Questhaven Residential Neighborhood

NOISE IMPACT ANALYSIS

COUNTY OF SAN DIEGO

PROJECT APPLICANT:

CR Questhaven, LLC
444 West Beech Street, Suite 300
San Diego, CA 92101

LEAD AGENCY:

County of San Diego
5510 Overland Avenue, Third Floor
San Diego, CA 92123

PREPARED BY:

William A. Maddux
County-Approved Preparer
bmaddux@urbanxroads.com
(619) 778-1971

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
CadnaA	Computer Aided Noise Abatement
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
County	County of San Diego
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
NSLU	Noise Sensitive Land Use
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	Questhaven Residential Neighborhood
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

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EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for the proposed Questhaven Residential Neighborhood development (Project). The Project site is located is located south of San Elijo Road and east of Denning Drive in the County of San Diego.

The results of this Questhaven Residential Neighborhood Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines (1). Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA. Off-site traffic noise level increases are considered **less than significant**. On-site traffic noise, operational noise, construction noise, and vibration impacts are considered **significant** without mitigation. However, with the incorporation of project design and mitigation measures, all noise and vibration impacts would be **less than significant**.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	2	*Less Than Significant*	-
On-Site Traffic	2	*Significant*	*Less Than Significant*
Operational Noise	3	*Significant*	*Less Than Significant*
Construction Noise	3	*Significant*	*Less Than Significant*
Construction Vibration	4	*Significant*	*Less Than Significant*

The Project consists of an 89.23-acre site located south of San Elijo Road and east of Denning Drive. The Project would provide for development of 76 single-family residential homes on 18.27 acres, recreation uses on 0.31-acre, open space uses on 63.9 acres, and water quality detention basins on 2.4 acres. The Project is designed to cluster development in the northern portion of the Project site in order to allow for the development of residential uses while providing biological open space in the southern portion of the site.

NOISE SENSITIVE LAND USES AFFECTED BY AIRBORNE NOISE

Traffic-generated noise at on-site noise sensitive land uses (NSLU) would be significant. Mitigation Measure (MM) N-1 requires the dedication of noise protection easements that require an analysis of noise compatibility at the time sufficient detail is available to determine site-specific mitigation, such as noise walls or site design. For the properties along San Elijo Road, site specific design for building placement and inclusion of walls would be required to reduce noise levels at exterior NSLU areas. This mitigation measure would effectively reduce impacts as it would allow the identification of specifications for noise barriers and site design requirements at the time of construction.

Interior noise levels of second-floor receivers adjacent to the roadways would not exceed allowable interior noise levels. Therefore, it is concluded that with interior noise impacts to NSLU would be less than significant.

PROJECT-GENERATED AIRBORNE NOISE

Noise at exterior receivers due to the stationary sources would be a potentially significant impact. Stationary sources of concern include mechanical equipment, such as heating, ventilation, and air conditioning (HVAC) units and other venting. Thus, MM N-2 is provided to verify that airborne noise levels would be reduced to comply with the County of San Diego property line limits. With implementation of MM N-2, impacts would be **less than significant**.

Even with the consideration of Project design features, construction noise levels would exceed the County of San Diego construction noise level limit of 75 A-weighted decibel equivalent noise level at adjacent property lines. Therefore, MM N-3 is provided to reduce noise levels at the Eden Park facility through the construction of a temporary 12-foot-high barrier to shield the users of Eden Park from construction activities. With implementation of MM N-2, impacts would be **less than significant**.

Construction would also involve blasting to break up bedrock close to the ground surface. As with typical construction activities, noise generated by in-ground blasting and rock drilling may exceed the County's noise level standard if conducted within 50 feet of the eastern property line. Therefore, MM N-4 would be applicable to blasting activities, which would reduce rock drilling and blasting noise levels to comply with County of San Diego construction noise level limits. With incorporation of MM N-3, construction noise level impacts would be **less than significant**.

GROUNDBORNE VIBRATION AND NOISE IMPACTS

There are no substantial vibration sources associated with Project operation. No pile driving is anticipated during building construction. However, blasting and rock drilling will be required during Project grading. Due to the proximity of off-site structures impacts were determined to be significant and MM N-4 is required to control impulsive noise and vibration impacts. Therefore, with the incorporation of MM N-4, vibration impacts associated with Project operation would be **less than significant**.

1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Questhaven Residential Neighborhood ("Project"). The Project consists of an 89.23-acre site located south of San Elijo Road and east of Denning Drive as shown on Exhibit 1-A.

The purpose of this analysis is to characterize the existing noise conditions, identify applicable regulations (i.e., County of San Diego General Plan Noise Element (2)and the County Noise Ordinance (3)), assess noise impacts from construction and operation of the Project, and identify mitigation measures and/or design considerations to reduce potential noise impacts. This report was prepared in accordance with the County's Guidelines for Determining Significance and Report Format and Content Requirements, Noise (County's Noise Guidelines) (4) (5). The results of this noise report will be used to inform the final environmental documentation pursuant to CEQA.

1.1 PROJECT DESCRIPTION

The Project consists of a Tentative Map, Density Bonus Permit, and an Administrative Permit for an 89.23-acre site. The Project would provide for development of 76 single-family residential homes on 18.27 acres, recreation uses on 0.31-acre, open space uses on 63.9 acres, and water quality detention basins on 2.4 acres. The Project is designed to cluster development in the northern portion of the Project site in order to allow for the development of residential uses while providing open space in the southern portion of the site. The Project site plan is shown on Exhibit 1-B.

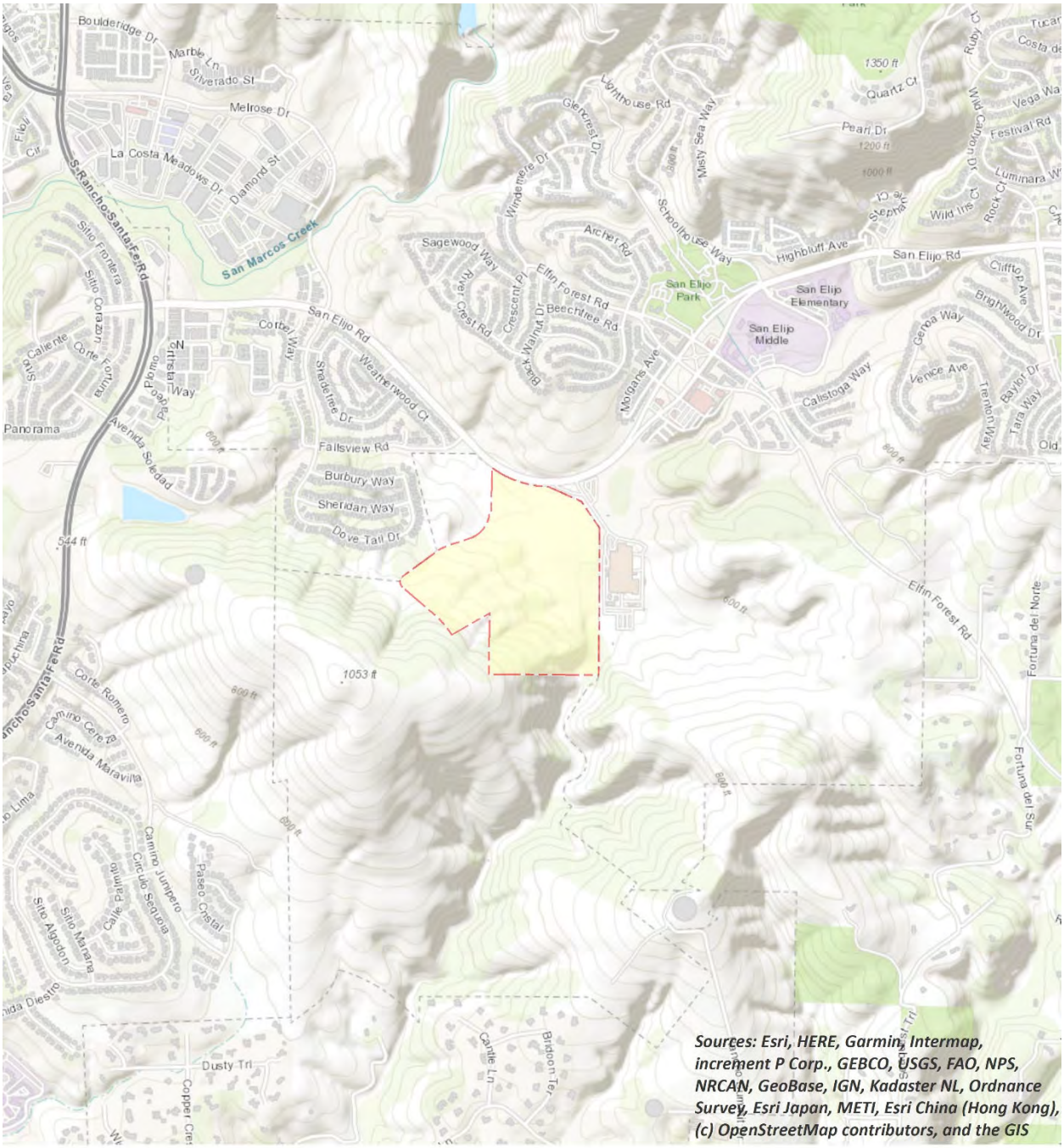
Grading proposed by the Project would result in disturbances to 31.26 acres of the Project site. The Project also includes 0.09-acre of off-site clearing within an existing road easement. The Project would connect to existing utilities within San Elijo Road and existing facilities that occupy existing easements along the Project's easterly boundary. Access to the Project would be provided via two (2) connections to San Elijo Road. San Elijo Road abuts the northern boundary of the property and would provide access to the site via proposed Street "D" and Street "E." Primary access to the western portion of the site would be provided via Street D at San Elijo Road. Primary access to the eastern portion of the site would be from Street E via San Elijo Road.

The on-site Project-related noise sources are expected to be limited to heating, ventilation, and air conditioning units (HVAC). This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site.

1.1.1 SITE LOCATION

The Project site is located in the western portion of unincorporated San Diego County within the San Dieguito Community Plan Area. The Project site is located immediately south and west of the City of San Marcos and east of the City of Carlsbad. Interstate 5 (I-5) is located approximately 5.3 miles west of the Project site. The Project site encompasses Assessor's Parcel Numbers (APNs) 223-080-46-00; 223-070-07-00; and 223-070-08-00.

EXHIBIT 1-A: LOCATION MAP



LEGEND:

Site Boundary

EXHIBIT 1-B: SITE PLAN

1.2 ENVIRONMENTAL SETTINGS AND EXISTING CONDITIONS

1.2.1 SETTINGS AND LOCATION

The Project site is undeveloped and includes several unimproved dirt roads and trails. Historically, the northern portion of the site has been subject to disturbance and was used as a laydown yard for construction equipment associated with the adjacent former recycling facilities. Additionally, a portion of the western area of the site was used for agricultural uses. The southern portion of the Project site contains a large area of steep hills that transition into a relatively flat area in the northern and central portion of the site. Elevations range between approximately 830 feet above mean sea level in the southwest corner to 500 feet above mean sea level along the eastern boundary.

The Project site is located within the unincorporated county, while the properties to the north, east and west are generally located in the City of San Marcos. The undeveloped parcel located adjacent to the northwest is also within the unincorporated county. All off-site noise sensitive land use (NSLU) assessed in this analysis are residential and located within the City of San Marcos. In addition to the NSLU, there is a non-residential sports facility, Eden Park, adjacent and east of the Project site.

To the west of the Project site is open space associated with the Rancho La Costa Habitat Conservation Area, beyond which is existing residential development. North of the Project site is land designated for open space, beyond which are existing residential uses. East of the Project site is a former recycling facility that is currently used as an indoor sports complex known as Eden Park. To the south of the Project site is open space associated with the Rancho La Costa Habitat Conservation Area. The Project site is adjacent to the San Elijo Hills development in the City of San Marcos and is within their Sphere of Influence.

Given that the Project site is adjacent open space preserves to the west and south, the Project proposes a design to cluster in the north in order to preserve a viable wildlife corridor in the more constrained land on the southern edge of the Project site and establish a level of compatibility with these adjacent preserves.

1.2.2 NOISE TERMINOLOGY

Noise is simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 1-C presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 1-C: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud (6). The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 100 feet, which can cause serious discomfort (7). Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most used figure is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period (typically one hour) and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment, however. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The County of San Diego relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. Based on guidance from the U.S. Department of Transportation, Federal Highway Administration (FHWA), Office of Environment and Planning, Noise and Air Quality Branch, the way noise reduces with distance depends on the following factors.

GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source (6).

GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source (8).

ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects (6).

SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearest residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The Federal Highway Administration (FHWA) does not consider the planting of vegetation to be a noise abatement measure (8).

REFLECTION

Field studies conducted by the FHWA have shown that the reflection from barriers and buildings does not substantially increase noise levels (8). If all the noise striking a structure was reflected back to a given receiving point, the increase would be theoretically limited to 3 dBA. Further, not all the acoustical energy is reflected back to same point. Some of the energy would go over the structure, some is reflected to points other than the given receiving point, some is scattered by ground coverings (e.g., grass and other plants), and some is blocked by intervening structures and/or obstacles (e.g., the noise source itself). Additionally, some of the reflected energy is lost due to the longer path that the noise must travel. FHWA measurements made to quantify reflective increases in traffic noise have not shown an increase of greater than 1-2 dBA; an increase that is not perceptible to the average human ear.

NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by up to 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source (8).

LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, recreation areas or buildings where people normally sleep. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized (9).

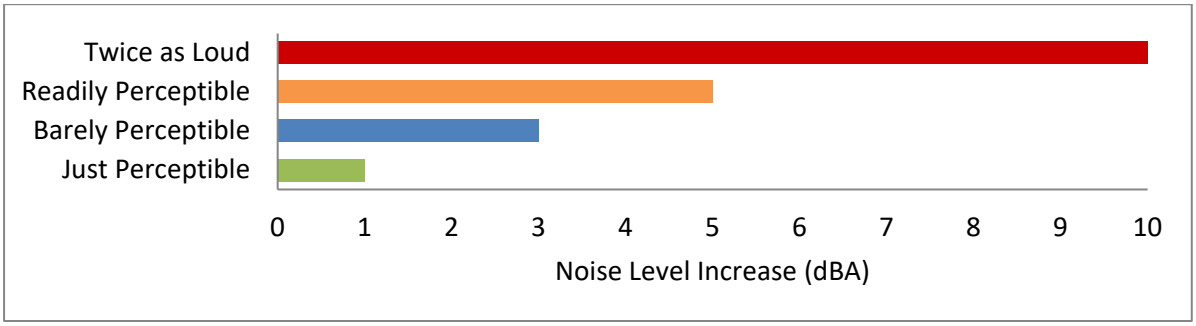
COMMUNITY RESPONSE TO NOISE

Community responses to noise varies depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment (10). Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain (10). Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 1-D. A change of 3 dBA is considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (8)

EXHIBIT 1-D: NOISE LEVEL INCREASE PERCEPTION



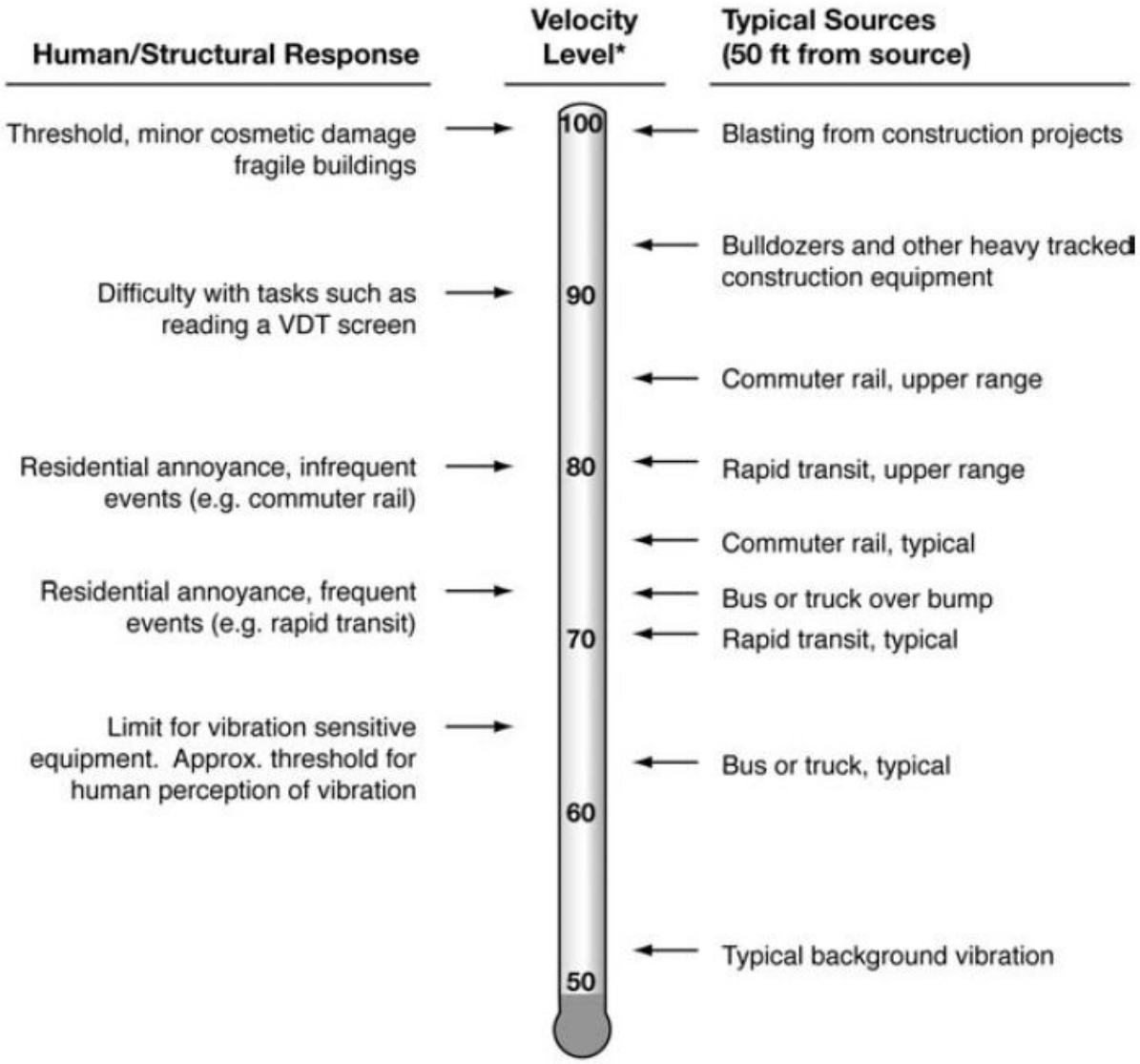
VIBRATION

Per the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (11), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment and/or activities.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 1-E illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 1-E: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual.

1.2.3 EXISTING NOISE CONDITIONS

To assess the existing noise level environment, 24-hour noise level measurements were taken at five locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 1-F provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Tuesday, January 5, 2021. Appendix 1.1 includes study area photos.

1.2.3.1 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest NSLU as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (6) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (11)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (11) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

1.2.3.4 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 1-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 1.2 provides a summary of the existing hourly ambient noise levels.

EXHIBIT 1-F: PROJECT SITE AND NOISE LEVEL MEASUREMENT LOCATIONS

TABLE 1-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
		Daytime	Nighttime	
L1	Located west of the Project site on Dove Tail Drive near existing single-family residential home at 2832 Dove Tail Drive.	44.9	42.6	49.7
L2	Located northwest of the Project site on Fallsview Road near Mahogany Park.	53.5	47.7	56.1
L3	Located on the intersection of River Crest Road and Black Walnut Drive near existing single-family residential home at 1554 Black Walnut Drive.	50.8	40.3	51.0
L4	Located northeast of the Project site on Dandelion Way near existing multi-family residential home at 1380 Dandelion Way.	53.0	49.5	56.9
L5	Located by the northeast boundary of the Project site near Play-by-Play Productions at 1601 San Elijo Road.	59.6	55.9	63.4

[1] See Exhibit 1-F for the noise level measurement locations.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

Table 1-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 1.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods. The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with surface streets in addition to background residential land use activities. This includes the auto and heavy truck activities on study area roadway segments near the noise level measurement locations.

1.3 METHODOLOGY AND EQUIPMENT

1.3.1 NOISE MEASURING METHODOLOGY AND PROCEDURES

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (12) During the measurement period, the weather was dry and slightly breezy (>3.5 miles per hour), and the temperature ranged between 72 degrees Fahrenheit (°F) and 76°F.

1.3.2 NOISE MODELING SOFTWARE

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613 protocol, CadnaA calculates the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613 protocol, the CadnaA noise prediction model relies on the reference sound power level (L_w) to describe individual noise sources. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment. Sound pressure levels (i.e., dBA L_{eq}) vary substantially with distance from the source and diminish because of intervening obstacles and barriers, atmospheric absorption, wind, and other factors.

The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.5 was used in the noise analysis to account for mixed ground representing a combination of hard and soft surfaces.

Vehicle traffic noise levels near the Project area were modeled using the FHWA Highway Traffic Noise Model (TNM) algorithms and traffic data provided by the Project traffic report. Existing traffic noise modeling is intended to establish a baseline for existing noise conditions generated from traffic operations adjacent to the project area. The FHWA model is based on reference noise emission factors for automobiles, medium trucks, heavy trucks, motorcycles, and buses with

consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and ground type. Truck usage and vehicle speeds on study area roadways were estimated from field observations.

