3.11 NOISE

This section of the Environmental Impact Report (EIR) evaluates the potential noise and vibration impacts from the construction and operation of the proposed Beach Cities Health District (BCHD) Healthy Living Campus Master Plan (Project) – including the Phase 1 preliminary site development plan and the more general Phase 2 development program. Information for this section was developed based on a review of current noise and vibration standards and assessment methodologies, including the Redondo Beach Noise Regulations (Redondo Beach Municipal Code [RBMC] Section 4-24), Redondo Beach General Plan Noise Element, Torrance Noise Regulations (Torrance Municipal Code [TMC] Section 6-46), Torrance General Plan Noise Element, Federal Highway Administration (FHWA) Traffic Noise Model, FHWA Roadway Construction Noise Model, and others contained in the Federal Transit Administration's (FTA's) Transit Noise and Impact Assessment Manual (FTA 2018).

3.11.1 Fundamentals of Sound and Environmental Noise

Noise

Noise is typically defined as unwanted sound that interferes with normal activities or otherwise diminishes the quality of the human or natural environment. Prolonged exposure to high levels of noise is known to have several adverse effects on people, including hearing loss, communication interference, sleep interference, physiological responses, and annoyance (Federal Interagency Committee on Urban Noise [FICUN] 1980). The ambient noise environment typically includes background noise generated from both near and distant noise sources. These can vary from an occasional aircraft overhead or an occasional train passing by to continuous noise from sources such as consistent vehicle traffic along a major road and/or pedestrian activity within open space recreational areas or other places where people congregate.

Sound is technically described in terms of the loudness (i.e., amplitude) and frequency (i.e., pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Sound frequency is measured in terms of hertz (hz), and the normal human ear can detect sounds ranging from about 20 to 15,000 hz. All sounds in the wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the 1,000 to 4,000 hz range. Since the human ear is not equally sensitive to sound at all frequencies (i.e., between 1,000 and 8,000 cycles per second), a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) adjusts very high and very low frequencies to approximate the human ear's lower sensitivity to those frequencies since. Decibels are based on a logarithmic scale, which compresses the wide range in sound pressure levels to a more useable

range of numbers. This is called "A-weighting" and is commonly used in the measurement of ambient community environmental noise. Unless otherwise noted, all dB measurements presented in the following noise analysis are dBA.

In terms of human response to noise, a 3-dBA increase is barely perceptible to most people, a 5-dBA increase is readily noticeable, and a 10-dBA increase would be perceived as a doubling of loudness (100 percent increase) (FICUN 1980; FTA 2018). Examples of various sound levels in different environments are shown in Table 3.11-1.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates, these scales consider the effect of noise upon people largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Each noise rating scale applicable to this analysis is defined as follows:

- **Equivalent Continuous Noise Level (L_{eq})** is the average acoustic energy of noise for a given period. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. This rating scale does not "weight" or "penalize" noise, depending on whether it occurs during the day or the night.
- **Community Noise Equivalent Level (CNEL)** is a 24-hour average L_{eq} with a 5-dBA "weighting" or "penalty" during the hours of 7:00 p.m. to 10:00 p.m. and a 10-dBA "weighting" or "penalty" a during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL. CNEL is often used due to its utility in identifying noise related sleep disturbance effects, often a key community concern for increases in noise levels. This metric is typically used within the State of California for noise analyses and CEQA-compliant documents.
- **Day-Night Average Noise Level (L_{dn})** is a 24-hour average L_{eq} with a 10 dBA "weighting" or "penalty" during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}. This metric is typically used by Federal agencies (e.g., Federal Aviation Administration [FAA]) for noise analyses and National Environmental Policy Act (NEPA) compliant environmental documentation.
- **Minimum Instantaneous Noise Level (L_{min})** is the minimum instantaneous noise level experienced during a given period.
- **Maximum Instantaneous Noise Level (L_{max})** is the maximum instantaneous noise level experienced during a given period.

Table 3.11-1. Representative Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Power saw	—110—	Rock band
Jet fly-over at 100 feet		Crying baby
Subway	—100—	
Gas lawnmower at 3 feet		
Rail transit horn / tractor	—90—	
Jack hammer		Food blender at 3 feet
Rail transit at-grade (50 miles per hour [mph])	—80—	Garbage disposal at 3 feet
Noisy urban area during daytime		
Gas lawnmower at 100 feet	—70—	Vacuum cleaner at 10 feet
Rail transit in station / commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	—60—	Sewing machine
Air conditioner		Large business office
Quiet urban area during daytime	—50—	Dishwasher in next room
		Refrigerator
Quiet urban area during nighttime	—40—	Theater, large conference room (background)
Quiet suburban area during nighttime		
	—30—	Library
Quiet rural area during nighttime		Bedroom at night, concert hall (background)
	—20—	
		Broadcast / recording studio
	—10—	
Lowest threshold of human hearing	—0—	Lowest threshold of human hearing

Source: California Department of Transportation (Caltrans) 1998.

Noise levels from a source attenuate (i.e., decline) as distance to the receptor increases. Other factors, such as the weather and reflecting or shielding by buildings or other structures, may intensify or reduce the noise level at a location. A common method for estimating roadway noise is that for every doubling of distance from the source, the noise level is reduced by approximately 3 dBA at acoustically "hard" locations (i.e., mostly asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically "soft" locations (i.e., exposed soil or landscaping, such as grass).

Noise from stationary sources – including construction-related noise – is reduced by approximately 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels may also be reduced by intervening structures; generally, a single row of buildings

between the receptor and the noise source reduces the noise level by approximately 5 dBA, while a solid wall or berm can reduce noise levels by up to 5 to 10 dBA. The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior noise reduction of newer residential units is generally 30 dBA or more (FTA 2018).

Vibration

Vibration is sound radiated through the ground. Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment and traffic on rough roads. If a road is smooth (e.g., newly constructed or newly re-paved), the ground-borne vibration from traffic is rarely perceptible. The vibration of floors and walls may cause perceptible vibration, rattling of items such as windows or dishes on shelves, or a rumble noise. The rumble is the noise radiated from the motion of the room surfaces. In essence, the room surfaces act like an amplifier causing what is called *"ground-borne noise."* Ground-borne vibration rarely disturbs people in outdoor settings. Although the motion of the ground may be perceived, without the effects associated with the shaking of a building, the motion does not provoke the same adverse human reaction. In addition, the rumble noise that usually accompanies the building vibration is perceptible only inside buildings. Typically, ground-borne vibration generated by manmade activities attenuates rapidly with distance from the source of the vibration. Man-made vibration issues are therefore usually confined to short distances from the source.

Service vehicles, such as delivery trucks and garbage trucks can generate ground-borne vibration in the vicinity of the Project site.

The ground motion caused by vibration can be measured as peak particle velocity (ppv) in inches per second (in/sec) (FTA 2018; Caltrans 2013). The vibration level at which continuous or frequent vibration is strongly perceptible is 0.1 in/sec. For transient ground-borne vibration (i.e., a single isolated vibration event), 0.035 in/sec is barely perceptible while 2.0 in/sec is felt severely (Caltrans 2013). Potential structural damage from ground-borne vibration, whether transient or continuous, is rare. The thresholds for potential structural damage to fragile buildings from

transient or continuous vibration events are 0.2 in/sec and 0.1 in/sec, respectively. New residential structures are less likely to have structural damage from transient or continuous vibration events which corresponds to threshold criteria of 2.0 in/sec and 0.5 in/sec, respectively.

3.11.2 Environmental Setting

Land uses within Redondo Beach and Torrance include a range of residential, commercial, institutional, and recreational open space areas that are common to urbanized coastal areas in Southern California (refer to Section 3.10, *Land Use and Planning*). The Project site is located along the border of Redondo Beach and Torrance, which includes primarily single-family and multi-family residential development as well as some neighborhood-serving commercial retail, restaurants, and fitness studios. Noise sources associated with these uses include, but are not limited to, the following: exposed mechanical equipment (e.g., heating, ventilation, and cooling [HVAC] equipment, elevator shafts, etc.); delivery, loading, and garbage truck operations; and other minor noise sources associated with restaurant, retail, and residential uses (e.g., amplified music, talking, etc.).

The ambient noise environment in the vicinity of the Project site is typical of an urban area, influenced by a variety of human-caused sources of noise typical for urban areas, most notably vehicular traffic on local roadways, along with occasional aircraft overflights, and activities associated with commercial businesses. The primary source of noise in the vicinity of the Project site is vehicle traffic, including passenger vehicles, buses, motorcycles, and trucks. Traffic noise is primarily generated on nearby arterial streets such as North Prospect Avenue and Beryl Street. Pacific Coast Highway (PCH) and 190th Street are additional sources of vehicle noise and are located to the west and north of the Project site, respectively. The high volume of daily vehicle trips along PCH is a large source of vehicle noise; however, PCH is located approximately 0.5 miles from the Project site, with many residential homes and other development acting as sound barriers, which contain the noise generated and limit the area affected by this noise source.

Towers Elementary School and Beryl Heights Elementary School are located 350 feet and 905 feet from the Project site, respectively. Noise associated with schools includes bells (e.g., attendance and dismissal), children's voices from recess/outdoor play areas, and vehicular traffic during student pick-up and drop-off times.

Noise sources along Beryl Street include the Redondo Village Shopping Center, Dominguez Park, and Towers Elementary School (left). The outdoor play area associated with Beryl Heights Elementary School (right) generates noise along Maria Avenue, which is three streets west of the Project site.

Additionally, construction projects in Redondo Beach and Torrance also generate construction noise, particularly during weekdays between the standard construction hours identified in Redondo Beach Noise Regulations (RBMC Section 4-24) and Torrance Noise Regulations (TMC Section 6-46). For example, recently completed construction along Flagler Lane from Beryl Street to 190th Street to the north of the Project site contributed to the ambient noise environment in the immediate vicinity of the Project site. (For a complete list of cumulative projects in the cities, refer to Tables 3.0-1, 3.0-2, 3.0-3, and 3.0-4.)

The Project site is bounded by North Prospect Avenue to the west and south, the Redondo Village Shopping Center and Beryl Street to the north, and Flagler Lane, Flagler Alley, and Diamond Street to the east. The Project site fronts two busy streets in Redondo Beach, North Prospect Avenue, and Beryl Street. North Prospect Avenue between Anita Street and PCH is identified in the Redondo Beach General Plan Noise Element as a major street with peak period noise exposure levels between 71 and 75 dBA and generating ambient L_{dn} noise levels ranging between 66 and 70 dBA. As such, North Prospect Avenue adjacent to the Project site is identified in the Redondo Beach General Plan Noise Element as a single-family residential area that exceeds State exterior noise guidelines established in Land Use Compatibility for Community Noise Environments (see Section 3.11.3, *Regulatory Setting*). Beryl Street and Diamond Street were identified as generating ambient L_{dn} noise levels ranging between 60 and 65 dBA (City of Redondo Beach 2008b).

The single-family residential neighborhood located immediately east of the Project site within West Torrance is subject to an average ambient noise level of 60 dBA CNEL, according to the Torrance General Plan Noise Element (City of Torrance 2010).

Bus service in the vicinity (within 0.5 miles) of the Project site is provided by Beach Cities Transit Line 102 (see Section 3.14, *Transportation*). The northbound line has three bus stops adjacent to

the Project site: one stop at the campus's southern secondary vehicle entrance (approximately 100 feet north of the North Prospect Avenue & Diamond Street intersection), and two stops along the southern side of Beryl Street, at the Shell gas station and just west of Flagler Lot. The southbound line has two bus stops adjacent to the Project site: one bus stop along the western side of North Prospect Avenue across the street of the campus's main entrance, and one stop along the northern side of Beryl Street across from Flagler Lot. The buses along this transit line are a source of traffic noise.

Redondo Beach Fire Department (RBFD) records indicate that a total of 451 emergency medical service (EMS) calls were dispatched to the Beach Cities Health Center between January 2015 and July 2019, with an average of 98 calls per year and 8 calls per month (see Table 3.11-2).

Table 3.11-2. EMS Calls for the BCHD Campus (2015-2019)

Period	EMS Calls Per Year	Average EMS Calls Per Month
2019 (January – July)	53	7.6
2018 (January – December)	102	8.5
2017 (January – December)	101	8.4
2016 (January – December)	92	7.7
2015 (January – December)	103	8.6
Average	98	8.2

Notes: Refer to Section 3.13, *Public Services* for additional details regarding EMS calls to the BCHD campus.
Source: RBFD 2019.

During incident responses, the typical practice for emergency vehicles is to break traffic at intersections and use sirens – at the discretion of the driver – to warn other drivers of the emergency vehicle approach when traffic is congested. However, emergency vehicles typically do not engage sirens unless necessary along congested roadways or congested intersections. Responses to nighttime emergency calls can routinely occur without the use of sirens due to the limited nighttime traffic. Approximately 13 percent of the 451 EMS calls dispatched to the Beach Cities Health Center between January 2015 and July 2019 were nighttime (i.e., between 10:00 p.m. and 7:00 a.m.) calls. When sirens are necessary for an emergency response, they typically emit noise at a magnitude of approximately 100 dBA at 100 feet. A decrease of about 3 dBA occurs with every doubling of distance from a mobile noise source; therefore, during a response requiring sirens, residences along North Prospect Avenue and Beryl Street experience peak short-duration exterior noise levels ranging from 91 to 100 dBA. Because emergency vehicle response is rapid by nature, the duration of exposure to these peak noise levels is estimated to last for a maximum of 10 seconds, depending on traffic.

