4.10 Noise

This section evaluates pre- and post-construction noise impacts associated with the implementation of the Project and describes the affected environment and regulatory setting for noise. The *Acoustical Analysis for the Koll Center Residences* study prepared by Michael Baker International (Michael Baker International, 2017c) is summarized in this section and provided in Appendix I of this EIR.

4.10.1 NOISE CRITERIA AND DEFINITIONS

Sound. Sound is a vibratory disturbance created by a moving or vibrating source and that is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment. Excessive noise levels may also affect performance and learning processes through distraction, reduced accuracy and increase fatigue, annoyance and irritability, and the ability to concentrate.

Decibels and Frequency. In its most basic form, a continuous sound can be described by its frequency or wavelength (pitch) and its amplitude (loudness). Sound pressure levels are described in units called the decibel (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Therefore, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease.

Groundborne vibration consists of oscillatory waves that propagate from the source through the ground to adjacent structures. The frequency of a vibrating object describes how rapidly it is oscillating. The number of cycles per second of oscillation is the vibration frequency, which is described in terms of hertz (Hz). The normal frequency range of most groundborne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz.

Perception of Noise. The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the “A-weighted” noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A-weighted measurements are written dB(A) or dBA.

Human perception of noise has no simple correlation with acoustical energy. The perception of noise is not linear in terms of dBA or in terms of acoustical energy. Two noise sources do not “sound twice as loud” as one source. It is widely accepted that the average healthy ear can barely perceive changes of a 3 dBA increase or decrease; that a change of 5 dBA is readily perceptible; and that an increase or decrease of 10 dBA sounds twice or half as loud, respectively.

As noise travels from the source to the receiver, noise changes both in level and frequency. The most obvious change is the decrease in noise as the distance from the source increases. The manner in which

noise reduces with distance (noise attenuation) depends on a number of factors. Ground absorption, atmospheric effects, and shielding (as by natural and man-made barriers) also affect the rate of noise attenuation.

Perception of Vibration. While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings caused by construction activities may be perceived as motion of building surfaces or rattling of windows, items on shelves, and pictures hanging on walls. Vibration of building components can also take the form of an audible low-frequency rumbling noise, which is referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when the structure and the construction activity are connected by foundations or utilities, such as sewer and water pipes.

The primary concern from vibration is the ability to be intrusive and annoying to nearby residents and other vibration-sensitive land uses. Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High frequency vibrations reduce much more rapidly than low frequencies, so that low frequencies tend to dominate the spectrum at greater distances from the source.

Noise and Vibration Rating Scales. Several rating scales exist to analyze effects of noise on a community. These scales include the equivalent noise level (L_{eq}), the community noise equivalent level (CNEL), and the day-night average sound level (L_{dn}). Average noise levels over a period of minutes or hours are usually expressed as dBA L_{eq}, which is the equivalent noise level for that period of time. The period of time averaging may be specified; for example, $L_{eq(3)}$ would be a three-hour average. When no period is specified, a one-hour average is assumed. It is important to understand that noise of short duration (i.e., a time period substantially less than the averaging period) is averaged into ambient noise during the period of interest. Therefore, a loud noise lasting many seconds or a few minutes may have minimal effect on the measured sound level averaged over a one-hour period.

To evaluate community noise impacts, a descriptor was developed that accounts for human sensitivity to nighttime noise. The descriptor is called the L_{dn}, which represents the 24-hour average sound level with a penalty for noise occurring at night. The L_{dn} computation divides the 24-hour day into two periods: daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM). The nighttime sound levels are assigned a 10 dBA "penalty"" prior to averaging with daytime hourly sound levels. CNEL is similar to L_{dn} except that it separates a 24-hour day into 3 periods: daytime (7:00 AM to 7:00 PM), evening (7:00 PM to 10:00 PM), and nighttime (10:00 PM to 7:00 AM). The evening and nighttime sound levels are assigned a 5 and 10 dBA penalty respectively, prior to averaging with daytime hourly sound levels. Several statistical descriptors are also often used to describe noise, including L_{max}, L_{min}, and L_x. L_{max} and L_{min} are respectively the highest and lowest A-weighted sound levels that occur during a noise event. The L_x signifies the noise level that is exceeded x percent of the time; for example, L_{10} denotes the level that was exceeded 10 percent of the time.

Vibration levels are usually expressed as single-number measure of vibration magnitude, in terms of velocity or acceleration, which describes the severity of the vibration without the frequency variable. The peak particle velocity (ppv) is defined as the maximum instantaneous positive or negative peak of the

vibration signal, usually measured in inches per second (in/sec). Since it is related to the stresses that are experienced by buildings, ppv is generally used to assess vibration to structures.

4.10.2 REGULATORY SETTING

Federal

Occupational Safety and Health Administration

Under the Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) adopted regulations (29 CFR § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations identify limits on noise exposure levels as a function of the amount of time during which the worker is exposed. The regulations further specify requirements for a hearing conservation program (§ 1910.95(c)), a monitoring program (§ 1910.95(d)), an audiometric testing program (§ 1910.95(g)), and hearing protection (§ 1910.95(i)). There are no federal laws governing community noise.

State of California

California Building Code

Title 24 of the California Code of Regulations contains standards for allowable interior noise levels associated with exterior noise sources. The standards apply to new hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family residences. The standards require interior noise level attributable to exterior sources not exceed 45 dBA CNEL in any habitable room. Multi-family residential structures proposed where the CNEL would exceed 60 dBA requires an acoustical analysis showing that the proposed building design would achieve the prescribed allowable interior noise standard.

Regional and Local

City of Newport Beach General Plan Noise Element

California Government Code Section 65302(g) requires that a Noise Element be included in the General Plan of each county and city. The *City of Newport Beach General Plan's* Noise Element (2006) is a tool for including noise control in the planning process in order to maintain compatible land use with environmental noise levels. It is the guiding document for the City's noise policy and is designed to protect residents and businesses from excessive and persistent noise intrusions. The Noise Element follows the State guidelines in Section 46050.1 of the *California Health and Safety Code.* The General Plan Noise Element quantifies the community noise environment in terms of noise exposure contours for both near-term and long-term levels of growth and traffic activity.

The City's noise standards are correlated with land use zoning classifications to maintain identified ambient noise levels and to limit, mitigate, or eliminate intrusive noise that exceeds the ambient noise levels within a specified zone. The City has adopted local guidelines based, in part, on the community noise compatibility guidelines established by the California Department of Health Services for use in assessing the compatibility of various land use types with a range of noise levels. The noise/land use compatibility guidelines for land uses within the City are presented in *Table 4.10-1*.

Table 4.10-1. Land Use Noise Compatibility Matrix

Land Use Categories		Community Noise Equivalent Level (CNEL)						
Categories	Uses	<55	55–60	60-65	65–70	70–75	75-80	>80
Residential	Single Family, Two Family, Multiple Family	A	A	B	C	C	D	D
Residential	Mixed Use	A	A	A	C	C	C	D
Residential	Mobile Home	A	A	B	C	C	D	D
Commercial- *Regional, District*	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial- *Regional, Village District, Special*	Commercial Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
Commercial Industrial Institutional	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
Commercial- *Recreational* Institutional- *Civic Center*	Amphitheatre, Concert Hall Auditorium, Meeting Hall	B	B	C	C	D	D	D
Commercial- *Recreation*	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
Commercial- *General, Special* Industrial, Institutional	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
Institutional	Hospital, Church, Library, Schools' Classroom	A	A	B	C	C	D	D
Open Space	Parks	A	A	A	B	C	D	D
Open Space	Golf Course, Cemeteries, Nature Centers Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
Agriculture	Agriculture	A	A	A	A	A	A	A

Zone A: Clearly Compatible—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
Zone B: Normally Compatible**—New construction or development should be undertaken only after detailed analysis of the noise reduction requirements and are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Zone C: Normally Incompatible—New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.
Zone D: Clearly Incompatible—New construction or development should generally not be undertaken.

Source: City of Newport Beach General Plan, adopted July 25, 2006.

Under "Clearly Compatible" conditions, the specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements. Under "Normally Compatible" conditions, new construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise

insulation features in the design are determined. Under "Normally Incompatible" conditions, new construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed insulation features must be included in the design.

The following discussion provides a summary of the City of Newport Beach Noise Element goals and policies as they apply to regulatory guidance and significance criteria.

Goal N1, Noise Compatibility, is focused on minimizing land use conflicts between various noise sources. Policies applicable to the Proposed Project include the following:

- *Policy N1.1, Noise Compatibility of New Development,* requires that all proposed projects are compatible with the noise environment through use of the noise compatibility matrix (Table 4.10-1) and that exterior and interior noise standards are enforced. The enforcement of interior and exterior noise standards is accomplished through the Noise Ordinance in the City of Newport Beach Municipal Code.
- *Policy N 1.4, New Developments in Urban Areas*, requires that applicants of residential portions of mixed-use projects and high density residential developments in urban areas (such as the Airport Area and Newport Center) demonstrate that the design of the structure will adequately isolate noise between adjacent uses and units (common floor/ceilings) in accordance with the California Building Code.
- *Policy N1.6, Mixed Use Developments,* encourages new mixed-use developments to site loading areas, parking lots, driveways, trash enclosures, mechanical equipment, and other noise sources away from the residential portion of the development.
- *Policy N1.8, Significant Noise Impacts,* requires the employment of noise mitigation measures for existing sensitive uses when a significant noise impact is identified for new development impacting existing sensitive uses,[1] as identified in *Table 4.10-2*.

Table 4.10-2. General Plan Policy N1.8 Significant Noise Impact Criteria for New Development Impacting Existing Sensitive Uses

CNEL (dBA)	dBA Increase
55–60	3
60–65	2
65–70	1
70–75	1
Over 75	Any increase is considered significant

CNEL: 24-hour community noise equivalent level; dBA: A-weighted decibel.
Source: City of Newport Beach General Plan, adopted July 25, 2006.

[1] According to the City of Newport Beach Noise Element, noise sensitive uses in the City include public and private educational facilities, hospitals, convalescent homes, and day cares. However, the primary noise sensitive use within the City is residential use. The noise exposure of these sensitive uses varies from low, in quiet residential areas, to high, in areas adjacent to the freeway.

Goal N2, Minimized motor vehicle traffic and boat noise impacts on sensitive noise receptors, is focused on minimizing transportation noise impacts on sensitive noise receptors.

- *Policy N2.1, New Development,* requires that noise-sensitive uses in areas above 60 dBA CNEL meet the interior and exterior noise levels (*Table 4.10-3)*.
- *Policy N2.2, Design of Sensitive Land Uses,* requires the use of walls, berms, and interior noise insulation, among others, in the design of new residential or other new noise-sensitive land uses that are adjacent to major roads.
- *Policy N 2.3 Limiting Hours of Truck Deliveries.* Limit the hours of truck deliveries to commercial uses abutting residential uses and other noise sensitive land uses to minimize excessive noise unless there is no feasible alternative. Any exemption shall require compliance with nighttime (10:00 P.M. to 7:00 A.M.) noise standards.

