IV. Environmental Impact Analysis

H. Noise

1. Introduction

This section of the Draft EIR analyzes potential noise and vibration impacts of the Project. Included in this section is a description of the existing noise environment within the Project Site area, an estimation of future noise and vibration levels at surrounding sensitive land uses associated with construction and operation of the Project, a description of the potential significant impacts, and the inclusion of mitigation measures to address any identified potential significant impacts. Additionally, this section of the Draft EIR evaluates the Project's incremental contribution to potential cumulative noise and vibration impacts resulting from past, present, and probable future projects. Noise monitoring data and calculations are included as **Appendix G** to this Draft EIR.

2. Environmental Setting

Due to the technical nature of noise and vibration impacts, a brief overview of basic noise principals and descriptors is provided below.

a) Noise and Vibration Basics

(1) Noise Principals and Descriptors

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air). Noise is generally defined as undesirable (i.e., loud, unexpected, or annoying) sound. Acoustics is defined as the physics of sound and addresses its propagation and control.[1] In acoustics, the fundamental scientific model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determine the sound level and characteristics of the noise perceived by the receiver.

Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) that is measured in decibels (dB), which is the standard unit of sound amplitude measurement and reflects the way people perceive changes in sound amplitude[2]. The dB scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up

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[1] *California Department of Transportation (Caltrans), Technical Noise Supplement (TeNS) to the Traffic Noise Analysis Protocol, Section 2.2.1, September 2013.*

[2] *All sound levels measured in decibel (dB), as identified in the noise calculation worksheets included in **Appendix G** of this Draft EIR and in this section of the Draft EIR, are relative to $2x10^{-5}$ N/m^2.*

any sound, with 0 dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of feeling pain. Pressure waves traveling through air exert a force registered by the human ear as sound.[3]

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude. When all of the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequencies spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.[4]

The typical human ear is not equally sensitive to the frequency range from 20 to 20,000 Hz. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that deemphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to these extremely low and extremely high frequencies. This method of frequency filtering or weighting is referred to as A-weighting, expressed in units of A-weighted decibels (dBA), which is typically applied to community noise measurements.[5] Some representative common outdoor and indoor noise sources and their corresponding A-weighted noise levels are shown in **Table IV.H-1, Decibel Scale and Common Noise Sources**.

Table IV.H-1
Decibel Scale and Common Noise Sources

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	—110—	Rock Band
Jet Fly-over at 1000 feet		
	—100—	
Gas Lawnmower at 3 feet		
	—90—	
		Food Blender at 3 feet
Diesel Truck going 50 mph at 50 feet	—80—	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime		
Gas Lawnmower at 100 feet	—70—	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	—60—	
		Large Business Office
Quiet Urban Area during Daytime	—50—	Dishwasher in Next Room
Quiet Urban Area during Nighttime	—40—	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		

[3] *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.3, September 2013.*
[4] *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.3, September 2013.*
[5] *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.3, September 2013.*

Table IV.H-1
Decibel Scale and Common Noise Sources

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	—30—	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	—20—	
		Broadcast/Recording Studio
	—10—	
Lowest Threshold of Human Hearing	—0—	Lowest Threshold of Human Hearing

Note: Colors are for illustrative purposes only.
Source: California Department of Transportation, Technical Noise Supplement, Page 2-20, September 2013.

(2) Noise Exposure and Community Noise

Community noise exposure is typically measured over a period of time; a noise level is a measure of noise at a given instant in time. Community noise varies continuously over a period of time with respect to the sound sources contributing to the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with many unidentifiable individual contributors. Single-event noise sources, such as aircraft flyovers, sirens, etc., may cause sudden changes in background noise level.[6] However, generally, background noise levels change gradually throughout the day, corresponding with the addition and subtraction of distant noise sources, such as changes in traffic volume.

These successive additions of sound to the community noise environment change the community noise level from moment to moment, requiring the noise exposure to be measured over periods of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. The following noise descriptors are used to characterize environmental noise levels over time.[7]

L_{eq}: The equivalent sound level over a specified period of time, typically, 1 hour (L_{eq}). The L_{eq} may also be referred to as the average sound level.

L_{max}: The maximum, instantaneous noise level experienced during a given period of time.

L_{min}: The minimum, instantaneous noise level experienced during a given period of time.

L_x: The noise level exceeded a percentage of a specified time period. For instance, L_{50} and L_{90} represent the noise levels that are exceeded 50 percent and 90 percent of the time, respectively.

6 *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1, September 2013.*

7 *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.2, September 2013.*

L_{dn}: The average A-weighted noise level during a 24-hour day, obtained after an addition of 10 dB to measured noise levels between the hours of 10:00 PM and 7:00 AMAM to account for nighttime noise sensitivity. The L_{dn} is also termed the day-night average noise level (DNL).

CNEL: The Community Noise Equivalent Level (CNEL) is the average A-weighted noise level during a 24-hour day that includes an addition of 5 dBA to measured noise levels between the hours of 7:00 PM and 10:00 PM and an addition of 10 dBA to noise levels between the hours of 10:00 PM and 7:00 AMAM to account for noise sensitivity in the evening and nighttime, respectively.

(3) Effects of Noise on People

Noise is generally loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity that is a nuisance or disruptive. The effects of noise on people can be placed into four general categories:

- Subjective effects (e.g., dissatisfaction, annoyance);
- Interference effects (e.g., communication, sleep, and learning interference);
- Physiological effects (e.g., startle response); and
- Physical effects (e.g., hearing loss).

Although exposure to high noise levels has been demonstrated to cause physical and physiological effects, the principal human responses to typical environmental noise exposure are related to subjective effects and interference with activities. Interference effects interrupt daily activities and include interference with human communication activities, such as normal conversations, watching television, telephone conversations, and interference with sleep.

The World Health Organization's Guidelines for Community Noise details the adverse health effects of high noise levels, which include hearing impairment, speech intelligibility, sleep disturbance, physiological functions (e.g., hypertension and cardiovascular effects), mental illness, performance of cognitive tasks, social and behavioral effects (e.g., feelings of helplessness, aggressive behavior), and annoyance.[8]

With regard to the subjective effects, the responses of individuals to similar noise events are diverse and influenced by many factors, including the type of noise, the perceived importance of the noise, the appropriateness of the noise to the setting, the duration of the noise, the time of day and the type of activity during which the noise occurs, and individual noise sensitivity. Overall, there is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction on people. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has

[8] *World Health Organization Team, edited by Berglund, Birgitta; Lindvall, Thomas; Schwela, Dietrich H, Guidelines for Community Noise, 1999.*

adapted (i.e., comparison to the ambient noise environment). In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships generally occur:[9]

- Except in carefully controlled laboratory experiments, a change of 1 dBA in ambient noise levels cannot be perceived.
- Outside of the laboratory, a 3 dBA change in ambient noise levels is considered to be a barely perceivable difference.
- A change in ambient noise levels of 5 dBA is considered to be a readily perceivable difference.
- A change in ambient noise levels of 10 dBA is subjectively heard as doubling of the perceived loudness.

These relationships between change in noise level and human hearing response occur in part because of the logarithmic nature of sound and the dB scale. Because the dBA scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but, rather, logarithmically. Under the dBA scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two sources are each producing sound of the same loudness, the resulting sound level at a given distance would be approximately 3 dBA higher than one of the sources under the same conditions. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA. Under the dB scale, three sources of equal loudness together produce a sound level of approximately 5 dBA louder than one source, and 10 sources of equal loudness together produce a sound level of approximately 10 dBA louder than the single source.[10]

(4) Noise Attenuation

When noise propagates over a distance, the noise level reduces, or attenuates, with distance depending on the type of noise source and the propagation path. Noise from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern, referred to as "spherical spreading." The rate of sound attenuation for a point source, such as a piece of mechanical or electrical equipment (e.g., air conditioner) or idling vehicle (e.g., bulldozer), is 6 dBA per doubling of distance from the noise source to the receptor over acoustically "hard" sites and 7.5 dBA per doubling of distance from the noise source to the receptor over acoustically "soft" sites .[11] Hard sites are those with a reflective surface between the source and the receiver, such as asphalt or concrete surfaces or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the reduction in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees, which in addition to geometric spreading, provides

[9] *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1, September 2013.*

[10] *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1.1, September 2013.*

[11] *Caltrans, TeNS to the Traffic Noise Analysis Protocol, Sections 2.1.4.1 and 2.1.4.2, September 2013.*

an excess ground attenuation value of 1.5 dBA (per doubling distance).[12] For example, an outdoor condenser fan that generates a sound level of 60 dBA at a distance of 50 feet from a point source at an acoustically hard site would attenuate to 54 dBA at a distance of 100 feet from the point source and attenuate to 48 dBA at 200 feet from the point source.

Roadways and highways consist of several localized noise sources on a defined path, and, hence, are treated as "line" sources, which approximate the effect of several point sources.[13] Noise from a line source propagates over a cylindrical surface, often referred to as "cylindrical spreading."[14] Line sources (e.g., traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement.[15] Therefore, noise due to a line source attenuates less with distance than that of a point source with increased distance.

Structures (e.g., buildings and solid walls) and natural topography (e.g., hills and berms) that obstruct the line-of-sight between a noise source and a receptor further reduce the noise level if the receptor is located within the "shadow" of the obstruction, such as behind a sound wall. This type of sound attenuation is known as "barrier insertion loss." If a receptor is located behind the wall but still has a view of the source (i.e., the line-of-sight is not fully blocked), barrier insertion loss would still occur but to a lesser extent. Additionally, a receptor located on the same side of the wall as a noise source may actually experience an increase in the perceived noise level as the wall can reflect noise back to the receptor, thereby compounding the noise. Noise barriers can provide noise level reductions ranging from approximately 5 dBA (where the barrier just breaks the line-of-sight between the source and receiver) to an upper range of 20 dBA with a larger barrier.[16] Additionally, structures with closed windows can further attenuate exterior noise by a minimum of 20 dBA to 30 dBA.[17]

Receptors located downwind from a noise source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels.[18] Atmospheric temperature inversion (i.e., increasing temperature with elevation) can increase sound levels at long distances. Other factors such as air temperature, humidity, and turbulence can, under the right conditions, also have substantial effects on noise levels.[19]

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12 *Caltrans, TeNS to the Traffic Noise Analysis Protocol, Sections 2.1.4.1 and 2.1.4.2, September 2013.*
13 *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.1, September 2013.*
14 *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.1, September 2013.*
15 *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.1, 2013.*
16 *Caltrans, TeNS to the Traffic Noise Analysis Protocol, Sections 2.1.4.24 and 5.1.1, September 2013.*
17 *Caltrans, TeNS to the Traffic Noise Analysis Protocol, Section 7.4.2, Table 7-1, September 2013.*
18 *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.3, September 2013.*
19 *California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.3, September 2013.*

(5) Vibration Fundamentals

Vibration can be interpreted as energy transmitted in waves through the ground or man-made structures, which generally dissipate with distance from the vibration source. 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. Since energy is lost during its transfer from one particle to another, vibration becomes less perceptible with increasing distance from the source.

As described in the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual*, groundborne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard.[20] In contrast to airborne noise, groundborne vibration is not a common environmental problem, as it is unusual for vibration from sources such as rubber-tired buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, heavy trucks traveling on rough roads, and certain construction activities, such as blasting, pile-driving, and operation of heavy earth-moving equipment.[21] Groundborne vibration generated by man-made activities (e.g., road traffic, construction operations) typically weakens with greater horizontal distance from the source of the vibration.

Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal in inches per second (in/sec), and is most frequently used to describe vibration impacts to buildings.[22] The root mean square (RMS) amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body.[23] Decibel notation (VdB) is commonly used to express RMS vibration velocity amplitude. The relationship of PPV to RMS velocity is expressed in terms of the "crest factor," defined as the ratio of the PPV amplitude to the RMS amplitude. PPV is typically a factor of 1.7 to 6 times greater than RMS vibration velocity; FTA uses a crest factor of 4. [24] The decibel notation VdB acts to compress the range of numbers required to describe vibration. Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include buildings where vibration would interfere with operations within the building or cause damage (especially older masonry structures), locations where people sleep, and locations with vibration sensitive equipment.[25]

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[20] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 7, 2018.*

[21] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 7, 2018.*

[22] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.*

[23] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.*

[24] *FTA Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.*

[25] *FTA, Transit Noise and Vibration Impact Assessment Manual, Section 6.1, 6.2, and 6.3, 2018.*

Groundborne noise specifically refers to the rumbling noise emanating from the motion of building room surfaces due to the vibration of floors and walls; it is perceptible only inside buildings.[26] The relationship between groundborne vibration and groundborne noise depends on the frequency of the vibration and the acoustical absorption characteristics of the receiving room. For typical buildings, groundborne vibration that causes low frequency noise (i.e., the vibration spectrum peak is less than 30 Hz) results in a groundborne noise level that is approximately 50 decibels lower than the velocity level. For groundborne vibration that causes mid-frequency noise (i.e., the vibration spectrum peak is between 30 and 60 Hz), the groundborne noise level will be approximately 35 to 37 decibels lower than the velocity level.[27] Therefore, for typical buildings, the groundborne noise decibel level is lower than the groundborne vibration velocity level at low frequencies.

b) Regulatory Framework

There are several plans, regulations, and programs that include policies, requirements, and guidelines regarding Noise at the federal, State, regional, and local levels. As described below, these plans, guidelines, and laws include the following:

- Noise Control Act of 1972
- Federal Transportation Administration Vibration Standards
- Occupational Safety and Health Act of 1970
- Office of Planning and Research Guidelines for Noise Compatible Land Use
- Caltrans Vibration/Groundborne Noise Standards
- Los Angeles County Airport Land Use Commission Comprehensive Land Use Plan
- City of Los Angeles Municipal Code
- City of Los Angeles General Plan Noise Element

(1) Federal

(a) Noise Control Act of 1972

Under the authority of the Noise Control Act of 1972, the United States Environmental Protection Agency (USEPA) established noise emission criteria and testing methods published in Parts 201 through 205 of Title 40 of the Code of Federal Regulations (CFR) that apply to some transportation equipment (e.g., interstate rail carriers, medium trucks, and heavy trucks) and construction equipment. In 1974, USEPA issued guidance levels for the protection of public health and welfare in residential areas of an outdoor L_{dn} of 55 dBA and an indoor L_{dn} of 45 dBA.[28] These guidance levels are not standards or regulations and were developed without consideration of technical or economic feasibility. There are no federal noise standards that directly regulate environmental noise related to the construction or operation of the Project. Moreover, the federal noise standards

26 *FTA, Transit Noise and Vibration Impact Assessment Manual, Section 5.4, 2018.*
27 *FTA, Transit Noise and Vibration Impact Assessment Manual, Table 6-3 and Table 6-14, , September 2018.*
28 *United States Environmental Protection Agency, EPA Identifies Noise Levels Affecting Health and Welfare, 1974.*

are not reflective of urban environments that range by land use, density, proximity to commercial or industrial centers, etc. As such, for purposes of determining acceptable sound levels to determine and evaluate intrusive noise sources and increases, this document utilizes the City of Los Angeles Noise Regulations, discussed below.

(b) Federal Transit Administration Vibration Standards

There are no federal vibration standards or regulations adopted by any agency that are applicable to evaluating vibration impacts from land use development projects such as the Project. However, the FTA has adopted vibration criteria for use in evaluating vibration impacts from construction activities.[29] The vibration damage criteria adopted by the FTA are shown in **Table IV.H-2, Construction Vibration Damage Criteria.**

Table IV.H-2
Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel or timber (no plaster)	0.50
II. Engineered concrete and masonry (no plaster)	0.30
III. Non-engineered timber and masonry buildings	0.20
IV. Buildings extremely susceptible to vibration damage	0.12
Source: FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018.	