The primary source of noise within the Project site is from the parking areas on-site, which are surface parking lots along the boundaries of the campus, the subterranean parking garage that fronts 520 North Prospect Avenue, and the above ground parking structure located at 512 North Prospect Avenue. Noise from the parking areas generally consists of sporadic noises from vehicles arriving and departing, tire squeals, car alarms, opening and closing of car doors, and people's voices. Variation in sound levels depends on factors such as the number of vehicles moving though the structure at any given time (e.g., weekday versus weekend), and the unpredictable nature of noise sources (e.g., car alarms). Additionally, many of the existing structures on the Project site have HVAC systems, which generate a continuous low humming noise. Natural sources of sound (e.g., wind blowing through trees and vegetation and birds) also contribute to the ambient noise environment in the vicinity of the Project site.

The BCHD campus includes five buildings as well as surface parking lots, a subterranean parking garage, and an above ground parking garage, which generate vehicle-related noise.

To identify representative noise levels around the Project site, daytime noise measurements were taken at seven locations including the streets on all sides of the Project site (i.e., North Prospect Avenue, Beryl Street, Flagler Lane, Flagler Alley, and Diamond Street) and along the proposed construction haul routes (i.e., 190th Street and Del Amo Boulevard) (see Figure 3.11-1). Noise levels were measured using a Quest Technologies 2200 Type I Integrating Sound Level Meter, which satisfies the American National Standards Institute (ANSI) Specifications for Integrating-Averaging Sound Level Meters for use in general environmental noise measurement. Measurements were taken during 10-minute intervals between 7:00 a.m. and 9:00 a.m. AM peak period and between 4:00 p.m. and 6:00 p.m. PM peak period (see Table 3.11-3).

Table 3.11-3. Existing Noise Levels Measured in the Project Vicinity (dBA)

		North Prospect Avenue	Diamond Street	Flagler Alley	Flagler Lane	Beryl Street	Mildred Avenue	Del Amo Blvd	190th Street
		Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8
AM Peak	L_{eq}	64.3	56.7	47.1	59.3	66.6	58.9	69.9	70.2
	L_{max}	77.1	66.2	56.2	72.3	82.1	69.1	80.5	79.6
	L_{min}	47.8	44.8	43.4	53.2	52.6	43.3	49.6	47.9
PM Peak	L_{eq}	68.8	55.3	49.4	61.5	64.2	53.0	70.4	71.5
	L_{max}	85.2	64.6	65.9	72.7	76.4	66.3	82.3	85.7
	L_{min}	49.8	46.8	44.2	54.8	51.6	42.6	48.9	47.3

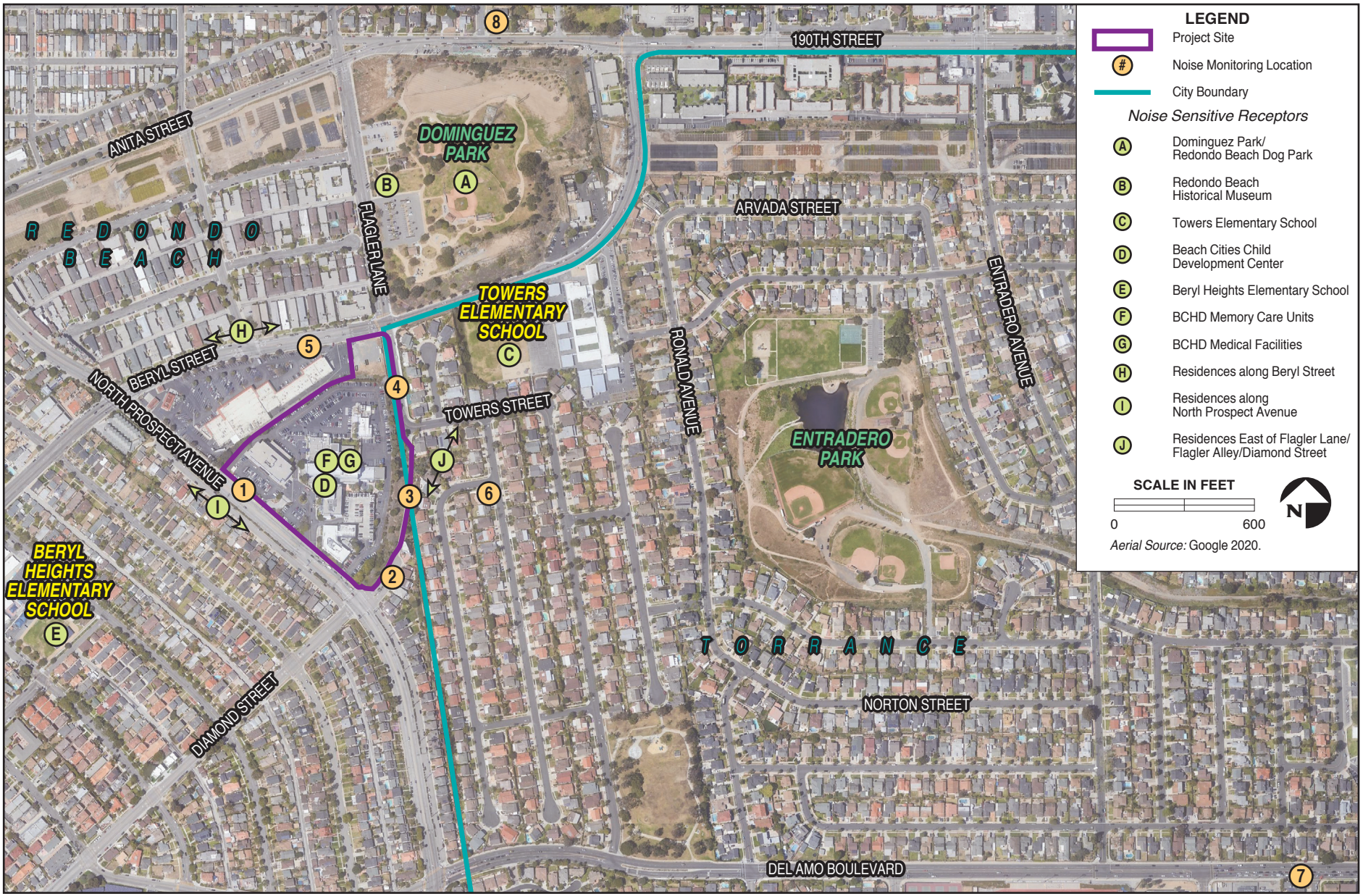
Notes: See Appendix I for noise monitoring results.

The highest measured noise levels were recorded along Del Amo Boulevard and 190th Street (Sites 7 and 8), with maximum sound levels during the AM and PM peak periods of 82.3 dBA and 85.7 dBA, respectively. Flagler Alley and Mildred Avenue (Sites 3 and 6) generally have lower noise levels, with maximum noise levels during the AM and PM peak periods of 65.9 dBA and 69.1 dBA, respectively. These noise levels are characteristic of a high-activity suburban area. Existing daytime noise levels were calculated using the data collected during noise monitoring as well as the highest recorded traffic volumes on the surrounding roadways to provide the most conservative value for ambient L_{eq} noise levels and presented in Table 3.11-4. Thus, the ambient noise levels are also reflective of roadway traffic noise.

Table 3.11-4. Daytime and 24-hour Average Noise Levels in the Project Vicinity

Street	Daytime Noise Level				24-hour Average Noise Level[1,2] (L_{dn})
	AM Peak Period (L_{eq} 1-hour)	Mid-day[1] (L_{eq} 1-hour)	PM Peak Period (L_{eq} 1-hour)	Ambient (L_{eq} 15-hour)	
Beryl Street	67	64	64	64	63
Diamond Street	57	54	55	54	53
Flagler Lane	59	59	62	59	58
Flagler Alley	47	46	49	46	45
North Prospect Avenue	64	66	69	66	65

Notes:
[1]Assumed daytime non-peak period traffic noise level was 3 dBA less than highest peak period traffic noise level (a 50 percent reduction in non-peak period traffic).
[2]Assumed nighttime noise level was 5 dBA less than daytime non-peak period traffic noise level consistent with the Redondo Beach Permissible Noise Levels as presented in Table 3.11-9.



wood.

Noise Monitoring Locations and Sensitive Receptors

FIGURE 3.11-1

Noise and Vibration Sensitive Receptors

The Redondo Beach General Plan Noise Element defines noise-sensitive uses as schools, libraries, health care facilities, and residential uses. Land uses identified by the Torrance General Plan Noise Element (2010) as noise-sensitive land uses include schools, hospitals, churches, and residential neighborhoods. Other noise-sensitive may include museums, libraries, and parks. Noise-sensitive land uses near to the Project site are shown in Figure 3.11-1 and are listed in Table 3.11-5.

Noise sensitive land uses in the vicinity of the Project site include the residential buildings adjacent to the Project site across North Prospect Avenue, Beryl Street (left), Flagler Lane, Flagler Alley, and Diamond Street. Dominguez Park (right) is a public park located across Beryl Street and Flagler Lane from the Project site.

The nearest schools to the Project site are the Beach Cities Child Development Center (located on-site), Towers Elementary School, and Beryl Heights Elementary School (see Table 3.11-5). Other schools located greater than 1,000 feet from the Project site include Redondo Shores High School, Redondo Beach Learning Academy, Redondo Union High School, Jefferson Elementary School, Parras Middle School, Our Lady of Guadalupe School, Valor Christian Academy, and West High School.

The nearest recreational space to the Project site is Dominguez Park, which is located immediately northeast across the intersection of Beryl Street & Flagler Lane (see Table 3.11-5). Other recreational areas in the vicinity of the Project site, but located greater than 1,000 feet from the BCHD campus include Sunnyglen Park, Entradero Park, Perry Allison Playfield, Sea Hawk Stadium, Moondust Parkette, and Edith Rodaway Friendship Park.

Table 3.11-5. Noise-Sensitive Land Uses within 1,000 Feet of the Project Site

Sensitive Receptor	Address	Distance and Direction	Use
Beach Cities Child Development Center	514 North Prospect Avenue, Redondo Beach	On the Project site	Preschool
Silverado Beach Cities Memory Care Community	514 North Prospect Avenue, Redondo Beach	On the Project site	60 Memory Care residential units for patients with Alzheimer's or other type of dementia
Outpatient Medical Facilities	510, 514, and 520 North Prospect Avenue, Redondo Beach	On the Project site	Outpatient medical facility
Residences east of Flagler Lane/Flagler Alley/Diamond Street	Flagler Lane/Flagler Alley/Diamond Street	80 feet East	Single-family residences
Residences along Beryl Street	Beryl Street	80 feet North	Multi-family residences
Residences along North Prospect Avenue	North Prospect Avenue	110 feet South and West	Single-family residences
Dominguez Park/Redondo Beach Dog Park	200 Flagler Lane, Redondo Beach	112 feet Northeast	Public park with a little league field, play structures, and a dog park
Towers Elementary School	5600 Towers St, Torrance	350 feet East	Elementary school
Morrell House and Queen Anne House at Dominguez Park	302 Flagler Lane, Redondo Beach	600 feet North	Historic houses showcasing local memorabilia
Beryl Heights Elementary School	920 Beryl St, Redondo Beach	905 feet West	Elementary school

Vibration senstive land uses are affected by construction activity in the cities as well as traffic and transportation vehicles, especially heavy-duty vehicles (e.g., delivery trucks) on local roadways. Vibration sensitive land uses, including historic buildings, are typically more structurally fragile due to older building materials and techniques. The vibration sensitive land uses nearest to the Project site are the locally designated landmarks shown in Figure 3.11-1 and are listed in Table 3.11-6 (refer also to Section 3.4, *Cultural Resources and Tribal Cultural Resources*).

Table 3.11-6. Vibration Sensitive Structures within 1,000 Feet of the Project Site

Sensitive Receptor	Address	Distance and Direction	Use
Morrell House and Queen Anne House at Dominguez Park	302 Flagler Lane, Redondo Beach	600 feet North	Historic houses showcasing local memorabilia

3.11.3 Regulatory Setting

Various standards have been developed to address the compatibility of land uses and noise levels. The applicable standards are presented in the following discussion. Special emphasis is placed on land uses that are noise sensitive.

Federal Regulations

No Federal noise requirements or regulations apply to local actions of Redondo Beach and Torrance. However, Federal regulations influence the audible landscape where Federal funding is involved. For example, FHWA requires abatement of highway traffic noise for highway projects through rules in Title 23 of the Code of Federal Regulations (CFR) Part 772.