Goal N3, Minimization of Airport-Related Noise, is focused on minimizing noise impacts on sensitive noise receptors from operations at John Wayne Airport.

- *Policy N3.2, Residential Development,* requires that residential development in the Airport Area be located outside of the 65 dBA CNEL noise contour no larger than shown in the 1985 JWA Master Plan and require residential developers to notify prospective purchasers or tenants of aircraft overflight and noise.

Goal N4, Minimization of Non-Transportation-Related Noise, is focused on minimizing noise impacts on sensitive noise receptors.

- *Policy N4.1, Stationary Noise Sources,* requires the enforcement of interior and exterior noise standards outlined in the City's Noise Ordinance.
- *Policy N4.4, Limiting Hours of Recreational Activities,* limits hours when recreational activities in parks and the harbor can take place. This goal is implemented by the *City of Newport Beach Municipal Code* (Section 11.04.040), which states that no person shall enter or remain upon any park facility between the hours of 11:00 PM and 6:00 AM.
- *Policy N4.6, Maintenance or Construction Activities,* requires the enforcement of the Noise Ordinance noise limits and limits hours of maintenance or construction activity in or adjacent to residential areas, including noise that results from in-home hobby or work related activities.

Goal N5, Minimized excessive construction-related noise, addresses construction noise.

- Policy N5.1, Limiting Hours of Activity, promotes enforcing the limits on hours of construction activity; these limits are in Section 10.28.040 of the Newport Beach Municipal Code.

City of Newport Beach Municipal Code

Interior and Exterior Noise Standards

The City has numerous ordinances and enforcement practices that apply to intrusive noise and that guide new construction. The City's comprehensive noise ordinance sets forth maximum ambient noise levels for

different land use zoning classifications, hours of operation for construction activities, standards for determining when noise is deemed to be a disturbance, and legal remedies for violations.

Section 10.26.025, Exterior Noise Standards, provides maximum exterior noise levels. *Table 4.10-3* identifies the noise standards that, unless otherwise specifically indicated, shall apply to all property with a designated noise zone. If the ambient noise level exceeds the resulting standard, the ambient shall be the standard.

Table 4.10-3. Allowable Exterior Noise Levels

Noise Zone	Type of Land Use	Allowable Exterior Noise Level (L_{eq})	
		7 AM to 10 PM	10 PM to 7 AM
I	Single-, two-or multiple-family residential	55 dBA	50 dBA
II	Commercial	65 dBA	60 dBA
III	Residential portions of mixed-use properties	60 dBA	50 dBA
IV	Industrial or manufacturing	70 dBA	70 dBA

Source: City of Newport Beach, *Municipal Code Section 10.26.025, Exterior Noise Standards*, current through Ordinance 2017-9, passed April 25, 2017.

Section 10.26.030, Interior Noise Standards, provides maximum interior noise levels. *Table 4.10-4* identifies the noise standards that, unless otherwise specifically indicated, shall apply to all residential property within all noise zones. If the ambient noise level exceeds the resulting standard, the ambient shall be the standard.

Table 4.10-4. Allowable Interior Noise Levels

Noise Zone	Type of Land Use	Allowable Interior Noise Level (L_{eq})	
		7 AM to 10 PM	10 PM to 7 AM
I	Residential	45 dBA	40 dBA
III	Residential portions of mixed-use properties	45 dBA	40 dBA

Source: City of Newport Beach, *Municipal Code Section 10.26.030, interior Noise Standards*, current through Ordinance 017-9, passed April 25, 2017.

Heating, Ventilation, and Air Conditioning (HVAC) Units

Section 10.26.045 of the City's Noise Ordinance specifies that new permits for HVAC equipment in or adjacent to residential areas shall be issued only where installations can be shown by computation, based on the sound rating of the proposed equipment, not to exceed an A-weighted sound pressure level of 50 dBA, or not to exceed an A-weighted sound pressure level of 55 dBA and be installed with a timing device that will deactivate the equipment during the hours of 10:00 PM to 7:00 AM.

Construction Noise

The City recognizes that the control of construction noise is difficult and therefore provides exemptions for construction noise. Section 10.26.035D, Exemptions, of the City's Noise Ordinance exempts noise sources associated with construction, repair, remodeling, demolition, or grading of any real property from the City's Noise Ordinance standards (Table 4.10-3 and Table 4.10-4). These activities are subject to the provisions of Chapter 10.28, which prohibits construction activities that generate loud noise that disturbs, or could disturb, a person of normal sensitivity who works or resides in the vicinity except during weekdays between the hours of 7:00 AM to 6:30 PM, and Saturdays between the hours of 8:00 AM to 6:00 PM. Construction is not allowed on Sundays or any federal holiday.

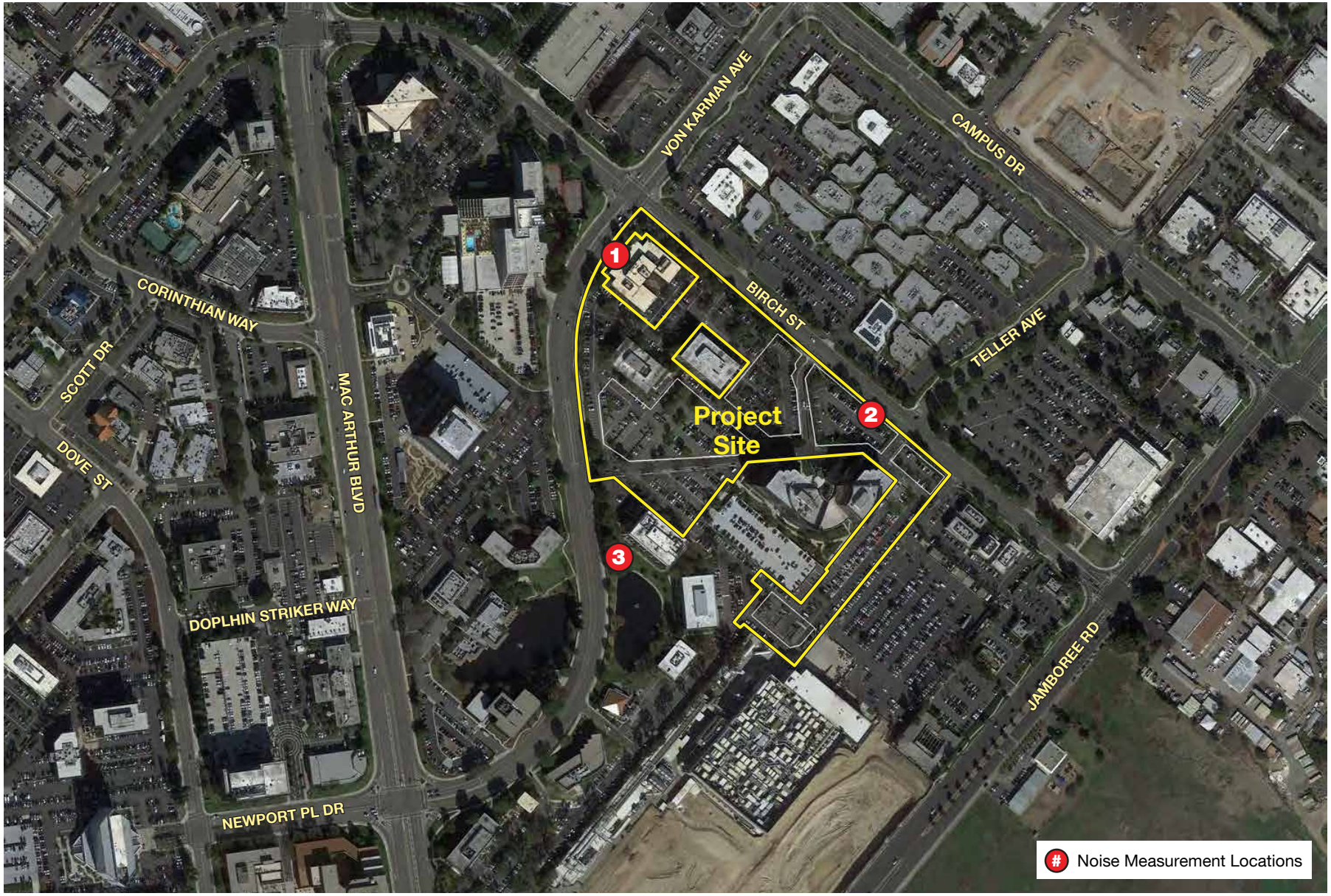
4.10.3 ENVIRONMENTAL SETTING

Noise-sensitive receptors are generally considered to be those people engaged in activities or utilizing land uses that may be subject to the stress of significant interference from noise. Activities usually associated with sensitive receptors include, but are not limited to, talking, reading, and sleeping. Land uses often associated with sensitive receptors include residential dwellings, hotels, hospitals, day care centers, and educational facilities. Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. The Noise Element of the General Plan identifies noise sensitive uses as public and private educational facilities, hospitals, convalescent homes, day cares, and other facilities that are considered noise sensitive. However, the primary noise sensitive use within the City is residential use. The noise exposure of these sensitive uses varies from low, in quiet residential areas, to high, in areas adjacent to the freeway.

Newport Beach is impacted by various noise sources. Mobile sources of noise, especially cars and trucks, are the most common and significant sources of noise in most communities. Other sources of noise are the various land uses (i.e., residential, commercial, institutional, and recreational and parks activities) throughout the city that generate stationary-source noise. The nearest airport and only airport in the project vicinity is John Wayne Airport, located approximately 0.44 mile northwest of the project site.

Existing Ambient Noise Measurements

The project site currently consists of surface parking at Koll Center Newport. A mix of office and retail and limited residential uses dominate the area. To quantify existing ambient noise levels in the project area, three short-term noise measurements were taken on April 18, 2017. As depicted on Figure 4.10-1, *Noise Measurement Locations*, the noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site. The 10-minute measurements were taken between 11:00 AM and 12:30 PM. Short-term (L_{eq}) measurements are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in *Table 4.10-5*.



Source: Michael Baker International, 2017

FIGURE 4.10-1: Noise Measurement Locations
The Koll Center Residences Project

N Not to scale

Kimley»Horn

The ambient recorded noise levels ranged from 64.3 dBA to 67.7 dBA near the project site (Table 4.10-5). The noise most commonly in the project vicinity is produced by automotive vehicles (cars, trucks, buses, motorcycles). Traffic moving along streets and freeways produces a sound level that remains relatively constant and is part of the city's minimum ambient noise level. Vehicular noise varies with the volume, speed and type of traffic. Slower traffic produces less noise than fast moving traffic. Trucks typically generate more noise than cars. Infrequent or intermittent noise also is associated with vehicles, including sirens, vehicle alarms, slamming of doors, garbage and construction vehicle activity and honking of horns. These noises add to urban noise and are regulated by a variety of agencies.

Table 4.10-5. Existing Noise Measurements

Site No.	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Time
1	Along the eastern boundary of project site, adjacent to the Birch St at Teller Ave intersection.	64.3	46.1	85.3	11:25 AM
2	Along the northwestern boundary of project site, adjacent to the Birch St at Von Karman Avenue intersection.	64.9	52.2	86.8	11:41 AM
3	Along the western boundary of project site along Von Karman Ave.	67.7	54.1	87.2	11.56 AM

Source: Michael Baker International, 2017c. See Appendix A of EIR Appendix I for noise measurement data.

