ATTACHMENT NO. 7

Appendix C

Noise and Vibration Analysis

Kimley»Horn

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TECHNICAL MEMORANDUM

To: **Jose Mendivil, City of Culver City**

From: **Jessie Fan, Olivia Chan, Simran Singh, Kimley-Horn and Associates, Inc.**

Date: **June 22, 2022**

Subject: **Culver Arts and Apartments Development Project – Noise and Vibration Analysis**

Purpose

The purpose of this memorandum is to identify the noise and vibration associated with construction and operations of the proposed Culver Arts and Apartments Project ("Project"), located in the City of Culver City, California. This memorandum has been prepared to support an exemption from the California Environmental Quality Act (CEQA) in accordance with CEQA Guidelines Section 15332 (In-Fill Development Projects). Specifically, this analysis addresses the noise and vibration impacts referenced in CEQA Guidelines Section 15332(d).

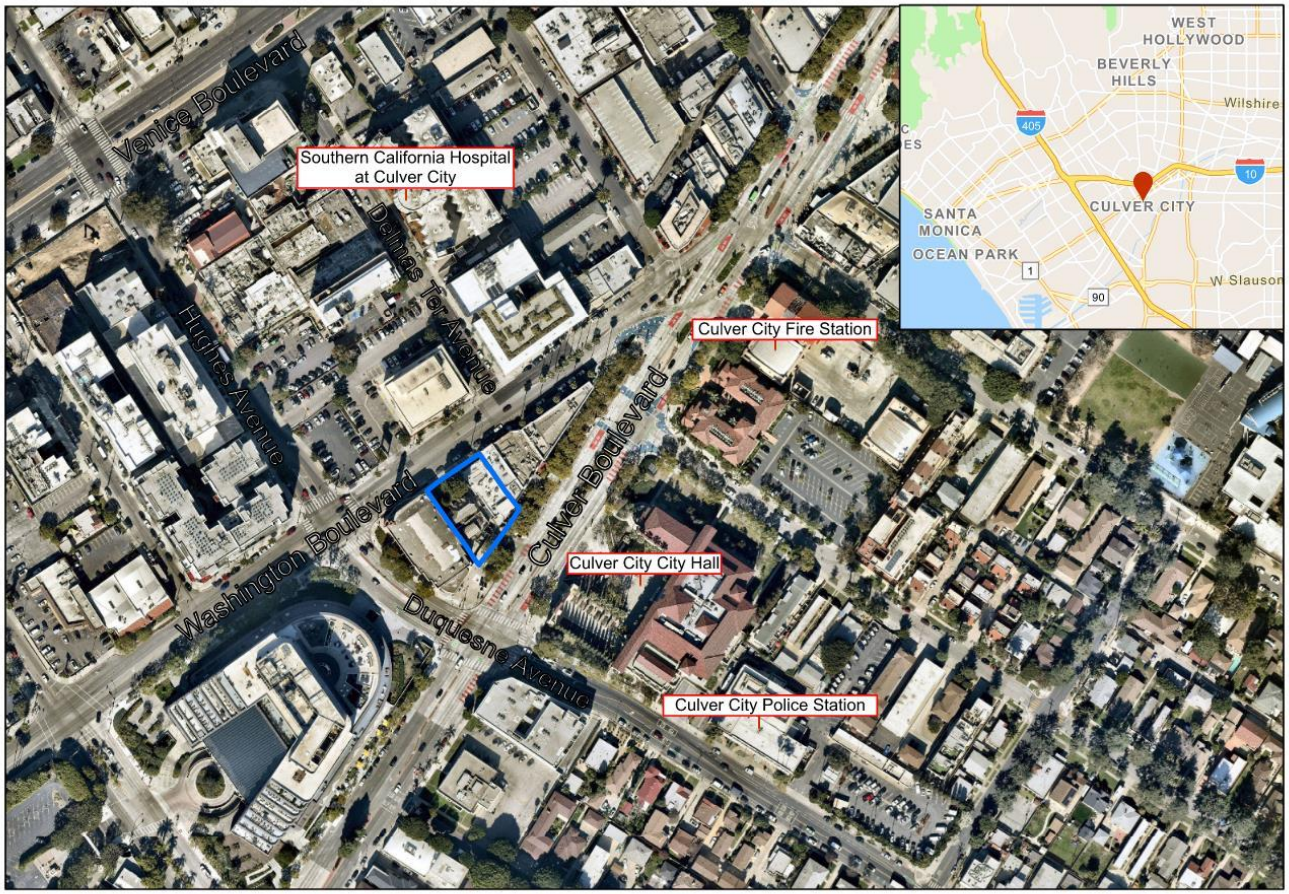
Project Location

The Project Site is located on an approximately 0.29-acre site (Project Site) at 9814 Washington Boulevard within the City of Culver City (City). The Project Site is bound by Washington Boulevard to the north, Duquesne Avenue to the southwest, and Culver Boulevard to the southeast. The Project Site is currently developed and consists of a 2,240 square-foot vacant single-family home and a 3,769 square-foot commercial restaurant. For more details, see Exhibit 1: Project Vicinity Map.

