Appendix G

Noise and Vibration Analysis

Kimley»Horn

TECHNICAL MEMORANDUM

To: Samantha Tewasart, Planning Manager, City of San Gabriel

From: Olivia Chan and Mayra Garcia, Kimley-Horn and Associates, Inc.

Date: July 21, 2023

Subject: Rubio Village Mixed-Use Project – Noise and Vibration Analysis

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Purpose

The purpose of this memorandum is to assess potential impacts due to noise and vibration impacts associated with construction and operations of the Rubio Project (Project), located in the City of San Gabriel (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 would be located on an approximately 2.9-acre site (Project Site) at 201-217 South San Gabriel Boulevard. The Project Site is located at the southwest corner of the intersection of East Live Oak Street and South San Gabriel Boulevard. The Project Site is generally bound by East Live Oak Street to the north, South San Gabriel Boulevard to the east, residential and commercial uses to the south, and South Pine Street to the west. The Project Site is undeveloped and is fenced off on all sides. The Project Site has a General Plan Land Use designation of General Commercial.[1] The Project Site is zoned Mixed-Use PD (Planned Development Overlay).[2] According to the San Gabriel Municipal Code (SGMC) Section 153.280, the PD Overlay zoning designation is intended to allow large-scale development (one acre or larger) in specific corridors within the City. Any use permitted under Residential, Commercial, Mixed-use zone may be permitted in a Mixed-Use PD Overlay zone.

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[1] City of San Gabriel, Land Use Plan, 2004, https://www.sangabrielcity.com/DocumentCenter/View/813/Copy-of-2004-GP-Land-Use-Map-SIGNED?bidId=. Accessed June 9, 2023.

[2] It should be noted that the City's 2016 Zoning Map shows that the Project Site is zoned C-1 (Retail Commercial). Under State Clearinghouse (SCH) No. 2006061078, a Zone Change was approved for the Project Site which redesignated the Project Site to Planned Development Overlay (C-1(P-D)).

Project Description

The Project would construct 3 buildings consisting of 225 multi-family residential units and approximately 13,449 square feet (SF) of commercial uses (restaurant/retail) in 5 spaces. The 225 multi-family residential units are comprised of 12 studios, 179 one-bedroom units, 31 two-bedroom units, and 3 three-bedroom units. The Project would include 191,453 SF of residential uses (including amenities), 13,449 SF of commercial uses, and 101,891 SF of above-ground parking, resulting in a total of 306,793 SF and a floor area ratio (FAR) of 2.44:1. The Project would locate one building (Building A) north of the Rubio Wash, fronting East Live Oak Street. The other two buildings (Building B fronting Pine Street and Building C fronting South San Gabriel Boulevard) would be south of the Rubio Wash. Building A would be a six-floor building consisting of 206 multi-family residential units comprised of 12 studios, 163 one-bedroom units, and 31 two-bedroom units. The ground floor would include 113 vehicle parking spaces, bike racks for both the residential and commercial uses (see Section 2.3.4 for more detail), a 1,261 SF amenity space/multi-purpose room/gym for the residents, a 1,682 SF retail space, a 3,240 SF residential lobby, a 6,316 SF retail space, and two restaurant spaces (2,000 SF and 1,722 SF). The second floor would include 102 vehicle parking spaces, residential units, and a 4,240 SF amenity space on the southern corner of the building. The third through sixth floor would comprise of only residential units. Two subterranean levels of parking would also be included. The first subterranean level would include 134 parking spaces long-term residential bike racks, and 49 storage lockers. The second subterranean level would include 83 parking spaces, long-term residential bike racks, and 87 storage lockers. Building A would have a maximum height of 70 feet and 7 inches to the top of the roof. Building A would be 77 feet and 2 inches inclusive of the feature tower roof.

Building B would be a two-story building consisting of 3 three-bedroom townhome units. Two-car garages would be attached to each townhome. Long-term residential bike racks and open space would be provided adjacent to the Rubio Wash.

Building C would be a four-floor building consisting of 16 multi-family residential units, all of which would be one-bedroom units. The ground floor would include a 1,729 SF restaurant space and residential units. The remaining floors would only consist of residential units. Short-term residential bike racks and open space would be provided adjacent to the Rubio Wash.

The Project would also include signage, security gates, and trash enclosures. The buildings' rooftops would be solar ready to include roof blocking, platform supports, and vacant conduits. The Project would be located adjacent to single-story scaled commercial and associated surface parking to the north and east and one- and two-story multi-family residential to the west and south. Buildings B and C would serve as transitions and buffers between the one- and two-story residential buildings to the six-story Building A.

The Project would be required to provide a total of 22,500 SF of publicly accessible open space area. The Project would provide 43,810 SF of open space, comprised of 27,048 SF of ground floor open space and 16,762 SF in a third floor courtyard. The Project would also include 10,667 square feet of private open space area in the form of residential balconies and patios. The Project includes open space along East Live Oak Street, South San Gabriel Boulevard, and along the Rubio Wash. Two amenity spaces would be provided in Building A on the ground floor and second floor.

The Project would provide a total of 438 vehicle parking spaces (351 for residential and 87 for commercial) consisting of 83 spaces on Building A's second subterranean level, 134 spaces on Building A's first subterranean level, 113 spaces on Building A's ground floor, 102 spaces on Building A's ground floor, and 6 spaces in Building B's private garages. Of the 438 vehicle parking spaces, 45 parking spaces would be designated for electric vehicles (EV) and 8 spaces would be designated for clean air, vanpool, and EV. Parking on the two subterranean levels and second above-ground floor would be for residents. Parking for the commercial uses will be located on the ground floor only. The Project also proposes a total of 76 bicycle parking spaces consisting of 56 long-term residential, 4 long-term commercial, 8 short-term residential (guest), and 8 short-term commercial.

Project construction is anticipated to occur as a single-phase, lasting approximately 25 months, beginning as early as February 2024 and ending as early as February 2026. For purposes of this environmental analysis, opening year is assumed to be 2026.

Grading for the proposed improvements would require cut and fill to create building pads. Maximum excavation depth would be 24.5 feet below ground surface, inclusive of foundations, pads, piers, and continuous footing. Project construction is estimated to require approximately 26,637 cubic yards (CY) of cut, 4,842 CY of fill, and 21,795 CY of export.

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 United States Code [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.

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.[3] 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."

[3] State of California Governor's Office of Planning and Research, General Plan Guidelines, Appendix D: Noise Element Guidelines, page 374, 2017, https://opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf. Accessed June 30, 2023.

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.

Groundborne Vibration

The California Department of Transportation' (Caltrans) *Transportation and Construction Vibration Manual* provides thresholds of vibration for human annoyance. Based on the Caltrans criteria, construction vibration impacts would be significant if vibration levels exceed 0.5 inches per second (in/sec) peak particle velocity (PPV) at older residential structures, which is the limit for potential building damage at these structures.[4]

City of San Gabriel General Plan

The City of San Gabriel Noise Standards are developed from those of several federal and State agencies including the Federal Highway Administration (FHWA), the United States Environmental Protection Agency (USEPA), the Department of Housing and Urban Development, the American National Standards Institute (ANSI), 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 Noise Element of the General Plan provides specific objectives to ensure that City residents will be protected from excessive noise. The following policies are applicable to the Project:

Chapter 9: Noise

Goal 9.2: Minimize the impact of traffic noise for those who live and work on our major roadways.

[4] Caltrans, Transportation and Construction Vibration Guidance Manual, 2020

Goal 9.4: Protect residents from the harmful effects of noise from mechanical equipment and trucks.

Goal 9.6: Promote the health of our community by protecting it from the harmful effects of noise.

