IV. Environmental Impact Analysis

I. Noise

1. Introduction

This section of the Draft EIR discusses the fundamentals of sound; examines federal, state, and local noise guidelines, policies, and standards; reviews noise levels at existing noise-sensitive receptor locations; evaluates potential noise and vibration impacts associated with the proposed Project; and provides mitigation, if needed, to reduce noise impacts at sensitive receptor locations. This evaluation uses procedures and methodologies as specified by the City of Los Angeles CEQA Thresholds Guide for construction, mobile, and stationary noise.[1] The Project Site is near the border of the City of Los Angeles and City of Gardena. The City of Gardena Municipal Code noise standards are used where applicable.[2] Appendix H of this Draft EIR provides supplementary, Project-specific background information, construction noise calculation worksheets, loading dock noise modeling outputs, and Project-generated traffic noise modeling results.

2. Environmental Setting

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 Fundamentals

Noise is commonly defined as sound that is undesirable because it interferes with speech communication and hearing, causes sleep disturbance, or is otherwise annoying (unwanted sound). It is described in terms of loudness or amplitude (measured in decibels), frequency or pitch (measured in Hertz [Hz] or cycles per second), and duration (measured in seconds or minutes). The standard unit of measurement of the loudness of sound is the decibel (dB). Changes of 1 to 3 dBA are detectable under quiet, controlled conditions and changes of less than 1 dBA are usually indiscernible. A 3 dBA change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dBA is readily discernible to most people in an exterior environment whereas a 10 dBA change is perceived as a doubling (or halving) of the sound.

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all and are "felt" more as a vibration. Similarly, while people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases,

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1 *Los Angeles, City of. L.A. CEQA Thresholds Guide. https://planning.lacity.org/eir/CrossroadsHwd/deir/files/references/A07.pdf.*

2 *Gardena, City of. November 2019. Gardena Municipal Code. https://www.codepublishing.com/CA/Gardena/#!/Gardena01/Gardena01.html*

hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz. Since the human ear is not equally sensitive to sound at all frequencies, a special frequency dependent rating scale is usually used to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by weighting frequencies in a manner approximating the sensitivity of the human ear.

(1) Noise

(a) Characteristics of Sound and Vibration

Noise is most often defined as unwanted sound. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as “noisiness” or “loudness.” The following are brief definitions of terminology used in this section:

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

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

Decibel (dB). A unitless measure of sound on a logarithmic scale.

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

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

Statistical Sound Level (L_n). The sound level that is exceeded “n” percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the “median sound level.” The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is often known as the “intrusive sound level.” The L_{90} is the sound level exceeded 90 percent of the time and is often considered the “effective background level” or “residual noise level.”

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

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

Peak Particle Velocity (PPV). The peak rate of speed at which soil particles move (e.g., inches per second) due to ground vibration.

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

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

Maximum Sound Level (L_{max}). The highest RMS sound level measured during the measurement period.

Minimum Sound Level (L_{min}). The lowest RMS sound level measured during the measurement period.

Root Mean Square Sound Level (RMS). The square root of the average of the square of the sound pressure over the measurement period.

RCNM. Federal Highway Administration Roadway Construction Noise Model[3]

(b) Duration

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called L_{eq}), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the L_{50} noise level represents the noise level that is exceeded 50 percent of the time; half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the L_2, L_8 and L_{25} values represent the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour, respectively. These “n” values are typically used to demonstrate compliance for stationary noise sources with many cities’ noise ordinances. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period, respectively.

[3] *Federal Highway Administration. August 2006. Construction Noise Handbook*

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law and many local jurisdictions use an adjusted 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (L_{dn}). The CNEL descriptor requires that an artificial increment (or "penalty") of 5 dBA be added to the actual noise level for the hours from 7:00 P.M. to 10:00 P.M. and 10 dBA for the hours from 10:00 P.M. to 7:00 A.M. The L_{dn} descriptor uses the same methodology except that there is no artificial increment added to the hours between 7:00 P.M. and 10:00 P.M. Both descriptors give roughly the same 24-hour level, with the CNEL being only slightly more restrictive (i.e., higher). The CNEL or L_{dn} metrics are commonly applied to the assessment of roadway and airport-related noise sources.

(c) Sound Propagation

Sound dissipates exponentially with distance from the noise source. This phenomenon is known as "spreading loss." For a single-point source, sound levels decrease by approximately 6 dB for each doubling of distance from the source (conservatively neglecting ground attenuation effects, air absorption factors, and barrier shielding). For example, if a backhoe at 50 feet generates 84 dBA, at 100 feet the noise level would be 79 dBA, and at 200 feet it would be 73 dBA. This drop-off rate is appropriate for noise generated by on-site operations from stationary equipment or activity at a Project Site. If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance over a reflective ("hard site") surface, such as concrete or asphalt. Line source noise in a relatively flat environment with ground-level absorptive vegetation decreases by an additional 1.5 dBA for each doubling of distance.

(d) Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects our entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, and thereby affecting blood pressure, functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA could result in permanent hearing damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. Table IV.I-1 shows typical noise levels from familiar noise sources.

Table IV.I-1
Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Onset of Physical Discomfort	120+	
	110	Rock Band (near amplification system)
Jet Flyover at 1,000 feet		
	100	
Gas Lawn More at 3 feet		
	90	
Diesel truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans 2013a

(2) Introduction to Vibration

(a) Characteristics of Vibration

Vibration is an oscillating motion in the earth. Like noise, vibration is transmitted in waves and is described in terms of amplitude and frequency, but in this case through the earth or solid objects. Amplitude may be characterized in three ways including displacement, velocity, and acceleration. Particle displacement is a measure of the distance that a vibrated particle travels from its original position and for the purposes of soil displacement is typically measured in inches or millimeters. Particle velocity is the rate of speed at which soil particles move in inches per second or millimeters per second. Particle acceleration is the rate of change in velocity with respect to time and is measured in inches per second or millimeters per second. Typically, particle velocity (measured in inches per second) and/or acceleration (measured in gravities) are used to describe vibration. Unlike noise, vibration is typically of a frequency that is felt rather than heard.

The way in which vibration is transmitted through the earth is called propagation. As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

Vibration amplitudes are usually described in terms of either PPV or RMS velocity. PPV is more appropriate for evaluating potential building damage, and RMS (measured in VdB) is typically more suitable for evaluating human response.

(b) Effects of Vibration

Vibration can cause adverse effects on humans and, if vibration levels are high enough, it can cause architectural damage to buildings. As with airborne sound, annoyance with vibrational energy is a subjective measure, depending on the level of activity and the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Persons accustomed to elevated ambient vibration levels, such as in an urban environment, may tolerate higher vibration levels. Table IV.I-2 presents the typical human response at various vibration levels as identified in the Federal Transit Administration's (FTA) *2018 Transit Noise and Vibration Impact Assessment Manual*.

Table IV.I-2
Human Response to Typical Vibration Levels

Vibration Velocity Level	Human Response
65 VdB	Approximate threshold of perception for many humans.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level annoying.
85 VdB	Vibration tolerable only if there are an infrequent number of events per day.

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

b. Regulatory Framework

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. For the purposes of this analysis, the guidelines and vibration standards promulgated by the FTA are used.

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 1972Federal Transportation Administration Vibration Standards
- Occupational Safety and Health Act of 1970

- State of California General Plan Guidelines
- California Building Code
- Caltrans Vibration/Groundborne Noise Standards
- City of Los Angeles General Plan Noise Element
- City of Los Angeles Municipal Code

(1) Federal

(a) Noise Control Act of 1972

The Noise Control Act of 1972 established mechanisms for setting noise emissions standards for sources such as motor vehicles, railroads, and aircraft. While there are no federal regulations directly applicable to implementation of the Project under CEQA, the federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the U.S. Environmental Protection Agency (USEPA). Such limitations would apply to the operation of construction equipment and would also apply to any proposed industrial warehouse land uses. Noise exposure of this type is dependent on work conditions and is addressed through a facility's Health and Safety Plan, as required under OSHA, and is, therefore, not addressed further in this analysis.

