Sherman Way Mixed Use Project
Noise Analysis

Prepared for:

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I. INTRODUCTION AND SUMMARY

1. PURPOSE OF ANALYSIS AND STUDY OBJECTIVES

This Noise Impact Study has been prepared by EcoTierra Consulting to determine the noise impacts associated with the construction and operation of the Sherman Way Mixed-Use Project. The following is provided in this report:

- A description of the study area and the project.
- Information regarding the fundamentals of noise.
- Information regarding the fundamentals of vibration.
- A description of the local noise guidelines and standards.
- An evaluation of the current noise environment.
- An analysis of the potential short-term construction-related noise and vibration impacts from the project.
- An analysis of long-term operations-related noise and vibration impacts from the project.
- An evaluation of airport-related noise impacts to the project.

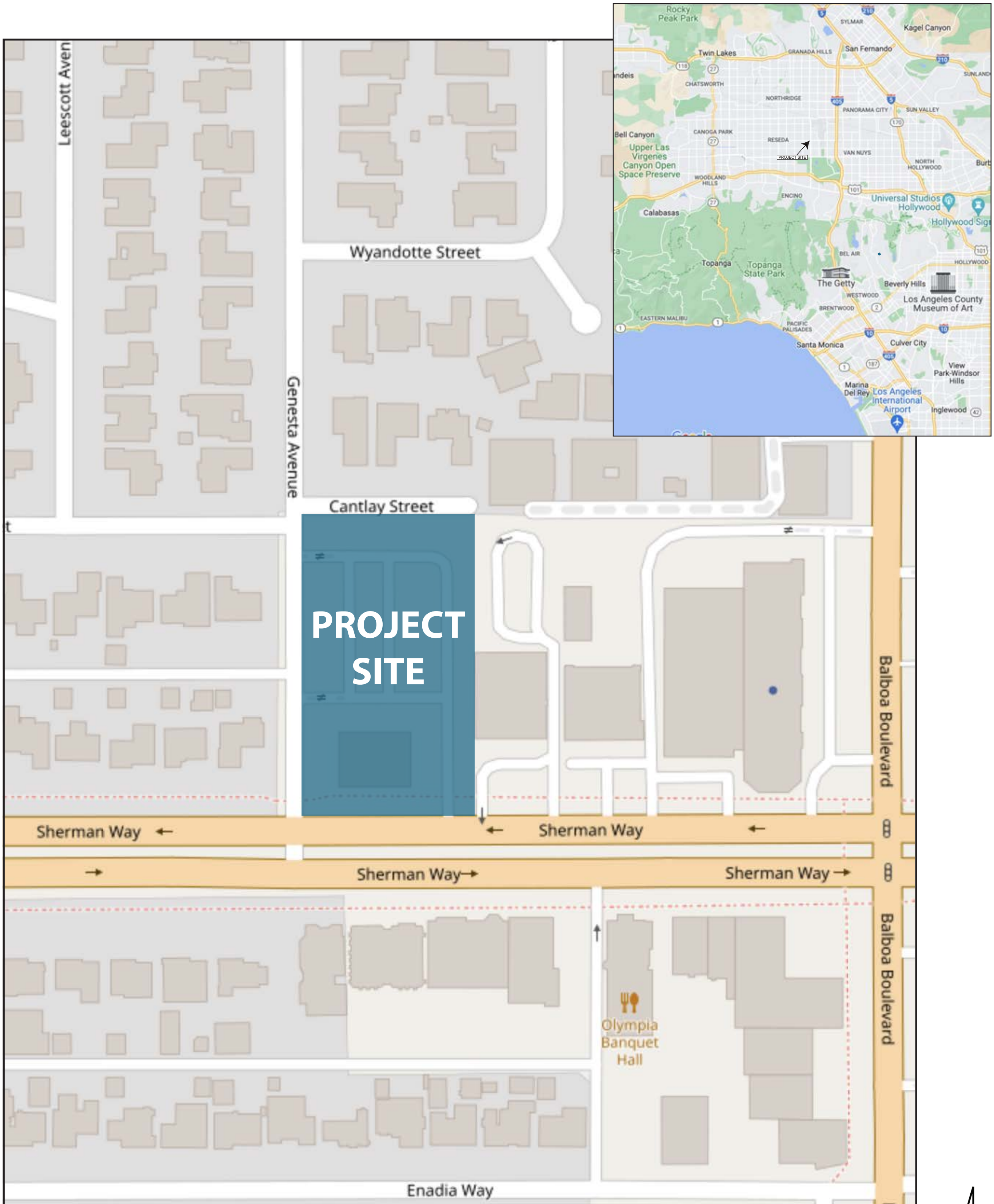
2. PROJECT LOCATION

The project site is located at 16949-16955 W. Sherman Way (APN 2227-003-017) in the City of Los Angeles. A vicinity map showing the project location is provided on **Figure 1, Project Location Map**.

3. PROJECT DESCRIPTION

The project includes demolition of an existing 4,212 square foot (SF) building, together with approximately 45,000 SF of surface parking lot and construction of a new, 4-story, 110,891 SF mixed-use building which includes 111 apartments and 5,300 SF of retail uses, on top of a 182-space, approximately 72,800 SF subterranean parking structure, on 1.13 acres. **Figure 2, Site Plan**, illustrates the proposed site plan.

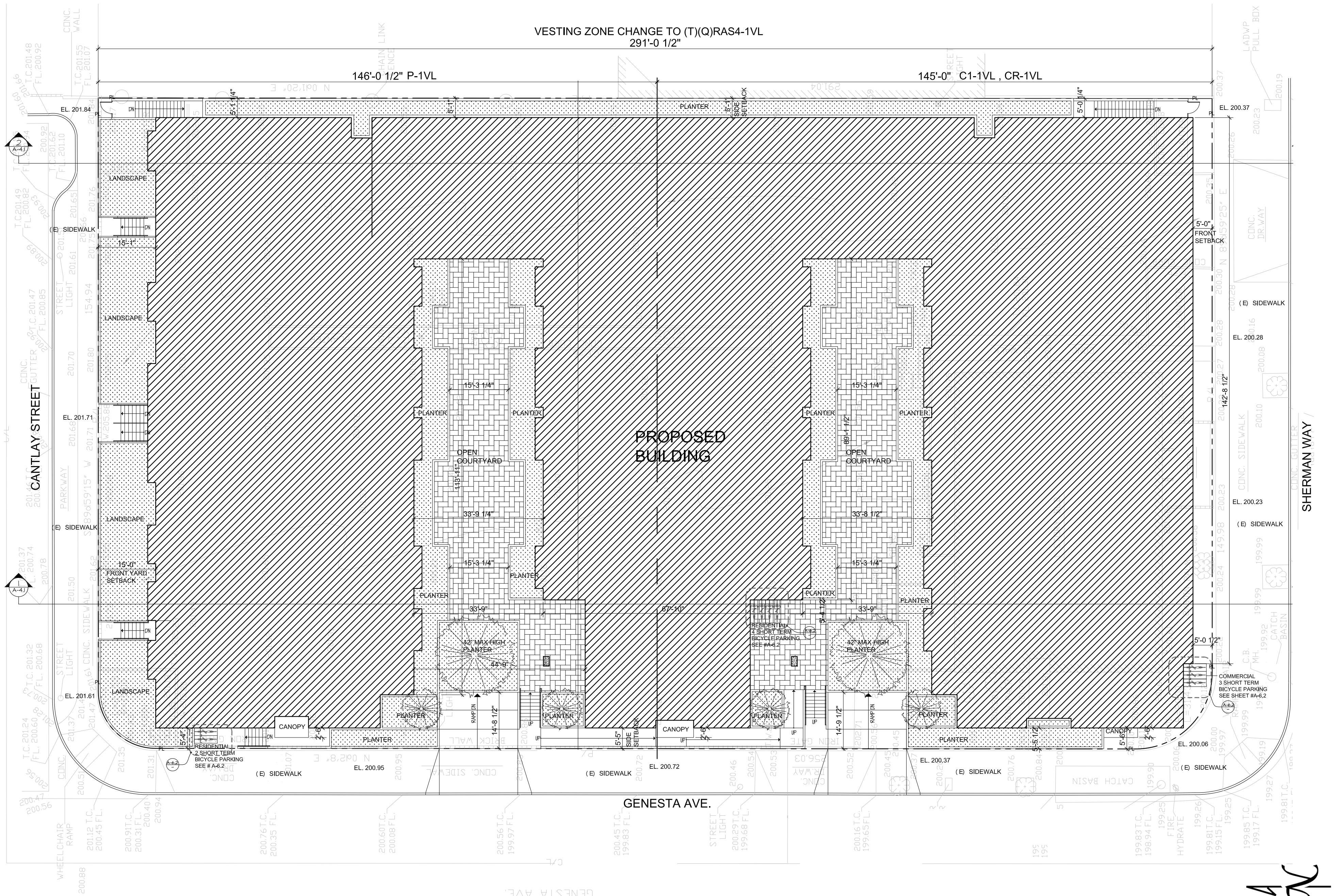
The project is anticipated to be built in one phase with demolition/construction to start no sooner than September 2023 and take approximately 2 years to complete. The project is anticipated to be operational in 2025. The project would include approximately 23,000 cubic yards (CY) of export



Project Site

Source: Google Earth and Open Street Maps, December 2022.

Figure 1
Project Location Map



Source: Alajajian Marcoosi Architects, Inc., September 2022.

Figure 2
Site Plan

4. SUMMARY OF IMPACTS

A. Construction Noise Impacts

Construction noise levels were modeled for each phase using methodology presented in the Road Construction Noise Model (RCNM) User's Guide. With incorporation of mitigation measure **MM NOI-1** (see Section VII of this report for details on **MM NOI-1**), impacts from construction noise will be less than significant.

B. Operational Noise Impacts

The project would not result in a perceptible increase in noise due to the increase of project-related traffic on roadways in the project vicinity. As the project-related increase in traffic noise does not exceed 3 dBA, the project would not contribute to a substantial permanent increase in ambient noise levels in the project vicinity. Impacts are considered less than significant.

On-site noise sources (HVAC, roof terrace and parking structure) associated with the project will not result in a significant increase in ambient noise levels at the closest receptor locations. Impacts related to project operational noise will be less than significant.

C. Vibration Impacts

With incorporation of mitigation measures **MM NOI-2, MM NOI-3** and project design feature **PDF NOI-1**, groundborne vibration levels associated with vibration-generating equipment that may be utilized during project construction would not exceed any FTA human annoyance or damage criteria (see Section VII of this report for details on **MM NOI-2, MM NOI-3 and PDF NOI-1**). The project will not be a source of operational vibration.

D. Airport Impacts

The project is not located within an airport noise contour and airport-related noise impacts are considered to be less than significant.

II. NOISE FUNDAMENTALS

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit, which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear.

1. NOISE DESCRIPTIONS

Noise equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in dBA. The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour L_{eq} is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Sound Level (L_{dn}) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the L_{dn}, except that it has another addition of 4.77 dB to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these times because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason, the sound is perceived to be louder in the evening and nighttime hours and is weighted accordingly. Many cities rely on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

Another noise descriptor that is used primarily for the assessment of aircraft noise impacts is the Sound Exposure Level, which is also called the Single Event Level (SEL). The SEL descriptor represents the acoustic energy of a single event (i.e., an aircraft overflight) normalized to one-second event duration. This is useful for comparing the acoustical energy of different events involving different durations of the noise sources. The SEL is based on an integration of the noise during the period when the noise first rises within 10 dBA of its maximum value and last falls below 10 dBA of its maximum value. The SEL is often 10 dBA greater, or more, than the L_{MAX} since the SEL logarithmetically adds the L_{eq} for each second of the duration of the noise.

2. TONE NOISE

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown the humans are more perceptible to changes in noise levels of a pure tone (Caltrans 1998). For a noise source to contain a “pure tone,” there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to “stand out” against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contagious one-third octave bands by: 5 dB for center frequencies of 500 Hertz (Hz) and above; by 8 dB for center frequencies between 160 and 400 Hz; and by 15 dB for center frequencies of 125 Hz or less (Department of Health Services 1977).

3. NOISE PROPAGATION

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects, and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

4. GROUND ABSORPTION

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models: soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone, and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. To be conservative, hard-site conditions were used in this analysis where applicable.

5. TRAFFIC NOISE PREDICTION

The level of traffic noise depends on the three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of traffic noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. Based on the FHWA community noise assessment criteria, this change is “barely perceptible,” for reference a doubling of perceived noise levels would require an increase of approximately 10 dBA. However, the 1992 findings of Federal Interagency Committee on Noise (FICON), which assessed changes in ambient noise levels resulting from aircraft operations, found that noise increases as low as 1.5 dB can cause annoyance, when the existing noise levels are already greater than 65 dB. The truck mix on a given roadway also has an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase.

6. NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. For a noise barrier to work, it must be high enough and long enough to block the view of a road. A noise barrier is most effective when placed close to the noise source or receiver. A noise barrier can achieve a 5-dBA noise level reduction when it is tall enough to break the line-of-sight. When the noise barrier is a berm instead of a wall, the noise attenuation can be increased by another 3 dBA.

III. GROUND BORNE VIBRATION FUNDAMENTALS

Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of groundborne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

1. VIBRATION DESCRIPTORS

Several different methods are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (RMS) amplitude of the vibration velocity. Because of the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as L_V and is based on the RMS velocity amplitude. A commonly used abbreviation is VdB, which in this text, is when vibration level (L_V) is based on the reference quantity of 1 microinch per second.

The PPV is defined as the maximum instantaneous peak of the vibration signal in inches per second (in/sec), and is most frequently used to describe vibration impacts to buildings.[1] The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body.[2] Decibel notation (VdB) is commonly used to express RMS vibration velocity amplitude. The relationship of PPV to RMS velocity is expressed in terms of the "crest factor," defined as the ratio of the PPV amplitude to the RMS amplitude. PPV is typically a factor of 1.7 to 6 times greater than RMS vibration velocity; FTA uses a crest factor of 4.[3] The decibel notation VdB acts to compress the range of numbers required to describe vibration. Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include buildings where vibration would interfere with operations within the building or cause damage (especially older masonry structures), locations where people sleep, and locations with vibration sensitive equipment.[4]

Groundborne noise specifically refers to the rumbling noise emanating from the motion of building room surfaces due to the vibration of floors and walls; it is perceptible only inside buildings.[5] The relationship between groundborne vibration and groundborne noise depends on the frequency of the vibration and

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[1] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.
[2] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.
[3] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.
[4] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 6.1, 6.2, and 6.3, 2018.
[5] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.4, 2018.

the acoustical absorption characteristics of the receiving room. For typical buildings, groundborne vibration that causes low frequency noise (i.e., the vibration spectrum peak is less than 30 Hz) results in a groundborne noise level that is approximately 50 decibels lower than the velocity level. For groundborne vibration that causes mid-frequency noise (i.e., the vibration spectrum peak is 30 to 60 Hz), the groundborne noise level will be approximately 35 to 37 decibels lower than the velocity level.[6] Therefore, for typical buildings, the groundborne noise decibel level is lower than the groundborne vibration velocity level.

2. VIBRATION PERCEPTION

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Offsite sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration. **Figure 3**, **Common Vibration Source Levels (VdB) and Human Response,** illustrates common vibration sources and the human and structural responses to ground-borne vibration. As shown in the figure, the threshold of perception for human response is approximately 65 VdB; however, human response to vibration is not usually substantial unless the vibration exceeds 70 VdB. Vibration tolerance limits for sensitive instruments such as magnetic resonance imaging (MRI) or electron microscopes could be much lower than the human vibration perception threshold.

3. VIBRATION FUNDAMENTALS AND PROPAGATION

Vibration can be interpreted as energy transmitted in waves through the ground or man-made structures, which generally dissipate with distance from the vibration source. Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Since energy is lost during its transfer from one particle to another, vibration becomes less perceptible with increasing distance from the source.

As described in the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual*, groundborne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard.[7] In contrast to airborne noise, groundborne vibration is not a common environmental problem, as it is unusual for vibration from sources such as rubber-tired buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, heavy trucks traveling on rough roads, and certain construction activities, such as blasting, pile-driving, and operation of heavy earth-

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

[7] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 7, 2018, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed February 16, 2021.*

moving equipment.[8] Groundborne vibration generated by man-made activities (e.g., road traffic, construction operations) typically weakens with greater horizontal distance from the source of the vibration.

