4.11 Noise

This Section describes the potential noise and vibration impacts of the proposed Project. It includes a discussion of noise and vibration fundamentals, existing regulatory requirements, the existing noise setting within the Project area, and noise and vibration impacts that would result from implementation of the proposed Project. The analysis is based on the *Noise and Vibration Analysis Report, The Cove at El Niguel, Laguna Niguel, California*, prepared by A/E Tech LLC, dated February 7, 2022, provided in Appendix K of this Draft Environmental Impact Report (Draft EIR).

4.11.1 Setting

Measurement of Noise

The standard unit of measurement of the loudness of sound is the decibel (dB). Decibels are based on a logarithmic scale. The logarithmic scale compresses the wide range in sound levels resulting in a more usable range of sound level values (similar to the Richter scale used to measure earthquakes). To humans, a sound 10 dB higher than another is considered to be twice as loud; a sound 20 dB higher than another is considered four times as loud; etc. Typical daily sounds in the environmental range from 30 dB (very quiet) to 100 dB (very loud). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale is utilized to relate noise to human sensitivity. The A-weighted decibel (dBA) scale performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Community noise levels are measured in terms of the dBA.

A-weighting is the measure most commonly used for traffic and environmental noise. Most community noise standards utilize A-weighting because, as described above, it accurately reflects human hearing and thereby provides for a high degree of correlation with human annoyance and health effects.

Table 4.11-1, seen below, shows the noise levels of common sounds measured in the environment and their effects. The actual impact of noise is not a function of loudness alone. The time-of-day noise occurs and duration of the noise are also important. In addition, frequency content (pitch) of the noise, and its onset rate (i.e., whether it is impulsive) affect people's reactions to the noise. Higher pitch sounds are typically more easily audible to an average human, and therefore, tend to be more annoying. A pure tone sound can be perceived more easily by humans than a variable-pitch sound of the same intensity. Furthermore, an impulsive noise with a very quick onset rate, such as a hammer drop or pile driving noise, can be more disturbing than a regular noise because of its startle effect.

Most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors, such as L_{eq}, L_{min}, L_{max}, L_n, and CNEL (or L_{dn}), are used to quantify noise

levels. While the existing background noise measurements conducted in and around the Project area have been conducted in term of various metrics, the primary noise descriptors used for this study are the average noise level (L_{eq}) and the Community Noise Equivalent Level (CNEL).

The L_{eq} is the equivalent steady-state sound level that, within a stated period of time, would contain the same acoustical energy as the time-varying sound level during the same period. The L_{eq} (h) is the energy-average of the A-weighted sound levels, occurring during a 1-hour period, in decibels (i.e., a 1-hour L_{eq}). CNEL is the average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m. to 10:00 p.m. and addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.

From the source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise decreases with distance depends on:

- Geometric spreading from point and line sources
- Ground absorption
- Atmospheric effects and refraction
- Shielding by natural and man-made features, noise barriers, diffraction, and reflection

Sounds from a small, localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level decreases or drops-off at a rate of 6 dBA for each doubling of the distance (6 dBA/DD). However, highway traffic noise is not a single, stationary point source of sound. The movement of the vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval.

Changes in noise levels are typically perceived by the human ear as follows:

- A 3-dBA change is barely perceptible.
- A 5-dBA change is readily perceptible.
- A 10-dBA change is perceived as a doubling or halving of noise.

For determination of significance of noise impacts in a given environment, noise level changes brought about by a specific project (or set of projects) are often evaluated in the context of preexisting noise conditions in that environment. For quieter existing noise environments, as opposed to already noisy environments, project-induced noise level changes are allowed to be higher before the project causes a significant impact.

Table 4.11-1. Typical Sound Levels Measured in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,00 Feet		
	100	
Gas Lawnmower at 3 Feet		
	90	
Diesel Truck at 50 Feet at 50 mph		Food Blender at 3 Feet
	80	Garbage Disposal at 3 Feet
Noisy Urban Area, Daytime		
Gas Lawnmower at 100 Feet	**70**	Vacuum Cleaner at 10 Feet
Commercial Area		Normal Speech at 3 Feet
Heavy Traffic at 300 Feet	**60**	
		Large Business Office
Quiet Urban Daytime	**50**	Dishwasher Next Room
Quiet Urban Nighttime	**40**	Theater (Background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night
	20	
		Broadcast/Recording Studio
	10	
	0	

Source: A/E Tech LLC

Measurement of Vibration

When the ground is subject to vibration from a source, such as heavy construction machinery, a disturbance propagates away from the vibration source. The ground vibration waves created are similar to those that propagate in water when a stone is dropped into the water.