(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 Federal Transit Administration (FTA) has adopted vibration criteria for use in evaluating vibration impacts from construction activities.[4]

(c) Occupational Safety and Health Act of 1970

Under the Occupational Safety and Health Act of 1970 (29 U.S.C. §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.[5]

(2) State

(a) General Plan Guidelines

The State of California, through its General Plan Guidelines, discusses how ambient noise should influence land use and development decisions and includes a table of normally acceptable,

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[4] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 7-5, page 186, 2018.*
[5] *United States Department of Labor. OSH Act of 1970.*

conditionally acceptable, normally unacceptable, and clearly unacceptable uses at different noise levels expressed in CNEL.[6] A conditionally acceptable designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and needed noise insulation features are incorporated in the design. By comparison, a normally acceptable designation indicates that standard construction can occur with no special noise reduction requirements. Local municipalities adopt these compatibility standards as part of their General Plan and modify them as appropriate for their local environmental setting. The City of Los Angles General Plan Noise Element discussed below includes a noise and land use compatibility table.[7]

(b) California Building Code

The State of California's noise insulation standards for nonresidential uses are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 11, California Green Building Standards (CALGreen) Code. The CALGreen Code noise standards are applied to new or renovation construction projects in California to control interior noise levels resulting from exterior noise sources. Proposed Projects may use either the prescriptive method (CALGreen Code Section 5.507.4.1)[8] or the performance method (CALGreen Code Section 5.507.4.2)[9] to show compliance. Under the prescriptive method, a project must demonstrate transmission loss ratings for the wall and roof-ceiling assemblies and exterior windows when located within a noise environment of 65 dBA CNEL or higher. Under the performance method, a project must demonstrate that interior noise levels do not exceed 50 dBA L_{eq}(1hr).

(c) 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, Caltrans has established vibration thresholds in its *Transportation and Construction Vibration Guidance Manual* that are more practical than those provided by the FTA.

(3) City of Los Angeles Regulations and Policies

The following section describes the City's regulations and policies, including those contained in the City of Los Angeles General Plan Noise Element and City of Los Angeles Municipal Code (LAMC). Thresholds of significance adopted from the L.A. CEQA Thresholds Guide are discussed below under Thresholds of Significance.

6 Governor's Office of Planning and Research. 2017. State of California General Plan 2017 Guidelines
7 Los Angeles, City of. 1999. Noise Element of the Los Angeles City General Plan.
8 California Code of Regulations, Title 24, Building Standards Administrative Code, Part 11, California Green Building Standards (CALGreen) Code, Section 5.507.4.1 (Exterior Noise Transmission, Prescriptive Method).
9 CALGreen Code, Section 5.507.4.2 (Exterior Noise Transmission, Performance Method).

(a) City of Los Angeles General Plan Noise Element

The Noise Element of the Los Angeles General Plan was adopted by the City Council on February 3, 1999 and includes standards for land use and noise compatibility when siting a new noise sensitive use. Those guidelines are summarized below in Table IV.I-3. The Noise Element also includes goals and policies for noise management in the City. Applicable goals and policies are listed below as well.

Table IV.I-3
Guidelines for Noise Compatible Land Use

Land Uses	Day-Night Average Exterior Sound Level (CNEL dB)						
	50	55	60	65	70	75	80
Residential-Low Density, Single Family, Duplex, Mobile Homes	A	C	C	C	N	U	U
Residential-Multiple Family	A	A	C	C	N	U	U
Transient Lodging: Hotels and Motels	A	A	C	C	N	U	U
Schools, Libraries, Churches, Hospitals, Nursing Homes	A	A	C	C	N	N	U
Auditoriums, Concert Halls, Amphitheaters	C	C	C	C/N	U	U	U
Sports Arenas, Outdoor Spectator Sports	C	C	C	C	C/U	U	U
Playground, Neighborhood Parks	A	A	A	A/N	N	N/U	U
Golf Courses, Riding Stables, Water Recreation, Cemeteries	A	A	A	A	N	A/N	U
Office Buildings, Businesses, Commercial and Professional	A	A	A	A/C	C	C/N	N
Industrial Manufacturing, Utilities, Agriculture	A	A	A	A	A/C	C/N	N

Source: City of Los Angeles, Noise Element of the General Plan, adopted February 3, 1999.
Notes:
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 should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design.
N = Normally unacceptable. New construction or development generally should be discouraged. A detailed analysis of 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.

Goal 1. A city where noise does not reduce the quality of urban life

Objective 2. 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. Reduce or eliminate noise impacts associated with proposed development of land and changes in land use.

(b) City of Los Angeles Noise Regulations (LAMC- Chapter XI)

The LAMC has set forth noise standards for construction and stationary activity noise.[10] Per LAMC Section 111.03, where the ambient noise level is less than the presumed ambient noise level designated in Table IV.1-4, the presumed ambient noise level shown in the table shall be deemed to be the minimum ambient noise level.

Table IV.I-4
City of Los Angeles Minimum Ambient Noise Level

Zone	Presumed Ambient Noise Level (dBA)	
	Day	**Night**
A1, A2, RA, RE, RS, RD, RW1, RW2, R1, R2, R3, R4, and R5	50	40
P, PB, CR, C1, C1.5, C2, C4, C5, and CM	60	55
M1, MR1, and MR2	60	55
M2 and M3	65	65

Source: LAMC, Section 111.03
Notes:
At the boundary line between two zones, the presumed ambient noise level of the quieter zone shall be used.

Under LAMC Section 112.02, air conditioning, refrigeration, heating, pumping, filtering equipment shall not exceed the ambient noise level by more than 5 dBA within any zone.

Construction noise or repair work is regulated under LAMC Section 41.40 (Noise Due to Construction, Excavation Work). Under this section no person shall perform construction work between the hours of 9:00 P.M. and 7:00 A.M. of the following day. Therefore, the allowable hours for construction work are Mondays to Fridays between 7:00 A.M. and 9:00 P.M and Saturdays between 8:00 A.M. and 6:00 P.M. No construction shall take place outside these hours, including any excavating, use of any power drills, riveting machine, or any device or equipment which makes loud noises to the disturbance of persons occupying sleeping quarters in any dwelling and the operation, repair, servicing of equipment and job-site construction material deliveries.

In addition, LAMC Section 112.05, Maximum Noise Level of Powered Equipment or Powered Hand Tools, regulates the level at which powered equipment or powered hand tools may be operated within any residential zone or within 500 feet thereof. The following noise limits shall not be exceeded at a distance of 50 feet:

- 75 dBA for construction, industrial, and agricultural machinery including crawler-tractors, dozers, rotary drills and augers, power shovels, cranes, derricks, motor graders, paving machines, off-highway trucks, ditchers, trenchers, compactors,

[10] *Los Angeles, City of. December 2019. Los Angeles Municipal Code.*

scrapers, wagons, pavement breakers, compressors and pneumatic or other powered equipment;

Said noise limits shall not apply where compliance is technically infeasible.[11] The person charged with a violation shall be responsible for proving technical infeasibility.

Per LAMC Section 114.02, it is unlawful for any person to unreasonably operate any motor driven vehicle upon any property within the City or to unreasonably accelerate the engine of any vehicle, or unreasonably sound, blow or operate the horn or other warning device of such vehicle in such manner:

- To disturb the peace, quiet and comfort of any neighborhood or of any reasonable person residing in such area;

- That such activity is audible to the human ear at a distance in excess of 150 feet from the property line of the noise source;

- As to create any noise which would cause the noise level on the premises of any occupied residential property, or if a condominium, apartment house or duplex, within any adjoining unit, to exceed the ambient noise level by more than 5 dBA.

This does not apply to any vehicle which is operated upon any public highway, street or right-of-way or to the operation of any off-highway vehicle to the extent it is regulated in the California Vehicle Code.

Per LAMC Section 114.03 it is unlawful to load and unload vehicles and equipment which cause any impulsive sound, raucous or unnecessary noise within 200 feet of any residential building.

(4) City of Gardena Municipal Code

The City of Gardena Municipal Code noise standards are included to analyze impacts to nearby sensitive receptors that reside outside the jurisdiction of the City of Los Angeles and within the City of Gardena. The City of Gardena has set forth noise standards under Section 8.36, Noise, of the Gardena Municipal Code. Table IV.I-5 below summarizes the City's allowable exterior noise levels based on land use and time of day.

[11] *In accordance with the Noise Regulations, "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.*

Table IV.I-5
City of Gardena Allowable Exterior Noise Standards

Type of Land Use	15-Minute Average Noise Level (L_{eq})		Maximum Noise Level (L_{max})	
	7:00 A.M. – 10:00 P.M.	10:00 P.M. – 7:00 A.M.	7:00 A.M. – 10:00 P.M.	10:00 P.M. – 7:00 A.M.
Residential	55	50	75	70
Residential portions of mixed-use	60	50	80	70
Commercial	65	60	85	80
Industrial or manufacturing	70	70	90	90

Source: City of Gardena Municipal Code, Section 8.36.040
Notes:
In the event that the ambient noise level exceeds the noise standard, the ambient noise level shall become the noise standard.