The propagation of groundborne vibration is not as simple to model as airborne noise. This is because noise in the air travels through a relatively uniform median, while groundborne vibrations travel through the earth, which may contain significant geological differences. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

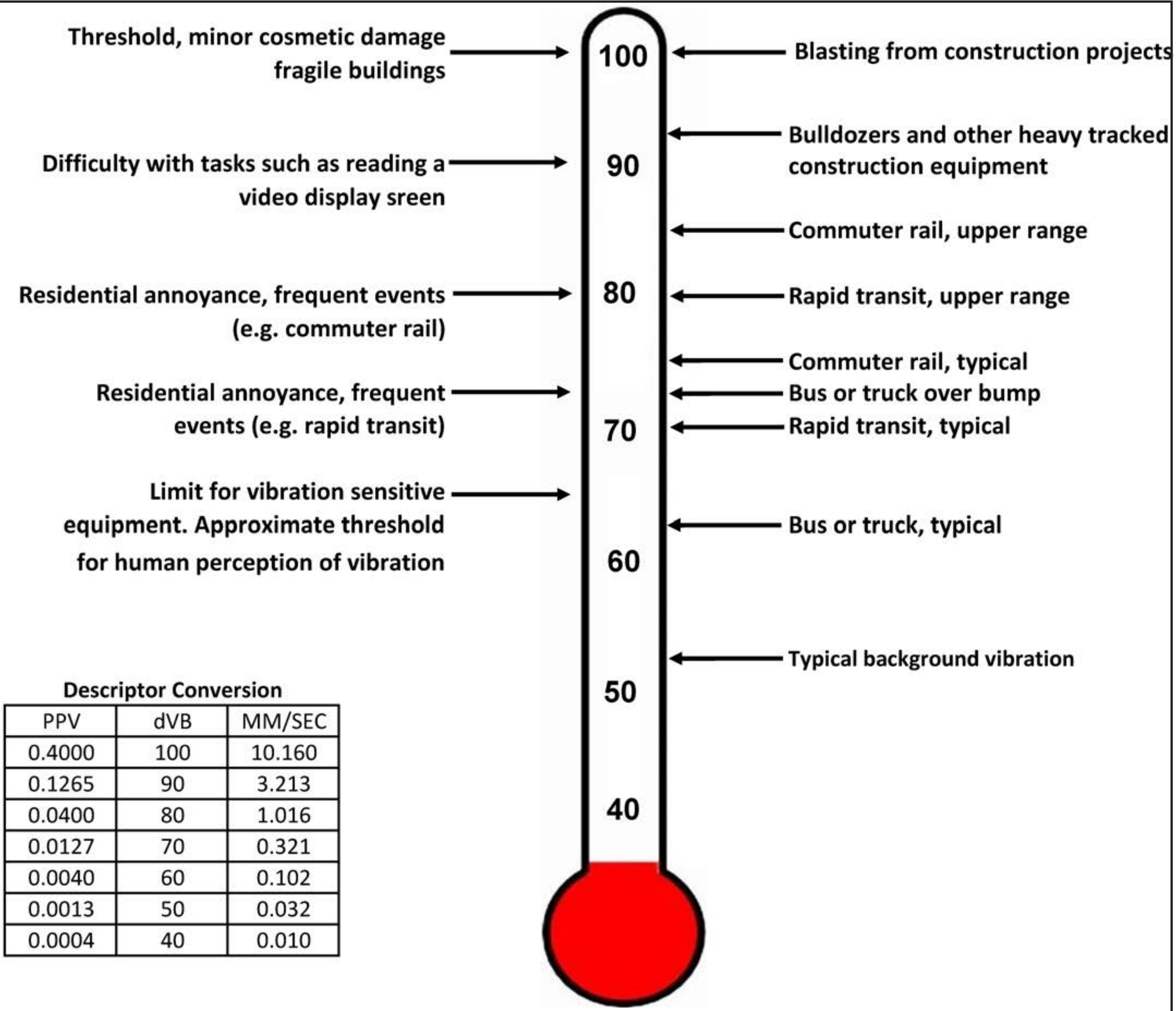
4. CONSTRUCTION-RELATED VIBRATION LEVEL PREDICTION

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. **Table 1, Vibration Source Levels for Construction Equipment,** gives approximate vibration levels for particular construction activities. The data in provides a reasonable estimate for a wide range of soil conditions.

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

Table 1
Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level (L_V) at 25 feet
Pile driver (impact)	1.518 (upper range) 0.644 (typical)	112 104
Pile driver (sonic)	0.734 upper range 0.170 typical	105 93
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall)	0.008 in soil 0.017 in rock	66 75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, Table 7-4. September 2018.		



Descriptor Conversion

PPV	dVB	MM/SEC
0.4000	100	10.160
0.1265	90	3.213
0.0400	80	1.016
0.0127	70	0.321
0.0040	60	0.102
0.0013	50	0.032
0.0004	40	0.010

Figure 3
Common Vibration Source Levels (VdB) and Human Response

IV. REGULATORY SETTING

The project is located in the City of Los Angeles and noise regulations are addressed through the efforts of various federal, State, and local government agencies. The agencies responsible for regulating noise are discussed below.

1. FEDERAL REGULATIONS

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce.
- Assisting state and local abatement efforts.
- Promoting noise education and research.

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency limits noise exposure of workers to 90 dB L_{eq} or less for 8 continuous hours or 105 dB L_{eq} or less for 1 continuous hour. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the federal Urban Mass Transit Administration (UMTA), while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

There are no federal vibration standards or regulations adopted by any agency that are applicable to evaluating vibration impacts from land use development projects such as the project. However, the FTA has adopted vibration criteria for use in evaluating vibration impacts from construction activities.[1] The

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

vibration damage criteria adopted by the FTA are shown in **Table 2, Construction Vibration Damage Criteria.**

Table 2
Construction Vibration Damage Criteria

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

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

Table 3
Groundborne Vibration and Groundborne Noise Impact Criteria

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

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

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

2. STATE REGULATIONS

Though not adopted by law, the State of California General Plan Guidelines 2017, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., L_{dn} or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the "normally acceptable" range is used, it any special acoustical is defined as the highest noise level that should be considered for the construction of the buildings which do not incorporate treatment or noise mitigation. The "conditionally acceptable" or "normally unacceptable" ranges include conditions calling for detailed acoustical study prior to the construction or operation of the project. The City of Los Angeles has adopted their own version of the State Land Use Compatibility Guidelines for land use planning and to assess potential transportation noise impacts to proposed land uses (see **Table 4, Guidelines for Noise Compatible Land Use**).

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

A. California Environmental Quality Act

The California Environmental Quality Act Guidelines (Appendix G) establishes thresholds for noise impact analysis. This noise study includes analysis of noise and vibration impacts necessary to assess the project in light of the following Appendix G Checklist Thresholds.

Would the project result in:

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

b) Generate excessive groundborne vibration or groundborne noise levels?

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

3. LOCAL REGULATIONS

The City of Los Angeles General Plan and Municipal Code establish the following applicable goals policies related to noise and vibration.

A. City of Los Angeles General Plan

The Noise Element of the City's General Plan (adopted February 1999) incorporates noise standards for various land uses, which are based on the OPR's Noise Element Guidelines. **Table 3, Guidelines for Noise Compatible Land Use,** presents the City's noise guidelines for land use planning. The objective of the noise compatibility guidelines is to provide a means of identifying acceptable noise exposure levels for a proposed use in relation to the existing noise environment.

The Noise Element of the City's General Plan policies include the CNEL guidelines for land use compatibility as shown in **Table 4, Guidelines for Noise Compatible Land Use,** and includes a number of goals, objectives, and policies for land use planning purposes. The overall purpose of the Noise Element is to guide policymakers in making land use determinations and in preparing noise ordinances that would limit exposure of citizens to excessive noise levels.[3] The following policies and objectives from the Noise Element apply to the project.

[3] *City of Los Angeles. General Plan, Noise Element adopted February 3, 1999. Pages 1.1-2.4. https://planning.lacity.org/odocument/b49a8631-19b2-4477-8c7f-08b48093cddd/Noise_Element.pdf. Accessed February 16, 2021.*

Objective 2 (Non-airport): Reduce or eliminate non-airport related intrusive noise, especially relative to noise sensitive uses.

Policy 2.2: Enforce and/or implement applicable city, state, and federal regulations intended to mitigate proposed noise producing activities, reduce intrusive noise and alleviate noise that is deemed a public nuisance.

Objective 3 (Land Use Development): Reduce or eliminate noise impact associated with proposed development of land and changes in land use.

Policy 3.1: Develop land use policies and programs that will reduce or eliminate potential and existing noise impacts.

Exhibit I of the Noise Element also contains guidelines for noise compatible land uses.[4] **Table 4, Guidelines for Noise Compatible Land Use,** summarizes these guidelines, which are based on OPR guidelines from 1990.

Table 4
Guidelines for Noise Compatible Land Use [1]

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

A Normally acceptable. Specified land use is satisfactory, based upon assumption buildings involved are conventional construction, without any special noise insulation.
C Conditionally acceptable. New construction or development only after a detailed analysis of noise mitigation is made and needed noise insulation features are included in project design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning normally will suffice.
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.
1 Based on the Governor's Office of Planning and Research, "General Plan Guidelines," 1990. To help guide determination of appropriate land use and mitigation measures vis-à-vis existing or anticipated ambient noise levels.
Source: Noise Element of the Los Angeles City General Plan, adopted February 1999.

4 *City of Los Angeles. General Plan, Noise Element adopted February 3, 1999. Page I-1. https://planning.lacity.org/odocument/b49a8631-19b2-4477-8c7f-08b48093cddd/Noise_Element.pdf. Accessed February 16, 2023.*

B. City of Los Angeles Municipal Code

In addition to any measures to reduce noise levels recommended in this report, project operations will be subject to City ordinances.

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

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

Table 5
City of Los Angeles Presumed Ambient Noise Levels

Zone	Daytime Hours (7 A.M. to 10 P.M.) dBA (L_{eq})	Nighttime Hours (10 P.M. to 7 A.M.) dBA (L_{eq})
Residential (A1, A2, RA, RE, RS, RD, RW1, RW2, R1, R2, R3, R4, and R5)	50	40
Commercial (P, PB, CR, C1, C1.5, C2, C4, C5, and CM)	60	55
Manufacturing (M1, MR1, and MR2)	60	55
Heavy Manufacturing (M2 and M3)	65	65
Source: City of Los Angeles Municipal Code, Chapter XI, Noise Regulation, Section 111.03, Table 2.		

LAMC Section 112.02 limits increases in noise levels from air conditioning, refrigeration, heating, pumping, and filtering equipment. Such equipment may not be operated in such manner as to create any noise which would cause the noise level on the premises of any other occupied property, or, if a condominium,

[5] *Los Angeles Municipal Code, Chapter XI, Article I, Section 111.02-(b). Accessed February 16, 2023.*

apartment house, duplex, or attached business, within any adjoining unit, to exceed the ambient noise level by more than 5 dB.

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

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

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

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

V. EXISTING NOISE CONDITIONS

To determine the existing noise level environment, short-term noise measurements were taken in the project study area at three locations in the project vicinity. The following describes the measurement procedures, measurement locations, and the noise measurement results.

1. MEASUREMENT PROCEDURE AND CRITERIA

To ascertain the existing noise at and adjacent to the project site, field monitoring was conducted on May 31, 2022. The field survey noted that noise within the project area is generally characterized by traffic with the occasional fixed-wing aircraft and/or helicopter passing overhead.

A. Noise Measurement Equipment

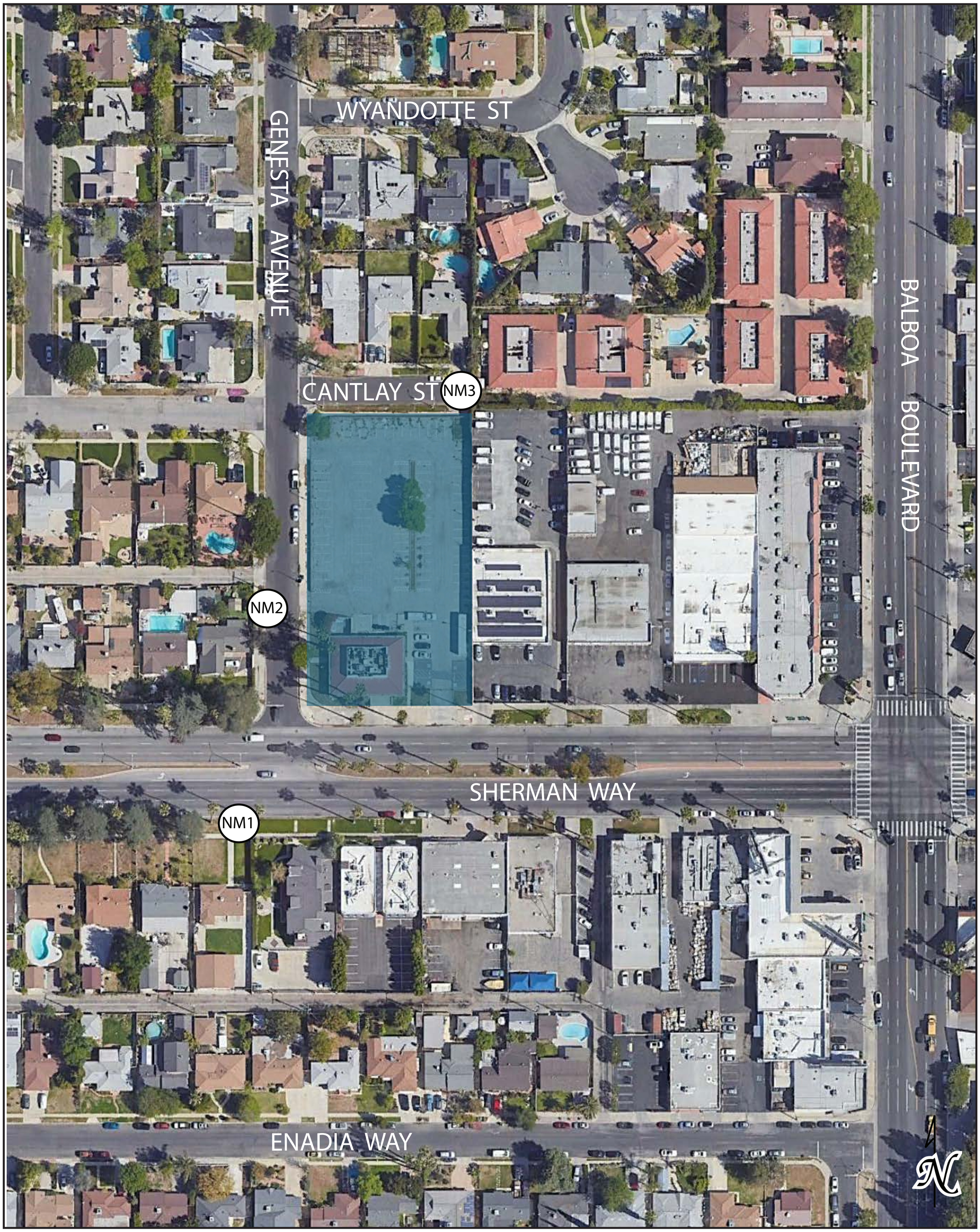
Noise monitoring was performed using an American National Standards Institute (ANSI Section SI4 1979, Type 1) Larson Davis model LxT sound level meter. The sound level meter was programmed in "slow" mode to record the sound pressure level at one second intervals for in A-weighted form. The sound level meter and microphone were mounted approximately five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before monitoring using Larson Davis Cal 250. The noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

B. Noise Measurement Locations

The noise monitoring locations were selected in order to obtain noise measurements of the current noise sources impacting the vicinity of the project site and to provide a baseline for any potential noise impacts that may be created by development of the project. The sites are shown in **Figure 4, Noise Monitoring Locations**, on the following page. **Appendix A** (of this analysis technical report) includes a photographic index of the study area and noise level measurement locations.

C. Noise Measurement Timing and Climate

The noise measurements were recorded between 2:02 PM and 3:27 PM on May 31, 2022. At the start of the noise monitoring, the temperature was 80°F, 10 percent humidity, clear, sunny skies, and calm wind conditions (3-5 mph).



Project Site

NM# Noise Measurement Locations

Source: Google Earth, March 2020.

Figure 4
Noise Measurement Location Map

2. NOISE MEASUREMENT RESULTS

The noise measurements were taken at three (3) locations in the project vicinity. The results of the noise level measurements are provided below in **Table 6, Existing Noise Level Measurements (dBA)**.

Table 6
Existing Noise Level Measurements (dBA)

Site Location	Description	L_{eq}	L_{MAX}	L_{MIN}
NM 1	On the sidewalk adjacent to the single-family residential use located south of Sherman Way and west of Genesta Avenue, approximately 134 feet southwest of the project site	70.3	78.9	47.7
NM 2	On the sidewalk adjacent to the single-family residential use located west of Genesta Avenue and north of Sherman Way, approximately 50 feet west of the project site	56.4	70.7	46.2
NM 3	At the end of the cul-de-sac of Cantlay Street, east of Genesta Avenue, in proximity to the single family residential uses located on the northern side of Cantlay Street and the multifamily residential uses located adjacent to the northeastern corner of the project site.	55.6	70.4	43.3

As shown in **Table 6**, receptors in the project vicinity are subject to average noise levels ranging from 55.6 dBA l_{eq} to 70.3 dBA l_{eq}, with maximum noise levels reaching as high as 78.9 dBA adjacent to the residential uses along Sherman Way.

VI. NOISE AND VIBRATION IMPACT ANALYSES

Consistent with the California Environmental Quality Act (CEQA) and the CEQA Guidelines, a significant impact related to noise would occur if a project is determined to result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- Exposure of persons residing or working in the project area to excessive noise levels from aircraft.

According to the CEQA checklist, to determine whether impacts to noise resources are significant environmental effects, the following thresholds are analyzed and evaluated:

- Exceedance of noise standards for construction and operational noise.
- Construction noise.
- Groundborne vibration.
- Operational noise.
- Airport noise.

