3.10 Noise and Vibration

Presented within this section is information on ambient noise conditions in the vicinity of the proposed Project and applicable regulations pertaining to noise and vibration. Noise and vibration impacts associated with construction and operation of the Project are based on evaluating the exposure of persons to Project-related noise and vibration levels in excess of existing conditions and/or defined thresholds of significance. The information and analysis in this section focuses on the terrestrial portion of the proposed Project (i.e. directional bores, ocean groundbeds, terrestrial cables, and PFE facilities) because sensitive receptors as defined in this section do not exist within the marine portion of the Project. Noise effects on marine wildlife species are discussed in Section 3.3, *Biological Resources*.

3.10.1 Environmental Setting

The assessment of noise utilizes specialized descriptors not used in normal conversation. Therefore, to assist in understanding the subsequent analysis, Table 3.10-1 provides definitions for certain technical terms used within this section.

Table 3.10-1. Summary of Acoustical Terms

Term	Definition
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
A-Weighted Sound Level (dBA)	The sound level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Ambient Noise Level	The composite noise from all sources resulting in the existing normal level of environmental noise at a given location.
Equivalent Noise Level (Leq)	The average dBA level, on an equal energy basis, during the measurement period.
Maximum Noise Level (Lmax)	The maximum noise level during a sound measurement period.
Minimum Noise Level (Lmin)	The minimum noise level during a sound measurement period.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour day obtained after the addition of 5 dB to sound levels in the evening from 7 p.m. to 10 p.m. and after the addition of 10 dB to sound levels in the night between 10 p.m. and 7 a.m.

3.10.1.1 General Information on Noise

The effects of noise on people can be grouped into three general categories:

- Subjective effects of annoyance and dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as startling and hearing loss.

In most cases, typical noise produces effects in the first two categories. No satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is due primarily to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparison with the ambient noise environment.

Noise levels are generally considered low when ambient levels are below 50 dBA, moderate between 50 and 65 dBA, and high above 65 dBA (FTA, 2006). Although people often accept the higher levels associated with very noisy urban residential and industrial-commercial zones, high noise levels are nevertheless considered to be an annoyance and may be adverse to public health. Typical noise sensitive land uses include residences, schools, hospitals, and recreational facilities.

In general, the more the level or the tonal (frequency) variations a new noise source exceeds the existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual. When comparing sound levels from similar sources (for example, changes in traffic noise levels), a 3 dBA increase is considered to be a just-perceivable difference, 5 dBA is clearly perceivable, and 10 dBA is considered a doubling in perceived loudness.

3.10.1.2 General Information on Vibration

Vibration is a phenomenon related to noise, with common man-made sources being trains, large vehicles on rough roads, and construction activities such as blasting, pile-driving, and operating heavy earth-moving equipment (FTA, 2006, Chapter 7). Vibration is defined as the mechanical motion of earth or ground, building, or other type of structure, induced by the operation of any mechanical device or equipment located upon or affixed thereto. Vibration generally results in an oscillatory motion in terms of the displacement, velocity, or acceleration of the ground or structure(s) that causes a normal person to be aware of the vibration by means such as, but not limited to, sensation by touch or visual observation of moving objects. Vibration sources are often accompanied by low frequency noise.

The ground-borne energy of vibration has the potential to cause annoyance and structural damage. Vibration can be felt outdoors, but the perceived intensity of vibration effects are much greater indoors due to the shaking of structures. Several land uses are considered sensitive to vibrations, and include residential areas, hospitals, libraries, schools, and churches. Additionally, certain land uses (such as research and manufacturing facilities where vibration-sensitive equipment is used, cultural and historic resources, and concert halls) are also sensitive to vibration.

Table 3.10-2. Human Response to Vibration PPV

Human Response	Vibration PPV (Inches/Second)
Severe	2.00
Strongly Perceptible	0.90
Distinctly Perceptible	0.24
Barely Perceptible	0.035

Source: CA DOT, 2004

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal and is most frequently used to describe human perception to vibration and impacts to built structures. The PPV velocity is normally described in inches per second. Table 3.10-2 summarizes human response to transient vibration.

Table 3.10-3 identifies maximum vibration levels for preventing damage to various structure types and conditions from intermittent sources.

Table 3.10-3. Maximum Vibration Levels for Preventing Damage to Various Structure Types

Structure and Condition	Limiting Vibration PPV (Inches/Second)
Residential Structures, Plastered Walls	0.2 – 0.3
Residential Structures in Good Repair with Gypsum Board Walls	0.4 – 0.5
Engineered Structures	1.0 – 1.5

Source: CA DOT, 2004

3.10.1.3 Sensitive Receptors

Existing land uses in the vicinity of the Project are listed in Section 3.9, *Land Use and Recreation*, Table 3.9-1 (Summary of Land Use and Recreation). As identified in Table 3.9-1, noise and vibration sensitive receptors are located immediately adjacent to the proposed Project and include residential, recreation (including Greenbelt), civic/community center, and school uses.

3.10.1.4 Existing Ambient Noise Levels

Short-term sound measurements were conducted on April 23, 2015, (Thursday) and June 18, 2015, (Thursday) documenting existing daytime ambient noise conditions proximate to Project locations containing the greatest numbers of sensitive receptors and near other sensitive land uses. These short-term measurements are intended to provide a snapshot of typical daytime ambient noise conditions. Ambient levels for the Project area would vary by day of the week and by time of day. The results of these measurements are provided in Table 3.10-4. The locations of these noise measurements are provided in Figure 3.10-1.

Table 3.10-4. Measured Short-Term Ambient Noise Levels, dBA

No.	Time	Measurement (dBA)			Notes
		Lmin	Leq	Lmax	
1	8:50 a.m. to 9:05 a.m.	42.4	60.4	79.5	Primary noise sources were nearby passenger vehicle trips and resident activities. Secondary noise sources were proximate beach area helicopter overflight and motorcycle pass by.
2	9:30 a.m. to 9:45 a.m.	43.5	50.8	59.7	Primary noise source was boardwalk recreation activities.
3	10:10 a.m. to 10:25 a.m.	45.6	65.4	79.7	Primary noise sources were nearby passenger vehicle trips and resident activities. Secondary noise sources were proximate beach area helicopter overflight, construction activity, dog barking, and fire truck pass by.
4	10:40 a.m. to 10:55 a.m.	45.8	56.6	73.6	Primary noise sources were nearby beach grading activities and recreational activities.
5	11:00 a.m. to 11:15 a.m.	43.8	57.9	77.6	Primary noise sources were boardwalk recreation activities and proximate helicopter overflight.
6	11:30 a.m. to 11:45 a.m.	51.9	66.2	81.2	Primary noise sources were nearby passenger vehicle trips and resident activities.
7	3:05 p.m. to 3:20 p.m.	49.0	53.5	60.3	Primary noise source was boardwalk recreation activities.
8	11:42 a.m. to 11:57 a.m.	47.7	60.0	77.0	Primary noise sources were recreational activities taking place at the park. Secondary noise sources were nearby passenger vehicle traffic from nearby streets (Gould Avenue, Valley Drive, and Ardmore Avenue).
9	12:10 p.m. to 12:25 p.m.	47.2	56.5	79.5	Primary noise source was runners and walkers on the trial, dogs, noise from school playground at a distance and light traffic from nearby streets.
10	12:35 p.m. to 12:50 p.m.	43.4	57.2	78.8	Primary noise sources were outdoor student activities and light traffic from the immediately adjacent Valley Drive.
11	1:02 p.m. to 1:18 p.m.	42.4	57.4	81.3	Primary noise sources were activities taking place at the baseball diamond, light traffic from Valley Drive, and runners on the Greenbelt.