When the ground is subject to vibratory impact, vibration waves propagate outward from the source of impact. These waves encounter an increasingly large volume of material in the ground as they travel outward, and the energy density in each wave decreases with distance from the source. This decrease in energy density and the associated decrease in displacement amplitude is called spreading loss, otherwise known as vibration attenuation.

The quantities that are used to describe vibratory motion include displacement, velocity, and acceleration. In describing vibration in the ground and in structures, the concepts of particle

displacement, velocity, and acceleration are used to describe how the ground or structure responds to excitation. Vibratory motion is commonly described by identifying the peak particle velocity (PPV) or peak particle acceleration (PPA). Velocity is measured in inches per second (in/sec) or millimeters per second (mm/sec). Acceleration is measured in in/sec per second (in/sec^2), mm/sec per second (mm/sec^2), or relative to the acceleration of gravity (g) (32.2 feet [ft.]/sec^2).

Soil and subsurface conditions are known to have a strong influence on the levels of groundborne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock. Experience with groundborne vibration is that vibration propagation is more efficient in stiff clay soils, and shallow rock seems to concentrate the vibration energy close to the surface and can result in groundborne vibration problems at large distances from the source. Factors such as layering of the soil and depth to water table can have significant effects on the propagation of groundborne vibration.

When the ground surfaces of the excitation source and the receiver are at different elevations, much of the vibration energy carried through waves causing surface displacement of the ground dissipates. This results in weaker vibratory motion at the receiver than if the receiver were at the same elevation as the source.

4.11.2 Existing Site Conditions

The main source of noise currently affecting the Project area is local vehicular traffic on Crown Valley Parkway located along the east side of the Project site. Other noise sources include occasional distant aircraft overflights, occasional landscape maintenance activities, and other natural sounds, such as those from chirping birds. The Project site is vacant and does not produce existing short-term or long-term on-site noise levels of which will be further analyzed in this chapter.

Ambient Noise

To determine existing ambient noise levels on and surrounding the Project site, two long-term (24 hour) and five short-term (15 minute) noise level measurements were taken. The two 24-hour measurements were taken in two different locations: near the backyard of the residence at 30581 North Hampton Road (LT 1) and in the southwest corner of the Project site (LT 2). The five short-term (15 minute) measurements were taken in the following areas surrounding the Project site: ST1) near the outdoor area of 30562 Via Estoril; ST2) near the outdoor area of 30652 Via Estoril; ST3) north of Building 1 within the La Vista Condominiums; ST4) north of Building 22 within the La Vista Condominiums; and ST5) on the public sidewalk next to 30652 Paseo Del Niguel.

Short-term background noise measurements indicate that existing daytime noise levels at exterior of single- and multi-family land uses west and southwest of the Project site, away from Crown Valley Parkway, are 46 to 48 dBA. At outdoor locations of condominiums south of the Project site

and closer to Crown Valley Parkway, exterior average daytime noise levels are approximately 58 dBA. Within the single-family residential neighborhoods beyond the first row of homes east of the Project site across Crown Valley Parkway, outdoor daytime noise levels are between 48 to 52 dBA. All the measured daytime background noise levels are typical of residential settings and considered relatively quiet.

The long-term measurements are reported in CNEL, which is a 24-hour weighted average and used to determine land use compatibility. The two long-term measurements were 50 dBA CNEL for LT 1 and 47.5 dBA CNEL for LT2.

During construction and operation of the proposed Project, the existing noise-sensitive receivers in the vicinity of the proposed Project include single-family residences to the north, east, and west of the Project site, and multi-family residences to the south. Figure 4.11.A shows the locations of the sensitive residential noise receivers and Table 4.11-2 shows the distance to proposed construction and the closest residences surrounding the site.

Table 4.11-2. Existing Sensitive Receivers Distance and Sound Levels

Receiver Location	Range of Distance to Construction (Feet)	Existing Sound Level (dBA)
C1: 30562 Via Estoril	455 -1,000	48
C2: 30652 Via Estoril	325 - 900	47
C3: Building 22, The Vista Condominiums	135 - 625	58
C4: First-Row Homes, Paseo Del Niguel	140 - 735	50
C5: Single-Family Homes, N Hampton Rd	70 - 610	46

Source: A/E Tech LLC

4.11.3 Related Policies and Regulations

Federal Regulations

The Occupational Safety and Health Act of 1970 (OSHA) governs worker exposure to noise levels. This regulation applies to all phases of the proposed project and is designed to limit worker exposure to noise levels of 85 dBA or lower over an eight-hour period. The U.S. Department of Transportation has also developed regulations that govern noise standards for designing highways.