(a) Loading and Unloading

Loading and unloading activities, including opening, closing, or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects, between the hours of 10:00 P.M. and 7:00 A.M. are prohibited in such a manner as to cause a noise disturbance across a residential real property line or at any time to violate the allowable exterior noise limits set forth in Section 8.36.040 of the Gardena Municipal Code.

(b) Construction Noise

The City of Gardena Municipal Code exempts construction noise from the exterior noise standards during the hours of 7:00 A.M. to 6:00 P.M., Monday through Friday, and 9:00 A.M to 6:00 P.M Saturdays. Construction noise is not exempt on Sundays or federal holidays.

(5) Vibration

There are no federal, State, or City of Los Angeles regulations or standards that are directly applicable to the Project. However, the FTA published recommended criteria for assessing construction vibration impacts, which are discussed below under Thresholds of Significance.[12]

The City of Gardena prohibits the operation of any device that creates a vibration which is above the vibration perception threshold[13] of an individual at or beyond the real property boundary of the source if on private property or at 150 feet from the source if on a public space or public right-of-way.

[12] *Federal Transit Administration (FTA). September 2018. Transit Noise and Vibration Impact Assessment.*
[13] *The minimum ground- or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observation of moving objects. The perception threshold shall be presumed to be a motion velocity of 0.01 in/sec over the range of 1 to 100 Hz.*

c. Existing Conditions

The Project Site is a vacant site in the Harbor Gateway Community Plan Area of the City of Los Angeles. Surrounding properties are primarily developed with one- and two-story, single- and multi-family dwellings, to the south across Redondo Beach Boulevard. A shopping complex is located immediately to the east; to the west across Vermont Avenue and a railroad right-of-way are commercial businesses and the Kei-Ai South Bay Healthcare Center; an open-air trash transfer/recycling center is immediately to the northeast; and Rosecrans Recreation Center is located to the north across a railroad right-of-way. First Southern Baptist Church and Amestoy Elementary School are located in the vicinity to the northwest.

(1) Noise-Sensitive Receptors

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

(a) City of Los Angeles

The nearest sensitive receptors within the City of Los Angeles are to the north and south. Sensitive receptors include residential uses and the Rosecrans Recreation Center (see Figure IV.I-1). South of the Project Site beyond the gas station is the Baby Geniuses day care.

(b) City of Gardena

The proposed Project is near the City of Gardena. The nearest sensitive receptors to the Project Site in the City of Gardena are Kei-Ai South Bay Healthcare Center First Southern Baptist Church, and Amestoy Elementary School to the northwest, and residential uses to the west.

(2) Existing Ambient Noise Levels

The Project Site is in an urban setting with noise sources dominated by traffic and industrial activities. To determine baseline noise levels at various locations in the vicinity of the Project, ambient noise monitoring was conducted on December 2, 3, and 9, 2019. Five short-term measurements (15-minute) and two long-term measurements (24-hour) were taken.

Noise sources at measurement locations varied. Measurements along arterial roadways were primarily influenced by traffic noise, and measurements at the Rosecrans Recreation Center and South Orchard Avenue were primarily influenced by industrial uses to the south and southeast. During short-term measurements, conditions included cloudy skies with temperatures of 66 degrees Fahrenheit (°F) and average wind speeds of 1 mile per hour. All sound level meters were equipped with a windscreen during measurements.

All sound level meters used for noise monitoring (Larson Davis model LxT and 820) satisfy the American National Standards Institute (ANSI) standard for Type 1 instrumentation. The sound level meters were set to “slow” response and dBA. The meters were calibrated prior to and after the monitoring period. All measurements were at least five feet above the ground and away from reflective surfaces. Noise measurement locations are described below and shown in Figure IV.I-1, *Approximate Noise Monitoring Locations*.

- **Long-Term Location 1 (LT-1)** was in the southeastern portion of the Rosecrans Recreation Center near the chain-link fence separating the park from the railroad tracks. A 24-hour noise measurement was conducted, beginning at the 12:00 A.M. hour on Monday, December 9, 2019. The noise environment is primarily characterized by industrial activities from California Waste Services to the southeast, park activity, and distant traffic.

- **Long-Term Location 2 (LT-2)** was near 822 West Redondo Beach Boulevard east of Vermont Avenue. A 24-hour noise measurement was conducted, beginning at the 4:00 P.M. hour on Monday, December 2, 2019. The noise environment is primarily characterized by traffic on West Redondo Beach Boulevard.

- **Short-Term Location 1 (ST-1)** was on Vermont Avenue near Kei-Ai South Bay Healthcare Center, approximately 20 feet west of the nearest southbound travel lane centerline. A 15-minute noise measurement began at 3:14 P.M., December 3, 2019. The noise environment is primarily characterized by traffic noise on Vermont Avenue. Noise levels generally ranged from 65 to 75 dBA.

- **Short-Term Location 2 (ST-2)** took place near the southwest corner of the Rosecrans Recreation Center. A 15-minute noise measurement began at 3:45 P.M., December 3, 2019. The noise environment is primarily characterized by traffic noise from Vermont Avenue. Noise levels generally ranged from 57 to 65 dBA. No trains were observed to pass by on the adjacent rail line during time of measurement.

- **Short-Term Location 3 (ST-3)** was at the end of the South Orchard Avenue cul-de-sac north of the railroad right-of-way to capture noise levels at existing residents northeast of the Project Site. A 15-minute noise measurement began at 4:07 P.M., December 3, 2019. The noise environment is primarily characterized by traffic on I-110 (approximately 600 feet east of this location) and activity from the California Waste Services facility to the south. Noise, such as equipment engine idling, and single-event noise sources from the surrounding land uses were noted to range from 58 to 62 dBA. A helicopter was observed, measuring up to 72 dBA.

- **Short-Term Location 4 (ST-4)** was near the corner of South Ainsworth Street and West Redondo Beach Boulevard. A 15-minute noise measurement began at 4:55 P.M., December 3, 2019. The noise environment is primarily characterized by traffic on West Redondo Beach Boulevard. Noise from traffic generally ranged from 62 to 77 dBA. A helicopter was briefly observed, measuring up to 75 dBA.

Figure IV.I-1 - Approximate Noise Monitoring Locations

Source: ESRI, 2019

- **Short-Term Location 5 (ST-5)** was on the southeast end of Rosecrans Recreation Center near the chain-link fence separating the park from the railroad tracks. A 15-minute noise measurement began at the 4:17 P.M. on Monday, December 2, 2019. The noise environment is primarily characterized by industrial activities from the nearby California Waste Services. Mobile equipment engine idling and impact noise was observed. No trains were observed to pass by during the measurement period.

(a) Ambient Noise Results

The long-term noise measurement results are summarized in Table IV.I-6, *Long-Term Noise Measurement Levels*. A summary of the daily trend during long-term noise measurements is provided in Appendix H, Ambient Noise Monitoring Resources, of this Draft EIR. The short-term noise measurement results are summarized in Table IV.I-7, *Short-Term Noise Measurement Levels*. An estimate of the corresponding CNEL noise level at each short-term location is given based on the difference between the L_{eq} noise level at the short-term location and the closest long-term location.

Table IV.I-6
Long-Term Noise Measurement Levels (dBA)

Monitoring Location	Description	CNEL	Lowest L_{eq} (1-hr)	Highest L_{eq} (1-hr)
LT-1, 12/9/2019	Rosecrans Recreation Center	65	51.3	77.9
LT-2 12/2/2019	W. Redondo Beach Boulevard	79	67.5	78.5

Table IV.I-7
Short-Term Noise Measurement Levels (dBA)

Monitoring Location	Description	L_{eq}	L_{max}	L_{min}	Est. CNEL
ST-1, 12/3/2019	Kei-Ai South Bay Healthcare Center	67.6	80.7	56.1	73
ST-2, 12/3/2019	Rosecrans Recreation Center	59.8	70.1	56.6	68
ST-3, 12/3/2019	South Orchard Avenue cul-de-sac	59.1	72.7	52.5	67
ST-4, 12/3/2019	South Ainsworth Street & W. Redondo Beach Boulevard	71.5	84.2	57.8	79
ST-5, 12/2/2019	Rosecrans Recreation Center	54.6	63.5	49.9	65

(3) Existing Vibration Sources

There are no existing substantial sources of vibration in the Project vicinity. For on-road trucks, Caltrans has studied the effects of propagation of vehicle vibration on sensitive land uses and found that the highest traffic-generated vibration is along freeways and state routes.[14] Their study found that vibration measured on freeway shoulders (five meters from the centerline of the nearest lane) have never exceeded 0.08 inches per second, with the worst combinations of heavy trucks and poor roadway conditions (while such trucks were moving at freeway speeds). A railroad (Torrance Industrial Lead subdivision) is adjacent to the north and west of the Project Site. However, the rail line has no through trains and approximately two switching trains per day traveling at a speed of approximately 5 – 10 mph.[15] At a relatively low train volume and low speeds, this rail line is not a substantial source of vibration.