Project Description

The Project would demolish the single-family home on the western portion of the Project Site and retain the existing commercial space on the eastern portion of the Project Site. The Project would develop a new four-story building (approximately 47.5 feet high) on the western portion of the Project Site comprised of up to 4,000 square feet of general retail uses on the ground floor and three stories of residential uses above. The new building would include a residential lobby, mail room, bike parking area, restrooms, and trash room on the ground floor. The Project would develop two stories of residential units on top of the retained one-story commercial building on the eastern portion of the Project Site. The three-story building would be up to 34 feet high. The residential units would be connected across the Project Site. A total of 34 dwelling units would be provided, comprised of 22 studio and 12 one- or two-bedroom units. The Project would result in a total developed floor area of approximately 23,912 square feet. No on-site vehicle parking would be provided. Construction is anticipated to begin as early as 2023 and be completed in 2024.

Exhibit 1: Project Vicinity Map



Noise Background

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Noise, on the other hand, is typically defined as unwanted sound. A typical noise environment consists of a base of steady ambient noise that is the sum of various distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from traffic on a major highway.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise as well as the time of day when the noise occurs. For example, the equivalent continuous sound level (L_{eq}) is the average acoustic energy content of noise for a stated period of time; thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. The Day-Night Sound level (L_{dn}) is a 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 P.M. to 7:00 A.M. to account for noise sensitivity in the nighttime. The Community Noise Equivalent Level (CNEL) is a 24-hour average L_{eq} with a 10 dBA weighting added to noise during the hours of 10:00 P.M. to 7:00 A.M. and an additional 5 dBA weighting during the hours of 7:00 P.M. to 10:00 P.M. to account for noise sensitivity in the evening and nighttime.

Regulatory Setting

Federal Noise and Vibration Standards

There are no federal noise standards that directly regulate environmental noise related to the construction or operation of the Project. Under the Occupational Safety and Health Act of 1970 (29 U.S.C. Section 1919 et seq.), the Occupational Safety and Health Administration (OSHA) has adopted regulations designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise level exposure as a function of the amount of time during which the worker is exposed. The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, ensuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

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, FTA has adopted vibration criteria that are commonly used to evaluate potential structural damage to

buildings by building category from construction activities. The vibration damage criteria adopted by FTA are shown in Table 1, Construction Vibration Damage Criteria.

Table 1: Construction Vibration Damage Criteria

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

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

FTA has also adopted vibration criteria associated with the potential for human annoyance from groundborne vibration for the following three land-use categories: Category 1 – High Sensitivity, Category 2 – Residential, and Category 3 – Institutional, as shown in Table 2,Groundborne Vibration Impact Criteria for General Assessment. 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 still have the potential for activity interference.

Table 2: Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

Notes:
1. "Frequent Events" is defined as more than 70 vibration events of the same source per day.
2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
3. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day.
4. 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, 2018.

State of California Noise Standards

The State of California does not have standards for environmental noise, but the Governor's Office of Planning and Research (OPR) has established general plan guidelines for evaluating the compatibility of various land uses as a function of community noise exposure, as presented in Figure 1, Guideline *for Noise Compatible Land Use*.[1] 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 uses 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 multi-family residential uses, while a noise environment of 75 dBA CNEL or above for multi-family 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 California Government Code Section 65302(f) requiring a noise element to be included in the general plan. The noise element must: (1) identify and appraise noise problems in the community; (2) recognize Office of Noise Control guidelines; and (3) analyze and quantify current and projected noise levels.

City of Culver City General Plan

The City of Culver City Noise Standards are developed from those of several federal and State agencies including the FHWA, the USEPA, the Department of Housing and Urban Development, the American National Standards Institute, and the State of California Department of Health Services. These standards set limits on the noise exposure level for various land uses. As with the California Noise Standards described above, these General Plan standards are related to the siting of land uses and are not typically used as thresholds of significance for determining noise impacts associated with construction and operation of the Project. However, the standards do provide a means for judging whether an existing noise environment would be compatible with development of a new noise-sensitive land use or whether a new use would create an incompatible noise environment for existing noise-sensitive uses. The Culver City General Plan (CCGP) Noise Element Table N-4 provides noise and land use compatibly criteria; see Exhibit 2: Land Use Compatibility for Community Noise Exposure.

[1] State of California Governor's Office of Planning and Research, General Plan Guidelines, 2003.