State Regulations

Government Code Section 65302(g)

California Government Code Section 65302(g) requires the preparation of a Noise Element, which shall identify and appraise the noise problems in the community. The Noise Element shall recognize the guidelines adopted by the Office of Noise Control in the State Department of Health

Services and shall quantify, to the extent practicable, current and projected noise levels for the following sources:

- Highways and freeways;
- Primary arterials and major local streets;
- Passenger and freight on-line railroad operations and ground rapid transit systems;
- Aviation and airport-related operations;
- Local industrial plants; and
- Other ground stationary noise sources contributing to the community noise environment.

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Noise Measurement Locations
The Cove at El Niguel

LT# 24-hour Noise Measurement Location

ST# Short-term Noise Measurement Location

Noise & Vibration

Source: AE Tech (02/2022).

Figure 4.11.A Sensitive Receivers and Noise Measurement Locations

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Local Regulations

Laguna Niguel Zoning Code

Article 1 of Division 6 of the Laguna Niguel Zoning Code (LNZC) contains the City's noise regulations. Section 6.6 of the LNZC provides the City's noise ordinance. The noise ordinance is intended to protect sensitive land uses from stationary (i.e., non-transportation) noise sources such as commercial and industrial activities, music, and mechanical equipment. Sections 6.6.5 and 6.6.6 of the noise ordinance set limits on the level and duration of noise that may affect the exterior and interior areas of residential properties, as summarized in Table 4.11-3. As shown in the table, the ordinance provides stricter noise limits at nighttime to reflect that people are typically more sensitive to noise during these hours.

Table 4.11-3. Laguna Niguel Noise Ordinance Standards at Residential Properties

		Noise Level (dBA) That May Not Exceed For More Than…				
Location	**Time Period**	**30 minutes per hour (L_{50})**	**15 minutes per hour (L_{25})**	**5 minutes per hour ($L_{8.33}$)**	**1 minute per hour ($L_{1.67}$)**	**Anytime (L_{MAX})**
Exterior	Daytime (7 a.m.-10 p.m.)	55	60	65	70	75
	Nighttime (10 p.m.-7 a.m.)	50	50	60	65	70
Interior	Daytime (7 a.m.-10 p.m.)	--	--	55	60	65
	Nighttime (10 p.m.-7 a.m.)	--	--	45	50	55

Source: City of Laguna Niguel, Zoning Code: Noise Control. Section 6.6.5: Exterior Noise Standards and Section 6.6.6: Interior Noise Standards.

If the alleged offensive noise consists entirely of impact noise, simple tone noise, speech or music, or any combination thereof, each of the noise levels specified in the table shall be reduced by 5 dBA.

If the ambient noise level exceeds any of the first four noise limit categories above (i.e., the 30-, 15-, 5-, or 1-minute limits), the cumulative period applicable to that category will be increased to reflect the ambient noise level. In the event the ambient noise level exceeds the fifth (i.e., anytime) noise limit category, the maximum allowable noise level under said category will be increased to reflect the maximum ambient noise level.

dBA = A-weighted decibels L_{max} = maximum sound level

Referring to Section 6.6.7(5) of the LNZC, construction noise is exempt from provisions in the noise ordinance provided that construction activities do not occur between the hours of 8:00 p.m. and 7:00 a.m. on weekdays or Saturdays, or at any time on Sundays or federal holidays.

Laguna Niguel General Plan

Noise Element

The Laguna Niguel General Plan (LNGP) includes a Noise Element, which is a comprehensive program to identify and temper environmental factors that potentially threaten community health and safety. The Noise Element requires consideration of potential noise impacts early in the planning process and provides interior and exterior noise standards for various land uses as summarized in Table 4.11-4. These noise standards are typically applied to transportation (i.e., non-stationary) noise standards.

Table 4.11-4. Laguna Niguel General Plan - Interior and Exterior Noise Standards

	Noise Standards (CNEL) (dBA)	
Land Use	**Interior**	**Exterior**
Residential Detached, Residential Attached	45	65
Neighborhood Commercial, Community Commercial	--	70
Professional Office	50	70
Industrial/Business Park	55[1]	75
Community Commercial/Professional Office	--	70
Professional Office/Industrial/Business Park/Community Commercial	--	75
Public/Institutional, Public Institutional/Professional Office	50	70
Schools	50[2]	65[2]
Parks and Recreation	--	70

Source: Laguna Niguel, General Plan: Noise Element. Chapter 6, Section VIII: Goals, Policies, and Actions (Table N-9). August 4, 1992.