State Policies and Regulations

California Air Resources Board Anti-Idling Measure

In 2004, the California Air Resource Board (CARB) adopted an Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling (Title 13 of the California Code of Regulations [CCR] Section 2485). The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. This measure does not allow diesel-fueled commercial vehicles to idle for more than 5 minutes at a time at a location, thereby minimizing vehicle noise from idling vehicles (refer to Section 3.2, *Air Quality*).

Title 24 of the California Building Standards Code

Title 24 of the CCR includes Sound Transmission Control requirements that establish uniform minimum noise insulation performance standards for new hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family units. Specifically, Title 24 states that interior noise levels attributable to exterior sources shall not exceed 45 dBA CNEL in any habitable room of new dwellings. As established in the State of California Department of Health and Safety's Land Use Compatibility for Community Noise Environments, the highest recommended *"normally acceptable"* exterior noise level exposure is 60 dBA CNEL for single-family residential

and 65 dBA CNEL for multi-family residential. The highest recommended *"normally acceptable"* exterior noise level exposure is 70 dBA CNEL for commercial, institutional, and public/government uses. Where such units are proposed in areas subject to exterior noise levels greater than 60 dBA CNEL, the standards require an acoustical analysis demonstrating how dwelling units have been designed to meet the interior standard. Dwellings are to be designed so that interior noise levels would meet this standard for at least 10 years from the time of a building permit application.

California Department of Transportation

The Caltrans Transportation and Construction Vibration Guidance Manual provides guidance and procedures that *"should be treated as screening tools for assessing the potential for adverse vibration effects related to human perception, structural damage, and equipment. This document is not an official policy, standard, specification, or regulation, and should not be used as such"* (Caltrans 2013).

The Caltrans vibration criteria for assessing structural damage and human perception are shown in Table 3.11-7 and Table 3.11-8, respectively.

Table 3.11-7. Caltrans Vibration Structural Damage Potential Criteria

Structure and Condition	Transient Sources (Maximum PPV [in/sec])	Continuous/Frequent Intermittent Sources (Maximum PPV [in/sec])
Extremely fragile historic buildings, ruins, and monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Caltrans 2013.

Table 3.11-8. Caltrans Vibration Perception Potential Criteria

Level of Perceptibility	Transient Sources (Maximum PPV [in/sec])	Continuous/Frequent Intermittent Sources (Maximum PPV [in/sec])
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Caltrans 2013.

Regional Policies and Regulations

Los Angeles County Code – Vibration Standards

Redondo Beach and Torrance have no vibration regulations; however, vibration is addressed in Chapter 12.08 of the County of Los Angeles Code. This chapter prohibits the operating of any device that creates vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet from the source if on a public space or right-of-way. The perception threshold is defined as a motion velocity of 0.01 in/sec over the range of 1 to 100 Hz.

City of Redondo Beach Local Policies and Regulations

Redondo Beach General Plan Noise Element

The Redondo Beach General Plan Noise Element establishes acceptable noise levels for various land uses, with emphasis on requirements for residential areas and other sensitive noise receptors, such as hospitals and schools. In addition, the Noise Element provides guidelines for determining project impacts and CNEL guidelines for noise/land use compatibility. The Noise Element contains the following goals and policies that are applicable to the proposed Project:

Objective 10.3: Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, and visitors of the community.

Policy 10.3.2 Implement requirements under Title 24 of the California Building Code to ensure that interior noise levels attributable to exterior sources shall not exceed an L_{dn} of 45 dBA in any habitable room within new hotels, motels, dormitories, long-term care facilities,

apartment houses, and dwellings other than detached single-family units.

Policy 10.3.4 Prohibit the development of new industrial, commercial, or related land uses or the expansion of existing land uses when it can be demonstrated that such new or expanded land uses would be directly responsible for causing overall (ambient) noise levels to exceed an L_{dn} of 65 dBA exterior upon areas containing housing, schools, health care facilities, or other "noise-sensitive" land uses (as determined by the City of Redondo Beach).

Policy 10.3.5 Encourage "noise sensitive" land uses, including schools, libraries, health care, facilities, and residential uses, to incorporate fences, walls, landscaping, and/or other noise buffers and barriers, where appropriate and feasible to do so.

Objective 10.5: Minimize noise spillover or encroachment from commercial and industrial uses into adjoining residential neighborhoods or "noise-sensitive" uses.

Policy 10.5.2 Require that all parking areas for commercial and industrial land uses abutting residential areas be buffered and shielded by walls, fences, or adequate landscaping.

Policy 10.5.3 Require that all parking structures serving commercial and industrial land uses be designed to minimize the potential noise impacts of vehicles using these facilities both onsite and on adjacent land uses or properties. The design measures used may include: 1) the use of materials which mitigate sound transmission; or 2) the configuration of interior spaces to minimize sound amplification and transmission.

Objective 10.7: Minimize the impacts of construction noise on adjacent uses.

Policy 10.7.1 Ensure that the prohibitions relative to legal hours of operation for construction activities contained within the existing City of Redondo Beach Noise Ordinance and/or any future/revised Noise Ordinance be adhered to and enforced.

Policy 10.7.2 Require that construction activities adjacent to residential land uses and dwelling units be regulated, as necessary, to prevent the generation of adverse and/or excessive noise impacts.

Policy 10.7.3 Require that construction activities employ feasible and practical techniques and practices which minimize the generation of adverse and/or excessive noise impacts on adjacent land uses.

Redondo Beach Municipal Code

The RBMC, under Title 4 Chapter 24, Noise Regulation (effective August 11, 1976), provides the local government ordinance relative to community noise level exposure, guidelines, and regulations. The ordinance establishes local noise limits by setting out a series of permissible exterior sound levels by land use categories (for sensitive receptors only). These limits differ between daytime hours (7:00 a.m. to 10:00 p.m.) and nighttime hours (10:00 p.m. to 7:00 a.m.), with the nighttime being more restrictive. The RBMC states that *"no person may operate, or cause to be operated, any source of sound at any location within the City or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person which causes the noise level when measured on any other property to exceed"* the assigned noise levels for the various land use categories shown in Table 3.11-9 (RBMC Section 3-24.301). Where the land use borders another land use category, the lower land use category limit is increased by 5 dBA. However, where actual ambient noise levels exceed the presumed ambient noise levels in the RBMC, the allowable noise exposure standard shall be increased in 5 dBA increments as appropriate to encompass or reflect such ambient noise level. For these regulations, Redondo Beach uses the L_{eq} metric based upon the Noise Element (Table 50). These levels are not applicable to motor vehicles operation on public rights-of-way (RBMC Section 4-24.693) and are not applicable to construction noise levels, which are regulated exclusively by hour of operation limitations contained in RBMC Section 4-24.503.

For operational interior noise, RBMC Section 4-24.401 states that the allowable interior noise level for residential, school, and hospital properties is 40 dBA from 10:00 p.m. to 7:00 a.m. and 45 dBA from 7:00 a.m. to 10:00 p.m. Again, these limits are not applicable to construction noise.

However, Redondo Beach Noise Regulations do limit construction activities to the hours between 7:00 a.m. and 6:00 p.m., Monday through Friday, and the hours between 9:00 a.m. and 5:00 p.m. on Saturday. No construction activity is permitted to occur on Sundays or holidays (RBMC Sections 4-24.503 and 9-1.12).

Table 3.11-9. Redondo Beach Permissible Sound Levels

Land Use Type	Time Period	Permissible Ambient Level (L_{eq})
Exterior		
Low Density Residential (R-1-A, R-1, R-2, P-D-R, P-U-D, Overlay)	7:00 a.m. – 10:00 p.m.	50
	10:00 p.m. – 7:00 a.m.	45
Medium Density Residential (R-3, R-4, P-D-R, P-U-D, Overlay)	7:00 a.m. – 10:00 p.m.	55
	10:00 p.m. – 7:00 a.m.	50
High Density Residential (R-5, R-6, P-D-R, P-U-D, Overlay)	7:00 a.m. – 10:00 p.m.	60
	10:00 p.m. – 7:00 a.m.	55
Commercial/Industrial (NSC, CSC, GC, P-D-C, P-D-I)	7:00 a.m. – 10:00 p.m.	65
	10:00 p.m. – 7:00 a.m.	60
Industrial (P-I)	7:00 a.m. – 10:00 p.m.	70
	10:00 p.m. – 7:00 a.m.	70
Interior		
Residential, Schools, Hospitals	7:00 a.m. – 10:00 p.m.	45
	10:00 p.m. – 7:00 a.m.	40

City of Torrance Local Policies and Regulations

Torrance General Plan Noise Element

The Torrance General Plan Noise Element addresses the issue of noise by identifying sources of noise in the City and providing goals, policies, and programs that ensure that noise from various sources does not create an unacceptable noise environment. The Noise Element establishes policies to guard against creation of new noise/land use conflicts and to minimize the impact of existing noise sources on the community.

The Noise Element's Table N-3, Torrance Noise/Land Use Compatibility Guidelines, specifies exterior and interior noise standards by proposed land use type and proposed density or intensity (see Table 3.11-10). The purpose of the Noise and Land Use Compatibility Guidelines is to serve as guidance criteria for new development to ensure a given land use is compatible with the ambient noise level.

As stated in the Noise Element,

> *"These compatibility criteria serve as guidelines. For example, an acoustical analysis must be prepared when noise-sensitive land uses are proposed within noise impact areas. The analysis must show that the project is designed to attenuate noise to meet the City's noise standards in order to receive approval. If the project design does not meet the noise*

standards, mitigation can be recommended in the analysis. If the analysis demonstrates that the noise standards can be met by implementing the mitigation measures, the project can be approved conditioned upon implementation of the mitigation measures."

Table 3.11-10. City of Torrance Permissible Sound Levels

Land Use Type	Land Use Designations	Permissible Ambient Level (L_{dn} or CNEL)	
		Interior	Exterior[3]
Residential	Low Density Residential Low Medium Density Residential Medium Density Residential	45	60/65[1]
	Medium High Density Residential	45	65/70[2]
	High Density Residential	45	70[1]
Commercial and Office	General Commercial Center	-	70
	Residential Office	50	70
Industrial	Business Park Light Industrial Heavy Industrial	55	75
Public and Medical Uses	Public/Quasi-Public/Open Space	50	65
	Hospital/Medical	50	70
Airport	Airport	-	70

Notes:
[1]The normally acceptable standard is 60 dBA. The higher standard is acceptable subject to inclusion of noise-reduction features in project design and construction.
[2]Maximum exterior noise levels up to 70 dBA CNEL are allowed for Multiple-Family Housing.
[3]Regarding aircraft-related noise, the maximum acceptable exposure for new residential development is 60 dBA CNEL.
Source: City of Torrance 2010.

Torrance Municipal Code

Noise from construction activities is regulated in TMC Section 6-46.3.1 (Construction of Buildings and Projects). It is unlawful for any person in Torrance to operate power construction tools, equipment, or engage in the performance of any outside construction or repair work on buildings, structures, or projects in or adjacent to a residential area involving the creation of noise beyond 50 dBA as measured at property lines, except between the hours of 7:30 a.m. and 6:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. on Saturdays. Construction is prohibited on Sundays and holidays observed by Torrance, with the exception of between the hours of 10:00 a.m. to 4:00 p.m. for homeowners that reside at the property.

Additionally, heavy construction equipment such as pile drivers, mechanical shovels, derricks, hoists, pneumatic hammers, compressors, or similar devices are prohibited to operate at any time within or adjacent to a residential area without first obtaining permission from the Community

Development Director to do so. Such request for permission shall include a list and type of equipment to be used and the requested hours and locations of its use, and the applicant shall be required to show that the selection of equipment and construction techniques has been based on minimization of noise within the limitations of such equipment as is commercially available or combinations of such equipment and auxiliary sound barriers. Such permission to operate heavy construction equipment will be revoked if operation of such equipment is not in accordance with the approval of the Community Development Director (TMC Section 6-46.3.1).

Whereas the noise standards of the Noise Element are primarily used to ensure noise/land use compatibility with ambient noise levels, which are dominated by transportation noise sources, the noise regulations in the TMC are used to regulate noise from local onsite noise sources, such as mechanical equipment or event noise. TMC Division 4, Public Health and Welfare, Chapter 6, Noise Regulation, establishes noise level limits in most residential areas of 50 to 55 dBA between 7:00 a.m. and 10:00 p.m., and 45 to 50 dBA between 10:00 p.m. and 7:00 a.m., depending on location. The regulations establish regions with differing noise regulations, with the noise standards in Region 4 – where this Project site is located – being the most lenient. As shown in Table 3.11-11, the highest permitted noise level for residences in Region 4 is 55 dBA from 7:00 a.m. to 10:00 p.m. and 50 dBA from 10:00 p.m. to 7:00 a.m. as measured from the residential property line. TMC Section 6-46.7.2 Subsection 3c states that for noises occurring less than 30 minutes per day or less than 6 minutes per night, the highest allowable noise level is adjusted upward by 15 dBA (i.e., for Region 4, 70 dBA from 7:00 a.m. to 10:00 p.m. and 65 dBA from 10:00 p.m. to 7:00 a.m.).

