APPENDIX G

Noise Technical Report Update

Noise Technical Report Update

Fairmount Avenue Fire Station Project

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
ADT	average daily traffic
AEOZ	Airport Environs Overlay Zone
ANSI	American National Standards Institute
AUF	acoustical usage factor
BMPs	Best Management Practices
Caltrans	California Department of Transportation
City	City of San Diego
CNEL	Community Noise Equivalent Level
County	County of San Diego
dB	decibel
dBA	A-weighted decibel
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HVAC	heating, ventilating, and air-conditioning
Hz	Hertz (cycles per second)
ips	inches per second
ISO	International Organization of Standardization
L_{90}	90% statistical sound level
L_{eq}	equivalent noise level
$L_{eq(h)}$	hourly Leq sound level
L_{max}	maximum sound level
L_{min}	minimum sound level
LT	Long-term
NIST	National Institute of Standards and Technology
OBCF	octave-band center frequency
PCE	Passenger car equivalent
proposed project	Fairmount Avenue Fire Station Project
PPV	Peak particle velocity
PWL	sound power level
RCNM	Roadway Construction Noise Model
report	Noise Technical Report
RMS	root mean square
SANDAG	San Diego Association of Governments
SDMC	San Diego Municipal Code
SLM	Sound level meter
SPL	Sound pressure level
ST	Short-term
TFIC	Traffic Forecast Information Center

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1 Introduction

1.1 Report Purpose and Scope

The purpose of this technical report is to assess potential noise and vibration impacts associated with construction and operation of the Fairmount Avenue Fire Station Project (project or proposed project). This analysis uses the Initial Study questions in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), the City's CEQA Significance Determination Thresholds (City of San Diego 2022), and other applicable thresholds of significance (e.g., Caltrans).

1.2 Project Location

The 1.28-acre project site is a vacant, undeveloped parcel, located in the City of San Diego (City), within the central portion of San Diego County (Figure 1, Project Location). The project is located approximately 0.5 miles east of Interstate 805 and 0.5 miles north of Highway 94. The project site is located north of the intersection of 47th Street and Fairmount Avenue, situated on the west side of 47th Street. The site is surrounded by residential uses to the east and northeast, open space to the north and west, and industrial uses and a school to the south.

The project site is designated Industrial Employment in the City's General Plan and Industrial in the Mid-City Communities Plan and zoned OP-2-1 (Open Space – Park) and RS-1-7 (Residential-Single Unit) (City of San Diego 2024, 2015).

1.3 Project Description

The project includes development of a 22,443 square foot, 4-story fire station with one apparatus bay, an exercise room, a kitchen, and 10 bunk rooms. The project also includes a trash enclosure, an emergency generator, a fuel tank, and parking.

Construction activities include ground and foundation preparation, utility installation, framing and assembly of the building and associated apparatus bay, paving of a parking lot and driveway areas, and landscaping. Project construction would require grading, requiring 3,783 cubic yards of import material. Off-site improvements include new 22-foot-wide and 40-foot-wide driveway aprons, a new crosswalk and sidewalk, a new concrete curb cut, and a new power pole on 47th Street. Project construction would also require off-site staging. The approximate 0.52 off-site staging area is a City-owned property located adjacent to Sunshine Berardini Park and Federal Boulevard.

During operations, the fire station would support a total of 12 firefighters and rescue staff (two [2] crews of four [4] firefighters and one [1] ambulance crew of two [2]). The firefighters work 24-hour shifts, and the ambulance crew works either 12 or 24-hour shifts per day. When a call is received, and fire trucks are dispatched vehicles would exit onto 47th Street and head towards the 47th Street and Fairmount Avenue intersection. The traffic signal at the 47th Street and Fairmount Avenue intersection would be controlled by the engine operator so all vehicles would be required to stop to allow access.

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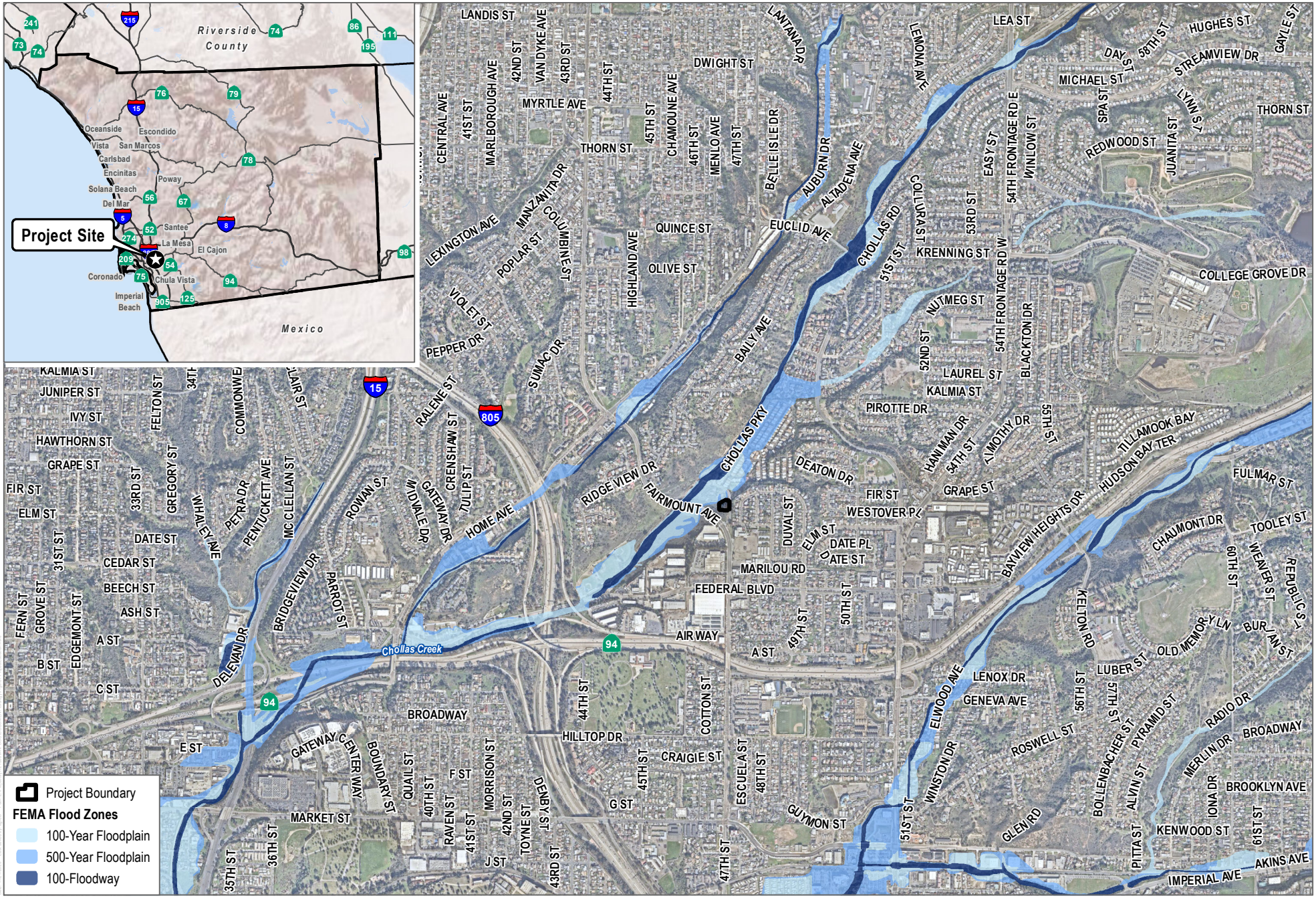

SOURCE: FEMA; SANGIS 2023

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FIGURE 1

Project Location

Fairmount Avenue Fire Station

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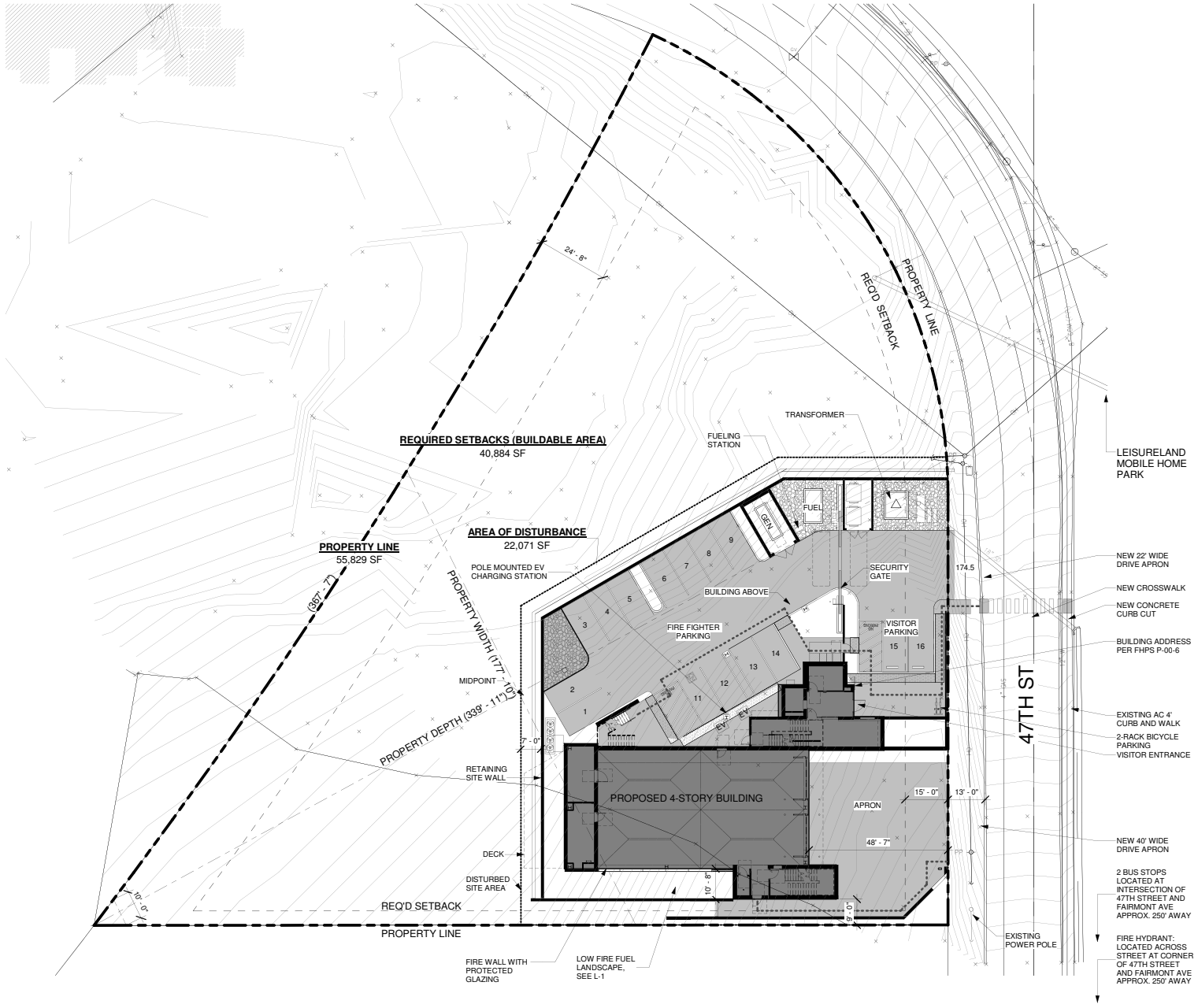

