WE ARE UP PROJECT

(APN 509-181-003, APN 509-181-005, APN 509-181-012, APN 509-181-061)

NOISE AND VIBRATION ASSESSMENT

McKinleyville, Humboldt County, California

April 29, 2025

Prepared for:

We Are Up
144 Weirup Lane
McKinleyville, CA 95519

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Project: 24-046

INTRODUCTION

This report presents the results of an environmental noise assessment completed for the proposed We Are Up project to be located on four adjacent parcels (1515, 1529, and 1551 Central Avenue and 144 Weirup Lane) in the unincorporated McKinleyville community within Humboldt County (see Figure 1). The purpose for this noise and vibration assessment is to evaluate the compatibility of the development with respect to the permissible noise levels identified in the General Plan for the land use designations and on nearby sensitive receptors in the area. The Setting Section of this report presents the fundamentals of environmental noise and vibration, describes the General Plan and regulatory criteria that are applicable in the project's assessment, and summarizes the results of a survey after considering the existing noise environment at the project site and vicinity. This analysis concludes that the construction and operational phases of the Project complies with the County General Plan and applicable uniform noise standards and, with the incorporation of a noise barrier fence/wall, will result in less-than-significant noise impacts to the nearest sensitive receptor.

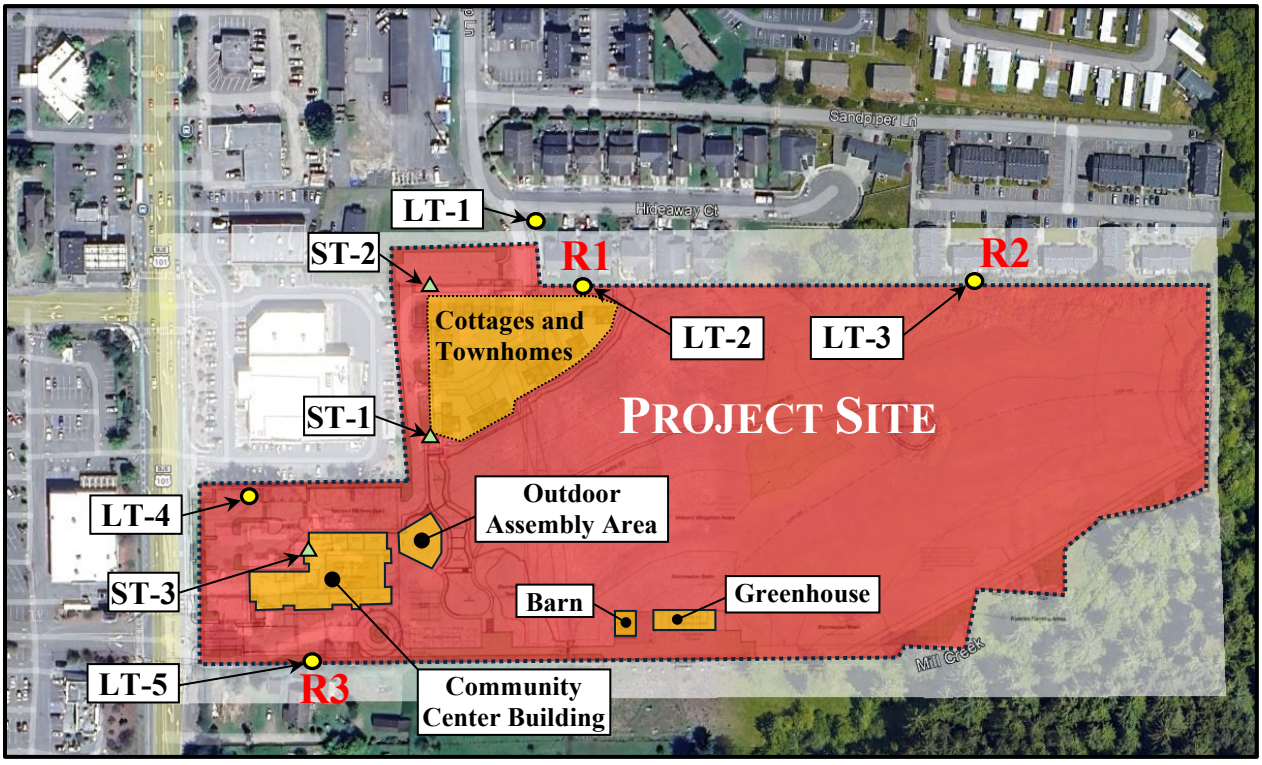


Figure 1: Project Site, Vicinity and Measurement Locations

PROJECT DESCRIPTION

The Project proposes the construction of a new infill mixed-use planned development consisting of residential housing units, a community center, a greenhouse and other Agricultural uses, and a noise barrier fence/wall to the south. The Project also includes various on-site temporary uses. The main access to the Project site will be from the Anna Sparks Way intersection on Central Ave which serves the Mill Creek Marketplace, and a secondary access point to the Project site will be via Weirup Lane, south of Sutter Road. The Project proposes to include a total of 178 parking spaces, of which 142 will be paved spaces, and approximately eight (8) will be in Garages, and 28 will be available on the lawn. The Garage spaces and 37 to 44 of the paved spaces will be reserved for residents and staff, while 126 to 133 spaces will be set aside for Temporary Use event parking. A discussion of the structures and related uses proposed at the Project is presented below:

Residential Uses:
The project proposes to develop not more than 70 residential units, each approximately 550 to 1,200 square feet (sf) in size, to house approximately 100 to 120 occupants. These units will include:

- 40 apartment units comprised of a mixture of studio, one-, two-, and three-bedroom units in the four-story Community Center building which will be located on the 1551, 1515, and 1529 Central Avenue Parcels *(APN 509-181-003, APN 509-181-005, APN 509-181-012)*, and
- 13 Attached Cottages and 17 Courtyard Apartment units with an approximately equal mix of one- and two- bedroom units located on the 144 Weirup Lane parcel *(APN 509-181-061)*.

Community Center:
The Community Center building will be a four-story building with an approximate height of 65 feet, a footprint of approximately 20,000 sf and a total floor area of up to 76,000 sf. Plans for this building include a commercial kitchen, with adjoining spaces to be used for classes, events, catering rental, and residential needs, a large meeting room with two partitionable spaces, an arts and crafts room, a reception area, support offices, restrooms, and a retail store space. The upper floors of the Community Center are primarily intended for residential use with office/support staff rooms to be used by staff and residents for bookkeeping, library and computer uses, and other needs.

The Community Center hours of operation will vary based on the types of uses:

- Residential uses within the Community Center, including use of the commercial kitchen to prepare meals for guests and residents, will operate 24 hours/day, 7 days per week.
- Retail Uses within the Community Center will generally operate Mondays through Sundays between 8:00 am and 6:00 pm, and occasionally during evening hours when events are taking place.
- Scheduled classes, training, meetings, and other smaller events will generally be held Mondays through Saturdays between 8:00 am and 6:00 pm but would be allowed to occur on Sundays and could go as late as 11:00 pm, as described later in the detailed "Temporary Uses" section below.

The Community Center will have a total of approximately eight (8) full-time employees for the retail store, commercial kitchen, maintenance, and for support and programs. In addition, residents will be employed as needed and as they may desire.

Greenhouse:
The Greenhouse will be a 2,880 sf structure on a concrete pad of 3,600 sf and will generally be used for hydroponic growing of plants (vegetables, flowers, herbs), while providing an educational/teaching venue for residents, community members, and occasional community events. The greenhouse will include one restroom, a shed to store equipment, and an area to wash materials. The Greenhouse will be open seven (7) days a week to tend to growing plants.

Other Agricultural Uses:
The Project will have an orchard, in ground and raised bed plantings throughout the site, one (1) small barn at 2,050 sf, and various livestock/farm-type animals such as chickens, sheep, goats, and/or cattle consistent with what is allowed under the Humboldt County Code. Unused plant material, animal feed and animal manure will be composted and used on site. The Greenhouse and other agricultural uses on the Project Site will be supported by one (1) full-time farm manager,

community volunteers, and either one (1) full-time or two (2) part-time farm/maintenance employees.

Temporary On-Site uses:

- Primary Events (Community Meals and Gatherings/Conferences/Meetings/Other Events)

  The Project Site will be available to host breakfasts and/or dinners, conferences, community fundraising, and similar meetings and events. These events may occur anywhere on the Project Site, either indoors or outdoors, or a combination of the two, but will have the following limitations and restrictions:

  1. Size: Primary Events will be allowed to host up to 150 persons including all guests, employees, and volunteer staff.
  2. Number and Frequency: There are no limitations on the number or frequency of Primary Events.
  3. Hours: Primary Events will be allowed to occur any day of the week between 8:00 am to 11:00 pm indoors and between 8:00 am to 10:00 pm outdoors.

- Weddings / Special Events

  - *Indoor Weddings / Special Events* The Community Center and the adjacent outdoor patio will be available to host Indoor Weddings or other similar Special Events including but not limited to educational, community, fundraising, or similar meetings and events. Indoor events will require that any amplified music must take place inside the Community Center. Guests may still gather and converse in the outdoor areas.
  - *Outdoor Weddings / Special Events* The outdoor grounds of the Project Site will be available to host Outdoor Weddings or other similar Special Events. These events will primarily occur outdoors with supporting uses occurring inside the Community Center.
  - Outdoor events may have background low volume outdoor amplified music[1] for performers such as acoustic guitar players or classical musicians, and guests may gather and converse outdoors.

    Limitations and Restrictions on all Indoor & Outdoor Weddings/Special Events

    1. Size: Each Indoor and Outdoor Weddings/Special Events will be allowed to host between 150 to 400 persons including all guests, employees, and volunteer staff.
    2. Number and Frequency: Up to twenty (20) Indoor and fifteen (15) Outdoor Weddings/Special Events may occur each calendar year (up to 35 events per year maximum), with no more than six (6) Indoor and three (3) Outdoor Weddings/Special Events occurring per month (up to nine [9] events per month maximum).
    3. Days of the Week/Hours: Each Indoor and Outdoor Wedding/Special Event will be allowed to occur any day of the week between the hours of 8:00 am to 11:00 pm for Indoor Events and 12:00 pm to 10:00 pm for Outdoor Events.

[1] Low volume amplified music is intended to allow for guests to maintain conversations, and not as a primary music event. Low volume amplified music is typically played at sound levels which are 10 dBA below that of the sound level of guests speaking in normal conversations so as not to compete with such conversations. Given that the average sound level of normal speech at 10 feet from groups of 150 and 400 guests are expected to be 69 and 73 dBA L_{eq}, respectively, low volume amplified music would generally be limited to average sound levels of between 59 to 67 dBA L_{eq} at 10 feet during 150 to 400 person events.

