APPENDIX E

Noise Study

Noise Technical Study

for the

7617 Santa Monica Boulevard Project

Prepared for:

City of West Hollywood
Planning and Development Services
8300 Santa Monica Boulevard
West Hollywood, CA 90069

Prepared by:

Meridian Consultants LLC
920 Hampshire Road, Suite A-5
Westlake Village, CA 91361

June 2019

Meridian Consultants

Table of Contents

Section	Page
Executive Summary	1
Project Description	2
Noise descriptors	2
Methodology	5
Regulatory Setting	6
Existing Conditions	10
Project Impacts	11
General Plan Consistency	16
Cumulative Noise	18
Mitigation Measures	19

Appendices

A Ambient Noise Monitoring Data Sheets

B Project Noise Data Spreadsheets

EXECUTIVE SUMMARY

This noise study assesses and discusses the potential noise and vibration impacts that may occur with the implementation of the 7617 Santa Monica Boulevard Project. The analysis describes the existing environment in the Project area and estimates future noise and vibration levels at surrounding land uses resulting from construction and operation of the Project. An evaluation of the Project's contribution to potential cumulative noise impacts is also provided. The study summarizes the potential for the Project to conflict with applicable noise and vibration regulations, standards, and thresholds. The information presented in this report is based on field reconnaissance; review of the Project and other planning documents; and photographs of the Project site and the surrounding land uses.

The proposed Project involves the demolition of an existing car wash and all associated structures, for the construction of a new 4-story, mixed-use building consisting of residential and commercial uses.

The findings of this analysis are as follows:

- Construction activities would potentially result in short-term and temporary noise impacts to nearby noise-sensitive receptors (approximately 25 feet to the north) due to on-site construction equipment and activities. Implementation of noise-attenuation techniques and placement of the construction-staging area and earthmoving equipment away from noise-sensitive sites would lower construction noise levels.
- Construction of the Project would generate sporadic, temporary vibration effects adjacent to the Project area but would not be expected to exceed the significance thresholds.
- Operation of the Project would generate noise from Project-related traffic or from on-site sources (parking, refuse collection area, mechanical equipment) that would not exceed the significance thresholds.
- Noise associated with cumulative construction activities would be reduced to the degree reasonably and technically feasible through proposed mitigation measures for each individual project and compliance with locally adopted and enforced noise ordinances.
- Noise associated with cumulative operational sources would not be significant.
- Due to the rapid attenuation characteristics of ground-borne vibration and distance of the cumulative projects to the Project site, no potential exists for cumulative construction- or operational-related impacts with respect to ground-borne vibration.

PROJECT DESCRIPTION

The Project Site is located in the City of West Hollywood ("City") and in an area generally bounded by the multifamily residential buildings to the north, Santa Monica Boulevard to the south; commercial buildings to the east; and the Los Angeles County Fire Department (LAFD) Station 8 to the west. More specifically, the Project is located along the north side of Santa Monica Boulevard between N. Curson Avenue and N. Spaulding Avenue within the City characterized by various commercial and residential uses ("Project Site").

The proposed Project involves the demolition of an existing car wash and all associated structures for the construction of a new 4-story, mixed-use building consisting of residential and commercial uses. The proposed 4-story building would also include a 2-level subterranean parking garage. The proposed building would contain 71 residential units (including 6 very low income and 5 moderate-income affordable housing units) and approximately 9,240 square feet of ground-floor commercial uses. The proposed mixed-use building would be approximately 45 feet in height to the top of the main roof.

NOISE DESCRIPTORS

Fundamentals of Sound

Because the human ear does not respond uniformly to sounds at all frequencies, sound-pressure level alone is not a reliable indicator of loudness. For example, the human ear is less sensitive to low and high frequencies than to the medium frequencies that more closely correspond to human speech. In response to the sensitivity of the human ear to certain sound frequencies, the A-weighted noise level, referenced in units of dBA, was developed to better correspond with people's subjective judgment of sound levels. To support assessing a community reaction to noise, scales have been developed that average sound-pressure levels over time and quantify the result in terms of a single numerical descriptor. Several scales have been developed that address community noise levels. The equivalent sound level (Leq) is the average A-weighted sound level measured over a given time interval. Leq can be measured over any period but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods. **Table 1: Noise Descriptors,** identifies various noise descriptors developed to measure sound levels over different periods of time.