1.3.3 NOISE FORMULAS AND CALCULATIONS

TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

To describe peak construction noise activities, this construction noise analysis was prepared using reference noise level measurements published in the Update of Noise Database for Prediction of Noise on Construction and Open Sites by the Department for Environment, Food and Rural Affairs (DEFRA). (20). The DEFRA database provides the most recent and comprehensive source of reference construction noise levels. Table 1-2 provides a summary of the DEFRA construction reference noise level measurements expressed in hourly average dBA L_{eq} using the estimated FHWA Roadway Construction Noise Model (13) (RCNM) usage factors to describe the typical construction activities for each stage of Project construction.

TABLE 1-2: TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Highest Reference Noise Level (dBA Leq)
Site Preparation	Crawler Tractors	77	77
	Hauling Trucks	71	
	Rubber Tired Dozers	71	
Grading	Graders	79	79
	Excavators	64	
	Compactors	67	
Building Construction	Cranes	67	72
	Tractors	72	
	Welders	65	
Paving	Pavers	70	70
	Paving Equipment	69	
	Rollers	69	
Architectural Coating	Cranes	67	67
	Air Compressors	67	
	Generator Sets	67	

[1] Update of noise database for prediction of noise on construction and open site expressed in hourly average L_{eq} based on estimated usage factor.

BLASTING REFERENCE NOISE LEVELS

Blasting for rock removal would involve drilling bore holes. While the numbers and diameters of the bore holes are dependent on the explosive and other factors, the noise levels generated by a rock drill would be very similar regardless of the hole size. According to the FHWA RCNM, a rock drill typically generates maximum noise levels of 81 dB(A) L_{max} at 50 feet. This is reduced by

the actual time the equipment is generating the maximum noise in a given period. Based on the FHWA data, a rock drill generates the greatest noise levels approximately 20 percent of an hour. Thus, a single rock drill would generate an hourly noise level of approximately 74 dBA L_{eq} at 50 feet.

According to the FHWA RCNM, within the audible frequency range, a blast generates maximum noise levels on the order of 94 dB(A) L_{max} (13). However, the total time for a blast would be a fraction of a minute and only one blasting event would occur in a given hour. Thus, hourly noise levels from blasting are calculated to be 74 dBA L_{eq} at 50 feet. The explosive charges used in mining and mass grading are typically wholly contained in the ground with a minimum 5-foot overburden, which would further attenuate noise levels.

TRAFFIC REFERENCE NOISE LEVELS

On-site noise and land use compatibility were assessed using the FHWA TNM and traffic volumes taken from the Project traffic report. All compatibility noise levels and contours were modeled using hard site conditions without consideration of topography or intervening structures. Off-site traffic noise level increases were calculated using accepted mathematical correlations between traffic volume changes and noise levels. Stationary source noise levels were calculated and attenuated based on standard equipment reference data and hard site propagation characteristics.

Table 1-3 identifies the ten off-site study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of San Marcos and City of Carlsbad General Plan Circulation Elements, and the posted vehicle speeds. Consistent with the *Questhaven Local Transportation Analysis* prepared by Chen Ryan Associates (14) the off-site traffic noise analysis includes the following traffic scenarios.

- Existing
- Existing Plus Project (E+P)
- Near-Term Year 2024 Cumulative (NT)
- Near-Term Year 2024 Cumulative with Project Conditions (NTP)
- Horizon Year 2035
- Horizon Year 2035 With Project Conditions

The average daily traffic (ADT) volumes used for this study are presented on Table 1-4. Tables 1-5 and 1-6 provide the time of day (daytime, evening, and nighttime) vehicle splits and the vehicle classification mix.

TABLE 1-3: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use[1]	Classification[2]	Centerline Distance to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	Sensitive	6-Lane Prime Arterial	61	55
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	Sensitive	6-Lane Prime Arterial	61	55
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	Sensitive	4-Lane Major Arterial	50	45
4	San Elijo Road	Melrose Drive to Street "E"	Sensitive	4-Lane Major Arterial	50	45
5	San Elijo Road	Street "E" to Baker Street	Sensitive	4-Lane Major Arterial	50	25
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	Sensitive	2-Lane Major Arterial (One-Way)	36	25
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	Sensitive	2-Lane Major Arterial (One-Way)	36	25
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	Sensitive	2-Lane Major Arterial (One-Way)	36	35
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	Sensitive	2-Lane Major Arterial (One-Way)	36	35
10	San Elijo Road	Schoolhouse Way and Hope Street	Sensitive	4-Lane Major Arterial	50	35

[1] Based on a review of existing aerial imagery. NSLU are all existing residential land uses.
[2] *Questhaven Local Transportation Analysis*, Chen Ryan 2021.
[3] Based upon the right-of-way distances for each roadway classification provided in the County of San Diego Street Design Manual.

TABLE 1-4: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Existing		2024		2035	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	32,797	33,027	37,930	38,160	36,100	36,198
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	45,551	45,826	49,650	49,925	47,900	48,017
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	20,913	21,416	30,000	30,503	27,200	27,413
4	San Elijo Road	Melrose Drive to Street "E"	29,431	29,982	39,450	40,001	33,500	33,733
5	San Elijo Road	Street "E" to Baker Street	29,431	30,347	31,960	32,326	33,500	33,655
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	14,676	14,859	15,940	16,123	14,700	14,777
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	11,504	11,687	12,770	12,953	17,400	17,477
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	14,788	14,971	16,050	16,233	14,900	14,977
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	11,071	11,254	12,070	12,253	15,500	15,577
10	San Elijo Road	Schoolhouse Way and Hope Street	21,968	22,243	23,960	24,235	45,500	45,617

Table 1-4 presents the time-of-day vehicle distribution representing the total daily percentages of traffic for the daytime, evening, and nighttime periods for input into the traffic noise model. Table 1-5 presents the traffic flow distributions (vehicle mixes) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks, and heavy trucks for input into the traffic model based on roadway types.

TABLE 1-5: TIME OF DAY VEHICLE DISTRIBUTION

Roadway Segment	Time of Day Vehicle Distribution			
	Daytime	Evening	Nighttime	Total
All	75%	10%	15%	100%

"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 1-6: VEHICLE MIX

Roadway	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
Prime and Major Arterial[1]	92.00%	5.00%	3.00%	100.00%

[1] County of San Diego Guidelines for Determining Significance for Noise - Appendix C: Screening Criteria for Potential Adverse Traffic Noise Effects, January 2009.
[2] Caltrans Traffic Data Branch Annual Average Daily Truck Traffic on the California Highways System, 2018

To predict the future noise environment at each building within the Project site, coordinate information was collected to identify the noise transmission path between the noise source and receiver. The coordinate information is based on the Project site plan showing the plotting of each lot in relationship to San Elijo Road and internal roadways. The site plan is used to identify the relationship between the roadway centerlines and the proposed lots. Modeling conservatively assumes a ground elevation of 0.0 feet for all sources and receivers as the relative elevations of the proposed development pads and surrounding roadways were similar. While the Project are still in the design stage and the height of the residences at not known, it is assumed the residences would be two-story similar to surrounding neighborhoods. First-floor exterior noise level receivers were placed five feet above ground level and second-floor receivers were placed 14 feet above ground level. All receivers were modeled with a clear line-of-sight to all roadways and the model did not account for attenuation from future structures.

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2 NOISE SENSITIVE LAND USES AFFECTED BY AIRBORNE NOISE

2.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

Guidelines for the determination of significance of environmental noise impacts for this and other impact sections were promulgated by the County in January 2009 in the County's Noise Guidelines (4).

A proposed project would result in a significant impact if the implementation would result in the exposure of any on-site or off-site existing or reasonably foreseeable future NSLUs to exterior or interior noise (including noise generated from a project, together with noise from roads, railroads, airports, heliports, and all other noise sources) in excess of any of the following:

A. Exterior Locations:

i. 60 dB (CNEL); or

ii. An increase of 10 dB CNEL over preexisting noise.

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area that adjoins and is on the same lot as the dwelling, and that contains at least the following minimum area:

(1) Net lot area up to 4,000 square feet: 400 square feet

(2) Net lot area 4,000 square feet to 10 acres: 10% of net lot area

(3) Net lot area over 10 acres: 1 acre

For all projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

B. Interior Locations:

45 dB (CNEL) except for the following cases:

i. Rooms which are usually occupied only a part of the day (schools, libraries, or similar facilities), the interior 1 hour average sound level due to noise outside should not exceed 50 decibels (A).

ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.

COUNTY GENERAL PLAN

The General Plan Update (GPU) was adopted by the County on August 3, 2011. Revisions to the General Plan Noise Element have not been updated in the Guidelines at this time; however, the new GPU noise compatibility guidelines and standards as contained in the GPU are applicable to the Project. Table 2-1 provides County's current noise compatibility guidelines and Table 2-2 provides the County's noise standards.

TABLE 2-1: NOISE COMPATIBILITY GUIDELINES

	Land Use Category	Exterior Noise Levels					
		55	60	65	70	75	80
A	Residential—single family residences, mobile homes, senior housing, convalescent homes						
B	Residential—multi-family residences, mixed-use (commercial/residential)						
C	Transient lodging—motels, hotels, resorts						
D	Schools, churches, hospitals, nursing homes, childcare facilities						
E	Passive recreational parks, nature preserves, contemplative spaces, cemeteries						
F	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation						
G	Office\professional, government, medical\dental, commercial, retail, laboratories						
H	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair						
	ACCEPTABLE—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.						
	CONDITIONALLY ACCEPTABLE—New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table 8, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate county decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.						
	UNACCEPTABLE—New construction or development shall not be undertaken.						

* Denotes facilities used for part of the day; therefore, an hourly standard would be used rather than CNEL, refer to Table 8.

TABLE 2-2: NOISE STANDARDS

1	The exterior noise level (as defined in Item 3) standard for Category A shall be 60 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
2	The exterior noise level standard for Categories B and C shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
3	The exterior noise level standard for Categories D and G shall be 65 CNEL and the interior noise level standard shall be 50 dBA Leq (one hour average).
4	For single-family detached dwelling units, "exterior noise level" is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 (ii) square feet, (iii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; for lots over 10 acres in area, the exterior area shall include 1 acre.
5	For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. "Private Usable Open Space" is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. "Group Usable Open Space" is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
6	For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.
7	For noise sensitive land uses where people normally do not sleep at night, the exterior and interior noise standard may be measured using either CNEL or the one-hour average noise level determined at the loudest hour during the period when the facility is normally occupied.
8	The exterior noise standard does not apply for land uses where no exterior use area is proposed or necessary, such as a library.
9	For Categories E and F the exterior noise level standard shall not exceed the limit defined as "Acceptable" in Table N-1 or an equivalent one-hour noise standard.

NOTE: Exterior Noise Level compatibility guidelines for Land Use Categories A-H are identified in Table 2-1, Noise Compatibility Guidelines.

2.2 POTENTIAL NOISE IMPACTS

The closest airport is a private airport, the McClellan Palomar Airport, located approximately 4.75 miles northwest of the Project site. Therefore, the Project site is not exposed to airport noise and the issue is not further addressed. The primary noise source affecting the Project site is traffic on San Elijo Road.

2.2.1 POTENTIAL BUILD-OUT NOISE CONDITIONS AND IMPACTS

Exterior noise levels were calculated at anticipated exterior locations and exterior use areas using the FHWA's TNM protocol in CadnaA, and the parameters outlined in Tables 1-4 through 1-6.

I. EXTERIOR LOCATIONS

Based on the exterior noise modeling, the expected future exterior noise levels were calculated. Table 2-3 presents a summary of future exterior noise level impacts at the ground level within the Project site. Receiver locations represent anticipated exterior use areas, such as back yards. The on-site traffic noise level impacts indicate that the outdoor living areas facing, or adjacent to, San Elijo Road will experience unmitigated exterior noise levels ranging from 56.6 to 64.5 CNEL. Based on the exterior noise levels, the Project will exceed the County of San Diego 60 CNEL exterior noise standards outlined in Tables 2-1 and 2-2. The on-site traffic noise analysis calculations are provided in Appendix 2.1.

TABLE 2-3: EXTERIOR GROUND FLOOR NOISE LEVELS

Receiver Location[1]	Location	Unmitigated Exterior Noise Level (CNEL)
R01	Lot 1	58.9
R02	Lot 2	60.1
R03	Lot 3	61.4
R04	Lot 4	**64.5**
R05	Lot 5	**62.2**
R06	Lot 6	**60.8**
R07	Lot 7	59.6
R08	Lot 18	62.9
R09	Lot 17	61.2
R10	Lot 16	60.2
R11	Lot 15	59.1
R12	Lot 19	57.1
R13	Lot 20	56.6

[1] See Exhibit 1-B for the locations.
[2] CadnaA noise model inputs and calculations are included in Appendix 2.1

II. INTERIOR LOCATIONS

The interior noise level is the difference between the predicted exterior noise level at the building façade and the noise reduction of the structure. Typical building construction will provide a Noise Reduction (NR) of approximately 12 dBA with "windows open" and a minimum 25 dBA noise reduction with "windows closed." (15) (16) However, sound leaks, cracks and openings within the window assembly can greatly diminish its effectiveness in reducing noise. Several methods are used to improve interior noise reduction, including: [1] weather-stripped solid core exterior doors; [2] upgraded dual glazed windows; [3] mechanical ventilation/air conditioning; and [4] exterior wall/roof assembles free of cut outs or openings.

Table 2-4 shows the future unmitigated exterior noise levels at the first-floor building façades are expected to range from 56.6 to 64.5 CNEL requiring an interior noise level reduction ranging from 11.6 to 19.5 CNEL. Table 2-5 shows the future unmitigated exterior noise levels at the second-floor building façades are expected to range from 56.1 to 64.0 CNEL requiring an interior noise level reduction ranging from 11.1 to 19.0 CNEL. Therefore, a windows-closed condition requiring a means of mechanical ventilation (e.g., air conditioning) is required for lots 1 through 6 and 16 through 18. The interior noise level analysis shows that the County of San Diego 45 CNEL interior noise standards can be satisfied using mechanical ventilation and standard windows with a minimum STC rating of 27. The on-site traffic noise inputs are provided in Appendix 2.1.

TABLE 2-4: FIRST FLOOR INTERIOR NOISE IMPACTS (CNEL)

Lot	Noise Level at Façade[1]	Required Interior NR[2]	Estimated Interior NR[3]	Upgraded Windows[4]	Interior Noise Level[5]	Threshold[6]	Threshold Exceeded?
R01	58.9	13.9	25.0	No	33.9	45	No
R02	60.1	15.1	25.0	No	35.1	45	No
R03	61.4	16.4	25.0	No	36.4	45	No
R04	64.5	19.5	25.0	No	39.5	45	No
R05	62.2	17.2	25.0	No	37.2	45	No
R06	60.8	15.8	25.0	No	35.8	45	No
R07	59.6	14.6	25.0	No	34.6	45	No
R18	62.9	17.9	25.0	No	37.9	45	No
R17	61.2	16.2	25.0	No	36.2	45	No
R16	60.2	15.2	25.0	No	35.2	45	No
R15	59.1	14.1	25.0	No	34.1	45	No
R19	57.1	12.1	25.0	No	32.1	45	No
R20	56.6	11.6	25.0	No	31.6	45	No

[1] Exterior noise level at the building facade.
[2] Noise reduction required to satisfy the 45 dBA CNEL interior noise standard.
[3] Estimated minimum interior noise reduction with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning)..
[4] Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?
[5] Estimated interior noise level with minimum STC rating for all windows.
"NR" = Noise Reduction

TABLE 2-5: SECOND FLOOR INTERIOR NOISE IMPACTS (CNEL)

Lot	Noise Level at Façade[1]	Required Interior NR[2]	Estimated Interior NR[3]	Upgraded Windows[4]	Interior Noise Level[5]	Threshold[6]	Threshold Exceeded?
R01	58.5	13.5	25.0	No	33.5	45	No
R02	59.7	14.7	25.0	No	34.7	45	No
R03	61.0	16.0	25.0	No	36.0	45	No
R04	64.0	19.0	25.0	No	39.0	45	No
R05	61.8	16.8	25.0	No	36.8	45	No
R06	60.3	15.3	25.0	No	35.3	45	No
R07	59.1	14.1	25.0	No	34.1	45	No
R18	62.5	17.5	25.0	No	37.5	45	No
R17	60.8	15.8	25.0	No	35.8	45	No
R16	59.8	14.8	25.0	No	34.8	45	No
R15	58.6	13.6	25.0	No	33.6	45	No
R19	56.7	11.7	25.0	No	31.7	45	No
R20	56.1	11.1	25.0	No	31.1	45	No

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
[2] Noise reduction required to satisfy the 45 dBA CNEL interior noise standard.
[3] Estimated minimum interior noise reduction.
[4] Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?
[5] Estimated interior noise level with minimum STC rating for all windows.
"NR" = Noise Reduction

2.2.2 DESIGN CONSIDERATIONS AND MITIGATION MEASURES

Due to the potential conflicts with the proposed land uses and predicted future noise levels along San Elijo Road, mitigation measure (MM) N-1 would be required to reduce potential traffic noise impacts to a less-than-significant level and ensure the Project complies with the County's noise standards:

I. EXTERIOR LOCATIONS

MM N-1: Prior to approval of the final map, or subsequent implementing tentative map, as appropriate, the Project applicant shall dedicate "noise protection easements" on the tentative map and each subsequent implementing tentative map for all lots located within the noise easement (lots 1 through 6 and 16 through 18), as shown on Exhibit 2-A.

The noise protection easements shall contain a restriction requiring compliance with the standards for the subject land use as stated in Tables N-1 and N-2 of the County General Plan Noise Element (see Tables 2-1 and 2-2 of this report). Thus, the noise easement shall contain the following language.

- For single-family lots: The noise level at exterior use areas associated with single-family detached dwelling units shall contain at least the following minimum net lot area:
    - for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, and
    - for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area.
- Noise levels with the single-family residential exterior use areas shall not exceed 60 CNEL.

To demonstrate compliance with Tables N-1 and N-2, the applicant shall have a noise study prepared by a County approved noise consultant and submitted to the Country for review and approval.

Implementation: Project applicant(s) and primary contractor(s) of all Project phases.

Timing: Prior to approval of the final map and issuance of building permits for lots within the noise easements.

Enforcement: County

II. INTERIOR LOCATIONS

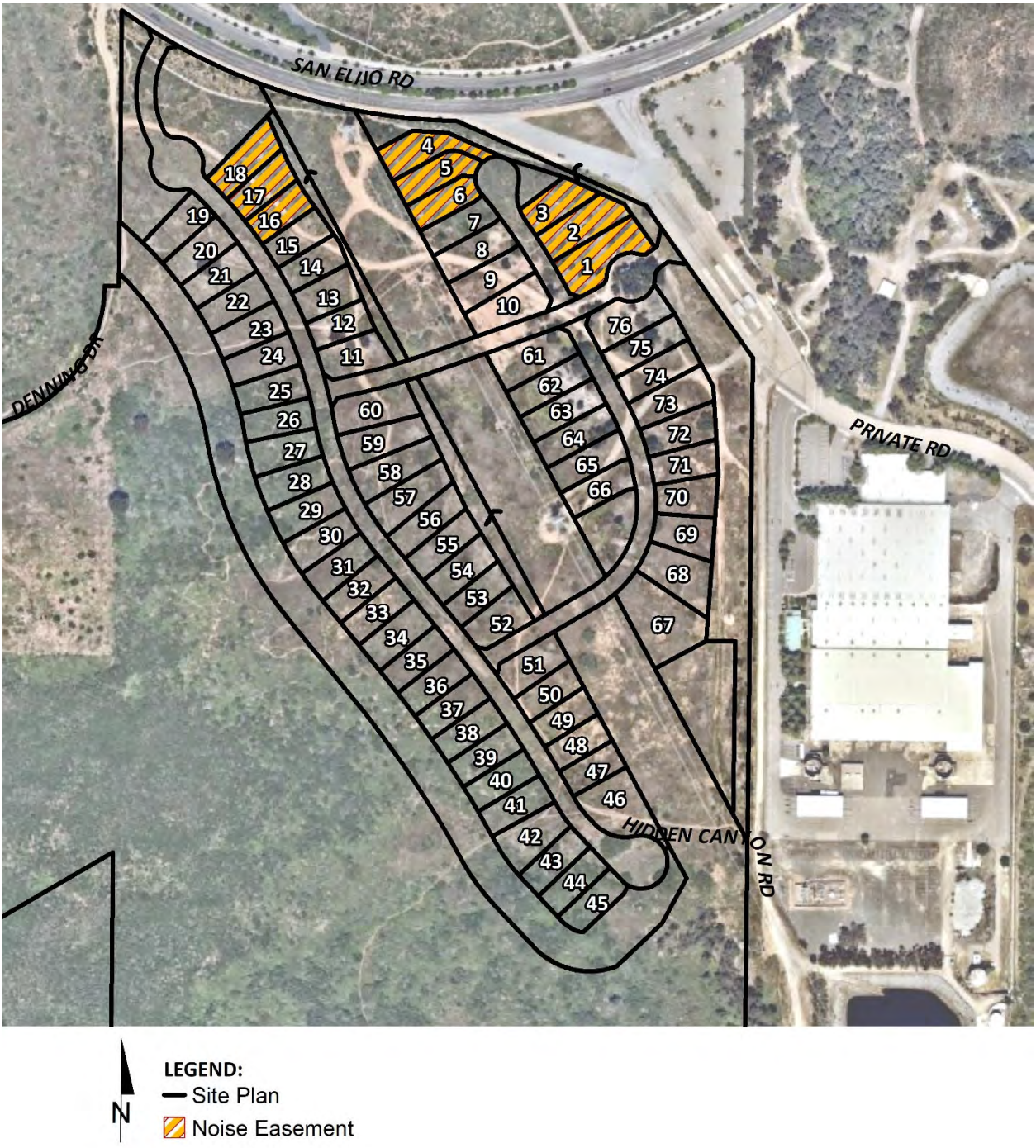
MM N-2: The Project applicant shall provide mechanical ventilation (e.g., air conditioning) for lots 1 through 6 and 16 through 18 to allow the windows to be maintained in a closed position.

