Chapter 3.9
Noise

Introduction

This chapter provides a discussion of the noise impacts associated with the Proposed Project and the 130-Unit Alternative in the Carmel Valley. The chapter includes a review of existing conditions; a summary of applicable noise policies and regulations; and an analysis of direct and indirect environmental impacts of the Proposed Project and the 130-Unit Alternative. Where feasible, mitigation measures are recommended to reduce the level of impacts.

Impact Summary

Table 3.9-1 below provides a summary of the potential environmental impacts of the Proposed Project and the 130-Unit Alternative. As shown in **Table 3.9-1**, the Proposed Project and the 130-Unit Alternative would result in significant noise impacts. However, with the implementation of the mitigation measures described in this Recirculated Draft EIR, all of the impacts listed would be reduced to less-than-significant levels.

Table 3.9-1 Noise Impact Summary

Impact	Proposed Project Level of Significance	130-Unit Alternative Level of Significance	Mitigation Measures	Level of Significance After Mitigation
A. Long-Term Increases in Noise				
NOI-1: Exposure of Onsite Noise-Sensitive Land Use to Noise	Potentially Significant	Potentially Significant	NOI-1: Implement Noise-Reducing Treatments at Residences Located Near the Batting Practice Area and Lot 130	LTS
NOI-2: Exposure of Offsite Noise-Sensitive Land Uses to Increased Noise	LTS	LTS	None Required	–
B. Short-Term Increases in Noise				
NOI-3: Exposure of Noise-Sensitive Land Uses to Construction Noise	Potentially Significant	Potentially Significant	NOI-2: Employ Noise-Reducing Construction Practices	LTS
C. Vibration				
NOI-4: Exposure of Sensitive Land Uses to Vibration from Construction Activity	LTS	LTS	None Required	–

LTS = Less than Significant

Environmental Setting

Information in the following sections describes existing noise conditions in the project area. This information was derived from the project noise study and supplemental noise monitoring and modeling conducted by ICF International (ICF).

Research Methods

Information in this chapter is based partially on information in the *Revised Noise Assessment Study for the Planned Rancho Cañada Village Specific Plan Monterey County* (project noise study) prepared by Edward L. Pack Associates, Inc. dated October 15, 2014 (**Appendix G**), which is available for review at the Monterey County Resource Management Agency, Salinas Permit Center, 168 West Alisal Street, 2nd Floor, Salinas, California. ICF also conducted supplemental noise monitoring and modeling to use instead of the some of the information provided in the 2014 Pack study to better represent current conditions. Noise monitoring was conducted on August 20th and 21st, 2015 and the results are presented in this section. Documentation of ICF supplemental modelling is also provided in **Appendix G**.

Noise Terminology

Sound, Noise, and Acoustics

Sound is a disturbance that is created by a moving or vibrating source in a gaseous or liquid medium or the elastic stage of a solid—it is the mechanical energy of a vibrating object transmitted by pressure waves through a medium to a hearing organ, such as a human ear. For traffic sound, for example, the medium of concern is air.

Sound is actually a process that consists of three components: the sound source, the sound path, and the sound receiver. All three components must be present for sound to exist. Without a source to produce sound or a medium to transmit sound pressure waves, there is no sound. Sound must also be received; a hearing organ, sensor, or object must be present to perceive, register, or be affected by sound. In most situations, there are many different sound sources, paths, and receivers, not only one of each.

Noise is defined as loud, unpleasant, unexpected, or undesired sound. *Acoustics* is the field of science that deals with the production, propagation, reception, effects, and control of sound.

Frequency and Hertz

A continuous sound can be described by its frequency (pitch) and its amplitude (loudness). *Frequency* relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch, like the low notes on a piano, whereas high-frequency sounds are high in pitch, like the high notes on a piano. Frequency is expressed in terms of oscillations, or cycles, per second. Cycles per second are commonly referred to as Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hz. The human ear can generally hear frequencies ranging from 20 Hz on the low end, to about 20,000 Hz (20 kHz) on the high end.

Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. Loudness of sound increases and decreases as amplitude increases and decreases. Sound-pressure amplitude is measured in units of micro-Newtons per square meter (FN/m2), also called micro-Pascals (µPa). One µPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. The pressure of a very loud sound may be 200 million µPa, or 10 million times the pressure of the weakest audible sound (20 µPa). Because expressing sound levels in terms of µPa would be cumbersome, sound pressure level (SPL) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called bels, named after Alexander Graham Bell. To provide finer resolution, a bel is divided into 10 decibels (dB).

Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. When two sounds of equal SPL are combined, they produce a combined SPL 3 dB greater than the original individual SPL. In other words, sound energy must be doubled to produce a 3 dB

increase. If two sound levels differ by 10 dB or more, the combined SPL is equal to the higher SPL; the lower sound level would not increase the higher sound level.

A-Weighted Decibels

SPL alone is not a reliable indicator of loudness. The frequency of a sound also has a substantial effect on how humans respond. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, the healthy human ear is most sensitive to sounds from 1,000 to 5,000 Hz and perceives a sound within that range as being more intense than a sound of higher or lower frequency with the same magnitude. To approximate the frequency response of the human ear, a series of SPL adjustments is usually applied to the sound measured by a sound level meter. The adjustments, referred to as a weighting network, are frequency-dependent.

The A-scale weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with highway traffic noise. Noise levels for environmental noise studies are typically reported in terms of A-weighted decibels (dBA). In environmental noise studies, A-weighted SPLs are commonly referred to as *noise levels*. **Table 3.9-2** shows typical A-weighted noise levels.

