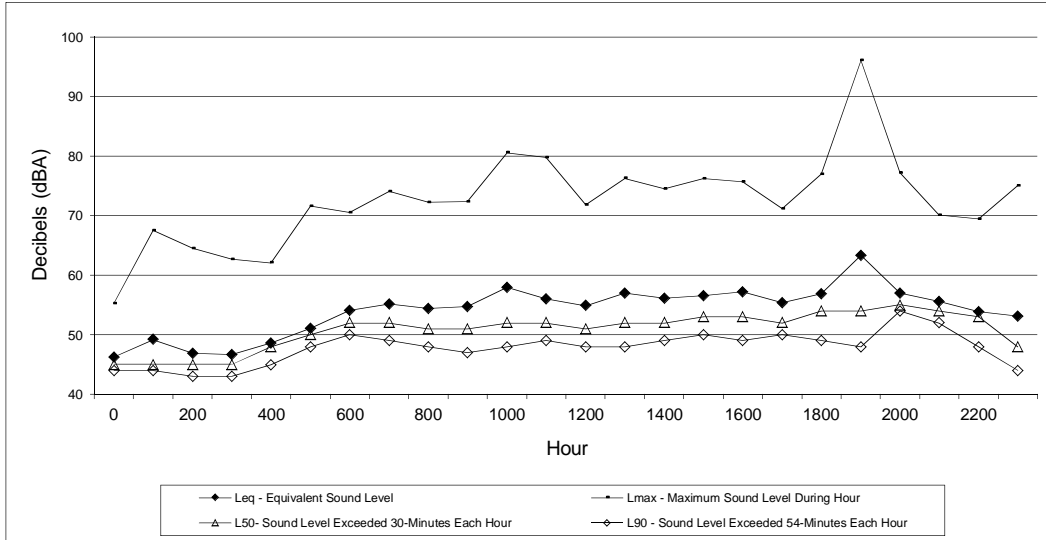
CNEL 60



Site 1. 300 feet east of Pacific Street
 Wednesday May 11, 2016

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L50 - Sound Level Exceeded 30-Minutes Each Hour	L90 - Sound Level Exceeded 54-Minutes Each Hour
0	51	76	45	43
100	45	58	43	43
200	52	73	46	43
300	46	58	45	43
400	51	67	48	46
500	53	69	52	49
600	56	72	54	52
700	57	78	53	50
800	57	74	52	49
900	56	81	51	47
1000	60	73	55	49
1100	56	76	52	49
1200	58	81	52	48
1300	55	75	51	48
1400	56	76	52	49
1500	57	78	53	50
1600	56	73	52	48
1700	56	75	53	50
1800	55	78	51	48
1900	55	80	50	47
2000	54	74	51	49
2100	53	70	50	48
2200	52	68	49	46
2300	53	78	47	45