Exhibit 2: Land Use Compatibility for Community Noise Exposure

NOISE ELEMENT

PROPOSED LAND USE CATEGORIES		COMPATIBLE LAND USE ZONES						
CATEGORIES	USES	CNEL <55	55-60	60-65	65-70	70-75	75-80	CNEL >80
RESIDENTIAL	Single Family, Duplex Multiple Family	A	A	B	B	C	D	D
RESIDENTIAL	Mobile Home	A	A	B	C	C	D	D
COMMERCIAL	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
COMMERCIAL	Commercial Retail, Bank Restaurant, Movie Theatres	A	A	A	A	B	B	C
COMMERCIAL INDUSTRIAL INSTITUTIONAL	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
COMMERCIAL INSTITUTIONAL	Amphitheater, Concert Hall Auditorium, Meeting Hall	B	B	C	C	D	D	D
COMMERCIAL	Children's Amusement Park, Miniature Golf Course, Go-Cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
COMMERCIAL INDUSTRIAL INSTITUTIONAL	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
INSTITUTIONAL	Hospital, Church, Library Schools' Classroom, Day Care	A	A	B	C	C	D	D
OPEN SPACE	Parks	A	A	A	B	C	D	D
OPEN SPACE	Golf Courses, Cemeteries, Nature Centers, Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
AGRICULTURE	Agriculture	A	A	A	A	A	A	A

SOURCE: Mestre Greve Associates

INTERPRETATION

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

ZONE B - COMPATIBLE WITH MITIGATION
New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction with closed windows and fresh air supply systems or air conditioning, will normally suffice. Note that residential uses are prohibited with Airport CNEL greater than 65 dB.

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

ZONE D - CLEARLY INCOMPATIBLE
New construction or development should generally not be undertaken.

TABLE N-4
LAND USE/NOISE COMPATIBILITY MATRIX

N-25

CULVER CITY GENERAL PLAN

Source: City of Culver City, *Culver City General Plan Table N-4: Land Use/Noise Compatibility Matix*, 1994.

The compatibility criteria indicate that residential land uses are considered clearly compatible with noise levels below 60 dBA L_{dn} and compatible with mitigation with noise levels of between 65 and 70 dBA L_{dn}. The compatibility criteria indicate that commercial land uses are considered clearly compabile with noise levels below 65 dBA L_{dn} and compatible with mitigation with noise levels of less than 70 dBA L_{dn}.

Table 3: Interior and Exterior Noise Standards lists exterior noise level standards and the type of occupancy to which they should be applied**.** While the City specifically identifies an exterior noise level limit for noise-sensitive residential land uses such as hotels, hospitals, schools, and parks, the City does not maintain exterior noise standards for non-noise sensitive land uses such as industrial uses, among others.

Table 3: Interior and Exterior Noise Standards			
Land Use		**CNEL (dBA)**	
Categories	**Uses**	**Interior[1]**	**Exterior[2]**
Residential	Single and multi-family, duplex	45[3]	65
	Mobile homes	----	65[4]
Commercial	Hotel, motel, transient housing	45	----
	Commercial retail, bank, restaurant	55	----
	Office building, research and development, professional offices	50	----
	Amphitheater, concert hall, auditorium, movie theater	45	----
	Gymnasium (Multipurpose)	50	----
	Sports Club	55	----
	Manufacturing, warehouse, wholesale, utilities	65	----
	Movie Theaters	45	----
Institutional/Public	Hospital, school classrooms/playgrounds	45	65
	Church, library	45	----
Open Space	Parks	---	65

Notes:
1. Indoor environment excluding: bathrooms, kitchens, toilets, closets, and corridors
2. Outdoor environment limited to:
   - Private yard of single-family dwellings
   - Multi-family private patios or balconies accessed from within the dwelling units (balconies 6.0 feet deep or less are exempt)
   - Mobile home parks
   - Park picnic areas
   - School playgrounds
   - Hospital patios
3. Noise level requirement with closed windows, mechanical ventilation or other means of natural ventilation shall be provided as per Uniform Building Code Section 1205.
4. Exterior noise levels should be such that interior noise levels will not exceed 45 dBA CNEL.

Source: City of Culver City, *Culver City General Plan Noise Element Table N-3, State of California Interior and Exterior Noise Standards*, 1994.

Policy 2.A Create a comprehensive ordinance establishing noise regulation criteria, and standards for noise sources and receptors to include but not be limited to the following:

- Noise reduction features during site planning to mitigate anticipated noise impacts on affected noise sensitive land uses, such as schools, hospitals, convalescent homes, and libraries.

- Temporary sound barrier installation at construction site if construction noise is impacting nearby noise sensitive land uses.
- Noise abatement and acoustical design criteria for construction and operation of any new development.