Existing Roadway Noise Levels

Existing roadway noise levels were calculated for the roadway segments in the vicinity of the project site using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and traffic volumes from the transportation impact analysis (see Appendix B of EIR Appendix I). The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by the California Department of Transportation (Caltrans). The Caltrans data shows that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels.

The average daily noise levels along these roadway segments are presented in *Table 4.10-6*. As identified in the table, the existing traffic-generated noise level on project-vicinity roadways currently ranges from 54.3 to 71.6 dBA CNEL. As previously described, CNEL is 24-hour average noise level with a 5 dBA "weighting" during the hours of 7:00 PM to 10:00 PM and a 10 dBA "weighting" added to noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the evening and nighttime, respectively.

Table 4.10-6. Existing Traffic Noise Levels	
Roadway Segment	**CNEL at 100 Feet from Centerline of Roadway**
MacArthur Boulevard	
North of Main Street	66.8
Main Street to NB I-405	68.2
Between I-405 NB and SB Ramps	69.7
Michelson Drive to SB I-405	68.7
Michelson Drive to Campus Drive	69.3
Jamboree Road to University Drive	70.4
Von Karman Avenue	
North of Main Street	64.1
Main Street to Michelson Drive	64.4
Michelson Drive to Dupont Drive	63.2
Dupont Drive to Campus Drive	63.2
Teller Avenue	
Michelson Drive to Dupont Drive	59.4
Dupont Drive to Campus Drive	56.6
Jamboree Road	
North of Main Street	70.7
Main Street to NB I-405	71.0
Between I-405 NB and SB I-405 Ramp	71.6
SB I-405 to Michelson Drive	71.2
Michelson Drive to Dupont Drive	69.2
Dupont Drive to Campus Drive	68.6
Campus Drive to Birch Street	68.4
Birch Street to Fairchild Road	68.6
Fairchild Road to MacArthur Boulevard	67.6
Carlson Avenue	
Michelson Drive to Campus Drive	59.9
Harvard Avenue	
North of Michelson Drive	66.1
Michelson Drive to University Drive	64.9
Main Street	
West of MacArthur Boulevard	66.0
MacArthur Boulevard to Von Karman Avenue	65.7
Von Karman Avenue to Jamboree Road	65.0
East of Jamboree Road	64.7
Michelson Drive	
MacArthur Boulevard to Von Karman Avenue	61.1
Von Karman Avenue to Jamboree Road	62.7

Table 4.10-6. Existing Traffic Noise Levels	
Roadway Segment	**CNEL at 100 Feet from Centerline of Roadway**
Jamboree Road to Carlson Avenue	63.9
Carlson Avenue to Harvard Avenue	64.0
East of Harvard Avenue	63.4
Dupont Drive	
Von Karman Avenue to Teller Avenue	55.7
Teller Avenue to Jamboree Road	54.3
Campus Drive	
West of MacArthur Boulevard	65.8
MacArthur Boulevard to Von Karman Avenue	62.0
Von Karman Avenue Ave to Teller Avenue	61.3
Teller Avenue to Jamboree Road	61.3
Jamboree Road to Carlson Avenue	63.4
Carlson Avenue to University Drive	65.7
East of University Drive	64.4
University Drive	
MacArthur Avenue Boulevard to California Avenue	67.1
California Avenue to Mesa Road	66.9
Mesa Road to Campus Drive	66.9
Campus Drive to Harvard Avenue	66.4
Note: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data within the Traffic Impact Analysis prepared by Kimley-Horn (2017). Source: Michael Baker International, 2017c.	

4.10.4 THRESHOLDS OF SIGNIFICANCE

The following significance criteria are from the City of Newport Beach Environmental Checklist. The Proposed Project would result in a significant impact related to noise if it would:

Threshold 4.10-1 Expose persons to or generate, noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies.

Threshold 4.10-2 Expose persons to, or generate, excessive ground borne vibration or ground borne noise levels.

Threshold 4.10-3 Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Threshold 4.10-4 Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Threshold 4.10-5 For a project located within an airport land use compatibility plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

The City has determined that the Proposed Project would not have a significant impact on the following threshold for the reasons stated below, and that no further analysis was required:

- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

There are no private airstrips located immediately adjacent to or near the project site. Therefore, the Proposed Project would not result in a safety hazard for people working or residing at the project site. Therefore, no impact would occur.

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose.

4.10.5 ENVIRONMENTAL IMPACTS

Threshold 4.10-1:	**Would the Project expose persons to or generate, noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies?**
Threshold 4.10-3:	**Would the Project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the Project?**
Threshold 4.10-4:	**Would the Project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the Project?**

Short-Term Construction-Generated Noise

Based on the Project's implementation assumptions, the Proposed Project would be phased over an approximately 4.5-year period with demolition and construction activities anticipated to commence in the first quarter of 2018 and construction completed in the third quarter of 2022. The free-standing parking structure would be constructed in Phase A over an approximate 10-month timeframe (months 0 through 10). Phase 1 includes the demolition of approximately 331 surface parking spaces to allow for the construction of Building 1. Phase 1 would not begin until after the Phase A parking structure is completed and ready for occupancy. Construction of Building 1 is anticipated to occur over an approximate 22-month timeframe (months 10 through 32). Phase 2 includes the demolition of approximately 242 office parking spaces to allow for the construction of Building 2 and Building 3. Construction of Building 2 and Building 3 is anticipated to occur over an approximate 22-month timeframe (months 32 through 54). Phase 3 includes the demolition of approximately 109 parking spaces at locations within the project site. Phase 3 is the construction of the public park and the reconfiguration of other on-site surface parking and access. No additional grading is assumed in Phase 3. Phase 3 construction activities are anticipated to

occur over an approximate six- to nine-month timeframe (months 45 through 54) (see Figure 3-7, *Site Plan*, in Section 3.0, *Project Description* for the Phase A, Phase 1, and Phase 2 construction sites locations).

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, and paving). Noise generated by construction equipment, including earthmovers, material handlers, and portable generators, can reach high levels. Some noise sources are mobile (e.g., vehicles) and others are moved from one location to another at a job site depending on the specific construction activity. All of these factors contribute to an intermittent and variable noise environment. Although noise ranges are generally similar for all construction phases, the ground clearing and excavation phase tends to involve the most heavy-duty equipment having a higher noise-generation potential.

Typical noise levels generated by construction equipment are shown in *Table 4.10-7*. Operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be due to random incidents potentially at different locations, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts).

Table 4.10-7. Typical Construction Equipment Noise Levels

Equipment	Typical Noise Level (dBA) at 50 Feet from Source	
	L_{max}	L_{eq}
Air Compressor	80	76
Backhoe/Front End Loader	80	76
Compactor (Ground)	80	73
Concrete Mixer Truck	85	81
Concrete Mixer (Vibratory)	80	73
Concrete Pump Truck	82	75
Concrete Saw	90	83
Crane	85	77
Dozer/Grader/Excavator/Scraper	85	81
Drill Rig Truck	84	77
Generator	82	79
Gradall	85	81
Hydraulic Break Ram	90	80
Jackhammer	85	78
Impact Hammer/Hoe Ram (Mounted)	90	83
Pavement Scarifier/Roller	85	78
Paver	85	82
Pneumatic Tools	85	82
Pumps	77	74
Truck (Dump/Flat Bed)	84	80

Source: Michael Baker International, 2017c.

Noise levels associated with individual construction equipment used for typical construction projects can reach levels of up to approximately 90 dBA L_{max} at 50 feet from the source (Table 4.10-7). Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended

purpose. The City of Newport Beach does not have quantitative standards for construction noise levels and only allows construction noise between 7:00 AM and 6:30 PM weekdays and 8:00 AM and 6:00 PM Saturdays. No construction noise is allowed on Sundays or any federal holidays.

Construction activities would also cause increased noise along access routes to and from the site due to movement of equipment and workers. The Proposed Project would require the export of approximately 118,500 cubic yards of soil, which could result in approximately 7,407 soil hauling trips over the approximately 4.5-year construction period. These trips would occur incrementally over the construction phases.

Currently, the closest sensitive receptors are multi-family residences located on the northeast corner of Campus Drive at Jamboree Road, approximately 1,410 feet east of the project site. Phase I of the Uptown Newport development is currently under construction and could have occupied residences during construction of the Proposed Project. Phase I of the Uptown Newport is located southeast of the project site on Jamboree Road approximately 440 feet away; however, there is an intervening industrial building that separates the construction site from the Phase A construction site. Additionally, it is expected that future Project residents would occupy Building 1 following the completion of Phase 1 construction. Residents in Building 1 would be exposed to Phase 2 construction noise for as long as a 22-month period of time.

Tenants in nearby office buildings would be exposed to elevated noise levels during all construction phases to varying degrees due to proximity to specific phases of construction. Specifically, tenants at 4910 Birch Street and 4440 Von Karman Avenue would be more affected by the construction of Buildings 1 and 2 over a 44-month timeframe than tenants at 4490 Von Karman Avenue, 4340 Von Karman Avenue, and 4350 Von Karman Avenue. Construction of the Phase A parking structure would affect tenants in 4340 and 4350 Von Karman Avenue to a greater degree than other buildings. Construction of the Phase A parking structure is not expected to affect tenants in 4910 Birch Street. Noise affecting 4340 Von Karman Avenue and 4350 Von Karman Avenue is the most notable and may be potentially disruptive at times, especially when equipment is operating at maximum power. Noise levels would be higher during the demolition, site preparation, and excavation activities, where the use of heavy construction equipment is more frequent, but also during other portions of the overall (building) construction process.

Phase A Construction Noise Impacts

Phase A would include the construction of a free-standing parking structure in the southernmost portion of the project site and is expected to take approximately 10 months. The nearest receptors that would be exposed to Phase A construction noise would include the 5000 Birch Street office building located approximately 230 feet to the north; a fast food restaurant (4501 Jamboree Road) located approximately 525 feet to the east; the Uptown Newport project site (multi-family residential community with neighborhood-serving retail uses) located approximately 20 feet to the south/east and the 4340 Von Karman Avenue office building located approximately 100 feet to the west of the Phase A construction site.[2] As a conservative estimate, the anticipated short-term and intermittent construction noise levels

[2] Distances to all receptors were measured using Google Earth, 2017. The measured distances are approximate and are from the nearest construction area boundary to the building exterior of the closest receptor.
Note: Where the Uptown Newport project site is adjacent to the Koll Center Residences site, the property is occupied by an industrial use. The timing of demolition of this use and development with a mix of uses including residential has not been determined.

generated during site clearing/excavation activities (i.e., the construction activity with highest number of equipment used during Phase A construction) were modeled using the FHWA's *Roadway Construction Noise Model (FHWA-HEP-05-054) (*dated January 2006). *Table 4.10-8* identifies the estimated construction noise levels at the closest receptors. Exterior noise levels would range between 65.7 dBA and 92.1 dBA at the closest receptors to the project site.

