4.11 NOISE

This section describes the existing noise setting of the project site, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures as necessary related to implementation of the Cypress Point Project (proposed project). The following analysis is based on the Noise Study for the Cypress Point project, prepared by Ldn Consulting, Inc. in August 2021. The Noise Study is included as Appendix I of this environmental impact report (EIR).

4.11.1 Existing Conditions

4.11.1.1 Methodology

Noise Characteristics and Descriptors

Sound is mechanical energy transmitted by pressure waves in a compressible medium, such as air. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired. The sound-pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The unit of measurement of sound pressure is a decibel (dB). Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern changes in sound levels of 1 dB when exposed to steady, single-frequency signals in the mid-frequency range. Outside such controlled conditions, the trained ear can detect changes of 2 dB in normal environmental noise. It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dB. A change of 3 dB is readily perceptible, and a change of 10 dB is perceived as twice or half as loud. A doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g., doubling the number of daily trips along a given road) would result in a barely perceptible change in sound level.

Sound may be described in terms of level or amplitude (measured in dB), frequency or pitch (measured in hertz or cycles per second), and duration (measured in seconds or minutes). 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 A-weighted decibel (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. These descriptors include the equivalent noise level over a given period (L_{eq}), the day–night average noise level (L_{dn}), and the community noise equivalent level (CNEL). Each of these descriptors uses units of dBA.

L_{eq} is a decibel quantity that represents the constant or energy-averaged value equivalent to the amount of variable sound energy received by a receptor during a time interval. For example, a one hour L_{eq} measurement of 60 dBA would represent the average amount of energy contained in all the noise that occurred in that hour. L_{eq} is an effective noise descriptor because of its ability to assess the total time-varying effects of noise on sensitive receptors, which can then be compared to an established L_{eq} standard or threshold of the same duration. Another descriptor is maximum sound level (L_{max}), which is the greatest sound level measured during a designated time interval or event. The minimum sound level (L_{min}) is often called the *floor* of a measurement period.

Unlike the L_{eq}, L_{max}, and L_{min} metrics, L_{dn} and CNEL descriptors always represent 24-hour periods and differ from a 24-hour L_{eq} value because they apply a time-weighted factor designed to emphasize noise events that occur during the non-daytime 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. to 7:00 p.m.) receives no penalty. Noise during the evening (7:00 p.m. to 10:00 p.m.) is penalized by adding five dB, and nighttime (10:00 p.m. to 7:00 a.m.) noise is penalized by adding 10 dB. L_{dn} differs from CNEL in that the daytime period is longer (defined instead as 7:00 a.m. to 10:00 p.m.), thus eliminating the dB adjustment for 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 to one dB, and are often considered or actually defined as being essentially equivalent by many jurisdictions.

Vibration Fundamentals

Vibration is oscillatory movement of mass (typically a solid) over time. It is described in terms of frequency and amplitude and, unlike sound, can be expressed as displacement, velocity, or acceleration. For environmental studies, vibration is often studied as a velocity that, akin to the discussion of sound pressure levels, can also be expressed in dB as a way to cast a large range of quantities into a more convenient scale. Vibration impacts to buildings are generally discussed in terms of inches per second (ips) peak particle velocity (PPV), which will be used herein to discuss vibration levels for ease of reading and comparison with relevant standards. Vibration can also be annoying and thereby impact occupants of structures, and vibration of sufficient amplitude can disrupt sensitive equipment and processes, such as those involving the use of electron microscopes and lithography equipment. Common sources of vibration within communities include construction activities and railroads. Groundborne vibration generated by construction projects is usually highest during pile driving, rock blasting, soil compacting, jack hammering, and demolition-related activities where sudden releases of subterranean energy or powerful impacts of tools on hard materials occur. Depending on their distances to a sensitive receptor, operation of large bulldozers, graders, loaded dump trucks, or other heavy construction equipment and vehicles on a construction site also have the potential to cause high vibration amplitudes. The maximum

vibration level standard used by the California Department of Transportation (Caltrans) for the prevention of structural damage to typical residential buildings is 0.3 ips PPV.