Table 3.9-2. Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 300 meters (1000 feet)		
	— 100 —	
Gas lawn mower at 1 meter (3 feet)		
	— 90 —	
Diesel truck at 15 meters (50 feet) at 80 kilometer per hour (50 miles per hour)		Food blender at 1 meter (3 feet)
	— 80 —	Garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime		
Gas lawn mower, 30 meters (100 feet)	**— 70 —**	Vacuum cleaner at 3 meters (10 feet)
Commercial area		Normal speech at 1 meter (3 feet)
Heavy traffic at 90 meters (300 feet)	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: California Department of Transportation 2013.
dBA = A-weighted decibel

Human Response to Changes in Noise Levels

Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the midfrequency range. Outside such controlled conditions, the trained ear can detect 2-dB changes in normal environmental noise. However, it is widely accepted that the average healthy ear can barely perceive 3-dB noise level changes. A 5-dB change is readily perceptible, and a 10-dB change is perceived as being twice or half as loud. As discussed above, doubling sound energy results in a 3-dB increase in sound; therefore, doubling sound energy (e.g., doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis.

- Equivalent Sound Level (Leq): Leq represents an average of the sound energy occurring over a specified period. In effect, Leq is the steady-state sound level that in a stated period would contain the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level (Leq[h]), is the energy average of the A-weighted sound levels occurring during a 1-hour period.
- Percentile-Exceeded Sound Level (Lx): Lx represents the sound level exceeded for a given percentage of a specified period (e.g., L10 is the sound level exceeded 10% of the time, L90 is the sound level exceeded 90% of the time).
- Maximum Sound Level (Lmax): Lmax is the highest instantaneous sound level measured during a specified period.
- Day-Night Level (L_{dn}): Ldn is the energy average of the A-weighted sound levels occurring during a 24-hour period with 10 dB added to the A-weighted sound levels occurring between 10 p.m. and 7 a.m.
- Community Noise Equivalent Level (CNEL): CNEL is the energy average of the A-weighted sound levels occurring during a 24-hour period with 10 dB added to the A-weighted sound levels occurring between 10 p.m. and 7 a.m. and 5 dB added to the A-weighted sound levels occurring between 7 p.m. and 10 p.m.

Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

Geometric Spreading: Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (or drops off) at a rate of 6 dBA for each doubling of distance. Highway noise is not a single, stationary point source of sound. The movement of the vehicles on a highway makes the source of the sound appear to emanate from a line (i.e., a line source) rather than a point. This line source results in cylindrical spreading rather than the spherical spreading that results from a point source. The change in sound level from a line source is 3 dBA per doubling of distance.

Ground Absorption: The noise path between the highway and the observer 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 done for simplification only because prediction results based on this scheme are sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., those sites with a reflective surface, such as a parking lot or a smooth body of water, between the source and the receiver), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees, between the source

and the receiver), an excess ground-attenuation value of 1.5 dBA per doubling of distance is normally assumed. When added to the geometric spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dBA per doubling of distance for a line source and 7.5 dBA per doubling of distance for a point source.

Atmospheric Effects: Atmospheric conditions can have a significant effect on noise propagation. Wind has been shown to be the most important meteorological factor within approximately 500 feet of the source, whereas vertical air-temperature gradients are more important for greater distances. Other factors such as air temperature, humidity, and turbulence also have significant effects. Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lower noise levels. Increased sound levels can also occur as a result of temperature inversion conditions (i.e., increasing temperature with elevation).

Shielding by Natural or Human-Made Features: 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 this shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction. A taller barrier may provide as much as 20 dB of noise reduction.

Noise-Sensitive Land Uses

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of noise could adversely affect the use of the land. Typical sensitive uses include residences, schools, and hospitals. Sensitive land uses in the project area that could be affected include those listed below.

- Single-family residences located along Carmel Valley Road and connecting roadways.
- Multi-family residences and condominiums located along Carmel Valley Road and Rio Road west.
- The Community Church of the Monterey Peninsula, and the Carmel Middle School located to the north of the project site.
- Rural residential and the Riverwood multi-family housing development located to the west of the project site.
- Single-family residences located along Via Mallorca to the east of the project site.

Existing Noise Environment

The project area includes residential and public land uses located along Carmel Valley Road between Carmel-by-the-Sea and Carmel Valley Village. The existing noise environment in the project area is dominated by noise from traffic traveling on Carmel Valley Road. Other noise sources in the area are listed below.

- Community Church of the Monterey Peninsula.
- Carmel School District maintenance facility (mostly school buses entering and exiting).

- Youth baseball fields and batting cages.
- Rancho Cañada Golf Club.

The existing noise environment in the project area has been characterized both with noise monitoring—sound level measurements taken in the project area—and traffic noise modeling. Noise monitoring, traffic noise modeling, as well as existing groundborne vibration levels are described below.

Noise Monitoring

ICF conducted noise monitoring on August 20–21, 2015. Long-term noise monitoring was conducted in three locations (LT-1 through LT-3), and short-term noise monitoring was conducted at one location (ST-1) (Figure 3.9-1). The long-term measurements were conducted starting on Thursday, August 20 and ending on Friday, August 21, 2015, for an approximately 24-hour period. The short-term measurement was conducted on August 20, 2015 for a 15-minute interval. **Table 3.9-3** summarizes the long-term and short-term noise monitoring locations and results.