Notes: Measurements were conducted utilizing a 3M Quest SoundPro DL Type 2 sound meter.

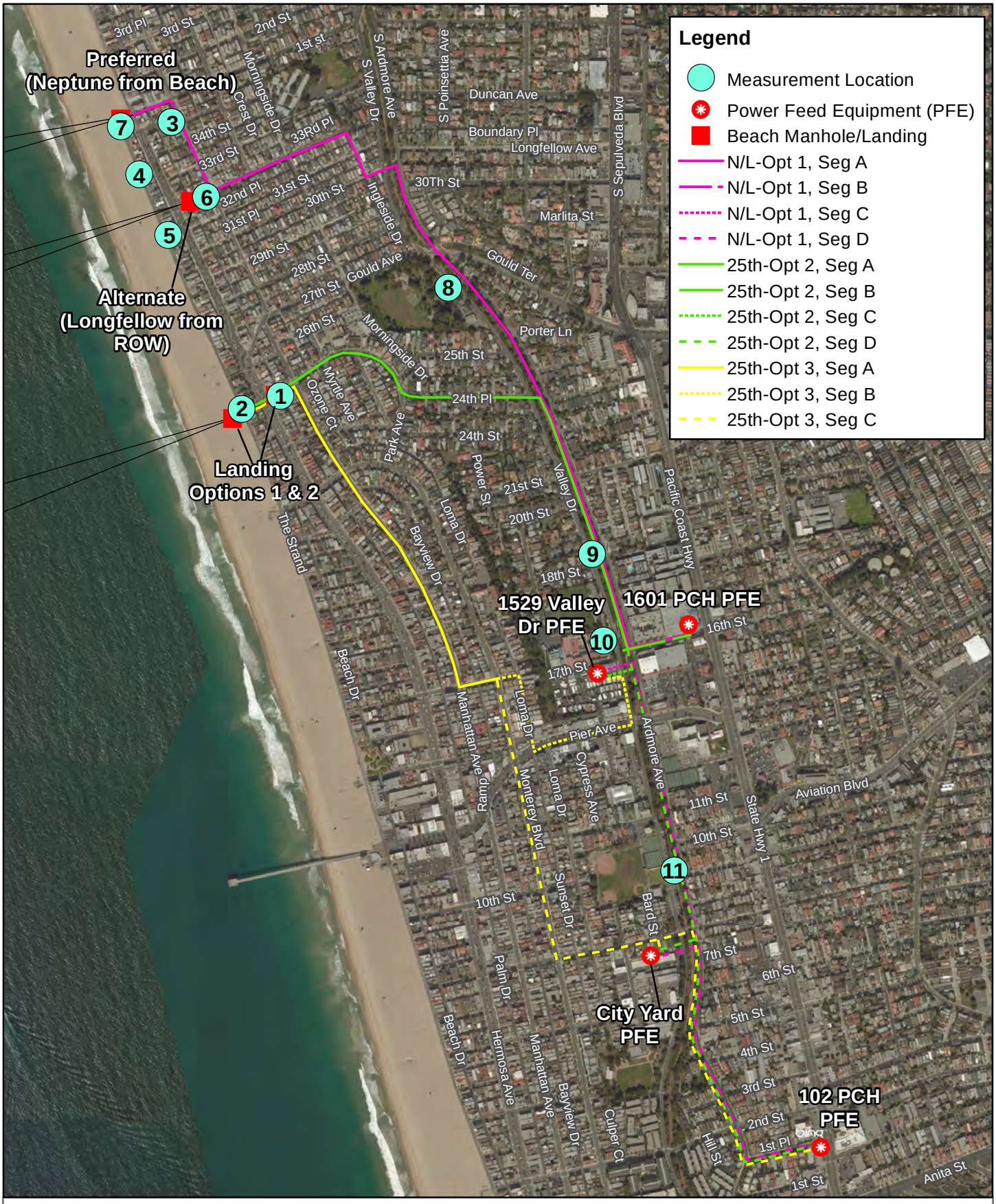


Figure 3.10-1
Ambient Noise Measurement Locations

3.10.1.5 Existing Vibration Sources

In the vicinity of the Project, the primary source of existing transient vibration is from heavy vehicles travelling over locations where uneven pavement occurs on public roads.

3.10.2 Regulatory Setting

3.10.2.1 Federal

Although no federal noise regulations exist, the United States Environmental Protection Agency (USEPA) has promulgated noise guidelines (USEPA, 1974). The EPA guideline recommends CNEL of 55 dBA to protect the public from the effect of broadband environmental noise outdoors in residential areas and farms, and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use (USEPA, 1974). Administrators of the USEPA determined in 1981 that subjective issues, such as noise, would be better addressed at lower levels of government. Consequently, in 1982, responsibilities for regulating noise control policies were transferred from the federal government to state and local governments. Noise control guidelines and regulations contained in rulings by the USEPA in prior years remain valid, but more individualized control for specific issues is allowed by designated state and local government agencies.

3.10.2.2 State

California Government Code Section 65302 requires each local government entity to implement a noise element as part of its general plan. In addition, the California Governor's Office of Planning and Research has developed guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. These recommendations have been incorporated into the local plans and policies discussed below.

3.10.2.3 Local

City of Hermosa Beach General Plan Noise Element

The City of Hermosa Beach General Plan Noise Element includes a number of goals and policies related to noise (City of Hermosa Beach, 1979). However, a review of the Noise Element found all goals, policies, and programs intended to guide City policy regarding the control of noise. Therefore, the noise standards identified below in the City's Noise Ordinance are designed to comply with the General Plan Noise Element goals and policies. The General Plan contains no goals or policies pertaining to vibration. The City's General Plan is currently being updated, but any changes in Noise Element goals and policies will not be in effect until adopted by the City Council.

City of Hermosa Beach Noise Ordinance

The City of Hermosa Beach Municipal Code contains no detailed standards pertaining to vibration. However, the following Municipal Code sections regulate noise and are applicable to the Project (City of Hermosa Beach, 2015):

- **8.24.030 Prohibited Noises - General Standard.** Unless otherwise permitted in this Chapter, no person shall make, permit to be made or cause to suffer any noises, sounds or vibrations that in view of the totality of the circumstances are so loud, prolonged and harsh as to be physically annoying to reasonable persons of ordinary sensitivity and to cause or contribute to the unreasonable discomfort of any persons within the vicinity. When considering whether a noise, sound or vibration is

unreasonable within the meaning of this section, the following factors shall be taken into consideration:

A. The volume and intensity of the noise, particularly as it is experienced within a residence or place of business;
B. Whether the noise is prolonged and continuous;
C. How the noise contrasts with the ambient noise level;
D. The proximity of the noise source to residential and commercial uses;
E. The time of day; and
F. The anticipated duration of the noise.