4. Internal Road Closure: During all Indoor and Outdoor Wedding/Special Events, a gate at the exit of We Are Up and Weirup Lane will be closed to prevent guests and staff from using Weirup Lane, thus minimizing impact to residents who live along this lane.

SETTING

FUNDAMENTALS OF ENVIRONMENTAL NOISE

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its loudness. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales, which are used to describe noise in a particular location. *A decibel (dB)* is a unit of measurement, which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness over a wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about +/-1 to 2 dBA.

Sound propagates over distance due to the spreading out of sound waves. Depending on ground absorption conditions noise from traffic or other ground level noise sources can be considered to attenuate at 3 to 4.5 dB per doubling of distance from the source while noise from fixed project source can be considered to attenuate at a rate of 6 to 7.5 dB per doubling of distance from the source. Atmospheric conditions such as wind speed, wind direction, turbulence, temperature gradients, and humidity also alter the propagation of noise and affect levels at a receiver. Furthermore, the presence of a barrier (e.g., topographic feature, intervening building, and dense vegetation) between the source and the receptor can provide substantial attenuation of noise levels at the receiver. Both natural (e.g., berms, hills, and dense vegetation) and human-made features (e.g., buildings and walls) may function as noise barriers.

Table 1: Definitions of Acoustical Terms Used in this Report

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro-Pascals (or 20 micro-Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro-Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period. The hourly Leq used for this report is denoted as dBA Leq[h].
Day-Night Level, CNEL	The equivalent noise level for a continuous 24-hour period with a 10-decibel penalty imposed during nighttime and morning hours (10:00 pm to 7:00 am).
Community Noise Exposure Level, CNEL	CNEL is the equivalent noise level for a continuous 24-hour period with a 5-decibel penalty imposed in the evening (7:00 pm to 10:00 pm) and a 10-decibel penalty imposed during nighttime and morning hours (10:00 pm to 7:00am)
L_1, L_{10}, L_{50}, L_{90}	The A-weighted noise levels exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level* (*DNL* or *CNEL*) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Table 2: Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), Caltrans, November 2009.

EFFECTS OF NOISE

Sleep and Speech Interference. The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA CNEL. Typically, the highest steady traffic noise level during the daytime is about equal to the CNEL and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57-62 dBA CNEL with open windows and 65-70 dBA CNEL if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development on a freeway right-of-way. To achieve an acceptable interior noise level, bedrooms facing secondary roadways need to be able to have their windows closed and those facing major roadways and freeways typically need special glass windows.

Annoyance. Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The CNEL as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. When measuring the percentage of the population that is highly annoyed, the threshold for ground vehicle noise is about 50 dBA CNEL. At a CNEL of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the CNEL increases to 70 dBA, the percentage of the population highly annoyed increases to about 25-30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a CNEL of 60-70 dBA. Between a CNEL of 70-80 dBA, each additional decibel increases the percentage of the population highly annoyed by about 3 percent. People appear to respond more adversely to aircraft noise. When the CNEL is 60 dBA, approximately 30-35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.

FUNDAMENTALS OF GROUNDBORNE VIBRATION

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the Peak Particle Velocity (PPV), and another is the Root Mean Square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration. In this section, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous vibration levels produce. The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying.

Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Table 3: Reaction of People and Damage to Buildings for Continuous Vibration Levels

Vibration Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.006 to 0.019	Threshold of perception, Possibility of intrusion	Vibration unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk of "architectural" damage to normal dwellings such as plastered walls or ceilings.
0.4 to 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations	Vibration at this level would cause "architectural" damage and possibly minor structural damage.

Source: Transportation Related Earthborne Vibrations (Caltrans Experiences), Technical Advisory, Vibration TAV-02-01-R9601, California Department of Transportation, February 20, 2002.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generate the highest construction related ground-borne vibration levels. Because of the impulsive nature of such activities, the use of the peak particle velocity descriptor (PPV) has been routinely used to measure and assess ground-borne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels such as people in an urban environment may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

REGULATORY BACKGROUND

The State of California and the County of Humboldt have established regulatory criteria that are applicable in this assessment. The State of California Environmental Quality Act (CEQA) Guidelines, Appendix G, are used to assess the reasonably foreseeable and potentially significant adverse noise impacts of the Project, including those pursuant to local General Plan policies and Zoning Code standards. By way of background and pursuant to Assembly Bill 1307 (AB 1307), signed into law by Governor Newsom in 2023, the effects of noise generated by occupants of a residential project, as defined, and their guests on human beings, is not a significant effect on the environment under CEQA. (Pub. Resources Code, § 21085 et seq.) A summary of the applicable regulatory criteria is provided below.

Federal

Federal Transit Administration. The Federal Transit Administration (FTA) has identified construction noise thresholds in the *Transit Noise and Vibration Impact Assessment Manual*,[2] which limit daytime construction noise to 80 dBA L_{eq} at residential land uses, to 85 dBA L_{eq} at commercial land uses, and to 90 dBA L_{eq} at industrial land uses.

State of California

State CEQA Guidelines. The California Environmental Quality Act (CEQA) contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, noise impacts would be considered significant if the project would result in:

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies,

(b) Generation of excessive groundborne vibration or groundborne noise levels,

(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

Checklist item (c) is not applicable to this project because the project is not located within an airport land use plan, is not within two miles of an airport or in the vicinity of a private air strip.

CEQA does not define what noise level increase would be considered substantial. Typically, project-generated noise level increases of 3 dBA L_{dn} or greater are considered significant where existing exterior noise levels exceed the normally acceptable noise level standard (60 dBA CNEL) for residential land uses. Where noise levels remain at or below the normally acceptable noise level standard with the project, noise level increases of 5 dBA L_{dn} or greater are considered significant.

2022 California Building Code, Title 24, Part 2.

The current version of the California Building Code (CBC) requires interior noise levels attributable to exterior environmental noise sources to be limited to a level not exceeding 45 dBA CNEL/CNEL in any habitable room.

[2] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

California Building Cal Green Code, Title 24, Part 11.
The Green Building Standards of the State of California Code of Regulations (Title 24, Part 11) establishes mandatory exterior sound transmission control standards for new non-residential buildings as set forth in the 2022 California Green Building Standards Code Sections 5.507.4.1 and 5.507.4.2 Exterior noise transmission as follows[3]:

5.507.4.1 Exterior noise transmission, prescriptive method. Wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

1. Within the 65 CNEL noise contour of an airport.
   Exceptions:
   1. CNEL or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.
   2. CNEL or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.
2. Within the 65 CNEL or CNEL noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway noise source as determined by the General Plan Noise Element.

5.507.4.1.1 Noise exposure where noise contours are not readily available. Buildings exposed to a noise level of 65 dB L_{eq}-1-hr during any hour of operation shall have exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

5.507.4.2 Performance method. For buildings located as defined in Sections A5.507.4.1 or A5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (L_{eq}-1Hr) of 50 dBA in occupied areas during any hour of operation.

5.507.4.2.1 Site features**.** Exterior features such as sound walls or earth berms may be utilized as appropriate to the project to mitigate sound migration to the interior.

5.507.4.2.2 Documentation of compliance. An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

Humboldt County

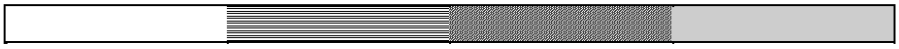
Humboldt County Noise Element. The goals of the 2017 Noise Element of the Humboldt County General Plan are to provide a quiet and healthful environment with limited disagreeable noise and to arrange land uses to reduce annoyance and complaints and minimize the exposure of community residents to excessive noise. The following standards are applicable to the project:

N-S1. Land Use/Noise Compatibility Matrix. The Land Use/Noise Compatibility Standards (Table 13-C) shall be used as a guide to ensure compatibility of land uses. Development may occur in areas identified as "normally unacceptable" if mitigation measures can reduce indoor noise levels to "Maximum Interior Noise Levels" and outdoor noise levels to the maximum "Normally Acceptable" value for the given Land Use Category.

[3] Exception: Buildings with few or no occupants and where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings.

- The General Plan considers residential land uses "clearly acceptable" in noise environments of 55 dBA CNEL or less, "normally acceptable" in noise environments between 55 to 60 dBA CNEL, and "normally unacceptable" in noise environments between 60 to 75 dBA CNEL. See Table 13-C.

Table 13-C Land Use / Noise Compatibility Standards



CLEARLY ACCEPTABLE | NORMALLY ACCEPTABLE | NORMALLY UNACCEPTABLE | CLEARLY UNACCEPTABLE

LAND USE INTERPRETATION FOR CNEL (or Ldn) VALUE

LAND USE CATEGORY	Maximum Interior Noise Levels*	50 – 60	61 - 70	71 - 80	81 - 90	91+
Residential Single Family, Duplex, Mobile Homes	45					
Residential Multiple Family, Dormitories, etc.	45					
Transient Lodging	45					
School Classrooms, Libraries, Churches	45					
Hospitals, Nursing Homes	45					
Auditoriums, Concert Halls, Music Shells	35					
Sports Arenas, Outdoor Spectator Sports						
Playgounds, Neighborhood Parks						
Golf Courses, Riding Stables, Water Rec., Cemeteries						
Commercial: Retail, Movie Theaters, Restaurants	50					
Commercial: Wholesale, Some Retail, Ind., Mfg., Util.						
Manufacturing, Communications(Noise Sensitive)						
Livestock Farming, Animal Breeding						
Agriculture (except Livestock), Mining, Fishing						
Public Right-of-Way						
Extensive Natural Recreation Areas						

*Due to exterior sources

(Source: Bolt, Beranek, and Newman, Inc., 1974)

CLEARLY ACCEPTABLE: The noise exposure is such that the activities associated with the land use may be carried out with essentially no interference. (Residential areas: both indoor and outdoor noise environments are pleasant.)

NORMALLY ACCEPTABLE: The noise exposure is great enough to be of some concern, but common constructions will make the indoor environment acceptable, even for sleeping quarters. (Residential areas: the outdoor environment will be reasonably pleasant for recreation and play at the quiet end and will be tolerable at the noisy end.)

NORMALLY UNACCEPTABLE: The noise exposure is significantly more severe so that unusual and costly building constructions are necessary to ensure adequate performance of activities. (Residential areas: barriers must be erected between the site and prominent noise sources to make the outdoor environment tolerable.)