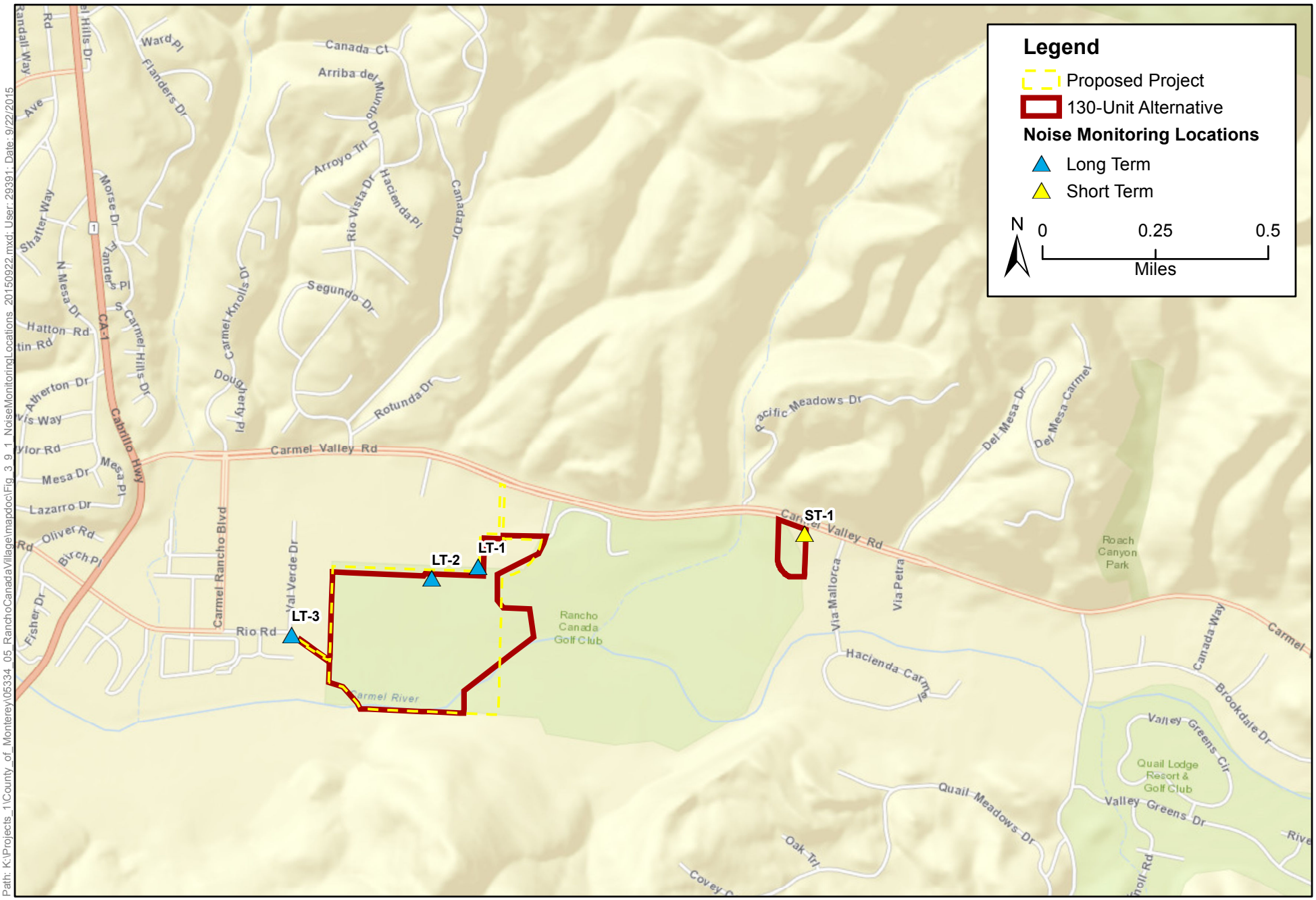
Table 3.9-3 Summary of Noise Monitoring Results

Location	Description	Dates	L_{eq}	dB CNEL
Long-Term Monitoring				
LT-1	Access road between the golf course and transportation yard at Carmel Middle School (northeast corner of the project site), approximately 160 feet from the transportation yard	August 20–21, 2015	N/A	47.6
LT-2	North side of the golf course, approximately 170 feet south of the easternmost baseball diamond on the Carmel Middle School campus.	August 20–21, 2015	N/A	52.9
LT-3	Eastern terminus of Rio Road west, in front of the Riverwood housing complex	August 20–21, 2015	N/A	54.5
Short-Term Monitoring				
ST-1	Lot 130, in front of the façade of the golf course maintenance facility and along fenceline, approximately 120 feet from the median of Carmel Valley Road.	August 20, 2015	64.3	N/A

dB L_{dn} = day-night noise level
dBA = A-weighted decibel

Traffic Noise Modeling

The project traffic study (**Appendix E**) provides traffic volumes through intersections in the project vicinity. The intersection volumes have been used to determine volumes on relevant roadway segments in the project vicinity, and these segment volumes have been modeled by ICF to assess the resulting traffic noise for existing conditions. The results are summarized in **Table 3.9-4**.



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Source: Imagery, ESRI 2015

Figure 3.9-1
Noise Monitoring Locations

Table 3.9-4. Traffic Noise Modeling Results for Existing Conditions

Road	Segment	CNEL *
Carmel Valley Road	East of Rio Road	69.3
	Rio Road to Carmel Middle School	69.3
	Carmel Middle School to Carmel Rancho Boulevard	69.6
Carmel Rancho Boulevard	South of Carmel Valley Road	64.4
	North of Rio Road	63.3
Rio Road East	South of Carmel Valley Road	48.6
Rio Road West	Project site to Carmel Rancho Boulevard	51.5
	Carmel Rancho Boulevard to Highway 1	62.5

Source: **Appendices G and X**.

