Technical Appendix J

Environmental Noise Study for the Proposed Balboa Marina West in the City of Newport Beach, CA
Wieland Acoustics
July 17, 2014

WIELAND ACOUSTICS, INC.
1371 Warner Avenue, Suite A
Tustin, CA 92780
Tel: 949.474.1222
www.wielandacoustics.com

Environmental Noise Study for the Proposed Balboa Marina West in the City of Newport Beach, CA

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Prepared for:

CAA Planning
65 Enterprise, Suite 130
Aliso Viejo, CA 92656

Prepared by:

David L. Wieland, Principal Consultant

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1 Introduction/Project Description

The purpose of this study is to identify and assess the potential acoustical impacts associated with the construction and operation of the proposed Balboa Marina West project in Newport Beach. The Project will include the development of a new point of public access in Newport Harbor, a new public transient dock area, and an expansion of the existing private boat slips at the Balboa Marina. A landside component with marine commercial development, including a restaurant, is also proposed.

Figure 1-1 identifies the location of the Project site. A conceptual site plan is provided in Figure 1-2, with the Public Transient Docks shown as Area A, the Private Dock Expansion shown as Area B, and the Landside Marina Development shown as Area C. Areas A and B, known as the "waterside development", will occupy approximately 0.87 acres of water surface.

Area A (the Public Transient Dock Area) will provide 12 public boat slips, including the relocation of 4 existing public slips currently located in the private Balboa Marina. The public slips will be transient in nature, meaning that there will be no overnight tie ups allowed. There will be no boat launches from this site. It is anticipated that boaters will access the docks from the water side and use the docks to tie up and access the existing landside restaurants and commercial uses. In addition, there will be a dedicated pedestrian walkway through the parking lot to allow boaters to navigate from the public dock to the existing uses on the landside.

Area B (the Private Dock Expansion Area) will add 24 private boat slips accessible from the existing Balboa Marina and a new private gangway. The marina expansion will include ten new slips for boats 20 feet in length and 14 new slips for boats 35 feet and longer.

The waterside component (Areas A and B) of the Project will require dredging of 7,100 cubic yards of material plus an additional 2 feet of over-dredge. This will result in a maximum of 9,900 cubic yards of dredging to accommodate the new boat slips. A riprap embankment will be reconstructed approximately 15 feet landward of the existing riprap embankment along the western edge of the project in order to maximize the number of boat slips. A new cap wall will be installed at the top of the riprap slope. The relocation of the riprap slope will create new intertidal mudflats.

In addition to the public and private dock components, Area C will include up to a maximum of 19,400 square feet of marine commercial development, including a restaurant with an outdoor patio. This development, referred to as the "landside" development, includes approximately 3.5 acres of the existing parking lot on Irvine Company property immediately north of the existing Balboa Marina docks.

An existing 1,200 square-foot structure located at 201 East Coast Highway will be demolished. The existing use, a yacht brokerage and marina restrooms, are anticipated to be accommodated within the new development.

The property is designated Recreational Marine Commercial (CM) in the City's General Plan and Coastal Land Use Plan. The CM designation provides for "commercial development on or near the

bay in a manner that will encourage the continuation of coastal-dependent and coastal-related uses, maintain the marine theme and character, encourage mutually supportive businesses, encourage visitor-serving and recreational uses, and encourage physical and visual access to the bay on the waterfront commercial and industrial building sites on or near the bay."

Development of marine commercial uses on the land side of the marina is subject to the City's Zoning Code and Local Coastal Program Land Use Plan. Consistent with the non-residential Shoreline Height Limit, the building height may be a maximum of 35 feet with a flat roof or 40 feet with a sloped roof with approval of a Site Development Review. A Conditional Use Permit will be required in order for the building to be occupied by a restaurant. The proposed marine commercial structure will be supported on piles and elevated to meet the topography of the upper portion of the site closest to East Coast Highway and will include tuck-under parking.

The parking lot will be reconfigured to provide more efficient internal circulation and parking. The parking lot near the Bayside Drive entry will be modified in order to reduce turning movements and the overall layout of the parking lot will be updated to improve internal way finding. As indicated above, a pedestrian walkway through the parking lot will provide access from the public dock to the landside development. Enhanced landscaping will be added throughout the parking lot.

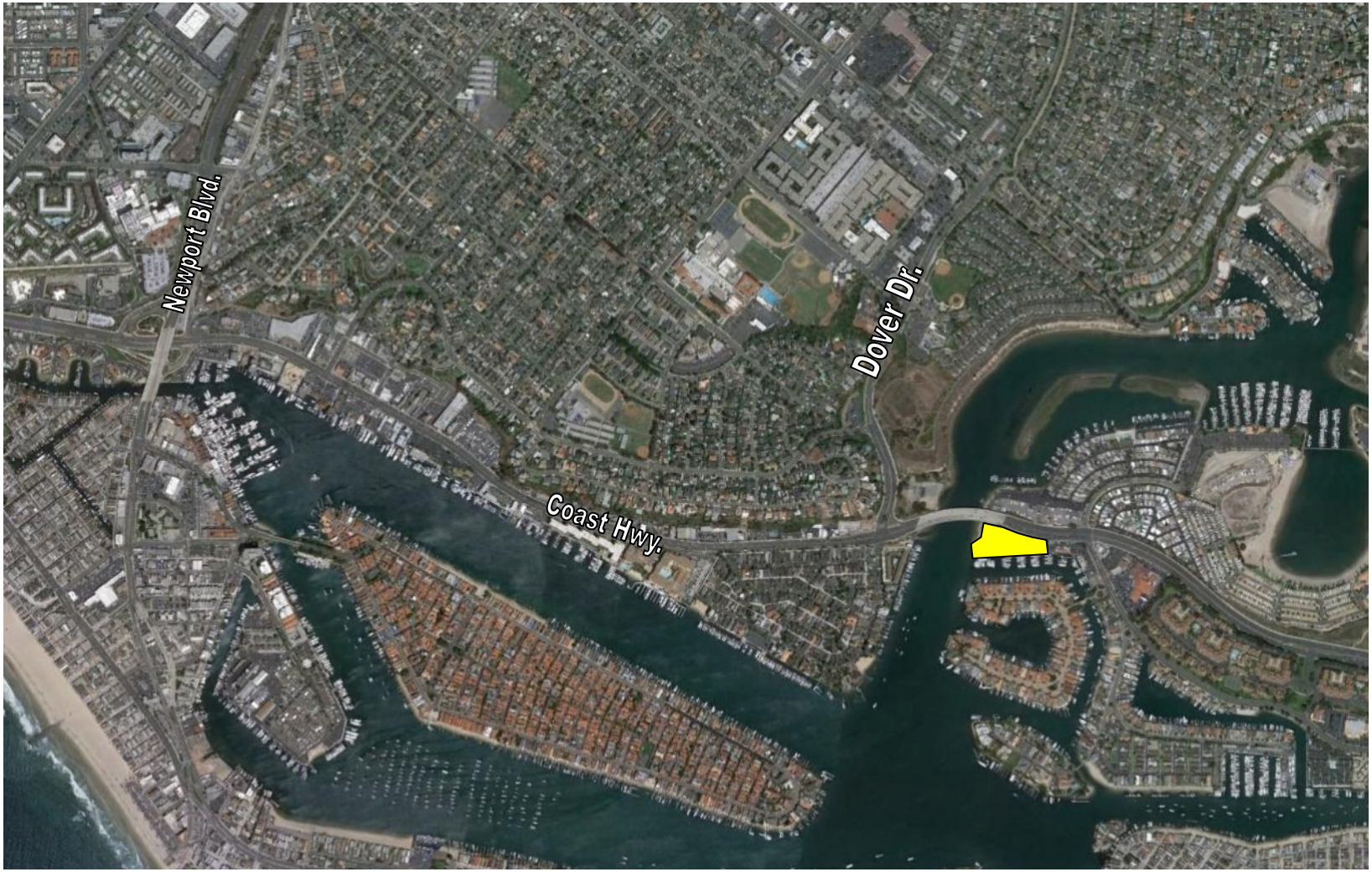

Figure 1-1. Location of the Project Site

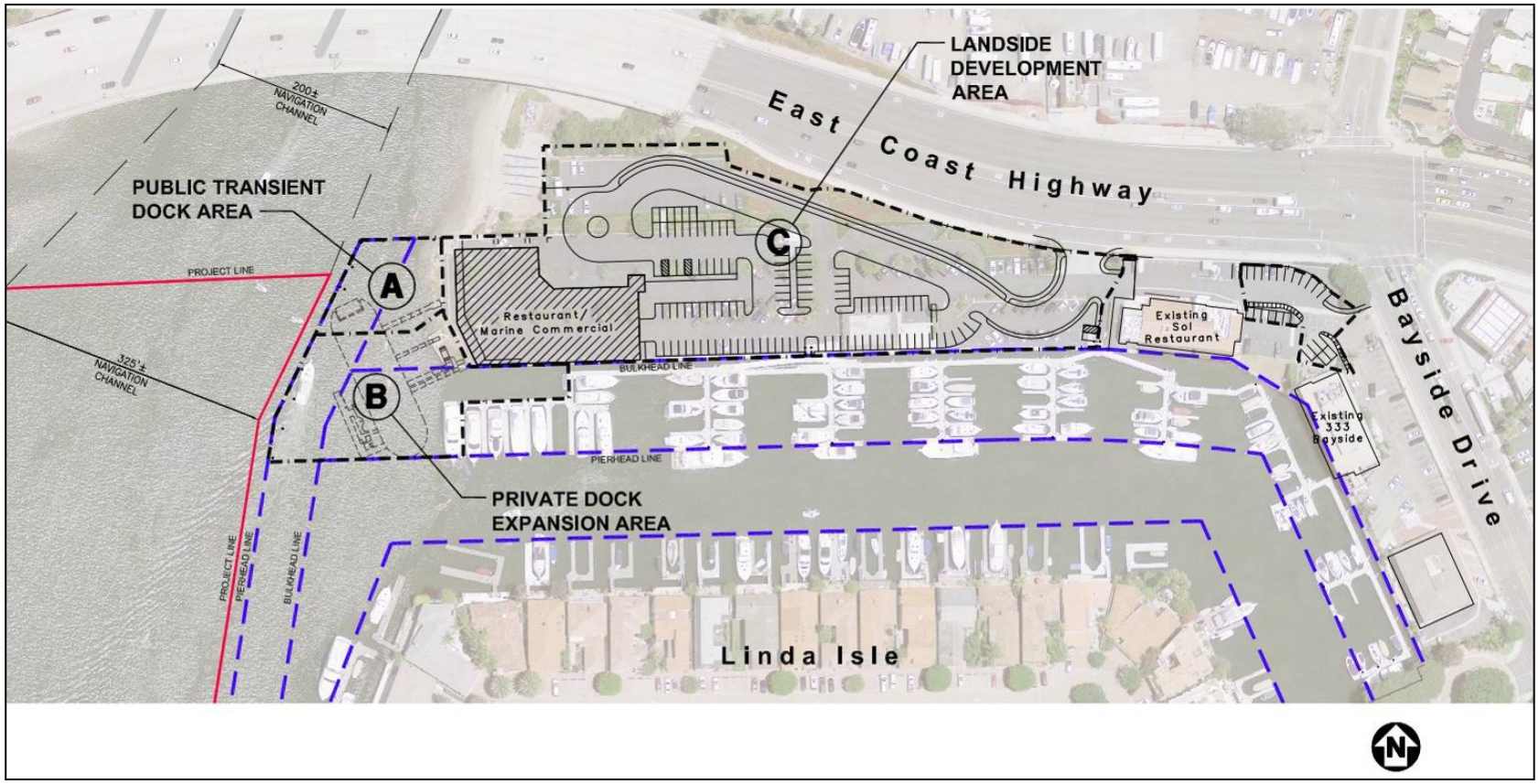

Figure 1-2. Conceptual Site Plan

2 Fundamentals of Sound

Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to the human ear. The medium of main concern for environmental noise is air. Noise is most simply defined as unwanted sound.

In its most basic form a sound can be described by its frequency and its amplitude. As a sound wave propagates past a point in the air it causes the air to alternate from a state of compression to a state of rarefaction. The number of times per second that the wave passes from a state of maximum compression through a state of rarefaction and back to a state of maximum compression is the frequency. The amplitude describes the maximum pressure disturbance caused by the wave; that is, the difference between the "resting" pressure in the air when no sound is present and the pressure during the state of maximum compression or rarefaction caused by the sound wave.

Frequency is expressed in cycles per second, or Hertz (Hz). One Hertz equals one cycle per second. High frequencies are sometimes more conveniently expressed in units of kilohertz (kHz) or thousands of Hertz. The extreme range of frequencies that can be heard by the healthiest human ear spans from 16 to 20 Hz on the low end to about 20,000 Hz on the high end. Frequencies are heard as the pitch or tone of sound. High frequencies produce high-pitched sounds; low frequencies produce low-pitched sounds. Very-low frequency airborne sound of sufficient amplitude may be felt before it can be heard, and can be confused with groundborne vibration.

For any given frequency, an increase in amplitude correlates to an increase in loudness and a decrease in amplitude correlates to a decrease in loudness. The measurement and description of amplitude is discussed further in Section 3.

3 Noise Descriptors

The following sections briefly describe the noise descriptors that will be used throughout this study:

3.1 Decibels

Sound pressures can be measured in units called microPascals (µPa). However, expressing sound levels in terms of µPa would be very cumbersome since it would require a wide range of very large numbers. For this reason, sound pressure levels are described in logarithmic units of ratios of actual sound pressures to a reference pressure squared. These units are called bels. In order to provide a finer resolution, a bel is subdivided into 10 decibels, abbreviated dB.

Since decibels are logarithmic units, sound pressure levels cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces a sound pressure level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB. In fact, they would combine to produce 73 dB. This same principle can be applied to other traffic quantities as well. In other words, doubling the traffic volume on a street or the speed of the traffic will increase

the traffic noise level by 3 dB. Conversely, halving the traffic volume or speed will reduce the traffic noise level by 3 dB.

3.2 A-Weighting

Sound pressure level alone is not a reliable indicator of loudness. The frequency or pitch of a sound also has a substantial effect on how humans will respond. While the intensity of the sound is a purely physical quantity, the loudness or human response depends on the characteristics of the human ear.

Human hearing is limited not only to the range of audible frequencies, but also in the way it perceives the sound pressure level in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, and perceives both higher and lower frequency sounds of the same magnitude with less intensity. In order to approximate the frequency response of the human ear, a series of sound pressure level adjustments is usually applied to the sound measured by a sound level meter. The adjustments, or weighting network, are frequency dependent.

The A-scale approximates the frequency response of the average young ear when listening to most ordinary everyday sounds. 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. A range of noise levels associated with common in- and outdoor activities is shown in Figure 3-1.

The A-weighted sound level of traffic and other long-term noise-producing activities within and around a community varies considerably with time. Measurements of this varying noise level are accomplished by recording values of the A-weighted level during representative periods within a specified portion of the day.

3.1 Equivalent Sound Level (L_{eq})

Many noise sources produce levels that fluctuate over time; examples include mechanical equipment that cycles on and off, or construction work which can vary sporadically. The equivalent sound level (L_{eq}) describes the average acoustical energy content of noise for an identified period of time, commonly 1 hour. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy over the duration of the exposure. For many noise sources, the L_{eq} will vary depending on the time of day – a prime example is traffic noise which rises and falls depending on the amount of traffic on a given street or freeway.

3.2 Community Noise Equivalent Level (CNEL)

It is recognized that a given level of noise may be more or less tolerable depending on the duration of exposure experienced by an individual. There are numerous measures of noise exposure that consider not only the A-level variation of noise but also the duration of the disturbance. The State Department of Aeronautics and the California Commission on Housing and Community Development have adopted the community noise equivalent level (CNEL). This measure weights the average noise levels for the evening hours (7:00 p.m. to 10:00 p.m.), increasing them by 5 dB, and

weights the late evening and morning hour noise levels (10:00 p.m. to 7:00 a.m.) by 10 dB. The daytime noise levels are combined with these weighted levels and are averaged to obtain a CNEL value. Figure 3-2 indicates the outdoor CNEL at typical locations.