Effect of Noise

Excessively noisy conditions can affect an individual's quality of life, health, and well-being. The effects of noise can be organized into six broad categories: sleep disturbance, permanent hearing loss, human performance and behavior, social interaction or communication, extra-auditory health effects, and general annoyance. An individual's reaction to noise and its level of disturbance depends on many factors such as the source of the noise, its loudness relative to the background noise level, time of day, whether the noise is temporary or permanent, and subjective sensitivity.

4.11.1.2 Existing Noise Environment

Existing Noise Environment On-site

Noise measurements were taken November 25, 2020 in the midday hours using a Larson-Davis Model LxT Type 1 precision sound level meter, programmed, in "slow" mode, to record noise levels. The sound level meter and microphone were mounted on a tripod, five feet above the ground, and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200.

Monitoring location 1 (ML1) was located at the southern end of the project site near Pala Road (see Figure 4.11-1). The results of the noise level measurements are presented in Table 4.11-1. The noise measurements were monitored for a time period of 15 minutes during normal traffic conditions. The existing noise levels in the project area consisted primarily of traffic from nearby Pala Road and aircraft activity from nearby Oceanside Municipal Airport. The ambient L_{eq} noise level measured in the area of the project during the midday hours was found to be roughly 48 dBA L_{eq}. The statistical indicators L_{max}, L_{min}, L_{10}, L_{50}, and L_{90}, are given for the monitoring location. As can be seen from the L_{90} data, 90% of the time the noise level is 42 dBA from roadway and aircraft activity. The noise measurement data is also included in Appendix I.

Table 4.11-1
Measured Ambient Noise Levels

Measurement Identification	Main Noise Source	Time	Noise Levels (dBA)					
			L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}
M1	Pala Road	12:45-1:00 p.m.	48.1	40.0	60.2	51.0	44.4	41.9

Source: Appendix I.

The proposed project is near the Oceanside Municipal Airport area but is not within any of the noise contours due to infrequent aircraft over flights. Noise from the Oceanside Municipal Airport would not be expected to exceed 65 dBA CNEL.

On-site Roadway Noise

The primary source of noise impacts to the project site is from vehicular noise from Pala Road. The projected roadway noise levels from vehicular traffic were calculated using the methods in the Highway Noise Model published by the Federal Highway Administration (FHWA 1978). The FHWA Model uses the traffic volume, vehicle mix, speed, and roadway geometry to compute the equivalent noise level. Table 4.11-2 presents the roadway parameters used in the analysis including the average daily traffic volumes, speeds and the traffic flow distribution (vehicle mix). The vehicle mix provides the distribution percentages of automobile, medium and heavy trucks for input into the FHWA Model.

Table 4.11-2
Traffic Parameters

Roadway	Year	Average Daily Traffic (ADT)	Peak Hour Volume	Modeled Speeds (MPH)	Vehicle Mix %		
					Auto	*Medium Trucks*	*Heavy Trucks*
Pala Road	2035	5,700[1]	570	30	96	2	2

Source: Appendix I.
Notes:
1 SANDAG Series 13, Model Year 2035

4.11.2 Regulatory Setting

Federal

Federal Transit Administration

In its Transit Noise and Vibration Impact Assessment guidance manual, the Federal Transit Administration (FTA) recommends a daytime construction noise level threshold of 80 dBA L_{eq} over an eight hour period when detailed construction noise assessments are performed to evaluate potential impacts to community residences surrounding a project (FTA 2006). Although this FTA guidance is not a regulation, it can serve as a quantified standard in the absence of such limits at the state and local jurisdictional levels.

State

California Code of Regulations, Title 24

Title 24 of the California Code of Regulations sets standards that new development in California must meet. According to Title 24 (Part 2, Volume 1, Chapter 12 – Interior Environment, Section 1206.4), interior noise levels attributed to exterior noise sources are not to exceed 45 dBA CNEL for any habitable room.

