5.9 NOISE

This section of the draft environmental impact report (Draft EIR) evaluates the fundamentals of sound; examines federal, state, and local noise guidelines, policies, and standards; identifies noise levels for existing conditions; and evaluates the potential noise and vibration impacts associated with buildout of the proposed project. The noise modeling data are included in Appendix J of this Draft EIR.

5.9.1 Environmental Setting

Noise Descriptors

Noise is most often defined as unwanted sound; whether it is loud, unpleasant, unexpected, or otherwise undesirable. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

The following are brief definitions of terminology used in this chapter:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

- **Decibel (dB).** A unitless measure of sound, expressed on a logarithmic scale and with respect to a defined reference sound pressure. The standard reference pressure is 20 micropascals (20 μPa).

- **Vibration Decibel (VdB).** A unitless measure of vibration, expressed on a logarithmic scale and with respect to a defined reference vibration velocity. In the U.S., the standard reference velocity is 1 micro-inch per second ($1x10^{-6}$ in/sec).

- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

- **Equivalent Continuous Noise Level (L_{eq}); also called the Energy-Equivalent Noise Level.** The value of an equivalent, steady sound level which, in a stated time period (often over an hour) and at a stated location, has the same A-weighted sound energy as the time-varying sound. Thus, the L_{eq} metric is a single numerical value that represents the equivalent amount of variable sound energy received by a receptor over the specified duration.

- **Statistical Sound Level (L_n).** The sound level that is exceeded "n" percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the

changing noise levels are above this value and half of the time they are below it. This is called the "median sound level." The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is often known as the "intrusive sound level." The L_{90} is the sound level exceeded 90 percent of the time and is often considered the "effective background level" or "residual noise level."

- **Day-Night Sound Level (L_{dn} or DNL).** The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.

- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added from 7:00 PM to 10:00 PM and 10 dB from 10:00 PM to 7:00 AM. NOTE: For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive – that is, higher than the L_{dn} value). As a matter of practice, L_{dn} and CNEL values are interchangeable and are treated as equivalent in this assessment.

- **Sensitive Receptor.** Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, motels and hotels, libraries, religious institutions, hospitals, and nursing homes are examples.

Characteristics of Sound

When an object vibrates, it radiates part of its energy as acoustical pressure in the form of a sound wave. Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate the human, frequency-dependent response, the A-weighted filter system is used to adjust measured sound levels. The normal range of human hearing extends from approximately 0 dBA (the threshold of detection) to 140 dBA (the threshold of pain).

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 5.9-1 presents the subjective effect of changes in sound pressure levels.

Table 5.9-1 Change in Apparent Loudness

± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20 dB	Much quieter or louder

Source: Bies and Hansen 2009.

Sound is generated from a source and the decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. This phenomenon is known as spreading loss or distance attenuation.

When sound is measured for distinct time intervals, the statistical distribution of the overall sound level during that period can be obtained. For example, L_{50} is the noise level that is exceeded 50 percent of the time: half the time the noise exceeds this level and half the time it is less than this level. This is also the level that is exceeded 30 minutes in an hour. Similarly, the L_{02}, L_{08}, and L_{25} values are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour. The energy-equivalent sound level (L_{eq}) is the most common parameter associated with community noise measurements. The L_{eq} metric is a single-number noise descriptor of the energy-average sound level over a given period of time. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values are the minimum and maximum root-mean-square (RMS) noise levels obtained over the stated measurement period.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and nighttime hours, state law requires that, for planning purposes and to account for this increased receptiveness of noise, an artificial decibel increment is to be added to quiet-time noise levels to calculate the 24-hour CNEL noise metric.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, through generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance. Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level number means. To help relate noise level values to common experience, Table 5.9-2 shows typical noise levels from familiar sources.

Table 5.9-2 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,000 feet	105	
	100	
Gas Lawn Mower at three feet	95	
	90	
Diesel Truck at 50 feet, at 50 mph	85	Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime	75	
	70	Vacuum Cleaner at 10 feet
Commercial Area	65	Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
	55	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
	45	
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime	35	
	30	Library
Quiet Rural Nighttime	25	Bedroom at Night, Concert Hall (background)
	20	
	15	Broadcast/Recording Studio
	10	
	5	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans 2009.

Vibration Fundamentals

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities such as railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface moves away from its original static position. The instantaneous speed that a point on a surface moves is the velocity, and the rate of change of the speed is the acceleration. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During project construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure. These types of vibration are best measured and described in terms of velocity and acceleration.

The three main types of waves associated with groundborne vibrations are surface or Rayleigh waves, compression or P-waves, and shear or S-waves.

- **Surface or Rayleigh waves** travel along the ground surface. They carry most of their energy along an expanding cylindrical wave front, similar to the ripples produced by throwing a rock into a lake. The particle motion is more or less perpendicular to the direction of propagation.

- **Compression or P-waves** are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal, in a push-pull motion. P-waves are analogous to airborne sound waves.

- **Shear or S-waves** are also body waves, carrying their energy along an expanding spherical wave front. Unlike P-waves, however, the particle motion is transverse, or perpendicular to the direction of propagation.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or RMS velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response.

The units for PPV and RMS velocity are normally inches per second (in/sec). Often, vibration is presented and discussed in dB units in order to compress the range of numbers required to describe the vibration. In this study, all PPV and RMS velocity levels are in in/sec and all vibration levels are in dB relative to one microinch per second (abbreviated as VdB). Typically, groundborne vibration generated by human activities attenuates rapidly with distance. Even the more persistent Rayleigh waves decrease relatively quickly as they move away from the source of the vibration. Man-made vibration problems are, therefore, usually confined to short distances (500 to 600 feet or less) from the source (FTA 2006).

Construction operations generally include a wide range of activities that can generate groundborne vibration. In general, blasting and demolition of structures generate the highest vibrations. Vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible amounts of vibration at up to 200 feet. Heavy trucks can also generate groundborne vibrations, which can vary depending on vehicle type, weight, and pavement conditions. Potholes, pavement joints, discontinuities, differential settlement of pavement, etc., all increase the vibration levels from vehicles passing over a road surface. Construction vibration is normally of greater concern than vibration from normal traffic flows on streets and freeways with smooth pavement conditions. Trains generate substantial quantities of vibration due to their engines, steel wheels, heavy loads, and wheel-rail interactions.

5.9.1.2 REGULATORY FRAMEWORK

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the State of California, and the City of Newport Beach have established standards and ordinances to control noise. The following discuss the noise standards applicable to the project.

State of California Noise Requirements

The State regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise insulation standards and provides guidance for local land use compatibility.

State Land Use Compatibility

State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared according to guidelines adopted by the Governor's Office of Planning and Research. The purpose of the Noise Element is to "limit the exposure of the community to excessive noise levels."

The State Noise Compatibility Guidelines, presented in Table 5.9-3, are designed to ensure that proposed land uses are compatible with the predicted future noise environment. At different exterior noise levels, individual land uses are identified as 'clearly acceptable', 'normally acceptable', 'normally unacceptable', or 'clearly unacceptable'. A 'conditionally acceptable' designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and needed noise insulation features are incorporated in the design. By comparison, a 'normally acceptable' designation indicates that standard construction can occur with no special noise reduction requirements.

In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts. Under CEQA, a project has a significant impact if the project exposes people to noise levels in excess of thresholds, which can include standards established in the local general plan or noise ordinance.