Implementation: Project applicant(s) and primary contractor(s) of all Project phases.

Timing: Prior to approval of the final map and issuance of building permits for lots 1 through 6 and 16 through 18.

Enforcement: County

EXHIBIT 2-A: NOISE EASEMENT



2.3 OFF-SITE DIRECT AND CUMULATIVE NOISE IMPACTS

The Project would increase traffic volumes on local roadways. Noise level increases would be greatest nearest the Project site, which would represent the greatest concentration of Project-related traffic. Traffic noise is primarily a function of volume, vehicle mix, speed, and proximity. For purposes of this evaluation, the vehicle mix, speed, and proximity are assumed to remain constant in the future. Thus, the primary factor affecting noise levels would be increased traffic volumes.

Impacts were determined by comparing existing average daily traffic volumes with the existing condition plus the Project at full build-out and the Near-Term Year 2024 Cumulative Condition with and without the Project. Horizon Year impacts were determined by comparing the 2035 Horizon Year conditions with Project and without the Project to determining the Project's contribution to the future noise levels.

2.3.1 DIRECT NOISE IMPACTS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 2-6 to 2-11 present a summary of the exterior traffic noise levels for each traffic condition. Appendix 2.2 includes the traffic noise level contours worksheets for each traffic condition.

TABLE 2-6: EXISTING WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at 50 feet (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	Sensitive	73.0	79	170	365
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	Sensitive	74.4	98	211	455
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	Sensitive	69.4	46	99	212
4	San Elijo Road	Melrose Drive to Street "E"	Sensitive	70.9	57	124	267
5	San Elijo Road	Street "E" to Baker Street	Sensitive	69.8	49	105	226
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	Sensitive	66.8	RW	66	142
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	Sensitive	65.8	RW	56	121
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	Sensitive	66.8	RW	66	143
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	Sensitive	65.6	25	55	118
10	San Elijo Road	Schoolhouse Way to Hope Road	Sensitive	68.5	40	86	186

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 2-7: EXISTING WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at 50 feet (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	Sensitive	73.0	79	170	367
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	Sensitive	74.4	98	212	456
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	Sensitive	69.5	46	100	216
4	San Elijo Road	Melrose Drive to Street "E"	Sensitive	71.0	58	125	270
5	San Elijo Road	Street "E" to Baker Street	Sensitive	70.0	50	107	231
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	Sensitive	66.9	RW	67	143
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	Sensitive	65.8	RW	57	122
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	Sensitive	66.9	RW	67	144
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	Sensitive	65.6	26	55	119
10	San Elijo Road	Schoolhouse Way to Hope Road	Sensitive	68.6	40	87	187

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 2-8: NEAR-TERM YEAR 2024 CUMULATIVE WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at 50 feet (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	Sensitive	73.6	87	187	402
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	Sensitive	74.8	104	224	482
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	Sensitive	71.0	58	125	270
4	San Elijo Road	Melrose Drive to Street "E"	Sensitive	72.2	70	150	324
5	San Elijo Road	Street "E" to Baker Street	Sensitive	70.2	51	111	239
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	Sensitive	67.2	RW	70	150
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	Sensitive	66.2	RW	60	130
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	Sensitive	67.2	RW	70	151
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	Sensitive	65.9	27	58	125
10	San Elijo Road	Schoolhouse Way to Hope Road	Sensitive	68.9	42	91	197

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 2-9: NEAR-TERM YEAR 2024 CUMULATIVE WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at 50 feet (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	Sensitive	73.6	87	188	404
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	Sensitive	74.8	104	224	483
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	Sensitive	71.1	59	127	273
4	San Elijo Road	Melrose Drive to Street "E"	Sensitive	72.2	70	152	327
5	San Elijo Road	Street "E" to Baker Street	Sensitive	70.2	52	112	241
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	Sensitive	67.2	RW	70	151
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	Sensitive	66.3	RW	61	131
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	Sensitive	67.2	RW	70	152
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	Sensitive	66.0	27	58	126
10	San Elijo Road	Schoolhouse Way to Hope Road	Sensitive	69.0	43	92	198

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 2-10: HORIZON YEAR 2035 WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at 50 feet (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	Sensitive	73.4	84	181	389
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	Sensitive	74.6	101	218	470
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	Sensitive	70.6	54	117	253
4	San Elijo Road	Melrose Drive to Street "E"	Sensitive	71.5	63	135	291
5	San Elijo Road	Street "E" to Baker Street	Sensitive	70.4	53	114	246
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	Sensitive	66.8	RW	66	142
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	Sensitive	67.5	RW	74	159
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	Sensitive	66.9	RW	67	143
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	Sensitive	67.0	32	68	147
10	San Elijo Road	Schoolhouse Way to Hope Road	Sensitive	71.7	65	140	302

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 2-11: HORIZON YEAR 2035 WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at 50 feet (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	Sensitive	73.4	84	181	390
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	Sensitive	74.6	101	219	471
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	Sensitive	70.6	55	118	254
4	San Elijo Road	Melrose Drive to Street "E"	Sensitive	71.5	63	136	292
5	San Elijo Road	Street "E" to Baker Street	Sensitive	70.4	53	115	247
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	Sensitive	66.8	RW	66	143
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	Sensitive	67.6	RW	74	160
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	Sensitive	66.9	RW	67	144
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	Sensitive	67.1	32	69	148
10	San Elijo Road	Schoolhouse Way to Hope Road	Sensitive	71.7	65	140	302

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

2.3.2 EXISTING PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report to fully analyze all the existing traffic scenarios identified in the *Questhaven Local Transportation Analysis* (17). This condition is provided solely for informational purposes and will not occur, since the Project will not be fully developed and occupied under Existing conditions. Table 2-6 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels are expected to range from 65.6 to 74.4 CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 2-7 shows the Existing with Project conditions will range from 65.6 to 74.4 CNEL. Table 2-12 shows that the Project off-site traffic noise level impacts will range from 0.0 to 0.2 CNEL. Based on the significance criteria for off-site traffic noise, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

2.3.3 NEAR-TERM YEAR 2024 CUMULATIVE PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 2-8 presents the Near-Term Year 2024 Cumulative without Project conditions CNEL noise levels. The Near-Term Year 2024 Cumulative without Project exterior noise levels are expected to range from 65.9 to 74.8 CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 2-9 shows the Near-Term Year 2024 Cumulative with Project conditions will range from 66.0 to 74.8 CNEL. Table 2-13 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.1 CNEL. Based on the significance criteria for off-site traffic noise, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

2.3.4 HORIZON YEAR 2035 PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 2-10 presents the Horizon Year 2035 without Project conditions CNEL noise levels. The Horizon Year 2035 without Project exterior noise levels are expected to range from 66.8 to 74.6 CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 2-11 shows the Horizon Year 2035 with Project conditions will range from 66.8 to 74.6 CNEL. Table 2-14 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.1 CNEL. Based on the significance criteria for off-site traffic noise, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

TABLE 2-12: EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	CNEL at Receiving Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Incremental Noise Level Increase Threshold	
			E	EP	Increase		Limit (dBA)	Exceeded?
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	73.0	73.0	0.0	Yes	3	No
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	74.4	74.4	0.0	Yes	3	No
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	69.4	69.5	0.1	Yes	3	No
4	San Elijo Road	Melrose Drive to Street "E"	70.9	71.0	0.1	Yes	3	No
5	San Elijo Road	Street "E" to Baker Street	69.8	70.0	0.2	Yes	3	No
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	66.8	66.9	0.1	Yes	3	No
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	65.8	65.8	0.0	Yes	3	No
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	66.8	66.9	0.1	Yes	3	No
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	65.6	65.6	0.0	Yes	3	No
10	San Elijo Road	East of Schoolhouse Way	68.5	68.6	0.1	Yes	3	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.

[2] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

TABLE 2-13: NEAR-TERM YEAR 2024 WITH PROJECT TRAFFIC NOISE INCREASES

ID	Road	Segment	CNEL at Receiving Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Incremental Noise Level Increase Threshold	
			NT 2024	NT+P 2024	Increase		Limit (dBA)	Exceeded?
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	73.6	73.6	0.0	Yes	1	No
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	74.8	74.8	0.0	Yes	1	No
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	71.0	71.1	0.1	Yes	1	No
4	San Elijo Road	Melrose Drive to Street "E"	72.2	72.2	0.0	Yes	1	No
5	San Elijo Road	Street "E" to Baker Street	70.2	70.2	0.0	Yes	1	No
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	67.2	67.2	0.0	Yes	1	No
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	66.2	66.3	0.1	Yes	1	No
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	67.2	67.2	0.0	Yes	1	No
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	65.9	66.0	0.1	Yes	1	No
10	San Elijo Road	East of Schoolhouse Way	68.9	69.0	0.1	Yes	1	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[2] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

TABLE 2-14: HORZION YEAR 2035 WITH PROJECT TRAFFIC NOISE INCREASES

ID	Road	Segment	CNEL at Receiving Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Incremental Noise Level Increase Threshold	
			2035 CY	2035 CYP	Increase		Limit (dBA)	Exceeded?
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road	73.4	73.4	0.0	Yes	1	No
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad	74.6	74.6	0.0	Yes	1	No
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive	70.6	70.6	0.0	Yes	1	No
4	San Elijo Road	Melrose Drive to Street "E"	71.5	71.5	0.0	Yes	1	No
5	San Elijo Road	Street "E" to Baker Street	70.4	70.4	0.0	Yes	1	No
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road	66.8	66.8	0.0	Yes	1	No
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way	67.5	67.6	0.1	Yes	1	No
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road	66.9	66.9	0.0	Yes	1	No
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way	67.0	67.1	0.1	Yes	1	No
10	San Elijo Road	East of Schoolhouse Way	71.7	71.7	0.0	Yes	1	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[2] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

3.0 PROJECT-GENERATED AIRBORNE NOISE

3.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

The County Noise Ordinance, Section 36.404, sets limits on the noise levels generated from one property to another, such as from mechanical equipment. Unless a variance has been applied for by an applicant and granted by the County, it is unlawful for a person to cause or allow noise generated on a particular property to exceed the 1-hour average sound level, at any point on or beyond the boundaries of the property, as shown in Table 3-1.

Section 36.409 states:

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause the construction equipment to be operated, exceeding an average sound level of 75 dBA for an 8-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

Section 36.410 states:

In addition to the general limitations on sound levels in Section 36.404 and the limitations on construction equipment in Section 36.409, the following additional sound level limitations shall apply:

(a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 3-2, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 3-2 are as described in the County Zoning Ordinance.

(b) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 3-3, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 3-3 are as described in the County Zoning Ordinance.

TABLE 3-1: COUNTY OF SAN DIEGO NOISE ORDINANCE SOUND LEVEL LIMITS

Zone	Applicable Hours	Sound Level Limit dBA L_{eq} (1 hour)
(1) RS, RD, RR, RMH, A70, A72, S80, S81, S90, S92, RV, and RU with a General Plan Land Use Designation density of less than 10.9 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
(2) RRO, RC, RM, S86, V5, RV and RU with a General Plan Land Use Designation density of 10.9 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
(3) S-94, V4 and all other commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
(4) V1, V2	7 a.m. to 10 p.m.	55
V1	10 p.m. to 7 a.m.	55
V2	10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
(5) M-50, M-52, and M-54	Anytime	70
(6) S82, M56 and M58	Anytime	75
(7) S88 (see subsection (c) below)		

Source: County of San Diego Noise Ordinance, Section 36.404

Notes:

(a) Except as provided in section 36.409 of this chapter, it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sound level limits in Table 36.404, when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

(b) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit, which authorizes the noise-generating use or activity and the decision making body approving the Major Use Permit determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.

(c) S88 zones are Specific Planning Areas which allow for different uses. The sound level limits in Table 3-1 above that apply in an S88 zone depend on the use being made of the property. The limits in Table 3-1, subsection (1) apply to property with a residential, agricultural, or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52 or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.

(d) If the measured ambient noise level exceeds the applicable limit in Table 3-1, the allowable one-hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

(e) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones. The one-hour average sound level limit applicable to extractive industries, however, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is located.

(f)A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section, measured at or beyond 6 feet from the boundary of the easement upon which the facility is located.

TABLE 3-2: COUNTY OF SAN DIEGO CODE SECTION 36.410, MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS

Occupied Property Use	Decibels (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial, or industrial use	85

TABLE 3-3: COUNTY OF SAN DIEGO CODE SECTION 36.410, MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS FOR PUBLIC ROAD PROJECTS

Occupied Property Use	Decibels (dBA)
Residential, village zoning or civic use	85
Agricultural, commercial, or industrial use	90

(c) The minimum measurement period for any measurements conducted under this section shall be 1 hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it will be deemed that the maximum sound level was exceeded during that minute.

The Project would also result in a significant impact if it would result in a substantial permanent increase in ambient noise levels in the vicinity. A substantial noise increase is defined as an increase of 10 CNEL above existing conditions as stated in the County of San Diego Noise Report Guidelines Section 4.1-A (ii).

3.2 POTENTIAL OPERATIONAL NOISE IMPACTS (NON-CONSTRUCTION NOISE)

3.2.1 POTENTIAL BUILD-OUT NOISE CONDITIONS WITHOUT MITIGATION

Project operational noise impacts were evaluated by review of the most recent Project plans, proposed operations, and noise data. Traffic noise impacts were evaluated by review of data in the Project traffic report, *Questhaven Local Transportation Analysis* (17).

3.2.1.2 MECHANICAL HVAC EQUIPMENT

HVAC equipment could be a primary noise source associated with single-family residential land uses. HVAC equipment associated with single-family residential is often ground mounted in the rear or side yard. The noise sources are primarily the fans and compressors associated with the condenser units.

Noise levels from HVAC equipment can vary substantially depending on unit efficiency, size, and location. Based on the Project location climate zone, a typical 2,500 to 3,000 square foot residence are typically requires 5 tons of HVAC per unit. Based on review of several manufactures (Carrier, Trane, and Rheem) sound level specifications for 5-ton units, generally range from 44 to

45 dBA L_{eq} at a distance of 50 feet. Based on the typical operating conditions for properly sized HVAC units, an HVAC unit would operate an estimated to operate for an average of 40 minutes per hour during the daytime hours, and 15 minutes per hour during the nighttime hours. These operating times would lower HVAC noise levels by approximately 2 dB and 6 dB during the day and nighttime hours. Accounting for typical attenuation rates of 6 dB per doubling of distance, noise levels attributed to unshielded HVAC mechanical systems could exceed the County property line noise limit (50 dBA L_{eq}) within 35 feet of the source depending on the operation schedule. At this time, no plans are available that show the location of the proposed structures or HVAC locations in relation to property lines. If the HVAC units must be located closer than 35 feet from any property line, a 5.5-foot-high barrier blocking the line to receivers would reduce noise levels by 10 dB, thus allowing HVAC units within 5 feet of property lines. Therefore, the impact of noise from HVAC equipment under the Project would be **significant** without mitigation**.**

3.2.2 MITIGATION MEASURES

Implementation of MM N-2 is required by the Project in order for all noise standards to be obtained.

MM N-2: Implement engineering practices and consider the placement of noise generating equipment and shielding when installing stationary noise sources associated with HVAC systems and standby generators.

Prior to the issuance of a building permit, the applicant, or its designee, will provide plans showing the HVAC units are at least 35 feet from the nearest property line or have a three-sided barrier blocking the line of sight to adjacent properties. The barrier shall have a minimum height of 5.5 feet or be 1.75 times the height of the HVAC units and must be constructed of materials with a minimum weight of 2 pounds per square foot. The barrier shall be solid with no holes, perforations, or gaps.

Implementation: Project applicant(s) and primary contractor(s) of all Project phases.

Timing: Prior to issuance of building permits.

Enforcement: County

3.3.2.3 SUMMARY

MM N-2 would ensure that on-site stationary noise sources associated with the Project would be reduced to a **less than significant** level.

3.3 POTENTIAL GENERAL CONSTRUCTION NOISE IMPACTS

3.3.1 POTENTIAL TEMPORARY CONSTRUCTION NOISE IMPACTS WITHOUT MITIGATION

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators that when combined can reach high levels. The number and mix of construction equipment are expected to occur in the following stages:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

3.3.2 TYPICAL CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearest NSLU locations were completed. To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity (Project site boundary) to each receiver location. As shown on Table 3-4, the construction noise levels are expected to range from 59.8 to 81.9 dBA L_{eq}, and the highest construction levels are expected to range from 69.9 to 81.9 dBA L_{eq} at the nearest property line with an occupied structure. Appendix 3.1 includes the detailed CadnaA unmitigated construction noise model inputs.

TABLE 3-4: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	71.1	69.3	67.4	67.0	61.0	71.1
R2	71.0	69.2	67.3	66.9	60.9	71.0
R3	69.9	68.1	66.2	65.8	59.8	69.9
R4	70.2	68.4	66.5	66.1	60.1	70.2
R5	81.9	80.1	78.2	77.8	71.8	81.9

[1] Noise receiver locations are shown on Exhibit 3-A.
[2] Construction noise level calculations based on distance from the Project site boundaries (construction activity area) to nearby receiver locations. CadnaA construction noise model inputs are included in Appendix 3.1.

3.3.3 BLASTING NOISE ANALYSIS

Blasting would be required for several areas within the Project site. Shallow blasting (<30 feet below existing grade) and moderate depth blasting (30–40 feet below existing grade) would occur in several areas across the site. The exact locations for blasting are not known at this time.

Prior to blasting, small holes would be drilled into the rock in a pattern that allows each hole to remove a small amount of rock. In order to comply with the County Fire Code, the blasting contractor would calculate and use only the amount of explosive in each of the small holes necessary to break the rock around each hole while crushing the rock for removal. The explosive would be detonated at each hole in a sequence with at least 8 milliseconds delay between charges to limit the total amount of vibration generated by the explosive fire at any one time. The blasting orientation would also be controlled in such a way that fractures and the energy

EXHIBIT 3-A: CONSTRUCTION NOISE RECEIVER LOCATIONS

from each blast would move the rock towards a hole that has already been cleared, limiting the containment of the explosive, and reducing potential vibrations at nearby structures. Another factor the blasting contractor can use to limit vibrations from blasting includes timing of energy release, i.e., the delay between each charge.

For blasting, it is estimated that drilling would occur in grids of 4 feet by 4 feet to 6 feet by 6 feet. The drill holes would be extended to a depth of approximately 18 to 24 inches below the proposed subgrade. Additionally, a five-foot-thick blanket of soil would be applied before drilling to reduce noise. Assuming the use of a single drill rig, it is estimated that the drilling, blasting, and excavation would be coordinated such that the duration of drilling and blasting combined would be require a few weeks to complete. Completion of excavation and stockpiling of fractured rock after the final blast may require an additional week or two.

3.3.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest property lines, a construction-related noise level threshold of 75 dBA L_{eq} is used as the threshold to assess the construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will exceed the 75 dBA L_{eq} significance threshold during Project construction activities as shown on Table 3-5. Therefore, typical construction noise would be **significant** and requires mitigation.

As discussed in Section 1.3, blasting and rock drilling are both calculated to be approximately 74 dBA L_{eq} at 50 feet. Blast locations are unknown at this time, blasting could be conducted anywhere within the construction activity footprint as shown in Exhibit 3-A. As the Project construction activity is less than 50 feet from the property line of Eden Park, rock drilling and blasting noise levels are considered **significant** and requires mitigation.

3.3.5 TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE - MITIGATED

To reduce construction related noise levels, a 12-foot-high barrier was modeled along the eastern property line between adjacent sports complex and the typical Project construction activities. The resultant noise levels are presented in Table 3-6, which demonstrates that with mitigation, construction noise levels at all receiver points would comply with the County of San Diego noise standards. Rock drilling and blasting noise levels would be reduced a similar amount as typical construction activity from the incorporation of the 12-foot-high temporary barrier along the eastern Property line. Therefore, with incorporation of MM N-3 the noise impacts due to Project construction noise, including rock drilling and blasting, would be considered *less than significant* at all receiver locations.

TABLE 3-5: TYPICAL UNMITIGATED CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold	Threshold Exceeded?[3]
R1	71.1	75	No
R2	71.0	75	No
R3	69.9	75	No
R4	70.2	75	No
R5	81.9	75	**Yes**

[1] Noise receiver locations are shown on Exhibit 3-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to nearby receiver locations as shown on Table 3-4.
[3] Do the estimated Project construction noise levels exceed the construction noise level threshold?

TABLE 3-6: TYPICAL MITIGATED CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold	Threshold Exceeded?[3]
R1	71.1	75	No
R2	71.0	75	No
R3	69.9	75	No
R4	69.5	75	No
R5	64.4	75	No

[1] Noise receiver locations are shown on Exhibit 3-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to nearby receiver locations as shown on Table 3-4.
[3] Do the estimated Project construction noise levels exceed the construction noise level threshold?

3.3.6 DESIGN CONSIDERATIONS AND TEMPORARY MITIGATION MEASURES

The following design considerations are included in the Project design.

3.3.6.1 DESIGN CONSIDERATIONS

DC-1: All construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.

DC-2: Whenever feasible, electrical power shall be used to run air compressors and similar power tools.

DC-3: Equipment staging areas should be located as far as feasible from occupied residences.

3.3.6.2 MITIGATION MEASURES

As identified in the preceding analysis, construction-related noise level would exceed County standards or result in a substantial increase in ambient noise levels without mitigation. Therefore, the following mitigation measure is required to reduce noise levels to comply with the County of San Diego construction noise level limits.

MM N-3: Prior to initiation of blasting activities within 50 feet of the eastern property line, or issuance of any grading permits, a temporary 12-foot-high noise barrier shall be erected along the eastern property line of the Project site where it borders the Eden Park facility south of the roadway. The barrier will be of sufficient length to block the line of sight from the adjacent property to the construction activities. The noise barrier shall be constructed of material with a minimum weight of 2 pounds per square foot with no gaps or perforations. Noise barriers may be constructed of, but are not limited to, 5/8-inch plywood, 5/8-inch oriented strand board, or hay bales.