Table 1
Noise Descriptors

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measure sound to a reference pressure.
A-weighted decibel (dBA)	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Hertz (Hz)	The frequency of the pressure vibration, which is measured in cycles per second.
Kilo hertz (kHz)	One thousand cycles per second.
Equivalent sound level (Leq)	The sound level containing the same total energy as a time varying signal over a given time period. The Leq is the value that expresses the time averaged total energy of a fluctuating sound level. Leq can be measured over any time period, but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods.
Community noise equivalent level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments add 5 dBA for the evening, 7:00 PM to 10:00 PM, and add 10 dBA for the night, 10:00 PM to 7:00 AM. The 5 and 10 dB penalties are applied to account for increased noise sensitivity during the evening and nighttime hours. The logarithmic effect of adding these penalties to the 1-hour Leq measurements typically results in a CNEL measurement that is within approximately 3 dBA of the peak-hour Leq.[a]
Nighttime (Lnight)	Lnight is the average noise exposure during the hourly periods from 10:00 PM to 7:00 AM.
Sound pressure level	The sound pressure is the force of sound on a surface area perpendicular to the direction of the sound. The sound pressure level is expressed in dB.
Ambient noise	The level of noise that is all encompassing within a given environment, being usually a composite of sounds from many and varied sources near to and far from the observer. No specific source is identified in the ambient environment.

[a] *California Department of Transportation,* Technical Noise Supplement; A Technical Supplement to the Traffic Noise Analysis Protocol *(Sacramento, California: November 2009), pp. N51–N54.*

A doubling of sound energy results in a 3 dBA increase in sound, which means that a doubling of sound wave energy (e.g., doubling the volume of traffic on a roadway) would result in a barely perceptible change in sound level. In general, changes in a noise level of less than 3 dBA are not noticed by the human ear.[1] Changes from 3 to 5 dBA may be noticed by some individuals who are extremely sensitive to changes in noise. An increase of greater than 5 dBA is readily noticeable, while the human ear perceives a 10 dBA increase in sound level to be a doubling of sound volume.

Noise sources can generally be categorized in two types: (1) point sources, such as stationary equipment; and (2) line sources, such as a roadway. Sound generated by a point source typically diminishes (attenuates) at a rate of 6 dBA for each doubling of distance from the source to the receptor at acoustically hard sites, and at a rate of 7.5 dBA at acoustically soft sites.[2] A hard, or reflective, site consists of asphalt, concrete, or very hard-packed soil, which does not provide any excess ground-effect attenuation. An acoustically soft or absorptive site is characteristic of normal earth and most ground with vegetation. As an example, a 60 dBA noise level measured at 50 feet from a point source at an acoustically hard site would be 54 dBA at 100 feet from the source and 48 dBA at 200 feet from the source. Noise from the same point source at an acoustically soft site would be 52.5 dBA at 100 feet and 45 dBA at 200 feet from the source. Sound generated by a line source typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling of distance from the source to the receptor for hard and soft sites, respectively.[3] Man-made or natural barriers can also attenuate sound levels.

Fundamentals of Vibration

Vibration is commonly defined as an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The peak particle velocity (PPV) or root-mean-square (RMS) velocity is usually used to describe vibration amplitudes. PPV is defined as the maximum instantaneous peak of the vibration signal, while RMS is defined as the square root of the average of the squared amplitude of the signal. PPV is typically used for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response to ground-borne vibration. The RMS vibration velocity level can be presented in inches per second (ips) or in VdB (a decibel unit referenced to 1 microinch per second). Commonly, ground-borne vibration generated by man-made activities (i.e., road traffic, construction) attenuates rapidly with distance from the source of the vibration.

1 US Department of Transportation (USDOT), Federal Highway Administration (FHWA), *Fundamentals and Abatement of Highway Traffic Noise* (Springfield, VA: Author, September 1980), 81.
2 USDOT, FHWA, *Fundamentals and Abatement,* 97.
3 USDOT, FHWA, *Fundamentals and Abatement,* 97.

The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings, such as the operation of mechanical equipment, the movement of people, or the slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration from traffic is barely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

METHODOLOGY

Ambient Noise Measurements

Noise level monitoring was conducted by Meridian Consultants on August 29, 2018, at three (3) locations within the Project area vicinity**.** Noise-level monitoring was conducted for 15-minute intervals at each location using a Larson Davis Model 831 sound-level meter. This meter satisfies the American National Standards Institute (ANSI) standard for general environmental noise measurement instrumentation. The ANSI specifies several types of sound-level meters according to their precision. Types 1, 2, and 3 are referred to as "precision," "general-purpose," and "survey" meters, respectively. Most measurements carefully taken with a Type 1 sound-level meter will have a margin of error not exceeding 1 dB.