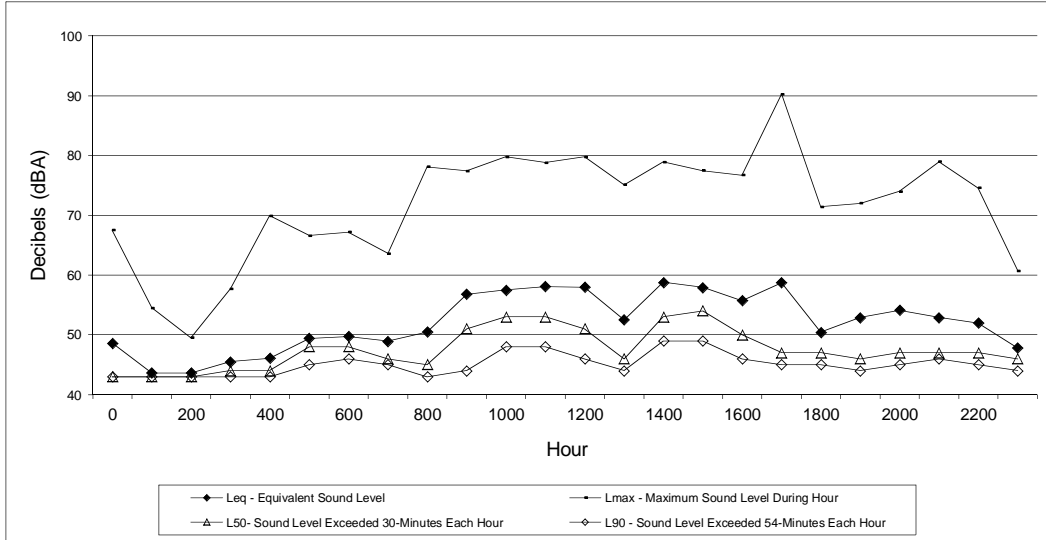
CNEL: 60



Site 1. 300 feet east of Pacific Street
Thursday May 12, 2016

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L50 - Sound Level Exceeded 30-Minutes Each Hour	L90 - Sound Level Exceeded 54-Minutes Each Hour
0	46	55	45	44
100	49	68	45	44
200	47	65	45	43
300	47	63	45	43
400	49	62	48	45
500	51	72	50	48
600	54	71	52	50
700	55	74	52	49
800	54	72	51	48
900	55	72	51	47
1000	58	81	52	48
1100	56	80	52	49
1200	55	72	51	48
1300	57	76	52	48
1400	56	75	52	49
1500	57	76	53	50
1600	57	76	53	49
1700	55	71	52	50
1800	57	77	54	49
1900	63	96	54	48
2000	57	77	55	54
2100	56	70	54	52
2200	54	70	53	48
2300	53	75	48	44

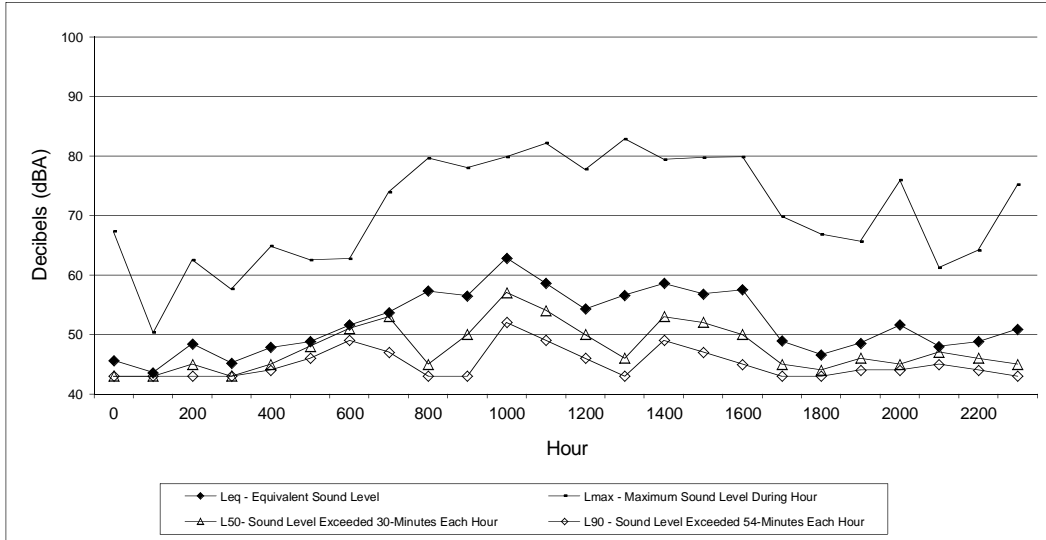
CNEL: 60



Site 2. Northeastern corner of Project site
Tuesday May 10, 2016

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L50 - Sound Level Exceeded 30-Minutes Each Hour	L90 - Sound Level Exceeded 54-Minutes Each Hour
0	49	68	43	43
100	44	55	43	43
200	44	50	43	43
300	46	58	44	43
400	46	70	44	43
500	49	67	48	45
600	50	67	48	46
700	49	64	46	45
800	51	78	45	43
900	57	77	51	44
1000	58	80	53	48
1100	58	79	53	48
1200	58	80	51	46
1300	53	75	46	44
1400	59	79	53	49
1500	58	78	54	49
1600	56	77	50	46
1700	59	90	47	45
1800	50	71	47	45
1900	53	72	46	44
2000	54	74	47	45
2100	53	79	47	46
2200	52	75	47	45
2300	48	61	46	44