Implementation: Project applicant(s) and primary contractor(s) of all Project phases.

Timing: Prior to issuance of grading permit.

Enforcement: County

3.4 POTENTIAL IMPULSIVE NOISE IMPACTS

3.4.1 POTENTIAL IMPULSIVE NOISE IMPACTS WITHOUT MITIGATION

There are no significant known sources of vibration associated with Project operation. No on-site rock crushing is anticipated during the grading operations. No pile driving is anticipated during building construction. However, based on the Project's geotechnical report blasting will be necessary to break up subsurface rock structures.

Blasting involves drilling bore holes and placing small amounts of explosives in each hole. By limiting the amount of explosives in each hole the blasting contractor can limit the fraction of the total energy released at any single time, which can limit noise and vibration levels. Rock drilling generates impulsive noise from the striking of the hammer with the anvil within the drill body, which drives the drill bit into the rock. As discussed in Section 1.3, rock drilling generates noise levels of approximately 85 dBA L_{max} at 50 feet 20 percent of an hour.

When explosive charges detonate in rock, almost all of the available energy from the explosion is used in breaking and displacing the rock mass. However, some blast energy escapes into the atmosphere. As discussed in Section 1.3, due to the short duration of a blast, blasting is calculated to generate approximately 94 dBA L_{max} at 50 feet approximately 1 percent of an hour.

Thus, the maximum noise levels from a rock drilling or blasting could exceed the County's maximum noise level threshold of 82 dBA, however, as rock drilling would only generate maximum noise levels 20 percent of an hour, and blasting would only generate maximum noise levels for 1 percent of an hour, neither activity would exceed the County impulsive threshold for 25 percent or more of an hour. Thus, based on duration, impulsive noise levels are anticipated

to be below the County's impulsive noise level threshold. No impulsive noise impacts are anticipated, and no mitigation measures are required.

3.5 CUMULATIVE OR COMBINED NOISE IMPACTS

3.5.1 POTENTIAL COMBINED NOISE IMPACTS

Noise is a localized occurrence and attenuates rapidly with distance. Therefore, only future development projects in the direct vicinity (1,000 feet) of the Project site could add to construction noise generated by the Project and result in a cumulative noise impact. No projects are known within 1,000 feet of Project construction. Beyond this distance construction noise levels would conform to the most restrictive daytime noise level limits. Therefore, even if multiple projects at this distance were perceivable, they would not combine to exceed the County of San Diego noise level standards.

The areas surrounding the Project site are developed residential areas and thus generate a similar level of noise as the Project. It is unlikely that Project implementation would create cumulative impacts due to stationary source noise because the surrounding developments of the Project site are residential development. In addition, MM N-1 would ensure that stationary source noise associated with the Project would conform to County standards. Therefore, it is concluded that this cumulative impact would be less than significant.

3.5.2 DESIGN CONSIDERATIONS AND MITIGATION MEASURES

Measure MM N-2 and MM N-3 is applicable and would reduce Project level and cumulative level impacts to less than significant levels from airborne noise sources.

4.0 GROUNDBORNE VIBRATION AND NOISE IMPACTS

4.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

Project implementation could expose the uses listed in Tables 4-1 and 4-2 to groundborne vibration and noise levels equal to or in excess of the levels shown.

TABLE 4-1: GUIDELINES FOR DETERMINING THE SIGNIFICANCE OF GROUNDBORNE VIBRATION AND NOISE IMPACTS

Land Use Category	Groundborne Vibration Impact Levels (inches/sec RMS)		Groundborne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events[1]	Occasional or Infrequent Events[2]	Frequent Events[1]	Occasional or Infrequent Events[2]
Category 1: Buildings where low ambient vibration is essential for interior operations (research & manufacturing facilities with special vibration constraints)[6]	0.0018[3]	0.0018[3]	Not applicable[4,5]	Not applicable[4,5]
Category 2: Residences and buildings where people normally sleep (hotels, hospitals, residences, & other sleeping facilities)[6]	0.0040	0.010	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use (schools, churches, libraries, other institutions, & quiet offices)[6]	0.0056	0.014	40 dBA	48 dBA

RMS = root mean square; re = relative

[1] "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

[2] "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

[3] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

[4] Vibration-sensitive equipment is not sensitive to groundborne noise.

[5] There are some buildings, such as concert halls, TV and recording studios, and theaters that can be very sensitive to vibration and noise but do not fit into any of the three categories. Table 4-2 gives criteria for acceptable levels of groundborne vibration and noise for these various types of special uses.

[6] For Categories 2 and 3 with occupied facilities, isolated events such as blasting are significant when the peak particle velocity (PPV) exceeds 1 inch per second. Non transportation vibration sources such as impact pile drivers or hydraulic breakers are significant when their PPV exceeds 0.1 inch per second. More specific criteria for structures and potential annoyance were developed by Caltrans (2004) and will be used to evaluate these continuous or transient sources in the County of San Diego.

SOURCE: FTA 2006.

TABLE 4-2: GUIDELINES FOR DETERMINING THE SIGNIFICANCE OF GROUNDBORNE VIBRATION AND NOISE IMPACTS FOR SPECIAL BUILDINGS

Type of Building or Room	Groundborne Vibration Impact Levels (inches/sec rms)		Groundborne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events[1]	Occasional or Infrequent Events[2]	Frequent Events[1]	Occasional or Infrequent Events[2]
Concert Halls, TV Studios, and Recording Studios	0.0018	0.0018	25 dBA	25 dBA
Auditoriums	0.0040	0.010	30 dBA	38 dBA
Theaters	0.0040	0.010	35 dBA	43 dBA

RMS = root mean square; re = relative

[1] "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

[2] "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

SOURCE: FTA 2006.

Impacts from general construction would occur if vibration levels exceed 0.0040 in/sec rms (0.016 in/sec PPV) at any surrounding residential structure or 0.0056 in/sec rms (0.0224 in/sec PPV) at any non-residential structure (18). There are no special buildings near the Project site that could be affected by Project related vibrations.

4.2 POTENTIAL GROUNDBORNE VIBRATION AND NOISE IMPACTS

4.2.1 POTENTIAL GROUNDBORNE VIBRATION AND NOISE IMPACTS WITHOUT MITIGATION

4.2.1.1 OPERATIONS

No operational components of the Project include significant groundborne noise or vibration sources and no significant vibrations sources currently exist, or are planned, in the Project area. Thus, no significant groundborne noise or vibration impacts would occur with the operation of the proposed Project.

4.2.1.1 CONSTRUCTION

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. Ground-borne vibration levels resulting from typical construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration (FTA) (11). However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used.

Ground vibration levels associated with various types of construction equipment are summarized on Table 4-3. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential Project construction vibration levels using the following vibration assessment methods defined by the FTA. The FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 4-3: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089

Federal Transit Administration, Transit Noise and Vibration Impact Assessment

Table 4-4 presents the expected Project related typical construction activity vibration levels at each of the nearest receiver locations. At distances ranging from 123 to 1,051 feet from the Project construction activity, the transient construction vibration velocity levels are estimated to range from 0.0003 to 0.0082 PPV in/sec. Based on maximum acceptable continuous vibration threshold of 0.016 PPV (in/sec) for residential structures or 0.0224 in/sec PPV for commercial buildings, the typical Project construction vibration levels will satisfy the thresholds at all the nearest receiver locations. Therefore, the vibration impacts due to the typical Project construction activities are considered *less than significant*.

TABLE 4-4: TYPICAL PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[1]	Structure Type[2]	Distance to Const. Activity (Feet)[3]	Typical Construction Vibration Levels PPV (in/sec)[4]				Thresholds PPV (in/sec)[5]	Thresholds Exceeded?[6]
			Jackhammer	Loaded Trucks	Large bulldozer	Highest Vibration Level		
R1	Residential	832'	0.00018	0.00040	0.00046	0.00046	0.0160	No
R2	Residential	569'	0.00032	0.00070	0.00082	0.00082	0.0160	No
R3	Residential	1,051'	0.00013	0.00028	0.00033	0.00033	0.0160	No
R4	Residential	1,051'	0.00013	0.00028	0.00033	0.00033	0.0160	No
R5	Commercial	123'	0.00321	0.00696	0.00816	0.00816	0.0224	No

[1] Receiver locations are shown on Exhibit 4-A.
[2] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Tables 19, p. 38.
[3] Distance from receiver location to Project construction boundary to nearest structure.
[4] Based on the Vibration Source Levels of Construction Equipment (Table 4-3).
[5] Thresholds converted to PPV from County RMS threshold shown in Table 4-1.
[6] Does the peak vibration exceed the acceptable vibration thresholds?

Moreover, the impacts at the site of the closest sensitive receivers are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

EXHIBIT 4-A: VIBRATION RECEIVER LOCATIONS

Vibration levels associated with blasting are site-specific and are dependent on the amount of explosive used, soil conditions between the blast site and the receptor, and the elevation where blasting would take place (specifically, how far below surface elevation where bedrock would be encountered). At the current stage of the proposed project design, a blasting and monitoring plan has not been completed; thus, specifics, such as the explosive, blasting quantities, and exact locations, have not been identified. However, it can be assumed all blasting locations would be associated with non-rippable rock, and to be conservative as the non-rippable rock locations are only generally known, the construction area is considered a potential blasting location.

As with noise, while almost all of the available energy from an explosion is used in breaking and displacing the rock mass, a small portion of the energy is released in the form of vibration waves that radiate away from the charge location. The strength, or 'amplitude,' of the waves reduces as the distance from the charge increases. The rate of amplitude decay depends on local geological conditions but can be estimated with a reasonable degree of consistency, which allows regulatory agencies to control blasting operations by means of relationships between distance and explosive quantity.

The explosive charges used in mining and mass grading are typically wholly contained in the ground and are typically covered with overburden. Based on extensive research conducted by the United States Bureau of Mines and the Office of Surface Mining, universities, and private groups, vibration standards, vibration damage criteria, seismographs standards, and techniques to predict and control blast vibrations have been developed that greatly reduce the risk of off-site impacts from blasting. These methods and techniques are incorporated into blasting and monitoring requirements of the County Fire Code.

The range of vibration levels in this analysis is based on the quantity of explosive, as all other parameters were held constant. As shown in Table 4-5, blasting is predicted to generate vibration levels ranging exceeding 1.0 in/sec PPV, depending on charge weight, anywhere from 20 feet to 70 feet from the blast.

TABLE 4-5: BLASTING VIBRATION BASED ON CHARGE WEIGHT AND DISTANCE

Distance to Blast (feet)	Predicted Vibration Level by Charge Weight in/sec. PPV					
	8.00 Lbs.	4.00 Lbs.	2.00 Lbs.	1.00 Lbs.	0.50 Lbs.	0.25 Lbs.
10	**26.52**	**15.23**	**8.75**	**5.02**	**2.89**	**1.66**
20	**8.75**	**5.02**	**2.89**	**1.66**	0.95	0.55
30	**4.57**	**2.63**	**1.51**	0.87	0.50	0.29
40	**2.89**	**1.66**	0.95	0.55	0.31	0.18
50	**2.02**	**1.16**	0.67	0.38	0.22	0.13
60	**1.51**	0.87	0.50	0.29	0.16	0.09
70	**1.18**	0.68	0.39	0.22	0.13	0.07
80	0.95	0.55	0.31	0.18	0.10	0.06

Bolded numbers exceed the County standard for intermittent

As indicated in Table 4-5, vibration levels associated with blasting can be controlled through the charge weight. However, the actual resulting PPV from blasting can be further controlled and reduced through best engineering practices used by professional, licensed, blasters, including, but not limited to, orienting the progressions of the charges away from receivers, decreasing confinement of the explosive energy, increasing spatial distribution of the charges, and increasing time of energy release or detonation. The County Fire Code includes a minimum energy release time for individual charges of 8 milliseconds to limit vibrations. However, based on empirical data, delays of as little as 5 milliseconds can minimize vibration in very close blasting situations (10 to 25 feet) (19).

The proposed Project would comply with the County Fire Code and would include all feasible vibration reduction strategies, including conducting pre- and post-construction surveys of all structures within 300 feet of any blast and would monitor blasting vibrations levels. The monitoring of blasting vibrations level would be used to reduce charge weights, increase timing between charges, or other appropriate measures as required to reduce vibrations from blasting. With the implementation of these requirements, vibrations from blasting would be reduced to 1.0 in/sec PPV or less at the nearest residence.

4.2.2 Design Considerations and Mitigation Measures

4.2.2.1 Design Considerations

The proposed blasting activities would incorporate the following design considerations:

DC-4: Per Section 96.1.3301.2.6 of the County of San Diego Fire Code, blasting will be prohibited between the hours of 6:00 p.m. (or half-hour before dusk whichever occurs first) and 7:00 a.m.

DC-5: Per the requirements of Section 96.1.3301.2.7 County of San Diego Fire Code, the blasting contractor will obtain a certified building inspector to inspect all structures within 300 feet of the proposed blasting locations.

DC-6: The blasting contractor will obtain a blasting permit issued by the County of San Diego.

DC-7: The Project will issue a one-time notice in writing for each blast to the local fire agency and dispatch center and to all residences, including mobile homes, and businesses within 300 feet of potential blast locations. The notice will be given not less than 24 hours, but not more than one week, before each blasting operation.

4.4.2.1 Mitigation Measures

In addition to DC-4 through DC-7, the following mitigation measure would be required to mitigation vibrations impacts.

MM N-4: If blasting is required, prior to approval of the grading permit for any tentative map, the Project applicant or the designated contractor shall have a blast-drilling and monitoring plan prepared with an estimate of vibration levels of each blast at occupied structures within 300 feet of each blast. Additionally, all Project phases

involving blasting shall conform to the following requirements:

- All blasting shall be performed by a blast contractor and blasting personnel licensed to operate in the County.
- To verify compliance with the blasting vibration limitations, all blasting operations shall be monitored with a seismograph located at the nearest structure. All seismograph reports shall be submitted to the County of San Diego.
- Each blast shall be monitored and recorded with an air blast over-pressure monitor approved by the County of San Diego that is located outside the closest structure to the blast. All air blast over-pressure monitor reports shall be submitted to the County of San Diego.
- A blasting plan, including estimates of the drill noise levels, maximum noise levels (L_{max}), air blast over-pressure levels, and groundborne vibration levels at each structure within 300 feet of the blasting location shall be submitted to the County of San Diego for review prior to the first blast. Blasting shall not commence until the County of San Diego has approved the blast plan.
- Blasting shall not exceed 1 inch per second (in/sec) peak particle velocity (PPV) at the nearest occupied residence in accordance with County of San Diego Noise Guidelines.

Implementation: Project applicant(s) and primary contractor(s) of all Project phases involving blasting.

Timing: Prior to and during Project-related blasting activities.

Enforcement: County

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5.0 SUMMARY OF PROJECT IMPACTS, DESIGN CONSIDERATIONS, MITIGATION, AND CONCLUSION

The proceeding analysis provides an evaluation of compatibility of the proposed land uses with the existing and future noise environment of the Project site, potential noise and vibration impacts due to construction of the Project, and the direct and indirect noise generated by operation of the Project.

5.1 LAND USE COMPATIBILITY

The majority of the residential land uses planned for the Project site would be compatible with the existing and future noise environment, with the exception of any proposed NSLU located within 400 feet of San Elijo Road. However, the potential noise impacts would be mitigated to **less than significant** levels by mitigation measure MM N-1.

5.1.1 MITIGATION MEASURES

The following traffic noise mitigation measure is required to minimize noise impacts to receptors:

MM N-1: Prior to approval of the final map, or subsequent implementing tentative map, as appropriate, the Project applicant shall dedicate "noise protection easements" on the tentative map and each subsequent implementing tentative map for all lots located within the noise easement contour, as shown on Exhibit 2-A.

The noise protection easements shall contain a restriction requiring demonstration of compliance with the standards for the subject land use as stated in Tables N-1 and N-2 of the County General Plan Noise Element (see Tables 2-1 and 2-2 of this report). Thus, the noise easement shall contain the following language.

- For single-family lots: The noise level at exterior use areas associated with single-family detached dwelling units shall contain at least the following minimum net lot area:
    - for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, and
    - for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area.
- Noise levels with the single-family residential exterior use areas shall not exceed 60 CNEL.

To demonstrate compliance with Tables N-1 and N-2, the project applicant(s) and primary contractor(s) shall have a noise study prepared by a County approved noise consultant and submitted to the Country for review and approval.

Implementation: Project applicant(s) and primary contractor(s) of all Project phases.

Timing: Prior to approval of the final map and issuance of building permits for lots within the noise easements.

Enforcement: County

II. INTERIOR LOCATIONS

No significant impacts were identified an no mitigation is required.

5.1.2 SUMMARY

Implementation of MM N-1 would ensure that traffic noise impacts associated with area traffic would be reduced to a **less than significant** level.

5.2 AIRBORNE NOISE

5.2.1 OPERATIONS

Stationary noise sources associated with the Project would include mechanical equipment associated with the residential and commercial developments, emergency generators, parking lots, and recreational activities. At this stage of Project development, even with design considerations, the data necessary to fully evaluate all the potential on-site sources are unavailable; therefore, a mitigation measure has been included that requires the Project verify that airborne noise levels would be reduced to comply with the County of San Diego property line limits.

5.2.2.2 MITIGATION MEASURES

The following stationary source noise mitigation measure is required to minimize noise impacts to NSLU:

MM N-2: Implement engineering practices and consider the placement of noise generating equipment and shielding when installing stationary noise sources associated with HVAC systems and standby generators.

Prior to the issuance of a building permit, the applicant, or its designee, will provide plans showing the HVAC units are at least 35 feet from the nearest property line or have a three-sided barrier blocking the line of sight to adjacent properties. The barrier shall have a minimum height of 5.5 feet or be 1.75 times the height of the HVAC units and must be constructed of materials with a minimum weight of 2 pounds per square foot. The barrier shall be solid with no holes, perforations, or gaps.

Implementation: Project applicant(s) and primary contractor(s) of all Project phases.

Timing: Prior to issuance of building permits.

Enforcement: County

5.2.2 CONSTRUCTION

As construction activities have the potential to generate sporadic short-term noise levels during peak construction activity in excess of 75 dBA L_{eq} at the adjacent property to the east, the following design considerations will be included in the Project design.

5.2.2.1 DESIGN CONSIDERATIONS

DC-1: All construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.

DC-2: Whenever feasible, electrical power shall be used to run air compressors and similar power tools.

DC-3: Equipment staging areas should be located as far as feasible from occupied residences or schools.

5.2.2.2 MITIGATION MEASURES

The following construction source noise mitigation measure is required to minimize noise impacts to the adjacent property:

MM N-3: Prior to initiation of blasting activities within 50 feet of the eastern property line, or issuance of any grading permits, a temporary 12-foot-high noise barrier shall be erected along the eastern property line of the Project site where it borders the Eden Park facility south of the roadway. The barrier will be of sufficient length to block the line of sight from the adjacent property to the construction activities. The noise barrier shall be constructed of material with a minimum weight of 2 pounds per square foot with no gaps or perforations. Noise barriers may be constructed of, but are not limited to, 5/8-inch plywood, 5/8 inch oriented strand board, or hay bales.

Implementation: Project applicant(s) and primary contractor(s) of all Project phases.

Timing: Prior to issuance of grading permit.

Enforcement: County

5.2.3 SUMMARY

Implementation of measure MM N-2 would reduce Project-generated airborne noise impacts associated with Project operation to a **less than significant** level. Furthermore, implementation of measures DC-1 through DC-3 and MM N-3 would reduce Project-generated airborne noise impacts associated with construction to a **less than significant** level.

5.3 VIBRATION

Implementations of measures DC-4 through DC-7 and MM N-4 would reduce Project-generated vibration impacts associated with construction to a **less than significant** level.

5.3.2.1 DESIGN CONSIDERATIONS

The Project includes the following design considerations:

DC-4: Per Section 96.1.3301.2.6 of the County of San Diego Fire Code, blasting will be prohibited between the hours of 6:00 p.m. (or half-hour before dusk whichever occurs first) and 7:00 a.m.

DC-5: Per the requirements of Section 96.1.3301.2.7 County of San Diego Fire Code, the blasting contractor will obtain a certified building inspector to inspect all structures within 300 feet of the proposed blasting locations.

DC-6: The blasting contractor will obtain a blasting permit issued by the County of San Diego.

DC-7: The Project will issue a one-time notice in writing for each blast to the local fire agency and dispatch center and to all residences, including mobile homes, and businesses within 300 feet of potential blast locations. The notice will be given not less than 24 hours, but not more than one week, before each blasting operation.

5.3.2.2 MITIGATION MEASURES

The project would incorporate the following mitigation measure to reduce vibrations impacts:

MM N-4: If blasting is required, prior to approval of the grading permit for any tentative map, the Project applicant or the designated contractor shall have a blast-drilling and monitoring plan prepared with an estimate of noise and vibration levels of each blast at occupied structures within 1,000 feet of each blast. Additionally, all Project phases involving blasting shall conform to the following requirements:

- All blasting shall be performed by a blast contractor and blasting personnel licensed to operate in the County.
- Each blast shall be monitored and recorded with an air blast over-pressure monitor and groundborne vibration accelerometer approved by the County that is located outside the closest structure to the blast.
- A blasting plan, including estimates of the drill noise levels, maximum noise levels (L_{max}), air blast over-pressure levels, and groundborne vibration levels at each structure within 300 feet of the blasting location shall be submitted to the County of San Diego for review prior to the first blast. Blasting shall not commence until the County of San Diego has approved the blast plan.
- Blasting shall not exceed 1 inch per second (in/sec) peak particle velocity (PPV) at the nearest occupied residence in accordance with County of San Diego

Noise Guidelines.