The Larson Davis Model 831 is a Type 1 precision sound-level meter. This meter meets all requirements of ANSI S1.4-1983 and ANSI1.43-1997 Type 1 standards, as well as International Electrotechnical Commission (IEC) IEC61672-1 Ed. 1.0, IEC60651 Ed 1.2, and IEC60804 Type 1, Group X standards.

The sound-level meter was located approximately 5 feet aboveground and was covered with a Larson Davis windscreen. The sound-level meter was field calibrated with an external calibrator prior to operation.

Construction Scenario

Construction would last approximately 30 months and would include (1) demolition, which would last approximately 1 month; (2) site preparation, which would last approximately 1 month; (3) grading, which would last approximately 6 months; (4) building construction, which would last approximately 18 months; and (5) paving and architectural coating, which would last approximately 4 months.[4] Each phase of construction would result in varying levels of intensity and number of construction personnel.

4 Paving and architectural coating will be taking place at the same time.

Each phase of construction would result in varying levels of intensity and number of construction personnel. The construction workforce would consist of approximately 10 worker trips during demolition; 5 worker trips per day during site preparation; 10 worker trips per day during grading; 84 worker trips per day and 21 total vendor trips during building construction; 18 worker trips per day during paving; and 17 worker trips per day during architectural coating.

Project Traffic

Based on the traffic impact study prepared for the Project, it is estimated to generate a net increase of 373 daily trips with 73 in the AM Peak Hour and 18 in the PM Peak Hour.

REGULATORY SETTING

Federal

US Environmental Protection Agency

The Federal Noise Control Act of 1972 establishes programs and guidelines to identify and address the effects of noise on public health and welfare and the environment.[5] The US Environmental Protection Agency administrators determined in 1981 that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982, responsibilities for regulating noise-control policies were transferred to state and local governments.

Federal Transit Administration Vibration Guidelines

The Federal Transit Administration (FTA) has published a technical manual titled *Transit Noise and Vibration Impacts Assessment,* which provides ground-borne vibration impact criteria with respect to building damage during construction activities.[6] Building vibration damage is measured in PPV described in the unit of inches per second (ips). For evaluating potential annoyance or interference with vibration-sensitive activities due to construction vibration, the criteria for General Assessment in Chapter 8 of the *Transit Noise and Vibration Impact Assessment* can be applied. In most cases, however, the primary concern regarding construction vibration related to potential damage effects. Guideline vibration damage criteria for various structural categories are provided in **Table 2: Construction Vibration Damage Criteria.**[7]

5 Noise Control Act of 1972, sec. 2 (1972). 42 U.S.C. sec. 4901 et seq.

6 USDOT, Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment,* prepared by Harris Miller, Miller & Hanson Inc. (May 2006).

7 FTA, *Transit Noise and Vibration Impact Assessment* (May 2006). https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Noise_and_Vibration_Manual.pdf

Table 2
Construction Vibration Damage Criteria

Building Category	PPV (ips)	Approximate Lv[a]
I. Reinforced-concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Nonengineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment *(May 2006).*
Note: ips = inches per second; Lv = velocity level.
[a] *RMS velocity in decibels (VdB) is 1 microinch/second.*

State

The state of California does not have statewide standards for environmental noise, but the California Department of Health Services (DHS) has established guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The purpose of these guidelines is to maintain acceptable noise levels in a community setting for different land use types. Noise compatibility by different land use types is categorized into four general levels: "normally acceptable," "conditionally acceptable," "normally unacceptable," and "clearly unacceptable.". For instance, a noise environment ranging from 50 dBA CNEL to 65 dBA CNEL is considered to be "normally acceptable" for multifamily residential uses, while a noise environment of 75 dBA CNEL or above for multifamily residential uses is considered to be "clearly unacceptable." In addition, California Government Code Section 65302(f) requires each county and city in the State to prepare and adopt a comprehensive long-range general plan for its physical development, with Section 65302(g) requiring a noise element to be included in the general plan. The noise element must: (1) identify and appraise noise problems in the community; (2) recognize Office of Noise Control guidelines; and (3) analyze and quantify current and projected noise levels.

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

Regional and Local

City of West Hollywood General Plan

The City of West Hollywood adopted the 2035 General Plan in September 2011. The 2035 General Plan's Safety and Noise chapter provides a description of existing noise levels and sources and incorporates comprehensive goals, policies, and implementing actions. The chapter also includes several policies on noise and acceptable noise levels. These policies address unnecessary, excessive, and annoying noise levels and sources such as vehicles, construction, special sources (e.g., radios, musical instrument, animals, etc.), and stationary sources (e.g., heating and cooling systems, mechanical rooms, etc.).