SOURCE: City of San Diego 2024; RRM Design Group, 2024

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FIGURE 2

Project Site Plan

Fairmount Avenue Fire Station

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2 Environmental Setting

Due to the technical nature of noise and vibration impact assessment, a brief overview of basic noise principles and descriptors is provided below, as well as a summary of the existing noise environment.

2.1 Noise and Vibration Basics

2.1.1 Sound

Per the City's Significance Thresholds, noise is defined as unwanted or objectionable sound. Sound may be described in terms of level or amplitude (measured in decibels [dB]), frequency or pitch (measured in hertz or cycles per second), and duration (measured in seconds or minutes). The standard unit of measurement of the amplitude of sound is the decibel. Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale is used to relate noise to human sensitivity. The dBA scale performs this compensation by discriminating against low and very high frequencies in a manner approximating the sensitivity of the human ear. Several descriptors of noise (noise metrics) exist to help predict average community reactions to the adverse effects of environmental noise, including traffic-generated noise, on a community. These descriptors include the equivalent noise level over a given period (L_{eq}), the statistical sound level, the day–night average noise level (L_{dn}), and the Community Noise Equivalent Level (CNEL). Each of these descriptors uses units of dBA. Table 1 provides examples of A-weighted noise levels from common sounds. In general, human sound perception is such that a change in sound level of 3 dBA is barely noticeable, a change of 5 dBA is clearly noticeable, and a change of 10 dBA is perceived as doubling or halving the sound level.

Table 1. Typical Exterior and Interior Sound Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
—	110	Rock band
Jet flyover at 300 meters (1,000 feet)	100	—
Gas lawn mower at 1 meter (3 feet)	90	—
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 mph)	80	Food blender at 1 meter (3 feet)
		Garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime	70	Vacuum cleaner at 3 meters (10 feet)
gas lawn mower at 30 meters (100 feet)		
Commercial area	60	Normal speech at 1 meter (3 feet)
Heavy traffic at 90 meters (300 feet)		
Quiet urban daytime	50	Large business office
		Dishwasher, next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime	30	Library
Quiet rural nighttime	20	Bedroom at night, concert hall (background)
—	10	Broadcast/recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 2013.
Note: dBA = A-weighted decibel.

The L_{eq} value is a sound level energy-averaged over a specified period (typically no less than 15 minutes for environmental studies). It is a single numerical value that, if constant over time, represents the same amount of variable sound energy received by a receptor during a time interval. For example, a 1-hour L_{eq} measurement would represent the average amount of energy contained in all the noise that occurred in that hour. The L_{eq} value is thus an effective noise descriptor because of its ability to assess the total time-varying effects of noise on sensitive receptors.

Unlike the L_{eq} metric that can be defined for any duration, L_{dn} and CNEL descriptors always represent 24-hour periods, often on an annualized basis. The L_{dn} and CNEL values also differ from L_{eq} because they apply a time-weighted dB adjustment designed to emphasize noise events that occur during the evening and nighttime hours (when speech and sleep disturbance is of more concern). "Time weighted" refers to the fact that L_{dn} and CNEL penalize noise that occurs during certain sensitive periods. In the case of CNEL, noise occurring during the daytime (7:00 a.m.–7:00 p.m.) receives no penalty. Noise during the evening (7:00 p.m.–10:00 p.m.) is penalized by adding 5 dB, while nighttime (10:00 p.m.–7:00 a.m.) noise is penalized by adding 10 dB. L_{dn} differs from CNEL in that the daytime period is defined as 7:00 a.m.–10:00 p.m., thus eliminating the evening period. L_{dn} and CNEL are the predominant criteria used to measure roadway noise affecting residential receptors. These two metrics generally differ from one another by no more than 0.5 dB to 1 dB and, as such, are often treated as equivalent to one another.

2.1.2 Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as blasting, pile driving, and heavy earthmoving equipment.

Several different methods are used to quantify vibration. Peak particle velocity (PPV), expressed in inches per second (ips), is defined as the maximum instantaneous peak of the vibration signal and is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body and is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to describe this RMS magnitude with respect to a reference value, which acts to compress the range of numbers required to discuss vibration in the context of impact assessment.

The calculation to determine PPV at a given distance is as follows:

$$PPV_{rcvr} = PPV_{ref} * (25/D)^{n}$$

Where:

PPV_{rcvr} = the peak particle velocity in inches per second of the equipment adjusted for distance (i.e., at the receiver)

PPV_{ref} = the reference vibration level in inches per second at 25 feet

D = the distance from the equipment to the receiver

n = an exponent, for which a value of 1.1 would be consistent with Caltrans suggestion for class III "hard soils" composed of dense compacted sand or dry consolidated clay.

The above PPV_{rcvr} value can be converted to an RMS vibration velocity level as follows, where the crest factor (CF) is assumed to be a value of 4 per FTA guidance (FTA 2018):

$$VdB_{rcvr} = 20*LOG(PPV_{rcvr}/(CF*0.000001))$$

2.1.3 Sensitive Receptors

Noise- and vibration-sensitive land uses are typically locations where medical patients and senior citizens reside or where the presence of unwanted sound could adversely affect the use of the land. Senior citizen centers, retirement homes, schools, day care centers, hospitals, guest lodging, libraries, and recreation areas would be considered noise- and vibration-sensitive and may warrant unique measures for protection from intruding noise. A sensitive receptor may exist in a residential site.

Existing sensitive and potentially sensitive receptors in the vicinity of the project site consist of residential single-family uses located on the northern/eastern side of 47th Street to the north (~180 feet) and east (~70 feet), and Webster Elementary School to the southeast (~310 feet). At residentially zoned land uses, the City's construction noise standard (75 dBA L_{eq} over a 12-hour period) applies. The City's non-construction exterior noise level thresholds are the most stringent to protect people from loud noise sources where people live. Hence, these nearby residential sensitive receptors (~70 feet from the project on the eastern side of 47th Street) represent those studied herein and have the greatest potential to be impacted by construction and/or operation of the project.

While the project site is surrounded by other land uses, such as open space directly adjacent to the north and south sides of the project site, sports fields (~1,450 feet to the southwest), warehouses (~270 feet to the south), industrial (~1,050 feet to the southwest), and commercial uses (~915 feet to the south), they do not have the same noise sensitivity as residentially zoned spaces, at which above-mentioned City construction noise limits and the most stringent non-construction exterior noise thresholds would apply. Additionally, because project noise emission attenuates naturally as it propagates away from sound sources, offsite receptors that are more distant from the nearest noise-sensitive residences would be exposed to lower project-attributed noise levels, especially when taking intervening roadways and structures into consideration. For these reasons, project noise exposure found to be compliant with City standards (with or without application of noise reduction measures) at the nearest residences studied would support a logical inference that compliance could thus also be expected at more distant offsite receptors and where such receptors have higher noise thresholds for compliance and impact significance assessment.

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3 Regulatory Setting

The following subsections summarize relevant laws, ordinances, regulations, policies, standards, and guidance that establish noise and vibration impact significance assessment criteria for the proposed project.

3.1 Federal

3.1.1 Federal Interagency Committee on Noise

Guidance regarding the determination of a substantial permanent increase in ambient noise levels in the project vicinity above existing levels is provided by the 1992 findings of the Federal Interagency Committee on Noise (FICON 1992), which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations. The FICON recommendations are based upon studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. Annoyance is a qualitative measure of the adverse reaction of people to noise that generates speech interference, sleep disturbance, or interference with the desire for a tranquil environment.

The rationale for the FICON recommendations is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of L_{dn}. This day-night sound level (L_{dn}) is comparable to the afore-described CNEL value but considers the 7:00 p.m. to 10:00 p.m. hours as daytime and thus not subject to the +5 dB "evening" penalty that the CNEL value derivation applies. The changes in noise exposure that are shown below are expected to result in equal changes in annoyance at sensitive land uses. Although the FICON recommendations were specifically developed to address aircraft noise impacts, they are used in this analysis to define a substantial increase in community noise levels related to all transportation noise sources and permanent non-transportation noise sources.

- Outdoor ambient sound level without the project is less than 60 dBA L_{dn}, then a project-attributed increase of 5 dBA or more would be considered significant;
- Outdoor ambient sound level without the project is between 60 and 65 dBA L_{dn}, project-attributed increase of 3 dBA or more would be considered significant; and
- Outdoor ambient sound level without the project is greater than 65 dBA L_{dn}, then project-attributed increase of 1.5 dBA or more would be considered significant.