- **Chapter 8.24.050 - Construction**

A. Permissible hours of construction**.** All construction shall be conducted between the hours of 8:00 a.m. and 6:00 p.m., Monday through Friday (except national holidays), and 9:00 a.m. and 5:00 p.m. Saturdays. Construction activity is prohibited at all other hours and on Sundays and national holidays. For purposes of this section, "construction" or "construction activity" shall include site preparation, demolition, grading, excavation, and the erection, improvement, remodeling or repair of structures, including operation of equipment or machinery and the delivery of materials associated with those activities.

3.10.3 Impact Analysis

This section evaluates impacts associated with temporary and permanent noise and vibration generated by proposed Project activities.

3.10.3.1 Methodology/Approach

This analysis utilizes the established baseline conditions presented above in Section 3.10.1, which includes a quantitative description of ambient conditions. The significance thresholds identified below in Section 3.10.3.2 are evaluated based on their potential to be exceeded by predicted noise and vibration generated during construction and operation/maintenance of the proposed Project in conjunction with the applicable local noise regulations presented in Section 3.10.2.3.

3.10.3.2 Significance Thresholds

An impact related to noise or vibration would be considered significant if:

- Construction activities occur outside of the hours allowed by the Hermosa Beach Municipal Code (see Section 3.10.2).
- Construction activity, including directional bores, results in an increase of more than 3 dBA in the lowest hourly ambient equivalent noise levels (Leq) at residential uses measured between the period 8:00 a.m. to 7:00 p.m.
- Construction activity, including directional bores, results in an increase of more than 5 dBA in the lowest hourly ambient equivalent noise levels (Leq) at non-residential sensitive uses measured between the period 8:00 a.m. to 7:00 p.m.
- Construction or operational activity causes vibration levels at the property line of any neighboring use to exceed 0.1 inches/second over the frequency range 1 - 100 Hz.
- Operational activity results in an increase of more than 3 dBA in the lowest hourly ambient equivalent noise levels (Leq) at any noise-sensitive use.

3.10.3.3 Impacts and Mitigation Measures

The impact discussions below address each of the significance thresholds listed above in Section 3.10.3.2.

Construction Activities Occurring Outside Time Periods Allowed by Municipal Code

Impact N-1: Noise from construction activities would occur outside of the hours allowed by the Hermosa Beach Municipal Code.

With respect to City of Hermosa Beach Municipal Code Chapter 8.24.050, the applicant is proposing to work between 8:00 a.m. and 6:00 p.m. Monday through Friday, 9:00 a.m. and 4:00 p.m. on Saturdays, and periodically on Sunday. The only construction work proposed outside the allowable hours defined under Municipal Code Chapter 8.24.050 is at each cable landing location on Sundays. Currently, this work would include pump circulation for two 30-minute intervals, once during the day and once during the night. This will keep the bore pipe from ceasing. Construction is expected to last 3 to 4 weeks at each boring location. Because this work is prohibited by Municipal Code Chapter 8.24.050, Mitigation Measure N-1a (*Construction Work Hours Authorization*) is proposed to ensure the Project applicant obtains all needed permits/variances from the City of Hermosa Beach prior to the start of construction. This would ensure that the City consider and approve any construction activities proposed during days and times inconsistent with Municipal Code Chapter 8.24.050.

With the incorporation of Mitigation Measure N-1a, impacts related to Project construction activities occurring outside the allowable days and hours specified in City of Hermosa Beach Municipal Code Chapter 8.24.050 would not be significant (Class II).

Mitigation Measures

N-1a **Construction Work Hours Authorization**. No construction activities shall occur outside the following hours and days without obtaining necessary variances from the City of Hermosa Beach:

- Between the hours of 8:00 a.m. and 6:00 p.m., Monday through Friday (except national holidays), and 9:00 a.m. and 5:00 p.m. Saturdays, as specified in Chapter 8.24.050 of the City of Hermosa Beach Municipal Code.
- Any request for a variance from the City shall specify the location, duration, expected noise level, affected receptors, and type of proposed construction activity occurring outside the allowable days and hours presented within Chapter 8.24.050 of the City of Hermosa Beach Municipal Code.

Temporary Increases in Ambient Noise Levels at Sensitive Receptor Locations

Impact N-2: Construction activities would result in a temporary increase (more than 3 dBA Leq) over the lowest hourly ambient levels at residential uses.

Temporary noise would be generated by the operation of construction equipment, construction activities, and vehicles trips associated with construction. The magnitude of temporary noise increases during construction would depend on the types and numbers of equipment operating at any given time, the site geometry (i.e., shielding from intervening terrain or other structures), and the distance between the noise source and sensitive receptors. While construction would require a number of different equipment pieces operating at each site for various times throughout a work day, the following provides a construction noise analysis by major phases of construction.

Cable Landing Sites and Directional Bores

As discussed in Section 2.4.1.1, two cable landing sites have been proposed on the beach at Neptune Avenue and 25th Street. Ambient noise levels at these locations are represented in Table 3.10-4 as measurement locations 7 (53.5 Leq) and 2 (50.8 Leq), respectively shown in Figure 3.10-1. The applicant has also proposed two optional cable landing sites located off the beach on 25th Street and Longfellow Avenue. Ambient noise levels at these locations are represented in Table 3.10-4 as measurement locations 3 (65.4 Leq) and 1 (60.4 Leq), respectively, shown in Figure 3.10-1.

To reduce noise levels to sensitive receptors near the cable landing sites, the applicant has committed to the installation of an 8-foot-high temporary noise barrier around the cable landing sites on all sides facing sensitive receptors (RAM, 2014). For the beach landing sites at Neptune Avenue and 25th Street, the barriers would be located along the eastern side of the construction site facing toward the residences and wrapping around along the north and south side of the fence line to provide sound abatement (RAM, 2014). These temporary barriers would reduce noise by 3 to 5 dBA depending on the specific location of the receptors (RAM, 2014). For the optional street landing sites, the sound barriers would enclose both sites on all sides.

Table 3.10-5 shows the calculated overall noise levels (by distance from source) for this phase of Project construction, which is expected to last approximately 3-4 weeks at each cable landing site. The calculated construction noise levels shown in Table 3.10-5 are considered worst-case (with all construction equipment operating simultaneously) with a 5 dBA reduction from noise barrier walls (RAM, 2014). Table 3.10-5 also assumes a conservative loss of 6 dBA across open space and a loss of 12 dBA for every doubling of distance where residences and other structures facing construction attenuate noise (FHWA, 2006), which is 80 feet from the beach landing sites and 40 feet from the optional landing sites.