The FTA has also adopted standards associated with human annoyance for determining the groundborne vibration and noise impacts from ground-borne noise on the following three off-site land-use categories: Vibration Category 1 – High Sensitivity, Vibration Category 2 – Residential, and Vibration Category 3 – Institutional.[30] The FTA defines Category 1 as buildings where vibration would interfere with operations within the building, including vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. Vibration-sensitive equipment includes, but is not limited to, electron microscopes, high-resolution lithographic equipment, and normal optical microscopes. Category 2 refers to all residential land uses and any buildings where people sleep, such as hotels and hospitals. Category 3 refers to institutional land uses such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment but that still potentially involve activities that could be disturbed by vibration. The vibration thresholds associated with human annoyance for these three land-use categories are shown in **Table IV.H-3**, **Ground-Borne Vibration Impact Criteria for General Assessment**. No thresholds have been adopted or recommended for commercial and office uses.

[29] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 7-5, page 186, 2018.*

[30] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 6-1, page 124, 2018.*

Table IV.H-3
Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1	65 VdB[d]	65 VdB[d]	65 VdB[d]
Category 2	72 VdB	75 VdB	80 VdB
Category 3	75 VdB	78 VdB	83 VdB

[a] *"Frequent Events" is defined as more than 70 vibration events of the same source per day.*
[b] *"Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.*
[c] *"Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day.*
[d] *This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.*
Source: FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018.

(c) Occupational Safety and Health Act of 1970

Under the Occupational Safety and Health Act of 1970 (29 United States Code [USC] Sections1919 et seq.), the Occupational Safety and Health Administration (OSHA) has adopted regulations designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise level exposure as a function of the amount of time during which the worker is exposed. The regulations further specify a hearing conservation program that involves monitoring noise to which workers are exposed, ensuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.[31]

(2) State

(a) Office of Planning and Research Guidelines for Noise Compatible Land Use

The State of California has not adopted Statewide standards for environmental noise, but the Governor's Office of Planning and Research (OPR) has established guidelines for evaluating the compatibility of various land uses as a function of community noise exposure, as presented in **Figure IV.H-1, Guidelines for Noise Compatible Land Use**.[32] The purpose of these guidelines is to maintain acceptable noise levels in a community setting for different land use types. Noise levels are divided into four general categories, which vary in range according to land use type: "normally acceptable," "conditionally acceptable," "normally unacceptable," and "clearly unacceptable." The City has developed its own compatibility guidelines in the Noise Element of the General Plan based in part on OPR Guidelines. California Government Code Section 65302 requires each county and city in the State to prepare and adopt a comprehensive long-range general plan for its physical development, with Section 65302(f) requiring a noise element to be included in the general plan. The noise element must: (1) identify and appraise noise problems in the community; (2) recognize Office of Noise Control guidelines; and (3) analyze and quantify current and projected noise levels.

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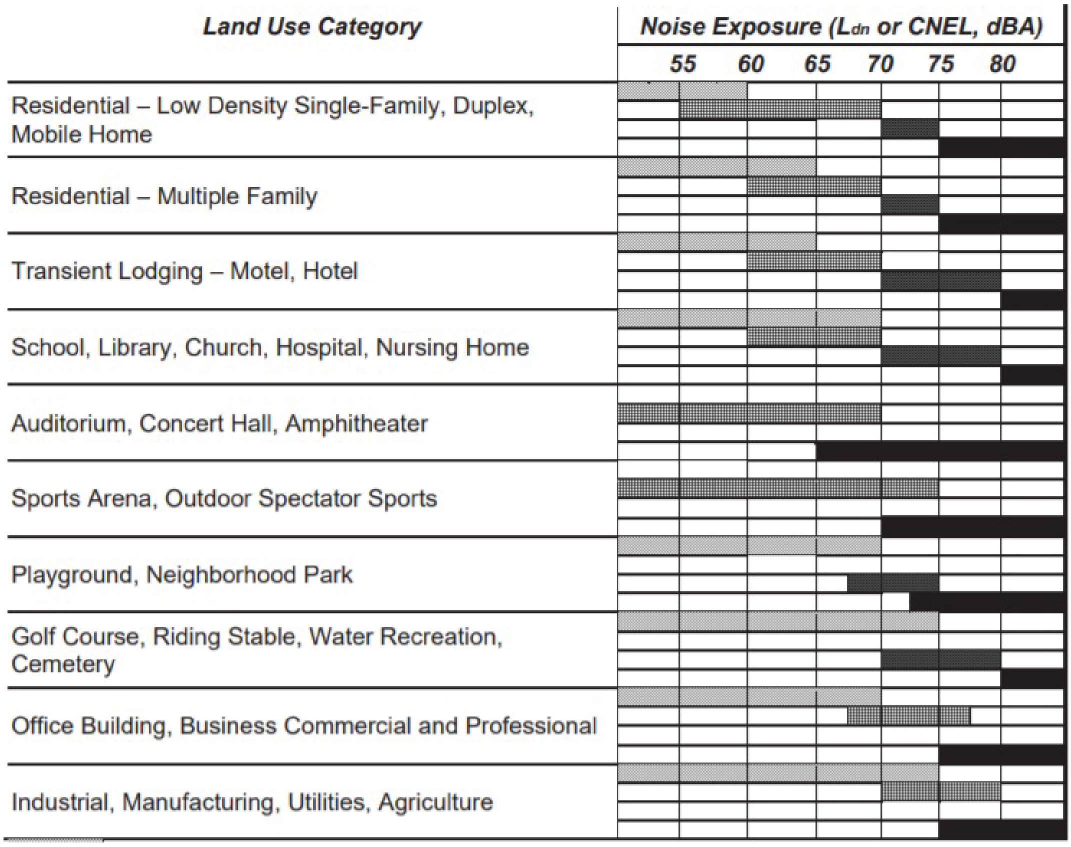
[31] *United States Department of Labor. OSH Act of 1970.*
[32] *State of California, Governor's Office of Planning and Research, General Plan 2017 Guidelines, page 377, 2017.*



NORMALLY ACCEPTABLE: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

NORMALLY UNACCEPTABLE: New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE: New construction or development should generally not be undertaken. Construction costs to make the indoor environmental acceptable would be prohibitive and the outdoor environment would not be usable.

D16XXXX

Source: State of California, General Plan Guidelines, Governor's Office of Planning and Research, 2003.

Figure IV.H-1
Guidelines for Noise Compatible Land Use

The purpose of these guidelines is to maintain acceptable noise levels in a community setting for different land use types. Noise levels are divided into four general categories, which vary in range according to land use type: "normally acceptable," "conditionally acceptable," "normally unacceptable," and "clearly unacceptable." The City has developed its own compatibility guidelines in the Noise Element of the General Plan based in part on OPR Guidelines. California Government Code Section 65302 requires each county and city in the State to prepare and adopt a comprehensive long-range general plan for its physical development, with Section 65302(f) requiring a noise element to be included in the general plan. The noise element must identify and appraise noise problems in the community and analyze and quantify current and projected noise levels.

The State has also established noise insulation standards for new multi-family residential units, hotels, and motels. These requirements are collectively known as the California Noise Insulation Standards (Title 24 of the California Code of Regulations [CCR]). The noise insulation standards set forth an interior standard of 45 dBA CNEL in any habitable room. The standards require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to exterior noise levels greater than 60 dBA CNEL. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

(b) Caltrans Vibration/Groundborne Noise Standards

The State of California has not adopted Statewide standards or regulations for evaluating vibration or groundborne noise impacts from land use development projects, such as the Project. Although the State has not adopted any vibration standard, Caltrans in its 2013 *Transportation and Construction Vibration Guidance Manual* recommends the following vibration thresholds that are more practical than those provided by the FTA. The Caltrans vibration thresholds are shown in **Table IV.H-4**, **Guideline Vibration Damage Potential Threshold Criteria**.

Table IV.H-4
Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources[a]	Continuous/Frequent Intermittent Sources[b]
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

NOTES:
[a] Transient sources create a single, isolated vibration event, such as blasting or drop balls.
[b] Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
SOURCE: Caltrans, Transportation and Construction Vibration Guidance Manual, Table 19, April 2020.

(3) Regional

(a) Los Angeles County Airport Land Use Commission Comprehensive Land Use Plan

In Los Angeles County the Regional Planning Commission has the responsibility for acting as the Airport Land Use Commission (ALUC) and for coordinating the airport planning of public agencies within the county. The ALUC coordinates planning for the areas surrounding public use airports. The Comprehensive Land Use Plan provides for the orderly expansion of Los Angeles County's public use airports and the area surrounding them. It is intended to provide for the adoption of land use measures that will minimize the public's exposure to excessive noise and safety hazards. In formulating the Comprehensive Land Use Plan, the Los Angeles County ALUC has established provisions for safety, noise insulation, and the regulation of building height within areas adjacent to each of the public airports in the County.

(4) Local

(a) Los Angeles Municipal Code

The City of Los Angeles Noise Regulations are provided in Chapter XI of the Los Angeles Municipal Code (LAMC). LAMC Section 111.02 provides procedures and criteria for the measurement of the sound level of "offending" noise sources. In accordance with the LAMC, a noise source that causes a noise level increase of 5 dBA over the existing average ambient noise level as measured at an adjacent property line creates a noise violation. This standard applies to radios, television sets, air conditioning, refrigeration, heating, pumping and filtering equipment, powered equipment intended for repetitive use in residential areas, and motor vehicles driven on-site. To account for people's increased tolerance for short-duration noise events, the Noise Regulations provide a 5 dBA allowance for a noise source that causes noise lasting more than 5 but less than 15 minutes in any one-hour period, and an additional 5 dBA allowance (for a total of 10 dBA) for a noise source that causes noise lasting 5 minutes or less in any one-hour period.[33]

The LAMC provides that in cases where the actual ambient conditions are not known, the City's presumed daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM) minimum ambient noise levels as defined in LAMC Section 111.03 should be used. The presumed ambient noise levels for these areas where the actual ambient conditions are not known as set forth in the LAMC Sections 111.03 are provided in **Table IV.H-5, City of Los Angeles Presumed Ambient Noise Levels**. For example, for residential-zoned areas, the presumed ambient noise level is 50 dBA during the daytime and 40 dBA during the nighttime.

[33] *Los Angeles Municipal Code, Chapter XI, Article I, Section 111.02-(b). Accessed December 2021.*

Table IV.H-5
City of Los Angeles Presumed Ambient Noise Levels

Zone	Daytime Hours (7 AM to 10 PM) dBA (Leq)	Nighttime Hours (10 PM to 7 AM) dBA (Leq)
Residential	50	40
Commercial	60	55
Manufacturing (M1, MR1 and MR2)	60	55
Heavy Manufacturing (M2 and M3)	65	65
Source: LAMC, Section 111.03.		

LAMC Section 112.02 limits increases in noise levels from air conditioning, refrigeration, heating, pumping and filtering equipment. Such equipment may not be operated in such manner as to create any noise which would cause the noise level on the premises of any other occupied property, or, if a condominium, apartment house, duplex, or attached business, within any adjoining unit, to exceed the ambient noise level by more than 5 dB.

LAMC Section 112.05 sets a maximum noise level for construction equipment of 75 dBA at a distance of 50 feet when operated within 500 feet of a residential zone. Compliance with this standard shall not apply where compliance therewith is technically infeasible.[34] LAMC Section 41.40 prohibits construction between the hours of 9:00 PM and 7:00 AM Monday through Friday, 6:00 PM and 8:00 AM on Saturday, and at any time on Sunday (i.e., construction is allowed Monday through Friday between 7:00 AM to 9:00 PM; and Saturdays and National Holidays between 8:00 AM to 6:00 PM). In general, the City's Department of Building and Safety enforces Noise Ordinance provisions relative to equipment, and the Los Angeles Police Department (LAPD) enforces provisions relative to noise generated by people.

LAMC Section 113.01 prohibits collecting or disposing of rubbish or garbage, operating any refuse disposal truck, or collecting, loading, picking up, transferring, unloading, dumping, discarding, or disposing of any rubbish or garbage, as such terms are defined in LAMC Section 66.00, within 200 feet of any residential building between the hours of 9:00 PM and 6:00 AM of the following day, unless a permit therefore has been duly obtained beforehand from the Board of Police Commissioners.

Section 91.1207.14.2 prohibits interior noise levels attributable to exterior sources from exceeding 45 dBA in any habitable room. The noise metric shall be either the day-night average sound level (L_{dn}) or the CNEL, consistent with the noise element of the local general plan.

(b) City of Los Angeles General Plan Noise Element

The Noise Element of the City's General Plan establishes CNEL guidelines for land use compatibility as shown in **Table IV.I-3** and includes a number of goals, objectives, and policies for land use planning purposes. The overall purpose of the Noise Element is to guide policymakers

34 In accordance with the City's Noise Ordinances, "technically feasible" means that the established noise limitations can be complied with at a project site, with the use of mufflers, shields, sound barriers, and/or other noise reduction devices or techniques employed during the operation of equipment.

in making land use determinations and in preparing noise ordinances that would limit exposure of citizens to excessive noise levels.[35] The following policies and objectives from the Noise Element of the General Plan are applicable to the Project.

- **Objective 2** (Non-airport): Reduce or eliminate non-airport related intrusive noise, especially relative to noise sensitive uses.
    - **Policy 2.2:** Enforce and/or implement applicable city, state, and federal regulations intended to mitigate proposed noise producing activities, reduce intrusive noise and alleviate noise that is deemed a public nuisance.
- **Objective 3** (Land Use Development): Reduce or eliminate noise impact associated with proposed development of land and changes in land use.
    - **Policy 3.1:** Develop land use policies and programs that reduce or eliminate potential and existing noise impacts.]

Exhibit I, shown as **Table IV.H-6**, **City of Los Angeles Land Use Compatibility for Community Noise**, of the Noise Element also contains guidelines for noise compatible land uses.[36] The following table summarizes these guidelines, which are based on OPR guidelines from 1990.

Table IV.H-6
City of Los Angeles Land Use Compatibility for Community Noise

Land Use	Community Noise Exposure CNEL (dBA)			
	Normally Acceptable [a]	Conditionally Acceptable [b]	Normally Unacceptable [c]	Clearly Unacceptable [d]
Single-Family, Duplex, Mobile Homes	50 to 60	55 to 70	70 to 75	Above 70
Multi-Family Homes	50 to 65	60 to 70	70 to 75	Above 70
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 to 70	60 to 70	70 to 80	Above 80
Transient Lodging—Motels, Hotels	50 to 65	60 to 70	70 to 80	Above 80
Auditoriums, Concert Halls, Amphitheaters	—	50 to 70	—	Above 65
Sports Arena, Outdoor Spectator Sports	—	50 to 75	—	Above 70
Playgrounds, Neighborhood Parks	50 to 70	—	67 to 75	Above 72
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 to 75	—	70 to 80	Above 80
Office Buildings, Business and Professional Commercial	50 to 70	67 to 77	Above 75	—
Industrial, Manufacturing, Utilities, Agriculture	50 to 75	70 to 80	Above 75	—

[a] *Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.*
[b] *Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.*

[35] *City of Los Angeles. General Plan, Noise Element adopted February 3, 1999. Pages 1.1-2.4.*
[36] *City of Los Angeles. General Plan, Noise Element, Page I-1, 1999.*

Table IV.H-6
City of Los Angeles Land Use Compatibility for Community Noise

Land Use	Community Noise Exposure CNEL (dBA)			
	Normally Acceptable [a]	Conditionally Acceptable [b]	Normally Unacceptable [c]	Clearly Unacceptable [d]

Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
[c] Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
[d] Clearly Unacceptable: New construction or development should generally not be undertaken.
Source: City of L.A. CEQA Thresholds Guide, 2006.