California Department of Health Services Guidelines

The California Department of Health Services has developed guidelines of community noise acceptability for use by local agencies. Selected relevant levels are listed here:

- Below 60 dBA CNEL: normally acceptable for low-density residential use
- 50 to 70 dBA: conditionally acceptable for low-density residential use
- Below 65 dBA CNEL: normally acceptable for high-density residential use and transient lodging
- 60 to 70 dBA CNEL: conditionally acceptable for high-density residential, transient lodging, churches, educational, and medical facilities

The normally acceptable exterior noise level for high-density residential use is up to 65 dBA CNEL. Conditionally acceptable exterior noise levels range up to 70 dBA CNEL for high-density residential use.

California Department of Transportation

In its Transportation and Construction Vibration Guidance Manual, Caltrans recommends a vibration velocity threshold of 0.2 ips PPV for assessing annoying vibration impacts to occupants of residential structures. Although this Caltrans guidance is not a regulation, it can serve as a quantified standard in the absence of such limits at the local jurisdictional level. Similarly, thresholds to assess building damage risk due to construction vibration vary with the type of structure and its fragility, but tend to range between 0.2 ips and 0.3 ips PPV for typical residential structures.

Local

City of Oceanside General Plan Noise Element

The Noise Element of the City of Oceanside (City) General Plan establishes target maximum noise levels in the City. The Noise Element provides the following limitations on construction noise (City of Oceanside 1974):

1. It should be unlawful for any person within any residential zone of 500 feet there from to operate any pile driver, power shovel, pneumatic, power hoist, or other construction equipment between 8:00 p.m. and 7:00 a.m. generating an ambient noise levels of 50 dBA at any property line unless an emergency exists.
2. It should be unlawful for any person to operate any construction equipment at a level in excess of 85 dBA at 100 feet from the source.
3. It should be unlawful for any person to engage in construction activities between 6:00 p.m. and 7:00 a.m. when such activities exceed the ambient noise level by 5 dBA. A special permit may be granted by the Director of Public Works if extenuating circumstances exist.

In addition, the Noise Element addresses nuisance noise and states that it should be unlawful for any person to make or continue any loud, unnecessary noise that causes annoyance to any reasonable person of normal sensitivity.

The City's Noise Element outlines general goals, objectives, and noise policies as follows:

Goal: To minimize the effects of excessive noise in the City of Oceanside.

Objective: To protect the residents and visitors to Oceanside from noise pollution. To improve the quality of Oceanside's environment.

Policies:

- Noise levels shall not be so loud as to cause danger to public health in all zones except manufacturing zones where noise levels may be greater.
- Noise shall be controlled at the source where possible.
- Noise shall be intercepted by barriers or dissipated by space where the source cannot be controlled.
- Noise levels shall be considered in any change to the Land Use and Circulation Elements of the City's General Plan.
- Noise levels of City vehicles, construction equipment, and garbage trucks shall be reduced to acceptable levels.

In a manner similar to the state's land use planning guidelines, the City's Noise Element establishes an implementation recommendation (#5) that puts attention to the careful planning of future residents in areas "subjected to noise levels of 65 dBA or higher."

For interior noise, the Noise Element refers to the aforementioned California Title 24 noise insulation standard: 45 dBA CNEL as the maximum acceptable level for inhabited rooms when exterior noise levels are 60 dBA CNEL or more. This implies that if windows and doors are required to be closed to meet this standard, then mechanical ventilation (i.e., air conditioning) shall be included in the project design.

The City of Oceanside has not yet adopted vibration criteria. The United States Department of Transportation Federal Transit Administration (FTA) provides criteria for acceptable levels of groundborne vibration for various types of special buildings that are sensitive to vibration. For purposes of identifying potential project-related vibration impacts, the FTA criteria will be used. The human reaction to various levels of vibration is highly subjective. The upper end of the range shown for the threshold of perception, or roughly 65 VdB, may be considered annoying by some people. Vibration below 65 VdB may also cause secondary audible effects, such as a slight rattling of doors, suspended ceilings/fixtures, windows, and dishes, any of which may result in additional annoyance (refer to Table 3-1 in Appendix I, Groundborne Vibration and Noise Impact Criteria). In addition to the vibration annoyance standards, the FTA also applies standards for construction vibration damage. Structural damage is possible for typical residential construction when the peak particle velocity (PPV) exceeds 0.2 inch per second (refer to Table 3-2 in Appendix I, Groundborne Vibration Impact Criteria).