Each of these thresholds is analyzed below.

1. EXCEEDANCE OF NOISE STANDARDS

This impact discussion analyzes the potential for project construction noise to cause an exposure of persons to or generation of noise levels in excess of established City of Los Angeles noise standards or applicable standards of other agencies.

Noise levels in the project area would be influenced by construction activities.

A. Construction Noise

As stated previously, LAMC Section 112.05 sets a maximum noise level for construction equipment of 75 dBA at a distance of 50 feet when operated within 500 feet of a residential zone. Compliance with this standard shall not apply where compliance therewith is technically infeasible.[1] LAMC Section 41.40 prohibits construction between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, 6:00 p.m. and 8:00 a.m. on Saturday, and at any time on Sunday (i.e., construction is allowed Monday through Friday

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

between 7:00 a.m. to 9:00 p.m.; and Saturdays and National Holidays between 8:00 a.m. to 6:00 p.m.). In general, the City's Department of Building and Safety enforces Noise Ordinance provisions relative to equipment and the Los Angeles Police Department (LAPD) enforces provisions relative to noise generated by people.

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, single and multiple-family residential, including transient lodging, motels and hotel uses make up the majority of these areas. The closest receptors to the project site include: the multi-family residential uses located adjacent to the northeastern corner of the site, the single-family residential uses located approximately 40 feet north of the site, north of Cantlay Street; the single-family residential uses located approximately 50 feet west of the site, west of Genesta Avenue; and the single-family residential uses located approximately 134 feet southwest of the site, south of Sherman Way. Please see **Figure 4, Noise Monitoring Locations** above and **Table 7,** below.

Short-term noise impacts could occur during construction activities from either the noise impacts created from the transport of workers and movement of construction materials to and from the project site, or from the noise generated onsite during: demolition, site preparation/foundation work, building, and architectural coating activities.

Construction noise levels will vary significantly based upon the size and topographical features of the active construction zone, duration of the work day, and types of equipment employed, as indicated in **Table 8, Typical Construction Equipment Noise Levels**. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Although there would be a relatively high single event noise exposure potential, resulting in potential short-term intermittent annoyances, the effect in long-term ambient noise levels would be small when averaged over longer time. As shown by the ambient noise level measurements in **Table 6, Existing Noise Level Measurements** (see Section V. Existing Noise Conditions of this report), the project vicinity is already exposed to a maximum noise level of 78.9 dBA.

Construction noise associated with the project was calculated utilizing methodology presented in the FTA Transit Noise and Vibration Impact Assessment Manual (2018) together with several key construction parameters including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the project site (see **Appendix C** for details). Distance to receptor calculated from the façade of the receptor to the project boundary line.

Table 7
Closest Sensitive Receptors to the Project Site

Type of use	Description	Closest Noise Measurement Location ID	Structure type/FTA building category	Distance from the façade of the receptor to the project boundary
Residential	Multi-family residential uses located adjacent to the northeastern corner of the project site (7231-7251 Balboa Blvd), east of the cul-de-sac of Cantlay Street	NM3	II. Engineered concrete and masonry (no plaster)	~35 feet
Residential	Single-family residential uses located north of the project site (16943-16955 Cantlay St), on the northern side of Cantlay Street, east of Genesta Avenue.	NM3	III. Non-engineered timber and masonry buildings	~75 feet
Residential	Single-family residential uses located northwest of the project site (7233 Genesta Ave), on the northern side of Cantlay Street, west of Genesta Avenue.	NM3	III. Non-engineered timber and masonry buildings	~120 feet
Residential	Single-family residential uses located west of the project site, west of Genesta Avenue (17000 Cantlay St and 17001 Sherman Way).	NM2	III. Non-engineered timber and masonry buildings	~65 feet
Residential	Single-family residential use located southwest of the project site (17000 Sherman Way), on the south side of Sherman Way, west of Genesta Ave.	NM1	III. Non-engineered timber and masonry buildings	~185 feet

Construction noise levels were calculated for each phase. To be conservative, the noise generated by each piece of equipment was added together for each phase of construction; however, it is unlikely (and unrealistic) that every piece of equipment will be used at the same time, at the same distance from the receptor, for each phase of construction. Furthermore, the construction noise levels reported are conservative and do not take into account any attenuation afforded by intervening structures/buildings/walls which would reduce noise levels at receptor locations by blocking the line-of-sight between the receptor and the construction activities.

Table 8
Typical Construction Equipment Noise Levels

Equipment Description	Impact Device?	Acoustical use Factor (%)	Typical Noise Level @ 50ft (Lmax dBA)
Compressor (air)	No	40	78
Concrete Mixer Truck	No	40	79
Concrete Pump	No	20	81
Concrete Saw	No	20	90
Crane	No	16	81
Drill Rig	No	20	79
Dozer	No	40	82
Forklift [a, b]	No	50	61
Front End Loader	No	40	79
Generator	No	50	81
Grader	No	40	85
Haul/Dump Truck	No	40	76
Paver	No	50	77
Pickup Truck	No	50	77
Roller	No	20	80
Tractor/Loader Backhoe	No	40	79
Welder/Torch	No	40	74

[a] *Warehouse & Forklift Noise Exposure - NoiseTesting.info Carl Stautins, November 4, 2014 http://www.noisetesting.info/blog/carl-strautins/page-3/*

[b] *Data provided Leq as measured at the operator. Sound Level at 50 feet is estimated.*

Source: FHWA RCNM User's Guide, 2006.

Table 9
Construction Noise Levels (by Phase) at Nearest Receptors

Construction Phase	Receptor Location	Construction Noise Levels (dBA Leq) [1]	Allowable Noise Threshold (dBA)	Exceeds Threshold?
Demolition	Multi-family residential adjacent to the Northeast (NM3)	88.6	75	**Yes**
	Closest Residential Receptors to the North (NM3)	82.0	75	**Yes**
	Closest Residential Receptors to the Northwest (NM3)	77.9	75	**Yes**
	Closest Residential Receptors to the West (NM2)	83.3	75	**Yes**
	Closest Residential Receptors to the Southwest (NM1)	74.2	75	No
Site Preparation /Foundation	Multi-family residential adjacent to the Northeast (NM3)	87.6	75	**Yes**
	Closest Residential Receptors to the North (NM3)	81.0	75	**Yes**
	Closest Residential Receptors to the Northwest (NM3)	76.9	75	**Yes**
	Closest Residential Receptors to the West (NM2)	82.3	75	**Yes**
	Closest Residential Receptors to the Southwest (NM1)	73.2	75	No
Building Construction	Multi-family residential adjacent to the Northeast (NM3)	84.6	75	**Yes**
	Closest Residential Receptors to the North (NM3)	77.9	75	**Yes**
	Closest Residential Receptors to the Northwest (NM3)	73.9	75	No
	Closest Residential Receptors to the West (NM2)	79.2	75	**Yes**

Table 9
Construction Noise Levels (by Phase) at Nearest Receptors

Construction Phase	Receptor Location	Construction Noise Levels (dBA Leq) [1]	Allowable Noise Threshold (dBA)	Exceeds Threshold?
	Closest Residential Receptors to the Southwest (NM1)	70.1	75	No
Architectural Coating	Multi-family residential adjacent to the Northeast (NM3)	78.1	75	**Yes**
	Closest Residential Receptors to the North (NM3)	71.5	75	No
	Closest Residential Receptors to the Northwest (NM3)	67.4	75	No
	Closest Residential Receptors to the West (NM2)	72.7	75	No
	Closest Residential Receptors to the Southwest (NM1)	63.6	75	No

[1] *Construction noise level calculations for each phase of construction at each receptor available in **Appendix C** of this report.*

As shown in **Table 9, Construction Noise Levels (by Phase) at Nearest Receptors** above, without incorporation of any mitigation, in the form of best management practices (BMPs), the highest construction noise levels at the most-impacted sensitive receptors located south of the project site could reach up to 88.6 dBA L_{eq} during the site demolition phase of construction, which would exceed the 75 dBA construction noise level defined by the Section 41.40 of the LAMC. However, the sensitive receptor located furthest from the project site, southwest of the project site (17000 Sherman Way), on the south side of Sherman Way, west of Genesta Avenue, would not be impacted by construction noise as the noise levels during all stages of construction do not exceed 75 dBA at that location. Therefore, any other sensitive receptors located 185 feet or greater from the project would also not be impacted by construction noise.

Therefore, mitigation, in the form of BMPs to reduce construction noise would need to be incorporated. See **Table 10, Construction Noise Levels With BMPs (by Phase) at Affected Receptors,** below for details on the reductions in noise levels at receptor locations from incorporation of BMP construction noise mitigation.

Table 10
Construction Noise Levels With Mitigation (by Phase) at Affected Receptors

Construction Phase	Receptor Location	Construction Noise Levels With BMPs (dBA Leq) [1]	Allowable Noise Threshold (dBA)	Exceeds Threshold?
Demolition	Multi-family residential adjacent to the Northeast (NM3)	73.6	75	No
	Closest Residential Receptors to the North (NM3)	67.0	75	No
	Closest Residential Receptors to the Northwest (NM3)	62.9	75	No
	Closest Residential Receptors to the West (NM2)	68.3	75	No
Site Preparation/Foundation	Multi-family residential adjacent to the Northeast (NM3)	72.6	75	No
	Closest Residential Receptors to the North (NM3)	66.0	75	No
	Closest Residential Receptors to the Northwest (NM3)	61.9	75	No
	Closest Residential Receptors to the West (NM2)	67.3	75	No
Building Construction	Multi-family residential adjacent to the Northeast (NM3)	69.6	75	No
	Closest Residential Receptors to the North (NM3)	62.9	75	No
	Closest Residential Receptors to the Northwest (NM3)	58.9	75	No
	Closest Residential Receptors to the West (NM2)	64.2	75	No
Architectural Coating	Multi-family residential adjacent to the Northeast (NM3)	63.1	75	No
	Closest Residential Receptors to the North (NM3)	56.5	75	No

Table 10
Construction Noise Levels With Mitigation (by Phase) at Affected Receptors

Construction Phase	Receptor Location	Construction Noise Levels With BMPs (dBA Leq) [1]	Allowable Noise Threshold (dBA)	Exceeds Threshold?
	Closest Residential Receptors to the Northwest (NM3)	52.4	75	No
	Closest Residential Receptors to the West (NM2)	57.7	75	No

[1] *Includes attenuation from the use of a temporary noise barrier and/or mufflers that would reduce noise levels by 15 dBA.*

As shown in **Table 10**, above, with incorporation of BMPs such as mufflers and/or use temporary construction noise barriers (where feasible) that provide approximately 15 dBA reduction during all phases of construction at receptors located closest to the northern, northwestern, northeastern and western boundaries of project site, construction noise levels would not exceed the applicable standard of 75 dBA at the nearby sensitive receptors. The use of an acoustical curtain, as a temporary construction noise barrier that blocks the line-of-sight between construction activities and receptors, can reduce noise impacts by up to 32 dBA.[2]

These industry-wide BMPs for construction in urban or otherwise noise-sensitive areas detailed in **MM NOI-1**, would be incorporated to attenuate construction noise levels to receptors located to the north, northeast, northwest and west.

Mitigation Measures

MM NOI-1

- The project contractor shall use power construction equipment with state-of-the-art noise shielding and muffling devices capable of a 15 dBA reduction.
- Demolition and construction activities shall be scheduled so as to avoid operating several pieces of equipment simultaneously, which causes high noise levels.
- A temporary noise control barrier/sound curtain shall be installed on the property line of the construction site abutting/facing adjacent multi-family residential uses located to the northeast and the closest residential uses located to the north, northwest and west of the project site. The noise control barrier shall be engineered to block the line-of-sight from the residential uses to the

[2] *Acoustical Surfaces, Inc. Temporary Exterior Quilted Curtains, website: https://www.acousticalsurfaces.com/curtan_stop/sound_blankets.htm.*

construction activity and reduce construction-related noise levels at the adjacent residential structures with a goal of a reduction of 15 dBA. The supporting structure shall be engineered and erected according to applicable codes. The temporary barrier shall remain in place until all windows have been installed and all activities on the project site are complete.

Therefore, with compliance with City noise regulations and incorporation of **MM NOI-1**, construction noise impacts would be less than significant.

As noted above, LAMC Section 41.40 regulates noise from construction activities by regulating the days and hours during which construction may occur. The construction activities associated with the project would comply with these LAMC requirements. In addition, pursuant to LAMC Section 112.05, construction noise levels are exempt from the 75 dBA noise threshold if all technically feasible noise attenuation measures are implemented. In conformance with the requirements of LAMC Section 112.05, implementation of the aforementioned attenuation measures would reduce the noise levels associated with construction of the project to the maximum extent that is technically feasible. Thus, based on the provisions set forth in LAMC 112.05, implementation of the noise attenuation measures provided above would ensure the project would be consistent with the LAMC.

Off-Site Construction Noise Impacts

The highest potential for off-site construction noise is sourced from hauling trips. During the demolition duration of 20 days, the project would generate approximately 7 one-way haul truck trips per day travelling to and from the project site. During the site preparation/foundation duration of 180 days, the project would generate approximately 16 one-way haul truck trips per day travelling to and from the project site. The anticipated outbound haul route from the project site would be along Sherman Way to the I-405 freeway. Approximately 23,000 cubic yards of soil will be excavated and exported from the project site. There are mixed commercial and residential uses along the route. As shown in **Table 8,** above, typical noise from haul trucks driving by can reach up to 76 dBA L_{max} at a distance of 50 feet. As shown in **Table 6, Existing Noise Measurements (dBA)**, the existing noise level along Sherman Way is 78.9 dBA L_{max}, and the intermittent noise from haul trucks passing by would be less than the ambient noise levels. **Therefore, impacts from off-site construction noise would be less than significant and no mitigation measures would be required.**

2. GROUNDBORNE VIBRATION

This impact discussion analyzes the potential for the proposed project to cause an exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Vibration levels in the project area would be influenced by construction activities and from the ongoing operations of the proposed project.

As described in the 2018 Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual*, groundborne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard.[3] In contrast to airborne noise, groundborne vibration is not a common environmental problem, as it is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, heavy trucks traveling on rough roads, and certain construction activities, such as blasting, pile-driving, and operation of heavy earth-moving equipment.[4] Ground-borne vibration generated by man-made activities (e.g., road traffic, construction operations) typically weakens with greater horizontal distance away from the source of the vibration.

The types of construction vibration impact include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ground vibrations from construction activities rarely reach levels that can damage structures, but can achieve the audible and perceptible ranges in buildings close to a construction site.

A. Construction Vibration

Construction activities can produce vibration that may be felt by adjacent uses. The construction of the proposed project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. It is not anticipated that any pile drivers will be used in-site; however, project design feature **PDF NOI-1** has been included below to ensure this. The highest degree of groundborne vibration would be generated during the demolition phase due to the use of a large bulldozer and during the site preparation/foundation phase due to the operation of a bore/drill rig. Based on the FTA data (see **Table 1, Vibration Source Levels for Construction Equipment**), vibration velocities from both a large bulldozer and caisson drill operation are estimated to be approximately 0.089 inch-per-second PPV (87 VdB) at 25 feet from the source of activity.[5]

Annoyance to Persons

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

[3] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 7, 2018.*
[4] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 7, 2018.*
[5] *Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.*

believe that the vibration is damaging their home, although vibration levels are well below minimum thresholds for damage potential.

Per the FTA Transportation and Construction Vibration Guidance Manual (May 2018), land uses sensitive to vibration include: buildings where people normally sleep, such as dwelling units, hotels, and hospitals; research and manufacturing facilities that are vibration-sensitive such as hospitals with vibration-sensitive equipment and universities conducting physical research operations; and institutions and offices that have vibration-sensitive equipment and have the potential for activity interference such as schools, churches, and doctors' offices. Further, the FTA states that commercial or industrial locations including office buildings are not included in this category, unless there is vibration-sensitive activity or equipment within the building.

The nearest off-site buildings to the area of construction activity with sensitive receptors are: the multi-family residential uses located approximately 35 feet from the northwestern corner of the project site, the single-family residential uses located approximately 75 feet to the north and the single-family residential uses located approximately 65 feet to the west. Other vibration sensitive receptors are located further from the Site and would have lower impacts.

As shown in **Table 3**, **Groundborne Vibration and Groundborne Noise Impact Criteria**, vibration from frequent events can be annoying to Category 2 uses (and any buildings where people sleep) at a level 72 VdB. At a distance of 35 feet, use of a large bulldozer or caisson drill would be expected to generate a vibration level of 82.62 VdB and at a distance of 65 feet that vibration level would be 74.55 VdB, and at 75 feet the vibration level would be 72.69 VdB. [6] As the use of a large bulldozer or caisson drill at a distance less than 80 feet from the residential use would exceed 72 VdB for Category 2 land uses, mitigation to the adjacent sensitive land uses is required.