State of California Building Code

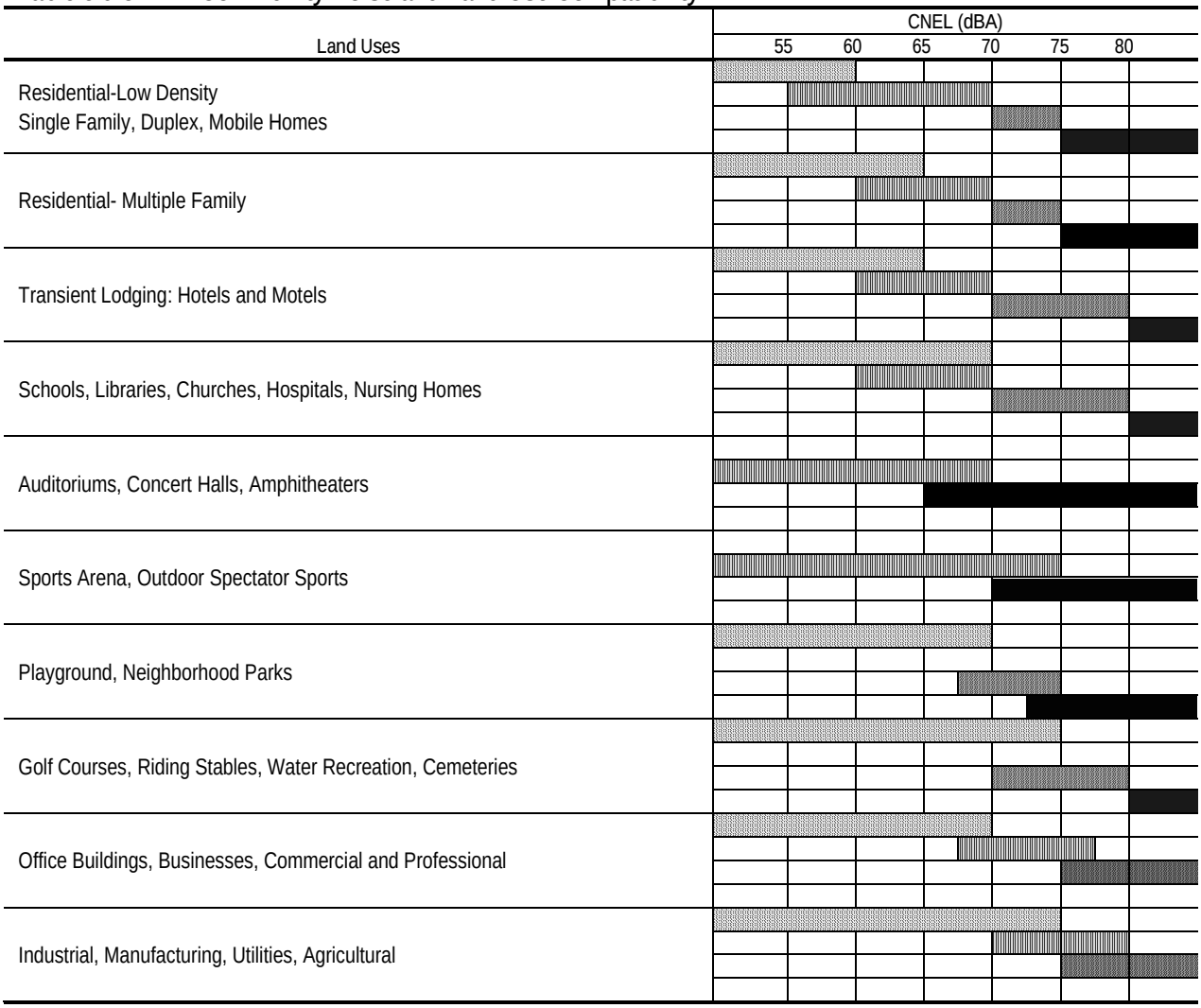
The State's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, and the California Building Code. These noise standards are applied to new construction in the State for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 60 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dBA CNEL.

City of Newport Beach Noise Standards

Noise Element

The City of Newport Beach General Plan Noise Element discusses the effects of noise exposure on the population and sets goals designed to protect residents and businesses from excessive and persistent noise intrusions. The General Plan Noise Element contains noise thresholds for developments located adjacent to mobile or transportation noise sources and thresholds for stationary noise sources. The City applies the state's Community Noise and Land Use Compatibility standards, summarized in Table N2 of the Noise Element (presented herein as Table 5.9-3), to assess the compatibility of new development with ambient noise.

Table 5.9-3 Community Noise and Land Use Compatibility



Explanatory Notes

	Normally Acceptable: With no special noise reduction requirements assuming standard construction.		*Normally Unacceptable:* New construction is discouraged. If new construction does not proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
	Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design.		*Clearly Unacceptable:* New construction or development should generally not be undertaken.

Source: California Office of Noise Control. *Guidelines for the Preparation and Content of Noise Elements of the General Plan.* February 1976.

City of Newport Beach Noise Standards

Noise Element

The City of Newport Beach General Plan Noise Element discusses the effects of noise exposure on the population and sets goals designed to protect residents and businesses from excessive and persistent noise intrusions. The General Plan Noise Element contains noise thresholds for developments located adjacent to mobile or transportation noise sources and thresholds for stationary noise sources. The City applies the state's Community Noise and Land Use Compatibility standards, summarized in Table N2 of the Noise Element (presented herein as Table 5.9-3), to assess the compatibility of new development with ambient noise.

The Land Use Noise Compatibility Matrix of the Newport Beach Noise Element identifies 'clearly compatible', 'normally compatible', 'normally incompatible', and 'clearly incompatible' noise levels for various land uses. A 'normally compatible' designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and needed noise insulation features are incorporated in the design. A 'clearly compatible' designation indicates that standard construction can occur with no special noise reduction requirements.

In no case would it be desirable for any land use to have noise exceeding the highest 'normally compatible' noise level shown in Table 5.9-3. For the purpose of residential uses, the highest exterior noise level is 65 dBA CNEL. It should be noted that California requires that interior noise levels in multi-family residential uses not exceed 45 L_{dn}; this is commonly used as an interior standard for all residential uses, but is not required under the California Administrative Code, Title 24, Part 2.

In addition to the noise/land use compatibility guidelines in the General Plan Noise Element, the City of Newport Beach has adopted Community Noise Control policies and standards as part of its Municipal Code in order to limit unnecessary, excessive, and annoying noise in the City. These noise standards are discussed below and displayed in Table 5.9-4.

Table 5.9-4 City of Newport Beach Exterior Noise Standards

Noise Zone	Time Interval	Maximum Daytime Noise Levels (dBA)	
		L_{eq}	L_{max}
Zone I – Single-, two-, or multiple-family residential	7 AM to 10 PM	55	75
	10 PM to 7 AM	50	70
Zone II – Commercial	7 AM to 10 PM	65	85
	10 PM to 7 AM	60	80
Zone III – Residential portions of mixed use properties	7 AM to 10 PM	60	80
	10 PM to 7 AM	50	70
Zone IV – Industrial or manufacturing	7 AM to 10 PM	70	90
	10 PM to 7 AM	70	90
Institutional	7 AM to 10 PM	55	75
	10 PM to 7 AM	50	70

Source: Section 10.26.025, Exterior Noise Standards, of the City of Newport Beach Municipal Code and Table N3, Noise Standards, of the City of Newport Beach General Plan Noise Element.
Notes:
These noise standards do not apply to heating ventilation and air conditioning (HVAC) systems or construction pursuant to Section 10.26.035 of the Municipal Code.
In the event the ambient noise level exceeds the noise standard, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.
The Noise Zone III standard shall apply to that portion of residential property falling within 100 feet of a commercial property, if the intruding noise originates from that commercial property.
If the measurement location is on boundary between two different noise zones, the lower noise level standard applicable to the noise zone shall apply.

The following discussion provides a summary of the City of Newport Beach Noise Element goals and policies as they apply to regulatory guidance and significance criteria for the proposed project:

Goal N1, Noise Compatibility, Minimized land use conflicts between various noise sources and other human activities.

- **Policy N 1.1, Noise Compatibility of New Development:** Require that all proposed projects are compatible with the noise environment through use of Table N2 (presented here as Table 5.9-3), and enforce the interior and exterior noise standards shown in Table N3 (see Table 5.9-4).

- **Policy N 1.2, Noise Exposure Verification for New Development:** Applicants for proposed projects that require environmental review and are, located in areas projected to be exposed to a CNEL of 60 dBA and higher, as shown on Figure N4, Figure N5, and Figure N6 of the Noise Element may conduct a field survey, noise measurements or other modeling in a manner acceptable to the City to provide evidence that the depicted noise contours do not adequately account for local noise exposure circumstances due to such factors as, topography, variation in traffic speeds, and other applicable conditions. These findings shall be used to determine the level of exterior or interior, noise attenuation needed to attain an acceptable noise exposure level and the feasibility of such mitigation when other planning considerations are taken into account.

- **Policy N 1.4, New Developments in Urban Areas:** Require that applicants of residential portions of mixed-use projects and high density residential developments in urban areas (such as the Airport Area

and Newport Center) demonstrate that the design of the structure will adequately isolate noise between adjacent uses and units (common floor/ceilings) in accordance with the California Building Code.

- **Policy N 1.8, Significant Noise Impacts:** Require the employment of noise mitigation measures for existing sensitive uses when a significant noise impact is identified for new development impacting existing sensitive uses, as presented in Table 5.9-5.

Table 5.9-5 City of Newport Beach Incremental Noise Impact Criteria for Noise-Sensitive Uses (dBA CNEL)

Existing Noise Exposure	Allowable Combined Noise Exposure	Allowable Noise Exposure Increment
55	58	3
60	62	2
65	66	1
70	71	1
75	75	0

Source: City of Newport Beach General Plan and General Plan EIR. Adopted November 2006.

Goal N2, Minimized motor vehicle traffic and boat noise impacts on sensitive noise receptors.

- **Policy N 2.1, New Development**: Require that proposed noise-sensitive uses in areas of 60 dBA and greater, as determined the analyses stipulated by Policy N1.1, demonstrate that they meet interior and exterior noise levels.

- **Policy N 2.2, Design of Sensitive Land Uses**: Require the use of walls, berms, and interior noise insulation, double paned windows, or other noise mitigation measures, as appropriate, in the design of new residential or other new noise sensitive land uses that are adjacent to major roads. Application of the Noise Standards in Table N3 (Table 5.9-4) shall govern this requirement.

Goal N4, Minimization of Non-transportation-Related Noise, Minimized non-transportation-related noise impacts on sensitive noise receptors.

- **Policy N 4.1, Stationary Noise Sources:** Enforce interior and exterior noise standards outlined in Table N3 (Table 4.10-3), and in the City's Municipal Code to ensure that sensitive noise receptors are not exposed to excessive noise levels from stationary noise sources, such as heating, ventilation, and air conditioning equipment.

