APPENDIX G

Noise & Vibration Report

NOISE AND VIBRATION TECHNICAL REPORT

1.0 INTRODUCTION

This study describes the existing noise and vibration environment of the proposed mixed-use development project at 5001 Wilshire Boulevard, 671-677 S. Highland Avenue, and 668 S. Citrus Avenue. This study evaluates potential impacts from construction and operation of this proposal. This report has been prepared by Impact Sciences, Inc., in support of the environmental documentation being prepared pursuant to the California Environmental Quality Act (CEQA).

1.1 Project Location

The Project site is located in a predominately residential and commercial area bounded by Wilshire Boulevard to the south, S. Highland Avenue to the east, and Citrus Avenue to the west. Carling Way, located between APN 5507-019-29 on the south and 5507-019-012 and -014 to the north, currently connects Citrus and Highland Avenues. A small commercial mall and associated surface parking currently occupies the southern portions of the site; the two northerly parcels are currently in use as a surface parking lot.

The Project Site is in a highly urbanized location surrounded by a mix of land use, including commercial, residential, office, and institutional uses. Immediately north of the Project Site are residential uses. Office uses are located east of the site across Highland Avenue. Across Wilshire Boulevard to the south are commercial uses, with more residential uses approximately 250 feet south of the project site. To the west across Citrus Avenue are office uses including the Consulate General of Spain and Argentine Consulate. Mansfield Avenue Park is also located to the west across Citrus Avenue.

1.2 Project Description

The Proposed Project would develop an 8-story, mixed-use building consisting of approximately 10,900 square feet (sf) of ground-floor commercial space and 242 apartments. The Project would be approximately 95 feet in height and would include a total square footage of approximately 282,050 sf, with a Floor Area Ratio (FAR) of 3.84:1. The residential component would include 66 studio units, 113 one-bedroom units, 56 two-bedroom units, and seven three-bedroom units. A total of ten percent of the proposed residential units (25 units) would be designated as restricted affordable housing for Extremely Low Income, or Very Low Income Households.

Up to 354 parking spaces (324 residential and 30 commercial parking spaces) would be provided in three subterranean levels. The Proposed Project would provide 164 bicycle spaces in (28 short term spaces and 136 long term spaces).

The Applicant also proposes to vacate Carling Way. A portion of the former right-of-way and the two northerly parcels would be redeveloped into a green belt and utilized as publicly accessible Common Open Space.

Project Characteristics

The Project would demolish the existing two-story commercial building and surface parking lots and construct an 8-story (approximately 95-foot tall) mixed-use project consisting of up to 242 dwelling units (10% restricted to Extremely Low Income households) and approximately 10,900 square feet of ground floor commercial uses over three levels of subterranean parking. Overall the project would include a maximum of approximately 282,050 square feet of floor area (FAR of 3.84 to 1). Additionally, Carling Way, a public street, is proposed to be vacated and merged to the site via a Tract Map request. Carling Way and the two northerly parcels will be redeveloped into a green belt and utilized as publicly accessible Common Open Space. Vehicular circulation to the Project would be along the two major streets of Wilshire Boulevard and S. Highland Avenue. Vehicle access to the parking would be provided via a full access driveway off Citrus Avenue specific to residents or retailers. Pedestrians would access the ground floor commercial retail spaces via Wilshire Boulevard.

The Project proposes to provide 354 automobile parking spaces on site within three levels of subterranean parking. The project would also provide 164 bicycle parking spaces (150 spaces for residential uses and 14 spaces for commercial uses).

Project Construction

The Project is anticipated to be constructed over a period of approximately 32 months, with completion anticipated in February of 2025. Grading activities would include cut with approximately 65,095 cubic yards being exported from the project site. Construction hours would occur in accordance with the LAMC requirements, which prohibit 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.

2.0 ENVIRONMENTAL SETTING

2.1 Fundamentals of Noise and Vibration

Noise

Noise is usually defined as unwanted sound that is an undesirable byproduct of society's normal day-to-day activities. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm, and/or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). The human ear does not respond uniformly to sounds at all frequencies. For example, the human ear is less sensitive to low and high frequencies than medium frequencies, which more closely correspond with human speech. In response to the sensitivity of the human ear to different frequencies, the A-weighted noise level (or scale), which corresponds better with people's subjective judgment of sound levels, has been developed. This A-weighted sound level, referenced in units of dB(A), is measured on a logarithmic scale such that a doubling of sound energy results in a 3 dB(A) increase in noise level. Typically, changes in a community noise level of less than 3 dB(A) are not noticed by the human ear.[1] Changes from 3 to 5 dB(A) may be noticed by some individuals who are sensitive to changes in noise. A greater than 5 dB(A) increase is readily noticeable, while the human ear perceives a 10 dB(A) increase in sound level to be a doubling of sound.

On the A-weighted scale, the range of human hearing extends from approximately 3 to 140 dB(A). **Table 1, A-Weighted Decibel Scale**, provides examples of A-weighted noise levels from common sources. Noise sources occur in two forms: (1) point sources, such as stationary equipment or individual motor vehicles; and (2) line sources, such as a roadway with a large number of point sources (motor vehicles). Sound generated by a point source typically diminishes (attenuates) at a rate of 6 dB(A) for each doubling of distance from the source to the receptor at acoustically "hard" sites and 7.5 dB(A) at acoustically "soft" sites.[2] For example, if a noise source produces a noise level of 89 dB(A) at a reference distance of 50 feet, the noise level would be 83 dB(A) at a distance of 100 feet from the noise source, 77 dB(A) at a distance of 200 feet, and so on. Noise generated by a mobile source will decrease by approximately 3 dB(A) over hard surfaces and 4.5 dB(A) over soft surfaces for each doubling of distance.

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1 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.

2 Federal Highway Administration, *Highway Noise Fundamentals*, (1980) 97. Examples of "hard" or reflective sites include asphalt, concrete, and hard and sparsely vegetated soils. Examples of acoustically "soft" or absorptive sites include soft, sand, plowed farmland, grass, crops, heavy ground cover, etc.

Table 1
A-Weighted Decibel Scale

Typical A-Weighted Sound Levels	Sound Level (dB(A), Leq)
Threshold of Pain	140
Jet Takeoff at 100 Meters	125
Jackhammer at 15 Meters	95
Heavy Diesel Truck at 15 Meters	85
Conversation at 1 Meter	60
Soft Whisper at 2 Meters	35

Source: United States Occupational Safety & Health Administration, Noise and Hearing Conservation Technical Manual, 1999.

