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 Pacifica Project (proposed project or project). Dudek completed on-site short-term sound measurements to describe the ambient noise environment and used noise predictive models to quantify noise levels from project construction, on-site mechanical equipment operation, and project off-site traffic noise contributions. Sound level measurement results and predictive noise modeling data are included in Appendix J of this environmental impact report (EIR).

4.11.1 Existing Conditions

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 5 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 1-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 5 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 1 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) (Caltrans 2020) 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.

Ambient Noise Survey

Sound-pressure level (SPL) measurements were conducted within the project site on September 12, 2022, to quantify and characterize the existing outdoor noise levels. Table 4.11-1 provides the location, date, and time at which these baseline noise level measurements were taken. The SPL measurements were performed by an attending Dudek field investigator using a Rion NL-52 sound level meter equipped with a 0.5-inch, pre-polarized condenser microphone with pre-amplifier. The sound level meter meets the current American National Standards Institute standard for a Type 1 (Precision Grade) sound level meter. The accuracy of the sound level meter was verified using a field calibrator before and after the measurements, and the measurements were conducted with the microphone positioned approximately five feet above the ground.

Two short-term noise level measurement locations (ST1 and ST2) represent the vicinities of existing sensitive receivers on and near the project site. These locations are depicted as receivers ST1 and ST2 on Figure 4.11-1, Noise Measurement and Modeled Receptor Locations. The L_{eq} and L_{max} noise levels are provided in Table 4.11-1. The primary noise sources at the sites consisted of traffic along adjacent roadways, distant aircraft, and birdsong. As shown in Table 4.11-1, the measured sound levels ranged from approximately 45.2 dBA L_{eq} at ST1 to 41.4 dBA L_{eq} at ST2. These samples of daytime L_{eq} measured at the two representative receptor positions in Table 4.11-1 can be interpreted as approximations of CNEL, since evening SPL would likely be 5 dBA less, and nighttime SPL would be 10 dBA less than the daytime values according to Federal Transit Administration (FTA) outdoor ambient sound level estimation techniques when a receptor is proximate to a major roadway or railroad (FTA 2018).

Table 4.11-1. City of Oceanside Exterior Noise Standards

Receptor	Location/Address	Time	L_{eq} (dBA)	L_{max} (dBA)
ST1	Northeastern entrance to existing project site	11:30 a.m. to 11:45 a.m.	45.2	54
ST2	Western cul-de-sac of Malaga Drive	11:55 a.m. to 12:10 p.m.	41.4	51.7

Source: Appendix J.
Notes: Leq = equivalent continuous sound level (time-averaged sound level); Lmax = maximum sound level during the measurement interval; dBA = A-weighted decibels; ST = short-term noise measurement locations.

4.11.2 Regulatory Setting

Federal

Federal Transit Administration

In its Transit Noise and Vibration Impact Assessment guidance manual, FTA recommends a daytime construction noise level threshold of 80 dBA L_{eq} over an 8-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, interior noise levels are not to exceed 45 dBA CNEL for new multifamily residences, hotels, and other attached residences.

Title 24 also requires that an interior acoustical study demonstrating that interior noise levels due to exterior sources will be less than or equal to 45 dBA CNEL be performed for affected multifamily structures and hotels that are exposed to exterior noise levels in excess of 60 dBA CNEL.

California Department of Health Services Guidelines

The California Department of Health Services has developed guidelines of community noise acceptability for use by local agencies (OPR 2017). 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

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 (Caltrans 2020). 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 PPV and 0.3 ips PPV for typical residential structures, relative to older or historic structures and contemporary construction, respectively.

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 2002):

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 Oceanside 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 (no. 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 Code of Regulations 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.

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 4.11-2). The project site and immediately adjacent parcel to the west are zoned commercial. The Noise Control Ordinance (Noise Ordinance) sets an allowed level for commercial zones to be 65 dBA L_{eq} from 7:00 a.m. to 9:59 p.m. (daytime), and 60 dBA L_{eq} from 10:00 p.m. to 6:59 a.m. (nighttime). The parcel to the north of the project site (across West Bobier Drive) is zoned for high density residential. The Noise Ordinance sets an allowed level for high density residential zones to be 55 dBA L_{eq} from 7:00 a.m. to 9:59 p.m. (daytime), and 50 dBA L_{eq} from 10:00 p.m. to 6:59 a.m. (nighttime). The allowed noise level at the boundary of these two zone districts (which follows the centerline of West Bobier Drive), would be the arithmetic mean of the noise limits for both zones sharing the joint boundary, or 60 dBA L_{eq} (daytime) and 55 dBA L_{eq} (nighttime).