At a distance of 80 feet, use of a large bulldozer or caisson drill would generate a VdB of 71.9. Therefore, with incorporation of mitigation measure **MM NOI-2** below, which restricts use of a large bulldozer or caisson drill within 80 feet of the façade of the residential use located adjacent to the northeastern and closest to the northern and western boundaries of the site, annoyance-based vibration levels would no longer exceed vibration annoyance thresholds. **Therefore, with incorporation of MM NOI-2 into the project, annoyance-based vibration impacts to the closest sensitive uses located west and south of the Site, would be reduced to a level of less than significant.**

The following mitigation measure is incorporated into the project to reduce the annoyance to sensitive receptors from construction-related vibration levels to a level of less than significant.

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

Mitigation Measures

MM NOI-2: The construction contractor shall not use large excavators, bulldozers or caisson drills within 80 feet of the façade of the residential uses located adjacent to the northeastern portion of the site and the residential uses located closest to the northern and western boundaries of the project site.

Architectural Damage

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

Table 2, Construction Vibration Damage Criteria, identifies a PPV level of 0.2 as the threshold at which there is a risk to non-engineered timber and masonry buildings. The building façade of the closest commercial use located adjacent to the eastern boundary of the project is located approximately 3 feet from the project boundary. At a distance of 3 feet, a large bulldozer or caisson drill would generate 2.141 in/sec PPV (please see vibration calculations available in **Appendix C** of this report for details). Therefore, vibration damage to the closest building could potentially occur during construction of the project.

At a distance of 15 feet from building facades, the vibration level from a large bulldozer or caisson drill is 0.191 in/sec PPV (please see vibration calculations available in **Appendix C** of this report for details). Therefore, to avoid the potential for any structural damage to the closest building, a bulldozer or caisson drill must not be operated within 15 feet of the façade of the adjacent commercial building. **With the incorporation of project design feature PDF-NOI-1** and **mitigation measure MM NOI-3 into the project, impacts from groundborne vibration would be reduced to a level of less than significant.**

The following project design feature and mitigation measures are incorporated into the project to reduce construction-related vibration levels to a level of less than significant.

Project Design Features

PDF NOI-1 The construction contractor shall not use pile drivers on the project site.

Mitigation Measures

MM NOI-3: The construction contractor shall not use large excavators, bulldozers, or caisson drills within 15 feet of the façades of the commercial building located to the east of the project boundary.

MM NOI-2 requires that any heavy machinery (e.g., excavators, bulldozers, caisson drills) is to be operated at least 80 feet from the façade of the residential uses located adjacent to the northwest and close to the western and northern boundaries of the project site. Construction activity that must occur within this distance to the closest residential façades would need to be performed with smaller equipment types that do not exceed the vibration thresholds applied herein. As discussed above and shown in **Appendix C** of this report, the estimated maximum vibration levels for the construction of the proposed project with the use of required setback distance mitigation measures (**MM NOI-2**) would be less than significant.

With incorporation of project design feature PDF NOI-1, and mitigation measures MM NOI-2 and MM NOI-3, annoyance-based vibration impacts to sensitive receptors closest to the site and vibration impacts to buildings adjacent to the project site will be less than significant.

B. Operational Vibration

The project proposes the construction of a new, 4-story, 110,891 SF mixed-use building which includes 111 apartments and 5,300 SF of retail uses, on top of a 182-space, approximately 72,800 SF subterranean parking structure. The project would not involve the use of stationary equipment that would result in high vibration levels, which are more typical for large manufacturing and industrial projects. Groundborne vibrations at the project site and immediate vicinity currently result from heavy-duty vehicular travel (e.g., refuse trucks and transit buses) on the nearby local roadways, and the proposed land uses at the project site would not result in a substantive increase of these heavy-duty vehicles on the public roadways. While refuse trucks would be used for the removal of solid waste at the project site, these trips would typically only occur once a week and would not be any different than those presently occurring in the vicinity of the project site. **As such, vibration impacts associated with operation of the project would be less than significant and no mitigation measures would be required.**

3. OPERATIONAL NOISE

This impact discussion analyzes the potential for a substantial permanent increase in ambient noise levels in the project vicinity associated with operation of the proposed project, including impacts related to offsite vehicular noise and exposure of neighboring land uses to onsite noise.

A. Parking Noise

The proposed parking areas have the potential to generate noise due to cars entering and exiting, engines accelerating, braking, car alarms, squealing tires, and other general activities associated with people using the parking areas (i.e., talking, opening/closing doors, etc.). Noise levels within the parking areas would fluctuate with the amount of automobile and human activity. Activity levels would be highest in the early morning and evening when the largest number of people would enter and exit as they go to or return from work. However, these events would occur at low exiting and entering speeds, which would not generate high noise levels. During these times, the noise levels can range from 36 to 69 dBA Leq at a distance of 50 feet from the source.[7] As the parking areas would be enclosed, except for the driveway area which would have garage access from Genesta Avenue, noise generated from within the parking area would be attenuated by the structure and not exceed existing noise levels of 56.4 dBA Leq, at the closest receptors to the entrance to the parking garage, located west of the project site on the western side of Genesta Avenue, and would therefore not adversely affect any off-site sensitive receptors. Furthermore, operational noise generated by motor vehicles within the project site is regulated under the LAMC. Specifically, Section 114.02 of the LAMC prohibits the operation of any motor vehicles upon any property within the City such that the created noise would cause the noise level on the premises of the property to exceed the ambient noise level by more than five decibels. LAMC Section 114.06 prohibits any person to install, operate or use any vehicle theft alarm system that emits or causes the emission of an audible sound, which is not, or does not become, automatically and completely silenced within five minutes. LAMC Section 114.03 prohibits loading or unloading of any vehicle, operating any dollies, carts, forklifts, or other wheeled equipment, which causes any impulsive sound, raucous or unnecessary noise within 200 feet of any residential building between the hours of 10:00 P.M. and 7:00 A.M. of the following day. **Therefore, through project design and compliance with existing LAMC regulations, noise impacts associated with parking would be less than significant and no mitigation measures would be required.**

B. Stationary Noise Sources

HVAC

As part of the project, HVAC units are anticipated to installed for the proposed use. Based on estimated A-weighted noise ratings published for standard HVAC equipment,[8] sound power from rooftop mounted HVAC equipment would be expected to range from 69 dBA Leq to 74 dBA Leq at the source. Sound power is the sound energy released from a source, which cannot be heard, while sound pressure is the sound that is heard based on the environment and distance to a receptor. By converting a 74-dBA sound power level at a source to sound pressure levels at 50 feet using standard acoustical fundamentals and formulas,[9] the sound pressure level for HVAC equipment would be approximately 39.9 dBA at 50 feet. The closest receptor would be located at least 135 feet from the HVAC units that will be placed on eastern side of the building, on the roof. As shown in **Table 6**, ambient noise levels at the closest receptor to the HVAC system (NM3 at the end of the cul-de-sac of Cantlay Street, east of Genesta Avenue, in proximity to the single-family residential uses located on the northern side of Cantlay Street and the multifamily residential uses located adjacent to the northeastern corner of the project site) would be 55.6 dBA Leq. The noise level generated by the HVAC system at 135 feet would be 31.27 dBA. Therefore, noise levels from use of HVAC would not exceed existing noise levels at sensitive receptor locations in the project vicinity.

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[7] *Gordon Bricken & Associates, 1996. Estimates are based on actual noise measurements taken at various parking lots.*

[8] *Carrier Corporation, Product Data Sheet for 25HBC5 Base 15 Heat Pump with Puron Refrigerant (1½ to 5 Nominal Tons.*

[9] *Daikin, HVAC Acoustic Fundamentals, Application Guide 31-010, Calculating Sound Pressure from Sound Power, pg. 16.*

Although the operation of this equipment would generate noise, the design of all of the project's mechanical equipment would be required to comply with the regulations under Section 112.02 of the LAMC, which prohibits noise from air conditioning, refrigeration, heating, pumping, and filtering equipment from exceeding the ambient noise level on the premises of other occupied properties by more than 5 decibels.

Level 4 Roof Terrace

Noise associated with the level 4 roof terrace would consist primarily of people talking. This would result in noise levels of approximately 60-65 dBA at three feet.[10] The roof terrace area is located approximately 45 feet above ground level and 135 feet from the closest receptor. At 135 feet, the noise from conversation would be approximately 31.94 dBA which would be below measured ambient noise levels at the closest receptor locations (i.e., 55.6 dBA measured along Cantlay Street north of the project site). Noise from use of the Level 4 Roof Terrance would be imperceptible at off-site receptor locations.

Therefore, impacts from stationary noise sources would be less than significant and no mitigation measures would be required.

C. Traffic Noise

In order for a new noise source to be audible, there would need to be a 3 dBA or greater CNEL noise increase. The traffic volume on any given roadway would need to double in order for a 3 dBA increase in ambient noise to occur.[11] The project is a mixed commercial/residential use. The City's 2023 Transportation Assessment (TIA) concluded that implementation of the project would not result in a significant transportation impact. The VMT analysis in the TIA showed that the project would generate 767 daily vehicle trips. Traffic count data from NavigateLA shows that the traffic volumes at Balboa Boulevard south of Sherman Way (the closest intersection with available data) would total 30,888 average daily trips (ADT). Therefore, even if all the project's traffic trips were added to the traffic volume on the roadway segments in the project Vicinity, the project would not generate a doubling of traffic volumes on any roadways within the project vicinity.

Therefore, the project will not cause the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Impacts are less than significant.

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[10] *California Department of Transportation, Technical Noise Supplement, October 1998.*

[11] *CODOT, website: https://www.codot.gov/programs/research/assets/Brochures/NoiseBrochureFinal.pdf.*

4. AIRPORT NOISE

This impact discussion analyzes the potential for nearby airports or private airstrips to expose people residing or working in the project area to excessive noise levels. The nearest airport is Van Nuys Airport, located approximately 0.5 miles east of the project site. **The project site falls well outside the 65 dBA noise contour[12] and is not considered as a source that contributes to the ambient noise levels on the project site. Impacts are considered to be less than significant.**

[12] *Los Angeles World Airports, Van Nuys Airport, Noise Measurement, website: https://www.lawa.org/-/media/lawa-web/environment/files/vny---quarterly-noise-report/vny3q22_20221201_quarterly-report-map.ashx.*

VII. NOISE/VIBRATION MITIGATION

1. CONSTRUCTION MITIGATION

MM NOI-1

- The project contractor shall use power construction equipment with state-of-the-art noise shielding and muffling devices capable of a 15 dBA reduction.
- Demolition and construction activities shall be scheduled so as to avoid operating several pieces of equipment simultaneously, which causes high noise levels.
- A temporary noise control barrier/sound curtain shall be installed on the property line of the construction site abutting/facing adjacent multi-family residential uses located to the northeast and the closest residential uses located to the north, northwest and west of the project site. The noise control barrier shall be engineered to block the line-of-sight from the residential uses to the construction activity and reduce construction-related noise levels at the adjacent residential structures with a goal of a reduction of 15 dBA. The supporting structure shall be engineered and erected according to applicable codes. The temporary barrier shall remain in place until all windows have been installed and all activities on the project site are complete.

MM NOI-2: The construction contractor shall not use large excavators, bulldozers, or caisson drills within 80 feet of the façade of the residential uses located adjacent to the northeastern portion of the site and the residential uses located closest to the northern and western boundaries of the project site.

MM NOI-3: The construction contractor shall not use large excavators, bulldozers, or caisson drills within 15 feet of the façades of the commercial buildings located to the east of the project boundary.

Project Design Features

PDF NOI-1 The construction contractor shall not use pile drivers on the project site.

2. OPERATIONAL MITIGATION

None required.

VIII. LIST OF ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
dBA/DD	A-weighted decibel per each doubling of distance
DOT	Department of Transportation
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
FTA	Federal Transit Administration
Hz	Hertz
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
L_{max}, L_{min}	RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. L_{min} is the minimum level.
L_V	Vibration Level
ONAC	Federal Office of Noise Abatement Control
ONC	California Department of Health Services Office of Noise Control
OSHA	Occupational Safety and Health Administration
PPV	peak particle velocity
PMC	Pasadena Municipal Code
RMS	root mean square
SEL	Single Event Level
sq ft	square feet
UMTA	Urban Mass Transit Administration
VdB	L_V at 1 microinch per second

IX. REFERENCES

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Los Angeles, City of. 1999. Noise Element of the General Plan.

Los Angeles, City of. 2023. Los Angeles Department of Transportation (LADOT). Transportation Impact Assessment for The Sherman Way Mixed-Use Project Located At 16949-16955 West Sherman Way (CPC-2022-7854-ZCJ-SPR-WDI-HCA/ENV-2022-7855-EAF). January 5.

U.S. Department of Transportation. 2006. FHWA Roadway Construction Noise Model User's Guide. January. Website: http://www.fhwa.dot.gov/environment/noise/rcnm/rcnm.pdf.

APPENDICES

APPENDIX A: STUDY AREA PHOTOGRAPHIC INDEX AND NOISE MEASUREMENT DATA

KWAQN

Office
7404 Kingsley Way,
Riverside, CA

15-Minute Noise Measurement Datasheet

Project: 16949-16955 West Sherman Way
Site Address/Location: 16955 Sherman Way, Los Angeles, CA 91406
Date: 5/31/2022
Field Tech/Engineer: Ian Edward Gallagher

General Location: 16955 Sherman Way, Los Angeles, CA 91406
Sound Meter: Larson Davis Sound Track LxT1 **SN:** 3855
Settings: A-weighted, slow, 10-sec, 15-minute interval
Meteorological Con.: 80 deg F, 3-5 mph wind, 10% humidity, clear skies, sunshine.
Site ID: NM-1 ,2 & 3.

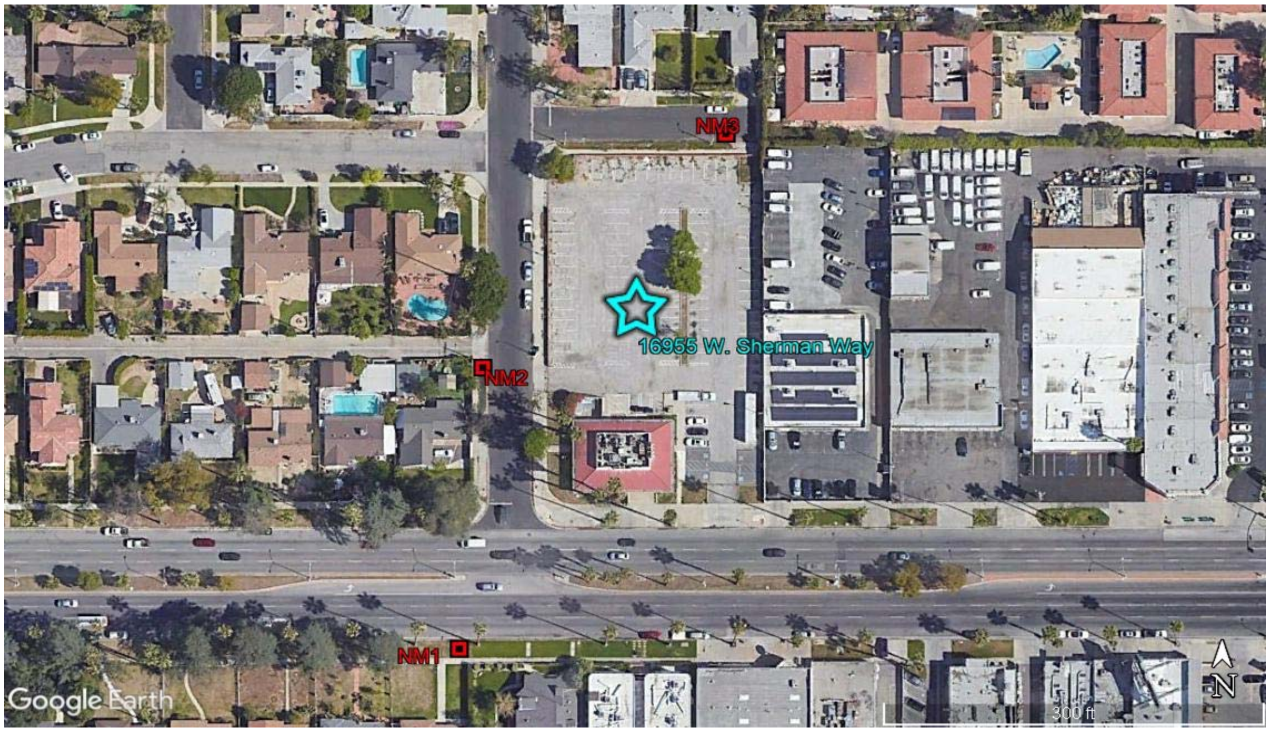
Site Observations: Main noise sources are from vehicular traffic travelling along W Sherman Way , Genesta Ave, Cantlay St & other surrounding roads . The local buildings reflect & refract much of the sound. Occasional low altitude aircraft, both fixed wing & helicopters passing overhead. Leaf rustle from nearby trees, palmtrees & other vegetation due to 8 mph breeze.

Site Topo: Asphalt parking lot, building SE corner, area fenced in.
Ground Type: Urban conditions, acoustically refractive, reflective & absorptive.

NM locations, latitude , longitude :

NM1 Meter: 34°12'3.66"N 118°30'12.45"W
NM3 Meter: 34°12'7.93"N 34°12'7.93"N
NM2 Meter: 34°12'5.99"N 118°30'12.23"W

Figure 1: Monitoring Locations



KWAQN

Office
7404 Kingsley Way,
Riverside, CA

15-Minute Noise Measurement Datasheet - Cont.