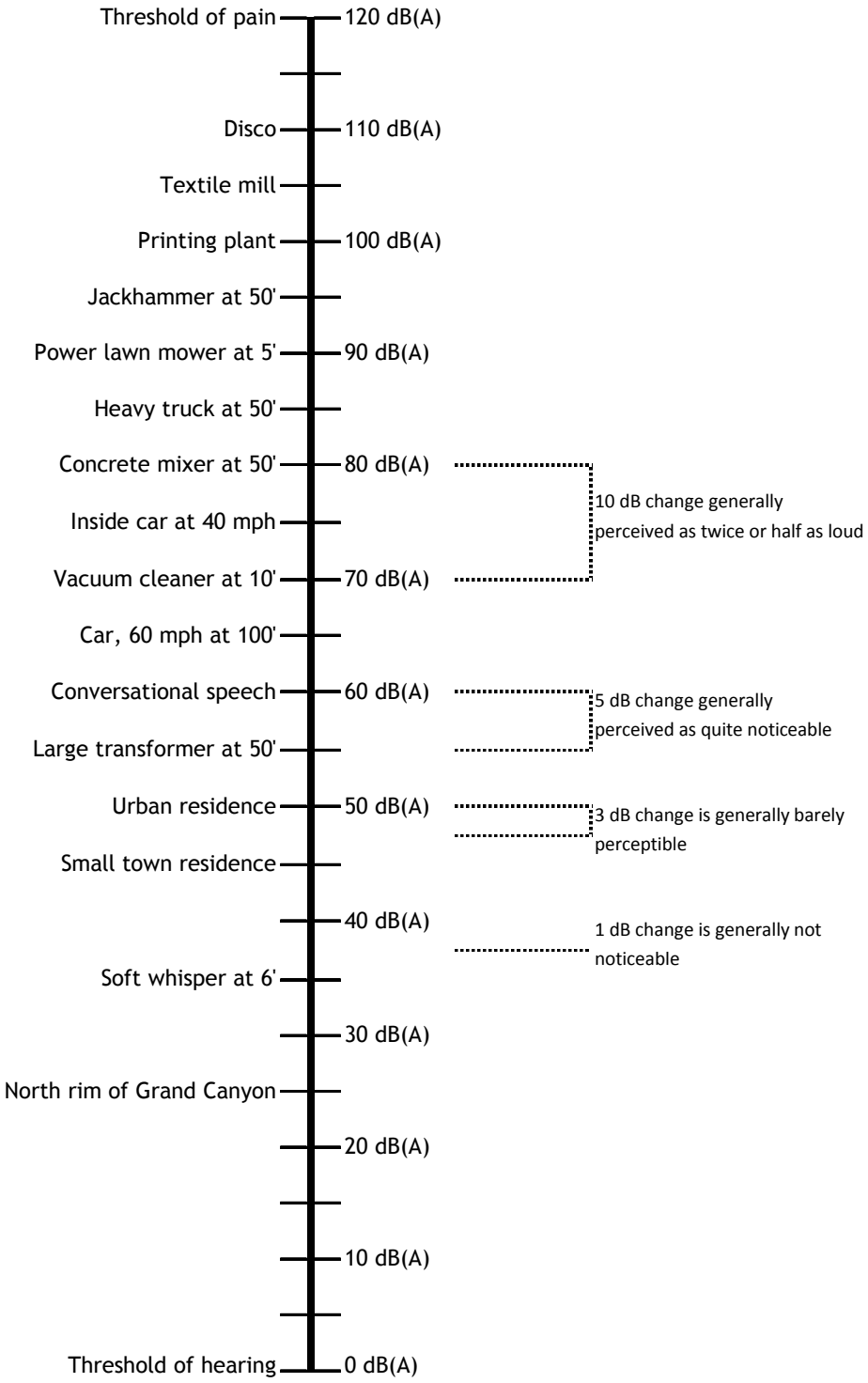

Figure 3-1. Common Noise Sources and A-Weighted Noise Levels

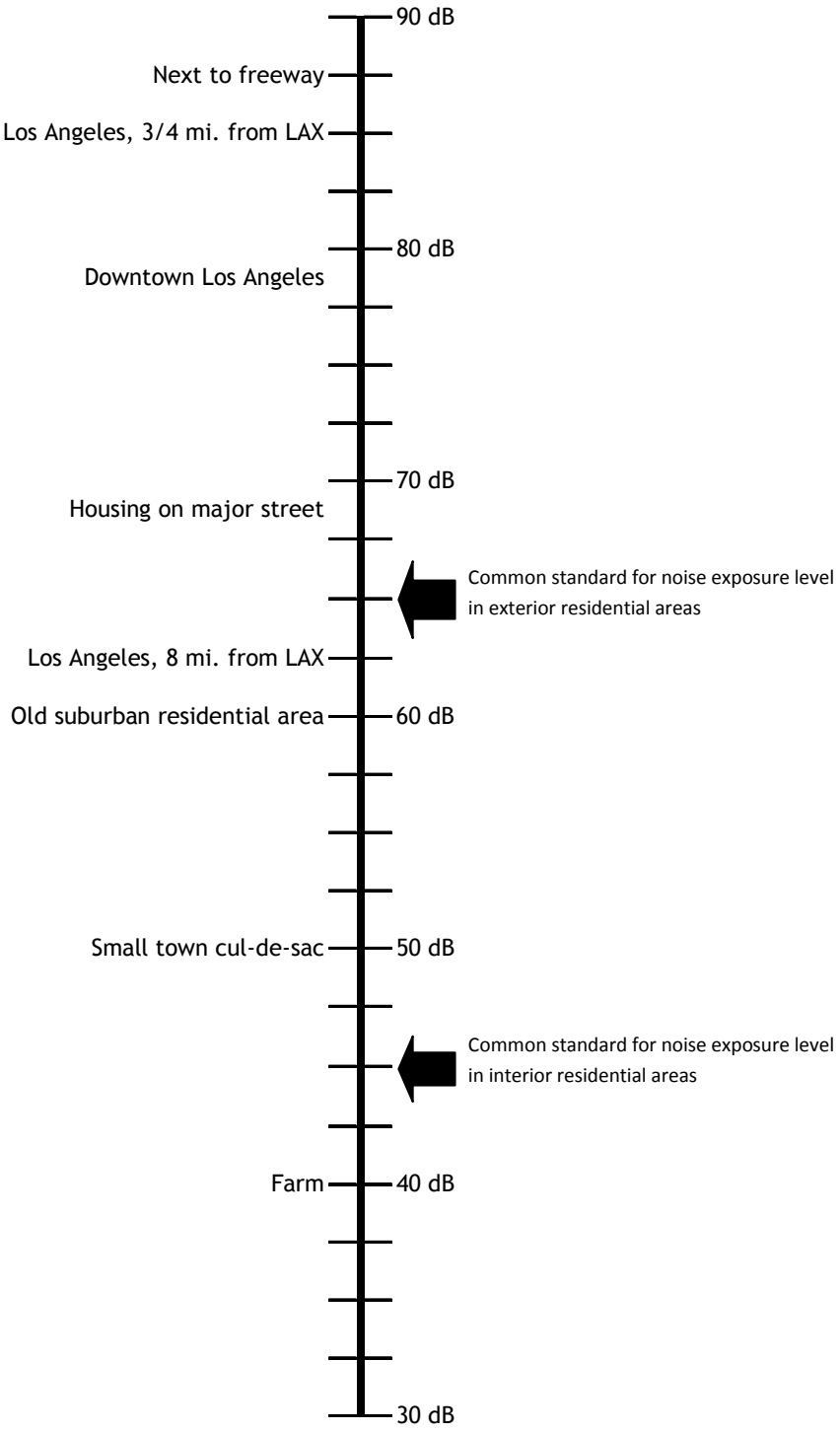

Figure 3-2. Common CNEL Noise Exposure Levels at Various Locations

4 Noise Criteria

The following sections discuss the various noise criteria that have been considered in this study.

4.1 State of California Green Building Standards Code

Section 5.507 of the California Green Building Standards Code (CALGreen) identifies mandatory interior noise standards for non-residential construction, which apply to buildings that are located within the 65 dB CNEL noise contour of an airport, freeway, expressway, railroad, industrial source, or fixed-guideway source as determined by the Noise Element of the General Plan.

Two alternative methods for demonstrating compliance with the standards are provided in the CALGreen Code. These are: (1) the prescriptive method, and (2) the performance method. Under the prescriptive method, the Applicant must show that the wall and roof-ceiling assemblies making up the building envelope that is exposed to the noise source meet a composite sound transmission class (STC) rating of at least 50, or a composite outdoor-indoor transmission class (OITC) rating of no less than 40, with exterior windows that provide a minimum STC of 40 or OITC of 30. The performance method of compliance requires that an acoustical analysis be prepared demonstrating that the walls and roof-ceiling assemblies making up the building envelope that are exposed to the noise source shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (L_{eq}) of 50 dBA in occupied areas during any hour of operation. It should be noted that the noise standard does not apply to "buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings."

4.2 City of Newport Beach General Plan

Policy N1.1 of the City's Noise Element of the General Plan requires that all new projects are compatible with the noise environment in which they will be located. Compatibility is determined by using the values identified in Table 4-1.

Table 4-1. Newport Beach Land Use Noise Compatibility Matrix

Category	Uses	CNEL, dB						
		<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 (Recreation), 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 are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditionally 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.

In addition, Policy N1.1 also identifies the following noise standards for various land uses:

Table 4-2. City of Newport Beach Noise Standards

Land Use Categories		Allowable Noise Levels, L_{eq} (dBA)			
		Interior		Exterior[a,b]	
Categories	Uses	7 AM to 10 PM	10 PM to 7 AM	7 AM to 10 PM	10 PM to 7 AM
Residential	Single Family, Two Family, Multiple Family (Zone I)	45	40	55	50
	Residential Portions of Mixed Use Developments (Zone III)	45	40	60	50
Commercial Industrial	Commercial (Zone II)	N/A	N/A	65	60
	Industrial or Manufacturing (Zone IV)	N/A	N/A	70	70
Institutional	Schools, Day Care Centers, Churches, Libraries, Museums, Health Care Institutions (Zone I)	45	40	55	50

a. If the ambient noise level exceeds the resulting standard, the ambient shall be the standard.
b. It shall be unlawful for any person at any location within the incorporated area of the City to create any noise or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such a person which causes the noise level when measured on any other property, to exceed either of the following:
- The noise standard for the applicable zone for any 15-minute period;
- A maximum instantaneous noise level equal to the value of the noise standard plus 20 dBA for any period of time (measured using A-weighted slow response.
- In the event the ambient noise level exceeds the noise standard, the noise standard applicable to said category shall be increased to reflect the maximum ambient noise level.
- The noise standard for the residential portions of the residential property falling within 100 feet of a commercial property, if the intruding noise originates from that commercial property.
- If the measurement location is on a boundary between two different noise zones, the lower noise level standard applicable to the noise zone shall apply.

Policy N1.7 requires that commercial/entertainment uses limit hours and/or require attenuation if they are adjacent to residential and other noise sensitive uses in order to minimize excessive noise to these receptors.

Policy N1.8 requires the employment of noise mitigation measures for existing sensitive uses when a significant noise impact is identified. A significant noise impact occurs when there is an increase in the ambient CNEL produced by new development impacting existing sensitive uses. The CNEL increase is shown in the following table:

Table 4-3. Significant Noise Impact Criteria

CNEL	dB Increase
55 dB	3
60 dB	2
65 dB	1
70 dB	1
Over 75 dB	Any increase is considered significant

Policy N2.3 limits 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 the nighttime (10:00 p.m. to 7:00 a.m.) noise standards.

Policy N2.5 requires the City to enforce compliance of all boating activities with the noise standards defined in the Municipal Code.

Policy N4.1 requires the City to enforce the interior and exterior noise standards outlined in Table 4-2, above, and in the Municipal Code to ensure that sensitive noise receptors are not exposed to excessive noise levels from stationary noise sources, such as heating, ventilation, and air conditioning equipment.

Policy N4.2 requires that new uses such as restaurants, bars, entertainment, parking facilities, and other commercial uses where large numbers of people may be present adjacent to sensitive noise receptors obtain a use permit that is based on compliance with the noise standards in Table 4-2, above, and the City's Municipal Code.

Policy N4.3 requires that new commercial developments abutting residentially designated properties be designed to minimize noise impacts generated by loading areas, parking lots, trash enclosures, mechanical equipment, and any other noise generating features specific to the development to the extent possible.

Policy N4.4 requires that the City limit hours when recreational activities in parks and the harbor can take place.

Policy N4.6 requires that the City enforce the Noise Ordinance noise limits and limits on hours of maintenance or construction activity in or adjacent to residential areas.

Policy N5.1 requires that the City enforce the limits on hours of construction activity.

4.3 City of Newport Beach Municipal Code

Chapter 5.28 of the Municipal Code specifies that live entertainment establishments must provide sufficient sound absorbing insulation so that noise generated inside the premises is not audible anywhere on adjacent property or public right-of-way or within any other building or other separate unit within the same building.

Chapter 10.26 of the Municipal Code identifies the City's noise standards for various land uses and activities. These are identified in Table 4-2, above. The following activities are specifically exempted from compliance with the noise standards:

- Occasional outdoor gatherings, public dances, show, sporting and entertainment events, provided said events are conducted pursuant to a permit or license issued by the appropriate jurisdiction relative to the staging of said events.
- Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle, work or warning alarm or bell.
- Noise sources associated with construction, repair, remodeling, demolition or grading of any real property. Such activities are subject to the provisions of Chapter 10.28 (discussed below).

- Noise sources associated with the maintenance of real property. Such activities are subject to the provisions of Chapter 10.28 (discussed below).

Chapter 10.26.045 states that new heating, venting and air conditioning (HVAC) equipment cannot exceed a noise level of 50 dBA when measured at a residential property line. A noise level of 55 dBA is permitted if the equipment is installed with a timer that deactivates the equipment between 10:00 p.m. and 7:00 a.m.

Chapter 10.28.020 prohibits the emission or transmission of any "loud or raucous" noise from any sound-making or sound-amplifying device. No quantitative noise standard is provided.

Chapter 10.28.040 of the City's Municipal Code prohibits construction work which produces loud noise that disturbs, or could disturb, a person of normal sensitivity who works or resides in the vicinity, on any weekday except between the hours of 7:00 a.m. and 6:30 p.m., or on any Saturday except between the hours of 8:00 a.m. and 6:00 p.m. Construction work is prohibited on Sundays and federal holidays. The City's Municipal Code does not identify any quantitative noise level standards for construction activities.

Chapter 10.28.045 prohibits maintenance work which produces loud noise that disturbs, or could disturb, a person of normal sensitivity who works or resides in the vicinity, on any weekday except between the hours of 7:00 a.m. and 6:30 p.m., or on any Saturday except between the hours of 8:00 a.m. and 6:00 p.m. Maintenance work is prohibited on Sundays and federal holidays. The City's Municipal Code does not identify any quantitative noise level standards for maintenance activities.

Chapter 20.30.080 prohibits deliveries, loading, unloading, opening/closing or other handling of boxes, crates, containers, building materials, trash receptacles, or similar objects within a nonresidential zoning district between 10:00 p.m. and 7:00 a.m. on weekdays and Saturdays, and between 10:00 p.m. and 9:00 a.m. on Sundays and Federal holidays.

Chapter 20.48.090(C) requires that owners/operators of an eating and drinking establishment that sells, serves, or gives away alcohol shall post signs at clearly visible locations within the establishment and at both on-site and off-site parking areas requesting that patrons keep noise to a minimum.

Chapter 20.48.090(E) requires that the building structure in which bars, nightclubs, and lounges are located be adequately soundproofed so that interior noise is not audible beyond the lot lines with the doors and windows closed.

5 Fundamentals of Groundborne Vibration

Groundborne vibration is an oscillatory motion which can be described in terms of displacement, velocity, or acceleration. Each of these measures can be further described in terms of frequency and amplitude. Displacement is the easiest descriptor to understand; it is simply the distance that a vibrating point moves from its static position (i.e., its resting position when the vibration is not

present). The velocity describes the instantaneous speed of the movement and acceleration is the instantaneous rate of change of the speed.

Although displacement is fundamentally easier to understand than velocity or acceleration, it is rarely used for describing groundborne vibration, for the following reasons: 1) human response to groundborne vibration correlates more accurately with velocity or acceleration; 2) the effect on buildings and sensitive equipment is more accurately described using velocity or acceleration; and, 3) most transducers used in the measurement of groundborne vibration actually measure either velocity or acceleration. For this study velocity is the fundamental measure used to evaluate the effects of groundborne vibration.

The peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak amplitude of the vibration velocity. The accepted unit for measuring PPV in the USA is inches per second (in/s); therefore, this is the unit that is used throughout this report. PPV is only applicable to this Project in the assessment of potential building damage due to groundborne vibration (PPV is related to the stresses that are experienced by buildings subjected to groundborne vibration); it is not used in the assessment of operational vibration.

6 Vibration Criteria

A root mean square (rms) particle velocity of 2 in/sec (≈ 0.05 m/sec) is commonly used as a safe (threshold) limit for buildings, although minor damage has occasionally occurred at 1 in/sec (≈ 0.025 m/sec) **[1]**. To provide a conservative assessment, this study will consider only an rms particle velocity of 1 in/sec.