CLEARLY UNACCEPTABLE: The noise exposure at the site is so severe that construction costs to make the indoor environment acceptable for performance of activities would be prohibitive. (Residential areas: the outdoor environment would be intolerable for normal residential use.)

N-S4. Noise Study Requirements. When a discretionary project has the potential to generate noise levels in excess of Plan standards, a noise study together with acceptable plans to assure compliance with the standards shall be required. The noise study shall measure or model as appropriate, Community Noise Equivalent Level (CNEL) and Maximum Noise Level (L_{max}) levels at property lines and, if feasible, receptor locations. Noise studies shall be

prepared by qualified individuals using calibrated equipment under currently accepted professional standards and include an analysis of the characteristics of the project in relation to noise levels, all feasible mitigations, and projected noise impacts. *The Noise Guidebook* published by the U.S. Department of Housing and Urban Development, or its equivalent, shall be used to guide analysis and mitigation recommendations.

N-S5. Noise Standards for Habitable Rooms. Noise reduction shall be required as necessary in new development to achieve a maximum of 45 CNEL (Community Noise Equivalent Level) interior noise levels in all habitable rooms per California building standards.

N-S6. Noise Reduction Requirements for Exterior Areas in Residential Zones. Newly created single family residential lots of 5,000 square feet or more, should contain a usable outdoor area at least 200 square feet in size per dwelling unit that meets the 60 CNEL (Community Noise Equivalent Level) standard.

N-S7 Short-term Noise Performance Standards (Lmax). The following noise standards, unless otherwise specifically indicated, shall apply to all property within their assigned noise zones and such standards shall constitute the maximum permissible noise level within the respective zones.

SHORT-TERM NOISE STANDARDS (Lmax)		
Zoning Classification	**Day (maximum) 6:00 a.m. to 10:00 p.m. dBA**	**Night (maximum) 10:00 p.m. to 6:00 a.m. dBA**
MG, MC, AE, TPZ,TC, AG, FP, FR, MH	80	70
CN, MB, ML, RRA, CG, CR	75	65
C-1, C-2. C-3, RM, R-3, R-4	65	60
RS, R-1, R-2, NR	65	60

Exceptions. The Short-Term Noise levels shown in the above table shall not apply to uses such as, but not limited to, temporary events in conformance with an approved Conditional Use Permit (CUP). It is understood that the applicant intends to obtain a CUP for the temporary Weddings and Special Events proposed by the project.

EXISTING NOISE ENVIRONMENT

A noise monitoring survey was conducted between 11 a.m. on Monday, March 3, 2025, and 12:00 p.m. on Tuesday, March 4, 2025, to quantify the existing noise environment on the project site and surroundings. The monitoring survey included five long-term continuous noise measurements (LT-1, LT-2, LT-3, LT-4 and LT-5), and three short-term noise measurements (ST-1, ST-2, and ST-3) as shown in Figure 1. The noise environment at the site and in the surrounding areas results primarily from vehicular traffic on Central Avenue, overhead aircraft, and operational noise from area commercial businesses, with traffic on smaller local roadway such as Weirup Lane and Hideaway Court, distant traffic on Hwy 101, and grassland/riparian wildlife and insects contributing to the noise environment in the area. The long-term and short-term noise measurements were conducted with Larson Davis Laboratories (LDL) Type I Model LXT Sound Level Meters fitted with a ½-inch pre-polarized condenser microphone and windscreen. The meters were calibrated with a Larson Davis Model CA250 precision acoustic calibrator prior to and following the measurement survey. Weather conditions during the measurement period were generally good for noise monitoring. Meteorological conditions generally consisted of overcast to

mostly clear skies and calm to moderate winds (~0 to 15 mph), with light rain (total accumulation of >0.05 in.) during the overnight hours and seasonable temperatures (43° F to 54° F).

The noise monitor at location LT-1 was positioned at a height of approximately 12 feet above existing grade on utility pole at the corner of Weirup Lane and Hideaway Court to document daily noise levels from traffic on these roadways and neighborhood activities. The measured noise levels at this location, including the energy equivalent noise level (L_{eq}), maximum (L_{max}), minimum (L_{min}), and the noise levels exceeded 10, 50 and 90 percent of the time (indicated as L_{10}, L_{50} and L_{90}) are shown on Chart 1, following. The L_{eq} noise level is typically considered the average noise level, while the L_1 is considered the intrusive level, the L_{50} is considered the median noise level and the L_{90} is considered the background noise level.

A review of Chart 1 indicates that the noise levels at site LT-1 followed a diurnal pattern characteristic of traffic noise, with an average daytime noise level of 50 dBA L_{eq} with levels ranging from 43 to 55 dBA L_{eq} and the average nighttime noise level of 42 dBA L_{eq} with levels ranging from 38 to 51 dBA L_{eq}. Peak hourly noise levels of 80 and 72 dBA L_{max} were measured in the 2pm and 5pm hours and correspond to vehicle starts, children at play and the voices of local residents. The Community Noise Equivalent Level (CNEL) over the 24-hour measurement period at the location LT-1 was calculated to be 53 dBA.

The noise monitor at location LT-2 was positioned at a height of approximately 6 feet above existing grade in the branches of a tree on the project property line above property shared between the residences at 1682 and 1686 Hideaway Court to document daily noise levels at the rear property line of the closest Hideaway Court residences (identified as receiver R1 in Figure 1) and on the site in an area removed from area traffic noise sources. The measured noise levels at this location, including the energy equivalent noise level (L_{eq}), maximum (L_{max}), minimum (L_{min}), and the noise levels exceeded 10, 50 and 90 percent of the time (indicated as L_{10}, L_{50} and L_{90}) are shown on Chart 2. As stated before, the L_{eq} noise level is typically considered the average noise level, while the L_1 is considered the intrusive level, the L_{50} is considered the median noise level and the L_{90} is considered the background noise level.

A review of Chart 2 indicates that the noise levels at site LT-2 followed a diurnal pattern characteristic of distant traffic and more constant grassland/riparian background noise, with the average daytime noise level of 47 dBA L_{eq} with levels ranging from 42 to 53 dBA L_{eq} and the average nighttime noise level of 40 dBA L_{eq} with levels ranging from 37 to 47 dBA L_{eq}. Peak hourly noise levels of 68 to 76 dBA L_{max} were measured between the 2pm and 6pm hours and correspond to typical periods residential activities in the home or yard. The Community Noise Equivalent Level (CNEL) over the 24-hour measurement period at the location LT-2 was calculated to be 50 dBA.

The noise monitor at location LT-3 was positioned at a height of approximately 10 feet above existing grade on the trunk of a tree at the edge of the grass open are behind the Apartment buildings at 1820 Blackhawk Lane (identified as receiver R2 in Figure 1) to document daily noise levels at the project property line shared with the multifamily residences in this area. The measured noise levels at this location, including the energy equivalent noise level (L_{eq}), maximum (L_{max}), minimum (L_{min}), and the noise levels exceeded 10, 50 and 90 percent of the time (indicated as L_{10}, L_{50} and L_{90}) are shown on Chart 3. As stated before, the L_{eq} noise level is typically considered the average noise level, while the L_1 is considered the intrusive level, the L_{50} is considered the median noise level and the L_{90} is considered the background noise level.

A review of Chart 3 indicates that the noise levels at site LT-3 followed a diurnal pattern characteristic of very distant traffic and more constant grassland/riparian background noise, with the average daytime noise level of 46 dBA L_{eq} with levels ranging from 43 to 50 dBA L_{eq} and the average nighttime noise level of 41 dBA L_{eq} with levels ranging from 36 to 47 dBA L_{eq}. Peak hourly noise levels of 66 to 71 dBA L_{max} were measured during the 7am and 5pm hours and correspond to typical periods residential activities in the home or yard. The Community Noise Equivalent Level (CNEL) over the 24-hour measurement period at the location LT-3 was calculated to be 50 dBA.

The noise monitor at location LT-4 was positioned at a height of approximately 12 feet above existing grade on the branches of a redwood street overhanging the trunk of a tree on the project property approximately 125 feet east of the Central Avenue centerline at the approximate setback of the proposed community center building to document daily noise levels at this building. The measured noise levels at this location, including the energy equivalent noise level (L_{eq}), maximum (L_{max}), minimum (L_{min}), and the noise levels exceeded 10, 50 and 90 percent of the time (indicated as L_{10}, L_{50} and L_{90}) are shown on Chart 4. As previously stated, the L_{eq} noise level is typically considered the average noise level, while the L_1 is considered the intrusive level, the L_{50} is considered the median noise level and the L_{90} is considered the background noise level.

A review of Chart 4 indicates that the noise levels at site LT-4 followed a diurnal pattern characteristic of traffic noise, with the average daytime noise level of 60 dBA L_{eq} with levels ranging from 55 to 63 dBA L_{eq} and the average nighttime noise level of 52 dBA L_{eq} with levels ranging from 48 to 60 dBA L_{eq}. Peak hourly noise levels of 76, 77, and 80 dBA L_{max} were attributable to loud vehicles passing on Central Avenue. The Community Noise Equivalent Level (CNEL) over the 24-hour measurement period at the location LT-4 was calculated to be 62 dBA.

The noise monitor at location LT-5 was positioned at a height of approximately 5 feet above existing grade and 230 feet east of the Central Avenue centerline in existing foliage above property shared line with the residence immediately South of the southern project property line (identified as receiver R3 in Figure 1) to document daily noise levels in this area. The measured noise levels at this location, including the energy equivalent noise level (L_{eq}), maximum (L_{max}), minimum (L_{min}), and the noise levels exceeded 10, 50 and 90 percent of the time (indicated as L_{10}, L_{50} and L_{90}) are shown on Chart 5. As previously stated, the L_{eq} noise level is typically considered the average noise level, while the L_1 is considered the intrusive level, the L_{50} is considered the median noise level and the L_{90} is considered the background noise level.

A review of Chart 5 indicates that the noise levels at site LT-5 followed a diurnal pattern characteristic of traffic noise, with the average daytime noise level of 51 dBA L_{eq} with levels ranging from 45 to 53 dBA L_{eq} and the average nighttime noise level of 42 dBA L_{eq} with levels ranging from 38 to 50 dBA L_{eq}. Peak hourly noise levels of 74, 79, and 72 dBA L_{max} due to the distance from Central Avenue these noise levels are likely attributable to local residential or animal (i.e. dog barks, bird calls, etc.) activities. The Community Noise Equivalent Level (CNEL) over the 24-hour measurement period at the location LT-5 was calculated to be 53 dBA.