Project: 16949-16955 West Sherman Way
Site Address/Location: 16955 Sherman Way, Los Angeles, CA 91406
Site ID: NM-1 ,2 & 3.

Figure 2: NM1 Photo

NM1 looking NNE across Sherman Way towards Genesta Avenue intersection, residence 17001 Sherman Way Van Nuys, on the left of intersection, site 16955 on the right of intersection.
482 vehicles passed microphome travelling alomg Sherman Way during 15 minute noise measurent.

Figure 3: NM2 Photo

NM2 looking SE across Genesta Avenue towards building 16955 W Shernan Way. Genesta Avenue intersection with Sherman Way on the far right of photo.
12 vehicles passed microphome travelling along Genesta Avenue during 15 minute noise measurent.

Office
7404 Kingsley Way,
Riverside, CA

15-Minute Noise Measurement Datasheet - Cont.

Project: 16949-16955 West Sherman Way
Site Address/Location: 16955 Sherman Way, Los Angeles, CA 91406
Site ID: NM-1 ,2 & 3.

Figure 4: NM3 Photo

NM3 looking W down Cantlay Street towards Genesta Avenue (50 yards). Residences 16955,16949 & 16943 Cantlay Street on the right. Site area aging, asphalt parking lot on the left behind fence.

Office
7404 Kingsley Way,
Riverside, CA

15-Minute Noise Measurement Datasheet - Cont.

Project: 16949-16955 West Sherman Way
Site Address/Location: 16955 Sherman Way, Los Angeles, CA 91406
Site ID: NM-1 ,2 & 3.

Table 1: Noise Measurement Summary

Location	Start	Stop	Leq/ dB	Lmax/ dB	Lmin/ dB	L2/ dB	L8/ dB	L25/ dB	L50/ dB	L90/ dB
NM 1	2:02 PM	2:17 PM	70.3	78.9	47.7	76.9	75.1	71.8	67.7	53.7
NM 2	2:38 PM	2:53 PM	56.4	70.7	46.2	67.0	63.5	60.1	56.9	50.6
NM 3	3:12 PM	3:27 PM	55.6	70.4	43.3	66.1	59.3	52.4	48.6	45.5

APPENDIX B: NOISE METER PRINTOUTS

Measurement Report

Report Summary

Meter's File Name	LxT_Data.019.s	Computer's File Name	LxT_0003855-20220531 140259-LxT_Data.019.ldbin
Meter	LxT1 0003855		
Firmware	2.404		
User	Ian Edward Gallagher	Location	NM1 34°12'3.66"N 118°30'12.45"W
Job Description	15 minute noise measurement (1 x 15 minutes)		
Note	KWAQN 16949-16955 West Sherman Way		

Start Time	2022-05-31 14:02:59	Duration	0:15:00.0		
End Time	2022-05-31 14:17:59	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	70.3 dB		
LAE	99.9 dB	SEA	--- dB
EA	1.1 mPa²h	LAFTM5	73.7 dB
EA8	34.5 mPa²h		
EA40	172.5 mPa²h		
LA_{peak}	98.6 dB	2022-05-31 14:04:00	
LAS_{max}	78.9 dB	2022-05-31 14:08:36	
LAS_{min}	47.7 dB	2022-05-31 14:09:29	
LA_{eq}	70.3 dB		
LC_{eq}	74.8 dB	LC_{eq} - LA_{eq}	4.4 dB
LAI_{eq}	71.5 dB	LAI_{eq} - LA_{eq}	1.2 dB

Exceedances

Exceedances	Count	Duration
LAS > 65.0 dB	30	0:10:20.3
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 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}	70.3 dB		74.8 dB		--- dB	
$Ls_{(max)}$	78.9 dB	2022-05-31 14:08:36	--- dB		--- dB	
$LS_{(min)}$	47.7 dB	2022-05-31 14:09:29	--- dB		--- dB	
$L_{Peak(max)}$	98.6 dB	2022-05-31 14:04:00	--- dB		--- dB	

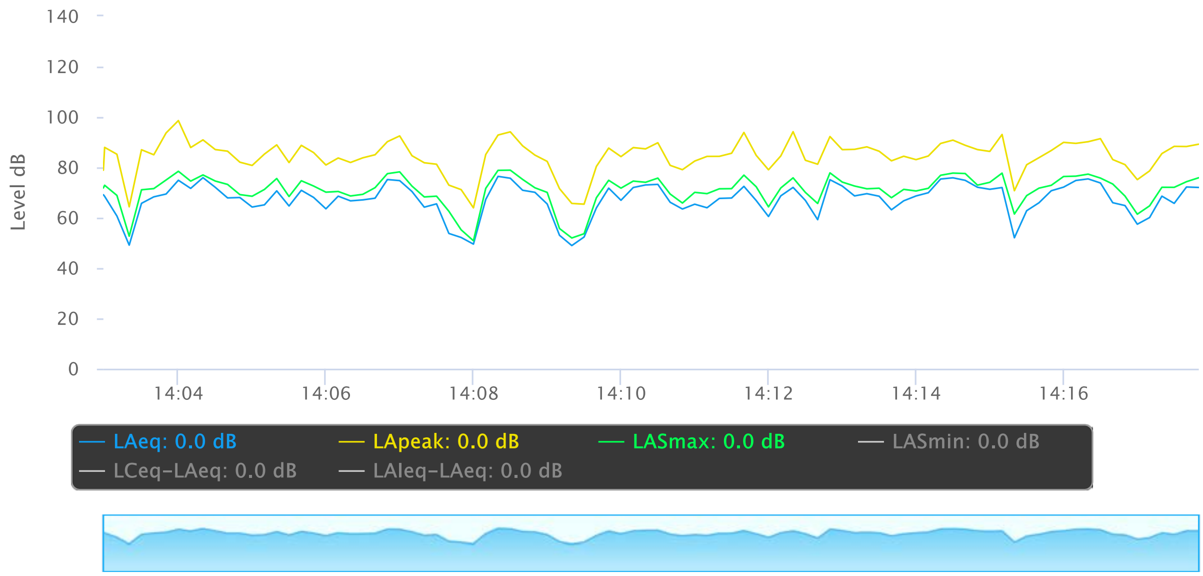
Overloads

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

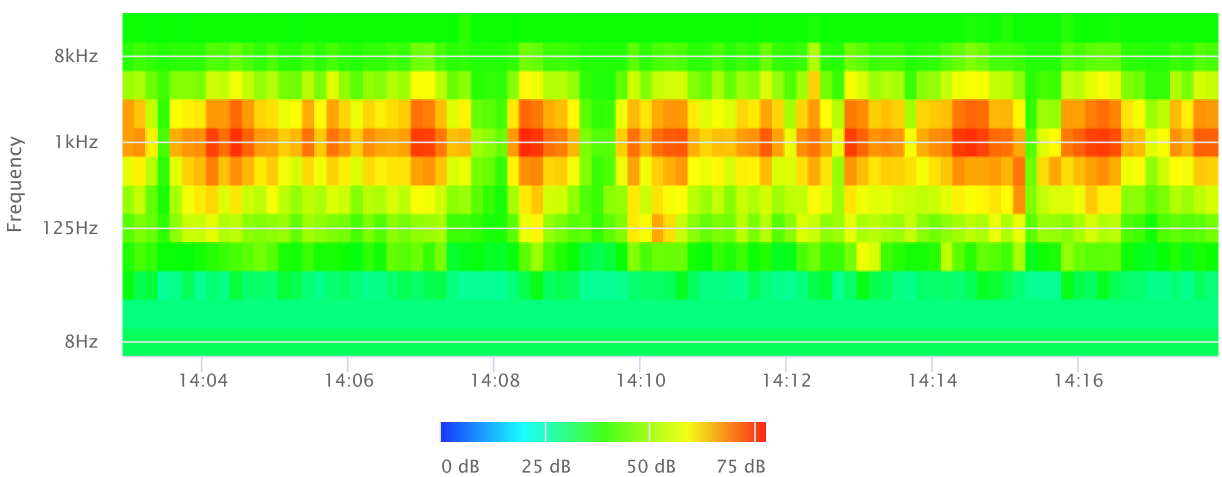
Statistics

LAS 2.0	76.9 dB
LAS 8.0	75.1 dB
LAS 25.0	71.8 dB
LAS 50.0	67.7 dB
LAS 66.6	64.3 dB
LAS 90.0	53.7 dB

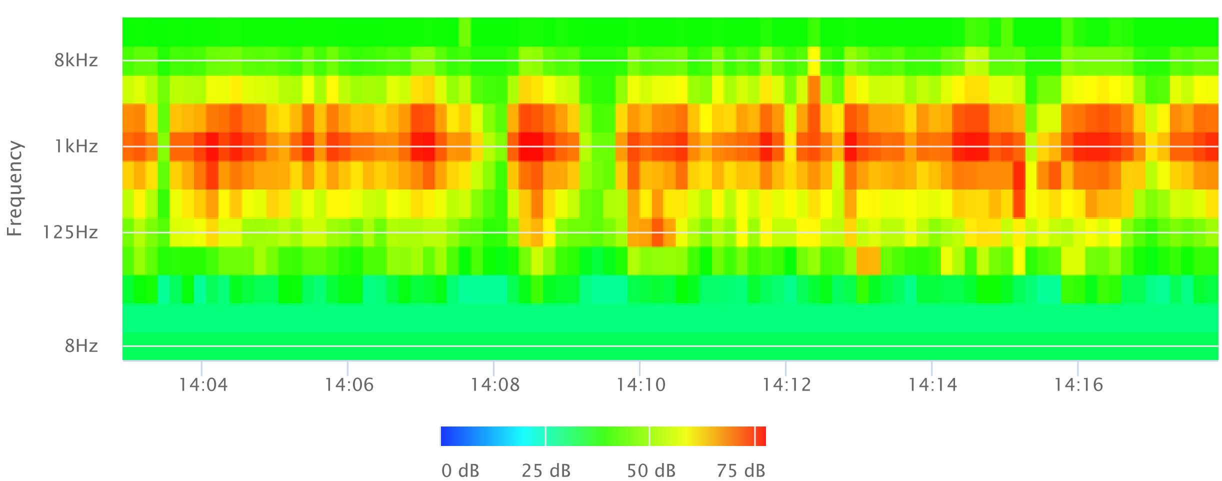
Time History



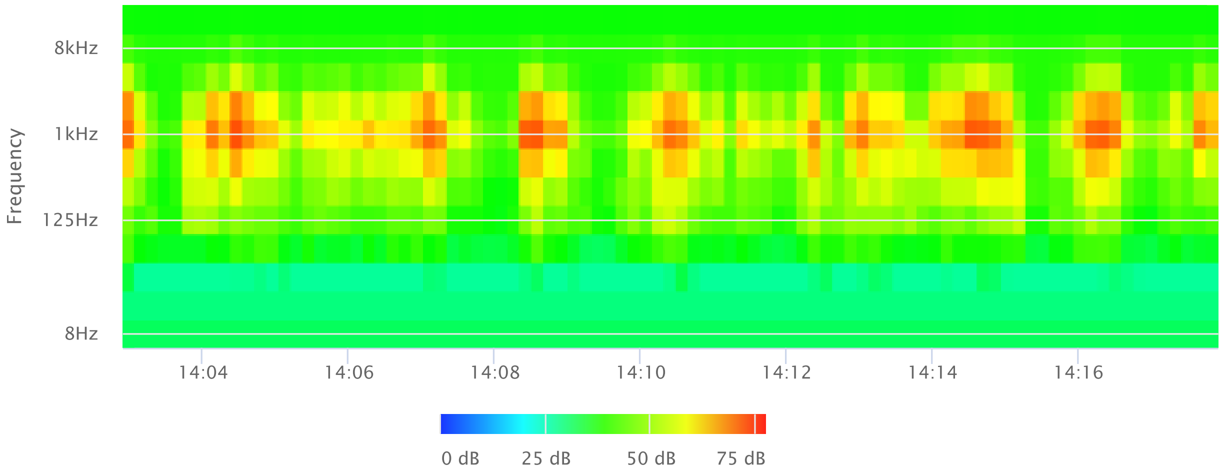
OBA 1/1 Leq



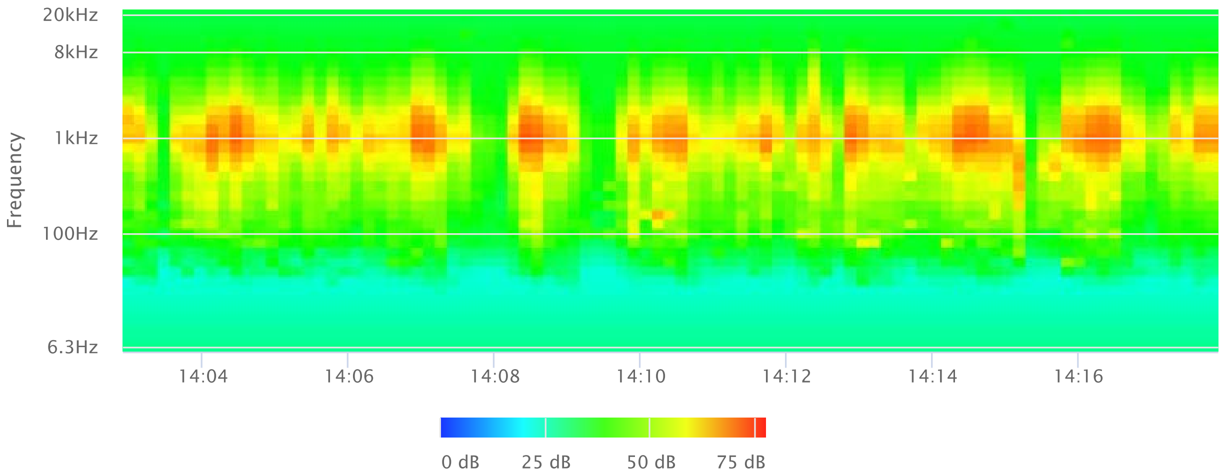
OBA 1/1 Lmax



OBA 1/1 Lmin



OBA 1/3 Leq



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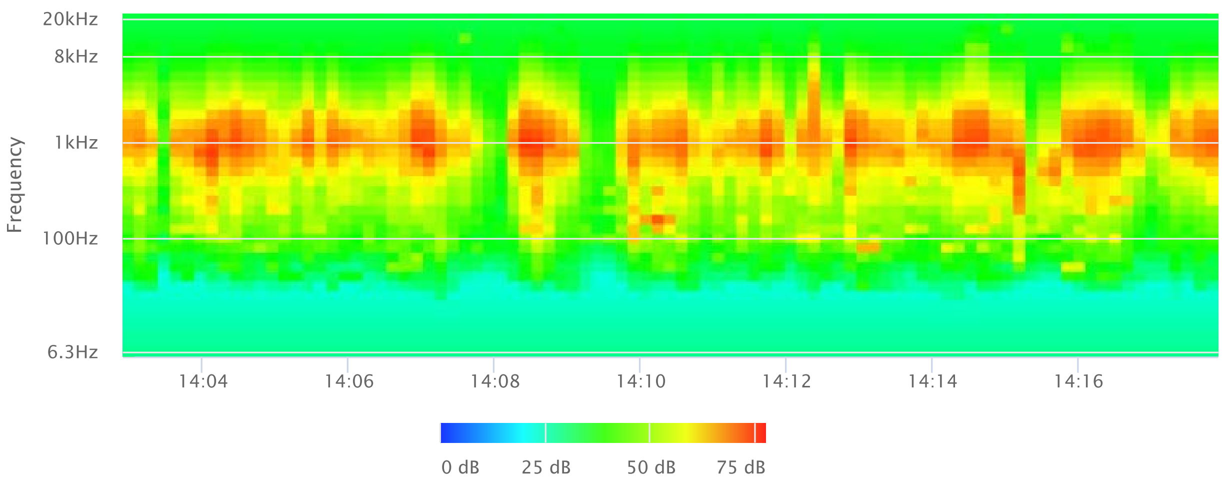
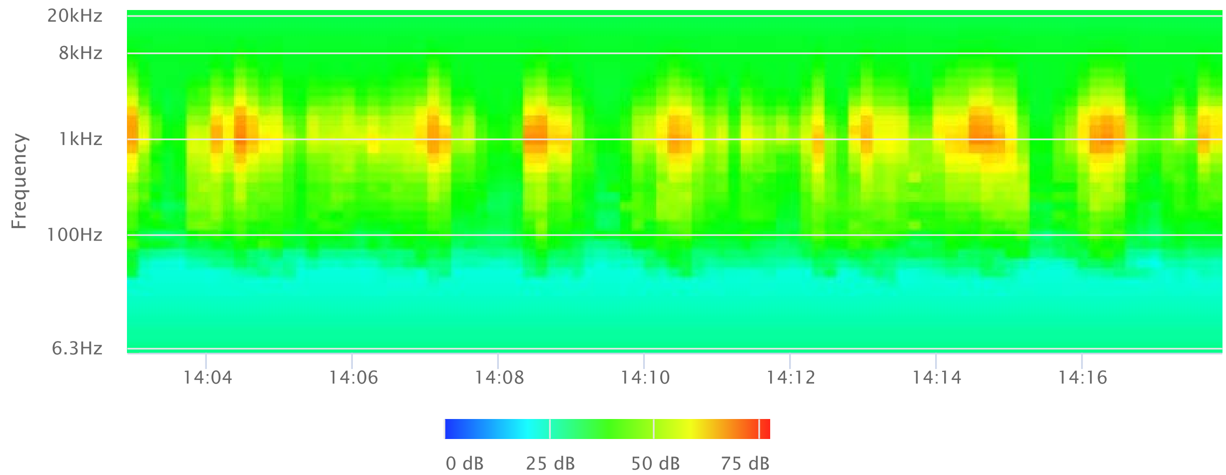


OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
14:04
14:06
14:08
14:10
14:12
14:14
14:16
0 dB
25 dB
50 dB
75 dB

Measurement Report

Report Summary

Meter's File Name	LxT_Data.020.s	Computer's File Name	LxT_0003855-20220531 143827-LxT_Data.020.ldbin
Meter	LxT1 0003855		
Firmware	2.404		
User	Ian Edward Gallagher	Location	NM2 34°12'5.99"N 118°30'12.23"W
Job Description	15 minute noise measurement (1 x 15 minutes)		
Note	KWAQN 16949-16955 West Sherman Way		

Start Time	2022-05-31 14:38:27	Duration	0:15:00.0		
End Time	2022-05-31 14:53:27	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	59.5 dB		
LAE	89.0 dB	SEA	--- dB
EA	88.9 µPa²h	LAFTM5	63.7 dB
EA8	2.8 mPa²h		
EA40	14.2 mPa²h		
LA_{peak}	88.8 dB	2022-05-31 14:48:30	
LAS_{max}	70.7 dB	2022-05-31 14:47:43	
LAS_{min}	46.2 dB	2022-05-31 14:49:50	
LA_{eq}	59.5 dB		
LC_{eq}	68.1 dB	LC_{eq} - LA_{eq}	8.6 dB
LAI_{eq}	61.7 dB	LAI_{eq} - LA_{eq}	2.2 dB

Exceedances	Count	Duration
LAS > 65.0 dB	7	0:01:04.4
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 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

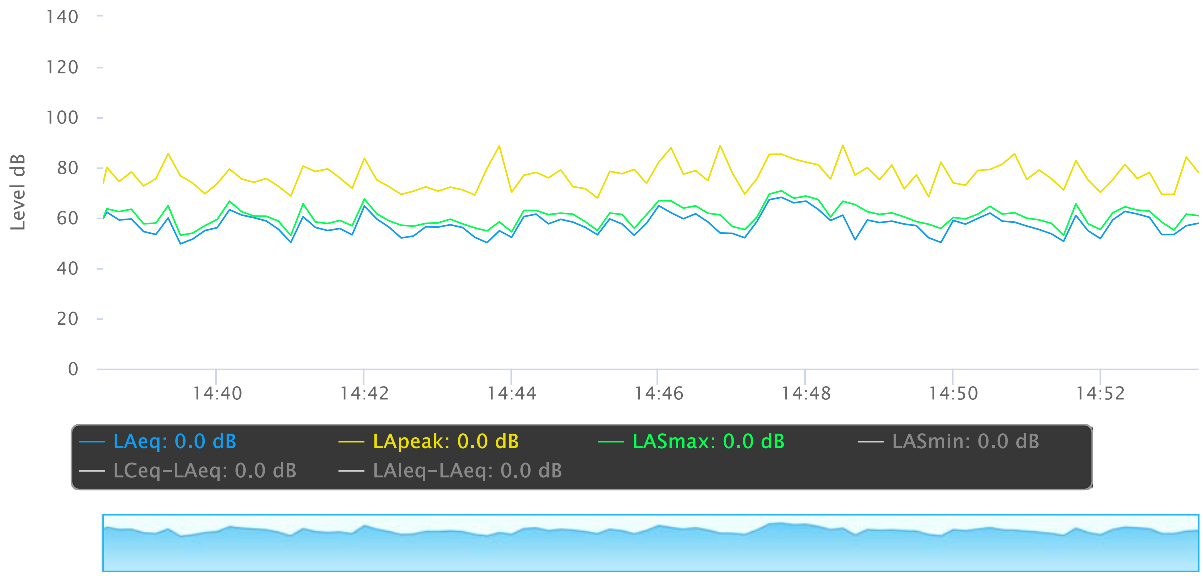
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	59.5 dB		68.1 dB		--- dB	
$Ls_{(max)}$	70.7 dB	2022-05-31 14:47:43	--- dB		--- dB	
$LS_{(min)}$	46.2 dB	2022-05-31 14:49:50	--- dB		--- dB	
$L_{Peak(max)}$	88.8 dB	2022-05-31 14:48:30	--- dB		--- dB	

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

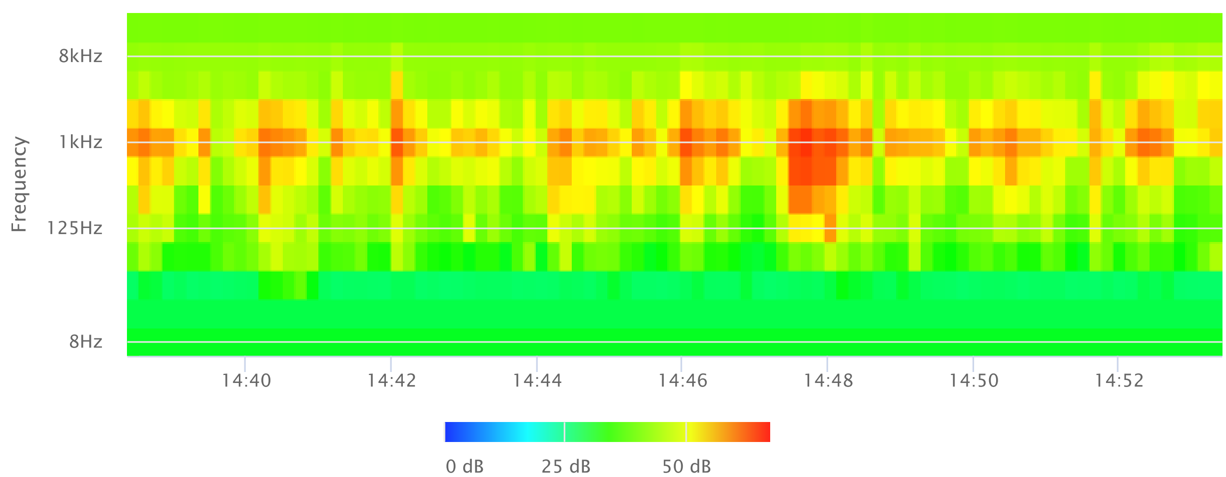
Statistics

LAS 2.0	67.0 dB
LAS 8.0	63.5 dB
LAS 25.0	60.1 dB
LAS 50.0	56.9 dB
LAS 66.6	55.0 dB
LAS 90.0	50.6 dB

Time History



OBA 1/1 Leq



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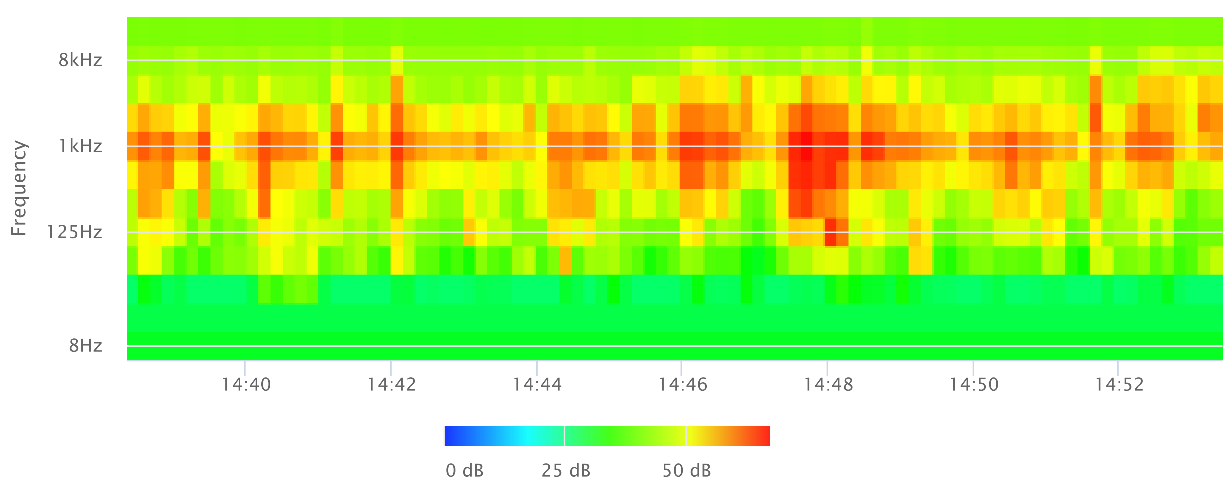

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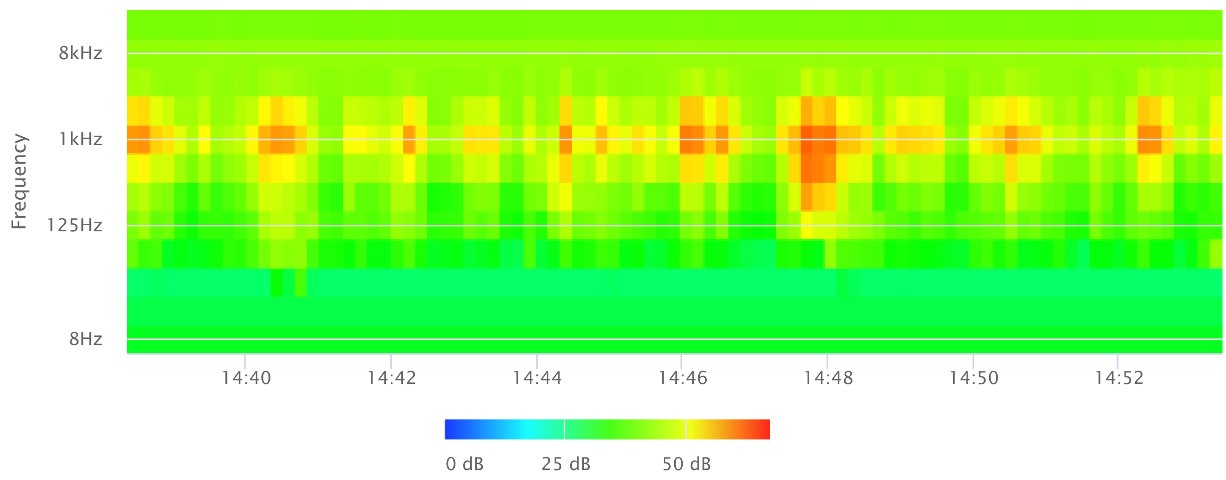
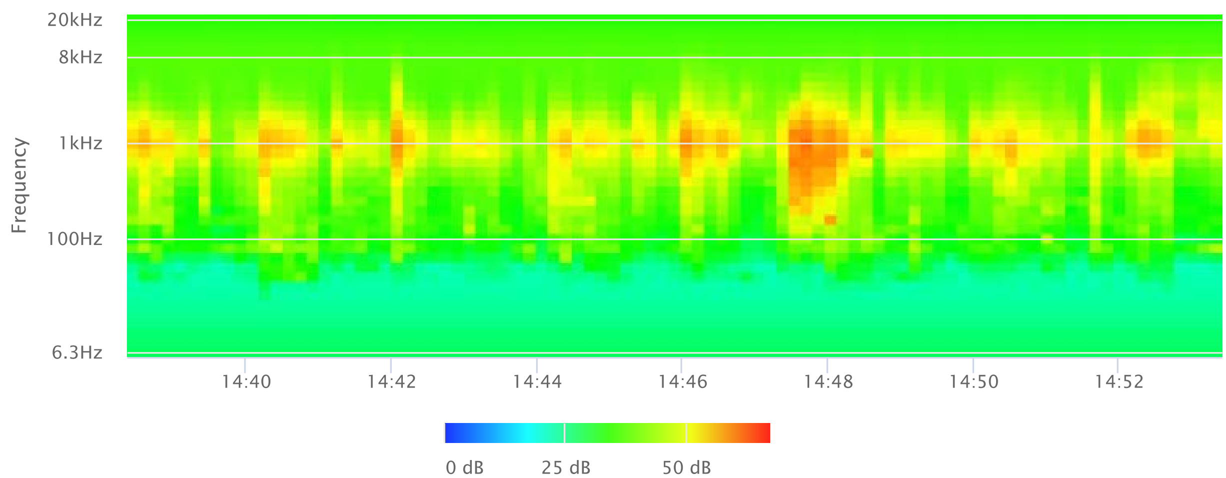
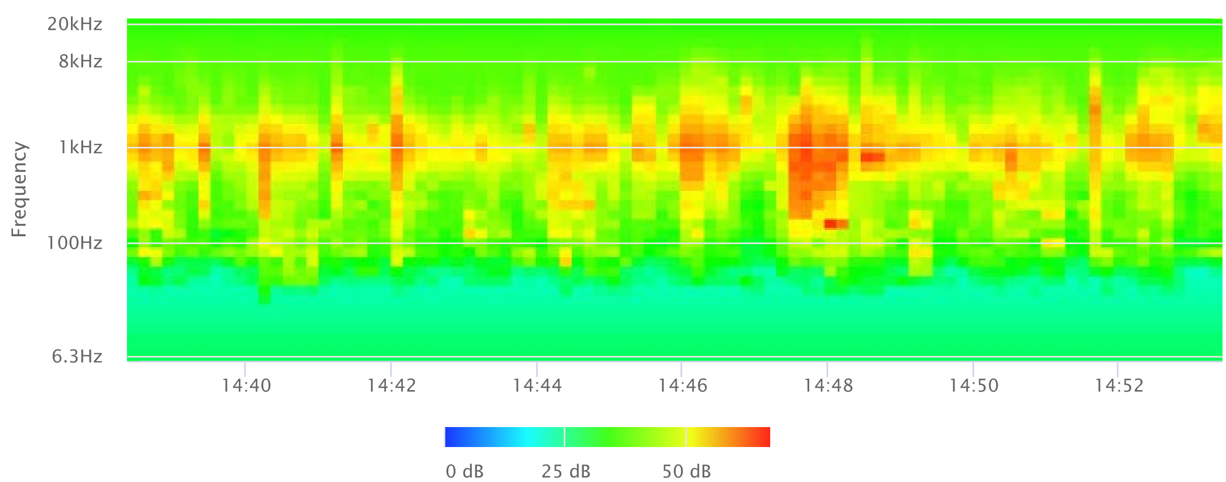


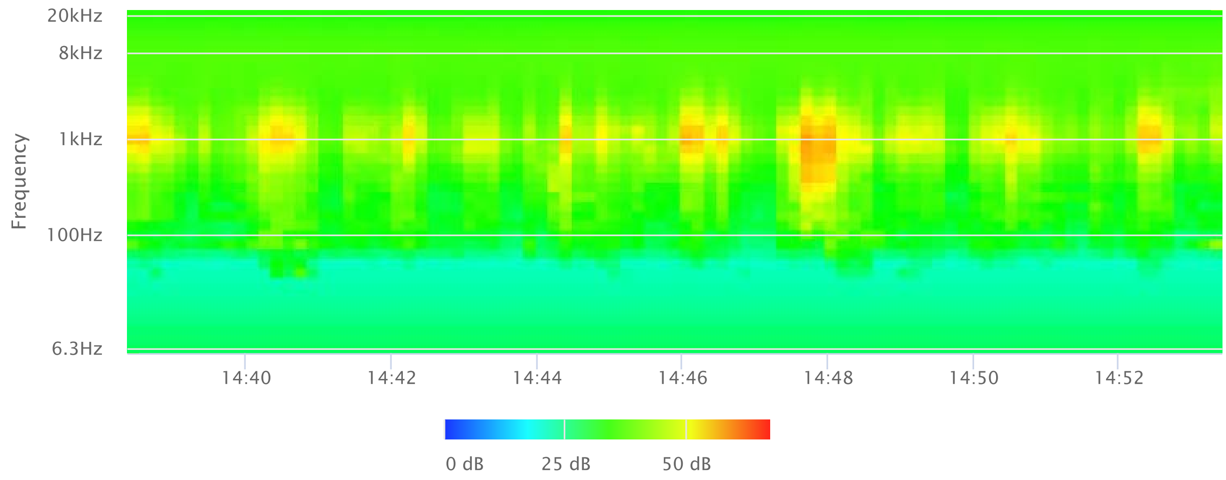
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin



20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
14:40
14:42
14:44
14:46
14:48
14:50
14:52
0 dB
25 dB
50 dB

Measurement Report

Report Summary

Meter's File Name	LxT_Data.021.s	Computer's File Name	LxT_0003855-20220531 151226-LxT_Data.021.ldbin
Meter	LxT1 0003855		
Firmware	2.404		
User	Ian Edward Gallagher	Location	NM3 34°12'7.93"N 118°30'9.95"W
Job Description	15 minute noise measurement (1 x 15 minutes)		
Note	KWAQN 16949-16955 West Sherman Way		