The peak particle velocity (PPV) value is the product of the crest factor and the rms particle velocity. The minimal crest factor is approximately 1.4 (for harmonic motion). Therefore, for an rms velocity of 1 in/sec, the equivalent minimal PPV value is 1.4 in/sec. For structurally reliable buildings, this is the level at which it is assumed that minor damage may occur. On this basis, there is a high probability that no damage should be expected at a PPV of 1 in/sec. For fragile buildings, the recommended safe limit is a PPV of 0.5 in/sec **[2, 3]**. It is noteworthy that the risk of structural damage still exists even at relatively low vibration velocities (in particular due to dynamic settlements caused in loose soils).

7 Thresholds of Significance

Based on the noise criteria discussed above, and the CEQA guidelines, a significant impact will be assessed if any of the following conditions occur:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. A noise impact will occur if:

  1. The proposed commercial building is exposed to a CNEL in excess of 80 dB;

2. The interior spaces within the proposed commercial building are exposed to an L_{eq} in excess of 50 dBA during the noisiest hour as a result of exterior sources (e.g., traffic);
3. Project traffic increases the CNEL at any off-site property to a level that exceeds the "Normally Compatible" (Zone B) level for that land use, as shown in Table 4-1;
4. Project operations or project-related equipment (e.g., HVAC equipment) generates a noise level that exceeds the City's noise ordinance standards, as shown in Table 4-2, at the exterior or interior of nearby residential properties or at the exterior of nearby commercial properties[1];
5. Truck deliveries, loading, unloading, opening/closing or other handling of boxes, crates, containers, building materials, trash receptacles, or similar objects occur between 10:00 p.m. and 7:00 a.m. on weekdays and Saturdays, or between 10:00 p.m. and 9:00 a.m. on Sundays and Federal holidays;
6. Activities within the interior of the proposed commercial building are audible at the property lines with the windows and doors closed if any portion of the commercial building is used as a live entertainment establishment, a bar, a nightclub, or a lounge; or
7. Construction activities occur outside of the time periods permitted in the City's noise ordinance.

- Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels. Because of the potential for damage, a significant impact will be assessed if the PPV exceeds 1 in/sec at any building.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. This impact will occur if the project's operation increases the ambient noise level by the amounts identified in Table 4-3.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. The City of Newport Beach has defined a substantial temporary or periodic increase as an increase in noise level that would violate the City's noise control ordinances.
- The project would expose people residing or working in the project area to excessive noise levels as a result of activities at an airport. As the project is located well outside the noise contours for John Wayne Airport, this aspect of the CEQA guidelines has not been considered in the study.

8 Existing Noise Environment

The study area for the Project is defined by the arterials selected for analysis in the referenced tables obtained from the traffic impact report **[4]**. Within the study area, the noise-sensitive land uses of concern are the residential properties adjacent to the arterials, the residences on Linda Isle,

[1] As indicated in Table 4-2, the City's noise ordinance allows the noise standards to be increased to the actual measured ambient noise level if the actual measured ambient noise level exceeds the noise standard for the land use category. However, to provide a conservative assessment, this correction will not be applied.

the residences on Bayshore Drive across Lower Newport Bay from the Project site, the restaurants east of the Project site, and Least Tern Island in Upper Newport Bay. Some of the residences are buffered from the traffic noise by walls and fences of various heights.

8.1 Noise Measurements

Traffic on the arterials is the predominant source of noise that currently affects the study area. However, the area is also affected occasionally by noise from activities at the existing marina, the parking lot, and the restaurants.

In order to document the existing noise environment, measurements were obtained at two locations in the study area. (Refer to Figure 8-1.) Location #1 was chosen in lieu of a measurement on Linda Isle due to private property issues, and Location #2 was chosen to represent the closest residences to the north of the Project site. At each location the measurement was obtained for a period of about 20 minutes; to obtain the measurement, the microphone was positioned at a height of 5' above the ground, and extraneous noise sources (such as sirens) were excluded from the measurement by placing the sound level meter on "standby" until the noise event concluded. The results of the noise measurements are provided in Appendix I and summarized in Table 8-1.

The instrumentation used to obtain the noise measurements consisted of an integrating sound level meter (Model 820) and an acoustical calibrator (Model CAL200) manufactured by Larson Davis Laboratories. The accuracy of the calibrator is maintained through a program established by the manufacturer, and is traceable to the National Bureau of Standards. All instrumentation meets the requirements of the American National Standards Institute (ANSI) S1.4.

Table 8-1. Summary of Noise Measurements

Location #	Location Description	Measurement Period	Measured Average Noise Level, dB(A)
1	On the seawall at Newport Harbor	3:50 PM to 4:10 PM	60.1
2	At the offset of the mobile homes north of the Project site	2:38 PM to 2:58 PM	59.5

Figure 8-1. Noise Measurement Locations

8.2 Traffic

The analysis of traffic noise was conducted using data provided by Kunzman Associates **[4]** and the lookup tables developed by the Federal Highway Administration (FHWA) for their Traffic Noise Model (TNM) **[5, 6]**. The Kunzman study provides hourly traffic volumes for AM and PM peak hours. The average daily traffic volumes (ADTs) used in the analysis of traffic noise levels were estimated by assuming that the PM peak hour volume represents 10% of the overall ADT for each arterial segment.

The Traffic Noise Model was used to estimate existing traffic noise levels adjacent to the streets based on traffic volumes, speeds, truck mix, site conditions, and distance from the roadway to the receptor. The results of the modeling effort are provided in Appendix II. Table 8-2 summarizes the results for those street segments with noise-sensitive receptors (i.e., generally residential properties). Referring to the table, the results are presented in terms of an unmitigated CNEL at the distance of the nearest existing sensitive receptor from the centerline of the roadway.

Table 8-2. Existing Traffic Noise Levels

Street Segment	Land Use of Nearest Sensitive Receptor	Unmitigated CNEL @ Nearest Sens. Receptor	Distance to CNEL Contour From Roadway Centerline		
			60 dB	65 dB	70 dB
16TH STREET					
W/O Dover Dr	Residential	59.7 dB	52'	--	--
BAYSIDE DRIVE					
N/O E. Coast Hwy	Residential	54.6 dB	--	--	--
S/O E. Coast Hwy	Residential	67.2 dB	190'	61'	--
COAST HIGHWAY (WEST)					
W/O Newport Blvd	Residential	68.8 dB	657'	266'	90'
E/O Newport Blvd	Residential	64.3 dB	582'	228'	75'
E/O Tustin Ave	Residential	68.0 dB	568'	222'	72'
W/O Dover Dr	Residential	69.9 dB	541'	210'	67'
E/O Dover Dr	Residential	70.7 dB	>985'	496'	193'
COAST HIGHWAY (EAST)					
W/O Bayside Dr	Residential	67.3 dB	>985'	504'	196'
E/O Bayside Dr	Residential	73.2 dB	>985'	448'	168'
W/O Jamboree Rd	Residential	70.9 dB	>985'	454'	172'
E/O Jamboree Rd	Residential	71.9 dB	881'	377'	136'
W/O Newport Center Dr	Residential	72.0 dB	835'	355'	126'
E/O Newport Center Dr	Residential	68.6 dB	730'	299'	104'
W/O Avocado Ave	Residential	68.1 dB	676'	272'	94'
E/O MacArthur Blvd	Residential	67.7 dB	578'	226'	74'
DOVER DRIVE					
E/O Irvine Ave	Residential	63.0 dB	67'	--	--
N/O Westcliff Dr	Residential	66.5 dB	152'	49'	--
S/O Westcliff Dr	Residential	67.6 dB	446'	165'	55'
N/O 16th St	Church	68.0 dB	455'	169'	56'
S/O 16th St	Residential	70.6 dB	489'	186'	60'
N/O W. Coast Hwy	Residential	70.3 dB	515'	198'	63'
IRVINE AVENUE					
N/O 19th St/Dover Dr	Residential	68.2 dB	296'	100'	--
S/O 19th St/Dover Dr	Residential	67.0 dB	266'	89'	--
N/O 17th St/Westcliff Dr	Residential	67.0 dB	265'	89'	--
JAMBOREE ROAD					
N/O San Joaquin Hills Rd	Residential	72.2 dB	>985'	466'	177'
S/O San Joaquin Hills Rd	Residential	71.1 dB	981'	423'	157'
N/O Santa Barbara Dr	Residential	68.2 dB	983'	424'	157'
S/O Santa Barbara Dr	Residential	70.1 dB	909'	392'	142'
N/O E. Coast Hwy	Residential	71.2 dB	864'	370'	131'
MACARTHUR BOULEVARD					
N/O San Joaquin Hills Rd	Residential	73.1 dB	>985'	599'	237'
S/O San Joaquin Hills Rd	Residential	72.3 dB	968'	418'	155'
N/O San Miguel Dr	Residential	71.7 dB	945'	408'	150'
S/O San Miguel Dr	Residential	70.5 dB	832'	355'	125'
N/O E. Coast Hwy	Residential	71.0 dB	802'	339'	119'
NEWPORT BOULEVARD					
N/O W. Coast Hwy	Residential	66.2 dB	490'	188'	61'
SAN JOAQUIN HILLS ROAD					
E/O Jamboree Rd	Residential	63.9 dB	317'	111'	36'
W/O Santa Cruz Dr	Residential	69.3 dB	506'	196'	63'
E/O Santa Cruz Dr	Residential	67.6 dB	370'	131'	44'
W/O Santa Rosa Dr	Residential	65.4 dB	414'	151'	51'
E/O Santa Rosa Dr	Residential	67.5 dB	528'	205'	65'
W/O MacArthur Blvd	Residential	69.5 dB	523'	203'	65'
E/O MacArthur Blvd	Residential	67.5 dB	510'	197'	63'
WESTCLIFF DRIVE					
E/O Irvine Ave	Residential	65.0 dB	187'	59'	--
W/O Dover Dr	Residential	64.9 dB	170'	55'	--

Notes:
"—" signifies that there is insufficient traffic volume to generate a noise contour outside of the right-of-way.

9 Future Acoustical Environment at Off-Site Locations within the Study Area

For ease of presentation, the discussion of future conditions in the study area with the Project has been divided into two sections: construction and operation. Each is discussed in greater detail in the following sections.

9.1 Construction at the Project Site

The dominant sources of noise and vibration associated with construction of the Project will be pile installation and dredging. All construction activities will be conducted in compliance with City requirements and in a manner that minimizes disruption to the surrounding properties. Such activities will be limited to between the hours of 7:00 a.m. and 6:30 p.m. Monday through Friday, and between 8:00 a.m. and 6:00 p.m. on Saturday. No construction activities will occur on Sundays or federal holidays.

Construction noise levels in the vicinity of the Project will fluctuate depending on the particular type, number and duration of use of various pieces of construction equipment. The exposure of persons to the periodic increase in noise levels will be short-term.

9.1.1 Waterside Improvements

To support the waterside improvements, approximately 45 piles will be placed, and approximately 9,900 cubic yards of material will be dredged. Figure 9-1 identifies the location of the waterside piles and the dredging area. The waterside piles will be placed using a technique called “jetting”. With this technique, high pressure water jets are used to insert the pile to within approximately 5 feet of the tip elevation. The pile is then driven the remaining approximately 5 feet using a pile driver.

In 2008-2009, noise and vibration monitoring was conducted by Anchor QEA at Linda Isle and at the existing restaurants east of the Project site during construction of the original Balboa Marina dock replacement project. (Refer to Enclosure 1 for a copy of the Anchor QEA report.) This project involved demolition, seawall repair, pile installation, dredging, and new marina construction. Information provided by the Project Applicant indicates that the same contractor, equipment, and construction techniques will be employed for the new Balboa Marina West project as were used for the original Balboa Marina project. Accordingly, at the direction of the City of Newport Beach, the noise and vibration data gathered during the construction monitoring effort for Balboa Marina will be used in this study to analyze and assess the potential for noise and vibration impacts associated with the new Project[2].

Referring to Figure 9-1, none of the waterside piles will be placed closer to the residences on Linda Isle than were placed during construction of the Balboa Marina project. Some of the waterside piles will be placed at the same distance from the residences on Linda Isle as occurred during construction of the Balboa Marina project, but the majority of the piles will be placed at a

[2] Wieland Acoustics is not responsible for the accuracy of the noise and vibration data gathered as part of the construction monitoring effort.

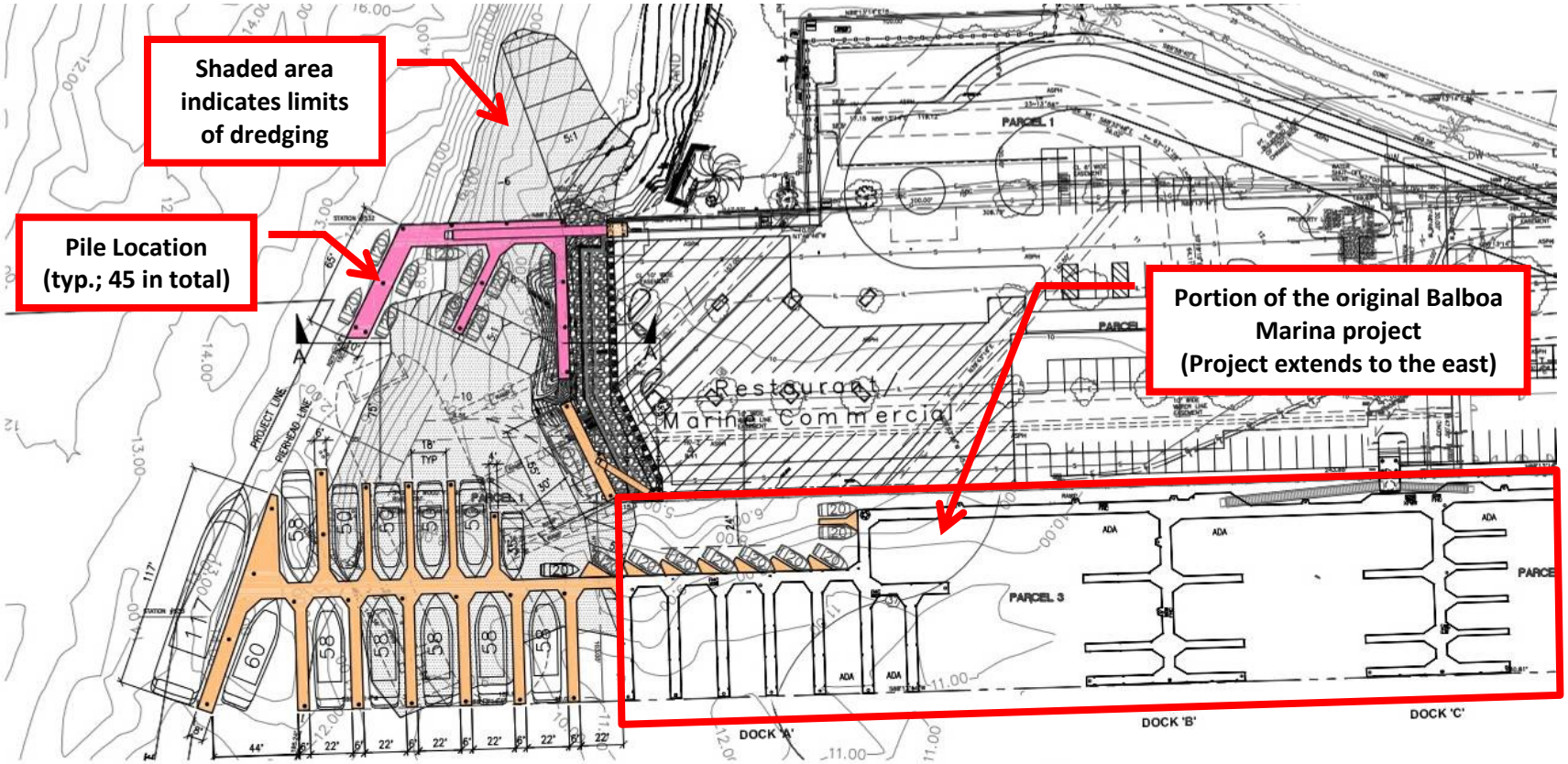

Figure 9-1. Locations of Pile Driving and Dredging to Support the Waterside Improvements

greater distance from the residences, lessening the noise and vibration levels that will be experienced at those locations. However, to provide a worst case assessment, the noise and vibration data gathered by Anchor QEA will be used in this study without applying any corrections for distance. During demolition and tieback installation, there was no measureable increase in vibration level at any monitoring location. Dredging activities produced peak particle velocities (PPVs) of up to 0.05 in/sec when they occurred close to the monitoring station but, in general, were not much higher than the background ambient vibration levels in the area. As expected, pile driving produced the highest vibration levels, with a maximum PPV of 0.0758 in/sec recorded at Linda Isle on one occasion. In general, the vibration was well below this level, and piles installed near the marina seawall showed little or no measurable vibration at the residences. The residential community on Bayshore Drive is located almost three times farther from the proposed construction as the residences on Linda Isle. Using calculation methodologies developed by the Federal Transit Administration **[7]**, it may be estimated that the maximum PPV at the Bayshore community will be 0.0163 in/sec. These vibration levels are less than the threshold of 1.0 in/sec; therefore, the impact of placing the waterside piles is less than significant.