City of Culver City Municipal Code

Chapter 9.07 of the City of Culver City Municipal Code (CCMC) provides specific noise restrictions and exemptions for noise sources within the City. CCMC noise regulations state that construction activity shall be prohibited, except between the hours of 8:00 A.M. and 8:00 P.M. Mondays through Fridays; 9:00 A.M. and 7:00 P.M. Saturdays; 10:00 A.M. and 7:00 P.M. Sundays. There are no established noise limits for noise associated with construction activity when construction occurs within the permitted hours. It is prohibited for any person to operate any radio, disc player or cassette player or similar device at a construction site in a manner that results in noise levels that are audible beyond the construction site property line.

Section 9.07.055(B) of the CCMC prohibits the operation of a loud speaker or sound amplifying equipment for the purposes of transmitting messages, giving instructions, or providing entertainment on an on-going basis which is audible at the subject property line. This section is applicable only to uses that would include regular and on-going amplification, such as outdoor speakers used for a drive-through restaurant.

Existing Environmental Setting

Mobile noise sources, especially cars and trucks, are the City's most common and significant noise sources. The existing mobile noise sources in the Project area are the motor vehicles traveling on Washington Boulevard, Culver Boulevard, and Duquesne Avenue. The primary stationary noise sources in the Project vicinity are those associated with the surrounding residential and commercial uses. Such stationary noise sources include mechanical equipment (e.g., heating, ventilation, and air conditioning [HVAC] equipment), idling vehicles, restaurant customers, music playing, dogs barking, and people talking. The noise associated with these sources may represent a single-event noise occurrence or short-term noise.

Noise Measurements

The Project Site contains one unoccupied vacant building and an existing occupied commercial building. To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted four short-term noise measurements on May 24, 2022; see Appendix A: RCNM Modeling Results. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project Site. The 15-minute measurements were taken between 10:00A.M. and 1:00 P.M. Measurements of L_{eq} are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in Table 4: Project Construction Noise Levels and shown on Exhibit 3: Noise Measurement Locations.

Table 4. Project Construction Noise Levels

Off-site Sensitive Land Uses	Receptor Location	Land Use	Nearest Distance from Construction Activity to Noise Receptor (ft.)	Construction Phase	Estimated Maximum Construction Noise Levels (dBA L_{eq})	Ambient Noise Levels	Threshold	Exceed Threshold?
ST-1	Southwest	Residential	270	Demolition	71.6	67.7	80	**No**
				Site Preparation	71.4			**No**
				Grading/Excavation	71.0			**No**
				Building Construction	69.7			**No**
				Paving	69.5			**No**
				Architectural Coating	67.9			**No**
				Maximum Noise Level	71.6			**No**
ST-2	North	Residential	360	Demolition	69.2	66.3	80	**No**
				Site Preparation	68.2			**No**
				Grading/Excavation	66.9			**No**
				Building Construction	68.2			**No**
				Paving	67.0			**No**
				Architectural Coating	65.4			**No**
				Maximum Noise Level	69.2			**No**
ST-3	Southeast	Residential	108	Demolition	79.7	65.7	80	**No**
				Site Preparation	78.7			**No**
				Grading/Excavation	79.1			**No**
				Building Construction	77.9			**No**
				Paving	77.4			**No**
				Architectural Coating	75.9			**No**
				Maximum Noise Level	79.7			**No**
ST-4	Southwest	Residential	510	Demolition	66.2	64.1	80	**No**
				Site Preparation	78.7			**No**
				Grading/Excavation	65.6			**No**
				Building Construction	64.4			**No**
				Paving	63.9			**No**
				Architectural Coating	62.6			**No**
				Maximum Noise Level	78.7			**No**

Exhibit 3: Noise Measurement Locations

Culver Arts & Apartments Project

Noise Measurement Receptor Locations

Kimley»Horn

Receptor Locations

Noise exposure standards and guidelines for various types of land uses reflect varying noise sensitivies associated with uses. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers , long-term health facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive land uses surrounding the Project consist of mostly residential communities approximately 510 feet south and south east of the Project Site. In addition, approximately 360 feet northwest of the Project there is a hospital and medical center. To quantify noise exposure levels near the Project Site, four receptor locations (see Exhibit 3) were chosen for noise measurements surrounding the Project Site closest to sensitive receptors including:

- ST-1: Village Well Books and Coffee at the corner of Culver Boulevard & Duquesne Avenue approximately 270 feet southwest of the Project Site
- ST-2: Southern California Hospital off of Washington Boulevard along Delmas Terra's Boulevard approximately 360 feet northwest of the Project Site
- ST-3: Culver Boulevard resturants and Kirk Douglas Theatre along Culver Boulevard about 108 feet next to the Project Site
- ST-4: United States Post Office at the Corner of Lincoln and Culver Boulevard approximately 560 feet southwest of the Project Site

Construction Noise

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction. Noise generated by construction equipment can reach high levels. During construction, exterior noise levels could affect the noise-sensitive receptors near the construction site. Construction activities would include demolition, site preparation, grading, building construction, paving, and architectural coating. Such activities may require graders, dozers, and tractors during site preparation and grading; cranes, forklifts, generators, tractors, and welders during building construction; pavers, rollers, mixers, tractors, and paving equipment during paving; and air compressors during architectural coating. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. L_{max} is the maximum level of a noise source environment and is often used as a threshold value for typical noise levels of construction activities. Typical noise levels associated with individual construction equipment are listed in Table 5: Typical Construction Noise Levels.