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c) Existing Conditions

The Project Site is bordered by South Hope Street to the west, West Pico Boulevard to the south, commercial uses to the north, and commercial and mixed-use land uses to the east. The Project Site is located in a highly urbanized area. The predominant source of noise in the vicinity of the Project Site is vehicular traffic on adjacent roadways. Ambient noise sources in the vicinity of the Project Site include automobile and truck traffic, commercial activities, surface parking lot activities, and other miscellaneous noise sources associated with typical urban activities. Noise sensitive land uses include the residential portion of the mixed-use land uses adjacent to the east.

(1) Noise and Vibration Sensitive Receptors

(a) Noise

Some land uses are considered more sensitive to noise than others due to the types of activities typically involved at the receptor location, and the effect that noise can have on those activities and the persons engaged in them. The City's Thresholds Guide states that residences, schools, transient lodging, libraries, churches, hospitals, nursing homes, auditoriums, concert halls, amphitheaters, playgrounds, and parks can be considered sensitive receptors for noise analysis. Similarly, the Noise Element of the City of Los Angeles General Plan (General Plan) defines noise sensitive land uses as: single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodging, and other residential uses; houses of worship; hospitals; libraries; schools; auditoriums; concert halls; outdoor theaters; nature and wildlife preserves; and parks.[37] These uses are generally considered more sensitive to noise than commercial and industrial land uses. The City's Thresholds Guide establishes the screening criterion of 500 feet for noise sensitive uses. Based on a review of the land uses in the vicinity of the Project Site, 10 off-site noise receptor locations (R1 through R10) represent noise sensitive uses within 500 feet of the Project Site as shown in **Figure IV.H-2, Noise Measurement and Receptor Location Map**. These locations represent areas with land uses that could qualify as noise sensitive uses according to the definition of such uses in the Thresholds Guide and the General Plan:

[37] *Noise Element, City of Los Angeles General Plan, Chapter IV, p. 4-1.*

- (R1) The residential portion of the mixed-use land uses located at 1249 E. Grand, approximately 20 feet east of the project site (E on Grand);
- (R2) The residential portion of the mixed-use land uses located at 424 W. Pico Boulevard, approximately 50 feet south of the project site (Onyx, directly across West Pico Boulevard);
- (R3) The residential portion of the mixed-use land uses located at 1201 S. Hope Street, approximately 80 feet northwest of the project site (Hope and Flower, across South Hope Street);
- (R4) The I AM Accredited Sanctuary church use located at 1320 S. Hope Street, approximately 230 feet south of the project site (on the eastern side of South Hope Street).
- (R5) The residential portion of the mixed-use land uses located at 1155 S. Grand Avenue, approximately 240 feet northeast of the project site (Evo, across West 12th Street).
- (R6) Residential uses located at 1200 South Grand Avenue, approximately 250 feet east of the project site (G12, across Grand Avenue);
- (R7) Residential uses located at 1325 S. Hope Street, approximately 300 feet southwest of the project site (on the western side of South Hope Street);
- (R8) Residential uses located at 1212 Flower Street, approximately 260 feet northwest of the project site (on the eastern side of South Flower Street);
- (R9) Residential uses located at 1328 S. Hope Street, approximately 340 feet south of the project site (Villa Metropolitiano, on the eastern side of South Hope Street); and
- (R10) Residential uses located at 1243 S. Olive Street, approximately 435 feet east of the project site (OLiVE DTLA, on the western side of Olive Street).
- (R11) Future residential uses located at 1201 S. Grand Avenue, approximately 80 feet northeast of the project site (operational sensitive receptor only as 1201 S. Grand is estimated to be operational in 2025).

All other land uses that could qualify as noise sensitive uses according to the definition of such uses in the Thresholds Guide and the General Plan are located greater than 500 feet from the Project Site. As discussed previously above, under Noise Attenuation, noise levels reduce with increasing distance from a noise source. As a result, noise sensitive uses located greater than 500 feet from the Project Site would experience lower noise levels from potential sources of noise on the Project Site due to attenuation and distance loss compared to the noise sensitive receptors located within 500 feet of the Project Site.

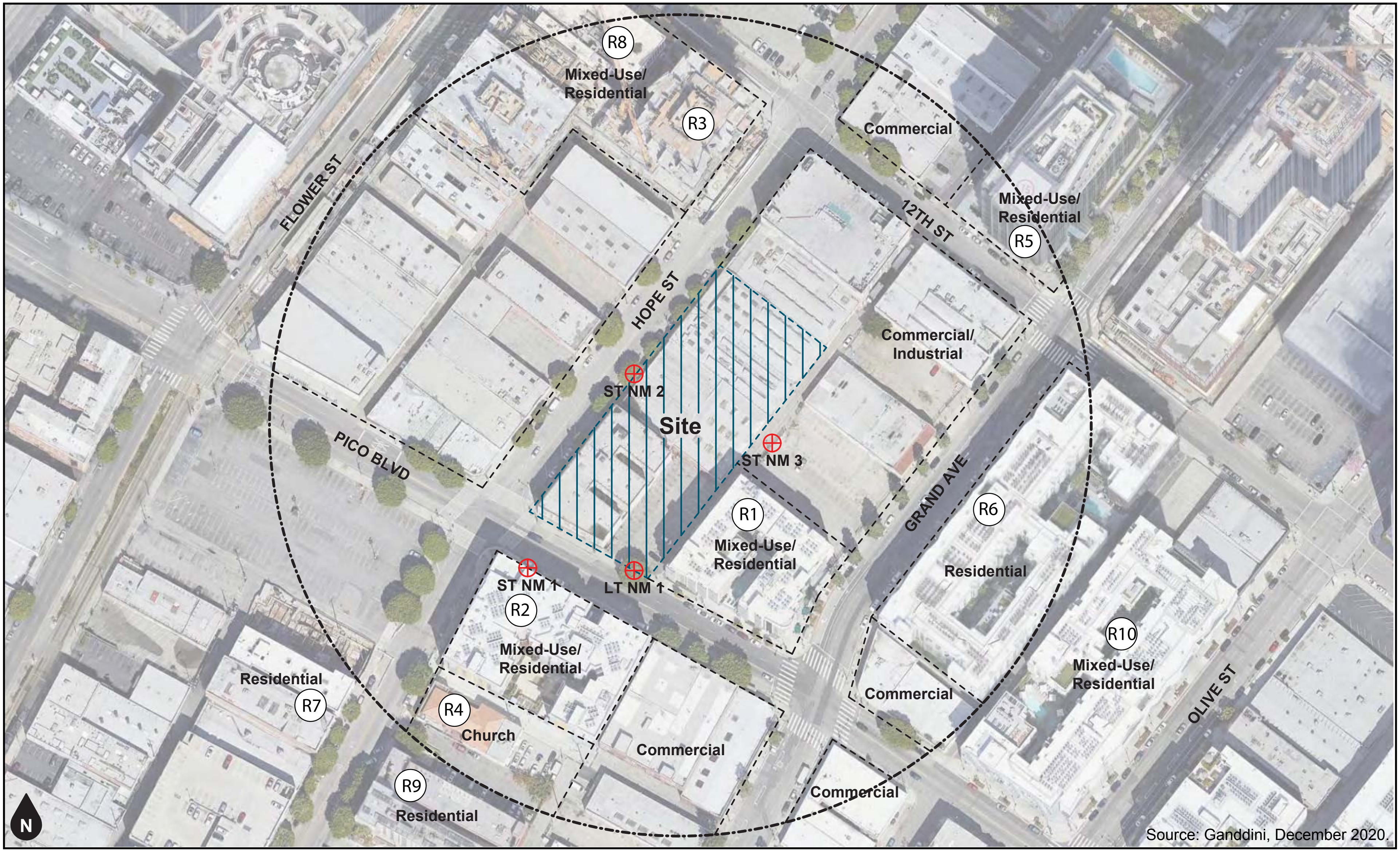
(b) Vibration

Typically, groundborne vibration generated by man-made activities (i.e., rail and roadway traffic, operation of mechanical equipment and typical construction equipment) diminishes rapidly with distance from the vibration source. The Federal Transit Administration (FTA) uses a screening distance of 100 feet for Category 1 uses (highly vibration-sensitive buildings, e.g., hospitals with vibration sensitive equipment), and 50 feet for Category 2 uses (residential uses), and Category 3 uses (schools). When vibration-sensitive uses are within these distances from a project site, vibration impact analysis is required. Category 1 vibration-sensitive receptors generally include historic buildings, buildings in poor structural condition, and uses that require precision instruments (e.g., hospital operating rooms or scientific research laboratories). The residential portion of the mixed-use land uses located at 1249 E. Grand, approximately 20 feet east of the Project Site (E on Grand); the residential portion of the mixed-use land uses located at 424 W. Pico Boulevard, approximately 50 feet south of the Project Site (Onyx, directly across West Pico Boulevard); and the residential portion of the mixed-use land uses located approximately at 1201 S. Hope Street, 50 feet west of the Project Site (Hope and Flower, across South Hope Street); would be located within 50 feet of the Project Site.

(2) Ambient Noise Levels

An American National Standards Institute (ANSI Section SI4 1979, Type 1) Larson Davis model LxT sound level meter was used to document existing ambient noise levels. In order to document existing ambient noise levels in the project area, three (3) 15-minute daytime noise measurements were taken between 12:59 PM and 2:31 PM on September 30, 2019. In addition, one (1) long-term 24-hour noise measurement was also taken from October 1, 2019 to October 2, 2019. Field worksheets and noise measurement output data are included in **Appendix G** of the Draft EIR.

As shown on **Figure IV.H-2, Noise Measurement and Receptor Location Map**, the noise measurements were taken near the multi-family residential uses to the south of the Project Site (across Pico Boulevard) (STNM1), at the western property line (along Hope Street) (STNM2), near the eastern property line along an alley way (STNM3), and at southern property line near Pico Boulevard (LTNM1). **Table IV.H-7, Short-Term Noise Measurement Summary (dBA)** provides a summary of the short-term ambient noise data. **Table IV.H-8, Long-Term Noise Measurement Summary (dBA)** provides hourly interval ambient noise data from the long-term noise measurement. Short-term ambient noise levels were measured between 65.4 and 73.4 dBA_{leq}. Long-term hourly noise measurement ambient noise levels ranged from 60.4 to 75.9 dBA_{leq}. The dominant noise sources were from vehicles traveling along Hope Street and Pico Boulevard.



Legend

NM 1 Noise Measurement Location

ST NM Short-Term Noise Measurement

LT NM Long-Term Noise Measurement

500 Foot Radius

(R1) 1249 E. Grand (E on Grand)
(R2) 424 W. Pico Boulevard (Onyx, directly across West Pico Boulevard)
(R3) 1201 S. Hope Street (Hope and Flower, across South Hope Street)
(R4) 1320 S. Hope Street (on the eastern side of South Hope Street)
(R5) 1155 S. Grand Avenue (Evo, across West 12th Street)
(R6) 1200 South Grand Avenue (G12, across Grand Avenue)
(R7) 1325 S. Hope Street (on the western side of South Hope Street)
(R8) 1212 Flower Street (on the eastern side of South Flower Street)
(R9) 1328 S. Hope Street (Villa Metropolitiano, on the eastern side of South Hope Street)
(R10) 1243 S. Olive Street (OLiVE DTLA, on the western side of Olive Street)

Figure IV.H-2
Noise Measurement and Receptor Location Map

Table IV.H-7
Short-Term Noise Measurement Summary (dBA)[a,b]

Daytime								
Site Location	**Time Started**	**Leq**	**Lmax**	**Lmin**	**L(2)**	**L(8)**	**L(25)**	**L(50)**
STNM1	12.59 PM	66.5	76.5	56.8	72.4	70.0	67.6	65.0
STNM2	1.37 PM	73.4	75.7	71.6	74.8	74.3	73.8	73.3
STNM3	2.16 PM	65.4	83.7	61.1	70.4	66.8	65.3	63.7

[a] *See Figure IV.H-1 for noise measurement locations. Each noise measurement was performed over a 10-minute duration.*
[b] *Noise measurements performed on September 30, 2019.*
Source: EcoTierra Consulting. October 2019. ***Appendix G.***

Table IV.H-8
Long-Term Noise Measurement Summary (dBA)[a,b]

24-Hour Ambient Noise								
Hourly Measurements	**Time Started**	**Leq**	**Lmax**	**Lmin**	**L(2)**	**L(8)**	**L(25)**	**L(50)**
Overall Summary	5:00 PM	70.7	106.3	47.1	75.5	72.3	68.1	63.3
1	5:00 PM	69.6	83.9	56.6	76.3	73.7	70.6	67.0
2	6:00 PM	68.1	79.3	55.9	74.5	72.4	69.3	65.8
3	7:00 PM	74.4	104.4	53.7	75.4	70.9	67.4	63.8
4	8:00 PM	75.9	105.6	52.2	74.7	70.5	66.1	61.3
5	9:00 PM	64.4	78.9	51.3	72.2	69.4	64.5	60.2
6	10:00 PM	62.9	76.1	50.6	70.9	67.8	63.1	58.7
7	11:00 AM	63.1	80.7	49.4	71.9	67.8	62.0	57.6
8	12:00 AM	61.4	80.7	48.0	70.5	65.9	58.9	54.2
9	1:00 AM	60.4	81.1	47.3	70.1	65.2	57.3	52.6
10	2:00 AM	61.7	80.7	47.3	71.0	66.5	60.2	54.4
11	3:00 AM	64.1	88.4	47.1	72.0	65.9	58.1	52.2
12	4:00 AM	62.5	81.7	49.1	72.4	66.7	59.3	54.5
13	5:00 AM	72.8	100.1	49.9	76.1	71.5	67.6	62.5
14	6:00 AM	68.9	83.8	52.7	76.1	73.5	69.6	65.0
15	7:00 AM	75.9	106.3	55.4	78.0	75.1	72.0	67.3
16	8:00 AM	70.7	83.4	56.2	76.7	74.9	72.2	68.2
17	9:00 AM	69.5	84.4	55.1	76.5	73.7	70.4	66.4
18	10:00 AM	73.0	99.1	56.0	76.7	73.2	69.9	66.7
19	11:00 PM	72.4	97.7	54.3	78.2	73.0	69.8	66.2
20	12:00 PM	68.1	82.7	55.1	74.9	72.3	69.0	65.2
21	1:00 PM	69.1	88.6	55.5	75.7	72.9	69.6	65.9
22	2:00 PM	69.2	86.4	55.7	76.0	73.0	69.6	66.2
23	3:00 PM	74.5	104.2	55.8	75.4	72.5	69.2	66.2
24	4:00 PM	68.8	82.0	55.6	75.8	72.9	69.7	66.1

[a] *See Figure IV.H-2 for noise measurement locations. Noise measurement was performed over a 24-hour duration.*
[b] *Noise measurement performed from September 30, 2019 to October 1, 2019.*
Source: EcoTierra Consulting, October 2019. ***Appendix G.***

(3) Existing Groundborne Vibration Levels

The main sources of groundborne vibration near the Project Site are heavy-duty vehicle travel (e.g., refuse trucks, delivery trucks, and transit buses) on local roadways. Trucks and buses typically generate groundborne vibration velocity levels of approximately 63 VdB at a distance of 50 feet from the centerline, and these levels could reach up to 75 VdB at a distance of 10 feet from the centerline.[38] Per the FTA, rubbered-tired vehicles rarely create ground-borne vibration problems unless there is a discontinuity or bump in the road that causes the vibration. As noted above, 75 VdB is the dividing line between barely perceptible (with regards to ground vibration) and distinctly perceptible. Therefore, existing ground vibration environment in the vicinity of the Project Site is generally below the perceptible level. However, ground vibration associated with heavy trucks traveling on road surfaces with irregularities, such as speed bumps and potholes, could reach the perceptible threshold. In terms of PPV levels, a heavy-duty vehicle traveling at a distance of 50 feet can result in a vibration level of approximately 0.001 inch per second.