City of San Gabriel Municipal Code

City of San Gabriel Municipal Code (SGMC) Title 15, Chapter 150, Building Regulations provides specific noise restrictions and exemptions for noise sources within the City. SGMC Section 15.003 states that construction activity shall be prohibited within the city except between Mondays through Fridays 7:00 A.M. to 7:00 P.M and between the hours of 8:00 A.M. and 4:00 P.M. on Saturday. Construction is prohibited on Sundays and on holidays. SGMC Section 18-312 provides exterior noise standards of 55 dBA during daytime hours (7:00 A.M. to 10:00 P.M.) and 50 dBA during nighttime hours (10:00 P.M. to 7:00 A.M.) for all residential uses within the City.

Existing Environmental Setting

Mobile noise sources, especially cars, trucks motorcycles, and aircrafts, are the City's most common and substantial noise sources. The existing mobile noise sources in the Project area are the motor vehicles traveling on San Gabriel Boulevard, East Live Oak Street, and South Pine Street. The primary stationary noise sources in the Project vicinity are those associated with the surrounding residential uses. Such stationary noise sources include mechanical equipment (e.g., heating, ventilation, and air conditioning [HVAC] equipment), moving vehicles, 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 is currently undeveloped and is fenced off on all sides. To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted four short-term noise measurements on June 7, 2023; see Appendix A: Noise Data. 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 8:00 A.M. and 11:00 A.M. Measurements of L_{eq} are considered representative of the noise levels throughout the day, and summarized in Table 1: Existing Noise Measurements, below. The sources of noise measured at each location are shown on Exhibit 1: Noise Measurement Locations.

Table 1: Existing Noise Measurements					
Site	**Location**	**L_{eq} (dBA)**	**L_{min} (dBA)**	**L_{max} (dBA)**	**Time**
1	Southwest of Project Site on South Pine Street	57.2	43.3	71.5	8:57 A.M.
2	Southeast of the project site on San Gabriel Boulevard	74.6	54.4	81.3	9:48 A.M.
3	West corner of South Pine Street and East Live Oak Street	60.9	46.8	71.6	9:19 A.M.
4	East of the Project Site on East Live Oak Street	60.9	51.1	77.6	10:14 A.M.
Source: Noise measurements taken by Kimley-Horn, June 07, 2023. See Appendix A for noise measurement results.					

EXHIBIT 1: NOISE MEASUREMENT LOCATIONS
Rubio Village Mixed-Use Project

NOT TO SCALE

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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 to south, east, and west of the Project Site. To quantify noise exposure levels near the Project Site, four receptor locations (see Exhibit 1) were chosen for noise measurements surrounding the Project Site closest to sensitive receptors including:

- #1: Multi-family residences south of the site at 230 South Pine Street
- #2: Data for Children after school program to the southeast of the site on San Gabriel Boulevard
- #3: Multi-family residences on the western corner of South Pine Street and East Live Oak Street, to the west of the Project Site
- #4: Multi-family residences east of the Project at 818 East Live Oak Street, to the east 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 site preparation, grading, foundations, building construction, and architectural coating. Such activities may require three dozers and four tractors during site preparation; one exacavator, grader, dozer, and three tractors during grading; three tractors, one crane, three forklifts, one generator and welder during foundations; one crane, generator, and welder and three forklifts during building construction; one tractor, and one air compressor during architectural coating.[5] 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 dozers, excavators, loaders, forklifts, and air compressors , 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

[5] Construction equipment list provided by Applicant on April 12, 2023.

associated with individual construction equipment are listed in Table 2: Typical Construction Noise Levels.

Table 2: Typical Construction Noise Levels	
Equipment	**Typical Noise Level (dBA L_{max}) at 50 feet from Source**
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Mobile	83
Dozer	85
Generator	82
Grader	85
Jack Hammer	88
Loader	80
Paver	85
Pneumatic Tool	85
Pump	77
Roller	85
Saw	76
Shovel	82
Truck	84
Note: 1. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1+20Log(d_1/d_2)$ 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.	

Daytime construction noise is not typically a concern for human health and is a common occurrence within the urban environment. The impact analysis is based on the potential temporary increase in ambient noise and the construction time limits in the SGMC Section 150.003 including the allowable hours of construction. Construction activity would occur within the allowable hours of construction including Mondays through Fridays 7:00 A.M. to 7:00 P.M and between the hours of 8:00 a.m and 4:00 p.m. on Saturday. Construction is prohibited outside of these hours and on holidays.

The Project's existing surroundings include both residential and commercial uses. Following the Federal Transit Administration's (FTA) methodology for quantitative construction noise assessments, FHWA's Roadway Construction Noise Model (RCNM) was used to predict construction noise. Per the

FTA Transit Noise and Vibration Manual, when calculating construction noise, all construction equipment is assumed to operate at the center of the active construction zone. During construction, equipment would be operating throughout the Project Site and not all equipment would be operating at the point closest to the sensitive receptors. Considering the distance between the center of the Project Site and the sensitive receptors, this is a reasonable assumption. Therefore, the distance used in the model was approximately 180 feet from the center of the Project Site to the nearest sensitive receptor (adjacent to the Project Site to the south); refer to Appendix A for construction noise modeling results. The SGMC does not establish quantitative exterior construction noise standards. While the Municipal Code does not establish quantitative construction noise standards, this analysis conservatively uses the FTA's threshold of 80 dBA (8-hour L_{eq}) for residential uses to evaluate construction noise impacts.[6]

Table 3: Construction Noise Level shows the maximum noise levels for each individual construction phase, assuming simultaneous use of equipment assumed for each phase at a distance of 180 feet. The highest exterior noise level at the residential use to the south of the Project site is estimated to be 78.2 dBA L_{eq}, which would not exceed the FTA's threshold of 80 dBA L_{eq} for residential uses.

Table 3: Construction Noise Level

Construction Phase	dBA L_{eq} at 180 feet
Site Preparation	76.1
Grading	76.1
Foundations	78.2
Building Construction	78.2
Paving	76.2
Architectural Coating	62.6

Source: Federal Highway Administration, Roadway Construction Noise Model, 2006. Refer to Appendix A for noise modeling results.

Although the noise generated by Project construction would be higher than ambient noise levels, which may result in a temporary increase in ambient noise levels, construction would be temporary and cease once Project construction is completed. Construction activities would comply with SGMC Section 150.003 and would be prohibited outside the hours of Mondays through Fridays 8:00 A.M. to 6:00 P.M. While construction may cause short-term annoyance to adjacent uses, it would be temporary and restricted to the hours permitted by the City's noise ordinance. Therefore, construction noise impacts would be less than significant.

[6] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Table 7-3, page 179, September 2018.

Operational Noise

Project implementation would introduce new noise sources in the Project vicinity. The Project's primary noise sources that could potentially impact nearby noise-sensitive land uses include parking, mechanical equipment (e.g., HVAC, etc.), conversation in open space gathering areas, and trash/recycling truck pickup noise.

