IV. Environmental Impact Analysis

F. 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 reduce any identified potential significant impacts, if feasible. 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. This section summarizes the noise and vibration information analyses provided in the Noise Calculation Worksheets included in Appendix G of this Draft EIR.

2. Environmental Setting

a. Noise and Vibration Fundamentals

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

a. Noise and Vibration Basics

(1) Noise Principles 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

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

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 any sound, with 0 dB corresponding roughly to the threshold of human hearing and 120 and 140 dB corresponding to the thresholds of feeling and pain, respectively. 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 Figure IV.F-1 on page IV.F-3.

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

[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.*

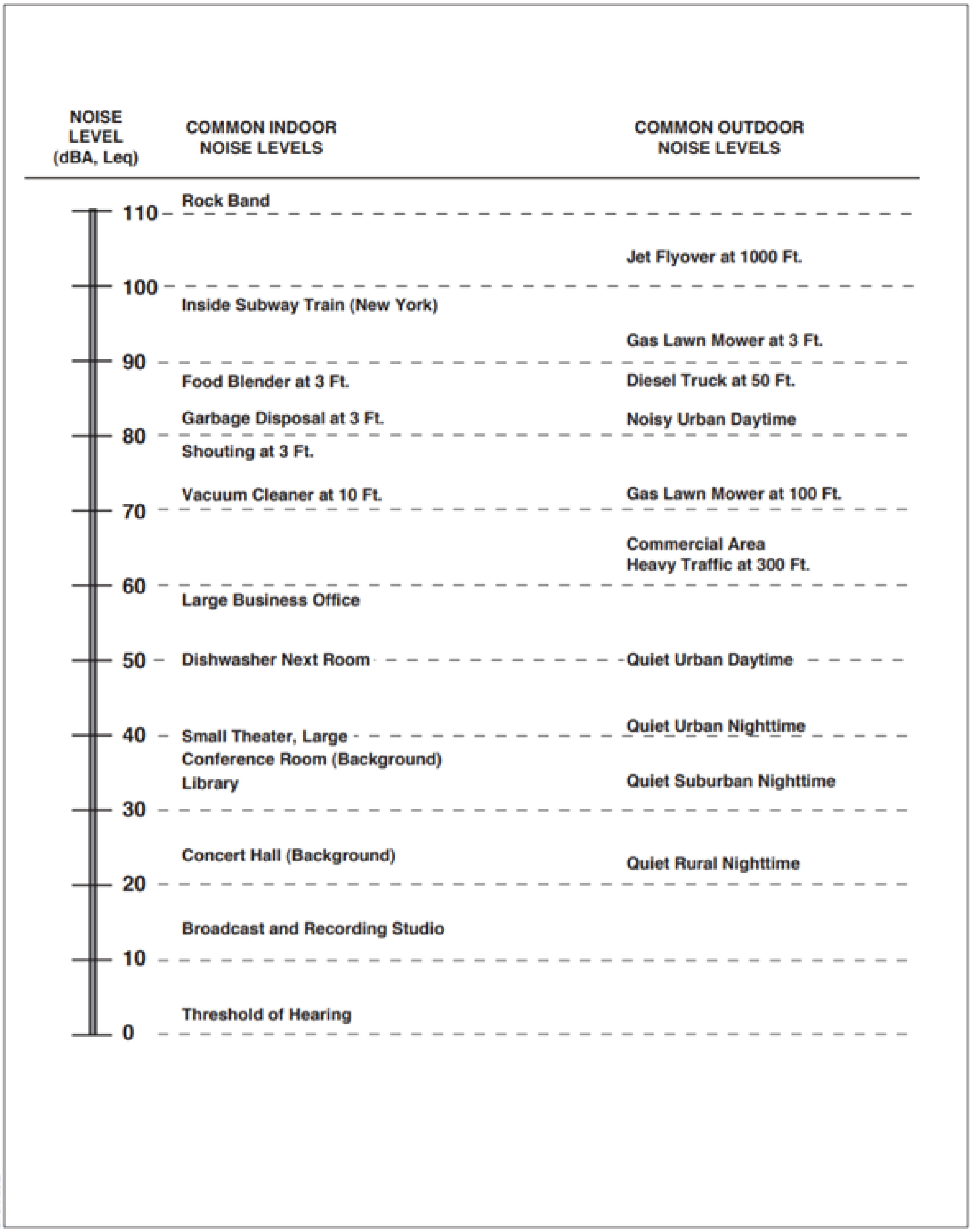

Figure IV.F-1

Decibel Scale and Common Noise Sources

Source: Caltrans, Technical Noise Supplement, 2009.

(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.

In an outdoor environment, sound energy attenuates through the air as a function of distance. Such attenuation is called “distance loss” or “geometric spreading” and is based on the type of source configuration (i.e., a point source or a line source). The rate of sound attenuation for a point source, such as a piece of mechanical or electrical equipment (e.g., air conditioner or bulldozer), is 6 dBA per doubling of distance from the noise source to the receptor over acoustically “hard” sites (e.g., asphalt and concrete surfaces) and 7.5 dBA per doubling of distance from the noise source to the receptor over acoustically “soft” sites (e.g., soft dirt, grass or scattered bushes and trees).[7] 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. The rate of sound attenuation for a line source, such as a constant flow of traffic on a roadway, is 3 dBA per doubling of distance from the point source to the receptor for hard sites and 4.5 dBA per doubling of distance for soft sites.[8]

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

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[6] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1, September 2013.*

[7] *Caltrans, Technical Noise Supplement (TeNS), 2009, Chapter 2.1.4.2.*

[8] *Caltrans, Technical Noise Supplement (TeNS), 2009, Chapter 2.1.4.2.*

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.[9] Additionally, structures with closed windows can further attenuate exterior noise by a minimum of 20 dBA to 30 dBA.[10]

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.[11]

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 energy-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.

L_{dn}: The average A-weighted noise level during a 24-hour day, obtained after an addition of 10 dBA to measured noise levels between the hours of 10:00 P.M. and 7:00 A.M. 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 time 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 P.M. and 10:00 P.M. and an addition of 10 dBA to noise levels between the hours of 10:00 P.M. and 7:00 A.M. to account for noise sensitivity in the evening and nighttime, respectively.

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9 *Caltrans, Technical Noise Supplement (TeNS), 2009, Chapter 2.1.4.2.*

10 *Caltrans, Technical Noise Supplement (TeNS), 2009, Chapter 2.1.4.2.*

11 *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.2.2.*

(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. Sleep interference effects can include both awakening and arousal to a lesser state of sleep.[12]

The World Health Organization's Guidelines for Community Noise details the adverse health effects of noise, 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.[13]

With regard to the subjective effects, an individuals' responses 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

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[12] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.2.1.*

[13] *Berglund, Birgitta, Lindvall, Thomas, Schwela, Dietrich H & World Health Organization, Occupational and Environmental Health Team, 1999, Guidelines for Community Noise. World Health Organization, https://apps.who.int/iris/handle/10665/66217, accessed April 29, 2021.*

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 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:[14]

- 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 ten sources of equal loudness together produce a sound level of approximately 10 dBA louder than the single source.[15]

(4) Noise Attenuation

When noise propagates over a distance, the noise level reduces 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." Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (i.e., reduce) at a rate between 6 dBA for

[14] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.2.1.*

[15] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.2.1.1.*

acoustically "hard" sites and 7.5 dBA for "soft" sites for each doubling of distance from the reference measurement, as their energy is continuously spread out over a spherical surface (e.g., for hard surfaces, 80 dBA at 50 feet attenuates to 74 dBA at 100 feet, 68 dBA at 200 feet).[16] 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.[17] 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.[18] Soft sites are those that have an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees, which in addition to geometric spreading, provides an excess ground attenuation value of 1.5 dBA (per doubling distance).[19]

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.[20] Noise from a line source propagates over a cylindrical surface, often referred to as "cylindrical spreading."[21] 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.[22] Therefore, noise due to a line source attenuates less with distance than that of a point source with increased distance.

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.[23] 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.[24]

(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.

[16] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.1.4.2.*

[17] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.1.4.2*

[18] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.1.4.2*

[19] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.1.4.2*

[20] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.1.4.2*

[21] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.1.4.1.*

[22] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.1.4.1.*

[23] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.1.4.3.*

[24] *Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, Section 2.1.4.3.*

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.[25] 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.[26] 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.[27] 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.[28] 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.[29] 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

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

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

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

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

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

cause damage (especially older masonry structures), locations where people sleep, and locations with vibration sensitive equipment.[30]

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.[31] 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 30 to 60 Hz), the groundborne noise level will be approximately 35 to 37 decibels lower than the velocity level.[32] Therefore, for typical buildings, the groundborne noise decibel level is lower than the groundborne vibration velocity level.

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
- California 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

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[30] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, 2018, Section 6.1, 6.2, and 6.3.*

[31] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, 2018, Section 5.4.*

[32] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, 2018, Table 6-3 and Table 6-14, pp. 126 and 146.*

- 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.[33] 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 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 proposed Project. However, the FTA has adopted vibration criteria for use in evaluating vibration impacts from construction activities.[34] The vibration damage criteria adopted by the FTA are shown in Table IV.F-1 on page IV.F-12.

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.[35] 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

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[33] *USEPA, EPA Identifies Noise Levels Affecting Health and Welfare, April 1974, https://archive.epa.gov/epa/aboutepa/epa-identifies-noise-levels-affecting-health-and-welfare.html, accessed April 29, 2021.*

[34] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, 2018, Table 7-5, p. 86.*

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

Table IV.F-1
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, 2018.

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.F-2 on page IV.F-13. No thresholds have been adopted or recommended for commercial or office uses.

(c) Occupational Safety and Health Act of 1970

Under the Occupational Safety and Health Act of 1970 (29 United States Code Section 1919 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.[36]

36 *U.S. Department of Labor, OSH Act of 1970, www.osha.gov/laws-regs/oshact/completeoshact, accessed April 29, 2021.*

Table IV.F-2
Groundborne Vibration and Groundborne Impact Criteria for General Assessment

Land Use Category	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Building where vibration would interfere with interior operations	65 VdB[d]	65 VdB[d]	65 VdB[d]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime uses	75 VdB	78 VdB	83 VdB

[a] *"Frequent Events" are defined as more than 70 vibration events of the same source per day.*

[b] *"Occasional Events" are defined as between 30 and 70 vibration events of the same source per day.*

[c] *"Infrequent Events" are defined as fewer than 30 vibration events of the same source per day.*

[d] *This criterion limit is based on the levels that are acceptable for most moderately sensitive equipment such as optical microscopes.*

Source: FTA, Transit Noise and Vibration Impact Assessment Manual, 2018.

(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.F-2 on page IV.F-14.[37] 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.

[37] *State of California, Governor's Office of Planning and Research, General Plan 2017 Guidelines, p. 377.*

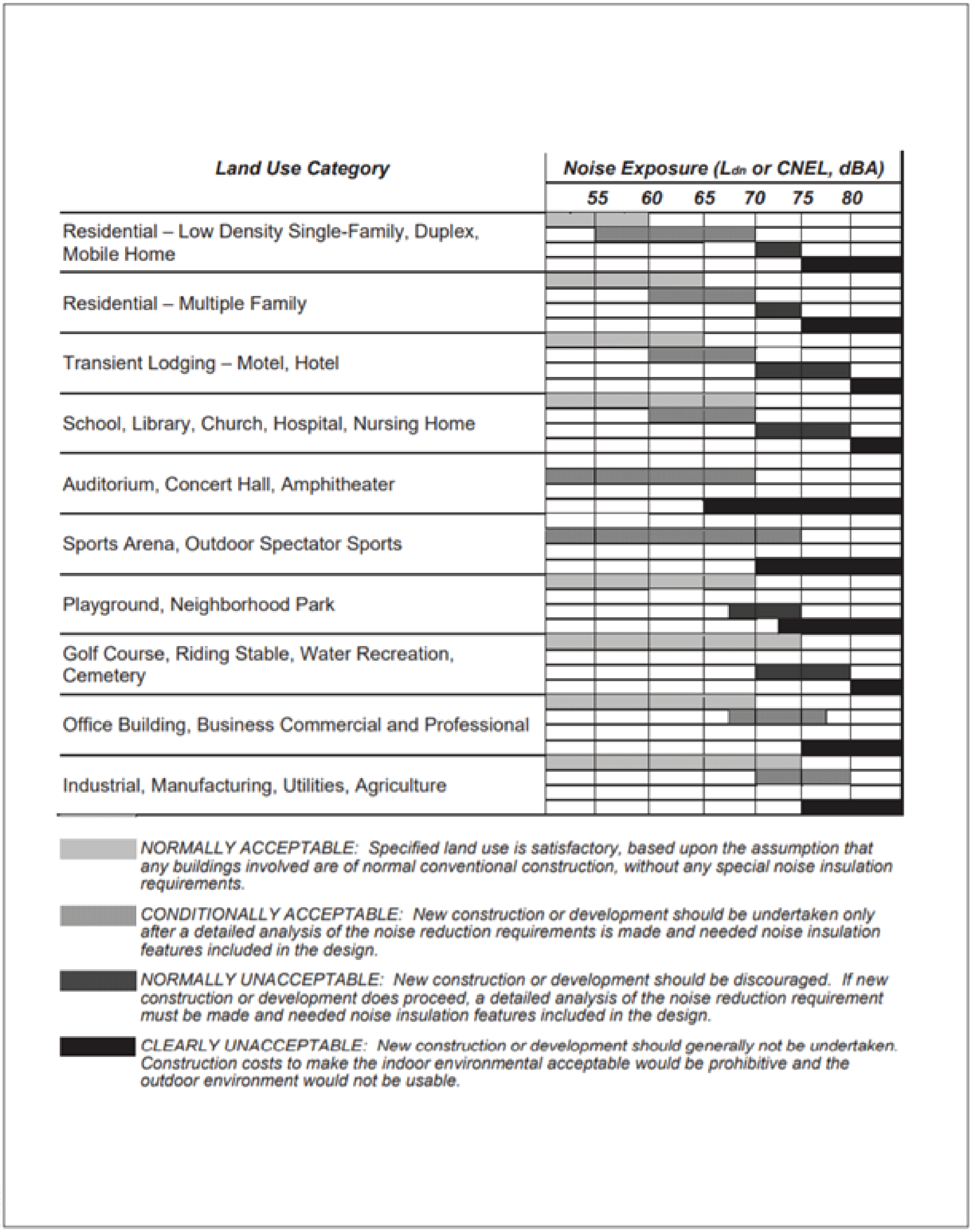

Figure IV.F-2

Guidelines for Noise Compatible Land Use

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

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, California Code of Regulations). The noise insulation standards set forth an interior standard of 45 dBA CNEL in any habitable room. The standards require an acoustical analysis demonstrating that 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 proposed Project. Although the State has not adopted any vibration standard, as shown in Table IV.F-3 on page IV.F-16, 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.