This criterion is the threshold at which there is a risk of damage to normal dwellings. The noise and vibration impacts associated with construction of the proposed project would be conditioned to comply with the thresholds stated above.

City of Oceanside Noise Control Ordinance

Chapter 38, Noise Control, of the Oceanside Municipal Code governs operational noise and contains the maximum 1-hour average sound levels for various land uses for operational noise (Table 4.11-3). The Noise Control Ordinance (Noise Ordinance) sets an allowed level for areas in the Single-Family Residential zone to be 50 dBA L_{eq} from 7:00 a.m. to 9:59 p.m. (daytime), and 45 dBA L_{eq} from 10:00 p.m. to 6:59 a.m. (nighttime) (City of Oceanside 2021).

Table 4.11-3
City of Oceanside Exterior Noise Standards

Zone	Applicable Limit (decibels) 1	Time Period
Residential Estate, Single-Family Residential, Medium Density Residential, Agricultural, Open Space	50 45	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
High Density, Residential Tourist	55 50	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Commercial	65 60	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Industrial	70 65	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Downtown	65 55	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.

Source: City of Oceanside 2021
Note:
1 One-hour average sound level.

Construction activities are subject to Section 38.17 of the Noise Ordinance, which specifically prohibits the operation of any pneumatic or air hammer, pile driver, steam shovel, derrick, steam, or electric hoist, parking lot cleaning equipment, or other appliance, the use of which is attended by loud or unusual noise, between the hours of 10:00 p.m. and 7:00 a.m.

Section 38.16 prohibits nuisance noise as recommended in the City's General Plan Noise Element. It is unlawful for any person to make, continue, or cause to be made or continued within the limits of the City any disturbing, excessive, or offensive noise that causes discomfort or annoyance to reasonable persons of normal sensitivity. However, Section 35.15 provides construction, maintenance or other public improvement activities by government agencies or public utilities may be exempt from the noise level limits upon the city manager (or manager's designee) determination that the authorization furthers the public interest.

City of Oceanside Engineering Manual

Construction noise in the City is governed by the City Engineering Manual (City of Oceanside 2004), which states the following:

> All operations conducted on the premises, including the warming up, repair, arrival, departure, or running of trucks, earthmoving equipment, construction equipment, and any other associated equipment shall be limited to the period between 7:00 a.m. and 6:00 p.m. each day, Monday through Friday, and no earthmoving or grading operations shall be conducted on the premises on Saturdays, Sundays or legal holidays, unless waived by the City Engineer. (Engineers Design and Processing Manual Appendix Construction Guidelines and Requirements, Page 139)

Hours of Operation (515)(34): 7:00 am to 6:00 p.m. M-F; including equipment warm-up.

Saturday Operation: Requires filing a permit by 2:30 p.m. on the preceding Thursday. (Engineers Design and Processing Manual Appendix Construction Guidelines and Requirements, Page 159)

4.11.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts related to noise are based on Appendix G of the CEQA Guidelines. According to Appendix G of the CEQA Guidelines, a significant impact related to noise would occur if the proposed project would:

1. 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?
2. Result in generation of excessive groundborne vibration or groundborne noise levels?
3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such 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?

In light of these above significance criteria, this analysis uses the significance thresholds and standards outlined in Section 3.0 of Appendix I to evaluate potential noise and vibration impacts.

Per Section 38.12 of the City's Municipal Code, the Noise Control Ordinance (Noise Ordinance) sets an allowed level for areas in the Single-Family Residential zone to be 50 dBA L_{eq} from 7:00 a.m. to 9:59 p.m. (daytime), and 45 dBA L_{eq} from 10:00 p.m. to 6:59 a.m. (nighttime) (City of Oceanside 2021). As both the proposed project site and the existing residences immediately to the east and south are within the Residential (Single-Family, Medium Density and High Density) zone, the arithmetic mean of the noise limits for such zones sharing a joint boundary would be the same: 50 dBA L_{eq} (daytime) and 45 dBA L_{eq} (nighttime).

4.11.4 Impacts Analysis

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?