Sound levels also can be attenuated by man-made or natural barriers (e.g., sound walls, berms, ridges), as well as elevational differences. Noise is most audible when traveling by direct line-of-sight, an interrupted visual path between the noise source and noise receptor. Barriers, such as walls or buildings that break the line-of-sight between the source and the receiver, can greatly reduce noise levels from the source since sound can only reach the receiver by diffraction. Sound barriers can reduce sound levels by up to 20 dB(A) or more. However, if a barrier is not high or long enough to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

Solid walls and berms may reduce noise levels by 5 to 10 dB(A) depending on their height and distance relative to the noise source and the noise receptor.[3] Sound levels may also be attenuated 3 dB(A) by a first row of houses and 1.5 dB(A) for each additional row of houses.[4] The minimum noise attenuation provided by typical structures in California is provided in **Table 2, Building Noise Reduction Factors**.

3 Federal Highway Administration, *Highway Noise Mitigation*, (1980) 18.

4 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.

Table 2
Building Noise Reduction Factors

Building Type	Window Condition	Noise Reduction Due to Exterior of the Structure (dB(A))
All	Open	10
Light Frame	Ordinary Sash (closed)	20
	Storm Windows	25
Masonry	Single Glazed	25
	Double Glazed	35

Source: Federal Highway Administration, Highway Traffic Noise: Analysis and Abatement Guidance. December 2011.

Sound Rating Scales

Various rating scales approximate the human subjective assessment to the "loudness" or "noisiness" of a sound. Noise metrics have been developed to account for additional parameters, such as duration and cumulative effect of multiple events. Noise metrics are categorized as single event metrics and cumulative metrics, as summarized below.

In order to simplify the measurement and computation of sound loudness levels, frequency weighted networks have obtained wide acceptance. The A-weighted scale, discussed above, has become the most prominent of these scales and is widely used in community noise analysis. Its advantages are that it has shown good correlation with community response and is easily measured. The metrics used in this analysis are all based upon the dB(A) scale.

Equivalent Noise Level

Equivalent Noise Level (Leq) is the sound level corresponding to a steady-state A-weighted sound level containing the same total energy as several single event noise exposure level events during a given sample period. Leq is the "acoustic energy" average noise level during the period of the sample. It is based on the observation that the potential for noise annoyance is dependent on the total acoustical energy content of the noise. The equivalent noise level is expressed in units of dB(A). Leq can be measured for any period, but is typically measured for 15 minutes, 1 hour, or 24 hours. Leq for a 1-hour period is used by the Federal Highway Administration (FHWA) for assessing highway noise impacts. Leq for 1 hour is referred to as the Hourly Noise Level (HNL) in the California Airport Noise Regulations and is used to develop Community

Noise Equivalent Level values for aircraft operations. Construction noise levels and ambient noise measurements in this section use the Leq scale.

Community Noise Equivalent Level

Community Noise Equivalent Level (CNEL) is a 24-hour, time-weighted energy average noise level based on the A-weighted decibel. It is a measure of the overall noise experienced during an entire day. The term "time-weighted" refers to the penalties attached to noise events occurring during certain sensitive periods. In the CNEL scale, 5 dB are added to measured noise levels occurring between the hours of 7 P.M. and 10 P.M. For measured noise levels occurring between the hours of 10 P.M. and 7 A.M., 10 dB are added. These decibel adjustments are an attempt to account for the higher sensitivity to noise in the evening and nighttime hours and the expected lower ambient noise levels during these periods. Existing and projected future traffic noise levels in this section use the CNEL scale.

Day-Night Average Noise Level

The day-night average sound level (Ldn) is another average noise level over a 24-hour period. Noise levels occurring between the hours of 10 P.M. and 7 A.M. are increased by 10 decibels (dB). This noise is weighted to take into account the decrease in community background noise of 10 dB(A) during this period. Noise levels measured using the Ldn scale are typically similar to CNEL measurements.

Adverse Effects of Noise Exposure

Noise is known to have several adverse effects on humans, which has led to laws and standards being set to protect public health and safety, and to ensure compatibility between land uses and activities. Adverse effects of noise on people include hearing loss, communication interference, sleep interference, physiological responses, and annoyance. Each of these potential noise impacts on people is briefly discussed in the following narrative.

Hearing Loss

Hearing loss is generally not a community noise concern, even near a major airport or a major freeway. The potential for noise-induced hearing loss is more commonly associated with occupational noise exposures in heavy industry, very noisy work environments with long-term exposure, or certain very loud recreational activities (e.g., target shooting and motorcycle or car racing). The Occupational Safety and Health Administration (OSHA) identifies a noise exposure limit of 90 dB(A) for 8 hours per day to protect from hearing loss (higher limits are allowed for shorter duration exposures). Noise levels in neighborhoods, even in very noisy neighborhoods, are not sufficiently loud enough to cause hearing loss.

Communication Interference

Communication interference is one of the primary concerns in environmental noise. Communication interference includes speech disturbance and intrusion with activities such as watching television. Noise can also interfere with communications such as within school classrooms. Normal conversational speech is in the range of 60 to 65 dB(A) and any noise in this range or louder may interfere with speech.

Sleep Interference

Noise can make it difficult to fall asleep, create momentary disturbances of natural sleep patterns by causing shifts from deep to lighter stages, and cause awakening. Noise may even cause awakening that a person may or may not be able to recall.

Physiological Responses

Physiological responses are those measurable effects of noise on people that are realized as changes in pulse rate, blood pressure, and other physical changes. Studies to determine whether exposure to high noise levels can adversely affect human health have concluded that, while a relationship between noise and health effects seems plausible, there is no empirical evidence of the relationship.

Annoyance

Annoyance is an individual characteristic and can vary widely from person to person. Noise that one person considers tolerable can be unbearable to another of equal hearing capability. The level of annoyance depends both on the characteristics of the noise (including loudness, frequency, time, and duration), and how much activity interference (such as speech interference and sleep interference) results from the noise. However, the level of annoyance is also a function of the attitude of the receiver. Personal sensitivity to noise varies widely. It has been estimated that 2% to 10% of the population is highly susceptible to annoyance from any noise not of their own making, while approximately 20% are unaffected by noise.[5] Attitudes may also be affected by the relationship between the person affected and the source of noise, and whether attempts have been made to abate the noise.

Vibration

Vibration consists of waves transmitted through solid material. Groundborne vibration propagates from a source through the ground to adjacent buildings by surface waves. Vibration may comprise a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how

5 Wayne County Airport Authority. *Background information on noise & its measurement, 2009*

rapidly it is oscillating and is measured in hertz (Hz). Most environmental vibrations consist of a composite, or "spectrum" of many frequencies, and are generally classified as broadband or random vibrations. The normal frequency range of most groundborne vibration that can be felt generally starts from a low frequency of less than one Hz to a high of about 200 Hz. Vibration is often measured in terms of the peak particle velocity (PPV) in inches per second (in/sec) when considering impacts on buildings or other structures, as PPV represents the maximum instantaneous peak of vibration that can stress buildings. Because it is a representation of acute vibration, PPV is often used to measure the temporary impacts of short-term construction activities that could instantaneously damage built structures. Vibration is often also measured by the Root Mean Squared (RMS) because it best correlates with human perception and response. Specifically, RMS represents "smoothed" vibration levels over an extended period of time and is often used to gauge the long-term chronic impact of a project's operation on the adjacent environment. RMS amplitude is the average of a signal's squared amplitude. It is most commonly measured in decibel notation (VdB).