Start Time	2022-05-31 15:12:26	Duration	0:15:00.0		
End Time	2022-05-31 15:27:26	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	55.6 dB		
LAE	85.1 dB	SEA	--- dB
EA	36.2 µPa²h	LAFTM5	59.5 dB
EA8	1.2 mPa²h		
EA40	5.8 mPa²h		
LA_{peak}	84.0 dB	2022-05-31 15:25:51	
LAS_{max}	70.4 dB	2022-05-31 15:25:47	
LAS_{min}	43.3 dB	2022-05-31 15:15:27	
LA_{eq}	55.6 dB		
LC_{eq}	65.5 dB	LC_{eq} - LA_{eq}	9.9 dB
LAI_{eq}	57.5 dB	LAI_{eq} - LA_{eq}	1.9 dB

Exceedances	Count	Duration
LAS > 65.0 dB	3	0:00:34.3
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 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

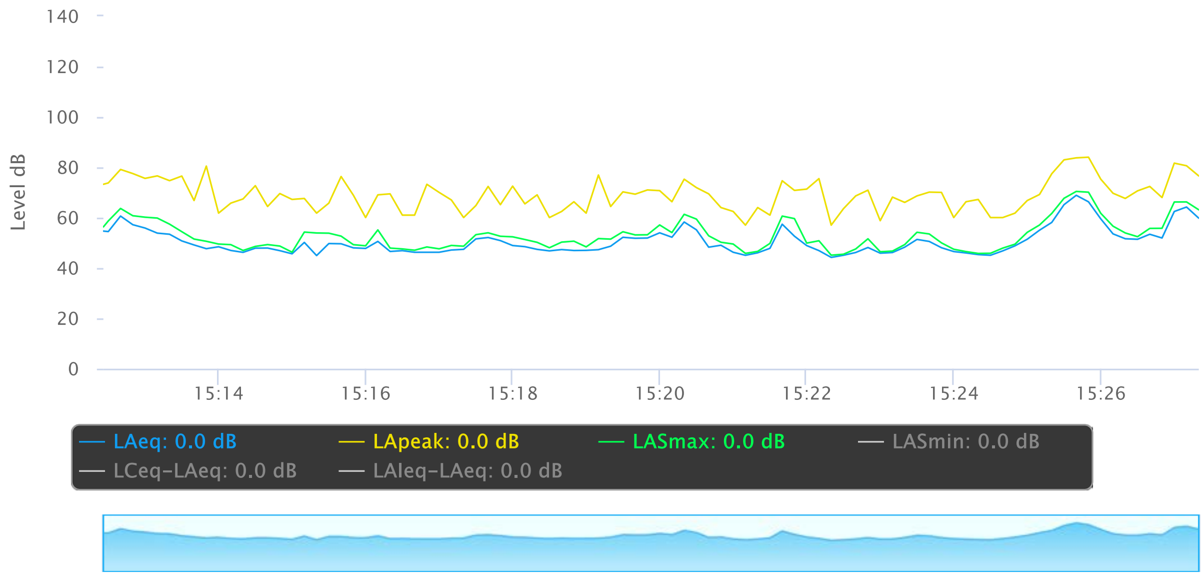
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	55.6 dB		65.5 dB		--- dB	
$Ls_{(max)}$	70.4 dB	2022-05-31 15:25:47	--- dB		--- dB	
$LS_{(min)}$	43.3 dB	2022-05-31 15:15:27	--- dB		--- dB	
$L_{Peak(max)}$	84.0 dB	2022-05-31 15:25:51	--- dB		--- dB	

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

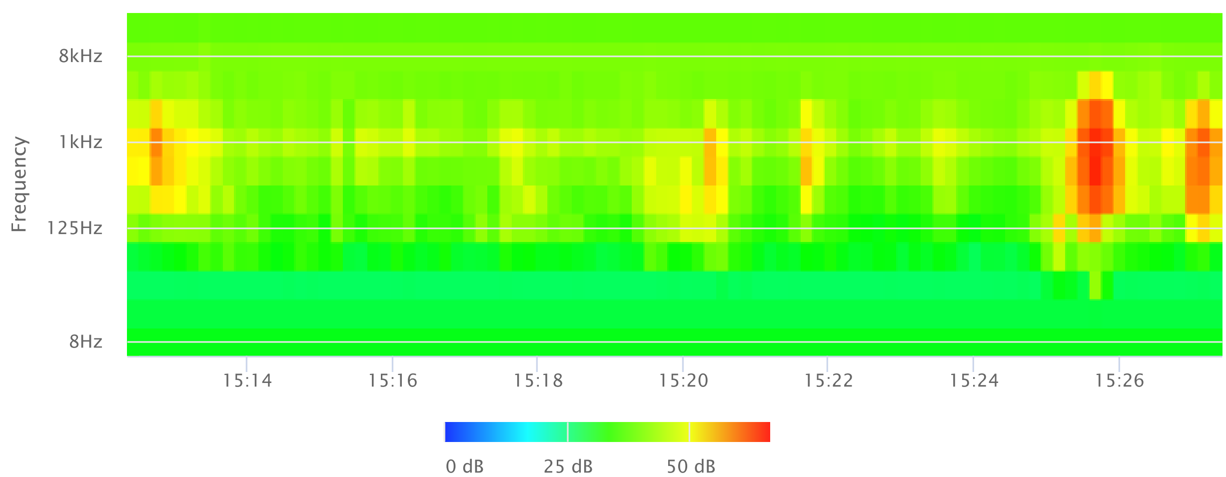
Statistics

LAS 2.0	66.1 dB
LAS 8.0	59.3 dB
LAS 25.0	52.4 dB
LAS 50.0	48.6 dB
LAS 66.6	47.3 dB
LAS 90.0	45.5 dB

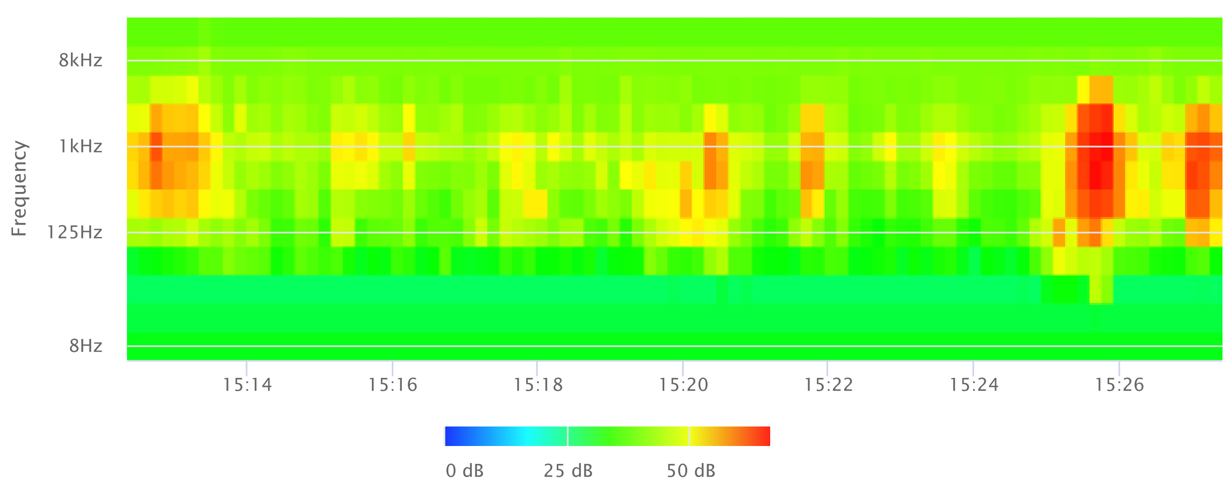
Time History



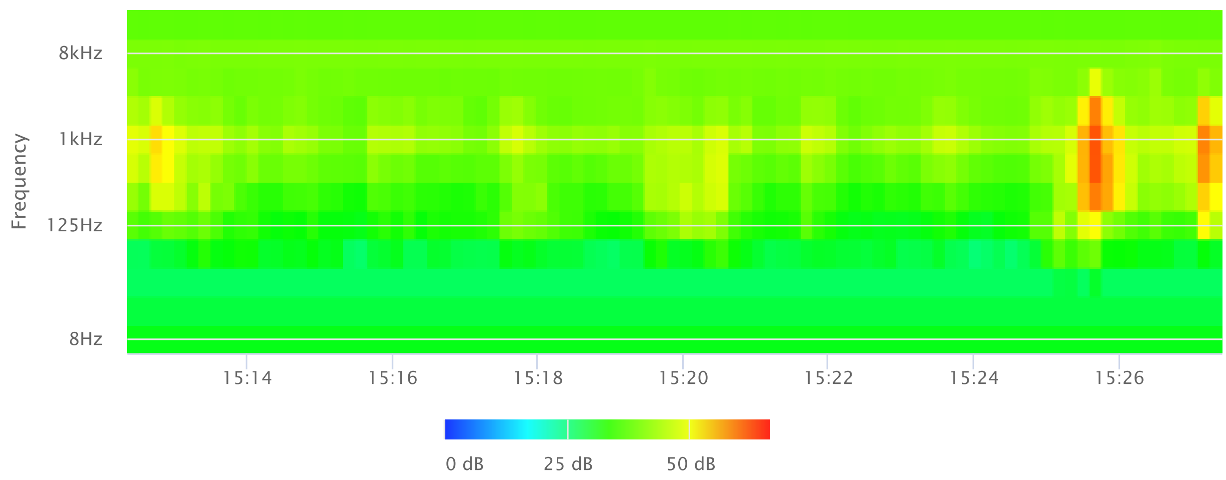
OBA 1/1 Leq



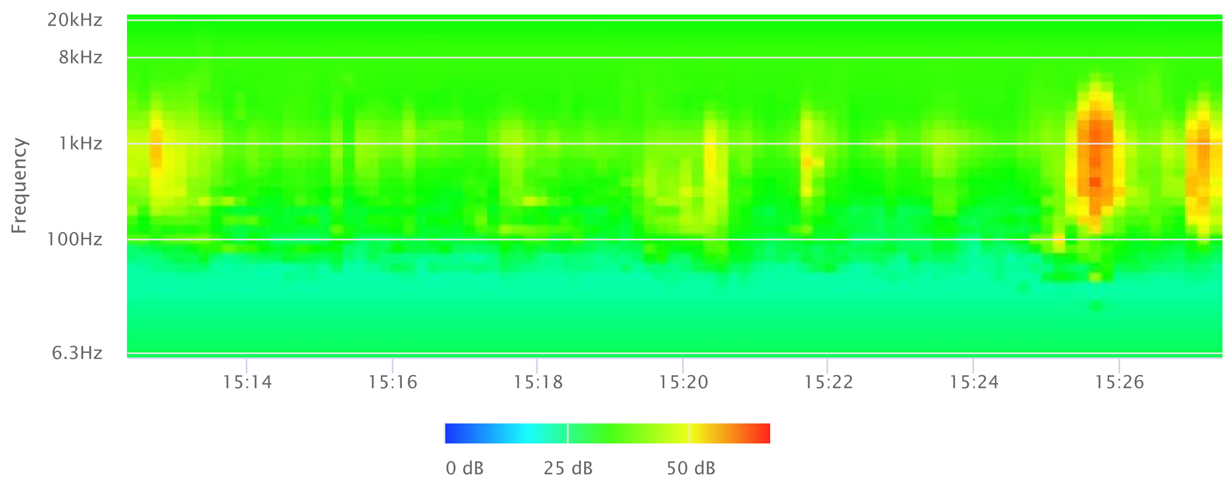
OBA 1/1 Lmax



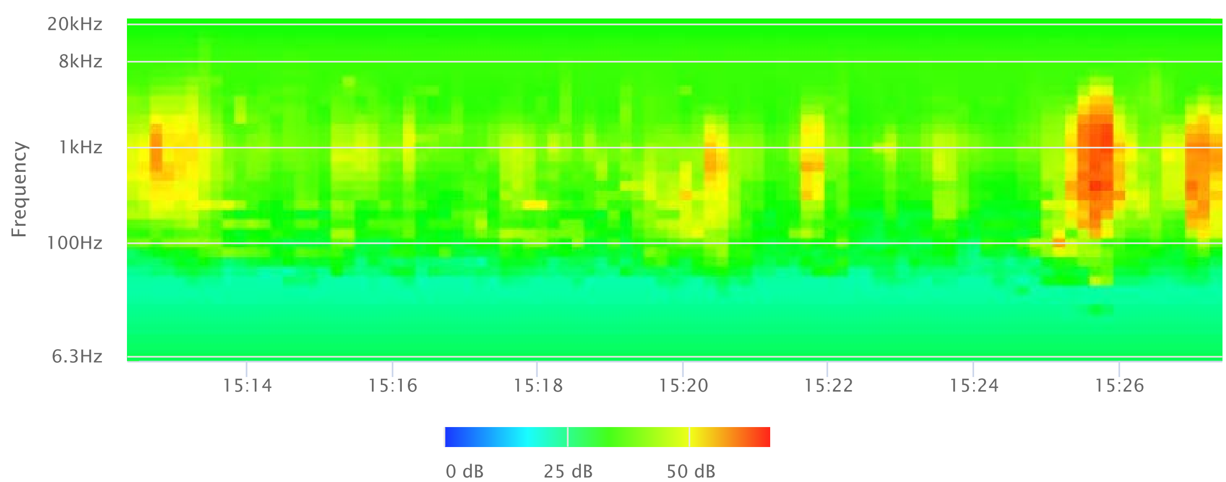
OBA 1/1 Lmin



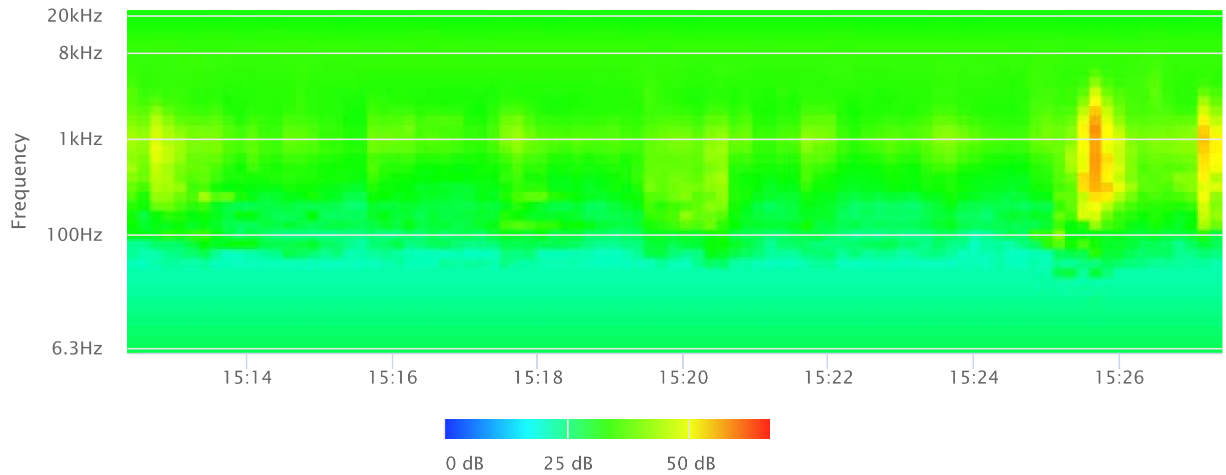
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin



20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
15:14
15:16
15:18
15:20
15:22
15:24
15:26
0 dB
25 dB
50 dB

APPENDIX C: RCNM CONSTRUCTION NOISE CALCULATIONS

Table A

Construction Noise by Phase - Multi-family residential to the Northeast (NM3)

A	B	C	D	E	F	G	H	I
Equipment Type	# of Equipment	Equipment Lmax at 50 feet, dBA[1, 2]	Distance to Receptor[3]	Equipment Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Noise Level Leq (dBA) at Receptor
Demolition								
Concrete/Industrial Saw	1	90	35	20	0.20	3.1	-7.0	86.1
Rubber Tired Dozers	1	82	35	40	0.40	3.1	-4.0	81.1
Tractors/Loaders/Backhoes	3	79	35	40	1.20	3.1	0.8	82.9
							Log Sum	88.6
Site Prep/Excavation								
Excavator	1	81	35	40	0.40	3.1	-4.0	80.1
Concrete Pumps	2	81	35	20	0.40	3.1	-4.0	80.1
Rubber Tired Dozers	1	82	35	40	0.40	3.1	-4.0	81.1
Concrete Mixer Truck	3	79	35	40	1.20	3.1	0.8	82.9
Forklifts	1	64	35	40	0.40	3.1	-4.0	63.1
Welders	1	73	35	40	0.40	3.1	-4.0	72.1
Bore/Drill Rig	1	79	35	20	0.20	3.1	-7.0	75.1
Tractors/Loaders/Backhoes	1	79	35	40	0.40	3.1	-4.0	78.1
							Log Sum	87.6
Building Construction								
Cranes	1	81	35	16	0.16	3.1	-8.0	76.1
Forklifts	1	64	35	50	0.50	3.1	-3.0	64.1
Generator Sets	1	81	35	50	0.50	3.1	-3.0	81.1
Welders	3	73	35	40	1.20	3.1	0.8	76.9
Tractors/Loaders/Backhoes	1	79	35	40	0.40	3.1	-4.0	78.1
							Log Sum	84.6
Architectural Coating								
Aerial Lift	1	75	35	20	0.20	3.1	-7.0	71.1
Air Compressors	1	78	35	40	0.40	3.1	-4.0	77.1
							Log Sum	78.1

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018).