Table 4.11-2. 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.

Table 4.11-2. City of Oceanside Exterior Noise Standards

Zone	Applicable Limit (decibels)[1]	Time Period
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: Appendix J.
Note:
1 1-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 Oceanside is governed by the City Engineering Manual. Construction is normally limited to the hours between 7:00 a.m. and 6:00 p.m., Monday through Friday. However, Saturday construction is allowed by permit. More specifically, the City Engineering Manual (Engineers Design and Processing Manual Appendix Construction Guidelines and Requirements) states the following on pages 139 and 159 (City of Oceanside 1991):

- 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.
- Hours of Operation: 7:00 a.m. to 6:00 p.m. Monday through Friday; including equipment warm-up.
- Saturday Operation: Requires filing a permit by 2:30 p.m. on the preceding Thursday.

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 California Environmental Quality Act (CEQA) Guidelines. According to CEQA Guidelines Appendix G, 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 following standards to evaluate potential noise and vibration impacts.

- Construction noise – Although Chapter 38 of the Oceanside Municipal Code does not quantify a threshold for allowable construction noise, the City's General Plan allows noise from construction equipment operation to be as high as 85 dBA at 100 feet from the source. Applying the principles of sound propagation for a point-type source, this level means 91 dBA at 50 feet, which is greater than the maximum sound levels of most operating construction equipment and would thus imply all but the loudest construction activities (e.g., pile driving) could be compliant with this standard. However, the apparent proximity of existing residential receptors to the north of the proposed project site suggests that source-to-receiver distances could be as short as 70 feet (between the edge construction and adjacent residential yard area). Additionally, most construction equipment and vehicles on a project site do not operate continuously. Therefore, consistent with the FTA guidance mentioned in Section 4.11.2, Regulatory Setting, this analysis will use 80 dBA L_{eq} over an 8-hour period as the construction noise impact criterion during daytime hours (7:00 a.m. to 6:00 p.m.). If construction work were to occur outside these hours, the impact threshold would align with the City's General Plan requirement during such hours: no more than a 5 dBA increase over existing ambient noise levels.
- Off-site project-attributed transportation noise – For purposes for this analysis, a direct roadway noise impact would be considered significant if increases in roadway traffic noise levels attributed to the proposed project were greater than 3 dBA CNEL at an existing noise-sensitive land use.
- Off-site project-attributed stationary noise – For purposes for this analysis, a noise impact would be considered significant if noise from typical operation of heating, ventilation, and air conditioning and other electro-mechanical systems associated with the proposed project exceeded 50 dBA hourly L_{eq} at the property line from 7:00 a.m. to 9:59 p.m., and 45 dBA hourly L_{eq} from 10:00 p.m. to 6:59 a.m. Note that these are the City's thresholds for the residential zones that characterize the proposed project site and its adjoining lands north and south.
- Construction vibration – 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. As for the receiving structure itself, the Caltrans guidance discussed in Section 4.11.2 recommends that a vibration level of 0.3 ips PPV would represent the threshold for building damage risk to an older residential structure.

For purposes of disclosure, as current CEQA noise criteria listed above do not consider it, this analysis also evaluates compatibility of on-site noise exposure levels (e.g., from roadway traffic) with the City of Oceanside exterior and interior noise standards of 65 dBA CNEL and 45 dBA CNEL, respectively.

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 Noise

Construction noise and vibration are temporary phenomena, with emission levels 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, backhoes, rubber-tired dozers, loaders, cranes, forklifts, pavers, rollers, and air compressors. The typical maximum noise levels at a distance of 50 feet from various pieces of construction equipment and activities anticipated for use on the proposed project site are presented in Table 4.11-3. Note that the equipment noise levels presented in Table 4.11-3 are maximum noise levels. Usually, construction equipment operates in alternating cycles of full power and low power, producing average noise levels over time that are less than the maximum noise level. The average sound level of construction activity also depends on the amount of time that the equipment operates and the intensity of construction activities during that time.