Notes:

1. Where quiet is a basis for use
2. In interior or exterior Classroom Areas during school operating hours

dBA = A-weighted decibel

L_{max} = Community Equivalent Noise Level

4.11.4 Thresholds of Significance

Criteria for determining the significance of impacts related to noise are based on criteria contained in Appendix G of the State CEQA Guidelines and the City's CEQA Manual. The proposed Project could have a significant impact on the environment if it would result in any of the following.

Threshold NOI-1 *Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

Threshold NOI-2 *Generation of excessive groundborne vibration or groundborne noise levels?*

Threshold NOI-3 *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, would the project expose people residing or working in the project area to excessive noise levels?*

According to the City's CEQA Manual, construction activities lasting more than ten (10) days in a three (3)-month period would cause a significant noise impact at residential land use if they result in the ambient exterior 8-hour average noise level (L_{eq}) to exceed 80 dBA during daytime hours of 7:00 a.m. to 7:00 p.m.

As related to operational noise, if baseline noise levels at nearest noise-sensitive land uses without a project are below 55 dBA CNEL, Project operation would result in a significant noise impact if it causes noise level increases of 10 dBA CNEL or more in ambient noise levels.

The City has established its CEQA thresholds of significance for vibration impacts from the California Department of Transportation (Caltrans) as shown in Table 4.11-5 and Error! **Not a valid bookmark self-reference.** lists the vibration damage criteria for four general categories of buildings. These criteria are expressed in terms of PPV, which is the maximum instantaneous positive or negative peak of the vibration signal, often used in monitoring of construction vibration (such as blasting) since it is related to the stresses that are experienced by buildings.
below.

Error! Not a valid bookmark self-reference. lists the vibration damage criteria for four general categories of buildings. These criteria are expressed in terms of PPV, which is the maximum instantaneous positive or negative peak of the vibration signal, often used in monitoring of construction vibration (such as blasting) since it is related to the stresses that are experienced by buildings.

Methodology

Construction Noise

The City's CEQA Manual provides guidance for assessing a project's construction noise impacts as follows. Typically, construction noise does not cause substantial noise at distances beyond 500 feet from construction activities or when construction is limited to allowed days and times. Therefore, the following noise screening criteria may be used for a new project construction:

- Would construction activities occur within 500 feet of a noise sensitive use?

- Would construction occur between the hours of 8:00 p.m. and 7:00 a.m. Monday through Saturday, or anytime on Sunday or federal holidays?

A "yes" response to either of the preceding questions indicates further study is required. Based on the above criteria, projects that do not qualify for an exemption from a construction noise assessment shall prepare a detailed analysis of construction noise impacts on sensitive receptors according to the methodology and criteria contained in the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* dated September 2018 (FTA Manual) or most current version. Specifically, the construction noise assessment shall be prepared in accordance with "Option B: Detailed Analysis" included in the FTA Manual. The thresholds of significance applied to construction projects within the City are the FTA standards found in Table 7-3 of the FTA Manual titled, *Table 7-3 Detailed Analysis Construction Noise Criteria*. For a development project adjacent to residential receptors the daytime construction noise threshold is 80 dBA L_{eq} 8 hour. Nighttime construction activities are generally prohibited by the Laguna Niguel Municipal Code, however if an exemption is provided, the construction noise thresholds found in Table 7-3 of the FTA Manual would also apply to nighttime construction. The Nighttime threshold of significance for construction noise at residential properties is 70 dBA L_{eq} 8 hour.

Operations Noise

The City's CEQA Manual provides guidance for assessing a project's operational noise impacts as follows. Project operational impacts are generally due to the project including single or multiple noise sources within the project site (stationary sources) or causing increases in vehicular traffic on city streets (mobile sources), or both. A project would cause a significant noise impact if (1) the project causes ambient exterior noise levels at nearby noise-sensitive uses to increase above 65 dBA CNEL; or (2) baseline noise levels at nearest noise-sensitive land uses without the project are below 55 dBA CNEL and the project results in noise level increases of 10 dBA CNEL or more in ambient noise levels; or (3) baseline noise levels at nearest noise-sensitive land uses without the project are in the range of 55-60 dBA CNEL and the project results in ambient noise levels that are 5 dBA CNEL or more above baseline noise levels; or (4) baseline noise levels at nearest noise-sensitive land uses without the project are above 60 dBA CNEL and the project results in a noise level increase of 3 dBA CNEL or more above baseline noise levels.