The predominant noise sources in the City, as in many other communities, come from mobile noise sources along major arterial streets including Sunset Boulevard, Fountain Avenue, and Santa Monica Boulevard. The City's noise standard for determining general compatibility of proposed residential properties with adjacent properties as exceeding exterior noise of 55 dBA for daytime (8:00 AM to 10:00 PM) and 50 dBA for nighttime (10 PM to 8 AM), which represent the maximum acceptable noise levels for new developments as measured from any adjoining or proposed residential property within the City.[8] The City's noise compatibility guidelines are provided in **Table 3: General Plan Noise Element Guidelines for Noise-Compatible Land Use**.

In adopting the City of West Hollywood General Plan 2035, the City adopted noise mitigation measures identified in the General Plan EIR. General Plan Mitigation Measure 3.9-1 states that "The City shall use the following thresholds and procedures for CEQA analysis of proposed projects, consistent with policies adopted within the General Plan … A project-related temporary increase in ambient noise levels of 10 dB Leq or greater." As such, this is the threshold of significance for the purpose of evaluating construction noise impacts.

8 City of West Hollywood, *West Hollywood General Plan 2035*, September 6, 2011.

Table 3
General Plan Noise Element Guidelines for Noise-Compatible Land Use

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

Source: General Plan, *"Noise Element," Exhibit A8: Land Use Compatibility Studies.*

Notes:

A = Normally acceptable. Specified land use is satisfactory, based upon assumption buildings that any buildings involved meet conventional Title 24 construction standards. No special noise insulation requirements.

B = Conditionally acceptable. New construction or development shall be undertaken only after a detailed noise analysis is made and noise reduction measures are identified and included in the project design.

C = Normally unacceptable. New construction or development is discouraged. If new construction is proposed, a detailed analysis is required, noise reduction must be identified, and noise insulation features included in the design.

D = Clearly unacceptable. New construction or development should not be undertaken.

City of West Hollywood Noise Ordinance

The City adopted a Noise Ordinance in order to implement the City's noise policies. The City's Noise Ordinance has no numerical standards, but restricts unnecessary or excessive noise within the City limits. Radios, musical instruments or similar devices operated between 10:00 PM and 8:00 AM may not be operated at a level to be plainly audible at a distance of 50 feet (Section 9.08.050[a]); the operation of any motor may not be audible at more than 50 feet from the source (Section 9.08.050[c]); loading and unloading activities are generally prohibited from 10:00 PM to 8:00 AM (Section 9.08.050[e]); and commercial activities may not be plainly audible at any residence between 10:00 PM to 8:00 AM (Section 9.08.050[k]). The City Manager has responsibility to enforce these noise regulations, with the assistance of the Sheriff's Department if necessary (Section 9.08.070).

Section 9.08.050 of the WHMC sets limits on when construction activities can occur. Construction activities are not permitted between the hours of 7:00 PM and 8:00 AM on weekdays and Saturdays, or at any time on Sundays or City holidays. Pursuant to Section 9.08.050 of the WHMC, the loading,

unloading, opening, closing or other handling of boxes, containers, building materials, solid waste and recycling containers or similar objects is not permitted between the hours of 10:00 PM and 8:00 AM in such manner as to cause unreasonable noise disturbance, excluding normal handling of solid waste and recycling containers by a franchised collector.

EXISTING CONDITIONS

Ambient Noise Levels

Short-term sound monitoring was conducted at three (3) locations to measure the ambient sound environment in the Project vicinity (see **Appendix A: Noise Monitoring Data Sheets**). Measurements were taken over 15-minute intervals at each location during morning peak hours, as indicated in **Table 4: Ambient Noise Measurements.** As shown in **Table 4,** ambient noise levels ranged from a low of 64.6 dBA north of the Project site (Site 1) to a high of 75.6 dBA southeast of the site (Site 3). **Figure 5** depicts locations where ambient noise measurements were conducted.

Vibration Conditions

Based on field observations, the primary source of existing ground-borne vibration in the vicinity of the Project Site is vehicle traffic on local roadways. According to the FTA,[9] typical road traffic–induced vibration levels are unlikely to be perceptible by people. Trucks and buses typically generate ground-borne vibration velocity levels of approximately 63 VdB (at a 50-foot distance), and these levels could reach 72 VdB when trucks and buses pass over bumps in the road. A vibration level of 72 VdB is above the 60 VdB level of perceptibility.