- **Policy N 4.6, Maintenance or Construction Activities:** Require the enforcement of the Noise Ordinance noise limits and limits hours of maintenance or construction activity in or adjacent to residential areas, including noise that results from in-home hobby or work related activities.

Goal N5, Minimized excessive construction-related noise.

- **Policy N 5.1, Limiting Hours of Activity:** Enforce the limits on hours of construction activity.

Municipal Code (regarding Noise)

The City's Noise Ordinance (Newport Beach Municipal Code Chapter 10.26) is designed to protect people from objectionable non-transportation noise sources such as music, machinery, pumps, and air conditioners. These standards do not gauge the compatibility of developments in the noise environment, but provide restrictions on the amount and duration of noise generated at a (source) property, as measured at the receiving property. The details on noise level measurement locations are given in Section 10.26.055.[1].

Stationary (Non-transportation) Noise

The City applies the Noise Ordinance standards (Newport Beach Municipal Code Section 10.26.025, Exterior Noise Standards) to non-transportation, stationary noise sources. These standards were summarized above in Table 5.9-4 (and are included as the exterior noise standards in Table N3, Noise Standards, of the General Plan Noise Element). These standards are not applicable to mobile noise sources (such as heavy trucks) that are traveling on public roadways. Control of the mobile noise sources on public roads is preempted by federal and state laws.

Equipment sound ratings of new heating ventilation and air condition (HVAC) equipment installed in the City of Newport Beach are reviewed during plan check and tested in the field after installation. According to Section 10.26.045 of the City of Newport Beach Municipal Code, new permits for HVAC equipment in or adjacent to residential areas shall be issued only where the sound rating of the proposed equipment does not exceed 55 dBA, and it is installed with a timing device that will deactivate the equipment during the hours of 10 PM to 7 AM.

Construction Noise

The City realizes that the control of construction noise is difficult and therefore provides exemption for this type of noise. According to the City of Newport Beach Municipal Code Section 10.26.035, Exemptions, noise sources associated with construction, repair, remodeling, demolition, or grading of any real property are exempt from the noise level limits shown in Table 5.9-4, above. Such activities shall instead be subject to the provisions of the City of Newport Beach Municipal Code Section 10.28.040, Construction Activity – Noise Regulations. According to this chapter, construction is permitted on weekdays between the hours of 7:00 AM and 6:30 PM and Saturdays between the hours of 8:00 AM and 6:00 PM. Construction is not permitted on Sundays or any federal holiday. Exceptions to these construction hours can be made when the maintenance, repair, or improvement cannot feasibly be conducted during normal business hours, as outlined in Section 10.28.040 of the City's Municipal Code.

Vibration

While the City of Newport Beach Municipal Code includes a definition for vibration, the code does not have specific limits or thresholds for vibration. However, the 2006 General Plan EIR established a limit of 72 VdB for vibration annoyance levels at residential uses, but no standards or thresholds were established for

[1] The measurement of potentially offending noise in a 'residential area' (at the receptor property) can include any part of a private yard, patio, deck or balcony normally used for human activity and identified by the owner of the affected property as suspected of exceeding the noise level standard. See Appendix J for additional details on the Newport Beach Noise Ordinance.

architectural damage from vibrational energy. In lieu of such damage standards, the Federal Transit Administration (FTA) provides criteria for acceptable levels of groundborne vibration for various types of special buildings that are sensitive to vibration (FTA 2006).

Vibration-Related Annoyance. As stated above, the 2006 General Plan EIR established a limit of 72 VdB for vibration annoyance levels at residential uses, which will be used as the significance threshold in this EIR. For comparison purposes, the FTA's annoyance criteria are shown in Table 5.9-6 below, as they are frequently used as significance thresholds. Table 5.9-6 shows the FTA's vibration criteria to evaluate vibration-related annoyance due to resonances of the structural components of a building. These criteria are based on extensive research that suggests humans are sensitive to vibration velocities in the range of 8 to 80 Hertz (Hz).

Table 5.9-6 Groundborne Vibration Criteria: Human Annoyance

Land Use Category	Max L_V (VdB)[1]	Description
Workshop	90	Distinctly felt vibration. Appropriate to workshops and non-sensitive areas
Office	84	Felt vibration. Appropriate to offices and non-sensitive areas.
Residential – Daytime	78	Barely felt vibration. Adequate for computer equipment.
Residential – Nighttime	72	Vibration not felt, but groundborne noise may be audible inside quiet rooms.

Source: FTA 2006.
[1] L_V is the velocity level in decibels, as measured in 1/3-octave bands of frequency over the frequency ranges of 8 to 80 Hz.

It should be noted that the Newport Beach General Plan EIR conservatively applied the residential-nighttime threshold of 72 VdB for all circumstances of vibrational energy; including for construction activities which would almost never be expected to occur during the nighttime period (i.e., from 10 PM to the following 7 AM) with the possible exception of emergency repair work. For the nearby offices uses, the table shows a threshold of 84 VdB as the applicable criteria level.

Vibration-Related Architectural Damage. Structures amplify groundborne vibration, and wood-frame buildings such as typical residential structures are more affected by ground vibration than heavier buildings. The level at which groundborne vibration is strong enough to cause architectural damage has not been determined conclusively. The most conservative estimates are reflected in the FTA standards, shown in Table 5.9-7.

Table 5.9-7 Groundborne Vibration Criteria: Architectural Damage

Building Category	PPV (in/sec)	L_V (VdB)[1]
I. Reinforced concrete, steel, or timber (no plaster)	0.50	102
II. Engineered concrete and masonry (no plaster)	0.30	98
III. Non-engineered timber and masonry buildings	0.20	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: FTA 2006.
[1] L_V is the velocity level in decibels, as measured in 1/3-octave bands of frequency over the frequency ranges of 8 to 80 Hz.

The nearest vibration-sensitive receptors would be the Villas at Fashion Island[2] (currently under construction) and the Colony Apartments; both of which should not be exposed to greater than 0.20 PPV, per the FTA criterion for non-engineering timber and masonry buildings. For the nearest office building, the applicable limit would be 0.30 PPV.

5.9.1.3 EXISTING NOISE ENVIRONMENT

General Community Noise Setting

The project site is in a commercial and residential area and is subject to noise from a myriad of transportation and stationary sources. The project property currently holds the Orange County Museum of Art (OCMA) building. Surrounding land uses include a parking structure to the east, a multi-story office building to the west, Villas at Fashion Island (currently under construction) to the north, and apartment and office uses across San Clemente Drive to the south.

Nearby noise sources include surrounding commercial and residential uses, as well as nearby roadways. However, given the project sites' proximity to major arterials (such as Jamboree Road and San Joaquin Hills Road) and minor arterials (such as Santa Cruz Drive, and Santa Barbara Drive), the predominant source for overall environmental noise in the area is taken to be traffic flows on these nearby streets. According to the Existing Noise Contours within the City's Noise Element (2006), the permanent living spaces of the Project are not located within the 60 CNEL contours of any roadways. Additionally, the site is well outside of the 60 CNEL contour for John Wayne Airport (see Appendix J for additional information). Therefore, the environmental noise level at the project site due to transportation sources is taken to be less than 60 CNEL and well below 65 CNEL (as a worst case). Thus, per Table 5.9-5, a significant noise level increase would occur if the project-related increment is greater than 2 dB, since the existing conditions are between 54 and 59 dBA CNEL (as discussed in detail in the ambient noise measurement sub-section below).

Sensitive Receptors

Certain land uses are particularly sensitive to noise and vibration. These uses include residences, schools, hospital facilities, houses of worship, and open space/recreation areas where quiet environments are necessary for the enjoyment, public health, and safety of the community. Commercial and industrial uses are not considered noise- and/or vibration-sensitive uses. The nearest noise-sensitive uses to the project site are the Colony apartments (approximately 260 feet southwest of the Project site), residences in the Big Canyon community to the northeast (950 feet), and Island Hotel Newport Beach to the southeast (1,100 feet). Additionally, apartments are under construction in the parcel(s) directly adjacent to the north side of the project site. These properties in the vicinity of the project site are currently exposed to noise from office, commercial, and residential uses, as well as from vehicle traffic and aircraft overflights.

The western portions of the Colony apartments would primarily be exposed to traffic flow noise primarily from Santa Barbara Drive which has an ADT flow rate of 10,000 vehicles and secondarily from traffic on Jamboree Road which has an ADT flow rate of 34,000 vehicles (Newport Beach 2006). As such, the 60 dBA

[2] Formerly called "San Joaquin Plaza Apartments."

CNEL contour line would be expected to extend to approximately 180 feet from the centerline of Santa Barbara Drive. Residences in the Big Canyon community would apartments would primarily be exposed to traffic flow noise primarily from San Joaquin Hills Road which has an ADT flow rate of 16,000 vehicles and which would experience 60 dBA CNEL noise levels at approximately 370 feet from the centerline of the roadway. The Island Hotel Newport Beach would experience traffic noise levels from both Santa Cruz Drive (8,000 ADT) and Newport Center Drive (of unknown ADT). Lastly, the Villas at Fashion Island (currently under construction) would have future noise levels that would be similar to those at the Big Canyon community since the Villas would experience the same flows along San Joaquin Hills Road (16,000 ADT).