(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

Table IV.F-3
Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (inch/sec) Transient Sources[a]	Maximum PPV (inch/sec) 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

[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, 2013, Table 19.

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.[38]

The LAMC provides that in cases where the actual ambient conditions are not known, the City's presumed daytime (7:00 A.M. to 10:00 P.M.) and nighttime (10:00 P.M. to 7:00 A.M.) 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.F-4 on page IV.F-17. For example, for residential-zoned areas, the presumed ambient noise level is 50 dBA during the daytime and 40 dBA during the nighttime.

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

[38] *LAMC, Chapter XI, Article I, Section 111.02-(b).*

Table IV.F-4
City of Los Angeles Presumed Ambient Noise Levels

Zone	Daytime (7:00 A.M. to 10:00 P.M.) dBA (L_{eq})	Nighttime (10:00 P.M. to 7:00 A.M.) dBA (L_{eq})
Residential (A1, A2, RA, RE, RS, RD, RW1, RW2, R1, R2, R3, R4, and R5)	50	40
Commercial (P, PB, CR, C1, C1.5, C2, C4, C5, and CM)	60	55
Manufacturing (M1, MR1, and MR2)	60	55
Heavy Manufacturing (M2 and M3)	65	65

Source: LAMC Section 111.03.

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.[39] LAMC Section 41.40 prohibits construction between the hours of 9:00 P.M. and 7:00 A.M. Monday through Friday, 6:00 P.M. and 8:00 A.M. on Saturday, and at any time on Sunday (i.e., construction is allowed Monday through Friday between 7:00 A.M. to 9:00 P.M.; and Saturdays and National Holidays between 8:00 A.M. to 6:00 P.M.). 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 P.M. and 6:00 A.M. of the following day, unless a permit therefore has been duly obtained beforehand from the Board of Police Commissioners.

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[39] *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.*

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 (Ldn) 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 policies include the CNEL guidelines for land use compatibility as shown in Table IV.F-5 on page IV.F-19 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 in making land use determinations and in preparing noise ordinances that would limit exposure of citizens to excessive noise levels.[40] The following policies and objectives from the Noise Element apply 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 will reduce or eliminate potential and existing noise impacts.

Exhibit I of the Noise Element also contains guidelines for noise compatible land uses. Table IV.F-5 summarizes these guidelines, which are based on OPR guidelines from 1990.

c. Existing Conditions

As discussed in Section II, Project Description, of this Draft EIR, the Project Site is located in an urbanized area and is surrounded by a mix of uses. The predominant source of noise in the vicinity of the Project Site is vehicular traffic on adjacent roadways. Other ambient noise sources in the vicinity of the Project Site include truck traffic, landscaping activities, and other miscellaneous noise sources associated with typical urban activities.

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40 *City of Los Angeles, General Plan Noise Element, Adopted February 3, 1999, pp. 1.1–2.4.*

Table IV.F-5
City of Los Angeles Guidelines for Noise Compatible Land Use

Land Use	Community Noise Exposure: Day-Night Average Exterior Sound Level (CNEL dB) 50	55	60	65	70	75	80
Residential Single-Family, Duplex, Mobile Home	A	C	C	C	N	U	U
Residential Multi-Family	A	A	C	C	N	U	U
Transient Lodging, Motel, Hotel	A	A	C	C	N	U	U
School, Library, Church, Hospital, Nursing Home	A	A	C	C	N	N	U
Auditoriums, Concert Hall, Amphitheater	C	C	C	C/N	U	U	U
Sports Arena, Outdoor Spectator Sports	C	C	C	C	C/U	U	U
Playgrounds, Neighborhood Park	A	A	A	A/N	N	N/U	U
Golf Course, Riding Stable, Water Recreation, Cemetery	A	A	A	A	N	A/N	U
Office Buildings, Business, Commercial, Professional	A	A	A	A/C	C	C/N	N
Agriculture, Industrial, Manufacturing, Utilities	A	A	A	A	A/C	C/N	N

A = Normally Acceptable: Specified land use is satisfactory, based upon assumption buildings involved are conventional construction, without any special noise insulation.

C = Conditionally Acceptable: New construction or development only after a detailed analysis of the noise mitigation is made and needed noise insulation features included in project design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

N = Normally Unacceptable: New construction or development generally should be discouraged. A detailed analysis of the noise reduction requirements must be made and noise insulation features included in the design of a project.

U = Clearly Unacceptable: New construction or development generally should not be undertaken.

Source: California Department of Health Services (DHS).

(1) Noise-Sensitive Receptors

Some land uses are considered more sensitive to intrusive noise than others based on the types of activities typically involved at the receptor location. The *L.A. CEQA Thresholds Guide* states that noise-sensitive uses include residences, transient lodgings (hotels), schools, libraries, churches, hospitals, nursing homes, auditoriums, concert halls, amphitheaters, playgrounds, and parks.[41] Similarly, the Noise Element 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

41 *City of Los Angeles, L.A. CEQA Thresholds Guide, p. I.1-3.*

lodging, and other residential uses; houses of worship; hospitals; libraries; schools; auditoriums; concert halls; outdoor theaters; nature and wildlife preserves; and parks.[42] These uses are generally considered more sensitive to noise than commercial and industrial land uses.

Based on a review of the land uses in the vicinity of the Project Site, five noise receptor locations (R1 through R5) were selected to represent noise-sensitive uses within 500 feet of the Project Site. These locations represent areas with land uses that could qualify as noise-sensitive uses according to the definition of such uses in the *L.A. CEQA Thresholds Guide* and the General Plan. Although studio uses are not defined as noise sensitive receptors by the *L.A. CEQA Thresholds Guide*, potential noise impacts at the nearest recording studio, including the Line 204 Studios located at 1043 Seward Street (represented by receptor R5), were also evaluated for informational purposes only. As discussed below, noise measurements were conducted at the five off-site locations around the Project Site to establish baseline noise conditions in the vicinity of the Project Site. The monitoring locations essentially surround the Project Site and thereby provide representative baseline measurements for uses in all directions. In addition, the monitoring locations provide an adequate basis to evaluate potential impacts at the monitoring locations and receptors beyond in the same direction, as impacts at these receptors would be further reduced due to distance attenuation and intervening building structures. The noise measurement locations are shown in Figure IV.F-3 on page IV.F-21 and described in Table IV.F-6 on page IV.F-22.

To establish baseline noise conditions, existing ambient noise levels were monitored at five off-site receptor locations (receptor locations R1 to R5) that are representative of noise sensitive uses in the vicinity of the Project Site. The baseline noise monitoring program was conducted on August 11, 2020, using a Quest Technologies Model 2900 Integrating/ Logging Sound Level Meter.[43] A 24-hour measurement was conducted at receptor location (R1). Two 15-minute measurements were conducted at the remaining four off-site receptor locations (R2 to R5) during daytime and nighttime hours. The daytime ambient noise levels were measured between 10:00 A.M. and 12:00 P.M., and the nighttime ambient noise levels were measured between 11:00 P.M. and 1:00 A.M. The ambient noise measurements were

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

[43] *This sound meter meets and exceeds the minimum industry standard performance requirements for "Type 2" standard instruments as defined in the American National Standard Institute (ANSI) S1.4. It also meets the requirement specified in Section 111.01(l) of the LAMC that instruments be "Type S2A" standard instruments or better. The sound meter was calibrated and operated according to the manufacturer's written specifications.*

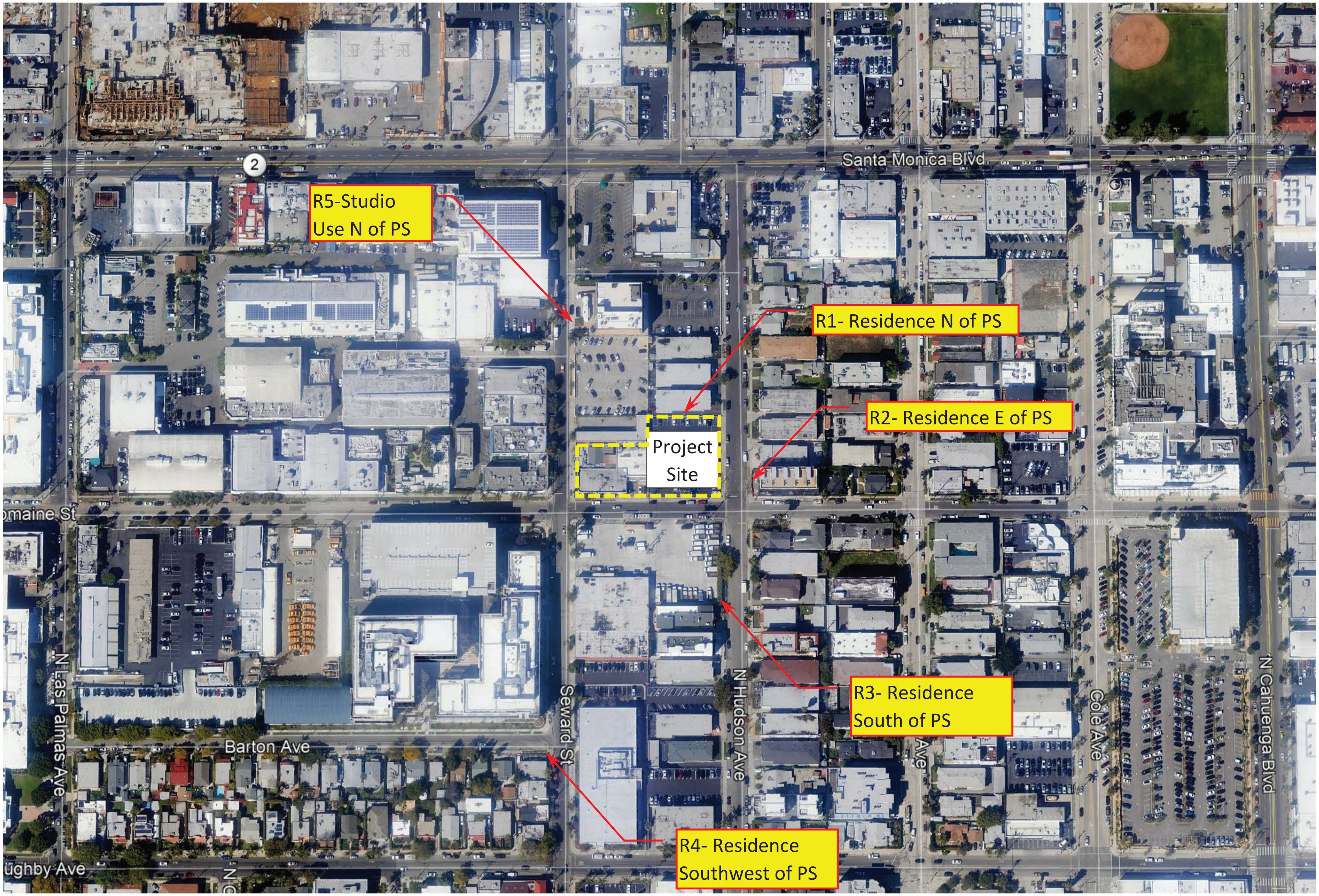

Figure IV.F-3

Noise Monitoring Locations

Source: Acoustical Engineering Services, 2021.