Vibration energy attenuates as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. High frequency vibrations reduce much more rapidly than low frequencies, so that in the far-field from a source, the low frequencies tend to dominate. Soil properties also affect the propagation of vibration. When groundborne vibration interacts with a building, there is usually a ground-to-foundation coupling loss (i.e., the foundation of the structure does not move in sync with the ground vibration), but the vibration can also be amplified by the structural resonances of the walls and floors. Vibration in buildings is typically perceived as rattling of windows or items on shelves, or the motion of building surfaces. At high levels, vibration can result in damage to structures.

Manmade groundborne vibration is generally limited to areas within a few hundred feet of certain types of construction activities, especially pile driving. Road vehicles rarely create enough groundborne vibration to be perceptible to humans unless the road surface is poorly maintained and there are potholes or bumps. If traffic induces perceptible vibration in buildings, such as window rattling or shaking of small loose items (typically caused by heavy trucks in passing), then it is most likely an effect of low-frequency airborne noise or ground characteristics. Human annoyance by vibration is related to the number and duration of events. The more events or the greater the duration, the more annoying it will be to humans.

Construction vibration damage criteria are assessed based on structural category (e.g. reinforced-concrete, steel, or timber). FTA guidelines consider 0.2 inch/sec PPV to be the significant impact level for non-engineered timber and masonry buildings. Structures or buildings constructed of reinforced concrete, steel, or timber have a vibration damage criterion of 0.5 inch/sec PPV pursuant to FTA guidelines.[6] The FTA

6 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual. September* 2018.

Guidelines include a table showing the vibration damage criteria based on structural category and is presented below in **Table 3, Construction Vibration Damage Criteria.**

Table 3
Construction Vibration Damage Criteria

Building/Structural Category	PPV, in/sec
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

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

2.2 Noise Sensitive Receptors

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses. Noise-sensitive receptors surrounding the project site include residential dwellings to the north, adjacent to the project site; more residential units to the northeast across Highland Avenue; John Burroughs Middle School to the east approximately 500 feet from the project site; residential uses approximately 250 feet south of the project site; Mansfield Avenue Park to the west across Citrus Avenue; and more residential uses to the northwest across Citrus Avenue.

2.3 Existing Conditions

A noise monitoring survey was completed to establish existing noise levels in the vicinity of the project site. Transportation noise is the main source of noise in urban environments, largely from the operation of internal combustion engines and frictional contact between vehicles and ground and air.[7] It should be noted that due to the ongoing Coronavirus pandemic, traffic conditions are likely lower than usual.

[7] World Health Organization, https://www.who.int/docstore/peh/noise/Comnoise-2.pdf accessed July 2, 2020.

Therefore, noise measurements that were conducted in February 2021 are likely lower than pre-pandemic conditions and therefore conservative measurements for the existing noise environment. **Figure 1, Noise Monitoring Locations** maps the noise measurement locations relative to the project site. The existing average daily noise levels are presented in **Table 4, Ambient Sound-Level Readings.**

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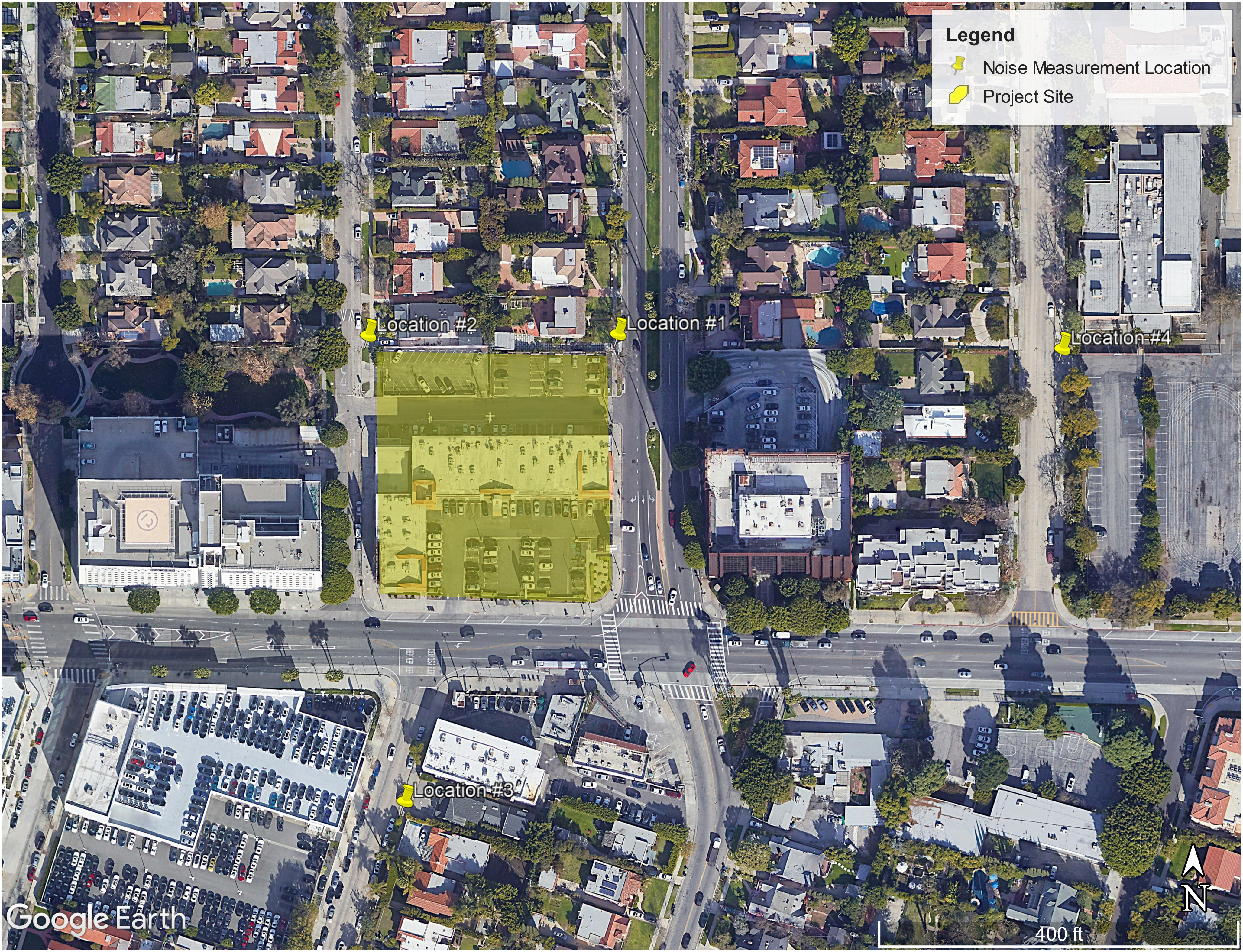
Table 4
Ambient Sound-Level Readings

Modeled Noise Measurement Location #	Street Address	dBA Leq
Location #1	665 S. Highland Ave (Residence)	68.7
Location #2	664 S. Citrus Ave (Residence)	56.7
Location #3	716 S. Citrus Ave (Residence)	59.6
Location #4	600 S. Mc Cadden Place (John Burroughs Middle School)	59.9

Source: Impact Sciences, Inc., February 2021

The only sources of groundborne vibration in the project site vicinity are heavy-duty vehicles (e.g., refuse trucks, delivery trucks, and school buses) traveling on local roadways. Trucks and buses typically generate groundborne vibration velocity levels of around 63 VdB, and these levels could reach 72 VdB where trucks and buses pass over bumps in the road.[8] In terms of PPV levels, a heavy-duty vehicle traveling at a distance of 50 feet can result in a vibration level of approximately 0.001 inch per second.