Ambient Noise Measurements

To ascertain the existing noise at and adjacent to the proposed residential development (with particular focus on the adjacent housing complex to the north [currently under construction]), noise monitoring was conducted by PlaceWorks staff in August of 2016. The general noise environment around the project site was noted to be a combination of local and distant roadway noise, general urban noise, chirping birds, rustling vegetation, and distant aircraft overflights.

While data acquisition for general community noise is typically conducted during the workweek, the need to exclude noise interference from the current construction activities at the adjoining Villas at Fashion Island development site (immediately north of the proposed project site) compelled noise measurements over a weekend period. Specifically, long-term measurements were conducted from Saturday evening, August 6, to Monday morning, August 8, 2016, while short-term sampling was performed on Sunday, August 7, 2016 (in the early afternoon).

Noise monitoring was performed using Larson-Davis Model 820 integrating/logging sound level meters. All measurement instruments conform to industry standards for Type 1 precision, per American National Standards Institute standards for general environmental noise measurement instrumentation. The sound level meters were programmed to record noise levels with the "slow" time constant and using the "A" weighting filter network. The sound level meter and microphone were mounted on a tripod five feet above the ground and equipped with a windscreen during all short-term measurements. For long-term measurements, the microphone and windscreen were attached to available objects, including a fence and two sturdy trees/shrubs. The meters were field calibrated immediately prior to the first set of readings. The calibration was rechecked immediately after the conclusion of the readings and no notable meter "drift" was noted (i.e., less than ½ dB deviation). This work effort included two short-term samples (of 15 minute duration) and one 24-hour, long-term noise readings. Noise measurement locations are described below and shown in Figure 5.9-1, *Noise Measurement Locations*.

Figure 5.9-1 - Noise Measurement Locations

5. Environmental Analysis

Base Map Source: Google Earth Pro, 2016

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Meteorological conditions during the measurement periods were favorable and were noted to be representative of typical conditions for the season. Generally, conditions included clear skies, daytime temperatures of approximately 75 to 80 degrees Fahrenheit (°F), and winds of less than five miles per hour. The following describes the noise level measurement locations:

- **Short-Term Sampling Location 1 (ST-1).** Short-term noise monitoring Location 1 was located at the intersection of Santa Maria Road and San Clemente Drive. The microphone and sound meter were positioned on the sidewalk on the southwestern corner of the intersection, just outside of the Colony Apartments. Fifteen minutes of noise measurements were made, beginning at 1:01 p.m. on Sunday, August 7, 2016, at which time the air temperature was 75°F and average wind speeds were in the range of 3 to 5 miles per hour. The noise environment of the site is dominated by traffic along San Clemente Drive, and rustling trees and bushes. Additional noise included more distant traffic, birds, and occasional distant and overhead aircraft. During the measurement period, 25 cars passed by on San Clemente Drive, and five planes passed overhead.

- **Short-Term Sampling Location 2 (ST-2).** Short-term noise monitoring Location 2 was located at the intersection of Santa Barbara Drive and San Clemente Drive. The microphone and sound meter were positioned on the sidewalk on the southwestern corner of the intersection, just outside of the Colony Apartments. Fifteen minutes of noise measurements were taken beginning at 1:20 p.m. on Sunday, August 7, 2016, at which time the air temperature was 76°F and average wind speeds were in the range of 2 to 5 miles per hour. The noise environment of the site is dominated by constant traffic along Santa Barbara Drive. Additional noise included traffic along San Clemente Drive, more distant traffic along Jamboree Road, birds, rustling trees and bushes, and one overhead aircraft.

- **Long-Term Monitoring Location 1 (LT-1).** Long-term noise monitoring Location 1 was located to the north of the museum, on the property line between the museum and the Villas at Fashion Island (currently under construction). The microphone was attached to the top of the chain-link fence, between the two trees along the property line. The 24-hour noise reading commenced at 5:25 p.m. on Saturday, August 6, 2016, at which time the air temperature was 82°F and average wind speeds were in the range of 0 to 2 miles per hour. Immediate nearby land uses to long-term Location 1 are primarily residential and office. Aside from the future Villas at Fashion Island apartments immediately to the north, other residential land uses in the vicinity include the Colony Apartments 260 feet to the southwest and the Big Canyon neighborhood 950 feet to the northeast. The noise environment at this site was characterized by general urban din (including traffic flows) and noise from a nearby heating, ventilating, and air conditioning unit, as well as distant traffic, birds, and distant aircraft. Construction noise (from the Villas at Fashion Island site) dominated the environment during the instrumentation retrieval on Monday morning.

Results of Short-Term Sampling

During the ambient noise survey, daytime energy-average noise levels within the areas surrounding the project site, as measured during the short-term noise measurements, ranged from 48.7 to 65.3 dBA $L_{eq\text{-}1min}$. Short-

term noise measurement locations are shown in Figure 5.9-1, and the readings are summarized in Table 5.9-8, *Short-Term Noise Measurements Summary*.

Table 5.9-8 Short-Term Noise Measurements Summary

Monitoring Location	Description	Lowest 1-min L_{eq}	Overall, 15-min L_{eq}	Highest 1-min L_{eq}
ST-1	Near SW corner of San Clemente Drive and Santa Maria Road	48.7	58.9	63.4
ST-2	Near SE corner of San Clemente Drive and Santa Barbara Drive	54.6	62.1	65.3

Noise sampling conducted by PlaceWorks staff on Sunday, August 7, 2016, for a minimum of 15 minutes at each site with a Larson Davis 820 sound level meter.

Results of Long-term Monitoring

The long-term noise measurement location is shown in Figure 5.9-1, and the results of the long-term noise monitoring are summarized in Table 5.9-9, *Long-Term Noise Measurements Summary*. The graphical depictions of the hourly noise level records for each long-term monitoring location are included in Appendix J of this Draft EIR.

Table 5.9-9 Long-Term Noise Measurements Summary

Monitoring Location	Description	24-hr Noise Levels, dBA[1]	Noisiest hour		Quietest hour	
			Hourly L_{eq}	Start Time	Hourly L_{eq}	Start Time
LT-1	Northern boundary of Project Site with Villas at Fashion Island development	54.4 CNEL 53.8 L_{dn} 51.6 $L_{eq\text{-}24hr}$	55.3	8 AM	42.9	3 AM

Conducted from Saturday evening, August 6, 2016, to Monday morning, August 8, 2016 by PlaceWorks staff.
1. 24-hour calculations from 00:00 through 23:59 of Sunday, August 7, 2016.

The hourly L_{eq} value at LT-1 was 54.3 dBA L_{eq} for the same period as when the short-term data were being acquired (i.e., during the 1 PM hour). For the daytime period (during which construction is exempted from municipal code noise limits), the hour-to-hour noise environments at the long-term location were generally very steady and consistent. The hourly L_{90} residual noise level[3] was centered around 45 dBA (±2 dB), the L_{eq} (energy-average) noise level was centered around 54 dBA (±2 dB), and the L_{max} (maximum) noise level was centered around 70 dBA (±3 dB). Although these noise levels were consistent throughout the daytime hours—indicating similar noise sources from hour to hour—the moment-to-moment data (also in Appendix J) shows sound level amplitude variability of approximately 20 dB (between the typical minima and the typical maxima), which indicates frequent, short-duration noise events, common for environments dominated by traffic flows and individual vehicle pass-bys.

[3] The 'residual noise level' indicates the nominal (but not absolute) minimum community noise level.

Ambient Measurement Summary

These results (and the additional details in Appendix J) indicate that the noise environments near the northern portion of the project site (i.e., closer to the Villas at Fashion Island) are approximately 5 to 8 dB lower than for the concurrent short-term samples (see Table 5.9-8, above). This outcome is due to a combination of the short-term locations being closer to traffic flows (on San Clemente Drive, Santa Maria Road, and Santa Barbara Drive) than the long-term location, coupled with shielding from intervening buildings and additional attenuation from ground effects and atmospheric absorption between the roadway sources and the long-term location.

Given the CNEL result at location LT-1 and the differential between that result and the sampling at ST-1, it is projected that the entire project site has a 24-hour soundscape of greater than 54 dBA (northern portion), but less than 60 dBA (southern portion) CNEL. Similarly, the project site would be expected to generally have hourly ambient sound levels—mostly generated by traffic flows—in the ranges of 54 to 59 dBA L_{eq} and of 70 to 72 dBA L_{max} during the daytime period.

5.9.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would result in:

N-1 Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

N-2 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

N-3 A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

N-4 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

N-5 For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

N-6 For a project within the vicinity of a private airstrip, expose people residing or working the project area to excessive noise levels.

Thresholds N-5 and N-6 have already been addressed in the Initial Study. They were found to have no significant impact and, as a result, will not need further assessment herein.

5.9.3 Environmental Impacts

The applicable thresholds are identified in brackets after the impact statement.

Impact 5.9-1: Construction activities would result in potentially significant temporary noise increases in the vicinity of the project site. [Threshold N-4]

Impact Analysis: The City of Newport Beach provides an exemption[4] for this type of noise when the work is performed within the hours specified within the Noise Ordinance (i.e., 7:00 AM to 6:30 PM on weekdays, and 8:00 AM to 6:00 PM on Saturdays).[5] There are no numerical noise level limits for construction activities. Compliance with the Noise Ordinance time window is mandatory and, as such, does not constitute mitigation under CEQA.