Table 4.11-3. Typical Construction Equipment Maximum Noise Levels

Equipment Type	Typical Equipment (L_{max}, dBA at 50 Feet)
All Other Equipment > 5 HP	85
Backhoe	78
Compressor (air)	78
Concrete Saw	90
Crane	81
Dozer	82
Excavator	81
Flat-Bed Truck	74
Front-End Loader	79
Generator	72
Grader	85
Man Lift	75
Paver	77
Roller	80
Scraper	84
Welder / Torch	73

Source: Appendix J.
Note: Lmax = maximum sound level; dBA = A-weighted decibels.

Aggregate noise emission from proposed project construction activities, broken down by sequential phase, was predicted at two evaluation distances to the nearest existing noise-sensitive receptor: (1) from the nearest position of the construction site boundary and (2) from the geographic center of the construction site, which serves as the time-averaged location or geographic *acoustical centroid* of active construction equipment for the phase under study. The intent of the former distance is to help evaluate anticipated construction noise from a limited quantity of equipment or vehicle activity expected to be at the boundary for some period of time, which would be most appropriate for phases such as site preparation, grading, and paving. The latter distance is used in a manner similar to the general assessment technique as described in the FTA guidance for construction noise assessment, when the location of individual equipment for a given construction phase is uncertain over some extent of (or the entirety of) the construction site area. In this studied scenario, because of the equipment location uncertainty, all the equipment for a construction phase is assumed to operate—on average—from the acoustical centroid position. Table 4.11-4 summarizes these two distances to the apparent closest noise-sensitive receptor for each of the nine sequential construction phases. At the site boundary, this analysis assumes that up to only one piece of equipment (conservatively, the loudest) of each listed type per phase will be involved in the construction activity for up to the full 8-hour period at this closest distance to the receptor. In other words, at such proximity, the operating equipment cannot "stack" or crowd the vicinity and still operate. For the acoustical centroid case, which intends to be a geographic average position for all equipment during the indicated phase, this analysis assumes that the equipment may be operating up to all 8 hours per day.

This Federal Highway Administration Roadway Construction Noise Model (RCNM) emulator includes consideration of equipment source elevation and receptor elevations with respect to local grade, and thus captures potential sound path occlusion due to topography and manmade barriers.

Table 4.11-4. Estimated Distances between Construction Activities and the Nearest Noise-Sensitive Receptors

Construction Phase (and Equipment Types Involved)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Distance from Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (Feet)
Phase 1		
Demolition (concrete saw/industrial saw, dozer, excavator)	74	240
Site preparation (dozer, tractor, front-end loader, backhoe)	74	240
Grading (excavator, grader, scraper, track dozer, tractor, front-end loader, backhoe)	74	240
Utilities Installation (excavator, backhoe)	240	240
Paving (paver, roller)	70	240
Phase 2		
Building construction (forklift, generator, tractor, front-end loader, backhoe)	70	240
Architectural coating (air compressor)	70	240
Phase 3		
Building construction (forklift, generator, tractor, front-end loader, backhoe)	70	240
Architectural coating (air compressor)	70	0

Source: Appendix J.

A Microsoft Excel–based noise prediction model emulating and using reference data from the Federal Highway Administration RCNM (FHWA 2008) was used to estimate construction noise levels at the nearest occupied noise-sensitive land use. (Although the RCNM was funded and promulgated by the Federal Highway Administration, it is often used for non-roadway projects because the same types of construction equipment used for roadway projects are often used for other types of construction.) Input variables for the predictive modeling consist of the equipment type and number of each (e.g., two graders, a loader, a tractor), the duty cycle for each piece of equipment (e.g., percentage of time within a specific time period, such as an hour, when the equipment is expected to operate at full power or capacity and thus make noise at a level comparable to what is presented in Table 4.11-3), and the distance from the noise-sensitive receiver. The predictive model also considers how many hours that equipment may be on site and operating (or idling) within an established work shift. Conservatively, no topographical or structural shielding was assumed in the modeling. The RCNM has default duty-cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were used for this noise analysis, which is detailed in Appendix J, Construction Noise Modeling Input and Output, and the predicted results are presented in Table 4.11-5.