Table 5: Typical Construction Noise Levels		
Equipment	**Typical Noise Level (dBA L_{max}) at 50 feet from Source**	**Typical Noise Level (dBA L_{max}) at 100 feet from Source[1]**
Air Compressor	80	74
Backhoe	80	74
Compactor	82	76
Concrete Mixer	85	79
Concrete Pump	82	76
Concrete Vibrator	76	70
Crane, Mobile	83	77
Dozer	85	79
Generator	82	76
Grader	85	79
Jack Hammer	88	82
Loader	80	74
Paver	85	79
Pneumatic Tool	85	79
Pump	77	71
Roller	85	79
Saw	76	70
Shovel	82	76
Truck	84	78
Note: 1. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1+20Log(d_1/d_2)$ Where: dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance.		
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.		

The City does not administer noise level standards for construction activities. However, this analysis conservatively uses the Federal Transit Administration (FTA)'s threshold of 80 dBA (8-hour L_{eq}) for residential uses to evaluate construction noise.[2] Following FTA's methodology for quantitative construction noise assessments, Federal Highway Administration's (FHWA's) Roadway Construction Noise Model (RCNM) was used to predict construction noise at the nearest noise receptors (i.e., the multi-family residential and commercial uses adjacent/immediately surrounding the Project Site) consistent with the methodologies in the FTA *Transit Noise and Vibration Impact Assessment Manual* (September 2018) (FTA Noise and Vibration Manual). Table 4 above shows the estimated exterior construction noise levels at the nearest receptors to the east of the Project Site. Following FTA methodology, when calculating construction noise, all equipment is assumed to operate at the center of the Project Site because equipment would operate throughout the Project Site and not at a fixed

[2] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 7-2, Page 179, September 2018.

location for extended periods of time. Therefore, the distance used in the RCNM model were varied depending on the sensitive receptors distance to the Project Site.

As indicated in Table 4, Project construction noise would be below the FTA noise threshold for residential land uses. Residential land use was used as the most conservative ambient noise threshold in RCNM. The Project's existing surroundings include both residential and commercial uses nearby. In addition, although construction noise levels may exceed the area's existing ambient levels, construction would be temporary and would not result in a permanent increase in ambient noise levels in the area. Project construction would also be prohibited between the hours of 8:00 P.M.and 8:00 A.M. in compliance with CCMC Section 9.07.035. Therefore, construction noise impacts would be less than significant.

Operational Noise

Project implementation would create new noise sources in the Project vicinity. The Project's primary noise sources that could potentially impact nearby noise-sensitive land uses include mechanical equipment (e.g., HVAC, etc.), activities associated with loading/unloading storage items, parking areas, trash/recycling truck pickups, and off-site traffic noise. The Project's hours of operation would be restricted to 8:00 A.M. to 8:00 P.M., Monday through Friday, 9:00 A.M. to 7:00 P.M. Saturday, and 10:00 A.M. to 7:00 P.M. on Sunday as per CCMC Construction Guidelines.[3]

Mechanical Equipment

Potential stationary noise sources related to long-term Project operations include mechanical equipment (e.g., HVAC equipment). The nearest receptors are the commercial and residental mixed use buildings approximately 100 feet adjacent from the nearest mechanical equipment location on the Project Site. Mechanical equipment typically generates noise levels of approximately 52 dBA at 50 feet.[4] Noise has a decay rate due to distance attenuation, which is calculated based on the Inverse Square Law of sound propagation. Based upon the Inverse Square Law, sound levels decrease by 6 dBA for each doubling of distance from the noise source. As a result, mechanical equipment noise would attenuate to approximately 48 dBA at the nearest noise receptors. The Project's mechanical equipment noise would be below the City's most stringent exterior and interior noise standards for residential uses of 65 dBA CNEL and 45 dBA CNEL, respectively. Therefore, the Project would result in a less than significant impact concerning mechanical equipment noise levels.

[3] City of Culver City, *Municipal Code § 9.07.035.A*, 2021,Culver City, Los Angeles County,California

[4] Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, June 26, 2015.