Phase 1 Construction Noise Impacts

Phase 1 includes the demolition of approximately 331 surface parking spaces and the construction of Building 1. The nearest receptors that would be exposed to Phase 1 construction noise would include 3636 Birch Street office building located approximately 315 feet to the north; the 5015 Birch Street office building located approximately 175 feet to the east; multiple office uses in the 5000 Birch Street office building located approximately 90 feet to the south; and the 4910 Birch Street office building located approximately 25 feet to the west of the Phase 1 construction site. As a conservative estimate, the anticipated short-term construction noise levels generated during concrete operation activities (i.e., the construction activity with highest number of equipment used during Phase 1 construction) were modeled using the FHWA's *Roadway Construction Noise Model (FHWA-HEP-05-054) (*dated January 2006). Exterior noise levels would range between 72.5 dBA and 94.5 dBA at the closest receptors to the project site.

Phase 2 Construction Noise Impacts

Phase 2 includes the demolition of approximately 242 office parking spaces and the construction of Building 2. The nearest receptors that would be exposed to Phase 2 construction noise would include the 4910 Birch Street office building located approximately 30 feet to the north; multi-family residences located approximately 50 feet to the east (i.e., Koll Center Building 1 residents), the 5000 Birch Street office building located approximately 100 feet to the south; and the 4400 MacArthur Boulevard office building located approximately 270 feet to the west of the Phase 2 construction site. As a conservative estimate, the anticipated short-term construction noise levels generated during concrete operation activities (i.e., the construction activity with highest number of equipment used during Phase 2 construction) were modeled using the FHWA's *Roadway Construction Noise Model (FHWA-HEP-05-054) (*dated January 2006). Exterior noise levels would range between 76.8 dBA and 95.9 dBA at the closest receptors to the project site.

Construction Phases Summary: Project-related construction activities would be limited to daytime hours and would comply with the construction hours specified in Section 10.28.040 (Construction Activity – Noise Regulations), of the City's Municipal Code. Phase A construction noise in an office complex adjacent to an industrial use would not result in significant impacts due to the 10-month construction period and the distance to sensitive receptors (since residences would not be built or occupied for Uptown Newport Phase 2 during the Proposed Project's Phase A construction). The adjacent office uses that would be mostly impacted during Phase 1 construction are not designated noise-sensitive uses, but construction activity would potentially cause annoyance and interfere with office activities in areas facing the Phase 1 construction area. Noise disturbances may occur for prolonged periods of time. In addition, construction of Phase 2 would result in high noise levels at the residential uses built during the Project's Phase 1. Due to the length of construction activities and the level of noise from the combination of construction activities, project-related construction noise at the nearby office and retail receivers and future Phase 1 uses would be significant. As such, a potentially significant impact would occur and mitigation would be required.

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Table 4.10-8. Project Construction Average Leq (dBA) Noise Levels by Receptor Distance and Construction Phase

Construction Phase/ Activity	Receptor Locations				Estimated Exterior Construction Noise Level (dBA L_{eq})[b]	Estimated Interior Construction Noise Level (dBA L_{eq})[b, c]
	Land Use	Address	Direction	Distance (ft)[a]		
Phase A						
Site Clearing, Excavation[d]	Office	5000 Birch S	North	230	72.9 dBA	48.9 dBA
	Fast Food	5000 Birch St	East	525	65.7 dBA	41.7 dBA
	Industrial/ Multi-Family (Uptown Newport)[g]	N/A	East/South	20	92.1 dBA	68.1 dBA
	Office	4340 Von Karman Ave	West	100	80.1 dBA	56.1 dBA
Phase 1						
Foundation Operation[e]	Office	3636 Birch St	North	315	72.5 dBA	48.5 dBA
	Office	5015 Birch St	East	175	77.6 dBA	53.6 dBA
	Office	5000 Birch St	South	90	83.4 dBA	59.4 dBA
	Office	4910 Birch St	West	25	94.5 dBA	70.5 dBA
Phase 2						
Foundation Operation[f]	Office	2050 Main St	North	30	95.9 dBA	71.9 dBA
	Multi-Family Residential: Building 1	N/A	East	50	91.5 dBA	67.5 dBA
	Office	5000 Birch St	South	100	85.4 dBA	61.4 dBA
	Office	4400 MacArthur Blvd	West	270	76.8 dBA	52.8 dBA

a. Distance is from the nearest receptor to the closest construction activity area of the project site.
b. Derived from the FHWA *Roadway Construction Noise Model (FHWA-HEP-05-054),* Jan 2006. Refer to Appendix B of EIR Appendix I for noise modeling assumptions and results.
c. A typical building can reduce noise levels by 24 dBA with the windows closed (United States Environmental Protection Agency, *Protective Noise Levels*, November 1978). This assumes all windows and doors are closed, thereby attenuating the exterior noise levels by 24 dBA.
d. Assumes the use of 1 excavator, 1 tractor/loader/backhoe, 1 loader, 1 air compressor, 1 concrete saw, 1 water truck, and 1 crew truck with tool trailer.
e. Assumes the use of 2 cement and mortar mixers, 2 concrete saws, 1 crane, 2 plate compactors, 2 concrete pumps, and 2 welders.
f. Assumes the use of 4 cement and mortar mixers, 4 concrete saws, 2 cranes, 4 plate compactors, 4 concrete pumps, and 2 welders.
g. Phase A would be approximately 20 feet from Phase 2 of Uptown Newport at its closest point. This location of Uptown Newport is currently an industrial use. Construction of Phase A of the Proposed Project is anticipated to be completed prior to 2027, when removal of the current industrial use and construction of the residential uses would occur.

Source: Michael Baker International, 2017c.

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Construction Noise Mitigation

The City of Newport Beach Municipal Code limits noise sources associated with construction, repair, remodeling, or grading of any real property to the hours of 7:00 AM and 6:30 PM on weekdays, and 8:00 AM and 6:00 PM on Saturdays or any federal holiday. The Code also exempts noise levels caused by construction equipment to meet the basic noise level limits previously identified in Tables 4.10-3 and 4.10-4. However, because of the magnitude of the noise levels discussed above and shown in Table 4.10-8, and because of the extended length of the overall construction period, these impacts would be significant.

Compliance with Standard Condition (SC) 4.10-1 would require that loud noise-generating construction would occur only during hours permitted by the City Noise Ordinance. In addition, Mitigation Measures (MM) 4.10-1 through MM 4.10-4 would reduce construction noise impacts or minimize the severity of the impacts through a variety of noise abatement methods. MM 4.10-1 requires the construction of temporary noise barriers between the construction site and sensitive receptors whenever grading or other operations requiring multiple units of diesel engine equipment would occur within 300 feet of receptors and occur for more than 20 working days. Noise reduction by a barrier depends upon the barrier interrupting the line of sight between the noise source and the receiver. Therefore, the barriers prescribed by MM 4.10-1 would provide noise reduction for exterior and first floor receptors, but would provide little or no noise reduction for second floor or higher receptors. Implementation of MM 4.10-1 could also provide benefits by abating dust movement that might escape the dust control measures described in Section 4.2, *Air Quality*.

MM 4.10-2 includes requirements for the proper maintenance and use of equipment; specifies the locations of stationary equipment and maintenance; places limits on engine idling; and restricts the use of noise-producing signals for safety warning purposes only. MM 4.10-3 and MM 4.10-4 require the notification of businesses within 500 feet of the project site, and the placement of signage related to construction activities, respectively. Implementation MMs 4.10-1 through 4.10-4 would reduce construction noise levels; however, this temporary noise increase is considered a significant unavoidable short-term noise impact.

Operational Noise

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels.

Off-Site Project-Related Traffic Noise

Increased traffic on local roadways would result from implementation of the Project and would be a contributor of noise in the study area. Traffic noise levels for roadways primarily affected by the Proposed Project were calculated using the FHWA's Highway Noise Prediction Model (FHWA-RD-77-108). Traffic noise modeling was conducted for conditions with and without the Project, based on traffic volumes obtained from the Project's traffic analysis (Kimley-Horn 2017).

Under CEQA, consideration must be given to the magnitude of the increase and the existence of noise-sensitive receptors in order to determine if the noise increase is a significant adverse environmental

effect. The following City of Newport Beach General Plan Noise Element Policy N1.8 for traffic noise increases is used to determine if a noise-sensitive land use would be impacted and would therefore require mitigation (Table 4.10-2):

- For an existing ambient noise level between 55 and 60 dBA CNEL, an increase of 3 dBA or more;
- For an existing ambient noise level between 60 and 65 dBA CNEL, an increase of 2 dBA or more;
- For an existing ambient noise level between 65 and 75 dBA CNEL, an increase of 1 dBA or more; and
- For an existing ambient noise level greater than 75 dBA CNEL, any increase.

Noise level impacts are assessed by evaluating the noise levels "with" and "without" the Project for the following scenarios: Existing Conditions (Without Project), Existing Conditions Plus Project, and Opening Year. Predicted traffic noise levels are summarized in *Table 4.10-9*.

Existing Conditions With and Without Project

As identified in *Table 4.10-9*, under the "Existing" scenario, noise levels would range from approximately from 54.3 to 71.6 dBA CNEL, with the highest noise levels occurring on Jamboree Road between the I-405 northbound and the southbound I-405 ramps. The "Existing With Project" scenario noise levels would range from approximately 54.3 to 71.6 dBA with the highest noise levels also occurring along the same roadway segment. The table also compares the "Existing" scenario to the "Existing With Project" scenario. The Project would increase noise levels on the surrounding roadways by a maximum of 0.1 dBA. Based on the significance criteria set forth in this EIR, Project noise increases would be less than significant and no mitigation would be required.

Opening Year With and Without Project

Table 4.10-10 compares the "Opening Year Without Project" and "Opening Year With Project" scenarios. Without the Project, noise levels would range from approximately from 55.4 to 72.1 dBA CNEL, with the highest noise levels occurring on Jamboree Road between the I-405 northbound and southbound I-405 ramps. With the Project, noise levels would range from approximately 55.4 to 72.1 dBA with the highest noise levels also occurring along the same roadway segment. Traffic noise levels would result in a maximum increase of 0.1 dBA. Based on the significance criteria set forth in this EIR, Project noise increases would be less than significant and no mitigation would be required.