3.2 State

3.2.1 California Department of Transportation – Vibration

In its *Transportation and Construction Vibration Guidance Manual* (Caltrans 2020), the California Department of Transportation (Caltrans) recommends 0.5 ips PPV as a threshold for the avoidance of structural damage to typical newer residential buildings exposed to continuous or frequent intermittent sources of groundborne vibration. For transient vibration events, such as blasting, the damage risk threshold would be 1.0 ips PPV (Caltrans 2020) at the same type of newer residential structures. For older structures, these guidance thresholds would be more stringent: 0.3 ips PPV for continuous/intermittent vibration sources, and 0.5 ips PPV for transient vibration events. With respect to human annoyance, Caltrans guidance indicates that building occupants exposed to continuous groundborne

vibration in the range of 0.1 ips PPV ("strongly perceptible") to 0.4 ips PPV ("severe") would find it "annoying" at 0.2 ips PPV and "unpleasant" at the 0.4 ips PPV value. Although these Caltrans guidance thresholds are not regulations, they can serve as quantified standards in the absence of such limits at the local jurisdictional level.

3.3 Local

3.3.1 City of San Diego Noise Ordinance

The following provides an overview of relevant City noise regulations, policies, and guidance with respect to assessing noise impacts associated with the project.

City of San Diego Municipal Code 59.5.0401 (Noise Ordinance, Sound Level Limits)

The City's Municipal Code (SDMC) Section 59.5.04.1(a) states it shall be unlawful for any person to cause noise by any means to the extent that the 1-hour average sound level exceeds the applicable limits given in Table 2, Applicable Noise Limits, at any location in the City 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 2. Applicable Noise Limits

Land Use	Time of Day	One-Hour A-weighted Average Sound Level (dBA)
Single-family residential	7:00 a.m. to 7:00 p.m.	50
	7:00 p.m. to 10:00 p.m.	45
	10:00 p.m. to 7:00 a.m.	40
Multifamily residential (up to a maximum density of 1/2,000)	7:00 a.m. to 7:00 p.m.	55
	7:00 p.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
All other residential	7:00 a.m. to 7:00 p.m.	60
	7:00 p.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50
Commercial	7:00 a.m. to 7:00 p.m.	65
	7:00 p.m. to 10:00 p.m.	60
	10:00 p.m. to 7:00 a.m.	60
Industrial or agricultural	Any time	75

Note: dB = decibels

Section 59.5.04.1(b) states that 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. Therefore, the applicable noise threshold for the project is the arithmetic mean of the single-family residential and commercial sound level limits, which is 57.5 dBA during daytime (7:00 a.m. to 7:00 p.m.) hours, 52.5 dBA during evening (7:00 p.m. to 10:00 p.m.) hours, and 50 dBA during nighttime (10:00 p.m. to 7:00 a.m.) hours.

City of San Diego Municipal Code 59.5.0402 (b) (Noise Ordinance, Motor Vehicles)

Section 59.5.0402 (b) of the SDMC states that nothing in the Noise Ordinance section shall apply to authorized emergency vehicles when being used in emergency situations, including the blowing of sirens and/or horns.

City of San Diego Municipal Code 59.5.0404 (Noise Ordinance, Construction Noise)

Section 59.5.0404 of the SDMC sets for the City's requirements specific to construction noise, as listed below.

A. 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.

B. Except as provided in subsection C. hereof, 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.

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

3.3.2 City of San Diego General Plan

The City's General Plan Noise Element identifies compatible exterior noise levels for various land use types (City of San Diego 2024). The maximum allowable noise exposure varies depending on the land use. The maximum acceptable exterior noise level for residential uses and other noise-sensitive uses (including schools, libraries, hospitals, daycare facilities, hotels, motels) is 65 dBA CNEL. Table 3 reproduces Table NE-3 from the City's General Plan Noise Element.

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Table 3. City of San Diego Land Use – Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (dBA CNEL)				
	55–60	60–65	65–70	70–75	75–80
Parks and Recreational					
Parks, Active and Passive Recreation					
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities					
Agricultural					
Crop Raising and Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries and Greenhouses; Animal Raising, Maintain and Keeping; Commercial Stables					
Residential					
Single Dwelling Units; Mobile Homes		45			
Multiple Dwelling Units*		45	45*		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12Educational Facilities; Libraries; Museums; Child Care Facilities		45			
Other Educational Facilities including Vocational/Trade Schools and Colleges and Universities		45	45		
Cemeteries					
Retail Sales					
Building Supplies/Equipment; Food, Beverages and Groceries; Pets and Pet Supplies; Sundries, Pharmaceutical, and Convenience Sales; Wearing Apparel and Accessories			50	50	
Commercial Services					
Building Services; Business Support; Eating and Drinking; Financial Institutions; Maintenance and Repair; Personal Services; Assembly and Entertainment (includes public and religious assembly); Radio and Television Studios; Golf Course Support			50	50	
Visitor Accommodations		45	45	45	
Offices					
Business and Professional; Government; Medical, Dental and Health Practitioner; Regional and Corporate Headquarters			50	50	
Vehicle and Vehicular Equipment Sales and Services Use					
Commercial or Personal Vehicle Repair and Maintenance; Commercial or Personal Vehicle Sales and Rentals; Vehicle Equipment and Supplies Sales and Rentals; Vehicle Parking					
Wholesale, Distribution, Storage Use Category					
Equipment and Materials Storage Yards; Moving and Storage Facilities; Warehouse; Wholesale Distribution					
Industrial					
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking and Transportation Terminals; Mining and Extractive Industries					
Research and Development				50	

Table Shading Key			
	Compatible	Indoor Uses	Standard construction methods should attenuate exterior noise to an acceptable indoor noise level.
		Outdoor Uses	Activities associated with the land use may be carried out.
45, 50	Conditionally Compatible	Indoor Uses	Building structure must attenuate exterior noise to the indoor noise level indicated by the number for occupied areas.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable.
	Incompatible	Indoor Uses	New construction should not be undertaken.
		Outdoor Uses	Severe noise interference makes outdoor activities unacceptable.

Source: City of San Diego 2024.
* For uses affected by aircraft noise, refer to General Plan Noise Element Policies NE-D.2 and NE-D.3.

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The City's General Plan Noise Element also lists the following policies with respect to noise and land use compatibility that would be applicable to the project.

- **NE-A.1.** Separate excessive noise-generating uses from residential and other noise-sensitive land uses with a sufficient spatial buffer of less sensitive uses.
- **NE-A.2.** Assure the appropriateness of proposed developments relative to existing and future noise levels by consulting the guidelines for noise-compatible land use (shown on Table 5) to minimize the effects on noise-sensitive land uses.
- **NE-A.3.** Limit future residential and other noise-sensitive land uses in areas exposed to high levels of noise.
- **NE-A.4.** Require an acoustical study consistent with Acoustical Study Guidelines (Table NE-4) for proposed developments in areas where the existing or future noise level exceeds or would exceed the "compatible" noise level thresholds as indicated on the Land Use - Noise Compatibility Guidelines (Table 5), so that noise mitigation measures can be included in the project design to meet the noise guidelines.
- **NE-A.5.** Prepare noise studies to address existing and future noise levels from noise sources that are specific to a community when updating community plans.

3.3.3 City CEQA Significance Determination Thresholds

The City's CEQA Significance Determine Thresholds address noise and vibration under different sections as follows:

- **Section II.K –** Significance Threshold 1 describes interior and exterior noise impact thresholds from traffic generated noise as shown in Table 4, reproduced from Table K-2 in the City's CEQA Significance Determination Thresholds document.

Table 4. Traffic Noise Significance Thresholds

Structure or Proposed Use that would be impacted by Traffic Noise	Interior Space	Exterior Useable Space [A]	General Indication of Potential Significance
Single-family detached	45 dB	65 dB	Structure or outdoor useable area [B] is < 50 feet from the center of the closest (outside) lane on a street with existing or future ADTs >7500 [C]
Multi-family, schools, libraries, hospitals, day care, hotels, motels, parks, convalescent homes	Development Services Department (DSD) ensures 45 dB pursuant to Title 24		
Offices, Churches, Business, Professional Uses	n/a	70 dB	Structure or outdoor usable area is < 50 feet from the center of the closest lane on a street with existing or future ADTs > 20,000
Commercial, Retail, Industrial, Outdoor Spectator Sports Uses	n/a	75 dB	Structure or outdoor usable area is < 50 feet from the center of the closest lane on a street with existing or future ADTs > 40,000

Source: City of San Diego 2022.
Notes: dBA = A-weighted decibel; n/a = not applicable; ADT = average daily traffic.
[A] If a project is currently at or exceeds the significance thresholds for traffic noise described above and noise levels would result in less than a 3 dB increase, then the impact is not considered significant.

[B] Exterior usable areas do not include residential front yards or balconies, unless the areas such as balconies are part of the required usable open space calculation for multi-family units.

[C] Traffic counts are available from San Diego Regional Association of Governments (SANDAG) Traffic Forecast Information Center (TFIC).

- Section II.K.6 – states with respect to construction noise:

  "Temporary construction noise which exceeds 75 dBA L_{eq} at a sensitive receptor would be considered significant. Construction noise levels measured at or beyond the property lines of any property zoned residential shall not exceed an average sound level greater than 75 dBA during the 12-hour period from 7:00 a.m. to 7:00 p.m. In addition, construction activity is prohibited 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, that would create disturbing, excessive, or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator, in conformance with San Diego Municipal Code Section 59.5.0404.

  Additionally, where temporary construction noise would substantially interfere with normal business communication, or affect sensitive receptors, a significant noise impact may be identified."

3.3.4 San Diego Fire Department Operations Manual

As noted above, the City exempts noise generated by emergency sirens. The San Diego Fire Department Operations Manual Standard Instruction 01, Fire Suppression: Response Guidelines, Section IV.B. states that the California Vehicle Code Regulation 21055 – Exemption of Authorized Emergency Vehicles is "exempt from the rules of the road under all the following conditions:"

b. if the driver of the vehicle sounds a siren as may be reasonably necessary…"

4 Existing Noise Conditions

Sound level measurements were conducted on March 27 and 28, 2024, to document the existing noise environment within the project area to establish baseline noise conditions against which to compare project noise levels. All noise measurements were performed in accordance with relevant American National Standards Institute (ANSI) and American Standards for Testing and Measurement (ASTM) guidelines, at three (3) locations in the proposed project area.