9 Federal Transit Administration, Transit Noise and Vibration Impact Assessment (2004).

Table 4
Ambient Noise Measurements

Location Number/Description		Time Period	Noise Source	dBA Leq
1	North of the Project site, along alley	8:26 AM –8:41 AM	Car wash; Traffic along Santa Monica Boulevard	64.6
2	Southwest of the Project site, along Santa Monica Boulevard	8:58 AM–9:13 AM	Heavy traffic along Santa Monica Boulevard	75.1
3	Southeast of the Project site, along Santa Monica Boulevard	8:42 AM–8:57 AM	Heavy traffic along Santa Monica Boulevard	75.6

Notes:
*Refer to **Appendix A** for noise monitoring data sheets.*
dBA = A-weighted decibels; Leq = average equivalent sound level.

PROJECT IMPACTS

Construction

Noise

Construction activities that would occur during the construction phases (demolition, site preparation, building construction, architectural coating, and paving) would generate both steady-state and episodic noise that would be heard both on and off the Project site. Estimated noise levels associated with the Project could occur as close as 15 feet from the nearest multifamily residence to the north (refer to **Figure 5**). Typical maximum noise levels and duty cycles of representative types of equipment are presented in **Table 5: Typical Maximum Noise Levels for Project Applicable Construction Equipment.** Construction equipment noise would not be constant because of the variations of power, cycles, and equipment locations. For maximum noise events, this analysis considers equipment operating at the edge of the property line of the Project site.

Construction activities including the use of heavy equipment would be compliant with Section 9.08.050 of the WHMC, which limits activities to occur between 8:00 AM and 7:00 PM and at no time on Sundays or holidays. However, because construction activities would occur over an extended period of time, noise at the nearby sensitive receptors would constitute a potentially significant temporary noise impact. Noise levels on the Project site would be considered high for intermittent periods of time and would occur during the most-sensitive times during the day (7:30 AM to 3:00 PM).

As mentioned previously, sound generated by the construction noise source typically diminishes at a rate of 6 dBA over hard surfaces, such as asphalt, and 7.5 dBA over soft surfaces, such as vegetation, for each

doubling of distance. Barriers—such as walls, berms, or buildings, and elevation differences—can also reduce sound levels by up to 20 dBA.[10]

10 Caltrans, Technical Noise Supplement (1998), 33–40, 123–131.

Table 5
Typical Maximum Noise Levels for Project Applicable Construction Equipment

Equipment Description	Noise Level at 50 feet (dBA)	Typical Duty Cycle (%)
Backhoe	80	40
Compressor (air)	80	40
Concrete mixer truck	85	40
Concrete/Industrial saw	90	20
Dozer	85	40
Forklift	75	10
Grader	85	40
Paver	77	50
Roller	85	20

Source: US Department of Transportation, Federal Highway Administration, Construction Noise Handbook, 9.0 Construction Equipment Noise Levels and Ranges.
Note: kVA = kilovolt-ampere.

The potential noise impact generated during construction depends on the phase of construction and the percentage of time the equipment operates over the workday. Demolition and grading would be the noisiest phase of construction, lasting approximately one month at various locations throughout the Project site. However, construction noise estimates used for the analysis are representative of worst-case conditions because it is unlikely that all the equipment contained on site would operate simultaneously.

Predicted noise levels from Project construction activity as experienced at the closest sensitive receptor are shown in **Table 6: Construction Noise Estimates.** Construction equipment operates at its nosiest levels for certain percentages of time during operation. Equipment such as excavators, graders, and loaders would operate at different percentages over the course of an hour.[11]

Receptor 1 (REC-1) are multifamily residential units approximately 15 feet to the north of the Project boundary. When all pieces of equipment are operating at the same time at the edge of the Project boundary without any noise-shielding reductions—a conservative estimate—construction noise levels at this site would increase ambient noise levels by approximately 31 dB.

11 Federal Highway Administration, Traffic Noise Model (2006).

Table 6
Construction Noise Estimates at Nearest Sensitive Receptor

Receptor ID	Distance from Project Site (feet)	Estimated Construction Noise Level during loudest Phase	Ambient Noise Leq (dBA)	Maximum Noise Exceedance, Leq (dBA)	Estimated Noise Reduction from Mitigation Measure N-1	Increase Over Ambient with Mitigation Measures (dB)
REC-1	15	95.4	64.6	30.8	25	5.8

*Note: Refer to **Appendix B** for construction noise data spreadsheets.*

In adopting the City of West Hollywood General Plan 2035, the City adopted Mitigation Measure 3.9-1 which states that "The City shall use the following thresholds and procedures for CEQA analysis of proposed projects, consistent with policies adopted within the General Plan … A project-related temporary increase in ambient noise levels of 10 dB Leq or greater." As such, Project construction could exceed this threshold by 20.8 dB and impacts would be significant. As such, the City should incorporate mitigation into the Project.