8 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.



Legend
Noise Measurement Location
Project Site
Location #1
Location #2
Location #3
Location #4
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3.0 REGULATORY FRAMEWORK

3.1 State Regulations

Title 24, California Code of Regulations

The California Noise Insulation Standards of 1988 (California Code of Regulations Title 24, Section 3501 et seq.) require that interior noise levels from the exterior sources not exceed 45 dBA Ldn/community noise equivalent level (CNEL)[9] in any habitable room of a multi-residential use facility (e.g., hotels, motels, dormitories, long-term care facilities, and apartment houses and other dwellings, except detached single-family dwellings) with doors and windows closed. Where exterior noise levels exceed 60 dBA CNEL/Ldn, an acoustical analysis is required to show that the building construction achieves an interior noise level of 45 dBA CNEL/Ldn or less.

3.2 Local Plans and Policies

City of Los Angeles Municipal Code

The LAMC provides two types of noise standards that are relevant to this analysis: 1) construction noise standards, and 2) general noise ordinance standards. The construction noise standards apply only to construction activities, while the general noise ordinance standards apply to noise generated by land use activities.

Construction Noise Standards

The City of Los Angeles Municipal Code (LAMC) has established noise regulations for both short-term construction activities and long-term operation of a project. The LAMC regulates noise from any powered equipment or powered hand tool in a residential zone (or within 500 feet) at a distance of 50 feet between 7:00 AM and 10:00 PM to the following:

- 75 dBA for construction, industrial, and agricultural machinery including crawler-tractors, dozers, rotary drills and augers, loaders, power shovels, cranes, derricks, motor graders, paving machines, off-highway trucks, ditchers, trenchers, compactors, scrapers, wagons, pavement breakers, compressors and pneumatic or other powered equipment;

- 75 dBA for powered equipment of 20 horse-power or less intended for infrequent use in residential areas, including chain saws, log chippers and powered hand tools;

9 Measurements are based on Ldn or CNEL.

- 65 dBA for powered equipment intended for repetitive use in residential areas, including lawn mowers, backpack blowers, small lawn and garden tools.[10]

These noise limits do not apply where compliance is deemed technically infeasible. Specifically, such activities are allowed when it is demonstrated that compliance is not possible "despite the use of mufflers, shields, sound barriers, and/or other noise reduction device or techniques during the operation of the equipment."[11]

Section 41.40 of the LAMC also prohibits construction activity from occurring between 9:00 PM and 7:00 AM Monday through Friday, and between 6:00 PM and 8:00 AM on Saturday.[12] This is intended to protect persons occupying sleeping quarters in any hotel, apartment, or other place of residence. Construction noise intruding onto property zoned for manufacturing or industrial uses is exempt from these standards.

General Noise Ordinance

LAMC Chapter XI, "Noise Regulation," regulates noise from non-transportation noise sources such as commercial or industrial operations, mechanical equipment or residential activities. Although these regulations do not apply to vehicles operating on public rights-of-way, the regulations do apply to noise generated by vehicles on private property, such as truck operations at commercial or industrial facilities. The exact noise standards vary depending on the type of noise source, but the allowable noise levels are generally determined relative to the existing ambient noise levels at the affected location. LAMC Section 111.01 (a) defines the ambient noise as "the composite of noise from all sources near and far in a given environment, exclusive of occasional and transient intrusive noise sources and of the particular noise source or sources to be measured. Ambient noise shall be averaged over a period of at least 15 minutes."

Section 112.01 of the LAMC would prohibit any amplified noises, especially those from outdoor sources (e.g., outdoor speakers, stereo systems, etc.) from exceeding the ambient noise levels of adjacent properties by more than 5 dBA. Amplified noises would also be prohibited from being audible at any distance greater than 150 feet from the Project's property line.

LAMC Section 112.02 (a) would prevent project HVAC systems and other mechanical equipment from elevating noise levels at neighboring residences by more than 5 dBA.

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10 City of Los Angeles, Municipal Code Chapter XI-Noise Regulation (Section 112.05), 1986.

11 Ibid.

12 City of Los Angeles, Municipal Code Chapter IV-Public Welfare (Section 41.40), 1984.

L.A. CEQA Thresholds Guide

In 2006, the City released the L.A. CEQA Thresholds Guide to provide further guidance for the determination of significant construction and operational noise impacts. According to the Guide, a Project would, under normal circumstances, have a significant impact if:

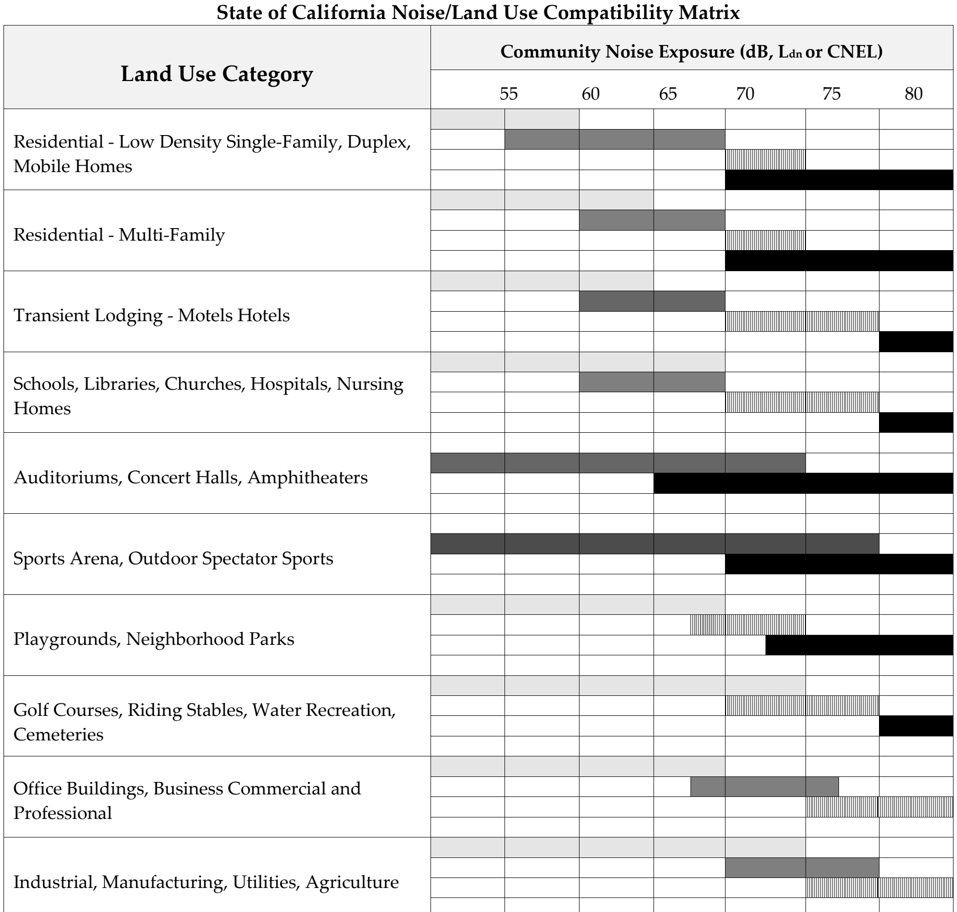
- Construction activities lasting more than one day would exceed existing ambient exterior noise levels by 10 dBA or more at a noise sensitive use;
- Construction activities lasting more than 10 days in a three month period would exceed existing ambient exterior noise levels by 5 dBA or more at a noise 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.