Implementation: Project applicant(s) and primary contractor(s) of all Project phases involving blasting.

Timing: Prior to and during Project-related blasting activities.

Enforcement: County

5.3.3 SUMMARY

Implementation of measures DC-4 through DC-7 and MM N-4 would reduce Project related vibration impacts associated with construction to a **less than significant** level.

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6.0 CERTIFICATION

The following is a list of preparers, persons, and organizations involved with the noise assessment.

Urban Crossroads, Inc.

- William Maddux, Senior Associate, County-approved Noise Consultant

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7.0 REFERENCES

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12. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
13. **US Department of Transportation Federal Highway Administration.** *Road Construction Noise Model, version 1.0.* 2006.
14. **Urban Crossroads, Inc.** *Tentative Parcel Map 2015-06 Traffic Impact Analysis.* October 2019.
15. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
16. **California Department of Transportation.** *Traffic Noise Analysis Protocol.* May 2011.
17. **Chen-Ryan.** *Questhaven Local Transportation Analysis.* March 2021.
18. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
19. **Bender, Wesley L.** *Back to Basics, the Fundamentals of Blast Design.* 2007.

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APPENDIX 1.1:

STUDY AREA PHOTOS

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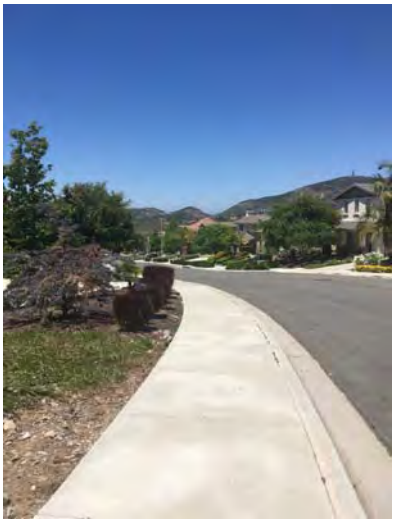
JN:13076 Study Area Photos

L1_E
33, 5' 34.200000", 117, 12' 40.670000"



L1_N
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L1_S
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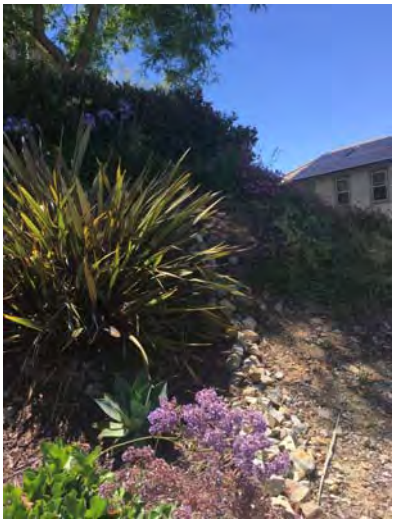


L1_W
33, 5' 34.160000", 117, 12' 40.690000"

L2_E
33, 5' 44.190000", 117, 12' 35.310000"

L2_N
33, 5' 44.170000", 117, 12' 35.890000"

JN:13076 Study Area Photos

L2_S
33, 5' 43.200000", 117, 12' 34.490000"

L2_W
33, 5' 43.130000", 117, 12' 34.510000"

L3_E
33, 5' 54.490000", 117, 12' 25.480000"

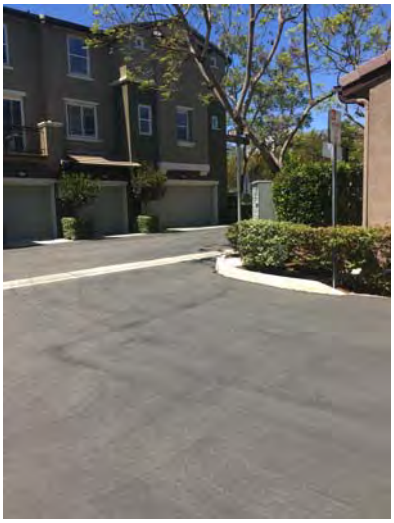
L3_N
33, 5' 56.190000", 117, 12' 25.780000"

L3_S
33, 5' 54.380000", 117, 12' 25.450000"

L3_W
33, 5' 54.360000", 117, 12' 25.340000"

JN:13076 Study Area Photos

L4_E
33, 5' 46.070000", 117, 12' 4.050000"



L4_N
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L4_S
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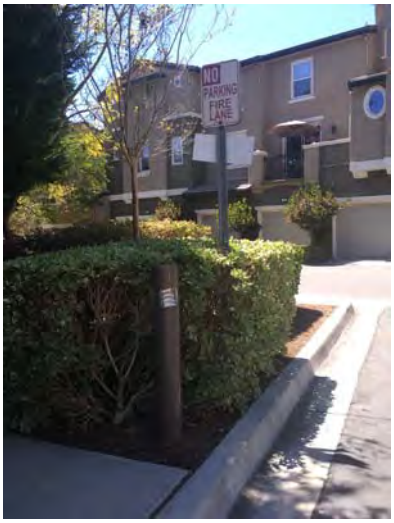

L4_W
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L5_E
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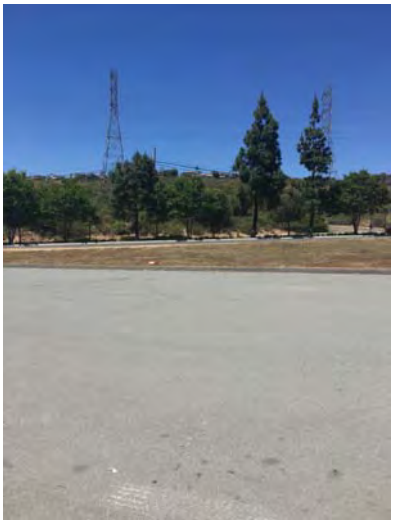

L5_N
33, 5' 38.410000", 117, 12' 17.810000"

JN:13076 Study Area Photos

L5_S
33, 5' 38.130000", 117, 12' 18.670000"

L5_W
33, 5' 38.050000", 117, 12' 18.690000"

APPENDIX 2.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

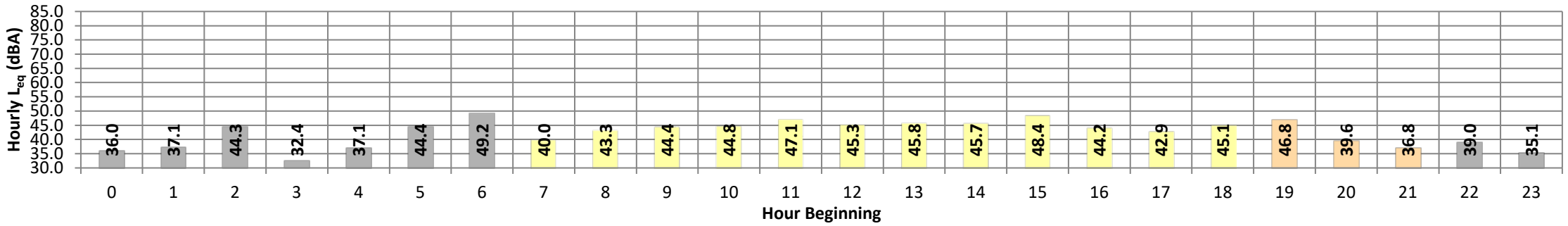
Date: Wednesday, May 27, 2020
Project: Questhaven

Location: L1 - Located west of the Project site on Dove Tail Drive near existing single-family residential home at 2832 Dove Tail Drive.

Meter: Piccolo II

JN: 13067
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	36.0	39.2	34.8	38.8	38.5	37.6	37.2	36.3	35.7	35.1	35.0	34.8	36.0	10.0	46.0
	1	37.1	40.6	35.3	40.4	40.1	39.5	39.1	37.4	36.6	35.6	35.5	35.4	37.1	10.0	47.1
	2	44.3	55.2	36.5	55.0	54.9	51.4	48.7	42.1	39.0	36.9	36.8	36.6	44.3	10.0	54.3
	3	32.4	34.2	31.6	34.1	34.0	33.7	33.4	32.6	32.2	31.8	31.7	31.6	32.4	10.0	42.4
	4	37.1	48.2	30.8	48.0	47.5	44.9	42.0	32.9	31.6	31.1	31.0	30.9	37.1	10.0	47.1
	5	44.4	50.0	37.5	49.3	48.9	48.0	47.3	45.6	43.5	40.0	39.2	38.0	44.4	10.0	54.4
	6	49.2	52.7	46.2	52.1	52.0	51.7	51.5	49.7	48.4	46.6	46.5	46.2	49.2	10.0	59.2
Day	7	40.0	47.0	35.7	46.3	45.9	44.5	43.4	40.7	38.5	36.6	36.2	35.8	40.0	0.0	40.0
	8	43.3	54.1	36.5	53.5	52.7	49.4	47.3	42.3	39.9	37.3	37.1	36.7	43.3	0.0	43.3
	9	44.4	52.4	40.0	51.8	51.3	49.5	48.3	44.1	42.6	40.8	40.5	40.2	44.4	0.0	44.4
	10	44.8	55.2	38.6	54.7	53.7	51.0	48.8	43.6	41.7	39.5	39.2	38.8	44.8	0.0	44.8
	11	47.1	57.1	40.6	56.8	56.4	53.9	51.1	45.7	43.7	41.4	41.1	40.7	47.1	0.0	47.1
	12	45.3	53.3	39.7	52.8	52.0	49.8	48.7	45.7	43.5	40.9	40.4	39.9	45.3	0.0	45.3
	13	45.8	56.1	38.8	55.7	55.1	52.5	50.3	44.7	42.1	39.7	39.4	39.0	45.8	0.0	45.8
	14	45.7	55.6	38.6	54.9	54.1	51.9	50.2	45.3	42.2	39.6	39.2	38.8	45.7	0.0	45.7
	15	48.4	60.8	41.1	59.7	57.9	53.7	52.3	46.9	44.5	42.1	41.7	41.3	48.4	0.0	48.4
	16	44.2	53.0	40.0	52.6	51.8	49.3	47.6	43.7	42.1	40.7	40.4	40.1	44.2	0.0	44.2
	17	42.9	50.3	39.3	49.7	49.1	47.5	45.9	43.2	41.4	40.0	39.7	39.4	42.9	0.0	42.9
	18	45.1	54.0	39.1	53.2	52.7	51.0	50.1	44.7	41.5	39.9	39.6	39.2	45.1	0.0	45.1
Evening	19	46.8	55.3	38.3	54.4	53.7	51.9	50.9	48.1	44.7	39.5	39.1	38.5	46.8	5.0	51.8
	20	39.6	45.9	37.1	45.3	44.7	43.2	42.0	39.6	38.7	37.7	37.5	37.2	39.6	5.0	44.6
	21	36.8	40.8	34.6	40.4	39.9	39.0	38.5	37.4	36.5	35.1	34.9	34.7	36.8	5.0	41.8
Night	22	39.0	50.2	32.4	49.7	49.1	45.9	43.3	35.7	34.2	32.8	32.6	32.4	39.0	10.0	49.0
	23	35.1	44.8	31.7	44.0	43.3	40.8	38.9	33.6	32.8	32.0	31.9	31.8	35.1	10.0	45.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	40.0	47.0	35.7	46.3	45.9	44.5	43.4	40.7	38.5	36.6	36.2	35.8
	Max	48.4	60.8	41.1	59.7	57.9	53.9	52.3	46.9	44.5	42.1	41.7	41.3
Energy Average		45.2	Average:		53.5	52.7	50.3	48.7	44.2	42.0	39.9	39.5	39.2
Evening	Min	36.8	40.8	34.6	40.4	39.9	39.0	38.5	37.4	36.5	35.1	34.9	34.7
	Max	46.8	55.3	38.3	54.4	53.7	51.9	50.9	48.1	44.7	39.5	39.1	38.5
Energy Average		43.2	Average:		46.7	46.1	44.7	43.8	41.7	39.9	37.4	37.2	36.8
Night	Min	32.4	34.2	30.8	34.1	34.0	33.7	33.4	32.6	31.6	31.1	31.0	30.9
	Max	49.2	55.2	46.2	55.0	54.9	51.7	51.5	49.7	48.4	46.6	46.5	46.2
Energy Average		42.6	Average:		45.7	45.3	43.7	42.4	38.4	37.1	35.8	35.6	35.3

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
44.2	44.9	42.6

24-Hour CNEL (dBA)

49.7

24-Hour Noise Level Measurement Summary

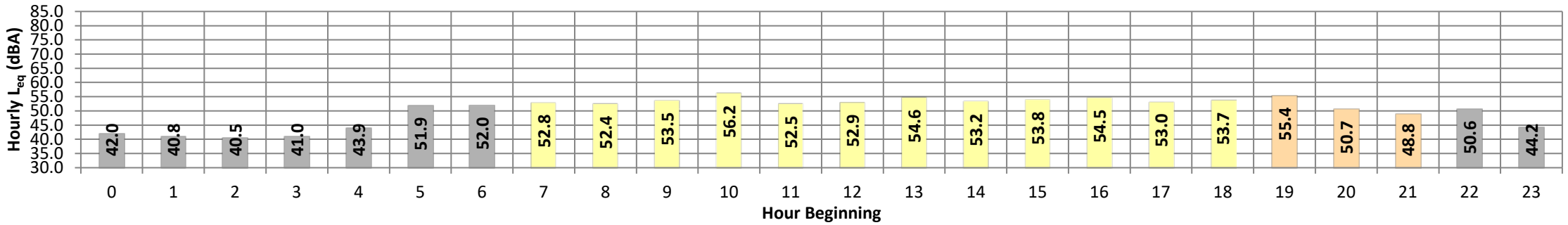
Date: Wednesday, May 27, 2020
Project: Questhaven

Location: L2 - Located northwest of the Project site on Fallsview Road near Mahogany Park.

Meter: Piccolo II

JN: 13067
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	42.0	51.7	34.7	51.3	50.5	48.4	47.2	41.2	37.2	35.0	34.9	34.7	42.0	10.0	52.0
	1	40.8	50.4	35.1	50.0	49.2	46.5	45.3	40.6	36.8	35.5	35.4	35.2	40.8	10.0	50.8
	2	40.5	48.6	33.9	48.3	47.6	45.9	45.0	41.6	36.6	34.2	34.1	34.0	40.5	10.0	50.5
	3	41.0	51.2	32.6	50.7	50.0	48.2	46.5	39.9	34.9	32.8	32.8	32.7	41.0	10.0	51.0
	4	43.9	55.2	32.1	54.6	53.7	51.4	49.8	41.9	36.5	32.6	32.4	32.2	43.9	10.0	53.9
	5	51.9	63.4	40.6	62.8	61.9	58.6	56.7	50.4	47.0	42.7	42.0	41.0	51.9	10.0	61.9
	6	52.0	61.0	40.9	60.6	59.8	57.6	56.3	52.6	49.3	43.4	42.2	41.2	52.0	10.0	62.0
Day	7	52.8	61.4	42.9	61.0	60.4	57.9	56.5	53.5	50.8	45.4	44.2	43.2	52.8	0.0	52.8
	8	52.4	59.9	43.1	59.4	58.9	57.2	56.0	53.3	50.9	45.8	44.7	43.4	52.4	0.0	52.4
	9	53.5	62.3	44.8	61.9	61.2	59.0	57.6	53.8	51.4	46.8	46.0	45.0	53.5	0.0	53.5
	10	56.2	64.4	48.7	64.0	63.3	60.6	59.0	56.7	54.9	51.1	50.2	49.0	56.2	0.0	56.2
	11	52.5	60.7	43.2	60.3	59.7	57.5	56.2	53.3	50.4	45.5	44.3	43.4	52.5	0.0	52.5
	12	52.9	61.6	43.6	61.2	60.5	58.2	56.9	53.5	50.8	45.7	44.8	43.9	52.9	0.0	52.9
	13	54.6	64.9	44.3	64.0	63.1	60.4	58.7	54.5	51.8	46.5	45.4	44.6	54.6	0.0	54.6
	14	53.2	62.4	43.8	61.9	61.2	58.6	57.1	53.8	50.7	45.9	44.9	44.1	53.2	0.0	53.2
	15	53.8	62.6	44.3	62.1	61.4	59.1	57.6	54.4	51.8	46.6	45.3	44.5	53.8	0.0	53.8
	16	54.5	64.3	44.4	63.8	63.2	60.6	58.6	54.5	51.7	46.6	45.7	44.6	54.5	0.0	54.5
	17	53.0	61.0	43.9	60.3	59.7	57.8	56.7	54.0	51.5	46.0	45.0	44.2	53.0	0.0	53.0
	18	53.7	63.1	43.2	62.6	61.9	59.6	58.0	54.2	50.6	45.2	44.3	43.4	53.7	0.0	53.7
Evening	19	55.4	65.2	42.3	64.1	63.1	61.0	59.8	56.6	51.8	45.1	44.0	42.6	55.4	5.0	60.4
	20	50.7	60.3	39.8	59.7	58.8	56.5	54.7	51.1	47.8	41.6	40.8	40.0	50.7	5.0	55.7
	21	48.8	58.3	37.5	57.6	56.7	54.6	53.2	49.5	45.6	39.5	38.6	37.7	48.8	5.0	53.8
Night	22	50.6	62.7	43.1	62.2	61.1	56.7	53.6	48.4	46.0	44.4	44.0	43.3	50.6	10.0	60.6
	23	44.2	54.9	33.5	54.4	53.4	50.5	49.2	43.9	38.9	34.2	33.9	33.6	44.2	10.0	54.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	52.4	59.9	42.9	59.4	58.9	57.2	56.0	53.3	50.4	45.2	44.2	43.2
	Max	56.2	64.9	48.7	64.0	63.3	60.6	59.0	56.7	54.9	51.1	50.2	49.0
Energy Average		53.7	Average:		61.9	61.2	58.9	57.4	54.1	51.4	46.4	45.4	44.4
Evening	Min	48.8	58.3	37.5	57.6	56.7	54.6	53.2	49.5	45.6	39.5	38.6	37.7
	Max	55.4	65.2	42.3	64.1	63.1	61.0	59.8	56.6	51.8	45.1	44.0	42.6
Energy Average		52.5	Average:		60.5	59.6	57.4	55.9	52.4	48.4	42.1	41.1	40.1
Night	Min	40.5	48.6	32.1	48.3	47.6	45.9	45.0	39.9	34.9	32.6	32.4	32.2
	Max	52.0	63.4	43.1	62.8	61.9	58.6	56.7	52.6	49.3	44.4	44.0	43.3
Energy Average		47.7	Average:		55.0	54.1	51.5	50.0	44.5	40.4	37.2	36.8	36.4

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
52.1	53.5	47.7

24-Hour CNEL (dBA)
56.1

24-Hour Noise Level Measurement Summary

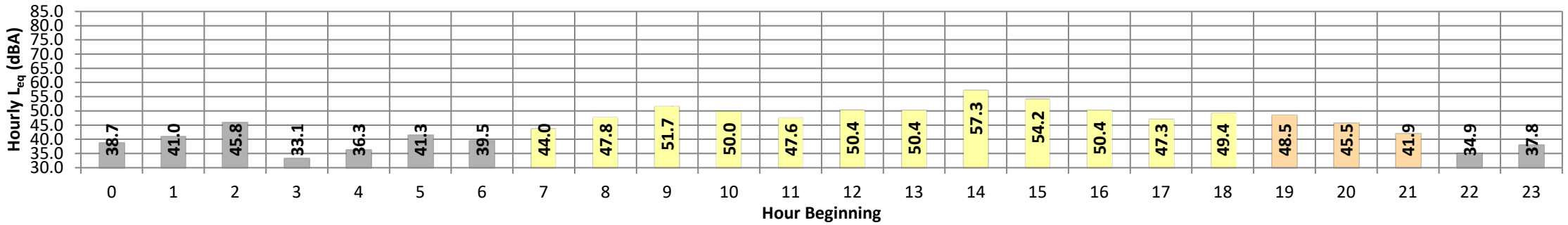
Date: Wednesday, May 27, 2020
Project: Questhaven

Location: L3 - Located on the intersection of River Crest Road and Black Walnut Drive near existing single-family residential home at 1554 Black Walnut Drive.