Construction activities would occur for approximately 28 months. Activities would include demolition of the existing OCMA building, site preparation, grading, utility trenching, construction of the 25-story condominium tower, and offsite sewer improvements. Two types of short-term noise impacts could occur during construction: (1) mobile-source noise from transport of workers, material deliveries, and debris and soil haul and (2) stationary-source noise from use of construction equipment. Existing uses surrounding the project site would be exposed to construction noise.

Construction Vehicles

On-Road Transport of Workers and Vendor/Haul Trucks

The transport of workers and equipment to the construction site would incrementally increase noise levels along site access roadways. Approximately 200 construction workers are expected to work throughout the 28-month construction period. The worst-case flow of construction-related trips would occur during the soil haul period, which includes site preparation, rough grading, and fine grading. There would be a total of 4,600 truck load trips during this period, which equates to 153 truckload trips per day over a 30-day soil haul period. This number of construction-related vehicle trips would be an increase of much less than 10 percent in total daily vehicle flows along Santa Barbara Drive and Santa Cruz Drive (which have ADT flow rates of approximately 10,000 and 8,000, respectively) (Newport Beach 2006; DKS Associates 2016). This would result in a noise level increase of much less than 0.5 dB (in the traffic-focused CNEL noise level metric)[6] and would, therefore, have a less than significant impact on noise receptors along the truck routes. Other phases of construction are anticipated to have less than 25 daily trips (for the aggregate of workers plus vendors plus haul-offs), and these phases would have even less of an incremental difference in noise levels along construction trip routes than the worst-case mass excavation soil haul phase.

While individual construction vehicle pass-bys may create momentary noise levels of up to approximately 85 dBA (L_{max}) at 50 feet from the vehicle, these occurrences—although potentially audible for a few seconds—

4 Per Municipal Code Section 10.26.035, Paragraph D.
5 Per Municipal Code Section 10.28.040, Paragraphs A and B.
6 That is, $10*\log_{10}(^{8155}/_{8000})$ is less than 0.1 dB.

would generally be infrequent. Due to the infrequency of events, their relatively short-lived durations, their commonality with existing truck pass-bys, and the vehicle code exemption, construction vehicle movement noise would be less than significant.

Truck Queuing

For this size project, it is possible that multiple deliveries (such as for fresh cement) and/or haul-offs (during demolition and site preparation) could occur simultaneously (or in quick succession). Thus, construction-related trucks may end up being queued near the entrance(s) to the site and could potentially be idling while waiting to enter the construction zone. However, per the City of Newport Beach, the project is required to prepare a construction traffic management plan that outlines items such as construction hours and truck routes. Construction trucks would be staged at an offsite location acceptable to the City and would be dispatched to the site five to ten trucks at a time to prevent truck queuing at inappropriate locations. Additionally, noise from idling construction trucks would be overshadowed by normal traffic flow noise on nearby streets, particularly from daytime traffic flows on San Clemente Drive. Therefore, idling trucks would not substantially add to the overall community noise environment. Further, according to the California Air Resources Board, construction trucks are prohibited from non-essential idling longer than five minutes. Based on the relatively low aggregate noise emissions and the short-term nature of such a source, queued construction trucks would create localized noise impacts that would be less than significant.

Construction Equipment

Noise generated during construction is based on the type of equipment used, the location of the equipment relative to sensitive receptors, and the timing and duration of the noise-generating activities. Each stage of construction involves the use of different kinds of construction equipment and, therefore, has its own distinct noise characteristics. Noise levels from construction activities are dominated by the loudest piece of construction equipment. The dominant noise source is typically the engine, although work piece noise (such as dropping of materials) can also be noticeable. Noise levels from project-related construction activities were calculated from the simultaneous use of all applicable construction equipment at spatially averaged distances (i.e., from the center of the general construction area) to the property line of the closest residences.

Many of the properties near the project site consist of office and commercial uses, but there are several residential and hotel developments near the site as well—the Colony Apartments (approximately 260 feet southwest of the project site), Big Canyon residential community to the northeast (950 feet), and Island Hotel Newport Beach to the southeast (1,100 feet). Additionally, the Villas at Fashion Island are under construction in the lot directly adjacent to the north side of the project site. According to the site plan for the Villas at Fashion Island apartment complex, the nearest building would be a distance of 230 feet from the center of construction for the proposed project. The center of the project site was used as the best representation of spatially-averaged activities throughout the construction zones (i.e., average construction noise levels). Although construction may occur across the entire site, the center of the project best represents the potential average construction-related noise levels to the various sensitive receptors during the overall construction portion of the project. Moreover, the existing building demolition and the erection of the proposed project

are primarily located towards the center of the two-acre site, providing some setback from the surrounding land uses.

Each stage of construction has a different equipment mix, depending on the work to be accomplished. The noise produced at each stage is determined by combining the L_{eq} contributions from each piece of equipment used at a given time. Construction activities associated with the proposed project would not require blasting or pile driving (see Table 3-2 in Chapter 3, *Project Description*, for a list of the anticipated construction equipment). In the construction of residential and mixed-use projects, demolition and grading typically generate the highest noise levels because they require the largest equipment. Noise attenuation due to distance, the number and type of equipment, and the load and power requirements to accomplish tasks at each construction phase, construction activities would result in different noise levels at a given sensitive receptor. As a result, construction noise quite often exhibits a high degree of variability from moment to moment, day to day, and even month to month. Heavy equipment, such as a dozer or a loader, can have maximum, short-duration noise levels in excess of 80 dBA at 50 feet. Since noise from construction equipment is intermittent and diminishes at a rate of 6 dB per doubling distance,[7] the average noise levels at noise-sensitive receptors would be much lower, because mobile construction equipment would move around the site with different loads and power requirements. Both average and maximum noise levels are discussed below.

Average Construction Noise Levels

Short-term noise during the approximately 28-month construction period can be associated with site preparation, grading, and building construction of the proposed land uses. As stated above, construction is performed in distinct steps, each with its own mix of equipment and its own noise characteristics. However, despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Using information provided by the City of Newport Beach and methodologies and inputs employed in the air quality assessment, the expected construction equipment mix was estimated and categorized by construction activity. The associated, aggregate sound levels—grouped by construction activity—are summarized in Table 5.9-10.

[7] The sound attenuation rate is generally conservative because it does not take into account attenuation provided by the existing buildings and structures around the project site.

Table 5.9-10 Project-Related Construction Noise Levels, Energy-Average (L_{eq}) Sound Levels

Construction Activity Phase (duration)	Sound Level at Various Distances from Construction Activities, dBA L_{eq}			
	Villas at Fashion Island Apts. (230 ft.)	Colony Apartments (260 ft.)	Big Canyon homes (950 ft.)	Island Hotel (1,100 ft.)
Demolition (2 months)	72	71	60	59
Site Prep (1 month)	67	66	54	53
Excavation 4 months)	67	66	54	53
Utility Trenching + Fine Grading (1 month)	68	67	55	54
Building Construction (22 months)	67	66	54	53
Building Const + Paving (overlaps with above)	70	69	58	57
Finishing / Landscaping (3 months)	67	66	54	53

Note: Calculations performed with the FHWA's RCNM software are included in Appendix J.

As shown, combined, spatially averaged noise levels for each construction phase would range between 66 and 72 dBA L_{eq} at the Villas at Fashion Island and Colony Apartments, and 60 dBA L_{eq} or lower at receptors at least 950 feet away. Assuming a typical interior noise reduction of 25 dB from exterior noise levels, the average noise levels due to project-related construction activities at the interior areas at the affected uses (i.e., closest units at the Villas of Fashion Island) would generally range from 28 to 47 dBA L_{eq}. There may be instances where these noise-sensitive receptors would be exposed to higher levels of noise from construction equipment operation. However, these moments would be sporadic and limited during the demolition, grading, and site preparation phases of construction; primarily when large construction equipment passes by.

Maximum Construction Noise Levels

Maximum noise levels for each stage were calculated as if the loudest piece of construction equipment was operating by the site's property line next to the nearest sensitive receptors in the vicinity of the site. This use of a distance from the closest equipment item to the closest noise-sensitive receptor is consistent with the assessment of maximum noise levels (due to the shortest propagation distance). Table 5.9-11 shows that the maximum unmitigated noise levels from each construction stage at the nearest affected receptors would range from 55 to 79 dBA L_{max}.

These levels represent the maximum levels that could occur during construction when the loudest piece of equipment is operating at maximum power at the location nearest to each receptor. Note also that longest phase, building construction, would involve noise sources on each floor of the multistory project as the development increased in elevation. These elevated noise sources (such as cutting, welding, sawing, and drilling activities) would, for various durations, be below, at, and finally above the elevation of the then-completed units at the Villas of Fashion Island. Therefore, intervening equipment or structures (between the project site and the Villas site) would not provide any barrier attenuation benefits for these elevated sources during the majority of the building construction phase.