(4) Existing Roadway Noise Levels

In addition to the ambient noise measurements in the vicinity of the Project Site, the existing traffic noise on local roadways in the surrounding area was calculated to quantify the CNEL noise levels, utilizing the Federal Highway Administration's (FHWA) Traffic Noise Prediction Model FHWA-RD-77-108.

The FHWA Traffic Noise Prediction Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the REMEL to account for: total average daily traffic volumes, roadway classification, width, speed and truck mix, roadway grade and site conditions (hard or soft ground surface). adjacent to all modeled roadways were assumed to have a "hard site" to predict worst-case, conservative noise levels. A hard site, such as pavement, is highly reflective and does not attenuate noise as quickly as grass or other soft sites. Possible reductions in noise levels due to intervening topography and buildings were not accounted for in this analysis.

Existing average daily trips (ADTs) were calculated from the existing volumes and Project trip distribution in the Project's Traffic Impact Analysis (Overland Traffic Consultants, Inc., 2020).

Roadway parameters utilized to model traffic noise levels include location, traffic volume, speed and vehicle mix (autos, medium trucks, and heavy trucks).[39] The various scenarios that are described above were modeled to determine project-specific increases in noise levels at distance of 50 feet from roadway centerline. The uniform distance allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies. FHWA calculation spreadsheets are included in **Appendix G** to this Draft EIR.

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38 *Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2018, p 137.*

39 *As the City of Los Angeles does not have its own vehicle mix, a typical Southern California vehicle mix was sourced from Riverside County Department of Health, Office of Industrial Hygiene (see **Appendix G** to this Draft EIR for details).*

Table IV.H-9
Existing Roadway Traffic Noise Levels

Road Segments	Existing	
	ADT	dB CNEL[1]
Hope Street		
n/o 12th Street	2,450	61.6
n/o Pico Boulevard	2,590	61.8
s/o Pico Boulevard	1,830	60.3
Grand Avenue		
s/o 12th Street	16,090	69.8
s/o Pico Boulevard	12,200	68.6
12th Street		
e/o Hope Street	3,280	62.9
e/o Grand Avenue	3,310	62.9
Pico Boulevard		
w/o Hope Street	8,680	67.1
e/o Hope Street	5,600	65.2
e/o Grand Avenue	6,040	65.5

[1] Noise levels 50 feet from roadway centerline.

3. Project Impacts

a) Thresholds of Significance

In accordance with the State *CEQA Guidelines* Appendix G (Appendix G), the Project would have a significant impact related to noise if it would result in the:

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

Threshold b) ***Generation of excessive groundborne vibration or groundborne noise levels; or***

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

For this analysis, the Appendix G Thresholds are relied upon. The analysis utilizes factors and considerations identified in the City's Thresholds Guide and the FTA's groundborne vibration and noise criteria for assessing potential impacts relating to building damage and human annoyance will, as appropriate, to assist in answering the Appendix G Threshold questions. The factors to evaluate noise impacts are listed below.

(1) Construction

The Thresholds Guide identifies the following criteria to evaluate construction noise:

- *Construction activities lasting more than one day would exceed existing ambient exterior noise levels by 10 dBA or more at a noise sensitive use;*
- *Construction activities lasting more than 10 days in a three-month period would exceed existing ambient exterior noise levels by 5 dBA or more at a noise sensitive use; or*
- *Construction activities would exceed the ambient noise level by 5 dBA at a noise sensitive use between the hours of 9:00 PM and 7:00 AMAM Monday through Friday, before 8:00 AM or after 6:00 PM on Saturday, or anytime on Sunday.*[40]

As discussed in **Section II, Project Description**, of this Draft EIR, construction is anticipated to start with demolition/excavation in 2022 and construction completion and occupancy is anticipated in 2024. Therefore, since construction activities would occur over a period longer than 10 days for all phases, the corresponding criteria used in the construction noise analysis presented in this section of the Draft EIR is an increase in the ambient exterior noise levels of 5 dBA_{leq} or more at a noise sensitive use.

(2) Operation

The following criteria are applied to the Project, as set forth in the Thresholds Guide and the City's Noise Regulations, with the more restrictive provisions applied, to evaluate operational noise. The Project would have a significant impact from operations if:

- The Project causes the ambient noise levels measured at the property line of affected uses to increase by 3 dBA CNEL to or within the "normally unacceptable" or "clearly unacceptable" categories; or
- The Project causes the ambient noise levels measured at the property line of affected uses to increase by 5 dBA CNEL or more increase in noise level; or
- Project-related operational on-site (i.e., non-roadway) noise sources such as outdoor building mechanical/electrical equipment, outdoor activities, loading, trash compactor, or parking facilities increase the ambient noise level (Leq) at noise sensitive uses by 5 dBA_{leq}.

In summary, the criterion for on-site operational noise is an increase in the ambient noise level of 5 dBA_{leq} at an adjacent property line, in accordance with the LAMC. The LAMC does not apply to off-site traffic (i.e., vehicle traveling on public roadways) noise levels. Therefore, the criteria for off-site traffic noise associated with Project operations is based on the Thresholds Guide. In addition, the criteria for composite noise levels (on-site and off-site sources) are also based on the Thresholds Guide as, again, the LAMC does not apply to off-site traffic noise. Therefore, the criteria used for determining impacts related to off-site operational noises and composite

[40] *City of Los Angeles L.A. CEQA Thresholds Guide, 2006, page I.1-3.*

operational noise are an increase in the ambient noise level of 5 dBA CNEL or 3 dBA CNEL to or within the “normally unacceptable” or “clearly unacceptable” categories, respectively, depending on the existing noise conditions at the affected noise-sensitive land use.

(3) FTA Ground-Borne Vibration Standards and Guidelines

The City currently does not have significance criteria to assess vibration impacts during construction. Thus, FTA guidelines set forth in FTA’s Transit Noise and Vibration Assessment, dated September 2018, are used to evaluate potential impacts related to construction vibration for both potential building damage and human annoyance. The FTA guidelines regarding construction vibration are the most current guidelines and are commonly used in evaluating vibration impacts.

Based on this FTA guidance, impacts relative to ground-borne vibration associated with potential building damage would be considered significant if any of the following future events were to occur:

- Project construction activities cause ground-borne vibration levels to exceed 0.5 PPV at the nearest off-site reinforced-concrete, steel, or timber building.
- Project construction activities cause ground-borne vibration levels to exceed 0.3 PPV at the nearest off-site engineered concrete and masonry building.
- Project construction activities cause ground-borne vibration levels to exceed 0.2 PPV at the nearest off-site non-engineered timber and masonry building.
- Project construction activities cause ground-borne vibration levels to exceed 0.12 PPV at buildings extremely susceptible to vibration damage, such as historic buildings.

Based on FTA guidance, construction vibration impacts associated with human annoyance would be significant if the following were to occur (applicable to frequent events; 70 or more vibration events per day):

- Project construction activities cause ground-borne vibration levels to exceed 72 VdB at off-site sensitive uses, including residential and hotel uses.
- Project construction activities cause ground-borne vibration levels to exceed 65 VdB at off-site studio (recording/broadcast) uses.

(4) Airport Noise

A project would normally have a significant impact on noise levels from airport noise if:

- Noise levels at a noise sensitive use attributable to airport operations exceed 65 dB CNEL and the project increases ambient noise levels by 1.5 dB CNEL or greater.

b) Methodology

(1) On-Site Construction Activities

Construction noise impacts due to on-site construction activities associated with the Project were evaluated by calculating the construction-related noise levels at representative sensitive receptor locations and comparing these estimated construction-related noise levels associated with construction of the Project to the existing ambient noise levels (i.e., noise levels without construction noise from the Project). Distances to receptors were based on the acoustical center of the proposed construction activity. Construction noise levels were calculated for each phase. To be conservative, the noise generated by each piece of equipment was added together for each phase of construction.

Construction noise associated with the Project was analyzed based on the Project's potential construction equipment inventory, construction durations, and construction schedule. The construction noise model for the Project is based on construction equipment noise levels as published by the FHWA's "Roadway Construction Noise Model." The ambient noise levels at surrounding sensitive receptor locations were based on field measurement data (see Tables IV.H-7 and IV.H-8). The construction noise levels were then calculated for sensitive receptor locations based on the standard point source noise-distance attenuation factor of 6.0 dBA for each doubling of distance. Additional noise attenuation was assigned to receptor locations w here the line-of-sight to the Project Site was interrupted by the presence of intervening structures. The construction noise calculation output worksheets are located in Appendix D of the Noise Technical Report.

(2) Off-Site Construction Haul Trucks

Off-site construction noise impacts from haul trucks associated with the Project were analyzed using the FHWA's TNM. The TNM is the current Caltrans standard computer noise model for traffic noise studies. The model allows for the input of roadway, noise receivers, and sound barriers, if applicable. The construction-related off-site truck volumes were obtained from the transportation assessment prepared for the Project. The TNM calculates the hourly Leq noise levels generated by construction-related haul trucks. Noise impacts were determined by comparing the predicted noise level of construction-related haul trucks plus the ambient with that of the existing ambient noise levels along the Project's anticipated haul route(s).

(3) On-Site Stationary Noise Sources (Operation)

On-site stationary point-source noise impacts were evaluated by: (1) identifying the noise levels that would be generated by the Project's stationary noise sources, such as rooftop mechanical equipment, outdoor activities, parking facilities, and trash compactor; (2) calculating the noise level from each noise source at surrounding sensitive receptor property line locations; and (3) comparing such noise levels to ambient noise levels to determine significance.

(4) Off-Site Roadway Noise (Operation)

Existing and Existing Plus Project traffic noise levels were modeled for roadways affected by Project generated traffic utilizing the FHWA Traffic Noise Prediction Model FHWA-RD-77-108 in order to quantify the Proposed Project's contribution to increases in ambient noise levels. Future traffic noise levels were modeled to assess potential traffic related impacts to the Project.

The FHWA Traffic Noise Prediction Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the REMEL to account for: total average daily traffic volumes, roadway classification, width, speed and truck mix, roadway grade and site conditions (hard or soft ground surface), adjacent to all modeled roadways were assumed to have a "hard site" to predict worst-case, conservative noise levels. A hard site, such as pavement, is highly reflective and does not attenuate noise as quickly as grass or other soft sites. Possible reductions in noise levels due to intervening topography and buildings were not accounted for in this analysis.

Existing and Existing Plus Project ADTs were calculated from the existing and project traffic volumes and Project trip distribution in the Project's Traffic Impact Analysis (Overland Traffic Consultants, Inc., 2020).

Roadway parameters utilized to model future traffic noise levels to the Project include location, traffic volume, speed and vehicle mix (autos, medium trucks, and heavy trucks).[41] The various scenarios that are described above were modeled to determine project-specific increases in noise levels at an arbitrary distance of 50 feet from roadway centerline. The uniform distance allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies. Therefore, the change in a noise level between scenarios is the focus of this portion of the analysis, rather than the resulting independent noise level for any one segment. FHWA calculation spreadsheets are included in **Appendix G** to this Draft EIR.

(5) Construction Vibration

Ground-borne vibration impacts due to the Project's construction activities were evaluated by identifying potential vibration sources (i.e., construction equipment), estimating the vibration levels at the potentially affected receptor, and comparing the Project's activities to the applicable vibration significance thresholds, as described below.

(6) Operational Vibration

The primary source of vibration related to operation of the Project would include vehicle circulation within the proposed subterranean parking garage and off-site vehicular trips. However, as discussed above, vehicular-induced vibration is unlikely to be perceptible by people. The Project would also include typical commercial-grade stationary mechanical equipment, such as air-

[41] *As the City of Los Angeles does not have its own vehicle mix, a typical Southern California vehicle mix was sourced from Riverside County Department of Health, Office of Industrial Hygiene (see **Appendix I** to this Draft EIR for details).*

condenser units (mounted at the roof level), that would include vibration-attenuation mounts to reduce the vibration transmission. The Project does not include land uses that would generate high levels of vibration. In addition, ground-borne vibration attenuates rapidly as a function of distance from the vibration source.

(7) Other Sources of Operational Noise

Operational noise sources include the pool, event ballroom, outdoor common space and amenity terrace noise, as well as heating, ventilation and air conditioning (HVAC) noise sources. Parking lots would be underground and would not contribute substantially to project operational noise.

c) Project Design Features

The following Project Design Features are applicable to the Proposed Project:

PDF-NOI-1: Project construction will not include the use of impact driven pile systems (i.e., pile drivers).

PDF-NOI-2: All construction equipment will utilize shielding, mufflers and other devices to minimize noise levels. All equipment will be properly maintained to assure that no additional noise, due to worn or improperly maintained parts, would be generated.

PDF-NOI-3: All outdoor mechanical equipment will be enclosed or screened from off-site noise-sensitive receptors.

d) Analysis of Project Impacts

Threshold a) Would the project result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

(1) Impact Analysis

(a) Construction

As discussed in Section II, Project Description of this Draft EIR, the Project would be constructed in one phase over approximately 36 months. Construction activities would include the demolition of the existing buildings at 1220, 1224, and 1240 Hope Street and removal of the existing surface parking lot, and grading, excavation, and building construction for the hotel expansion and the new hotel and residential tower. Demolition activities are anticipated to start in 2022, with construction completion and occupancy by 2024. Construction would consist of the following stages: site preparation and demolition (4 months), grading and excavation (5 months), building construction (22 months), and finishing (5 months).

Construction of the Project would require the use of heavy equipment for demolition, grading/excavation, installation of utilities, building fabrication, and finishing. Construction activities would also involve the use of smaller power tools, generators, and other sources of noise. During each stage of construction, several types of equipment potentially could be operating concurrently; therefore, noise levels would vary based on the amount of equipment in operation and the location of the activity. The FHWA Roadway Construction Noise Model has compiled data regarding the noise-generating characteristics of specific types of construction equipment and typical construction activities. The data pertaining to the types of construction equipment and activities that would occur at the Project Site are presented in **Table IV.H-10, Noise Range of Project Construction Equipment**.

Table IV.H-10
Noise Range of Project Construction Equipment

Equipment	Estimated Usage Factor %[a]	Typical Noise Level at 50 Feet (dBA Lmax)
Air Compressor	40	78
Backhoe	40	78
Concrete Saw	20	90
Crane	16	81
Dozer	40	82
Excavator	40	81
Forklift [b,c]	50	61
Haul/Dump Truck	40	76
Tractor	40	84
Welders	40	74

a Usage factor represents the percentage of time the equipment would be operating at full speed.
b Warehouse & Forklift Noise Exposure - NoiseTesting.info Carl Stautins, November 4, 2014.
c Data provided $_{leq}$ as measured at the operator. Sound Level at 50 feet is estimated.
Source: FHWA Roadway Construction Noise Model User's Guide, 2006 unless otherwise noted.

As described in the explanation of noise fundamentals above, according to the California Department of Transportation, noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance (noise from stationary or point sources is reduced by about 6 dBA for every doubling of distance at acoustically hard locations). For example, a noise level of 86 dBA_{leq} measured at 50 feet from the noise source to the receptor would decline to 80 dBA_{leq} at 100 feet from the source to the receptor, and fall by another 6 dBA L_{eq} to 74 dBA_{leq} at 200 feet from the source to the receptor.[42] These noise attenuation (reduction) rates assume a flat and unobstructed distance between the noise generator and the receptor; intervening structures and vegetation further attenuate noise.