Parking

According to the ground floor plan, parking stalls would be located in the center of the proposed Project building. According to the *Traffic Impact Study for Rubio Village Mixed-Use Project* prepared by Kimley-Horn (dated February 2023), the Project would generate up to 70 trips during the peak hour. For the purpose of providing a conservative, quantitative estimate of the noise levels that would be generated from the vehicles entering and exiting the parking lot, the methodology recommended by FTA for the general assessment of stationary transit noise sources is used. Using the methodology, the Project's peak hourly noise level that would be generated by the on-site parking levels was estimated using the following FTA equation for a parking lot:

$$L_{eq(h)} = SEL_{ref} + 10 \log (NA/1{,}000) - 35.6$$

Where:

$L_{eq(h)}$ = hourly L_{eq} noise level at 50 feet

SEL_{ref} = reference noise level for stationary noise source represented in sound exposure level (SEL) at 50 feet

NA = number of automobiles per hour

35.6 is a constant in the formula, calculated as 10 times the logarithm of the number of seconds in an hour

Using the FTA's reference noise level of 92 dBA SEL[7] at 50 feet from the noise source, the Project's highest peak hour vehicle trips would generate noise levels of approximately 44.9 dBA L_{eq} at 50 feet from the parking lot. The nearest sensitive receptors (to the south) are located approximately 45 feet from the nearest on-site parking area (measured from receptor property line to the nearest parking lot area). Conservatively assuming that all vehicles would park at a location nearest to sensitive receptors rather than dispersed throughout all available parking and based strictly on distance attenuation, parking lot noise at the nearest receptor would be 45.8 dBA, which is below City's normally acceptable residential exterior noise standard (55 dBA). Therefore, noise impacts from parking lots would be less than significant.

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

Mechanical Equipment

Potential stationary noise sources related to long-term Project operations include mechanical equipment (e.g., HVAC equipment). A mechanical room is located a the nortwest corner of the Project site and mechanical equipment would likely be located on the rooftops of retail spaces on the east side of the Project Site. The nearest receptors to mechanical equipment are the multi-family residences approximately 65 feet west from the nearest mechanical equipment location on the Project Site. Mechanical equipment typically generates noise levels of approximately 52 dBA at 50 feet.[8] 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. According to the Project Proposed Floor plan, mechanical equipment would be located toward the northwest corner of the ground floor. The distance from the proposed mechanical equipment to the property line of each sensitive receptor was measured and calculated. As indicated in Table 4: On-Site Composite Noise Levels, noise levels from mechanical equipment at the Project Site would be 49.7 dBA L_{eq} at the nearest residential uses to the west and would not exceed the City's daytime or nighttime standards of 55 dBA or 50 dBA, respectively. Therefore, the Project would result in a less than significant impact concerning mechanical equipment noise levels.

Trash/Recycling Truck Pickups

During loading and unloading activities of trash and recycling pickups, noise would be generated by the trucks' diesel engines, exhaust systems, and brakes during low gear shifting' braking activities; opening and closing of the trash/recycling bins. The Project would have two trash rooms located on the ground floor, one designated for commercial trash and another designated for residential trash. Both trash collection areas would be shielded from surrounding sensitive receptors. Therefore, on-site collection of trash/recycling would not contribute to increases in ambient noise.In addition, trash/recycling truck pickup activity servicing the Project area currently occurs under existing conditions and would not be a new noise source. The hours of trash/recycling pick up activity would be dependant on the service provider and not be regulated by the Project. Therefore, the Project would result in less than significant impacts concerning trash/recycling truck pickup noise levels.

Outdoor Open Space

The Project would include several outdoor living spaces for residents of the new building. Users of the open space would be dispersed throughout the outdoor areas and would not present a concentrated noise source. Noise levels from human conversation was estimated based on potential maximum

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

capacity of each of the outdoor living spaces. Although the outdoor living spaces would not be completely open and shielding would be provided by building walls and architectural features, noise level reductions have not been assumed in the modeling. Conservatively, maximum noise levels reaching each receptor from each outdoor living space has been combined to provide an overall worst-case estimate of open space noise. Note that amplified sound systems would not be provided on proposed open living spaces.

Noise from female adults and male adults talking at a raised level is approximately 63 dBA and 65 dBA, respectively, at a distance of 3 feet.[9] As a conservative analysis, it is assumed that each outdoor living space would be at full capacity and that half of the visitors would be male and half female. Of the adults, half would be talking simultaneously (assuming approximately half of the occupants talking and the other half listening). According to the California Fire Code Section 1004, Table 1004.5, *Maximum Floor Area Allowances per Occupant*, the occupancy load for business areas is 150 square feet per occupant.

A pocket park would be located along Pine Street with a total of 27,048 square feet. The ground floor open space would allow for approximately 180 occupants with 90 speaking at raised levels. Open space would also be located on the third floor courtyard in the center of the Project. However, this space would be enclosed by the Project building and noise generated would be shielded from nearby receptors. Noise levels from outdoor open space at the Project Site would be 53.2 dBA L_{eq} at the nearest residential uses to the west and would not exceed the City's daytime standard of 55 dBA. Therefore, the Project would result in a less than significant impact concerning outdoor open space noise levels.

Composite On-Site Noise Levels

An evaluation of the combined noise levels from the Project's various operational noise sources (i.e., composite noise level) was conducted to conservatively ascertain the potential maximum Project-related noise level increase that may occur at the nearest noise-sensitive receptors. Table 4 details the on-site noise levels from the Project Site at the nearest residential uses. As shown in Table 4, the composite on-site operational noise attributable to the Project would result in a maximum increase in ambient conditions of 1.0 dBA L_{eq} at the residential uses located immediated west and south of the Project Site. In general, an increase of 3 dBA is considered to be barely perceptible, and a 5 dBA change in noise levels is required before any noticeable change in community response would be expected.[10] Therefore, the Project would not result in a significant permanent increase in ambient noise levels.

[9] American Journal of Audiology Vol.7 21-25 October 1998. doi:10.1044/1059-0889(1998/012).

[10] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, and FHWA, Noise Fundamentals, 2017.

Table 4: On-Site Composite Noise Levels

Receptor	Maximum On-Site Noise Levels by Source (dBA L_{eq})			Combined Noise Level at Receptor (dBA L_{eq})	Ambient Noise Level (dBA L_{eq})	Ambient + Combined Project Noise (dBA L_{eq})	Incremental Increase over Ambient (dBA L_{eq})
	Parking	Mechanical Equipment	Open Space Ground Floor				
1. Multi-Family Residential (SW)	45.8	47.4	45.6	51.1	57.2	58.2	1.0
2. After School Program (SE)	30.9	43.4	38.4	44.8	74.6	74.6	0.0
3. Multi-Family Residential (W)	41.9	49.7	53.2	55.0	60.9	61.9	1.0
4. Hotel (E)	34.5	44.4	41.5	46.5	60.9	61.1	0.2

Source: Federal Highway Administration, Roadway Construction Noise Model, 2006. Refer to Appendix A for noise modeling results.

Mobile Traffic Noise

The Project is anticipated to generate 1,227 net daily trips, with up to 70 trips during the A.M. peak-hour and up to 57 trips during the P.M. peak-hour.[11] 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.[12] According to the San Gabriel General Plan Mobility Element, the Average Daily Traffic (ADT) Volumes for a six-lane arterial such as San Gabriel Boulevard located near the Project vicinity is 50,000.[13] As noted above, the Project would result in approximately 1,227 net daily trips, which is not enough to double the existing traffic volumes on San Gabriel Boulevard, or nearby throughstreets. The 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 from Project-related traffic noise.

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

[12] 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.

[13] City of San Gabriel General Plan (2004), Chapter 3 – Mobility. Street Classifications.

Vibration

Increases in groundborne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Project construction could result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Construction activities would occur as close as 23 feet from adjacent residential buildings. Table 5: Typical Construction Equipment Vibration Levels identifies vibration velocity levels at 23 feet and 27 feet for various types of equipment likely to operate at the Project Site during construction.