At Linda Isle, the average daily noise levels measured during construction of the original Balboa Marina project were generally in the mid-80 dBA range during heavy equipment operations. Otherwise, the average daily noise level varied in the high 60 dBA to low 70 dBA range. Maximum noise levels of greater than 100 dBA were recorded on occasion during pile driving operations but, in general, the maximum noise levels varied in the high 80 dBA to low 90 dBA range. The residential community on Bayshore Drive is located almost three times farther from the proposed construction as the residences on Linda Isle. Therefore, at these locations it is estimated that the construction noise levels will be about 9 dB lower than those measured on Linda Isle. No significant impact is assessed for the construction noise because it will only occur during the hours permitted by the City's Municipal Code. Because the construction activities will only occur during the hours permitted by the City's Municipal Code, there are no restrictions on the noise levels that the activities can produce; therefore, the construction will not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, and the impact is less than significant.

All of the waterside construction activities (piling, dredging, tieback installation, etc.) will occur at a much greater distance from the existing restaurants than occurred during construction of the Balboa Marina project. This will noticeably lessen the noise and vibration that will be experienced at the restaurants. Based on the monitoring discussed previously, pile driving produced the highest vibration level: a maximum PPV of 0.0758 in/sec at Linda Isle on one occasion. Using calculation methodologies developed by the Federal Transit Administration **[7]**, it may be estimated that the maximum PPV that will be experienced at the existing restaurants will be 0.009 in/sec. This vibration level is less than the threshold of 1.0 in/sec; therefore, the impact of construction vibration is less than significant.

As discussed previously, the average daily noise level measured at Linda Isle during construction of the original Balboa Marina project varied from the high 60 dBA to the mid-80 dBA range. Maximum noise levels of greater than 100 dBA were recorded on occasion during pile driving operations but, in general, the maximum noise levels varied in the high 80 dBA to low 90 dBA range. The existing restaurants are located at least 500 feet farther from the proposed construction as the residences

on Linda Isle. Therefore, at these restaurants it is estimated that the construction noise levels will be about 12 dB lower than those measured on Linda Isle. No significant impact is assessed for the construction noise because it will only occur during the hours permitted by the City's Municipal Code. Because the construction activities will only occur during the hours permitted by the City's Municipal Code, there are no restrictions on the noise levels that the activities can produce; therefore, the construction will not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, and the impact is less than significant.

9.1.2 Landside Improvements

Table 9-1 shows typical noise levels associated with the various types of construction-related machinery that will be used at the Project site during the landside improvements.

Table 9-1. Construction Noise Levels for the Landside Improvements

Equipment Type or Activity	Typical Maximum Noise Level at 50 ft. in dBA
Air Compressor	77.7
Bore/Drill Rig	84.4
Cement Mixer Truck	85.0
Cement & Mortar Mixer	80.0
Concrete/Industrial Saw	89.6
Crane	80.6
Dozer	81.7
Forklift	74.7
Generator Set	80.6
Grader	85.0
Paver	77.2
Paving Equipment Unit	77.2
Roller	80.0
Skid Steer Loader	79.1
Tractor/Loader/Backhoe	84.0
Welding Unit	74.0
Source: *Roadway Construction Noise Model 1.0.* Federal Highway Administration. February 2, 2006.	

Nine phases of demolition and construction have been identified by the Project applicant. These, together with the number and type of equipment to be used during each phase, are provided in Table 9-2. The table also provides the estimated duration of each phase and an analysis of the estimated overall demolition and construction noise levels during each phase. In reviewing the table it should be noted that the landside piles will not require a pile driver. Rather, they will be constructed using a technique referred to as "auger cast pressure grouted". With this technique, piles are constructed by rotating a hollow stem, continuous flight auger into the ground to the desired tip elevation. When the required depth is reached, a high strength, fluid grout is pumped under pressure through the hollow stem of the auger exiting through the tip (or bit). Grout is then pumped prior to lifting the auger to build up a "grout head" around the outside of the auger. The

auger is then withdrawn in a controlled manner slowly rotating clockwise as the pumping continues to both maintain the head of grout and avoid any intrusion of water or soil into the grout column. Reinforcing steel is then placed through the fluid grout column, and the pile top elevation is established by either dipping out or adding fluid grout to the pile. **[8]**

Table 9-2. Estimated Combined Noise Level During Construction — Landside Improvements

Construction Phase & Equipment	Typical Maximum Noise Level at 50 ft	Usage Factor[1]	Avg. Equipment Noise Level @ 50' with Usage Factor
Demolition (approximately 22 active working days)			
1 concrete saw	89.6 dBA	0.2	82.6 dBA
1 dozer	81.7 dBA	0.4	77.7 dBA
1 tractor/loader/backhoe	84.0 dBA	0.4	80.0 dBA
Combined			*85.3 dBA*
Site Preparation (approximately 22 active working days)			
1 dozer	81.7 dBA	0.4	77.7 dBA
1 grader	85.0 dBA	0.4	81.0 dBA
1 tractor/loader/backhoe	84.0 dBA	0.4	80.0 dBA
Combined			*84.5 dBA*
Grading (approximately 51 active working days)			
1 grader	85.0 dBA	0.4	81.0 dBA
1 dozer	81.7 dBA	0.4	77.7 dBA
2 tractors/loaders/backhoes	87.0 dBA	0.4	83.0 dBA
Combined			*85.8 dBA*
Pile Installation (approximately 52 active working days)			
2 bore/drill rigs	87.4 dBA	0.2	80.4 dBA
2 air compressors	80.7 dBA	0.4	76.7 dBA
2 welding units	77.0 dBA	0.4	73.0 dBA
Combined			*82.5 dBA*
Building Construction (approximately 148 active working days)			
1 crane	80.6 dBA	0.16	72.6 dBA
1 forklift	74.7 dBA	0.4	70.7 dBA
1 generator set	80.6 dBA	0.5	77.6 dBA
2 welding units	77.0 dBA	0.4	73.0 dBA
1 tractor/loader/backhoe	84.0 dBA	0.4	80.0 dBA
Combined			*83.2 dBA*
Site Work, Drainage (approximately 107 active working days)			
2 cement & mortar mixers	83.0 dBA	0.5	80.0 dBA
1 skid steer loader	79.1 dBA	0.4	75.1 dBA
1 tractor/loader/backhoe	84.0 dBA	0.4	80.0 dBA
Combined			*83.7 dBA*
Paving (approximately 9 active working days)			
1 paver	77.2 dBA	0.5	74.2 dBA
1 paving equipment unit	77.2 dBA	0.5	74.2 dBA
2 rollers	83.0 dBA	0.2	76.0 dBA
1 tractor/loader/backhoe	84.0 dBA	0.4	80.0 dBA
1 cement mixer truck	85.0 dBA	0.4	81.0 dBA
Combined			*85.0 dBA*
Tenant Improvements (approximately 98 active working days)			
1 air compressor	77.7 dBA	0.4	73.7 dBA
1 forklift	74.7 dBA	0.4	70.7 dBA
Combined			*75.5 dBA*
Architectural Coating (approximately 16 active working days)			
1 air compressor	77.7 dBA	0.4	73.7 dBA
Combined			*73.7 dBA*

Source: Roadway Construction Noise Model 1.0. Federal Highway Administration. February 2, 2006.
1. Percentage of time equipment is operating at noisiest mode in most used phase on site.

Based on the estimated combined construction noise levels identified in Table 9-2, an analysis was conducted to estimate the noise levels that will be experienced at the nearest off-site receptors. It has been assumed in this study that the types and numbers of construction equipment identified in Table 9-2 represent the activity that will occur simultaneously on site during each phase of construction. Each phase of construction will have a construction zone associated with it; that is, an area in which the construction equipment and activity is concentrated. The equipment and construction activities will be distributed throughout these construction zones, moving around as needed to complete the work. Therefore, to simplify the analysis of average noise levels, it has been assumed that the average location of the construction equipment and activities during each phase of construction is at the center of the construction zone for that phase. This analysis is provided in Table 9-3.

Table 9-3. Analysis of Estimated Average Construction Noise Levels — Landside Improvements

Noise-Sensitive Location	Construction Phase	Estimated Avg. Level @ 50', dBA	Attenuation Due to Distance, dBA[1]	Estimated Construction Noise at Receptor Location, dBA
Existing residences on Linda Isle	Demolition	85.3	-15.3 (290')	70.0
	Site Preparation	84.5	-17.4 (370')	67.1
	Grading	85.8	-17.4 (370')	68.4
	Pile Installation	82.5	-16.0 (315')	66.5
	Building Construction	83.2	-16.0 (315')	67.2
	Site Work, Drainage	83.7	-17.4 (370')	66.3
	Paving	85.0	-17.4 (370')	67.6
	Tenant Improvements	75.5	-16.0 (315')	59.5
	Architectural Coating	73.7	-16.0 (315')	57.7
Existing residences on Bayshore Dr.	Demolition	85.3	-26.8 (1,090')	58.5
	Site Preparation	84.5	-25.2 (910')	59.3
	Grading	85.8	-25.2 (910')	60.6
	Pile Installation	82.5	-22.9 (695')	59.6
	Building Construction	83.2	-22.9 (695')	60.3
	Site Work, Drainage	83.7	-25.2 (910')	58.5
	Paving	85.0	-25.2 (910')	59.8
	Tenant Improvements	75.5	-22.9 (695')	52.6
	Architectural Coating	73.7	-22.9 (695')	50.8
Existing Sol Restaurant in Newport Harbor	Demolition	85.3	-14.6 (270')	70.7
	Site Preparation	84.5	-19.3 (460')	65.2
	Grading	85.8	-19.3 (460')	66.5
	Pile Installation	82.5	-22.5 (670')	60.0
	Building Construction	83.2	-22.5 (670')	60.7
	Site Work, Drainage	83.7	-19.3 (460')	64.4
	Paving	85.0	-19.3 (460')	65.7
	Tenant Improvements	75.5	-22.5 (670')	53.0
	Architectural Coating	73.7	-22.5 (670')	51.2
Existing residences on N. Bayside Dr.	Demolition	85.3	-21.2 (570')	64.1
	Site Preparation	84.5	-21.4 (585')	63.1
	Grading	85.8	-21.4 (585')	64.4
	Pile Installation	82.5	-23.8 (775')	58.7
	Building Construction	83.2	-23.8 (775')	59.4
	Site Work, Drainage	83.7	-21.4 (585')	62.3
	Paving	85.0	-21.4 (585')	63.6
	Tenant Improvements	75.5	-23.8 (775')	51.7
	Architectural Coating	73.7	-23.8 (775')	49.9

Notes:

1. Attenuation is based on a reduction of 6 dB for every doubling of distance from the source. Distance is calculated from the center of the construction zone for each construction phase.

No significant impact is assessed for the construction noise because it will only occur during the hours permitted by the City's Municipal Code. Because the construction activities will only occur during the hours permitted by the City's Municipal Code, there are no restrictions on the noise levels that the activities can produce; therefore, the construction will not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, and the impact is less than significant.

The primary vibratory sources during the construction of the landside improvements will be the dozers and the bore/drill rig used to place the landside piles. Based on published data **[7]**, such equipment typically generates a peak particle velocity (PPV) of 0.089 in/s at a distance of 25 feet. Using this value, an analysis was conducted to estimate the groundborne vibration velocities that will be experienced at the nearest adjacent buildings during construction of the Project. The results of this analysis are summarized in Table 9-4.

Table 9-4. Estimated Construction Vibration Levels — Landside Improvements

Location	Distance	Estimated PPV
Residences on Linda Isle	270'	0.003 in/s
Residences on Bayshore Dr.	600'	0.001 in/s
Sol Restaurant in Newport Harbor	190'	0.004 in/s
Residences on N. Bayside Dr.	45'	0.037 in/s

These vibration levels are less than the threshold of 1.0 in/sec; therefore, the impact of constructing the landside improvements is less than significant.

9.1.3 Combined Waterside and Landside Improvements

Although actual construction schedules are currently unknown, it is possible that the following landside improvement construction phases could occur simultaneously with the waterside improvements: pile installation, building construction, site work and drainage, paving, tenant improvements, and architectural coatings. Therefore, the surrounding land uses could be exposed to the combined noise levels from the landside and waterside improvements, as illustrated in Table 9-5.

Table 9-5. Analysis of Estimated Average Construction Noise Levels —Combined Improvements

Noise-Sensitive Location	Construction Phase	Estimated Construction Noise at Receptor Location, dBA		
		Waterside	Landside	Combined
Existing residences on Linda Isle	Pile Installation Building Construction Site Work, Drainage Paving Tenant Improvements Architectural Coating	70-85	66.5 67.2 66.3 67.6 59.5 57.7	72-85 72-85 72-85 72-85 70-85 70-85
Existing residences on Bayshore Dr.	Pile Installation Building Construction Site Work, Drainage Paving Tenant Improvements Architectural Coating	61-76	59.6 60.3 58.5 59.8 52.6 50.8	63-76 64-76 63-76 64-76 62-76 61-76
Existing Sol Restaurant in Newport Harbor	Pile Installation Building Construction Site Work, Drainage Paving Tenant Improvements Architectural Coating	58-73	60.0 60.7 64.4 65.7 53.0 51.2	62-73 63-73 65-74 66-74 59-73 59-73
Existing residences on N. Bayside Dr.	Pile Installation Building Construction Site Work, Drainage Paving Tenant Improvements Architectural Coating	55-70	58.7 59.4 62.3 63.6 51.7 49.9	60-70 61-70 63-71 64-71 57-70 56-70

No significant impact is assessed for the combined construction noise because it will only occur during the hours permitted by the City's Municipal Code. Because the construction activities will only occur during the hours permitted by the City's Municipal Code, there are no restrictions on the noise levels that the activities can produce; therefore, the construction will not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, and the impact is less than significant.

As indicated previously, the primary vibratory sources are expected to be dozers and the bore/drill rig during the construction of the landside improvements, and pile driving during the construction of the waterside improvements. Table 9-6 provides the estimated combined vibration levels that may occur if these activities occur simultaneously.

Table 9-6. Estimated Construction Vibration Levels — Combined Improvements

Location	Estimated PPV, in/sec		
	Waterside	Landside	Combined
Residences on Linda Isle	0.0758	0.003	0.0788
Residences on Bayshore Dr.	0.0163	0.001	0.0173
Sol Restaurant in Newport Harbor	0.009	0.004	0.013
Residences on N. Bayside Dr.	0.010	0.037	0.047

These vibration levels are less than the threshold of 1.0 in/sec; therefore, the impact of constructing the landside improvements is less than significant.

9.2 Project Operation

The operation of the Project will not involve the use of heavy equipment or machinery that can generate groundborne vibration levels that will be perceptible beyond the property lines. Therefore, this impact is less than significant.

The predominant noise sources associated with the proposed Project are additional traffic on the local streets, activities and equipment at the proposed commercial building, and parking lot activities. Each of these is discussed in the following sections. When the marina is completed, it is expected that there will be an incremental increase in noise levels associated with the use of the boat slips. The increase will be commensurate with the number of new boats using the slips, the frequency with which the new slips are used, and the mix of engine types (fueled or electric) on the new boats. Since these factors are unknown, the incremental increase in noise can be estimated by assuming that it will be proportional to the increase in the number of slips. There are currently 107 slips at the Balboa Marina. The proposed project will add 24 private boat slips and 8 new public boat slips, for a total of 139 slips. This will produce an estimated increase of 1 dB relative to the noise level produced by the use of the current marina. This estimated increase in noise level from the use of the new slips is a less than significant impact.

9.2.1 Traffic

Using data provided by Kunzman Associates **[4]**, analyses were conducted to identify the traffic noise exposures that will occur in the study area with and without the Project. The analyses were conducted using the Federal Highway Administration's Traffic Noise Model (TNM) lookup tables **[5, 6]**. The results of the analyses, provided in Appendix II, are summarized in Tables 9-7 and 9-8.