Table 3.11-11. Torrance Municipal Code Noise Regulations

Region of Noise Receiver	Noise Level (dBA)	
	Day	Night
3	50	45
4	55	50

Source: TMC, Division 4, Chapter 6, Article 7, Section 46.7.2.

3.11.4 Impact Assessment and Methodology

Thresholds for Determining Significance

The following thresholds of significance are based on Appendix G of the 2020 CEQA Guidelines. For purposes of this EIR, implementation of the proposed Project may have a significant adverse impact on noise if it would do any of the following:

a) The project would generate a substantial temporary or permanent increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b) The project would generate excessive ground-borne vibration or ground-borne noise levels.

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

Screened-Out Threshold(s):

- Threshold (c) (*Private Airstrip or Airport Land Use Plan Area*): The Initial Study (IS) (see Appendix A) prepared for the proposed BCHD Healthy Living Campus Master Plan determined that the proposed Project would not result in noise impacts associated with a public airport or private airstrip. The Project site is located approximately 5.75 miles south of the Los Angeles International Airport (LAX) and is not located within an Airport Land Use Plan. Therefore, the proposed Project would not expose people residing or working at the Project site to excessive noise levels from an airport or airstrip. Therefore, for the reasons stated above and as discussed in Section XIII, *Noise and Vibration* of the IS, this issue is not further analyzed in the EIR.

Construction Noise Levels

The timing of construction noise impacts is an important factor in determining significance. In any urban area, residents expect to be exposed periodically to construction noise during normal working hours on weekdays and for more abbreviated periods on Saturdays (and sometimes Sundays). As described in Section 3.11.3, *Regulatory Setting*, construction activities are permitted in Redondo Beach between 7:00 a.m. and 6:00 p.m. on weekdays, and between 9:00 a.m. and 5:00 p.m. on Saturdays (RBMC Sections 4-24.503 and 9-1.12). Similarly, construction activities are permitted in Torrance between 7:30 a.m. and 6:00 p.m. on weekdays, and between 9:00 a.m. and 5:00 p.m. on Saturdays (TMC Section 6-46.3.1). Neither of the local noise ordinances establish quantitative noise limits or other standards for construction. The RBMC and TMC provide noise standards for interior and exterior levels in residential areas; however, these noise standards do not apply to construction activities (refer to Section 3.11.3, *Regulatory Setting*).

Neither Redondo Beach nor Torrance have established standards or thresholds for evaluating the environmental impacts of construction noise. Recent EIRs prepared by the City of Redondo Beach have relied on the City of Los Angeles CEQA Guidelines (2006) significance threshold for

construction noise, while recent EIRs prepared by the City of Torrance have applied thresholds based in part upon Table N-2 of the General Plan Noise Element.[1] However, these thresholds differ and, given the location of the Project site within Redondo Beach and partially within City of Torrance right-of-way, BCHD has elected to identify a standardized threshold that is applicable across all local jurisdictions (i.e., it does not rely on a single city's general plan). For that reason, the Detailed Analysis Construction Noise Criteria presented in the FTA's Transit Noise and Vibration Impact Assessment Manual Guidelines will be considered in this EIR based on the reasonable criteria for assessment and if exceeded, could result in adverse community reaction (FTA 2018; see Table 3.11-12). As discussed further below, both cities use the FTA's Transit Noise and Vibration Impact Assessment Manual for the assessment of physical impacts associated with ground-borne vibration, which further supports the suitability of these criteria.

In the absence of an established construction noise level criteria, the FTA has stated that an 8-hour L_{eq} of 80 dBA and a 30-day average of 75 L_{dn} is a reasonable criterion for assessment of construction activities on residential land use (FTA 2018). The FTA asserts that project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. The metric L_{eq} shall be used to assess construction noise, and this unit of measurement is appropriate because L_{eq} can be used to describe:

- Noise level from operation of each piece of equipment separately, and noise levels can be combined to represent the noise level from all equipment operating during a given period;
- Noise level during an entire phase; and,
- Average noise over all phases of the construction.

Given the length of construction associated with the Phase 1 preliminary site development plan and the more general Phase 2 development program, the noise metric L_{dn}, averaged over 30-days was also assessed. A detailed quantitative construction noise assessment utilizing the FHWA Roadway Construction Noise Model and FTA Noise and Vibration Impact Assessment Manual has been completed based on the length of the development programs and the proximity to sensitive receptors.

[1] *"For the purposes of determination of significant impact from temporary construction noise, the City of Torrance applies a threshold of 75 dBA, based in part upon Table N-2 of the General Plan Noise Element."* Solana Residential Development Project Draft EIR (State Clearinghouse [SCH] No. 2017071061).

Table 3.11-12. Construction Noise Impact Criteria for a Detailed Quantitative Construction Noise Assessment

Land Use	L_{eq} (dBA)		L_{dn} (dBA)
	Day	Night	30-day average
Residential	80	70	75
Commercial	85	85	80
Industrial	90	90	85

Source: FTA 2018.

Operational Noise Levels (Permanent Increase in Ambient Noise Levels in Excess of Standards)

With regard to operational noise, RBMC Section 4-24.401 states that the allowable interior noise level for residential properties is 40 dBA from 10:00 p.m. to 7:00 a.m. and 45 dBA from 7:00 a.m. to 10:00 p.m. With regard to exterior noise levels (other than construction noise), RBMC Section 4-24.301 states that no person may operate, or cause to be operated, any source of sound at any location within the City or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person which causes the noise level when measured on any other property to exceed the presumed or actual measured ambient noise level for the various land use categories in RBMC Section 4-24.301.

TMC Section 46.7.2 establishes exterior noise level limits in most residential areas of 50 to 55 dBA between 7:00 a.m. and 10:00 p.m., and 45 to 50 dBA between 10:00 p.m. and 7:00 a.m., depending on location. TMC Ordinance 4-24.509 (Refuse Collection Vehicles) prohibits the operation of refuse collection vehicles between the hours of 7:00 p.m. and 7:00 a.m. in a residential area.

As described in Section 3.11.1, *Fundamentals of Sound and Environmental Noise*, a noise level increase of 3-dBA is barely perceptible to most people, a 5-dBA increase is readily noticeable, and a 10-dBA increase would be perceived as a doubling of loudness (FICUN 1980; FTA 2018). As set forth in the previous discussion of the local policies and regulations, RBMC Section 4-24, where actual ambient noise levels exceed the presumed ambient noise levels in the RBMC, the allowable noise exposure standard shall be increased in 5 dBA increments as appropriate to encompass or reflect actual ambient noise level. Therefore, because actual ambient noise levels exceed the presumed ambient noise levels for the purposes of this EIR, operational noise from the proposed Project would be considered significant if the projected noise levels reach 5 dBA above the ambient noise levels (i.e., readily noticeable).

Ground-borne Vibration

For the purpose of this EIR, guidelines and criteria established by the FTA for impacts to residences and businesses as well as for impacts related to building damage within Redondo Beach and Torrance will be utilized. To assess vibration impacts associated with residences and businesses, the metric Vibration Velocity Level (VdB) is used, and levels correspond to land use category and the number of vibratory events. Construction activities within 200 feet would be potentially disruptive to vibration-sensitive uses (e.g., concert halls, television studios, etc.) (FTA 2018).

Table 3.11-13. Ground-borne Vibration Impact Criteria for General Assessment

Land Use Category	Frequent Events	Occasional Events	Infrequent Events
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB	65 VdB	65 VdB
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

Notes:
"Frequent Events" is defined as more than 70 vibration events of the same source per day.
"Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
"Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day.
This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.
Source: FTA 2018.

When assessing vibration impacts related to buildings damage, the metric PPV (in/sec) is used (FTA 2018). The FTA has established four types of constructed buildings which can withstand varying levels of vibration. As such, the FTA has assigned threshold criteria of PPV where if exceeded, building damage could be expected (see Table 3.11-14).

Table 3.11-14. FTA Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

Source: FTA 2018.

Methodology

Construction Noise Levels

The precise construction timeline for the Phase 1 preliminary site development plan and the Phase 2 development program depends on the timing of entitlements and permit processing. For the purposes of this EIR, construction activity for Phase 1 of the proposed Project is assumed to begin in Spring 2022 and extend over approximately 29 months into the Summer 2024 (refer to Section 2.5.1.6, *Construction Activities*). It is expected that construction activities during the Phase 1 construction time period would include overlapping construction activities including approximately 3 months for soil excavation, grading, and utility work; 7 months for exterior hardscape improvements; 24 months for the construction of the proposed RCFE Building; and 2 months for the demolition of the existing Beach Cities Health Center, including backfill of the existing basement. Phase 2 construction activities would last for a period of 28 months and would be dependent upon the timing of the permit process and financing considerations (refer to Section 2.5.2.4, *Construction Activities*). It is expected that construction activities during the Phase 2 construction time period also would include overlapping activities including approximately 3 months for demolition, soil excavation, grading, and utility work; 27 months for the construction; and 8 months for the hardscape and landscape improvements.

Construction-related noise and ground-borne vibration would be generated by various types of equipment as a result of construction activities anticipated to occur on the Project site. Construction noise levels are estimated based on the anticipated construction equipment inventory, estimated duration of construction, anticipated construction phasing distance, all of which were developed with significant input from construction managers/schedulers at CBRE, and the distance between the construction activities at the Project site and the noise-sensitive land uses (refer to Table 3.11-5).

Construction noise levels at on- and off-site locations were estimated using the FHWA Roadway Construction Noise Model where inputs included distance from construction equipment to receptor, equipment types, and usage factor, which is presented as a percentage of the equipment operating at full power within a given time frame.

As described in Section 3.11.1, *Fundamentals of Sound and Environmental Noise*, noise levels diminish rapidly with distance from the construction site, at a rate of approximately 6 dBA per doubling of distance. This assumption applies only if equipment is generally stationary or confined to specific areas during construction. For example, a noise level of 86 dBA measured at 50 feet from the noise source to the receptor would reduce to 80 dBA at 100 feet from the source to the

receptor, and reduce by another 6 dBA to 74 dBA at 200 feet from the source to the receptor. The construction noise levels at the offsite sensitive uses can be determined with the following equation from FTA's Transit Noise and Vibration Impact Assessment Manual:

$$L_{eq} = L_{eq} \text{ at } 50 \text{ feet} - 20 \text{ Log}(D/50)$$

Where: L_{eq} = noise level of noise source (equipment), D = distance from the noise source to the receiver, L_{eq} at 50 feet = noise level of source at 50 feet.

Table 3.11-15. Noise Ranges of Typical Construction Equipment

Construction Equipment	Noise Levels in dBA L_{max} at 50 Feet
Front loader	73–86
Trucks	82–95
Cranes (moveable)	75–88
Cranes (derrick)	86–89
Vibrator	68–82
Saws	72–82
Pneumatic impact equipment	83–88
Jackhammers	81–98
Pumps	68–72
Generators	71–83
Compressors	75–87
Concrete mixers	75–88
Concrete pumps	81–85
Back hoe	73–95
Tractor	77–98
Scraper/grader	80–93
Paver	85–88

Note: Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.
Source: U.S. Department of Transportation 2013.

Operational Noise Levels

Existing ambient noise levels were measured along the streets in the vicinity of the Project site and along the proposed construction haul routes (refer to Table 3.11-3). Because traffic is the primary component of the noise environment in the vicinity, these measurements are indicative of local roadway noise. Roadway noise associated with the proposed Project was considered in terms of the increases in operational vehicle trips compared to existing conditions. Existing traffic noise was determined based on traffic counts along the roadways in the immediate vicinity of the Project site and subsequent noise modeling. Changes in trip volumes associated with Phase 1 and Phase 2

of the proposed Project were provided by Fehr & Peers in the Transportation Study prepared for the proposed Project (see Appendix K).

With respect to stationary sources of noise, projected noise levels generated from the proposed Project's stationary sources were estimated based on the typical noise levels (dBA) generated from urban noise sources, such as HVAC equipment, delivery trucks, and other common uses (refer to Table 3.11-1). Stationary source noise levels were then estimated for nearby sensitive receptor locations based on the standard point source noise-distance attenuation factor of 6 dBA for each doubling of distance. The distance from the noise-sensitive receptors in the vicinity of the Project site to the noise source (i.e., loudspeaker) from proposed outdoor fitness classes and other community events was measured at the center of the proposed central lawn within the interior portion of the campus.

Ground-borne Vibration Associated with Construction Equipment

Ground-borne vibration levels resulting from construction activities were estimated using FTA-published data (FTA 2018). Potential vibration levels are identified for on- and off-site locations that are sensitive to vibration, including residences and schools. The vibration levels at sensitive uses can be determined with the following equation from the FTA's Transit Noise and Vibration Impact Assessment Manual:

$$Lv\ (D) = Lv\ (25\ feet) - 30Log(D/25)$$

Where: Lv = vibration level of equipment, D = distance from the equipment to the receiver, Lv (25 feet) = vibration level of equipment at 25 feet.