*50 feet from roadway centerline CNEL = community noise equivalent level

Groundborne Vibration Levels

Ground vibration is measured in terms of the vibration velocity level, or VdB, which is the root mean square velocity amplitude for measured ground motion expressed in dB. The most common sources of groundborne vibration are construction activities and roadway truck traffic. Large delivery trucks typically generate ground-borne vibration velocity levels around 63 VdB at 50 feet from the source (California Department of Transportation 2013). The vibration velocity level threshold of perception for humans is approximately 65 VdB. Therefore, existing traffic vibration is neither distinctly nor generally perceptible at the project site.

Regulatory Setting

This section discusses the local policies relevant to the analysis of noise in the project area. Noise standards in the County of Monterey are defined in the 2010 General Plan Safety Element, Health and Safety Noise Control Ordinance, and the 1986 Carmel Valley Master Plan. The following is a brief discussion of each as it applies to the Project.

Local Policies and Regulations

Current County Plans and Policies

2010 Monterey County General Plan

The project site is located in Carmel Valley within the unincorporated area of Monterey County. The County has established policies and regulations concerning the generation and control of noise that could adversely affect its citizens and noise-sensitive land uses. The 2010 Monterey County General Plan provides an overall framework for development in the jurisdiction and protection of its natural and cultural resources.

Safety Element

The General Plan's Safety Element contains the following planning guidelines relating to noise.

Goal S-7: Maintain a healthy and quiet environment free from annoying and harmful sounds.

Policy S-7.1: New noise-sensitive land uses may only be allowed in areas where existing and projected noise levels are "acceptable" according to "Land Use Compatibility for Community Noise Table" [included as **Table 3.9-5** below]. A Community Noise Ordinance shall be established consistent with said Table that addresses, but is not limited to the following:

a. Capacity-related roadway improvement projects.

b. Construction-related noise impacts on adjacent land uses.

c. New residential land uses exposed to aircraft operations at any airport or air base.

d. Site planning and project design techniques to achieve acceptable noise levels such as: building orientation, setbacks, earthen berms, and building construction practices. The use of masonry sound walls for noise control in rural areas shall be discouraged.

e. Design elements necessary to mitigate significant adverse noise impacts on surrounding land uses.

f. Impulse noise.

g. Existing railroad locations & noise levels.

Policy S-7.2: Proposed development shall incorporate design elements necessary to minimize noise impacts on surrounding land uses and to reduce noise in indoor spaces to an acceptable level.

Policy S-7.3: Development may occur in areas identified as "normally unacceptable" provided effective measures to reduce both the indoor and outdoor noise levels to acceptable levels are taken.

Policy S-7.6: Acoustical analysis shall be part of the environmental review process for projects when:

a. Noise sensitive receptors are proposed in areas exposed to existing or projected noise levels that are "normally unacceptable" or higher according [refer to **Table 3.9-5**].

b. Proposed noise generators are likely to produce noise levels exceeding the levels shown in the adopted Community Noise Ordinance when received at existing or planned noise-sensitive receptors.

Table 3.9-5. Monterey County Community Noise Exposure Levels (L_{dn} or CNEL, dBA)

Land Use Category	55	60	65	70	75	80	Interpretation:
Residential – Low Density Single Family, Duplex, Mobile Homes							**Normally Acceptable** Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Residential – Multi Family							**Conditionally Acceptable** New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.
Transient Lodging – Motels, Hotels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							**Normally Unacceptable** New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Auditoriums, Concert Halls, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							**Cleary Unacceptable** New construction or development should generally not be undertaken.
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

Source: Monterey County 2010: Safety Element Table S-2.
CNEL = community noise equivalent level.
dBA = A-weighted decibel.
L_{dn} = day-night level.

Policy S-7.7: All discretionary residential projects that are within roadway or railroad noise contours of 60 CNEL or greater shall include a finding of consistency with the provisions of the Noise Hazards section of the Safety Element. If found that roadway noise exceeds the 60 CNEL within the project site, a project-specific noise impact analysis shall be required. If impacts are identified, the applicant shall conduct mitigation analysis using published Caltrans/Federal Highway Administration guidelines and implement mitigation measures as required. Mitigation measures may include, but are not limited to sound walls, adjacent roadway design, dual pane glass, building location or design, etc. Any proposed mitigation measures shall be concurrently implemented with the implementation of the project.

Policy S-7.8: All discretionary projects that propose to use heavy construction equipment that has the potential to create vibrations that could cause structural damage to adjacent structures within 100 feet shall be required to submit a pre-construction vibration study prior to the approval of a building permit. Projects shall be required to incorporate specified measures and monitoring identified to reduce impacts. Pile driving or blasting are illustrative of the type of equipment that could be subject to this policy.

Policy S-7.9: No construction activities pursuant to a County permit that exceed "acceptable" levels listed in Policy S-7.1 shall be allowed within 500 feet of a noise sensitive land use during the evening hours of Monday through Saturday, or anytime on Sunday or holidays, prior to completion of a noise mitigation study. Noise protection measures, in the event of any identified impact, may include but not be limited to:

- Constructing temporary barriers, or
- Using quieter equipment than normal.

Policy S-7.10: Construction projects shall include the following standard noise protection measures:

- Construction shall occur only during times allowed by ordinance/code unless such limits are waived for public convenience;
- All equipment shall have properly operating mufflers; and
- Lay-down yards and semi-stationary equipment such as pumps or generators shall be located as far from noise-sensitive land uses as practical.

In addition to the County's land use compatibility guidelines summarized above, Monterey County has established 70 decibels (dB) as the maximum acceptable noise level for residential uses (Monterey County 2010).