Short-Term Construction

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment includes haul trucks, water trucks, graders, dozers, loaders, and scrapers and can reach relatively high levels. Grading activities typically represent one of the highest potential sources for noise impacts. The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal weekday working hours.

Because the City of Oceanside does not have property line standards for construction, the County of San Diego 75 dBA L_{eq} standard is utilized in the analysis. Section 36.408 and 36.409 of the County of San Diego Municipal Code addresses the limits of disturbing or offensive construction noise. The Municipal Code states that with the exception of an emergency, it should be unlawful 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 an 8-hour period from 7:00 a.m. to 7:00 p.m.

The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment can range from 60 dBA to in excess of 100 dBA when measured at 50 feet. However, these noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling distance. For example, a noise level of 75 dBA measured at 50 feet from the noise source to the receptor would be reduced to 69 dBA at 100 feet from the source to the receptor, and reduced to 63 dBA at 200 feet from the source (Appendix I).

Using a point-source noise prediction model, calculations of the expected construction noise levels were completed. The essential model input data for these performance equations include the source levels of the equipment, source to receiver horizonal and vertical separations, the amount of time the equipment is operating in a given day (also referred to as the duty-cycle), and any transmission loss from topography or barriers.

Based on the EPA noise emissions, empirical data and the amount of equipment needed, the worse-case noise levels from the construction equipment operations would occur during the base operations (grading/site preparation). Due to physical constraints and normal site preparation operations, most of the equipment will be spread out over the site. Based on the proposed site plan, majority of grading

operations would occur more than 100 feet from the nearest property lines. It is expected that the worst-case noise condition would occur when the construction equipment is working in close proximity to each other at an average distance of approximately 90 feet from the property lines (Appendix I). The noise levels utilized in this analysis are shown in Table 4.11-4. The amount of time the equipment will be utilized over an 8-hour period at this distance from the property line is also given and factored into the average noise level calculations. This is referred to as the duty-cycle.

Table 4.11-4
Construction Noise Levels

Equipment Type	Quantity Used	Source at 50 Feet (dBA)	Cumulative Noise Level at 50 Feet (dBA)
Tractor/Backhoe/Loader	1	72	72.0
Dozer Cat	1	74	74.0
Grader	1	73	73.0
Water Trucks	1	70	70.0
Scraper	1	75	75.0
		Cumulative Level	**80.1**
		Distance to Sensitive Use	**90**
		Noise Reduction due to Distance	**-5.1**
		Property Line Noise Level	**75.0**

Source: Appendix I.

Paving operations are expected to be in close proximity to the eastern property line, adjacent to the existing residential uses. The amount of equipment utilized would be limited due to alignment and work area constraints. Noise levels from paving activities are linear and the equipment would be moving along the property line at an average distance of 20 feet from the existing residences. Based on noise measurements taken at a similar residential development, the roadway paving operations are anticipated to move along the property line in 200 to 300 foot increments. The average hourly construction noise levels were found to be approximately 72 dBA Leq or lower at 50 feet. At a distance of 20 feet, the noise levels could increase to approximately 76-80 dBA may be experienced at local residences at any specific location. However, there is existing fencing at the residences that would reduce the noise levels below the average 75 decibels during an 8-hour period.

Therefore, for the reasons stated above, and as reflected in Table 4.11-4, none of the proposed construction equipment would exceed the City of Oceanside 85 dBA standard at 100 feet from the source. The project would meet the County of San Diego 75 dBA Leq standard and impacts related to short-term construction noise are determined to be less than significant.

Long-Term Operational

On-Site Roadway Noise

As described in Section 4.11.1.2 above, the primary source of noise impacts to the project site is from vehicular noise from Pala Road. The projected roadway noise levels from vehicular traffic were calculated using the methods in the Highway Noise Model published by the Federal Highway Administration (FHWA). The FHWA Model uses the traffic volume, vehicle mix, speed, and roadway geometry to compute the equivalent noise level. Table 4.11-2 above presents the roadway parameters used in the analysis including the average daily traffic volumes, speeds, and the traffic flow distribution (vehicle mix). The vehicle mix provides the distribution percentages of automobile, medium and heavy trucks for input into the FHWA Model.