This equation was used to assess vibration calculations with inputs for bulldozer vibration levels from the FTA's Transit Noise and Vibration Impact Assessment Manual. According to the FTA, the vibration levels from a bulldozer are 0.089 PPV and 87 VdB at 25 feet. This was attenuated for distance to the nearest sensitive receptors.

As previously described, the FTA considers construction activities within 200 feet to be potentially disruptive to vibration-sensitive uses (FTA 2018). The Morrell House and Queen Anne House at Dominguez Park are located approximately 600 feet north of the Project site (refer to Table 3.11-6; Section 3.4, *Cultural Resources and Tribal Cultural Resources*). As such, these local landmarks would not be affected by ground-borne vibration associated with construction activities (e.g., bull dozers) associated with the proposed Project. Therefore, impacts to historic buildings or structures associated with construction-related vibration are not discussed further in this EIR.

Operation of the proposed Project – including the residential, medical office, community service, administrative, and restaurant uses – would not be anticipated to generate excessive levels of ground-borne vibration. Occasionally, vibration could occur along adjacent roadways as a result of truck travel to and from the Project site for periodic deliveries; however, no substantial sources of ground-borne vibration would be introduced as part of the proposed Project. Therefore, operation of the proposed Project would not expose sensitive receptors on-site or off-site to excessive ground-borne vibration or ground-borne noise levels and operational sources of ground-borne noise are not discussed further in this EIR.

3.11.5 Project Impacts and Mitigation Measures

Impact Description (NOI-1)

a) The project would generate a substantial temporary or permanent increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

NOI-1 **Construction activities associated with proposed Project – including the Phase 1 preliminary development plan and the more general Phase 2 development program – would result in a temporary, but prolonged increase in noise levels at the following noise-sensitive residential areas: 1) Beryl Street between North Prospect and Flagler Lane; 2) Flagler Lane and Flagler Alley between Beryl Street and North Prospect Avenue; 3) Diamond Street between Flagler Alley and North Prospect Avenue; and, 4) North Prospect Avenue between Diamond Street and Beryl Street. While compliance with the Redondo Beach and Torrance Noise Regulations and implementation of a Construction Noise Management Plan would reduce construction noise, construction noise levels would exceed Federal Transit Administration (FTA) thresholds and this impact would remain *significant and unavoidable* during both Phase 1 and Phase 2 of the proposed Project.**

On-site Construction Noise

Development under the Phase 1 preliminary site development plan would require excavation of approximately 20,000 cubic yards (cy) of asphalt and soil for the subterranean service area and loading dock, followed by the construction of the proposed 203,700-square-foot (sf) RCFE Building, and demolition of the existing 158,000-sf Beach Cities Health Center and 3,200-sf maintenance building. Phase 1 construction would occur over approximately 29 months. Development under the Phase 2 development program would require demolition of the existing

above ground parking structure and potentially the Beach Cities Advanced Imaging Building (510 North Prospect Avenue) as well as excavation of approximately 30,250 cy of asphalt and soil for the subterranean levels of the proposed parking structure. Demolition and excavation activities would be followed by the construction of the proposed Wellness Pavilion, Aquatics Center, and CHF, as well as a 292,500-sf parking structure. Phase 2 construction would occur over 28 months.

All phases of construction would involve the use of heavy equipment (e.g., cranes, tractors, loaders, excavators, etc.) that would produce noise. Construction activities would also involve the use of smaller power tools, generators, and other equipment that generate noise. Construction of the subterranean levels would involve the use of typical *"drill and pour"* cast-in-place concrete piles. Haul trucks used to deliver construction materials and to export soil and demolition debris would generate noise along the local roadways to and from the Project site. Each stage of construction would involve a different mix of operating equipment, and noise levels would vary based on the amount and types of equipment in operation and the location of the activity.

Construction activities would produce increased noise levels that would impact surrounding noise-sensitive receptors. Existing on-site noise-sensitive receptors include the Silverado Beach Cities Memory Care Community, Beach Cities Child Development Center, and outpatient medical facilities. Off-site noise sensitive receptors include single-family residential uses to the south, east, and west, multi-family residences to the north. Additionally, Dominguez Park is located adjacent to the northeast of the Project site and Towers Elementary School is located approximately 350 feet to the east (refer to Table 3.11-5 and Figure 3.11-1). Approximate noise levels anticipated to occur at these nearby noise-sensitive land uses during the Phase 1 and Phase 2 construction activities are presented in Table 3.11-16 and Table 3.11-17, respectively. The metric L_{eq} is used to assess noise levels over the period of the construction day and is the average acoustic energy of noise for a given period. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. Additionally, a 30-day average of the metric L_{dn} is presented to assess prolonged construction activities. L_{dn} is a 24-hour average L_{eq} with a 10 dBA *"weighting"* or *"penalty"* during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn} Some construction activities would overlap resulting in increased noise levels. Noise levels presented represent conservative estimates where construction activities might only overlap for a few weeks. Distances from construction activities to sensitive receptors were measured from the boundary of the Project site and nearest the specific phase development to the closest sensitive receptor.

Table 3.11-16. Phase 1 Estimated Construction Noise Levels at Sensitive Receptors

Construction Activity	West Torrance Residences adjacent to Flagler Alley (80 feet)		West Torrance Residences adjacent to Flagler Lane (80 feet)		Redondo Beach Residences along Beryl Street to the North (110 ft)		Redondo Beach Residences along North Prospect Avenue (260 ft)		Redondo Beach Residences along Diamond Street (290 ft)		Towers Elementary School to the East (350 feet)		On-site Beach Cities Health Center Memory Care/ Child Care Facilities (200 feet)	
	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}
Excavation/ Shoring	85	77	85	79	82	77	75	71	74	69	72	68	72*	69
Foundations	85	77	85	79	82	77	75	71	74	69	72	68	72*	69
Structural	86	78	86	80	83	78	76	76	75	69	73	68	73*	70
External Finishing	87	79	87	80	84	79	76	76	75	69	74	69	74*	70
Demolition	85	77	85	79	82	77	75	71	74	69	72	68	72*	69
Exceeds L_{eq} Threshold of 80 dBA?	**Yes**		**Yes**		**Yes**		**No**		**No**		**No**		**No**	
Exceeds 30-day avg. L_{dn} Threshold of 75 dBA?		**Yes**		**Yes**		**Yes**		**Yes**		**No**		**No**		**No**

Note: Noise levels at off-site sensitive uses were determined with the following equation from the FTA Transit Noise and Vibration Impact Assessment Manual: $L_{eq} = L_{eq}$ at 50 feet. – 20 Log(D/50), where L_{eq} = noise level of noise source, D = distance from the noise source to the receiver, L_{eq} at 50 feet = noise level of source at 50 feet. The highest L_{eq} noise levels during each construction phase are used for a conservative analysis. Noise levels have been rounded up to the nearest whole number.
Assumed Torrance Towers Elementary School has the same daytime/nighttime L_{eq} as Flagler Lane.
Assumed Memory Care and Child Care facilities has the same daytime/nighttime L_{eq} as North Prospect Avenue.
* Includes 5 dB reduction based of line-of-sight obstruction (Beach Cities Health Center located at 514 North Prospect Avenue) between receptor and Phase 1 project footprint
# for L_{dn} calculation daytime L_{eq} noise levels taken from ambient levels in Table 3.11-4 and nighttime L_{eq} noise levels were assumed 5 dBA below daytime levels.
30-day average includes 26 working days and 4 non-working days.
Sources: FHWA 2008; FTA 2018; U.S. Environmental Protection Agency (USEPA) 1971.

Table 3.11-17. Phase 2 Estimated Construction Noise Levels at Sensitive Receptors

Construction Activity	West Torrance Residences adjacent to Flagler Alley (80 feet)		West Torrance Residences adjacent to Flagler Lane (80 feet)		Redondo Beach Residences along Beryl Street to the North (110 feet)		Redondo Beach Residences along North Prospect Avenue (260 feet)		Redondo Beach Residences along Diamond Street (290 feet)		Towers Elementary School to the Northeast (560 feet)		On-site RCFE Building Assisted Living and Memory Care Facilities (50 feet)	
	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}	L_{eq}	30-day avg. L_{dn}
Demolition/ Excavation	87	79	87	80	79	74*	76	72	75	69	70	66	91	91
Foundations (Building)	87	79	87	80	79	74*	76	72	75	69	70	66	91	84
Structural (Building)	85	77	85	79	77	72*	75	71	74	69	68	64	89	82
External Finishing (Building)	87	79	87	80	79	74*	76	72	75	69	70	66	91	84
Foundations (Parking)	87	79	87	80	79	74*	76	72	75	69	70	66	91	84
Structural (Parking)	87	79	87	80	79	74*	76	72	75	69	70	66	91	84
External Finishing (Parking)	87	79	87	80	79	74*	76	72	75	69	70	66	91	84
Exceeds L_{eq} Threshold of 80 dBA?	**Yes**		**Yes**		**No**		**No**		**No**		**No**		**Yes**	
Exceeds 30-day avg. L_{dn} Threshold of 75 dBA?		**Yes**		**Yes**		**No**		**No**		**No**		**No**		**Yes**

Note: Noise levels at off-site sensitive uses were determined with the following equation from the FTA Transit Noise and Vibration Impact Assessment, Manual: $L_{eq} = L_{eq}$ at 50 feet. – 20 Log(D/50), where Leq = noise level of noise source, D = distance from the noise source to the receiver, L_{eq} at 50 feet = noise level of source at 50 feet. The highest Leq noise levels during each construction phase are used for a conservative analysis. Noise levels have been rounded up to the nearest whole number.
Assume Torrance Towers Elementary School has the same daytime/nighttime L_{eq} as Flagler Lane
Assume Memory Care and Child Care facilities has the same daytime/nighttime L_{eq} as Flagler Lane.
* - includes 5 dB reduction based of line of sight obstruction between RCFE and Beryl Street
# for L_{dn} calculation daytime L_{eq} noise levels taken from ambient levels in Table 3.11-4 and nighttime L_{eq} noise levels were assumed 5 dBA below daytime levels. 30-day average includes 26 working days and 4 non-working days.
Sources: FHWA 2008; FTA 2018; USEPA 1971.

As described in Section 3.11.1, *Fundamentals of Sound and Environmental Noise*, construction noise levels would diminish rapidly with distance from the construction site at a rate of approximately 6 dBA for every doubling of distance at acoustically hard locations. For example, a noise level of 88 dBA measured at 50 feet from the noise source to the receptor would reduce to 82 dBA at 100 feet from the source to the receptor, and reduce by another 6 dBA to 76 dBA at 200 feet from the source to the receptor.

Consistent with RBMC Section 4-24.503 and TMC Section 6-46.3.1, construction activities would be restricted to the hours of 7:30 a.m. to 6:00 p.m. on weekdays and 9:00 a.m. to 5:00 p.m. on Saturdays. No construction activities would occur on Sundays or public holidays.

Based on the FTA's quantitative construction noise impact criteria, the proposed construction activities during both Phase 1 and Phase 2 would have significant impacts to noise-sensitive receptors for the duration of the construction phases, because the projected L_{eq} would exceed the *Residential* criteria (8-hour L_{eq} of 80 dBA and 30-day average L_{dn} of 75 dBA) (refer to Tables 3.11-16 and 3.11-17).

To reduce impacts from construction noise, MM NOI-1 would require the implementation of noise attenuation measures including the use of noise barriers (e.g., sound walls). Noise levels could be reduced by 3 to 15 dBA depending on the type, height, and length of the noise barrier (FTA 2018). Standard noise barriers blocking the line of sight between the noise source and receptor could result in reduction of 6 to 10 dBA if the barrier is placed either close to the source or close to the receptor (FTA 2018). Noise barriers placed at a distance from the source or receptor might only reduce noise levels by 3 dBA even if the line of sight is blocked (FTA 2018). The effectiveness of barriers can be increased by as much as 5 dBA by applying sound-absorbing material to the inner surface of the barrier (FTA 2018).

The proposed RCFE Building constructed during Phase 1 would be 6 stories tall with a finished roof height of 82 feet from the ground surface and rooftop projections (e.g., enclosed cooling towers) that would extend an additional 21 feet to a total height of 103 feet from the existing campus ground surface. Additionally, the proposed parking structure constructed during Phase 2 would rise to a similar height. Table 3.11-18 depicts the various noise barrier height requirements to block the line of sight between construction on specific floors and the nearest sensitive receptors located in Redondo Beach (North Prospect Avenue and Diamond Street) and West Torrance (Flagler Alley).