County of Monterey Health and Safety Noise Control Ordinance

Chapter 10.60.030 of the County of Monterey Health and Safety Noise Control Ordinance prohibits the generation of mechanical noise in excess of 85 dBA, measured 50 feet from the noise source. This ordinance is only applicable to noise generated within 2,500 feet of any occupied dwelling unit and can be used to regulate construction-related noise.

Prior County Plans and Policies

As stated in Chapter 1, *Introduction*, discussion pertaining to the 1982 General Plan is provided for informational purposes only.

1982 Monterey County General Plan

According to the Noise Hazards element of the 1982 Monterey County General Plan, the maximum exterior sound level acceptable for residential land uses is 60 CNEL. The maximum allowable

interior noise level for these land uses is 45 dBA. For new roadway improvement projects and general construction projects, the acceptable exterior community noise levels shown in **Table 3.9-6** must be met. Further, construction-related noise is subject to the County's Noise Control Ordinance, described below.

Where existing noise-sensitive land uses may be exposed to increased noise levels, the following criteria is used to determine the significance.

- Where existing noise levels are less than 60 dB L_{dn} at outdoor activity areas of noise-sensitive land uses, a 5 dB L_{dn} increase in noise levels will be considered significant.
- Where existing noise levels are between 60 and 65 dB L_{dn} at outdoor activity areas of noise-sensitive land uses, a 3 dB L_{dn} increase in noise levels will be considered significant.
- Where existing noise levels are greater than 65 dB L_{dn} at outdoor activity areas of noise-sensitive land uses, a 1.5 dB L_{dn} increase in noise levels will be considered significant.

Table 3.9-6. Land Use Compatibility for Exterior Community Noise

	Noise Ranges (L_{dn} or CNEL) dB			
Land Use Category	I	II	III	IV
Passively used open spaces	50	50–55	55–70	70+
Auditoriums, concert halls, amphitheaters	45–50	50–65	65–70	70+
Residential—low density single-family, duplex, mobile homes	50–60	60–70	70–75	75+
Residential—multi-family	50–60	60–70	70–75	75+
Transient lodging—motels, hotels	50–60	60–70	70–80	80+
Schools, libraries, churches, hospitals, nursing homes	50–60	60–70	70–80	80+
Actively used open spaces—playgrounds, neighborhood parks	50–67	–	67–73	73+
Golf courses, riding stables, water recreation, cemeteries	50–70	–	70–80	80+
Office buildings, business commercial and professional	50–67	67–75	75+	–
Industrial, manufacturing, utilities, agriculture	50–70	70–75	75+	–

Source: Monterey County 1982.

Noise Range I—Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Noise Range II—Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Noise Range III—Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Noise Range IV—Clearly Unacceptable: New construction or development should generally not be undertaken.

Impact Analysis

Methods for Analysis

CEQA requires the significance of noise impacts to be determined for proposed projects. The process of assessing the significance of noise impacts associated with a proposed project starts by establishing thresholds at which significant impacts are considered to occur. Next, noise levels associated with project-related activities are predicted and compared to the criteria for determining significance, outlined in the following section. A significant impact is considered to occur when a predicted noise level exceeds a threshold.

Noise from traffic on roadways in the project area has been evaluated under existing conditions without the Project and existing conditions plus the Project and 130-Unit Alternative (including the extension of Rio Road west). The traffic noise modeling was conducted based on the Draft

Transportation Impact Study (DTIS). The DTIS and details of the traffic noise modeling are presented as **Appendix G** of this Recirculated Draft EIR and are available for review at the Monterey County Resource Management Agency, Salinas Permit Center, 168 West Alisal Street, 2nd Floor, Salinas, California. Traffic noise impacts for the 130-Unit Alternative were analyzed using the same methods as the methods used for the Project.

Criteria for Determining Significance

In accordance with CEQA, State CEQA Guidelines, 2010 General Plan's plans and policies, and agency and professional standards, a project impact would be considered significant if it would:

A. Long-Term Increases in Noise

- Expose persons to or generate noise levels in excess of standards established in the County's "Land Use Compatibility for Exterior Community Noise" chart.
- For new receptors, expose residential single- or multi-family housing to noise levels above 60 or 65 CNEL, respectively.
- Result in an increase in traffic that would increase existing traffic noise levels by 3.0 dBA or more (3 dBA is the threshold level for most people to notice a change in noise) in areas where Project noise levels would exceed land use noise standards for the affected land use.

B. Short-Term Increases in Noise

- Expose outdoor activity areas of noise sensitive land uses to construction noise of greater than 85 dB at 50 feet when construction is located within 2,500 feet of any occupied dwelling unit.

C. Vibration

- Expose persons to or generate excessive groundborne vibration or groundborne noise levels.

Impacts and Mitigation Measures

A. Long-Term Increases in Noise

Impact NOI-1: Exposure of Onsite Noise-Sensitive Land Use to Noise (less than significant with mitigation)

Proposed Project

New noise sensitive land uses on the project site (condominiums and single-family residences) would be exposed to noise from various sources. These land uses and noise sources are discussed below.

Condominiums

For the Proposed Project, the nearest residences would be the condominiums, which are more than 700 feet away from Carmel Valley Road. Current noise in the area of the project site where the condominiums would be located is approximately 47.6 CNEL, based on measurements conducted at LT-1 (**Table 3.9-3**). Existing sources of noise in the area include operational noise from the

Community Church of the Monterey Peninsula and the Carmel School District Maintenance Facility and transportation yard. Existing plus Project noise along Carmel Valley Road, between Carmel Middle School and Rio Road, is anticipated to be 69.5 CNEL at 50 feet from the roadway based on the traffic modeling conducted for the Project (**Table 3.9-7**). At the distance at which the condominiums would be located, 700 feet, noise from Carmel Valley Road would attenuate to below 60 CNEL, assuming the standard attenuation rate of -3 dB per doubling of distance and, conservatively, no ground attenuation effect. Existing plus Project noise from Rio Road east, which will be adjacent to the condominiums, is anticipated to be 52.8 CNEL at 50 feet from the roadway (**Table 3.9-7**). Thus, including existing noise sources and future traffic noise, noise levels at the condominiums will be below 60 CNEL.