Table 3.10-5. Calculated Construction Noise Levels by Phase - Cable Landing Site Direction Bore

Distance From Source	Beach Landing Sites Mitigated Temporary Noise Level dBA	Alternative Landing Sites Mitigated Temporary Noise Level DBA
10 feet	97.1	97.1
40 feet	85.1	85.1
80 feet	79.1	73.1
160 feet	67.1	61.1
320 feet	55.1	49.1

Source: RAM, 2014; FHWA, 2006

Based on the ambient daytime noise conditions measured at residential receptors near beach landing locations and the predicted construction noise levels shown in Table 3.10-5, residences within approximately 200 feet of each beach landing site would have construction noise levels that are 3 dBA over ambient during the 3- to 4-week construction period at each location. These affected areas are shown in Figure 3.10-2. This accounts for ambient noise levels being higher at residences east of the beach, as shown in Table 3.10-4 as measurement locations 3 and 1. Construction noise levels at the nearest receptor would be approximately 79.1 dBA.

Based on the ambient daytime noise conditions measured at residential receptors near the optional landing locations and the predicted construction noise levels shown in Table 3.10-5, residences within approximately 150 feet of each optional landing site would have construction noise levels that are 3 dBA over ambient during the 3 to 4-week construction period at each location. These affected areas are shown in Figure 3.10-3. Construction noise levels at the nearest receptor would be approximately 85.1 dBA.

Terrestrial Conduit System

As discussed in Section 2.4.1.1, the terrestrial conduit systems provide the link from the cable landing site to existing or future fiber-optic infrastructure. Separate alignments would be used to connect the two cable landings with proposed PFE facilities. The alignments of each system would follow public ROWs from their landing points to their respective PFE facilities as described in Section 2.4.3, *Terrestrial Alignments and Locations*, and shown on Figure 2-1 (Terrestrial Facilities Conceptual Layout). Ambient noise conditions along conduit routes are provided in Table 3.10-4, with measurement locations shown in Figure 3.10-1.

Conduit installation would progress at a pace of approximately 500 feet per day. A typical manhole placement crew can install one to two intermediate manholes per day. Therefore, temporary construction noise at any one sensitive receptor location is not expected to last more than 2 days and will usually be less than one day.

Table 3.10-6 shows the calculated unmitigated overall noise levels (by distance from source) for this phase of Project construction. The calculated construction noise levels shown in Table 3.10-6 are considered worst-case (with all construction equipment operating simultaneously) with a 12 dBA for every doubling of distance where residences and other structures facing construction attenuate noise area (FHWA, 2006), which is assumed as an average of 50 feet from the work area.

Based on a typical daytime ambient noise level of 55 dBA at residential receptors along the terrestrial cable routes and the predicted construction noise levels shown in Table 3.10-6, residences within approximately 200 feet of each work location would have construction noise levels that are 3 dBA over ambient during the 1- to 2-day construction period at each work location. Construction noise levels at the nearest receptor would be approximately 85.0 dBA.

Table 3.10-6. Calculated Construction Noise Levels by Phase – Conduit and Manhole Installation

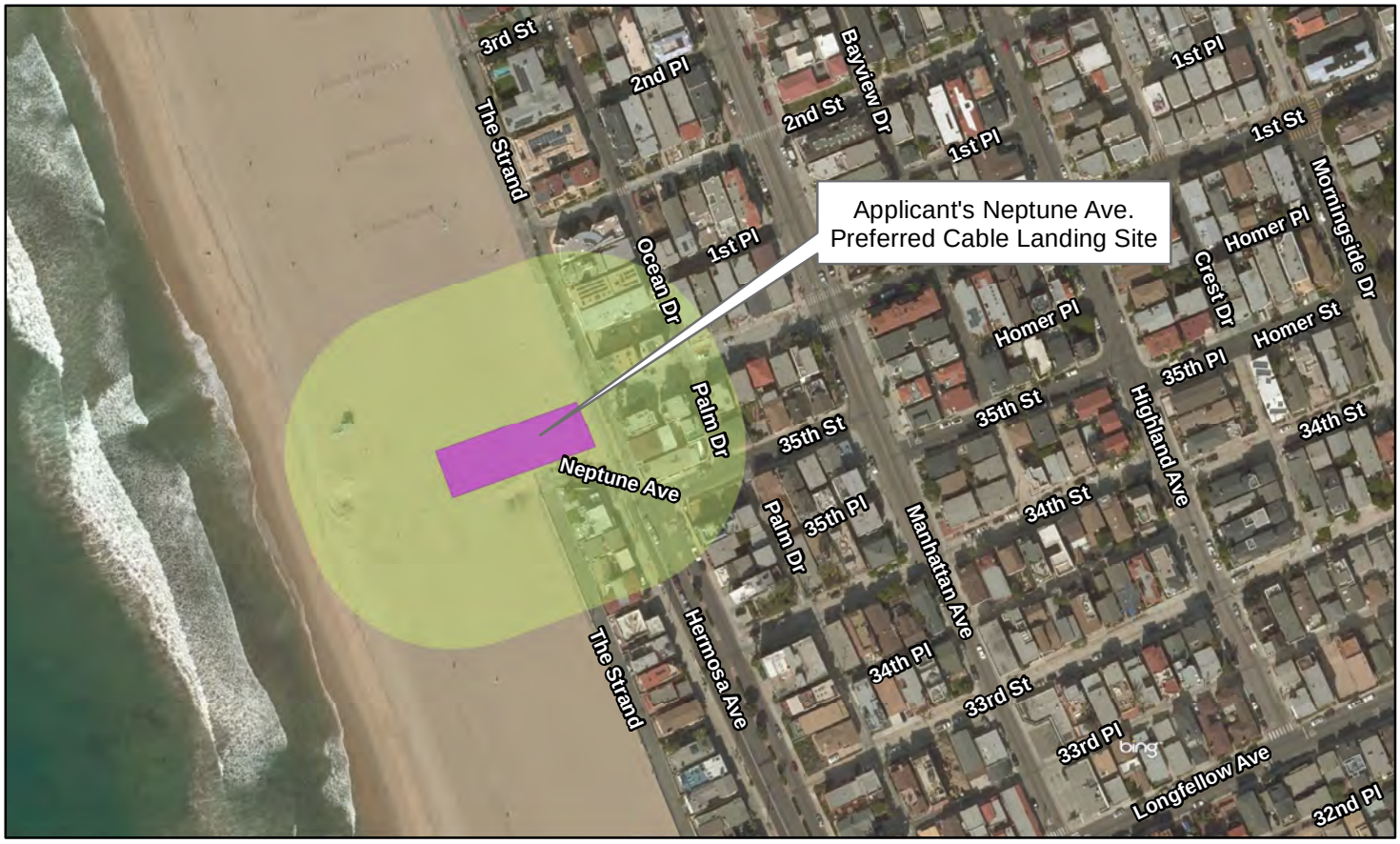
Distance From Source	Unmitigated Temporary Noise Level DBA
50 feet	85.0
100 feet	72.0
150 feet	60.0
300 feet	48.0