Table 5.9-11 Project-Related Construction Noise Levels, Maximum (L_{max}) Sound Levels

Construction Activity Phase (duration)	Sound Level at Various Distances from Construction Activities, dBA L_{max}			
	Villas at Fashion Island (100 ft.)	Colony Apartments (150 ft.)	Big Canyon homes (770 ft.)	Island Hotel (910 ft.)
Demolition (2 months)	79	76	62	61
Site Prep (1 month)	74	71	56	55
Excavation (4 months)	74	71	56	55
Utility Trenching + Fine Grading (1 month)	75	72	57	56
Building Construction (22 months)	74	71	56	55
Building Const + Paving (overlaps with above)	77	74	60	59
Finishing / Landscaping (3 months)	74	71	56	55

Note: Calculations performed with the FHWA's RCNM software are included in Appendix J.

The maximum exterior noise levels during the loudest activity (demolition) would range from 79 dBA L_{max} at the Villas at Fashion Island apartments to 61 dBA L_{max} at the Island Hotel. Assuming a typical interior noise reduction of 25 dBA due to closed windows, the maximum noise levels during demolition would range from 55 dBA L_{max} at the Villas at Fashion Island to 36 dBA L_{max} at the Island Hotel. To illustrate, 55 dBA is comparable to noise levels at a large business office and below the noise levels generated by normal speech at 3 feet (see Table 5.9-2). Maximum noise levels during the building construction phase are projected to be approximately 5 dB less than for the demolition phase.

As noted above, with the high degree of variability in construction noise, exposure to such sound level incursions would be brief, and the maximum noise levels at the residential property line would lessen as the noisiest piece of construction equipment moved farther away, reduced the necessary power setting, and/or changed the interaction with the work piece.

Construction Equipment Noise Summary

Adjacent sensitive receptors to the project site would be exposed to elevated noise levels during the approximately 28-month construction schedule. Demolition and site preparation/grading activities are typically the phases that result in the most complaints and disturbances to nearby receptors. Demolition activities would occur for approximately two months, and site preparation/grading activities would occur for approximately for four months. The calculations presented in Tables 5.9-10 and 5.9-11 show that noise from demolition activities would be highest. Noise from the main construction of the residential building would have the longest duration and would last for the remaining 22 months.

The noise levels related to project construction at the Colony Apartments facing San Clemente Drive and the future Villas at Fashion Island residences facing the project site would be perceptible and/or potentially annoying at times, especially when equipment is operating at maximum power and nearest to the boundary of the site. The nearest receptors would sporadically experience perceptible noise levels, especially during the demolition, site preparation, and excavation activities, where the use of heavy construction equipment is more frequent, but also during other portions of the overall (building) construction process. The highest noise levels within the affected interior areas would be in the range of 42 to 47 dBA L_{eq} and in the range of 50 to 55 dBA L_{max}, which would be audible and comparable to noise levels at a business office or for normal speech, potentially causing sporadic disturbances for these residences. And the highest noise levels within the affected exterior areas would be approximately 72 dBA L_{eq} and 79 dBA L_{max}.

The City of Newport Beach Municipal Code limits noise sources associated with construction, repair, remodeling, or grading of any real property to the hours of 7:00 AM and 6:30 PM on weekdays, and 8:00 AM and 6:00 PM on Saturdays. This same portion of the code exempts noise levels caused by construction equipment in having to meet the basic noise level limits (of § 10.26.025 in Table 5.9-4, above). However, because of the magnitude of the noise levels within the then-completed nearest units at the Villas of Fashion Island complex and because of the extended length of the overall construction period, these impacts would be potentially significant. While construction activities would occur during the daytime when many adjacent occupants (at the Villas complex) might be away at work, the Villas occupants present during the daytime may be exposed to potentially disruptive interior noise levels from the construction activities.

Impact 5.9-2 Buildout of the project would not expose sensitive uses to strong levels of groundborne vibration. [Threshold N-2]

Impact Analysis: Potential vibration impacts associated with development projects are usually related to the use of heavy construction equipment during (a) demolition and grading phases of construction and/or (b) the operation of large trucks over uneven surfaces during project operations. Since neither the City of Newport Beach nor the County of Orange sets quantitative vibration level standards for structural damage, impacts are defined as significant if they exceed the FTA standards of 0.20 inches/second. As established in the 2006 General Plan EIR, vibration annoyance at residential uses would be a significant impact if they exceed 72 VdB.[8] The FTA standards for commercial/office land uses would be 0.30 inch/second for structural damage or 84 VdB for annoyance.

Operations Vibration Impacts

The operation of the proposed project would not include any long-term vibration sources. Thus, no significant vibration effects from operations sources would occur and no mitigation measures are required.

[8] Note that this is the FTA criterion for Residential-Nighttime land use, when no construction activities would be allowed per City of Newport Beach Code Section 10.28.040. The FTA criterion for Residential-Daytime land use is 78 VdB, which would nominally be more applicable to construction activities.

Construction Vibration Impacts

Construction operations can generate varying degrees of ground vibration, depending on the construction procedures and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish with distance from the source. The effect on buildings in the vicinity of the construction site varies depending on soil type, ground strata, and receptor-building construction. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight structural damage at the highest levels. Vibration from construction activities rarely reaches the levels that can damage structures, but can achieve the audible and perceptible ranges in buildings close to the construction site. Table 5.9-12 lists vibration levels for typical construction equipment.

Table 5.9-12 Vibration Levels for Typical Construction Equipment

Equipment		Approximate Velocity Level at 25 Feet (VdB)	Approximate RMS[1] Velocity at 25 Feet (in/sec)
Large Bulldozer		87	0.089
Caisson Drilling		87	0.089
Jackhammer		79	0.035
Small Bulldozer		58	0.003
Loaded Trucks		86	0.076
Criteria	2006 GP EIR – Human Annoyance (residential)	*72*	—
	FTA – Human Annoyance (Residential Daytime) FTA – Human Annoyance (Residential Nighttime) FTA – Human Annoyance (Office)	*78* *72* *84*	—
	FTA – Structural Damage (Residential)	—	*0.20*
	FTA – Structural Damage (Office)	—	*0.30*

Source: FTA 2006.
1 RMS velocity calculated from vibration level (VdB) using the reference of 1 microinch/second.

As shown in Table 5.9-12, vibration generated by certain, vibration-intensive construction equipment has the potential to be substantial since these items have the potential to exceed the FTA criteria for structural damage of 0.20 in/sec. However, groundborne vibration is almost never annoying to people who are outdoors, and vibration damage is generally not a concern for accessory features or auxiliary buildings (such as outdoor water features, storage sheds, or exterior decorative assemblies), so it is usually evaluated in terms of indoor receivers (as represented by the closest façade of the receptor building) (FTA 2006).

Construction would entail demolishing the existing OCMA building and constructing an apartment complex and underground parking and would last approximately 28 months. High-vibration equipment, such as pile drivers or vibratory rollers, would not be used (see Chapter 3, *Project Description*, for a discussion of the anticipated construction approaches). While the project site is generally level, a notable amount of heavy earthwork would be required during the excavation subphase to create the underground parking levels and building foundations. Thus, there would be some use of vibration-inducing construction equipment such as excavators, bulldozers, graders, jackhammers, and loaders/backhoes, during this approximately four-month period. Following the mass excavation phase, construction equipment for the building erection phase would

primarily employ items that would not generate substantial levels of vibration, including forklifts, cranes, and haul trucks.

Vibration-Induced Architectural Damage

The threshold at which there is a risk of architectural damage to typical wood-framed buildings is 0.20 in/sec or 0.30 in/sec for engineered concrete and masonry buildings. Building damage is not normally a factor unless the project requires blasting and/or pile driving. As stated previously, no blasting, pile driving, or hard rock ripping/crushing activities are anticipated for the proposed project, and the use of vibratory rollers is also not anticipated. Small construction equipment generates vibration levels less than 0.1 PPV in/sec at 25 feet away (FTA 2006).

Table 5.9-13 shows the peak particle velocities of some common construction equipment and (loaded) haul trucks expected to be employed at the proposed project site. Since architectural damage from construction vibration sources can be a one-time event and since such damage is dependent on the soil type, ground strata, and receptor building construction, vibration damage distances are measured from the nearest likely location at the construction site to the façade of the nearest receptor building.

Table 5.9-13 Architectural Damage Vibration Levels from Construction Equipment

	Peak Particle Velocity in inches per second		
Equipment	Villas at Fashion Island (70 ft.) with limit of 0.20	Colony Apartments (110 ft.) with limit of 0.20	Office Building (25 ft.) with limit of 0.30
Large Bulldozer	0.019	0.010	0.089
Loaded Trucks	0.016	0.008	0.076
Jackhammer	0.007	0.004	0.035
Small Bulldozer	0.001	0.000	0.003

Source: FTA 2006.

As shown in Table 5.9-13, project-related construction activities would not result in vibration levels at nearby structures that exceed the FTA's pertinent criteria for vibration-induced architectural damage (i.e., 0.20 PPV in/sec for residential land uses or 0.30 for commercial/office land uses). Therefore, construction activities are not expected to result levels that would cause vibration-induced damage, and these types of impacts would be less than significant.