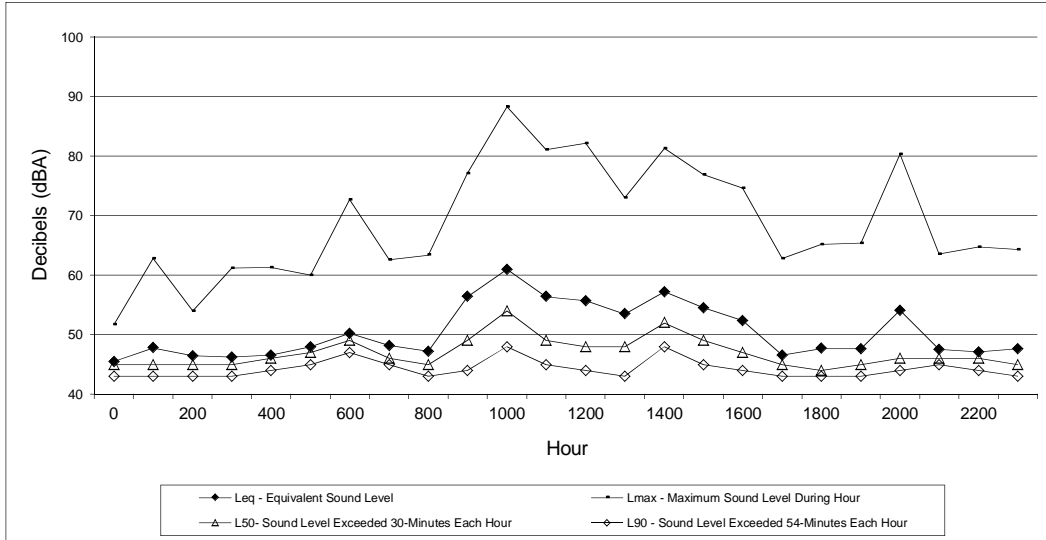
CNEL: 57



Site 2. Northeastern corner of Project site
Wednesday May 11, 2016

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L50- Sound Level Exceeded 30-Minutes Each Hour	L90 - Sound Level Exceeded 54-Minutes Each Hour
0	46	67	43	43
100	44	50	43	43
200	48	63	45	43
300	45	58	43	43
400	48	65	45	44
500	49	63	48	46
600	52	63	51	49
700	54	74	53	47
800	57	80	45	43
900	57	78	50	43
1000	63	80	57	52
1100	59	82	54	49
1200	54	78	50	46
1300	57	83	46	43
1400	59	79	53	49
1500	57	80	52	47
1600	58	80	50	45
1700	49	70	45	43
1800	47	67	44	43
1900	49	66	46	44
2000	52	76	45	44
2100	48	61	47	45
2200	49	64	46	44
2300	51	75	45	43