Recommended mitigation includes the use of a sound curtain when the use of heavy equipment is prevalent (during the demolition and site clearing phase), which would result in a minimum of 15 dB reduction..[12] Furthermore, optimal muffler systems for all equipment would reduce construction noise levels by approximately 10 dB or more.[13] Limiting the number of noise-generating heavy-duty off-road construction equipment (e.g., backhoes, dozers, excavators, loaders, rollers, etc.) simultaneously used on the Project site within 50 feet of off-site noise sensitive receptors surrounding the site to no more than two or three pieces of heavy-duty off-road equipment would further reduce construction noise levels. Taken together, these measures would reduce potential noise levels to within 10 dB of ambient. With implementation of these recommended measures and compliance with the City's Noise Ordinance, construction noise levels would not exceed the City's thresholds of significance and impacts would not be considered significant after mitigation.

12 Behrens and Associates Environmental Noise Control, "Temporary Compressor Sound Walls," http://www.drillingnoisecontrol.com/tempcompressor.html.

13 FHWA, *Special Report – Measurement, Prediction, and Mitigation*, updated June 2017. https://www.fhwa.dot.gov/Environment/noise/construction_noise/special_report/hcn04.cfm, accessed November 2018.

Vibration

Table 7: Construction Vibration Levels Estimates lists the vibration source levels at varying distances of the assumed construction equipment to be used for during construction. As shown in **Table 7**, cement and mortar mixers are capable of producing approximately 0.160 ips PPV at 25 feet and would not generate vibration levels in excess of 0.2 ips PPV. As such, the multifamily residential units (REC-1) located nearest to the Project site with regard to construction vibration activities would not be affected as a result of attenuation of ground-borne vibration. This is a conservative estimate assuming all all pieces of equipment are operating at the same time at the edge of the Project boundary without any shielding reductions. Furthermore, construction activities would be restricted to daytime hours when people are the least sensitive to vibration intrusions.

Operation

Roadway Noise

As mentioned previously, the Project is estimated to generate approximately 373 daily trips with 73 in the AM Peak Hour and 18 in the PM Peak. Caltrans has noted that a doubling of roadway traffic would double the sound energy but that would only result in a 3 dBA in sound which is generally barely detectable by the human ear.[14] The Project would not generate double the existing number of trips and the additional trips would be distributed among the surrounding roadways. As such, impacts would be less than significant.

Parking Noise

Development of the Project would introduce parking associated with the Project Site. Generally, noise associated with parking lots is not of sufficient volume to exceed community noise standards based on the time-weighted CNEL scale. Parking lots can be a source of annoyance due to automobile engine start-ups and acceleration, and the activation of car alarms. Parking lots can generate Leq noise levels of between 49 dBA Leq (tire squeals) to 74 dBA Leq (car alarms) at 50 feet. Vehicle access to the Project site includes the entrance/exit on Santa Monica Boulevard on the south side of the Project site and a security gate on the alley north of the Project site. The Project is proposing two levels of subterranean parking. As this is underneath the ground, much of the noise associated with parking lot noise sources would be masked. In addition, due to the existing level of traffic noise along area roadways, noise would not likely be audible due to the additional masking of noise by traffic.

---

[14] Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf. Accessed September 2018.

Stationary Sources

The Project would introduce various stationary noise sources, including heating, ventilation, and air conditioning (HVAC) systems, which would be located either on the roof, to the side of a structure, or on the ground. This equipment would be screened and integrated in architectural design of the building and would further attenuate sound emanating from the HVAC systems. As such, the use of such equipment would not generate levels that would substantially elevate the ambient noise environment.

GENERAL PLAN CONSISTENCY

Table 8: General Plan Applicable Goals and Policies evaluates the Project's consistency with the applicable goals provided in the City's General Plan to determine whether the Project would result in adverse impacts to noise. Based on the evaluation, the Project would be consistent with all feasible and applicable goals listed in the City's General Plan.

Table 7
Construction Vibration Levels Estimates

Equipment	Inches per Second PPV at Adjusted Distance 25 feet
Air compressor	0.090
Backhoe	0.040
Cement and mortar mixer	0.160
Concrete saw	0.018
Dozer	0.071
Forklift	0.040
Grader	0.071
Paver	0.063
Roller	0.020

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, *FTA-VA-90-1003-06 (May 2006), p. 12-12.*
Note: PPV = peak particle velocity.