Table 4.10-9. Existing Plus Project Conditions Predicted Traffic Noise Levels

Roadway Segment	Existing (Without Project)					Existing Plus Project					Difference in dBA @ 100 Ft from Roadway
	ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet) 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet) 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
MacArthur Boulevard											
North of Main St	26,939	66.8	-	133	286	26,999	66.8	-	133	286	0
Main St to NB I-405	35,479	68.2	76	164	353	35,539	68.2	76	164	353	0
Between I-405 NB and SB Ramps	51,177	69.7	96	207	446	51,328	69.8	96	208	447	0.1
Michelson Dr to SB I-405	52,637	68.7	81	175	377	52,879	68.7	82	176	379	0
Michelson Dr to Campus Dr	35,873	69.3	90	194	418	36,115	69.3	90	195	420	0
Jamboree Rd to University Dr	39,361	70.4	106	229	494	39,601	70.4	107	230	496	0
Von Karman Avenue											
North of Main St	21,662	64.1	-	88	189	21,722	64.2	-	88	189	0.1
Main St to Michelson Dr	22,999	64.4	-	92	198	23,059	64.5	-	92	198	0.1
Michelson Dr to Dupont Dr	16,965	63.2	-	75	162	17,025	63.2	-	76	163	0
Dupont Dr to Campus Dr	16,965	63.2	-	75	162	17,025	63.2	-	76	163	0
Teller Avenue											
Michelson Dr to Dupont Dr	5,566	59.4	-	42	91	5,566	59.4	-	42	91	0
Dupont Dr to Campus Dr	2,955	56.6	-	-	60	2,955	56.6	-	-	60	0
Jamboree Road											
North of Main St	63,067	70.7	111	238	513	63,127	70.7	111	238	513	0
Main St to NB I-405	70,074	71.0	117	253	544	70,224	71.0	117	253	545	0
Between I-405 NB and SB I-405 Ramp	78,431	71.6	127	274	590	78,581	71.6	127	274	591	0
SB I-405 to Michelson Dr	71,095	71.2	120	258	556	71,337	71.2	120	259	557	0
Michelson Dr to Dupont Dr	45,474	69.2	89	191	413	45,716	69.3	89	192	414	0.1
Dupont Dr to Campus Dr	41,587	68.6	81	175	377	41,829	68.7	81	176	378	0.1

Table 4.10-9. Existing Plus Project Conditions Predicted Traffic Noise Levels

Roadway Segment	Existing (Without Project)					Existing Plus Project					Difference in dBA @ 100 Ft from Roadway
	ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet)			ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
Campus Dr to Birch St	39,071	68.4	78	169	364	39,283	68.4	79	170	365	0
Birch St to Fairchild Rd	41,102	68.6	81	175	377	41,344	68.7	81	175	378	0.1
Fairchild Rd to MacArthur Blvd	33,314	67.6	70	150	323	33,556	67.7	70	151	325	0.1
Carlson Avenue											
Michelson Dr to Campus Dr	6,128	59.9	-	46	98	6,128	59.9	-	46	98	0
Harvard Avenue											
North of Michelson Dr	25,439	66.1	55	118	254	25,439	66.1	55	118	254	0
Michelson Dr to University Dr	19,009	64.9	-	98	211	19,009	64.9	-	98	211	0
Main Street											
West of MacArthur Blvd	23,739	66.0	-	116	250	23,739	66.0	-	116	250	0
MacArthur Blvd to Von Karman Ave	29,325	65.7	-	112	241	29,325	65.7	-	112	241	0
Von Karman Ave to Jamboree Rd	24,984	65.0	-	100	216	24,984	65.0	-	100	216	0
East of Jamboree Rd	23,323	64.7	-	96	207	23,323	64.7	-	96	207	0
Michelson Drive											
MacArthur Blvd to Von Karman Ave	10,635	61.1	-	55	118	10,635	61.1	-	55	118	0
Von Karman Ave to Jamboree Rd	15,386	62.7	-	70	150	15,386	62.7	-	70	150	0
Jamboree Rd to Carlson Ave	20,475	63.9	-	84	182	20,475	63.9	-	84	182	0
Carlson Ave to Harvard Ave	20,475	64.0	-	85	184	20,475	64.0	-	85	184	0
East of Harvard Ave	17,894	63.4	-	78	168	17,894	63.4	-	78	168	0

Table 4.10-9. Existing Plus Project Conditions Predicted Traffic Noise Levels

Roadway Segment	Existing (Without Project)					Existing Plus Project					Difference in dBA @ 100 Ft from Roadway
	ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet) 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet) 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
Dupont Drive											
Von Karman Ave to Teller Ave	4,176	55.7	-	-	52	4,176	55.7	-	-	52	0
Teller Ave to Jamboree Rd	3,021	54.3	-	-	-	3,021	54.3	-	-	-	0
Campus Drive											
West of MacArthur Blvd	29,714	65.8	-	113	243	29,714	65.8	-	113	243	0
MacArthur Blvd to Von Karman Ave	13,075	62.0	-	63	136	13,075	62.0	-	63	136	0
Von Karman Ave to Teller Ave	11,189	61.3	-	57	122	11,189	61.3	-	57	122	0
Teller Ave to Jamboree Rd	11,186	61.3	-	57	122	11,216	61.3	-	57	122	0
Jamboree Rd to Carlson Ave	18,431	63.4	-	79	170	18,431	63.4	-	79	170	0
Carlson Ave to University Dr	18,427	65.7	51	111	239	18,427	65.7	51	111	239	0
East of University	22,648	64.4	-	92	197	22,648	64.4	-	92	197	0
University Drive											
MacArthur Blvd to California Ave	24,765	67.1	64	139	299	24,765	67.1	64	139	299	0
California Ave to Mesa Rd	30,386	66.9	62	134	288	30,386	66.9	62	134	288	0
Mesa Rd to Campus	30,580	66.9	62	134	290	30,580	66.9	62	134	290	0
Campus Dr to Harvard Ave	25,303	66.4	-	123	265	25,303	66.4	-	123	265	0

A ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level

Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data within the Traffic Impact Analysis prepared by Kimley-Horn (2017). Refer to Appendix B of EIR Appendix I for noise modeling assumptions and results.

Source: Michael Baker International, 2017c.

Table 4.10-10. Opening Year With and Without Project Predicted Traffic Noise Levels

Roadway Segment	Opening Year					Opening Year Plus Project					Difference in dBA @ 100 Ft from Roadway
	ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet) 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet) 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
MacArthur Boulevard											
North of Main St	34,645	67.9	73	157	338	34,705	67.9	73	157	338	0
Main St to NB I-405	53,893	70.0	100	216	466	53,953	70.0	101	217	466	0
Between I-405 NB and SB Ramps	55,245	70.1	101	218	470	55,396	70.1	101	218	471	0
Michelson Dr to SB I-405	59,303	69.2	88	190	409	59,545	69.2	88	190	410	0
Michelson Dr to Campus Dr	38,911	69.7	95	205	441	39,153	69.7	95	206	443	0
Jamboree Rd to University Dr	21,640	67.8	71	154	332	21,880	67.9	72	155	334	0.1
Von Karman Avenue											
North of Main St	26,738	65.1	47	101	217	26,798	65.1	47	101	218	0
Main St to Michelson Dr	28,299	65.3	49	105	227	28,359	65.3	49	106	227	0
Michelson Dr to Dupont Dr	19,351	63.7	-	82	177	19,411	63.7	-	82	178	0
Dupont Dr to Campus Dr	19,247	63.7	-	82	177	19,307	63.7	-	82	177	0
Teller Avenue											
Michelson Dr to Dupont Dr	8,011	61.0	-	54	116	8,011	61.0	-	54	116	0
Dupont Dr to Campus Dr	5,514	59.4	-	42	91	5,514	59.4	-	42	91	0
Jamboree Road											
North of Main St	71,163	71.2	120	258	556	71,223	71.2	120	258	556	0
Main St to NB I-405	76,261	71.4	124	267	576	76,411	71.4	124	268	577	0
Between I-405 NB and SB I-405 Ramp	65,025	70.7	112	242	521	65,175	70.8	112	242	522	0.1
SB I-405 to Michelson Dr	87,498	72.1	138	296	638	87,740	72.1	138	297	639	0
Michelson Dr to Dupont Dr	61,592	70.6	109	234	505	61,834	70.6	109	235	506	0
Dupont Dr to Campus Dr	47,754	69.2	89	192	413	47,996	69.3	89	192	415	0.1

Table 4.10-10. Opening Year With and Without Project Predicted Traffic Noise Levels

Roadway Segment	Opening Year					Opening Year Plus Project					Difference in dBA @ 100 Ft from Roadway
	ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet)			ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
Campus Dr to Birch St	45,570	69.1	87	187	403	45,782	69.1	87	188	405	0
Birch St to Fairchild Rd	44,841	69.0	86	185	399	45,083	69.0	86	186	400	0
Fairchild R to MacArthur Blvd	39,327	68.4	78	168	361	39,569	68.4	78	168	363	0
Carlson Avenue											
Michelson Dr to Campus Dr	9,156	61.6	-	60	128	9,156	61.6	-	60	128	0
Harvard Avenue											
North of Michelson Dr	25,802	66.1	55	119	256	25,802	66.1	55	119	256	0
Michelson Dr to University Dr	19,247	64.9	-	99	213	19,247	64.9	-	99	213	0
Main Street											
West of MacArthur Blvd	27,050	66.5	59	126	272	27,050	66.5	59	126	272	0
MacArthur Blvd to Von Karman Ave	35,270	66.5	59	126	272	35,270	66.5	59	126	272	0
Von Karman Ave to Jamboree Rd	28,403	65.6	-	109	236	28,403	65.6	-	109	236	0
East of Jamboree Rd	24,449	64.9	-	99	213	24,449	64.9	-	99	213	0
Michelson Drive											
MacArthur Blvd to Von Karman Ave	22,681	64.4	-	91	196	22,681	64.4	-	91	196	0
Von Karman Ave to Jamboree Rd	21,640	64.1	-	88	189	21,640	64.1	-	88	189	0
Jamboree Rd to Carlson Ave	26,530	65.0	47	100	216	26,530	65.0	47	100	216	0
Carlson Ave to Harvard Ave	25,594	64.9	-	99	213	25,594	64.9	-	99	213	0
East of Harvard Ave	19,039	63.6	-	81	175	19,039	63.6	-	81	175	0

Table 4.10-10. Opening Year With and Without Project Predicted Traffic Noise Levels

Roadway Segment	Opening Year					Opening Year Plus Project					Difference in dBA @ 100 Ft from Roadway
	ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet) 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	ADT	dBA @ 100 Ft from Centerline	Distance from Roadway Centerline to: (Feet) 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
Dupont Drive											
Von Karman Ave to Teller Ave	5,618	57.0	-	-	63	5,618	57.0	-	-	63	0
Teller Ave to Jamboree Rd	3,849	55.4	-	-	49	3,849	55.4	-	-	49	0
Campus Drive											
West of MacArthur	33,397	66.3	-	122	262	33,397	66.3	-	122	262	0
MacArthur Blvd to Von Karman Ave	16,126	62.9	-	72	156	16,126	62.9	-	72	156	0
Von Karman Ave to Teller Ave	13,629	62.2	-	65	139	13,629	62.2	-	65	139	0
Teller Ave to Jamboree Rd	12,797	61.9	-	62	134	12,827	61.9	-	62	134	0
Jamboree Rd to Carlson Ave	20,808	64.0	-	85	184	20,808	64.0	-	85	184	0
Carlson Ave to University Dr	19,664	66.0	54	116	250	19,664	66.0	54	116	250	0
East of University	24,866	64.8	-	97	210	24,866	64.8	-	97	210	0
University Drive											
MacArthur Blvd to California Ave	27,154	67.5	68	147	317	27,154	67.5	68	147	317	0
California Ave to Mesa Rd	32,877	67.2	66	141	304	32,877	67.2	66	141	304	0
Mesa Rd to Campus	33,397	67.3	66	143	307	33,397	67.3	66	143	307	0
Campus Dr to Harvard Ave	28,507	66.9	62	133	287	28,507	66.9	62	133	287	0

ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level
Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data within the Traffic Impact Analysis prepared by Kimley-Horn (2017). Refer to Appendix B of EIR Appendix I for noise modeling assumptions and results.