Table 5: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 23 feet (in/sec)	Peak Particle Velocity at 25 feet (in/sec)
Vibratory Roller	0.21	0.187
Large Bulldozer	0.089	0.079
Loaded Truck	0.076	0.068
Small Bulldozer	0.003	0.003

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

The City has not adopted specific standards for vibration impacts during construction. Therefore, the Caltrans *Transportation and Construction Vibration Guidance* Manual (2020) is used to evaluate construction vibration impacts related to potential building damage. Based on the Caltrans criteria, construction vibration impacts would be significant if vibration levels exceed 0.5 in/sec PPV at older residential structures, which is the limit for potential building damage at these structures. As shown in Table 5**,** the vibration velocities at 23 feet from construction equipment could be up to 0.21 in/sec PPV at the nearest structure. Therefore, construction vibration would not exceed the 0.5 in/sec PPV threshold of structural damage to older residential structures, and vibration impacts during Project construction would be less than significant.

Conclusion

The Project's construction and operational noise and vibration levels would not exceed applicable City or Caltrans 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 CEQA Guidelines Section 15332(d).

Appendix A

Noise Data

Noise Measurement Field Data

Project:	Rubio Village	Job Number:	099902002.3.203
Site No.:	ST-1	Date:	6/7/2023
Analyst:	Mayra Garcia & Ryan Callahan	Time:	8:57 AM
Location:	South Pine Street		
Noise Sources:	Vehicles, Home construction, Freeway nose, birds, people walking, car		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
57.2	43.3	71.5	98.5

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

Weather	
Temp. (degrees F):	60
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.97
Humidity:	59%

Photo:

Kimley»Horn

Summary

File Name on Meter	Ing.049.s
File Name on PC	LxTse_0005586-20230607 085749-Ing.049.ldbin
Serial Number	0005586
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2023-06-07 08:57:49
Stop	2023-06-07 09:12:49
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-06-07 08:55:03
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamplifier	PRMLxT1L			
Microphone Correction	Off			
Integration Method	Linear			
OBA Range	Normal			
OBA Bandwidth	1/1 and 1/3			
OBA Frequency Weighting	A Weighting			
OBA Max Spectrum	At LMax			
Overload	122.6 dB			
	A	C	Z	
Under Range Peak	79.1	76.1	81.1	dB
Under Range Limit	25.3	26.0	31.7	dB
Noise Floor	16.2	16.9	22.6	dB
	First	Second	Third	
Instrument Identification	Kimley-Horn & Associates, Inc.	1100 W. Town & Country Rd, 700	714.939.1030	

Results

L_{Aeq}	57.2	dB	
LAE	86.7	dB	
EA	52.481	µPa²h	
$L_{Apeak\ (max)}$	2023-06-07 09:08:48	98.5	dB
LAS_{max}	2023-06-07 09:09:37	71.5	dB
LAS_{min}	2023-06-07 09:01:05	43.3	dB
SEA	----	----	dB

	Exceedance Counts	Duration	
LAS > 85.0 dB	0	0.0	s
LAS > 115.0 dB	0	0.0	s
L_{Apeak} > 135.0 dB	0	0.0	s
L_{Apeak} > 137.0 dB	0	0.0	s
L_{Apeak} > 140.0 dB	0	0.0	s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00	LNight 22:00-07:00	
	57.2	57.2	----	57.2	57.2	----	----	dB

LC_{eq}	63.9	dB
L_{Aeq}	57.2	dB
LC_{eq} - L_{Aeq}	6.7	dB
LA_{Eq}	65.2	dB
L_{Aeq}	57.2	dB
LA_{Eq} - L_{Aeq}	8.0	dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	57.2		63.9			
$L_{1(max)}$	71.5	2023/06/07 9:09:37				
$L_{1(min)}$	43.3	2023/06/07 9:01:05				
$L_{Peak(max)}$	98.5	2023/06/07 9:08:48				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	63.6 dB
LA 10.00	61.3 dB
LA 33.30	54.2 dB
LA 50.00	51.4 dB
LA 66.60	50.0 dB
LA 90.00	47.6 dB

Calibration History

Preamp	Date	dB re. 1V/Pa	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
Direct	2019-10-29 12:18:45	-28.39	2.58	5.73	0.93	0.50	3.86	9.51	0.44	-3.11	1.43	6.00	2.05	-3.57	7.95	14.24	0.02	5.29	13.46	6.91	5.51	6.87	6.62	5.46	4.87	7.03	8.87	9.88	11.23	13.40	11.42	40.36	23.45	16.13	16.83	19.76	18.96	19.66
PRMLxT1L	2023-06-07 08:55:01	-28.82	69.12	55.56	51.67	63.01	51.53	53.14	49.70	57.03	69.87	63.77	60.99	54.17	49.20	52.67	41.66	37.47	38.68	33.57	33.80	31.32	27.01	29.00	113.97	49.08	20.28	66.12	19.52	58.84	19.73	27.36	21.18	22.57	24.05	25.61	28.16	30.80
PRMLxT1L	2023-06-06 10:03:27	-28.81	59.32	45.72	59.12	53.11	55.62	59.35	48.39	51.52	54.26	57.37	58.12	48.84	50.77	46.89	42.29	51.51	46.84	39.38	36.32	29.73	33.09	28.44	113.92	48.80	18.43	65.85	19.67	58.83	19.79	27.84	21.00	22.22	23.71	25.18	27.26	30.41
PRMLxT1L	2023-06-01 09:59:25	-28.74	44.79	51.19	54.83	55.61	55.13	46.54	58.98	55.37	53.49	60.52	61.55	53.00	57.22	54.29	50.43	48.59	53.16	48.67	38.00	35.30	34.57	31.56	113.94	48.87	27.91	66.17	19.57	58.46	19.97	27.67	21.16	22.24	23.95	25.19	27.56	30.43
PRMLxT1L	2023-05-19 09:46:38	-28.70	52.77	49.80	48.80	52.00	39.09	41.90	44.54	44.27	55.94	46.08	38.21	39.28	36.32	41.84	37.83	28.38	27.10	20.72	18.53	16.75	17.58	28.67	113.99	49.10	18.71	66.92	19.07	57.59	18.77	25.79	21.07	22.14	23.94	25.77	27.93	30.49
PRMLxT1L	2023-05-18 02:36:18	-28.71	58.04	58.44	43.74	36.86	45.45	44.57	44.25	45.37	42.13	44.24	42.17	49.38	46.91	45.31	39.67	36.93	37.94	31.38	31.85	29.23	30.94	29.38	114.00	49.13	18.97	66.90	19.34	57.63	18.78	27.07	21.40	22.47	23.67	25.40	27.56	30.57
PRMLxT1L	2023-05-18 02:35:35	-28.72	43.46	45.66	54.05	49.68	46.86	45.84	44.80	45.33	50.12	46.54	43.31	38.67	34.92	41.71	34.37	35.33	32.12	32.74	34.37	35.53	21.18	29.23	113.84	48.93	18.19	66.80	19.12	57.47	19.02	26.43	20.70	22.16	23.53	25.66	27.93	30.55
PRMLxT1L	2023-05-17 02:27:40	-28.58	19.55	38.93	38.82	40.98	38.49	42.22	45.35	53.62	50.58	55.65	55.97	45.06	48.50	57.02	46.86	45.21	48.96	41.59	40.78	33.76	31.26	29.33	114.26	49.16	18.25	65.02	18.44	55.46	19.14	23.95	18.58	19.94	19.94	19.89	19.93	19.26
PRMLxT1L	2023-05-16 13:21:54	-28.65	0.26	27.73	113.28	47.99	1.24	53.84	3.20	29.02	12.93	8.79	13.00	2.53	4.20	8.02	6.36	7.37	10.15	10.23	11.37	10.61	9.93	13.33	11.58	11.86	14.26	13.51	15.95	17.21	17.03	18.07	19.53	21.32	23.43	24.72	27.02	29.47
PRMLxT1L	2023-05-16 11:52:20	-26.38	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
PRMLxT1L	2023-04-26 09:15:01	-28.85	76.98	76.87	81.65	78.87	69.59	78.40	77.46	72.93	68.86	65.19	70.21	66.08	62.22	63.22	61.41	59.31	57.78	54.64	51.74	48.13	38.64	34.05	113.90	49.05	21.77	65.89	20.59	58.90	19.95	27.61	21.62	22.68	24.21	25.72	27.90	30.56
PRMLxT1L	2023-04-06 09:21:13	-28.77	61.09	62.99	55.90	55.12	63.06	53.53	59.15	63.58	61.85	64.44	59.44	63.93	71.99	69.74	65.10	67.40	66.56	63.07	64.14	65.24	58.91	48.04	114.03	49.22	25.83	66.10	19.89	58.75	19.84	27.89	21.18	22.55	23.87	25.47	27.73	30.68