Table 8
General Plan Applicable Goals and Policies

Goal		Consistency
SN-3	Minimize the impact of point source noise and ambient noise levels throughout the community.	**Consistent.** HVAC systems would be located either on the roof, to the side of a structure, or on the ground. This equipment would be screened and integrated in architectural design of the building.
SN-4	Minimize transportation-related noise	**Consistent.** As stated before, the Project would result in 373 daily trips with 73 in the AM Peak Hour and 18 in the PM Peak. This would not cause any of the surrounding roadways to double in volume and therefore the increase in trips would not have a significant impact on roadway noise.
SN-5	Create a healthy physical environment related to noise.	**Consistent.** As stated above, the Project would work to minimize noise impacts from stationary noise such as HVAC systems and construction activities in accordance with WHMC 9.08.050. In addition, the Project's mixed-use building would be designed to prevent additional noise to off-site sensitive receptors.

CUMULATIVE NOISE

For purposes of this analysis, development of the related projects will be considered to contribute to cumulative noise impacts. Noise by definition is a localized phenomenon and drastically reduces as distance from the source increases. As a result, only project and growth in the general area of the Project site would contribute to cumulative noise impacts. Noise impacts are localized in nature and decrease with distance. Cumulative construction noise impacts have the potential to occur when multiple construction projects in the local area generate noise within the same time frame and contribute to the local ambient noise environment. It is expected that, as with the Project, the related projects would implement BMPs, or similar mitigation measures, which would minimize any noise-related nuisances during construction. Therefore, the combined construction noise impact of the related projects and the Project's contribution would not cause a significant cumulative impact.

With regard to stationary sources, cumulative significant noise impacts may result from cumulative development. Stationary sources of noise that could be introduced in the area by cumulative projects could include mechanical equipment, loading docks, and parking lots. Given that these projects would be required to adhere to the City's noise standards, all the stationary sources would be required to provide shielding or other noise abatement measures so as not to cause a substantial increase in ambient noise levels. Moreover, due to distance, it is unlikely that noise from multiple cumulative projects would interact to create a significant combined noise impact. As such, it is not anticipated that a significant cumulative increase in permanent ambient noise levels would occur.

MITIGATION MEASURES

The following mitigation measures provided to reduce noise impacts during construction activities.

N-1: For all construction-related activities, noise-attenuation techniques shall be employed as needed to ensure that noise remains as low as possible during construction, specifically at REC-1. The following noise-attenuation techniques are recommended to further reduce the impact of construction noise:

- Ensure that construction equipment is properly muffled according to industry standards and in good working condition.
- Place noise-generating construction equipment and locate construction-staging areas away from sensitive uses, where feasible.
- Schedule high noise-producing activities between the hours of 8:00 AM and 7:00 PM to minimize disruption on sensitive uses.
- Implement noise-attenuation measures to the extent feasible, which may include but are not limited to temporary noise barriers or noise blankets around stationary construction noise sources.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- Operate all stationary construction equipment (e.g., air compressors, generators, impact wrenches, etc.) as far away from residential uses as possible, and shield such equipment with temporary sound barriers, sound aprons, or sound skins.
- Turn off construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, when not in use for more than 5 minutes.
- Clearly post construction hours, allowable workdays, and the phone number of the job superintendent at all construction entrances to allow surrounding owners to contact the job superintendent. If the City or the job superintendent receives a complaint, the superintendent shall investigate, take appropriate corrective action, and report the action taken to the reporting party.

APPENDIX A

Ambient Noise Monitoring Data Sheets

Monitoring Location: Site 1
Monitoring Date: 8/29/2019

Monitoring Period

Time	LAeq	LASmax	LASmin
8:26:53	66.5	71.7	61.4
8:27:53	62.9	69.5	59.8
8:28:53	64.5	70.3	61.1
8:29:53	63.3	68.2	61.8
8:30:53	62.4	63.7	61.3
8:31:53	62.8	63.9	61.1
8:32:53	63.5	65.1	62.6
8:33:53	64.6	66.3	63.0
8:34:53	65.3	66.1	64.7
8:35:53	65.3	66.4	64.7
8:36:53	64.9	66.2	64.1
8:37:53	65.9	67.9	64.3
8:38:53	65.0	66.4	64.2
8:39:53	65.3	66.0	64.7
8:40:53	64.4	67.3	63.0
8:41:53	64.4	65.3	63.2