Assuming the widely-used nominal exterior-to-interior noise reduction of 15 dB with windows closed, the interior noise level would be less than 45 CNEL. Because exterior and interior noise levels would be less than 60 CNEL and 45 CNEL, respectively, the noise impact at the condominiums would be *less than significant.*

Table 3.9-7 Traffic Noise Modeling Results for the Proposed Project

Road	Segment	Existing CNEL*	Existing Plus Project CNEL*	Project Increase in Noise (dBA)	Significant Noise Increase?
Carmel Valley Road	East of Rio Road	69.3	69.3	0.0	No
	Rio Road to Carmel Middle School	69.3	69.5	0.2	No
	Carmel Middle School to Carmel Rancho Boulevard	69.6	69.8	0.2	No
Carmel Rancho Boulevard	South of Carmel Valley Road	64.4	64.4	0.0	No
	North of Rio Road	63.3	63.4	0.1	No
Rio Road East	South of Carmel Valley Road	48.6	52.8	4.2	No
Rio Road West	Project site to Carmel Rancho Boulevard	51.5	53.7	2.2	No
	Carmel Rancho Boulevard to Highway 1	62.5	62.6	0.1	No

Source: **Appendices G and X**.
*50 feet from roadway centerline
CNEL = community noise equivalent level
dBA = A-weighted decibel

Single-Family Residences

The noise exposure at the lots closest to the baseball fields and batting cage is expected to be 52.9 CNEL, as indicated by the long-term measurement conducted at site LT-2 (**Table 3.9-3**). Corresponding interior noise levels would be approximately 37.9 CNEL (52.9 – 15 = 37.9). Noise exposure at lots closest to the golf course is predicted to be the same as the noise indicated for the lots closest to the baseball fields and batting cage area 52.9 CNEL, because site LT-2 was located near the baseball area as well as the golf course. Noise exposure at lots closest to the Carmel School District Maintenance Facility and transportation yard is predicted to be 47.6 CNEL exterior (see

long-term measurement conducted at LT-1 in **Table 3.9-3**) and 32.6 CNEL interior (47.6 – 15 = 32.6). Noise exposure at lots closest to Rio Road east is predicted to be 52.8 CNEL exterior (see modeled traffic noise for Rio Road east segment in **Table 3.9-7**) and 37.8 CNEL interior (52.8 – 15 = 37.8) as a reasonable worst case scenario. Traffic noise from Rio Road east would likely be lower than the aforementioned levels, because the traffic modeling assumes a distance of 50 feet from the roadway centerline. The single-family residences would likely be located at a distance greater than 50 feet from the centerline, leading to lower noise levels. All predicted traffic noise levels are less than 60 CNEL exterior and 45 CNEL interior.

The project residences would be exposed to temporary noise from lawn mowers, which would be used for maintenance of the golf course. However, the noise from lawn mowers would be short in duration and would be consistent with noise generated by maintenance activities typically associated with a residential area. In addition, noise measured at the northern border of the golf course was determined to be 52.9 CNEL, which is below the day-night noise level at activity areas of 60 CNEL or greater. Thus, this source of noise would have a *less-than-significant* effect on residential land uses for the Proposed Project.

Noise from the batting practice area and baseball fields could temporarily result in elevated noise levels, but the 24-hour noise would be below 60 CNEL exterior and 45 CNEL interior, as indicated by the long-term measurement conducted at site LT-2. Nevertheless, the exposure of the single-family residences to noise from the batting area and baseball fields would be *potentially significant* during active use periods. This impact can be mitigated to a *less-than-significant* level through implementation of **Mitigation Measure NOI-1**.

130-Unit Alternative

Similar to the Proposed Project, the 130-Unit Alternative would also expose new single-family residences, condominiums, duplexes, and apartments to noise. The residential units under the 130-Unit Alternative, with the exception of Lot 130, would experience similar levels of exterior and interior noise as those discussed above for the Proposed Project. Noise exposure at lots near the Community Church of the Monterey Peninsula, the Rancho Cañada Golf Club, and Carmel School District Maintenance Facility and transportation yard would not be expected to exceed 48 CNEL exterior and 33 CNEL interior (48 – 15 = 33), as indicated by the CNEL measured at LT-1 (**Table 3.9-3**).

Noise exposure from the golf course, as discussed for the Proposed Project, would be temporary and not expected to result in a day-night noise levels at outdoor activity areas of more than 60 dBA CNEL. Thus, this source of noise would have a *less-than-significant* impact on residential land uses for this alternative.

The units that are closest to the batting practice area and baseball fields could experience temporarily elevated noise levels during active use periods. However, as discussed for the Proposed Project, noise measured south of the baseball field area where the closest units would be was determined to be 52.9 CNEL, which would result in an interior noise level of approximately 37.9 CNEL (52.9 – 15 = 37.9). Thus, similar to the Proposed Project, noise levels would be below 60 CNEL for the land uses under the 130-Unit Alternative, excluding Lot 130, although noise could be temporarily elevated at residences near the baseball area. Implementation of **Mitigation Measure NOI-1** would reduce temporarily elevated noise levels during the active use periods on the baseball fields.