Table IV.F-6
Description of Noise Measurement Locations

Receptor Location	Description	Approximate Distance from Measurement Location to Nearest Project Site Boundary (feet)[a]	Nearest Noise-Sensitive Land Use(s)
R1	Multi-family residential use adjacent to the Project Site to the north. Noise measurement occurred at the property line adjacent to receptor.	Adjacent to the Project Site	Residential
R2	Multi-family residential use on east side of Hudson Avenue, east of the Project Site	70	Residential
R3	Multi-family residential use on west side of Hudson Avenue, south of the Project Site.	210	Residential
R4	Single-family residential use on Barton Avenue (west of Seward Street), south of the Project Site.	500	Residential
R5	Line 204 Studios on Seward Street, north of the Project Site	160	Recording Studio[b]

[a] *Distances are estimated using Google Earth.*

[b] *Recording studio uses are not considered noise sensitive uses by the L.A. CEQA Thresholds Guide. Therefore, the Line 204 Studios represented by receptor location R5, is included in the noise analysis for informational purposes only.*

Source: Acoustical Engineering Services (AES). See Appendix G of this Draft EIR.

recorded in accordance with the City's standards, which require ambient noise to be measured over a period of at least 15 minutes.[44]

Table IV.F-7 on page IV.F-23 provides a summary of the ambient noise measurements. The existing ambient noise measurements are lower than typical conditions, as the ambient noise generally due to local traffic is lower due to the decrease in traffic volume associated with the COVID-19 pandemic.[45] Based on field observations, the ambient noise at the Project measurement locations is dominated by local traffic (i.e., Seward Street, Hudson Avenue, Romaine Street, and Santa Monica Boulevard) and, to a lesser extent, helicopter flyovers and other typical urban noises. As indicated in Table IV.F-7, the existing daytime ambient noise levels at the off-site noise receptor locations ranged from 51.9 dBA (L_{eq}) at receptor location R3 to 57.5 dBA (L_{eq}) at receptor

[44] *LAMC Section 111.01.*

[45] *The noise analysis is conservative based on the lower ambient noise levels measured during the COVID-19 pandemic.*

Table IV.F-7
Existing Ambient Noise Levels

Receptor Location	Noise-Sensitive Land Use	Measured Noise Levels, L_{eq} (dBA)		CNEL[a] (24-hour)
		Daytime Hours[b] (7:00 A.M.–10:00 P.M.)	Nighttime Hours[b] (10:00 P.M.–7:00 A.M.)	
R1	Residential	56.6[c]	51.5[c]	59.4
R2	Residential	52.6	48.1	56.1
R3	Residential	51.9	46.8	55.0
R4	Residential	52.0	48.4	56.0
R5	Recording Studio	57.5	52.8	60.9

[a] *Estimated based on short-term (15-minute) noise measurement based on FTA procedures.*

[b] *The range of hours for the daytime and nighttime periods shown herein are defined by the LAMC. For receptor locations R2 through R5, daytime ambient noise levels were measured between 10:00 A.M. and 12:00 P.M., and the nighttime ambient noise levels were measured between 11:00 P.M. and 1:00 A.M.*

[c] *Levels shown for R1 represent the average for the entire daytime and nighttime periods.*

Source: AES. See Appendix G of this Draft EIR.

location R5. The measured nighttime ambient noise levels ranged from 46.8 dBA (L_{eq}) at receptor location R3 to 52.8 dBA (L_{eq}) at receptor location R5. Thus, the existing ambient noise levels at off-site locations (R1 through R4) are above the City's presumed daytime and nighttime ambient noise levels of 50 dBA (L_{eq}) and 40 dBA (L_{eq}), respectively, for residential uses, as presented above in Table IV.F-3 on page IV.F-17.

(2) Ambient 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 24-hour CNEL noise levels using information provided by the Transportation Study prepared for the Project and included as Appendix J of this Draft EIR. Twelve (12) roadway segments were selected for the existing off-site traffic noise analysis included in this section based on proximity to noise-sensitive uses along the roadway segments and potential increases in traffic volumes from the Project. Traffic noise levels were calculated using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) and traffic volume data from the Transportation Assessment prepared for the Project. The TNM calculates the hourly L_{eq} noise levels based on specific information including the hourly traffic volume, vehicle type mix, vehicle speed, and lateral distance between the noise receptor and the roadway. To calculate the 24-hour CNEL levels, the hourly L_{eq} levels were calculated during daytime hours (7:00 A.M. to 7:00 P.M.), evening hours (7:00 P.M. to 10:00 P.M.), and nighttime hours (10:00 P.M. to 7:00 A.M.). The TNM calculates the 24-hour CNEL noise levels based on specific information, including Average Daily Traffic (ADT);

percentages of day, evening, and nighttime traffic volumes relative to ADT; vehicle speed; and distance between the noise receptor and the roadway. Vehicle mix/distribution information used in the noise calculations is shown in Table IV.F-8 on page IV.F-25.

Table IV.F-9 on page IV.F-26 provides the calculated CNEL for the analyzed local roadway segments based on existing traffic volumes. As shown therein, the existing CNEL due to surface street traffic volumes ranges from 57.0 dBA CNEL along Romaine Street (between Wilcox Avenue and Cahuenga Boulevard) to 70.4 dBA CNEL along Santa Monica Boulevard. Currently, the existing traffic-related noise levels along the analyzed roadway segments of Seward Street (between Santa Monica Boulevard and Romaine Street) and Romaine Street (between Las Palmas and Seward Street) fall within the normally acceptable noise levels for office uses (i.e., less than 67.5 dBA CNEL). The estimated traffic noise levels along Seward Street (between Romaine Street and Melrose Avenue), Hudson Avenue (between Santa Monica Boulevard and Romaine Street and Romaine Street and Melrose Avenue), Wilcox Avenue (between Fountain Avenue and Santa Monica Boulevard and Santa Monica Boulevard and Romaine Street), and Romaine Street (between Seward Street and Wilcox Avenue and Wilcox Avenue and Cahuenga Boulevard) fall within the conditionally acceptable noise levels for residential uses (i.e., between 55 and 70 dBA CNEL). The estimated traffic noise levels along Santa Monica Boulevard (between Las Palmas and Seward Street) fall with the normally unacceptable noise levels for residential uses (i.e., between 70 and 75 dBA CNEL).

(3) Existing Ground-Borne Vibration Levels

Based on field observations, the primary source of existing ground-borne vibration in the vicinity of the Project Site is vehicular travel (e.g., standard cars, refuse trucks, delivery trucks, construction trucks, school buses, and buses) on local roadways. According to the FTA technical study "Federal Transit Administration: Transit Noise and Vibration Impacts Assessments," typical road traffic-induced vibration levels are unlikely to be perceptible by people. Specifically, the FTA study reports that "[i]t is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads."[46] Trucks and buses typically generate ground-borne vibration velocity levels of around 63 VdB (at 50 feet distance), and these levels could reach 72 VdB when trucks and buses pass over bumps in the road. Per the FTA, 75 VdB is the dividing line between barely perceptible (with regards to ground vibration) and distinctly perceptible.[47] Therefore, based on information from the FTA, existing ground vibration in the vicinity of the Project Site is

[46] *FTA, Transit Noise and Vibration Impact Assessment, September 2018, p. 112 .*

[47] *FTA, Transit Noise and Vibration Impact Assessment, September 2018, Table 5-5.*

Table IV.F-8
Vehicle Mix for Traffic Noise Model

Vehicle Type	Percent of Average Daily Traffic (ADT)			Total Percent of ADT per Vehicle Type
	Daytime Hours (7 A.M.–7 P.M.)	Evening Hours (7 P.M.–10 P.M.)	Nighttime Hours (10 P.M.–7 A.M.)	
Automobile	77.6	9.7	9.7	97.0
Medium Truck[a]	1.6	0.2	0.2	2.0
Heavy Truck[b]	0.8	0.1	0.1	1.0
Total	80.0	10.0	10.0	100.0

[a] *Medium Truck—Trucks with 2 axles.*
[b] *Heavy Truck—Trucks with 3 or more axles.*
Source: AES. See Appendix G of this Draft EIR.

generally less than 65 VdB and would be below the perceptible level of 75 VdB. However, ground vibration associated with heavy trucks traveling on road surfaces with irregularities, such as speed bumps and potholes, could reach the perceptible threshold.

Table IV.F-9
Existing Roadway Traffic Noise Levels

Roadway Segment	Adjacent Land Use	Approximate Distance to Roadway Center Line (feet)	Calculated Traffic Noise Levels, CNEL (dBA)[a]	Noise-Sensitive Land Uses	Existing Noise Exposure Compatibility Category[b]
Seward Street					
Between Santa Monica Blvd. and Romaine St.	Office, Studio	25	59.3	No	Normally Acceptable
Between Romaine St. and Melrose Ave.	Commercial, Residential, Studio	25	60.7	Yes	Conditionally Acceptable
Hudson Avenue					
Between Santa Monica Blvd. and Romaine St.	Residential, Commercial	30	58.1	Yes	Conditionally Acceptable
Between Romaine St. and Melrose Ave.	Residential, Commercial	30	57.5	Yes	Conditionally Acceptable
Wilcox Avenue					
Between Fountain Ave. and Santa Monica Blvd.	Residential, Commercial	30	61.2	Yes	Conditionally Acceptable
Between Santa Monica Blvd. and Romaine St.	Residential, Commercial	30	59.9	Yes	Conditionally Acceptable
Santa Monica Boulevard					
Between Las Palmas and Seward St.	Residential, Commercial	35	70.4	Yes	Normally Unacceptable
Between Seward St. and Wilcox Ave.	Commercial	35	70.4	No	Conditionally Acceptable
Between Wilcox Ave. and Cahuenga Blvd.	Commercial, Park	35	70.4	Yes	Conditionally Acceptable
Romaine Street					
Between Las Palmas and Seward St.	Studio, Office	25	57.4	No	Normally Acceptable
Between Seward St. and Wilcox Ave.	Residential, Commercial	25	57.2	Yes	Conditionally Acceptable
Between Wilcox Ave. and Cahuenga Blvd.	Residential, Commercial	25	57.0	Yes	Conditionally Acceptable

[a] *Detailed calculation worksheets are included in Appendix G of this Draft EIR.*
[b] *Noise compatibility is based on the most stringent land use, per City's land use compatibility as provided in Table IV.F-5 on page IV.F-19.*
Source: AES.

3. Project Impacts

a. Thresholds of Significance

In accordance with the State CEQA Guidelines 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,***

Threshold (b): ***Generation of excessive groundborne vibration or groundborne noise levels.***

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, expose people residing or working in the project area to excessive noise levels.***

For this analysis, the Appendix G Thresholds listed above are relied upon. The analysis utilizes factors and considerations identified in the City's 2006 *L.A. CEQA Thresholds Guide*, as appropriate, to assist in answering the Appendix G Threshold questions.

The *L.A. CEQA Thresholds Guide* identifies the following criteria to evaluate noise impacts:

(1) Construction Noise

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

- Construction activities lasting more than one day would exceed existing ambient exterior sound levels by 10 dBA (hourly L_{eq}) 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 (hourly L_{eq}) or more at a noise-sensitive use; or
- Construction activities of any duration would exceed the ambient noise level by 5 dBA (hourly L_{eq}) at a noise-sensitive use between the hours of 9:00 P.M. and

7:00 A.M. Monday through Friday, before 8:00 A.M. or after 6:00 P.M. on Saturday, or at any time on Sunday.

As discussed in Section II, Project Description, of this Draft EIR, the Project occupancy is anticipated in 2025. Therefore, since construction activities would occur over a period longer than 10 days for all phases, the corresponding significance criteria used in the construction noise analysis presented in this section of the Draft EIR is an increase in the ambient exterior noise levels by 5 dBA (hourly L_{eq}) or more at a noise-sensitive use.

(2) Operational Noise

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

- The project causes the ambient noise levels measured at the property line of affected noise-sensitive uses to increase by 3 dBA in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category (see Table IV.F-5 on page IV.F-19 for a description of these categories); or
- The project causes the ambient noise levels measured at the property line of affected noise-sensitive uses to increase by 5 dBA in CNEL or greater; 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 (hourly L_{eq}) at noise-sensitive uses by 5 dBA.

The significance criteria used in the noise analysis for on-site operations presented below is an increase in the ambient noise level of 5 dBA (hourly L_{eq}) at the noise-sensitive uses, in accordance with the City's Noise Regulation (LAMC Chapter XI). The Noise Regulations do not apply to off-site traffic (i.e., vehicles traveling on public roadways).[48] Therefore, based on the *L.A. CEQA Thresholds Guide*, the significance criteria for off-site traffic noise associated with Project operations is an increase in the ambient noise level by 3 dBA or 5 dBA in CNEL (depending on the land use category) at noise-sensitive uses. In addition, the significance for composite noise levels (on-site and off-site sources) is also based on the *L.A. CEQA Thresholds Guide*, which is an increase in the ambient noise level of 3 dBA or 5 dBA in CNEL (depending on the land use category) for the Project's composite noise (both Project-related on-site and off-site sources) at noise-sensitive uses.

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48 *LAMC Section 114.02.(b)*

(3) 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.

(4) 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 residential uses.

- Project construction activities cause ground-borne vibration levels to exceed 65 VdB at off-site recording studios.
- Project construction activities cause ground-born vibration levels to exceed 75 VdB for religious uses.

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). 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 (FHWA 2006)."[49] The ambient noise levels at surrounding sensitive receptor locations were based on field measurement data (see Table IV.F-7 on page IV.F-23). 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 (as described above in Subsection 2.a(1)(b), Outdoor Sound Propagation). Additional noise attenuation was assigned to receptor locations where the line-of-sight to the Project Site was interrupted by the presence of intervening structures.

(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 Study prepared for the Project, which is included in Appendix J of this Draft EIR. The TNM calculates the hourly L_{eq} noise levels generated by construction-related haul trucks. Noise impacts were determined by comparing the predicted noise level plus ambient with that of the existing ambient noise levels along the Project's anticipated truck route(s). As noted above, this analysis is conservative because

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[49] *The reference noise levels for construction equipment from the FHWA are based on measurements of newer construction equipment (published in 2006), rather than the noise levels from the Environmental Protection Agency report referenced in the L.A. CEQA Thresholds Guide (published in 1971).*

the existing ambient noise measurements are lower than typical conditions, as the ambient noise generally due to local traffic is lower due to the decrease in traffic volume associated with the COVID-19 pandemic.[50]

(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 (e.g., use of the outdoor courtyard), 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. The on-site stationary noise sources were calculated using the SoundPLAN (version 8.2) computer noise prediction model.[51] SoundPLAN is widely used by acoustical engineers as a noise modeling tool for environmental noise analysis.

(4) Off-Site Roadway Noise (Operation)

As discussed in Subsection 2.c, Existing Conditions, above, off-site roadway noise was analyzed using the FHWA TNM and traffic data from the Project's Transportation Study, included as Appendix J of this Draft EIR. Roadway noise levels were calculated for various roadway segments, based on the intersection traffic volumes. Roadway noise conditions without the Project were compared to noise levels that would occur with implementation of the Project to determine Project-related noise impacts for operational off-site roadway noise. As noted above, this analysis is conservative because the existing ambient noise measurements are lower than typical conditions, as the ambient noise generally due to local traffic is lower due to the decrease in traffic volume associated with the COVID-19 pandemic.[52]

(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.