Chart 1: Measured Noise Levels at LT-1

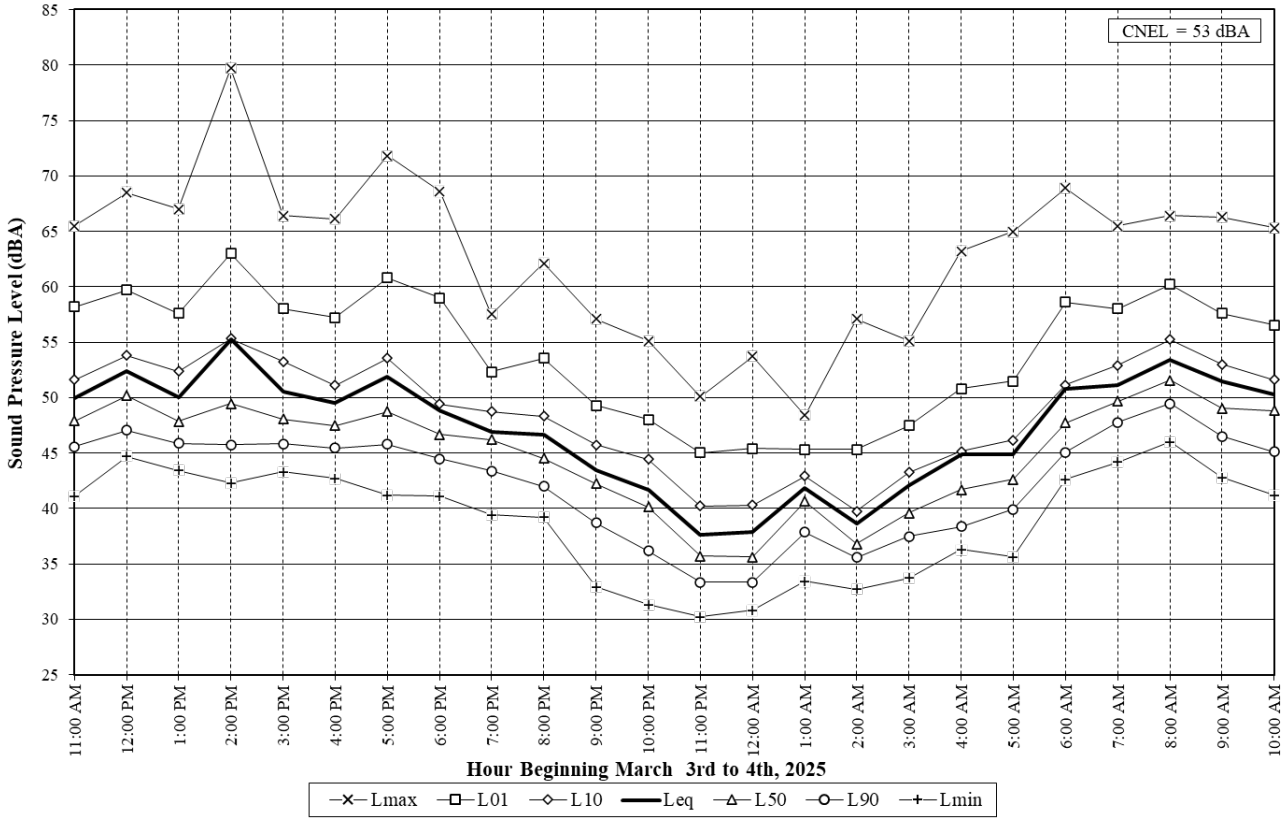


Chart 2: Measured Noise Levels at LT-2

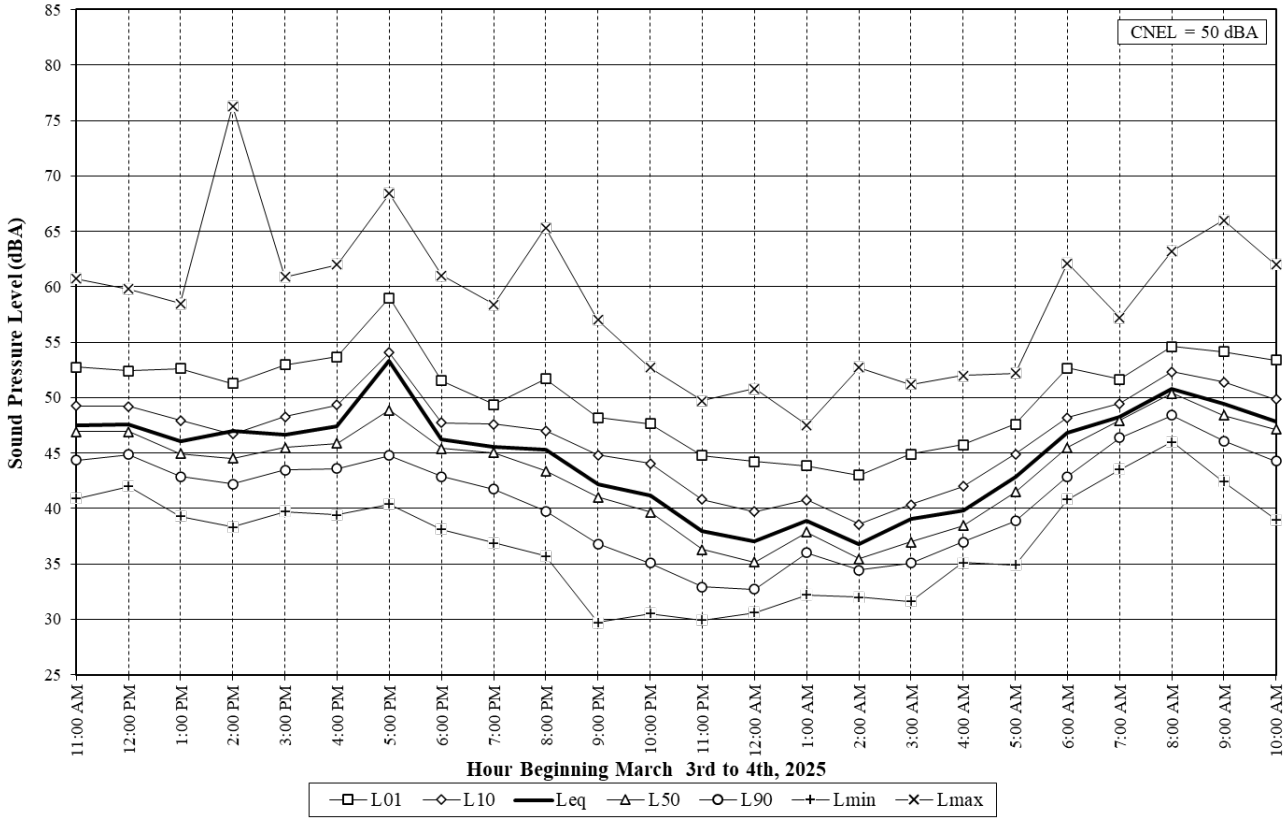


Chart 3: Measured Noise Levels at LT-3

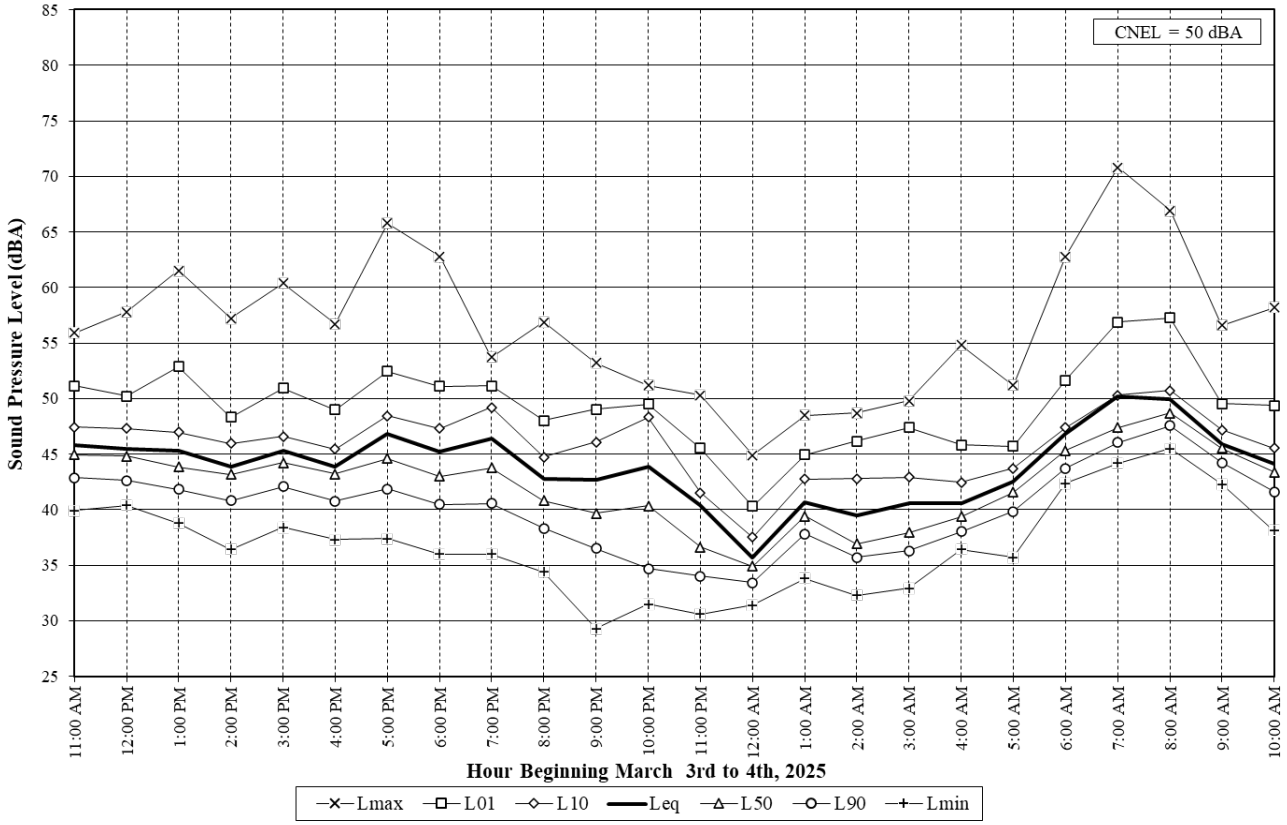


Chart 4: Measured Noise Levels at LT-4

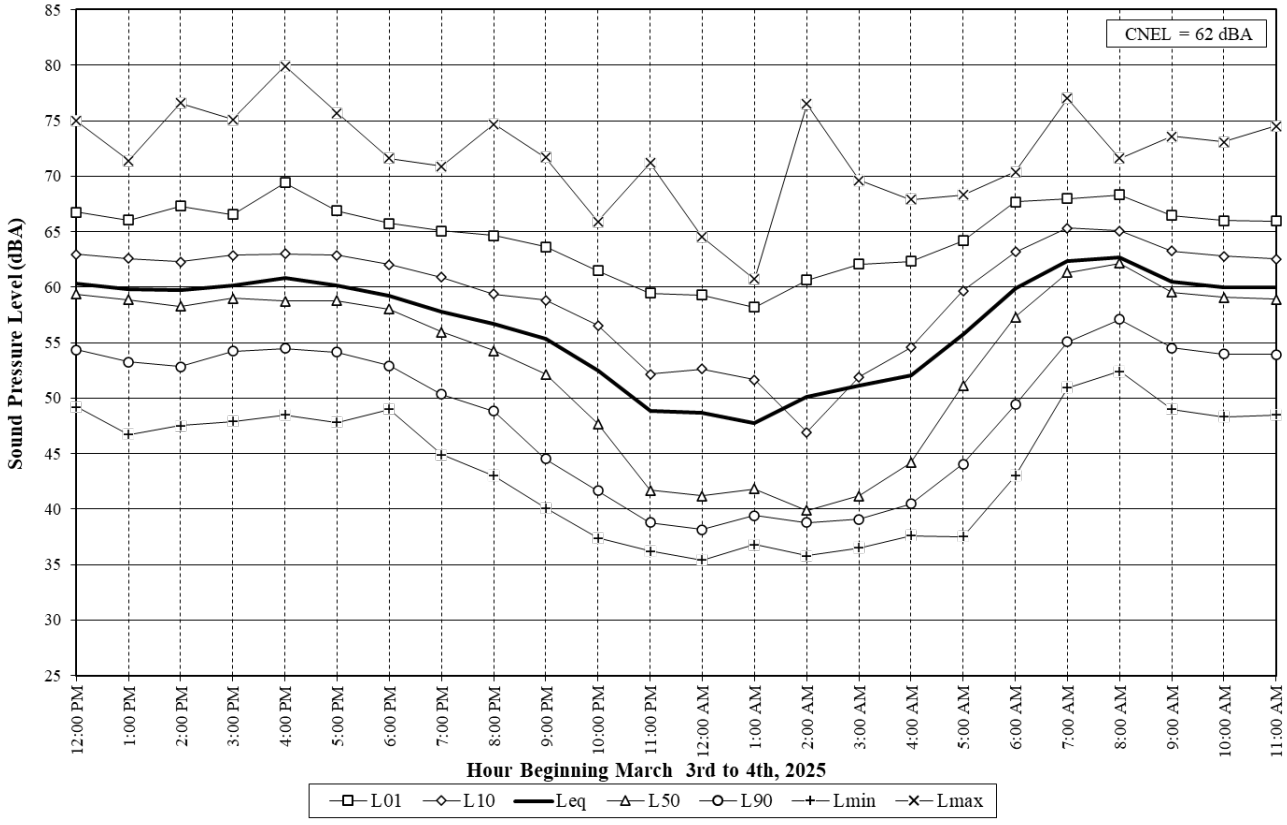
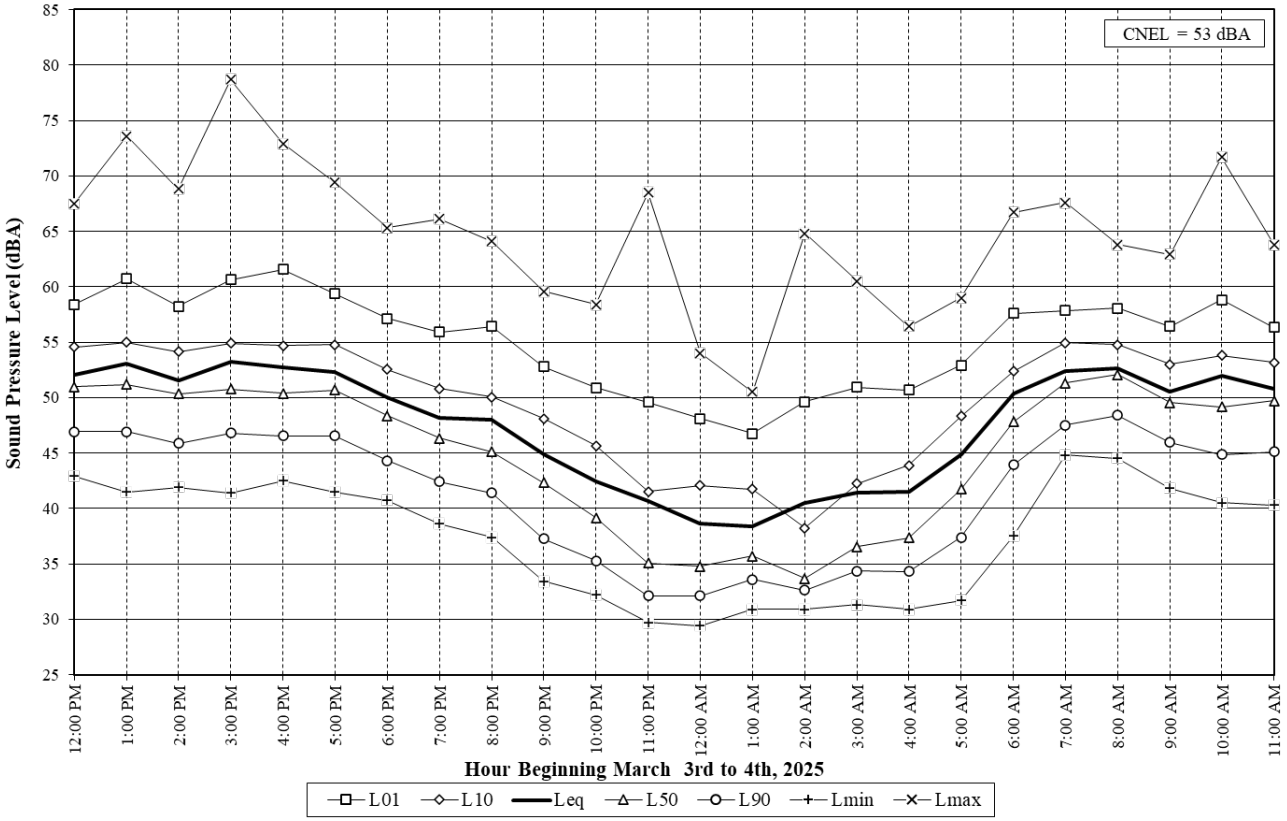


Chart 5: Measured Noise Levels at LT-5



Three short-term (ST-1, ST-2 and ST-3) measurements were made on the site between 2:00 pm and 3:00 pm on March 3rd to evaluate the existing noise environment at project facades and outdoor use areas on the site. The short-term measurements were made simultaneously with the long-term measurements at the following locations:

1. ST-1 was conducted at the current setback of the existing barn on site approximately 400 feet from the centerline of Central Avenue with a partially obscured view of the roadway in an area which represents the closest measure-able setback to the southwestern-most proposed residential cottage,
2. ST-2 was conducted at approximately 400 feet from the centerline of Central Avenue at the northern project property line with a mostly clear view of the roadway at the approximate setback of the northwestern-most proposed residential townhome, and
3. ST-3 was conducted at approximately 215 feet from the centerline of Central Avenue with a clear view of the roadway at the approximate setback of the proposed second tier upper-level residences above the community building.

Table 3, following, summarizes the results of these measurements and Figure 1, preceding, shows the plan location of each measurement.

TABLE 3: Summary of Short-term Noise Measurement Data

Noise Measurement Location and Time Period	L_{max}	$L_{(1)}$	$L_{(10)}$	L_{eq}	$L_{(50)}$	$L_{(90)}$	CNEL
ST-1: ~400 ft. from Central Avenue Centerline [partially obscured view] (3/3/25, 2:00 pm to 2:10 pm)	**65**	**53**	**49**	**47**	**46**	**44**	**53**