The noise measurements were performed using a Rion NL-62 model Type 1 precision grade sound level meter (SLM) and a SoftdB Piccolo II Type II general use SLM. Field calibrations were performed on the SLM with an acoustic calibrator before and after the measurements. All instrumentation components, including microphones, preamplifiers and field calibrators have laboratory-certified calibrations traceable to the National Institute of Standards and Technology (NIST). The SLMs used meet the current ANSI standard for Type 1 and Type 2 SLMs. Meteorological conditions during the monitoring periods were consistent with seasonal expectations and appropriate for collection of usable noise level data.

Long-term (LT) noise monitoring (24-hour) was performed at one location with instruments configured to operate in a continuous manner, cataloging all noise metrics pertinent to identification and evaluation of noise levels (i.e., L_{eq}, L_{max}, L_x, etc.) in the project vicinity. Ambient noise levels recorded at the long-term noise monitoring location are presented in Table 5 and the location is shown in Figure 3. More detailed information for the noise measurements can be found in Appendix A.

Table 5. Summary of Long-Term Ambient Noise Measurements

Site	Location	L_{dn}	Average Noise Levels (dBA)							
			Daytime				Nighttime			
			L_{eq}	L_{max}	L_{50}	L_{90}	L_{eq}	L_{max}	L_{50}	L_{90}
LT1	North of Fairmount Ave., east of 47th St.	60	53	87	56	52	53	56	48	44

Source: Dudek 2024, Appendix A.
Notes: dBA = A-weighted decibels; L_{dn} = Day Night noise level; L_{eq} = average equivalent noise level; L_{max} = maximum noise level; L_{50} = sound level exceeded 50% of the period; L_{90} = sound level exceeded 90% of the period.

The primary noise source affecting the long-term noise monitoring location was vehicular traffic on the local roadway network. Additional noise sources experienced during the noise-monitoring were bird noise, distant dogs barking, intermittent adjacent truck operations, and heavy trucks loading nearby. During the long-term noise monitoring, the day-night (L_{dn}) noise level was approximately 60 dBA.

Short-term (ST) noise monitoring was conducted at three locations (as shown on Figure 3; ST2 and LT1 share an approximate location), with results presented in Table 6, to further characterize noise levels generated by the existing ambient noise environment.

Table 6. Summary of Short-Term Ambient Noise Measurements

Site	Location	Time	Average Noise Levels (dBA)			
			L_{eq}	L_{max}	L_{50}	L_{90}
ST1	North of 47th Street, south of the Leisureland Mobile Homes	9:09 AM to 9:24 AM	44.9	50.3	42.3	39.9
ST2	On the eastern corner of the Fairmount Ave. and 47th St. intersection	9:28 AM to 9:43 AM	57.7	62.1	57.0	54.1
ST3	East of 47th St. and West of Webster Elementary School	9:44 AM to 9:59 AM	60.8	69.3	56.8	64.9

Source: Dudek 2024, Appendix A.
Notes: dBA = A-weighted decibels; L_{eq} = average equivalent noise level; L_{max} = maximum noise level; L_{50} = sound level exceeded 50 percent of the period; L_{90} = sound level exceeded 90% of the period.

SOURCE: RRM Design 2024; SANGIS 2023, 2024

DUDEK

0 100 200 Feet

FIGURE 3

Noise Measurement Locations

Fairmount Avenue Fire Station

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5 Thresholds of Significance

The following questions are based on Appendix G of the California Environmental Quality Act Guidelines (14 CCR 15000 et seq.). Impacts to noise would be potentially significant if the proposed project would result in the following:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
B. Generation of excessive groundborne vibration or groundborne noise levels.
C. Expose people residing or working in the project area to excessive noise levels (for a project located within the vicinity of a private airstrip or an airport land use plan, or where such a plan has not been adopted, within 2 miles of a public airport or public use airport).

This analysis also uses the City of San Diego Significance Determination Thresholds (2022)[1] to evaluate potential noise and vibration impacts.

Interior and Exterior Noise Impacts from Traffic-Generated Noise

As shown in Table 4 from Section 3.3.3, which is reproduced from Table K-2 in the City's CEQA Significance Determination Thresholds, the noise level at exterior usable open space for land uses akin to the intended uses of the proposed project should not exceed 65 dBA CNEL (City of San Diego 2020). A significant permanent increase is defined as a direct project-related permanent ambient increase of 3 dBA or greater, where exterior noise levels would already exceed the City's significance thresholds (City of San Diego 2020) (e.g., 65 dBA daytime for single-family residential land uses). An increase of 3 dBA is perceived by the human ear as a barely perceptible increase.

Airport Noise

If the project is proposed within the Airport Environs Overlay Zone (AEOZ) as defined in Chapter 13, Article 2, Division 3 of the SDMC, the potential exterior noise impacts from aircraft noise would not constitute a significant environmental impact. Remodels and additions to single-family and multi-family residences subject to airport noise levels above 65 dBA CNEL ordinarily would not be considered a significant issue, and a noise study would not be required for the purposes of the CEQA analysis. Nevertheless, a brief discussion regarding potential airport impacts is included in Section 6.5.

Noise from Adjacent Stationary Uses (Noise Generators)

The City's Noise Ordinance limits property line noise levels for various land uses by time of day for noise generated by onsite sources associated with project operation (see Table of Allowable Limits in SDMC Section 59.5.0401). By way of illustration, the limit for single-family residential land uses is 50 dBA L_{eq} from 7:00 a.m. to 7:00 p.m., 45 dBA L_{eq} from 7:00 p.m. to 10:00 p.m., and 40 dBA L_{eq} from 10:00 p.m. to 7:00 a.m. A project that would generate noise levels at the property line that exceed the City's Noise Ordinance Standards is considered potentially significant (such as potentially a carwash or projects operating generators or noisy equipment). If a nonresidential use, such as a commercial, industrial, park, or school use, is proposed to abut an existing residential use, the decibel level at

[1] Note: Since this is not a HUD-funded project this threshold was not included.

the property line should be the arithmetic mean of the decibel levels allowed for each use as set forth in SDMC Section 59.5.0401.

According to the City of San Diego Zoning Map (City of San Diego 2019), the project site is adjacent to single-family residential land uses; therefore, per Table 2, the property line noise threshold for adjacent land uses is 50 dBA L_{eq} from 7:00 a.m. to 7:00 p.m., 45 dBA L_{eq} from 7:00 p.m. to 10:00 p.m., and 40 dBA L_{eq} from 10:00 p.m. to 7:00 a.m.

Sensitive Wildlife

Noise mitigation may be required for significant noise impacts to certain avian species during their breeding season, depending upon the location of the project such as in or adjacent to an Multi-Habitat Planning Area (MHPA), whether or not the project is occupied by a protected species such as the California gnatcatcher, least Bell's vireo, southern willow flycatcher, least tern, cactus wren, tricolored blackbird or western snowy plover, and whether or not noise levels from the project, including construction during the breeding season of these species would exceed 60 dBA or existing ambient noise level if above 60 dBA. In addition, significant noise impacts to the California gnatcatcher are only analyzed if the project is within an MHPA; there are no restrictions for the gnatcatcher outside the MHPA any time of year.

Temporary Construction Noise and Sound Level Limits

Temporary construction noise that exceeds 75 dBA L_{eq} at a sensitive receptor would be considered significant. In particular, per SDMC 59.5.0404(c), construction noise levels measured at or beyond the property lines of any property zoned residential shall not exceed an average sound level greater than 75 dB L_{eq} during the 12-hour period from 7:00 a.m. to 7:00 p.m. In addition, construction activity is prohibited 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 SDMC Section 21.04, with the exception of Columbus Day and Washington's Birthday, or on Sundays, which would create disturbing, excessive, or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator, in conformance with SDMC Section 59.5.0404. Additionally, where temporary construction noise would substantially interfere with normal business communication, or affect sensitive receptors, such as educational facilities, a significant noise impact may be identified.

Construction Vibration Guidance

Guidance from Caltrans indicates that a vibration velocity level of 0.2 ips PPV received at a structure would be considered annoying by occupants within (Caltrans 2020). As for the receiving structure itself, aforementioned Caltrans guidance recommends that a vibration level of 0.5 ips PPV would represent the threshold for building damage risk to a newer residential building experiencing continuous/frequent ground-borne vibration.

Exterior Noise Land Use Compatibility

Table K-4 from the City's CEQA Significance Determination Thresholds (provided above as Table 4) indicates that up to 60 dBA CNEL would be considered an exterior noise level compatible with the fire station (City of San Diego 2020) as proposed by the project. Above this level, the City's significance threshold (#7 under Section K) elaborates that "the transition zone between compatible and incompatible should be evaluated by the environmental planner to determine whether the use would be acceptable based on all available information and the extent to which the noise from the proposed project would affect the surrounding uses". Hence, this analysis shall refer to Table 3 and apply 65 to 70 dBA CNEL as "conditionally compatible" for the proposed project exterior spaces.

6 Impact Analysis

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

6.1 Short-Term Construction Noise

Construction noise and vibration are temporary phenomena, varying from hour to hour and day to day, depending on the equipment in use, the operations performed, and the distance between the source and receptor. Equipment that would be in use during construction would include, in part, graders, scrapers, backhoes, rubber-tired dozers, loaders, cranes, forklifts, cement mixers, pavers, rollers, and air compressors. The typical maximum noise levels for various pieces of construction equipment at 50 feet are presented in Table 7. Usually, construction equipment operates in alternating cycles of full power and low power, which the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) User's Guide (DOT 2006) characterizes as "acoustical usage factor" (AUF) and thereby produces energy-average noise levels over time (L_{eq}) that are less than the listed maximum noise level (L_{max}). The average sound level of construction activity also depends on the amount of time that the equipment operates onsite.

Table 7. Typical Construction Equipment Maximum Noise Levels

Equipment Type	Maximum Noise Levels, L_{max} (dBA) at 50 feet
Air Compressor	80
Asphalt Paver	80
Backhoe	80
Compactor	82
Concrete Pump	90
Concrete Saw	85
Crane, Mobile	85
Dozer	85
Forklift	85
Front-End Loader	80
Generator	82
Grader	85
Paver	85
Pneumatic Tools	85
Rock Drill	85
Roller	85
Scraper	85
Trucks	84
Water Pump	84
Welder	84

Source: DOT 2006, FHWA 2008, FTA 2018.
Notes: dBA = A-weighted decibels; L_{max} = maximum noise level; all equipment fitted with a properly maintained and operational noise control device, per manufacturer specifications.