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[50] *The noise analysis is conservative based on the lower ambient noise levels measured during the COVID-19 pandemic.*

[51] *SoundPLAN GmbH, SoundPLAN version 8.2, 2020.*

[52] *The noise analysis is conservative based on the lower ambient noise levels measured during the COVID-19 pandemic.*

(6) Operational Vibration

The primary source of vibration related to operation of the Project would include vehicle circulation within the proposed above-grade and 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-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.

c. Project Design Features

The following project design features are proposed with regard to noise and vibration:

Project Design Feature NOI-PDF-1: Power construction equipment (including combustion engines), fixed or mobile, will be equipped with state-of-the-art noise shielding and muffling devices (consistent with manufacturers' standards). All equipment will be properly maintained to assure that no additional noise, due to worn or improperly maintained parts, would be generated.

Project Design Feature NOI-PDF-2: Project construction will not include the use of driven (impact) pile systems.

Project Design Feature NOI-PDF-3: All loading areas will be acoustically screened from off-site noise-sensitive receptors.

Project Design Feature NOI-PDF-4: Outdoor amplified sound systems, if any, will be designed so as not to exceed the maximum noise level of 70 dBA ($L_{eq\text{-}1hr}$) at a distance of 15 feet from the amplified speaker sound systems at Level 4, 75 dBA ($L_{eq\text{-}1hr}$) at a distance of 15 feet from the amplified speaker sound systems at Level 1, Level 2, Level 5, Level 8, Level 9, and Level 10 terraces, and 80 dBA ($L_{eq\text{-}1hr}$) at a distance of 25 feet from the amplified speaker sound systems at Roof level terrace. A qualified noise consultant will provide written documentation that the design of the system complies with this maximum noise level.

Project Design Feature NOI-PDF-5: The hours of operation for use of the outdoor terrace at Level 4 will be from 7:00 A.M. to 10:00 P.M.

d. Analysis of Project Impacts

Threshold (a): Would the Project result in 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 Noise

Construction of the Project would commence with the demolition of the existing on-site buildings, followed by grading and excavation for the subterranean parking. Building foundations would then be constructed, followed by building construction, paving/concrete installation, and landscape installation. It is estimated that approximately 54,111 cubic yards of export material would be hauled from the Project Site during the demolition and excavation phase. Construction delivery/haul trucks would travel on approved truck routes between the Project Site and the US-101 Freeway. Incoming trucks are anticipated to access the Project Site from US-101 via Ardmore Avenue (southbound); right turn onto Melrose Avenue (westbound); right turn onto Seward Street (northbound) to the Project Site. Outgoing trucks would exit the Project Site on Seward Street (northbound); right turn onto Santa Monica Boulevard (eastbound); left turn onto Western Avenue (northbound) to the US-101 Freeway on-ramp.

(i) On-Site Construction Noise

Noise impacts from Project-related construction activities occurring within or adjacent to the Project Site would be a function of the noise generated by construction equipment, the location of the equipment, the timing and duration of the noise-generating construction activities, and the relative distance to noise-sensitive receptors. Construction activities for the Project would generally include demolition, site grading and excavation for the subterranean parking garage, and building construction. Each stage of construction would involve the use of various types of construction equipment and would, therefore, have its own distinct noise characteristics. Demolition generally involves the use of backhoes, front-end loaders, and heavy-duty trucks. Grading and excavation typically require the use of earth-moving equipment, such as excavators, front-end loaders, and heavy-duty trucks. Building construction typically involves the use of cranes, forklifts, concrete trucks, pumps, and delivery trucks. Noise from construction equipment would generate both steady-state and episodic noise that could be heard within and adjacent to the Project Site.

As provided in Project Design Feature NOI-PDF-1 above, construction equipment would have proper noise muffling devices per the manufacturer's standards. Individual pieces of construction equipment anticipated to be used during construction of the Project could produce maximum noise levels (L_{max}) of 74 dBA to 85 dBA at a reference distance of 50 feet from the noise source, as shown in Table IV.F-10 on page IV.F-35. These maximum noise levels would occur when equipment is operating under full power conditions (i.e., the equipment engine at maximum speed). However, equipment used on construction sites often operates under less than full power conditions, or part power. To more accurately characterize construction-period noise levels, the average (hourly L_{eq}) noise level associated with each construction phase is calculated based on the quantity, type, and usage factors for each type of equipment that would be used during each construction phase.[53] These noise levels are typically associated with multiple pieces of equipment operating on part power, simultaneously.

Table IV.F-11 on page IV.F-36 provides the estimated construction noise levels for various construction phases at the four off-site noise-sensitive receptor locations, as well as R5 which is not a noise sensitive use but included for informational purposes. To present a conservative impact analysis, the estimated noise levels were calculated for a scenario in which all pieces of construction equipment were assumed to operate simultaneously and be located at the construction area nearest to the affected receptors. These assumptions represent the worst-case noise scenario because construction activities would typically be spread out throughout the Project Site, and, thus, some equipment would be farther away from the affected receptors. In addition, the noise modeling assumes that construction noise is constant, when, in fact, construction activities and associated noise levels are periodic and fluctuate based on the construction activities.

As discussed above, since construction activities would occur over a period longer than 10 days for all phases combined, the corresponding significance criteria used in the construction noise analysis is when the construction-related noise exceeds the ambient L_{eq} noise level of 5 dBA at a noise-sensitive use. As indicated in Table IV.F-11, the estimated noise levels during Project construction would be below the significance criteria at off-site receptor locations R4 and R5. The estimated construction-related noise levels would exceed the significance threshold at receptor locations R1 through R3, ranging from 14.9 dBA at receptor location R3 to 27.7 dBA at receptor location R1, without implementation of mitigation, respectively. **Therefore, temporary noise impacts associated with the Project's on-site construction would be significant without mitigation measures.**

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[53] *Pursuant to the FHWA Roadway Construction Noise Model User's Guide, 2006, the usage factor is the percentage of time during a construction noise operation that a piece of construction is operating at full power.*

Table IV.F-10
Construction Equipment Noise Levels

Equipment	Estimated Usage Factor[a] (%)	Typical Noise Level at 50 feet from Equipment, dBA (L_{max})
Air Compressor	40	78
Cement and Mortar Mixer	50	80
Concrete Mixer Truck	40	79
Crane	16	81
Drill Rig	20	84
Forklift	20	75
Generator	50	81
Grader	40	85
Dump/Haul Truck	40	76
Excavator	40	81
Paver	50	77
Pump	50	81
Roller	20	80
Rubber Tired Loader	40	79
Tractor/Loader/Backhoe	40	80
Delivery Truck	40	74
Welders	40	74

[a] *Usage factor represents the percentage of time the equipment would be operating at full speed.*
Source: FHWA Roadway Construction Noise Model User's Guide, 2006.

(ii) Off-Site Construction Noise

In addition to on-site construction noise sources, other noise sources may include materials delivery, concrete mixing, and haul trucks (construction trucks), as well as construction worker vehicles accessing the Project Site during construction. Typically, construction trucks generate higher noise levels than construction worker vehicles. The major noise sources associated with off-site construction trucks would be from the delivery/concrete/haul trucks. As described above, construction delivery/haul trucks would access the Project Site via Ardmore Street, Melrose Avenue, and Seward Street, and leave the Project Site via Seward Street, Santa Monica Boulevard, and Western Avenue.

Based on data provided by the Applicant, the peak period of construction with the highest number of construction trucks would occur during the site grading phase, which would include 115 trucks (100 haul trucks and 15 delivery trucks) per day (equal to 230 truck trips per day). In addition, the mat foundation phase would include up to

Table IV.F-11
Construction Noise Impacts

Off-Site Receptor Location	Approximate Distance from Receptor to Project Construction Area (feet)	Estimated Construction Noise Levels by Construction Phases (L_{eq} (dBA))						Existing Daytime Ambient Noise Levels (L_{eq} (dBA))	Significance Criteria (L_{eq} (dBA))[a]	Maximum Noise Exceedance Above the Criteria (L_{eq} (dBA))	Sig. Impact Without Mitigation?
		Demo	Grading/ Excavation	Mat Foundation	Foundation	Building Construction	Paving				
R1	15	89.3	89.3	85.9	88.2	87.3	88.3	56.6	61.6	27.7	**Yes**
R2	70	79.2	80.2	76.4	77.7	79.5	77.3	52.6	57.6	22.6	**Yes**
R3	210	70.4	71.8	68.1	69.3	71.1	68.3	51.9	56.9	14.9	**Yes**
R4	500	53.1	54.7	51.1	52.1	54.1	50.9	52.0	57.0	0.0	No
R5	160	57.6	59.0	55.3	56.4	58.3	55.5	57.5	62.5	0.0	No

[a] *Significance criteria are equivalent to the measured daytime ambient noise levels (see Table IV.F-7 on page IV.F-23) plus 5 dBA, per the L.A. CEQA Thresholds Guide for construction activities lasting longer than 10 days in a three-month period. If the estimated construction noise levels exceed those significance criteria, a construction-related noise impact is identified.*

Source: AES. See Appendix G of this Draft EIR.

180 concrete trucks per day (equal to 360 trips per day). Table IV.F-12 on page IV.F-38 provides the estimated number of construction-related truck trips for the various construction phases, including haul/concrete/material delivery trucks and worker vehicles, and the estimated noise levels along the anticipated truck route(s). As indicated in Table IV.F-12, the hourly noise levels generated by construction trucks during all stages of Project construction would be below the existing daytime ambient noise levels along Ardmore Avenue, Melrose Avenue, Santa Monica Boulevard, and Western Avenue and would be below the 5-dBA significance criteria. However, the estimated noise levels from the Project-related trucks along Seward Street would exceed the 5-dBA significance criteria. **Therefore, noise impacts from off-site construction traffic would be significant, without mitigation measures.**

(iii) Summary of Construction Noise Impacts

As discussed above, temporary noise impacts associated with the Project's on-site and off-site construction activities would be significant. **Therefore, without mitigation measures, Project construction activities would result in the generation of a substantial temporary increase in ambient noise levels in the vicinity of the Project in excess of significance criteria established by the City.**

(b) Operational Noise

This section provides a discussion of potential operational noise impacts on nearby noise-sensitive receptors. Specific operational noise sources addressed herein include (a) on-site stationary noise sources, including outdoor mechanical equipment (e.g., heating, ventilation, and air conditioning [HVAC] equipment), activities within the proposed outdoor spaces (e.g., outdoor dining and terraces), parking facilities, loading docks and trash compactors; and (b) off-site mobile (roadway traffic) noise sources.

(i) On-Site Stationary Noise Sources

Mechanical Equipment

As part of the Project, new mechanical equipment (e.g., air ventilation equipment) would be located at the building roof level, as well as within the building interior (e.g., garage exhaust fans and mechanical rooms). Although operation of this equipment would generate noise, Project-related outdoor mechanical equipment would be designed so as not to increase the existing ambient noise levels by 5 dBA in accordance with the City's Noise Regulations. Specifically, the Project would comply with LAMC Section 112.02, which prohibits noise from air conditioning, refrigeration, heating, pumping, and filtering equipment from exceeding the ambient noise levels on the premises of other occupied properties by more than 5 dBA. Table IV.F-13 on page IV.F-39 presents the estimated

Table IV.F-12
Off-Site Construction Truck Noise Levels

Construction Phase	Estimated Number of Construction Truck/ Worker Trips per Day	Estimated Number of Construction Truck/ Worker Trips per Hour[a]	Estimated Truck Noise Levels Plus Ambient Along the Project Truck Routes,[a] (L_{eq} (dBA)) (Project/Project + Ambient)				
			Ardmore Ave.	Melrose Ave.	Seward St.	Santa Monica Blvd.	Western Ave.
Demolition	50/25	9/10	58.9/68.6	58.9/71.1	59.6/60.3	58.9/71.1	58.9/71.1
Grading/ Excavation	230/75	39/30	64.8/69.8	64.8/71.8	65.5/65.7	64.8/71.8	64.8/71.8
Mat Foundation	360/100	45/40	65.4/70.0	65.4/71.9	66.2/66.4	65.4/71.9	65.4/71.9
Foundation	190/350	24/140	64.2/69.6	64.2/71.7	64.9/65.1	64.2/71.7	64.2/71.7
Building Construction	30/75	4/30	56.8/68.4	56.8/71.0	57.6/58.7	56.8/71.0	56.8/71.0
Paving	30/20	4/8	55.2/68.3	55.2/70.9	56/57.5	55.2/70.9	55.2/70.9
Existing Ambient Noise Levels along the Project Haul Routes,[c] L_{eq} (dBA)			68.1	70.8	52.0	70.8	70.8
Significance Criteria,[d] L_{eq} (dBA)			73.1	75.8	57.0	75.8	75.8
Significance Impact?			No	No	**Yes**	No	No

[a] *For construction trucks, the number of hourly trips is based on an hourly average, assuming a uniform distribution of trips over an 8-hour workday. Haul truck hourly trips are based on 6-hour hauling per day. For worker vehicles, the number of hourly trips is based on 40% of the worker trips that would arrive in one hour to represent a conservative analysis.*

[b] *Noise levels include Project-related truck trips plus ambient.*

[c] *Ambient noise level along the truck routes are based on measured ambient at nearby receptor locations, i.e., ambient along Seward Street is based on measured ambient at receptor location R4. Ambient along Ardmore Avenue is based on measured ambient along Van Ness Avenue (a similar roadway segment off the US-101 Freeway). Ambient along Melrose Avenue, Santa Monica Boulevard, and Western Avenue are based on measured ambient noise levels from the 5570 Melrose Project (conducted on June 26, 2017), which is located along the Melrose Avenue (Project haul route), (City of Los Angeles, ENV-2016-4317-CE). As noted above, As noted above, the existing ambient noise measurements are lower than typical conditions, as the ambient noise generally due to local traffic is lower due to the decrease in traffic volume associated with the COVID-19 pandemic. Refer to Section 3.b, Methodology, above.*

[d] *Significance criteria are equivalent to the measured ambient noise levels plus 5 dBA.*

Source: AES. See Appendix G of this Draft EIR.

noise levels at the off-site receptor locations from operation of the Project's mechanical equipment.