Meter: Piccolo II

JN: 13067
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	38.7	44.5	36.6	44.2	43.8	42.5	41.4	38.5	37.6	37.0	36.9	36.7	38.7	10.0	48.7
	1	41.0	49.9	36.6	49.7	49.2	47.3	45.2	40.1	38.0	36.9	36.8	36.7	41.0	10.0	51.0
	2	45.8	52.8	35.2	52.5	52.3	51.8	50.8	47.4	42.4	35.7	35.5	35.3	45.8	10.0	55.8
	3	33.1	34.6	32.6	34.4	34.2	33.8	33.7	33.3	33.1	32.8	32.7	32.6	33.1	10.0	43.1
	4	36.3	45.3	32.0	45.1	44.8	42.6	39.9	35.6	33.0	32.2	32.2	32.1	36.3	10.0	46.3
	5	41.3	49.7	37.5	48.7	48.2	46.1	44.9	41.1	39.3	38.1	37.9	37.6	41.3	10.0	51.3
	6	39.5	46.5	37.2	45.7	44.9	43.2	41.9	39.5	38.3	37.6	37.5	37.3	39.5	10.0	49.5
Day	7	44.0	53.0	38.3	52.5	52.0	49.8	48.0	43.9	41.2	39.0	38.8	38.5	44.0	0.0	44.0
	8	47.8	56.3	41.5	56.0	55.5	53.8	51.9	47.8	45.3	42.2	41.9	41.6	47.8	0.0	47.8
	9	51.7	59.3	45.1	58.9	58.5	56.9	55.8	52.4	49.3	46.2	45.7	45.3	51.7	0.0	51.7
	10	50.0	61.0	40.8	60.7	60.0	57.7	54.8	47.8	44.8	41.6	41.3	40.9	50.0	0.0	50.0
	11	47.6	56.8	41.7	56.2	55.5	53.2	51.0	47.8	45.4	42.5	42.2	41.9	47.6	0.0	47.6
	12	50.4	59.6	43.0	59.2	58.8	57.2	55.7	49.6	46.7	43.9	43.6	43.2	50.4	0.0	50.4
	13	50.4	55.9	48.6	55.3	54.6	53.0	52.1	50.6	49.7	49.0	48.9	48.7	50.4	0.0	50.4
	14	57.3	62.3	52.1	61.9	61.5	60.7	60.2	58.5	56.5	53.5	52.9	52.3	57.3	0.0	57.3
	15	54.2	61.2	50.9	60.8	60.4	58.2	56.6	54.3	53.1	51.5	51.3	51.0	54.2	0.0	54.2
	16	50.4	59.7	46.7	59.3	58.6	55.7	53.3	49.5	48.2	47.1	47.0	46.8	50.4	0.0	50.4
	17	47.3	56.2	40.9	55.6	55.1	53.4	52.1	47.1	44.3	41.6	41.4	41.0	47.3	0.0	47.3
	18	49.4	59.5	41.3	58.5	57.6	55.2	53.9	50.0	45.3	42.2	41.8	41.4	49.4	0.0	49.4
Evening	19	48.5	55.7	40.4	55.3	54.9	53.9	53.0	49.8	44.9	41.3	40.9	40.5	48.5	5.0	53.5
	20	45.5	55.9	39.4	55.6	54.8	52.7	49.8	43.3	41.3	40.0	39.8	39.6	45.5	5.0	50.5
	21	41.9	52.1	36.4	51.4	50.7	48.4	45.7	40.9	38.3	37.0	36.8	36.5	41.9	5.0	46.9
Night	22	34.9	39.8	33.5	39.3	38.7	37.2	36.4	34.9	34.4	33.8	33.7	33.5	34.9	10.0	44.9
	23	37.8	45.6	34.3	45.4	45.1	43.8	41.8	37.4	35.1	34.6	34.5	34.4	37.8	10.0	47.8

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	44.0	53.0	38.3	52.5	52.0	49.8	48.0	43.9	41.2	39.0	38.8	38.5
	Max	57.3	62.3	52.1	61.9	61.5	60.7	60.2	58.5	56.5	53.5	52.9	52.3
Energy Average		51.4	Average:		57.9	57.3	55.4	53.8	49.9	47.5	45.0	44.7	44.4
Evening	Min	41.9	52.1	36.4	51.4	50.7	48.4	45.7	40.9	38.3	37.0	36.8	36.5
	Max	48.5	55.9	40.4	55.6	54.9	53.9	53.0	49.8	44.9	41.3	40.9	40.5
Energy Average		46.1	Average:		54.1	53.5	51.7	49.5	44.7	41.5	39.4	39.2	38.9
Night	Min	33.1	34.6	32.0	34.4	34.2	33.8	33.7	33.3	33.0	32.2	32.2	32.1
	Max	45.8	52.8	37.5	52.5	52.3	51.8	50.8	47.4	42.4	38.1	37.9	37.6
Energy Average		40.3	Average:		45.0	44.6	43.2	41.8	38.6	36.8	35.4	35.3	35.1

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
48.9	50.8	40.3

24-Hour CNEL (dBA)
51.0

24-Hour Noise Level Measurement Summary

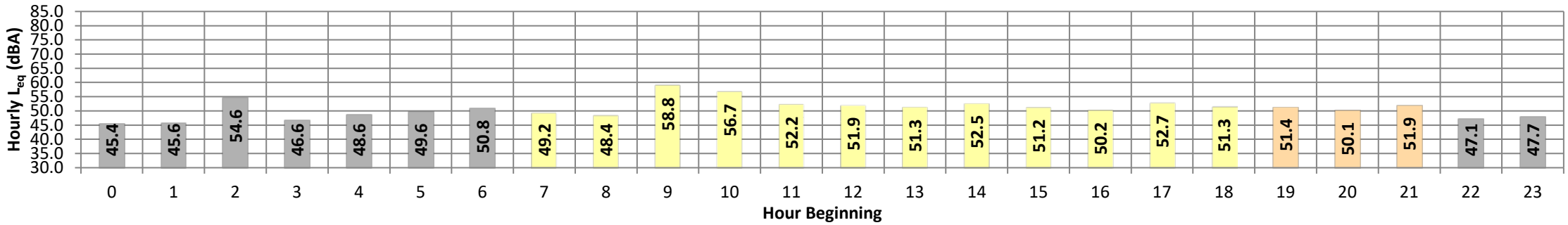
Date: Wednesday, May 27, 2020
Project: Questhaven

Location: L4 - Located northeast of the Project site on Dandelion Way near existing multi-family residential home at 1380 Dandelion Way.

Meter: Piccolo II

JN: 13067
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	45.4	47.9	44.3	47.7	47.5	47.1	46.6	45.7	45.2	44.5	44.5	44.4	45.4	10.0	55.4
	1	45.6	49.8	44.1	49.5	49.2	47.9	46.8	45.6	45.2	44.6	44.4	44.1	45.6	10.0	55.6
	2	54.6	56.2	54.0	56.1	56.0	55.6	55.2	54.9	54.5	54.1	54.1	54.0	54.6	10.0	64.6
	3	46.6	49.1	45.5	48.6	48.3	47.8	47.5	47.0	46.4	45.9	45.9	45.6	46.6	10.0	56.6
	4	48.6	61.6	55.9	61.0	60.4	59.7	58.9	57.0	56.6	56.0	55.9	55.9	48.6	10.0	58.6
	5	49.6	59.3	43.6	58.8	58.0	55.5	53.8	49.2	46.4	44.3	44.1	43.8	49.6	10.0	59.6
	6	50.8	60.8	45.7	60.0	59.3	56.7	53.8	50.2	48.2	46.4	46.1	45.8	50.8	10.0	60.8
Day	7	49.2	55.8	45.3	55.5	55.1	53.8	52.5	49.6	47.8	45.9	45.7	45.4	49.2	0.0	49.2
	8	48.4	54.5	44.1	54.0	53.5	52.2	51.2	49.1	47.4	45.1	44.8	44.3	48.4	0.0	48.4
	9	58.8	69.4	47.2	68.9	68.2	66.9	63.5	57.7	53.4	48.6	48.1	47.4	58.8	0.0	58.8
	10	56.7	66.3	45.5	65.5	65.2	63.8	61.7	57.1	51.5	46.5	46.0	45.7	56.7	0.0	56.7
	11	52.2	60.6	45.7	60.0	59.3	57.4	56.2	52.9	49.9	46.9	46.5	46.0	52.2	0.0	52.2
	12	51.9	60.6	46.1	59.8	59.0	57.0	55.8	52.2	49.3	47.0	46.6	46.2	51.9	0.0	51.9
	13	51.3	59.1	47.4	58.4	57.7	55.6	54.2	51.6	49.6	48.0	47.7	47.5	51.3	0.0	51.3
	14	52.5	60.3	46.3	59.8	59.4	58.1	56.9	53.0	50.0	47.1	46.8	46.4	52.5	0.0	52.5
	15	51.2	58.6	46.7	58.1	57.5	55.8	54.6	51.4	49.5	47.6	47.2	46.9	51.2	0.0	51.2
	16	50.2	58.5	45.6	57.8	57.0	55.3	53.6	50.2	48.5	46.4	46.1	45.7	50.2	0.0	50.2
	17	52.7	61.2	48.7	60.3	59.2	57.6	56.5	52.7	50.8	49.1	49.0	48.8	52.7	0.0	52.7
	18	51.3	58.6	48.3	57.7	57.0	55.4	54.0	51.4	50.2	48.9	48.6	48.4	51.3	0.0	51.3
Evening	19	51.4	57.7	48.2	57.0	56.5	55.1	54.1	51.9	50.5	48.8	48.5	48.3	51.4	5.0	56.4
	20	50.1	57.1	47.2	56.5	55.8	54.8	53.7	49.8	48.5	47.6	47.4	47.3	50.1	5.0	55.1
	21	51.9	60.8	47.5	59.7	58.3	56.1	55.2	52.5	49.6	47.8	47.7	47.6	51.9	5.0	56.9
Night	22	47.1	52.4	44.6	52.0	51.6	50.5	49.7	47.6	46.0	45.0	44.8	44.7	47.1	10.0	57.1
	23	47.7	53.5	45.4	53.2	52.8	51.6	50.5	48.1	46.4	45.6	45.6	45.5	47.7	10.0	57.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	48.4	54.5	44.1	54.0	53.5	52.2	51.2	49.1	47.4	45.1	44.8	44.3
	Max	58.8	69.4	48.7	68.9	68.2	66.9	63.5	57.7	53.4	49.1	49.0	48.8
Energy Average		53.3	Average:		59.6	59.0	57.4	55.9	52.4	49.8	47.3	46.9	46.5
Evening	Min	50.1	57.1	47.2	56.5	55.8	54.8	53.7	49.8	48.5	47.6	47.4	47.3
	Max	51.9	60.8	48.2	59.7	58.3	56.1	55.2	52.5	50.5	48.8	48.5	48.3
Energy Average		51.2	Average:		57.8	56.9	55.4	54.3	51.4	49.5	48.1	47.9	47.7
Night	Min	45.4	47.9	43.6	47.7	47.5	47.1	46.6	45.6	45.2	44.3	44.1	43.8
	Max	54.6	61.6	55.9	61.0	60.4	59.7	58.9	57.0	56.6	56.0	55.9	55.9
Energy Average		49.5	Average:		54.1	53.7	52.5	51.4	49.5	48.3	47.4	47.3	47.1

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
52.0	**53.0**	**49.5**

24-Hour CNEL (dBA)

56.9

24-Hour Noise Level Measurement Summary

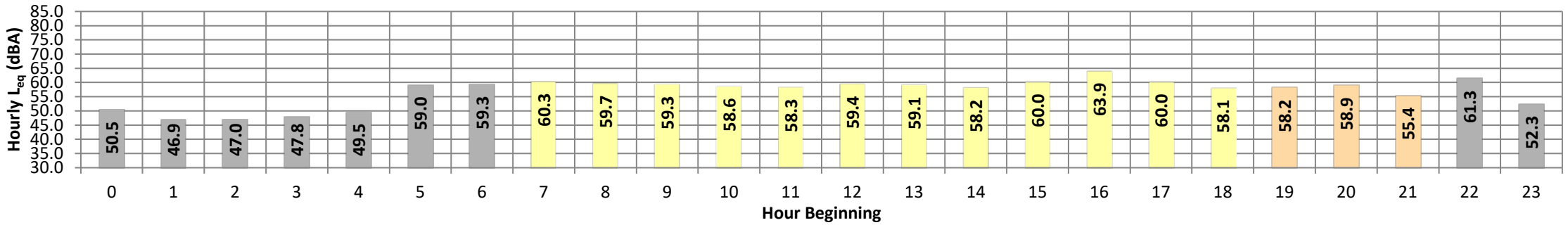
Date: Wednesday, May 27, 2020
Project: Questhaven

Location: L5 - Located by the northeast boundary of the Project site near Play by Play Productions at 1601 San Elijo Road.

Meter: Piccolo II

JN: 13067
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	50.5	61.3	38.4	61.0	60.5	58.4	56.1	48.5	43.3	39.1	38.8	38.5	50.5	10.0	60.5
	1	46.9	58.5	37.5	58.1	57.3	54.5	52.1	43.9	40.0	37.9	37.7	37.6	46.9	10.0	56.9
	2	47.0	56.8	36.9	56.5	56.2	54.3	52.5	46.2	41.1	38.3	38.1	37.4	47.0	10.0	57.0
	3	47.8	58.3	35.5	58.1	57.6	55.5	53.6	46.4	40.0	35.9	35.7	35.5	47.8	10.0	57.8
	4	49.5	60.1	36.5	59.8	59.3	57.3	55.1	48.3	41.5	37.1	36.8	36.6	49.5	10.0	59.5
	5	59.0	68.3	48.2	67.6	66.8	65.0	63.6	59.5	56.1	50.9	50.0	48.8	59.0	10.0	69.0
	6	59.3	67.1	48.0	66.8	66.2	64.6	63.5	60.5	57.2	50.5	49.2	48.3	59.3	10.0	69.3
Day	7	60.3	68.1	49.9	67.8	67.3	65.5	64.2	61.2	58.3	52.0	50.9	50.1	60.3	0.0	60.3
	8	59.7	66.7	48.8	66.4	66.1	64.9	63.8	60.9	58.0	51.1	49.8	49.0	59.7	0.0	59.7
	9	59.3	66.4	48.9	66.2	65.8	64.6	63.6	60.5	57.3	51.2	49.9	49.1	59.3	0.0	59.3
	10	58.6	65.8	47.4	65.5	65.1	63.7	62.9	59.8	56.4	49.7	48.6	47.6	58.6	0.0	58.6
	11	58.3	65.6	47.8	65.3	64.9	63.3	62.4	59.6	56.3	50.1	49.1	48.1	58.3	0.0	58.3
	12	59.4	66.4	47.8	66.2	65.9	64.7	63.7	60.6	57.7	50.3	49.1	48.0	59.4	0.0	59.4
	13	59.1	67.3	47.6	67.0	66.5	64.9	63.3	60.1	56.7	50.3	48.8	47.8	59.1	0.0	59.1
	14	58.2	65.4	48.4	65.0	64.6	63.5	62.4	59.4	56.1	50.6	49.5	48.6	58.2	0.0	58.2
	15	60.0	66.8	50.1	66.5	66.2	64.9	63.8	61.3	58.5	52.4	51.2	50.3	60.0	0.0	60.0
	16	63.9	71.9	50.9	71.4	70.9	69.6	68.5	65.6	60.4	53.5	52.3	51.2	63.9	0.0	63.9
	17	60.0	66.4	49.4	66.0	65.6	64.5	63.9	61.7	58.3	52.2	50.9	49.8	60.0	0.0	60.0
	18	58.1	66.2	47.4	65.8	65.4	63.6	62.2	59.0	55.8	49.9	48.8	47.7	58.1	0.0	58.1
Evening	19	58.2	66.0	45.3	65.6	65.1	63.6	62.8	59.5	55.5	47.6	46.5	45.6	58.2	5.0	63.2
	20	58.9	70.2	45.8	69.5	68.1	65.0	63.5	58.4	54.6	47.7	46.8	45.9	58.9	5.0	63.9
	21	55.4	64.1	41.0	63.9	63.4	61.9	60.6	56.0	51.5	43.6	42.1	41.2	55.4	5.0	60.4
Night	22	61.3	70.5	48.3	70.4	70.0	68.7	67.3	61.0	56.7	50.2	49.2	48.4	61.3	10.0	71.3
	23	52.3	64.7	35.8	63.9	62.7	59.4	57.3	50.4	44.3	36.9	36.3	35.9	52.3	10.0	62.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	58.1	65.4	47.4	65.0	64.6	63.3	62.2	59.0	55.8	49.7	48.6	47.6
	Max	63.9	71.9	50.9	71.4	70.9	69.6	68.5	65.6	60.4	53.5	52.3	51.2
Energy Average		59.9	Average:		66.6	66.2	64.8	63.7	60.8	57.5	51.1	49.9	48.9
Evening	Min	55.4	64.1	41.0	63.9	63.4	61.9	60.6	56.0	51.5	43.6	42.1	41.2
	Max	58.9	70.2	45.8	69.5	68.1	65.0	63.5	59.5	55.5	47.7	46.8	45.9
Energy Average		57.7	Average:		66.3	65.6	63.5	62.3	58.0	53.9	46.3	45.2	44.2
Night	Min	46.9	56.8	35.5	56.5	56.2	54.3	52.1	43.9	40.0	35.9	35.7	35.5
	Max	61.3	70.5	48.3	70.4	70.0	68.7	67.3	61.0	57.2	50.9	50.0	48.8
Energy Average		55.9	Average:		62.5	61.8	59.7	57.9	51.6	46.7	41.9	41.3	40.8

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
58.5	59.6	55.9

24-Hour CNEL (dBA)

63.4

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APPENDIX 2.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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CadnaA Noise Prediction Model: 13067_Operation_1st Flr.cna
Date: 30.03.21
Analyst:

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr				Limit. Value				Land Use			Height		Coordinates		
			Day	Evening	Night	CNEL	Day	Evening	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
RECEIVERS_ON-SITE		R01	56.5	53.8	50.8	58.9	0.0	0.0	0.0	60.0				1.54	a	6269307.05	1978937.47	1.54
RECEIVERS_ON-SITE		R02	57.7	55.0	52.0	60.1	0.0	0.0	0.0	60.0				1.54	a	6269243.68	1978980.01	1.54
RECEIVERS_ON-SITE		R03	59.0	56.2	53.2	61.4	0.0	0.0	0.0	60.0				1.54	a	6269181.18	1979020.80	1.54
RECEIVERS_ON-SITE		R04	62.1	59.4	56.3	64.5	0.0	0.0	0.0	60.0				1.54	a	6268826.14	1979105.01	1.54
RECEIVERS_ON-SITE		R05	59.8	57.1	54.1	62.2	0.0	0.0	0.0	60.0				1.54	a	6268860.00	1979038.17	1.54
RECEIVERS_ON-SITE		R06	58.4	55.6	52.6	60.8	0.0	0.0	0.0	60.0				1.54	a	6268887.78	1978984.35	1.54
RECEIVERS_ON-SITE		R07	57.2	54.5	51.4	59.6	0.0	0.0	0.0	60.0				1.54	a	6268915.55	1978932.26	1.54
RECEIVERS_ON-SITE		R08	60.5	57.8	54.8	62.9	0.0	0.0	0.0	60.0				1.54	a	6268539.25	1979124.54	1.54
RECEIVERS_ON-SITE		R09	58.8	56.1	53.1	61.2	0.0	0.0	0.0	60.0				1.54	a	6268567.90	1979057.26	1.54
RECEIVERS_ON-SITE		R10	57.8	55.1	52.1	60.2	0.0	0.0	0.0	60.0				1.54	a	6268603.49	1979004.31	1.54
RECEIVERS_ON-SITE		R11	56.7	53.9	50.9	59.1	0.0	0.0	0.0	60.0				1.54	a	6268636.47	1978943.55	1.54
RECEIVERS_ON-SITE		R12	54.7	52.0	49.0	57.1	0.0	0.0	0.0	60.0				1.54	a	6268340.90	1978927.49	1.54
RECEIVERS_ON-SITE		R13	54.2	51.4	48.4	56.6	0.0	0.0	0.0	60.0				1.54	a	6268375.19	1978875.84	1.54

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src Number		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Day	Evening	Nig
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)				

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)

Roads

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)
San Elijo Rd - EB		0	64.5	61.8	58.8			1054.0	562.0	281.0	5.0	5.0	5.0	72		0.0	0.0	1	0.0	0.0		
San Elijo Rd WB		0	66.2	63.5	60.5			1054.0	562.0	281.0	5.0	5.0	5.0	72		0.0	0.0	1	0.0	0.0		

RoadsGeo

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(m)	(%)
	(m)		(m)		(m)	(m)	(m)	(m)		
San Elijo Rd - EB	0.00	a			6266228.52	1981264.94	0.00	0.00		
					6266352.22	1981212.86	0.00	0.00		
					6266467.24	1981158.60	0.00	0.00		
					6266575.75	1981091.33	0.00	0.00		
					6266664.72	1981026.23	0.00	0.00		
					6266749.36	1980963.29	0.00	0.00		
					6266892.59	1980835.25	0.00	0.00		
					6267001.09	1980722.41	0.00	0.00		
					6267118.28	1980594.37	0.00	0.00		
					6267872.66	1979810.68	0.00	0.00		
					6267922.57	1979752.08	0.00	0.00		
					6267986.59	1979686.98	0.00	0.00		
					6268064.72	1979607.77	0.00	0.00		
					6268133.07	1979539.41	0.00	0.00		
					6268207.94	1979477.56	0.00	0.00		
					6268271.96	1979428.73	0.00	0.00		
					6268357.68	1979370.14	0.00	0.00		
					6268449.92	1979322.40	0.00	0.00		
					6268562.76	1979278.99	0.00	0.00		
					6268661.50	1979245.36	0.00	0.00		
					6268745.05	1979227.99	0.00	0.00		
					6268843.80	1979212.80	0.00	0.00		
					6268954.47	1979210.63	0.00	0.00		
					6269062.98	1979210.63	0.00	0.00		
					6269170.40	1979224.74	0.00	0.00		
					6269231.17	1979236.67	0.00	0.00		
					6269336.42	1979263.80	0.00	0.00		
					6269424.31	1979295.27	0.00	0.00		
					6269502.43	1979331.08	0.00	0.00		
					6269559.94	1979360.37	0.00	0.00		
					6269618.53	1979396.18	0.00	0.00		
					6269679.30	1979436.33	0.00	0.00		
					6269736.81	1979480.82	0.00	0.00		
					6269798.66	1979533.77	0.00	0.00		
					6269869.19	1979602.13	0.00	0.00		
					6269960.33	1979711.72	0.00	0.00		
					6270013.50	1979785.50	0.00	0.00		
					6270092.71	1979870.14	0.00	0.00		
					6270164.32	1979935.24	0.00	0.00		
					6270302.13	1980041.58	0.00	0.00		
					6270539.76	1980237.98	0.00	0.00		
San Elijo Rd WB	0.00	a			6266209.68	1981318.92	0.00	0.00		
					6266321.84	1981274.06	0.00	0.00		
					6266436.86	1981219.80	0.00	0.00		
					6266556.03	1981154.86	0.00	0.00		
					6266649.97	1981088.73	0.00	0.00		
					6266740.93	1981022.05	0.00	0.00		
					6266880.43	1980904.26	0.00	0.00		
					6267007.60	1980781.00	0.00	0.00		
					6267124.79	1980652.96	0.00	0.00		
					6267868.32	1979872.53	0.00	0.00		
					6267918.23	1979813.93	0.00	0.00		
					6267988.76	1979741.02	0.00	0.00		
					6268062.55	1979670.70	0.00	0.00		
					6268125.48	1979602.34	0.00	0.00		
					6268201.43	1979535.07	0.00	0.00		
					6268254.60	1979493.84	0.00	0.00		
					6268338.15	1979435.24	0.00	0.00		
					6268417.36	1979389.67	0.00	0.00		
					6268530.21	1979338.67	0.00	0.00		
					6268627.87	1979300.69	0.00	0.00		
					6268711.42	1979283.33	0.00	0.00		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(m)	(%)
	(m)		(m)		(m)	(m)	(m)	(m)		
					6268809.07	1979263.58	0.00	0.00		
					6268915.41	1979255.12	0.00	0.00		
					6269023.92	1979254.04	0.00	0.00		
					6269133.51	1979263.80	0.00	0.00		
					6269204.04	1979274.44	0.00	0.00		
					6269297.35	1979298.31	0.00	0.00		
					6269386.33	1979325.43	0.00	0.00		
					6269465.54	1979357.12	0.00	0.00		
					6269523.05	1979386.41	0.00	0.00		
					6269581.64	1979422.22	0.00	0.00		
					6269642.41	1979462.37	0.00	0.00		
					6269699.92	1979506.86	0.00	0.00		
					6269761.76	1979559.81	0.00	0.00		
					6269832.29	1979628.17	0.00	0.00		
					6269923.44	1979737.76	0.00	0.00		
					6269976.61	1979811.54	0.00	0.00		
					6270034.12	1979922.22	0.00	0.00		
					6270077.52	1980009.03	0.00	0.00		
					6270138.28	1980137.07	0.00	0.00		
					6270216.41	1980284.63	0.00	0.00		
					6270314.06	1980449.57	0.00	0.00		