[14] *California Department of Transportation (Caltrans). September 2013, Transportation and Construction Vibration Guidance Manual.*

[15] *Federal Railroad Administration (FRA). June 2020, U.S. DOT Crossing Inventory Form, Crossing Number 760490R.*

3. Environmental Impacts

a. Thresholds of Significance

In accordance with Appendix G of the CEQA Guidelines, a project would have a significant impact related to hydrology and water quality if the Project would result in:

Threshold (a): ***Generation of a substantial temporary or periodic 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; or***

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

In assessing impacts related to noise in this section, the City will use Appendix G as the thresholds of significance. The criteria identified above from the Thresholds Guide will be used where applicable and relevant to assist in analyzing the Appendix G thresholds.

(1) Construction Noise

A project would have a significant construction noise impact if:

- Construction activities lasting more than one day would exceed existing ambient exterior noise levels by 10 dBA or more at a noise sensitive use;
- Construction activities lasting more than 10 days in a three-month period would exceed existing ambient exterior noise levels by 5 dBA or more at a noise sensitive use; or
- Construction activities would exceed the ambient noise level by 5 dBA at a noise sensitive use between the hours of 9:00 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.

The City of Gardena does not have established construction noise thresholds. Therefore, the thresholds above are used for receptors in the City of Gardena to determine significance.

(2) Operational Noise – Transportation & Stationary

A project would have a significant operational noise impact if noise levels from the project operation would result in:

- a 3 dBA CNEL increase and noise levels reach or are within the "normally unacceptable" or "clearly unacceptable" category, or
- any increase of 5 dBA CNEL or greater.

(3) Vibration

The City of Los Angeles and the City of Gardena do not have established vibration thresholds for potential architectural damage. Therefore, the FTA-recommended criteria of 0.20 inches/second (in/sec) PPV and 0.30 in/sec PPV (depending on building type) are used in this analysis.[16]

The City of Gardena does provide standards for perceptibility of vibration and vibration annoyance, measured in vibration decibels (VdB); however, these are not quantitative thresholds for determining vibration-related Project impacts. The City of Los Angeles does not provide vibration annoyance standards to any extent. Therefore, the FTA recommended-criterion of 72 VdB[17] at sensitive receptors in both cities is used in this analysis.

b. Methodology

(1) On-Site Construction Equipment Noise

Construction noise is evaluated using the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) and the SoundPLAN acoustic ray tracing noise propagation software based on the construction equipment and use as anticipated by the Project Applicant at the nearest off-site sensitive receptors. SoundPLAN uses industry-accepted propagation algorithms based on International Organization for Standardization (ISO) and ÖAL-28 standards for outdoor sound propagation. The modeling calculations account for classical sound wave divergence (spherical spreading loss with adjustments for source directivity from point sources) plus attenuation factors due to air absorption, ground effects, and shielding. Additionally, SoundPLAN provides for other correction factors, including level increases due to reflections, source directivity, and source tonality.[18]

Construction of the Project is anticipated to commence October 2021 and last through June of 2022, for a duration of approximately 9 months. It is anticipated that construction activities would occur Monday through Friday from 7:00 AM to 4:00 PM. Construction would entail asphalt

[16] *Federal Transit Administration (FTA). September 2018. Transit Noise and Vibration Impact Assessment.*
[17] *Federal Transit Administration (FTA). September 2018. Transit Noise and Vibration Impact Assessment.*
[18] *Harris, Cyril M. 1998. Handbook of Acoustical Measurements and Noise Control. 3rd edition. Woodbury, NY: Acoustical Society of America.*

demolition, on-site processing of asphalt demolition debris, grading, construction of the proposed Project, trenching, paving of the surface parking lot and internal circulation, landscaping, and architectural coating. Approximately 1,000 tons of asphalt demolition would be hauled off-site to the Ewles Material – Stanton Plant facility in the City of Stanton, while the majority of asphalt demolition debris would be reprocessed on-site. Table IV.I-8, *Construction Activities, Phasing, and Equipment*, shows the anticipated construction activities, schedule, construction equipment, and construction workers based on information provided by the Applicant and CalEEMod defaults.

Table IV.I-8
Construction Activities, Phasing, and Equipment

Activities	Start/End Dates	Equipment	Workers
Asphalt Demolition	10/1/2021 to 10/29/2021	1 pulverizer & 1 skip loader	6
Asphalt Demolition Debris On-site Processing	10/1/2021 to 11/5/2021	1 crusher/processor & 1 skip loader	6
Rough Grading	11/8/2021 to 12/3/2021	7 scrapers, 1 loader, 1 blade, & 1 water truck	11
Building Construction	12/3/2021 to 6/28/2022	1 crane, 3 forklifts, 1 generator set, 3 loaders, & 1 welder	50
Utility Trenching	1/2/2022 to 1/23/2022	1 backhoe & 1 trencher	4
Fine Grading	4/15/2022 to 4/26/2022	2 skip loaders, 1 blade, 1 scraper, 1 smooth drum roller, & 1 water truck	6
Paving	4/27/2022 to 5/18/2022	1 blade, 2 rollers, & 1 water truck	6
Architectural Coating	5/2/2022 to 5/13/2022	Spray painter & Air Compressor	6
Finishing/Landscaping	5/19/2022 to 6/15/2022	1 backhoe, 1 trencher, & 1 skip loader	15

Note: Based on information provided by the Applicant. Building construction equipment mix based on CalEEMod defaults.

Noise generated by on-site construction equipment is based on the type of equipment used, its location relative to sensitive receptors, and the timing and duration of noise-generating activities. Each phase of construction involves different types of equipment and has distinct noise characteristics. Noise levels from construction activities are typically dominated by the loudest several pieces of equipment. The dominant equipment noise source is typically the engine, although work-piece noise (such as dropping of materials) can also be noticeable.

The noise produced at each construction phase is determined by combining the L_{eq} contributions from each piece of equipment used at a given time, while accounting for the ongoing time-variations of noise emissions (commonly referred to as the usage factor). Table IV.I-9 lists typical construction equipment noise levels at a reference distance of 50 feet.

Table IV.I-9
Typical Construction Equipment Noise Emissions Levels

Construction Equipment	Typical Max Noise Level	Construction Equipment	Typical Max Noise Level (dBA L_{max})[1]
Air Compressor	81	Pile-Driver (Impact)	101
Backhoe	80	Pile-Driver (Sonic)	96
Ballast Equalizer	82	Pneumatic Tool	85
Ballast Tamper	83	Pump	76
Compactor	82	Rail Saw	90
Concrete Mixer	85	Rock Drill	98
Concrete Pump	71	Roller	74
Concrete Vibrator	76	Saw	76
Crane, Derrick	88	Scarifier	83
Crane, Mobile	83	Scraper	89
Dozer	85	Shovel	82
Generator	81	Spike Driver	77
Grader	85	Tie Cutter	84
Impact Wrench	85	Tie Handler	80
Jack Hammer	88	Tie Inserter	85
Loader	85	Truck	88
Paver	89		

Source: FTA 2018.
[1] Measured 50 feet from the source

Noise attenuation due to distance, the number and type of equipment, and the load and power requirements to accomplish tasks at each construction phase would result in different noise levels from construction activities at a given receptor. Since noise from construction equipment is intermittent and diminishes at a rate of at least 6 dBA per doubling of distance (conservatively ignoring other attenuation effects from air absorption, ground effects, and shielding effects), the average noise levels at noise-sensitive receptors could vary considerably, because mobile construction equipment would move around the site with different loads and power requirements. Per Project Design Feature N-PDF-6, construction and demolition will be restricted to the hours of 7:00 am to 6:00 pm Monday through Friday, and 9:00 am to 6:00 pm on Saturday.

Noise levels from Project-related construction activities were calculated from the simultaneous use of all applicable construction equipment at spatially averaged distances (i.e., from the acoustical center of the general construction site) to the property line of the nearest receptors. Although construction may occur across the entire Project area, the center of construction activities best represents the potential average construction-related noise levels at the various sensitive receptors.