As indicated in Table IV.F-13 on page IV.F-39, the estimated noise levels from the mechanical equipment would range from 25.4 dBA (L_{eq}) at the uses represented by receptor location R5 to 33.7 dBA (L_{eq}) at the uses represented by receptor location R1, which would be below the existing ambient noise levels. As such, the estimated ambient noise levels at all off-site receptor locations with the addition of the Project's mechanical equipment would be below the significance criteria of 5 dBA (L_{eq}) above ambient noise

Table IV.F-13
Estimated Noise Levels from Mechanical Equipment

Receptor Location	Existing Ambient Noise Levels, dBA (L_{eq})	Estimated Noise Levels from Mechanical Equipment, dBA (L_{eq})	Ambient + Project Noise Levels, dBA (L_{eq})	Significance Criteria, dBA (L_{eq})[a]	Exceedance over Significance Criteria	Significant Impact?
R1	51.5	31.7	51.5	56.5	0.0	No
R2	48.1	31.9	48.2	53.1	0.0	No
R3	46.8	33.7	47.0	51.8	0.0	No
R4	48.4	33.6	48.5	53.4	0.0	No
R5	52.8	25.4	52.8	57.8	0.0	No

[a] *Significance criteria are equivalent to the measured daytime or nighttime ambient noise levels, whichever is lower (see Table IV.F-7 on page IV.F-23) plus 5 dBA, per the City of Los Angeles Noise Regulations. If the estimated noise levels exceed those significance criteria, a noise impact is identified.*

Source: AES. See Appendix G of this Draft EIR.

levels. **Therefore, noise impacts from mechanical equipment would be less than significant.**

Outdoor Spaces

As discussed in Section II, Project Description, of this Draft EIR, the Project would include various outdoor spaces including the outdoor dining at Level 1, and tenant terraces at Levels 2, 4, 5, 8, 9, 10, and the roof deck. Noise sources associated with outdoor uses typically include noise from people gathering and conversing. For this operational noise analysis, reference noise levels of 65 dBA for a male and 62 dBA for a female speaking in a raised voice were used for analyzing potential noise impacts from people gathering at the outdoor spaces.[54] In order to analyze a typical noise scenario, it was assumed that up to 50 percent of the people (half of which would be male and the other half female) would be talking at the same time. In addition, the hours of operation for use of the outdoor areas were assumed to be from 7:00 A.M. to 2:00 A.M., with the exception of the outdoor terrace at Level 4, which would be from 7:00 A.M. to 10:00 P.M. pursuant to Project Design Feature NOI-PDF-5. Table IV.F-14 on page IV.F-40 presents the anticipated number of people at each of the outdoor spaces.

[54] *Harris, Cyril M., Handbook of Acoustical Measurements and Noise Control, Third Edition, 1991, Table 16.1.*

Table IV.F-14
Outdoor Use Analysis Assumptions

Location	Approximate Area (sf)[a]	Estimated Total Number of People[b]
Level 1—Outdoor Dining/ Seating	1,500	100
Level 2—Tenant Terrace	750	50
Level 4—Tenant Terrace	6,000	400
Level 5—Tenant Terrace	3,850	257
Level 8—Tenant Terrace	8,800	587
Level 9—Tenant Terrace	1,300	87
Level 10—Restaurant Dining	800	54
Roof Level—Tenant Terrace	7,500	500

sf = square feet

[a] *Does not include non-occupied open space at the ground level.*

[b] *Based on maximum 15 square feet per person, per the City of Los Angeles Building Code.*

Source: Hawkins\Brown, 2020; AES, 2021. Refer to Exhibit A of the Noise Calculation Worksheets included as Appendix G of this Draft EIR.

An additional potential noise source associated with outdoor spaces would be the use of an outdoor sound system (e.g., music or other sounds broadcast through an outdoor mounted speaker system) at the outdoor spaces. As set forth in Project Design Feature NOI-PDF-4, if an amplified sound system is used in outdoor areas, it would be designed so as not to exceed the maximum noise level of 70 dBA L_{eq} at Level 4, Level 5, and Level 8 terraces, 75 dBA L_{eq} at Level 1 outdoor dining, Level 2, Level 9, and Level 10 terraces, and 80 dBA L_{eq} at the roof level terrace, thereby ensuring that the amplified sound system would not exceed the significance criteria (i.e., an increase of 5 dBA L_{eq}) at any off-site noise-sensitive receptor location.

Table IV.F-15 on page IV.F-41 presents the estimated noise levels at the off-site receptors resulting from the use of outdoor areas. The estimated noise levels were calculated with the assumption that all outdoor spaces would be fully occupied and operating concurrently to represent a worst-case noise analysis. As presented in Table IV.F-15, the estimated noise levels from the outdoor spaces would range from 34.8 dBA (L_{eq}) at the uses represented by receptor location R5 to 55.5 dBA (L_{eq}) at the uses represented by receptor location R2 during the daytime hours. During the nighttime hours, the estimated noise levels from the outdoor spaces would range from 34.7 dBA (L_{eq}) at receptor R5 to 51.0 dBA (L_{eq}) at receptor R4. The estimated composite ambient noise levels with the addition of the noise levels generated by the Project's outdoor spaces would be below the significance criteria of 5 dBA (L_{eq}) above ambient noise levels (based on the

Table IV.F-15
Estimated Noise Levels from Outdoor Uses

Receptor Location	Existing Ambient Noise Levels (dBA (L_{eq})) Daytime/ Nighttime	Estimated Noise Levels from Outdoor Uses (dBA (L_{eq})) Daytime/ Nighttime	Ambient + Project Noise Levels (dBA (L_{eq})) Daytime/ Nighttime	Significance Criteria[a] Daytime/ Nighttime	Exceedance over Significance Criteria Daytime/ Nighttime	Significant Impact?
R1	56.6/51.5	45.1/44.5	56.9/52.3	61.6/56.5	0.0/0.0	No
R2	52.6/48.1	55.5/49.5	57.3/51.9	57.6/53.1	0.0/0.0	No
R3	51.9/46.8	49.4/49.0	53.8/51.0	56.9/51.8	0.0/0.0	No
R4	52.0/48.4	51.0/51.0	54.5/52.9	57.0/53.4	0.0/0.0	No
R5	57.5/52.8	34.9/34.8	57.5/52.9	62.5/57.8	0.0/0.0	No

[a] *Significance criteria are equivalent to the measured daytime or nighttime ambient noise levels (see Table IV.F-7 on page IV.F-23) plus 5 dBA, per the City of Los Angeles Noise Regulations. If the estimated noise levels exceed those significance criteria, a noise impact is identified.*

Source: AES. See Appendix G of this Draft EIR.

measured ambient noise level) at all off-site receptor locations. **As such, noise impacts from the use of the outdoor spaces would be less than significant.**

<u>Parking Facilities</u>

As discussed in Section II, Project Description, of this Draft EIR, the Project would provide 310 vehicular parking spaces within four subterranean levels, one at grade, and three fully enclosed and mechanically ventilated above grade parking levels. Sources of noise within the parking garage would primarily include vehicular movements and engine noise, doors opening and closing, and intermittent car alarms. Since the subterranean and above grade parking levels would be fully enclosed on all sides, noise generated within the subterranean parking garage would be effectively shielded from off-site sensitive receptor locations in the immediate vicinity of the Project Site. In addition, noise levels associated with vehicle parking inside the subterranean and fully-enclosed parking structure would be less than the existing on-site surface parking lot. **Therefore, noise impacts from the parking facilities would be less than significant.**

<u>Loading Area and Trash Collection Areas</u>

The Project includes a loading area within the Level 1 parking structure. The Project trash compactors would be located inside the building adjacent to the loading area. Noise sources associated with the loading area and trash collection area would include delivery/trash collection trucks and operation of the trash compactor. The loading area would be acoustically screened from off-site noise sensitive-receptors in accordance with

Project Design Feature NOI-PDF-3. Based on measured noise levels from typical loading areas and trash compactors, delivery/trash collection trucks and trash compactors could generate noise levels of approximately 71 dBA (L_{eq}) and 66 dBA (L_{eq}), respectively, at a distance of 50 feet.[55] In addition, the trash compactors would be located inside an enclosed room, which would be effectively shielded to the off-site sensitive receptors. Table IV.F-16 on page IV.F-43 presents the estimated noise levels at the off-site receptor locations from operation of the loading area and trash compactor. As indicated in Table IV.F-16, the estimated noise from the loading area and trash compactor would range from 8.1 dBA (L_{eq}) at the uses represented by receptor location R4 to 47.6 dBA (L_{eq}) at the uses represented by receptor location R1, which would be below the significance criteria of 5 dBA (L_{eq}) above ambient noise levels at all off-site sensitive receptors. **Therefore, noise impacts from loading area and trash compactor operations would be less than significant.**

(ii) Off-Site Mobile Noise Sources

Future Plus Project

As identified in the Transportation Assessment, the Project is expected to generate a net increase of 1,542 daily trips.[56] As such, Project-related traffic would increase the existing traffic volumes along the roadway segments in the study area when compared with Future without Project conditions. This increase in roadway traffic volumes was analyzed to determine if any traffic-related noise impacts would result from operation of the Project. Table IV.F-17 on page IV.F-44 provides a summary of the roadway noise impact analysis. The calculated CNEL levels are conservatively calculated in front of the roadways and do not account for the presence of any physical sound barriers or intervening structures. As shown in Table IV.F-17, the Project would result in a maximum noise increase of 1.4 dBA along the roadway segment of Hudson Avenue (between Santa Monica Boulevard and Romaine Street). The estimated noise increase along all other analyzed roadway segments would be 1.1 dBA or lower. The estimated noise increase due to the Project-generated traffic would be well below the 5-dBA significance criteria along Seward Street, Hudson Avenue, Wilcox Avenue, and Romaine Street (as the estimated noise level is less than 70 dBA CNEL). The estimated increase in traffic-related noise levels along Santa Monica Boulevard would be well below the 3-dBA CNEL significance criteria (applicable to noise levels 70 dBA CNEL or higher). **Therefore, traffic noise impacts under Future Plus Project conditions would be less than significant.**

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55 *RK Engineering Group, Inc., Wal-Mart/Sam's Club Reference Noise Level Study, 2003.*

56 *Gibson Transportation Consulting Inc., Transportation Assessment for the 1000 Seward Mixed-Use Development Project, July 2021.*

Table IV.F-16
Estimated Noise Levels from Loading Area and Trash Compactor

Receptor Location	Existing Ambient Noise Levels (dBA (L_{eq}))	Estimated Noise Levels from Loading Area and Trash Compactor (dBA (L_{eq}))	Ambient + Project Noise Levels (dBA (L_{eq}))	Significance Criteria[a]	Exceedance Over Significance Criteria	Significant Impact?
R1	56.6	47.6	57.1	61.6	0.0	No
R2	52.6	40.6	52.9	57.6	0.0	No
R3	51.9	17.6	51.9	56.9	0.0	No
R4	52.0	8.0	52.0	57.0	0.0	No
R5	57.5	9.1	57.5	62.5	0.0	No

[a] *Significance criteria are equivalent to the measured daytime ambient noise levels (see Table IV.F-7 on page IV.F-23) plus 5 dBA, per the City of Los Angeles Noise Regulations. If the estimated noise levels exceed those significance criteria, a noise impact is identified. Significance criteria based on the daytime ambient noise levels, loading and trash compactors would only operate during the daytime hours. Nevertheless, the estimated noise levels from the loading dock and trash compactor operation would also be below the nighttime ambient noise levels.*

Source: AES. See Appendix G of this Draft EIR.

<u>Existing Plus Project</u>

The analysis of traffic noise impacts provided above was based on the incremental increase in traffic noise levels attributable to the Project as compared to Future Without Project conditions. An additional analysis was performed to determine the potential noise impacts based on the increase in noise levels due to Project-related traffic compared with the existing baseline traffic noise conditions. As shown in Table IV.F-18 on page IV.F-45, when compared with existing conditions, the Project would result in a maximum increase of up to 1.5 dBA CNEL in traffic-related noise levels along the roadway segment of Hudson Avenue (between Santa Monica Boulevard and Romaine Street). At other analyzed roadway segments, the increase in traffic-related noise levels would be 1.1 dBA or less. The estimated increase in traffic noise levels as compared to existing conditions would be well below both the 3-dBA CNEL (applicable to noise levels less than 70 dBA CNEL) and the 5-dBA CNEL (applicable to noise levels 70 dBA CNEL or higher) significance criteria. **Therefore, traffic noise impacts under Existing Plus Project conditions would be less than significant.**

(iii) Composite Noise Level Impacts from Project Operations

In addition to considering the potential noise impacts to neighboring noise-sensitive receptors from each specific on-site and off-site noise source (e.g., mechanical equipment, outdoor areas, loading and trash compactor, and off-site traffic), an evaluation of potential

Table IV.F-17
Roadway Traffic Noise Impacts—Future Plus Project

Roadway Segment	Adjacent Land Use	Calculated Traffic Noise Levels (CNEL (dBA))		Increase in Noise Levels due to Project (CNEL (dBA))	Significant Impact?
		Future Without Project	Future Plus Project		
Seward Street					
Between Santa Monica Blvd. and Romaine St.	Office, Studio	59.8	59.8	0.0	No
Between Romaine St. and Melrose Ave.	Commercial, Residential, Studio	60.8	60.9	0.1	No
Hudson Avenue					
Between Santa Monica Blvd. and Romaine St.	Residential, Commercial	58.3	59.7	1.4	No
Between Romaine St. and Melrose Ave.	Residential, Commercial	57.6	57.8	0.2	No
Wilcox Avenue					
Between Fountain Ave. and Santa Monica Blvd.	Residential, Commercial	61.4	61.5	0.1	No
Between Santa Monica Blvd. and Romaine St.	Residential, Commercial	60.0	60.2	0.2	No
Santa Monica Boulevard					
Between Las Palmas and Seward St.	Residential, Commercial	71.3	71.3	0.0	No
Between Seward St. and Wilcox Ave.	Commercial	71.4	71.4	0.0	No
Between Wilcox Ave. and Cahuenga Blvd.	Commercial, Park	71.3	71.4	0.1	No
Romaine Street					
Between Las Palmas and Seward St.	Studio, Office	58.1	58.7	0.6	No
Between Seward St. and Wilcox Ave.	Residential, Commercial	57.5	58.5	1.0	No
Between Wilcox Ave. and Cahuenga Blvd.	Residential, Commercial	57.3	58.2	0.9	No

Source: AES. See Appendix G of this Draft EIR.