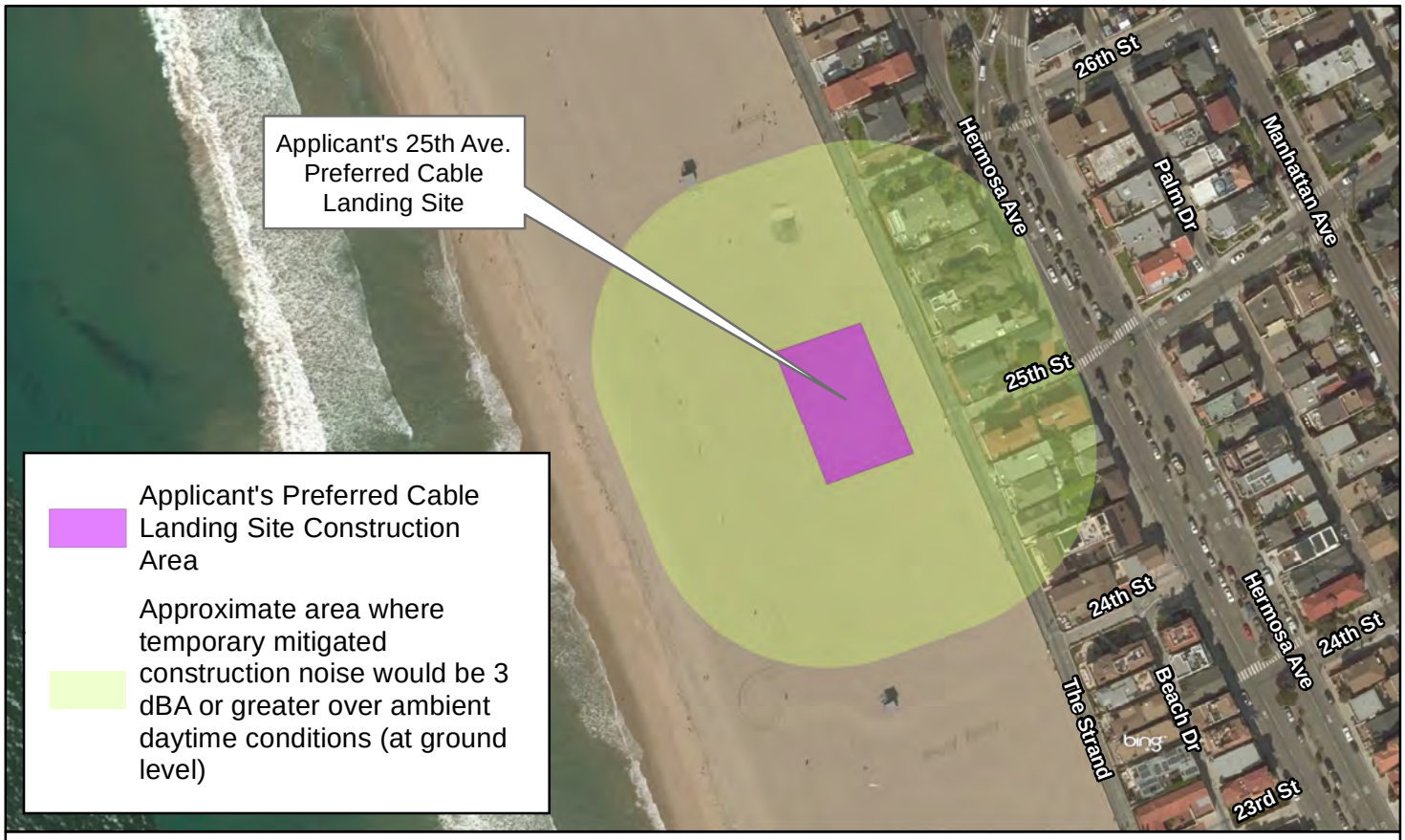
Source: RAM, 2014; FHWA, 2006

The Project has an expected life of about 25 years. Upon retirement of the Project, the applicant anticipates that the terrestrial cable system would be abandoned in place, meaning it would not be removed (see Section 2.7, *Retirement, Abandonment, or Removal of the Cable Systems*). If the cables are completely abandoned in place, there would be no onshore noise associated with the retirement of the Project. One possibility is that the terrestrial cable would be pulled out of the buried conduit, leaving the conduit itself in place. If this occurs, noise would be generated from the use of a truck with a reel puller that would pull the terrestrial cable from the existing manhole locations. The noise associated with this limited decommissioning activity would be substantially lower than the noise associated with the installation of the cable.

Power Feed Equipment (PFE) Facilities

As discussed in Section 2.4.1.5, up to four proposed PFE locations may be constructed, with their locations being 1529 Valley Drive inside an existing commercial building, 1601 Pacific Coast Highway inside an existing commercial building, 102 Pacific Coast Highway inside the existing commercial building, and/or the City of Hermosa Beach Maintenance Yard at 6th Street and Valley Drive. However, the Project may not require the construction of all four facilities. Each PFE facility is assumed to require 2 weeks of construction.