Source: Michael Baker International, 2017c.

On-Site Mobile Noise

Residences

Future residents at the project site would be exposed to mobile traffic noise along Birch Street and Von Karman Avenue, and some aircraft noise from John Wayne Airport. *Table 4.10-11* identifies the combined noise levels of mobile traffic and aircraft noise at the future residences on the site.

Table 4.10-11. On-Site Mobile Combined Noise Levels

Project Boundary	Roadway Segment	Distance to Road	Traffic Noise (dBA CNEL)[a, b]	Aircraft Noise (dBA CNEL)	Total Exterior Noise Level (dBA CNEL) [b]	Total Interior Noise Level (dBA CNEL)[c]
Northeast	Birch Street	200	62.0	60	64.1	40.1
West	Von Karman Avenue	40	65.1	60	66.3	42.3

a. Calculated using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and traffic volumes from the *Final Environmental Impact Report for Uptown Newport* (City of Newport Beach, February 2013).
b. Noise levels calculated from the roadway centerline to the closest residential building on the project site.
c. Typical building construction can reduce noise levels by 24 dBA with the windows closed (United States Environmental Protection Agency, *Protective Noise Levels*, November 1978).

Source: Michael Baker International, 2017c.

As shown in the Table 4.10-11, buildings facing Von Karman Avenue would experience interior noise levels ranging between 40.1 dBA and 42.3 dBA, which would be below the City's 45 dBA interior daytime threshold, and 45 dBA standard in Title 24 of the California Code of Regulations. However, interior noise levels would exceed the City's 40 dBA nighttime standard, and exterior noise levels (approximately 66.3 dBA) would exceed the City's 60 dBA daytime exterior standard (for residential portions of a mixed-use development). Therefore, the Project would be required to comply with MM 4.10-5, which requires all residential units to be designed to ensure that interior noise levels in habitable rooms from exterior sources (including aircraft and vehicles on adjacent roadways) shall not exceed 45 dBA, in compliance with Title 24 of the California Code of Regulations. Further, the Project would be required to comply with MM 4.10-6, which require a detailed acoustical study demonstrating that all residential units would meet the City's 60 dBA exterior noise standard for all patios, balconies, and common outdoor living areas through any necessary noise reduction features (barriers, berms, enclosures, etc.). Compliance with MM 4.10-5 and MM 4.10-6 would result in a less than significant impact.

Public and Private Outdoor Amenity and Recreational Areas

A 1.17-acre public park would be constructed adjacent to Birch Street as part of the Proposed Project. Due to its location along Birch Street, users of the proposed park would be exposed to frequent traffic noise. Based on the FHWA Noise Prediction Model (FHWA-RD-77-108) and traffic volumes from the *Final Environmental Impact Report for Uptown Newport* (City of Newport Beach, February 2013), traffic noise levels at the public park would be approximately 68.0 dBA, which would be considered within the Zone "B" "normally compatible" range of 65-70 dBA in the City's Land Use Noise Compatibility Matrix (Table 4.10-1). As defined in the City's General Plan, new construction or development should be undertaken only after detailed analysis of the noise reduction requirements and are made and needed

noise insulation features in the design are determined for areas designated "normally compatible". Therefore, an acoustical study analyzing potential noise reduction features at the public park is required as part of MM 4.10-6, in accordance with the City's General Plan Noise Element and Table 4.10-1.

On-Site Stationary Noise

Potential long-term stationary noise impacts would be associated with residential and retail uses, and the public park. An analysis of the long-term stationary noise sources from the Proposed Project is provided below.

Mechanical Equipment. Mechanical equipment (e.g., HVAC equipment) typically generates noise levels of approximately 50 to 60 dBA at 50 feet. SC 4.10-2 requires that HVAC units be designed and installed in accordance with the Newport Beach Noise Ordinance. This section of the Noise Ordinance specifies noise levels for new HVAC installations in or adjacent to residential areas. Compliance may be achieved by several methods, including selecting quiet models, constructing barriers or parapet walls, enclosing the equipment, and placing the equipment in locations that would result in compliance with the Noise Ordinance. Operation of mechanical equipment would not be anticipated to increase ambient noise levels beyond the acceptable compatible land use noise levels. Therefore, the Proposed Project would result in a less than significant impact related to stationary noise levels.

Truck Deliveries. Potential noise impacts with the Project's retail uses would be associated primarily with truck deliveries. The primary noise associated with truck deliveries is the arrival and departure of trucks. Normal deliveries are mostly by two-axle medium trucks and typically occur during daytime hours. No loading docks are proposed. It is anticipated that truck deliveries would be infrequent and limited to small two-axle trucks. While there would be temporary noise increases during truck maneuvering and engine idling, these impacts would short term and infrequent. Additionally, General Plan Policy N 2.3 requires truck deliveries abutting noise sensitive land uses to be limited to minimize excessive noise. An exemption to this policy would require compliance with nighttime (10:00 PM to 7:00 AM) noise standards (refer to SC 4.10-3). Impacts would be less than significant.

Public and Private Outdoor Amenity and Recreational Areas. As noted above, the Project would include a 1.17-acre public park along Birch Street in the eastern portion of the project site. Activities at the park would include two pickleball courts, a passive garden, lawn area, park gathering plaza, and tables for chess/seating. The most prominent noise sources at the park would be from pickleball and gatherings at the plaza area. Pickleball creates noise levels of approximately 58 dBA at a distance of 30 feet.[3] Noise has a decay rate due to distance attenuation, which is calculated based on the Inverse Square Law of sound propagation. Based upon the Inverse Square Law, sound levels decrease by 6 dBA for each doubling of distance from the source.[4] The closest sensitive receptors to the pickleball courts would be residences at Building 1 (of the Proposed Project) located approximately 120 feet to the west. At this distance, noise levels would be approximately 46 dBA, which is well below the City's 60 dBA exterior threshold for Zone III (residential portions of mixed-use properties) between the hours of 7:00 a.m. and 6:00 PM. Interior

[3] Michael Baker International noise measurements conducted on August 15, 2017.

[4] Cyril M. Harris, *Noise Control in Buildings*, 1994.

noise levels would be approximately 22 dBA, which is well below the City's 40 and 45 dBA interior threshold for Zone III during nighttime and daytime hours, respectively.

As noted above, the proposed park includes a gathering plaza for residents to use. This area has the potential to be accessed by groups of people intermittently for various occasions (e.g., birthday parties, picnics, etc.). Noise generated by groups of people (i.e., crowds) is dependent on several factors including vocal effort, impulsiveness, and the random orientation of the crowd members. Crowd noise is estimated at 60 dBA at one meter (3.28 feet) away for raised normal speaking.[5] This noise level would have a +5 dBA adjustment for the impulsiveness of the noise source, and a -3 dBA adjustment for the random orientation of the crowd members.[6] Therefore, crowd noise would be approximately 62 dBA at one meter from the source (i.e., at the gathering plaza). As a result, crowd noise would be approximately 25 dBA at the closest sensitive receptors (i.e., residences in Building 1 located approximately 230 feet to the west of the proposed gathering plaza), which would not exceed the existing the City's 60 dBA exterior noise standard for Zone III (residential portions of mixed-use properties) between the hours of 7:00 AM and 6:00 PM**.** Further, noise levels from the proposed park would not be louder than the existing ambient noise levels in the area (i.e., 64.3 dBA L_{eq} along Birch Street; refer to *Table 4.10-5*).

The proposed residential buildings would include outdoor pool areas on the podium level (level 3) that would constitute a stationary noise source. Specifically, an outdoor pool area would be provided at Building 1, and a shared outdoor pool area would be provided for Buildings 2 and 3. Similar to the noise generated at the gathering plaza for the proposed park, crowd noise at the pool areas would be approximately 62 dBA at one meter from the source. The closest sensitive receptors (residences at Buildings 1, 2, and 3) would be located approximately 170 feet, 40 feet, and 40 feet away, respectively. At these distances, noise levels would be approximately 28 dBA, 40 dBA, and 40 dBA, respectively, which are below the City's 60 dBA exterior noise standards for Zone III (residential portions of mixed-use properties) between the hours of 7:00 AM and 6:00 PM**.**

As discussed above, the proposed park and outdoor pool areas would not generate noise levels that would exceed the City's noise standards at the closest sensitive receptors. Therefore, impacts would be less than significant.

Surface Parking and Parking Structures. The Proposed Project includes the construction of a free-standing parking structure, and parking structures associated with Buildings 1, 2, and 3. The free-standing parking structure would include three levels of below-ground parking and five levels of above-ground parking including rooftop parking. Building 1 is proposed as a 13-story podium building with 5 levels of structured parking (3 levels below ground and 2 levels above ground). Building 2 and Building 3 share common parking and amenities located within the podium the two buildings share. Building 2 and 3 would have four levels of common structured parking (2 levels below ground and 2 levels above ground). Surface parking would also be provided, and currently exists on the site.

Traffic associated with parking lots and garages is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. While the

[5] M.J. Hayne, et al, *Prediction of Crowd Noise*, Acoustics, November 2006.

[6] Ibid.

instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-bys may be an annoyance, noise levels are not a significant impact.

Maximum noise levels from noise events at surface parking areas and parking levels that are not completely shielded, such as car door slamming, engine start-up, alarm activation, car horns and tire squealing range from 55 to 70 dBA L_{max} at 50 feet from the source. The City of Newport Beach Noise Ordinance standards prescribe exterior noise level limits of 50 dBA at residential portions of mixed-use properties for nighttime hours and 60 dBA for daytime hours; interior noise limits are 45 dBA during daytime hours and 40 dBA during nighttime hours. The closest sensitive receptors to the proposed free-standing parking structure would be residences located approximately 25 feet to the east at Uptown Newport. At this distance, noise levels from the parking structure could reach 76 dBA L_{max}, which would exceed the City's interior and exterior noise standards (daytime and nighttime) for residential uses. To reduce noise levels at the residences to the east of the free-standing parking structure, the project would be required to submit an acoustical study to the City of Newport beach Community Development detailing noise-attenuation features that would reduce noise levels to below City standards (refer to MM 4.10-7). To further reduce noise at the proposed free-standing parking structure, MM 4.10-8 requires the parking lot surface of all proposed parking garages to be textured to eliminate tire squeal noise, and requires ventilation equipment to not exceed the City's noise standards for Zone III (i.e., a daytime exterior maximum of 60 dBA L_{eq} [or 80 dBA L_{max}] and a nighttime exterior maximum of 50 dBA L_{eq} [or 70 dBA L_{max}], daytime interior maximum of 45 dBA L_{eq}, and a nighttime interior maximum of 40 dBA L_{eq}). Due to the noise reduction requirements as part of MM 4.10-7 and the additional noise reduction measures required in MM 4.10-8, noise from the proposed free-standing parking structure would be less than significant.