The expected construction equipment mix was estimated and categorized by construction activity using the FHWA Roadway Construction Noise Model (RCNM). No pile driving is proposed.

(2) Off-Site Construction Vehicle Noise

Construction-related trips from worker and vendor vehicles and haul trucks are analyzed by logarithmically comparing the existing roadway volumes and with those anticipated with the Project. Overlapping phases are anticipated to have up to 229 daily vendor and worker trips. Export of the 1,000 tons of demolition debris would generate up to a total of 100 one-way truck trips (50 truckloads). Haul trips would have a maximum of 6 daily trips on average during the hauling of asphalt demolition for a 21- work-day duration. The maximum daily vehicle trips (235) were logarithmically compared to the roadway study segment with the lowest existing volumes (20,788 ADT) and the estimated increase was determined and compared to the threshold of 5 dBA.

As documented in Appendix I1 of this Draft EIR, approvals required by the City of Los Angeles for implementation of the proposed Project include a Truck Haul Route program. It is anticipated that the demolition, material export, and construction debris will be transported to an off-site facility in the City of Stanton. In the Project vicinity, the planned haul routes for loaded trucks to the disposal facility in Stanton would likely include Redondo Beach Boulevard and I-110. The proposed haul routes would require review and approval by the City of Los Angeles.

(3) Stationary Operational Noise Sources

Stationary operational noise is evaluated with the SoundPLAN model using input parameters from previous noise studies and sound reference levels from truck loading dock operations, and truck and automobile movements across the Project Site. Noise from rooftop heating, ventilation, and air conditioning (HVAC) systems is evaluated by using a reference noise level and projecting the noise level at the nearest sensitive receptor using distance attenuation principles.

Reference noise levels of truck loading dock operational noise from the SoundPLAN library were used to evaluate potential impacts from loading dock noise at nearby sensitive receptors. Major noise sources from loading and unloading include airbrake discharge, king-pin coupling, back-up warning ‘beep’ tone, and drive-off. To evaluate multiple trucks operating at the Project Site simultaneously, the single-truck reference level was adjusted to include the maximum number of trucks loading/unloading simultaneously. In addition, truck and automobile movements were modeled in SoundPLAN around the Project perimeter where trucks would drive and park. Project operation, including the loading area, was modeled as 24 hours a day. This was conservatively assumed since the loading area is not within 300 feet of the closest residential property line to the north (Project Design Feature N-PDF-4). SoundPLAN modeling worksheets are included in Appendix H.

(4) Mobile Operational Noise Sources

Traffic noise increases were calculated using a version of the Federal Highway Administration’s (FHWA) Traffic Noise Prediction Model based on existing and future traffic volumes and vehicle mix provided by LLG, Engineers (Appendix I1 of this Draft EIR) for roadway segments in the Project area.[19] The posted speed limits and number of travel lanes were also input to the model.

(5) Construction Vibration

Construction vibration is analyzed using FTA criteria and reference vibration levels for typical construction equipment provided in the 2018 Transit Noise and Vibration Impact Assessment Manual as detailed above in Thresholds of Significance. Construction assumptions are identified above under *On-Site Construction Equipment Noise* and *Off-Site Construction Vehicle Noise*.

(6) Operational Vibration

There are no substantial sources of operational vibration associated with the Project, such as rail activity or subways. Operational vibration from Project trucks is assessed using Caltrans guidance.[20] Because FTA does not have guidance related to vibration from on-road vehicles, such as trucks, Caltrans guidance was used.

c. Project Design Features

The following Project Design Features are proposed with regard to noise:

N-PDF-1: **Docks**. The Project will be limited to no more than 36 dock high truck loading positions.

N-PDF-2 : **Construction-source noise.** All construction equipment that is required to be equipped with a backup alarm will utilize a broadband-style backup alarm.

N-PDF-3: **Operational-source noise.** Back-up beepers will not be allowed; alternate safety means for exterior operated vehicles will be utilized between the hours of 10:00 p.m. and 7:00 a.m.

N-PDF-4: **Operational-source noise.** Loading and unloading will be prohibited within 300 feet of any existing residential building between the hours of 10:00 p.m. and 7:00 a.m. the following day.

N-PDF-5: **Operational-source noise:** The Project will include a minimum 14-foot tall concrete masonry unit (CMU) or concrete wall along the northern property line to shield surrounding uses from noise relating to loading dock activities.

N-PDF-6: **Increased Noise Levels (Demolition, Grading, and Construction Activities).**

a. Construction and demolition will be restricted to the hours of 7:00 am to 6:00 pm Monday through Friday.

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[19] *Linscott Law & Greenspan. November 2019. Transportation Assessment Report, Prologis Vermont Avenue and Redondo Beach Boulevard Industrial Park, Los Angeles, California.*

[20] *California Department of Transportation (Caltrans). September 2013. Technical Noise Supplement ("TeNS").*

b. Demolition and construction activities will be scheduled so as to avoid operating several pieces of equipment simultaneously, which causes high noise levels.

c. The contractor will use power construction equipment with muffling devices.

d. The contractor will use on-site electrical sources or solar generators to power equipment rather than diesel generators where feasible.

e. The contractor will erect a temporary construction noise barrier 10-feet in height along the entire northern property line of the Project Site for the duration of construction activities. The barrier may be constructed with 1-inch plywood but will be solid, without holes or cracks, and will extend to the ground surface.

f. During all Project Site excavation and grading on-site, construction contractors will equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturer standards.

g. The contractor will place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project Site.

h. Equipment will be shut off and not left to idle when not in use.

i. The contractor will locate equipment staging in areas that will create the greatest distance between construction-related noise/vibration sources and sensitive receptors nearest the Project Site during all Project construction.

j. Jackhammers, pneumatic equipment, and all other portable stationary noise sources will be shielded and noise will be directed away from sensitive receptors.

k. A construction monitoring program will be prepared in order to document the decrease in noise levels obtained by the above listed construction measures.

d. Analysis of Project Impacts

Threshold (a): ***Would the project result in generation of a substantial temporary or periodic 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

Two types of short-term noise impacts could occur during construction: (1) mobile-source noise from construction workers vehicle trips, material deliveries, and the transport of debris and soil and (2) stationary-source noise from use of construction equipment.

(i) On-Site Construction Noise

As stated above under Methodology, noise generated by on-site construction equipment is based on the type of equipment used, its location relative to sensitive receptors, and the timing and duration of noise-generating activities. Each phase of construction involves different types of equipment and has distinct noise characteristics. Noise levels from construction activities are typically dominated by the loudest several pieces of equipment. The dominant equipment noise source is typically the engine, although work-piece noise (such as dropping of materials) can also be noticeable. The noise produced at each construction phase is determined by combining the L_{eq} contributions from each piece of equipment used at a given time, while accounting for the ongoing time-variations of noise emissions (commonly referred to as the usage factor).

The associated, aggregate sound levels at a distance of 50 feet—grouped by construction activity—are presented in Table IV.I-10, *Project-Related Construction Noise*. RCNM modeling input and output worksheets are included in Appendix H of this Draft EIR.

Table IV.I-10
Project-Related Construction Noise

Construction Activity Phase	RCNM reference at 50 feet (dBA L_{eq})
Asphalt Demolition	84
Rough Grading	86
Building Construction	84
Utility Trenching	80
Fine Grading	86
Asphalt Paving	83
Architectural Coating	74
Finish Landscaping	80

Source: Roadway Construction Noise Model

Using the reference noise level for rough and fine grading in Table IV.1-10 above (loudest phase) at a distance of 50 feet, construction noise levels at nearby sensitive receptors was modeled using SoundPLAN and taking into account the proposed 10-foot high temporary construction noise barrier around the perimeter of the Project Site (Project Design Feature N-PDF-6). SoundPLAN modeling worksheets are included in Appendix H. Figure IV.I-2 shows the projected noise exposure from Project construction to visually represent the increase in ambient noise levels in the vicinity of the Project Site.

(ii) City of Los Angeles

Project construction noise levels at the nearest sensitive receptors within the City of Los Angeles are shown on Table IV.I-11.