Table 9-7. Existing Year (2014) Traffic Noise Levels With and Without Project

Street Segment	Land Use of Nearest Receptor	CNEL @ Nearest Receptor		Change in CNEL Due to Project
		Without Project	With Project	
16TH STREET				
W/O Dover Dr	Residential	59.7 dB	59.8 dB	0.1 dB
BAYSIDE DRIVE				
N/O E. Coast Hwy	Residential	54.6 dB	54.9 dB	0.3 dB
S/O E. Coast Hwy	Residential	67.2 dB	67.2 dB	0.0 dB
COAST HIGHWAY (WEST)				
W/O Newport Blvd	Residential	68.8 dB	68.8 dB	0.0 dB
E/O Newport Blvd	Residential	64.3 dB	64.3 dB	0.0 dB
E/O Tustin Ave	Residential	68.0 dB	68.0 dB	0.0 dB
W/O Dover Dr	Residential	69.9 dB	69.9 dB	0.0 dB
E/O Dover Dr	Residential	70.7 dB	70.8 dB	0.1 dB
COAST HIGHWAY (EAST)				
W/O Bayside Dr	Residential	67.3 dB	67.3 dB	0.0 dB
E/O Bayside Dr	Residential	73.2 dB	73.2 dB	0.0 dB
W/O Jamboree Rd	Residential	70.9 dB	70.9 dB	0.0 dB
E/O Jamboree Rd	Residential	71.9 dB	71.9 dB	0.0 dB
W/O Newport Center Dr	Residential	72.0 dB	72.0 dB	0.0 dB
E/O Newport Center Dr	Residential	68.6 dB	68.6 dB	0.0 dB
W/O Avocado Ave	Residential	68.1 dB	68.1 dB	0.0 dB
E/O MacArthur Blvd	Residential	67.7 dB	67.7 dB	0.0 dB
DOVER DRIVE				
E/O Irvine Ave	Residential	63.0 dB	63.0 dB	0.0 dB
N/O Westcliff Dr	Residential	66.5 dB	66.5 dB	0.0 dB
S/O Westcliff Dr	Residential	67.6 dB	67.6 dB	0.0 dB
N/O 16th St	Church	68.0 dB	68.0 dB	0.0 dB
S/O 16th St	Residential	70.6 dB	70.6 dB	0.0 dB
N/O W. Coast Hwy	Residential	70.3 dB	70.4 dB	0.1 dB
IRVINE AVENUE				
N/O 19th St/Dover Dr	Residential	68.2 dB	68.3 dB	0.1 dB
S/O 19th St/Dover Dr	Residential	67.0 dB	67.0 dB	0.0 dB
N/O 17th St/Westcliff Dr	Residential	67.0 dB	67.1 dB	0.1 dB
JAMBOREE ROAD				
N/O San Joaquin Hills Rd	Residential	72.2 dB	72.2 dB	0.0 dB
S/O San Joaquin Hills Rd	Residential	71.1 dB	71.1 dB	0.0 dB
N/O Santa Barbara Dr	Residential	68.2 dB	68.2 dB	0.0 dB
S/O Santa Barbara Dr	Residential	70.1 dB	70.1 dB	0.0 dB
N/O E. Coast Hwy	Residential	71.2 dB	71.3 dB	0.1 dB
MACARTHUR BOULEVARD				
N/O San Joaquin Hills Rd	Residential	73.1 dB	73.1 dB	0.0 dB
S/O San Joaquin Hills Rd	Residential	72.3 dB	72.3 dB	0.0 dB
N/O San Miguel Dr	Residential	71.7 dB	71.7 dB	0.0 dB
S/O San Miguel Dr	Residential	70.5 dB	70.5 dB	0.0 dB
N/O E. Coast Hwy	Residential	71.0 dB	71.0 dB	0.0 dB
NEWPORT BOULEVARD				
N/O W. Coast Hwy	Residential	66.2 dB	66.2 dB	0.0 dB
SAN JOAQUIN HILLS ROAD				
E/O Jamboree Rd	Residential	63.9 dB	63.9 dB	0.0 dB
W/O Santa Cruz Dr	Residential	69.3 dB	69.3 dB	0.0 dB
E/O Santa Cruz Dr	Residential	67.6 dB	67.6 dB	0.0 dB
W/O Santa Rosa Dr	Residential	65.4 dB	65.4 dB	0.0 dB
E/O Santa Rosa Dr	Residential	67.5 dB	67.5 dB	0.0 dB
W/O MacArthur Blvd	Residential	69.5 dB	69.5 dB	0.0 dB
E/O MacArthur Blvd	Residential	67.5 dB	67.5 dB	0.0 dB
WESTCLIFF DRIVE				
E/O Irvine Ave	Residential	65.0 dB	65.0 dB	0.0 dB
W/O Dover Dr	Residential	64.9 dB	64.9 dB	0.0 dB

Table 9-8. Traffic Noise Levels With and Without Project for Existing + Growth + Approved Projects + Cumulative Projects

Street Segment	Land Use of Nearest Receptor	CNEL @ Nearest Receptor		Change in CNEL Due to Project
		Without Project	With Project	
16TH STREET				
W/O Dover Dr	Residential	59.9 dB	59.9 dB	0.0 dB
BAYSIDE DRIVE				
N/O E. Coast Hwy	Residential	59.1 dB	59.2 dB	0.1 dB
S/O E. Coast Hwy	Residential	67.3 dB	67.4 dB	0.1 dB
COAST HIGHWAY (WEST)				
W/O Newport Blvd	Residential	69.4 dB	69.5 dB	0.1 dB
E/O Newport Blvd	Residential	65.0 dB	65.0 dB	0.0 dB
E/O Tustin Ave	Residential	68.8 dB	68.8 dB	0.0 dB
W/O Dover Dr	Residential	70.7 dB	70.7 dB	0.0 dB
E/O Dover Dr	Residential	71.4 dB	71.4 dB	0.0 dB
COAST HIGHWAY (EAST)				
W/O Bayside Dr	Residential	67.9 dB	67.9 dB	0.0 dB
E/O Bayside Dr	Residential	73.9 dB	73.9 dB	0.0 dB
W/O Jamboree Rd	Residential	71.7 dB	71.7 dB	0.0 dB
E/O Jamboree Rd	Residential	72.8 dB	72.8 dB	0.0 dB
W/O Newport Center Dr	Residential	72.9 dB	72.9 dB	0.0 dB
E/O Newport Center Dr	Residential	69.6 dB	69.6 dB	0.0 dB
W/O Avocado Ave	Residential	69.2 dB	69.2 dB	0.0 dB
E/O MacArthur Blvd	Residential	68.6 dB	68.6 dB	0.0 dB
DOVER DRIVE				
E/O Irvine Ave	Residential	63.1 dB	63.2 dB	0.1 dB
N/O Westcliff Dr	Residential	66.6 dB	66.6 dB	0.0 dB
S/O Westcliff Dr	Residential	67.9 dB	67.9 dB	0.0 dB
N/O 16th St	Church	68.3 dB	68.3 dB	0.0 dB
S/O 16th St	Residential	70.9 dB	70.9 dB	0.0 dB
N/O W. Coast Hwy	Residential	70.8 dB	70.8 dB	0.0 dB
IRVINE AVENUE				
N/O 19th St/Dover Dr	Residential	68.4 dB	68.4 dB	0.0 dB
S/O 19th St/Dover Dr	Residential	67.1 dB	67.1 dB	0.0 dB
N/O 17th St/Westcliff Dr	Residential	67.2 dB	67.2 dB	0.0 dB
JAMBOREE ROAD				
N/O San Joaquin Hills Rd	Residential	73.0 dB	73.0 dB	0.0 dB
S/O San Joaquin Hills Rd	Residential	71.8 dB	71.8 dB	0.0 dB
N/O Santa Barbara Dr	Residential	68.9 dB	68.9 dB	0.0 dB
S/O Santa Barbara Dr	Residential	70.8 dB	70.8 dB	0.0 dB
N/O E. Coast Hwy	Residential	72.0 dB	72.0 dB	0.0 dB
MACARTHUR BOULEVARD				
N/O San Joaquin Hills Rd	Residential	73.5 dB	73.5 dB	0.0 dB
S/O San Joaquin Hills Rd	Residential	72.7 dB	72.7 dB	0.0 dB
N/O San Miguel Dr	Residential	72.2 dB	72.2 dB	0.0 dB
S/O San Miguel Dr	Residential	71.0 dB	71.0 dB	0.0 dB
N/O E. Coast Hwy	Residential	71.5 dB	71.5 dB	0.0 dB
NEWPORT BOULEVARD				
N/O W. Coast Hwy	Residential	66.7 dB	66.7 dB	0.0 dB
SAN JOAQUIN HILLS ROAD				
E/O Jamboree Rd	Residential	64.8 dB	64.8 dB	0.0 dB
W/O Santa Cruz Dr	Residential	69.7 dB	69.7 dB	0.0 dB
E/O Santa Cruz Dr	Residential	68.0 dB	68.1 dB	0.1 dB
W/O Santa Rosa Dr	Residential	65.9 dB	65.9 dB	0.0 dB
E/O Santa Rosa Dr	Residential	67.7 dB	67.7 dB	0.0 dB
W/O MacArthur Blvd	Residential	70.0 dB	70.0 dB	0.0 dB
E/O MacArthur Blvd	Residential	67.7 dB	67.7 dB	0.0 dB
WESTCLIFF DRIVE				
E/O Irvine Ave	Residential	65.7 dB	65.8 dB	0.1 dB
W/O Dover Dr	Residential	65.2 dB	65.3 dB	0.1 dB

Referring to the tables, additional traffic generated by the Project is not expected to increase the CNEL at any location in the study area to a level that exceeds the City's "Normally Compatible" level for that land use. Therefore, Project traffic will not result in the exposure of persons to or generation of noise levels in excess of standards established in the Newport Beach General Plan, and the impact is less than significant.

Referring to the tables, additional traffic generated by the Project is expected to increase the ambient CNEL in the study area by only up to 0.3 dB. This is less than the thresholds of significance identified in Table 4-3; therefore, the Project will not result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project, and the impact is less than significant.

9.2.2 Proposed Commercial Building

As indicated previously, the Project will include up to a maximum of 19,400 square feet of marine commercial development, including a restaurant, in a single building to be located at the west end of the site. It is expected that the non-restaurant commercial uses within the building will consist of one or more office spaces. Because the activities associated with office spaces occur within the interior of the building, they are not expected to produce significant noise levels at the nearest residences on Linda Isle or Bay Shore Drive, or at the existing nearby restaurants. This is for commercial operations that fully comply with the City's Municipal Code regulations that limit certain activities (e.g., truck deliveries) to daytime hours only.

The proposed restaurant, however, may produce a significant impact if it has an outdoor dining area and/or live entertainment. Based on measurements obtained as part of other noise studies for restaurants in Newport Beach, and taking into account the long distances to the nearest residential properties (270' to 650'), it is unlikely that the activities at the proposed restaurant will exceed the quantitative noise standards identified in Chapter 10.26 of the City's Municipal Code. However, they may violate the qualitative provisions of the Municipal Code that require noise from such establishments to be inaudible at the property lines (Chapter 5.28, Chapter 20.48.090E), or that prohibit "loud or raucous" noise (Chapter 10.28.020). Therefore, the impact of the Project is considered to be potentially significant.

9.2.3 Parking Lot Activities

The traffic study prepared for the Project **[4]** indicates that during the peak evening hour, the Project will generate 75 vehicles entering or leaving the parking lot. In order to estimate the noise levels that will be generated by the parking lot activities, a computer noise model was prepared utilizing SoundPLAN software, which predicts noise levels based on the size of the parking lot, the number of parking spaces, and the number of hourly vehicle movements. This model takes a number of important variables into account, including source sound power levels, the distance from sources to receivers, the heights of sources and receivers, ground conditions, barrier effects provided by walls, buildings and topography, and noise reflected from hard surfaces such as buildings and walls.

The results of the noise modeling are shown in Figure 9-2 as a noise contour map. Referring to Figure 9-2, the noise level due to peak evening parking lot activities is estimated to be 43 dBA at the closest residential property on Linda Isle, and notably less at the residences on Bayshore Drive to the west. These levels are below the City's daytime and nighttime standards of 55 dBA and 50 dBA, respectively; therefore, the impact is less than significant. Assuming that standard residential construction provides at least 10 dB of noise reduction with windows open the interior noise level due to parking lot activities is expected to be 33 dBA at the residences on Linda Isle. At the residences on Bayshore Drive the interior noise levels will be even less. These levels are below the City's daytime and nighttime standards of 45 dBA and 40 dBA, respectively; therefore, the impact is less than significant.

At the nearest existing restaurant, the noise level from the parking lot activities is expected to be about 48 dBA. This is below the City's daytime and nighttime standards of 65 dBA and 60 dBA, respectively; therefore, the impact is less than significant.

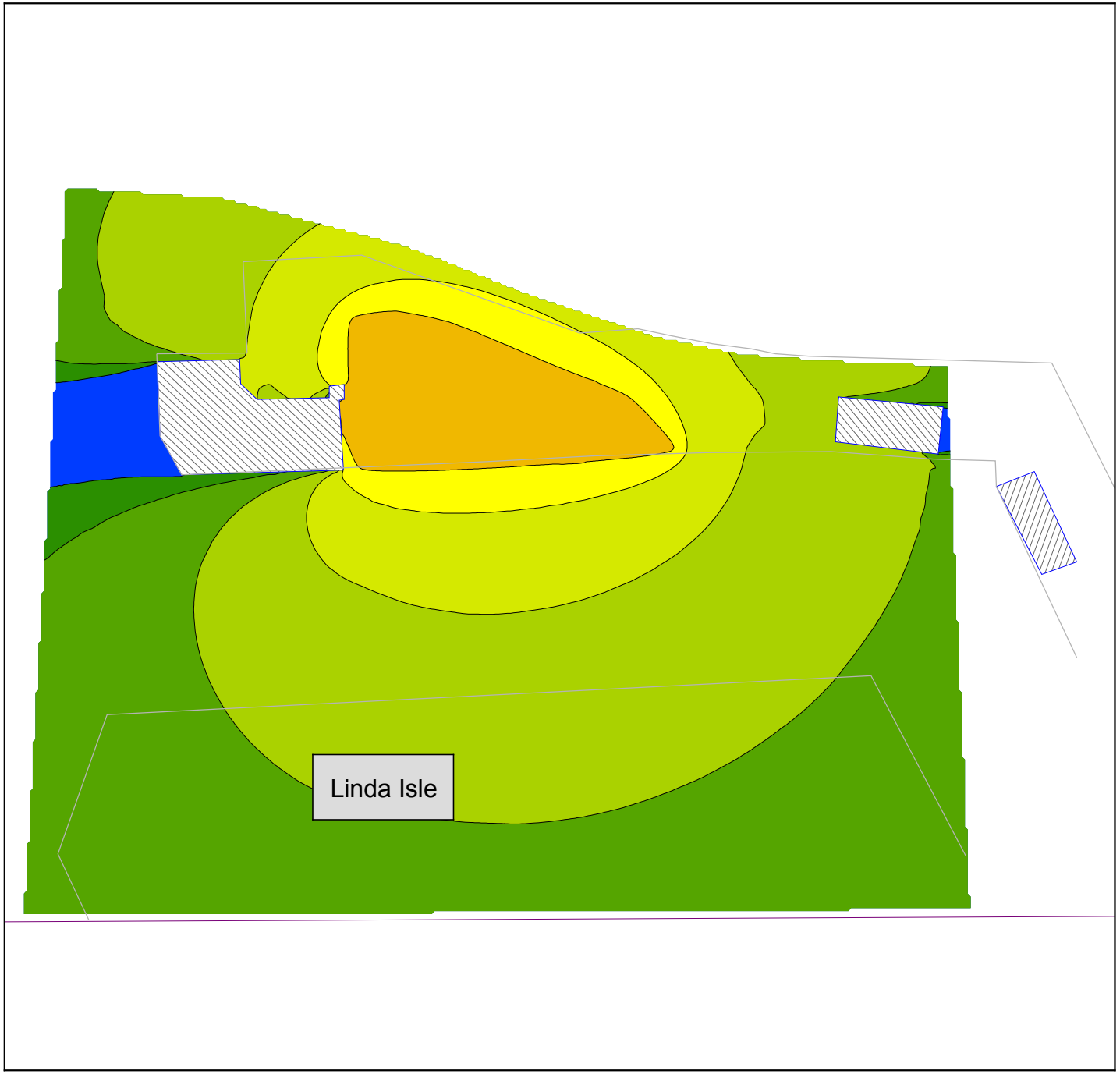

Figure 9-2. Estimated Noise Levels Due to Parking Lot Activities

Leq, dBA

>	65
60 -	65
55 -	60
50 -	55
45 -	50
40 -	45
35 -	40
30 -	35
<=	30

Signs and symbols

Buildings

Property Lines

N

0 100 200 300 feet

Calculation Date: May 14, 2014

WIELAND ACOUSTICS
noise & vibration consultants

10 Future Noise Environment at the Project Site

The nearest proposed building façade to East Coast Highway is located at a distance of about 230 feet from the centerline of the road. Referring to Table II-5 in Appendix II, the estimated CNEL at the proposed building is 70 dB. This is less than the significance criterion of 80 dB; therefore, the Project will not result in the exposure of persons to noise levels in excess of standards established in the City's general plan, and the impact is less than significant.