15-minute LAeq **64.6**

Monitoring Location: Site 2
Monitoring Date: 8/29/2019

Monitoring Period

Time	LAeq	LASmax	LASmin
8:58:28	75.0	82.3	71.5
8:59:28	75.5	81.2	71.9
9:00:28	75.3	78.7	73.6
9:01:28	74.4	76.8	71.9
9:02:28	76.1	83.4	72.5
9:03:28	74.7	82.5	72.5
9:04:28	75.3	81.0	72.1
9:05:28	73.6	79.4	69.1
9:06:28	72.5	75.3	67.6
9:07:28	73.1	75.3	71.3
9:08:28	75.4	79.0	72.7
9:09:28	73.1	83.3	70.7
9:10:28	75.0	80.2	70.4
9:11:28	74.7	78.3	71.6
9:12:28	79.1	84.3	74.4
9:13:28	88.6	91.0	84.3

15-minute LAeq **78.8**

Monitoring Location: Site 3
Monitoring Date: 8/29/2019

Monitoring Period

Time	LAeq	LASmax	LASmin
8:42:44	75.7	79.9	70.2
8:43:44	78.3	87.3	72.5
8:44:44	74.9	79.1	71.5
8:45:44	74.2	76.9	70.9
8:46:44	75.3	79.8	69.5
8:47:44	74.6	78.9	70.9
8:48:44	74.2	78.2	66.3
8:49:44	71.5	76.4	60.8
8:50:44	75.8	81.6	70.8
8:51:44	76.3	79.0	74.0
8:52:44	74.0	77.4	68.8
8:53:44	70.8	77.2	65.7
8:54:44	74.5	76.9	70.9
8:55:44	76.8	86.0	72.2
8:56:44	79.2	91.7	65.6
8:57:44	74.3	75.5	73.6

15-minute LAeq **75.5**

APPENDIX B

Project Noise Data Spreadsheets

REC-1

Parameters

Construction Hours:

11	Daytime hours (7:00 AM to 7:00 PM)
0	Evening hours (7:00 PM to 10:00 PM)
0	Nighttime hours (10:00 PM to 7:00 AM)

Calculation

Construction Phase / **Equipment Type**	**Number of Units**	**Acoustical Usage Factor**	**Actual Noise Level At 50 feet, Lmax**	**Distance Feet**	**Leq**
Demolition					91.0
Concrete Saws	1	0.2	90	25	89.0
Rubber Tired Dozers	1	0.4	82	25	84.0
Tractor/Loaders/Backhoes	2	0.25	80	25	83.0
Site Preparation					87.8
Graders	1	0.4	85	25	87.0
Tractor/Loaders/Backhoes	1	0.25	80	25	80.0
Grading					91.0
Concrete Saws	1	0.2	90	25	89.0
Rubber Tired Dozers	1	0.4	82	25	84.0
Tractor/Loaders/Backhoes	2	0.25	80	25	83.0
Building Construction					84.9
Forklifts	2	0.1	75	25	74.0
Cranes	1	0.16	81	25	79.1
Tractor/Loaders/Backhoes	2	0.25	80	25	83.0
Paving					89.0
Paver	1	0.5	77	25	80.0
Cement and Mortar Mixers	4	0.4	79	25	87.1
Tractor/Loaders/Backhoes	1	0.25	80	25	80.0
Rollers	1	0.2	80	25	79.0
Architectural Coating					80.0
Compressor	1	0.4	78	25	80.0

REC-2

Parameters

Construction Hours:

11	Daytime hours (7:00 AM to 7:00 PM)
0	Evening hours (7:00 PM to 10:00 PM)
0	Nighttime hours (10:00 PM to 7:00 AM)

Calculation

Construction Phase / **Equipment Type**	**Number of Units**	**Acoustical Usage Factor**	**Actual Noise Level At 50 feet, Lmax**	**Distance Feet**	**Leq**
Demolition					75.4
Concrete Saws	1	0.2	90	200	73.5
Rubber Tired Dozers	1	0.4	82	200	68.5
Tractor/Loaders/Backhoes	2	0.25	80	200	67.4
Site Preparation					72.3
Graders	1	0.4	85	200	71.5
Tractor/Loaders/Backhoes	1	0.25	80	200	64.4
Grading					75.4
Concrete Saws	1	0.2	90	200	73.5
Rubber Tired Dozers	1	0.4	82	200	68.5
Tractor/Loaders/Backhoes	2	0.25	80	200	67.4
Building Construction					69.3
Forklifts	2	0.1	75	200	58.5
Cranes	1	0.16	81	200	63.5
Tractor/Loaders/Backhoes	2	0.25	80	200	67.4
Paving					73.4
Paver	1	0.5	77	200	64.4
Cement and Mortar Mixers	4	0.4	79	200	71.5
Tractor/Loaders/Backhoes	1	0.25	80	200	64.4
Rollers	1	0.2	80	200	63.5
Architectural Coating					64.5
Compressor	1	0.4	78	200	64.5