Mobile Traffic Noise

The Project is anticipated to generate 117 daily trips, with up to 15 trips during the A.M. peak-hour and up to 13 trips during the P.M. peak-hour.[5] There would be daily foot traffic to the proposed building as well. In general, a 3-dBA increase in traffic noise is barely perceptible to people, while a 5-dBA increase is readily noticeable. Traffic volumes on Project area roadways would have to approximately double for the resulting traffic noise levels to generate a barely perceptible 3-dBA increase.[6] The City does not have Average Daily Traffic (ADT) Volumes for the Project vicinity's main thoroughfares; however, existing traffic studies for previous projects within the Project vicinity have calculated ADT. For reference, ADT volume along perpendicular side streets to Culver and Washington Boulevard such as Lafayette Place, Lucerne Avenue, and Duquense Avenue range from 8,000 to 9,000 ADT respectively.[7,8] As noted above, the proposed Project would result in approximately 117 daily trips, which is not enough to double the existing traffic volumes on Washington and Culver Boulevard, or nearby throughstreets. The proposed Project would not generate enough traffic to result in a noticeable 3-dBA increase in ambient noise levels. Therefore, the Project would result in a less than significant impact concerning mobile traffic noise levels.

Vibration

Increases in ground-borne vibration levels attributable to the proposed Project would be primarily associated with short-term construction-related activities. Project construction could result in varying degrees of temporary ground-borne vibration, depending on the specific construction equipment used and the operations involved.

The FTA has published standard vibration velocities for construction equipment operations. In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.2 in/sec) appears to be conservative. The types of construction vibration impacts 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. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that

5 The Project's daily vehicle trips are based on Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition.

6 According to the California Department of Transportation, Technical Noise Supplement to Traffic Noise Analysis Protocol (September 2013), it takes a doubling of traffic to create a noticeable (i.e., 3 dBA) noise increase.

7 Raju Associates, Inc., Draft Traffic Study For the 8888 Washington Boulevard Project, Table 8: Residential Street Traffic Analysis, February 2017.

8 Fehr & Peers, The Culver Studios Innovation Plan Traffic Study, Table 24: Neighborhood Street Impact Analysis – Daily Traffic Volume – Existing Baseline Conditions, September 2017.

a vibration level of up to 0.20 inch-per-second peak particle velocity (in/sec PPV) is considered safe and would not result in any construction vibration damage. This analysis uses the FTA architectural damage criterion for continuous vibrations at non-engineered timber and masonry buildings of 0.2 in/sec PPV and human annoyance criterion of 0.4 in/sec PPV in accordance with Caltrans guidance[9] to evaluate potential construction vibration impacts.

Table 6: Typical Construction Equipment Vibration Levels lists vibration levels at 25 feet for typical construction equipment. The nearest off-site buildings/structures are the residential and commercial buildings located adjacent to the north and east of the Project Site, approximately 100 feet from Project construction activities. Groundborne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in Table 6, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.003 to 0.089 in/sec PPV at 25 feet from the activity source.

Table 6: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 feet (in/sec)
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Rock Breaker	0.089
Jackhammer	0.035
Small Bulldozer/Tractors	0.003

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

As shown in Table 6**,** the vibration velocities at 25 feet from construction equipment would be 0.089 in/sec PPV, which would be below the FTA's 0.20 in/sec PPV threshold for building damage and Caltrans' 0.4 in/sec PPV threshold for human annoyance. It is also acknowledged that construction activities would occur throughout the Project Site and would not be concentrated at the point closest to the nearest off-site structures. Once operational, the proposed Project would not include vibration-generating uses or operations. Therefore, the Project would result in a less than significant impact concerning construction vibration levels.

Conclusion

The Project's construction and operational noise and vibration levels would not exceed any City or FTA standards. The Project would result in less than significant construction and operational noise and vibration impacts and no mitigation is required. Therefore, the Project's approval would not result in any significant effects relating to noise and vibration pursuant to State CEQA Guidelines Section 15332(d).

[9] California Department of Transportation, Transportation and Construction Vibration Guidance Manual, Table 20, September 2013.