Lot 130 would be developed with a single-family residence. Lot 130 is immediately adjacent to Carmel Valley Road and extends up to 300 to 400 feet south and, thus, traffic noise levels would range from 69.3 CNEL at 50 feet from Carmel Valley Road (**Table 3.9-8**) to 60[1] CNEL at 429 feet from Carmel Valley Road. Thus, traffic from Carmel Valley Road could cause noise levels that exceed 60 CNEL exterior and 45 CNEL interior. Implementation of **Mitigation Measure NOI-1** would reduce noise exposure at these areas. Noise reducing treatments would be implemented when the development is being completed, reducing *potentially significant* noise impacts to a *less-than-significant* level.

Mitigation Measure NOI-1: Implement Noise-Reducing Treatments at Residences Located Near the Batting Practice Area and Lot 130

Prior to construction, the Project Applicant will retain a qualified acoustical consultant to identify specific outdoor and indoor residential areas near the baseball fields and batting practice area and residential areas on Lot 130 that could be exposed to noise exceeding 60 CNEL exterior and 45 CNEL interior. The consultant will prepare a report which identifies specific treatments to be implemented that will reduce exterior and interior noise to less than 60 CNEL and 45 CNEL, respectively. Treatments that can be implemented to achieve these performance standards may include those listed below.

- Construction of a solid barrier between the batting practice area and the outdoor use areas (for residential areas near the baseball fields and batting practice area) or between Carmel Valley Road and Lot 130.
- Upgraded acoustical insulating of building structures.
- Addition of fresh air ventilation to allow windows to be closed when baseball games or batting practice is occurring (for residential areas near the baseball fields and batting practice area) or the residence on Lot 130 along Carmel Valley Road.
- For Lot 130, any solid barriers (soundwalls, earthen berms, or other structures) proposed to attenuate Carmel Valley Road traffic noise shall be designed to preserve the rural character and views along Carmel Valley Road, which may require setback from Carmel Valley Road and/or use of screening vegetation to hide any proposed solid structures. If such barriers must be set back from Carmel Valley Road to maintain scenic road views, this may require relocation or realignment of the Lot 130 residence to locations further from the roadway.

The report will be submitted to the County for review and approval prior to issuance of buildings permits.

[1] This assumes the standard geometric attenuation of -3 dB per doubling of distance, and, conservatively, assumes that there is no ground attenuation effect.

Table 3.9-8 Traffic Noise Modeling Results for the 130-Unit Alternative

Road	Segment	Existing CNEL*	Existing + 130-Unit Alternative CNEL*	Project Increase in Noise (dBA)	Significant Noise Increase?
Carmel Valley Road	East of Rio Road	69.3	69.3	0.0	No
	Rio Road to Carmel Middle School	69.3	69.5	0.2	No
	Carmel Middle School to Carmel Rancho Boulevard	69.6	69.8	0.2	No
Carmel Rancho Boulevard	South of Carmel Valley Road	64.4	64.5	0.1	No
	North of Rio Road	63.3	63.4	0.1	No
Rio Road East	South of Carmel Valley Road	48.6	51.8	3.2	No
Rio Road West	Project site to Carmel Rancho Boulevard	51.5	51.5	0.0	No
	Carmel Rancho Boulevard to Highway 1	62.5	63.4	0.9	No

Source: **Appendices G and X**.
*50 feet from roadway centerline
CNEL = community noise equivalent level
dBA = A-weighted decibel

Impact NOI-2: Exposure of Offsite Noise-Sensitive Land Uses to Increased Noise (less than significant)

Proposed Project

Table 3.9-7 summarizes predicted traffic noise levels under existing and existing plus Project conditions. The modeling of the roadway intersections in the vicinity of the Project site was conducted using peak-hour traffic volumes. Therefore, the noise modeling resulted in 1-hour L_{EQ} values at a distance of 50 feet from the centerline of the roadway, which was generally the worst-case closest distance. Therefore, the results were converted into approximate CNEL values based on trends apparent in the long-term, onsite noise measurements.[2]

The traffic noise modeling results in **Table 3.9-7** indicate that with the exception of Rio Road west and Rio Road east, Project-related increases in traffic noise would be less than 1 dB at all roadways in the area. As shown in **Table 3.9-7**, all Project-related increases would be below 3.0 dBA, the threshold for most people to notice a change in noise, except for Rio Road east south of Carmel Valley Road. The increase in traffic noise at this roadway segment would be 4.2 dBA, which is above the threshold of perceptibility and could be noticeable to some people. However, because the existing traffic noise and existing plus Project traffic noise would be below 60 CNEL, which is considered normally acceptable according to the General Plan compatibility standards for single-family residential areas, the increase in traffic noise would not result in incompatible noise levels for

[2] Long-term 24-hour noise measurements were conducted near the project site, as discussed above; in general, the peak-hour noise captured during the long-term measurement was up to approximately 2 dBA higher than the total CNEL for each 24-hour measurement. Therefore, the 1-hour L_{eq} modeling results were converted into CNEL values by subtracting 2 dBA from each L_{eq} result.

the existing church, existing school or new residences. The noise impact of the Proposed Project on the affected roadways is therefore considered to be *less than significant*, and no mitigation is required.

130-Unit Alternative

Traffic volumes associated with the 130-Unit Alternative would generally be less than those associated with Proposed Project due to the fewer number of housing units under the 130-Unit Alternative. The 130-Unit Alternative would have less than half of the number of development units as the Proposed Project. Pedestrian and emergency vehicles would use the Rio Road west extension of the 130-Unit Alternative only. Through traffic would not be permitted from the project to travel directly to Rio Road west. **Table 3.9-8** summarizes predicted traffic noise levels under existing and existing plus 130-Unit Alternative conditions.