Construction noise associated with the Project was calculated utilizing methodology presented in the FTA Transit Noise and Vibration Impact Assessment Manual (2018) together with several key construction parameters including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the Project Site. Distances to receptors were based on the acoustical center of the proposed construction activity. Construction noise levels were

42 *Caltrans, TeNS, Section 2.1.4.1.*

calculated for each phase. To be conservative, the noise generated by each piece of equipment was added together for each phase of construction; however, it is unlikely (and unrealistic) that every piece of equipment would be used at the same time, at the same distance from the receptor, for each phase of construction. The maximum noise levels at receptors R1 through R10 during all phases of construction are illustrated in **Table IV.H-11, Unmitigated Construction Levels (Leq)**. As shown in **Table IV.H-11**, the maximum construction noise levels, which would occur during the paving phase, would result in significant noise increases at three sensitive receptor locations, R1, R2 and R8.

Table IV.H-11
Unmitigated Construction Noise Levels (Leq)

Off-Site Receptor Location	Existing Ambient Noise Levels (Leq)[a]	Maximum Unmitigated Construction Noise Levels[b]	Applicable Standard (dBA)[c]	Exceeds Standard?
(R1) E on Grand. Mixed-Use/Residential at 1249 E. Grand to the East (across alleyway)	65.4	80.5	70.4	**Yes**
(R2) Onyx. Mixed-Use/Residential at 424 W. Pico Boulevard to the South (across Pico Blvd)	66.5	73.2	71.5	**Yes**
(R3) Hope and Flower. Mixed-Use/Residential at 1201 S. Hope Street to the West (across S Hope St)	73.4	78.2	78.4	No
(R4) The I AM Church located at 1320 S. Hope Street, to the South (eastern side of Hope Street)	66.5	68.1	71.5	No
(R5) Evo. Mixed Use/Residential located at 1155 S. Grand Avenue, to the Northeast	65.4	67.9	70.4	No
(R6) G12. Residential uses located at 1200 South Grand Avenue to the East (across Grand)	65.4	70.2	70.4	No
(R7) Residential uses located at 1325 S. Hope Street, southwest of the project site (on the western side of South Hope Street)	66.5	67.1	71.5	No
(R8) Residential uses located at 1212 Flower Street, northwest of the project site (on the eastern side of South Flower Street)	65.4	72.7	70.4	**Yes**
(R9) Villa Metropolitiano. Residential uses located at 1328 S. Hope Street, south of	66.5	66.0	71.5	No

Table IV.H-11
Unmitigated Construction Noise Levels (Leq)

Off-Site Receptor Location	Existing Ambient Noise Levels (Leq)[a]	Maximum Unmitigated Construction Noise Levels[b]	Applicable Standard (dBA)[c]	Exceeds Standard?
the project site (on the eastern side of South Hope Street)				
(R10) OLiVE DTLA. Residential uses located at 1243 S. Olive Street, east of the project site (on the western side of Olive Street).	65.4	66.4	70.4	No

[a] Noise measurement locations are shown on Figure IV.H-1. Due to topographical considerations, noise measurement 1 was chosen to represent noise levels at the property lines of receptors to the south and southwest, noise measurement 2 was chosen to represent noise levels at the property lines of receptors to the west and northwest, and noise measurement 3 was chosen to represent the property lines of receptors to the east, northeast, and north.
[b] Construction noise worksheets showing noise levels for all phases of construction are provided in ***Appendix G*** *of this Draft EIR.*
[c] The applicable LAMC standard is the daytime ambient noise levels plus 5 dBA_{leq}.

As shown in **Table IV.H-11** above, maximum construction noise levels may reach up to 80.5 dBA Leq at the closest receptor, R1, the mixed use/residential receptor located east of the Project Site, during the paving phase, which would generate a noise level of 15.1 dBA above ambient at the most-impacted receptor location.

Since construction activities would last for more than 10 days in a three-month period, the Project would cause a significant noise impact during construction if the ambient exterior noise levels at sensitive receptors increase by 5 dBA or more. Increases in noise levels at sensitive receptors during construction would be temporary and would not generate continuously high noise levels. However, occasional single-event disturbances from construction are possible. In addition, the construction noise experienced at sensitive receptors during the initial periods of construction (i.e., demolition, site prep [excavation/foundation work], and grading) typically would be reduced in the later construction periods (i.e., interior building construction). As the structure would be built, the noise from interior construction work would be reduced at off-site locations because the proposed structure would break the line-of-sight noise transmission from the interior construction area to the exterior areas of sensitive receptors. As defined by the Section 41.40 of the LAMC, a project would normally have a significant impact on noise levels from construction if construction activity (including demolition) or repair work, where the use of any power tool, device, or equipment would disturb persons occupying sleeping quarters in any dwelling hotel, apartment, or other place of residence, occurs between the hours of 9:00 PM and 7:00 AM Monday through Friday, or between 6:00 PM and 8:00 AM on Saturday. Per Section 112.05 of the LAMC, a significant impact on noise levels from construction could also occur if equipment is operated in a manner that causes it to exceed 75 dBA at a distance of 50 feet, between the hours of 7:00 AM and 10:00 PM. The aforementioned noise level limitations do not apply where compliance is deemed to be technically infeasible, which means that said noise limitations cannot be met despite the use of mufflers, shields, sound barriers, and/or other noise reduction techniques during the operation of the equipment.

In addition to these on-site construction activities, the Project would also generate additional light duty automobile trips from construction workers and haul trips during the excavation phase. The maximum number of construction worker trips would be 254 trips per day. Per the FTA, the traffic volume on any given roadway would need to double in order for a three dBA increase in ambient noise to occur. [43] As the existing traffic volumes in the project vicinity range between 1,830 to 16,090 average daily trips (ADT) (see Table IV.H-12 below), the addition of 254 additional construction worker vehicle trips would not double the volume and the increase in traffic noise due to construction worker trips is considered to be negligible. The Project would export a total of approximately 130,000 cubic yards of material over the grading duration of 102 days, which would generate approximately 159 haul truck trips per day travelling to and from the Project Site. Exported materials would likely be disposed at Sunshine Canyon Landfill in Sylmar. The anticipated haul route from the Project Site would be via Pico Boulevard and L.A. Live Way to SR-110 North and I-5 North or via Pico Boulevard and Flower Street to I-10 East to I-5 North. There are mainly commercial uses, some mixed use (commercial/residential) and a multi-family apartment (Grand Park Apartments,1361 Flower Street) along the haul route. Commercial, mixed use and multi-family residential building frontages along the haul route are located approximately 30-40 feet from the roadway center line along the anticipated haul route and the Metro A Line (a source of existing noise and vibration) is located on the eastern side of Flower Street. As shown in Table IV.H-8 above, noise from haul trucks driving by could reach up to 76 dBA Lmax at a distance of 50 feet. As shown in Table IV.H-7, the existing, daytime maximum noise for Pico Boulevard ranges between 76.5 dBA and 106.3 Lmax (as shown in Tables IV.H-6 and H-7 respectively). Therefore, as the noise level for a truck passing by is lower than the existing, ambient noise levels at off-site receptor locations, **noise impacts from off-site construction are considered to be less than significant.**

(b) Operation

(i) Noise Impacts to Off-Site Receptors Due to Project Generated Trips

Existing and Existing Plus Project traffic noise levels were modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108 at a distance of 50 feet from roadway centerline. The uniform distance allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies. Therefore, the change in a noise level between scenarios is the focus of this portion of the analysis, rather than the resulting independent noise level for any one segment. These worksheets are included as **Appendix G** to this Draft EIR. The modeling is theoretical, and is considered conservative because it does not account for any existing barriers, structures, and/or topographical features that may further reduce noise levels. Therefore, the levels are shown for comparative purposes only to show the difference with and without project conditions. Roadway input parameters are based on ADTs, speeds, and vehicle distribution data. The

[43] *2018 FTA Transit Noise and Vibration Assessment Manual, page 210.*

potential off-site noise impacts caused by an increase of traffic volumes from operation of the Project on the nearby roadways were calculated for the following scenarios:

Existing refers to year 2019 traffic noise conditions. *Existing Plus Project* refers to year 2019 traffic noise conditions plus traffic generated by the Project. Both scenarios are demonstrated in **Table IV.H-12, Off-Site Traffic Noise Impacts– Existing With Project Conditions.**

Table IV.H-12
Off-Site Traffic Noise Impacts – Existing With Project Conditions (2019)

Noise Levels 50 feet from Roadway Centerline*						
	Existing		Existing Plus Project			
Road Segments	ADT	dB CNEL	ADT	Total	Project-Specific Increase	Is the Increase Significant?
Hope Street						
n/o 12th Street	2,450	61.6	2,900	62.3	0.7	**No**
n/o Pico Boulevard	2,590	61.8	4,580	64.3	2.5	**No**
s/o Pico Boulevard	1,830	60.3	1,980	60.7	0.4	**No**
Grand Avenue						
s/o 12th Street	16,090	69.8	16,690	69.9	0.1	**No**
s/o Pico Boulevard	12,200	68.6	13,010	68.8	0.2	**No**
12th Street						
e/o Hope Street	3,280	62.9	4,350	64.1	1.2	**No**
e/o Grand Avenue	3,310	62.9	3,580	63.2	0.3	**No**
Pico Boulevard						
w/o Hope Street	8,680	67.1	9,120	67.3	0.2	**No**
e/o Hope Street	5,600	65.2	5,860	65.4	0.2	**No**
e/o Grand Avenue	6,040	65.5	6,230	65.6	0.1	**No**

Notes: ADT = average daily trips, dB = decibels, CNEL = community noise equivalent level
** The uniform distance of 50 feet allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies.*

As defined in the Thresholds Guide, and the Noise Element of the Los Angeles City General Plan threshold standards, a project would normally have a significant impact on noise levels from operations if the ambient noise level measured at the property line of affected uses were to increase by 3 dBA in CNEL to within the "normally unacceptable" or "clearly unacceptable" category (as shown in **Table IV.H-5**), or any 5 dBA or greater noise increase. To be conservative, the 3 dBA standard has been used.

As shown in **Table IV.H-12**, Project generated vehicular trips from all of the modeled roadway segments would result in increases in ambient noise levels (between 0.1 and 2.5 dBA CNEL)[44] over the Existing scenario, and would not exceed the *City of Los Angeles CEQA Threshold* or the

[44] *As the increase in noise levels is 2.5 dBA CNEL at 50 feet from the centerline, it would also be an increase of 2.5 dBA CNEL at the property line of affected uses.*

Noise Element threshold standards presented above. **Therefore, traffic noise impacts to off-site receptors due to Project generated operational trips would be less than significant.**

(ii) Noise Impacts To Off-Site Receptors due to On-Site Operational Noise

As defined in the Thresholds Guide and the Noise Element of the Los Angeles City General Plan threshold standards, a project would normally have a significant impact if operational noise levels cause the ambient noise level measured at the property line of an affected use to increase by 3 dBA CNEL or to the "normally unacceptable" or "clearly unacceptable" category of the noise exposure chart prepared by the California Department of Health Services (DHS). Noise levels were measured between 64.4 and 73.4 dBA_{leq}, and long-term hourly noise measurement ambient noise levels ranged from 60.4 to 75.9 dBA_{leq}.

The proposed hotel expansion includes a 11,091-square-foot immersive museum, 3,327-square-foot loggia/coworking space, 2,792-square-foot lobby/bar, approximately 12,000 square feet of event and meeting spaces, a 1,050-square-foot fitness area, and 357 guestrooms, would be located on the first subterranean level, levels 1 through 15 of the Hotel Expansion, and levels 1 through 5 of the Hotel/Residential Tower. Two high-ceiling event/ballrooms would be located on level 2, and two meeting spaces would be located on level 3, with an event/ballroom and 3,523-square-foot amenity terrace located on level 5. A hotel pool, 1,678-square-foot restaurant/roof bar, and a 1,715-square-foot covered and 3,677-square-foot uncovered outdoor terrace would be located on Level 15.

Level 2 Ballroom and Outdoor Amenity Area

As the ballrooms on level 2 are fully enclosed, and it is anticipated that doors and windows would be kept closed during events, the noise emanating from the interior of those uses would be attenuated by the structure and would not increase ambient noise levels at nearby receptor locations.

As the 1,982 square foot outdoor amenity area adjacent to the event ballrooms is only approximately 10 feet wide, it is anticipated that no amplified music would be played outside, and the area would be primarily utilized as a gathering space where patrons/guests can interact; therefore, the dominant sources of noise would include noise generated by human conversation. Noise from human conversation is approximately 60-65 dBA at three feet.[45] The closest receptor to the Level 2 Outdoor Amenity Area is the residential portion of the mixed use located at 1201 S. Hope Street (R3 Hope and Flower), approximately 80 feet northwest of the project site. As the ambient noise level is already at 73.4 dBA_{leq} (see **Table IV.H-6**) at this location, the noise level generated by conversation would be less than ambient levels and would not cause a significant increase in ambient noise at the closest receptor location. The future residential receptor, located at 1201 S. Grand Avenue (R11), would be located at a distance of approximately 130 feet from the Ballroom and over 250 feet from the outdoor amenity area, would also be shielded from

[45] *Caltrans, Technical Noise Supplement, October 1998. See Table IV.H-1 provided previously.*

activities at these locations by the Morrison building. Therefore, noise impacts at this future receptor would also be less than significant.

Level 5 Ballroom and Outdoor Amenity Terrace

The event ballroom on level 5 is surrounded on three sides by an amenity terrace. Similar to the ballroom on level 2, it is anticipated that the ballroom on level 5 would have doors and windows closed during events. The following is an analysis of open space areas that may be a source of operational noise.

Level 5 includes an approximately 3,523 square foot outdoor amenity terrace associated with the Event/Ballroom. The outdoor amenity terrace is located along the perimeter of the Event/Ballroom on the western side of the proposed building adjacent to Hope Street. The terrace is shielded from receptors on the north, south, and east by the proposed building. The dominant sources of noise would include noise generated by human conversation. Noise from human conversation is approximately 60-65 dBA at a distance of three feet.[46] To estimate a worst-case scenario, it was assumed that all open space amenity areas would have amplified music. For music and entertainment purposes, amplified speakers in a dance club setting can expose persons within the dance club to noise levels ranging from 84 dBA to 104 dBA[47]. Therefore, to estimate potential noise impacts from an event that includes amplified music and/or speech, a noise level of 104 dBA at a distance of 1 foot from a loudspeaker was utilized. The noise source was treated as a point source where the sound radiates uniformly outward as it travels away from the source in a spherical pattern and the noise drop-off rate is 6 dBA per each doubling of the distance (dBA/DD). It is assumed that the loudspeakers on the amenity terrace are oriented toward the Project Site. Amplified music events are conservatively assumed to occur between 6 PM and 2 AM. On weekends (Friday through Sunday), it is conservatively assumed that amplified music may start as early as 11 AM and last through 2 AM.

As exact placement of the sound system's primary and secondary speakers may vary, it is assumed that the loudspeakers and/or amplifiers would be located on the northwestern portion of the amenity terrace, approximately 10 feet from the edge of the building. At this location, the building façade of the closest receptors (R3 Hope and Flower) would be located approximately 100 feet from the source. At this distance, the noise level generated from the speaker would be approximately 64 dBA. As mentioned above, the short-term ambient noise levels ranged between 64.4 and 73.4 dBA_{leq}, and long-term hourly noise measurement ambient noise levels ranged from 60.4 to 75.9. Therefore, the noise from the operation of amplified music at the Level 5 Outdoor Amenity Terrace would not exceed ambient noise levels at the closest receptor by more than 5 dBA during the day. As shown in **Table IV.H-6,** the ambient noise level at 1 AM, when the amenity area is still operational and allowed to have amplified music, is 60.4 dBA. As the evening and nighttime are more noise sensitive periods, a 5 dB penalty has been added to the noise level

46 *American Journal of Audiology Vol.7 21-25 October 1998. doi:10.1044/1059-0889(1998/012)*

47 *Sound Advice, Note 11, Pubs and Clubs, Amplified music played in nightclubs, bars, pubs and restaurants, 2007, http://www.soundadvice.info/thewholestory/san11.htm. Accessed August 10, 2017. Sound Advice has been produced by a working group of industry stakeholders with support from the Health and Safety Executive (United Kingdom). It provides practical guidance on the control of noise in music and entertainment.*

generated by the Project to account for bass drum beats, per LAMC Section 111.02 (b) 2. Therefore, the nighttime noise level at the closest receptor could now be approximately 69 dBA, which would exceed the ambient noise levels by approximately 8.6 dBA.