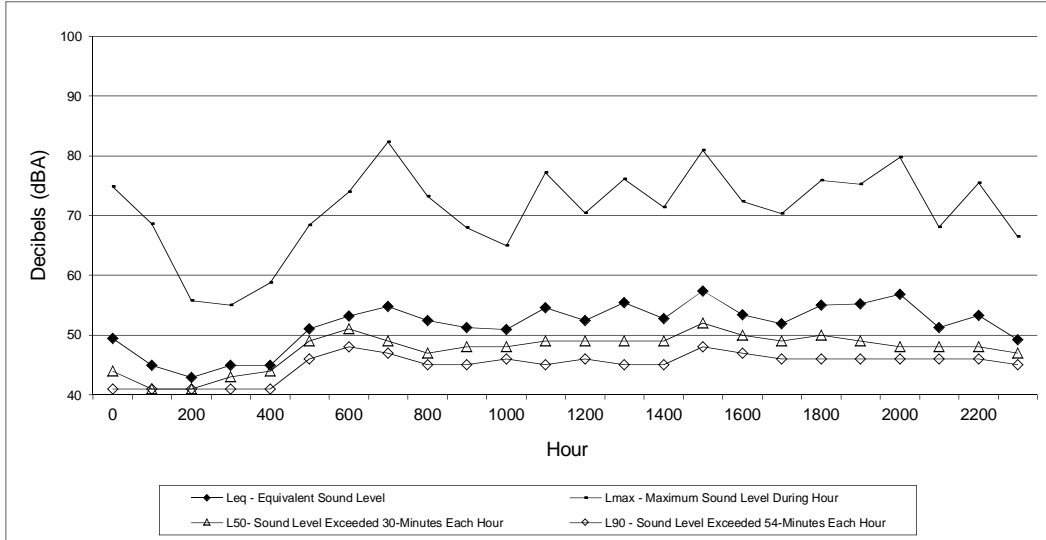
CNEL: 58



Site 2. Northeastern corner of Project site
Thursday May 12, 2016

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L50- Sound Level Exceeded 30-Minutes Each Hour	L90 - Sound Level Exceeded 54-Minutes Each Hour
0	46	52	45	43
100	48	63	45	43
200	47	54	45	43
300	46	61	45	43
400	47	61	46	44
500	48	60	47	45
600	50	73	49	47
700	48	63	46	45
800	47	63	45	43
900	56	77	49	44
1000	61	88	54	48
1100	56	81	49	45
1200	56	82	48	44
1300	54	73	48	43
1400	57	81	52	48
1500	55	77	49	45
1600	52	75	47	44
1700	47	63	45	43
1800	48	65	44	43
1900	48	65	45	43
2000	54	80	46	44
2100	48	64	46	45
2200	47	65	46	44
2300	48	64	45	43

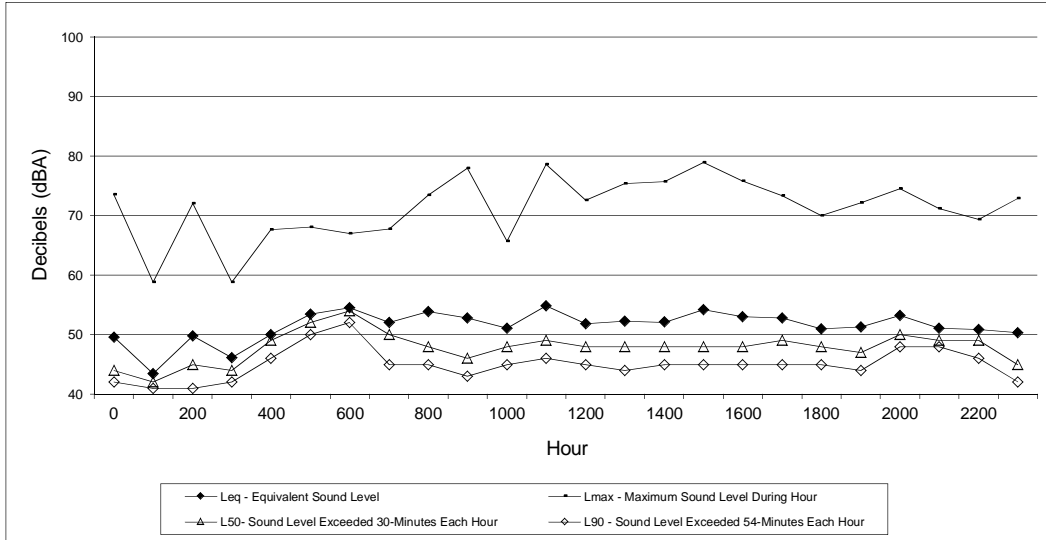
CNEL: 56



Site 3. Southern Project boundary 400 feet north of Sunset Boulevard
Tuesday May 10, 2016