Table 3.11-18. Noise Barrier Height Requirements to Block the Line of Sight and Reduce Noise Levels in West Torrance

Floor	Max Height of Construction Floor Level (feet)	Barrier at the Edge of BCHD Development Footprint (feet)*	Barrier at the BCHD Property Line (feet)*	Barrier at the West Torrance Property Line (feet)*
1st	18	20	15	20
2nd	31	35	25	20
3rd	44	45	35	20
4th	57	60	40	20
5th	70	75	50	20
6th	82	85	60	20
Rooftop Projections	103	105	70	20

Notes: *approximate
Assumptions:

1) BCHD campus is located approximately 30 feet above the grade of the adjacent West Torrance neighborhood.
2) The 1st story of residential development within West Torrance is blocked by a concrete wall, which would provide noise attenuation. However, the 2nd story windows – located at a height of approximately 15 feet – would be directly impacted to construction noise.
3) The distance of construction activities is approximately 80-feet from the nearest West Torrance residence
4) Noise barrier heights are assumed in 5-foot increments.

The feasibility of noise barrier construction is limited based on engineering variables (e.g., wind load, etc.) and property ownership. Noise barriers are most commonly developed to a height of between 10 and 30 feet. While there have been noise barriers developed to a height of 143 feet to enclose drilling rigs, the base of these enclosures is less than 180 feet by 180 feet and then narrows as height increases (Nederlandse Aardolie Maatschappij 2007). This height is achieved by constructing all four-sides to share equal structural load and withstand winds, up to 78 miles per hour (mph) (Nederlandse Aardolie Maatschappij 2007). For Phase 1 and Phase 2 construction, the necessary noise barrier heights (i.e., up to 105 feet) at the edge of the BCHD development footprint are too great to allow only one- to three-sided barriers and the total building footprint is too large to construct a fully enclosed four-sided noise barrier. Further, the construction of the foundation and framing structure required to support a fully enclosed four-sided noise barrier would result in significant and unavoidable noise impacts to adjacent residential areas in Redondo Beach and West Torrance.

A shorter noise barrier could be constructed at the edge of the sensitive receptors in West Torrance (and similarly in Redondo Beach). However, any such off-site construction of a noise barrier would require approval from the City of Torrance and/or the City of Redondo Beach, which cannot be assured. Additionally, while the construction of a 30-foot-tall noise barrier may be feasible along Flagler Lane and Flagler Alley, a 30-foot noise barrier along Beryl Street and North Prospect Avenue fronting residences may not be feasible.

In an effort to reduce construction noise levels, a 30-foot noise barrier would be erected on BCHD property and encompass the development footprint associated with Phase 1 and Phase 2 of construction. With implementation of a 30-foot noise barrier, sensitive receptors would not be directly impacted by construction noise until development reached a height that exceeded the noise barrier (Table 3.11-19 and Table 3.11-20).

Table 3.11-19. Construction Noise Levels at Sensitive Receptors with a 30-foot Noise Barrier during Phase 1

Receptor	Max Height of Construction Floor for Barrier Reduction	Additional Floors with No Noise Level Reduction	Maximum Construction Daytime L_{eq} without Barrier	Maximum Barrier Reduction Daytime L_{eq}	Minimum Barrier Reduction Daytime L_{eq}
West Torrance/ Flagler Lane	2nd Floor (31 feet)	5	87	72	75
West Torrance Flagler Alley	3rd Floor (44 feet)	4	87	72	82
Redondo Beach/ Beryl Street	4th Floor (57 feet)	3	84	69	77
Redondo Beach/ Diamond Street	3rd Floor (44 feet)	4	75	60	60
Redondo Beach/ North Prospect Avenue	2nd Floor (31 feet)	5	76	61	61
Memory Care/ Child Care	2nd Floor (31 feet)	5	74*	59*	59*
Torrance Towers Elementary School	2nd Floor (31 feet)	5	74	59	59

Notes: Notes: L_{eq} presented are the maximum over the course of the entire phase of construction.
* includes 5 dBA reduction based of line of sight obstruction (Beach Cities Health Center located at 514 North Prospect Avenue) between receptor and Phase 1 project footprint
Assumptions:

1) BCHD campus is located approximately 30 feet above the grade of homes along Flagler Alley and Diamond St.
2) Proposed development across from Beryl St occurs at grade and 30-feet above grade, assume noise-barrier at grade along property line at Beryl St. and barrier at development footprint 30-feet above grade.
3) Noise source height is 15-feet for second story windows/balconies.
4) The distance of construction activities is approximately 80-feet from the nearest West Torrance residence
5) Shielding effect from existing hospital between RCFE development and Memory Care/Child Care

Table 3.11-20. Construction Noise Levels at Sensitive Receptors with a 30-foot Noise Barrier during Phase 2

Receptor	Max. Height of Construction Floor for Barrier Reduction	Additional Floors with No Noise Level Reduction	Construction Daytime L_{eq} without Barrier	Max. Barrier Reduction Daytime L_{eq}	Min. Barrier Reduction Daytime L_{eq}
West Torrance/ Flagler Lane	2nd Floor (31 feet)	5	87	62	62
West Torrance Flagler Alley	3rd Floor (44 feet)	4	87	62	82
Redondo Beach/ Beryl Street	4th Floor (57 feet)	3	79*	64*	64*
Redondo Beach/ Diamond Street	3rd Floor (44 feet)	4	76	61	63
Redondo Beach/ North Prospect Avenue	2nd Floor (31 feet)	5	75	60	63
RCFE Building/ Assisted Living Memory Care	2nd Floor (31 feet)	4	91	76	76
Torrance Towers Elementary School	2nd Floor (31 feet)	5	70	55	55

Notes: L_{eq} presented are the maximum over the course of the entire phase of construction.
* Includes 5 dBA reduction based of line of sight obstruction between RCFE and Beryl Street
Assumptions:

1) BCHD campus is located approximately 30 feet above the grade of homes along Flagler Alley and Diamond Street.
2) Proposed development across from Beryl St occurs at grade and 30-feet above grade, assume noise-barrier at grade along property line at Beryl Street and barrier at development footprint 30-feet above grade.
3) Noise source height is 15-feet for second story windows/balconies.
4) The distance of construction activities is approximately 80-feet from the nearest West Torrance residence.
5) Shielding effect from RCFE to Beryl Street.

Compliance with existing local noise regulations along with the implementation of MM NOI-1 would reduce potential noise impacts; however, *significant and unavoidable* noise impacts would occur through implementation of proposed construction.

Off-site Construction Noise

In addition to construction-related noise generated at the Project site, off-site construction-related noise would be generated by construction-related vehicle trips (i.e., haul trucks, concrete trucks, and construction worker commutes). Project construction would generate additional construction worker commute trips associated with an average of 210 employees per day during Phase 1 (29 months) and 130 employees per day during Phase 2 (28 months). Haul trucks would be used during the site clearing and demolition phases as well as during excavation of the subterranean levels of the proposed RCFE Building during Phase 1 and parking structure during Phase 2. This haul truck

activity would be a source of off-site noise for surrounding sensitive receptors including residences and public open space (e.g., Dominguez Park). The proposed Project would result in up to 78 heavy truck trips per day over a 30-week period in Phase 1 and up to 30 heavy truck trips per day over a 35-week period in Phase 2.

Construction trucks would access the Project site via Interstate (I-) 405 traveling on 190th Street or Hawthorne Avenue to 190th Street and reach the site using Del Amo Street to North Prospect Avenue (refer to Figure 2-13). Trucks would pass by a mix of residential and commercial uses along these routes, including single- and multi-family homes, retail stores, offices, and other uses typically present in urban areas. Roadways along the inbound and outbound haul routes carry substantial volumes of traffic. For example, 190th Street between Rindge Lane and Inglewood Avenue is a four-lane road that carries approximately 40,280 average daily trips (ADT) (City of Redondo Beach 2008a).

Table 3.11-21. Estimated Peak Period Construction Traffic Noise Levels at Sensitive Receptors

Receiver	L_{eq}		
	2020 Noise Levels	2020 Noise plus Phase 1 Construction	2020 Noise plus Phase 2 Construction
North Prospect Avenue	69.5	70.5	70.1
Diamond Street (S)	61.4	62.0	61.7
Diamond Street (N)	57.5	58.0	57.8
Towers Street	60.1	60.4	60.3
Mildred Avenue	55.4	55.9	55.7
Beryl Street (S)	66.2	67.1	67.0
Beryl Street (N)	65.5	66.4	66.0
Del Amo Boulevard	69.9	70.3	70.1
W. 190th Street (W)	69.0	69.2	69.1
W. 190th Street (E)	70.8	70.8	70.8

Notes: 2020 L_{eq} noise levels differ slightly from monitored noise levels included in Table 3.11-3, as these are based on traffic counts used in the Transportation Study (see Appendix K).
Modeled Fleet Mix: 97 percent Auto / 2 percent Medium Truck / 1 percent Heavy Truck. For reference this fleet mix is similar to the assumption in the Draft EIR prepared for the Kensington Assisted Living Facility (SCH No. 203121065).
Source: See Appendix I.

Haul trucks typically generate traffic noise levels of 85 dBA L_{max} at 50 feet (FHWA 2008). Temporary construction-related trips would increase daytime noise by less than 1 dBA on the majority of the streets analyzed (refer to Table 3.11-21). The greatest increase in noise levels from construction-related trips would be an increase of 1 dBA on North Prospect Avenue to 70.8 dBA L_{eq} during Phase 1 construction. Other roadways along the haul route would experience a similar

increase in noise levels. Noise contributions from these haul truck trips would be imperceptible (i.e., less than 3 dBA). In addition, the Construction Traffic and Access Management Plan under MM T-2, would require that construction haul trucks avoid residential neighborhoods to the maximum extent feasible, which would reduce roadway noise levels during construction. Therefore, noise impacts from construction-related vehicle trips would be *less than significant*.

Mitigation Measures (MM)

To further reduce the noise levels resulting from construction of the proposed Project for off-site residential uses, the following mitigation measure would be implemented:

MM NOI-1 ***Construction Noise Management Plan.*** *BCHD shall prepare a Construction Noise Management Plan for approval by the Redondo Beach and Torrance Building & Safety Divisions, in accordance with TMC Section 46.3.1. The Construction Noise Management Plan would address noise and vibration impacts and identify measures that would be used to reduce impacts. At a minimum measures would include:*

- *Construction activities shall be restricted to the hours between 7:30 a.m. and 6:00 p.m., Monday through Friday, or the hours between 9:00 a.m. and 5:00 p.m. on Saturday to the maximum extent feasible, in accordance with RBMC Sections 4-24.503 and 9-1.12 and TMC Section 6-46.3.1.*
- *BCHD and its contractors and subcontractors shall coordinate approvals with the City of Redondo Beach and the City of Torrance and construct noise barriers to reduce noise levels to on- and off-site sensitive receptors, where feasible:*
    - *During Phase 1, noise barriers containing sound-absorbing materials would be constructed to a height that blocks the line-of-sight to sensitive receptors to the maximum extent feasible taking into account environmental constraints (e.g., wind loading, property ownership, etc.).*
    - *During Phase 2, noise barriers containing sound-absorbing materials would be constructed to a height that blocks the line-of-sight to sensitive receptors to the maximum extent feasible taking into account environmental constraints (e.g., wind loading, property ownership, etc.).*

- *BCHD's construction contracts shall require implementation of the following construction best management practices (BMPs) by all construction contractors and subcontractors working in or around the Project site to reduce construction noise levels:*
    - *BCHD and its contractors and subcontractors shall ensure that construction equipment is properly muffled according to manufactures specifications or as required by the Redondo Beach and City of Torrance Building & Safety Division, whichever is the more stringent.*
    - *BCHD and its contractors and subcontractors shall use electrically powered tools and facilities to the maximum extent feasible. Electrical power shall be used to run air compressors and similar power tools and to power any temporary structures, such as construction trailers or caretaker facilities.*
    - *BCHD and its contractors and subcontractors shall place noise-generating construction equipment and locate construction staging areas away from on-site and off-site sensitive uses (e.g., centrally on the existing campus), where feasible, to the satisfaction of the Redondo Beach and Torrance Building & Safety Divisions.*
- *BCHD's construction contracts shall include the requirement that construction staging areas, construction worker parking and the operation of earthmoving equipment within the Project site, are located as far away from noise-sensitive sites as feasible. Contract provisions incorporating the above requirements shall be included as part of the construction documents, which shall be reviewed and approved by the City of Redondo Beach and Torrance Building & Safety Divisions prior to issuance of demolition or grading permits.*
- *BCHD's construction contracts shall include the requirement that haul trucks remain on the designated haul routes identified in the Redondo Beach and Torrance General Plans. Further, haul trucks should attempt to operate in traffic lanes that are located at the greatest distance from sensitive receptors, typically the lane nearest the roadway centerline on a four-lane roadway. Contract specifications shall be included in the proposed Project's construction documents, which shall be reviewed by the Redondo Beach and Torrance Building & Safety Divisions prior to issuance of demolition or grading permits.*

At least 1 month prior to the initiation of construction-related activities during Phase 1 and Phase 2, BCHD shall prepare and distribute notices to residents and businesses located within a 0.25-mile radius of the Project site. At a minimum, the notices shall describe the overall construction schedule, advise residents, business owners, and employees of increased construction-related noise.