Table IV.I-11
Construction Noise Levels at Nearest Sensitive Receptors – City of Los Angeles (dBA)

Monitoring Location	Description	Ambient L_{eq}	Peak Construction L_{eq}	Exceed 5dBA Threshold?
Nearest Residences to the North of the Project	South Orchard Avenue cul-de-sac	59	59	No
Nearest Residents to the South of the Project	South Ainsworth Street & W. Redondo Beach Boulevard	72	66	No
North of the Project	Rosecrans Recreation Center	55	59	No

As shown, none of the noise levels at any of the sensitive receptors would exceed the typical existing daytime ambient noise levels by 5 dBA for construction projects lasting more than 10 days. **Therefore, the Project’s on-site construction-related noise would not result in the generation of a substantial temporary or periodic increase in ambient noise levels in the Project vicinity and impacts would be less than significant.**

(iii) City of Gardena

Project construction noise levels at the nearest sensitive receptors within the City of Gardena are shown on Table IV.I-12.

Table IV.I-12
Construction Noise Levels at Nearest Sensitive Receptors – City of Gardena (dBA)

Monitoring Location	Description	Ambient L_{eq}	Peak Construction L_{eq}	Exceed 5dBA Threshold?
Northwest of the Project	Kei-Ai South Bay Healthcare Center	68	62	No

As shown, project construction noise levels at the Kei-Ai South Bay Healthcare Center across Vermont Avenue are calculated to be as high as 62 dBA L_{eq}. This would be 6 dBA below the typical existing daytime ambient of 68 dBA L_{eq}. Ambient noise levels would not increase by 5 dBA for construction project's lasting more than 10 days. **Therefore, the Project's on-site construction-related noise would not result in the generation of a substantial temporary or periodic increase in ambient noise levels in the Project vicinity, and impacts would be less than significant.**

(iv) Off-Site Construction Noise

Construction workers vehicle trips and the transport of materials to and from the construction site would incrementally increase noise levels along roadways in the vicinity of the Project area. Individual construction vehicle pass-bys and haul truck trips may create momentary noise levels of up to approximately 85 dBA (L_{max}) at 50 feet from the vehicle, but these occurrences would generally be infrequent and short lived.

Construction generates temporary worker and vendor trips and the number of trips vary by activity phase. Overlapping phases are anticipated to have up to 229 daily vendor and worker trips. Haul trips would have a maximum of 6 daily trips on average during the hauling of asphalt demolition for a 21-work-day duration. As stated previously, the planned haul routes for loaded trucks will include Redondo Beach Boulevard and I-110. This increase in trips when compared to the existing average daily trips of 20,788 to 37,538[21] along nearby roadway segments in the Project vicinity would result in noise levels that are less than 0.1 dBA CNEL, which are negligible increases in noise levels. As discussed above, changes of 1 to 3 dBA are detectable under quiet, controlled conditions and changes of less than 1 dBA are usually indiscernible. A 3-dBA change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dBA is readily discernable to most people in an exterior environment. **Therefore, the Project's off-site construction-related noise would not result in the generation of a substantial temporary or periodic increase in ambient noise levels in the Project vicinity and impacts would be less than significant.**

[21] *See Table IV.1-15, below.*

(b) Operational Noise

(i) On-Site Operational Noise

Mechanical Equipment

HVAC systems are anticipated to be on the rooftop of the building. Typical HVAC equipment generates noise levels ranging up to 72 dBA at a distance of 3 feet. The nearest noise-sensitive receptor is approximately 175 feet south of the proposed building. At this distance, noise levels from HVAC noise would attenuate to approximately 36 dBA. This is well below existing ambient noise levels and below the noise standards for both the City of Los Angles and Gardena, since mechanical equipment would not result in a 3 dBA CNEL increase in noise levels. **Therefore, the Project's on-site operational noise related to HVAC mechanical equipment would not result in the generation of a substantial temporary or periodic increase in ambient noise levels in the Project vicinity and impacts would be less than significant**

Loading Docks

The proposed Project would have operational noise associated with truck loading bay operations, such as truck movements, short-term idling (limited to 5 minutes per CARB Rule 2485 and no more than 2 minutes of non-essential idling per Mitigation Measure MM-AQ-4), and loading/unloading. The Project would have one building with 36 loading dock positions and 71 parking stalls for truck trailers. The loading docks would be located on the north side of the building where the nearest sensitive receptors to the north would be shielded by the proposed 14-foot high concrete sound wall (Project Design Feature N-PDF-5). Additional, 14-foot high concrete screening walls are proposed immediately east and west of the loading area. Figure IV.I-3 shows the projected noise exposure from Project on-site operation to visually represent the increase in ambient noise levels in the vicinity of the Project.

City of Los Angeles

Project on-site operational noise levels at the nearest sensitive receptors within the City of Los Angeles are shown on Table IV.I-13.

Table IV.I-13
Operational Noise Levels at Nearest Sensitive Receptors – City of Los Angeles

Monitoring Location	Description	Ambient dBA CNEL	Project Noise Level dBA CNEL	Change in Ambient dBA CNEL
Nearest Residences to the North of the Project	South Orchard Avenue cul-de-sac	67	58	+0.5
Nearest Residents to the South of the Project	South Ainsworth Street & W. Redondo Beach Boulevard	79	51	0
North of the Project	Rosecrans Recreation Center	68	66	+2

As shown, on-site operational noise levels at all sensitive receptor locations would be below ambient conditions. Ambient noise levels would not increase by 3 dBA CNEL due to operation of the Project. **Therefore, the Project's on-site operational noise would not result in the generation of a substantial temporary or periodic increase in ambient noise levels in the Project vicinity and impacts would be less than significant.**

City of Gardena

Project on-site operational noise levels at the nearest sensitive receptors within the City of Gardena are shown on Table IV.I-14.

Table IV.I-14
Operational Noise Levels at Nearest Sensitive Receptors – City of Gardena

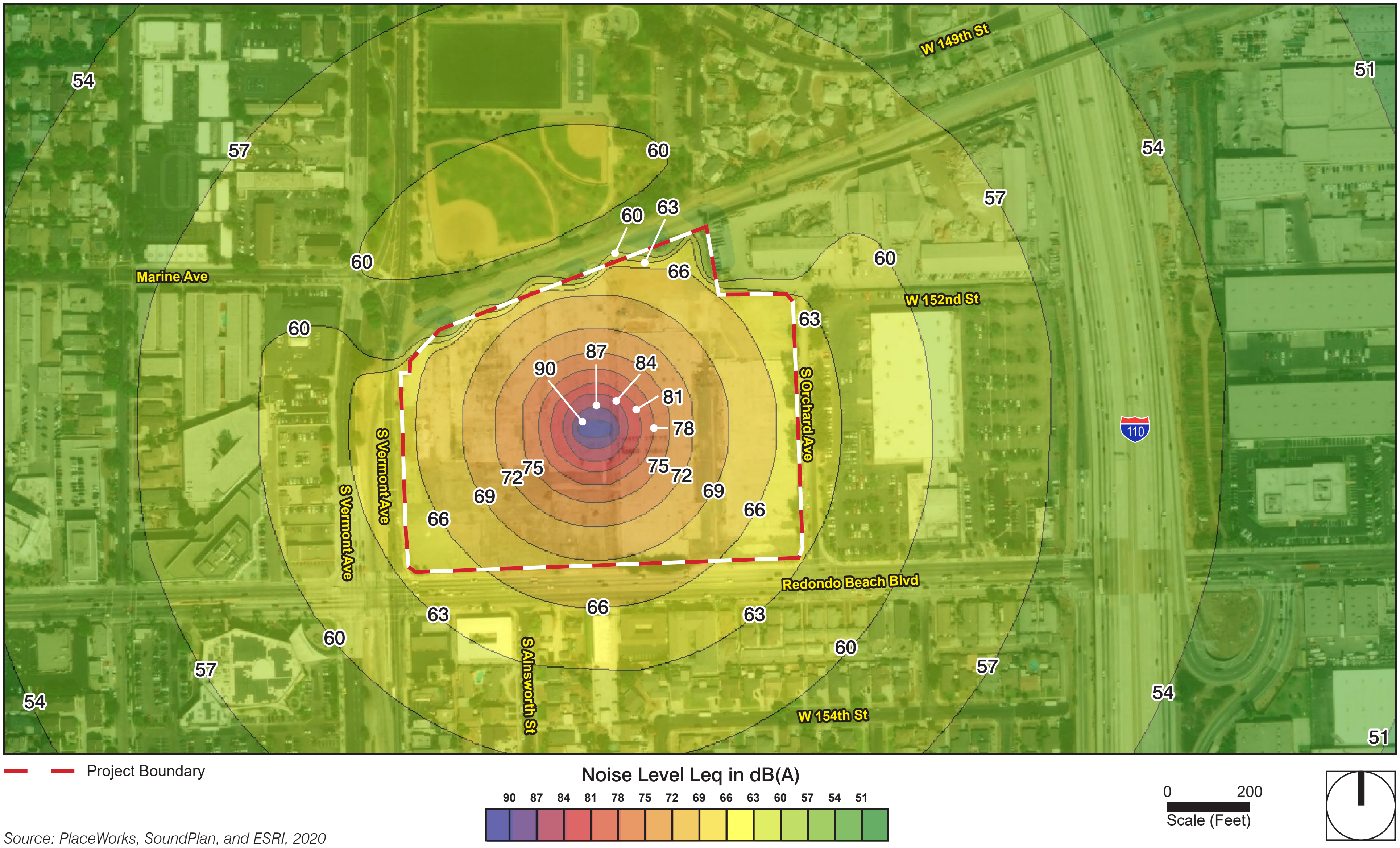
Monitoring Location	Description	Ambient	Project Noise	Change
Northwest of the Project	Kei-Ai South Bay Healthcare Center	62 dBA L_{eq}	62 dBA L_{eq}	+3 dBA L_{eq}
		73 dBA CNEL	68 dBA CNEL	+1 dBA CNEL