LT-1: At corner of Weirup Lane and Hideaway Court (3/3/25, 2:00 pm to 2:10 pm)	59	56	50	48	47	45	53
LT-2: Property line shared w/1682 and 1686 Hideaway Ct. (3/3/25, 2:00 pm to 2:10 pm)	53	49	46	44	44	41	50
LT-3: Property line shared w/ Blackhawk Lane Apartments (3/3/25, 2:00 pm to 2:10 pm)	51	48	45	43	43	40	50
LT-4: 125 feet east of the Central Avenue centerline (3/3/25, 2:00 pm to 2:10 pm)	72	67	62	59	58	54	62
LT-5: 230 feet east of the Central Avenue centerline (3/3/25, 2:00 pm to 2:10 pm)	59	57	54	51	50	47	53
ST-2: ~400 ft. from Central Avenue Centerline [mostly clear view] (3/3/25, 2:20 pm to 2:30 pm)	**64**	**58**	**51**	**49**	**47**	**45**	**50**
LT-1: At corner of Weirup Lane and Hideaway Court (3/3/25, 2:20 pm to 2:30 pm)	80	71	61	59	49	47	53
LT-2: Property line shared w/1682 and 1686 Hideaway Ct. (3/3/25, 2:20 pm to 2:30 pm)	76	57	46	51	45	42	50
LT-3: Property line shared w/ Blackhawk Lane Apartments (3/3/25, 2:20 pm to 2:30 pm)	77	69	62	60	58	53	50
LT-4: 125 feet east of the Central Avenue centerline (3/3/25, 2:20 pm to 2:30 pm)	65	61	54	52	50	45	62
LT-5: 230 feet east of the Central Avenue centerline (3/3/25, 2:20 pm to 2:30 pm)	48	47	46	44	43	42	53
ST-3: ~215 ft. from Central Avenue Centerline [partially obscured view] (3/3/25, 2:50 pm to 3:00 pm)	**70**	**62**	**57**	**55**	**54**	**50**	**59**
LT-1: At corner of Weirup Lane and Hideaway Court (3/3/25, 2:50 pm to 3:00 pm)	59	57	52	50	48	46	53
LT-2: Property line shared w/1682 and 1686 Hideaway Ct. (3/3/25, 2:50 pm to 3:00 pm)	51	50	47	45	45	43	50
LT-3: Property line shared w/ Blackhawk Lane Apartments (3/3/25, 2:50 pm to 3:00 pm)	51	48	46	44	43	41	50
LT-4: 125 feet east of the Central Avenue centerline (3/3/25, 2:50 pm to 3:00 pm)	71	65	62	60	59	53	62
LT-5: 230 feet east of the Central Avenue centerline (3/3/25, 2:50 pm to 3:00 pm)	61	58	55	52	51	46	53

Note: The CNEL at the short-term sites is approximated by correlating data to that at the long-term sites with most similar noise exposures.