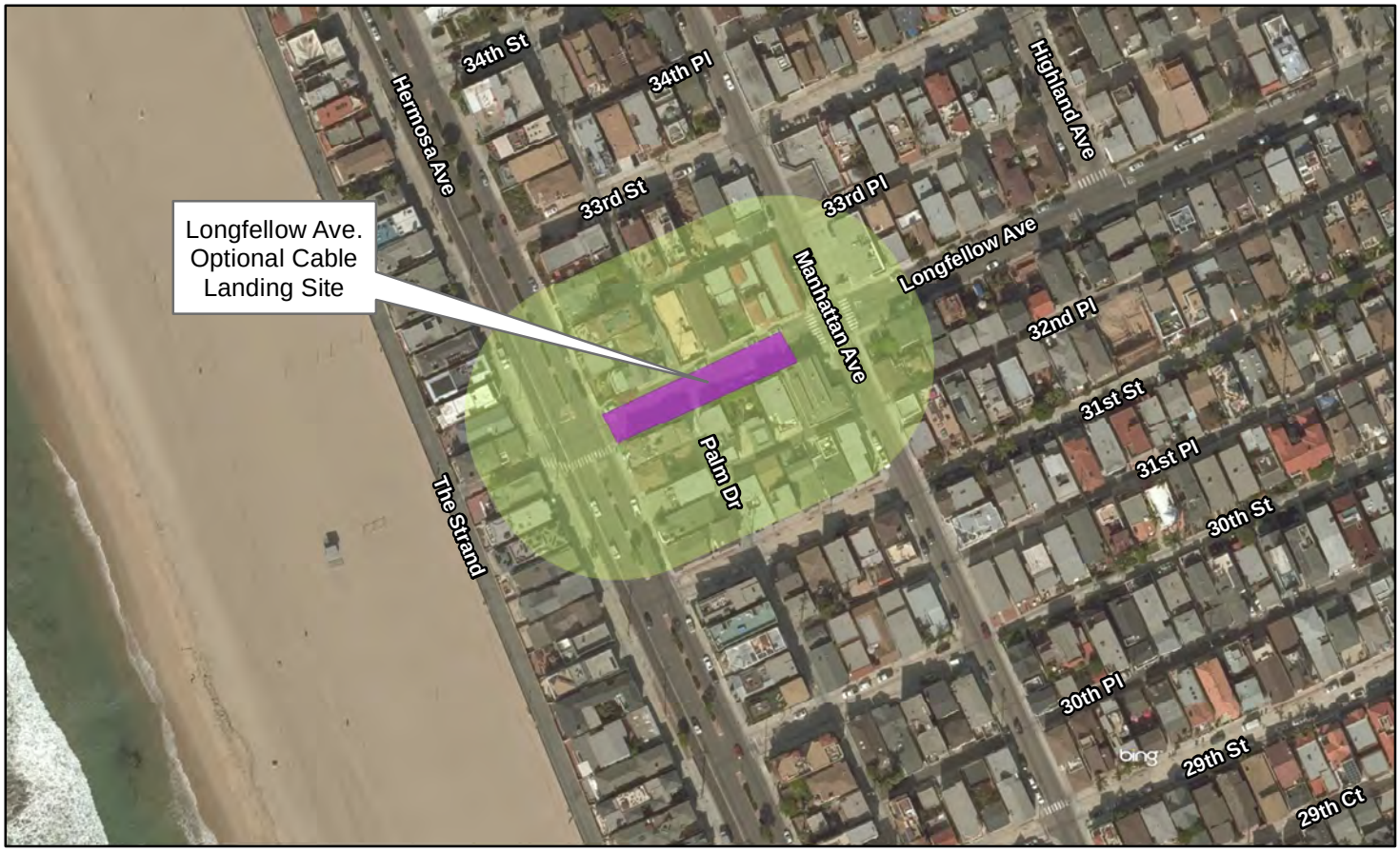




0 125 250 Feet

Figure 3.10-2

Temporary Construction Noise Area Proposed Cable Landing Locations



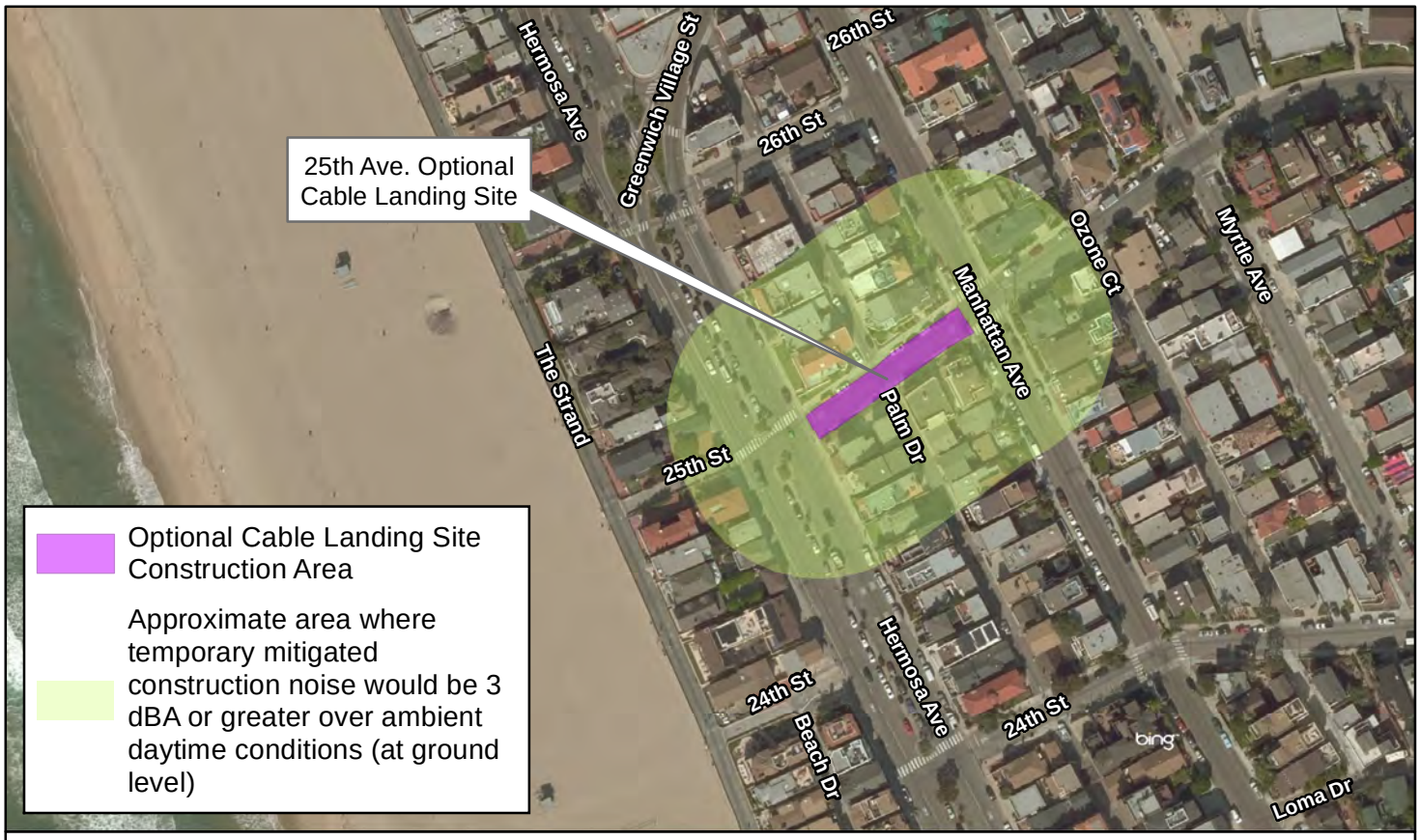


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Figure 3.10-3

Temporary Construction Noise Area Optional Cable Landing Locations

Table 3.10-7 shows the calculated unmitigated overall noise levels (by distance from source) for this phase of Project construction. The calculated construction noise levels shown in Table 3.10-7 are considered worst-case (with all construction equipment operating simultaneously) with a 12 dBA for every doubling of distance where residences and other structures facing construction attenuate noise area (FHWA, 2006), which is assumed as an average of 50 feet from the work area.

Based on a typical daytime ambient noise level of 55 dBA within these locations and the predicted construction noise levels shown in Table 3.10-7, residences within approximately 120 feet of each work location would have construction noise levels that are 3 dBA over ambient during the 2-week construction period at each work location. Construction noise levels at the nearest receptor would be approximately 80 dBA.

Table 3.10-7. Calculated Construction Noise Levels by Phase – PFE Facility Construction

Distance From Source	Unmitigated Temporary Noise Level DBA
50 feet	80.0
100 feet	68.0
150 feet	56.0
300 feet	44.0

Source: RAM, 2014; FHWA, 2006

Construction Traffic

Construction traffic would include large trucks hauling material away from the site and returning for pick up. A loaded heavy-duty truck typically generates a noise level of 84 dBA Leq at 50 feet (FHWA, 2006). Noise from the use of heavy truck trips along the local roadway network would be most perceptible along residential streets, increasing ambient noise levels by more than 3 dBA momentarily and then dissipating once the truck passed by.

Utilizing average daily traffic (ADT) volumes presented in Section 3.12 (Transportation and Traffic) Table 3.12-2 for several roadway segments utilized by Project-related trucks for worksite access, traffic noise levels with and without Project-related trips were calculated using Caltrans methodology (Caltrans, 2013). The results of traffic noise modeling are presented in Table 3.10-8.