CadnaA Noise Prediction Model: 13067_Operation_2nd Flr.cna
Date: 30.03.21
Analyst:

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr				Limit. Value				Land Use			Height		Coordinates		
			Day	Evening	Night	CNEL	Day	Evening	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
RECEIVERS_ON-SITE		R01	56.1	53.3	50.3	58.5	0.0	0.0	0.0	60.0				4.27	a	6269307.05	1978937.47	4.27
RECEIVERS_ON-SITE		R02	57.3	54.5	51.5	59.7	0.0	0.0	0.0	60.0				4.27	a	6269243.68	1978980.01	4.27
RECEIVERS_ON-SITE		R03	58.5	55.8	52.8	61.0	0.0	0.0	0.0	60.0				4.27	a	6269181.18	1979020.80	4.27
RECEIVERS_ON-SITE		R04	61.6	58.9	55.8	64.0	0.0	0.0	0.0	60.0				4.27	a	6268826.14	1979105.01	4.27
RECEIVERS_ON-SITE		R05	59.4	56.6	53.6	61.8	0.0	0.0	0.0	60.0				4.27	a	6268860.00	1979038.17	4.27
RECEIVERS_ON-SITE		R06	57.9	55.2	52.2	60.3	0.0	0.0	0.0	60.0				4.27	a	6268887.78	1978984.35	4.27
RECEIVERS_ON-SITE		R07	56.7	54.0	51.0	59.1	0.0	0.0	0.0	60.0				4.27	a	6268915.55	1978932.26	4.27
RECEIVERS_ON-SITE		R08	60.1	57.3	54.3	62.5	0.0	0.0	0.0	60.0				4.27	a	6268539.25	1979124.54	4.27
RECEIVERS_ON-SITE		R09	58.4	55.7	52.7	60.8	0.0	0.0	0.0	60.0				4.27	a	6268567.90	1979057.26	4.27
RECEIVERS_ON-SITE		R10	57.3	54.6	51.6	59.8	0.0	0.0	0.0	60.0				4.27	a	6268603.49	1979004.31	4.27
RECEIVERS_ON-SITE		R11	56.2	53.5	50.5	58.6	0.0	0.0	0.0	60.0				4.27	a	6268636.47	1978943.55	4.27
RECEIVERS_ON-SITE		R12	54.2	51.5	48.5	56.7	0.0	0.0	0.0	60.0				4.27	a	6268340.90	1978927.49	4.27
RECEIVERS_ON-SITE		R13	53.7	50.9	47.9	56.1	0.0	0.0	0.0	60.0				4.27	a	6268375.19	1978875.84	4.27

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src Number		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Day	Evening	Nig
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)				

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)

Roads

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)
San Elijo Rd - EB		0	64.5	61.8	58.8			1054.0	562.0	281.0	5.0	5.0	5.0	72		0.0	0.0	1	0.0	0.0		
San Elijo Rd WB		0	66.2	63.5	60.5			1054.0	562.0	281.0	5.0	5.0	5.0	72		0.0	0.0	1	0.0	0.0		

RoadsGeo

Name	Height			Coordinates				Dist	LSlope
	Begin		End	x	y	z	Ground	(m)	(%)
	(m)		(m)	(m)	(m)	(m)	(m)		
San Elijo Rd - EB	0.00	a		6266228.52	1981264.94	0.00	0.00		
				6266352.22	1981212.86	0.00	0.00		
				6266467.24	1981158.60	0.00	0.00		
				6266575.75	1981091.33	0.00	0.00		
				6266664.72	1981026.23	0.00	0.00		
				6266749.36	1980963.29	0.00	0.00		
				6266892.59	1980835.25	0.00	0.00		
				6267001.09	1980722.41	0.00	0.00		
				6267118.28	1980594.37	0.00	0.00		
				6267872.66	1979810.68	0.00	0.00		
				6267922.57	1979752.08	0.00	0.00		
				6267986.59	1979686.98	0.00	0.00		
				6268064.72	1979607.77	0.00	0.00		
				6268133.07	1979539.41	0.00	0.00		
				6268207.94	1979477.56	0.00	0.00		
				6268271.96	1979428.73	0.00	0.00		
				6268357.68	1979370.14	0.00	0.00		
				6268449.92	1979322.40	0.00	0.00		
				6268562.76	1979278.99	0.00	0.00		
				6268661.50	1979245.36	0.00	0.00		
				6268745.05	1979227.99	0.00	0.00		
				6268843.80	1979212.80	0.00	0.00		
				6268954.47	1979210.63	0.00	0.00		
				6269062.98	1979210.63	0.00	0.00		
				6269170.40	1979224.74	0.00	0.00		
				6269231.17	1979236.67	0.00	0.00		
				6269336.42	1979263.80	0.00	0.00		
				6269424.31	1979295.27	0.00	0.00		
				6269502.43	1979331.08	0.00	0.00		
				6269559.94	1979360.37	0.00	0.00		
				6269618.53	1979396.18	0.00	0.00		
				6269679.30	1979436.33	0.00	0.00		
				6269736.81	1979480.82	0.00	0.00		
				6269798.66	1979533.77	0.00	0.00		
				6269869.19	1979602.13	0.00	0.00		
				6269960.33	1979711.72	0.00	0.00		
				6270013.50	1979785.50	0.00	0.00		
				6270092.71	1979870.14	0.00	0.00		
				6270164.32	1979935.24	0.00	0.00		
				6270302.13	1980041.58	0.00	0.00		
				6270539.76	1980237.98	0.00	0.00		
San Elijo Rd WB	0.00	a		6266209.68	1981318.92	0.00	0.00		
				6266321.84	1981274.06	0.00	0.00		
				6266436.86	1981219.80	0.00	0.00		
				6266556.03	1981154.86	0.00	0.00		
				6266649.97	1981088.73	0.00	0.00		
				6266740.93	1981022.05	0.00	0.00		
				6266880.43	1980904.26	0.00	0.00		
				6267007.60	1980781.00	0.00	0.00		
				6267124.79	1980652.96	0.00	0.00		
				6267868.32	1979872.53	0.00	0.00		
				6267918.23	1979813.93	0.00	0.00		
				6267988.76	1979741.02	0.00	0.00		
				6268062.55	1979670.70	0.00	0.00		
				6268125.48	1979602.34	0.00	0.00		
				6268201.43	1979535.07	0.00	0.00		
				6268254.60	1979493.84	0.00	0.00		
				6268338.15	1979435.24	0.00	0.00		
				6268417.36	1979389.67	0.00	0.00		
				6268530.21	1979338.67	0.00	0.00		
				6268627.87	1979300.69	0.00	0.00		
				6268711.42	1979283.33	0.00	0.00		

Name	Height			Coordinates				Dist	LSlope
	Begin		End	x	y	z	Ground	(m)	(%)
	(m)		(m)	(m)	(m)	(m)	(m)		
				6268809.07	1979263.58	0.00	0.00		
				6268915.41	1979255.12	0.00	0.00		
				6269023.92	1979254.04	0.00	0.00		
				6269133.51	1979263.80	0.00	0.00		
				6269204.04	1979274.44	0.00	0.00		
				6269297.35	1979298.31	0.00	0.00		
				6269386.33	1979325.43	0.00	0.00		
				6269465.54	1979357.12	0.00	0.00		
				6269523.05	1979386.41	0.00	0.00		
				6269581.64	1979422.22	0.00	0.00		
				6269642.41	1979462.37	0.00	0.00		
				6269699.92	1979506.86	0.00	0.00		
				6269761.76	1979559.81	0.00	0.00		
				6269832.29	1979628.17	0.00	0.00		
				6269923.44	1979737.76	0.00	0.00		
				6269976.61	1979811.54	0.00	0.00		
				6270034.12	1979922.22	0.00	0.00		
				6270077.52	1980009.03	0.00	0.00		
				6270138.28	1980137.07	0.00	0.00		
				6270216.41	1980284.63	0.00	0.00		
				6270314.06	1980449.57	0.00	0.00		

CadnaA Noise Prediction Model: 13067_Operation_3rd Flr.cna
Date: 30.03.21
Analyst:

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr				Limit. Value				Land Use			Height		Coordinates		
			Day	Evening	Night	CNEL	Day	Evening	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
RECEIVERS_ON-SITE		R01	56.0	53.2	50.2	58.4	0.0	0.0	0.0	60.0				7.01	a	6269307.05	1978937.47	7.01
RECEIVERS_ON-SITE		R02	57.1	54.4	51.4	59.6	0.0	0.0	0.0	60.0				7.01	a	6269243.68	1978980.01	7.01
RECEIVERS_ON-SITE		R03	58.4	55.7	52.7	60.8	0.0	0.0	0.0	60.0				7.01	a	6269181.18	1979020.80	7.01
RECEIVERS_ON-SITE		R04	61.3	58.6	55.6	63.8	0.0	0.0	0.0	60.0				7.01	a	6268826.14	1979105.01	7.01
RECEIVERS_ON-SITE		R05	59.2	56.5	53.4	61.6	0.0	0.0	0.0	60.0				7.01	a	6268860.00	1979038.17	7.01
RECEIVERS_ON-SITE		R06	57.8	55.1	52.1	60.2	0.0	0.0	0.0	60.0				7.01	a	6268887.78	1978984.35	7.01
RECEIVERS_ON-SITE		R07	56.6	53.9	50.9	59.0	0.0	0.0	0.0	60.0				7.01	a	6268915.55	1978932.26	7.01
RECEIVERS_ON-SITE		R08	59.9	57.1	54.1	62.3	0.0	0.0	0.0	60.0				7.01	a	6268539.25	1979124.54	7.01
RECEIVERS_ON-SITE		R09	58.3	55.5	52.5	60.7	0.0	0.0	0.0	60.0				7.01	a	6268567.90	1979057.26	7.01
RECEIVERS_ON-SITE		R10	57.2	54.5	51.5	59.6	0.0	0.0	0.0	60.0				7.01	a	6268603.49	1979004.31	7.01
RECEIVERS_ON-SITE		R11	56.1	53.4	50.4	58.5	0.0	0.0	0.0	60.0				7.01	a	6268636.47	1978943.55	7.01
RECEIVERS_ON-SITE		R12	54.1	51.4	48.4	56.5	0.0	0.0	0.0	60.0				7.01	a	6268340.90	1978927.49	7.01
RECEIVERS_ON-SITE		R13	53.6	50.8	47.8	56.0	0.0	0.0	0.0	60.0				7.01	a	6268375.19	1978875.84	7.01

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src Number		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Day	Evening	Nig
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m^2)		(min)	(min)	(min)	(dB)	(Hz)				

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)

Roads

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)
San Elijo Rd - EB		0	64.5	61.8	58.8			1054.0	562.0	281.0	5.0	5.0	5.0	72		0.0	0.0	1	0.0	0.0		
San Elijo Rd WB		0	66.2	63.5	60.5			1054.0	562.0	281.0	5.0	5.0	5.0	72		0.0	0.0	1	0.0	0.0		

RoadsGeo

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(m)	(%)
	(m)		(m)		(m)	(m)	(m)	(m)		
San Elijo Rd - EB	0.00	a			6266228.52	1981264.94	0.00	0.00		
					6266352.22	1981212.86	0.00	0.00		
					6266467.24	1981158.60	0.00	0.00		
					6266575.75	1981091.33	0.00	0.00		
					6266664.72	1981026.23	0.00	0.00		
					6266749.36	1980963.29	0.00	0.00		
					6266892.59	1980835.25	0.00	0.00		
					6267001.09	1980722.41	0.00	0.00		
					6267118.28	1980594.37	0.00	0.00		
					6267872.66	1979810.68	0.00	0.00		
					6267922.57	1979752.08	0.00	0.00		
					6267986.59	1979686.98	0.00	0.00		
					6268064.72	1979607.77	0.00	0.00		
					6268133.07	1979539.41	0.00	0.00		
					6268207.94	1979477.56	0.00	0.00		
					6268271.96	1979428.73	0.00	0.00		
					6268357.68	1979370.14	0.00	0.00		
					6268449.92	1979322.40	0.00	0.00		
					6268562.76	1979278.99	0.00	0.00		
					6268661.50	1979245.36	0.00	0.00		
					6268745.05	1979227.99	0.00	0.00		
					6268843.80	1979212.80	0.00	0.00		
					6268954.47	1979210.63	0.00	0.00		
					6269062.98	1979210.63	0.00	0.00		
					6269170.40	1979224.74	0.00	0.00		
					6269231.17	1979236.67	0.00	0.00		
					6269336.42	1979263.80	0.00	0.00		
					6269424.31	1979295.27	0.00	0.00		
					6269502.43	1979331.08	0.00	0.00		
					6269559.94	1979360.37	0.00	0.00		
					6269618.53	1979396.18	0.00	0.00		
					6269679.30	1979436.33	0.00	0.00		
					6269736.81	1979480.82	0.00	0.00		
					6269798.66	1979533.77	0.00	0.00		
					6269869.19	1979602.13	0.00	0.00		
					6269960.33	1979711.72	0.00	0.00		
					6270013.50	1979785.50	0.00	0.00		
					6270092.71	1979870.14	0.00	0.00		
					6270164.32	1979935.24	0.00	0.00		
					6270302.13	1980041.58	0.00	0.00		
					6270539.76	1980237.98	0.00	0.00		
San Elijo Rd WB	0.00	a			6266209.68	1981318.92	0.00	0.00		
					6266321.84	1981274.06	0.00	0.00		
					6266436.86	1981219.80	0.00	0.00		
					6266556.03	1981154.86	0.00	0.00		
					6266649.97	1981088.73	0.00	0.00		
					6266740.93	1981022.05	0.00	0.00		
					6266880.43	1980904.26	0.00	0.00		
					6267007.60	1980781.00	0.00	0.00		
					6267124.79	1980652.96	0.00	0.00		
					6267868.32	1979872.53	0.00	0.00		
					6267918.23	1979813.93	0.00	0.00		
					6267988.76	1979741.02	0.00	0.00		
					6268062.55	1979670.70	0.00	0.00		
					6268125.48	1979602.34	0.00	0.00		
					6268201.43	1979535.07	0.00	0.00		
					6268254.60	1979493.84	0.00	0.00		
					6268338.15	1979435.24	0.00	0.00		
					6268417.36	1979389.67	0.00	0.00		
					6268530.21	1979338.67	0.00	0.00		
					6268627.87	1979300.69	0.00	0.00		
					6268711.42	1979283.33	0.00	0.00		

Name	Height			Coordinates				Dist	LSlope
	Begin		End	x	y	z	Ground	(m)	(%)
	(m)		(m)	(m)	(m)	(m)	(m)		
				6268809.07	1979263.58	0.00	0.00		
				6268915.41	1979255.12	0.00	0.00		
				6269023.92	1979254.04	0.00	0.00		
				6269133.51	1979263.80	0.00	0.00		
				6269204.04	1979274.44	0.00	0.00		
				6269297.35	1979298.31	0.00	0.00		
				6269386.33	1979325.43	0.00	0.00		
				6269465.54	1979357.12	0.00	0.00		
				6269523.05	1979386.41	0.00	0.00		
				6269581.64	1979422.22	0.00	0.00		
				6269642.41	1979462.37	0.00	0.00		
				6269699.92	1979506.86	0.00	0.00		
				6269761.76	1979559.81	0.00	0.00		
				6269832.29	1979628.17	0.00	0.00		
				6269923.44	1979737.76	0.00	0.00		
				6269976.61	1979811.54	0.00	0.00		
				6270034.12	1979922.22	0.00	0.00		
				6270077.52	1980009.03	0.00	0.00		
				6270138.28	1980137.07	0.00	0.00		
				6270216.41	1980284.63	0.00	0.00		
				6270314.06	1980449.57	0.00	0.00		

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APPENDIX 2.2:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA Traffic Noise Model

Model Input

Project Name :	Towne Centre Drive		
Project Number :	13564		
Modeling Condition :	Existing		
Ground Type :	Soft	**Peak ratio to ADT:**	10
Metric (L_{eq}, L_{dn}, CNEL) :	CNEL	**Traffic Desc. (Peak or ADT) :**	ADT

Segment Number	Roadway	Segment		Traffic Volume	Speed (mph)	Distance to Centerline	Vehicle Cassification Mix (%)					24-Hour Traffic Distribution (%)			K-Factor
		From	To				Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	Day	Evening	Night	
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road		32,797	55	50	92			5	3	75	10	15	
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad		45,551	55	50	92			5	3	75	10	15	
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive		20,913	45	50	92			5	3	75	10	15	
4	San Elijo Road	Melrose Drive to Street “E”		29,431	45	50	92			5	3	75	10	15	
5	San Elijo Road	Street “E” to Baker Street		29,431	25	50	92			5	3	75	10	15	
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road		14,676	25	50	92			5	3	75	10	15	
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way		11,504	25	50	92			5	3	75	10	15	
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road		14,788	35	50	92			5	3	75	10	15	
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way		11,071	35	50	92			5	3	75	10	15	
10	San Elijo Road	East of Schoolhouse Way		21,968	35	50	92			5	3	75	10	15	

FHWA Traffic Noise Model

Model Results

Project Number :	Towne Centre Drive
Modeling Condition :	13564
Ground Type :	Existing
Metric (Leq, Ldn, CNEL) :	CNEL

Segment Number	Roadway	Segment		Noise Levels (dB) CNEL						Distance to Traffic Noise Contours (feet)				
		From	To	Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Rancho Santa Fe Road	Melrose Drive to San E		71.0	0.0	0.0	64.4	66.6	73.0	79	170	365	787	1,695
2	Rancho Santa Fe Road	San Elijo Road to Aven		72.4	0.0	0.0	65.8	68.0	74.4	98	211	455	980	2,110
3	San Elijo Road	Rancho Santa Fe Road		67.1	0.0	0.0	61.2	63.6	69.4	46	99	212	457	985
4	San Elijo Road	Melrose Drive to Stree		68.6	0.0	0.0	62.6	65.1	70.9	57	124	267	574	1,238
5	San Elijo Road	Street "E" to Baker Str		67.0	0.0	0.0	61.6	65.0	69.8	49	105	226	487	1,049
6	San Elijo Road (SB)	Baker Street to Elfin Fo		64.0	0.0	0.0	58.6	61.9	66.8	31	66	142	306	660
7	San Elijo Road (SB)	Elfin Forest Road to Sc		62.9	0.0	0.0	57.5	60.9	65.8	26	56	121	260	561
8	San Elijo Road (NB)	Baker Street to Elfin Fo		64.2	0.0	0.0	58.7	61.6	66.8	31	66	143	307	662
9	San Elijo Road (NB)	Elfin Forest Road to Sc		63.0	0.0	0.0	57.5	60.3	65.6	25	55	118	253	546
10	San Elijo Road	East of Schoolhouse W		65.9	0.0	0.0	60.4	63.3	68.5	40	86	186	400	862

FHWA Traffic Noise Model

Model Input

Project Name :	Questhaven		
Project Number :	13067		
Modeling Condition :	Existing+Project		
Ground Type :	Soft	**Peak ratio to ADT:**	10
Metric (L_{eq}, L_{dn}, CNEL) :	CNEL	**Traffic Desc. (Peak or ADT) :**	ADT

Segment Number	Roadway	Segment From	Segment To	Traffic Volume	Speed (mph)	Distance to Centerline	Vehicle Cassification Mix (%) Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	24-Hour Traffic Distribution (%) Day	Evening	Night	K-Factor
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road		33,027	55	50	92			5	3	75	10	15	
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad		45,826	55	50	92			5	3	75	10	15	
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive		21,416	45	50	92			5	3	75	10	15	
4	San Elijo Road	Melrose Drive to Street “E”		29,982	45	50	92			5	3	75	10	15	
5	San Elijo Road	Street “E” to Baker Street		30,347	25	50	92			5	3	75	10	15	
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road		14,859	25	50	92			5	3	75	10	15	
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way		11,687	25	50	92			5	3	75	10	15	
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road		14,971	35	50	92			5	3	75	10	15	
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way		11,254	35	50	92			5	3	75	10	15	
10	San Elijo Road	East of Schoolhouse Way		22,243	35	50	92			5	3	75	10	15	