The project would generate noise associated with the operation of heavy construction equipment and construction related activities in the vicinity of the project area. Construction noise levels in the vicinity of the proposed project would fluctuate depending on the type, number, and duration of usage for the various pieces of equipment, as well as the relative exposure and distance between the source and receptors.

The effects of construction noise depend largely on the types of construction activities occurring on any given day, noise levels generated by those activities, distances to noise-sensitive receptors, and the existing ambient noise environment in the vicinity of the receiver. Construction generally occurs in several discrete and sequential phases, with each phase varying the equipment mix and the associated noise. These phases of onsite project construction activities thus temporarily alter the characteristics of the outdoor ambient noise environment on the project site and in the surrounding community for the duration of construction progress.

The site preparation and grading stages typically generate the most substantial noise levels due to onsite equipment grading and excavating activities, which often uses the loudest mix of construction equipment. Specific site preparation equipment can include backhoes, bulldozers, loaders; excavation equipment such as graders and scrapers; and compaction equipment. Erection of larger structural elements and mechanical systems could require the use of a crane for placement and assembly tasks, which may also generate substantial noise levels. Table 7 above lists the maximum noise levels typically generated by various types of common heavy construction equipment.

To assess noise levels associated with the various equipment types and their operation, construction equipment can be considered to operate in two modes, mobile and stationary. Mobile equipment sources move around a construction site performing tasks in a recurring manner (e.g., loaders, graders, dozers). Stationary equipment operates in a location for an extended period to perform continuous or periodic operations (e.g., compressor or generator). Thus, it is necessary to determine the location of stationary sources during specific stages of construction, and the effective acoustical center of operations for mobile equipment during various stages of the construction process. The effective acoustical center is the idealized point from which the energy sum of all construction activity noise near and far would appear to originate. As one increases the distance between equipment and/or between areas with simultaneous construction activity, dispersion and distance attenuation reduce the effects of separate noise sources added together.

A Microsoft Excel–based noise prediction model emulating and using reference data from the FHWA RCNM (FHWA 2008) was used to estimate construction noise levels. Input variables for the predictive modeling consist of the equipment type and number of each, the afore-mentioned AUF, the expected duration (in hours) of onsite activity, the distance from the receiver, and the construction schedule for the consideration of concurrent construction activities. Conservatively, no topographical or structural shielding was assumed in the modeling. The construction scenario assumptions are shown in Table 8.

Table 8. Project Construction Equipment Roster

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Daily Haul Truck Trips	Equipment Type	Qty.	Usage Hours
Site Preparation (20 days)	6	2	2	Graders	1	8
				Tractors/Loaders/Backhoes	1	8
Grading (280 days)	12	4	8	Graders	1	6
				Rubber Tired Dozers	1	6
				Tractors/Loaders/Backhoes	1	7
Building construction (380 days)	30	6	0	Cranes	1	4
				Forklifts	2	6
				Tractors/Loaders/Backhoes	2	8
Paving (20 days)	18	2	0	Cement and Mortar Mixers	4	6
				Pavers	1	7
				Rollers	1	7
				Tractors/Loaders/Backhoes	1	7
Architectural coating (10 days)	4	2	0	Air compressors	1	6

Source: RRM 2023.

Using the provided construction information, prediction results are summarized in Table 9 at the nearest noise-sensitive receptor (the single-family residences to the east of the project) for two calculation scenarios as follows:

- Usage of the shortest activity-to-receptor distance for all equipment in a construction phase; and
- An "acoustic centroid" approach, akin to the Federal Transit Administration (FTA) general assessment technique for estimating construction noise, whereby all listed equipment for a construction phase is represented by a common location at the geographic center of the studied construction zone or area.

The first of these methods is considered a conservative approach to assess what might be characterized as a peak exposure level, applicable to not more than approximately 10%–15% of the total construction period and when the studied construction activity is taking place with loudest equipment along the property boundary closest to these nearest off-site receivers. The second approach utilizes the acoustic centroid technique to represent a time-averaged location for the phase equipment and activity, thereby yielding average noise levels to represent overall noise exposure as experienced for adjacent receivers over the duration of each construction phase. Appendix B displays the construction noise model worksheets for each of these analysis approaches.

Although the quantities and types of equipment per construction phase are the same in each of the two approaches, due primarily to the differences in source-to-receptor distance variables, Table 9 shows that prediction results of both scenarios by individual construction phase.

Table 9. Predicted Construction Noise Levels per Construction Activity Phase

Construction Phase (and Equipment Types Involved)	Closest Distance to Nearest Noise Sensitive Receptor	Acoustic Center to Nearest Noise Sensitive Receptor
	12-hour L_{eq}, dBA	12-hour L_{eq}, dBA
Site Preparation (Grader, Backhoe)	74.7	67.1
Grading (Grader, Dozer, Backhoe)	75.1	67.5
Building Construction (Crane, Lift, Backhoe)	71.4	63.8
Paving (Mixer Truck, Paver, Roller, Backhoe)	74.9	67.3
Architectural Coating (Air Compressor)	65.7	58.1

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 9, the estimated construction noise exposure levels are not predicted to exceed 75 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptors.

The application of construction Best Management Practices (BMPs) during project construction would further reduce the noise level at nearby sensitive receptors. BMP's may include pro-active public relations such as: clear and abundant notices or alerts of potentially noisy construction activity well in advance of actual work periods; community engagement to inform potentially affected project vicinities of the local benefits of efforts to modernize its infrastructure; and special consideration for selected receptors that may be closest to project activities or otherwise at risk of greatest adverse effects (with respect to noise and other topics, such as traffic interruption).

Therefore, temporary construction-related noise impacts at nearby residential receptors would be considered **less than significant**. No mitigation measures are required.

6.2 Long-Term Off-Site Traffic Noise Exposure

According to acoustical principles, the increase in traffic noise level relates directly to the increase in volumes by the following expression: $10*LOG(V_f/V_e)$, where V_f is the future traffic volume, V_e is the existing traffic volume, and vehicle speeds and proportion of vehicle types are essentially unchanged. The project would therefore have to roughly double the traffic volumes on nearby roadway segments to increase traffic by 3 dBA, which would be considered a barely perceptible increase (Caltrans 2013).

The proposed project would result in the creation of additional vehicle trips on local roadways (i.e., 47th Street and Fairmount Avenue), which could result in increased traffic noise levels at adjacent noise-sensitive land uses. Based upon available data from Table 1 of the project's Transportation Technical Memorandum, the total daily trips generated by the project is 230 passenger car equivalent (PCE) vehicles. According to the San Diego Association of Government (SANDAG) Transportation Forecast Information Center (TFIC), Average Daily Traffic (ADT) for Fairmount Avenue is approximately 9,100 and 1,200 for 47th Street. Comparing the maximum number of daily project trips (230 PCE) to the average daily traffic volume of the lowest-volume street (1,200 vehicles on 47th Street), the additional vehicle trips would amount to an increase of approximately 19%. Based upon the fundamentals of acoustics, a doubling (i.e., a 100% increase) would be needed to result in a 3-dB increase in noise levels, which is the level corresponding to an audible change to the typical human listener. An increase in traffic volumes on the order of 19% (all other things being equal) would amount to an increase of approximately 0.76 dB.

As noted in Section 4.3.1, noise produced by emergency vehicle sirens is exempt from City sound level limits. Further, the San Diego Fire Department Operations Manual clarifies the exemption through the California Vehicle Code Regulation 21055, which exempts emergency vehicle drivers from all rules of the road if the driver of the vehicle sounds a siren as may be reasonably necessary. In practice, the sirens are not automatically turned on and are subject to the discretion of the driver. Drivers may take into account the setting (for example, residential areas during nighttime hours) while maintaining safety when making the decision to turn on the emergency siren (City of San Diego Fire-Rescue Department 2024).

Therefore, traffic related to project activities would not result in a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of City standards. Therefore, impacts from project-related traffic noise would be **less than significant**. No mitigation measures are required.

6.3 Long-Term Operational Noise Exposure

Project Stationary Noise Sources

Prediction of operation noise attributed to the project involved creation of a sound propagation model using the Datakustik CadnaA sound model. CadnaA is a commercially available software program for the calculation, presentation, assessment, and prediction of environmental noise based on algorithms and reference data per International Organization of Standardization (ISO) Standard 9613-2, "Attenuation of Sound During Propagation Outdoors, Part 2: General Method of Calculation" (ISO 1996). The CadnaA computer software allows one to position sources of sound emission in a simulated three-dimensional (3-D) space having heights and footprints consistent with Project architectural plans and elevations.

Stationary Noise Sources

Dudek received site plan information that provided facility equipment locations that were used to help derive reference sound power levels for expected project on-site operating noise-producing system components and features as summarized in the preceding paragraphs. Based on client-provided information and similar prior Dudek project noise study experience, expected sources of noise emission from within the boundary of the proposed project include consideration of on-site electro-mechanical equipment. The following are descriptions of modeled sound sources, with Table 10 (presented later in this report) exhibiting modeled sound power level (PWL) data at octave-band center frequency (OBCF) resolution.

Project Building Sources

Roof-Mounted Heating, Ventilation, and Air Conditioning (HVAC) – The proposed project buildings would be served by air-conditioning equipment that includes packaged air-handling units and air-cooled condensers that provide the expected cooling demand (expressed as refrigeration "tonnage") for a given building. The HVAC reference sound power levels were calculated from a combination of inputs that include square footage values for the project's proposed buildings, project applicant response to data requests, and manufacturer sound power level data. For the analysis of noise from HVAC equipment operation, the equivalent of eight air conditioning units were modeled on the roof of the project building. Detailed information supporting these summary descriptions and quantities appear in Appendix C.

Ground Level Sources

Ground level noise sources attributed to the project include an emergency generator and a transformer north of the project building. The emergency generator would be enclosed with solid masonry walls 16 feet in height.

- **Power conversion systems ([PCS], or "transformer")** – One transformer was included in the modeling effort. Manufacturer data was not provided by the client hence, sound data from a comparable transformer model (and for which Dudek has sound data from the other manufacturer) has been utilized for this operation noise assessment, with OBCF PWL presented in Table 10.