For a project's operational impacts:

- The ambient noise level measured at the property line of affected uses to increase by 3 dBA in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category…
- Any 5 dBA or greater noise increase.

These "normally unacceptable" and "clearly unacceptable" categories refer to those outlined by the State's noise and land-use compatibility chart, shown in **Table 5** below.

Table 5
State of California Noise/Land Use Compatibility Matrix



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

Conditionally Acceptable - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditioning will normally suffice.

Normally Unacceptable - New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable - New construction or development should generally not be undertaken.

Source: California Office of Planning and Research, General Plan Guidelines - Noise Element Guidelines (Appendix C), 2003.

4.0 NOISE ANALYSIS

4.1 Thresholds of Significance

The impacts of the proposed project related to noise would be considered significant if they would exceed any of the following Standards of Significance, in accordance with Appendix G of the *California Environmental Quality Act (CEQA) Guidelines*:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project site in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive groundborne vibration or groundborne noise levels;
- 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.

4.2 Methodology

Noise levels associated with project-related construction activities were calculated using the FHWA Roadway Construction Noise Model (RCNM) and evaluated with existing ambient noise levels to determine new ambient noise levels with construction activities. The California Emissions Estimator Model (CalEEMod) construction equipment assumptions were used to develop a construction equipment list used for RCNM inputs. Noise levels were compared to the City's noise ordinance which includes provisions regarding construction noise levels.

Traffic noise in the project area was estimated using average daily traffic information obtained for the project to get a percentage of increase to traffic volumes. Studies have shown that a 3 dB(A) increase in sound level pressure is barely detectable by the human ear. A 3 dB(A) increase in roadway noise levels requires an approximate doubling of roadway traffic volume, assuming that travel speeds and fleet mix remain constant.[13]

13 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Protocol.* September 2013.

4.3 Impact Analysis

Impact NOI-1 **Would the proposed project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project site in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? *(Less than Significant with Mitigation).***

Construction Impacts

Temporary On-Site Construction Activity Noise

During all construction phases, noise-generating activities could occur at the Project site between the hours of 7:00 A.M. and 9:00 P.M. Monday through Friday, in accordance with Section 41.40(a) of the LAMC. On-site activities could include the use of heavy equipment such as excavators and loaders, as well as smaller equipment such as saws, hammers, and pneumatic tools. Off-site secondary noises could be generated by sources such as construction worker vehicles, vendor deliveries, and haul trucks.

Noises from demolition and grading activities are typically the foremost concern when evaluating a project's construction noise impacts, as these activities often require the use of heavy-duty, diesel-powered earthmoving equipment. The types of heavy equipment required for these activities may include excavators, bulldozers, front-end loaders, graders, backhoes, and scrapers.

For this Project, demolition and grading noise impacts were modeled using the noise reference levels of excavators and front-end loaders, as these vehicles would be utilized extensively to demolish and grade for the Project. Excavators can produce average peak noise levels of 81 dBA at a reference distance of 50 feet; front-end loaders, 79 dBA. Compounding their noise impacts is the fact that these vehicles commonly operate in tandem. Excavators remove soils and demolished materials, and front-end loaders transport this matter to on-site stockpiles or haul trucks for off-site export. As a result, excavators and front-end loaders have the greatest potential to cause sustained and significant noise impacts at nearby receptors. The impacts of other construction equipment and vehicles would be neither as loud nor as extensive over the duration of the Project's demolition, grading, and other phases. Therefore, this analysis examines a worst-case-scenario; the noise impacts of all other construction equipment and phases would not exceed the impacts analyzed here. The projected noise impact from excavators and front-end loaders are shown in **Table 6, Construction Noise Impacts at Off-Site Sensitive Receptors – Unmitigated** and summarized below.

Table 6
Construction Noise Impacts at Off-Site Sensitive Receptors (without Mitigation)

Receptor	Maximum Construction Noise Level (dBA L_{eq})	Existing Ambient Noise Level (dBA L_{eq})	New Ambient Noise Level (dBA L_{eq})	Increase(dBA L_{eq})	Potentially Significant?
Location #1 – Residences at 665 S. Highland Ave	73.0	68.7	74.4	5.7	Yes
Location #2 – Residences at 664 S. Citrus Ave	73.0	56.7	73.1	16.4	Yes
Location #3 – Residences at 716 S. Citrus Ave	59.0	59.6	62.3	2.7	No
Location #4 – John Burroughs Middle School	50.0	59.9	60.3	0.4	No

Source: Impact Sciences, 2021.

These estimated construction noise levels would exceed the City's significance threshold of 5 dBA. However, **Mitigation Measure NOI-1** would require the use of mufflers or other suitable noise reduction devices and **Mitigation Measure NOI-2** would require the use of sound barriers capable of achieving attenuation of at least 15 dBA along the Project's northern and western boundaries.

Mitigation Measures:

MM-NOI-1: All powered construction equipment shall be equipped with exhaust mufflers or other suitable noise reduction devices capable of achieving a sound attenuation of at least 3 dBA.

MM-NOI-2: Temporary sound barriers capable of achieving a sound attenuation of at least 15 dBA shall be erected along the Project's northern and western boundaries to obstruct line of sight noise travel from the Project site to residences directly north of the Project site and residences along Citrus Avenue.

As shown in **Table 7, Construction Impacts at Off-Site Sensitive Receptors (with Mitigation)**, implementation of **Mitigation Measures NOI-1** and **NOI-2** would reduce noise exposure of sensitive receptors to below the 5 dBA threshold. As a result, construction noise impacts would be considered less than significant with mitigation.