The Project would be required to comply with LAMC Section 112.01 Amplified Sound (Radios, Televisions Sets, and Similar Devices). LAMC Section 112.01 states the following:

a) It shall be unlawful for any person within any zone of the City to use or operate any radio, musical instrument, phonograph, television receiver, or other machine or device for the producing, reproducing or amplification of the human voice, music, or any other sound, in such a manner, as to disturb the peace, quiet, and comfort of neighbor occupants or any reasonable person residing or working in the area.

b) Any noise level caused by such use or operation which is audible to the human ear at a distance in excess of 150 feet from the property line of the noise source, within any residential zone of the City or within 500 feet thereof, shall be a violation of the provisions of this section.

c) Any noise level caused by such use or operation which exceeds the ambient noise level on the premises of any other occupied property, or if a condominium, apartment house, duplex, or attached business, within any adjoining unit, by more than five (5) decibels shall be a violation of the provisions of this section.

The project would be required to comply with LAMC Section 112.06, Places of Public Entertainment. This section limits the sound level from amplified sound in any public entertainment to 95 dBA, unless a conspicuous and legible sign is located outside such place, stating: “WARNING: SOUND LEVELS WITHIN MAY CAUSE HEARING IMPAIRMENT.”

The future residential receptor, located at 1201 S. Grand Avenue (R11), would be located at a distance of approximately 80 feet from the northeastern portion of the amenity terrace walkway, over 150 feet from the closest door of the event ballroom (where sound could escape if the door was opened), and approximately 175 feet from the main area of the amenity terrace (on the western side of the building). At a distance of 80 feet, the main source of noise on the amenity terrace walkway would be from human conversation, which generates a noise level of approximately 60-65 dBA at three feet; therefore, at a distance of 80 feet, the noise level from human conversation would be approximately 36 dBA (basically inaudible). At a distance of 150 feet, any music escaping the ballroom through an open door would be at a noise level less than 60 dBA. The future residents of 1201 S. Grand would be shielded from any music amplified music or speech played on the western amenity terrace by physical structure of the Morrison building. Therefore, noise impacts at this future receptor would also be less than significant.

Therefore, based on the analysis above, operational impacts from amplified music at Level 5 Outdoor Amenity Terrace after 10 PM are potentially significant and mitigation is required.

Level 15 Outdoor Amenity Terrace

Level 15 includes an approximately 3,677 square foot uncovered outdoor amenity terrace and a 1,715 square foot covered amenity terrace associated with the 666 square foot swimming pool. The outdoor amenity terrace is located along the perimeter of the pool on the southwestern side of the proposed building adjacent to Pico Boulevard. The level 15 terrace is located approximately 20 feet to the west and approximately 100 feet above the 6th story of the E on Grand mixed commercial/residential use. Therefore, the level 15 terrace is located approximately 101 feet from the façade of the closest receptor (R1 E on Grand). Similar to the analysis above, as details on the placement of the sound system may vary, it is assumed that the loudspeakers and/or amplifiers would be facing toward the Project and located approximately 10 feet from the edge of the building; therefore, the noise source is anticipated to be approximately 111 feet from the façade of the closest sensitive receptor. At this distance, using a reference noise level of 104 dBA at a distance of 1 foot, noise levels from amplified music at the closest receptor would be approximately 63.1 dBA. As the noise source would not be in the line of sight of the receptors below, noise levels are anticipated to be attenuated by approximately 5 dBA, by the edge of the building. Therefore, noise levels are anticipated to be closer to 58 dBA. This noise level would not exceed the daytime ambient noise level of 64.4 dBA. With the 5 dBA bass/drum penalty added for evening/nighttime noise levels, the noise level from ambient music is anticipated to be back up to 63.1 dBA. As the lowest nighttime noise level in the Project vicinity is 60.4 dBA at 1 AM, amplified music played on the level 15 terrace is not anticipated to exceed the 5 dBA over ambient noise level threshold (65.4 dBA).

Noise associated with the remaining Level 15 amenity space would consist primarily of people talking and using the pool. People talking would result in noise levels of approximately 60-65 dBA at three feet,[48] which would be at or below measured ambient noise levels (i.e., between 64.4 and 73.4 dBA_{leq} for short-term measurements, and from 60.4 to 75.9 dBA_{leq} for long-term hourly noise measurements) and noise level increases associated with the dining area and terraces would be imperceptible at off-site locations. Typical noise levels for pool use and recreational swimming including children playing and range from approximately 64.8 dBA_{leq} at a distance of 50 feet from the source.[49] As noted previously, existing ambient noise levels in the vicinity of the Project Site were measured between 60.4 to 75.9 dBA. Thus, the Level 15 amenity noise levels would be substantially similar to existing ambient noise levels associated with the heavily urbanized Project Site vicinity. At a distance of 111 feet, noise levels from pool use would be approximately 57.87 dBA at receptor R1. If live music and pool activities were to overlap, the noise level from both activities would be 64.2 dBA, which again would not exceed the 5 dBA above ambient noise level threshold. As stated above, the Project would be required to comply with LAMC 112.01 and 112.06.

The future residential receptor, located at 1201 S. Grand Avenue (R11), would be located at a distance of approximately 190 feet from the closest portion of the amenity terrace walkway and over 300 feet from the pool area. Due to distance and shielding from the physical building, the

48 *Caltrans, Technical Noise Supplement, October 1998. See Table IV.H-1 provided previously.*
49 *Reference noise data for pool sources is provided in* ***Appendix G*** *of this Draft EIR. Reference data collected by PES at Sierra Hills Swim and Racquet Club.*

noise associated with the Level 15 amenity space and pool area would be inaudible at the future receptor location.

Level 25 Outdoor Amenity Terrace

Level 25 includes an approximately 1,629 square-foot uncovered outdoor amenity terrace, 3,756square-foot covered amenity terrace, and a 423 square-foot swimming pool. Approximately 477 square feet of the uncovered amenity terrace is located along the southeastern side of the Project building, facing Grand Avenue, while the remaining 1,152 square feet of uncovered amenity terrace surrounds the pool located on the northwest side of the building, adjacent to Hope Street. The covered amenity terrace is located along the northeastern side of the building, facing W. 12th St. The level 25 terrace is located approximately 90 feet to the north and 221 feet above the 6th story of the E on Grand mixed commercial/residential use (R1 E on Grand). Therefore, the level 25 terrace is located approximately 238 feet from the façade of the closest receptor. Similar to the analysis above, as details on the placement of the sound system may vary, it is assumed that the loudspeakers and/or amplifiers would be facing toward the Project and located approximately 10 feet from the edge of the building; therefore, the noise source is anticipated to be approximately 249 feet from the façade of the closest sensitive receptor. At this distance, using a reference noise level of 104 dBA at a distance of 1 foot, noise levels from amplified music at the closest receptor (R1 E on Grand) would be approximately 56.08 dBA. As the noise source would not be in the line of site of the receptors below, noise levels are anticipated to be attenuated by approximately 5 dBA, by the edge of the building. Therefore, noise levels are anticipated to be closer to 51 dBA. This noise level would not exceed the daytime ambient noise level of 64.4 dBA. With the 5 dBA bass/drum penalty added for evening/nighttime noise levels, the noise level from ambient music is anticipated to be back up to 56.08 dBA. As the lowest nighttime noise level in the Project vicinity is 60.4 dBA at 1 AM, amplified music played on the level 25 terrace is not anticipated to exceed the 5dBA over ambient noise level threshold.

Noise associated with the remaining Level 25 amenity space would consist primarily of people talking and using the pool. People talking would result in noise levels of approximately 60-65 dBA at three feet,[50] which would be at or below measured ambient noise levels (i.e., between 64.4 and 73.4 dBA_{leq} for short-term measurements, and from 60.4 to 75.9 dBA_{leq} for long-term hourly noise measurements) and noise level increases associated with the dining area and terraces would be imperceptible at off-site locations. Typical noise levels for pool use and recreational swimming, including children playing, range from approximately 64.8 $_{leq}$ dBA at a distance of 50 feet from the source.[51] As noted previously, existing ambient noise levels in the vicinity of the Project Site were measured between 60.4 to 75.9 dBA. Thus, the Level 25 amenity noise levels would be substantially similar to existing ambient noise levels associated with the heavily urbanized Project Site vicinity. At a distance of 100 feet (the distance from the pool area to the closest receptor located at R3 Hope and Flower), noise levels from pool use would be approximately 58.78 dBA. If live music and pool activities were to overlap, the noise level from both activities would be 60.6 dBA, which again would not exceed the 5 dBA above ambient noise level threshold. As stated

50 Caltrans, Technical Noise Supplement, October 1998. See Table IV.H-1 provided previously.

51 Reference noise data for pool sources is provided in ***Appendix G*** *of this Draft EIR. Reference data collected by PES at Sierra Hills Swim and Racquet Club.*

above, the Project would be required to comply with LAMC 112.01 and 112.06. Impacts from daytime use are summarized below. Receptors located further than 100 feet from the Project boundary would not be impacted by operational noise from the amenity terraces, due to the attenuation afforded by distance and intervening buildings.

The future residential receptor, located at 1201 S. Grand Avenue (R11), would be located at a distance of at least 100 feet from the closest portion of the amenity terrace walkway and over 165 feet from the pool area. Due to distance and shielding from the physical building, the noise associated with the Level 25 outdoor amenity space and pool area would be inaudible at the future receptor location.

Table IV.H-13
Operational Noise Impacts at Closest Receptors from Outdoor Amenity Activities

Receptor Location	Daytime Ambient Noise Level (dBA)	Distance from Project Boundary (feet)	Dominant Stationary Operational Noise Source	Operational Noise Level at Receptor (dBA)	Exceeds Standard?
(R1) E on Grand. Mixed-Use/Residential at 1249 E. Grand to the East (across alleyway)	65.4	20	Level 2 Amenity	< 60	No
			Level 5 Amenity	< 64	No
			Level 15 Amenity	64.2	No
			Level 25 Amenity	60.6	No
(R2) Onyx. Mixed-Use/Residential at 424 W. Pico Boulevard to the South (across Pico Blvd)	66.5	50	Level 2 Amenity	< 60	No
			Level 5 Amenity	< 64	No
			Level 15 Amenity	< 64.2	No
			Level 25 Amenity	< 60.6	No
(R3) Hope and Flower. Mixed-Use/Residential at 1201 S. Hope Street to the West (across S Hope St)	73.4	80	Level 2 Amenity	< 60	No
			Level 5 Amenity	64*	No*
			Level 15 Amenity	< 64.2	No
			Level 25 Amenity	< 60.6	No
(R4) The I AM Church located at 1320 S. Hope Street, to the South (eastern side of Hope Street)	66.5	230	Level 2 Amenity	66.5	No
			Level 5 Amenity		
			Level 15 Amenity		
			Level 25 Amenity		
(R5) Evo. Mixed Use/Residential located at 1155 S. Grand Avenue, to the Northeast	65.4	240	Level 2 Amenity	65.4	No
			Level 5 Amenity		
			Level 15 Amenity		
			Level 25 Amenity		
	65.4	250	Level 2 Amenity	65.4	No

Table IV.H-13
Operational Noise Impacts at Closest Receptors from Outdoor Amenity Activities

Receptor Location	Daytime Ambient Noise Level (dBA)	Distance from Project Boundary (feet)	Dominant Stationary Operational Noise Source	Operational Noise Level at Receptor (dBA)	Exceeds Standard?
(R6) G12. Residential uses located at 1200 South Grand Avenue to the East (across Grand)			Level 5 Amenity Level 15 Amenity Level 25 Amenity		
(R7) Residential uses located at 1325 S. Hope Street, southwest of the project site (on the western side of South Hope Street)	66.5	300	Level 2 Amenity Level 5 Amenity Level 15 Amenity Level 25 Amenity	66.5	No
(R8) Residential uses located at 1212 Flower Street, northwest of the project site (on the eastern side of South Flower Street)	65.4	260	Level 2 Amenity Level 5 Amenity Level 15 Amenity Level 25 Amenity	65.4	No
(R9) Villa Metropolitiano. Residential uses located at 1328 S. Hope Street, south of the project site (on the eastern side of South Hope Street)	66.5	340	Level 2 Amenity Level 5 Amenity Level 15 Amenity Level 25 Amenity	66.5	No
(R10) OLiVE DTLA. Residential uses located at 1243 S. Olive Street, east of the project site (on the western side of Olive Street).	65.4	435	Level 2 Amenity Level 5 Amenity Level 15 Amenity Level 25 Amenity	65.4	No
(R11) Future Sensitive Receptor located at 1201 S. Grand Avenue	65.4	80	Level 2 Amenity Level 5 Amenity Level 15 Amenity Level 25 Amenity	65.4	No

Table IV.H-13
Operational Noise Impacts at Closest Receptors from Outdoor Amenity Activities

Receptor Location	Daytime Ambient Noise Level (dBA)	Distance from Project Boundary (feet)	Dominant Stationary Operational Noise Source	Operational Noise Level at Receptor (dBA)	Exceeds Standard?
** MM NOI-2 required to meet nighttime ambient standard at closest receptor.*					

Parking Noise

The proposed parking areas have the potential to generate noise due to cars entering and exiting, engines accelerating, braking, car alarms, squealing tires, and other general activities associated with people using the parking areas (i.e., talking, opening/closing doors, etc.). Noise levels within the parking areas would fluctuate with the amount of automobile and human activity. Activity levels would be highest in the early morning and evening when the largest number of people would enter and exit. However, these events would occur at low exiting and entering speeds, which would not generate high noise levels. During these times, the noise levels can range from 44 to 63 dBA_{leq}.[52] As the parking area would be fully enclosed on all sides except the driveway areas and located in the subterranean levels of the Project Site, noise generated from within the parking area would not adversely affect off-site sensitive receptors. Furthermore, operational noise generated by motor vehicles within the Project Site is regulated under the LAMC. Specifically, LAMC Section 114.02 prohibits the operation of any motor vehicles upon any property within the City such that the created noise would cause the noise level on the premises of the property to exceed the ambient noise level by more than five decibels. LAMC Section 114.06 prohibits any person to install, operate or use any vehicle theft alarm system that emits or causes the emission of an audible sound, which is not, or does not become, automatically and completely silenced within five minutes. LAMC Section 114.03 prohibits loading or unloading of any vehicle, operating any dollies, carts, forklifts, or other wheeled equipment, which causes any impulsive sound, raucous or unnecessary noise within 200 feet of any residential building between the hours of 10:00 PM and 7:00 AM of the following day. As noted above, the proposed parking would be contained within a fully enclosed subterranean parking structure, which would further serve to reduce any parking related noise levels at off-site locations. **Therefore, Project noise impacts associated with parking would be less than significant.**

Stationary Noise Sources

As part of the Project, new mechanical equipment, emergency back-up generator, pool equipment, HVAC units, and exhaust fans would be installed for the proposed uses. Although the operation of this equipment would generate noise, the design of all mechanical equipment would be required to comply with the regulations under LAMC Section 112.02, which prohibits noise from air conditioning, refrigeration, heating, pumping, and filtering equipment from exceeding the ambient noise level on the premises of other occupied properties by more than 5 decibels.