- **Emergency Generator** – One emergency generator was modeled using client-supplied information for a Kohler model 200REOZJF with 1575L capacity with sound enclosure. According to manufacturer data, one Kohler 200REOZJF with sound enclosure is expected to yield a noise level of 74 dBA at 23 feet (Kohler 2023). With 1/3-OBCF detail unavailable for the Kohler product, OBCF data for a comparable generator (Cummins 2018) was utilized in the modeling effort.

Table 10. Sound Power Levels for Modeled Sources of Outdoor Noise Emission

Source	Reference Source Sound Power Level (PWL, dBA) per Octave Band Center Frequency (OBCF, Hz)									Overall Sound Level (dBA)
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	
Air Handling	64	64	76	77	78	75	68	62	57	83
Air Conditioning	51	51	64	68	76	77	69	66	58	81
Transformer	28	47	59	61	67	64	60	55	46	70
Emergency Generator	58	86	89	91	96	98	96	93	89	103

Notes: OBCF = Octave Band Center Frequency in cycles per second (Hertz [Hz]); dBA = A-weighted decibels

These above-listed PWL values were used to define sources of sound emission in the CadnaA computer model. In addition to the above sound source inputs, the following assumptions, features, and parameters, which are included in this CadnaA-supported stationary noise source assessment:

- Ground effect acoustical absorption coefficient equal to 0.5, which intends to represent an average or blending of ground covers that are characterized by a mix of soft, natural materials and hard, reflective pavements along with existing building surfaces across the Project site and the surroundings;
- Reflection order of 1, which allows for a single reflection of sound paths on encountered structural surfaces such as the modeled building masses;
- Conservatively, topography, off-site structures, and buildings have not been rendered in the model;
- Calm meteorological conditions (i.e., no wind) with 68 degrees Fahrenheit and 50% relative humidity; and
- All of the modeled noise sources are operating concurrently and continuously for a minimum period of 1 hour.

Other Stationary Noise Sources

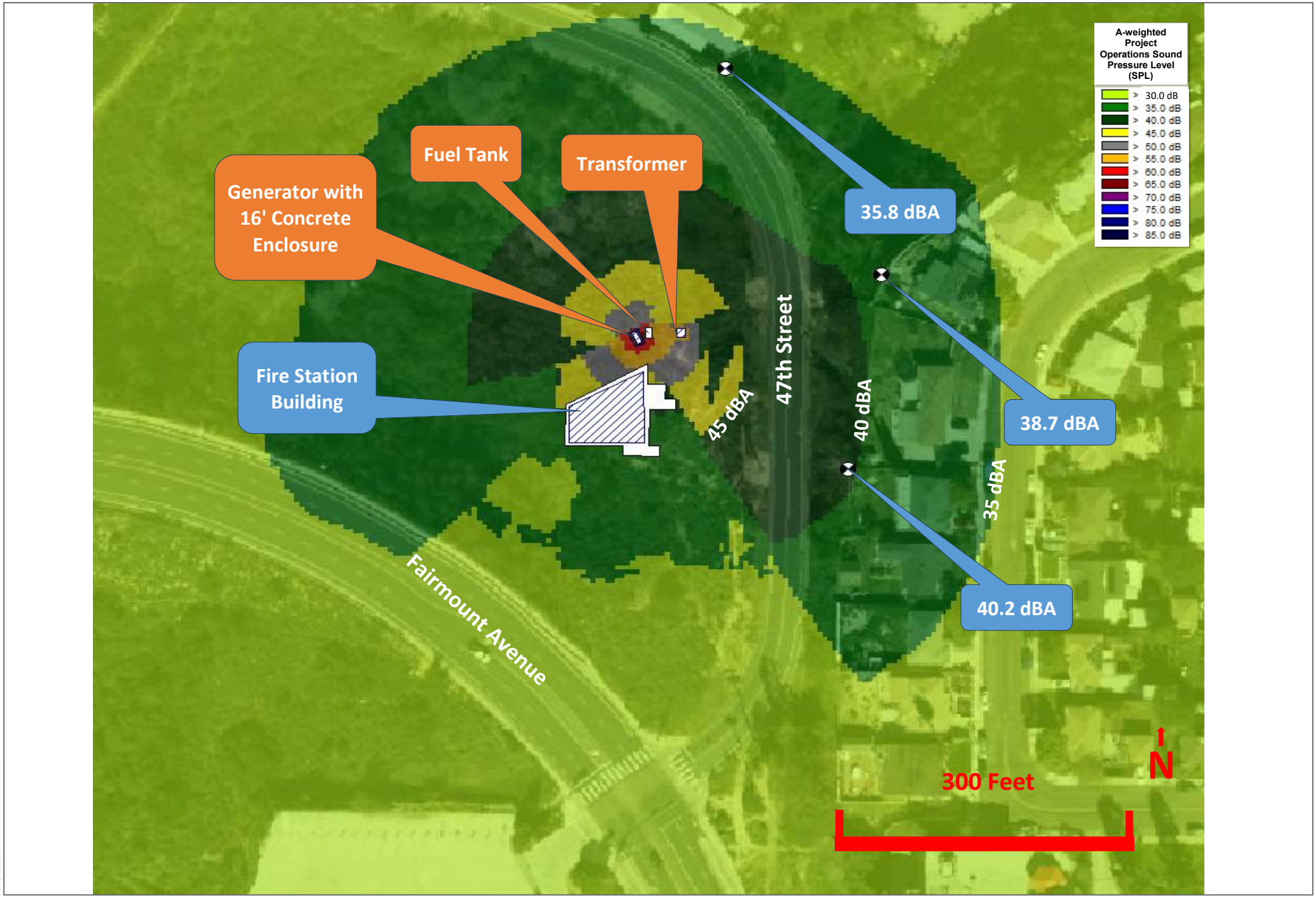
The proposed building may feature other noise emitters, but their contributions would tend to be sporadic or otherwise occur infrequently and thus be expected to have no greater acoustic contribution to an hourly L_{eq} than the continuous-type electro-mechanical noise studied herein.

Prediction Results

An operational scenario of the project was modeled that assumes all the electro-mechanical equipment is operating simultaneously for a minimum period of one hour. Figure 4, Predicted Onsite Operations Noise Contours, displays the predicted noise contours associated with aggregate sound propagation from operating electro-mechanical sound sources.

Figure 4 illustrates predicted aggregate SPL propagation solely from operation of the project sound sources as described above. The color-coded annular bands of SPL are calculated across a field parallel with and five (5) feet above local grade.

Based on the noise level contours appearing in Figure 4, the project is predicted to be up to 40 dBA L_{eq} at the nearby residential land use and is therefore expected to be lower than and thus comply with the City's 50 dBA L_{eq} daytime threshold and 40 dBA L_{eq} nighttime threshold for single-family residential land uses. Therefore, impacts associated with stationary operations noise would be **less than significant**.



SOURCE: Google 2025

DUDEK

FIGURE 4

Predictued Onsite Operation Noise Contours

Fairmount Avenue Fire Station

6.4 Sensitive Wildlife

Effects from short-term construction and long-term operational noise on covered species that have a moderate to high potential to forage, roost, and nest in the study area may occur. Covered species with potential to occur in the project study area include California gnatcatcher, least Bell's vireo, and Cooper's hawk. These effects are most severe during the breeding season, as they may negatively affect species' ability to reproduce.

Clearing, grubbing, and grading associated with construction will be conditioned (and included on the project's construction plans) such that noise levels are reduced within habitat occupied by breeding California gnatcatcher, least Bell's vireo, or raptors including Cooper's hawk. With implementation of these measures, the project would avoid adverse effects of excessive noise on sensitive species during the breeding season in compliance with the City's Multiple Species Conservation Program Land Use Adjacency Guidelines (LUAG).

Long-term operational noise is primarily oriented to the south, because of walls and graded that separate the proposed building from the Multi-Habitat Planning Area (MHPA) to the north. Consistent operational noise such as roof-mounted air conditioning units are expected to emit minimal noise and be consistent with the existing urban environmental setting. Sporadic noise from sirens and other infrequent noise emitters are not expected to result in consistently elevated noise levels that would substantially change overall noise levels within the adjacent MHPA. As such, the project would comply with the City's Multiple Species Conservation Program LUAG related to noise.

Uses in or adjacent to the MHPA should be designed to minimize noise impacts. Berms or walls should be constructed adjacent to commercial areas, recreational areas, and any other use that may introduce noises that could impact or interfere with wildlife utilization of the MHPA. Excessively noisy uses or activities adjacent to breeding areas must incorporate noise reduction measures and be curtailed during the breeding season of sensitive species. Adequate noise reduction measures should also be incorporated for the remainder of the year.

Effects from noise on covered species that have a moderate to high potential to forage, roost, and nest in the study area may occur. Covered species with potential to occur in the project study area include California gnatcatcher, least Bell's vireo, and Cooper's hawk.

Prior to construction, the City Project Manager (or appointed designee) shall verify that the MHPA boundaries and the project requirements regarding coastal California gnatcatcher and Cooper's hawk, specified as follows, are shown on the construction plans.

No clearing, grubbing, grading, or other construction activities shall occur during the breeding seasons of the coastal California gnatcatcher (March 1 to August 15) until the appropriate species specific LUAG compliance measures have been met, as described below, to the satisfaction of the City Manager to ensure no impacts to this species would occur from project implementation.

> **Land Use Adjacency Guidelines Compliance Measures for coastal California gnatcatcher**: Prior to construction, the City Project Manager (or appointed designee) shall verify that the MHPA boundaries and the project requirements regarding the California gnatcatcher, specified as follows, are shown on the construction plans.