Table 7
Construction Noise Impacts at Off-Site Sensitive Receptors (with Mitigation)

Receptor	Maximum Construction Noise Level (dBA L_{eq})	Existing Ambient Noise Level (dBA L_{eq})	New Ambient Noise Level (dBA L_{eq})	Increase(dBA L_{eq})	Potentially Significant?
Location #1 – Residences at 665 S. Highland Ave	58.0	68.7	69.1	0.4	No
Location #2 – Residences at 664 S. Citrus Ave	58.0	56.7	60.4	3.7	No
Location #3 – Residences at 716 S. Citrus Ave	56.0	59.6	61.2	1.6	No
Location #4 – John Burroughs Middle School	47.0	59.9	60.1	0.2	No

Source: Impact Sciences, 2021.

Temporary Off-Site Construction Activity Noise

Construction haul trucks would generate noise off-site during site demolition and would peak during grading. This would include removal of materials from the project site, base materials, and demolished materials. While this vehicle activity would increase ambient noise levels along the haul route, ambient noise levels would not be expected to significantly increase ambient noise levels by 3 dBA or greater at any noise sensitive land use. Studies have shown that a 3 dBA increase in sound level pressure is barely detectable by the human ear. A 3 dBA increase in roadway noise levels requires an approximate doubling of roadway traffic volume, assuming that travel speeds and fleet mix remain constant.[14] While this vehicle activity would marginally increase ambient noise levels along the haul route, it would not be expected to significantly increase ambient noise levels by 5 dBA or greater at any noise sensitive land uses. According to the L.A. CEQA Thresholds Guide, a 3 dBA increase in roadway noise levels requires an approximate doubling of roadway traffic volume, assuming that travel speeds and fleet mix remain constant.

The proposed haul truck route would have arriving trucks exit the I-10 freeway and head north on Crenshaw Boulevard then turn west onto Wilshire to arrive at the project site. Exiting trucks would head west on Wilshire then south on La Brea to the I-10 freeway.

Average daily traffic (ADT) counts from the City of Los Angeles Department of Transportation were used to estimate the existing traffic at the intersection of Wilshire Boulevard and Highland Avenue. Traffic

14 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Protocol.* September 2013.

counts indicate average daily traffic at the intersection of Wilshire Boulevard and Highland Avenue are 42,203 daily vehicle trips.[15]

The grading phase for project construction would average approximately 142 haul truck trips per day. Because haul trucks generate more noise than traditional passenger vehicles, a 19.1 passenger car equivalency (PCE) was used to convert haul truck trips to a reference level conversion to an equivalent number of passenger vehicles.[16] Therefore, 142 haul truck trips would account for approximately 2,712 PCE trips per day during the grading phase. This would account for approximately 6.43 percent of the average daily traffic that passes through the intersection of Wilshire Boulevard and Highland Avenue. Since it would take a doubling (i.e. a 100 percent increase) of roadway traffic volume to increase noise levels by 3 dBA, the addition of haul trucks from the project would not increase traffic to levels capable of producing 3 dBA ambient noise increases.

Though the addition of haul trucks would alter the fleet mix of the Project haul route, their minimal addition to local roadways would not nearly double those roads' traffic volumes, let along augment their traffic to levels capable of producing 5 dBA ambient noise increases. As a result, off-site construction noise impacts related to haul trips would be considered less than significant.

Operational Impacts

Permanent Operational Traffic Noise

As discussed above, a 3 dBA increase in roadway noise levels requires an approximate doubling of roadway traffic volume, assuming that travel speeds and fleet mix remain constant. A 3 dBA noise level increase is the minimum noise level increase required for a human to perceive a change in ambient noise.

Traffic volumes in the project area were obtained from the Los Angeles Department of Transportation traffic count information.[17] Trip generation information for the proposed project was added to average daily traffic volumes for Wilshire Boulevard at the intersection of Highland Avenue to determine whether traffic increased enough to result in an audible noise level increase. The DOT Traffic Count shows that the

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15 City of Los Angeles Department of Transportation. December 2013. 24 Hours Traffic Volume: Highland Av N/O Wilshire Bl. Available at: https://navigatela.lacity.org/dot/traffic_data/automatic_counts/HIGHLAND.WILSHIRE.131217.N-AUTO.pdf, accessed March 24, 2021.

16 Caltrans, Technical Noise Supplement Table 3-3, 2013.

17 City of Los Angeles Department of Transportation. December 2013. 24 Hours Traffic Volume: Highland Av N/O Wilshire Bl. Available at: https://navigatela.lacity.org/dot/traffic_data/automatic_counts/HIGHLAND.WILSHIRE.131217.N-AUTO.pdf, accessed March 24, 2021.

intersection of Wilshire Boulevard and Highland Avenue has a daily traffic volume of approximately 42,203 vehicles.[18] The project's estimated 1,547 daily vehicle trips would account for approximately 3.67 percent of the average daily traffic volume at this intersection which lies immediately to the southeast of the project site. This volume is not nearly the doubling of traffic volume required for a 3 dBA increase in noise. This increase in traffic volumes compared to current traffic counts is not significant enough to cause an audible increase in traffic noise and impacts would be less than significant.

Permanent Operation Stationary Noise

Regulatory compliance with LAMC Sec.112.02 would ultimately ensure that noises from sources such as heating, air conditioning, and ventilation systems not increase ambient noise levels at neighboring occupied properties by more than 5 dBA. Given this regulation, ambient noise levels, and the relatively quiet operation of modern HVAC systems, these on-site noise sources would not be capable of causing the ambient noise levels of nearby uses to increase by 3 dBA CNEL to or within their respective L.A. CEQA Thresholds Guide's "normally unacceptable" or "clearly unacceptable" noise categories, or by 5 dBA or greater overall.

Parking noise typically generates noise levels of approximately 60 dBA at 50 feet. However, parking from the project would occur in a three-level underground structure. Noises from the Project's underground parking level would be inaudible, or at the very least considerably attenuated, at nearby receptors. These parking noises would not exceed the normally acceptable level of noise identified in **Table 5**. Therefore, parking noise would result in a less than significant impact.

Impact NOI-2 **Would the proposed project result in the generation of excessive groundborne vibration or groundborne noise levels? *(Less than Significant)*.**

The Federal Transit Administration provides ground-born vibration impact criteria with respect to building damage during construction activities. PPV, expressed in inches per second, is used to measure building vibration damage. Construction vibration damage criteria are assessed based on structural category (e.g. reinforced-concrete, steel, or timber). FTA guidelines consider 0.2 inch/sec PPV to be the significant impact level for non-engineered timber and masonry buildings. Structures or buildings constructed of reinforced concrete, steel, or timber have a vibration damage criterion of 0.5 inch/sec PPV pursuant to FTA guidelines.[19]

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18 Ibid.

19 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual. September* 2018.