As shown, on-site operational noise levels at the KeiAi South Bay Healthcare Center across Vermont Avenue are calculated to be up to 62 dBA L_{eq}. This would not exceed the existing nighttime ambient estimated to be 62 dBA L_{eq}. As noted in Table IV.I-5, which shows the City of Gardena's exterior noise standards, in the event that the ambient noise level exceeds the noise standard, the ambient noise level shall become the noise standard. Over a 24-hour period, Project on-site operational noise levels at the Kei-Ai South Bay Healthcare Center are calculated to be as high as 68 dBA CNEL. This would be 5 dBA below the existing ambient of 73 dBA CNEL. Project operational noise would not exceed the existing ambient level and ambient noise levels would not increase by 3 dBA CNEL due to operation of the Project. **Therefore, the Project's on-site operational noise would not result in the generation of a substantial temporary or periodic increase in ambient noise levels in the Project vicinity and impacts would be less than significant.**

(ii) Off-Site Traffic Noise

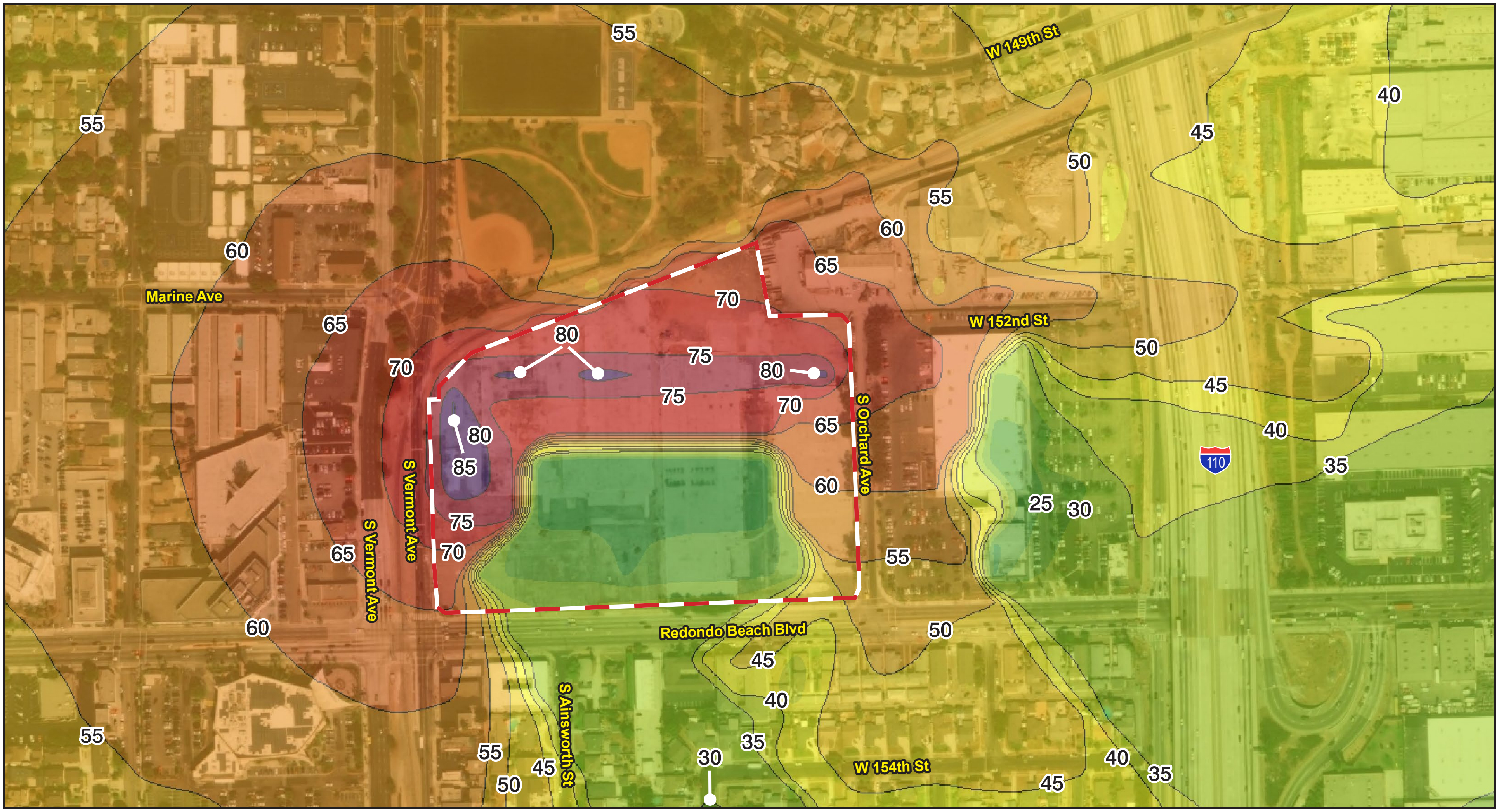
As discussed above, traffic noise increases were calculated using a version of the FHWA Traffic Noise Prediction Model based on existing and future traffic volumes and vehicle mix for roadway segments in the Project area. Table IV.I-15 shows the existing and future predicted CNEL levels at 50 feet from the nearest travel lane centerline, as well as the predicted traffic noise increase with implementation of the proposed Project. Cumulative traffic noise impacts are discussed below in the Cumulative Impacts section.

Figure IV.I-2 - Project Construction Noise Contours



Source: PlaceWorks, SoundPlan, and ESRI, 2020

Figure IV.I-3 - Project Operational Noise Contours



Project Boundary

Noise Level CNEL in dB(A)

85 80 75 70 65 60 55 50 45 40 35 30 25 20

0 200
Scale (Feet)

Source: PlaceWorks, SoundPlan, and ESRI, 2020

Table IV.I-15
Traffic Noise Levels for Existing and Project Buildout Conditions

Roadway Segment	Traffic Volumes (ADT)				Traffic Noise levels at 50 Feet (dBA CNEL)				Noise Increase		
	Existing	Existing with Project	2022 No Project	2022 With Project	Existing	Existing with Project	2022 No Project	2022 With Project	Project Increase	Cumulative Increase	Project Cumulative Contribution
1	24,375	24,584	26,475	26,684	71.3	71.5	71.7	71.8	0.2	0.5	0.2
2	20,788	20,948	22,577	22,737	70.7	70.9	71.1	71.2	0.2	0.5	0.1
3	33,175	33,455	36,033	36,313	72.3	72.4	72.7	72.8	0.1	0.5	0.1
4	37,538	38,868	40,771	42,101	72.9	74.2	73.3	74.4	1.2	1.5	1.2
5	30,125	30,223	32,720	32,818	73.4	73.5	73.8	73.9	0.1	0.4	0.1
6	35,850	35,899	38,938	38,987	74.3	74.0	74.3	74.3	-0.3	0.1	0.0

Notes:
Segments:
1. Vermont Avenue – Rosecrans Avenue to Redondo Beach Boulevard
2. Vermont Avenue – Redondo Beach Boulevard to 161 St/Alondra Boulevard
3. Redondo Beach Boulevard – Normandie Avenue to Vermont Avenue
4. Redondo Beach Boulevard – Vermont Avenue to I-110 Freeway
5. Redondo Beach Boulevard – I-110 Freeway to Figueroa Street
6. Rosecrans Avenue – Vermont Avenue to I-110 Freeway

Source: LLG, Engineers

As shown in Table IV.I-15, traffic noise increases due to implementation of the proposed Project would be less than 3 dBA in all cases. **Therefore, the Project's off-site operational noise would not result in the generation of a substantial temporary or periodic increase in ambient noise levels in the Project vicinity and impacts would be less than significant.**

(2) Mitigation Measures

The Project would not result in the generation of a substantial temporary or periodic increase in ambient noise levels in the Project vicinity. Project impacts related to on- and off-site construction and operation-related noise would be less than significant. Therefore, no mitigation measures are required.