Appendix A

RCNM Modeling Results

ST-1 Demolition	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total dBA	74.9	71.6
All Other Equipment > 5 HP	70.4	67.3
Backhoe	62.9	58.9
Concrete Saw	74.9	67.9
Dozer	67	63
Pickup Truck	60.4	59.4

ST-2 Demolition	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	72.4	69.2
All Other Equipment > 5 HP	67.9	64.8
Pickup Truck	57.9	53.9
Concrete Saw	72.4	65.4
Dozer	64.5	60.5
Backhoe	60.4	56.4

ST-3 Demolition	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	82.9	79.7
All Other Equipment > 5 HP	78.3	75.3
Pickup Truck	68.3	64.3
Concrete Saw	82.9	75.9
Dozer	75	71
Backhoe	70.9	66.9

ST-4 Demolition	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	69.4	66.2
All Other Equipment > 5 HP	64.8	61.8
Pickup Truck	54.8	50.8
Concrete Saw	69.4	62.4
Dozer	61.5	57.5
Backhoe	57.4	53.4

ST-1 Site Preparation	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	70.4	71.4
All Other Equipment > 5 HP	70.4	67.3
Scraper	68.9	65
Backhoe	62.9	58.9
Grader	70.4	66.4
Pickup Truck	60.4	59.4

ST-2 Site Preparation	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	67.9	68.2
All Other Equipment > 5 HP	67.9	64.8
Pickup Truck	57.9	53.9
Dozer	64.5	60.5
Scraper	66.4	62.5
Backhoe	60.4	56.4

ST-3 Site Preparation	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	78.3	78.7
All Other Equipment > 5 HP	78.3	75.3
Pickup Truck	68.3	64.3
Dozer	75	71
Scraper	76.9	72.9
Backhoe	70.9	66.9

ST-4 Site Preparation	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	64.8	65.2
All Other Equipment > 5 HP	64.8	61.8
Pickup Truck	54.8	50.8
Dozer	61.5	57.5
Scraper	63.4	59.4
Backhoe	57.4	53.4

ST-1 Grading	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	70.4	71
All Other Equipment > 5 HP	70.4	67.3
Backhoe	62.9	58.9
Grader	70.4	66.4
Dozer	67	63
Pickup Truck	60.4	59.4

ST-2 Grading	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	67.9	66.9
All Other Equipment > 5 HP	67.9	64.8
Pickup Truck	57.9	53.9
Dozer	64.5	60.5
Backhoe	60.4	56.4
Grader	67.9	63.9

ST-3 Grading	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	78.3	79.1
All Other Equipment > 5 HP	78.3	75.3
Pickup Truck	68.3	64.3
Dozer	75	71
Grader	78.3	74.3
Backhoe	70.9	66.9

ST-4 Grading	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	64.8	65.6
All Other Equipment > 5 HP	64.8	61.8
Pickup Truck	54.8	50.8
Dozer	61.5	57.5
Grader	64.8	60.8
Backhoe	57.4	53.4

ST-1 Construction	Calculated (dBA)	
Equipment	Lmax*	Leq
Total	70.4	69.7
All Other Equipment > 5 I	70.4	67.3
Backhoe	62.9	58.9
Welder / Torch	59.4	55.4
Generator	66	63
Crane	65.9	57.9
Man Lift	60.1	53.1
Pickup Truck	60.4	59.4

ST-2 Construction	Calculated (dBA)	
Equipment	Lmax*	Leq
Total	67.9	68.2
All Other Equipment > 5 I	67.9	64.8
Pickup Truck	57.9	53.9
Backhoe	60.4	56.4
Crane	63.4	55.4
Generator	63.5	60.5
Welder / Torch	56.9	52.9
Man Lift	57.6	50.6

ST-3 Construction	Calculated (dBA)	
Equipment	Lmax*	Leq
Total	78.3	77.9
All Other Equipment > 5 I	78.3	75.3
Pickup Truck	68.3	64.3
Backhoe	70.9	66.9
Crane	73.9	65.9
Generator	73.9	70.9
Welder / Torch	67.3	63.3
Man Lift	68	61

ST-4 Construction	Calculated (dBA)	
Equipment	Lmax*	Leq
Total	64.8	64.4
All Other Equipment > 5 I	64.8	61.8
Pickup Truck	54.8	50.8
Backhoe	57.4	53.4
Crane	60.4	52.4
Generator	60.5	57.4
Welder / Torch	53.8	49.8
Man Lift	54.5	47.5

ST-1 Paving	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	70.4	69.5
All Other Equipment > 5 HP	70.4	67.3
Concrete Mixer Truck	64.2	60.2
Backhoe	62.9	58.9
Paver	62.6	59.6
Roller	65.4	58.4
Pickup Truck	60.4	59.4

ST-2 Paving	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	67.9	67
All Other Equipment > 5 HP	67.9	64.8
Backhoe	60.4	56.4
Paver	60.1	57.1
Roller	62.9	55.9
Concrete Mixer Truck	61.7	57.7

ST-3 Paving	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	78.3	77.4
All Other Equipment > 5 HP	78.3	75.3
Backhoe	70.9	66.9
Paver	70.5	67.5
Roller	73.3	66.3
Concrete Mixer Truck	72.1	68.1

ST-4 Paving	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	64.8	63.9
All Other Equipment > 5 HP	64.8	61.8
Backhoe	57.4	53.4
Paver	57	54
Roller	59.8	52.8
Concrete Mixer Truck	58.6	54.6