Vibration Annoyance

Construction activities may generate levels of vibration that may be perceptible at the nearest off-site receptors due to of proximity to the activities. Vibration-related construction activities would occur in the daytime when residential land uses are least susceptible to vibration levels. For projects within the City of Newport Beach, the level where vibration becomes annoying is 72 VdB for residential uses and 84 VdB for commercial/office uses. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Construction activities are typically distributed throughout the project site and would only occur for a very limited duration when equipment would be working in close proximity. Additionally, since sensitivity and/or annoyance to groundborne vibration are

both variable and subjective, it is common industry practice to evaluate annoyance in terms of average vibration levels. Further, heavy equipment would only operate at the project boundary for brief periods.[9] Because heavy construction equipment moves around the project site, average vibration levels at the nearest structures would diminish with increasing distance between structures. Thus, in practical implementation of annoyance assessment methodologies, distances to the nearest receptors are measured from the center of the construction site, to represent the average vibration level. This differs from the architectural damage assessment (above) that implements the nearest distance from the closest equipment item to the closest building façade.

The nearest sensitive receptors are the Colony Apartments (approximately 260 feet), residences in the Big Canyon community (950 feet), and Island Hotel Newport Beach (1,100 feet). There is an office building to the west of the project site that is approximately 150 feet from the center of construction activities. Additionally, the Villas at Fashion Island are under construction in the parcels directly adjacent to the north side of the project site. According to the site plan for the Villas apartment complex, the nearest residential receptor building would be a distance of 230 feet from the center of construction for the proposed project. Table 5.9-14 shows the average vibration levels from typical earthmoving construction equipment at the pertinent receptors. As described above, this equipment would be primarily used during the site preparation/grading phase of construction, which would last approximately four months.

Table 5.9-14 Average Annoyance Vibration Levels from Construction Equipment

Equipment	Villas at Fashion Island Apts. (230 ft.) with limit of 72 VdB	Colony Apartments (260 ft.) with limit of 72 VdB	Big Canyon homes (950 ft.) with limit of 72 VdB	Island Hotel (1,100 ft.) with limit of 72 VdB	Office Building (150 ft.) with limit of 84 VdB
Large Bulldozer	68	67	55	54	72
Caisson Drilling	68	67	55	54	72
Loaded Trucks	67	66	54	53	71
Jackhammer	60	59	47	46	64
Small Bulldozer	39	38	26	25	43

Source: Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment, May 2006.

As shown above, the average, construction-generated vibration levels would not exceed 72 VdB at any nearby sensitive residential or hospitality receptors and would not exceed 84 VdB at any nearby office/commercial receptors. Therefore, construction-generated vibration levels would not exceed the thresholds for human annoyance, and impacts related to construction vibration annoyance would be less than significant.

[9] Estimated to be approximately 10 to 20 percent of the overall construction duration.

Impact 5.9-3: Buildout of the project would not cause a substantial noise increase related to traffic on local roadways. [Thresholds N-1 and N-3]

Impact Analysis: The proposed project could cause a substantial increase in noise levels if it generates traffic volumes that are substantial enough to elevate ambient noise levels above the City of Newport Beach General Plan community noise standards.

Off-Site Traffic Noise

Per General Plan Policy N 1.8 (summarized above in Table 5.9-5), the City of Newport Beach incremental noise impact criteria is up to plus-3 dB for existing exposures from 55 to 60 dBA CNEL, up to plus-2 dB for existing exposures from 60 to 65 dBA CNEL, up to plus-1 dB for existing exposures from 65 to 75 dBA CNEL, and a zero dB increase for existing exposures greater than 75 dBA CNEL.

Given the project site's proximity to major arterials (such as Jamboree Road and San Joaquin Hills Road) and minor arterials (such as Santa Cruz Drive, and Santa Barbara Drive), coupled with the lack of notable commercial or industrial noise sources, the predominant source for overall environmental noise in the area is taken to be traffic flows on these nearby streets. As identified in Table 5.9-8, noise measurements on San Clemente Drive proximate to the project site identified hourly noise levels ranging from 58.9 dBA L_{eq} (near Santa Maria Road) to 62.1 dBA L_{eq} (near Santa Barbara Drive). As discussed above in subsection 5.9.1.3 and shown in Tables 5.9-8 and 5.9-9, ambient noise levels were identified as 54.4 dBA CNEL on the project site, 58.9 dBA CNEL at San Clemente Drive and Santa Maria Road, and 62.1 dBA CNEL at San Clemente Drive and Santa Barbara Drive. The project may generate a noise increment associated with additional vehicles traveling to and from the project site on local roadways.

However, community noise environments would not appreciably change as a result of project implementation. Per the project's traffic study (DKS 2016), the project is estimated to generate 310 net new daily trips.[10] Worst-case conditions would be 30 net new trips during the AM peak hour and 33 net new trips during the PM peak hour. On average, the project would add one trip for every two minutes during the peak hours. In comparison to existing daily traffic flows on Santa Barbara Drive (10,000) and Santa Cruz Drive (8,000) (Newport Beach 2006), the project contribution represents a worst-case increment of much less than 10 percent. This small increment in flows translates into less than 0.5 dB of traffic-generated noise. This noise increase would be inaudible and well below the 2 dB threshold of significance, which is the pertinent increment per Noise Element Policy 1.8 (summarized above in Table 5.9-5) for the demonstrated existing conditions. Thus, no roadways in the vicinity of the project site would experience project-generated increases in traffic noise levels that would be significant. Therefore, traffic noise increases would be less than significant.

[10] These figures include a trip credit for existing uses on the site.

Impact 5.9-4: Adjacent noise-sensitive uses would not be exposed to elevated noise levels from project-related stationary sources. [Thresholds N-1 and N-3]

Impact Analysis: An impact could be significant if the project would generate noise levels that would exceed the applicable noise standards. For stationary sources, noise ordinance compliance (i.e., potential impacts of the proposed project onto nearby or adjoining receptors) is the goal. The City's Noise Ordinance (Newport Beach Municipal Code Chapter 10.26) is designed to protect people from objectionable non-transportation noise sources such as music, machinery, pumps, and air conditioners. These standards do not gauge the compatibility of developments in the noise environment, but provide restrictions on the amount and duration of noise generated at a (source) property, as measured at the receiving property. The details on noise level measurement locations are given in Section 10.26.055 of the code.[11]

Noise generated by stationary sources at the proposed project (including HVAC systems and other mechanical equipment) would be required to comply with the following noise standards:

- For HVAC equipment: no more than 50 dBA (generally) or no more than 55 dBA if the equipment has a timing device that deactivates the equipment between 10:00 PM and 7:00 AM. (§ 10.26.045)

- For general stationary items:
  - no more than 55 dBA L_{eq} at (single-, two- or multi-family) residential receptors during the daytime[12] or 50 dBA L_{eq} during the nighttime.[13]

  - no more than 65 dBA L_{eq} at commercial receptors during the daytime or 60 dBA L_{eq} during the nighttime.

Stationary (non-transportation) noise sources associated with the proposed residential development would include HVAC units and other mechanical equipment (e.g., relating to elevator systems and pool/water feature systems). These new mechanical equipment items are expected to be located on the roof of the 26-story, multifamily building (behind a parapet wall) or inside equipment rooms within the building shell. For the latter, no notable noise is expected to escape the equipment rooms so as to propagate into the surround community since such spaces are typically designed to encapsulate noise by providing through-wall noise reduction features of 30 to 40 dB or more. For any roof-top equipment, the long propagation distances to nearby receptors, coupled with the project building itself acting as a barrier to reduce noise (spilling over the edge of the roof), the associated noise levels would be expected to be notably less than the similar mechanical equipment noise levels generated at the existing (and soon-to-be-completed) residential and office land uses in the immediate vicinity of the project site. That is, distance attenuation alone would provide at least 30 dB of noise reduction, with barrier effects adding another 10 to 20 dB of reduction, and rooftop equipment would be expected to have noise levels at the nearest receptors of no more than 35 to 40 dBA,[14] which is well

[11] The measurement of potentially offending noise in a 'residential area' (at the receptor property) can include any part of a private yard, patio, deck or balcony normally used for human activity and identified by the owner of the affected property as suspected of exceeding the noise level standard. See Appendix J for additional details on the Newport Beach Noise Ordinance.

[12] Daytime = 7 AM to 10 PM.

[13] Nighttime = 10 PM to the following 7 AM.

[14] Assuming a typical equipment emissions levels of 85 dBA L_{eq} at 10 feet.

below the existing ambient and would be expected to be totally inaudible at these nearest offsite receptors. Additionally, ambient noise levels at the existing land used are primarily driven by traffic flows on Santa Barbara Drive and San Joaquin Hills Road. The project's mechanical equipment noise levels would be lower at the nearby receptor apartments than ambient noise levels caused by the commercial and traffic-related sources.

Since the proposed project's mechanical equipment units would comply with noise standards in the City of Newport Beach Municipal Code, and since surrounding noise-sensitive uses experience ambient noise levels controlled by traffic flows and their own mechanical equipment, the proposed project would not significantly increase area noise levels, would not exceed municipal code noise level limits (for stationary equipment), and would not impact any existing noise-sensitive uses in the project vicinity.