Impact Summary:

Construction Noise: Significant Unavoidable Impact. Construction activities would result in a substantial temporary increase in ambient noise levels to various receptors adjacent to site development, including residential, office, and commercial uses. SC 4.10-1 and Mitigation Measures 4.10-1 through 4.10-4 are proposed to reduce noise levels. However, due to proximity of the noise-sensitive receivers and duration of construction activities, the temporary noise increases would be significant. There would be periodic, temporary, unavoidable significant noise impacts that would cease upon completion of construction activities.

Operational Noise: Less than Significant Impact With Mitigation. Noise level increases associated Project vehicular traffic would not exceed significance thresholds. However, on-site mobile noise levels would exceed the City's 60 dBA daytime exterior noise standard and the City's 50 dBA nighttime standard. With implementation of MMs 4.10-5 and 4.10-6, on-site noise levels from mobile sources (mobile traffic and aircraft) would comply with the City of Newport Beach Noise Ordinance and General Plan Noise Element, as applicable, and would be less than significant.

Stationary Noise: Less than Significant with Mitigation. The Proposed Project would introduce new stationary noise sources that would result in small noise level increases proximate to noise-sensitive land uses. With the application of SC 4.10-2 and the implementation of MMs 4.10-6, 4.10-7, and 4.10-8, noise levels from

Project-related stationary sources to existing and proposed sensitive receptors would comply with the City of Newport Beach Noise Ordinance (i.e., 60 dBA daytime exterior and 50 dBA nighttime exterior, and 45 dBA daytime interior and 45 dBA nighttime interior), as applicable, and would be less than significant.

Threshold 4.10-2:	**Would the Project expose persons to, or generate, excessive ground borne vibration or ground borne noise levels?**

Increases in groundborne vibration levels attributable to the Proposed Project would be primarily associated with construction-related activities. Construction on the project site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. The effect on buildings located in the vicinity of the construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Groundborne vibrations from construction activities rarely reach levels that damage structures.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. Vibration decreases rapidly with distance.

The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations. In general, depending on the building category of the nearest buildings adjacent to the potential pile driving area, the potential construction vibration damage criteria vary. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.50 inch per second (in/sec) peak particle velocity (PPV) is considered safe and would not result in any construction vibration damage. The FTA architectural damage criterion for continuous vibrations for non-engineered timber and masonry buildings (i.e., 0.20 inch/second) appears to be conservative. The types of construction vibration impact include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. The City of Newport Beach does not provide numerical vibration standards for construction activities. Therefore, this impact discussion uses FTA standard of 0.20 inch/second PPV with respect to the prevention of structural damage for normal buildings and human annoyance.

The nearest structures to any of the construction activities include office buildings that are within approximately 50 feet. *Table 4.10-12* identifies vibration levels feet for typical construction equipment. Based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction would range from 0.003 to 0.089 inch/second PPV at 25 feet and

0.001 to 0.024 inch/second PPV from the source of activity. It is also acknowledged that construction activities would occur throughout the project site and would not be concentrated at the point closest to the nearest structure. Vibration from construction activities experienced at the nearest building would be expected to be below the 0.20 inch/second PPV significance threshold. As noted above, the 0.20 inch/second PPV threshold is conservative because the construction vibration damage criteria for non-engineered timber and masonry buildings. Buildings would be better represented by the 0.50 inch/second PPV significance threshold (construction vibration damage criteria for a reinforced concrete, steel or timber buildings). Once operational, the Project would not be a source of groundborne vibration. Because construction equipment vibration levels would be below the significance thresholds, impacts would be less than significant.

Table 4.10-12. Typical Construction Equipment Vibration Levels

Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)	Peak Particle Velocity at 50 Feet (inches per second)[a]
Large Bulldozer	0.089	0.024
Caisson Drilling	0.089	0.024
Loaded Trucks	0.076	0.020
Rock Breaker	0.059	0.016
Jackhammer	0.035	0.001
Small Bulldozer/Tractor	0.003	0.001

a. Calculated using the following formula:

$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

where: PPV (equip) = the peak particle velocity in inch per second of the equipment adjusted for the distance

PPV (ref) = the reference vibration level in inch per second from Table 12-2 of the FTA Transit Noise and Vibration Impact Assessment Guidelines

D = the distance from the equipment to the receiver

Source: Michael Baker International, 2017c.

Impact Summary: ***Less Than Significant Impact.*** Vibration may be noticeable for short periods during construction, but it would be temporary and periodic and would not be excessive. Vibration effects would be less than significant.

Threshold 4.10-5: **For a Project located within an airport land use compatibility plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the project area to excessive noise levels?**

John Wayne Airport is approximately 0.44 mile northwest of the project site. However, a review of the Land Use Plan for John Wayne Airport (2008), shows the project site located outside of the 60 dBA CNEL contour. Therefore, there is no impact surrounding the Proposed Project concerning airport noise and no mitigation is required.

Impact Summary: ***Less Than Significant Impact.*** Since the Project is located outside the 60 dBA CNEL from John Wayne Airport, no significant noise impacts from aircraft activities would occur. No mitigation is required.

4.10.6 CUMULATIVE IMPACTS

Cumulative Construction Noise

The Project's construction activities would result in a substantial temporary increase in ambient noise levels. There would be periodic, temporary, unavoidable significant noise impacts that would cease upon completion of construction activities. The Project would contribute to significant unavoidable construction noise impacts should other development proximate to the project site occur concurrent with the Project.

Cumulative Operational Noise

Cumulative noise impacts describe how much noise levels are projected to increase over existing conditions with the development of the Proposed Project and other foreseeable projects. Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to buildout of the Proposed Project and other projects in the vicinity. Cumulative increases in traffic noise levels were estimated by comparing the Existing Plus Project and Opening Year scenarios to existing conditions. The traffic analysis considers cumulative traffic from future growth assumed in the traffic mode, as well as cumulative projects identified by the cities of Newport Beach and Irvine.

A project's contribution to a cumulative traffic noise increase would be considered significant when the combined effect exceeds perception level (i.e., auditory level increase) threshold. The following criteria is used to evaluate the combined effect of the cumulative noise increase.

- *Combined Effect.* The cumulative with Project noise level ("Cumulative With Project") would cause a significant cumulative impact if a 3.0 dB increase over "Existing" conditions occurs and the resulting noise level exceeds the applicable exterior standard at a sensitive use. Although there may be a significant noise increase due to the Proposed Project in combination with other related projects (combined effects), it must also be demonstrated that the Project has an incremental effect. In other words, a significant portion of the noise increase must be due to the Proposed Project.

The following criteria have been used to evaluate the incremental effect of the cumulative noise increase.

- *Incremental Effects*. The "Cumulative With Project" causes a 1.0 dBA increase in noise over the "Cumulative Without Project" noise level.

A significant impact would result only if both the combined and incremental effects criteria have been exceeded. Noise by definition is a localized phenomenon, and reduces as distance from the source increases. Consequently, only the Proposed Project and growth due to occur in the general area would contribute to cumulative noise impacts. *Table 4.10-13* identifies the traffic noise effects along roadway segments in the vicinity of the project site for "Existing," "Cumulative Without Project," and "Cumulative With Project," conditions, including incremental and net cumulative impacts.

First, it must be determined whether the "Future With Project" increase above existing conditions (*Combined Effects*) is exceeded. As indicated in the table, the Proposed Project has one street segment (Michelson Drive between MacArthur Boulevard to Von Karman Avenue) that exceeds combined effects criterion. Next, under the *Incremental Effects* criteria, cumulative noise impacts are defined by determining if the forecast ambient ("Future Without Project") noise level is increased by 1 dB or more. As shown in the table, the incremental effects criterion is not exceeded. Based on the significance criteria set forth in this EIR, not roadway segments would result in significant impacts because they would not exceed either the combined or the incremental effects criteria. The Proposed Project would not result in long-term mobile noise impacts based on Project-generated traffic as well as cumulative and incremental noise levels. Therefore, the Proposed Project, in combination with cumulative background traffic noise levels, would result in a less than significant cumulative impact. The Proposed Project's contribution to would not be cumulatively considerable.

Table 4.10-13. Cumulative Plus Project Conditions Predicted Traffic Noise Levels

Roadway Segment	Existing	Cumulative Without Project	Cumulative With Project	Combined Effects	Incremental Effects	Cumulatively Significant Impact?
	dBA @ 100 Ft from Centerline	dBA @ 100 Ft from Centerline	dBA @ 100 Ft from Centerline	dBA Difference: Existing and Cumulative With Project	dBA Difference: Cumulative Without and With Project	
MacArthur Boulevard						
North of Main St	66.8	67.9	67.9	1.1	0	No
Main St to NB I-405	68.2	70.0	70.0	1.8	0	No
Between I-405 NB and SB Ramps	69.7	70.1	70.1	0.4	0	No
Michelson Dr to SB I-405	68.7	69.2	69.2	0.5	0	No
Michelson Dr to Campus Dr	69.3	69.7	69.7	0.4	0	No
Jamboree Rd to University Dr	70.4	67.8	67.9	-2.5	0.1	No
Von Karman Avenue						
North of Main St	64.1	65.1	65.1	1	0	No
Main St to Michelson Dr	64.4	65.3	65.3	0.9	0	No
Michelson Dr to Dupont Dr	63.2	63.7	63.7	0.5	0	No
Dupont Dr to Campus Dr	63.2	63.7	63.7	0.5	0	No
Teller Avenue						
Michelson Dr to Dupont Dr	59.4	61.0	61.0	1.6	0	No
Dupont Dr to Campus Dr	56.6	59.4	59.4	2.8	0	No
Jamboree Road						
North of Main St	70.7	71.2	71.2	0.5	0	No

Table 4.10-13. Cumulative Plus Project Conditions Predicted Traffic Noise Levels

Roadway Segment	Existing	Cumulative Without Project	Cumulative With Project	Combined Effects	Incremental Effects	Cumulatively Significant Impact?
	dBA @ 100 Ft from Centerline	dBA @ 100 Ft from Centerline	dBA @ 100 Ft from Centerline	dBA Difference: Existing and Cumulative With Project	dBA Difference: Cumulative Without and With Project	
Main St to NB I-405	71.0	71.4	71.4	0.4	0	No
Between I-405 NB and SB I-405 Ramps	71.6	70.7	70.8	-0.8	0.1	No
SB I-405 to Michelson Dr	71.2	72.1	72.1	0.9	0	No
Michelson Dr to Dupont Dr	69.2	70.6	70.6	1.4	0	No
Dupont Dr to Campus Dr	68.6	69.2	69.3	0.7	0.1	No
Campus Dr to Birch St	68.4	69.1	69.1	0.7	0	No
Birch St to Fairchild Rd	68.6	69.0	69.0	0.4	0	No
Fairchild Rd to MacArthur Blvd	67.6	68.4	68.4	0.8	0	No
Carlson Avenue						
Michelson Dr to Campus Dr	59.9	61.6	61.6	1.7	0	No
Harvard Avenue						
North of Michelson Dr	66.1	66.1	66.1	0	0	No
Michelson Dr to University Dr	64.9	64.9	64.9	0	0	No
Main Street						
West of MacArthur Blvd	66.0	66.5	66.5	0.5	0	No
MacArthur Blvd to Von Karman Ave	65.7	66.5	66.5	0.8	0	No
Von Karman Ave to Jamboree Rd	65.0	65.6	65.6	0.6	0	No
East of Jamboree Rd	64.7	64.9	64.9	0.2	0	No
Michelson Drive						
MacArthur Blvd to Von Karman Ave	61.1	64.4	64.4	3.3	0	No
Von Karman Ave to Jamboree Rd	62.7	64.1	64.1	1.4	0	No
Jamboree Rd to Carlson Ave	63.9	65.0	65.0	1.1	0	No
Carlson Ave to Harvard Ave	64.0	64.9	64.9	0.9	0	No
East of Harvard Ave	63.4	63.6	63.6	0.2	0	No