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L50 - Sound Level Exceeded 30-Minutes Each Hour	L90 - Sound Level Exceeded 54-Minutes Each Hour
0	49	75	44	41
100	45	69	41	41
200	43	56	41	41
300	45	55	43	41
400	45	59	44	41
500	51	68	49	46
600	53	74	51	48
700	55	82	49	47
800	52	73	47	45
900	51	68	48	45
1000	51	65	48	46
1100	55	77	49	45
1200	52	70	49	46
1300	55	76	49	45
1400	53	71	49	45
1500	57	81	52	48
1600	53	72	50	47
1700	52	70	49	46
1800	55	76	50	46
1900	55	75	49	46
2000	57	80	48	46
2100	51	68	48	46
2200	53	76	48	46
2300	49	67	47	45

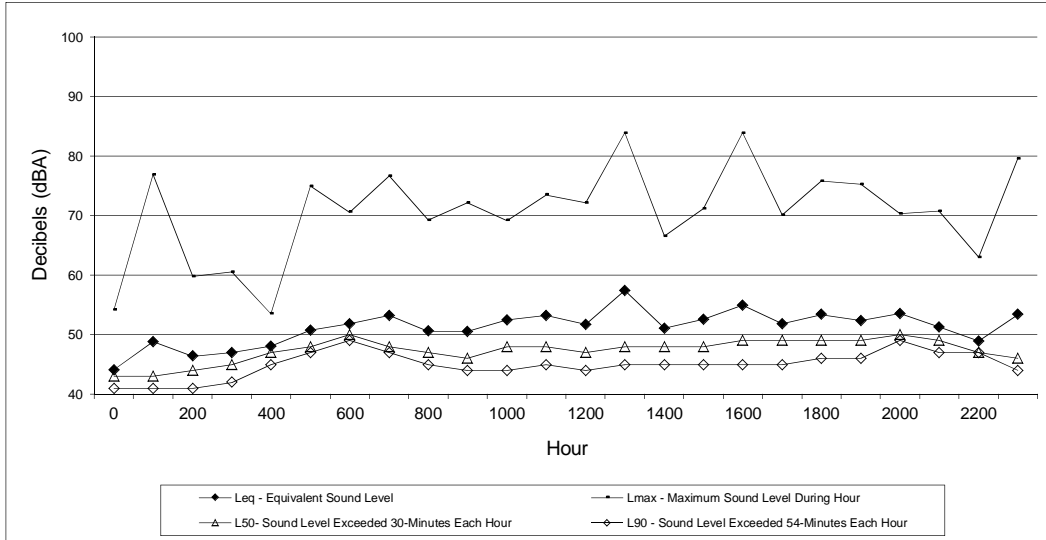
CNEL: 58



Site 3. Southern Project boundary 400 feet north of Sunset Boulevard
Wednesday May 11, 2016

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L50- Sound Level Exceeded 30-Minutes Each Hour	L90 - Sound Level Exceeded 54-Minutes Each Hour
0	50	74	44	42
100	43	59	42	41
200	50	72	45	41
300	46	59	44	42
400	50	68	49	46
500	53	68	52	50
600	55	67	54	52
700	52	68	50	45
800	54	73	48	45
900	53	78	46	43
1000	51	66	48	45
1100	55	79	49	46
1200	52	73	48	45
1300	52	75	48	44
1400	52	76	48	45
1500	54	79	48	45
1600	53	76	48	45
1700	53	73	49	45
1800	51	70	48	45
1900	51	72	47	44
2000	53	75	50	48
2100	51	71	49	48
2200	51	69	49	46
2300	50	73	45	42

CNEL: 58



Site 3. Southern Project boundary 400 feet north of Sunset Boulevard
Thursday May 12, 2016