Noise Measurement Field Data

Project:	Rubio Village	Job Number:	099902002.3.203
Site No.:	ST-2	Date:	6/7/2023
Analyst:	Mayra Garcia & Ryan Callahan	Time:	9:48 AM
Location:	San Gabriel Blvd		
Noise Sources:	traffic, pedestrian activity		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
74.6	54.4	81.3	95.0

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

Weather	
Temp. (degrees F):	62
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.97
Humidity:	71%

Photo:

Kimley»Horn

Summary

File Name on Meter	lng.051.s
File Name on PC	LxTse_0005586-20230607 094829-lng.051.ldbin
Serial Number	0005586
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2023-06-07 09:48:29
Stop	2023-06-07 10:03:29
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-06-07 08:55:01
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	122.6 dB

	A	C	Z
Under Range Peak	79.1	76.1	81.1 dB
Under Range Limit	25.3	26.0	31.7 dB
Noise Floor	16.2	16.9	22.6 dB

	First	Second	Third
Instrument Identification	nley-Horn & Associates, Inc.100 W.Town & Country Rd, 700		714.939.1030

Results

LAeq	74.6	dB
LAE	104.1	dB
EA	2.884	mPa²h
LApeak (max)	2023-06-07 09:55:49	95.0 dB
LASmax	2023-06-07 09:55:49	81.3 dB
LASmin	2023-06-07 09:51:10	54.4 dB
SEA	---	dB

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00	LNight 22:00-07:00	
	74.6	74.6	-99.9	74.6	74.6	-99.9	-99.9	dB

LCeq	78.2	dB
LAeq	74.6	dB
LCeq - LAeq	3.6	dB
LAleq	75.4	dB
LAeq	74.6	dB
LAleq - LAeq	0.8	dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	74.6		78.2			
LS(max)	81.3	2023/06/07 9:55:49				
LS(min)	54.4	2023/06/07 9:51:10				
LPeak(max)	95.0	2023/06/07 9:55:49				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	78.9 dB
LA 10.00	78.2 dB
LA 33.30	75.8 dB
LA 50.00	73.9 dB
LA 66.60	69.5 dB
LA 90.00	60.6 dB

Calibration History

Preamp	Date	dB re. 1V/Pa	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
Direct	2019-10-29 12:18:45	-28.39	2.56	5.73	0.93	0.50	3.86	9.51	0.44	-3.11	1.43	6.00	2.05	-3.57	7.95	14.24	0.02	5.29	13.46	6.91	5.51	6.87	6.62	5.46	4.67	7.03	8.87	9.88	11.23	13.40	11.42	40.36	23.45	16.13	16.83	19.76	18.96	19.66
PRMLxT1L	2023-06-07 08:55:01	-28.82	69.12	55.56	51.67	63.01	51.53	53.14	49.70	57.03	69.87	63.77	60.99	54.17	49.20	52.67	41.66	37.47	38.68	33.57	33.80	31.32	27.01	29.00	113.97	49.08	20.28	66.12	19.52	58.84	19.73	27.36	21.18	22.57	24.05	25.61	28.16	30.80
PRMLxT1L	2023-06-06 10:03:27	-28.81	59.32	45.72	59.12	53.11	55.62	59.35	48.39	51.52	54.26	57.37	58.12	48.84	50.77	48.89	42.29	51.51	46.84	39.38	36.32	29.73	33.08	28.44	113.92	48.80	18.43	65.85	19.67	58.83	19.79	27.84	21.00	22.22	23.71	25.18	27.26	30.41
PRMLxT1L	2023-06-01 09:59:25	-28.74	44.79	51.19	54.83	55.61	55.13	46.54	58.98	55.37	53.40	60.52	61.55	53.00	57.22	54.29	50.43	48.59	53.16	48.67	38.00	35.30	34.57	21.56	113.94	48.87	27.91	66.17	19.57	58.46	19.97	27.67	21.16	22.24	23.95	25.19	27.56	30.43
PRMLxT1L	2023-05-19 09:46:38	-28.70	52.77	49.80	48.80	52.00	39.09	41.90	44.54	44.27	55.94	46.08	38.21	39.28	36.32	41.84	37.83	28.38	27.10	20.72	18.53	16.75	17.58	28.67	113.99	49.10	18.71	66.92	19.07	57.59	18.77	25.79	21.07	22.14	23.94	25.77	27.93	30.49
PRMLxT1L	2023-05-18 02:36:18	-28.71	58.04	58.44	43.74	36.86	45.45	44.57	44.25	45.37	42.13	44.24	42.17	49.38	46.91	45.31	39.67	36.93	37.94	31.38	31.85	29.23	20.94	29.38	114.00	49.13	18.97	66.90	19.34	57.63	18.78	27.07	21.40	22.47	23.67	25.40	27.56	30.57
PRMLxT1L	2023-05-18 02:35:35	-28.72	43.46	45.66	54.05	49.68	46.86	45.84	44.80	45.33	50.12	46.54	43.31	38.67	34.92	41.71	34.37	35.33	32.12	32.74	34.37	35.53	21.18	29.23	113.84	48.93	18.19	66.80	19.12	57.47	19.02	26.43	20.70	22.16	23.53	25.66	27.93	30.55
PRMLxT1L	2023-05-17 02:27:40	-28.58	19.55	38.93	38.82	40.98	38.49	42.22	45.35	53.62	50.58	55.65	55.97	45.06	48.50	57.02	46.86	45.21	48.96	41.59	40.78	33.76	31.26	29.33	114.26	49.16	18.25	65.02	18.44	55.46	19.14	23.95	18.58	19.94	19.94	19.89	19.93	19.26
PRMLxT1L	2023-05-16 13:21:54	-28.85	0.26	27.73	113.28	47.99	1.24	53.84	3.20	29.02	12.93	8.79	13.00	2.53	4.20	8.02	6.36	7.37	10.15	10.23	11.37	10.61	9.93	13.33	11.58	11.86	14.26	13.51	15.55	17.21	17.03	18.07	19.53	21.32	23.43	24.72	27.02	29.47
PRMLxT1L	2023-05-16 11:52:20	-26.38	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞
PRMLxT1L	2023-04-26 09:15:01	-28.85	76.98	76.87	81.65	78.87	69.59	78.40	77.46	72.93	68.86	65.19	70.21	66.08	62.22	63.22	61.41	59.31	57.78	54.64	51.74	48.13	38.64	34.05	113.90	49.05	21.77	65.89	20.59	58.90	19.95	27.61	21.62	22.68	24.21	25.72	27.90	30.56
PRMLxT1L	2023-04-06 09:21:13	-28.77	61.09	62.99	55.90	55.12	63.06	53.53	59.15	63.58	61.85	64.44	59.44	63.93	71.99	69.74	65.10	67.40	66.56	63.07	64.14	65.24	58.91	48.04	114.03	49.22	25.83	66.10	19.89	58.75	19.84	27.89	21.18	22.55	23.87	25.47	27.73	30.68

Noise Measurement Field Data

Project:	Rubio Village	Job Number:	099902002.3.203
Site No.:	ST-3	Date:	6/7/2023
Analyst:	Mayra Garcia & Ryan Callahan	Time:	9:19 AM
Location:	East Live Oak Street		
Noise Sources:	Cars, freeway, birds		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
60.9	46.8	71.6	88.3

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

Weather	
Temp. (degrees F):	60
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.97
Humidity:	59%

Photo:

Kimley»Horn

Summary

File Name on Meter	lng.050.s
File Name on PC	LxTse_0005586-20230607 091932-lng.050.ldbin
Serial Number	0005586
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2023-06-07 09:19:32
Stop	2023-06-07 09:34:32
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-06-07 08:55:01
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	122.6 dB

	A	C	Z
Under Range Peak	79.1	76.1	81.1 dB
Under Range Limit	25.3	26.0	31.7 dB
Noise Floor	16.2	16.9	22.6 dB

	First	Second	Third
Instrument Identification	nley-Horn & Associates, Inc.100 W.Town & Country Rd, 700		714.939.1030

Results

LAeq	60.9	dB
LAE	90.4	dB
EA	123.027	µPa²h
LApeak (max)	2023-06-07 09:24:49	88.3 dB
LASmax	2023-06-07 09:26:23	71.6 dB
LASmin	2023-06-07 09:25:09	46.8 dB
SEA	---	dB

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00	LNight 22:00-07:00	
	60.9	60.9	-99.9	60.9	60.9	-99.9	-99.9	dB

LCeq	71.3	dB
LAeq	60.9	dB
LCeq - LAeq	10.4	dB
LAleq	62.4	dB
LAeq	60.9	dB
LAleq - LAeq	1.5	dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	60.9		71.3			
LS(max)	71.6	2023/06/07 9:26:23				
LS(min)	46.8	2023/06/07 9:25:09				
Lpeak(max)	88.3	2023/06/07 9:24:49				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	67.2 dB
LA 10.00	64.8 dB
LA 33.30	59.2 dB
LA 50.00	57.0 dB
LA 66.60	55.6 dB
LA 90.00	52.4 dB

Calibration History

Preamp	Date	dB re. 1V/Pa	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
Direct	2019-10-29 12:18:45	-28.39	2.56	5.73	0.93	0.50	3.86	9.51	0.44	-3.11	1.43	6.00	2.05	-3.57	7.95	14.24	0.02	5.29	13.46	6.91	5.51	6.87	6.62	5.46	4.67	7.03	8.87	9.88	11.23	13.40	11.42	40.36	23.45	16.13	16.83	19.76	18.96	19.66
PRMLxT1L	2023-06-07 08:55:01	-28.82	69.12	55.56	51.67	63.01	51.53	53.14	49.70	57.03	69.87	63.77	60.99	54.17	49.20	52.67	41.66	37.47	38.68	33.57	33.80	31.32	27.01	29.00	113.97	49.08	20.28	66.12	19.52	58.84	19.73	27.36	21.18	22.57	24.05	25.61	28.16	30.80
PRMLxT1L	2023-06-06 10:03:27	-28.81	59.32	45.72	59.12	53.11	55.62	59.35	48.39	51.52	54.26	57.37	58.12	48.84	50.77	48.89	42.29	51.51	46.84	39.38	36.32	29.73	33.08	28.44	113.92	48.80	18.43	65.85	19.67	58.83	19.79	27.84	21.00	22.22	23.71	25.18	27.26	30.41
PRMLxT1L	2023-06-01 09:59:25	-28.74	44.79	51.19	54.83	55.61	55.13	46.54	58.98	55.37	53.40	60.52	61.55	53.00	57.22	54.29	50.43	48.59	53.16	48.67	38.00	35.30	34.57	21.56	113.94	48.87	27.91	66.17	19.57	58.46	19.97	27.67	21.16	22.24	23.95	25.19	27.56	30.43
PRMLxT1L	2023-05-19 09:46:38	-28.70	52.77	49.80	48.80	52.00	39.09	41.90	44.54	44.27	55.94	46.08	38.21	39.28	36.32	41.84	37.83	28.38	27.10	20.72	18.53	16.75	17.58	28.67	113.99	49.10	18.71	66.92	19.07	57.59	18.77	25.79	21.07	22.14	23.94	25.77	27.93	30.49
PRMLxT1L	2023-05-18 02:36:18	-28.71	58.04	58.44	43.74	36.86	45.45	44.57	44.25	45.37	42.13	44.24	42.17	49.38	46.91	45.31	39.67	36.93	37.94	31.38	31.85	29.23	20.94	29.38	114.00	49.13	18.97	66.90	19.34	57.63	18.78	27.07	21.40	22.47	23.67	25.40	27.56	30.57
PRMLxT1L	2023-05-18 02:35:35	-28.72	43.46	45.66	54.05	49.68	46.86	45.84	44.80	45.33	50.12	46.54	43.31	38.67	34.92	41.71	34.37	35.33	32.12	32.74	34.37	35.53	21.18	29.23	113.84	48.93	18.19	66.80	19.12	57.47	19.02	26.43	20.70	22.16	23.53	25.66	27.93	30.55
PRMLxT1L	2023-05-17 02:27:40	-28.58	19.55	38.93	38.82	40.98	38.49	42.22	45.35	53.62	50.58	55.65	55.97	45.06	48.50	57.02	46.86	45.21	48.96	41.59	40.78	33.76	31.26	29.33	114.26	49.16	18.25	65.02	18.44	55.46	19.14	23.95	18.58	19.94	19.94	19.89	19.93	19.26
PRMLxT1L	2023-05-16 13:21:54	-28.85	0.26	27.73	113.28	47.99	1.24	53.84	3.20	29.02	12.93	8.79	13.00	2.53	4.20	8.02	6.36	7.37	10.15	10.23	11.37	10.61	9.93	13.33	11.58	11.86	14.26	13.51	15.55	17.21	17.03	18.07	19.53	21.32	23.43	24.72	27.02	29.47
PRMLxT1L	2023-05-16 11:52:20	-26.38	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞
PRMLxT1L	2023-04-26 09:15:01	-28.85	76.98	76.87	81.65	78.87	69.59	78.40	77.46	72.93	68.86	65.19	70.21	66.08	62.22	63.22	61.41	59.31	57.78	54.64	51.74	48.13	38.64	34.05	113.90	49.05	21.77	65.89	20.59	58.90	19.95	27.61	21.62	22.68	24.21	25.72	27.90	30.56
PRMLxT1L	2023-04-06 09:21:13	-28.77	61.09	62.99	55.90	55.12	63.06	53.53	59.15	63.58	61.85	64.44	59.44	63.93	71.99	69.74	65.10	67.40	66.56	63.07	64.14	65.24	58.91	48.04	114.03	49.22	25.83	66.10	19.89	58.75	19.84	27.89	21.18	22.55	23.87	25.47	27.73	30.68

Noise Measurement Field Data

Project:	Rubio Village	Job Number:	099902002.3.203
Site No.:	ST-4	Date:	6/7/2023
Analyst:	Mayra Garcia & Ryan Callahan	Time:	10:14 AM
Location:	East Live Oak Street		
Noise Sources:	traffic, idling concrete mixer, commercial activity		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
60.9	51.1	77.6	99.0

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

Weather	
Temp. (degrees F):	63
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.97
Humidity:	69%

Photo:

Kimley»Horn

Summary

File Name on Meter	lng.052.s
File Name on PC	LxTse_0005586-20230607 101505-lng.052.ldbin
Serial Number	0005586
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2023-06-07 10:15:05
Stop	2023-06-07 10:30:05
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-06-07 08:55:01
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	122.6 dB

	A	C	Z
Under Range Peak	79.1	76.1	81.1 dB
Under Range Limit	25.3	26.0	31.7 dB
Noise Floor	16.2	16.9	22.6 dB

	First	Second	Third
Instrument Identification	nley-Horn & Associates, Inc.1100 W.Town & Country Rd, 700		714.939.1030

Results

LAeq	60.9 dB						
LAE	90.4 dB						
EA	123.027 µPa²h						
LApeak (max)	2023-06-07 10:21:25	99.0 dB					
LASmax	2023-06-07 10:21:25	77.6 dB					
LASmin	2023-06-07 10:22:35	51.1 dB					
SEA	--- dB						

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00	LNight 22:00-07:00	
	60.9	60.9	-99.9	60.9	60.9	-99.9	-99.9	dB

LCeq	68.8 dB						
LAeq	60.9 dB						
LCeq - LAeq	7.9 dB						
LAleq	65.3 dB						
LAeq	60.9 dB						
LAleq - LAeq	4.4 dB						

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	60.9		68.8			
LS(max)	77.6	2023/06/07 10:21:25				
LS(min)	51.1	2023/06/07 10:22:35				
LPeak(max)	99.0	2023/06/07 10:21:25				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	64.4 dB
LA 10.00	62.8 dB
LA 33.30	60.9 dB
LA 50.00	58.9 dB
LA 66.60	57.2 dB
LA 90.00	54.3 dB

Calibration History

Preamp	Date	dB re. 1V/Pa	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
Direct	2019-10-29 12:18:45	-28.39	2.58	5.73	0.93	0.50	3.86	9.51	0.44	-3.11	1.43	6.00	2.05	-3.57	7.95	14.24	0.02	5.29	13.46	6.91	5.51	6.87	6.62	5.46	4.67	7.03	8.87	9.88	11.23	13.40	11.42	40.36	23.45	16.13	16.83	19.76	18.96	19.66
PRMLxT1L	2023-06-07 08:55:01	-28.82	69.12	55.56	51.67	63.01	51.53	53.14	49.70	57.03	69.87	63.77	60.99	54.17	49.20	52.67	41.66	37.47	38.68	33.57	33.80	31.32	27.01	29.00	113.97	49.08	20.28	66.12	19.52	58.84	19.73	27.36	21.18	22.57	24.05	25.61	28.16	30.80
PRMLxT1L	2023-06-06 10:03:27	-28.81	59.32	45.72	59.12	53.11	55.62	59.35	48.39	51.52	54.26	57.37	58.12	48.84	50.77	48.89	42.29	51.51	46.84	39.38	36.32	29.73	33.08	28.44	113.92	48.80	18.43	65.85	19.67	58.83	19.79	27.84	21.00	22.22	23.71	25.18	27.26	30.41
PRMLxT1L	2023-06-01 09:59:25	-28.74	44.79	51.19	54.83	55.61	55.13	46.54	58.98	55.37	53.40	60.52	61.55	53.00	57.22	54.29	50.43	48.59	53.16	48.67	38.00	35.30	34.57	31.56	113.94	48.87	27.91	66.17	19.57	58.46	19.97	27.67	21.16	22.24	23.95	25.19	27.56	30.43
PRMLxT1L	2023-05-19 09:46:38	-28.70	52.77	49.80	48.80	52.00	39.09	41.90	44.54	44.27	55.94	46.08	38.21	39.28	36.32	41.84	37.83	28.38	27.10	20.72	18.53	16.75	17.58	28.67	113.99	49.10	18.71	66.92	19.07	57.59	18.77	25.79	21.07	22.14	23.94	25.77	27.93	30.49
PRMLxT1L	2023-05-18 02:36:18	-28.71	58.04	58.44	43.74	36.86	45.45	44.57	44.25	45.37	42.13	44.24	42.17	49.38	46.91	45.31	39.67	36.93	37.94	31.38	31.85	29.23	20.94	29.38	114.00	49.13	18.97	66.90	19.34	57.63	18.78	27.07	21.40	22.47	23.67	25.40	27.56	30.57
PRMLxT1L	2023-05-18 02:35:35	-28.72	43.46	45.66	54.05	49.68	46.86	45.84	44.80	45.33	50.12	46.54	43.31	38.67	34.92	41.71	34.37	35.33	32.12	32.74	34.37	35.53	21.18	29.23	113.84	48.93	18.19	66.80	19.12	57.47	19.02	26.43	20.70	22.16	23.53	25.66	27.93	30.55
PRMLxT1L	2023-05-17 02:27:40	-28.58	19.55	38.93	38.82	40.98	38.49	42.22	45.35	53.62	50.58	55.65	55.97	45.06	48.50	57.02	46.86	45.21	48.96	41.59	40.78	33.76	31.26	29.33	114.26	49.16	18.25	65.02	18.44	55.46	19.14	23.95	18.58	19.94	19.94	19.89	19.93	19.26
PRMLxT1L	2023-05-16 13:21:54	-28.85	0.26	27.73	113.28	47.99	1.24	53.84	3.20	29.02	12.93	8.79	13.00	2.53	4.20	8.02	6.36	7.37	10.15	10.23	11.37	10.61	9.93	13.33	11.58	11.86	14.26	13.51	15.55	17.21	17.03	18.07	19.53	21.32	23.43	24.72	27.02	29.47
PRMLxT1L	2023-05-16 11:52:20	-26.38	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞	-∞
PRMLxT1L	2023-04-26 09:15:01	-28.85	76.98	76.87	81.65	78.87	69.59	78.40	77.46	72.93	68.86	65.19	70.21	66.08	62.22	63.22	61.41	59.31	57.78	54.64	51.74	48.13	38.64	34.05	113.90	49.05	21.77	65.89	20.59	58.90	19.95	27.61	21.62	22.68	24.21	25.72	27.90	30.56
PRMLxT1L	2023-04-06 09:21:13	-28.77	61.09	62.99	55.90	55.12	63.06	53.53	59.15	63.58	61.85	64.44	59.44	63.93	71.99	69.74	65.10	67.40	66.56	63.07	64.14	65.24	58.91	48.04	114.03	49.22	25.83	66.10	19.89	58.75	19.84	27.89	21.18	22.55	23.87	25.47	27.73	30.68

Project: Rubio Village
Construction Noise Impact on Sensitive Receptors

Parameters

Construction Hours:	Daytime hours (7 am to 7 pm)	8
	Evening hours (7 pm to 10 pm)	0
	Nighttime hours (10 pm to 7 am)	0
Leq to L10 factor		3

	Receptor (Land Use)	Distance (feet)	Shielding	Direction
1	Mult-Family Residential	180	0	SW
2	After-School Program	400	0	SE
3	Multi-Family Residential	225	0	W
4	Hotel	227	0	E

					RECEPTOR 1		RECEPTOR 2		RECEPTOR 3		RECEPTOR 4	
Construction Phase	Equipment Type	No. of Equip.	Acoustical Usage Factor	Reference Noise Level at 50ft per Unit, Lmax	Noise Level at Receptor 1, Lmax	Noise Level at Receptor 1, Leq	Noise Level at Receptor 2, Lmax	Noise Level at Receptor 2, Leq	Noise Level at Receptor 3, Lmax	Noise Level at Receptor 3, Leq	Noise Level at Receptor 4, Lmax	Noise Level at Receptor 4, Leq
Site Preparation												
	Dozer	3	40%	82	75.3	71.4	68.4	64.4	73.4	69.4	73.3	69.4
	Tractor	4	40%	84	78.9	74.9	72.0	68.0	77.0	73.0	76.9	72.9
Combined LEQ						76.5		69.6		74.6		74.5
Grading												
	Excavator	1	40%	81	69.6	65.6	62.6	58.7	67.6	63.7	67.6	63.6
	Grader	1	40%	85	73.9	69.9	66.9	63.0	71.9	68.0	71.9	67.9
	Dozer	1	40%	82	70.6	66.6	63.6	59.7	68.6	64.7	68.6	64.6
	Tractor	3	40%	84	77.6	73.7	70.7	66.7	75.7	71.7	75.6	71.7
Combined LEQ						76.1		69.2		74.2		74.1
Foundations												
	Tractor	3	40%	84	77.6	73.7	70.7	66.7	75.7	71.7	75.6	71.7
	Crane	1	16%	81	69.5	61.5	62.5	54.6	67.5	59.6	67.5	59.5
	All Other Equipment > 5 HP	3	50%	85	78.6	75.6	71.7	68.7	76.7	73.7	76.6	73.6
	Generator	1	50%	81	69.5	66.5	62.5	59.5	67.5	64.5	67.5	64.4
	Welder/Torch	1	40%	74	62.9	58.9	55.9	52.0	60.9	57.0	60.9	56.9
Combined LEQ						78.2		71.3		76.3		76.2
Building Construction												
	Crane	1	16%	81	69.5	61.5	62.5	54.6	67.5	59.6	67.5	59.5
	All Other Equipment > 5 HP	3	50%	85	78.6	75.6	71.7	68.7	76.7	73.7	76.6	73.6
	Generator	1	50%	81	69.5	66.5	62.5	59.5	67.5	64.5	67.5	64.4
	Tractor	3	40%	84	77.6	73.7	70.7	66.7	75.7	71.7	75.6	71.7
	Welder/Torch	1	40%	74	62.9	58.9	55.9	52.0	60.9	57.0	60.9	56.9
Combined LEQ						78.2		71.3		76.3		76.2
Paving												
	Concrete Mixer Truck	2	40%	79	70.7	66.7	63.7	59.8	68.7	64.8	68.7	64.7
	Paver	1	50%	77	66.1	63.1	59.1	56.1	64.1	61.1	64.1	61.0
	All Other Equipment > 5 HP	2	50%	85	76.9	73.9	69.9	66.9	74.9	71.9	74.9	71.9
	Roller	2	20%	80	71.9	64.9	64.9	58.0	69.9	63.0	69.9	62.9
	Tractor	1	40%	84	72.9	68.9	65.9	62.0	70.9	67.0	70.9	66.9
Combined LEQ						76.2		69.3		74.3		74.2
Architectural Coating												
	Compressor (air)	1	40%	78	66.6	62.6	59.6	55.7	64.6	60.7	64.6	60.6
Combined LEQ						62.6		55.7		60.7		60.6

Source for Ref. Noise Levels: RCNM, 2005

Project: Rubio Village
Parking

Receptor	Reference Level (dBA)[1]	Reference Distance (feet)	Distance to Receptor (feet)[2]	Level at Receptor (dBA)	Daytime Threshold	Nighttime Threshold	Significant (Day)?	Significant (Night)?
1 Multi-Family Residential	44.9	50	45	45.8	55.0	50.0	No	No
2 Data for Children	44.9	50	250	30.9	55.0	50.0	No	No
3 Multi-Family Residential	44.9	50	70	41.9	55.0	50.0	No	No
4 Hotel	44.9	50	165	34.5	55.0	50.0	No	No

Parking Lot Noise

Number of Vehicles Per Hour:	70
Hourly L_{eq} at 50 feet:	44.9

$L_{eq(h)} = SEL_{ref} + 10\log(NA/1{,}000) - 35.6$

Where:

$L_{eq(h)}$	=	44.9	hourly L_{eq} noise level at 50 feet
SEL_{ref}	=	92	reference noise level for stationary noise source represented in sound exposure level (SEL) at 50 feet
NA	=	70	number of automobiles per hour
35.6	=	35.6	Constant, calculated as 10 times the logarithm of the number of seconds in an hour

FTA's reference noise level is 92 dBA SEL at 50 feet from the noise source for a parking lot
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual* , September 2018.

Project: Rubio Village

Open Space Noise Calculation

Pocket Park					
Category	# of Individuals (estimated capacity)	# of Individuals Speaking (half of estimated capacity)	Reference Distance (ft)[1]	Reference Noise Level (dBA)[1]	Combined Noise Level (dBA)
Total Capacity	180				
Females (Adult)	90	45	3	63	79.5
Males (Adult)	90	45	3	65	81.5
Total	180	90	-	-	83.7

Source:

[1] American Journal of Audiology Vol. 7, p. 3 (1998)

Ground Floor

Pocket Park	Reference Level (dBA)	Reference Distance (feet)	Distance to Receptor (feet)	Level at Receptor (dBA)[4]	Daytime Threshold	Significant (Day)?
1 Multi-Family Residential	83.7	3	240	45.6	55.0	No
2 Data for Children	83.7	3	550	38.4	55.0	No
3 Multi-Family Residential	83.7	3	100	53.2	55.0	No
4 Hotel	83.7	3	385	41.5	55.0	No

Project: Rubio Village Project
Mechanical Equipment Noise Calculations

Receptor	Reference Level (dBA)	Reference Distance (feet)	Distance to Receptor (feet)	Level at Receptor (dBA)[4]	Daytime Threshold	Nighttime Threshold	Significant (Day)?	Significant (Night)?
1 Multi-Family Residential	52	50	85	47.4	55.0	50.0	No	No
2 Data for Children	52	50	135	43.4	55.0	50.0	No	No
3 Multi-Family Residential	52	50	65	49.7	55.0	50.0	No	No
4 Hotel	52	50	120	44.4	55.0	50.0	No	No

1. Source for reference level: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values* , July 6, 2010.

2. Distance estimated using location of rooftop equipment as indiciated on Site Plan

Project: Rubio Village
Composite Noise

Receptor	Parking	Mechanical Equipment	Open Space (Ground Floor)	Combined Noise at Receptor (dBA)	Ambient	Ambient + Project	Increase
1 Multi-Family Residential	45.8	47.4	45.6	51.1	57.2	58.2	1.0
2 Data for Children	30.9	43.4	38.4	44.8	74.6	74.6	0.0
3 Multi-Family Residential	41.9	49.7	53.2	55.0	60.9	61.9	1.0
4 Multi-Family Residential	34.5	44.4	41.5	46.5	60.9	61.1	0.2

1. Source for reference level: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values* , July 6, 2010.

Equipment		PPV at 25 feet (in/sec)	Calculated distance (feet)
			23
Pile Driver (impact)	upper range	1.518	1.7202
	typical	0.644	0.7298
Pile Driver (sonic)	upper range	0.734	0.8318
	typical	0.17	0.1926
Clam shovel drop (slurry wall)		0.202	0.2289
Hydromill (slurry wall)	in soil	0.008	0.0091
	in rock	0.017	0.0193
Vibratory Roller		0.21	0.2380
Hoe Ram		0.089	0.1009
Large bulldozer		0.089	0.1009
Caisson drilling		0.089	0.1009
Loaded trucks		0.076	0.0861
Jackhammer		0.035	0.0397
Small bulldozer		0.003	0.0034
Rock Breaker		0.059	0.0669
		PPV at 50 ft	
Blasting		0.4	1.2821

Notes:
1. Calculated using the following formula:
PPV equip = PPVref x (25/D)1.5

where: PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance
PPV (ref) = the reference vibration level in in/sec from Table 12-2 of the FTA Transit Noise and Vibration Impact
D = the distance from the equipment to the receiver