5.9.4 Cumulative Impacts

Mobile Source Noise

Project-related cumulative noise impacts would occur if the project's contribution to cumulative noise increases results in a substantial noise increase in comparison to existing conditions (3 dBA or more when the existing CNEL is 60 dBA or less, 2 dBA or more when the CNEL is between 60 and 65 dBA, 1 dBA or more when the CNEL is between 65 and 75, or any amount when the CNEL exceeds 75 dBA in the vicinity of any noise-sensitive receptors). Project-induced traffic noise increases on local roadways in the vicinity of the project site were previously discussed under Impact 5.9-3.

The project's traffic analyses analyzed several future scenarios, including (DKS 2016):

- Ambient (traffic) growth + approved projects
- Year 2021 traffic + other approved projects + growth
- Year 2021 traffic + other approved projects + growth + proposed project
- Year 2021 traffic + other approved projects + growth + cumulative projects
- Year 2021 traffic + other approved projects + growth + proposed project + cumulative projects

For the last three scenarios—which would be worst-case conditions in 2021—the traffic study indicated increases over existing conditions in the range of approximately 2.5 to 3.5 percent. This suggests that there would be relatively minimal growth of traffic flows in the project vicinity.

As discussed in Impact 5.9-3, the project would generate 310 new trips on local streets, whose existing ADT flows are in the range of approximately 8,000 to 10,000 vehicles per day. With worst-case future conditions (in 2021) that would include all nonproject contributions to cumulative growth, the future ADT flows are forecast to be in the range of approximately 8,300 to 10,400 vehicles per day. As with the comparison of the project's 310 new trips to existing conditions, that same project-generated trip contribution to the future, cumulative conditions would be much less than 0.5 dBA CNEL along roadways in the vicinity of the project area. Consequently, project-related traffic noise increases would not be cumulatively considerable and no significant cumulative noise impacts would occur.

Stationary Source Noise

Unlike transportation noise sources, whose effects can extend well beyond the limits of the project site, stationary noise generated by the project is limited to impacts to noise-sensitive receptors adjacent to the project site. Stationary-source noise impacts generated by the project would be associated with HVAC and other mechanical equipment. Project-generated stationary noise levels would comply with the City of Newport Beach Municipal Code and would be expected to be much lower than the noise levels produced by nearby traffic flows and commercial uses (see Impact 5.9-4, above). Therefore, the combination of traffic sources plus stationary sources would be controlled by the traffic sources (as analyzed immediately above). Because no significant stationary noise impacts from project implementation were identified and the City of Newport Beach restricts stationary noise generated on a property from creating a nuisance to other noise-sensitive receptors, cumulative stationary source noise generation would also be less than significant.

Construction Noise and Vibration

Like stationary source noise, cumulative construction noise and vibration impacts are confined to a local area. Consequently, cumulative impacts would only occur if other projects are being constructed in the local vicinity of the project at the same time as the project. The general area around the project site is built out, and the only other project planned to be built in the vicinity of the project site is the Villas at Fashion Island, which is currently under construction on the property immediately to the north. Since construction of this project is already partially complete, it is assumed that construction activities for Villas at Fashion Island will be concluded before development of the Museum House project begins. Since no surrounding activities would combine with project-site activities, this cumulative impact would be less than significant.

5.9.5 Existing Regulations and Standard Conditions

Local Regulations

- City of Newport Beach Municipal Code
  - Chapter 10.26: Community Noise Control
  - Chapter 10.28: Loud and Unreasonable Noise

Standard Conditions of Approval

The following City-adopted standard operating conditions of approval would apply to the proposed project:

- The project must comply with the exterior noise standards for residential uses of the Noise Ordinance. The exterior noise level standard is 65 dBA between the hours of 7:00 AM and 10:00 PM and 60 dBA between the hours of 10:00 PM and 7:00 AM. An acoustic study shall be performed by a qualified professional that demonstrates compliance with these standards of the Noise Ordinance. This acoustic study shall be performed and submitted to the Community Development Department as part of the Site Development Review permit application for each residential structure. If the exterior noise levels exceed applicable standards, additional mitigation shall be required, which may include the installation of

additional sound attenuation devices as recommended by the acoustic study and subject to the approval of the Community Development Director.

- The operator of the proposed residential facility uses shall be responsible for the control of noise generated by the subject facility including permanent stationary/mechanical equipment. Likewise, the individual apartment renters shall be responsible for the noise generated within their respective units. All noise generated by the proposed use shall comply with the provisions of Chapter 10.26 and other applicable noise control requirements of the Newport Beach Municipal Code. The maximum noise shall be limited to no more than noise limits specified in Table 5.9-4 for the specified time periods unless the ambient noise level is higher.

- All mechanical equipment shall be screened from view of adjacent properties and adjacent public streets for each residential structure, as authorized by a Site Development Review permit, and shall be sound-attenuated in accordance with Chapter 10.26 of the Newport Beach Municipal Code, Community Noise Control.

- The City of Newport Beach Municipal Code Chapter 10.32, Sound-Amplifying Equipment, requires a permit for use of any sound-amplifying equipment and regulates the volume so sound-amplifying equipment is not a nuisance to persons. The use of sound-amplifying equipment is prohibited outdoors between the hours of 8 PM and 8 AM.

- The City of Newport Beach General Plan Noise Element, through Policy N 3.2, requires that residential development in the airport area be outside of the 65 dBA CNEL noise contour no larger than shown in the 1985 JWA Master Plan and require residential developers to notify prospective purchasers or tenants of aircraft overflight and noise.

5.9.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.9-2, 5.9-3, and 5.9-4. Cumulative impacts would also be less than significant. Without mitigation, the following impacts would be significant:

- **Impact 5.9-1** Construction activities would result in potentially significant temporary noise increases in the vicinity of the project site.

5.9.7 Mitigation Measures

Impact 5.9-1

9-1 At least 30 days prior to commencement of demolition or any other construction activities, notification shall be given to all residents or businesses within 500 feet of the project site regarding the planned construction activities. The notification shall include a brief description of the project, the activities that would occur, and the duration and hours when

construction would occur. The notification shall also include the telephone number of the construction contractor's authorized representative to respond in the event of a vibration or noise complaint.

9-2 Prior to the beginning of construction activities, a sign shall be posted at the entrance to the job site, clearly visible to the public, that contains a contact name and telephone number of the construction contractor's authorized representative to respond in the event of a vibration or noise complaint. If the authorized representative receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City of Newport Beach's Community Development Director.

9-3 Route all construction-related trips (including worker commuting, material deliveries, and debris/soil hauling) so as to minimize pass-bys or residential areas around the project site.

9-4 All heavy construction equipment used on the proposed project shall be maintained in good operating condition, with all internal combustion, engine-driven equipment fitted with intake and exhaust muffles, air intake silencers, and engine shrouds no less effective than as originally equipped by the manufacturer.

9-5 Electrically powered equipment instead of pneumatic or internal combustion powered equipment shall be used to the extent possible.

9-6 All stationary noise-generating equipment shall be located as far away as possible from neighboring property lines, with particular attention paid to the residential complex (currently under construction) to the north of the project site.

9-7 Limit all internal combustion engine idling both on the site and at nearby queuing areas to no more than five minutes for any given vehicle or machine. Signs shall be posted at the job site and along queueing lanes to reinforce the prohibition of unnecessary engine idling.

9-8 The use of noise producing signals, including horns, whistles, alarms, and bells will be for safety warning purposes only. Use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with human spotters.

9-9 A temporary noise barrier/curtain shall be erected between the construction zone and adjacent residential receptors to the north of the project site boundary. The temporary sound barrier shall have a minimum height of 16 feet and be free of gaps and holes and must achieve a Sound Transmission Class (STC) of 35 or greater. The barrier can be (a) a ¾-inch-thick plywood wall OR (b) a hanging blanket/curtain with a surface density of at least 2 pounds per square foot. For either configuration, the construction side of the barrier shall have an exterior lining of sound absorption material with a Noise Reduction Coefficient (NRC) rating of at least 0.7.

All the above conditions shall be included on the permit applicant drawings with verification by the Building Division Plan Check staff. Additionally, all the above conditions shall be verified in the field by the Building Division field inspection staff at the project site.

5.9.8 Level of Significance After Mitigation

Impact 5.9-1

With implementation of Mitigation Measures 9-1 through 9-9, construction noise impacts due to construction activities would be reduced to the extent feasible.[15] Specifically, Mitigation Measure 9-9 would require a noise barrier/curtain that would reduce construction noise levels by approximately 10 to 20 dB where the barrier has direct line-of sight.[16]

However, given the expected noise levels during the two-month demolition phase (predicted to be as high as 47 dBA L_{eq} and 55 dBA L_{max} within living spaces at the closest, then-completed units at the Villas of Fashion Island complex), coupled with the length of the site preparation/grading (4 months) and building construction phase (22 months) and its expected noise levels as high as 42 dBA L_{eq} and 50 dBA L_{max} within living spaces at the closest, then-completed units at the Villas of Fashion Island complex, significant construction noise impacts would remain. Impact 5.9-1 would remain **significant and unavoidable**.

5.9.9 References

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[15] The term "feasible" is defined in CEQA to mean "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors" (Public Resources Code § 21061.1). This is consistent with the feasibility clause of Municipal Code Section 41.40.

[16] Actual reductions would be highly dependent on the distance from the source(s) to the barrier, the distance from the barrier to the receptor unit, and the respective elevations of the sources and receivers.

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