During construction, BCHD shall monitor noise and vibration resulting from construction activities to ensure that all noise attenuation measures are implemented as described in the Plan. Further, BCHD shall provide a non-automated telephone number for residents and employees to call to submit complaints associated with construction noise. BCHD shall keep a log of complaints and shall address complaints as feasible to minimize noise issues for neighbors. The Redondo Beach and Torrance Building & Safety Divisions shall require modification to the conditions of the Construction Noise Plan, if necessary, to address non-performance issues.

Residual Impacts

Compliance with the Redondo Beach and Torrance Noise Regulations (RBMC Sections 4-24.503 and 9-1.12 and TMC Section 6-46.3.1, respectively) in conjunction with implementation of MM NOI-1 would reduce construction noise impacts; however, feasible noise barrier heights and locations would not reduce noise levels below the FTA's residential criterion (8-hour L_{eq} of 80 dBA or 30-day average L_{dn} of 75 dBA). Therefore, noise impacts resulting from construction of the proposed Project would be *significant and unavoidable*. See Section 5.0, *Alternatives* for discussion of alternatives to the proposed Project that would substantially reduce this impact.

Impact Description (NOI-2)

b) The project would generate excessive ground-borne vibration or ground-borne noise levels.

NOI-2 **Ground-borne vibration levels generated during construction of the proposed Project – including the Phase 1 preliminary site development plan as well as the more general Phase 2 development program – would be below Federal Transit Administration (FTA) thresholds for on-site construction activities but would exceed FTA thresholds for off-site haul truck operations. Nevertheless, impacts to sensitive receptors associated with construction vibration would be *less than significant*.**

During construction, ground-borne vibration would be generated from the use of heavy construction equipment at the Project site, which could potentially expose existing sensitive land uses in the vicinity to excessive vibration. The duration and amplitude of vibration generated by construction equipment varies widely depending on the type of equipment and the purpose for which it is being used. The vibration levels of bulldozer operations (PPV of 0.089 and VdB of 87 at 25 feet) during site preparation would result in the greatest ground-borne vibration for development of Phase 1. Bulldozer operations would occur at no less than 80 feet to the nearest noise-sensitive use (i.e., single-family residences) within Torrance, and would result in a PPV of 0.016 and VdB of 72. Both PPV and VdB vibration levels would be below FTA impact criteria.

During Phase 2 site preparation, the greatest ground-borne vibration at the Project site would result from bulldozer operations within 120 feet of the nearest noise-sensitive (i.e., single-family residences) in Redondo Beach. Phase 2 bulldozer operations would result in a PPV of 0.008 and VdB of 67 at the nearest noise-sensitive use in Redondo Beach. Both PPV and VdB vibration levels would be below FTA threshold criteria of 0.12 PPV to buildings susceptible to vibration damage and 72 VdB for frequent events to residences or buildings where people normally sleep.

Under both Phase 1 and Phase 2, haul trucks would be used for delivery of materials and removal of soil and debris. Operation of loaded trucks results in PPV of 0.076 and VdB of 86 at a distance of 25-feet. Haul routes along Del Amo Boulevard, North Prospect Avenue, Beryl Street, and 190th Street have residences adjacent to traffic lanes.

Table 3.11-22. Vibration Levels from Loaded Haul Trucks at Sensitive Receptors

	Beryl Street	Del Amo Boulevard	North Prospect Avenue	190th Street
VdB (Category 2)				
Lane 1	84	84	78	84
Exceeds 80 VdB?	**Yes**	**Yes**	**No**	**Yes**
Lane 2	N/A	93	N/A	93
Exceeds 80 VdB?	**N/A**	**Yes**	**N/A**	**Yes**
PPV (Building Category III)				
Lane 1	0.058	0.164	0.068	0.164
Exceeds 0.2 PPV?	**No**	**No**	**No**	**No**
Lane 2	N/A	0.058	N/A	0.058
Exceeds 0.2 PPV?	**N/A**	**No**	**N/A**	**No**

Notes: Lane 1 is furthest from the residence and Lane 2 is closest.
Del Amo Boulevard and 190th Street: Lane 1 at 30 feet and Lane 2 at 15 feet
Beryl Street: Lane 1 at 30 feet
North Prospect Avenue: Lane 1 at 45 feet
Source: FTA 2018.

Vibration levels used for determining structural damage (PPV) would not be exceeded by the operation of loaded haul trucks associated with Phase 1 or Phase 2 of development. However, vibration levels used for determining annoyance would be exceeded with loaded haul trucks operating in either Lane 1 or Lane 2 along the haul truck route with the exception of along North Prospect Avenue. Loaded trucks typically operate along 190th Street, Beryl Street, and Del Amo Boulevard given the commercial and institutional land use in the area, thus residences are currently subject to infrequent vibration levels exceeding FTA annoyance criteria for Category 3. According to the FTA, the proposed Project would have no impact, even if the existing vibration exceeds the standard vibration criteria, so long as the number of events does not increase significantly (i.e., approximate doubling of events), and the project vibration does not exceed the existing vibration by 3 dBA or more (FTA 2018). Haul truck operations associated with Phase 1 and Phase 2 would not resulting in the doubling of events, would be temporary in nature, and would not exceed the existing vibration by 3 dB or more. Therefore, vibration levels from construction equipment and haul trips associated with BCHD development would not exceed criteria established by the FTA and impacts would be *less than significant*. Recommended mitigation measure MM NOI-2 would be implemented to further reduce noise levels from heavy haul truck trips during construction associated with the proposed Project.

Recommended Mitigation Measures (MM)

To further reduce the noise levels resulting from construction of the proposed Project for off-site residential uses, the following recommended mitigation measure would be implemented:

MM NOI-2 ***Haul and Delivery Truck Operations.*** *Where feasible, haul and delivery truck operations associated with Phase 1 and Phase 2 development would enter and exit the Project site utilizing Lane 1 (the lane farthest from residences) along the given haul route.*

Impact Description (NOI-3)

a) The project would generate a substantial temporary or permanent increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

NOI-3 **Operational noise associated with the proposed Project – particularly noise associated with outdoor events (e.g., movie nights, farmers' markets, fitness classes, etc.) – would result in potentially significant noise impacts. However, operational noise impacts would be *less than significant with mitigation*.**

Long-term operations of the proposed Project would include noise from HVAC equipment, delivery trucks, and parking operations. In addition, on-site outdoor activities associated with the proposed BCHD Healthy Living Campus – including outdoor fitness classes, outdoor movie nights, farmers' markets, etc. – would result in additional periodic noise.

HVAC Equipment

Large HVAC systems like those associated with the proposed Project can result in noise levels up to 100 dBA at a distance of 3 feet (U.S. Environmental Protection Agency [USEPA] 1971). However, these units are typically fitted with noise shielding cabinets or are placed on the roof or in mechanical equipment rooms to reduce noise levels. Typically, the shielding and location of these units reduces noise levels to no greater than 55 dBA L_{eq} at 50 feet from the source (County of Santa Barbara 2016). The HVAC systems for the proposed Project would be located on the roofs of the buildings and would be enclosed to reduce associated noise. Additionally, noise from mechanical equipment associated with operation of the proposed Project would be required to comply with the California Building Code (CBC) requirements pertaining to noise attenuation, resulting in a noise level reduction of approximately 20 dBA (refer to Section 3.11.3, *Regulatory Setting*). Therefore, noise associated with the proposed Project's HVAC systems or mechanical equipment noise would not exceed maximum exterior noise limits for Redondo Beach or Torrance and impacts would be *less than significant.*

Delivery and Service Trucks

Operation of the proposed Project would involve daily delivery of goods and trash hauling services to support residential, medical office, administrative, and restaurant uses associated with the proposed Project. The service area and loading dock would be located within the subterranean levels below the RCFE Building, accessible from the proposed dedicated entry/exit along Flagler Lane. Given the relatively narrow two-lane roadway along Flagler Lane, deliveries would be made by a mix of small, medium, and large two-axle trucks. While a specific frequency of deliveries is unknown at this time, given the size of the proposed Project, deliveries of various kinds could be expected on a daily basis, with larger trucks arriving to and departing from the Project site several times per week. Trash hauling would occur over an average of 3 days per week with a medium-sized trash truck, although frequency could increase in summer and immediately following community events on the central lawn or private events at the proposed Aquatics Center.

Noise generated by delivery, trash hauling, and other service trucks would mainly consist of short-term temporary increases in peak sound levels from diesel engines, backup beepers as required by California Division of Occupational Safety and Health (Cal OSHA), braking, and the sound of

truck bays being opened and closed along with loading and unloading activities. Backup beepers are required by Cal OSHA to be at least 5 dBA above ambient noise levels. The maximum sound level from delivery trucks (assuming heavy-duty trucks) would be approximately 87 dBA L_{eq} at 50 feet and would therefore reach up to 82.9 dBA L_{eq} at a distance of 80 feet (i.e., at the nearest sensitive receptor). The proposed service area and loading dock would be below ground, which would reduce noise levels at nearby sensitive receptors by a total of up to 30 dBA or more (City of Hermosa Beach 2018). Pursuant to RBMC Section 4-24.509 (Refuse Collection Vehicles) trash pickup and delivery operations would occur between the hours of 7:00 a.m. and 7:00 p.m. This noise would be temporary in nature, typically lasting no more than 5 minutes. Trash pickup and compacting operations typically take approximately 3 minutes, with the higher noise levels occurring during about half of the operation. Implementation of MM NOI-3a would ensure deliveries and trash pick-ups would occur during the daytime operating hours (i.e., 7:00 a.m. to 4:00 p.m.) and would prohibit idling longer than 5 minutes.

These types of truck noises associated with the proposed BCHD Healthy Living Campus would be similar to existing activities occurring both on-site and in the vicinity. Existing businesses located within the Redondo Village Shopping Center already receive deliveries and trash pick-up via Beryl Street with similar noise levels. Additionally, garbage collection for existing residences within Torrance generates similar noise levels. Further, given the short-term temporary nature and subterranean location of these types of activities, they would not measurably increase the existing ambient noise levels along Flagler Lane (i.e., 72.7 dBA L_{max} as shown in Table 3.11-3). Therefore, the proposed Project would not exceed 5 dBA above the ambient noise levels along Flagler Lane and impacts would be *less than significant with mitigation.*

Emergency Vehicle Noises

Phase 1 of the proposed Project would incrementally increase the total number of individuals requiring ambulance services through the overall addition of 177 new Assisted Living bed spaces to the existing 120 Memory Care bed spaces, bringing the total permanent residents supported at the site to 297. Based on an assumed average of 0.82 annual calls per bed space per year to the existing campus (see Section 3.13, *Public Services*), following the completion of the proposed development under the Phase 1 preliminary site development plan, it is anticipated that the BCHD campus would generate an estimated 244 ambulance calls per year.

While estimated emergency calls would increase by 149 percent, all responses would be sporadic and not all would require use of sirens, as a majority of these calls are related to medical situations that do not always require an emergency response. When sirens are necessary for an emergency response, they typically emit noise at a magnitude of approximately 100 dBA at 100 feet. A

decrease of about 3 dBA occurs with every doubling of distance from a mobile noise source; therefore, during a response requiring sirens, residences along North Prospect Avenue and Beryl Street experience peak short-duration exterior noise levels between 91 and 100 dBA. Because emergency vehicle response is rapid by nature, the duration of exposure to these peak noise levels is estimated to last for a maximum of 10 seconds, depending on traffic. Thus, given the infrequent and short duration of siren utilization responding to emergency situations, noise impacts from emergency vehicles would be both negligible and *less than significant*.

Parking Operations

Surface parking lots can be a source of annoyance to neighboring uses due to sporadic noises from vehicles arriving and departing, tire squeals, car alarms, opening and closing of car doors, and people's voices. Parking lots with 1,000 cars during peak activity hours have a reference hourly L_{eq} of approximately 56 dBA at 50 feet (FTA 2018). As such, the proposed surface parking lot developed during Phase 1 of the proposed Project, which would include 86 parking spaces, would likely generate noise levels below 56 dBA at 50 feet. Noise levels would be further attenuated at the nearest noise-sensitive receptors located along North Prospect Avenue approximately 110 feet from the boundary of the Project site boundary.

Similar to surface parking lots, noise generating activities associated with parking structures also result in sporadic noises from vehicles arriving and departing, tire squeals, car alarms, opening and closing of car doors, and people's voices. For reference, Illingworth & Rodkin, Inc. conducted noise measurements near a four-story parking structure in Downtown Petaluma. Noise measurements were made of typical noise-generating activities occurring on the various parking levels. At each parking level, a car door was opened and closed several times, the engine was started, and the vehicle's horn was sounded. The noise sources were generated at the edge of each story and at a parking stall located about 50 feet from the edge. Noise measurements were also made as a vehicle traveled up and down the parking structure. The loudest noise was generated by a vehicle's horn. Maximum instantaneous noise levels, measured approximately 75 feet from the façade of the structure at ground level, typically ranged from 53 to 58 dBA L_{max}. Typical noise levels of a car horn ranged from 62 to 70 dBA L_{max}. However, Beryl Street and North Prospect Avenue have daytime noise levels of 63 and 65 L_{dn}, respectively, related to existing vehicle traffic. Due to the relatively high level of traffic noise along streets in the vicinity of the Project site, normal daytime parking garage L_{eq} noise of 56 dBA would likely be imperceptible. Therefore, noise impacts relating to parking operations would result in *less than significant* operational noise impacts.