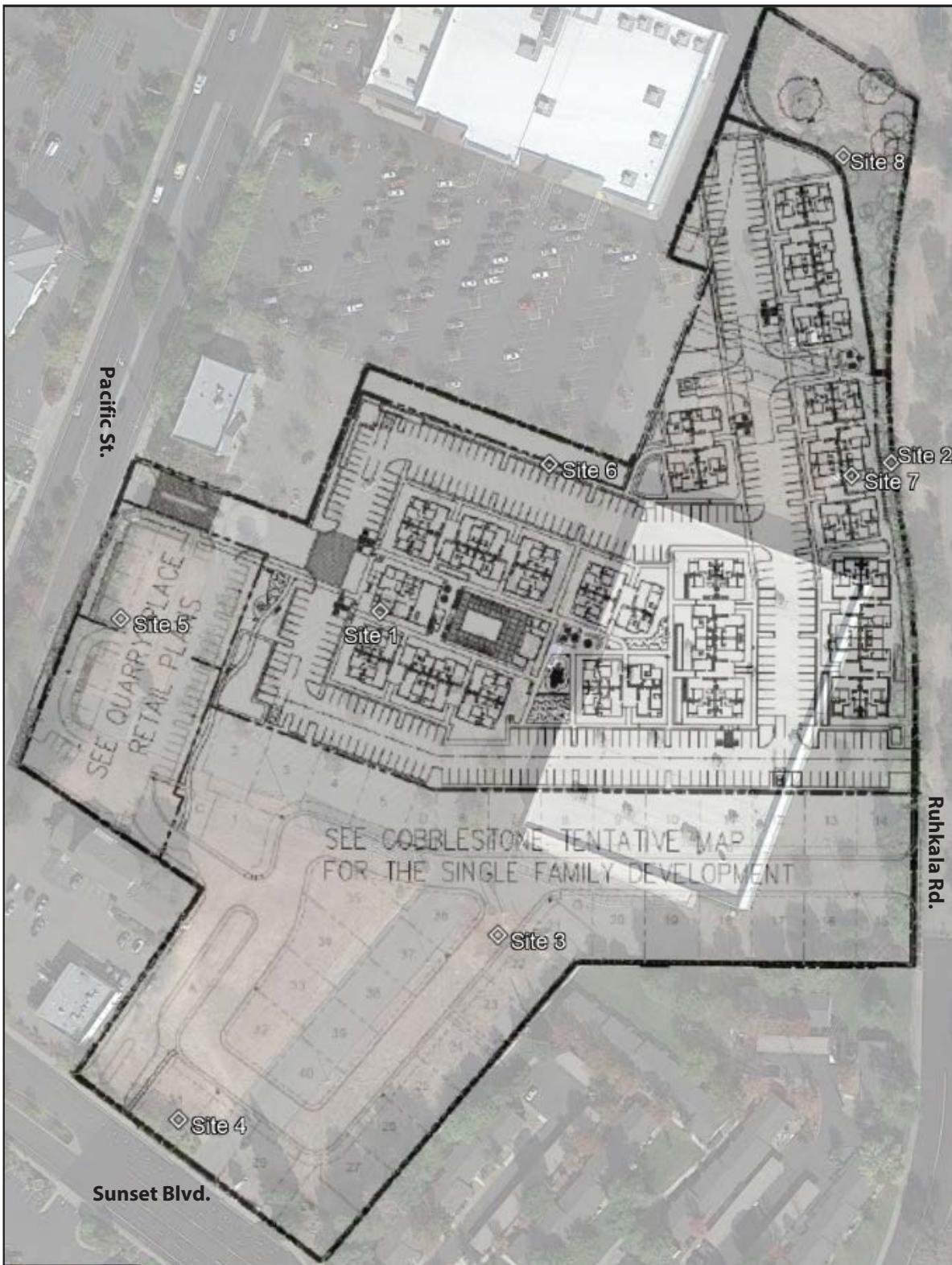
Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L50- Sound Level Exceeded 30-Minutes Each Hour	L90 - Sound Level Exceeded 54-Minutes Each Hour
0	44	54	43	41
100	49	77	43	41
200	46	60	44	41
300	47	61	45	42
400	48	54	47	45
500	51	75	48	47
600	52	71	50	49
700	53	77	48	47
800	51	69	47	45
900	51	72	46	44
1000	53	69	48	44
1100	53	74	48	45
1200	52	72	47	44
1300	57	84	48	45
1400	51	67	48	45
1500	53	71	48	45
1600	55	84	49	45
1700	52	70	49	45
1800	53	76	49	46
1900	52	75	49	46
2000	54	70	50	49
2100	51	71	49	47
2200	49	63	47	47
2300	53	80	46	44