No clearing, grubbing, grading, or other construction activities shall occur during the California gnatcatcher breeding season (March 1 to August 15), until the following requirements have been met to the satisfaction of the City Manager:

1. A Qualified Biologist (possessing a valid ESA Section 10(a)(1)(a) Recovery Permit) shall survey those habitat areas within the MHPA that would be subject to construction noise levels exceeding 60 decibels dBA hourly average for the presence of the California gnatcatcher. Surveys for California gnatcatcher shall be conducted pursuant to the protocol survey guidelines established by the USFWS within the breeding season prior to the commencement of any construction. If California gnatcatchers are present, then the following conditions must be met:
    a. Between March 1 and August 15, no clearing, grubbing, or grading of occupied California gnatcatcher habitat shall be permitted. Areas restricted from such activities shall be staked or fenced under the supervision of a Qualified Biologist; and
    b. Between March 1 and August 15, no construction activities shall occur within any portion of the site where construction activities would result in noise levels exceeding 60 dBA hourly average at the edge of occupied California gnatcatcher habitat. An analysis showing that noise generated by construction activities would not exceed 60 dBA hourly average at the edge of occupied habitat must be completed by a Qualified Acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the City Manager at least 2 weeks prior to the commencement of construction activities. Prior to the commencement of construction activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a Qualified Biologist; or
    c. At least 2 weeks prior to the commencement of construction activities, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities will not exceed 60 dBA hourly average at the edge of habitat occupied by the California gnatcatcher. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 dBA hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the Qualified Acoustician or Biologist, then the associated construction activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season (August 16). Construction noise monitoring shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the construction activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dBA hourly average or to the ambient noise level if it already exceeds 60 dBA hourly average. If not, other measures shall be implemented in consultation with the biologist and the City Manager, as necessary, to reduce noise levels to below 60 dBA hourly average or to the ambient noise level if it already exceeds 60 dBA hourly average. Such measures may include, but are not limited to, limitations on the placement of construction equipment and the simultaneous use of equipment.
2. If California gnatcatchers are not detected during the protocol survey, the Qualified Biologist shall submit substantial evidence to the City Manager and applicable resource agencies, which

demonstrates whether or not mitigation measures such as noise walls are necessary between March 1 and August 15 as follows:

a. If this evidence indicates that the potential is high for California gnatcatcher to be present based on historical records or site conditions, then Condition 1(a) shall be adhered to as previously specified.
b. If this evidence concludes that no impacts to this species are anticipated, no mitigation measures would be necessary.

Mitigation measure (see MM-BIO-2 in the Biological Resources Technical Report) would be required for indirect noise impacts to least Bell's vireo, which have potential to be present in riparian habitat adjacent to the project footprint, should work be proposed to occur during this species' breeding season (March 15 to September 15,).

Compliance with the California Fish and Game Code Section 3503.5 would avoid any impacts to Cooper's hawk.

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b) Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

6.5 Construction Vibration

Section 2.1.2 provides the groundborne vibration propagation expression for estimating vibration velocity (in inches per second [ips] PPV) level at a receiving offsite structure. Although ignored to provide a more conservative analysis, FTA guidance information suggests that coupling losses between the vibrating soil mass and that of a receiving building foundation (e.g., the multi-story residences to the north) might provide further attenuation to this estimated PPV value by an amount represented by a 3 VdB reduction (FTA 2018).

The main concern associated with ground-borne vibration is annoyance; however, in extreme cases, vibration can cause damage to buildings, particularly those that are old or otherwise fragile. Some common sources of ground-borne vibration are trains, and construction activities such as blasting, pile-driving, and heavy earth-moving equipment. The primary source of ground-borne vibration occurring as part of the project is construction activity. The project does not require blasting or pile driving for construction.

According to Caltrans, D-8 and D-9 Caterpillars, earthmovers, and trucks such as those expected to be used during project construction have not exceeded 0.10 inches/second PPV at 10 feet (Caltrans Division of Environmental Analysis 2020). Since the closest off-site residence is located approximately 70 feet away from likely heavy construction equipment, vibration from construction activities at the closest sensitive receiver would not exceed the significance threshold of 0.20 ips PPV.

Operationally, vibration from the fire station would primarily be attributed to vehicle traffic. However, as stated in the FTA guidance: “If the roadway is fairly smooth, the vibration from rubber-tired traffic is rarely perceptible” and “buses and trucks rarely create vibration that exceeds 70 VdB unless there are bumps due to frequent potholes in the road” (FTA 2018). Therefore, construction and operation vibration impacts due to the project would be **less than significant**.

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

6.6 Aviation Noise

The San Diego International Airport is approximately 4.7 miles from the project area. The project area is outside of the 60 dB CNEL contour shown in the San Diego International Airport Land Use Compatibility Plan (SDCRAA 2014). Therefore, construction workers, and fire station staff, and visitors to the fire station would not be subjected to excessive noise levels and there is **no impact**.

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Appendix A

Baseline Field Measurement Photos and Collected Data

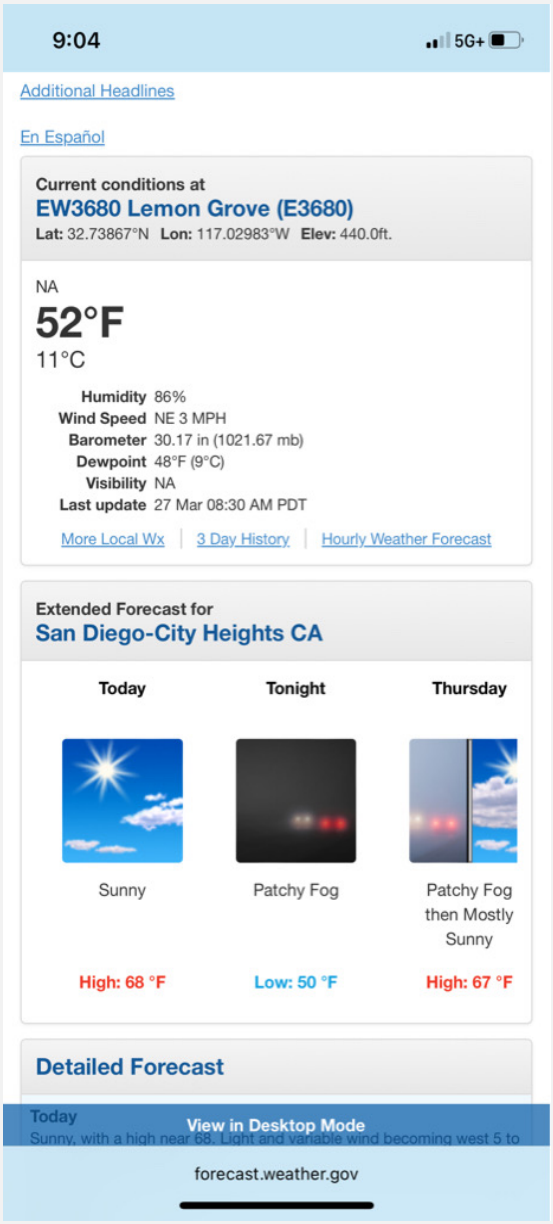
FORMS FIELD DATA REPORT

Field Noise Measurement Data

Record: 1872	
Project Name	*Fairmount Fire Station #2 (3/27/24)*
Project #	*11213*
Date	*2024-03-27*

Meteorological Conditions

Upload NOAA Forecast



Temp (F)	*52*
Humidity % (R.H.)	*86*
Wind	*Calm*
Wind Speed (MPH)	*3*
Wind Direction	*North East*
Sky	*Clear*

Instrument and Calibrator Information	
Instrument Name List	*(SAC) NL-62*
Instrument Name	*(SAC) NL-62*
Instrument Name Lookup Key	*(SAC) NL-62*
Manufacturer	*Rion*
Model	*NL-62*
Serial Number	*350815*
Calibration Date	*7/16/2018*
Calibrator Name	*(SAC) Rion NC-74*
Calibrator Name	*(SAC) Rion NC-74*
Calibrator Name Lookup Key	*(SAC) Rion NC-74*
Calibrator Manufacturer	*Rion*
Calibrator Model	*NC-74*
Calibrator Serial #	*34167529*
Pre-Test (dBA SPL)	*93.7*
Post-Test (dBA SPL)	*94*

Windscreen	*Yes*
Weighting?	*A-WTD*
Slow/Fast?	*Slow*
ANSI?	*Yes*

Monitoring	
Record #	*1*
Site ID	*ST1*
Site Location Lat/Long	*32.725841, -117.094079*
Begin (Time)	*09:09:00*
End (Time)	*09:24:00*
Leq	*44.9*
Lmax	*50.3*
Lmin	*39.1*
Other Lx?	*L90, L50, L10*
L90	*39.9*
L50	*42.3*
L10	*48.6*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Traffic*
Other Noise Sources Additional Description	*Noise from nearby residences*
Is the same instrument and calibrator being used as previously noted?	*Yes*

Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos

Site Photos

Photo	
Comments / Description	*Facing S*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing W*

Monitoring	
Record #	*2*
Site ID	*ST2*
Site Location Lat/Long	*32.724289, -117.093639*

Begin (Time)	*09:28:00*
End (Time)	*09:43:00*
Leq	*57.7*
Lmax	*62.1*
Lmin	*52.8*
Other Lx?	*L90, L50, L10*
L90	*54.1*
L50	*57*
L10	*60.5*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft*
Other Noise Sources Additional Description	*Traffic on Fairmount Ave and 47th St*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos

Site Photos

Photo	
Comments / Description	*Facing S*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing W and LT1*

Monitoring	
Record #	*3*
Site ID	*ST3*
Site Location Lat/Long	*32.723816, -117.093354*

Begin (Time)	*09:44:00*
End (Time)	*09:59:00*
Leq	*60.8*
Lmax	*69.3*
Lmin	*46*
Other Lx?	*L90, L50, L10*
L90	*47*
L50	*56.8*
L10	*64.9*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft*
Other Noise Sources Additional Description	*Traffic on Fairmount Ave*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos

Site Photos

Photo	
Comments / Description	*Facing S*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing E and Webster Elementary*