Table 3.10-8. Calculated Traffic Noise Levels – With and Without Project Truck Trips

	Morning Peak Hour (7-9 A.M.)		Average Daytime Hour	
Roadway Segment	Baseline (Leq)	Baseline With Project (Leq)	Baseline (Leq)	Baseline With Project (Leq)
Artesia Blvd (PCH to Prospect Ave)	72.90	72.91	66.45	66.46
Gould Ave (Ardmore Ave to PCH)	69.92	69.94	63.47	63.49
Hermosa Ave (27th St to 16th St)	67.92	67.95	61.48	61.51

As shown in Table 3.10-8, the addition of Project-related truck trips will have a negligible temporary effect on roadway noise along the haul routes. While existing ADT volumes are not available for all segments of the proposed haul route (refer to Section 3.12), increases similar to the results shown in Table 3.10-8 are expected for all segments of the proposed haul route.

Construction Noise Summary

When modeled construction noise levels (shown in Tables 3.10-5 through 3.10-7) are compared against the measured daytime ambient conditions in the Project area (shown in Table 3.10-4), a temporary increase in ambient noise levels of 3 dBA or more will occur at residences proximate to work areas. Because of the proximity of residences to the proposed work areas, it is not feasible to reduce construction noise to less than 3 dBA over ambient conditions. To ensure construction noise is reduced to the maximum extent feasible, Mitigation Measures N-2a (*Employ Noise-Reducing*

Construction Practices) and N-2b (*Construction Noise and Vibration Complaint Plan*) are proposed. However, even with implementation of these measures, temporary noise impacts to residences during construction would remain significant (Class I).

Mitigation Measures

N-2a **Employ Noise-Reducing Construction Practices**. The construction contractor shall implement noise-reducing construction practices to reduce noise to the greatest extent feasible. Measures that can be implemented include, but are not limited to, the following:

- All stationary construction equipment shall be located at the greatest distance feasible from residences and other noise-sensitive receptors.
- Based on the equipment layout, portable noise barriers shall be strategically positioned around equipment at each cable landing site to absorb and reduce noise generated by operation of the equipment. The noise barriers will be positioned so as not to interfere with the operation of the equipment. These portable noise barriers will be in addition to the perimeter noise barrier to be installed around each cable landing site.
- All construction equipment, including the horizontal directional drill rig, shall be well maintained and include mufflers or other sound attenuation devices consistent with manufacturer specifications (as applicable).
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.

N-2b **Construction Noise and Vibration Complaint Program**. Prior to construction, the applicant and/or construction contractor shall:

- Establish a telephone number for use by the public to report any nuisance noise or vibration conditions associated with construction activities. The applicant and/or construction contractor shall ensure that a noise and vibration liaison is assigned to respond to all public construction noise and vibration complaints in a timely manner, and either (a) the telephone number is staffed by the noise and vibration liaison during construction hours; or (b) the phone number is connected to an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. Public noise or vibration complaints shall be forwarded to the City of Hermosa Beach within 48 hours.
- This telephone number shall be posted at entrances to all work areas and construction yards in a manner visible to passersby.
- The Project applicant and its contractor(s) shall document how it responded to noise and vibration complaints and the resolution of those complaints. These actions shall include, but not be limited to:
  - Taking ambient noise and/or vibration measurements near the complainant location(s).
  - In the event construction noise levels have significantly exceeded ambient levels (>10 dBA as it is not feasible to reduce construction noise to less than 5 dBA over ambient conditions), additional attenuation methods shall be explored to reduce temporary construction noise levels to the degree feasible. These additional noise-

attention methods might include actions such as repositioning equipment and/or noise barriers, or adding more noise shielding (barriers, acoustical blankets, etc.).

- In the event vibration levels demonstrably attributed to construction activities exceed 0.20 PPV at the complainant structure(s), construction activities shall cease until vibration levels can be reduced to below this level.

- In the event a noise or vibration complaint cannot be resolved, the Project applicant and its contractor(s) shall notify the City of Hermosa Beach within 12 hours.

Impact N-3: Construction activities would result in a temporary increase (more than 5 dBA Leq) over the lowest hourly ambient levels at non-residential sensitive receptors.

Identical to the discussion provided above for Impact N-2 above, when modeled construction noise levels (shown in Tables 3.10-5 through 3.10-7) are compared against the measured daytime ambient conditions in the Project area (shown in Table 3.10-4), a temporary increase in ambient noise levels of 5 dBA or more will occur at all non-residential sensitive uses proximate to work areas. Because of the proximity of recreational uses (including the beach) and the Hermosa Valley Elementary School (located on Valley Drive) to the proposed work areas, it is not feasible to reduce construction noise to less than 5 dBA over ambient conditions. To ensure construction noise is reduced to the extent feasible, Mitigation Measures N-2a and N-2b are proposed. However, even with implementation of this mitigation, temporary noise impacts to non-residential sensitive receptors during construction would remain significant (Class I).

Mitigation Measures

N-2a **Employ Noise-Reducing Construction Practices.** See above for the full text of this measure.

N-2b **Construction Noise and Vibration Complaint Program.** See above for the full text of this measure.

Generate Excessive Vibration Levels at Sensitive Receptors

Impact N-4: Construction activity could result in vibration levels that could potentially cause annoyance.

Based on the vibration levels presented in Tables 3.10-2 (for human response) and 3.10-3 (for preventing damage to various structure types), vibration exceeding 0.1 inches per second would be considered the threshold of concern. At this level, vibration would be somewhere between barely perceptible and distinctly perceptible by humans, with a doubling of vibration level still required to potentially generate damage to fragile residential structures.

During construction, minor localized vibration may occur proximate to the work areas. The primary sources of temporary vibration would be from stationary diesel engines powering directional bore machines, as well as heavy truck trips on uneven road surfaces. Along the proposed conduit routes, roadways were observed to be generally smooth with relatively few uneven surfaces. Typically, ground-borne vibrations generated by man-made activities attenuate rapidly with distance from the source of the vibration. Ground vibrations from construction activities do not often reach the levels that can damage structures, but can achieve the audible and feelable ranges in buildings very close to the source (FTA, 2006).

During construction of the Project, vibration from typical heavy construction equipment operation (including heavy truck trips on uneven pavement) are estimated at 0.076 inches per second PPV at 25 feet from the source of activity (RAM, 2014). Vibration levels would reduce to 0.038 inches per

second at 40 feet from the source (RAM, 2014). At these distances, based on the levels provided in Tables 3.10-2 (for human response) and 3.10-3 (for preventing damage to various structure types), temporary and periodic vibration from construction activities would not occur at levels where significant annoyance or damage could occur.

While temporary vibration levels would not result at levels that could cause significant impacts, Mitigation Measures N-2a (*Employ Noise-Reducing Construction Practices*) and N-2b (*Construction Noise and Vibration Complaint Program*) are proposed. The techniques employed in Mitigation Measure N-2a would help to reduce temporary vibration levels and occurrences. Mitigation Measure N-2b requires the preparation and approval of a Construction Noise and Vibration Complaint Program, which would ensure investigation and response to any vibration complaints. With the incorporation of these measures, impacts from construction vibration would not be significant (Class II).

Mitigation Measures

N-2a **Employ Noise-Reducing Construction Practices.** See above for the full text of this measure.

N-2b **Construction Noise and Vibration Complaint Program.** See above for the full text of this measure.

Impact N-5: Generation of backup power during Project operations at the PFE facilities would periodically result in increased noise or vibration.