Groundborne vibration generated by construction activities associated with the proposed project would affect sensitive uses located in close proximity to the project site. **Table 8, Vibration Levels at Off-Site Sensitive Uses from Project Construction** shows the estimated vibration velocities for nearby sensitive receptors.

Table 8
Vibration Levels at Off-Site Sensitive Uses from Project Construction

Sensitive Uses Off-Site	Distance to Project Site (ft.)	Receptor Significance Threshold PPV (in/sec)	Estimated PPV (in/sec)
Location #1 – Residences at 665 S. Highland Ave	15	0.2	0.191
Location #2 – Residences at 664 S. Citrus Ave	15	0.2	0.191
Location #3 – Residences at 716 S. Citrus Ave	250	0.2	0.003
Location #4 – John Burroughs Middle School	500	0.2	0.001

Source: Impact Sciences, 2021.

The vibration velocities predicted to occur at the nearest receptors located 15 feet from the nearest project site boundary would be 0.191 in/sec PPV. All receptors are considered to be a non-engineered timber or masonry building and would not experience a PPV groundborne vibration level that exceed the FTA 0.2 in/sec PPV threshold. Therefore, vibration impacts associated with building damage due to construction activities would result in a less than significant impact. No mitigation is required.

Impact NOI-3 **For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise? *(No Impact)*.**

The project site is not in the vicinity of a private airstrip or airport land use plan. Likewise, the project site is not located within an airport land use plan or within two miles of a public airport or public use airport. As such, the project would not expose people residing or working in the project area to excessive airport-related noise levels. No impact would occur from the proposed project and no further analysis is required.

REFERENCES

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

City of Los Angeles Department of Transportation. December 2013. 24 Hours Traffic Volume: Highland Av N/O Wilshire Bl. Available at: https://navigatela.lacity.org/dot/traffic_data/automatic_counts/HIGHLAND.WILSHIRE.131217.N-AUTO.pdf, accessed March 24, 2021.

City of Los Angeles, Municipal Code Chapter XI-Noise Regulation (Section 112.05), 1986.

City of Los Angeles, Municipal Code Chapter IV-Public Welfare (Section 41.40), 1984.

City of Moreno Valley, Moreno Valley WalMart Noise Impact Analysis, Table 901. February 10, 2015

Federal Highway Administration, *Highway Noise Mitigation*, (1980) 18.

Federal Highway Administration, *Highway Noise Fundamentals*, (1980) 97.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual. September* 2018

Wayne County Airport Authority. *Background information on noise & its measurement, 2009*

World Health Organization, https://www.who.int/docstore/peh/noise/Comnoise-2.pdf

APPENDIX A

Noise and Vibration Technical Appendix

Measurement Report

Report Summary

Meter's File Name	LxT_Data.074.s	Computer's File Name	LxT_0005667-20210217 105144-LxT_Data.074.ldbin
Meter	LxT1 0005667		
Firmware	2.302		
User		Location	
Job Description			
Note			

Start Time	2021-02-17 10:51:44	Duration	0:15:00.0		
End Time	2021-02-17 11:06:44	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	68.7 dB		
LAE	98.3 dB	SEA	--- dB
EA	749.5 µPa²h		
EA8	24.0 mPa²h		
EA40	119.9 mPa²h		
LZ_{peak}	114.0 dB	2021-02-17 10:59:10	
LAS_{max}	89.9 dB	2021-02-17 10:59:11	
LAS_{min}	52.6 dB	2021-02-17 11:06:32	
LA_{eq}	68.7 dB		
LC_{eq}	78.6 dB	LC_{eq} - LA_{eq}	9.8 dB
LAI_{eq}	71.2 dB	LAI_{eq} - LA_{eq}	2.4 dB

Exceedances	Count	Duration
LAS > 85.0 dB	1	0:00:04.10
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	--- dB	--- dB	0.0 dB	
	LDEN	**LDay**	**LEve**	**LNight**
	--- dB	--- dB	--- dB	--- dB

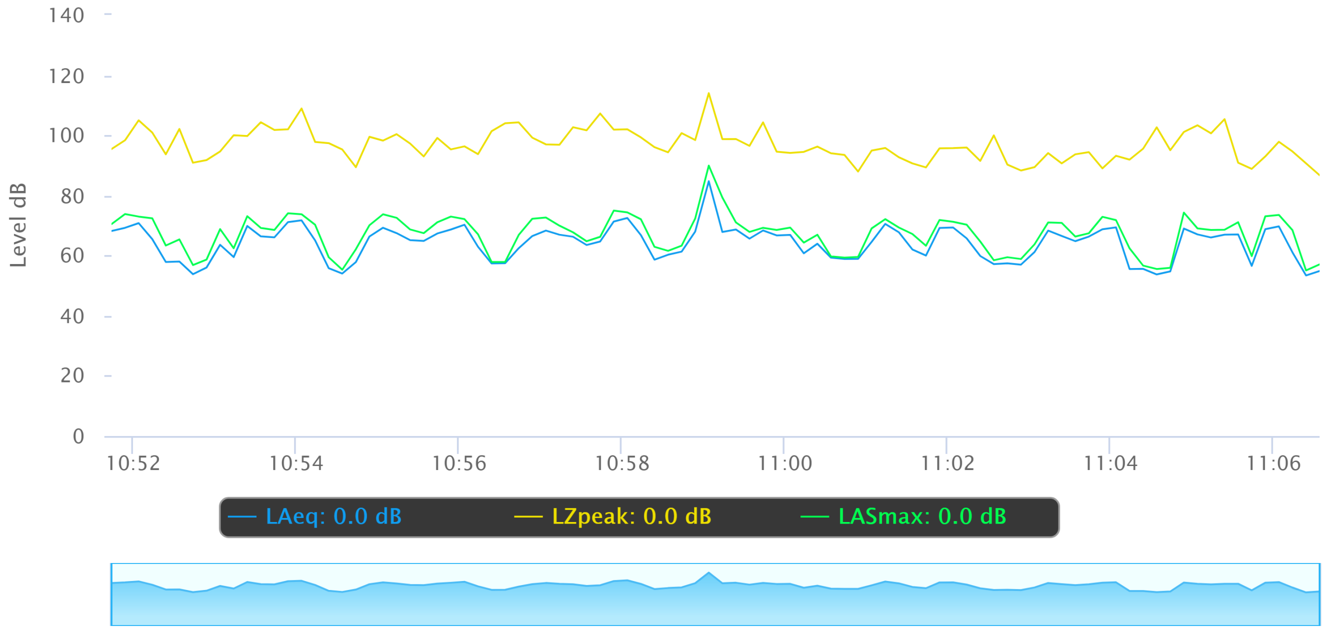
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	68.7 dB		78.6 dB		--- dB	
$Ls_{(max)}$	89.9 dB	2021-02-17 10:59:11	--- dB		--- dB	
$LS_{(min)}$	52.6 dB	2021-02-17 11:06:32	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		114.0 dB	2021-02-17 10:59:10