A measurement was obtained at the Project site during the evening peak hour to identify the existing average noise level at the nearest proposed building façade. The results of this measurement, provided in Appendix I, indicate an L_{eq} of 60.3 dBA. This value was then used to calibrate a proprietary version of the FHWA's Traffic Noise Model to estimate the future peak hour noise level that will occur at the upper level of the proposed commercial building. The results of the analysis, provided in Appendix II, indicate an estimated peak hour L_{eq} of 69.8 dBA. Assuming that standard commercial construction provides a noise reduction of 25 dB with windows and doors closed, the interior L_{eq} within the proposed building is estimated to be 44.8 dBA. This complies with the State's CALGreen standard of 50 dBA; therefore, the impact is less than significant.

11 Summary of Impacts

Using the criteria established in this study, the following may be concluded regarding the impact of the proposed Project:

- The Project may result in the exposure of persons to or generation of noise levels in excess of standards established in the Newport Beach General Plan and the Newport Beach Municipal Code, or applicable standards of other agencies. This potentially significant impact to off-site noise-sensitive receptors is associated with the operation of the proposed restaurant if it includes an outdoor dining area and/or live entertainment. (Refer to Mitigation Measure 1 in Section 12.)
- Project construction will not result in the exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels.
- The Project will not result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project.
- Project construction will not result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project.
- The Project will not expose people residing or working in the project area to excessive noise levels as a result of activities at an airport.

12 Mitigation Measures

The following measure is recommended to mitigate the potentially significant noise impact associated with the project's operation if the commercial building includes a restaurant with an outdoor dining area and/or live entertainment:

1. An acoustical study shall be required prior to the issuance of occupancy permits to verify that the operation of the restaurant comply with the requirements identified in Chapters 5.28, 10.26, 10.028.020, and 20.48.090(E) of the City's Municipal Code.

13 References

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ENCLOSURE 1

Anchor QEA Monitoring Report

FINAL VIBRATION AND NOISE MONITORING REPORT
BALBOA MARINA DOCK REPLACEMENT

Prepared for

The Irvine Company

550 Newport Center Drive

Newport Beach, California 92660

Prepared by

Anchor QEA, L.P.

28202 Cabot Road, Suite 425

Laguna Niguel, California 92677

September 2009

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Appendix C Construction Photographs

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Appendix G Individual Home Monitoring Forms

Appendix H Final Surveyor Documentation

LIST OF ACRONYMS AND ABBREVIATIONS

Anchor QEA	Anchor QEA, L.P.
dB	decibel
GPI	Geotechnical Professionals, Inc.
in/sec	inch per second
LIHOA	Linda Isle Homeowners Association
PPV	peak particle velocity
TIC	The Irvine Company
URS/Cash	URS/Cash and Associates

1 INTRODUCTION AND PURPOSE

This document presents the findings of the monitoring program documented in the *Vibration and Noise Monitoring Plan* (Anchor 2008a), created to monitor construction noise and vibration in conjunction with The Irvine Company's (TIC's) Balboa Marina dock replacement project (Figure 1). Additional details can be found in the *Pre-construction Conditions Report for Monitored Structures* (Anchor 2008b) and the *Linda Isle Monitoring Post-major Construction Update* memorandum (Anchor QEA 2009).

The Balboa Marina dock replacement project involved demolition, seawall repair, pile installation, dredging, and new marina construction. Monitoring was performed before, during, and immediately after all phases of construction, and was performed at homes on the adjacent Linda Isle, the Linda Isle access bridge, and restaurants adjoining the Balboa Marina property (together referred to as "Monitored Structures"). The objectives of the monitoring program were as follows:

- Provide an ongoing assessment of project noise and vibration at Monitored Structures
- Document noise and vibration levels during project construction
- Document conditions of Monitored Structures before and immediately after project construction
- Document any apparent displacement, movement, or cracking to Monitored Structures
- Obtain "real-time" measurements during construction as that appropriate actions can be taken, if necessary, to address noise and vibration impacts resulting from the project

The details of the monitoring were developed by the project engineering team, consisting of Anchor QEA, L.P. (Anchor QEA; author of this document), URS/Cash and Associates (URS/Cash), Geotechnical Professionals, Inc. (GPI; geotechnical engineering subconsultant to URS/Cash), and Weiland Acoustics, Inc. (noise and vibration subconsultant to TIC). All details of the monitoring were finalized after being reviewed by the Linda Isle Homeowners Association (LIHOA) and its representative geotechnical firm (Geosoils, Inc.). The work was carried out by Anchor QEA's monitoring team, led by the project's Monitoring Engineer (Michael Whelan, P.E.).

SOURCE: Aerial from Google Earth Pro 2007.

0 800
Scale in Feet

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Sep 16, 2009 12:52pm heriksen

ANCHOR QEA

Figure 1
Vicinity Map
Balboa Marina Dock Replacement Project

2 VIDEO AND PHOTOGRAPHIC DOCUMENTATION

Prior to construction, for each Linda Isle residence that signed an Access and Entry Agreement with TIC, the monitoring team selected specific features of the Monitored Structures to document structural condition through video footage and photographs. Documented features typically included guide piles for floating docks, seawall panels and concrete cap, exterior patios, and interior locations, both downstairs and upstairs. Photographic documentation and video footage were recorded prior to construction and replicated at the close of the project. This process allowed for visual comparison of post-construction conditions to pre-existing conditions. Please see the *Pre-construction Conditions Report for Monitored Structures* (Anchor 2008b) for additional information regarding the pre-construction video and photographic sweeps performed. Appendix A contains the post-construction video footage, and Appendix B contains descriptive photographic logs and correlating photographs of Monitored Structures.

In addition to the photograph and video documentation of Linda Isle homes, Anchor QEA documented construction progress during the course of all phases of construction. Photographs documenting construction means and methods, pre-and post-construction conditions, and buried utilities and future expansions installed during construction can be found in Appendix C.

3 NOISE AND VIBRATION MONITORING

Noise and vibration monitoring occurred at Monitored Structures during construction activities that had the potential to produce discernable construction-related noise (air-borne vibration) and/or ground-borne vibrations in the surrounding areas. Although full monitoring was conducted during dredging and demolition activities, pile installation was the most prominent of these activities.

The monitoring team, working under the oversight of the Monitoring Engineer, used professional judgment to select representative locations for noise and vibration monitoring stations. The monitoring stations were moved periodically throughout construction to focus on Monitored Structures that were closest to the construction activities at any given time. Monitoring locations are shown on Figure 2; all monitoring sites were subject access granted by the TIC's Access and Entry Agreement and the Monitoring Engineer's professional judgment.

For the first full week of each segment of major construction, noise and vibration levels were recorded throughout the work day. Once levels were shown to be consistently below selected threshold levels (see Section 3.1), the Monitoring Engineer reduced monitoring frequency, as necessary, based on site activities. Any significant changes to construction activities initiated a new series of daily monitoring events until it was noted that noise and vibration levels were below selected threshold levels.

3.1 Criteria for Vibration Monitoring

Three threshold levels (i.e., enhanced monitoring, construction review, and construction pause limits) were defined by the project's *Vibration and Noise Monitoring Plan* (Anchor 2008a) and utilized during monitoring. All thresholds were set at a very conservative level and at levels where no damage to Monitored Structures would be expected to occur. For comparison, the City of Newport Beach's criteria for allowable vibration levels was 1.4 inches per second (in/sec) peak particle velocity (PPV), which is significantly higher than the highest threshold used for this program (i.e., 0.8 in/sec PPV, at which construction would be temporarily stopped). Vibration threshold levels for this project are shown in Table 1.

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SOURCE: Aerial from Google Earth Pro 2007.

Pile Tilt Meter Installation

Vibration Monitor Noise and Range of Deployment

93 Entry Authorization Received (Home address indicated by Number)

Monitored Homes Include the Following:

- Crack Plate Installations - Existing cracks are monitored for movement
- Pile Tile Meters - Piles are monitored for movement
- Survey Locations - Points along the home, patio, and seawall are surveyed to monitor for movement
- Noise and Vibration Monitoring - Noise and vibration monitors are deployed as work progresses. Locations determined according to the location of the ongoing work.
- Interior and Exterior Photo and Video Surveys

0 200
Scale in Feet

ANCHOR QEA

Figure 2
Monitoring Locations
Balboa Marina Dock Replacement Project

Table 1
Vibration Monitoring Threshold Levels

Threshold Level	PPV (in/sec)
Enhanced Monitoring	0.4
Construction Review	0.6
Construction Pause	0.8

3.2 Vibration Monitoring

Vibration monitoring occurred throughout each phase of construction in accordance with the *Vibration and Noise Monitoring Plan* (Anchor 2008a). At the start of each new phase of construction, initial monitoring occurred daily, and if readings were consistently well below threshold levels, monitoring frequency was reduced afterwards. Any changes to monitoring were subject to the discretion of the Monitoring Engineer. Once a new phase of construction started, or a change was made to construction equipment or methods, daily monitoring occurred for a minimum of one full work week to determine if measurable vibrations were occurring at the Monitored Structures. When collected data indicated no significant vibrations were occurring after one full week, the frequency of monitoring was reduced to 2 or 3 days per week or until construction activities progressed far enough along the waterfront to warrant monitoring at a different location.

As construction progressed along the length of the site, monitoring locations were moved periodically to focus on Monitored Structures that were closest to the construction activities at any given time. All collected data were reviewed throughout the day to determine if any significant vibrations were detected by monitoring stations.

No exceedances of vibration threshold levels were recorded at any of Monitored Structures during the construction work. Prior to construction, typical recorded "ambient background" levels ranged from 0.01 to 0.02 in/sec. Recordings during demolition and tieback installation recorded no discernable vibrations above the ambient background levels. During dredging operations, very minor vibrations were recorded, depending on the proximity of dredging activity to the structure; measured vibrations during dredging work were no higher than 0.05 in/sec at any time, which is well below the vibration threshold levels. The largest recorded vibration levels at Linda Isle were detected during pile-driving operations. A

momentary peak vibration was recorded at 0.0758 in/sec when pile driving occurred nearest Linda Isle, which again is well below vibration threshold levels. Generally, recorded levels during pile driving were well below the peak levels, and piles installed near the marina seawall showed little to no recorded vibrations at the monitored homes.

Appendix D contains data collected during vibration monitoring.

3.3 Noise Monitoring

Noise monitoring was conducted using a NIST-certified sound level meter, which logged maximum decibel levels and recorded actual levels at 5-second intervals throughout the day. Maximum and average sound levels were recorded throughout construction. During heavy equipment operations, daily averages reached the mid-80 dB range; while during the remainder of construction, levels averaged between the high 60 and low 70 dB range. Peaks of more than 100 dB were seen at limited times during pile-driving operations, otherwise daily maximum levels were typically in the high 80 dB to low 90 dB range. Prior to construction, a baseline noise survey performed at Balboa Marina showed a typical week's day noise level averaged 57 dB (with a maximum of 79 dB), showing construction related noise outside of pile driving generated very little additional noise throughout the work day. Appendix E contains the logs of sound data collected during construction.

4 STRUCTURAL MONITORING

Structural monitoring occurred throughout construction and documented the condition of selected Monitored Structures before, during, and immediately after construction operations. Monitoring was conducted for the following measurements:

- Alignment (plumbness) of existing guide piles
- Potential movement or growth of existing cracks
- Surveyed settlement and deflection points

4.1 Alignment (Plumbness) of Existing Guide Piles

Per the *Vibration and Noise Monitoring Plan* (Anchor 2008a), the vertical alignment (or plumbness) of existing guide piles was monitored at participating Linda Isle homes (those who signed the TIC's Access and Entry Agreement). After reviewing the pre-existing condition of piles at each participating residence, one to two representative piles at each monitored home were selected for monitoring based on existing plumbness, location, and condition of concrete. Mounting brackets were installed on each selected pile, either a single bracket on the top of the pile under the pile cap or two brackets installed vertically on two adjoining sides of the pile. These brackets served as set attachment points for a portable tilt meter that used to measure the inclination of the plate (and therefore that face of the pile) to a high degree of precision. Brackets installed horizontally on the top of the pile were measured in two directions, indicating the two axes of possible pile movement; piles with two brackets installed vertically were measured in one direction on each bracket to record the two axes of potential movement.

Prior to the start of construction, a series of periodic recordings of the angle of each bracket provided a measure of pre-existing pile alignments. This series of readings indicated small-scale, ambient, ongoing, and seemingly random pile deflections of the piles, likely in response to tides, currents, winds, waves, and interaction of boats and docks with the floats and piles. These forces apply continuously varying amounts of leverage against the pile, which likely resulted in this small-scale shifting of the pile in different directions over time. During construction, inclination measurements from each pile were continuously compared against the range of previous readings to evaluate indications of significant pile movement.

During the period of heavy in-water construction, as well as during the lighter landside construction, no significant movement was noted during the pile alignment monitoring. The only case of apparent pile movement was noted early during construction, when a guide pile at Linda Isle home number 104 appeared to undergo a slight change in angle between monitoring events, during a time when no notable in-water construction was occurring. The measured change was approximately 0.2 degrees, a value undetectable to visual observation. Subsequent additional observations of this pile revealed no additional movement, indicating that the 0.2 degree shift was the result of a singular event. It appeared to have no effect on the condition of the pile. All other pile readings were within the previously measured range of ambient pile deflections, as identified during the series of baseline monitoring measurements. Appendix F contains the data set collected during monitoring.

4.2 Potential Movement or Growth of Existing Cracks

Monitoring of existing cracks occurred before, during, and after construction, per the *Vibration and Noise Monitoring Plan* (Anchor 2008a). Notable existing cracks were identified during the pre-construction survey and crack monitoring gauges were installed on selected representative cracks to allow determination of any differential movement between the two sides of the crack. Between two and six locations were identified at each Monitored Structure, encompassing patio concrete, side walls, and seawall face and cap where existing cracks were noted; additionally eight locations were monitored on the Linda Isle access bridge. Crack plates were installed at these locations and monitored at regular intervals throughout all construction activities, as per the *Pre-construction Conditions Report for Monitored Structures* (Anchor 2008b).

No measureable movement was observed on any of the installed crack gauges on Monitored Structures. See Appendix G for copies of the monitoring forms for each home.

4.3 Surveyed Settlement and Deflection Points

Prior to construction, during the pre-construction general review, a series of survey points were selected to act as points where small-scale settlements and/or deflections could be monitored and recorded during subsequent survey events. Survey points were established on features such as seawalls, seawall caps, patios, and other points of interest on Monitored Structures. A pre-construction survey was completed in August of 2008 to determine

baseline horizontal and vertical positions of survey points, which were used as a baseline for comparison to later conditions. Following construction, these locations were resurveyed to verify any deflection or movement. None of the survey monitoring points showed evidence of change in position. Appendix H includes a letter from Bill Carr Surveys, Inc., indicating no change in position of any surveyed point.

5 CONCLUSIONS

At the close of construction for the Balboa Marina dock replacement project, the monitoring program documented in the *Vibration and Noise Monitoring Plan* (Anchor 2008a), created to monitor construction noise and vibration in connection with construction was successfully completed. All aspects of monitoring outlined in the *Vibration and Noise Monitoring Plan* were utilized to track possible impacts at the adjacent Linda Isle. Following the year of construction monitoring, no evidence of any significant impact to the homes at Linda Isle was observed. Noise levels were periodically high but generally within the range of existing ambient noises from the nearby Pacific Coast Highway and overhead passage of planes en route to John Wayne Airport. No significant vibrations were recorded at any of the homes during the course of construction, even during pile-driving operations. Vibrations during dredging and pile driving could occasionally be felt by home owners, but these vibrations did not exceed any established levels of concern for damage or impact to the homes. Monitoring of survey points, cracks, and pile alignment did not show any significant movement or deflections at monitored homes. Comparisons between pre- and post-construction video and photography did not show any indications of damage or changes to existing conditions at the homes. At the close of construction, the monitoring that occurred (per the *Vibration and Noise Monitoring Plan*) showed a successful completion of the project with no significant impact to the homes at Linda Isle.

6 REFERENCES

Anchor Environmental CA, L.P. (Anchor). 2008a. Vibration and Noise Monitoring Plan. Prepared for The Irvine Company. May 2008.

Anchor. 2008b. Pre-construction Conditions Report for Monitored Structures. Prepared for The Irvine Company. September 2008.

Anchor QEA, L.P. (Anchor QEA). 2009. Memorandum. Re: Linda Isle Monitoring Post-major Construction Update. March 9, 2009.

LIST OF APPENDICES

APPENDIX A POST-CONSTRUCTION VIDEO FOOTAGE

APPENDIX B PHOTOGRAPHIC LOGS AND PHOTOGRAPHS OF MONITORED STRUCTURES

APPENDIX C CONSTRUCTION PHOTOGRAPHS

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APPENDIX E NOISE MONITORING DATA

APPENDIX F PILE MONITORING DATA

APPENDIX G INDIVIDUAL HOME MONITORING FORMS

APPENDIX H FINAL SURVEYOR DOCUMENTATION

(APPENDICES PROVIDED ON TWO ATTACHED CDS.)