Based on the exterior noise model for the roadways, the worse-case exterior noise level at the building facades nearest the roadways is 63.8 dBA CNEL along Pala Road at a distance of 50-feet from the centerline. The model does not take into account any noise reductions for existing or proposed structures, barriers, or topographic features. Proposed residential rear yards would be set back a minimum 75 feet from the centerline of Pala Road. Based on the increased distance from the roadway, the noise level would be reduced to a worst-case exterior noise level of 62.0 dBA CNEL. Based upon these findings noise mitigation is not necessary to comply with the City's 65 dBA Noise standards and no additional modeling is required.

Off-site *Project Related Transportation Noise Levels*

To determine if direct or cumulative off-site noise level increases associated with the development of the proposed project would create noise impacts, the traffic volumes for the existing conditions were compared with the traffic volume increase of existing plus the proposed project. The project is estimated to only generate 540 daily trips with peak hour volume of 54 trips according to the project transportation assessment (Appendix N). The existing average daily traffic volume along Pala Road is 1,480 ADT. The existing average daily traffic (ADT) volumes on the remaining area roadways are more than several thousand ADT. Typically, it requires a project to double (or add 100%) the traffic volumes to have a direct impact of 3 dBA CNEL or be a major contributor to the cumulative traffic volumes. The project will add approximately 36% more traffic to Pala Road and approximately 25% or less increase to the remaining roadway volumes and no direct or cumulative impacts are anticipated (please refer to Chapter 4.15 Traffic and Circulation for a detailed analysis on project related traffic volumes).

Potential Project Operational Noise

Fixed or point sources radiate outward uniformly as sound travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance. For example, a noise level of 75 dBA measured at 3 feet from the noise source to the receptor would be reduced to 69 dBA at 6 feet from the source to the receptor and 63 dBA at a distance of 12 feet.

Ground mechanical ventilation units (HVAC) will be installed at the proposed residential units. The project anticipates installing Carrier CA15NA (Series, 24-A) or equivalent HVAC units with a reference noise level of 71 dBA at 3-feet (Source: Carrier). The manufacturer's specifications and noise levels are provided in Appendix I as Attachment A. The HVAC units will cycle on and off throughout the day. Typically, HVAC units run for approximately 20 minutes each operating cycle to provide the necessary heating or cooling. It is anticipated that the HVAC units will operate twice in any given hour or run for 40 minutes in any given hour. Noise levels drop 3 decibels each time the duration of the source is reduced in half. Therefore, hourly HVAC noise level over a 40 minute period would be reduced approximately 2 decibels to 69 dBA based on operational time. To predict the property line noise level, a reference noise level of 69 dBA at 3-feet was used to represent the HVAC units. The HVAC units are located a minimum of 60 feet from the property lines and are shielded by the proposed homes, solid side yard fences and solid perimeter fencing, six (6) feet in height, as shown in Figure 3-A of Appendix I. The solid fencing will be vinyl, ¾-inch or thicker consisting of solid panels on minimum 4x4-inch posts with no cracks or gaps through or below and all seams or cracks will be filled or caulked. The typical locations of the proposed HVAC units are also shown in Figure 4-D of Appendix I. Two HVAC units maybe located near each other with a side yard fence separating them and would create the worst case cumulative noise level. The remainder of the units are separated by at least 30 feet and have a 6-foot side yard fence shielding them. This separation of 30 feet would result in a 20 dBA difference between two separate HVAC units and would not cumulatively increase the noise levels. Therefore, the worst case combined noise from the HVAC would occur from two units.

Utilizing a 6 dBA decrease per doubling of distance, noise levels at the nearest property line as described above were calculated for the HVAC. The noise levels associated with the HVAC will be limited by the existing 6-foot perimeter fencing and 6-foot side yard fencing that will shield them both visually and acoustically. The HVAC units are located a minimum of 60 feet from the nearest property lines. To determine the noise level reductions from the perimeter fencing, the Fresnel Barrier Reduction Calculations based on distance, source height, receiver elevation and the top of barrier were modeled (Appendix I). The adjacent receptor was located 5 feet behind the perimeter fencing. The noise level reductions due to distance and the fencing for the nearest property line is provided in Table 4-3 of Appendix I. The Fresnel barrier reduction calculations for the fencing are provided in Appendix I as Attachment B.