FUTURE NOISE ENVIRONMENT

The future noise environment on the project site would continue to result primarily from vehicular traffic on Central Avenue, overhead aircraft, and operational noise from area commercial businesses. Based on a review of the project traffic analysis[4], the project will result in the generation of an average of 191 daily vehicle trips which though not discussed within the traffic analysis would likely result in 20 trips during the a.m. or p.m. peak hours. Considering the much higher traffic volumes on Central Avenue this level of traffic would not be expected to result in an increase in existing traffic noise.

Though the project traffic study does not include predictions of future traffic volumes on area roadways to assess the future noise environment we have assumed a conservative 1-2% annual increase in traffic volumes along these roadways as a result of general area and regional growth over the next 10 to 15 years. With this increase in traffic volumes estimate, the future noise environment on the site and in the project area would, very conservatively, be expected to increase by 1 to 2 decibels over existing noise levels. Considering this, and the clearer view of roadway traffic at upper-level facades, we expect future noise levels at the most noise-exposed facades and outdoor use areas of the project to be:

1. 63 to 64 dBA CNEL at the western façade of the proposed community building and upper-level residences.
2. 62 to 63 dBA CNEL at the western façade of the second tier upper-level residential uses above the community building,
3. 51 to 52 dBA CNEL at the western façades of the northern residential townhome, and
4. 54 to 55 dBA CNEL at the western façade of the southernmost residential cottage.

GENERAL PLAN CONSISTENCY & PROGRAM EIR ANALYSIS

Pursuant to Public Resources Code section 21083.3 and CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.) section 15183, CEQA provides for an exemption from environmental review for projects " 'consistent with the development density established by existing zoning, community plan, or general plan policies for which an EIR was certified,' except as might be necessary to determine whether there are project-specific significant effects. Guidelines section 15183 was promulgated on the authority of . . . [Public Resources Code] section 21083.3, which provides a public agency need examine only those environmental effects that are peculiar to the project and were not addressed or were insufficiently analyzed as significant effects in the prior EIR." (*Hilltop Group, Inc. v. County of San Diego* (2024) 99 Cal.App.5th 890, 908–916 (*Hilltop Group*), citing *Lucas v. City of Pomona* (2023) 92 Cal.App.5th 508, 534.)

Specifically, projects that are consistent with the development density established by the existing zoning, community plan, or general plan policies for which an EIR was certified "shall not require additional review, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site." (CEQA Guidelines, § 15183, subd. (a), italics added.) If an impact is not peculiar to the parcel or to the project, has been addressed as a significant effect in the prior EIR, or can be substantially mitigated by the imposition of uniformly applied development policies or standards, then an additional EIR need not be prepared for the project solely on the basis of that impact. (*Id.*, subds. (c), (e).)

Consequently, this noise analysis is limited to considering impacts of the Project that: (1) are peculiar to the project or the parcel on which the project would be located; (2) were not analyzed

[4] W-Trans, "Draft Additional Transportation Analysis for the We Are Up Project", April 2024

as significant effects in a prior EIR for the general plan or community plan with which the project is consistent; (3) are potentially significant off-site impacts and cumulative impacts which were not discussed in the prior EIR prepared for the general plan, community plan or zoning action; or (4) are previously identified significant effects which, as a result of substantial new information which was not known at the time the EIR was certified, are determined to have a more severe adverse impact than discussed in the prior EIR. (CEQA Guidelines, § 15183, subd. (b)(1)-(4).)

As discussed further in this document, the Project is consistent with the residential and commercial land uses established by the County's General Plan and the McKinleyville Community Plan (MCCP) after certification of an EIR. The Project is also consistent with the Site's underlying zoning designations under the Humboldt County Zoning Code (HCC).

The potential environmental effects of the Project's allowed land uses were analyzed in the certified Programmatic Environmental Impact Report (PEIR) prepared for the County's General Plan Update (GPU) as well as the McKinleyville Community Plan (MCCP) and Programmatic EIR (PEIR) prepared for the Community Plan, of which the Project Site is a part. (See GPU Revised Draft EIR, pp. 3.6-1 thru 3.6-11; see also, 3.6-8 [noting the "McKinleyville Community Plan Environmental Impact Report (EIR) (SCH# 9808024) identifies the following sources of noise within that planning area: aircraft landings and take-offs at the Arcata-Eureka Airport; vehicular traffic on Highway 101 and major arterial and collector streets; industrial processes; construction sites; and noise nuisances (barking dogs, amplified music, heavy equipment operation at late/early hours, etc."]; see MCCP PEIR, pp. 2-15, 4-91 thru -92 [noise less-than-significant with mitigation], 3-7 [Planned Buildout]; see also, McKinleyville Community Plan Update (2017), pp. 35-37.)

The peculiar effects of the Project on noise would be adequately addressed by the Project design, the CUP and the uniformly applied General Plan and Community Plan standards. The potential noise effects of the Project are therefore consistent with the updated General Plan and McKinleyville Community Plan.

GENERAL CEQA SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans or if noise generated by the project would substantially increase existing noise levels at sensitive receivers over a permanent or temporary basis. A significant impact would be identified for a proposed land use if it would be exposed to noise levels exceeding established guidelines or standards for noise and land use compatibility. As noted above, generally, a substantial permanent noise increase would occur if the noise level increase resulting from a project is more than 5 dBA CNEL in a residential area with a noise environment of 60 dBA CNEL or less or a noise level increase of more than 3 dBA CNEL in a residential area with a noise environment of greater than 60 dBA CNEL. Under Guidelines section 15183, however, the focus is on the Project's consistency with the Programmatic EIRs prepared for the General Plan Update and the McKinleyville Community Plan Amendments. To verify consistency, this noise analysis was prepared for the Project and focused on the peculiar effects of the Project.

A substantial temporary noise level increase due to temporary on-site project uses, such as the Primary Events and/or Wedding/Special Events discussed in the project description, would occur if it resulted in maximum (L_{max}) noise levels which exceed the County General Plan N-S7 Short-term Noise Performance Standards of 65 dBA L_{max} between 6 a.m. and 10 p.m. (daytime) or 60 dBA between 10 p.m. and 6 a.m. (nighttime).

For construction related noise a substantial temporary noise level increase would be considered to occur if construction related noise would result in a substantial temporary increase in ambient noise levels. Construction noise is typically considered significant when noise from construction activities exceed 60 dBA L_{eq} and the ambient noise environment by at least 5 dBA L_{eq} for a period of greater than one year or more at exterior areas of noise sensitive residential uses in the project area, or if noise levels produced by construction activities would result in interior noise levels within adjacent residences which could result in significant speech interference. As presented in the Fundamentals of Environmental Acoustics discussion within the Setting Section, the threshold for speech interference indoors is about 45 dBA if the noise is steady and above 55 dBA if the noise fluctuates. Thus, constant noise from construction related activities would begin to result in speech interference at a level of 45 dBA, while maximum noise from construction related activities would result in speech interference at a level of 55 dBA or above. Also, per this section, typical structural attenuation is as low as 12 dBA with open windows, around 20 dBA for an older structures with closed windows in good condition, and around 25 dBA for a newer dwelling. Considering that the existing residences in the project vicinity are not new, but generally in good condition, a consideration that neighbors would generally choose to close their windows for other reasons in addition to noise control during periods of heavy, close construction, and that most construction noise levels are fluctuating in nature, residential speech interference is considered possible when noise levels at the exterior facades of residences in the project vicinity reach average (L_{eq}) levels of 65 dBA or maximum (L_{max}) noise levels of 75 dBA. Vibration levels generated during demolition or construction activities would be significant if they exceed FTA limits.

NOISE IMPACTS AND MITIGATION MEASURES

Impact 1a: **Exterior Residential Noise and Land Use Compatibility.** Residential uses developed at portions of the project site would be exposed to normally acceptable noise levels. **This is a less-than-significant impact.**

Current project drawings indicate that residential uses on the site will be in cottages and town homes on the eastern project parcel and at the 2nd level of the community building on the western project parcel closer to Central Avenue. Though not specifically called out as common open space, the project includes a large amount of open space on the western parcel. Based on the results of our measurement survey and future noise predictions, this open space will be distant enough from Central Avenue and other area noise source to be exposed to environmental noise levels below 60 dBA CNEL under future conditions. Such exterior noise levels are considered "normally acceptable" for residential land uses by the County General Plan Noise Element.

Mitigation 1a: None Required.

Impact 1b: **Interior Residential Noise and Land Use Compatibility.** The project facades at the 2nd level of the community building facing Central Avenue would be exposed to "conditionally acceptable" noise levels such that the interior noise levels may exceed the County and State required 45 dBA L_{dn} level. **This is a less-than-significant impact with the incorporation of noise control measures (mechanical ventilation system) in the project design.**

Interior noise levels within residential buildings of normal construction are typically 15 dBA lower than exterior noise levels with the windows partially open. With the windows closed, standard residential construction typically provides 20 to 25 decibels of exterior to interior noise reduction. Considering this, where exterior day-night average noise levels are 65 dBA L_{dn}, or less, interior

noise levels can typically be maintained below the County and State interior noise standard of 45 dBA L_{dn} with the incorporation of forced air mechanical ventilation systems to provide adequate fresh air when residents wish to keep their windows closed for noise control. Where noise levels exceed 65 dBA L_{dn}, forced-air mechanical ventilation systems and sound-rated building elements are normally required.

Residential units on the 2nd, 3rd and 4th levels of the community building closest to Central Avenue are expected to be exposed to exterior noise levels of up to 63 dBA CNEL under future conditions. Considering this, the following noise control measures are assumed to be included in the final project design:

Project Design Feature – Exterior to Interior Noise Control (NOI-01b):

1. The residential units on the 2nd, 3rd and 4th levels of the community building with direct views of Central Avenue traffic will be equipped with a mechanical ventilation system capable of supplying adequate fresh air to the units when windows and doors are closed for noise control. Acceptable mechanical ventilation systems include acoustically rated straight air transfer ducts such as the Fresh 80, 90 or 100-dB units by Fresh Ventilation (or equal) or a standard central air conditioning and/or a central heating system with adequate fresh air supply, which is equipped with a 'summer switch' to allow the fan to circulate air without cooling or heating operation, or other systems satisfactory to the local building official.