Table 4.10-13. Cumulative Plus Project Conditions Predicted Traffic Noise Levels

Roadway Segment	Existing	Cumulative Without Project	Cumulative With Project	Combined Effects	Incremental Effects	Cumulatively Significant Impact?
	dBA @ 100 Ft from Centerline	dBA @ 100 Ft from Centerline	dBA @ 100 Ft from Centerline	dBA Difference: Existing and Cumulative With Project	dBA Difference: Cumulative Without and With Project	
Dupont Drive						
Von Karman Ave to Teller Ave	55.7	57.0	57.0	1.3	0	No
Teller Ave to Jamboree Rd	54.3	55.4	55.4	1.1	0	No
Campus Drive						
West of MacArthur Boulevard	65.8	66.3	66.3	0.5	0	No
MacArthur Blvd to Von Karman Ave	62.0	62.9	62.9	0.9	0	No
Von Karman Ave to Teller Ave	61.3	62.2	62.2	0.9	0	No
Teller Ave to Jamboree Rd	61.3	61.9	61.9	0.6	0	No
Jamboree Rd to Carlson Ave	63.4	64.0	64.0	0.6	0	No
Carlson Ave to University Dr	65.7	66.0	66.0	0.3	0	No
East of University Dr	64.4	64.8	64.8	0.4	0	No
University Drive						
MacArthur Blvd to California Ave	67.1	67.5	67.5	0.4	0	No
California Ave to Mesa Rd	66.9	67.2	67.2	0.3	0	No
Mesa Rd to Campus Dr	66.9	67.3	67.3	0.4	0	No
Campus Dr to Harvard Ave	66.4	66.9	66.9	0.5	0	No

ADT = average daily traffic; dBA = A-weighted decibels; CNEL = community noise equivalent level
Note: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data within the Traffic Impact Analysis prepared by Kimley-Horn (2017). Refer to Appendix B of EIR Appendix I for noise modeling assumptions and results.

Source: Michael Baker International, 2017c.

Vibration

Vibration impacts during construction of the Proposed Project would be localized and would occur intermittently for varying periods of time throughout the construction period. Short-term cumulative impacts related to vibration levels could occur if construction associated with the Proposed Project as well

as surrounding current and future development were to occur simultaneously. Noise and vibration associated with construction of the Proposed Project, in combination with other projects proximate to the project site boundaries, could adversely impact sensitive receptors in the vicinity of the project site with a cumulative noise level greater than the noise generated solely at the project site.

Potential cumulative projects include Uptown Newport which is the only reasonably foreseeable project near the project site. Based on the proposed schedule for Uptown Newport (Phase 1 of Uptown Newport is currently being constructed, and Phase 2 construction would begin in 2022 or 2027), construction of the Proposed Project could coincide with construction of the Uptown Newport Project. However, as discussed above, short-term construction vibration impacts from the Proposed Project would less than significant. Therefore, there would be no cumulative vibration impacts.

4.10.7 MITIGATION PROGRAM

Project Design Features

No project design features have been identified by the Applicant.

Standard Conditions

SC 4.10-1 To ensure compliance with Newport Beach Municipal Code Section 10.28.040, grading and construction plans shall include a note indicating that loud noise-generating Project construction activities (as defined in Section 10.28.040 of the Newport Beach Municipal Code) shall take place between the hours of 7:00 AM and 6:30 PM on weekdays and from 8:00 AM to 6:00 PM on Saturdays. Loud, noise-generating construction activities are prohibited outside of these hours and on Sundays and federal holidays.

SC 4.10-2 Heating, ventilation and air conditioning (HVAC) units shall be designed and installed in accordance with Section 10.26.045 of the Newport Beach Municipal Code, which specifies the maximum noise levels for new HVAC installations and associated conditions. All mechanical equipment shall be screened from view of adjacent properties and adjacent public streets for each residential structure, as authorized by a Site Development Review Permit.

SC 4.10-3 As required by General Plan Policy N 2.3, the hours of truck deliveries to commercial uses abutting residential uses and other noise sensitive land uses shall be limited to minimize excessive noise unless there is no feasible alternative. Any exemption shall require compliance with nighttime (10:00 P.M. to 7:00 A.M.) noise standards.

Mitigation Measures

Construction Activities

MM 4.10-1 Grading plans and specifications shall include temporary noise barriers for all grading, hauling, and other heavy equipment operations that would occur within 300 feet of sensitive receptors and occur for more than 20 working days. The noise barriers shall be a minimum height of 12 feet high. The barriers shall be solid from the ground to the top of the barrier, and have a weight of at least 2.5 pounds per square foot, which is

equivalent to ¾ inch thick plywood. The barrier design shall optimize the following requirements: (1) the barrier shall be located to maximize the interruption of line of sight between the equipment and the receptor; (2) the length and of the barrier shall be selected to block the line of sight between the construction area and the receptors; (3) the barrier shall be located as close as feasible to the receptor or as close as feasible to the construction area.

MM 4.10-2 Prior to the start of grading, the Construction Manager shall provide evidence acceptable to the City of Newport Beach Public Works Director and/or Community Development Director, that:

a. All construction vehicles and equipment, fixed or mobile, shall be maintained in good operating condition and be equipped with all internal combustion, engine-driven equipment fitted with intake and exhaust muffles, air intake silencers, and engine shrouds no less effective than as originally equipped by the manufacturer.

b. Where stationary equipment, such as generators, cranes, and air compressors, is located within 50 feet of a sensitive receptor including offices, the equipment shall be equipped with appropriate noise reduction measures (e.g., silencers, shrouds, or other devices) to limit equipment noise.

c. Equipment maintenance, vehicle parking, and material staging areas shall be located as far away from office buildings adjacent to the project site as feasible.

d. Electrically powered equipment instead of pneumatic or internal combustion powered equipment shall be used to the extent possible.

e. All internal combustion engine idling both on the site and at nearby queuing areas shall be limited to no more than five minutes for any given vehicle or machine. Signs shall be posted at the job site and along queueing lanes to reinforce the prohibition of unnecessary engine idling.

f. The use of noise producing signals, including horns, whistles, alarms, and bells shall be for safety warning purposes only. Use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with human spotters.

MM 4.10-3 At least 30 days prior to the start of any ground disturbing or other noise generating activities, the contractor shall notify all businesses within 500 of the project site of the planned start date, duration, nature of the construction activity, and noise abatement measures to be provided. The notification shall include a contact telephone number for questions and the submittal of any complaints of excess, unanticipated noise or vibration.

MM 4.10-4 Prior to the beginning of construction activities, a sign shall be posted at the entrance to the job site, clearly visible to the public, that contains a contact name and telephone number of the construction contractor's authorized representative to respond in the event of a vibration or noise complaint. If the authorized representative receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City of Newport Beach's Community Development Director.

Operational Activities

MM 4.10-5 All residential units shall be designed to ensure that interior noise levels in habitable rooms from exterior sources (including aircraft and vehicles on adjacent roadways) shall not exceed 45 dBA CNEL. This mitigation measure complies with the applicable sections of the California Building Code (Title 24 of the *California Code of Regulations*). Prior to granting of a building permit, the Applicant shall submit to the City of Newport Beach Community Development Department for review and approval architectural plans and an accompanying noise study that demonstrates that interior noise levels in the habitable rooms of residential units would be 45 dBA CNEL or less. Where closed windows are required to achieve the 45 dBA CNEL limit, Project plans and specifications shall include ventilation as required by the California Building Code.

MM 4.10-6 Prior to issuance of building permits for Phase 1 and Phase 2, a detailed acoustical study based on architectural plans shall be prepared by a qualified acoustical consultant and submitted to the Community Development Department to demonstrate that all residential units would meet the City's 60 dBA daytime (7:00 AM to 10:00 PM) exterior noise standard, and 50 dBA L_{eq} nighttime (10:00 PM to 7:00 AM) exterior noise standard for all patios, balconies, and common outdoor living areas. In addition, the acoustical study shall demonstrate that interior noise levels at all residential units at the project site would meet the City's 45 dBA L_{eq} daytime threshold, and 40 dBA L_{eq} nighttime threshold. This mitigation measure complies with the applicable sections of the California Building Code (Title 24 of the *California Code of Regulations*). The necessary noise reduction may be achieved by implementing noise control measures at the receiver locations. The final grading and building plans shall incorporate the required noise barriers (patio enclosure, wall, berm, or combination wall/berm), and the property owner/developer shall install these barriers and enclosures.

MM 4.10-7 Prior to issuance of building permits for Phase A, a detailed acoustical study based on architectural plans for the free-standing parking structure shall be prepared by a qualified acoustical consultant and submitted to the Community Development Department to demonstrate that the future adjoining residences to the southeast at the Uptown Newport property would meet the City's 60 dBA L_{eq} daytime (7:00 AM to 10:00 PM) exterior noise standard, and 50 dBA L_{eq} nighttime (10:00 PM to 7:00 AM) exterior noise standard for all patios, balconies, and common outdoor living areas. In addition, the acoustical study shall demonstrate that interior noise levels at the Uptown Newport residential units would meet the City's 45 dBA L_{eq} daytime threshold, and 40 dBA L_{eq} nighttime threshold. The necessary noise reduction may be achieved by incorporating a solid perimeter barrier or other light and noise-attenuation features at the free-standing parking structure. The final building plans shall incorporate the required noise-attenuation features, and the property owner/ developer shall install these barriers and enclosures.

MM 4.10-8 The parking lot surface of all parking garages shall be textured to eliminate tire squeal noise. Ventilation equipment for the parking garages shall be designed to meet the City's noise limits for Zone III, not exceed exterior daytime maximum of 60 dBA and a nighttime

maximum of 50 dBA. This can be accomplished by selecting quieter equipment or by enclosing ventilation equipment.

4.10.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

With implementation of the Mitigation Program, construction noise impacts due to construction activities would be reduced to the extent feasible. However, construction impacts would remain significant and unavoidable. All other noise impacts would be less than significant or can be mitigated to a less than significant level.