No significant impacts are anticipated at the property lines with the existing 6-foot perimeter fencing and proposed 6-foot side yard fencing as shown in Figure 4-D of Appendix I. All other property lines are located further from the proposed HVAC units and the resulting noise levels would also be below the 45 dBA threshold. Therefore, impacts related to operational noise impacts would be less than significant.

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

Construction activities may expose persons to excessive groundborne vibration or groundborne noise, causing a potentially significant impact. Caltrans has collected groundborne vibration information related to construction activities. Information from Caltrans indicates that continuous vibrations with a PPV of approximately 0.2 ips is considered annoying. For context, heavier pieces of construction equipment, such as a bulldozer that may be expected on the project site, have peak particle velocities of approximately 0.089 ips or less at a reference distance of 25 feet (Appendix I).

The nearest vibration-sensitive uses are the existing residences located 50 feet or more from the proposed construction. The anticipated construction equipment will be spread out over the site working in different portions of the site as needed. Table 4.11-5 lists the average vibration that would be experienced at the nearest vibration sensitive land uses from the temporary construction activities. Vibration levels were assessed at a distance of 50 feet to be conservative.

Table 4.11-5
Vibration Levels from Construction Activities (Residential Receptors)

Equipment	Approximately Velocity Level at 25 Feet (VdB)	Approximate RMS Velocity at 25 Feet (in/sec)	Approximately Velocity Level at 50 Feet (VdB)	Approximate RMS Velocity at 50 Feet (in/sec)
Small bulldozer	58	0.003	49.0	0.0011
Jackhammer	79	0.035	70.0	0.0124
Loaded trucks	86	0.076	77.0	0.0269
Large bulldozer	87	0.089	78.0	0.0315
		FTA Criteria	80	0.2
		Significant Impact?	**No**	**No**

Source: Appendix I.
Notes: PPV at Distance D = PPVref x $(25/D)^{1.5}$

The FTA has determined vibration levels that would cause annoyance to a substantial number of people and potential damage to building structures. The FTA criterion for vibration induced structural damage is 0.20 in/sec for the peak particle velocity (PPV). Project construction activities

would result in PPV levels below the FTA's criteria for vibration induced structural damage. Therefore, project construction activities would not result in the potential for vibration induced structural damage to residential buildings near the demolition and construction areas.

Furthermore, construction activities would generate levels of vibration that would not exceed the FTA criteria for nuisance for nearby residential uses. Given attenuation of vibration velocities with distance, the RMS vibration velocity and peak particle velocity at the nearest existing residence would be approximately 78 VdB and 0.03 inch per second, respectively. Based on the construction vibration human annoyance criterion of 80 VdB published by the FTA, the vibration levels for the construction activity on nearby residential structures would not be significant.

Once operational, the proposed project would not be expected to feature major producers of groundborne vibration. Anticipated mechanical systems like heating, ventilation, and air-conditioning units are designed and manufactured to feature rotating (fans, motors) and reciprocating (compressors) components that are typical of such residential land uses are not expected to result in substantial vibration on- or off-site.

For the reasons outlined above, potential vibration impacts due to proposed project construction and operation is determined to be **less than significant**.

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?

There are no private airstrips within the vicinity of the project site. The closest airport to the project site is the Oceanside Municipal Airport, approximately 1.3 miles southwest of the site. The project site is not within any of the noise contours of the Ocean Municipal Airport due to infrequent aircraft over flights and noise from the Oceanside Municipal Airport would not be expected to exceed 65 dBA CNEL. Therefore, impacts from aviation overflight noise exposure is determined to be **less than significant**.

4.11.5 Mitigation Measures

Impacts related to noise as a result of project implementation are determined to be less than significant, and therefore no mitigation measures are required.

4.11.6 Level of Significance After Mitigation

No substantial impacts related to noise were identified; therefore, no mitigation measures are required. Impacts related noise would be **less than significant**.