Table IV.F-18
Roadway Traffic Noise Impacts—Existing Plus Project

Roadway Segment	Adjacent Land Use	Calculated Traffic Noise Levels (CNEL (dBA))		Increase in Noise Levels due to Project (CNEL (dBA))	Significant Impact?
		Existing Without Project	Existing Plus Project		
Seward Street					
Between Santa Monica Blvd. and Romaine St.	Office, Studio	59.3	59.3	0.0	No
Between Romaine St. and Melrose Ave.	Commercial, Residential, Studio	60.7	60.7	0.0	No
Hudson Avenue					
Between Santa Monica Blvd. and Romaine St.	Residential, Commercial	58.1	59.6	1.5	No
Between Romaine St. and Melrose Ave.	Residential, Commercial	57.5	57.6	0.1	No
Wilcox Avenue					
Between Fountain Ave. and Santa Monica Blvd.	Residential, Commercial	61.2	61.3	0.1	No
Between Santa Monica Blvd. and Romaine St.	Residential, Commercial	59.9	60.0	0.1	No
Santa Monica Boulevard					
Between Las Palmas and Seward St.	Residential, Commercial	70.4	70.4	0.0	No
Between Seward St. and Wilcox Ave.	Commercial	70.4	70.5	0.1	No
Between Wilcox Ave. and Cahuenga Blvd.	Commercial, Park	70.4	70.5	0.1	No
Romaine Street					
Between Las Palmas and Seward St.	Studio, Office	57.4	58.2	0.8	No
Between Seward St. and Wilcox Ave.	Residential, Commercial	57.2	58.3	1.1	No
Between Wilcox Ave. and Cahuenga Blvd.	Residential, Commercial	57.0	57.9	0.9	No

Source: AES. See Appendix G of this Draft EIR.

composite noise level increases (i.e., noise levels from all on-site and off-site noise sources combined) at the analyzed sensitive receptor locations was also performed. The composite noise analysis uses the CNEL noise metric to determine the contributions at the noise-sensitive receptor locations in the vicinity of the Project Site.

Table IV.F-19 on page IV.F-47 presents the estimated composite noise levels in terms of CNEL at the off-site sensitive receptor locations from the Project-related noise sources. As indicated in Table IV.F-19, the Project would result in an increase (relative to the existing ambient) in composite noise levels ranging from 1.1 dBA at the uses represented by receptor location R1 to 3.4 dBA at the uses represented by receptor location R2. The composite noise level from Project operation would be below the 5-dBA significance criteria at all receptor locations (applicable to normally unacceptable noise levels of 70 dBA CNEL or higher for residential land use category). **As such, composite noise level impacts due to Project operations would be less than significant.**

(2) Mitigation Measures

(a) On-Site Construction Noise

As analyzed above, construction of the Project would have the potential to result in significant noise impacts at the off-site sensitive receptor locations R1 through R3 from on-site construction activities. Therefore, the following mitigation measure is provided to reduce construction-related noise impacts:

Mitigation Measure NOI-MM-1: Prior to grading activities, a temporary and impermeable sound barrier shall be erected at the following locations. At plan check, building plans shall include documentation prepared by a noise consultant verifying compliance with this measure.

- Along the northern property line of the Project Site between the construction area and the residential use to the north (receptor location R1). The temporary sound barrier shall be designed to provide a minimum 15-dBA noise reduction at the ground level of receptor location R1.
- Along the eastern property line of the Project Site between the construction area and the residential use east of the Project Site (receptor location R2). The temporary sound barrier shall be designed to provide a minimum 15-dBA noise reduction at the ground level of receptor location R2.
- Along the southern property line of the Project Site between the construction area and the residential uses south of the Project Site (receptor location R3). The temporary sound barrier shall be designed to provide a minimum 15-dBA noise reduction at the ground level of receptor location R3.

Table IV.F-19
Composite Noise Impacts

Receptor Location	Existing Ambient Noise Levels (CNEL (dBA))	Calculated Project-Related Noise Sources (CNEL (dBA))				Project Composite Noise Levels (CNEL (dBA))	Ambient Plus Project Composite Noise Levels (CNEL (dBA))	Increase in Noise Levels Due to Project (CNEL (dBA))	Sig. Criteria[a] (CNEL (dBA))	Sig. Impact?
		Traffic	Mechanical	Loading/ Trash Compactor	Outdoor Spaces					
R1	59.4	52.6	31.2	44.8	46.1	54.0	60.5	1.1	64.4	No
R2	56.1	51.7	37.2	25.3	55.3	56.9	59.5	3.4	61.1	No
R3	55.0	42.0	39.0	15.3	51.0	51.7	56.7	1.7	60.0	No
R4	56.0	43.6	38.6	8.5	52.6	53.3	57.9	1.9	61.0	No
R5	60.9	40.6	30.7	9.0	36.7	42.4	60.9	0.0	65.9	No

[a] *Significance criteria are equivalent to the existing ambient plus 3 dBA if the estimated noise levels (ambient plus Project) fall within the "normally unacceptable" or "clearly unacceptable" land use categories or ambient plus 5 dBA if the estimated noise levels fall within the "normally acceptable" or "conditionally acceptable" land use categories, per the City of Los Angeles Noise Element. If the estimated noise levels exceed those significance criteria, a noise impact is identified.*

Source: AES. See Appendix G of this Draft EIR.

(3) Level of Significance After Mitigation

(a) On-Site Construction Noise

Implementation of Mitigation Measure NOI-MM-1 provided above would reduce the Project's construction noise levels to the extent feasible. Specifically, implementation of Mitigation Measure NOI-MM-1 (installation of temporary sound barrier) would reduce the noise generated by on-site construction activities by a minimum 15 dBA at the residential uses to the north (receptor location R1), the residential uses to the east (receptor location R2), and residential use to the south (receptor location R3), which would reduce impacts at receptor location R3 to less than significant level. However, the construction noise levels still exceed the ambient noise by 12.7 dBA receptor location R1 and 7.6 dBA at receptor location R2, as noise attenuation from temporary construction noise barriers is typically limited to maximum 15 dBA noise reduction. **Therefore, construction noise impacts associated with on-site noise sources with mitigation measures would remain significant and unavoidable.**

(b) Off-Site Construction Noise

As discussed above, the short-term noise impacts associated with off-site construction traffic would be significant without mitigation. There are no feasible mitigation measures that could be implemented to reduce this short-term impact because conventional mitigation measures, such as providing temporary noise barrier walls to reduce the off-site construction truck traffic noise impacts, would not be feasible as the barriers would obstruct the access and visibility to the properties along the anticipated haul routes. **Therefore, the Project's construction noise impact associated with off-site construction traffic would be significant and unavoidable.**

(c) Operational Noise

Noise impacts associated with on-site and off-site noise sources during Project operations would be less than significant without mitigation.

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

(1) Impact Analysis

(a) Construction

Construction activities can generate varying degrees of ground vibration, depending on the construction procedures and the type of construction equipment used. The operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the construction site often varies, depending on soil type, ground strata, and construction characteristics of the receptor buildings. The results from vibration can range from no perceptible effects at the lowest vibration levels to low rumbling sounds and perceptible vibration at moderate levels. However, ground-borne vibrations from construction activities rarely reach levels that damage structures.

(i) Building Damage Impacts from On-Site Construction

With regard to potential building damage, the Project would generate ground-borne construction vibration during building demolition and site excavation/grading activities when heavy construction equipment, such as large bulldozers, drill rigs, and loaded trucks, would be used. The FTA has published standard vibration velocities for various construction equipment operations. As discussed in the Project's Historic Resources Technical Report included as Appendix C of this Draft EIR, the nearest historic resource to the Project Site is the Seward Film Vaults building, which is located adjacent to the Project's northwest corner.[57] In addition, the Hollywood Center Studio, is composed of multiple structures directly west of the Project Site. The nearest existing historic structure of the Hollywood Center Studio is located approximately 230 feet west of the Project Site.

Therefore, the assessment of construction vibration provided below for potential building damage due to on-site construction compares the estimated vibration levels generated during construction of the Project to the 0.12 PPV significance criteria for buildings extremely susceptible to vibration damage (applicable to the Seward Film Vault and the Hollywood Center Studio), the 0.3 PPV significance criteria for engineered concrete and masonry buildings (applicable to the off-site single- and two-story commercial and residential buildings adjacent to the Project Site to the north and across the Project Site to the south and east), and the 0.5 PPV significance criteria for reinforced-concrete, steel, and timber buildings (applicable to the recently constructed multi-story parking structure adjacent to the north and the multi-story office building to the west).

Table IV.F-20 on page IV.F-50 provides the estimated ground vibration velocity levels (in terms of inch per second PPV) at the nearest off-site structures to the Project Site. It is noted that since impact pile driving methods would not be used during construction of the Project, in accordance with Project Design Feature NOI-PDF-2 provided above, impact pile driving vibration is not included in the on-site construction vibration analysis. Installation of piles for shoring and foundation would utilize drilling methods to minimize vibration generation. As indicated in Table IV.F-20, the estimated vibration levels

[57] *Historic Resources Group, Historical Resources Technical Report, 1000 Seward Street, Los Angeles, January 2021. Included as Appendix C of this Draft EIR.*

Table IV.F-20
Construction Vibration Impacts—Building Damage

Nearest On- and Off-Site Building Structure[a]	Estimated Vibration Velocity Levels at the Outside of and Adjacent to the Nearest Off-Site Structures from the Project Construction Equipment (inch/second (PPV))[b]					Signifi-cant Criteria (PPV)	Signif-icant Impact?
	Large Bulldozer	Caisson Drilling	Loaded Trucks	Jack-hammer	Small Bulldozer		
FTA Reference Vibration Levels at 25 feet	0.890	0.890	0.760	0.035	0.003	—	—
Two-story Apartment building to the north	0.156	0.156	0.133	0.061	0.005	0.3[c]	No
Multi-story Parking structure to the north	0.274	0.274	0.234	0.108	0.009	0.5[d]	No
Two-story Apartment building to the east	0.019	0.019	0.016	0.008	0.001	0.3[c]	No
Single-Story Residential building to the southeast	0.011	0.011	0.010	0.004	0.000	0.3[c]	No
Single-Story Commercial building to the south	0.006	0.006	0.005	0.002	0.000	0.3[c]	No
Multi-story Office building to the west	0.032	0.032	0.027	0.012	0.001	0.5[d]	No
Seward Film Vaults building to the north (historic structure)	0.361	0.361	0.308	0.142	0.012	0.12[e]	**Yes**
Hollywood Center Studio building to the west (historic structure)	0.003	0.003	0.003	0.001	<0.001	0.12[e]	No

[a] *Represents off-site building structures located nearest to the Project Site to the north, south, east, and west.*
[b] *Vibration level calculated based on FTA reference vibration level at 25-foot distance.*
[c] *FTA criteria for engineered concrete and masonry buildings.*
[d] *FTA criteria for reinforced-concrete, steel or timber buildings.*
[e] *FTA criteria for buildings extremely susceptible to vibration damage.*
Source: FTA, 2018; AES. See Appendix G of this Draft EIR.

from the construction equipment would be well below the 0.12 PPV building damage significance criteria for the Hollywood Center Studio to the west, the 0.3 PPV building damage significance criteria for the single- and two-story residential and commercial buildings to the north, south and east and the 0.5 PPV building damage significance criteria for the multi-story parking structure (to the north) and the multi-story office building to the west. However, the estimated vibration levels would exceed the 0.12 PPV significance criteria for the Seward Film Vaults building adjacent to the Project Site to the north. **Therefore, the on-site vibration impacts during construction of the Project, pursuant**

to the significance criteria for building damage would be significant, without mitigation measures.

(ii) Human Annoyance Impacts from On-Site Construction

Table IV.F-21 on page IV.F-52 provides the estimated vibration levels at the off-site vibration sensitive uses due to construction equipment operation and compares the estimated vibration levels to the specified significance criteria for human annoyance. Per FTA guidance, the significance criteria for human annoyance is 72 VdB for residential uses and 65 VdB for recording studio uses, assuming there are minimum of 70 vibration events occurring during a typical construction day. As indicated in Table IV.F-21, the estimated ground-borne vibration levels from construction equipment would be below the significance criteria for human annoyance at off-site receptor locations R3, R4, and R5. The estimated ground-borne vibration levels at receptor locations R1 and R2 would exceed the 72 VdB significance criteria during the demolition and grading/excavation phases with large construction equipment (i.e., large bulldozer, caisson drilling and loaded trucks) operating within 80 feet of receptor locations R1 and R2. **Therefore, on-site vibration impacts during construction of the Project, pursuant to the significance criteria for human annoyance, would be significant without mitigation measures.**

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

As described above, construction delivery/haul trucks would travel between the Project Site and US-101 Freeway via Ardmore Avenue, Melrose Avenue, Seward Street, Santa Monica Boulevard, and Western Avenue. Heavy-duty construction trucks would generate ground-borne vibration as they travel along the Project's anticipated truck route(s). Thus, an analysis of potential vibration impacts using the building damage and human annoyance criteria for ground-borne vibration along the anticipated local truck routes was conducted.