A noise measurement survey consisting of long-term (24-hour) and short-term (15-minute) noise measurements was conducted at seven locations representative of noise-sensitive receivers nearest to the Project site (see above Figure 4.11.A). The noise measurements consisted of 24-hour measurements at two of the monitoring sites (LT1 and LT2, located near the north and west parts of the Project site), and short-term measurements at the remaining sites (ST1 through ST5) representing other noise-sensitive uses surrounding the Project site. The purpose of the 24-hour measurements was to capture variations in background noise levels during the day and night hours and capture CNEL values typical of the adjoining existing homes in the Project area. The short-term noise levels were conducted in order to quantify existing background noise levels at

representative noise-sensitive locations around the Project site during the daytime hours when future construction activities would occur. Short-term Crown Valley Parkway traffic noise measurements and concurrent traffic counts were also conducted at one additional location within the Project site (ST6) in order to validate the noise model developed for Crown Valley Parkway traffic.

Characteristic noise sources are typically identified with land use intensification such as that proposed for the development of the proposed Project. Construction activities, especially construction heavy equipment and traffic, will create short-term noise increases near the Project site. Such impacts would be important for nearby noise-sensitive receptors, such as any existing residential uses. Upon completion of Project construction, Project-related traffic will cause an incremental increase in area-wide noise levels throughout the Project area. Traffic noise impacts are analyzed to ensure that the Project does not adversely impact the acoustic environment of the surrounding community.

For assessment of potential future noise impacts due to the proposed Project, temporary noise exposure during the construction phase and permanent noise effects due to existing traffic on area roadways and additional traffic generated by the project are evaluated.

Noise levels due to construction of the proposed project are estimated based upon available reference noise level data from construction equipment (FHWA, 2006), distance between construction activities and nearest representative noise-sensitive receiver locations, and shielding effects of local terrain, where applicable.

Traffic noise levels were evaluated using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) version 2.5 computer program. TNM is the latest analytical method developed for roadway traffic noise prediction. The model is based upon reference energy emission levels for automobiles, medium trucks (2 axles), heavy trucks (3 or more axles), buses and motorcycles, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, atmospheric conditions, and the acoustical characteristics of the site. TNM was developed to predict hourly L_{eq} values for free-flowing and interrupted-flow traffic conditions.

Traffic data used in the noise model were developed from the Project construction and operation traffic study data provided by the Project traffic consultant (LLG, 2021) and included in Appendix L. Peak-hour and daily traffic volumes with and without the Project for existing (2020) conditions were utilized in TNM to assess changes in noise exposure of noise-sensitive uses due to traffic changes induced by the proposed Project.

Construction Vibration

The City's CEQA Manual provides guidance for assessing a project's construction vibration impacts. Table 4.11-5 and Table 4.11-6 are thresholds of vibration levels that pertain to both

building damage and human annoyance from groundborne vibration. These levels are expressed in terms of Peak Particle Velocity (PPV), which is often used in construction vibration (such as blasting) monitoring because it is related to the stresses that are experienced by buildings.

Table 4.11-5. Construction Vibration Damage Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.10
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.		

Source: City's CEQA Manual (Caltrans Transportation and Construction Vibration Guidance Manual, 2013)

Criteria listed in Table 4.11-6 are thresholds of vibration levels that would result in annoyance or interference with activities of people. These levels are also expressed in terms of the PPV. The City has adopted the "distinctly perceptible" levels as its threshold of significance for people's sensitivity to vibration.

Table 4.11-6. Groundborne Vibration Potential Annoyance Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.		

Source: City's CEQA Manual (Caltrans Transportation and Construction Vibration Guidance Manual, 2013)

For estimation of groundborne vibration levels at the nearest residential structures in the vicinity of the Project site due to Project construction, reference vibration levels were obtained from the Caltrans *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2013). Local ground vibration attenuation rate was determined based on the type of soil within the Project site.

Ground vibration attenuation rate was then applied to reference vibration levels from construction machinery to predict the levels of construction vibration at the nearest residential structures to the Project site. Estimated construction vibration levels are compared with applicable building damage and human perceptibility criteria to determine Project vibration impacts at neighboring receivers.