Mitigation 1b: No additional measures required.

Impact 1c: **Interior Non-Residential Noise and Land Use Compatibility.** Uses at the interiors of the proposed non-residential community building along Central Avenue could be exposed to a CNEL level of up to 64 dBA. Following the State of California *Cal Green* Building Code standard, exterior sound transmission control must be incorporated in the design of these buildings using either the prescriptive (section 5.507.4.1) or performance (section 5.507.4.2) analysis methods. **This is a less-than-significant impact.**

Under the performance method wall, window and roof-ceiling assemblies facing noise sources need to be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level ($L_{eq\text{-}1Hr}$) of 50 dBA in occupied areas during any hour of operation. A review of the noise measurement of existing conditions indicates that the existing peak hour L_{eq} level is 60 dBA. Considering a possible increase of 1 to 2 dBA over existing noise conditions under future traffic conditions, the future peak hour $L_{eq\ -1Hr}$ level is expected to be between 61 and 62 dBA.

Considering this, the exterior façades of the non-residential uses along Central Avenue will need to reduce the exterior to interior noise level by up to 12 dBA to meet the 50 dBA Leq-1Hr standard. As discussed above, interior noise levels within buildings of normal construction are typically 15 dBA lower than exterior noise levels with the windows partially open. With the windows closed, standard construction typically provides 20 to 25 decibels of exterior to interior noise reduction.

Based on this typical level of exterior to interior noise reduction, future peak hour $L_{eq\ -1Hr}$ level are expected to be less than the $L_{eq\text{-}1Hr}$ limit of 50 dBA with the use of standard construction and windows and doors open or closed. Therefore, this report finds that the interior hourly equivalent noise level ($L_{eq\text{-}1Hr}$) limit of 50 dBA during any hour of operation without special acoustical construction.

Mitigation 1c: None Required.

Impact 2: **Project Operational Noise Generation** Noise due to the use and occupation of the project residences on adjacent noise sensitive uses is not expected to significantly increase or alter the existing noise environment at these uses. **This is a less-than-significant impact.**

The proposed project would place new residential cottages and townhomes within approximately 50 to 90 feet of existing single-family homes to the north on Hideaway Court, the community center and upper-level residential uses within approximately 100 feet of an existing residence (and 80 feet from the property line) to the south, and the parking area associated with the community center and upper-level residences with approximately 50 feet of the existing residence to the south.

The Heating Ventilation and Air Conditioning (HVAC) and other mechanical equipment associated with the proposed residential and community center development will also add noise to the existing environment. Based on a review of the current project plans, any outdoor HVAC equipment is expected to be installed at ground level for the cottages and townhomes and at the rooftop of the proposed 4-story community center/residential building. Based on noise measurements made at similar projects, the individual outdoor condensing units at the proposed residences may produce constant sound pressure levels of 51 to 56 dBA L_{eq} at 10 feet and the HVAC system for the community center could produce constant sound pressure levels of 73 dBA L_{eq} at 10 feet. Considering this level of noise, that with equipment on the rooftop the structure if the building itself would provide at least 10 decibels of noise reduction from the 3rd or 4th floor rooftops to ground level and attenuation over the distance to the adjacent residential uses, noise from the project HVAC equipment is expected to be below ambient noise levels at the adjacent residences and would be considered compatible with the surrounding land uses.

The occupation and use of the proposed residences is expected to result in the typical noises associated with residential development, including voices of the new residents, residential maintenance activities, barking dogs and children. Though these sounds may noticeably change the noise environment in some adjacent residential areas, these sources are not expected to increase the CNEL in any surrounding areas by 3 dBA or more. Thus, the noise associated with the occupation of the proposed residential is considered compatible with the surrounding land uses.

The project will include the following on-site temporary uses:

<u>Primary Events.</u>

- This type of event will include breakfasts and/or dinners, conferences, community fundraising, and similar meetings and events, and may occur anywhere on the Project Site, either indoors or outdoors, or a combination of the two.
- Primary events and will be allowed to include up to 150 persons and could occur any day of the week between 8:00 am to 11:00 pm indoors and between 8:00 am to 10:00 pm outdoors.

<u>Weddings and Special Events.</u>

- These will be either:
    - Indoor centered events within the Community Center and the adjacent outdoor patio, or
    - Outdoor centered events which will have supporting uses occurring inside the Community Center.
        - Indoor events will require that any amplified music must take place inside the Community Center with guests allowed to gather and converse in the outdoor areas.

- Outdoor events may have low outdoor amplified music which are limited to average sound levels of between 58 to 63 dBA L_{eq} at 10 feet during 150 to 400 person events and guests would be allowed to gather and converse outdoors.

- Indoor and Outdoor Weddings/Special Events, including all guests, employees, and volunteer staff, will be allowed to have between 150 to 400 persons.
- Up to twenty (20) Indoor and fifteen (15) Outdoor Weddings/Special Events may occur each calendar year (up to 35 events per year maximum), with no more than six (6) Indoor and three (3) Outdoor Weddings/Special Events occurring per month (up to nine [9] events per month maximum).
- Each Indoor and Outdoor Wedding/Special Event will be allowed to occur any day of the week between the hours of 8:00 am to 11:00 pm for Indoor Events and 12:00 pm to 10:00 pm for Outdoor Events.
- During all Indoor and Outdoor Wedding/Special Events, a gate at the exit of We Are Up and Weirup Lane will be closed to prevent guests and staff from using Weirup Lane, thus minimizing impact to residents who live along this lane.

Table 4, following, summarizes typical maximum (L_{max}) noise levels generated by such small-to-moderate sized weddings and events at distances of 50 feet from the source which have been developed from measurements conducted by Illingworth & Rodkin at actual wedding and non-concert celebration/party events in the Northbay and throughout the San Francisco Bay Area

TABLE 4: Typical Maximum Noise Source Levels for Special Events

Event or Activity	Typical Noise L_{max} @ 50 ft.
Amplified Music Performances	80 dBA[1]
Amplified Speech	76 dBA
Non-amplified (acoustic) Music	73 dBA
400 Guests in Raised Conversation with Background Music	78 dBA
150 Guests in Raised Conversation with Background Music	71 dBA
Low Volume Amplified Background Music	51 to 59 dBA

[1] Based on the results of measurements conducted at event venues, I&R has found that Music performances are louder than a large multiple of guests with background music. In general, we have found that when music is only used as a background for dinners and similar events it is played at a lower level to encourage conversation. Conversely, where Music performances are a focal point of an event, they typically produce higher sound levels than simple background music.

Based on the project site plan and on a review of Google Earth distances, the Community Center Building would be located approximately 450 feet from the closest single-family residence (R1) to the north, 890 feet the property line of the multifamily residences (R2) to the northeast, and 80 feet from the property line of the residence to the south (R3). An additional review of Google Earth distances indicates that the primary Community Center outdoor assembly area will be located approximately 390 feet from R1, 820 feet the property line of R2 and 160 feet from the property line R3.

Considering;

1. The above distances,
2. The typical event noise levels in Table 4,
3. Atmospheric distance attenuation only[5] for outdoor events,
4. The noise barrier fence/wall (PDF NOI-01) proposed along the property line of (R)(3), and

[5] See the Fundamentals of Environmental Acoustics discussion in the Setting Section

5. Distance attenuation[5] in addition to the typical interior to exterior building attenuation[5] of 15 dBA with windows and doors partially open for all events without amplified music and the typical interior to exterior building attenuation of 25 dBA with closed windows and doors for indoor events,

We expect the event noise levels at the closest adjacent residences to the north (R1), northeast (R2) and south (R3), to be as shown in Tables 5a and 5b, following. These tables also show the daytime and nighttime substantial temporary noise level significance criteria established above.

TABLE 5a: Indoor Event Noise Levels at Nearest Residential Uses, Lmax (dBA)

Indoor Event L_{eq} Levels at Receivers	Sensitive Receiver (see Figure 1)		
	R1 (North)	R2 (NE)	R3 (South)
1. Amplified Music Performances	31	24	51
2. Amplified Speech	27	20	47
3. Non-amplified (acoustic) Music	24	17	54
4. 400 Guests in Raised Conversation with Background Music	29	22	59
5. 150 Guests in Raised Conversation with Background Music	22	15	52
General Plan NS-7 Daytime (7 am to 10 pm) Noise Limit	**65**	**65**	**65**
Daytime Outdoor Event Noise meets NS-7 Standard?	**Yes**	**Yes**	**Yes**
General Plan NS-7 Nighttime (10 pm to 7 am) Noise Limit	**60**	**60**	**60**
Nighttime Outdoor Event Noise Meets NS-7 Standard?	**Yes**	**Yes**	**Yes**

TABLE 5b: Outdoor Event Noise Levels at Nearest Residential Uses, Lmax (dBA)

Outdoor Event L_{eq} Levels at Receivers	Sensitive Receiver (see Figure 1)		
	R1 (North)	R2 (NE)	R3 (South)
1. Amplified Music Performances	Not Allowed	Not Allowed	Not Allowed
2. Amplified Speech	Not Allowed	Not Allowed	Not Allowed
3. Non-amplified (acoustic) Music	51	43	57
4. 400 Guests in Raised Conversation with Background Music	56	48	62
5. 150 Guests in Raised Conversation with Background Music	49	41	55
General Plan NS-7 Daytime (7 am to 10 pm) Noise Limit	**65**	**65**	**65**
Daytime Outdoor Event Noise Meets NS-7 Standard?	**Yes**	**Yes**	**Yes**

Based on the results shown in Tables 5a and 5b, all indoor and outdoor events will meet the daytime and nighttime General Plan NS-7 standards at sensitive receivers R1 and R2. With the noise barrier fence/wall (PDF-NOI-01) and a Conditional Use Permit (CUP) in place for the Project's Temporary Events, outdoor events with up to 400 guests in attendance would also meet the General Plan NS-7 standard at sensitive receiver R3.