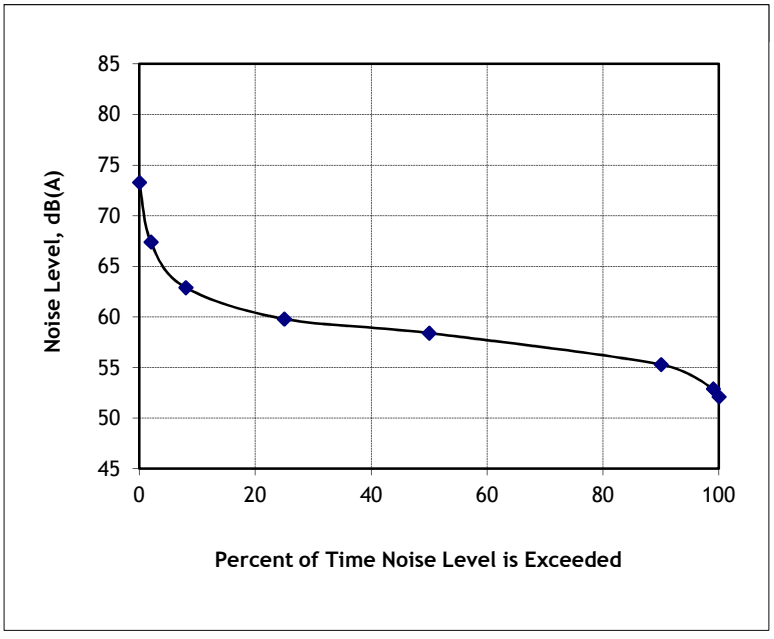
APPENDIX I

Noise Measurements

Table I-1. Noise Survey

Project:	Balboa Marina West
Position:	#1, On the seawall at Newport Harbor
Date:	May 13, 2014
Time:	Noted
Noise Source:	Ambient traffic
Distance:	Approximately 150' from Coast Hwy.
SLM Height:	5'
LD 820 S/N:	1632
LD CAL200 Calibrator S/N:	2916
Operator:	David Limberg

	Measurement Period		
	3:50 PM to 4:10 PM	to	to
n*	**Ln**	**Ln**	**Ln**
2	67.4		
8	62.9		
25	59.8		
50	58.4		
90	55.3		
99	52.9		
Leq	60.1		
Lmax	73.3		
Lmin	52.1		



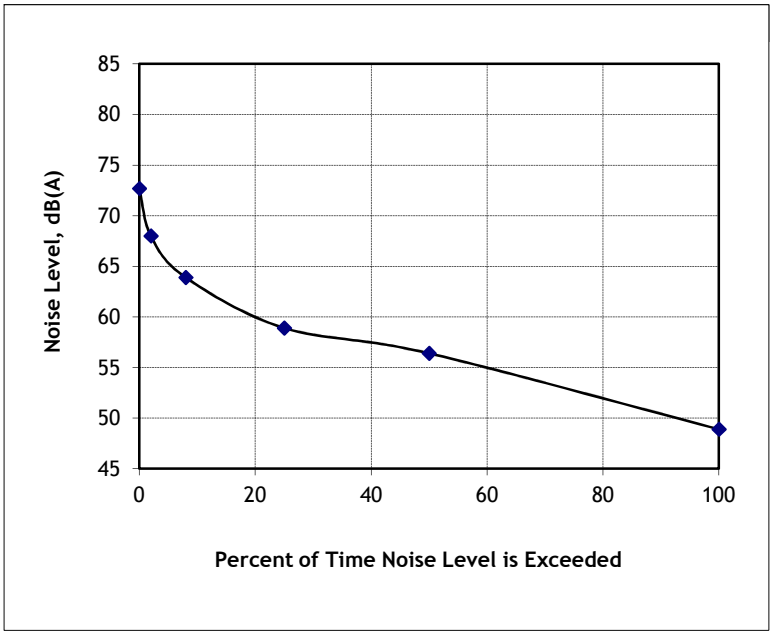
* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

WIELAND ACOUSTICS, INC.

Table I-2 Noise Survey

Project:	Balboa Marina West
Position:	#2, at the offset of the mobile homes north of the Project site
Date:	June 18, 2014
Time:	Noted
Noise Source:	Ambient traffic, aircraft
Distance:	Varies
SLM Height:	5'
LD 712 S/N:	0555
LD CAL150 Calibrator S/N:	2206
Operator:	R. Wieland

	Measurement Period		
	2:38 PM to 2:58 PM	to	to
n*	**Ln**	**Ln**	**Ln**
2	68.0		
8	63.9		
25	58.9		
50	56.4		
90			
99			
Leq	59.5		
Lmax	72.7		
Lmin	48.9		



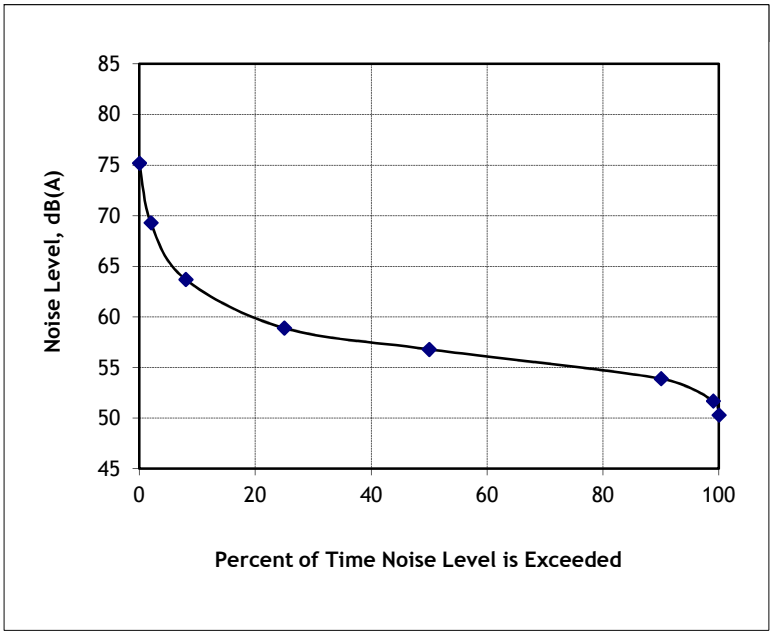
* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

WIELAND ACOUSTICS, INC.

Table I-3. Noise Survey

Project:	Balboa Marina West
Position:	At the location of the nearest proposed commercial façade to Coast Highway
Date:	May 13, 2014
Time:	Noted
Noise Source:	Ambient traffic
Distance:	21' from curb of Bayside Dr.
SLM Height:	5'
LD 820 S/N:	1632
LD CAL200 Calibrator S/N:	2916
Operator:	David Limberg

	Measurement Period		
	4:30 PM to 5:36 PM	to	to
n*	**Ln**	**Ln**	**Ln**
2	69.3		
8	63.7		
25	58.9		
50	56.8		
90	53.9		
99	51.7		
Leq	60.3		
Lmax	75.2		
Lmin	50.3		



* Leq is the average sound level during the measurement period.
Ln is the sound level exceeded n% of the time during the measurement period.
Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

APPENDIX II

Traffic Noise Analysis

Table II-1. Distance to Existing (2014) CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
16TH STREET															
West of Dover Dr	35	1.84%	0.74%	1	3,830	H			55'	59.7	52	--	--	--	--
17TH STREET															
West of Irvine Ave	35	1.84%	0.74%	1	23,430	H				N/A	291	98	--	--	--
19TH STREET															
West of Irvine Ave	25	1.84%	0.74%	1	5,710	H			33'	60.1	34	--	--	--	--
AVOCADO AVENUE															
North of E. Coast Hwy	45	1.84%	0.74%	1	7,710	H				N/A	203	65	--	--	--
South of E. Coast Hwy	30	1.84%	0.74%	1	5,780	H			53'	60.0	53	--	--	--	--
BAY SHORE DRIVE															
South of W. Coast Hwy	25	1.84%	0.74%	1	2,180	H			33'	55.9	--	--	--	--	--
BAYSIDE DRIVE															
North of E. Coast Hwy	25	1.84%	0.74%	1	1,590	H			33'	54.6	--	--	--	--	--
South of E. Coast Hwy	40	1.84%	0.74%	1	10,030	H			37'	67.2	190	61	--	--	--
BIG CANYON DRIVE															
North entry, N/O San Joaquin Hills	25	1.84%	0.74%	1	1,440	H			53'	52.3	--	--	--	--	--
South entry, N/O San Joaquin Hills	25	1.84%	0.74%	1	3,140	H			45'	56.4	--	--	--	--	--
CASTAWAYS LANE															
East of Dover Dr.	25	1.84%	0.74%	1	2,630	H			45'	55.7	--	--	--	--	--
COAST HIGHWAY (WEST), SR-1															
West of Newport Blvd	45	0.55%	0.25%	1	36,560	H			118'	68.8	657	266	90	--	--
East of Newport Blvd	40	0.88%	0.26%	1	43,150	H			263'	64.3	582	228	75	--	--
West of Riverside Ave	40	0.88%	0.26%	1	47,160	H				N/A	621	248	83	--	--
East of Riverside Ave	40	0.88%	0.26%	1	41,820	H				N/A	570	223	73	--	--
West of Tustin Ave	40	0.88%	0.26%	1	41,780	H				N/A	570	223	72	--	--
East of Tustin Ave	40	0.88%	0.26%	1	41,590	H			115'	68.0	568	222	72	--	--
West of Dover Dr	40	0.88%	0.26%	1	38,970	H			69'	69.9	541	210	67	--	--
East of Dover Dr.	50	0.88%	0.26%	1	57,340	H			163'	70.7	>985	496	193	62	--

Table II-1, cont. Distance to Existing (2014) CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
COAST HIGHWAY (EAST), SR-1															
West of Bayside Dr	50	0.88%	0.26%	1	58,340	H			336'	67.3	>985	504	196	63	--
East of Bayside Dr	50	0.88%	0.26%	1	49,860	H			83'	73.2	>985	448	168	56	--
West of Jamboree Rd	50	0.88%	0.26%	1	50,970	H			140'	70.9	>985	454	172	57	--
East of Jamboree Rd	50	0.88%	0.26%	1	39,910	H			90'	71.9	881	377	136	46	--
West of Newport Center Dr	50	0.88%	0.26%	1	36,920	H			81'	72.0	835	355	126	42	--
East of Newport Center Dr	50	0.88%	0.26%	1	30,320	H			143'	68.6	730	299	104	33	--
West of Avocado Ave	50	0.88%	0.26%	1	27,130	H			143'	68.1	676	272	94	--	--
East of Avocado Ave	40	0.88%	0.26%	1	28,700	H				N/A	427	157	52	--	--
West of MacArthur Blvd	40	0.88%	0.26%	1	30,950	H				N/A	454	169	55	--	--
East of MacArthur Blvd	40	0.88%	0.26%	1	42,680	H			127'	67.7	578	226	74	--	--
DOVER DRIVE															
East of Irvine Avenue	30	1.84%	0.74%	1	7,590	H			33'	63.0	67	--	--	--	--
North of Westcliff Dr	35	1.84%	0.74%	1	11,360	H			33'	66.5	152	49	--	--	--
South of Westcliff Dr	45	1.84%	0.74%	1	19,650	H			93'	67.6	446	165	55	--	--
North of 16th St	45	1.84%	0.74%	1	20,190	H			87'	68.0	455	169	56	--	--
South of 16th St	45	1.84%	0.74%	1	22,190	H			54'	70.6	489	186	60	--	--
North of West Coast Hwy	45	1.84%	0.74%	1	23,710	H			60'	70.3	515	198	63	--	--
IRVINE AVENUE															
North of 19th St/Dover Dr	35	1.84%	0.74%	1	23,940	H			49'	68.2	296	100	--	--	--
South of 19th St/Dover Dr	35	1.84%	0.74%	1	21,140	H			57'	67.0	266	89	--	--	--
North of 17th St/Westcliff Dr	35	1.84%	0.74%	1	21,050	H			56'	67.0	265	89	--	--	--
South of 17th St/Westcliff Dr	35	1.84%	0.74%	1	17,280	H			43'	67.4	225	72	--	--	--
JAMBOREE ROAD															
North of San Joaquin Hills Rd	55	1.84%	0.74%	1	36,800	H			109'	72.2	>985	466	177	58	--
South of San Joaquin Hills Rd	55	1.84%	0.74%	1	32,520	H			124'	71.1	981	423	157	53	--
North of Santa Barbara Dr	55	1.84%	0.74%	1	32,610	H			230'	68.2	983	424	157	53	--
South of Santa Barbara Dr	55	1.84%	0.74%	1	29,300	H			139'	70.1	909	392	142	48	--
North of East Coast Hwy	55	1.84%	0.74%	1	27,170	H			100'	71.2	864	370	131	44	--
South of East Coast Hwy	35	1.84%	0.74%	1	10,310	H			55'	64.0	138	44	--	--	--

Table II-1, cont. Distance to Existing (2014) CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
MACARTHUR BOULEVARD															
North of San Joaquin Hills Rd	55	1.84%	0.74%	1	50,950	H			122'	73.1	>985	599	237	80	--
South of San Joaquin Hills Rd	55	1.84%	0.74%	1	31,940	H			93'	72.3	968	418	155	52	--
North of San Miguel Dr	55	1.84%	0.74%	1	30,890	H			102'	71.7	945	408	150	50	--
South of San Miguel Dr	55	1.84%	0.74%	1	25,750	H			112'	70.5	832	355	125	42	--
North of E. Coast Hwy	55	1.84%	0.74%	1	24,390	H			95'	71.0	802	339	119	39	--
NEWPORT BOULEVARD (SR-55)															
North of W. Coast Hwy	50	2.55%	1.05%	1	15,650	H			144'	66.2	490	188	61	--	--
NEWPORT CENTER DRIVE															
North of E. Coast Hwy	45	1.84%	0.74%	1	12,500	H			95'	65.5	309	107	33	--	--
NEWPORTER WAY															
West of Jamboree Rd	25	1.84%	0.74%	1	1,750	H			54'	53.1	--	--	--	--	--
RIVERSIDE AVENUE															
North of W. Coast Hwy	30	1.84%	0.74%	1	8,350	H			40'	62.8	75	--	--	--	--
SAN JOAQUIN HILLS ROAD															
West of Jamboree Rd	35	1.84%	0.74%	1	4,070	H			67'	59.0	55	--	--	--	--
East of Jamboree Rd	50	1.84%	0.74%	1	9,470	H			140'	63.9	317	111	36	--	--
West of Santa Cruz Dr	50	1.84%	0.74%	1	17,100	H			74'	69.3	506	196	63	--	--
East of Santa Cruz Dr	50	1.84%	0.74%	1	11,390	H			73'	67.6	370	131	44	--	--
West of Santa Rosa Dr	50	1.84%	0.74%	1	13,100	H			137'	65.4	414	151	51	--	--
East of Santa Rosa Dr	50	1.84%	0.74%	1	17,990	H			119'	67.5	528	205	65	--	--
West of MacArthur Blvd	50	1.84%	0.74%	1	17,780	H			73'	69.5	523	203	65	--	--
East of MacArthur Blvd	50	1.84%	0.74%	1	17,270	H			113'	67.5	510	197	63	--	--
SAN MIGUEL DRIVE															
West of MacArthur Blvd	35	1.84%	0.74%	1	18,510	H				N/A	238	78	--	--	--
East of MacArthur Blvd	40	1.84%	0.74%	1	9,910	H			66'	64.5	188	60	--	--	--
SANTA BARBARA DRIVE															
East of Jamboree Rd	45	1.84%	0.74%	1	10,140	H			80'	65.4	259	87	--	--	--
SANTA CRUZ DRIVE															
South of San Joaquin Hills Rd	35	1.84%	0.74%	1	8,830	H				N/A	119	37	--	--	--

Table II-1, cont. Distance to Existing (2014) CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
SANTA ROSA DRIVE															
South of San Joaquin Hills Rd.	35	1.84%	0.74%	1	12,070	H				N/A	161	52	--	--	--
TUSTIN AVENUE															
North of W. Coast Hwy	30	1.84%	0.74%	1	1,690	H				N/A	--	--	--	--	--
WESTCLIFF DRIVE															
East of Irvine Ave	35	1.84%	0.74%	1	14,140	H			60'	65.0	187	59	--	--	--
West of Dover Dr	35	1.84%	0.74%	1	12,770	H			56'	64.9	170	55	--	--	--

* The following summarizes the traffic distributions used in the analysis:

Traffic Distribution No.	Day			Evening			Night		
	A	MT	HT	A	MT	HT	A	MT	HT
1	75.51%	1.56%	0.64%	12.57%	0.09%	0.02%	9.34%	0.19%	0.08%
2	65.83%	2.92%	2.10%	17.98%	0.20%	0.23%	9.49%	0.50%	0.75%
3	73.60%	0.90%	0.35%	13.60%	0.04%	0.04%	10.22%	0.90%	0.35%
4	69.50%	1.44%	2.40%	12.90%	0.06%	0.10%	9.60%	1.50%	2.50%
5	64.81%	1.27%	4.49%	17.70%	0.09%	0.49%	9.34%	0.22%	1.60%
6	63.80%	1.53%	5.24%	17.42%	0.10%	0.57%	9.20%	0.26%	1.87%
7	57.86%	3.19%	9.57%	15.80%	0.22%	1.05%	8.34%	0.55%	3.42%
8	64.91%	2.39%	3.44%	17.73%	0.16%	0.38%	9.36%	0.41%	1.23%
9	66.18%	2.28%	2.30%	18.07%	0.16%	0.25%	9.54%	0.39%	0.82%
10	74.04%	0.79%	0.18%	13.68%	0.04%	0.02%	10.28%	0.79%	0.18%
11	71.85%	1.94%	0.44%	13.28%	0.09%	0.05%	9.98%	1.94%	0.44%

A = automobiles; MT = medium (2-axle) trucks; HT = heavy (3+ axle) trucks

The above values are adjusted as needed so that the overall medium truck and heavy truck percentages for a traffic distribution number agree with the values entered into the "% Trucks" columns on the summary table.