4.11.5 Project Design Features and Standard Conditions of Approval

SCA NOI-1 Limit construction hours and employ noise-reducing construction practices. The following noise control measures shall be incorporated into the project contract specifications in order to minimize construction noise effects.

- Construction activities shall be limited to the hours of 7:00 a.m. to 8:00 p.m. on weekdays and Saturdays, and shall not occur at any time on Sundays or federal holidays. Construction personnel shall not be permitted on the job site, and material or equipment deliveries and collections shall not be permitted, outside of these hours.

- All mobile or fixed construction equipment used on the project that is regulated for noise output by a local, state, or federal agency shall comply with such regulations while in the course of project activity.

- All construction equipment shall be properly maintained. (Poor maintenance of equipment may cause excessive noise levels.)

- All construction equipment shall be operated only when necessary and shall be switched off when not in use.

- Construction employees shall be trained in the proper operation and use of the equipment. (Careless or improper operation or inappropriate use of equipment can increase noise levels. Poor loading, unloading, excavation, and hauling techniques are examples of how a lack of adequate guidance and training may lead to increased noise levels.)

- Electrically powered equipment shall be used instead of pneumatic or internal combustion– powered equipment, where feasible.

- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors.

- Construction site and access road speed limits shall be established and enforced during the construction period.

- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.

- To minimize potential public objections to unavoidable noise, the contractor shall maintain good communication with the surrounding community regarding the schedule, duration, and progress of the construction. Notification shall be provided advising that there will be loud noise associated with construction and providing a telephone contact number for affected parties to ask questions and report any unexpected noise levels. The on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints.

- Prior to issuance of a grading and/or a building permit, the name and phone number of the on-site construction supervisor shall be submitted to the Community Development and Public Works Departments. In addition, clearly visible signs shall be posted on the perimeter of the site indicating who shall be contacted for information regarding this development and any construction/grading-related concerns. This contact person shall be available immediately to address any concerns or issues raised by adjacent property owners during the construction activity. The contact person will be responsible for ensuring compliance with the City imposed Mitigation Measures and Conditions of Approval (e.g., grading activities, truck routes, construction hours, noise, etc.).

SCA NOI-2 To minimize construction equipment noise, the Applicant or designee shall implement the following construction noise reducing practices:

- All construction equipment and vehicles using internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specifications.

- Place construction staging and equipment storage areas at locations as far away from noise-sensitive locations as possible.

4.11.6 Environmental Impact Evaluation

Threshold NOI-1	*Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

Less than Significant. As indicated previously, all the measured daytime background noise levels are typical of residential settings and considered relatively quiet. Exterior of single- and multi-

family land uses west and southwest of the Project site, away from Crown Valley Parkway range from 46 to 48 dBA and closer to Crown Valley Parkway exterior average daytime noise levels are about 58 dBA.

Construction Noise

During the construction of the proposed Project, overall noise levels would vary based on the construction activity, the types of equipment used, when the equipment is being operated, and the distance from construction activities to neighboring noise-sensitive receivers. Grading and excavating generates the highest noise levels and would potentially impact surrounding noise-sensitive receivers.

Grading and excavating would take place over a period of two to six working weeks. Equipment estimated to be utilized during peak grading activities include two scrapers, one dozer, one motor grader, and one water truck. The noise levels at exterior areas of the nearest neighboring noise-sensitive receivers (see Figure 4.11.A), were estimated for grading and excavation activities by using equipment reference noise levels, equipment utilization rates, and estimated distances to each receiver.

Typical construction equipment noise level data were obtained from the Roadway Construction Noise Model developed by the Federal Highway Administration (FHWA, 2006). The noise database utilized for estimating construction noise levels includes maximum noise level from each piece of machinery at a reference distance of 50 feet. Noise attenuation due to distance is assumed to be 6 dBA per doubling of distance from the equipment. Approximate local shielding effects due to topography and property walls were also taken into account in the calculations.

Table 4.11-7 summarizes estimated ranges of grading/excavation noise levels in terms of hourly L_{eq} and compares the overall resultant noise levels to the existing background noise levels at each representative receiver location. These noise levels are based on a conservative assumption of non-stop grading activities by multiple construction equipment in each area during a full construction day. Therefore, because of variations in intensity of grading activities, it is unlikely that such noise levels would be generated for the full scheduled duration of grading/excavation.

Comparison of the combined construction and background noise levels to those existing at each location shows that grading and excavation operations would increase noise levels during construction, however the temporary increase in noise levels would remain below the threshold of significance of 80 dBA L_{eq} 8-hour and therefore result in a less than significant impact.