Table 4.11-5. Predicted Construction Noise Levels per Activity Phase

Construction Phase (and Equipment Types Involved)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (dBA)
Phase 1		
Demolition (concrete saw/industrial saw, dozer, excavator)	80	69
Site preparation (dozer, tractor, front-end loader, backhoe)	75	67
Grading (excavator, grader, scraper, track dozer, tractor, front-end loader, backhoe)	80	70
Utilities Installation (excavator, backhoe)	64	64
Paving (paver, roller)	76	62
Phase 2		
Building construction (forklift, generator, tractor, front-end loader, backhoe)	75	59
Architectural coating (air compressor)	75	60
Phase 3		
Building construction (forklift, generator, tractor, front-end loader, backhoe)	75	59
Architectural coating (air compressor)	75	60

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

As presented in Table 4.11-5, the estimated construction noise levels are predicted to be nearly as high as 80 dBA L_{eq} over an 8-hour period at the nearest occupied property (as close as 70 feet away) when grading activities take place near the northern project boundaries. Note that these estimated noise levels at a source-to-receiver distance of 70 feet are conservatively high, in that they presume the noted pieces of heavy equipment would each operate, on average at this distance, for a cumulative period of 8 hours a day. The reality of construction progress on site would likely be different. By way of example, a grader might make multiple passes on site that are this close to a receiving occupied property, but for the remaining time during the day, the grader may be sufficiently farther away and either performing work at a more distant location or simply not operating. Short-term construction noise remains in compliance with the FTA guidance of 80 dBA L_{eq} over an 8-hour period, and therefore impacts would be **less than significant.**

Long-Term Operational Noise

Off-Site Traffic Noise Exposure

The proposed project would result in the creation of additional vehicle trips on local arterial roadways (i.e., Monica Circle, Macario Drive, and Roja Drive), which could result in increased traffic noise levels at adjacent noise-sensitive land uses. The Local Transportation Study prepared for the proposed project (Appendix L) includes a spreadsheet with traffic volume data (average daily traffic) for Monica Circle. In particular, the proposed project would create additional traffic along Melrose Drive, which, according to the Local Transportation Study, would add 1,312 total average daily trips to adjacent to the project site.

Potential noise effects from vehicular traffic were assessed using the Federal Highway Administration's Traffic Noise Model version 2.5 (FHWA 2004). Information used in the model included the roadway geometry, existing (year 2022), and existing plus project traffic volumes and posted traffic speeds. Noise levels were modeled at representative noise-sensitive receivers ST1 and ST2, as shown in Figure 4.11-1. The receivers were modeled to be 5 feet above the local ground elevation. The noise model results are summarized in Table 4.11-6. Based on results of the model, implementation of the proposed project would not result in readily perceptible increases in traffic noise.

Table 4.11-6. Roadway Traffic Noise Modeling Results

Modeled Receiver No.	Existing (2022) Noise Level	Existing with Project Noise Level	Near-term (2025) Noise Level	Near-term (2025) with Project Noise Level	Horizon (2050) Noise Level	Horizon with Project Noise Level	Maximum Project-Related Noise Level Increase
	(dBA CNEL)	(dBA CNEL)	(dBA CNEL)	(dBA CNEL)	(dBA CNEL)	(dBA CNEL)	(dB)
ST1	53	54	53	54	54	55	1
ST2	46	47	46	47	46	47	1

Source: Appendix J.
Notes: dBA = A-weighted decibel; CNEL = community noise equivalent level; dB = decibel.

Table 4.11-6 shows that at both listed representative receivers, the addition of proposed project traffic to the roadway network would result in an increase in the CNEL of less than 3 dB, which is below the discernible level of change for the average healthy human ear. Thus, a **less-than-significant** impact is expected for proposed project-related off-site traffic noise increases affecting existing residences in the vicinity.

On-site Traffic Interior Noise Exposure

Aside from exposure to aviation traffic noise, current CEQA noise-related guidelines at the state level do not require an assessment of exterior-to-interior noise intrusion, environmental noise exposure to occupants of newly created project residences, or environmental noise exposure to exterior non-residential uses attributed to the development of the proposed project. Nevertheless, the City's General Plan and the California Building Code requires that interior background noise levels not exceed a CNEL of 45 dB within habitable rooms. Hence, the following predictive analysis of traffic noise exposure at the exteriors of occupied residences and outdoor living areas is provided below.

In addition to the prediction results presented in Table 4.11-6, the Federal Highway Administration Traffic Noise Model software was also used to predict the existing-with-project scenario traffic noise levels at multiple on-site exterior areas, as listed in Table 4.11-7. These on-site modeled receptor locations include representative positions for the exteriors of multiple floors and positions of five of the proposed project building façades. Predicted exterior sound levels that are higher than 60 dBA CNEL indicate locations where an exterior-to-interior noise analysis should be performed for the proximate occupied residential unit. According to Table 4.11-7, there are no modeled receptors that exceed 60 dBA CNEL; therefore, additional exterior-to interior noise analysis is not needed. Individual Modeling locations appear in Figure 4.11-1.