FHWA Traffic Noise Model

Model Results

Project Number :	Questhaven
Modeling Condition :	13067
Ground Type :	Existing+Project
Metric (Leq, Ldn, CNEL) :	CNEL

Segment Number	Roadway	Segment		Noise Levels (dB) CNEL						Distance to Traffic Noise Contours (feet)				
		From	To	Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Rancho Santa Fe Road	Melrose Drive to San E		71.0	0.0	0.0	64.4	66.6	73.0	79	170	367	791	1,703
2	Rancho Santa Fe Road	San Elijo Road to Aven		72.4	0.0	0.0	65.8	68.0	74.4	98	212	456	983	2,119
3	San Elijo Road	Rancho Santa Fe Road		67.2	0.0	0.0	61.3	63.7	69.5	46	100	216	465	1,001
4	San Elijo Road	Melrose Drive to Stree		68.7	0.0	0.0	62.7	65.1	71.0	58	125	270	582	1,253
5	San Elijo Road	Street "E" to Baker Str		67.1	0.0	0.0	61.8	65.1	70.0	50	107	231	497	1,071
6	San Elijo Road (SB)	Baker Street to Elfin Fo		64.0	0.0	0.0	58.7	62.0	66.9	31	67	143	309	665
7	San Elijo Road (SB)	Elfin Forest Road to Sc		63.0	0.0	0.0	57.6	61.0	65.8	26	57	122	263	567
8	San Elijo Road (NB)	Baker Street to Elfin Fo		64.3	0.0	0.0	58.8	61.6	66.9	31	67	144	310	667
9	San Elijo Road (NB)	Elfin Forest Road to Sc		63.0	0.0	0.0	57.5	60.4	65.6	26	55	119	256	552
10	San Elijo Road	East of Schoolhouse W		66.0	0.0	0.0	60.5	63.3	68.6	40	87	187	403	869

FHWA Traffic Noise Model

Model Input

Project Name :	Questhaven		
Project Number :	13067		
Modeling Condition :	Near Term 2024 Cumulative		
Ground Type :	Soft	**Peak ratio to ADT:**	10
Metric (L_{eq}, L_{dn}, CNEL) :	CNEL	**Traffic Desc. (Peak or ADT) :**	ADT

Segment Number	Roadway	Segment		Traffic Volume	Speed (mph)	Distance to Centerline	Vehicle Cassification Mix (%)					24-Hour Traffic Distribution (%)			K-Factor
		From	To				Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	Day	Evening	Night	
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road		37,930	55	50	92			5	3	75	10	15	
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad		49,650	55	50	92			5	3	75	10	15	
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive		30,000	45	50	92			5	3	75	10	15	
4	San Elijo Road	Melrose Drive to Street “E”		39,450	45	50	92			5	3	75	10	15	
5	San Elijo Road	Street “E” to Baker Street		31,960	25	50	92			5	3	75	10	15	
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road		15,940	25	50	92			5	3	75	10	15	
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way		12,770	25	50	92			5	3	75	10	15	
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road		16,050	35	50	92			5	3	75	10	15	
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way		12,070	35	50	92			5	3	75	10	15	
10	San Elijo Road	East of Schoolhouse Way		23,960	35	50	92			5	3	75	10	15	

FHWA Traffic Noise Model

Model Results

Project Number :	Questhaven
Modeling Condition :	13067
Ground Type :	Near Term 2024 Cumulative
Metric (Leq, Ldn, CNEL) :	CNEL

Segment Number	Roadway	Segment		Noise Levels (dB) CNEL						Distance to Traffic Noise Contours (feet)				
		From	To	Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Rancho Santa Fe Road	Melrose Drive to San E		71.6	0.0	0.0	65.0	67.2	73.6	87	187	402	867	1,868
2	Rancho Santa Fe Road	San Elijo Road to Aven		72.8	0.0	0.0	66.2	68.4	74.8	104	224	482	1,037	2,235
3	San Elijo Road	Rancho Santa Fe Road		68.7	0.0	0.0	62.7	65.1	71.0	58	125	270	582	1,253
4	San Elijo Road	Melrose Drive to Stree		69.9	0.0	0.0	63.9	66.3	72.2	70	150	324	698	1,504
5	San Elijo Road	Street "E" to Baker Str		67.4	0.0	0.0	62.0	65.3	70.2	51	111	239	515	1,109
6	San Elijo Road (SB)	Baker Street to Elfin Fo		64.3	0.0	0.0	59.0	62.3	67.2	32	70	150	324	697
7	San Elijo Road (SB)	Elfin Forest Road to Sc		63.4	0.0	0.0	58.0	61.3	66.2	28	60	130	279	601
8	San Elijo Road (NB)	Baker Street to Elfin Fo		64.6	0.0	0.0	59.1	61.9	67.2	32	70	151	324	699
9	San Elijo Road (NB)	Elfin Forest Road to Sc		63.3	0.0	0.0	57.8	60.7	65.9	27	58	125	268	578
10	San Elijo Road	East of Schoolhouse W		66.3	0.0	0.0	60.8	63.7	68.9	42	91	197	424	913

FHWA Traffic Noise Model

Model Input

Project Name :	Questhaven		
Project Number :	13067		
Modeling Condition :	Near Term 2024 Cumulative with Project		
Ground Type :	Soft	**Peak ratio to ADT:**	10
Metric (L_{eq}, L_{dn}, CNEL) :	CNEL	**Traffic Desc. (Peak or ADT) :**	ADT

Segment Number	Roadway	Segment		Traffic Volume	Speed (mph)	Distance to Centerline	Vehicle Cassification Mix (%)					24-Hour Traffic Distribution (%)			K-Factor
		From	To				Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	Day	Evening	Night	
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road		38,160	55	50	92			5	3	75	10	15	
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad		49,925	55	50	92			5	3	75	10	15	
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive		30,503	45	50	92			5	3	75	10	15	
4	San Elijo Road	Melrose Drive to Street “E”		40,001	45	50	92			5	3	75	10	15	
5	San Elijo Road	Street “E” to Baker Street		32,326	25	50	92			5	3	75	10	15	
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road		16,123	25	50	92			5	3	75	10	15	
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way		12,953	25	50	92			5	3	75	10	15	
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road		16,233	35	50	92			5	3	75	10	15	
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way		12,253	35	50	92			5	3	75	10	15	
10	San Elijo Road	East of Schoolhouse Way		24,235	35	50	92			5	3	75	10	15	

FHWA Traffic Noise Model

Model Results

Project Number :	Questhaven
Modeling Condition :	13067
Ground Type :	Near Term 2024 Cumulative with Project
Metric (Leq, Ldn, CNEL) :	CNEL

Segment Number	Roadway	Segment		Noise Levels (dB) CNEL						Distance to Traffic Noise Contours (feet)				
		From	To	Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Rancho Santa Fe Road	Melrose Drive to San E		73.7	0.0	0.0	67.1	69.3	75.7	187	591	1,869	5,911	18,692
2	Rancho Santa Fe Road	San Elijo Road to Aven		74.9	0.0	0.0	68.3	70.5	76.9	245	773	2,446	7,733	24,455
3	San Elijo Road	Rancho Santa Fe Road		70.9	0.0	0.0	64.9	67.3	73.2	104	328	1,038	3,284	10,384
4	San Elijo Road	Melrose Drive to Stree		72.1	0.0	0.0	66.1	68.5	74.4	136	431	1,362	4,306	13,617
5	San Elijo Road	Street "E" to Baker Str		69.5	0.0	0.0	64.1	67.5	72.4	86	272	859	2,717	8,593
6	San Elijo Road (SB)	Baker Street to Elfin Fo		66.5	0.0	0.0	61.1	64.5	69.3	43	136	429	1,355	4,286
7	San Elijo Road (SB)	Elfin Forest Road to Sc		65.6	0.0	0.0	60.2	63.5	68.4	34	109	344	1,089	3,443
8	San Elijo Road (NB)	Baker Street to Elfin Fo		66.7	0.0	0.0	61.2	64.1	69.3	43	136	430	1,361	4,303
9	San Elijo Road (NB)	Elfin Forest Road to Sc		65.5	0.0	0.0	60.0	62.9	68.1	32	103	325	1,027	3,248
10	San Elijo Road	East of Schoolhouse W		68.5	0.0	0.0	63.0	65.8	71.1	64	203	642	2,031	6,424

FHWA Traffic Noise Model

Model Input

Project Name :	Questhaven		
Project Number :	13067		
Modeling Condition :	Horizon 2035		
Ground Type :	Soft	**Peak ratio to ADT:**	10
Metric (L_{eq}, L_{dn}, CNEL) :	CNEL	**Traffic Desc. (Peak or ADT) :**	ADT

Segment Number	Roadway	Segment From	Segment To	Traffic Volume	Speed (mph)	Distance to Centerline	Vehicle Cassification Mix (%) Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	24-Hour Traffic Distribution (%) Day	Evening	Night	K-Factor
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road		36,100	55	50	92			5	3	75	10	15	
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad		47,900	55	50	92			5	3	75	10	15	
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive		27,200	45	50	92			5	3	75	10	15	
4	San Elijo Road	Melrose Drive to Street "E"		33,500	45	50	92			5	3	75	10	15	
5	San Elijo Road	Street "E" to Baker Street		33,500	25	50	92			5	3	75	10	15	
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road		14,700	25	50	92			5	3	75	10	15	
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way		17,400	25	50	92			5	3	75	10	15	
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road		14,900	35	50	92			5	3	75	10	15	
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way		15,500	35	50	92			5	3	75	10	15	
10	San Elijo Road	East of Schoolhouse Way		45,500	35	50	92			5	3	75	10	15	

FHWA Traffic Noise Model

Model Results

Project Number :	Questhaven
Modeling Condition :	13067
Ground Type :	Horizon 2035
Metric (Leq, Ldn, CNEL) :	CNEL

Segment Number	Roadway	Segment		Noise Levels (dB) CNEL						Distance to Traffic Noise Contours (feet)				
		From	To	Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Rancho Santa Fe Road	Melrose Drive to San E		71.4	0.0	0.0	64.8	67.0	73.4	84	181	389	839	1,807
2	Rancho Santa Fe Road	San Elijo Road to Aven		72.6	0.0	0.0	66.0	68.2	74.6	101	218	470	1,013	2,182
3	San Elijo Road	Rancho Santa Fe Road		68.3	0.0	0.0	62.3	64.7	70.6	54	117	253	545	1,174
4	San Elijo Road	Melrose Drive to Stree		69.2	0.0	0.0	63.2	65.6	71.5	63	135	291	626	1,349
5	San Elijo Road	Street "E" to Baker Str		67.6	0.0	0.0	62.2	65.5	70.4	53	114	246	531	1,144
6	San Elijo Road (SB)	Baker Street to Elfin Fo		64.0	0.0	0.0	58.6	62.0	66.8	31	66	142	307	661
7	San Elijo Road (SB)	Elfin Forest Road to Sc		64.7	0.0	0.0	59.3	62.7	67.5	34	74	159	343	739
8	San Elijo Road (NB)	Baker Street to Elfin Fo		64.2	0.0	0.0	58.8	61.6	66.9	31	67	143	309	665
9	San Elijo Road (NB)	Elfin Forest Road to Sc		64.4	0.0	0.0	58.9	61.8	67.0	32	68	147	317	683
10	San Elijo Road	East of Schoolhouse W		69.1	0.0	0.0	63.6	66.4	71.7	65	140	302	650	1,400

FHWA Traffic Noise Model

Model Input

Project Name :	Questhaven		
Project Number :	13067		
Modeling Condition :	Horizon 2035 + Project		
Ground Type :	Soft	**Peak ratio to ADT:**	10
Metric (L_{eq}, L_{dn}, CNEL) :	CNEL	**Traffic Desc. (Peak or ADT) :**	ADT

Segment Number	Roadway	Segment From	Segment To	Traffic Volume	Speed (mph)	Distance to Centerline	Vehicle Cassification Mix (%) Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	24-Hour Traffic Distribution (%) Day	Evening	Night	K-Factor
1	Rancho Santa Fe Road	Melrose Drive to San Elijo Road		36,198	55	50	92			5	3	75	10	15	
2	Rancho Santa Fe Road	San Elijo Road to Avenida Soledad		48,017	55	50	92			5	3	75	10	15	
3	San Elijo Road	Rancho Santa Fe Road to Melrose Drive		27,413	45	50	92			5	3	75	10	15	
4	San Elijo Road	Melrose Drive to Street "E"		33,733	45	50	92			5	3	75	10	15	
5	San Elijo Road	Street "E" to Baker Street		33,655	25	50	92			5	3	75	10	15	
6	San Elijo Road (SB)	Baker Street to Elfin Forest Road		14,777	25	50	92			5	3	75	10	15	
7	San Elijo Road (SB)	Elfin Forest Road to Schoolhouse Way		17,477	25	50	92			5	3	75	10	15	
8	San Elijo Road (NB)	Baker Street to Elfin Forest Road		14,977	35	50	92			5	3	75	10	15	
9	San Elijo Road (NB)	Elfin Forest Road to Schoolhouse Way		15,577	35	50	92			5	3	75	10	15	
10	San Elijo Road	East of Schoolhouse Way		45,617	35	50	92			5	3	75	10	15	

FHWA Traffic Noise Model

Model Results

Project Number :	Questhaven
Modeling Condition :	13067
Ground Type :	Horizon 2035 + Project
Metric (Leq, Ldn, CNEL) :	CNEL

Segment Number	Roadway	Segment		Noise Levels (dB) CNEL						Distance to Traffic Noise Contours (feet)				
		From	To	Automobiles	Motorcycles	Bus	Medium Trucks	Heavy Trucks	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Rancho Santa Fe Road	Melrose Drive to San E		71.4	0.0	0.0	64.8	67.0	73.4	84	181	390	840	1,811
2	Rancho Santa Fe Road	San Elijo Road to Aven		72.6	0.0	0.0	66.0	68.2	74.6	101	219	471	1,015	2,186
3	San Elijo Road	Rancho Santa Fe Road		68.3	0.0	0.0	62.3	64.8	70.6	55	118	254	548	1,180
4	San Elijo Road	Melrose Drive to Stree		69.2	0.0	0.0	63.2	65.7	71.5	63	136	292	629	1,355
5	San Elijo Road	Street "E" to Baker Str		67.6	0.0	0.0	62.2	65.5	70.4	53	115	247	533	1,148
6	San Elijo Road (SB)	Baker Street to Elfin Fo		64.0	0.0	0.0	58.6	62.0	66.8	31	66	143	308	663
7	San Elijo Road (SB)	Elfin Forest Road to Sc		64.7	0.0	0.0	59.4	62.7	67.6	34	74	160	344	741
8	San Elijo Road (NB)	Baker Street to Elfin Fo		64.3	0.0	0.0	58.8	61.6	66.9	31	67	144	310	668
9	San Elijo Road (NB)	Elfin Forest Road to Sc		64.4	0.0	0.0	58.9	61.8	67.1	32	69	148	318	685
10	San Elijo Road	East of Schoolhouse W		69.1	0.0	0.0	63.6	66.5	71.7	65	140	302	651	1,403

APPENDIX 3.1:

CADNAA: UNMITIGATED CONSTRUCTION NOISE MODEL INPUTS

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CadnaA Noise Prediction Model: 13067_Construction.cna
Date: 02.04.21
Analyst:

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
RECEIVERS		R1	71.1	71.1	75.0	0.0				0.00	a	1910308.44	603164.11	0.00
RECEIVERS		R2	71.0	71.0	75.0	0.0				0.00	a	1910426.55	603424.83	0.00
RECEIVERS		R3	69.9	69.9	75.0	0.0				0.00	a	1910727.35	603593.52	0.00
RECEIVERS		R4	70.2	70.2	75.0	0.0				0.00	a	1911125.43	603414.88	0.00
RECEIVERS		R5	81.9	81.9	75.0	0.0				0.00	a	1910965.41	602919.47	0.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		
CONSTRUCITON_AREA		0	130.9	130.9	130.9	79.0	79.0	79.0	Lw''	79		0.0	0.0	0.0							0.0	500	(none)	Da

Name	Height			Coordinates			
	Begin		End	x	y	z	Ground
	(m)		(m)	(m)	(m)	(m)	(m)
CONSTRUCITON_AREA	3.05	a		1910961.16	602794.89	3.05	0.00
				1910923.09	602769.16	3.05	0.00
				1910907.41	602740.35	3.05	0.00
				1910875.14	602711.81	3.05	0.00

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)
			1910865.24	602709.91	3.05	0.00
			1910858.44	602709.80	3.05	0.00
			1910851.83	602710.62	3.05	0.00
			1910845.32	602712.35	3.05	0.00
			1910839.01	602715.01	3.05	0.00
			1910833.22	602718.46	3.05	0.00
			1910818.36	602732.69	3.05	0.00
			1910787.37	602767.60	3.05	0.00
			1910781.67	602776.42	3.05	0.00
			1910773.57	602790.81	3.05	0.00
			1910758.41	602816.04	3.05	0.00
			1910745.52	602835.74	3.05	0.00
			1910728.48	602859.74	3.05	0.00
			1910689.09	602909.03	3.05	0.00
			1910668.59	602934.10	3.05	0.00
			1910655.28	602951.95	3.05	0.00
			1910646.83	602965.30	3.05	0.00
			1910633.64	602990.95	3.05	0.00
			1910623.11	603019.17	3.05	0.00
			1910619.17	603033.58	3.05	0.00
			1910614.67	603055.56	3.05	0.00
			1910611.38	603068.80	3.05	0.00
			1910604.75	603088.16	3.05	0.00
			1910599.24	603100.65	3.05	0.00
			1910592.89	603112.72	3.05	0.00
			1910589.40	603118.59	3.05	0.00
			1910581.84	603129.94	3.05	0.00
			1910560.21	603155.26	3.05	0.00
			1910561.39	603323.83	3.05	0.00
			1910597.77	603300.56	3.05	0.00
			1910639.46	603280.65	3.05	0.00
			1910649.79	603276.18	3.05	0.00
			1910684.38	603265.62	3.05	0.00
			1910711.22	603258.58	3.05	0.00
			1910748.58	603254.29	3.05	0.00
			1910776.12	603252.83	3.05	0.00
			1910896.06	603198.98	3.05	0.00
			1910964.87	603102.52	3.05	0.00

APPENDIX 3.2:

CADNAA: MITIGATED CONSTRUCTION NOISE MODEL INPUTS

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CadnaA Noise Prediction Model: 13067_Construction_Mit.cna
Date: 02.04.21
Analyst:

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
RECEIVERS		R1	71.1	71.1	75.0	0.0				0.00	a	1910308.44	603164.11	0.00
RECEIVERS		R2	71.0	71.0	75.0	0.0				0.00	a	1910426.55	603424.83	0.00
RECEIVERS		R3	69.9	69.9	75.0	0.0				0.00	a	1910727.35	603593.52	0.00
RECEIVERS		R4	69.5	69.5	75.0	0.0				0.00	a	1911125.43	603414.88	0.00
RECEIVERS		R5	64.4	64.4	75.0	0.0				0.00	a	1910965.41	602919.47	0.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		
CONSTRUCITON_AREA		0	130.9	130.9	130.9	79.0	79.0	79.0	Lw"	79		0.0	0.0	0.0							0.0	500	(none)	Da

Name	Height			Coordinates			
	Begin		End	x	y	z	Ground
	(m)		(m)	(m)	(m)	(m)	(m)
CONSTRUCITON_AREA	3.05	a		1910961.16	602794.89	3.05	0.00
				1910923.09	602769.16	3.05	0.00
				1910907.41	602740.35	3.05	0.00
				1910875.14	602711.81	3.05	0.00

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)
			1910865.24	602709.91	3.05	0.00
			1910858.44	602709.80	3.05	0.00
			1910851.83	602710.62	3.05	0.00
			1910845.32	602712.35	3.05	0.00
			1910839.01	602715.01	3.05	0.00
			1910833.22	602718.46	3.05	0.00
			1910818.36	602732.69	3.05	0.00
			1910787.37	602767.60	3.05	0.00
			1910781.67	602776.42	3.05	0.00
			1910773.57	602790.81	3.05	0.00
			1910758.41	602816.04	3.05	0.00
			1910745.52	602835.74	3.05	0.00
			1910728.48	602859.74	3.05	0.00
			1910689.09	602909.03	3.05	0.00
			1910668.59	602934.10	3.05	0.00
			1910655.28	602951.95	3.05	0.00
			1910646.83	602965.30	3.05	0.00
			1910633.64	602990.95	3.05	0.00
			1910623.11	603019.17	3.05	0.00
			1910619.17	603033.58	3.05	0.00
			1910614.67	603055.56	3.05	0.00
			1910611.38	603068.80	3.05	0.00
			1910604.75	603088.16	3.05	0.00
			1910599.24	603100.65	3.05	0.00
			1910592.89	603112.72	3.05	0.00
			1910589.40	603118.59	3.05	0.00
			1910581.84	603129.94	3.05	0.00
			1910560.21	603155.26	3.05	0.00
			1910561.39	603323.83	3.05	0.00
			1910597.77	603300.56	3.05	0.00
			1910639.46	603280.65	3.05	0.00
			1910649.79	603276.18	3.05	0.00
			1910684.38	603265.62	3.05	0.00
			1910711.22	603258.58	3.05	0.00
			1910748.58	603254.29	3.05	0.00
			1910776.12	603252.83	3.05	0.00
			1910896.06	603198.98	3.05	0.00
			1910964.87	603102.52	3.05	0.00

Barrier(s)

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
			left	right		horz.	vert.	Begin	End	x	y	z	Ground
					(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
Barrier_01		1						3.66 r		1910966.72	603102.95	3.66	0.00
										1910960.00	602796.33	3.66	0.00