Roadway Noise

The proposed Project would result in a net decrease in daily and peak period vehicle trips to and from the Project site following buildout of Phase 1. Phase 2 would result in a minor increase in daily trips that would incrementally increase traffic in the area; however, peak period trips would be reduced compared to existing conditions (see Section 3.14, *Transportation*). Peak period trips represent the greatest number of vehicle operations within a 24-hour period and where vehicle operations are the dominant noise source, the greatest daily L_{eq}. According to the Transportation Study, the proposed Project is expected to generate up to 271 trips during the AM peak period as compared to 307 trips during the AM peak period under existing conditions (see Appendix K). Therefore, the Project would not contribute to L_{eq} traffic noise, and traffic noise levels would incrementally decrease along two roadways (i.e., Diamond Street and Del Amo Boulevard) under Project implementation (see Table 3.11-23).

Future Year (2032) noise levels along the roadways in the vicinity of the Project site are based on traffic projections from the Transportation Study (see Appendix K). Future plus Project noise levels on these roadways are estimated based on the traffic projections included in the Transportation Study. Future roadway noise levels with and without the Project are compared to 2020 noise levels in Table 3.11-23.

Table 3.11-23. Estimated Peak Period Traffic Noise Levels at Sensitive Receptors

Receiver	L_{eq}		
	Existing Year (2020)	Future Year (2032) Without Project	Future Year (2032) With Project
North Prospect Avenue	69.5	69.7	69.7
Diamond Street (S)	61.4	61.5	61.5
Diamond Street (N)	57.5	57.7	57.6
Towers Street	60.1	60.2	60.2
Mildred Avenue	55.4	55.6	55.6
Beryl Street (S)	66.2	66.4	66.4
Beryl Street (N)	65.5	65.7	65.7
Del Amo Boulevard	69.9	70.1	70.0
W. 190th Street (W)	69.0	69.2	69.2
W. 190th Street (E)	70.8	71.0	71.0

Notes: 2020 L_{eq} noise levels are based on traffic counts used in the Transportation Study (see Appendix K).
2032 L_{eq} noise levels are based on projected traffic levels in the Transportation Study.
Modeled Fleet Mix: 97 percent Auto / 2 percent Medium Truck / 1 percent Heavy Truck. For reference this fleet mix is similar to the assumption in the Draft EIR prepared for the Kensington Assisted Living Facility (SCH No. 203121065).
Source: See Appendix I.

Passenger drop-off and pick-up to and from the RCFE Building would occur via Flagler Lane. Noise monitoring along Flagler Lane measured an L_{eq} of 59.3 during AM peak period (refer Table 3.11-3). An hourly L_{eq} of 52.3 dBA at 30 feet would result from 125 passenger vehicles traveling 25 mph along Flagler Lane (FHWA 2004). Should 125 vehicles drop off or pick-up passengers from the RCFE during the AM peak period, the resulting L_{eq} at residences East of Flagler lane would be 60.1 dBA. Noise levels associated with passenger drop-off and pick-up via Flagler Lane were calculated to increase by 0.8 dBA, thus noise impacts would be imperceptible (i.e., less than 3 dBA) and *less than significant*.

Outdoor Function Areas

The outdoor dining spaces at the proposed RCFE Building constructed under the Phase 1 preliminary site development plan, including the dining terrace on the south side of the building, the porch on the south side of the building, and the larger dining terrace above the PACE services on the north side of the building, would operate during the daytime hours and are expected to close by 10:00 p.m. The indoor and outdoor pools associated with the Aquatics Center would be located within the interior of the site, approximately 150 feet west of the nearest noise-sensitive residences along Flagler Alley (refer to Figure 2-11 through Figure 2-13). An L_{eq} of 60 dBA associated with 100 people outdoor pool activities would result in a noise level of 50 L_{eq} at the nearest sensitive receptor, below the criteria of 55 L_{eq} from 7:00 a.m. to 10:00 p.m. established in TMC Section 6-46.7.2

It is anticipated that the majority of outdoor noise would be primarily generated during fitness classes and events (e.g., outdoor movie nights, farmer's markets, etc.) on the central lawn (refer to Figure 2-9). Noise associated with these areas is anticipated to include guests socializing, amplified music, and Public Address (PA) system announcements. Noise levels generated by fitness classes and events that would include amplified music and involve up to 200 people on the central lawn, may contribute to an increase in ambient noise levels in the vicinity of the Project site above existing levels. Noise levels generated by outdoor events that include live amplified music (e.g., three piece band with electric or amplified instruments), may generate maximum noise levels of over 100 dBA at 50 feet (Caltrans 1998). Acoustic accompaniments can generate maximum noise levels of 80 dBA at 1 foot and 46 dBA at 50 feet. However, maximum noise levels over 100 dBA at 50 feet would typically be associated with live amplified music from large concerts, such as rock concerts. An average loudspeaker comes with a sensitivity of approximately 88 dBA (Definitive Technology 2021). Therefore, amplified loudspeaker music associated with outdoor fitness classes on the central lawn is conservatively assumed to generate a maximum loudspeaker L_{max} of 90 dBA at 45 feet. Without any amplified music, 200 people each talking at 60 dBA would

result in noise level of 83 dBA L_{eq} at 5 feet and 63 dBA L_{eq} at 50 feet (Wood 2021). A majority of these events, such as the fitness classes and farmers' markets, would occur during the daytime hours; however, some community events (e.g., outdoor movie nights) would occur during evening hours until 10:00 p.m.

The central lawn would be oriented such that amplified sound would be directed towards the southwest, away from the nearby noise-sensitive receptors east of Flagler Lane and Flagler Alley. Residences east of Flagler Lane and Flagler Alley would be located approximately 450 feet away from the noise source (i.e., loudspeaker) during outdoor events (as measured from the center of the proposed lawn within the interior portion of the campus), which would result in a 20-dBA reduction based on attenuating distance. Based on a maximum loudspeaker L_{max} of 90 dBA at 45 feet, the maximum noise level at receptors along Flagler Lane and Flagler Alley would be an L_{max} of approximately 70 dBA (County of Santa Barbara 2016).

Noise from amplified music at the central lawn would not adversely affect ambient noise levels at the residences southwest of North Prospect Avenue, given the distance (approximately 400 feet from the center of the proposed lawn) and intervening structures between the noise source and residences along North Prospect Avenue. The attenuating distance of 400 feet from the residences along North Prospect Avenue would result in an 18-dB reduction and intervening buildings would result in a 5-dBA reduction, for a combined reduction of 23 dBA from the L_{max} of 90 dBA at 45 feet. Therefore, an L_{max} of 67 dBA would be expected at residences along North Prospect Avenue. The projected maximum noise levels at residences along Flagler Lane and Flagler Alley (70 dBA) and North Prospect Avenue (67 dBA) would be equivalent to normal to elevated speech at a distance of 3 feet.

Elevated noise levels from outdoor events would vary throughout the year. During summer months, events held on the central lawn would be anticipated to occur more frequently, potentially with events or larger gatherings occurring almost every weekend. During winter months, it is anticipated that fitness classes and outdoor events would be less frequent due to the weather and instead would be hosted in the Wellness Center, Aquatics Center, or CHF. Implementation of MM NOI-3b would ensure noise levels from outdoor dining spaces, fitness classes, and community events do not occur after 10:00 p.m. consistent with RBMC Section 4-24.401 and TMC Section 6-46.7.2.

Disturbance from noise levels causing impacts to surrounding sensitive receptors from outdoor fitness classes and community events would be infrequent; however, given the potential for maximum noise levels of over 100 dBA at 50 feet (which would be attenuated to 80 dBA at the nearest sensitive receptor approximately 450 feet away) associated with live amplified music,

operational noise impacts to nearby sensitive receptors are considered *potentially significant*. However, compliance with RBMC Section 4-24.401 and TMC Section 6-46.7.2, as well as the implementation of MM NOI-3b, which would require preparation of an Event Management Plan, would reduce noise impacts related to outdoor events to *less than significant with mitigation*. Additionally, MM NOI-3c would require the proposed Aquatics Center to close operations by 10:00 p.m. to comply with RBMC and TMC lower nighttime noise level criteria, which would further reduce operational noise impacts.

Mitigation Measures (MM)

To further reduce the noise levels resulting from operation of the proposed Project, the following mitigation measures would be implemented:

MM NOI-3a ***Delivery Truck Hours and Idling.*** *Deliveries from heavy-duty trucks, including refrigerator trucks, trash and recycling pick-ups, and parking lot sweeping, shall be restricted to daytime operating hours (7:00 a.m. to 4:00 p.m.); idling longer than 5 minutes in the same period shall be prohibited.*

MM NOI-3b ***Events Management Plan.*** *BCHD shall prepare an Event Management Plan, which shall include, but is not limited to, establishment of procedures to limit noise generated by operations on the proposed BCHD Healthy Living Campus, particularly for outdoor events. The Plan shall also detail the hours of outdoor classes/events, maximum class/event capacities, and allowable noise levels consistent with the RBMC and TMC. Limitations on outdoor events shall include prohibiting the use of amplification systems for outdoor events after 10:00 p.m. to comply with RBMC and TMC lower nighttime noise level criteria and review of the proposed sound system by a qualified acoustical engineer to ensure that event set ups would meet the acceptable exterior noise criteria of 50 to 55 dBA consistent with RBMC Section 4-24.301 and TMC Section 6-46.7.2.*

MM NOI-3c ***Outdoor Pool Activities****. The Aquatics Center, specifically the outdoor pool and deck area would close operations by 10:00 p.m. to comply with RBMC and TMC lower nighttime noise level criteria*.

Residual Impacts

Implementation of MM NOI-3a would eliminate nighttime noise impacts associated with heavy-duty delivery trucks by limiting delivery operations to daytime operating hours (7:00 a.m. to 4:00 p.m.) and would reduce daytime noise impacts associated with heavy-duty delivery trucks by

prohibiting idling longer than 5 minutes. Implementation of MM NOI-3b would substantially reduce operational noise associated with outdoor fitness classes and community events by requiring a qualified acoustical engineer ensure that event set ups would meet the acceptable exterior noise criteria of 50 to 55 dBA consistent with RBMC Section 4-24.301 and TMC Section 6-46.7.2. Implementation of MM NOI-3c would ensure Aquatic Center operations close by 10:00 p.m. With required compliance with RBMC Section 4-24.301 and TMC Section 6-46.7.2, as well as the implementation of MM NOI-3a, MM NOI-3b, and MM NOI-3c, impacts associated with proposed Project operations would be *less than significant*.

Cumulative Impacts

Construction of the proposed Project would occur at the same or similar time as other major construction projects identified in the cumulative projects list in Chapter 3.0.2, *Cumulative Impacts*. Tables 3.0-1, 3.0-2, 3.0-3, and 3.0-4 contain a list of pending, approved, and recently completed projects within the Redondo Beach, Torrance, Hermosa Beach, and Manhattan Beach, respectively (within 3 miles of the Project site). At least some of the cumulative projects in the vicinity of the Project site may have a construction schedule that overlaps with the anticipated construction schedule for the proposed Project. Cumulative impacts may include a temporary increase in noise levels from site preparation and construction activities. Most noise generation from the proposed Project would occur during excavation, shoring, and foundation construction, and would be limited to approximately 3 months. The addition of construction worker traffic and, particularly, increased haul truck traffic associated with grading and hauling from the proposed Project combined with other cumulative projects would increase existing ambient noise levels in the area by approximately 1 dBA, which would not be perceptible to the human ear, and thus, would be less than significant. Noise levels from construction activities are typically considered as point sources for noise generation and would decrease at a rate of 6 dBA per doubling of distance from the source over hard site surfaces. Further, noise levels would also slightly decrease is areas where buildings (and to a lesser extent trees) act as noise barriers; thus, it would be unlikely that noise from the cumulative projects would reach each other and combine to produce a cumulatively significant impact. Therefore, any cumulative impacts generated from the simultaneous construction of these projects would have a less than significant impact. It is also assumed that construction of these cumulative projects would be limited to daytime hours, consistent with RBMC and TMC restrictions. Therefore, the proposed Project would not have a substantial contribution to cumulatively considerable construction-related noise impacts.

Upon completion of the proposed BCHD Healthy Living Campus, long-term noise impacts associated with the operation of the proposed Project would result from outdoor uses and periodic

outdoor events on the central lawn and Main Street promenade. However, the proposed campus would be required to comply with the Redondo Beach and Torrance Noise Regulations. Additionally, noise during events or large gatherings would be reduced through implementation of MM NOI-3b. Noise impacts associated with other cumulative development projects would be addressed on a case-by-case basis through compliance with the respective applicable noise regulations. Therefore, the proposed Project would not have a substantial contribution to cumulatively considerable noise impacts.