In addition to noise from event activities, parking lot activities associated with these events (and the use of the project itself) have also been considered. The acoustical center of the parking areas associated with the use of the community center closest to the identified adjacent residential uses will be within approximately 450 feet of the property line of R1, 920 feet of the property line of R2, and 50 feet of the property line of R3. The sounds of automobile traffic accessing this parking lot will produce noise from driving within the lot along with engine starts and door slams in the parking areas. These noises typically produce maximum (L_{max}) sound levels of 53 dBA to 63 dBA at 50 feet, with average maximum sound levels of 57 dBA. Automobile traffic traveling at constant speeds on the access driveway would be expected to produce average maximum sound levels of

56 dBA at 50 feet[6]. Based on these levels, and with the noise barrier fence/wall (PDF-NOI-01) at the R3 property line we expect the parking lot activity noise at the closest adjacent residences to the north(R1), northeast(R2) and south(R3), to be as shown in Table 6, following:

TABLE 6: Parking and Driveway Noise Levels at Nearest Residential Uses, Lmax (dBA)

Activity Type	Sensitive Receiver (see Figure 1)		
	R1 (North)	R2 (NE)	R3 (South)
1.Parking Lot Activities (i.e. engine starts, door slams, etc.)	44	38	57
2.Vehicles Driving in Lot	37	31	50
General Plan NS-7 Daytime (7 am to 10 pm) Noise Limit	**65**	**65**	**65**
Daytime Outdoor Event Noise Exceeds NS-7 Standard?	**No**	**No**	**No**
General Plan NS-7 Nighttime (10 pm to 7 am) Noise Limit	**60**	**60**	**60**
Nighttime Outdoor Event Noise Meets NS-7 Standard?	**Yes**	**Yes**	**Yes**

Based on the results shown in Table 6, with the noise barrier fence/wall (PDF-NOI-01) at the R3 property line, neither daytime and nighttime parking lot activities would exceed the General Plan NS-7 standard at receivers R1, R2 or R3.

Considering all of the above findings, project operational functions and activities will result in temporary noise increases at the single-family residence to the south (R3) from the Special Events. However, the Project's proposed special events would be operated in conformance with an approved Conditional Use Permit (CUP), per General Plan NS-7. Noise from the special events and parking lot activities would also be reduced by 6 dBA at the property line of the nearest sensitive residential receptor (R3) through the construction of the Project's implementation of a noise barrier fence/wall as described below.

To further ensure any potential noise impacts do not exceed the County's short-term noise standards, the following voluntary design feature was incorporated into the Project:

Project Design Feature – Property Perimeter/Barrier Fencing (PDF NOI-01): To avoid and substantially reduce a new significant adverse noise impact under CEQA, and prior to the issuance of a certificate of occupancy for the Community Center Building, the applicant will construct an approximately 210 foot long noise barrier fence/wall with a minimum top of wall elevation of six (6) feet above the adjacent project site finish grade, and along the property line shared with the residence shown as R3 in Figure 2, below. Such a barrier would reduce noise from the Project, including special events, weddings and parking lot activity.

To be effective as a barrier to noise, the noise barrier fence/wall should be built without cracks or gaps in the face or large or continuous gaps at the base or where they adjoin the homes or each other. The wall should also have a minimum surface weight of 3.0 lbs. per sq. ft. Acceptable materials for such walls include a 2x4 wood framed wall with wood or stucco finishes, masonry, and pre-cast concrete panels. A wood fence type wall may also be used. For a wood fence to meet these requirements, we typically recommend that the fence be double faced with butted vertical fence boards on each side with a continuous layer of 1/2" plywood. Using the plywood ensures continued effectiveness of the barrier with age, since wood slats alone have a tendency to warp and separate with age allowing gaps to form and the barrier effect of the wall to diminish.

[6] Reported sound levels are calculated considering a driveway speed of 20 mph with the use of the California Vehicle Noise Reference Energy Mean Emissions Levels (REMELS) per Cal Trans Technical Advisory, Noise TAN 95-03, Page 2.

The implementation of Voluntary Project Design Feature PDF NOI-01 would further ensure the Project's proposed operational functions and activities meet the established significance criteria at all identified sensitive receivers.

Figure 2: Property Line Noise Barrier Location

Impact 3: **Project-Generated Traffic Noise.** The proposed project would not substantially increase noise levels on a permanent basis at noise sensitive uses in the vicinity. **This is a less-than-significant impact.**

A significant impact would be identified if traffic generated by the project would substantially increase noise levels at sensitive receivers in the vicinity. A substantial increase would occur if the project traffic on area roadways were to result in a noise level increase of 5 dBA L_{dn} or greater at the residences to the north along Hideaway Court (identified as R1 in Figure 1) or result in a noise level increase of 3 dBA L_{dn} or greater at the residence to the to the south of the community center building (identified as R3 in Figure 1).

A review of the traffic report for the development indicates that under existing or future conditions project traffic would not be expected to result in any measurable increase in traffic noise in the project vicinity.

Mitigation 3: None Required.

Impact 4: **Construction Noise.** Noise levels generated by project construction activities would temporarily elevate ambient noise levels at sensitive land uses in the vicinity. Major noise generating construction activities would be limited to less than one construction season or less. **This is a less-than-significant impact.**

The construction of the project would generate noise and would temporarily increase noise levels at adjacent residential receivers. Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment operating on site, the timing and duration of noise generating activities, and the distance between construction noise sources and noise

sensitive receptors. Construction of the project would involve site improvements, such as the establishment of utilities, excavation of foundations, building erection, paving, and landscaping along with home construction. The hauling of excavated material and construction materials would generate truck trips on local roadways.

Construction activities are typically carried out in stages. During each stage of construction, there would be a different mix of equipment operating. Construction noise levels would vary by stage and vary within stages based on the amount of equipment in operation and location where the equipment is operating. Typical noise levels during the construction of housing and commercial developments at 50 feet are shown in Table 5, which gives the average noise level ranges by construction phase. Site work and building construction noise typically ranges from 78 to 89 dBA at 50 feet from the source with all pertinent equipment on site.

The nearest noise sensitive (residential) uses will be 50 to 100 feet from close-in on-site construction. Average noise levels produced by construction activities at this distance would range from 72 to 89 dBA, with an average level of 80 dBA. These noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor, such that noise levels produced during most site construction activities, which would occur at distances of 150 feet or more from adjacent noise sensitive uses, would produce average noise levels of 72 dBA or less during construction activities.

TABLE 5: Typical Ranges of L_{eq} Construction Noise Levels at 50 Feet, dBA

Construction Stage	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	84
Excavation	88	75	89	79	88	78
Foundations	81	81	78	78	88	88
Erection	81	65	87	75	79	78
Finishing	88	72	89	75	84	84
I - All pertinent equipment present at site, **II** - Minimum required equipment present at site.						

Source: U.S.E.P.A., Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

Though no construction schedule for the project was available, given the project size and scope, it is reasonable to assume that the project would take more than 1 year to complete, with site work taking around 3 months and building construction continuing for over a period of 12 months or more. Though this timetable indicates a greater than 1 year total construction period, based on the construction noise levels at various distances discussed above, and a consideration that once intervening structures are built, they would provide noise attenuation at the adjacent residences, we expect that the existing residences adjacent to the project site would not be exposed to construction related noise levels exceeding 60 dBA L_{eq} for a period of greater than one year.

Additionally, in keeping with commonly adopted construction management best practices, the following construction noise controls and allowable hours of construction are assumed to be included in the project:

- Noise-generating construction activities, including truck traffic coming to and from the construction site for any purpose, shall be limited to between the hours of 7:00 am and 6:00 pm on weekdays and 9:00 am and 6:00 pm on Saturdays. No construction shall occur on Sundays or holidays.
- All equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.

- The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.
- At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences.
- Unnecessary idling of internal combustion engines beyond 5 minutes shall be prohibited.
- Construction staging areas shall be established at locations that will create the greatest distance between the construction related noise sources and noise-sensitive receptors nearest the project site during all project construction.
- Haul truck deliveries are subject to the same hours specified for construction equipment.
- Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing.
- The construction contractor shall designate a "noise disturbance coordinator" who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and institute reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site.

With the implementation of these controls, and the limited duration of the noise generating construction at the adjacent noise sensitive uses, the substantial temporary increase in ambient noise levels associated with construction activities would be less-than-significant.

Mitigation 4: No additional measures required.

Impact 5: Exposure to Construction Generated Groundborne Vibration. Residences in the vicinity of the project site are not expected to be exposed to perceptible vibration levels from construction activities. **This is a less-than-significant impact.**

Construction activities would include the demolition of existing buildings, site preparation work, foundation work, paving, and new building framing and finishing. The construction of the project may generate perceptible vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams) are used. Construction techniques that generate the highest vibration levels, such as impact or vibratory pile driving, are not expected at this project. For structural damage, the California Department of Transportation uses a vibration limit of 0.5 in/sec, PPV for buildings structurally sound and designed to modern engineering standards and 0.2 in/sec, PPV for buildings that are found to be structurally sound but where structural damage is a major concern.

Project construction activities such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. Building framing, exterior and interior finishing, and landscaping activities are not anticipated to be sources of substantial vibration. Based on a review of the site plan and surrounding uses, construction activities would generally occur at distances of 40 feet or more from the nearest residences. Construction activities may extend over more than one construction season, but construction vibration would not be substantial for most of this time except during vibration generating activities (as discussed above).

Table 6 presents vibration source levels for typical construction equipment at a distance of 40 feet. At this distance jackhammers typically generate vibration levels of 0.017 in/sec PPV, drilling typically generates vibration levels of 0.044 in/sec PPV, and vibratory rollers generate vibration levels of 0.104 in/sec PPV at 60 feet. Based on this, construction vibration levels would be well below the 0.20 in/sec and 0.50 in/sec PPV damage criteria at the closest structures.

TABLE 6 Vibration Source Levels for Construction Equipment[7]

Equipment		PPV at 40 ft. (in/sec)
Clam shovel drop		0.100
Hydromill (slurry wall)	in soil	0.004
	in rock	0.008
Vibratory Roller		0.104
Hoe Ram		0.044
Large bulldozer		0.044
Caisson drilling		0.044
Loaded trucks		0.038
Jackhammer		0.017
Small bulldozer		0.004

In areas where vibration would not be expected to cause structural damage, vibration levels may still be perceptible. However, as with any type of construction, this would be anticipated and would not be considered significant given the intermittent and short duration of the phases that have the highest potential of producing vibration (jackhammers and vibratory rollers). By use of administrative controls such as notifying adjacent land uses of scheduled construction activities and scheduling construction activities with the highest potential to produce perceptible vibration to hours with least potential to affect nearby residences, perceptible vibration can be kept to a minimum and as such would not result in a significant impact with respect to perception.

Mitigation 5: None Required

[7] Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006.