(2) Source: https://www.google.com/url?q=http://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/&sa=D&source=hangouts&ust=1545259247311000&usg=AFQjCNHFcKKoEKUjv5VZMOtw_KO977Em1A

(3) Distance to receptor calculated from the façade of the receptor to the project boundary. Construction noise projected from the edge the project site to the structural façade of the nearest sensitive use.

Table B

Construction Noise by Phase - Adjacent Residential Receptors to the North (NM3)

A	B	C	D	E	F	G	H	I
Equipment Type	# of Equipment	Equipment Lmax at 50 feet, dBA[1, 2]	Distance to Receptor[3]	Equipment Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Noise Level Leq (dBA) at Receptor
Demolition								
Concrete/Industrial Saw	1	90	75	20	0.20	-3.5	-7.0	79.5
Rubber Tired Dozers	1	82	75	40	0.40	-3.5	-4.0	74.5
Tractors/Loaders/Backhoes	3	79	75	40	1.20	-3.5	0.8	76.3
							Log Sum	82.0
Site Prep/Excavation								
Excavator	1	81	75	40	0.40	-3.5	-4.0	73.5
Concrete Pumps	2	81	75	20	0.40	-3.5	-4.0	73.5
Rubber Tired Dozers	1	82	75	40	0.40	-3.5	-4.0	74.5
Concrete Mixer Truck	3	79	75	40	1.20	-3.5	0.8	76.3
Forklifts	1	64	75	40	0.40	-3.5	-4.0	56.5
Welders	1	73	75	40	0.40	-3.5	-4.0	65.5
Bore/Drill Rig	1	79	75	20	0.20	-3.5	-7.0	68.5
Tractors/Loaders/Backhoes	1	79	75	40	0.40	-3.5	-4.0	71.5
							Log Sum	81.0
Building Construction								
Cranes	1	81	75	16	0.16	-3.5	-8.0	69.5
Forklifts	1	64	75	50	0.50	-3.5	-3.0	57.5
Generator Sets	1	81	75	50	0.50	-3.5	-3.0	74.5
Welders	3	73	75	40	1.20	-3.5	0.8	70.3
Tractors/Loaders/Backhoes	1	79	75	40	0.40	-3.5	-4.0	71.5
							Log Sum	77.9
Architectural Coating								
Aerial Lift	1	75	75	20	0.20	-3.5	-7.0	64.5
Air Compressors	1	78	75	40	0.40	-3.5	-4.0	70.5
							Log Sum	71.5

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018).

(2) Source: https://www.google.com/url?q=http://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/&sa=D&source=hangouts&ust=1545259247311000&usg=AFQjCNHFcKKoEKUjv5VZMOtw_KO977Em1A

(3) Distance to receptor calculated from the façade of the receptor to the project boundary. Construction noise projected from the edge the project site to the structural façade of the nearest sensitive use.

Table C
Construction Noise by Phase - Adjacent Residential Receptors Northwest of the Project Site (NM3)

A	B	C	D	E	F	G	H	I
Equipment Type	# of Equipment	Equipment Lmax at 50 feet, dBA[1, 2]	Distance to Receptor[3]	Equipment Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Noise Level Leq (dBA) at Receptor
Demolition								
Concrete/Industrial Saw	1	90	120	20	0.20	-7.6	-7.0	75.4
Rubber Tired Dozers	1	82	120	40	0.40	-7.6	-4.0	70.4
Tractors/Loaders/Backhoes	3	79	120	40	1.20	-7.6	0.8	72.2
							Log Sum	77.9
Site Prep/Excavation								
Excavator	1	81	120	40	0.40	-7.6	-4.0	69.4
Concrete Pumps	2	81	120	20	0.40	-7.6	-4.0	69.4
Rubber Tired Dozers	1	82	120	40	0.40	-7.6	-4.0	70.4
Concrete Mixer Truck	3	79	120	40	1.20	-7.6	0.8	72.2
Forklifts	1	64	120	40	0.40	-7.6	-4.0	52.4
Welders	1	73	120	40	0.40	-7.6	-4.0	61.4
Bore/Drill Rig	1	79	120	20	0.20	-7.6	-7.0	64.4
Tractors/Loaders/Backhoes	1	79	120	40	0.40	-7.6	-4.0	67.4
							Log Sum	76.9
Building Construction								
Cranes	1	81	120	16	0.16	-7.6	-8.0	65.4
Forklifts	1	64	120	50	0.50	-7.6	-3.0	53.4
Generator Sets	1	81	120	50	0.50	-7.6	-3.0	70.4
Welders	3	73	120	40	1.20	-7.6	0.8	66.2
Tractors/Loaders/Backhoes	1	79	120	40	0.40	-7.6	-4.0	67.4
							Log Sum	73.9
Architectural Coating								
Aerial Lift	1	75	120	20	0.20	-7.6	-7.0	60.4
Air Compressors	1	78	120	40	0.40	-7.6	-4.0	66.4
							Log Sum	67.4

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018).

(2) Source: https://www.google.com/url?q=http://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/&sa=D&source=hangouts&ust=1545259247311000&usg=AFQjCNHFcKKoEKUjv5VZMOtw_KO977Em1A

(3) Distance to receptor calculated from the façade of the receptor to the project boundary. Construction noise projected from the edge the project site to the structural façade of the nearest sensitive use.

Table D
Construction Noise by Phase - Adjacent Residential Receptors West of the Project Site (NM2)

A	B	C	D	E	F	G	H	I
Equipment Type	# of Equipment	Equipment Lmax at 50 feet, dBA[1, 2]	Distance to Receptor[3]	Equipment Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Noise Level Leq (dBA) at Receptor
Demolition								
Concrete/Industrial Saw	1	90	65	20	0.20	-2.3	-7.0	80.7
Rubber Tired Dozers	1	82	65	40	0.40	-2.3	-4.0	75.7
Tractors/Loaders/Backhoes	3	79	65	40	1.20	-2.3	0.8	77.5
							Log Sum	83.3
Site Prep/Excavation								
Excavator	1	81	65	40	0.40	-2.3	-4.0	74.7
Concrete Pumps	2	81	65	20	0.40	-2.3	-4.0	74.7
Rubber Tired Dozers	1	82	65	40	0.40	-2.3	-4.0	75.7
Concrete Mixer Truck	3	79	65	40	1.20	-2.3	0.8	77.5
Forklifts	1	64	65	40	0.40	-2.3	-4.0	57.7
Welders	1	73	65	40	0.40	-2.3	-4.0	66.7
Bore/Drill Rig	1	79	65	20	0.20	-2.3	-7.0	69.7
Tractors/Loaders/Backhoes	1	79	65	40	0.40	-2.3	-4.0	72.7
							Log Sum	82.3
Building Construction								
Cranes	1	81	65	16	0.16	-2.3	-8.0	70.8
Forklifts	1	64	65	50	0.50	-2.3	-3.0	58.7
Generator Sets	1	81	65	50	0.50	-2.3	-3.0	75.7
Welders	3	73	65	40	1.20	-2.3	0.8	71.5
Tractors/Loaders/Backhoes	1	79	65	40	0.40	-2.3	-4.0	72.7
							Log Sum	79.2
Architectural Coating								
Aerial Lift	1	75	65	20	0.20	-2.3	-7.0	65.7
Air Compressors	1	78	65	40	0.40	-2.3	-4.0	71.7
							Log Sum	72.7

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018).

(2) Source: https://www.google.com/url?q=http://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/&sa=D&source=hangouts&ust=1545259247311000&usg=AFQjCNHFcKKoEKUjv5VZMOtw_KO977Em1A

(3) Distance to receptor calculated from the façade of the receptor to the project boundary. Construction noise projected from the edge the project site to the structural façade of the nearest sensitive use.

Table E
Construction Noise by Phase - Adjacent Residential Receptors Southwest of the Project Site (NM1)

A	B	C	D	E	F	G	H	I
Equipment Type	# of Equipment	Equipment Lmax at 50 feet, dBA[1, 2]	Distance to Receptor[3]	Equipment Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Noise Level Leq (dBA) at Receptor
Demolition								
Concrete/Industrial Saw	1	90	185	20	0.20	-11.4	-7.0	71.6
Rubber Tired Dozers	1	82	185	40	0.40	-11.4	-4.0	66.7
Tractors/Loaders/Backhoes	3	79	185	40	1.20	-11.4	0.8	68.4
							Log Sum	74.2
Site Prep/Excavation								
Excavator	1	81	185	40	0.40	-11.4	-4.0	65.7
Concrete Pumps	2	81	185	20	0.40	-11.4	-4.0	65.7
Rubber Tired Dozers	1	82	185	40	0.40	-11.4	-4.0	66.7
Concrete Mixer Truck	3	79	185	40	1.20	-11.4	0.8	68.4
Forklifts	1	64	185	40	0.40	-11.4	-4.0	48.7
Welders	1	73	185	40	0.40	-11.4	-4.0	57.7
Bore/Drill Rig	1	79	185	20	0.20	-11.4	-7.0	60.6
Tractors/Loaders/Backhoes	1	79	185	40	0.40	-11.4	-4.0	63.7
							Log Sum	73.2
Building Construction								
Cranes	1	81	185	16	0.16	-11.4	-8.0	61.7
Forklifts	1	64	185	50	0.50	-11.4	-3.0	49.6
Generator Sets	1	81	185	50	0.50	-11.4	-3.0	66.6
Welders	3	73	185	40	1.20	-11.4	0.8	62.4
Tractors/Loaders/Backhoes	1	79	185	40	0.40	-11.4	-4.0	63.7
							Log Sum	70.1
Architectural Coating								
Aerial Lift	1	75	185	20	0.20	-11.4	-7.0	56.6
Air Compressors	1	78	185	40	0.40	-11.4	-4.0	62.7
							Log Sum	63.6

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018).

(2) Source: https://www.google.com/url?q=http://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/&sa=D&source=hangouts&ust=1545259247311000&usg=AFQjCNHFcKKoEKUjv5VZMOtw_KO977Em1A

(3) Distance to receptor calculated from the façade of the receptor to the project boundary. Construction noise projected from the edge the project site to the structural façade of the nearest sensitive use.

Table F
Construction Noise Levels (L_{eq})

Construction Phase	Receptor Location	Unmitigated Construction Noise Levels (dBA Leq)[1]	Noise Level Where Construction Impacts Would Be Significant?	Increase Over Threshold Levels (dBA)	Noise Levels with BMPs[2] (dBA)
Demolition	Multi-family residential to the Northeast (NM3)	88.6	75.0	13.6	73.6
	Adjacent Residential Receptors to the North (NM3)	82.0	75.0	7.0	67.0
	Adjacent Residential Receptors to the Northwest (NM3)	77.9	75.0	2.9	62.9
	Adjacent Residential Receptors to the West (NM2)	83.3	75.0	8.3	68.3
	Adjacent Residential Receptors to the Southwest (NM1)	74.2	75.0	-0.8	-
Site Prep/Excavation	Multi-family residential to the Northeast (NM3)	87.6	75.0	12.6	72.6
	Adjacent Residential Receptors to the North (NM3)	81.0	75.0	6.0	66.0
	Adjacent Residential Receptors to the Northwest (NM3)	76.9	75.0	1.9	61.9
	Adjacent Residential Receptors to the West (NM2)	82.3	75.0	7.3	67.3
	Adjacent Residential Receptors to the Southwest (NM1)	73.2	75.0	-1.8	-
Building Construction	Multi-family residential to the Northeast (NM3)	84.6	75.0	9.6	69.6
	Adjacent Residential Receptors to the North (NM3)	77.9	75.0	2.9	62.9
	Adjacent Residential Receptors to the Northwest (NM3)	73.9	75.0	-1.1	58.9
	Adjacent Residential Receptors to the West (NM2)	79.2	75.0	4.2	64.2
	Adjacent Residential Receptors to the Southwest (NM1)	70.1	75.0	-4.9	-
Architectural Coating	Multi-family residential to the Northeast (NM3)	78.1	75.0	3.1	63.1
	Adjacent Residential Receptors to the North (NM3)	71.5	75.0	-3.5	56.5
	Adjacent Residential Receptors to the Northwest (NM3)	67.4	75.0	-7.6	52.4
	Adjacent Residential Receptors to the West (NM2)	72.7	75.0	-2.3	57.7
	Adjacent Residential Receptors to the Southwest (NM1)	63.6	75.0	-11.4	-

Notes:

(1) Construction noise calculated in Tables A through E.

(2) Noise level reduction with incorporation of BMPs which requires a 15 dBA noise reduction from mufflers and/or shielding.

VdB Calculations
Based on reference equation 7-3 from Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, 2018, pg 185

*Lv (distance) = Lv (ref) - 30*log (D/25)*

large bulldozer @ 35 feet

Lv 82.62

large bulldozer @ 65 feet

Lv 74.55

large bulldozer @ 75 feet

Lv 72.69

large bulldozer @ 80 feet

Lv 71.85

GROUNDBORNE VIBRATION ANALYSIS			
Project:	Sherman Way		Date: 3/21/23
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Project Site		
Address:	Adjacent commercial		
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	3.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equation 7-2 from Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, 2018, pg 185.			
RESULTS			
PPV =	2.141	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	Sherman Way		Date: 3/21/23
Source:	Large Bulldozer		
Scenario:	Mitigated		
Location:	Project Site		
Address:	Adjacent commercial		
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	15.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equation 7-2 from Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, 2018, pg 185.			
RESULTS			
PPV =	0.191	IN/SEC	OUTPUT IN BLUE

24 Hours Traffic Volume

City of Los Angeles

Department of Transportation

Counter	KENT
Date	11/03/10
Start Time	12 AM

Location	**BALBOA BL S/O SHERMAN WAY**	**Day of Week**	WEDNESDAY	**Prepared**	11/05/10
Direction	N/S STREET	**DOT District**	WEST VALLEY	**By**	AMS
Serial Number	RD97736 D	**Weather**	CLEAR		

Time	NORTHBOUND or WESTBOUND 1ST QTR	2ND QTR	3RD QTR	4TH QTR	HOUR TOTAL	SOUTHBOUND or EASTBOUND 1ST QTR	2ND QTR	3RD QTR	4TH QTR	HOUR TOTAL	**TOTAL**
12 AM	45	28	26	25	124	26	21	17	20	84	208
1 AM	21	8	8	15	52	18	9	34	16	77	129
2 AM	21	12	17	10	60	13	10	12	4	39	99
3 AM	5	8	9	14	36	5	7	9	9	30	66
4 AM	12	7	10	17	46	8	11	12	12	43	89
5 AM	19	32	42	44	137	22	25	65	69	181	318
6 AM	62	92	76	108	338	127	194	299	373	993	1331
7 AM	157	180	194	256	787	413	444	442	402	1701	2488
8 AM	283	272	261	221	1037	398	422	394	337	1551	2588
9 AM	187	185	179	191	742	306	310	284	222	1122	1864
10 AM	191	214	197	156	758	222	213	163	198	796	1554
11 AM	229	218	225	189	861	187	187	215	213	802	1663
12 NN	202	227	239	233	901	218	175	231	217	841	1742
1 PM	225	229	208	189	851	187	194	196	194	771	1622
2 PM	220	220	258	279	977	199	215	206	220	840	1817
3 PM	246	341	368	364	1319	245	239	243	213	940	2259
4 PM	328	332	324	343	1327	241	201	212	217	871	2198
5 PM	334	350	385	396	1465	252	243	245	229	969	2434
6 PM	369	313	341	322	1345	271	232	196	193	892	2237
7 PM	264	239	200	235	938	172	122	133	109	536	1474
8 PM	192	154	142	115	603	104	103	106	91	404	1007
9 PM	132	126	125	104	487	80	65	80	68	293	780
10 PM	116	97	96	68	377	64	53	51	52	220	597
11 PM	46	61	36	39	182	52	28	29	33	142	324

FIRST 12-HOURS PEAK QUARTER COUNT	**283**	8 AM	1ST	**444**	7 AM	2ND
LAST 12-HOURS PEAK QUARTER COUNT	**396**	5 PM	4TH	**271**	6 PM	1ST
24 HOUR VEHICLES TOTAL		15,750			15,138	**30,888**
TOTAL VEHICLES STANDARD DEVIATION (STD)	[+,-]	455.78		[+,-]	470.44	861.95

PEAK HOURS VOLUME

	NORTH or WEST BOUND PEAK HOUR	VEHICLE VOLUME	SOUTH or EAST BOUND PEAK HOUR	VEHICLE VOLUME	BOTH DIRECTIONS PEAK HOUR	VEHICLE VOLUME
First 12H Peak	8 AM	1,037	7 AM	1,701	8 AM	**2,588**
Last 12H Peak	5 PM	1,465	5 PM	969	5 PM	**2,434**
First 12H Peak STD		[+,-] 371.29		[+,-] 597.49		[+,-] 943.86
Last 12H Peak STD		[+,-] 401.32		[+,-] 292.10		[+,-] 682.71