CNEL: 57

Traffic Noise Level Estimates

15m= 49 FEET

		TOTAL # VEHICLES	VEHICLE TYPE %					VEHICLE SPEED				calveno factors			Calculated dBA (15 meters from roadway center)	Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten	Adjusted Level (dBA) 4.5 dBA Atten	Measured Noise Levels	Model Offset						
			Auto %	Medium Truck %	Heavy Truck %	HT %	HT	Auto k/h	MT k/h	HT k/h	Auto	MT	HT													
Pacific Street:																										
Interval 1: 85 feet	AM 5/13 Field Measurements	125	1,500	95	1,428	4	60	1	12	40	64	40	64	40	64	67.5	62.7	62.1	69.6	26	67.2	66.1	60.8	-5.3		
Interval 2: 85 feet	AM 5/13 Field Measurements	113	1,356	95	1,284	5	72	0	1	40	64	40	64	40	64	67.1	63.5	52.6	68.8	26	66.4	65.2	60.8	-4.4		
Interval 1: 85 feet	PM 5/09 Field Measurements	166	1,992	99	1,968	1	12	1	12	40	64	40	64	40	64	68.9	55.8	62.1	69.9	26	67.5	66.4	62.2	-4.2		
Interval 2: 85 feet	PM 5/09 Field Measurements	186	2,232	99	2,208	1	12	1	12	40	64	40	64	40	64	69.4	55.7	62.1	70.3	26	67.9	66.7	64.5	-2.2		
																								-4.0 Average differ		
Sunset BLVD																										
Interval 1: 85 feet	PM 5/09 Field Measurements	26	312	100	312	0	0	1	3	40	64	40	64	40	64	60.9	19.9	56.2	62.2	26	59.8	58.6	57.1	-1.5		
Interval 2: 85 feet	PM 5/09 Field Measurements	27	324	100	324	0	0	0	0	40	64	40	64	40	64	61.1	20.0	26.4	61.1	26	58.7	57.5	58.6	1.1		
Interval 1 : 85 feet	AM 5/13 Field Measurements	33	396	97	384	3	12	0	0	40	64	40	64	40	64	61.8	55.7	27.3	62.8	26	60.4	59.2	57.5	-1.7		
Interval 2: 85 feet	AM 5/13 Field Measurements	17	204	100	204	0	0	0	0	40	64	40	64	40	64	59.1	18.0	14.4	59.1	26	56.7	55.5	55.1	-0.4		
																									-0.6 Average differ	
1 Pacific Street - Sunset to Main Access																										
ADT																										
2016 Count		25420	2,542	97	2,466	2	51	1	25	40	64	40	64	40	64	69.9	62.0	65.3	71.7	69	65.1	61.8	57.8			
Project Traffic		1150	115	97	112	2	2	1	1	40	64	40	64	40	64	56.5	48.6	51.9	58.2	69	51.6	48.3	44.3			
2016 + Project		27910	2,791	97	2,707	2	56	1	28	40	64	40	64	40	64	70.3	62.4	65.7	72.1	69	65.5	62.2	58.2	0.4		
2030 + Project		47905	4,791	97	4,647	2	96	1	29	40	64	40	64	40	64	72.7	64.8	65.9	74.0	69	67.4	64.1	60.1	2.3		
2030 With all Retail on Subject Site (No housing)		48660	4,866	97	4,720	2	97	1	26	40	64	40	64	40	64	72.7	64.8	65.5	74.0	69	67.4	64.1	60.1	2.3		
2 Sunset Blvd - Pacific to Kmart Access																										
ADT																										
2016 Count		5360	536	99	531	1	5	0	1	40	64	40	64	40	64	63.2	52.2	48.6	63.7	26	61.3	60.1	60.1			