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	72.0 dB
LAS 10.0	70.5 dB
LAS 33.3	66.7 dB
LAS 50.0	64.4 dB
LAS 66.6	60.1 dB
LAS 90.0	55.5 dB

Time History



Measurement Report

Report Summary

Meter's File Name	LxT_Data.075.s	Computer's File Name	LxT_0005667-20210217 110841-LxT_Data.075.ldbin
Meter	LxT1 0005667		
Firmware	2.302		
User		Location	
Job Description			
Note			

Start Time	2021-02-17 11:08:41	Duration	0:15:00.0		
End Time	2021-02-17 11:23:41	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	56.7 dB		
LAE	86.3 dB	SEA	--- dB
EA	46.9 µPa²h		
EA8	1.5 mPa²h		
EA40	7.5 mPa²h		
LZ_{peak}	101.1 dB	2021-02-17 11:13:09	
LAS_{max}	67.6 dB	2021-02-17 11:13:09	
LAS_{min}	49.8 dB	2021-02-17 11:21:24	
LA_{eq}	56.7 dB		
LC_{eq}	67.7 dB	LC_{eq} - LA_{eq}	11.0 dB
LAI_{eq}	60.3 dB	LAI_{eq} - LA_{eq}	3.6 dB

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	--- dB	--- dB	0.0 dB	
	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	56.7 dB		67.7 dB		--- dB	
$Ls_{(max)}$	67.6 dB	2021-02-17 11:13:09	--- dB		--- dB	
$LS_{(min)}$	49.8 dB	2021-02-17 11:21:24	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		101.1 dB	2021-02-17 11:13:09

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	60.5 dB
LAS 10.0	59.3 dB
LAS 33.3	56.7 dB
LAS 50.0	55.7 dB
LAS 66.6	54.8 dB
LAS 90.0	53.3 dB

Measurement Report

Report Summary

Meter's File Name	LxT_Data.076.s	Computer's File Name	LxT_0005667-20210217 114326-LxT_Data.076.ldbin
Meter	LxT1 0005667		
Firmware	2.302		
User		Location	
Job Description			
Note			

Start Time	2021-02-17 11:43:26	Duration	0:15:00.0		
End Time	2021-02-17 11:58:26	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	59.6 dB		
LAE	89.2 dB	SEA	--- dB
EA	91.6 µPa²h		
EA8	2.9 mPa²h		
EA40	14.7 mPa²h		
LZ_{peak}	102.3 dB	2021-02-17 11:47:10	
LAS_{max}	72.4 dB	2021-02-17 11:52:44	
LAS_{min}	50.1 dB	2021-02-17 11:44:15	
LA_{eq}	59.6 dB		
LC_{eq}	69.1 dB	LC_{eq} - LA_{eq}	9.5 dB
LAI_{eq}	63.4 dB	LAI_{eq} - LA_{eq}	3.8 dB

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	--- dB	--- dB	0.0 dB	
	LDEN	**LDay**	**LEve**	**LNight**
	--- dB	--- dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	59.6 dB		69.1 dB		--- dB	
$Ls_{(max)}$	72.4 dB	2021-02-17 11:52:44	--- dB		--- dB	
$LS_{(min)}$	50.1 dB	2021-02-17 11:44:15	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		102.3 dB	2021-02-17 11:47:10

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	66.1 dB
LAS 10.0	62.6 dB
LAS 33.3	57.4 dB
LAS 50.0	56.1 dB
LAS 66.6	55.1 dB
LAS 90.0	53.1 dB

Measurement Report

Report Summary

Meter's File Name	LxT_Data.077.s	Computer's File Name	LxT_0005667-20210217 121649-LxT_Data.077.ldbin
Meter	LxT1 0005667		
Firmware	2.302		
User		Location	
Job Description			
Note			

Start Time	2021-02-17 12:16:49	Duration	0:15:00.0		
End Time	2021-02-17 12:31:49	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	59.9 dB		
LAE	89.4 dB	SEA	--- dB
EA	97.4 µPa²h		
EA8	3.1 mPa²h		
EA40	15.6 mPa²h		
LZ_{peak}	99.3 dB	2021-02-17 12:21:41	
LAS_{max}	70.8 dB	2021-02-17 12:31:46	
LAS_{min}	50.4 dB	2021-02-17 12:23:33	
LA_{eq}	59.9 dB		
LC_{eq}	68.7 dB	LC_{eq} - LA_{eq}	8.8 dB
LAI_{eq}	61.4 dB	LAI_{eq} - LA_{eq}	1.5 dB

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	--- dB	--- dB	0.0 dB	
	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	59.9 dB		68.7 dB		--- dB	
$Ls_{(max)}$	70.8 dB	2021-02-17 12:31:46	--- dB		--- dB	
$LS_{(min)}$	50.4 dB	2021-02-17 12:23:33	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		99.3 dB	2021-02-17 12:21:41

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	65.0 dB
LAS 10.0	63.3 dB
LAS 33.3	58.8 dB
LAS 50.0	57.6 dB
LAS 66.6	56.6 dB
LAS 90.0	54.2 dB

Wilshire-Highland Project | Construction Noise - Mitigated

Reference Noise Distance 50

Reference Noise Level 79

Sensitive Receptor	Distance (feet)	Attenuation Factors	Maximum Construction Noise Level (RCNM)	Existing Ambient (dBA, Leq)	New Ambient (dBA, Leq)	Increase
Location #1 (665 S. Highland Ave)	15	21	58.0	68.7	69.1	0.4
Location #2 (664 S. Citrus Ave)	15	21	58.0	56.7	60.4	3.7
Location #3 (716 S. Citrus Ave)	250	9	56.0	59.6	61.2	1.6
Location #4 (John Burroughs Middle School)	500	12	47.0	59.9	60.1	0.2

A 6 dBA attenuation was given for hard ground surfuce, and 3 dBA reduction was given for the first row of buildings intervening between the construction site and sensitive receptors (1.5 dBA for subsequent intervening structures), as recommended by the Caltrans Technical Noise Supplement.

A 15 dBA attenuation was given for sound barrier shielding along the northern and western boundaries of the project to obstruct line of sight noise travel from the project site to residences immediately adjacent to the north and residences along Citrus Ave. A 3 dBA attenuation was given for the addition of mufflers.

Wilshire/Highland			John Burroughs MS
Ref=	Reference vibration level (PPV)		
RefD=	Reference distance for Reference vibration level (Feet)		
	Vibration PPV		
	Ref=	0.089	Based on type of equipment
	RefD=	25	
	D=	500	Distance from equipment to sensitive receptor
	Equip=	0.001	
	Annoyance VdB		
	Ref=	87	Based on type of equipment
	RefD=	25	
	D=	500	Distance from equipment to sensitive receptor
	Equip=	48	

Peak demolition vibration based on utilizing a large bulldozer.

Source: FTA Tranist Noise and Vibration Impact Assessment, 2006.