The new PFE facility would require approximately 740 square feet of space and would include an 80-kW diesel emergency backup generator in the event of a loss of power from the local electrical distribution system. This situation is expected to be infrequent. However, to avoid noise or vibration impacts from emergency backup generator use, Mitigation Measure N-5 is recommended to require noise- and vibration-generating equipment to be contained within a prefabricated enclosure designed to reduce noise and vibration. The remaining features of the proposed fiber-optic line would be subterranean and would not produce noise or vibration. Further, maintenance activities would not generate perceptible noise or vibration. Therefore, operational noise and vibration impacts at the PFE facilities would not be significant (Class II).

Mitigation Measures

N-5 **PFE Facility Design Requirements**. Final design of each PFE facility shall ensure:

- No operational equipment noise is audible outside the structure. At a minimum, final design shall ensure that operational noise does not exceed 40 dBA at the nearest residential property line.
- No groundborne vibration from backup power generation is measurable outside the structure.

A structural or acoustical engineer shall demonstrate compliance with these requirements at the time of building permit application to the City of Hermosa Beach.

Permanent Increases in Ambient Noise Levels at Sensitive Receptor Locations

Impact N-6: Project operation could result in localized increases in existing ambient noise conditions.

Following construction, the PFE facilities would be operated by commercially delivered energy. To ensure no operational noise impacts would occur, Mitigation Measure N-5 is proposed and requires all noise-generating equipment contained within each structure from leaving the structure. With the implementation of this measure, operational noise from each PFE facility would have no impact on

the existing ambient noise conditions. The remaining features of the proposed fiber-optic cables would be subterranean and would not produce noise. Therefore, noise impacts from Project operation would not be significant (Class II).

Mitigation Measures

N-5 **PFE Facility Design Requirements**. See above for the full text of this measure.

3.10.3.4 Cumulative Effects

Introduction

The geographic area of analysis for cumulative noise impacts is generally limited to areas within approximately 0.5 mile of a construction site or operational noise source. This area is defined as the geographic extent of the cumulative noise analysis because noise generated by the proposed Project would only affect the local area and would reduce in intensity as distance from the noise source increases. At distances greater than 0.5 mile, noise would attenuate such that the level of any Project-related noise would blend in with background noise levels.

Ground vibrations dissipate more rapidly than noise levels, limiting the geographic extent of ground vibration to the immediate vicinity of the vibration source. As discussed in Section 3.10.3.3 (Impact N-4), the geographic extent of potentially significant ground vibrations would not extend more than 50 feet from the source of the vibrations.

Historically, noise levels proximate to the onshore landing locations have likely been steady over time, with the main noise source being ocean waves and beach recreational activities. Along the cables routes and near the PFE sites, both ambient noise levels and vibration have gradually increased over time with continued development and traffic growth. Current ambient noise levels along these locations are presented in Table 3.10-4, as shown in Figure 3.10-1.

Project Contribution to Cumulative Impacts

Based on the geographic scope of cumulative noise analysis discussed above, only projects 5, 8, 9, 10, 11, 12, 13, and 14 identified in Table 3-1 would be close enough to Project activities such that cumulative noise impacts could occur. These projects are located within 0.5 mile of the Project's proposed terrestrial cable routes and PFE locations. Therefore, if construction of the proposed Project were to occur concurrently with construction of these other projects, temporary cumulative noise impacts could occur with the potential to affect residences and other sensitive receptors located in close proximity to two or more construction sites. Therefore, the potential for cumulative construction noise impacts would be greatest for receptors located near multiple active construction sites. Construction noise from cumulative projects would attenuate with distance similar to noise generated by construction of the proposed Project. Once operational, terrestrial Project components will either be located underground or within buildings (enclosed structures), which would substantially reduce their potential to contribute to cumulative noise impacts. As discussed in Section 2.6.2, once operational, no routine maintenance is planned for the terrestrial segments of the cable network. These cables typically operate for 25 years without maintenance.

While Project construction noise could combine with construction noise generated by other projects if they occurred concurrently, any increase in ambient daytime noise levels would be temporary and the Project's contribution would be reduced with the implementation of recommended Mitigation Measures N-1a (*Construction Work Hours Authorization*), N-2a (*Employ Noise-Reducing Construction*

Practices), and N-2b (*Construction Noise and Vibration Complaint Plan*). It should be noted that cumulative construction noise impacts would only occur when the Project and other nearby projects are under construction at the same time, which substantially reduces the potential for cumulative effects, especially considering the short construction time period for the proposed Project. While construction noise impacts at receptors proximate to the Project would be significant (refer to Section 3.10.3.3), with the implementation of mitigation measures, the Project's potential contribution to cumulative temporary noise impacts would be minimized and the Project would only have to the potential to contribute to cumulative noise impacts if construction of other projects occurred in relatively close proximity and at the same time as the proposed Project. However, as discussed above in Impacts N-2 and N-3, the proposed Project would result in significant temporary construction noise impacts. This is considered a significant contribution should cumulative construction noise sources overlap.

Based on the geographic scope of cumulative vibration analysis discussed above, no cumulative projects identified in Table 3-1 are within 150 feet of Project activities, the geographic range such that vibration effects could combine.

3.10.3.5 Summary of Impacts, Mitigation Measures, and Significance Conclusions

Table 3.10-9, below, provides a summary of the Project's significant impacts (Class I or Class II) related to noise and vibration. The table also indicates the mitigation measures proposed to reduce these significant impacts.

Table 3.10-9. Summary of Noise and Vibration Impacts, Mitigation Measures, and Significance Conclusions

Impact	Mitigation Measures		Significance Conclusion
Impact N-1: Noise from construction activities would occur outside of the hours allowed by the Hermosa Beach Municipal Code.	N-1a	Construction Work Hours Authorization.	Class II
Impact N-2: Construction activities would result in a temporary increase (more than 3 dBA Leq) over the lowest hourly ambient levels at residential uses.	N-2a N-2b	Employ Noise-Reducing Construction Practices. Construction Noise and Vibration Complaint Program.	Class I
Impact N-3: Construction activities would result in a temporary increase (more than 5 dBA Leq) over the lowest hourly ambient levels at non-residential sensitive receptors.	N-2a N-2b	Employ Noise-Reducing Construction Practices. Construction Noise and Vibration Complaint Program.	Class I
Impact N-4: Construction activity could result in vibration levels that could potentially cause annoyance.	N-2a N-2b	Employ Noise-Reducing Construction Practices. Construction Noise and Vibration Complaint Program.	Class II
Impact N-5: Generation of backup power during Project operations at the PFE facilities would periodically result in increased vibration.	N-5	PFE Facility Design Requirements	Class II
Impact N-6: Project operation could result in localized increases in existing ambient noise conditions.	N-5	PFE Facility Design Requirements	Class II

Class I: **Significant impact; cannot be mitigated to a level that is not significant.** A Class I impact is a significant adverse effect that cannot be mitigated below a level of significance through the application of feasible mitigation measures. Class I impacts are significant and unavoidable.

Class II: **Significant impact; can be mitigated to a level that is not significant.** A Class II impact is a significant adverse effect that can be reduced to a less-than-significant level through the application of feasible mitigation measures presented in this EIR.