ST-1 Coating	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	70.4	67.9
All Other Equipment > 5 HP	70.4	67.3
Compressor (air)	63	59

ST-2 Coating	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	67.9	65.4
All Other Equipment > 5 HP	67.9	64.8
Compressor (air)	60.5	56.5

ST-3 Coating	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	78.3	75.9
All Other Equipment > 5 HP	78.3	75.3
Compressor (air)	71	67

ST-4	Calculated (dBA)	
Equipment	**Lmax***	**Leq**
Total	64.8	62.6
All Other Equipment > 5 HP	64.8	61.8
Concrete Mixer Truck	58.6	54.6

Project Construction Noise Levels

Off-site Sensitive Land Uses	Receptor Location	Land Use	Nearest Distance from Construction Activity to Noise Receptor (ft.)	Construction Phase	Estimated Maximum Construction Noise Levels (dBA L_{eq})	Ambient Noise Levels	Threshold	Exceed Threshold?
ST-1	Southwest	Residential	270	Demolition	71.6	67.7	80	No
				Site Preparation	71.4			No
				Grading/Excavation	71			No
				Building Construction	69.7			No
				Paving	69.5			No
				Architectural Coating	67.9			No
				Maximum Noise Level	71.6			No
ST-2	North	Residential	360	Demolition	69.2	66.3	80	No
				Site Preparation	68.2			No
				Grading/Excavation	66.9			No
				Building Construction	68.2			No
				Paving	67			No
				Architectural Coating	65.4			No
				Maximum Noise Level	69.2			No
ST-3	Southeast	Residential	108	Demolition	79.7	65.7	80	No
				Site Preparation	78.7			No
				Grading/Excavation	79.1			No
				Building Construction	77.9			No
				Paving	77.4			No
				Architectural Coating	75.9			No
				Maximum Noise Level	79.7			No
ST-4	Southwest	Residential	510	Demolition	66.2	64.1	80	No
				Site Preparation	78.7			No
				Grading/Excavation	65.6			No
				Building Construction	64.4			No
				Paving	63.9			No
				Architectural Coating	62.6			No
				Maximum Noise Level	78.7			No

All Phases of Construction

Appendix B

Project Site Visit Log

Noise Measurement Field Data			
Project:	9814 Washington Blvd	**Job Number:**	099909001.3.103
Site No.:	ST-1	**Date:**	5/24/2022
Analyst:	Serena Lin, Simran Singh	**Time:**	10:46 AM
Location:	Village Well & Books Coffee - corner of Culver Blvd and Duquesne Avenue		
Noise Sources:	Pedestrians, foot traffic, shop customers, vehicles and traffic		

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
67.7	54.0	78.8	98.0

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	67
Wind (mph):	<5
Sky:	Clear
Bar. Pressure:	29.84 Hg
Humidity:	68%

Photo:

Kimley»Horn

Noise Measurement Field Data			
Project:	9814 Washington Blvd	**Job Number:**	099909001.3.103
Site No.:	ST-2	**Date:**	5/24/2022
Analyst:	Serena Lin, Simran Singh	**Time:**	2:08 PM
Location:	Southern California Hospital at Culver City - Delmas Terras Blvd		
Noise Sources:	Hospital noises, machinery, vehicle entry and exit, pedestrians, construction		

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
66.3	57.9	74.9	96.9

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	68
Wind (mph):	<5
Sky:	Clear
Bar. Pressure:	29.7 Hg
Humidity:	65%

Photo:

Kimley»Horn

Noise Measurement Field Data

Project:	9814 Washington Blvd	**Job Number:**	099909001.3.103
Site No.:	ST-3	**Date:**	5/24/2022
Analyst:	Serena Lin, Simran Singh	**Time:**	11:25 AM
Location:	9814 Washington Boulevard - to the left of Café Vida infront of proposed site		
Noise Sources:	Pedestrians, foot traffic, shop customers, vehicles and traffic		

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
65.7	56.7	79.9	101.0

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	67
Wind (mph):	<5
Sky:	Clear
Bar. Pressure:	29.84 Hg
Humidity:	68%

Photo:

Kimley»Horn

Noise Measurement Field Data

Project:	9814 Washington Blvd	**Job Number:**	099909001.3.103
Site No.:	ST-4	**Date:**	5/24/2022
Analyst:	Serena Lin, Simran Singh	**Time:**	11:05 AM
Location:	Lincoln Avenue and Culver Blvd - United States Postal Service Building		
Noise Sources:	Pedestrians, foot traffic, shop customers, vehicles and traffic		

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
64.1	50.4	78.8	96.6

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	67
Wind (mph):	<5
Sky:	Clear
Bar. Pressure:	29.84 Hg
Humidity:	67%

Photo: