

EXTERIOR NOISE ANALYSIS REPORT

AVA PACIFIC BEACH

San Diego, CA

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EXECUTIVE SUMMARY

This analysis evaluates noise associated with the implementation of the proposed AVA Pacific Beach project. The project proposes in-fill development of 138 apartments in three new buildings. The project site is bounded by Ingraham Street, Jewell Street, Fortuna Avenue, and La Playa Avenue, in the Crown Point neighborhood of the Pacific Beach community of the City of San Diego, California (Figure 1).

Future exterior noise levels would be below 60 A-weighted decibels (dBA) Community Noise Equivalent Level (CNEL) or lower at all common open space areas in the project. Future exterior noise levels at all required outdoor spaces in the project would be below 60 dBA CNEL, and would be considered Compatible with the multi-family residential land use per the City's General Plan Noise Element Land Use – Noise Compatibility Guidelines [City of San Diego 2015].

Future exterior noise levels would exceed 60 dBA CNEL at some building façades. Therefore, interior noise levels in habitable rooms could exceed the City of San Diego General Plan Noise Compatibility Guidelines and California Building Code (CBC) Section 1206.4 (Title 24) requirement of 45 dBA CNEL in residences. To comply with this requirement, upgraded building façade elements (windows, walls, doors, and/or exterior wall assemblies) with Sound Transmission Class (STC) ratings of 35 or higher may be necessary. If the interior noise limit can be achieved only with the windows closed, the building design must include mechanical ventilation that meets CBC requirements. Implementation of these design features would ensure that interior noise levels would be 45 dBA CNEL or below in residences, and the project would comply with the City of San Diego General Plan Noise Compatibility Guidelines and the CBC Section 1206.4 (Title 24) requirement.

The project site is exposed to aircraft noise levels below 60 dBA CNEL from operations associated with the San Diego International Airport (SDIA). These noise levels are compatible with the multi-family residential use per the Noise Element [City of San Diego 2015].

Project operation would generate noise levels up to 40 dBA average / equivalent level (Leq) at its property lines. Project-generated operational noise would comply with Municipal Code Section 59.5.401, and project operation impacts would be less than significant.

Project demolition and construction would generate noise levels of 75 dBA Leq or less at existing offsite residences and adjacent residences on the AVA Pacific Beach property. Demolition and construction noise would not exceed the 75 dBA Leq threshold at occupied residences in accordance with Municipal Code Section 59.5.0404, and impacts would not occur.

Vibration is distinctly perceptible at 0.04 inches per second (in/sec) peak particle velocity (PPV) per industry standards. The project would include specific construction and demolition equipment and practices as a condition of approval to control vibration to below levels that would be distinctly perceptible. With the proposed equipment selection and usage constraints, project vibration impacts would be less than significant.

Project traffic would add less than 1 dBA CNEL to existing land uses along project access roadways. As this would be below a 3-dBA perceptible change, project-generated traffic noise impacts would be less than significant.

*AvalonBay Pacific Beach
Noise Analysis*



*FIGURE 1
Vicinity Map*

1.0 INTRODUCTION

1.1 Purpose of the Report

The purpose of this report is to evaluate noise affecting and produced by the proposed AVA Pacific Beach project.

1.2 Project Location

The project site is bounded by Ingraham Street, Jewell Street, Fortuna Avenue, and La Playa Avenue, in the Crown Point neighborhood of the Pacific Beach community of the City of San Diego (Figure 1).

1.3 Project Description

The project involves the re-development of underutilized portions of the project site. Specifically, the project would demolish three parking lots and construct three buildings, with a total of 138 residential units, and two new parking structures.

1.4 Environmental Noise Background

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound typically associated with human activity and that interferes with or disrupts normal activities. The human environment is characterized by a certain consistent noise level which varies with each area. This is called ambient noise. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, perceived importance of the noise and its appropriateness in the setting, time of day and type of activity during which the noise occurs, and sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in cycles per second, or hertz (Hz), whereas intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels. Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA would be noticeable and would likely evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would cause a community response [Caltrans 2013a]. Sound levels of typical noise sources and environments are provided in Table 1.

Table 1. Sound Levels of Typical Noise Sources and Noise Environments

Noise Source (at Given Distance)	Noise Environment	A-Weighted Sound Level	Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels*)
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140 Decibels	128 times as loud
Civil Defense Siren (100 ft)		130	64 times as loud
Commercial Jet Take-off (200 ft)		120	32 times as loud Threshold of Pain
Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100	8 times as loud Very Loud
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90	4 times as loud
Garbage Disposal (3 ft)	Noisy Urban Daytime	80	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)	Commercial Areas	70	Reference Loudness Moderately Loud
Normal Speech (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40	1/8 as loud Quiet
Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30	1/16 as loud
	Broadcast and Recording Studio	20	1/32 as loud Just Audible
		0	1/64 as loud Threshold of Hearing

Source: Compiled by dBF Associates, Inc.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. A simple rule is useful, however, in dealing with sound levels. If a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example, $60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB}$, and $80 \text{ dB} + 80 \text{ dB} = 83 \text{ dB}$. The normal human ear can detect sounds that range in frequency from about 20 Hz to 20,000 Hz.

However, all sounds in this wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the range of 1,000 Hz to 4,000 Hz. This frequency dependence can be taken into account by applying a correction to each frequency range to approximate the human ear's sensitivity within each range. This is called A-weighting and is commonly used in measurements of community environmental noise. The A-weighted sound pressure level (abbreviated as dBA) is the sound level with the "A-weighting" frequency correction. In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Because community noise fluctuates over time, a single measure called the Equivalent Sound Level (L_{eq}) is often used to describe the time-varying character of community noise. The L_{eq} is the energy-averaged A-weighted sound level during a measured time interval, and is equal to the level of a continuous steady sound containing the same total acoustical energy over the averaging time period as the actual time-varying sound. Additionally, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the L_{max} and L_{min} indicators, which represent the root-mean-square maximum and minimum noise levels obtained during the measurement interval. The L_{min} value obtained for a particular monitoring location is often called the "acoustic floor" for that location.

To describe the time-varying character of environmental noise, the statistical noise descriptors L_{10} , L_{50} , and L_{90} are commonly used. They are the noise levels equaled or exceeded during 10, 50, and 90 percent of a stated time, respectively. Sound levels associated with L_{10} typically describe transient or short-term events, whereas levels associated with L_{90} describe the steady-state (or most prevalent) noise conditions.

The Community Noise Equivalent Level (CNEL) is a descriptor representing a 24-hour, time-weighted, annual average noise level based on the "A-weighted" decibel. In the calculation process, noise occurring in the evening time period (7 p.m. to 10 p.m.) is penalized by adding 5 dB, while noise occurring in the nighttime period (10 p.m. to 7 a.m.) is penalized by adding 10 dB. These time periods and decibel increases are intended to reflect a typical person's increased sensitivity to noise during late-night and early morning hours. This descriptor is used by the State of California and the City of San Diego to evaluate land-use compatibility with regard to noise.

2.0 REGULATORY FRAMEWORK

2.1 City of San Diego

2.1.1 General Plan

The City of San Diego requires new projects to meet noise level standards as established in the Noise Element of the General Plan [City of San Diego 2008, Amended 2015: Policy NE-A.4]. These standards are shown in Table NE-3: Land Use – Noise Compatibility Guidelines (Table 2 of this report).

In the Residential – Multiple Dwelling Units land use category, noise levels up to 60 dBA CNEL are considered Compatible with outdoor use areas; noise levels up to 70 dBA CNEL are considered Conditionally Compatible. The building structure must attenuate exterior noise in occupied areas to 45 dBA CNEL or below.

Table 2. City of San Diego Land Use – Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (dBA CNEL)			
	60	65	70	75
<i>Parks and Recreational</i>				
Parks, Active and Passive Recreation				
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities				
<i>Agricultural</i>				
Crop Raising & Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries & Greenhouses; Animal Raising, Maintain & Keeping; Commercial Stables				
<i>Residential</i>				
Single Dwelling Units; Mobile Homes		45		
Multiple Dwelling Units <i>*For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.</i>		45	45*	
<i>Institutional</i>				
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12 Educational Facilities; Libraries; Museums; Child Care Facilities		45		
Other Educational Facilities including Vocational/Trade Schools and Colleges and Universities		45	45	
Cemeteries				
<i>Retail Sales</i>				
Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries Pharmaceutical, & Convenience Sales; Wearing Apparel & Accessories			50	50
<i>Commercial Services</i>				
Building Services; Business Support; Eating & Drinking; Financial Institutions; Maintenance & Repair; Personal Services; Assembly & Entertainment (includes public and religious assembly); Radio & Television Studios; Golf Course Support			50	50
Visitor Accommodations		45	45	45
<i>Offices</i>				
Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters			50	50
<i>Vehicle and Vehicular Equipment Sales and Services Use</i>				
Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking				
<i>Wholesale, Distribution, Storage Use Category</i>				
Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution				
<i>Industrial</i>				
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries				
Research & Development				50
Compatible	Indoor Uses	Standard construction methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I.		
	Outdoor Uses	Activities associated with the land use may be carried out.		
45, 50	Indoor Uses	Building structure must attenuate exterior noise to the indoor noise level indicated by the number (45 or 50) for occupied areas. Refer to Section I.		
	Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable. Refer to Section I.		
Incompatible	Indoor Uses	New construction should not be undertaken.		
	Outdoor Uses	Severe noise interference makes outdoor activities unacceptable.		

2.1.2 CEQA Significance Thresholds

The City California Environmental Quality Act (CEQA) Significance Determination Thresholds [City of San Diego 2022] asks if the project would:

1. Result or create a significant increase in the existing ambient noise levels?
2. Expose people to noise levels which exceed the City's adopted noise ordinance or are incompatible with Table K-4?
3. Expose people to current or future transportation noise levels which exceed standards established in the Transportation Element of the General Plan or an adopted airport Comprehensive Land Use Plan?
4. Result in land uses which are not compatible with aircraft noise levels as defined by an adopted airport Comprehensive Land Use Plan (CLUP)?

Related to those issues, the Thresholds discuss interior and exterior noise impacts from traffic generated noise; United States Department of Housing and Urban Development (HUD) funded projects and noise; airport noise impacts; noise from adjacent stationary uses (noise generators); impacts to sensitive wildlife; temporary construction noise; and noise / land use compatibility. While these topics are included in the Thresholds, updates to CEQA have occurred specifying that CEQA analysis is only to address project impacts on the environment, and not the converse. The effects of environmental noise to the project are considered land use planning issues, not CEQA issues. It is also noted that the source of Thresholds Table K-2 regarding traffic noise significance thresholds was the previous General Plan, which has been superseded. The currently adopted 2015 General Plan noise information is utilized for this analysis herein.

The CEQA Significance Determination Thresholds also identify that construction noise that exceeds 75 dBA Leq at a sensitive receptor, or that would occur between 7 p.m. to 7 a.m. or on holidays, would be considered significant. Additionally, construction noise that would substantially interfere with normal business communications or affect sensitive receptors may be significant.

Note: Table K-4 was updated in the 2008 General Plan. The updated land use noise compatibility table is included as Table 2 of this report.

2.1.3 Municipal Code

2.1.3.1 Operational Noise

Operational noise within the City is governed by Municipal Code Section 59.5.401: Sound Level Limits.

It shall be unlawful for any person to cause noise by any means to the extent that the one-hour average sound level exceeds the applicable limit given in the following table, at any location in the City of San Diego on or beyond the boundaries of the property on which the noise is produced. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person.

TABLE OF APPLICABLE LIMITS

Land Use	Time of Day	One-Hour Average Sound Level (decibels)
1. Single Family Residential	7 a.m. to 7 p.m.	50
	7 p.m. to 10 p.m.	45
	10 p.m. to 7 a.m.	40
2. Multi-Family Residential (up to a maximum density of 1/2000)	7 a.m. to 7 p.m.	55
	7 p.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
3. All Other Residential	7 a.m. to 7 p.m.	60
	7 p.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
4. Commercial	7 a.m. to 7 p.m.	65
	7 p.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	60
5. Industrial or Agricultural	any time	75

The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. Permissible construction noise level limits shall be governed by Section 59.5.0404 of this article.

...

(Amended 9-11-1989 by O-17337 N.S.)

(Amended 11-28-2005 by O-19446 N.S.; effective 2-9-2006.)

With the project buildings in place, the project property would have a density greater than one dwelling unit per 2,000 square feet of lot area, which means that the project is considered in the “All Other Residential” land use category. Adjacent land uses within the AVA Pacific Beach property are multifamily residential buildings, with the following operational sound level limits:

- 60 dBA Leq during daytime hours (7:00 a.m. to 7:00 p.m.),
- 55 dBA Leq during evening hours (7:00 p.m. to 10:00 p.m.), and
- 50 dBA Leq during nighttime hours (10:00 p.m. to 7:00 a.m.).

Building 1 Site

Surrounding offsite land uses include the Crown Point Junior Music Academy to the north and single-family residential to the west. Noise limits for the “All Other Residential” land use category were considered applicable to the school property.

At the north project property line, toward the school use, the operational sound level limits are:

- 60 dBA Leq during daytime hours (7:00 a.m. to 7:00 p.m.),
- 55 dBA Leq during evening hours (7:00 p.m. to 10:00 p.m.), and
- 50 dBA Leq during nighttime hours (10:00 p.m. to 7:00 a.m.).

At the west project property line, toward the single-family residential uses, the operational sound level limits are:

- 55 dBA Leq during daytime hours (7:00 a.m. to 7:00 p.m.),
- 50 dBA Leq during evening hours (7:00 p.m. to 10:00 p.m.), and
- 45 dBA Leq during nighttime hours (10:00 p.m. to 7:00 a.m.).

Building 2 Site

Surrounding offsite land uses include multi-family residential with a density greater than one dwelling unit per 2,000 square feet of lot area to the east.

At the east project property line, the operational sound level limits are:

- 60 dBA Leq during daytime hours (7:00 a.m. to 7:00 p.m.),
- 55 dBA Leq during evening hours (7:00 p.m. to 10:00 p.m.), and
- 50 dBA Leq during nighttime hours (10:00 p.m. to 7:00 a.m.).

Building 3 Site

Surrounding offsite land uses include multi-family residential with a density greater than one dwelling unit per 2,000 square feet of lot area to the east and single-family residential buildings to the south.

At the east project property line, toward the multi-family residential use, the operational sound level limits are:

- 60 dBA Leq during daytime hours (7:00 a.m. to 7:00 p.m.),
- 55 dBA Leq during evening hours (7:00 p.m. to 10:00 p.m.), and
- 50 dBA Leq during nighttime hours (10:00 p.m. to 7:00 a.m.).

At the south project property line, toward the single-family residential uses, the operational sound level limits are:

- 55 dBA Leq during daytime hours (7:00 a.m. to 7:00 p.m.),
- 50 dBA Leq during evening hours (7:00 p.m. to 10:00 p.m.), and
- 45 dBA Leq during nighttime hours (10:00 p.m. to 7:00 a.m.).

2.1.3.2 Construction Noise

Construction noise within the City is governed by Municipal Code Section 59.5.0404: Construction Noise.

It shall be unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator. In granting such permit, the Administrator shall consider whether the construction noise in the vicinity of the proposed work site would be less objectionable at night than during the daytime because of different population densities or different neighboring activities; whether obstruction and interference with traffic particularly on streets of major importance, would be less objectionable at night than during the daytime; whether the type of work to be performed emits noises at such a low level as to not cause significant disturbances in the vicinity of the work site; the character and nature of the neighborhood of the proposed work site; whether great economic hardship would occur if the work were spread over a longer time; whether proposed night work is in the general public interest; and he shall prescribe such conditions, working times, types of construction equipment to be used, and permissible noise levels as he deems to be required in the public interest.

Except as provided in subsection C. hereof [of Municipal Code Section 59.5.0404], it shall be unlawful for any person, including The City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m.

The provisions of subsection B of this section [Municipal Code Section 59.5.0404] shall not apply to construction equipment used in connection with emergency work, provided the Administrator is notified within 48 hours after commencement of work.

(Amended 1-3-1984 by O-16100 N.S.)

2.1.3.3 Refuse Vehicles and Parking Lot Sweepers

Refuse vehicle and parking lot sweeper noise within the City is governed by Municipal Code Section 59.5.0406: Refuse Vehicles and Parking Lot Sweepers.

No person shall operate or permit to be operated a refuse compacting, processing, or collection vehicle between the hours of 7:00 p.m. to 6:00 a.m. or a parking lot sweeper between the hours of 7:00 p.m. to 7:00 a.m. in any residential area unless a permit has been applied for and granted by the Administrator.

*(“Refuse Vehicles” added 9-18-1973 by O-11122 N.S.; amended 9-22-1976 by O-11916 N.S.)
(Amended 6-9-2010 by O-19960 N.S.; effective 7-9-2010.)*

2.2 State of California

2.2.1 Residential

California Building Code (CBC), Chapter 12: Interior Environment, Section 1206: Sound Transmission regulates noise levels in buildings with multiple habitable units [State of California 2019]. Relevant portions are reproduced below.

1206.4 Allowable interior noise levels. Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan.

2.2.2 Vibration

The City of San Diego does not regulate construction vibration levels. In the absence of vibration limits, the California Department of Transportation (Caltrans) criteria were used. For continuous or frequent intermittent sources, vibration is “barely perceptible” at 0.01 in/sec PPV and “distinctly perceptible” at 0.04 in/sec PPV. Damage to “older residential structures” could occur at 0.3 in/sec PPV.

The City of San Diego considers a vibration level of 0.04 in/sec PPV or greater to be significant.

3.0 ENVIRONMENTAL SETTING AND EXISTING CONDITIONS

Noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise.

3.1 Existing Conditions

The project proposes added three new residential buildings and two parking structures within an existing multi-family residential development. Building sites are currently developed with three parking lots, one of which is covered. Noise-sensitive land uses in the project area include the existing on-site multifamily residences adjacent to locations of the new buildings, multi-family residences to the east across Jewell Street, single-family residences to the west across the alley and to the south across La Playa Street, and the Crown Point Junior Music Academy school to the north. The primary existing noise source in the vicinity of the project is vehicular traffic on surface streets.

3.1.1 Roadway

Ingraham Street is a four-lane two-way undivided Major Arterial roadway adjacent to the project site on the west. Ingraham Street carries an existing (year 2022) peak-hour volume of 1,254-1,367 vehicles between Fortuna Avenue and La Playa Avenue [LLG 2023]. Its speed limit is 35 miles per hour (mph). The existing vehicle mix is approximately 3% medium trucks, 1% buses, and 1% motorcycles, based on observations conducted during the site visit.

Jewell Street is a two-lane two-way undivided Local Collector roadway adjacent to the project site on the east. Jewell Street carries an existing (year 2022) peak-hour volume of 142-219 vehicles between Fortuna Avenue and La Playa Avenue [LLG 2023]. Its speed limit is unposted; vehicles were observed generally travelling approximately 25 mph. The existing vehicle mix is approximately 5% medium trucks and 2.5% buses, based on observations conducted during the site visit.

Fortuna Avenue is an unclassified roadway, not in the Mobility Element, adjacent to the project site on the north. Fortuna Avenue carries an existing peak-hour volume of 101-112 vehicles between Ingraham Street and Jewell Street [LLG 2023]. Its speed limit is unposted; vehicles were observed generally travelling approximately 25 mph. The existing vehicle mix is approximately 10% medium trucks, based on observations conducted during the site visit.

La Playa Avenue is a two-lane two-way undivided Local Collector roadway adjacent to the project site on the south. La Playa Avenue carries an existing (year 2022) peak-hour volume of 148-174 vehicles between Ingraham Street and Jewell Street [LLG 2023]. Its speed limit is unposted; vehicles were observed generally travelling approximately 25 mph. The existing vehicle mix is approximately 100% cars, based on observations conducted during the site visit.

3.1.2 Aircraft

The project site is exposed to an existing (year 2018) and projected future (year 2026) aircraft noise level of less than 60 dBA CNEL from SDIA operations [SDCRAA 2021]. However, noise associated with aircraft operations may be periodically audible on the project site or within the project buildings. As the project is located outside of any 60 dBA CNEL airport noise level contour per the aforementioned document, aircraft noise does not warrant further discussion herein.

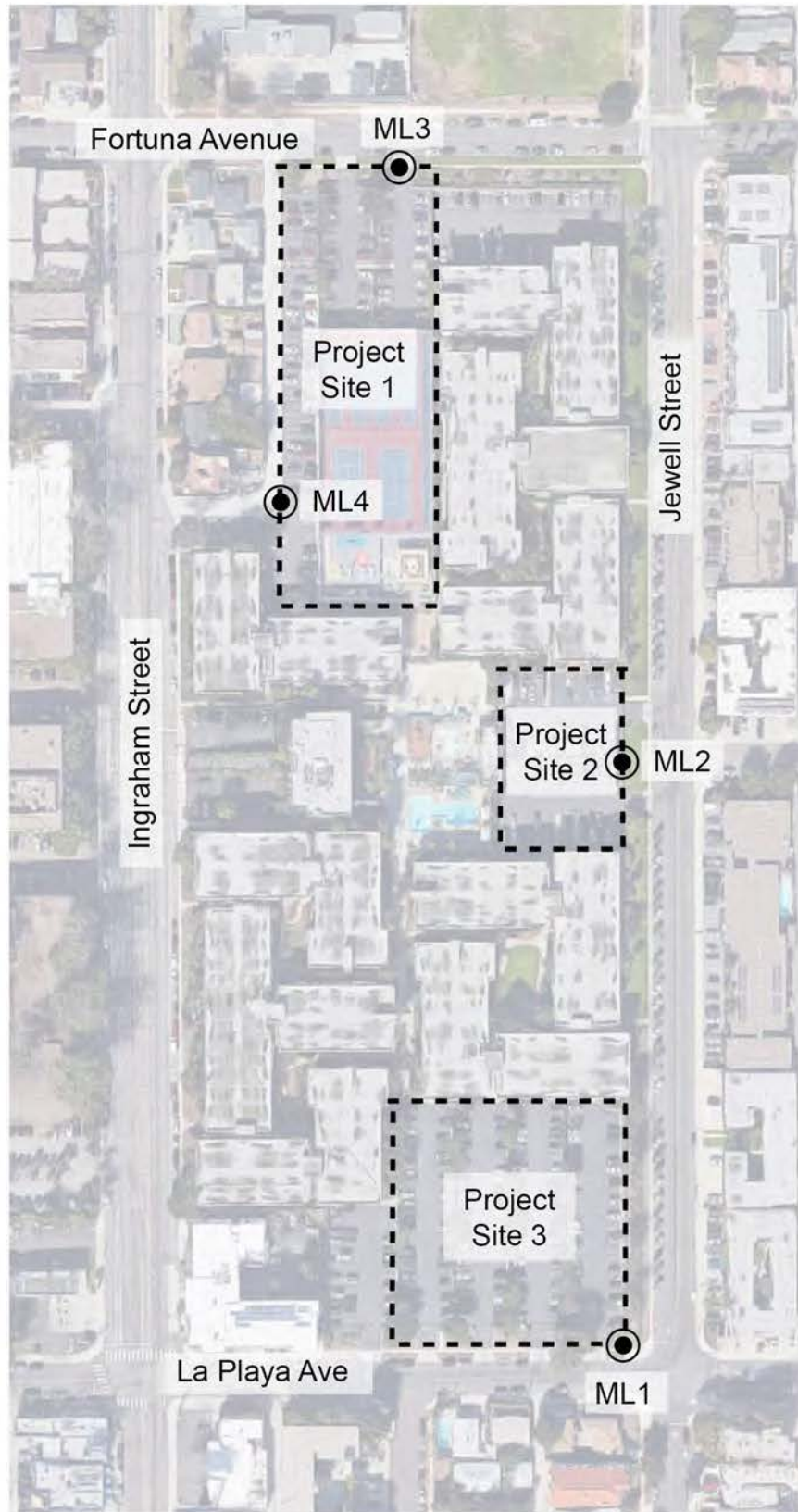
3.2 Ambient Sound Level Measurements

Ambient sound level measurements were conducted to estimate the existing acoustical environment on the project site. A RION Model NL-31 ANSI Type 1 Integrating SLM was used as the data-collection device. The meter was mounted on a tripod roughly 5 feet above ground to simulate the average height of the human ear. The microphone was fitted with a windscreen. The sound level meter was calibrated before the measurement periods. Simultaneous traffic counts were conducted during the measurement periods. The measurement results are summarized in Table 3 and correspond to the locations depicted on Figure 2.

The primary noise source was roadway traffic. Other noise sources included birds, pedestrians, distant aircraft, and distant construction.

Table 3. Sound Level Measurements (dBA)

Measurement Location		Date / Time	Leq	Lmin	Lmax	L10	L50	L90	Traffic
ML1	Southeast corner of Building 3 site 52' from La Playa CL, 45' from Jewell CL	2023-03-29 12:10 – 12:20	56.2	45.1	69.5	58.8	52.1	47.1	La Playa: 21 cars Jewell: 21 cars, 2 medium trucks, 1 bus
ML2	East side of Building 2 site 48' from Jewell CL	2023-03-29 12:30 – 12:40	54.7	47.7	67.2	57.1	52.4	49.3	Jewell: 19 cars
ML3	North side of Building 1 site 33' from Fortuna CL	2023-03-29 12:55 – 13:05	53.3	47.8	77.0	56.4	52.3	50.2	Fortuna: 9 cars, 1 medium truck
ML4	Near southwest corner of Building 1 site 160' from Ingraham CL	2023-03-29 13:10 – 13:20	54.8	45.0	69.5	57.5	52.6	48.2	Ingraham: 94 cars, 3 medium trucks, 1 bus, 1 motorcycle



4.0 POTENTIAL NOISE IMPACTS AND LAND USE COMPATIBILITY

4.1 Demolition and Construction Noise

The project would involve the demolition of parking lots at three locations (Building 1: 2.03 acres, Building 2: 0.78 acre, and Building 3: 1.88 acres) within a 12.96-acre existing multi-family development. Subsequently, the project would involve grading these areas. Project grading would involve cut of 3,460 cubic yards and fill of 4,547 cubic yards, with cuts extending to 15 feet and fills extending to 1.5 feet. Three buildings, providing a total of 138 new multi-family residential units, two new parking structures, and new surface parking, would be constructed. Construction activity and delivery of construction materials and equipment would be limited to between 7:00 a.m. and 7:00 p.m., except on Sundays or holidays when no demolition or construction would occur.

Demolition and construction would generate a short-term temporary increase in noise in the project area. The increase in noise level would be primarily experienced close to the noise source; i.e., demolition, grading, and construction of the new buildings within each of the development areas. The magnitude of the impact would depend on the type of activity, noise level generated by various pieces of equipment, duration of the phase, acoustical shielding and distance between the noise source and receiver.

The Datakustik Cadna/A industrial noise prediction model was used to estimate demolition and construction noise levels. It was assumed that activity would occur continuously within the building area boundaries, and that every workday would be no longer than 8 hours. No noise reduction related to ground effects, atmospheric absorption, or intervening topography was included in the model. Equipment and operational parameters are described in Table 4. These parameters apply to each of the three building sites, with the exception of Building 2. At Building 2, there would be no subterranean parking garage. As such, during shoring and excavation, no drill rigs and only one excavator and one wheel loader would operate at the Building 2 site.

The closest offsite occupied residential properties are located approximately 23 feet away, across the alley from the Building 1 site to the west. The closest onsite occupied residences are units in multiple 3-story buildings located as close as approximately 11 feet from the project building boundaries. Project demolition and construction activity would produce noise levels of 75 dBA Leq (12 hours) or less at offsite and onsite residences, in compliance with the City's Noise Ordinance.

The project would include improvements to sewer lines within the project property. These improvements would require digging trenches using a mini excavator as close as approximately 5 feet from a building façade. A mini excavator produces approximately 65 dBA at 10 meters [DEFRA 2005], which is equivalent to approximately 84 dBA at 5 feet. The excavator is expected to be within 5 feet of any given point on a building façade for a duration less than 1 hour; as such, the average noise level would be less than 75 dBA Leq (12 hours).

Table 4. Demolition and Construction Noise Source Levels

Phase	Noise Source	Power (HP)	Number	Sound Level *	Usage Factor
Demolition	Wheel Loader	256	1	79 dBA at 10 meters	40%
	Skid Steer (Bulldozer)	310	1	80 dBA at 10 meters	40%
	Excavator	266	1	82 dBA at 10 meters	40%
Shoring & Excavation	Loader	165	1	76 dBA at 10 meters	40%
	Crane	213	1	67 dBA at 10 meters	15%
	Reachfork	142	1	79 dBA at 10 meters	40%
	Drill Rig 1	275	1	86 dBA at 10 meters	20%
	Drill Rig 2	523	1	86 dBA at 10 meters	20%
	Drill Rig 3	329	1	86 dBA at 10 meters	20%
	Vibratory	-	1	75 dBA at 10 meters	20%
	Air Compressor 1	100	1	75 dBA at 10 meters	40%
	Air Compressor 2	300	1	75 dBA at 10 meters	40%
	Excavator	266	2	82 dBA at 10 meters	40%
	Wheel Loader	243	2	79 dBA at 10 meters	40%
	Skid Steer (Bulldozer)	310	1	80 dBA at 10 meters	40%
	Dry Utilities	Dump Truck	-	1	79 dBA at 10 meters
Excavator		247	1	82 dBA at 10 meters	40%
Skid Steer		73	1	71 dBA at 10 meters	40%
Backhoe		78	1	69 dBA at 10 meters	40%
Saw Cutter		-	1	87 dBA at 10 meters	20%
Concrete	Backhoe	90	1	69 dBA at 10 meters	40%
	Telehandler	112	2	79 dBA at 10 meters	40%
	Loader	85	1	76 dBA at 10 meters	40%
	Concrete Mixer Truck	-	1	80 dBA at 10 meters	40%
	Concrete Pump Truck	-	1	78 dBA at 10 meters	20%

* Source: DEFRA 2005

Demolition and construction would occur during the days and hours proscribed by the City of San Diego Municipal Code. With project conditions, demolition and construction noise levels at residential property lines and onsite residential façades would not exceed the 75 dBA Leq (12 hours) sound level allowed by the City of San Diego Municipal Code. Temporary demolition and construction noise would also not substantially interfere with normal business operations or affect any other sensitive receptors. No project demolition or construction noise impacts would occur.

4.2 Construction Vibration

Vibration levels were estimated using the following Caltrans formula:

$$PPV_{Equipment} = PPV_{Ref} (25/D)^n \quad (in/sec) \quad (Eq. 12)$$

Where:

PPV_{Ref} = reference PPV at 25 ft.

D = distance from equipment to the receiver in ft.

$n = 1.1$ (the value related to the attenuation rate through ground)

Note: For PPVs measured at a different reference distance than 25 feet, that value was substituted into the equation.

Equipment	Vibration Level (PPV)	Distance		
		0.3 in/sec	0.04 in/sec	0.01 in/sec
Small Vibratory Roller	0.022 in/sec at 100 feet [ATS] – 0.029 in/sec at 99 feet [University of Nebraska]	9-12 feet	58-75 feet	205-263 feet
Hand-Operated Tamper	0.0079 in/sec at 49.2 feet [King / Demarco]	2 feet	11 feet	40 feet
Walk-Behind Compactor	0.0039 in/sec at 49.2 feet [King / Demarco]	1 foot	6 feet	21 feet
Excavators, Dozers, Loaders, Motor Grader, Backhoe	0.089 in/sec at 25 feet [FTA]	8 feet	52 feet	182 feet
Trucks, Reach Lift	0.076 in/sec at 25 feet [FTA]	7 feet	45 feet	158 feet
Small Bulldozer	0.003 in/sec at 25 feet [FTA]	-	2 feet	8 feet

No vibratory soil compaction would occur within 11 feet of a residence. As a condition of approval, to avoid annoyance from vibration during demolition and construction, the following conditions would be required and shall be included on the grading plan prior to grading permit issuance:

- When grading occurs within 52 feet of a residence, only use of a small bulldozer shall be allowed.
- When soil compaction occurs within 75 feet of a residence, only use of a hand-operated tamper, walk-behind compactor, or non-vibratory compaction shall be allowed.

With these preventive measures, no vibration impacts would occur.

4.3 Operational (Non-Construction) Noise

4.3.1 Stationary Noise Sources

The project building would have rooftop HVAC units. It is anticipated that there would be one unit per residence. It was assumed that the units would be screened with parapet walls at least as tall as the units. The unit sizes are not currently specified; however, it was assumed that 3-ton units would be used. A typical 3-ton HVAC condenser produces a sound power level of approximately 77 dBA [Carrier].

The Datakustik Cadna/A industrial noise prediction model was used to estimate operational noise levels. It was assumed that the units could operate continuously. The HVAC units would produce operational noise levels up to approximately 40 dBA Leq at the project property lines.

Project operation would not exceed the property line sound levels allowed by the City of San Diego Municipal Code. Operational stationary noise source impacts of the project would be less than significant.

4.3.2 Mobile Noise Sources

The project would add an a.m. peak-hour volume of 24 vehicles to the existing volume of 112 vehicles on Fortuna Avenue east of Ingraham Street [LLG 2023]. The project would cause a lower relative increase of vehicles to all other roadway segments.

This increase in traffic would result in an increase of less than 1 dBA CNEL. As this increase in traffic noise would be less than 3 dBA, it would be considered not perceptible to the average person and less than significant. Project operation mobility noise impacts would be less than significant.

4.4 Land Use Compatibility

The future noise environment on the project site would primarily be a result of vehicular traffic on surface streets.

4.4.1 Vehicular Traffic Noise

The Federal Highway Administration (FHWA) Traffic Noise Model (TNM) version 2.5 was used to estimate traffic noise levels. The modeling effort considered the peak-hour traffic volume, average estimated vehicle speed, and estimated vehicle mix, i.e., percentage of cars, medium trucks, heavy trucks, buses, and motorcycles. The peak hour traffic noise level was considered equivalent to the CNEL [24 CFR §51.106]. The model was calibrated using actual traffic counts and sound level measurements. Measured sound levels within 2 dBA of modeled sound levels; no adjustment was made to future modeled levels. Future vehicular traffic calculations are summarized in Appendix A.

Sound levels caused by line sources (i.e., variable or moving sound sources such as traffic) generally decrease at a rate of 3 to 4.5 dBA when the distance from the road is doubled, depending on the ground surface hardness between the source and the receiving property [Caltrans 2013a]. The model assumed “pavement” propagation conditions, which corresponds to a drop-off rate of approximately 3 dBA per doubling of distance. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures (walls and buildings), barriers, and topography. The noise attenuating effects of changes in elevation and topography were not included in the model. Therefore, the modeling effort is considered a worst-case representation of the roadway noise.

Ingraham Street is projected to carry a future (horizon year 2050 + project) peak-hour volume of up to 1,719 vehicles between Fortuna Avenue and La Playa Avenue [LLG 2023]. The existing speed of 35 mph and traffic mix of 3% medium trucks, 1% buses, and 1% motorcycles were assumed to remain constant in the future.

Jewell Street is projected to carry a future (horizon year 2050 + project) peak-hour volume of up to 272 vehicles between Fortuna Avenue and La Playa Avenue [LLG 2023]. The existing speed of 25 mph and traffic mix of 5% medium trucks and 2.5% buses were assumed to remain constant in the future.

Fortuna Avenue is projected to carry a future (horizon year 2050 + project) peak-hour volume of up to 161 vehicles between Ingraham Street and Jewell Street [LLG 2023]. The existing speed of 25 mph and traffic mix of 10% medium trucks were assumed to remain constant in the future.

La Playa Avenue is projected to carry a future (horizon year 2050 + project) peak-hour volume of up to 215 vehicles between Ingraham Street and Jewell Street [LLG 2023]. The existing speed of 25 mph and traffic mix of 100% cars were assumed to remain constant in the future.

Future exterior roadway noise levels at the proposed buildings would range up to approximately 61 dBA CNEL at the northwest façade corner of Building 1.

The project includes the following common outdoor usable areas: a courtyard on the south side of Building 1, and a courtyard on the central east side of Building 3. These areas would be shielded from roadway traffic by the project buildings and existing buildings to remain. Future exterior noise levels would be below 60 dBA CNEL at all common outdoor spaces in the project. Refer to Figure 3 for details.

Multi-family residential uses are compatible with noise levels up to 60 dBA CNEL and conditionally compatible with noise levels up to 70 dBA CNEL per the General Plan Noise Element. As a condition of approval, an interior noise analysis would be required to demonstrate that interior noise levels in the proposed residential buildings would not exceed 45 dBA CNEL, as discussed further in Section 4.4.2 below.

4.4.2 Interior Noise

Because future exterior noise levels would exceed 60 dBA CNEL at some building façades, interior noise levels in habitable rooms could exceed the City of San Diego General Plan Noise Compatibility Guidelines requirement of 45 dBA CNEL in residences and the CBC Section 1206.4 requirement of 45 dBA CNEL in residences.

To comply with this requirement, upgraded building façade elements (windows, walls, doors, and/or exterior wall assemblies) with Sound Transmission Class (STC) ratings of 35 or higher may be necessary.

If the interior noise limit can be achieved only with the windows closed, the building design must include mechanical ventilation that meets CBC requirements.

Implementation of these design features would ensure that interior noise levels would be 45 dBA CNEL or below in residences, and the project would comply with the City of San Diego General Plan Noise Compatibility Guidelines requirement and the CBC Section 1206.4 requirement.

AvalonBay Pacific Beach Noise Analysis

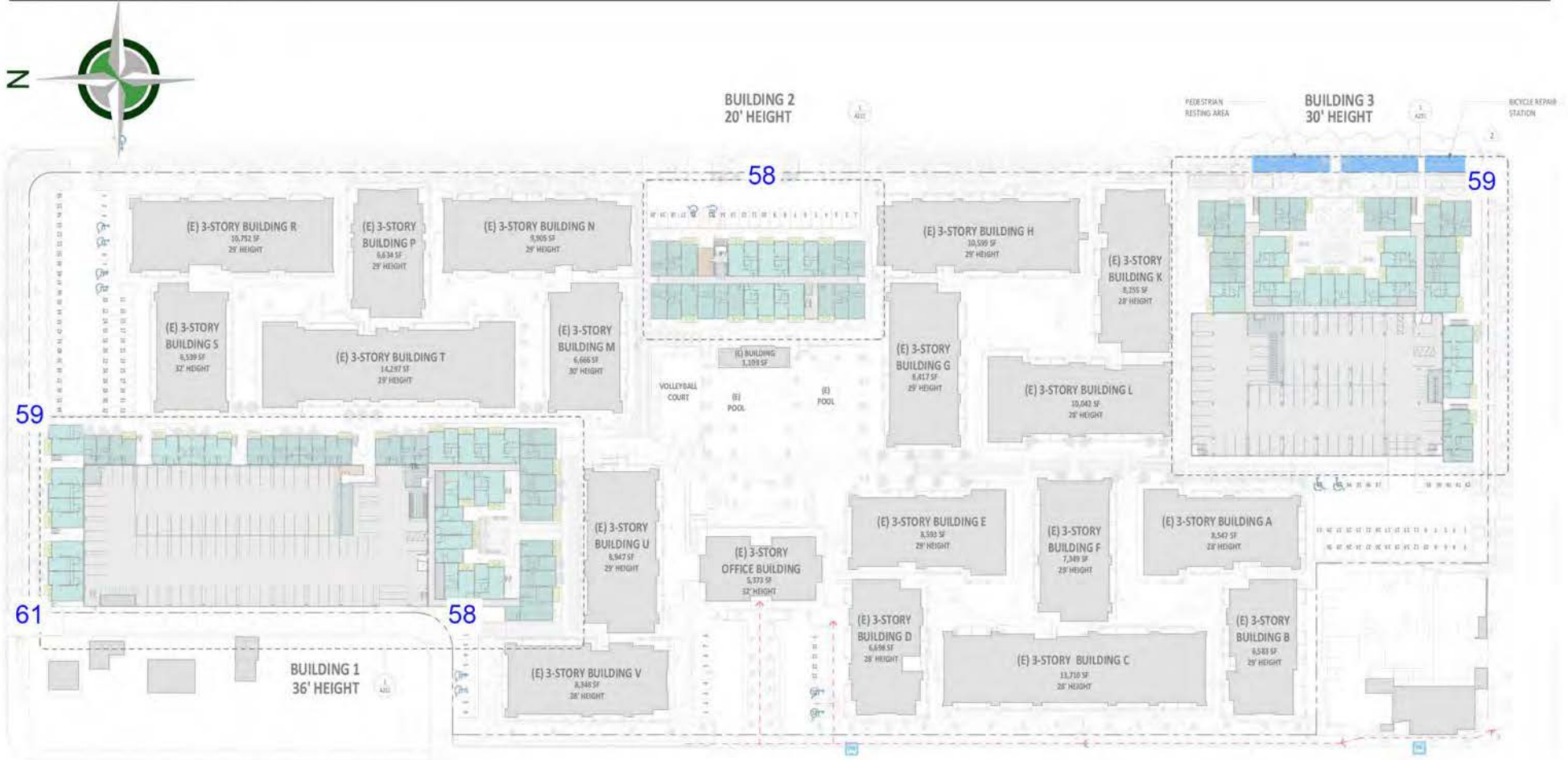


FIGURE 3
Future Exterior Noise Levels (CNEL)

5.0 RECOMMENDATIONS

5.1 Demolition and Construction Noise

As a condition of approval, the following conditions would be required and shall be included on the grading plan prior to grading permit issuance:

Mitigation Monitoring Coordination shall verify that construction activity occurring as a result of the proposed project implementation within 75 feet of noise-sensitive receivers includes noise-reduction measures to ensure construction activities do not exceed 75 dBA CNEL and comply with City of San Diego Noise Standards (San Diego Municipal Code Section 59.5.0401, Sound Level Limits, and Section 59.5.0404, Construction Noise), as follows:

- A. Construction operations and related activities associated with the proposed project shall be performed as outlined within the San Diego Municipal Code, between 7:00 a.m. and 7:00 p.m., with the exception of the days and holidays identified in the Municipal Code.
- B. When digging occurs within 35 feet of a residence, only a mini excavator shall be allowed.
- C. Construction equipment shall not be idled for extended periods (e.g., 15 minutes or longer) of time in the immediate vicinity (i.e., within 25 feet) of noise-sensitive receptors.
- D. A disturbance coordinator shall be designated by the general contractor, who shall post contact information in a conspicuous location near the entrance of the project construction site, prior to start of any construction activities, so that it is clearly visible to nearby sensitive receivers most likely to be disturbed. The coordinator shall manage complaints resulting from the construction noise, by instituting modifications to the construction operations and/or construction equipment to ensure compliance with the San Diego Municipal Code standards, where complaints are valid and substantive.
- E. Recurring disturbances shall be evaluated by a qualified acoustical consultant retained by the project proponent to ensure compliance with applicable standards.

5.2 Construction Vibration

As a condition of approval, the following conditions would be required and shall be included on the grading plan prior to grading permit issuance:

- When grading occurs within 52 feet of a residence, only use of a small bulldozer shall be allowed.
- When soil compaction occurs within 75 feet of a residence, only use of a hand-operated tamper, walk-behind compactor, or non-vibratory compaction shall be allowed.

5.3 Operational (Non-Construction) Noise

No recommendations are required.

5.4 Vehicular Traffic Noise

As a condition of approval, an interior noise analysis would be required to demonstrate that interior noise levels in the proposed residential buildings would not exceed 45 dBA CNEL.

6.0 REFERENCES

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1996c. ISO 1996-3. Acoustics – Description and Measurement of Environmental Noise – Part 3: Application to Noise Limits.

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7.0 LIST OF PREPARERS



Steven Fiedler, INCE
Principal, dBF Associates, Inc.

INPUT: ROADWAYS

AvalonBay Pacific Beach

dBf Associates, Inc. SPF				1 September 2023 TNM 2.5							
INPUT: ROADWAYS							Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA				
PROJECT/CONTRACT:		AvalonBay Pacific Beach									
RUN:		Measured									
Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Fortuna EB	12.0	point1	1	0.0	1,339.0	0.00				Average	
		point2	2	500.0	1,339.0	0.00					
Fortuna WB	12.0	point3	3	500.0	1,327.0	0.00				Average	
		point4	4	0.0	1,327.0	0.00					
La Playa EB	12.0	point5	5	0.0	-39.0	0.00				Average	
		point6	6	500.0	-39.0	0.00					
La Playa WB	12.0	point7	7	500.0	-27.0	0.00				Average	
		point8	8	0.0	-27.0	0.00					
Ingraham NB1	12.0	point9	9	-43.0	-500.0	0.00				Average	
		point10	10	-43.0	1,400.0	0.00					
Ingraham NB2	12.0	point11	11	-31.0	-500.0	0.00				Average	
		point12	12	-31.0	1,400.0	0.00					
Ingraham SB1	12.0	point13	13	-70.0	1,400.0	0.00				Average	
		point14	14	-70.0	-500.0	0.00					
Ingraham SB2	12.0	point15	15	-81.0	1,400.0	0.00				Average	
		point16	16	-81.0	-500.0	0.00					
Jewell NB	12.0	point17	17	551.0	-500.0	0.00				Average	
		point18	18	551.0	1,300.0	0.00					
Jewell SB	12.0	point19	19	539.0	1,300.0	0.00				Average	
		point20	20	539.0	-500.0	0.00					

INPUT: TRAFFIC FOR LAeq1h Volumes

AvalonBay Pacific Beach

dBF Associates, Inc.		1 September 2023										
SPF		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		AvalonBay Pacific Beach										
RUN:		Measured										
Roadway	Points											
Name	Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
			Autos		V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Fortuna EB	point1	1	27	25	3	25	0	0	0	0	0	0
	point2	2										
Fortuna WB	point3	3	27	25	3	25	0	0	0	0	0	0
	point4	4										
La Playa EB	point5	5	63	25	0	0	0	0	0	0	0	0
	point6	6										
La Playa WB	point7	7	63	25	0	0	0	0	0	0	0	0
	point8	8										
Ingraham NB1	point9	9	141	35	5	35	0	0	2	35	2	35
	point10	10										
Ingraham NB2	point11	11	141	35	4	35	0	0	1	35	1	35
	point12	12										
Ingraham SB1	point13	13	141	35	5	35	0	0	2	35	2	35
	point14	14										
Ingraham SB2	point15	15	141	35	4	35	0	0	1	35	1	35
	point16	16										
Jewell NB	point17	17	63	25	6	25	0	0	3	25	0	0
	point18	18										
Jewell SB	point19	19	63	25	6	25	0	0	3	25	0	0
	point20	20										

INPUT: RECEIVERS

AvalonBay Pacific Beach

dBF Associates, Inc.												
SPF												
INPUT: RECEIVERS												
PROJECT/CONTRACT:	AvalonBay Pacific Beach											
RUN:	Measured											
Receiver												
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active	
			X	Y	Z	above	Existing	Impact Criteria		NR	in	
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.	
			ft	ft	ft	ft	dBA	dBA	dB	dB		
ML1	1	1	500.0	2.0	0.00	5.00	56.20	66	10.0	8.0	Y	
ML2	3	1	497.0	650.0	0.00	5.00	54.70	66	10.0	8.0	Y	
ML3	4	1	280.0	1,300.0	0.00	5.00	53.30	66	10.0	8.0	Y	
ML4	5	1	160.0	925.0	0.00	5.00	54.80	66	10.0	8.0	Y	

INPUT: BARRIERS

AvalonBay Pacific Beach

dBF Associates, Inc.				1 September 2023															
SPF				TNM 2.5															
INPUT: BARRIERS																			
PROJECT/CONTRACT:		AvalonBay Pacific Beach																	
RUN:		Measured																	
Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	\$ per Unit	\$ per Unit	Top Width	Run:Rise	\$ per Unit			X	Y	Z	at Point	Seg	Ht	Perturbs	On	Important
				Area	Vol.			Length							Incre-	#Up	#Dn	Struct?	Reflec-
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft			ft	ft	ft	ft	ft				tions?
Barrier1	W	0.00	99.99	0.00				0.00	point1	1	40.0	875.0	0.00	30.00	0.00	0	0		
									point2	2	40.0	50.0	0.00	30.00					

INPUT: BUILDING ROWS

AvalonBay Pacific Beach

dBF Associates, Inc.					1 September 2023	
SPF					TNM 2.5	
INPUT: BUILDING ROWS						
PROJECT/CONTRACT:	AvalonBay Pacific Beach					
RUN:	Measured					
Building Row			Points			
Name	Average	Building	No.	Coordinates (ground)		
	Height	Percent		X	Y	Z
	ft	%		ft	ft	ft
Building1	15.00	60	1	40.0	1,275.0	0.00
			2	40.0	975.0	0.00

RESULTS: SOUND LEVELS

AvalonBay Pacific Beach

dBF Associates, Inc.													1 September 2023	
SPF													TNM 2.5	
													Calculated with TNM 2.5	
RESULTS: SOUND LEVELS														
PROJECT/CONTRACT:			AvalonBay Pacific Beach											
RUN:			Measured											
BARRIER DESIGN:			INPUT HEIGHTS						Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.					
ATMOSPHERICS:			68 deg F, 50% RH											
Receiver														
Name		No.	#DUs	Existing LAeq1h	No Barrier LAeq1h			Increase over existing		Type	With Barrier			
					Calculated	Crit'n	Calculated	Crit'n	Impact	Calculated LAeq1h	Noise Reduction		Goal	Calculated minus Goal
				dB	dB	dB	dB	dB		dB	dB	dB	dB	dB
ML1		1	1	56.2	57.3	66	1.1	10	----	57.3	0.0	8	-8.0	
ML2		3	1	54.7	56.2	66	1.5	10	----	56.2	0.0	8	-8.0	
ML3		4	1	53.3	54.9	66	1.6	10	----	54.9	0.0	8	-8.0	
ML4		5	1	54.8	53.9	66	-0.9	10	----	53.9	0.0	8	-8.0	
Dwelling Units			# DUs	Noise Reduction										
				Min	Avg	Max								
				dB	dB	dB								
All Selected			4	0.0	0.0	0.0								
All Impacted			0	0.0	0.0	0.0								
All that meet NR Goal			0	0.0	0.0	0.0								

INPUT: TRAFFIC FOR LAeq1h Volumes

AvalonBay Pacific Beach

dBF Associates, Inc.		1 September 2023										
SPF		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		AvalonBay Pacific Beach										
RUN:		Future										
Roadway	Points											
Name	Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
			Autos		V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Fortuna EB	point1	1	73	25	8	25	0	0	0	0	0	0
	point2	2										
Fortuna WB	point3	3	73	25	8	25	0	0	0	0	0	0
	point4	4										
La Playa EB	point5	5	108	25	0	0	0	0	0	0	0	0
	point6	6										
La Playa WB	point7	7	108	25	0	0	0	0	0	0	0	0
	point8	8										
Ingraham NB1	point9	9	409	35	13	35	0	0	4	35	4	35
	point10	10										
Ingraham NB2	point11	11	409	35	13	35	0	0	4	35	4	35
	point12	12										
Ingraham SB1	point13	13	409	35	13	35	0	0	4	35	4	35
	point14	14										
Ingraham SB2	point15	15	409	35	13	35	0	0	4	35	4	35
	point16	16										
Jewell NB	point17	17	125	25	7	25	0	0	4	25	0	0
	point18	18										
Jewell SB	point19	19	125	25	7	25	0	0	4	25	0	0
	point20	20										

INPUT: RECEIVERS

AvalonBay Pacific Beach

dBF Associates, Inc.												
SPF												
INPUT: RECEIVERS												
PROJECT/CONTRACT:	AvalonBay Pacific Beach											
RUN:	Future											
Receiver												
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active	
			X	Y	Z	above	Existing	Impact Criteria		NR	in	
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.	
			ft	ft	ft	ft	dBA	dBA	dB	dB		
ML1	1	1	500.0	2.0	0.00	5.00	0.00	66	10.0	8.0	Y	
ML2	3	1	497.0	650.0	0.00	5.00	0.00	66	10.0	8.0	Y	
ML3	4	1	280.0	1,300.0	0.00	5.00	0.00	66	10.0	8.0	Y	
ML4	5	1	160.0	925.0	0.00	5.00	0.00	66	10.0	8.0	Y	
NW corner	6	1	160.0	1,290.0	0.00	15.00	0.00	66	10.0	8.0	Y	

RESULTS: SOUND LEVELS

AvalonBay Pacific Beach

dBF Associates, Inc.													1 September 2023																							
SPF													TNM 2.5																							
													Calculated with TNM 2.5																							
RESULTS: SOUND LEVELS																																				
PROJECT/CONTRACT:													AvalonBay Pacific Beach																							
RUN:													Future																							
BARRIER DESIGN:													INPUT HEIGHTS		Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.																					
ATMOSPHERICS:													68 deg F, 50% RH																							
Receiver																																				
Name													No.		#DUs		Existing		No Barrier		With Barrier															
															LAeq1h		LAeq1h		Increase over existing		Type		Calculated		Noise Reduction											
																	Calculated		Crit'n		Calculated		Crit'n		Impact		LAeq1h		Calculated		Goal		Calculated			
																															minus		Goal			
															dBA		dBA		dBA		dB		dB				dBA		dB		dB		dB			
ML1													1		1		0.0		59.2		66		59.2		10		----		59.2		0.0		8		-8.0	
ML2													3		1		0.0		58.2		66		58.2		10		----		58.2		0.0		8		-8.0	
ML3													4		1		0.0		59.0		66		59.0		10		----		59.0		0.0		8		-8.0	
ML4													5		1		0.0		58.1		66		58.1		10		----		58.1		0.0		8		-8.0	
NW corner													6		1		0.0		59.9		66		59.9		10		----		59.9		0.0		8		-8.0	
Dwelling Units															# DUs		Noise Reduction																			
																	Min		Avg		Max															
																	dB		dB		dB															
All Selected															5		0.0		0.0		0.0															
All Impacted															0		0.0		0.0		0.0															
All that meet NR Goal															0		0.0		0.0		0.0															