Similar to the Proposed Project traffic modeling results, the traffic noise modeling results in **Table 3.9-8** for the 130-Unit Alternative indicate that with the exception of Rio Road east (South of Carmel Valley Road), 130-Unit Alternative-related increases in traffic noise would be less than 1 dBA, which is well below the threshold of perceptibility. As shown in **Table 3.9-8**, the increase in traffic noise at the Rio Road east segment, south of Carmel Valley Road, would be 4.6 dBA, which is above the threshold of perceptibility and could be noticeable to some people. However, because the existing traffic noise and existing plus 130-Unit Alternative traffic noise would be below 60 CNEL, which is considered normally acceptable according to the General Plan compatibility standards for single-family residential areas, the increase in traffic noise would not result in incompatible noise levels for the existing church, existing school or new residences. The noise impact of the 130-Unit Alternative on the affected roadways is, therefore, considered to be *less than significant*, and no mitigation is required.

B. Short-Term Increases in Noise

Impact NOI-3: Exposure of Noise-Sensitive Land Uses to Construction Noise (less than significant with mitigation)

Proposed Project

Short-term construction noise impacts may occur during construction of the Proposed Project. Construction noise generates noise levels in the range of 75 to 95 dBA at a distance of 30 feet (**Appendix G**) from the source and has the potential to disturb nearby residential and public land uses. Noise from construction equipment (a point source) attenuates at a rate of 6 dB per doubling of distance. At receptor locations approximately 250 feet from the site, construction noise would be in the range of 56 to 76 dBA. Because construction noise could exceed 85 dBA at 50 feet, and there are residences within 2,500 feet of where construction would take place, noise from construction would be *potentially significant*. Implementation of **Mitigation Measure NOI-2** would reduce this impact to a *less-than-significant* level.

130-Unit Alternative

As discussed for the Proposed Project, construction noise associated with the 130-Unit Alternative has the potential to disturb nearby residential land uses. Thus, the same general type of equipment would be used as for the Proposed Project. Although the 130-Unit Alternative has fewer development units than the Proposed Project, the noise that would be generated during residential

construction would be comparable to the noise generated under the Proposed Project. It is expected that the same number and type of construction equipment pieces could operate simultaneously to construct the development and utilities of the 130-Unit Alternative as those used for the Proposed Project. Thus, the range of noise would also be between 75 to 95 dBA at a distance of 30 feet. Consequently, construction noise could exceed 85 dBA at 50 feet, and there are residences located within 2,500 feet of where construction would take place. Consequently, the residences adjacent to these lots could experience construction noise that is substantial so this impact would be *potentially significant*. Implementation of **Mitigation Measure NOI-2** would reduce noise impacts to a *less-than-significant* level.

Mitigation Measure NOI-2: Employ Noise-Reducing Construction Practices

During construction, the Project Applicant will implement noise reducing construction practices such that noise from construction is incompliance with the Monterey County Health and Safety Noise Control Ordinance. The ordinance limits construction noise to 85 dBA measured 50 feet from the noise source when construction is located within 2,500 feet of any occupied dwelling unit. Measures that would be implemented to comply with the requirement may include those listed below.

- Prohibit night-time and weekend construction and schedule all construction for daytime hours between 7:00 a.m. and 5:00 p.m. Monday through Friday.
- Require all internal combustion engines used at the project site to be equipped with a type of muffler recommended by the vehicle manufacturer.
- Require all equipment to be in good working condition to minimize noise created by faulty or poorly maintained engine, drive train, and other components.
- Restrict or prohibit construction traffic on Rio Road west of the project site. All construction equipment should access the site via Rio Road east from Carmel Valley Road to minimize noise at existing residences.
- Require all diesel equipment to be located more than 200 feet from any residence if equipment is to operate more than several hours per day.
- Place of berming or stockpiled material between equipment and noise sensitive location to reduce construction noise.
- Use scrapers as much as possible for earth removal rather than noisier loaders and haul trucks.
- Use a backhoe for backfilling which is quieter than dozers or loaders.
- Shield or enclose power saws where practical to decrease noise emissions. Use nail guns where possible instead of manual hammering.

C. Vibration Impacts

Impact NOI-4: Exposure of Sensitive Land Uses to Vibration from Construction Activity (less than significant)

Proposed Project

The operation of heavy construction equipment would produce ground vibration. The highest vibration levels are typically created by high impact equipment such as pile driving. Operation of other equipment such as scrapers and graders does not produce perceptible ground vibration beyond about 250 feet (Federal Transit Administration 2006). Noise sensitive land uses within 250 feet of the project area include a church to the north and residences to the west of the project site. However, because no high impact construction equipment would be used, and the distance between the project site and the sensitive land uses is between 200 and 250 feet, ground vibration would not be substantially perceptible. This impact would be *less than significant*. No mitigation is required.

130-Unit Alternative

Similar to the Proposed Project, the 130-Unit Alternative would not utilize high impact construction equipment that could generate substantial ground vibration. It is not likely that the residential property on Lot 130 would require pile driving activities. There would be noise-sensitive land uses within 250 feet of the site boundaries, identical to the Proposed Project, including a church to the north and residences to the west of the 130-Unit Alternative site that are located between 200 and 250 feet from the project site. In addition, there are existing residential structures directly east of Lot 130. Nevertheless, the construction equipment that would be used to construct the 130-Unit Alternative would not be high-impact equipment. Any ground vibration that does occur from the Proposed Project would be minor and temporary and would not be substantially perceptible. Therefore, this impact would be *less than significant*. No mitigation is required.