52 *Source: Gordon Bricken & Associates, 1996. Estimates are based on actual noise measurements taken at various parking lots.*

Therefore, Project impacts related to stationary noise sources would be less than significant.

(2) Mitigation Measures

Mitigation in form of temporary acoustical shielding/acoustical tent that provide at least a 11 dBA reduction, construction noise levels would not exceed 5 dBA above ambient noise levels at any receptor, or the applicable standard of 75 dBA at the nearby sensitive receptors.

Under the Project, construction noise impacts to the residential uses from on-site construction activities would require the following mitigation measure:

MM NOI-1 During all Project Site construction phases on-site, construction contractors shall utilize enclosures/acoustical tents and/or sound barriers (as appropriate) that shall achieve a minimum of 11 dBA reduction in construction noise. The sound barriers need to be at least 15-feet in height, solid without holes or cracks. Openings in the temporary barriers for access would be necessary, but should be placed in a manner that does not interrupt the solid barrier between the noise source and the affected sensitive receptor(s).

Under the Project, operational noise impacts during nighttime amplified music events on the Level 5 Outdoor Amenity Terrace, could impact the residential portion of the mixed uses west of the project site (R3, Hope and Flower, across South Hope Street). On-site operational activities would require the following mitigation measure:

MM NOI-2 Prior to operating outdoor amplified music and entertainment speakers on the 5th floor Amenity Terrace, an acoustical design plan shall be submitted to the City, shown to result in a composite noise level of no more than 104 dBA_{leq} (94 dBA_{leq} on or before 10 PM) at a distance of 10 feet from the edge of the building. The composite noise level is defined as the sound level resulting from the amplification of recorded or live music combined with simultaneous spoken word (i.e., D.J.) emanating from all speakers in use, and excluding noise from guests and the normal operation of the amenities lounge, food and beverage service. To achieve this performance level, the acoustical design plan shall rely on, among other strategies and technologies, the following:

- Directional speakers or arrays of smaller speakers shall be used so as to maximize on-site sound levels while minimizing the spread of sound beyond the Amenity Terrace perimeter.
- Within the outdoor seating areas of the Amenity Terrace, speakers shall be generally directed towards the interior of the property. Sound from all speakers shall be directed below the top of the railing (if necessary, downward tilted at an appropriate angle). All

ceiling-mounted speakers shall be oriented directly downward towards the floor.

- The areas shall be designed with the strategic use of materials with high sound absorption properties within the Amenity Terrace area and shall avoid using highly sound- reflective surfaces, to the extent possible, at the Amenity Terrace.
- The use of amplified speakers for recorded or live music performances shall be limited to up to 2:00 A.M and noise levels must be reduced by at least 10 dBA on or before 10 PM.
- All disc jockeys (DJs) and musicians shall utilize the on-site sound system. The DJs and musicians shall use speakers set at or below pre-approved settings and in predetermined speaker locations and directions.

(3) Level of Significance After Mitigation

As discussed above, since construction activities would last for more than 10 days in a three-month period, the Project would cause a significant impact if the ambient exterior noise levels at sensitive receptors increase by 5 dBA or more. Table IV.H-11, above, shows Project construction would generate noise levels of 15.1 dBA above ambient levels at the ground floor level of the nearest sensitive receptor (R1). Construction noise levels with incorporation of mitigation measure **MM NOI-1** at the impacted receptor locations (R1, R2, and R8) are shown in **Table IV.H-14, Mitigated Construction Noise Levels (Leq)**, below.

Table IV.H-14
Mitigated Construction Noise Levels (Leq)

Off-Site Receptor Location	Existing Ambient Noise Levels (Leq)[a]	Mitigated Construction Noise Levels[b]	Applicable Standard (dBA)[c]	Exceeds Standard With Mitigation?
(R1) E on Grand. Mixed-Use/Residential at 1249 E. Grand to the East (across alleyway)	65.4	69.5	70.4	**No**
(R2) Onyx. Mixed-Use/Residential at 424 W. Pico Boulevard to the South (across Pico Blvd)	66.5	62.2	71.5	**No**
(R8) Residential uses located at 1212 Flower Street, northwest of the project site (on the eastern side of South Flower Street)	65.4	61.7	70.4	**No**

Table IV.H-14
Mitigated Construction Noise Levels (Leq)

Off-Site Receptor Location	Existing Ambient Noise Levels (Leq)[a]	Mitigated Construction Noise Levels[b]	Applicable Standard (dBA)[c]	Exceeds Standard With Mitigation?

[a] Noise measurement locations are shown on Figure IV.H-1. Due to topographical considerations, noise measurement 1 was chosen to represent noise levels at the property lines of receptors to the south and southwest, noise measurement 2 was chosen to represent noise levels at the property lines of receptors to the west and northwest, and noise measurement 3 was chosen to represent the property lines of receptors to the east, northeast, and north.
[b] Construction noise worksheets showing mitigated noise levels for all phases of construction are provided in Appendix G of this Draft EIR
[c] The applicable LAMC standard is the daytime ambient noise levels plus 5 dBA_{leq}.

As shown in the table above, mitigated construction noise levels in the form of temporary acoustical shielding/acoustical tent would provide a reduction of at least 11 dBA at the ground floor level, and as such, construction noise levels would not exceed 5 dBA above ambient noise levels at the ground floor level of any receptor or the applicable standards of 75 dBA at the nearby sensitive receptors. The use of 8-foot-tall, half-inch plywood as a noise barrier would reduce noise impacts by 20 dBA.[53] However, the temporary noise barrier would not be effective in reducing the construction-related noise levels to the upper levels of the mixed use/residential buildings located at (R1) 1249 E. Grand (E on Grand), (R2) 424 W. Pico Boulevard (Onyx) and the (R8) residential building located at 1212 Flower Street. In order to reduce construction noise at the upper levels of these buildings, the temporary noise barrier would need to be as high as these buildings (6 stories or higher), which is not feasible (i.e., cost prohibitive). There are no other feasible mitigation measures to further reduce the construction noise at the receptor locations above the first floor at R1, R2 and R8. **Therefore, even with incorporation of MM NOI-1, construction noise impacts associated with on-site noise sources remain significant and unavoidable.**

Implementation of mitigation measure **MM NOI-2** requires that amplified music must be reduced by at least 10 dBA on or before 10 PM and that an acoustical specialist verify that noise levels do not exceed 104 dBA at a distance of 10 feet from the edge of the building. As previously discussed, and shown on **Table IV.H-6**, above, the ambient noise level at 1 AM, when the Level 5 Outdoor Amenity Terrace is still operational and allowed to have amplified music, is 60.4 dBA. As the evening and nighttime are more noise sensitive periods, a 5 dB penalty has been added to the noise level generated by the Project to account for bass drum beats, per LAMC. As a result, the nighttime noise level at the closest receptor could now be approximately 69 dBA, which would exceed the ambient noise levels by approximately 8.6 dBA. **Therefore, this mitigation measure would reduce the potential operational noise impacts from the nighttime operation of amplified music on Level 5 Outdoor Amenity Terrace and thereby reduce potentially significant operational impacts to a less than significant level.**

53 *FHWA Noise Barrier Design Handbook (July 14, 2011), Table 3, Approximate sound transmission loss values for common materials.*

Threshold b) Would the project result in the generation of excessive groundborne vibration or groundborne noise levels?

(1) Impact Analysis

(a) Construction

Table IV.H-15, Construction Equipment Vibration Source Levels identifies various PPV levels for the types of construction equipment that would operate during the construction of the Project. For example, as shown in **Table IV.H-15**, a vibratory roller could generate up to 0.21 PPV at a distance of 25 feet; and operation of a large bulldozer (0.089 PPV) at a distance of 25 feet (two of the most vibratory pieces of construction equipment). Groundborne vibration at sensitive receptors associated with this equipment would drop off as the equipment moves away. For example, as the vibratory roller moves further than 100 feet from the sensitive receptors, the vibration associated with it would drop below 0.0026 PPV. It should also be noted that these vibration levels are reference levels and may vary slightly depending upon soil type and specific usage of each piece of equipment.

Table IV.H-15
Construction Equipment Vibration Source Levels

Equipment	Peak Particle Velocity (inches per second)		
	At 25 feet	At 50 feet	At 100 feet
Clam Shovel Drop (slurry wall)	0.202	0.071	0.025
Vibratory Roller	0.210	0.074	0.026
Hoe Ram	0.089	0.031	0.011
Large Bulldozer	0.089	0.031	0.011
Caisson Drilling	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Jackhammer	0.035	0.012	0.004
Small Bulldozer	0.003	0.001	0.0004
Source: Federal Transit Administration: Transit Noise and Vibration Impact Assessment, 2006.			

(i) Human Annoyance Impacts from On-Site Construction

The primary effect of perceptible vibration is often a concern. However, secondary effects, such as the rattling of a china cabinet, can also occur, even when vibration levels are well below perception. Any effect (primary perceptible vibration, secondary effects, or a combination of the two) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping or reading will be more sensitive than someone who is running on a treadmill. Reoccurring primary and secondary vibration effects often lead people to believe that the vibration is damaging their home, although vibration levels are well below minimum thresholds for damage potential.

The nearest off-site building, an industrial use building, is located adjacent to the northern property line. Per the FTA *Transit Noise and Vibration Impact Assessment Manual* (May 2018), land uses sensitive to vibration include: buildings where people normally sleep, such as dwelling units, hotels, and hospitals; research and manufacturing facilities that are vibration-sensitive such as hospitals with vibration-sensitive equipment and universities conducting physical research operations; and institutions and offices that have vibration-sensitive equipment and have the potential for activity interference such as schools, churches, and doctors' offices. Further, the FTA states that commercial or industrial locations including office buildings are not included in this category, unless there is vibration-sensitive activity or equipment within the building. **Therefore, as the closest building is an industrial use that has no vibration sensitive equipment and where no people are sleeping, annoyance-related vibration impacts to the industrial building located adjacent and to the north of the Project Site, would be considered less than significant.**

As shown previously in **Table IV.H-3, Groundborne Vibration Impact Criteria for General Assessment,** vibration from frequent events can be annoying to Category 2 uses (residential land uses and any buildings where people sleep) at a level of 72 VdB. Per the CalEEMod modeling provided in the Air Quality Analysis (**Appendix B** to this Draft EIR), a vibratory roller and a large bulldozer are the most vibratory piece of equipment expected to be used at the Project Site. Vibration worksheets are provided in **Appendix G** to this Draft EIR. However, it is unknown whether the roller that may be used onsite will be vibratory, smooth-wheeled or pneumatic; therefore, to be conservative, the roller was assumed to be vibratory for this analysis. Vibration worksheets are provided in **Appendix G** to this Draft EIR.

The closest off-site mixed-use building with residential (vibration-sensitive) uses is the E on Grand Apartments (R1) located approximately 20 feet to the east. To be conservative, this distance represents the closest a piece of equipment could come to the building façade of the sensitive receptors as the equipment passes by the Project boundary. Other vibration sensitive land uses are located further from the Project Site and would experience lower impacts.

At 20 feet, use of a vibratory roller would be expected to generate a vibration level of 96.91 VdB and use of a bulldozer would be expected to generate a vibration level of 89.91 VdB. The next nearest residential uses (R2), Onyx, directly across West Pico Boulevard; and (R3), Hope and Flower, across South Hope Street are located approximately 50 feet to the west and south respectively. At 50 feet, use of a vibratory roller would be expected to generate a vibration level of 84.96 VdB and use of a bulldozer would be expected to generate a vibration level of 77.97 VdB. Therefore, use of a vibratory roller and large bulldozer on-site would exceed the 72 VdB threshold at the closest sensitive receptors located at a distance of 50 feet or less to the Project Site boundary. Mitigation is therefore required.

Other vibration-sensitive receptors will be less affected by construction-related vibration. Receptor (R4) The I AM Accredited Sanctuary church use located at 1320 S. Hope Street, approximately 230 feet south of the project site (on the eastern side of South Hope Street) would be subject to a vibration level of 65.08 VdB from use of a vibratory roller on-site and a vibration level of 58.09 VdB from the use of a large bulldozer on-site. At (R5) the residential portion of the mixed-use land uses located at 1155 S. Grand Avenue, approximately 240 feet northeast of the project site (Evo, across West 12th Street), use of a vibratory roller would be expected to generate a vibration level of 64.53 VdB and use of a bulldozer would be expected to generate a vibration level of 57.53 VdB. Therefore, the vibration levels at receptors R4 and R5 would not exceed the 72 VdB threshold.

Table IV.H-16
Construction Equipment Vibration Source Levels

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level (L_V) at 25 feet
Pile driver (impact)	1.518 (upper range) 0.644 (typical)	112 104
Pile driver (sonic)	0.734 upper range 0.170 typical	105 93
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall)	0.008 in soil 0.017 in rock	66 75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, Table 7-4. September 2018.

(ii) Architectural Damage

Vibration generated by construction activity generally has the potential to damage structures. This damage could be structural damage, such as cracking of floor slabs, foundations, columns, beams, or wells, or cosmetic architectural damage, such as cracked plaster, stucco, or tile.

Table IV.H-2, Construction Vibration Damage Criteria above identifies a PPV level of 0.3 as the threshold at which there is a risk of architectural damage to Type II engineered concrete and masonry (no plaster) buildings. The nearest off-site building, an industrial use (type II) building, is located adjacent to the northern property line. At a distance of 1 foot (directly adjacent to the building), use of a vibratory roller would be expected to generate a PPV of 26.25 in/sec and use of a bulldozer would be expected to generate a PPV of 11.13 in/sec. The next nearest building (R1, E on Grand) a type II building, is the mixed commercial/residential use located approximately 20 feet to the east. At a distance of 20 feet, use of a vibratory roller would be expected to generate a PPV of 0.293 in/sec and use of a bulldozer would be expected to generate a PPV of 0.124 in/sec. The next nearest buildings, (R2), Onyx, directly across West Pico Boulevard; and (R3), Hope and Flower, across South Hope Street; are also type II buildings and are located approximately 50 feet to the west and south respectively. At a distance of 50 feet, use of a vibratory roller would be expected to generate a PPV of 0.074 in/sec and use of a bulldozer would be expected to generate a PPV of 0.031 in/sec.

As stated above, use of a vibratory roller at a distance of 20 feet would generate a PPV of 0.293 in/sec, which would not exceed the PPV level of 0.3 in/sec threshold for Type II engineered concrete and masonry (no plaster) buildings. Use of a large bulldozer at a distance of 12 feet would generate a PPV of 0.268 PPV and would also not exceed the 0.3 in/sec PPV threshold. Therefore, use of a vibratory roller at a distance less than 20 feet and use of a bulldozer a distance less than 12 feet from the façade of the closest building could result in architectural damage.