Project Traffic		900	90	99	89	1	1	0	0	40	64	40	64	40	64	55.5	44.5	40.8	55.9	26	53.6	52.4	52.4			
2016 + Project		6020	602	99	596	1	6	0	1	40	64	40	64	40	64	63.7	52.7	49.1	64.2	26	61.8	60.6	60.6	0.5		
2030 + Project		5585	559	99	553	1	6	0	1	40	64	40	64	40	64	63.4	52.4	48.7	63.9	26	61.5	60.3	60.3	0.2		
2030 With all Retail on Subject Site (No housing)		6200	620	99	614	1	6	0	1	40	64	40	64	40	64	63.9	52.9	49.2	64.3	26	61.9	60.7	60.7	0.6		
3 Sunset Blvd - Kmart Access to Woodside																										
ADT																										
2016 Count		2920	292	99	289	1	3	0	0	40	64	40	64	40	64	60.6	49.6	45.9	61.1	26	58.7	57.5	57.5			
Project Traffic		550	55	99	54	1	1	0	1	40	64	40	64	40	64	53.3	42.3	38.7	53.8	26	51.4	50.2	50.2			
2016 + Project		3470	347	99	344	1	3	0	0	40	64	40	64	40	64	61.3	50.3	46.7	61.8	26	59.4	58.2	58.2	0.7		
2030 + Project		3450	345	99	342	1	3	0	0	40	64	40	64	40	64	61.3	50.3	46.7	61.8	26	59.4	58.2	58.2	0.7		
2030 With all Retail on Subject Site (No housing)		3000	300	99	297	1	3	0	0	40	64	40	64	40	64	60.7	49.7	46.0	61.2	26	58.8	57.6	57.6	0.1		
4 Pacific Street - Main Access to Farron St																										
ADT																										
2016 Count		25070	2,507	97	2,432	2	50	1	25	40	64	40	64	40	64	69.8	61.9	65.3	71.6	96	63.6	59.5	55.5			
Project Traffic		920	92	97	89	2	2	1	1	40	64	40	64	40	64	55.5	47.6	50.9	57.3	96	49.2	45.2	41.2			
2016 + Project		25990	2,599	97	2,521	2	52	1	26	40	64	40	64	40	64	70.0	62.1	65.4	71.8	96	63.7	59.7	55.7	0.2		
2030 + Project		47600	4,760	97	4,617	2	95	1	29	40	64	40	64	40	64	72.6	64.7	65.9	74.0	96	65.9	61.9	57.9	2.4		
2030 With all Retail on Subject Site (No housing)		48300	4,830	97	4,685	2	97	1	26	40	64	40	64	40	64	72.7	64.8	65.4	74.0	96	65.9	61.9	57.9	2.4		
5 Woodside Dr - Sunset Blvd to Evelyn Rd																										
ADT																										
2016 Count		1360	136	99	135	1	1	0	0	40	64	40	64	40	64	57.3	46.3	42.6	57.7	131	48.3	43.6	43.6			
Project Traffic		585	59	99	58	1	1	0	0	40	64	40	64	40	64	53.6	42.6	38.9	54.1	131	44.7	40.0	40.0			
2016 + Project		1945	195	99	193	1	2	0	0	40	64	40	64	40	64	58.8	47.8	44.2	59.3	131	49.9	45.2	45.2	1.6		
2030 + Project		1985	199	99	197	1	2	0	0	40	64	40	64	40	64	58.9	47.9	44.3	59.4	131	50.0	45.3	45.3	1.6		
2030 With all Retail on Subject Site (No housing)		1400	140	99	139	1	1	0	0	40	64	40	64	40	64	57.4	46.4	42.7	57.9	131	48.5	43.7	43.7	0.1		



SOURCE: Google Earth and RCH Group 2019

Quarry Place / Cobblestone
 Quarry Place/Cobblestone
 Noise Measurement Locations