Description / Photos	
Terrain	*Mixed*

Site Photos

Photo	
Comments / Description	*LT1*

Site Photos

Photo	
Comments / Description	*LT1*

Hour	CNEL	DNL	Leq	Lmax	Lmin	L(10)	L(50)	L(90)
9:00:00 AM	D3	D3	60	87	42	60	55	50
10:00:00 AM	D4	D4	56	68	44	59	54	49
11:00:00 AM	D5	D5	55	71	44	58	53	48
12:00:00 PM	D6	D6	57	71	48	59	55	51
1:00:00 PM	D7	D7	57	68	50	60	56	53
2:00:00 PM	D8	D8	58	74	50	60	56	53
3:00:00 PM	D9	D9	58	70	49	60	57	53
4:00:00 PM	D10	D10	58	71	50	61	58	53
5:00:00 PM	D11	D11	58	71	47	60	57	53
6:00:00 PM	D12	D12	58	72	48	60	57	52
7:00:00 PM	E1	D13	58	79	49	61	57	53
8:00:00 PM	E2	D14	57	71	48	60	56	52
9:00:00 PM	E3	D15	57	79	45	59	54	50
10:00:00 PM	N8	N8	56	71	46	59	54	49
11:00:00 PM	N9	N9	54	79	35	56	48	42
12:00:00 AM	N1	N1	50	64	34	53	44	39
1:00:00 AM	N2	N2	51	65	42	54	48	45
2:00:00 AM	N3	N3	50	72	35	52	44	42
3:00:00 AM	N4	N4	48	67	37	51	45	42
4:00:00 AM	N5	N5	50	66	43	53	48	46
5:00:00 AM	N6	N6	53	76	41	56	48	45
6:00:00 AM	N7	N7	56	67	40	59	54	48
7:00:00 AM	D1	D1	59	69	43	62	58	53
8:00:00 AM	D2	D2	59	71	44	62	58	52

24-hour			57	87	34	58	53	49
Leq day	D		58					
Leq eve	E		57					
Leq night	N		53					
CNEL			61					
Leq day		D	58	87	42	60	56	52
Leq night		N	53	56	34	55	48	44
LDN			60					

Appendix B

Construction Noise Prediction Model Worksheets

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at occupied building, per San Diego County (36.409) = 75

allowable hours over which Leq is to be averaged (example: 8 per SD County 36.409) = 12

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	ILbarr (dB)	Notes
Site Preparation	grader	1	40	85		80	0.0		79.7	8	480	74	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
	backhoe	1	40	78		80	0.0		72.7	8	480	67	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
									Total for Site Preparation Phase:			**74.7**													
Grading	grader	1	40	85		80	0.0		79.7	6	360	73	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
	dozer	1	40	82		80	0.0		76.7	6	360	70	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
	backhoe	1	40	78		80	0.0		72.7	7	420	66	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
									Total for Grading Phase:			**75.1**													
Building Construction	crane	1	16	81		80	0.0		75.7	4	240	63	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
	man lift	2	20	75		80	0.0		69.7	6	360	63	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
	backhoe	2	40	78		80	0.0		72.7	8	480	70	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
									Total for Building Construction Phase:			**71.4**													
Paving	concrete mixer truck	4	40	79		80	0.0		73.7	6	360	73	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
	paver	1	50	77		80	0.0		71.7	7	420	66	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
	roller	1	20	80		80	0.0		74.7	7	420	65	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
	backhoe	1	40	78		80	0.0		72.7	7	420	66	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
									Total for Paving Phase:			**74.9**													
Architectural Coating	compressor (air)	1	40	78		80	0.0		72.7	6	360	66	5	15	0	5	70	75	7.1	71.6	75.7	0.00	0.1	0.0	
									Total for Architectural Coating Phase:			**65.7**													

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at occupied building, per San Diego County (36.409) = 75

allowable hours over which Leq is to be averaged (example: 8 per SD County 36.409) = 12

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	ILbarr (dB)	Notes
Site Preparation	grader	1	40	85		150	0.0		72.1	8	480	66	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
	backhoe	1	40	78		150	0.0		65.1	8	480	59	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
									Total for Site Preparation Phase:			**67.1**													
Grading	grader	1	40	85		150	0.0		72.1	6	360	65	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
	dozer	1	40	82		150	0.0		69.1	6	360	62	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
	backhoe	1	40	78		150	0.0		65.1	7	420	59	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
									Total for Grading Phase:			**67.5**													
Building Construction	crane	1	16	81		150	0.0		68.1	4	240	55	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
	man lift	2	20	75		150	0.0		62.1	6	360	55	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
	backhoe	2	40	78		150	0.0		65.1	8	480	62	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
									Total for Building Construction Phase:			**63.8**													
Paving	concrete mixer truck	4	40	79		150	0.0		66.1	6	360	65	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
	paver	1	50	77		150	0.0		64.1	7	420	59	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
	roller	1	20	80		150	0.0		67.1	7	420	58	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
	backhoe	1	40	78		150	0.0		65.1	7	420	59	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
									Total for Paving Phase:			**67.3**													
Architectural Coating	compressor (air)	1	40	78		150	0.0		65.1	6	360	58	5	20	0	5	140	145	7.1	141.4	145.8	0.00	0.1	0.0	
									Total for Architectural Coating Phase:			**58.1**													

Appendix C

Stationary Operation Calculation Worksheets

AHUs (plenum-type return fan only, no condenser units [see separate worksheet]):

Building Minimum Ventilation

percent GSF actually occupied (and need ventilation): 95

														A-weighted PWL (for CadnaA inputs)								
Tag	Building	GSF	Avail. SF	Height (ft)	Avg. minutes to change air*	Volume (ft3)	CFM	m^2	comparable facility function	Pressure (iwg)	Pressure (Pa)	Q (m^3/s)	fantype = plug, tube, or prop	63	125	250	500	1000	2000	4000	8000	OA dB
return air fans in building rooftop AHUs:																						
Bldg1	Fire Station	6880	6536	45	5	294120	58824	608	Residence	2.5	625	28	plug	64	76	77	78	75	68	62	57	**83**
													A-weighting adjustments	26	13	9	3	0	-1	-1	1	
													average of values for the two fan diameter ranges, per Guyer (Table 12) plug	40	40	38	34	29	23	19	16	
													average of values for the two fan diameter ranges, per Guyer (Table 12) tube	47	44	46	47	44	45	38	35	
													per Guyer (Table 12, presumed based on Bies & Hansen ENC) prop	46	48	55	53	52	48	43	38	
													fan or AHU cabinet liner/interior attenuation (excludes inlet/outlet PWL split, already in calcs above:	2	3	4	5	6	8	10	10	

*from Loren Cook's "Engineering Cookbook", 1999 edition, p. 42

ACCs (air-cooled chillers on rooftops):

Building Interior Comfort

with or without sound insulation? (enter Y/N): y

	tons	LWA	**unweighted** PWL (dB) per OCBF (Hz) at full load (100%) 63	125	250	500	1000	2000	4000	8000	*data for models "without sound insulation" or no "sound blankets"* LWA	63	125	250	500	1000	2000	4000	8000	*data for models "with sound insulation" or "sound blankets"* LWA	63	125	250	500	1000	2000	4000	8000
Bryant BH16-018 (no sound blanket)	1.5	67	66.2	66.2	63.9	63.8	62.3	58.4	56.4	50.3	68	66.2	66.2	63.8	64.1	64.6	59.9	57.7	53.6	67	66.2	66.2	63.9	63.8	62.3	58.4	56.4	50.3
Bryant BH16-024 (no sound blanket)	2	71	65	65	63.7	63.4	68.5	64.7	58.7	52.8	72	63.4	63.4	63.3	63.3	70.4	64.5	59.3	55.5	71	65	65	63.7	63.4	68.5	64.7	58.7	52.8
Bryant BH16-036 (no sound blanket)	3	71	68.2	68.2	66.4	67.5	68.4	59.6	58.2	52.4	72	67.7	67.7	66.8	68.1	69.9	62.8	60.3	55.2	71	68.2	68.2	66.4	67.5	68.4	59.6	58.2	52.4
Bryant BH16-048 (no sound blanket)	4	71	68.4	68.4	67.7	69.7	67.6	59.4	56.4	50	73	67.5	67.5	67.8	70.1	70.6	63.1	58.5	53.3	71	68.4	68.4	67.7	69.7	67.6	59.4	56.4	50
Bryant BH16-060 (no sound blanket)	5	69	63.7	63.7	65.4	67.3	64.9	58.3	56.2	51.9	70	61.7	61.7	65.6	68.1	65.8	59.8	58.4	56.1	69	63.7	63.7	65.4	67.3	64.9	58.3	56.2	51.9
Daikin AGZ-E 30 (w/out sound insulation)	30	85	84	84	83	84	77	75	74	70	88	92	91	88	87	83	78	73	68	85	84	84	83	84	77	75	74	70
Daikin AGZ-E 40 (w/out sound insulation)	40	85	84	84	83	84	77	75	74	70	89	92	91	90	88	84	79	74	69	85	84	84	83	84	77	75	74	70
Daikin AGZ-E 50 (w/out sound insulation)	50	87	85	85	85	86	80	77	75	70	90	93	93	91	89	85	79	74	69	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 60 (w/out sound insulation)	60	87	85	85	85	86	80	77	75	70	91	94	93	94	89	86	81	76	71	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 70 (w/out sound insulation)	70	87	85	85	85	86	80	77	75	70	92	95	95	94	89	87	81	76	71	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 80 (w/out sound insulation)	80	88	88	85	87	86	81	81	77	71	92	95	95	95	89	87	81	76	71	88	88	85	87	86	81	81	77	71
Daikin AGZ-E 90 (w/out sound insulation)	90	88	88	87	87	86	83	80	77	71	93	94	95	92	91	89	83	81	81	88	88	87	87	86	83	80	77	71
Daikin AGZ-E 120 (w/out sound insulation)	120	89	91	85	88	86	82	81	79	72	95	93	96	92	92	90	84	84	82	89	91	85	88	86	82	81	79	72
Daikin AGZ-E 240 (w/out sound insulation)	241	94	94	88	91	90	91	84	82	75	100	98	98	98	95	96	90	90	86	94	94	88	91	90	91	84	82	75

actual percent of GSF occupied: 95

Phase	Building Tag	GSF	Avail. SF	comparable facility function	Avg. GSF per ton*	tons of refrig.	Approx. Qty. of ACCs	tons per ACC	Approx. Total PWL (dBA)	**unweighted** PWL (dB) per OCBF (Hz) at full load (100%) 63	125	250	500	1000	2000	4000	8000	
Bldg1	Fire Station	6880	6536	Dormitory Sleeping Rooms	175	37.3	8	5	**80**	77	77	77	79	77	68	65	59	**85**

*based upon "lo" value per Loren Cook's "Engineering Coolbook", 1999 edition, pp. 59-60

a weighting adj