(iii) Building Damage and Human Annoyance Impacts from Off-Site Construction

The Project would export a total of approximately 130,000 cubic yards of material over the grading duration of 102 days, which would generate approximately 159 haul truck trips per day travelling to and from the Project Site. Exported materials would likely be disposed at Sunshine Canyon Landfill in Sylmar. The anticipated haul route from the Project Site would be via Pico Boulevard and L.A. Live Way to SR-110 North and I-5 North or via Pico Boulevard and Flower Street to I-10 East to I-5 North. There are mainly commercial uses, some mixed use (commercial/residential) and a multi-family apartment (Grand Park Apartments,1361 Flower Street) along the haul route. Commercial, mixed use and multi-family residential building frontages along the haul route are located approximately 30-40 feet from the roadway center line along the anticipated haul route and the Metro A Line (a source of existing noise and vibration) is located on the eastern side of Flower Street. It is assumed that haul truck trips would occur predominately outside of peak hours. The proposed haul truck routes would be identified for the Proposed Project and approved by LADOT as part of the Construction Traffic Control/Management Plan (refer to Project Design Features PDF TR-1). These construction delivery/haul trucks would travel along the haul routes from the Development Site to offsite locations during phases of construction. Heavy-duty construction trucks would generate ground-borne vibration (similar to the trucks and buses that uses these routes in the existing conditions) as they travel along the anticipated truck route(s). The construction activity is temporary and the source of potential off-site vibration (delivery/haul trucks on the haul routes) is not materially different than the type and volume of vehicles currently on the haul routes. The haul routes are heavily traveled vehicular routes that provide access to regional freeways. In the existing conditions, there is a high volume of vehicular traffic, including heavy trucks and numerous buses that travel on the proposed haul routes. Moreover, hauling activity would not occur during nighttime hours, which according to the FTA guidance is a consideration for impact analysis. Regarding building damage, based on FTA data, the vibration generated by a loaded truck would be approximately 86 VdB (0.076 PPV in/sec) at a distance of 25 feet from the truck.[54] At a distance of 30 feet, the vibration level would 0.058 PPV, well below the most stringent threshold of 0.12 PPV for buildings extremely susceptible to vibration. According to the FTA, it is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Busses and trucks rarely generate vibration that exceeds 70 Vdb, which would be less than the significance threshold of 72 VdB; however, at

[54] *FTA, Transit Noise and Vibration Impact Assessment, September 2018, Table 7-4.*

a distance of 30 feet, the vibration level experienced by residential receptors along the haul route could be as high as 83.6 VdB, which would exceed the significance threshold of 72 VdB.

As no feasible mitigation for the haul trucks would be available, human annoyance-related vibration impacts from off-site construction activities are considered to be significant and unavoidable.

(b) Operation

(i) Structural Damage

The Project's day-to-day operations would include typical commercial-grade stationary mechanical and electrical equipment, such as air handling units, condenser units, and exhaust fans, which would produce vibration at low levels that would not cause damage or annoyance impacts to the Project buildings or onsite occupants and would not cause vibration impacts to the off-site environment. According to the American Society of Heating, Refrigeration, and Air Conditioning Engineering (ASHRAE), pumps or compressors would generate groundborne vibration levels of 0.5 inches per second PPV at a distance of 1-foot from the source.[55] The Project's mechanical equipment, including air handling units, condenser units, and exhaust fans, would be located on the building rooftop and would not be located in direct contact with the ground. As such, it would not generate groundborne vibration at off-site locations, including vibration-sensitive receptors.

The primary sources of transient vibration from the Site would be from delivery trucks and passenger vehicle circulation within the proposed parking area. According to the FTA, delivery trucks rarely generate vibration that exceeds 70 VdB,[56] which is equivalent to approximately 0.013 inches per second PPV, which would be less than the significance threshold of 0.2 inches per second PPV for potential residential building damage. As passenger vehicles are much smaller than delivery trucks, the vibration from passenger vehicles would be lower.

Therefore, impacts with respect to potential building damages resulting from operation-generated vibration would be less than significant.

(ii) Human Annoyance

As discussed above, the Project mechanical equipment, including air handling units, condenser units, and exhaust fans, would be located on Project building rooftops and would, therefore, not generate groundborne vibration at off-site locations, including vibration-sensitive receptors.

With regard to transient vibration from delivery trucks and on-site passenger car circulation, because delivery trucks rarely generate vibration that exceeds 70 VdB,[57] which is below the conservative threshold of 72 VdB for human annoyance, and because passenger vehicles are

55 *American Society of Heating, Refrigeration, and Air-Conditioning Engineers, Inc., Heating, Ventilation, and Air-Conditioning Applications, 1999.*
56 *FTA, Transit Noise and Vibration Impact Assessment Manual, 2018, page 113.*
57 *FTA, Transit Noise and Vibration Impact Assessment Manual, 2018, page 113.*

much smaller than delivery trucks, the vibration from delivery trucks and passenger vehicles would not exceed the human annoyance threshold.

Therefore, impacts with respect to human annoyance resulting from operation-generated vibration would be less than significant.

As discussed above, operation of the Project would result in groundborne vibration levels substantially less than the threshold for groundborne vibration at groundborne vibration-sensitive receptors. For typical buildings, groundborne vibration results in groundborne noise levels approximately 35 to 37 decibels lower than the velocity level.[58] Given that the groundborne vibration level would be much lower than the threshold for groundborne vibration-sensitive uses, and given that the groundborne noise would be approximately 35 to 37 decibels lower than the velocity level, operational groundborne noise would also not exceed the human annoyance threshold.

As such, impacts related to groundborne noise would be less than significant during operation and no mitigation measures would be required.

(2) Mitigation Measures

MM NOI-3 During all Project Site construction, vibratory rollers and/or any other equivalent vibratory equipment shall not be utilized within 136 feet, and large bulldozers shall not be used within 80 feet of the façades of closest residential/mixed-use buildings ([R1] E on Grand Apartments located 20 feet to the east, [R2], Onyx, directly across West Pico Boulevard; and [R3], Hope and Flower, across South Hope Street located approximately 50 feet to the west and south respectively).

MM NOI-4 During all Project Site construction, vibratory rollers and/or any other equivalent vibratory equipment shall not be utilized within 20 feet, and large bulldozers shall not be used within 12 feet of the façade of the adjacent industrial building to the north of the site.

(3) Level of Significance After Mitigation

Implementation of **MM NOI-3** prohibits the operation of vibratory rollers and/or other vibratory equipment during construction within 136 feet and large bulldozers within 80 feet of the façades of closest residential/mixed-use buildings ([R1] E on Grand Apartments located 20 feet to the east, [R2], Onyx, directly across West Pico Boulevard; and [R3], Hope and Flower, across South Hope Street located approximately 50 feet to the west and south respectively. As discussed above, the use of a vibratory roller within 136 feet and use of a large bulldozer within 80 feet of the façades of the closest vibration -sensitive receptors (R1, R2 and R3) would exceed the threshold of 72 VdB and the human reaction to this threshold is considered “annoying to residences and buildings where people normally sleep” (see **Table IV.H-3**). With incorporation of

[58] *FTA, Transit Noise and Vibration Impact Assessment Manual, 2018, Table 6-3, page 126.*

MM NOI-3, requiring adequate distance between the equipment and the façade of the closest vibration-sensitive receptors, vibration levels at the closest receptors (R1, R2, and R3) would no longer exceed 72 VdB.

Exceedance of the 0.30 PPV threshold presents a risk for architectural damage to Type II engineered concrete and masonry (no plaster) buildings. As discussed above, operation of vibratory equipment within 20 feet, and large bulldozers within 12 feet of the closest building façade would exceed the 0.30 PPV threshold for architectural damage to Type II buildings. Implementation of **MM NOI-4** would ensure that potentially significant impacts related to construction vibration and architectural damage to the closest building, the industrial use located directly adjacent to the project site, would remain less than significant by requiring adequate distance between vibratory rollers and/or vibratory equipment, large bulldozers and the façade of the adjacent industrial building to the north. Construction activity that must occur within 12 feet of the closest building façade would need to be performed with smaller equipment types or employ methods that do not exceed the vibration thresholds applied herein.

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

(1) Impact Analysis

As discussed in the Initial Study (see **Appendix A**), the Project Site is not located within the vicinity of a private airstrip, an airport's influence area, or within two miles of a public or public use airport. The nearest public airports are Santa Monica Airport, approximately 10 miles to the west of the Project Site, and Los Angeles International Airport, approximately 10 miles southwest of the Project Site. Moreover, the Project Site is not located within an existing or projected noise contour associated with an airport.[59] The nearest private airstrip is located at the Goodyear Blimp Base Airport in the City of Carson, approximately 13 miles south from the Project Site. **Therefore, no impacts related to Threshold c) and airport noise would occur.**

(2) Mitigation Measures

The Project would not result in significant impacts from airport-related noise. Therefore, no mitigation measures are recommended.

(3) Level of Significance After Mitigation

No Project-level impacts related to excessive noise from airports would occur.

59 *Los Angeles County Airport Land Use Commission, Los Angeles County Airport Land Use Plan, Airport Influence Area figures, adopted December 19, 1991, revised December 4, 2004; website: http://planning.lacounty.gov/view/alup/; accessed: May 2018.*

e) Cumulative Impacts

(1) Impact Analysis

(a) Construction

There are 172 Related Projects that have been identified and listed in **Section III, Environmental Setting**. There are five other related projects proposed in close proximity (250 feet) to the Project Site. The first is #59, the development of a hotel located to the northwest of the Project Site (across Hope Street) at 1219 S. Hope Street, the second is #41, the development of another hotel/apartments at 1306 S. Hope Street (next to the Onyx), the third, #111, is the development of condominiums and restaurant uses located east of the Project Site (across the alleyway) at 1229 Grand Avenue, the fourth, #78, is the development of apartments located east of the Project Site (across the alleyway) at 1247 Grand Avenue, and the fifth, #172, is the development of apartments and retail/restaurant at 1201 Grand Avenue. All other related projects in the Project vicinity are farther than 250 feet from the Project and would not contribute to potential cumulatively considerable impacts due to distance and shielding from intervening buildings.

Construction of these and other unforeseen projects could potentially combine construction noise and vibration levels with the Project construction activities. All Related Projects would be required to comply with the City's Noise Ordinance Nos. 144,331 and 161,574. In addition, each of the Related Projects would be subject to LAMC Section 41.40, which limits the hours of allowable construction activities, and LAMC Section 112.05, which prohibits any powered equipment or powered hand tool from producing noise levels that exceed 75 dBA at a distance of 50 feet from the noise source within 500 feet of a residential zone. Noise levels are only allowed to exceed this noise limitation under conditions where compliance is technically infeasible. As previously discussed, construction noise levels for the Project could exceed existing ambient noise levels by more than 5 dBA for 10 days in a three-month period.

Therefore, while the Related Projects would also be expected to comply with City requirements regarding construction noise impacts, cumulative construction noise levels are anticipated to exceed the City's applicable standard of 75 dBA at the nearby sensitive receptors by resulting in a 5 dBA or greater increase for 10 days in a three-month period in ambient noise level at receptor locations in the Project vicinity. **Therefore, cumulative construction noise impacts would be significant.**

(b) Construction Vibration

Regarding cumulative construction-related vibration, due to the rapid attenuation characteristics of groundborne vibration, only those Related Projects located within close proximity to the mixed-use land uses located approximately 20 feet east of the project site (R1, E on Grand); 50 feet south of the project site (R2, Onyx, directly across West Pico Boulevard); and approximately 50 feet west of the project site (R3, Hope and Flower, across South Hope Street); would have the potential to result in cumulative vibration from on-site construction activities. The closest Related Projects to these residential uses include: the development of a hotel located to the northwest of the Project Site (across Hope Street) at 1219 S. Hope Street, the second is the development of condominiums located east of the Project Site (across the alleyway) at 1229 Grand Avenue, the third is the development of apartments located south of the Project Site (across Pico Boulevard) at 1306 S. Hope Street, and the fourth is the development of apartments located east of the Project Site (across the alleyway) at 1247 Grand Avenue. Based on the distances of the Related Project to their nearest receptors and the worst-case construction vibration levels at various distances presented in **Table IV.H-13**, there would be no potential for cumulative construction-period impacts with respect to groundborne vibration.

However, as the related projects would be anticipated to use similar trucks as the Project, it is expected that construction trucks from the related projects would generate similar vibration levels along the anticipated haul routes. The timing and location of haul trucks used by the Related Projects would be speculative at best and it is unknown as to the frequency of travel along these haul routes. However, as the Project's off-site construction vibration-related impacts are significant and unavoidable, any additional haul traffic along similar haul routes would contribute to an already significant impact. **Therefore, cumulative impacts with respect to groundborne vibration during construction of the Project would be considered to be significant and unavoidable due to off-site construction traffic.**

(c) Operation

(i) Cumulative Noise Impacts to Off-Site Receptor due to Project Generated Trips

Cumulative mobile source noise impacts would occur primarily as a result of increased traffic on local roadways due to the Project, ambient growth, and Related Projects. As shown in **Table IV.H-17, Project Traffic Cumulative Noise Contributions,** there would be a marginal increase in cumulative roadway noise levels with the Project and Future Projects, as community noise levels would only increase by a maximum of 2.1 dBA CNEL at the roadway segment of Hope Street north of Pico Boulevard, which does not exceed the 3 dBA threshold.

Table IV.H-17
Project Traffic Cumulative Noise Contributions

50 Feet from Centerline*						
	Future without Project		Future with Project			
Road Segments	ADT	dB CNEL	ADT	Total	Project-Specific Increase	Is the Increase Significant?
Hope Street						
n/o 12th Street	5,700	65.3	6,060	65.5	0.2	**No**
n/o Pico Boulevard	5,470	65.1	8,880	67.2	2.1	**No**
s/o Pico Boulevard	4,200	63.9	4,350	64.1	0.2	**No**

Table IV.H-17
Project Traffic Cumulative Noise Contributions

50 Feet from Centerline*						
	Future without Project		Future with Project			
Road Segments	**ADT**	**dB CNEL**	**ADT**	**Total**	**Project-Specific Increase**	**Is the Increase Significant?**
Grand Avenue						
s/o 12th Street	19,970	70.7	20,570	70.8	0.1	**No**
s/o Pico Boulevard	14,860	69.4	15,690	69.7	0.3	**No**
12th Street						
e/o Hope Street	5,900	65.4	7,000	66.2	0.8	**No**
e/o Grand Avenue	5,160	64.8	5,700	65.3	0.5	**No**
Pico Boulevard						
w/o Hope Street	11,180	68.2	11,620	68.4	0.2	**No**
e/o Hope Street	8,090	66.8	8,360	66.9	0.1	**No**
e/o Grand Avenue	9,160	67.3	9,350	67.4	0.1	**No**

* *The uniform distance of 50 feet allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies.*

Therefore, cumulative traffic noise impacts to off-Site receptors due to Project generated trips would be less than significant.

(ii) Cumulative Noise Impacts to Off-Site Receptor due to Operational Noise

Operational noise associated with the Proposed Project would be consistent with the other land uses in the Project area. The Project includes outdoor common open space, outdoor seating, outdoor dining areas, and dancing and live-entertainment in the ballroom, bar/lounge, restaurant and hotel uses. Live entertainment or amplified music shall be subject to compliance with mitigation measure MM NOI-2 and ballroom/dining room areas would be fully enclosed. **With the implementation of mitigation measure MM NOI-2 already required for the Project, the incremental contribution of on-site Project operational noise would not be cumulatively considerable and impacts from outdoor amplification would be reduce to a level of less than significant.**

(iii) Cumulative Operational Vibration Impacts

Due to the rapid attenuation characteristics of groundborne vibration and distance from each of the related projects to the Project Site, there is no potential for cumulative operational-period impacts with respect to groundborne vibration. **Therefore, cumulative groundborne vibration impacts under the Project would be less than significant.**

(2) Mitigation Measures

Under the Project, cumulative impacts to noise would be less than significant; no additional mitigation would be required. However, cumulative impacts to off-site construction would be significant and unavoidable. As there are residential uses at various locations along the haul route and also along every road connected to the Project Site, avoidance of sensitive receptors along the haul route is basically impossible. Therefore, there is no feasible mitigation to reduce the off-site construction vibration-related impacts.

(3) Level of Significance After Mitigation

Under the Project, cumulative impacts to noise and operational vibration would be less than significant without mitigation. Cumulative impacts to construction-related vibration remain significant and unavoidable.