Regarding building damage, based on FTA data, the vibration generated by a typical heavy-duty truck would be approximately 63 VdB (0.00566 PPV) at a distance of 50 feet from the truck.[58] According to the FTA "[i]t is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads." Nonetheless, there are existing buildings along the Project's anticipated truck routes (Ardmore Avenue, Melrose Avenue, Seward Street, Santa Monica Boulevard, and Western Avenue) that are situated approximately 20 feet from the right-of-way and would be exposed to ground-borne vibration levels of approximately 0.022 PPV, as provided in the noise calculation

[58] *FTA, Transit Noise and Vibration Impact Assessment, Figure 5-4, September 2018.*

Table IV.F-21
Construction Vibration Impacts—Human Annoyance

Off-Site Receptor Location	Estimated Vibration Velocity Levels at the Off-Site Vibration Sensitive Uses Due to On-Site Construction Equipment Operation[a] (VdB)					Significance Criteria (VdB)	Signifi-cant Impact?
	Large Bulldozer	Caisson Drilling	Loaded Trucks	Jack-hammer	Small Bulldozer		
FTA Reference Vibration Levels at 25 feet	87	87	86	79	58	—	—
R1	94	94	93	86	65	72	**Yes**
R2	74	74	73	66	45	72	**Yes**
R3	59	59	58	51	30	72	No
R4	48	48	47	40	19	72	No
R5	63	63	62	55	34	65	No

[a] *Vibration levels calculated based on FTA reference vibration level at 25 distance.*
Source: FTA, 2018; AES. See Appendix G of this Draft EIR.

worksheets included in Appendix G of this Draft EIR. This estimated vibration generated by construction trucks traveling along the anticipated truck route(s) would be well below the most stringent building damage criteria of 0.12 PPV for buildings extremely susceptible to vibration. **Therefore, vibration impacts (pursuant to the significance criteria for building damage) from off-site construction activities (i.e., construction trucks traveling on public roadways) would be less than significant**.

As discussed above, per FTA guidance, the significance criteria for human annoyance is 72 VdB for residential uses, 75 VdB for religious uses, and 65 VdB for recording studios. It should be noted that buses and trucks rarely create vibration that exceeds 70 VdB at 50 feet from the receptor unless there are bumps in the road.[59] As indicated in the noise calculation worksheets included in Appendix G (page 76 of the noise worksheets) of this Draft EIR, the residential uses along Ardmore Avenue, Melrose Avenue, and Seward Avenue are located approximately 24 feet from the truck travel and would be exposed to ground-borne vibration levels of approximately 72.6 VdB, which would exceed the 72-VdB significance criteria. The residential uses along Western Avenue are located approximately 45 feet from the truck travel and would be exposed to ground-borne vibration levels of approximately 64.4 VdB, which would be below the 72-VdB significance criteria. In addition, there is a church located along Western Avenue, which would be exposed to ground-borne vibration levels of approximately 69.7 VdB and would be below

[59] *FTA, Transit Noise and Vibration Impact Assessment, Page 113, September 2018.*

the 75-VdB significance criteria. Finally, there are studios (recording) located along Melrose Avenue and Seward Avenue, which would also be exposed to vibration level up to 72.6 VdB, which would exceed the 65-VdB significance criteria. **As such, potential vibration impacts with respect to human annoyance that would result from temporary and intermittent off-site vibration from construction trucks traveling along the anticipated truck route(s) (i.e., along Ardmore Avenue, Melrose Avenue, and Seward Avenue) would be significant.**

(iv) Summary of Construction Vibration Impacts

As discussed above, the estimated vibration levels from on-site construction equipment would be below the building damage significance criteria for the nearest off-site buildings surrounding the Project Site to the north, south, east and west, with the exception of the Seward Film Vaults building. The estimated vibration levels from on-site construction equipment would exceed the building damage significance criteria at the Seward Film Vaults building adjacent to the Project Site to the north, prior to the implementation of mitigation measures. In addition, the estimated vibration levels from on-site construction equipment would reach the human annoyance significance criteria of 72 VdB at the off-site receptor locations R1 and R2.

Vibration impacts associated with temporary and intermittent vibration from off-site construction activities (i.e., construction trucks traveling along the anticipated truck routes) would be less than significant with respect to building damage; however, vibration impacts from off-site construction activities would be significant with respect to the significance criteria for human annoyance along the roadway segments of Ardmore Avenue, Melrose Avenue, and Seward Street.

(b) Operation Vibration Impacts

As described above, sources of vibration related to operation of the Project would include vehicle circulation, delivery trucks, and building mechanical equipment. As also discussed above, vehicular-induced vibration, including vehicle circulation within the subterranean parking area, would not generate perceptible vibration levels at off-site sensitive uses. Building mechanical equipment installed as part of the Project would include typical commercial-grade stationary mechanical equipment, such as air-condenser units (mounted at the roof level), that would include vibration-attenuation mounts to reduce vibration transmission so vibration would not be perceptible at the off-site sensitive receptors. **Therefore, operation of the Project would not result in the generation of excessive ground-borne vibration levels that would be perceptible in the vicinity of the Project Site. As such, vibration impacts associated with operation of the Project would be less than significant.**

(2) Mitigation Measures

(a) *Construction Vibration*

As discussed above, Project vibration levels generated from on-site construction activities would result in significant impacts with respect to building damage at one off-site building adjacent to the Project Site. Therefore, the following mitigation measure is provided to reduce vibration impacts:

Mitigation Measure NOI-MM-2: Prior to start of construction, the Applicant shall retain the services of a structural engineer to visit the Seward Film Vaults building adjacent to the Project Site to the north to inspect and document (video and/or photographic) the apparent physical condition of the building. In addition, the structural engineer shall establish baseline structural conditions of the building and prepare a shoring plan (see MM CUL-MM-1)

Prior to construction, the Applicant shall retain the services of a qualified acoustical engineer to review proposed construction equipment and develop and implement a vibration monitoring program capable of recording and documenting the construction-related ground vibration levels at the Seward Film Vaults building during demolition, shoring and excavation phase, as follows:

a) The vibration monitoring system shall measure (in vertical and horizontal directions) and continuously store the peak particle velocity (PPV) in inch/second. The system shall also be programmed for two preset velocity levels: a warning level of 0.10 inch/second (PPV) and a regulatory level of 0.12 inch/second (PPV). The system shall also provide real-time alert when the vibration levels exceed the two preset levels.

b) The vibration monitoring program shall be submitted to the Department of Building and Safety, prior to initiating any construction activities.

c) In the event the warning level 0.10 inch/second (PPV) is triggered, the contractor shall identify the source of vibration generation and provide feasible steps to reduce the vibration level, including but not limited to staggering concurrent activities (if doing so would not pose a safety risk to personnel or damage risk to buildings) and utilizing lower vibratory techniques.

d) In the event the regulatory level 0.12 inch/second (PPV) is triggered (i.e., exceeded), the contractor shall halt the construction activities in the vicinity of the building and visually inspect the building for any damage. Results of the inspection must be logged. The contractor shall identify the source of vibration generation and provide feasible steps to reduce the vibration level. Construction activities may then restart once the vibration level is re-measured and below the warning level.

As analyzed above, vibration impacts from on-site construction activities would be significant pursuant to the significance criteria for human annoyance. Mitigation measures considered to reduce vibration impacts from on-site construction activities with respect to human annoyance included the installation of a wave barrier, which is typically a trench or a thin wall made of sheet piles installed in the ground (essentially a subterranean sound barrier to reduce noise). However, wave barriers must be very deep and long to be effective, are cost prohibitive for temporary applications such as construction, and therefore are considered infeasible.[60] In addition, constructing a wave barrier to reduce the Project's construction-related vibration impacts would, in and of itself, generate ground-borne vibration from the excavation equipment. Furthermore, it would not be feasible to install a wave barrier along the public roadways for the off-site construction vibration impacts. As such, there are no feasible mitigation measures to reduce the potential vibration human annoyance impacts. While these impacts are temporary and would cease when construction is complete, impacts would remain significant and unavoidable throughout the duration of Project construction activities.

(b) Operation Vibration Impacts

As discussed above, operation of the Project would not result in a significant vibration impact during operation and no mitigation measures are required.

(3) Level of Significance After Mitigation

(a) Construction Vibration

With implementation of Mitigation Measure NOI-MM-2 and the Mitigation Measure CUL-MM-1, potential building damage impacts to the Seward Film Vaults building would be reduced to less than significant levels. Vibration impacts associated with off-site haul trucks would be less than significant without mitigation with regard to building damage. However, because implementation of Mitigation Measure NOI-MM-2 requires consent from the adjacent property owner, who may not agree, it is conservatively concluded that structural vibration impacts on the Seward Film Vaults building would be significant and unavoidable because it cannot be assured that all components of NOI-MM-2 can be implemented. **Therefore, Project vibration impacts from on-site construction activities would result in significant impacts with respect to building damage at one off-site building adjacent to the Project Site.**

[60] *Caltrans, Transportation- and Construction-Induced Vibration Guidance Manual, June 2004.*

Vibration impacts associated with off-site haul trucks would be less than significant without mitigation with regard to building damage. Vibration impacts from both on-site and off-site construction activities would be significant with respect to human annoyance. However, as described above, there are no feasible mitigation measures that could be implemented to reduce the temporary vibration impacts from on-site and off-site construction associated with human annoyance to a less-than-significant level. **Therefore, Project vibration impacts from on-site and off-site construction activities with respect to human annoyance would remain significant and unavoidable.**

(b) Operation Vibration

As discussed above, vibration impacts associated with Project operation would be less than significant without mitigation.

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?

As discussed in Section VI, Other CEQA Considerations, of this Draft EIR, and evaluated in the Initial Study prepared for the Project, included as Appendix A of this Draft EIR, the Project Site is not located within the vicinity of a private airstrip or an airport land use plan or within 2 miles of an airport. Thus, the Project would not expose people residing or working in the project area to excessive airport-related noise levels. The nearest airport is the Hollywood-Burbank Airport located approximately 7.3 miles northeast of the Project Site. Since the Project is not located within an airport land use plan, within two miles of a public airport or public use airport, or within the vicinity of a private airstrip, impacts with regard to airport-related noise would not occur. **Therefore, no impacts with respect to Threshold (c) would occur. No further analysis is required.**

e. Cumulative Impacts

(1) Impact Analysis

The Project, together with the related projects and future growth, could contribute to cumulative noise impacts. The potential for cumulative noise impacts to occur is specific to the distance between each related project and their stationary noise sources, as well as the cumulative traffic that these projects would add to the surrounding roadway network.

(a) Construction Noise

(i) On-Site Construction Noise

As indicated in Section III, Environmental Setting, of this Draft EIR, 16 specific related projects have been identified in the vicinity of the Project Site. Related Project No. 17, the Hollywood Community Plan Update, is also included. Noise from construction of development projects is typically localized and has the potential to affect noise-sensitive uses within 500 feet from the construction site, based on the *L.A. CEQA Thresholds Guide* screening criteria. Thus, noise from construction activities for two projects within 1,000 feet of each other can contribute to a cumulative noise impact for receptors located midway between the two construction sites. Of the 16 related projects, 12 related projects are located more than 1,000 feet from the Project and with intervening building structures, which would not contribute to the cumulative on-site construction noise impacts. The following four related projects are located within 1,000 feet of the Project Site, however, as explained below, would not create any cumulative construction noise impacts.

- Related Project No. 2 (Hollywood Center Studios Office Project), Related Project No. 3 (Hollywood 959 Project), and Related Project No. 4 (The Lexington Mixed-Use Project) have been completed. Therefore, the Related Project No. 2, Related Project No. 3, and Related Project No. 4 would not contribute to cumulative construction-related noise impacts.
- Related Project No. 1 (Seward Street Office Project) is located at 956 Seward Street, approximately 50 feet south of the Project Site. However, the Related Project No. 1 has not been built and the approval has expired. As such, there would not be a potential for cumulative construction-related noise impacts from Related Project No. 1.