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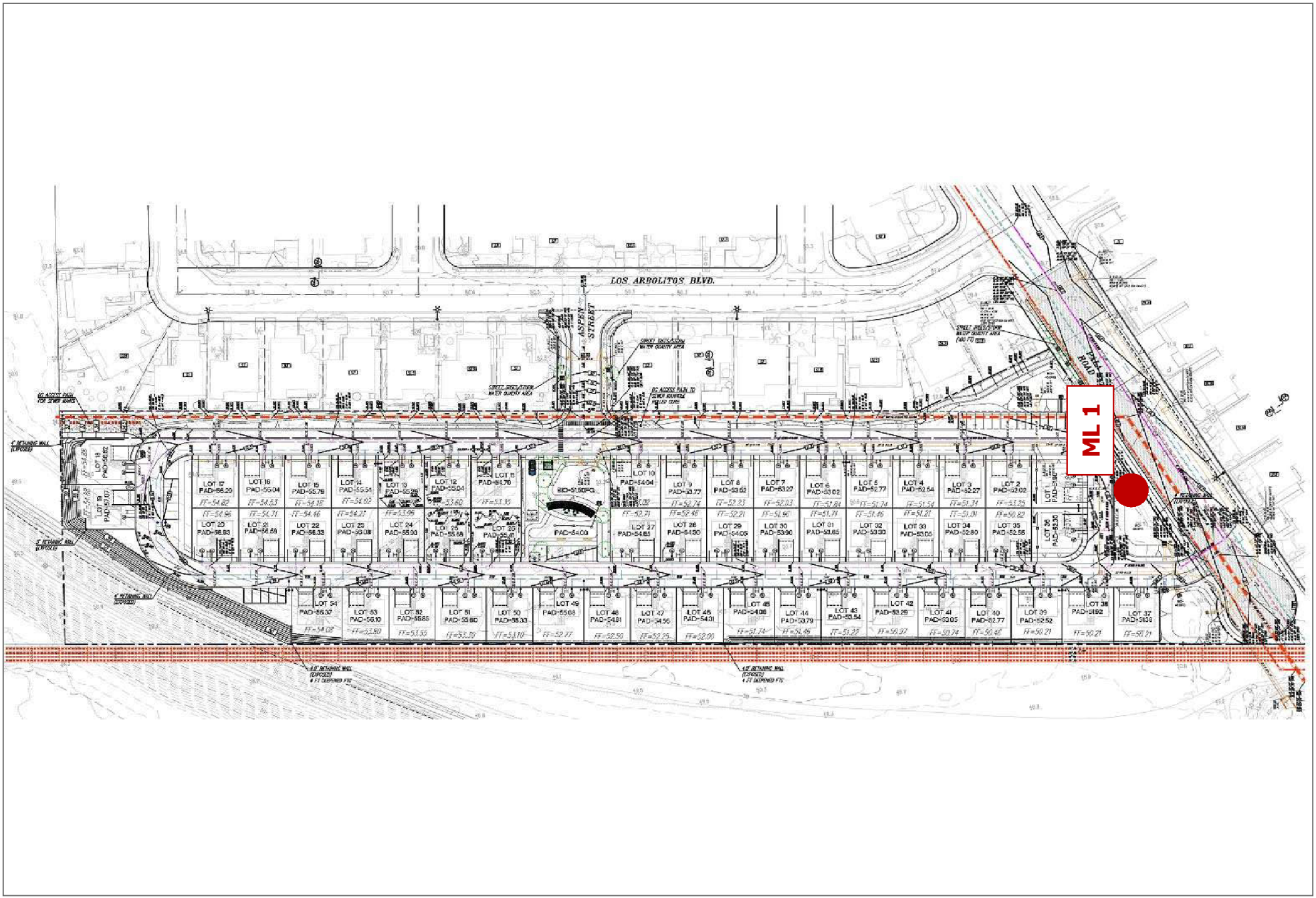

SOURCE: Omega Engineering 2020

FIGURE 4.11-1

Ambient Noise Monitoring Location

Cypress Point Project Draft Environmental Impact Report

DUDEK

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