Table 4.11-7. Future Ambient Noise Levels at Residential Facades

Modeled Receptor	Noise Level (A-weighted CNEL)		
	1st Floor	2nd Floor	3rd Floor
M1	52.7	54.2	54.1
M2	50.7	51.7	51.5
M3	48.6	49.5	49.8
M4	50	51.5	51.8
M5	48.3	51.2	51.7
OS-1	42.4		
Dog Park	38.8		

Typically, with the windows open, building shells provide approximately 15 dB (i.e., an average of 12 to 18 dB) of exterior-to-interior noise reduction; while with windows closed residential construction generally provides a minimum of 25 dB attenuation. Therefore, rooms exposed to an exterior CNEL not greater than 60 dB would result in an interior background CNEL of 45 dB or less, even with open fenestration. In other words, the arithmetic difference of an exterior noise level less than 60 dBA CNEL and an exposed building façade that provides 15 dB of sound insulation results in an interior background sound level less than 45 dBA CNEL. Table 4.11-7 shows that none of the residential rooms modeled will be exposed to a CNEL of above 60 dB, and thus, interior background noise levels will not exceed a CNEL of 45 dB within habitable rooms. Therefore, impacts related to interior traffic noise exposure would be **less than significant.**

On-site Open Spaces

As analyzed herein and with prediction results presented in Table 7.11-7, shared outdoor project spaces such as "OS-1" and "Dog Park" are expected to experience noise levels that are compliant with the City's General Plan Noise Element guidance of 65 dBA CNEL for "parks" and "playgrounds." Impacts to on-site open spaces would be **less than significant.**

Stationary Noise Sources

The incorporation of new multifamily homes and a mix of open space uses attributed to development of the proposed project will add a variety of noise-producing electro-mechanical equipment that include those presented and discussed in the following paragraphs. Most of these noise-producing equipment or sound sources would be considered stationary or limited in mobility to a defined area. Using a Microsoft Excel–based outdoor sound propagation prediction model, project-attributed operational noise at nearby community receptors was predicted using two assumptions:

- Treatment of exposed at-grade air-cooled condensing units as point-type sound emission sources
- Point-source sound propagation (i.e., 6 dB per doubling of distance) that conservatively ignores acoustical absorption from atmospheric and ground surface effects

Please see Appendix J for quantitative details of the inputs and outputs that form the basis of the following assessment presentations.

Night-Time Residential Unit Heating, Ventilation, and A*ir Conditioning Noise*

For purposes of this analysis, each of the new occupied residential units would be expected to feature a split-system type air-conditioning unit, with an air-cooled refrigeration (3-ton capacity) condenser unit. Each condenser unit has an SPL of 68 dBA at 3 feet based on available data from a likely manufacturer, and the units would generally be installed at grade near the apparent “front porch” areas. Therefore, the closest existing noise-sensitive residential receptor to the north of the proposed project’s northern unit would be as close as 105 horizontal feet to the nearest of these condenser units. The predicted sound emission level from the combination of all operating condenser units as received by this off-site single-family home would be 45 dBA L_{eq} and thus would be compliant with the City’s nighttime threshold of 45 dBA hourly L_{eq}. Under such conditions, the operation of residential air-conditioning units would result in a **less-than-significant** noise impact.

Pickleball Noise and Daytime HVAC

In addition to noise from on-site HVAC units discussed in the preceding paragraph, during the daytime hours there is a potential for on-site pickleball activities near the southern boundary of the project. For purposes of this analysis, each pickleball court will have players making intermittent paddle-to-pickleball contact for which a measured one-second reference noise level of 77.4 dBA L_{eq} at 1 meter would apply (Appendix J). The closest existing noise-sensitive residential receptor to the south of the proposed project’s pickleball courts would be as close as 200 horizontal feet away. The predicted sound emission level from the combination of all operating condenser units and pickleball activity as received by this off-site single-family home would be 45 dBA L_{eq} and thus would be compliant with the City’s daytime threshold of 50 dBA hourly L_{eq}. Under such conditions, the concurrence of pickleball noise and operation of daytime residential air-conditioning units would result in a **less-than-significant** noise impact.