Table 4.11-7. Combined Construction and Existing Noise Levels (L_{eq}, dBA)

Receiver Location	Existing Sound Level	Range of Distances to Construction (feet)	Estimated Construction Noise Level	Combined Construction + Existing Noise Level	Significant Noise Impact?
C1: 30562 Via Estoril	48	455–1,000	55–62	56–62	No
C2: 30652 Via Estoril	47	325–900	56–65	57–65	No
C3: Building 22, The Vista Condominiums	58	135–625	59–72	62–72	No
C4: First-Row Homes, Paseo Del Niguel	50	140–735	53–67	55–67	No
C5: Single-Family Homes, N Hampton Rd	46	70–610	54–73	55–73	No

Source: A/E Tech LLC

Regulatory compliance with Laguna Niguel Municipal Code Section 6.6.5(b) as described in **SCA NOI-1** would limit construction to the hours of 7 a.m. and 8 p.m. on weekdays and Saturdays. Furthermore, noise reducing practices outlined in **SCA NOI-2** would further reduce temporary construction noise levels.

With windows and doors closed, standard residential building construction achieves outdoor-to-indoor noise reductions of 25 dBA or more. Therefore, interior noise levels at the homes immediately adjacent to the Project site would have interior noise levels of 48 dBA (73 dBA - 25 dBA = 48 dBA) or less. Such levels would be below the City's daytime interior noise level limit of 55 dBA (see Table 4.11-3) resulting in a less than significant impact and no mitigation is required.

Construction Traffic Noise

In addition to the increase in noise from on-site grading and excavation activities, vehicular traffic on local roadways will increase due to use of personal vehicles by construction employees and hauling trucks transporting materials and equipment to and from the Project site. Employee traffic during these most intensive construction activities would total five employee automobiles to the Project site in the AM peak-hour, two truck arrivals, and one truck departure from the Project site. As seen below in Table 4.11-8, this increase in traffic volume would be negligible and result in minimal increase in traffic noise levels along the local roadways utilized by traffic associated with the Project. Construction traffic increases during the PM peak hour would be even less, given construction operations typically shut down daily around 3:00 to 4:00 PM and outside of the typical daily evening peak hour.

Table 4.11-8. Comparison of AM Peak-Hour Traffic L_{eq} (dBA) Between Existing and Existing with Construction Conditions

Roadway Segment	AM Peak-hour Traffic Volume		Predicted Peak-hour Traffic Noise Level at 100 ft from Roadway Centerline		
	Existing	Existing With Construction	Existing	Existing With Construction	Noise Level Change
SB Crown Valley Pkwy – North of Project site	1,029	1,036	62.6	62.8	+0.2
NB Crown Valley Pkwy – North of Project site	749	750			
Based on the construction traffic assumptions, a total of 5 employee automobiles would travel to the project site in the AM peak-hour, two trucks would arrive at and one truck would depart from the Project site during this hour. Construction traffic is assumed to travel on Crown Valley Parkway north of the Project site.					

Sources: LLG, 2021
A/E Tech LLC, 2022

The increase of 0.2 dBA $_{Leq}$ would not be an audible change and is therefore a less than significant impact and no mitigation is required.

Operational Traffic Noise

Operational traffic would be minimal due to the Project's projected traffic volumes. During the AM and PM peak hours, the Project would generate 10 and 12 vehicle trips, respectively. Over a 24-hour period, the Project would generate a total of 161 vehicle trips. Based on the FHWA TNM version 2.5 model, the addition of 161 average daily trips to the existing traffic volumes on Crown Valley Parkway would cause an increase of 0.1 dBA CNEL, resulting in a less than significant impact. No mitigation is required.

Threshold NOI-2 *Generate an of excessive groundborne vibration or groundborne noise levels?*

Less Than Significant Impact

Building Damage Vibration Impact

Construction of the Project would require large steel-tracked earthmoving equipment such as bulldozers that produce vibration noise affecting surrounding land use. A large bulldozer can produce vibration levels of 0.089 inches per second and a small bulldozer can produce 0.003 inches per second of vibration at a reference distance of 25 feet (Caltrans 2013). The soil type at the Project site may be categorized as competent soil type, which generally includes sandy clays, silty clays, gravel, silts, or weathered rock (American Geotechnical, 2021), for which the dampening effects have been considered.