(3) Level of Significance After Mitigation

Project impacts related to on- and off-site construction and operation-related noise would be less than significant without mitigation. Therefore, no mitigation measures were required or included, and impacts remain less than significant.

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

(1) Impact Analysis

(a) Construction Vibration

As discussed above, Caltrans has studied the effects of propagation of vehicle vibration on sensitive land uses and found that the highest traffic-generated vibration is along freeways and state routes. Their study found that vibration measured on freeway shoulders (five meters from the centerline of the nearest lane) have never exceeded 0.08 inch per second, with the worst combinations of heavy trucks and poor roadway conditions (while such trucks were moving at freeway speeds). Therefore, the Project's off-site construction and operations would not have a measurable vibration impact, and, accordingly, this analysis focuses on the Project's on-site construction and operational vibration impacts.

(i) Architectural Vibration Damage

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

Table IV.I-16 summarizes vibration levels for typical construction equipment at the nearest structures. For reference, residential structures are assigned the Building Category III, engineered concrete and masonry (no plaster) threshold of 0.20 in/sec PPV, and commercial buildings are assigned the Building Category II, engineered concrete and masonry (no plaster) threshold of 0.30 in/sec PPV.

Table IV.I-16
Vibration Levels for Typical Construction Equipment

Equipment	PPV in/sec			
	Reference Vibration at 25 feet	Residential 115 ft south[1]	Commercial 200 ft east[1]	Commercial/Retail 150 ft west[2]
Vibratory Roller	0.21	0.02	0.01	0.01
Large Bulldozer	0.089	0.01	<0.01	0.01
Loaded Trucks	0.076	0.01	<0.01	0.01
Jackhammer	0.035	<0.01	<0.01	<0.01
Small Bulldozer	<0.01	<0.01	<0.01	<0.01

Source: FTA, 2018 Transit Noise and Vibration Impact Assessment.
Notes: Distances measured from the edge of construction to façade of sensitive receptor/nearest structure.
1 City of Los Angeles -
2 City of Gardena – Fashion Barber and Beauty Salon

As shown in Table IV.I-16 above, the nearest structures to the Project Site and construction activities would experience vibration levels below 0.20 in/sec PPV. **Therefore, the Project's construction activities would not result in the generation of excessive groundborne vibration or noise levels, and impacts would be less than significant.**

(ii) Vibration Levels Related to Human Annoyance

Vibration impacts (related to human annoyance) to nearby sensitive receptors both in the City of Los Angeles and City of Gardena are analyzed. A significant impact would occur if vibration levels would exceed 80 VdB at the nearest residential building façade. This is based on the FTA criterion for infrequent events (fewer than 30 per day) at residences and buildings where people sleep, since construction equipment such as rollers or grading equipment are not anticipated to pass along the edge of the construction more than 30 times per day. Table IV.I-17 shows FTA reference VdB levels for typical construction equipment and the estimated vibration levels at nearby sensitive receptors. Potential vibration levels (human annoyance) were calculated based on the distance from the edge of the construction site to the nearest residential building facade.

Table IV.I-17
Vibration Levels (VdB) from Project Construction Equipment

Equipment	VdB Levels		
	Reference Levels at 25 feet	Residences 150 feet to north	Residences 125 feet to south
Vibratory Roller	94	71	73
Large Bulldozer	87	64	66
Loaded Trucks	86	63	65
Jackhammer	79	56	58
Small Bulldozer	58	35	37
Threshold	N/A	80	80
Exceeds Threshold?	N/A	No	No

Source: FTA 2018.

As shown in Table IV.I-17, vibration levels related to human annoyance would not exceed 80 VdB at the nearest sensitive receptors. **Therefore, the Project's construction activities would not result in the generation of excessive groundborne vibration or noise levels and impacts would be less than significant.**

(b) Operational Vibration

The proposed Project would include truck movement activity at the proposed Project Site. These movements would generally be low speed (i.e., less than 15 miles per hour) and would occur over new, smooth surfaces. Since the Project's truck movements would be at low speed (not at freeway speeds), would be over smooth surfaces (not under poor roadway conditions), Project-related vibration associated with truck activity would not result in excessive groundborne vibrations; no vehicle-generated vibration impacts would occur. In addition, there are no sources of substantial groundborne vibration associated with the Project, such as rail or subways. **Therefore, the Project operation would not result in the generation of excessive groundborne vibration or noise levels and impacts would be less than significant.**

(2) Mitigation Measures

The Project's construction and operation would not result in the generation of excessive groundborne vibration. Project impacts from construction- and operation-related vibration would be less than significant. Therefore, no mitigation measure are required.

(3) Level of Significance After Mitigation

Project impacts from construction- and operation-related vibration would be less than significant without mitigation. Therefore, no mitigation measures were required or included, and impacts remain less than significant.

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 airstrip, 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 in the Initial Study included as Appendix A of this Draft EIR, the Project Site would not expose people residing or working in the Project area to excessive airport-related noise levels. The nearest airport is the Compton/Woodley Airport located approximately 2.3 miles southeast of the Project Site. Therefore, the Project would not expose people working in the Project area to excessive aircraft noise, and there would be no impact related to Threshold (c). No further analysis is required.

4. Cumulative Impacts

(1) Impact Analysis

(a) Construction Noise

Cumulative impacts would potentially occur if other projects are being constructed in the vicinity of the proposed Project at the same time. There are four projects identified in the Traffic Impact Study that are within a half-mile radius of the proposed Project. One project is already built-out, two are currently under construction, and one is proposed and has yet not begun construction. Please see Table IV.I-18 below.

Table IV.I-18
Cumulative Projects Within a Half-Mile of Proposed Project

Project Name/Address	Project Status	Land-Use
1201 W. 155th Avenue	Built	Dialysis Facility
1420 Redondo Beach Boulevard	Under Construction	Retail
Compton Boulevard between Figueroa Street & Broadway	Proposed	Transfer STA and MRF
15310 S. Figueroa Street	Under Construction	Convenience Retail

Source: Prologis Vermont Ave and Redondo Beach Blvd Industrial Transportation Assessment Report, 2019, LLG Engineers

Since one project is built, and two projects are already under construction, overlapping construction phases would be minimal. Given that the nearest project is approximately 1,800 feet away, construction noise levels between this related project and the proposed Project would not combine to result in cumulatively considerable construction-related noise impacts. **Therefore, this would result in a less than significant cumulative construction impacts.**

(b) Operational Stationary Noise.

As discussed under cumulative construction noise and vibration, the nearest cumulative project is approximately 1,800 feet away. **At this distance, stationary noise sources from the cumulative project would not be audible, and this would result in a less than significant cumulative operational impact.**

(c) Traffic Noise

If a cumulative traffic noise increase of greater than 3 dBA is calculated (applicable when noise levels fall within the normally acceptable or clearly unacceptable land use category) the cumulative impact would be considered cumulatively significant. Table IV.I-15 above, shows that the maximum projected cumulative increase is 1.5 dBA, which is less than 3 dBA. **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.**

(d) Construction Vibration

Since one project is built, and two projects are already under construction, overlapping construction phases would be minimal. Given that the nearest project is approximately 1,800 feet away, vibration levels between this related project and the proposed Project are not anticipated to be additive since vibration dissipates rapidly by distance. **Therefore, this would result in a less than significant cumulative construction impacts.**

(e) Operational Vibration

Project-related vibration associated with truck activity would not result in excessive groundborne vibrations; no vehicle-generated vibration impacts would occur. In addition, there are no sources of substantial groundborne vibration associated with the Project, such as rail or subways. **With the nearest cumulative project approximately 1,800 feet away, the proposed Project would not contribute to or cause any cumulative operational vibration impacts.**

(2) Mitigation Measures

Cumulative noise and vibration impacts are found to be less than significant. Therefore, no mitigation measures are required.

(3) Level of Significance After Mitigation

Cumulative noise impacts would be less than significant without mitigation. Therefore, no mitigation measures were required or included, and impacts remain less than significant.