Emergency Generator

The proposed project also features a backup generator that will be installed on ground level north of the pickleball courts. Noise emission from regular testing at an expected frequency of up to one half-hour test per month during daytime hours would need to comply with the City’s established noise limit at the property line: 50 dBA hourly L_{eq}.

For purposes of this analysis, the generator is using a reference noise level of 69 dBA L_{eq} at 50 feet. The closest existing noise-sensitive residential receptor to the south of the proposed project’s emergency generator would be as close as 260 horizontal feet away. The predicted sound emission level from the combination of all operating condenser units, pickleball noise, and emergency generator operation as received by this off-site single-family home would be 50 dBA L_{eq} and thus would be compliant with the City’s daytime threshold of 50 dBA hourly L_{eq}. Under such conditions, the operation of all stationary equipment and activities would result in a **less-than-significant** noise impact.

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

Construction

Construction activities may expose persons to excessive groundborne vibration, 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 PPVs of approximately 0.089 ips or less at a reference distance of 25 feet.

Groundborne vibration attenuates rapidly—even over short distances. When groundborne vibration encounters a building foundation, a coupling loss occurs depending on its mass and design. For typical wood-framed houses, like those near the proposed project, this coupling loss is expected to be 5 vibration velocity decibels (VdB) according to FTA guidance.

The attenuation of groundborne vibration as it propagates from source to receptor through intervening soils and rock strata can be estimated with expressions found in FTA and Caltrans guidance. By way of example, for a bulldozer operating on site and as close as the northern project boundary (that is 70 feet from the nearest receiving sensitive land use) the estimated groundborne vibration velocity level would be 0.028 ips as received by the residential structure and would be compliant with the 0.3 ips PPV threshold per Caltrans guidance with respect to building damage risk. Therefore, vibration-induced annoyance to occupants of nearby existing homes would be considered **less than significant**.

Operation

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 well-balanced with isolated vibration within or external to the equipment casings. On this basis, vibration due to proposed project operation would 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, located approximately 5.0 miles southwest of the project site. According to the Airport Land Use Compatibility Plan (San Diego County Regional Airport Authority 2010), the project site is not located within an aviation noise exposure range of 60 dB CNEL and would therefore not expose people residing or working in the project area to excessive noise levels, since this 60 dB CNEL exterior noise standard is compatible with previously mentioned state noise insulation standards. Therefore, impacts from aviation overflight noise exposure would be **less than significant**.

4.11.5 Cumulative Analysis

Noise levels tend to diminish quickly with distance from a source. Therefore, the geographic scope of the analysis of cumulative impacts related to noise is limited to locations immediately surrounding and in close proximity to the project site. None of the cumulative projects are located adjacent to the project site, but the closest cumulative project is North River Farms, located approximately 0.8 miles east of the project site. This project would construct 689 dwelling units, a mix comprising of both multifamily and single-family detached, 25,000 square feet of commercial land use, 5,000 square feet of restaurant land use, a 30-acre farm, and a 100-room hotel.

The North River Farms EIR concluded that construction and operational noise impacts would be potentially significant and reduced to below a level of significance with mitigation measures MM-NOI-1 through MM-NOI-5. As stated above, the proposed project would have a less-than-significant impact on construction and operational noise, and no mitigation is required. Therefore, while construction activities may occur simultaneously, given the distance between the two projects, and lack of project-related impacts, it is unlikely that the noise increase would exceed 3 dB (the minimum change in sound level of individual events that an average human ear can detect).

Further, as stated above, the addition of proposed project traffic to the roadway network would result in an increase in the CNEL of 1 dB along area roadways, which is below the discernible level of change for the average healthy human ear. The North River Farms EIR determined that traffic-related impacts would result in a 2 dB or less increase along area roadways. Therefore, the increase in noise associated with cumulative traffic would not be cumulatively considerable. All cumulative projects would be required to analyze potential noise impacts associated with construction and operation and would have to comply with the City's Noise Control Ordinance and limit construction activities to the allowable hours. Overall, cumulative noise impacts would be **less than significant.**

4.11.6 Mitigation Measures

No impacts related to noise were identified; thus, no mitigation measures would be required.

4.11.7 Level of Significance After Mitigation

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

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SOURCE: SANGIS 2019; Open Streets Map 2019

DUDEK

0 100 200 Feet

FIGURE 4.11-1

Noise Measurement Locations

Pacifica Project EIR

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SECTION **PAGE NO.**

FIGURES

NO TABLE OF FIGURES ENTRIES FOUND.

TABLES