As seen below in Table 4.11-9, compared to the established City vibration criteria, the highest groundborne vibration level of 0.023 in/sec due to a large bulldozer is far below the damage criteria for all building categories. In terms of perceptibility to the people living near the Project site, the estimated vibration levels generated by a large dozer would be below the limit of 0.04 in/sec significance threshold for frequent intermittent events at all the residential buildings nearest to the Project site. Vibration levels due to a small dozer would be well below all the sensitivity criteria at any of the neighboring structures

Table 4.11-9. Calculated Groundborne Vibration Levels (PPV, in/sec)

Receiver	Distance (feet)	Large Dozer	Small Dozer
1: 30562 Via Estoril	479	0.001	0.00005
2: 30652 Via Estoril	340	0.002	0.0001
3: Building 22 at The Vista Condos	164	0.006	0.0002
4: 30631 Paseo Del Niguel	199	0.005	0.0002
5: 30582 N Hampton Rd	97	0.013	0.0004
6: 30585 N Hampton Rd	65	0.023	0.0008
7: 30581 N Hampton Rd	76	0.019	0.0006

Source: A/E Tech LLC

Therefore, groundborne vibration would not result in building damage or exceed the vibration sensitivity criterion at all neighboring properties, resulting in less than significant impacts and no mitigation is required.

Off-Site Construction Sources

As discussed earlier, construction of the Project would generate trips from large trucks including concrete mixing trucks, concrete pumping trucks, and vendor delivery trucks. Given the Project access is over 50 feet to the south from adjacent residence, heavy trucks accessing the Project could generate groundborne vibrations that are readily perceptible at nearby residences. However, the potential for annoyance for temporary, intermittent haul truck travel would be minimal, the Project's truck trips would be prohibited from occurring during late night or early morning hours when the potential to negatively affect quality sleeping environments is much greater with the implementation of **SCA NOI-1**. In the absence of criteria specific to vibration from short-term activities, human annoyance with truck travel would be limited given the limited number of truck trips. As such, impacts would be less than significant.

Operational Vibration Sources

During Project operations, there would be no significant stationary sources of groundborne vibration, such as heavy equipment or industrial operations. The Project's long-term vibration

impact from operational sources would be nominal and less than significant, and no mitigation is required.

Threshold NOI-3	*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, would the project expose people residing or working in the project area to excessive noise levels?*

No Impact. The Project Site would not expose people to excessive noise levels related to the operation of a public airport or private airstrip due to the nearest airport, John Wayne Airport, which 21 miles away. As a result, the Project would have no impact, requiring no mitigation.

4.11.7 Cumulative Impacts

Less than Significant Impact. The related projects in the general Project vicinity are all located more than 1,000 feet away from the Project site, and therefore would not contribute substantially to cumulative noise impacts at receptors near the Project site during short-term construction or long-term operational activities. Noise naturally attenuates at 6 dB every doubling of distance of the reference noise source. Most construction equipment has a reference noise source of 50 feet. Therefore, at 500 feet noise will have naturally attenuated over 20 dB, which also does not account for other natural attenuation such as topography, vegetation, or other structures. As a result, the Project's potential to contribute to any noise or vibration- related cumulative impacts would be considered less than significant.

4.11.8 Summary of Mitigation Measures

No mitigation measures are required.

4.11.9 Significant Environmental Impacts

No significant noise and vibration impacts will occur from the proposed Project.

4.11.10 References

14 CCR 15000–15387 and Appendix A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended.

A/E Tech LLC. February 7, 2022. Noise and Vibration Analysis Report, The Cove at El Niguel, Laguna Niguel, California.

City of Laguna Niguel. February 2022. City of Laguna Niguel CEQA Manual.

City of Laguna Niguel. 1992. General Plan for the City of Laguna Niguel. Available: http://cityoflagunaniguel.org/DocumentCenter/Home/View/1886. (Accessed: August 11, 2021.)

City of Laguna Niguel. 2021. City of Laguna Niguel 2021–2029 Housing Element. Available: https://www.cityoflagunaniguel.org/1352/Housing-Element-Update. Last revised: October 2021. (Accessed February 22, 2022).

City of Laguna Niguel, Laguna Niguel Municipal Code Title 9, Planning and Zoning. https://library.municode.com/ca/laguna_niguel/codes/code_of_ordinances?nodeId=TIT9PLZO (Accessed June 20, 2021).

Linscott, Law & Greenspan Engineers. June 9, 2021. Revised Traffic Assessment – The Cove at El Niguel.

U.S. Department of Transportation Federal Highway Administration, Construction Noise. https://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/(Accessed September 20, 2021).

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