Construction-related noise levels from the related projects would be intermittent and temporary and it is anticipated that, as with the Project, the related projects would comply with the construction hours and other relevant provisions set forth in the LAMC. In addition, noise associated with cumulative construction activities would be reduced to the degree reasonably and technically feasible through proposed mitigation measures for each individual related project and compliance with locally adopted and enforced noise ordinances. Based on the above, there would not be potential cumulative noise impacts at the nearby sensitive uses. **As such, cumulative noise impacts from on-site construction would be less than significant.**

(ii) Off-Site Construction Noise

Off-site construction haul trucks would have a potential to result in cumulative impacts if the trucks for the related projects and the Project were to utilize the same truck routes. Based on the existing daytime ambient noise level of 68.1 dBA (L_{eq}) along Ardmore

Avenue and 70.8 dBA (L_{eq}) along Melrose Avenue and Santa Monica Boulevard (refer to Table IV.F-12 on page IV.F-38), it is estimated that up to 96 truck trips along Ardmore Avenue and 179 truck trips per hour along Melrose Avenue and Santa Monica Boulevard would increase the ambient noise levels by 5 dBA and exceed the significance criteria.[61] There are three related projects located near Melrose Avenue, Related Project No. 7, Related Project No. 9, and Related Project No. 13, which could contribute to the cumulative truck trips along Melrose Avenue. However, Related Project No. 7 and Related Project No. 9 have been constructed, and Related Project No. 13 is under construction and would not contribute up to 96 cumulative truck trips along Melrose Avenue. There are four related projects located near Santa Monica Boulevard, Related Project No. 4, Related Project No. 5, Related Project No. 8, and Related Project No. 11, which could contribute to the cumulative truck trips along Santa Monica Boulevard. However, the anticipated haul routes for Related Project No. 11 would not overlap with the Project.[62] Related Project No. 4, Related Project No. 5, and Related Project No. 8 have been constructed and therefore would not contribute to the cumulative construction truck traffic. Therefore, cumulative off-site construction impacts would be less than significant along Ardmore Avenue, Melrose Avenue, and Santa Monica Boulevard. As analyzed above (see Table IV.F-12), the estimated off-site construction noise levels from the Project would exceed the significance criteria along Seward Street (between Santa Monica Boulevard and Melrose Avenue). Therefore, any addition of trucks from the related projects that would travel along Seward Street (between Santa Monica Boulevard and Melrose Avenue), would increase the ambient noise and contribute to the cumulative impact. Related Project No. 1 is located directly across the Project Site and could utilize Seward Street for construction trucks; however, Related Project No. 1 has not been built and the approval has expired. Therefore, it would not contribute to the cumulative off-site construction noise impacts. **As such, cumulative noise impacts from off-site construction would be less than significant.**

(iii) Summary of Cumulative Construction Noise Impacts

As discussed above, on-site and off-site construction activities and related projects would not have potential to result in cumulative construction impacts. **Therefore,**

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[61] *It is estimated that with 96 truck trips, the noise level along Ardmore Avenue would be 71.4 dBA, when added to the existing ambient of 68.1 dBA the cumulative noise levels would be 73.1 dBA, which would increase the ambient by 5.0 dBA. Similarly, it is estimated that with 179 truck trips, the noise level along Melrose Avenue and Santa Monica Boulevard would be 74.1 dBA, and when added to the existing ambient of 70.8 dBA the cumulative noise level would be 75.8 dBA, which would increase the ambient by 5.0 dBA.*

[62] *Anticipated haul routes for Related Project No. 11: Inbound haul trucks will exit from the US-101, head south on Highland Avenue, turn west on Santa Monica Boulevard, and enter the project site from Santa Monica Boulevard. Outbound haul trucks will exit the project site by turning east on Santa Monica Boulevard, then turning north on Highland Avenue, and enter the US-101 heading north*

cumulative noise impacts from on-site and off-site construction activities would be less than significant.

(b) Operational Noise

The Project Site and surrounding area have been developed with uses that have previously generated, and will continue to generate, noise from a number of community noise sources, including mechanical equipment (e.g., HVAC systems), outdoor activity areas, and vehicle travel. Similar to the Project, each of the related projects that have been identified in the vicinity of the Project Site would also generate stationary-source and mobile-source noise due to ongoing day-to-day operations. All related projects are of a residential, retail, commercial, or institutional nature, and these uses are not typically associated with excessive exterior noise levels. However, each project would produce traffic volumes that are capable of generating roadway noise impacts. The potential cumulative noise impacts associated with on- and off-site noise sources are addressed below.

(i) On-Site Stationary Noise Sources

Due to provisions set forth in the LAMC that limit stationary source noise from items such as rooftop mechanical equipment, noise levels would be less than significant at the property line for each related project. In addition, as discussed above, noise impacts associated with operations within the Project Site would be less than significant. **Therefore, based on the distance of the related projects from the Project Site and the operational noise levels associated with the Project, cumulative stationary source noise impacts associated with operation of the Project and related projects would be less than significant**.

(ii) Off-Site Mobile Noise Sources

The Project and related projects in the area would produce traffic volumes (off-site mobile sources) that would generate roadway noise. Cumulative noise impacts due to off-site traffic were analyzed by comparing the projected increase in traffic noise levels from "Existing" conditions to "Future Plus Project" conditions to the applicable significance criteria. Future Plus Project conditions include traffic volumes from future ambient growth, related projects, and the Project. The calculated traffic noise levels under "Existing" and "Future Plus Project" conditions are presented in Table IV.F-22 on page IV.F-60. As shown therein, cumulative traffic volumes would result in an increase ranging from 0.2 dBA (CNEL) along the roadway segment of Seward Street (between Romaine Street and Melrose Avenue) to up to 1.6 dBA (CNEL) along the roadway segment of Hudson Avenue (between Santa Monica Boulevard and Romaine Street). The estimated cumulative noise increase along Seward Street, Hudson Avenue, Wilcox Avenue, and Romaine Street would be below the 5-dBA significance criteria (applicable to noise levels less than 70 dBA CNEL).

Table IV.F-22
Cumulative Roadway Traffic Noise Impacts

Roadway Segment	Adjacent Land Use	Calculated Traffic Noise Levels (CNEL (dBA))		Increase in Noise Levels Due to Cumulative + Project (CNEL (dBA))	Significant Impact?
		Existing Conditions	Future Cumulative Plus Project		
Seward Street					
Between Santa Monica Blvd. and Romaine St.	Office, Studio	59.3	59.8	0.5	No
Between Romaine St. and Melrose Ave.	Commercial, Residential, Studio	60.7	60.9	0.2	No
Hudson Avenue					
Between Santa Monica Blvd. and Romaine St.	Residential, Commercial	58.1	59.7	1.6	No
Between Romaine St. and Melrose Ave.	Residential, Commercial	57.5	57.8	0.3	No
Wilcox Avenue					
Between Fountain Ave. and Santa Monica Blvd.	Residential, Commercial	61.2	61.5	0.3	No
Between Santa Monica Blvd. and Romaine St.	Residential, Commercial	59.9	60.2	0.3	No
Santa Monica Boulevard					
Between Las Palmas and Seward St.	Residential, Commercial	70.4	71.3	0.9	No
Between Seward St. and Wilcox Ave.	Commercial	70.4	71.4	1.0	No
Between Wilcox Ave. and Cahuenga Blvd.	Commercial, Park	70.4	71.4	1.0	No
Romaine Street					
Between Las Palmas and Seward St.	Studio, Office	57.4	58.7	1.3	No
Between Seward St. and Wilcox Ave.	Residential, Commercial	57.2	58.6	1.4	No
Between Wilcox Ave. and Cahuenga Blvd.	Residential, Commercial	57.0	58.2	1.2	No

Source: AES. See Appendix G of this Draft EIR

The estimated cumulative noise increase along Santa Monica Boulevard would be below the 3-dBA significance criteria (applicable to noise levels of 70 dBA CNEL and higher). **Therefore, cumulative noise impacts due to off-site mobile noise sources associated with the Project, future growth, and related projects would be less than significant.**

(iii) Summary of Cumulative Operational Noise Impacts

As discussed above, on-site and off-site noise sources associated with the Project and related projects would not result in the exposure of persons to or generation of noise levels in excess of the significance criteria established by the City or in a substantial permanent increase in ambient noise levels in the vicinity of the Project Site above levels existing without the Project and the related projects. **Therefore, cumulative operational noise impacts from on-site and off-site sources would be less than significant.**

(c) Construction Vibration

(i) On-Site Construction Vibration

As previously discussed, ground-borne vibration decreases rapidly with distance. Potential vibration impacts due to construction activities are generally limited to buildings/structures that are located in proximity to the construction site (i.e., within 20 feet as related to building damage and 80 feet as related to human annoyance at residential uses).[63] As indicated above, the closest related project, Related Project No. 1, is approximately 50 feet south of the Project Site. However, Related Project No. 1 has not been built and the approval has expired, and thus would not have potential to contribute to the cumulative vibration impacts. **Therefore, the Project would not contribute to a cumulative construction vibration impact with respect to both building damage and human annoyance associated with on-site construction and the cumulative impact would be less than significant.**

(ii) Off-Site Construction Vibration

As previously discussed, based on FTA data, the vibration generated by a typical heavy truck would be approximately 63 VdB (0.00566 PPV) at a distance of 50 feet from the truck.[64] In addition, according to the FTA "[i]t is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads." As discussed above, there are existing buildings that are approximately 20 feet from the

[63] Distances calculated based on estimated vibration levels for typical construction equipment at a distance which would be below the 72 VdB significance threshold with respect to human annoyance and 0.12 PPV significance threshold applicable to buildings extremely susceptible to vibration damage.

[64] FTA, Transit Noise and Vibration Impact Assessment, Figure 5-4, September 2018.

right-of-way of the anticipated truck routes for the Project (i.e., Ardmore Avenue, Melrose Avenue, Seward Street, Santa Monica Boulevard, and Western Avenue). These buildings are anticipated to be exposed to ground-borne vibration levels of approximately 0.022 PPV. Trucks from the related projects are expected to generate similar ground-borne vibration levels. Therefore, the vibration levels generated from off-site construction trucks associated with the Project and other related projects along the anticipated truck route(s) would be below the most stringent building damage significance criteria of 0.12 PPV for buildings extremely susceptible to vibration. **As such, potential cumulative vibration impacts with respect to building damage from off-site construction would be less than significant.**

As discussed above, potential vibration impacts associated with temporary and intermittent vibration from project-related construction trucks traveling along the anticipated truck route (i.e., Ardmore Avenue, Melrose Avenue, Western Avenue, and Seward Street) would be significant with respect to human annoyance. As discussed above, the Related Project No. 1 could utilize Seward Street for construction trucks. However, Related Project No. 1 has not been built and the approval has expired. Therefore, it would not contribute to the cumulative off-site construction vibration impacts along Seward Street. It is anticipated that some of the related projects would use similar trucks as the Project, including Related Projects No. 7 and 9 (located along Melrose), which could utilize Ardmore Avenue and Melrose Avenue (as from the US-101 Freeway) and Related Projects No. 4 and 8 (located near Santa Monica Boulevard), which could utilize Santa Monica Boulevard and Western Avenue to access the US-101 Freeway. If related projects use similar trucks as the Project, it is anticipated that construction trucks from the related projects would generate similar vibration levels along the anticipated truck route (i.e., Ardmore Avenue, Melrose Avenue, and Western Avenue), which would exceed the significance criteria. **Therefore, to the extent that other related projects use the same truck route as the Project, potential cumulative vibration impacts with respect to human annoyance associated with temporary and intermittent vibration from haul trucks traveling along the designated truck route (i.e., Ardmore Avenue, Melrose Avenue, and Western Avenue) would be significant and unavoidable.**

(iii) Summary of Cumulative Construction Vibration Impacts

As discussed above, due to the rapid attenuation characteristics of ground-borne vibration and given the distance of the nearest related project to the Project Site, there is no potential for a cumulative construction vibration impact with respect to building damage associated with ground-borne vibration from on-site sources. In addition, potential cumulative vibration impacts with respect to building damage from off-site construction would be less than significant. **Therefore, cumulative vibration impacts associated with on-site and off-site construction activities would be less than significant with respect to building damage**.

Cumulative construction vibration impacts from off-site construction activities pursuant to the significance criteria for human annoyance would be significant in the event concurrent construction of the Project and the related projects were to occur. **Therefore, cumulative vibration impacts associated with off-site construction activities would be significant and unavoidable with respect to human annoyance.**

(d) Operational Vibration

Vibration levels from project operation are generally limited to building mechanical equipment and vehicle circulations and would be limited to immediate vicinity of the project sites. The related projects (mixed-use and commercial developments) would generate similar vibration levels as the Project. As described above, the nearest related project is approximately 50 feet from the Project Site (Related Project No. 1). However, Related Project No. 1 has not been built and the approval has expired, which would not have potential to contribute to the cumulative vibration impacts. As analyzed above, Project operation would not result in the generation of excessive ground-borne vibration levels that would be perceptible in the vicinity of the Project Site. **Therefore, based on the distance of the related projects from the Project Site and the operational vibration levels associated with the Project, cumulative vibration impacts associated with operation of the Project and related projects would be less than significant**.

(2) Mitigation Measures

(a) Construction Noise

As analyzed above, there would not be potential cumulative noise impacts at the nearby sensitive uses located in proximity to the Project Site. As such, cumulative on-site noise impacts from on-site construction would be less than significant, and no mitigation is required.

As analyzed above, cumulative noise impacts associated with off-site construction trucks from the Project and other related projects would be less than significant and no mitigation is required.

(b) Operational Noise

As discussed above, cumulative operational noise impacts from on-site and off-site sources would be less than significant.

(c) Construction Vibration

Cumulative on-site and off-site construction vibration impacts with respect to building damage would be less than significant, and no mitigation is required.

Cumulative on-site construction vibration impacts with respect to human annoyance would be less than significant, and no mitigation is required.

Cumulative off-site construction vibration impacts with respect to human annoyance would be significant and unavoidable. As described above, there are no feasible mitigation measures that could be implemented to reduce the temporary vibration impacts from off-site construction associated with human annoyance to a less-than-significant level.

(d) Operational Vibration

Cumulative vibration impacts associated with operation of the Project and related projects would be less than significant. Therefore, no mitigation is required.

(3) Level of Significance after Mitigation

(a) Construction Noise

Cumulative on-site and off-site construction noise impacts would be less than significant.

(b) Operational Noise

Cumulative impacts related to on-site and off-site operational noise would be less than significant.

(c) Construction Vibration

Cumulative on-site construction vibration impacts with respect to building damage and human annoyance would be less than significant.

Cumulative off-site construction vibration impacts with respect to building damage would be less than significant. However, cumulative off-site construction vibration impacts with respect to human annoyance would remain significant and unavoidable.

(d) Operational Vibration

Cumulative impacts related to operational vibration would be less than significant.