** For street segments with barriers, noise levels and contour distances are only reported for locations 10m (approx. 30') or more beyond the noise barrier.

Table II-2. Distance to Existing (2014) + Project CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
16TH STREET															
West of Dover Dr	35	1.84%	0.74%	1	3,870	H			55'	59.8	53	--	--	--	--
17TH STREET															
West of Irvine Ave	35	1.84%	0.74%	1	23,500	H				N/A	292	98	--	--	--
19TH STREET															
West of Irvine Ave	25	1.84%	0.74%	1	5,710	H			33'	60.1	34	--	--	--	--
AVOCADO AVENUE															
North of E. Coast Hwy	45	1.84%	0.74%	1	7,710	H				N/A	203	65	--	--	--
South of E. Coast Hwy	30	1.84%	0.74%	1	5,780	H			53'	60.0	53	--	--	--	--
BAY SHORE DRIVE															
South of W. Coast Hwy	25	1.84%	0.74%	1	2,180	H			33'	55.9	--	--	--	--	--
BAYSIDE DRIVE															
North of E. Coast Hwy	25	1.84%	0.74%	1	1,700	H			33'	54.9	--	--	--	--	--
South of E. Coast Hwy	40	1.84%	0.74%	1	10,210	H			37'	67.2	193	62	--	--	--
BIG CANYON DRIVE															
North entry, N/O San Joaquin Hills	25	1.84%	0.74%	1	1,440	H			53'	52.3	--	--	--	--	--
South entry, N/O San Joaquin Hills	25	1.84%	0.74%	1	3,140	H			45'	56.4	--	--	--	--	--
CASTAWAYS LANE															
East of Dover Dr.	25	1.84%	0.74%	1	2,630	H			45'	55.7	--	--	--	--	--
COAST HIGHWAY (WEST), SR-1															
West of Newport Blvd	45	0.55%	0.25%	1	36,630	H			118'	68.8	658	266	90	--	--
East of Newport Blvd	40	0.88%	0.26%	1	43,290	H			263'	64.3	583	229	75	--	--
West of Riverside Ave	40	0.88%	0.26%	1	47,380	H				N/A	624	249	83	--	--
East of Riverside Ave	40	0.88%	0.26%	1	42,040	H				N/A	572	224	73	--	--
West of Tustin Ave	40	0.88%	0.26%	1	42,000	H				N/A	572	224	73	--	--
East of Tustin Ave	40	0.88%	0.26%	1	41,810	H			115'	68.0	570	223	73	--	--
West of Dover Dr	40	0.88%	0.26%	1	39,190	H			69'	69.9	544	211	67	--	--
East of Dover Dr.	50	0.88%	0.26%	1	57,820	H			163'	70.8	>985	500	195	63	--

Table II-2, cont. Distance to Existing (2014) + Project CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
COAST HIGHWAY (EAST), SR-1															
West of Bayside Dr	50	0.88%	0.26%	1	58,560	H			336'	67.3	>985	506	197	63	--
East of Bayside Dr	50	0.88%	0.26%	1	50,050	H			83'	73.2	>985	449	169	56	--
West of Jamboree Rd	50	0.88%	0.26%	1	51,160	H			140'	70.9	>985	455	173	57	--
East of Jamboree Rd	50	0.88%	0.26%	1	39,980	H			90'	71.9	882	378	136	46	--
West of Newport Center Dr	50	0.88%	0.26%	1	36,990	H			81'	72.0	836	356	126	42	--
East of Newport Center Dr	50	0.88%	0.26%	1	30,390	H			143'	68.6	731	300	105	33	--
West of Avocado Ave	50	0.88%	0.26%	1	27,200	H			143'	68.1	678	272	94	--	--
East of Avocado Ave	40	0.88%	0.26%	1	28,770	H				N/A	428	158	52	--	--
West of MacArthur Blvd	40	0.88%	0.26%	1	31,030	H				N/A	455	169	55	--	--
East of MacArthur Blvd	40	0.88%	0.26%	1	42,720	H			127'	67.7	578	227	74	--	--
DOVER DRIVE															
East of Irvine Avenue	30	1.84%	0.74%	1	7,630	H			33'	63.0	67	--	--	--	--
North of Westcliff Dr	35	1.84%	0.74%	1	11,430	H			33'	66.5	153	49	--	--	--
South of Westcliff Dr	45	1.84%	0.74%	1	19,840	H			93'	67.6	449	166	55	--	--
North of 16th St	45	1.84%	0.74%	1	20,380	H			87'	68.0	459	171	56	--	--
South of 16th St	45	1.84%	0.74%	1	22,420	H			54'	70.6	493	188	61	--	--
North of West Coast Hwy	45	1.84%	0.74%	1	23,970	H			60'	70.4	519	200	64	--	--
IRVINE AVENUE															
North of 19th St/Dover Dr	35	1.84%	0.74%	1	24,020	H			49'	68.3	297	101	--	--	--
South of 19th St/Dover Dr	35	1.84%	0.74%	1	21,180	H			57'	67.0	267	89	--	--	--
North of 17th St/Westcliff Dr	35	1.84%	0.74%	1	21,090	H			56'	67.1	266	89	--	--	--
South of 17th St/Westcliff Dr	35	1.84%	0.74%	1	17,280	H			43'	67.4	225	72	--	--	--
JAMBOREE ROAD															
North of San Joaquin Hills Rd	55	1.84%	0.74%	1	36,870	H			109'	72.2	>985	466	178	58	--
South of San Joaquin Hills Rd	55	1.84%	0.74%	1	32,630	H			124'	71.1	984	424	158	53	--
North of Santa Barbara Dr	55	1.84%	0.74%	1	32,730	H			230'	68.2	>985	425	158	53	--
South of Santa Barbara Dr	55	1.84%	0.74%	1	29,420	H			139'	70.1	912	393	143	48	--
North of East Coast Hwy	55	1.84%	0.74%	1	27,290	H			100'	71.3	866	371	132	44	--
South of East Coast Hwy	35	1.84%	0.74%	1	10,310	H			55'	64.0	138	44	--	--	--

Table II-2, cont. Distance to Existing (2014) + Project CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
MACARTHUR BOULEVARD															
North of San Joaquin Hills Rd	55	1.84%	0.74%	1	50,990	H			122'	73.1	>985	599	237	80	--
South of San Joaquin Hills Rd	55	1.84%	0.74%	1	31,980	H			93'	72.3	969	418	155	52	--
North of San Miguel Dr	55	1.84%	0.74%	1	30,930	H			102'	71.7	946	408	150	50	--
South of San Miguel Dr	55	1.84%	0.74%	1	25,790	H			112'	70.5	833	355	126	42	--
North of E. Coast Hwy	55	1.84%	0.74%	1	24,430	H			95'	71.0	803	340	120	39	--
NEWPORT BOULEVARD (SR-55)															
North of W. Coast Hwy	50	2.55%	1.05%	1	15,720	H			144'	66.2	491	189	61	--	--
NEWPORT CENTER DRIVE															
North of E. Coast Hwy	45	1.84%	0.74%	1	12,500	H			95'	65.5	309	107	33	--	--
NEWPORTER WAY															
West of Jamboree Rd	25	1.84%	0.74%	1	1,750	H			54'	53.1	--	--	--	--	--
RIVERSIDE AVENUE															
North of W. Coast Hwy	30	1.84%	0.74%	1	8,350	H			40'	62.8	75	--	--	--	--
SAN JOAQUIN HILLS ROAD															
West of Jamboree Rd	35	1.84%	0.74%	1	4,070	H			67'	59.0	55	--	--	--	--
East of Jamboree Rd	50	1.84%	0.74%	1	9,510	H			140'	63.9	318	111	36	--	--
West of Santa Cruz Dr	50	1.84%	0.74%	1	17,140	H			74'	69.3	507	196	63	--	--
East of Santa Cruz Dr	50	1.84%	0.74%	1	11,430	H			73'	67.6	371	132	44	--	--
West of Santa Rosa Dr	50	1.84%	0.74%	1	13,140	H			137'	65.4	415	152	51	--	--
East of Santa Rosa Dr	50	1.84%	0.74%	1	18,030	H			119'	67.5	529	205	65	--	--
West of MacArthur Blvd	50	1.84%	0.74%	1	17,820	H			73'	69.5	524	203	65	--	--
East of MacArthur Blvd	50	1.84%	0.74%	1	17,310	H			113'	67.5	511	198	63	--	--
SAN MIGUEL DRIVE															
West of MacArthur Blvd	35	1.84%	0.74%	1	18,510	H				N/A	238	78	--	--	--
East of MacArthur Blvd	40	1.84%	0.74%	1	9,910	H			66'	64.5	188	60	--	--	--
SANTA BARBARA DRIVE															
East of Jamboree Rd	45	1.84%	0.74%	1	10,140	H			80'	65.4	259	87	--	--	--
SANTA CRUZ DRIVE															
South of San Joaquin Hills Rd	35	1.84%	0.74%	1	8,830	H				N/A	119	37	--	--	--

Table II-2, cont. Distance to Existing (2014) + Project CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
SANTA ROSA DRIVE															
South of San Joaquin Hills Rd.	35	1.84%	0.74%	1	12,070	H				N/A	161	52	--	--	--
TUSTIN AVENUE															
North of W. Coast Hwy	30	1.84%	0.74%	1	1,690	H				N/A	--	--	--	--	--
WESTCLIFF DRIVE															
East of Irvine Ave	35	1.84%	0.74%	1	14,250	H			60'	65.0	189	60	--	--	--
West of Dover Dr	35	1.84%	0.74%	1	12,890	H			56'	64.9	172	55	--	--	--

* The following summarizes the traffic distributions used in the analysis:

Traffic Distribution No.	Day			Evening			Night		
	A	MT	HT	A	MT	HT	A	MT	HT
1	75.51%	1.56%	0.64%	12.57%	0.09%	0.02%	9.34%	0.19%	0.08%
2	65.83%	2.92%	2.10%	17.98%	0.20%	0.23%	9.49%	0.50%	0.75%
3	73.60%	0.90%	0.35%	13.60%	0.04%	0.04%	10.22%	0.90%	0.35%
4	69.50%	1.44%	2.40%	12.90%	0.06%	0.10%	9.60%	1.50%	2.50%
5	64.81%	1.27%	4.49%	17.70%	0.09%	0.49%	9.34%	0.22%	1.60%
6	63.80%	1.53%	5.24%	17.42%	0.10%	0.57%	9.20%	0.26%	1.87%
7	57.86%	3.19%	9.57%	15.80%	0.22%	1.05%	8.34%	0.55%	3.42%
8	64.91%	2.39%	3.44%	17.73%	0.16%	0.38%	9.36%	0.41%	1.23%
9	66.18%	2.28%	2.30%	18.07%	0.16%	0.25%	9.54%	0.39%	0.82%
10	74.04%	0.79%	0.18%	13.68%	0.04%	0.02%	10.28%	0.79%	0.18%
11	71.85%	1.94%	0.44%	13.28%	0.09%	0.05%	9.98%	1.94%	0.44%

A = automobiles; MT = medium (2-axle) trucks; HT = heavy (3+ axle) trucks

The above values are adjusted as needed so that the overall medium truck and heavy truck percentages for a traffic distribution number agree with the values entered into the "% Trucks" columns on the summary table.

** For street segments with barriers, noise levels and contour distances are only reported for locations 10m (approx. 30') or more beyond the noise barrier.

Table II-3. Distance to Existing (2014) + Growth (2017) + Approved Projects CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
16TH STREET															
West of Dover Dr	35	1.84%	0.74%	1	3,920	H			55'	59.8	53	--	--	--	--
17TH STREET															
West of Irvine Ave	35	1.84%	0.74%	1	24,160	H				N/A	299	101	--	--	--
19TH STREET															
West of Irvine Ave	25	1.84%	0.74%	1	5,780	H			33'	60.2	35	--	--	--	--
AVOCADO AVENUE															
North of E. Coast Hwy	45	1.84%	0.74%	1	9,210	H				N/A	237	79	--	--	--
South of E. Coast Hwy	30	1.84%	0.74%	1	5,850	H			53'	60.1	54	--	--	--	--
BAY SHORE DRIVE															
South of W. Coast Hwy	25	1.84%	0.74%	1	2,200	H			33'	56.0	--	--	--	--	--
BAYSIDE DRIVE															
North of E. Coast Hwy	25	1.84%	0.74%	1	2,980	H			33'	57.3	--	--	--	--	--
South of E. Coast Hwy	40	1.84%	0.74%	1	10,430	H			37'	67.3	197	63	--	--	--
BIG CANYON DRIVE															
North entry, N/O San Joaquin Hills	25	1.84%	0.74%	1	1,450	H			53'	52.4	--	--	--	--	--
South entry, N/O San Joaquin Hills	25	1.84%	0.74%	1	3,140	H			45'	56.4	--	--	--	--	--
CASTAWAYS LANE															
East of Dover Dr.	25	1.84%	0.74%	1	2,750	H			45'	55.9	--	--	--	--	--
COAST HIGHWAY (WEST), SR-1															
West of Newport Blvd	45	0.55%	0.25%	1	39,390	H			118'	69.1	693	284	97	--	--
East of Newport Blvd	40	0.88%	0.26%	1	46,510	H			263'	64.6	615	245	81	--	--
West of Riverside Ave	40	0.88%	0.26%	1	51,650	H				N/A	665	268	90	--	--
East of Riverside Ave	40	0.88%	0.26%	1	46,260	H				N/A	612	243	81	--	--
West of Tustin Ave	40	0.88%	0.26%	1	46,260	H				N/A	612	243	81	--	--
East of Tustin Ave	40	0.88%	0.26%	1	46,070	H			115'	68.5	610	242	81	--	--
West of Dover Dr	40	0.88%	0.26%	1	43,460	H			69'	70.3	584	230	76	--	--
East of Dover Dr.	50	0.88%	0.26%	1	62,370	H			163'	71.1	>985	533	208	67	--

Table II-3, cont. Distance to Existing (2014) + Growth (2017) + Approved Projects CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
COAST HIGHWAY (EAST), SR-1															
West of Bayside Dr	50	0.88%	0.26%	1	62,850	H			336'	67.6	>985	536	210	67	--
East of Bayside Dr	50	0.88%	0.26%	1	54,320	H			83'	73.6	>985	476	184	60	--
West of Jamboree Rd	50	0.88%	0.26%	1	56,230	H			140'	71.4	>985	488	190	62	--
East of Jamboree Rd	50	0.88%	0.26%	1	43,230	H			90'	72.2	932	402	147	49	--
West of Newport Center Dr	50	0.88%	0.26%	1	39,690	H			81'	72.3	877	376	135	45	--
East of Newport Center Dr	50	0.88%	0.26%	1	32,550	H			143'	68.9	764	319	112	36	--
West of Avocado Ave	50	0.88%	0.26%	1	29,200	H			143'	68.4	711	289	100	--	--
East of Avocado Ave	40	0.88%	0.26%	1	30,240	H				N/A	446	165	54	--	--
West of MacArthur Blvd	40	0.88%	0.26%	1	32,600	H				N/A	473	178	58	--	--
East of MacArthur Blvd	40	0.88%	0.26%	1	44,700	H			127'	67.9	596	236	78	--	--
DOVER DRIVE															
East of Irvine Avenue	30	1.84%	0.74%	1	7,750	H			33'	63.1	69	--	--	--	--
North of Westcliff Dr	35	1.84%	0.74%	1	11,530	H			33'	66.5	154	50	--	--	--
South of Westcliff Dr	45	1.84%	0.74%	1	20,050	H			93'	67.7	453	168	56	--	--
North of 16th St	45	1.84%	0.74%	1	20,700	H			87'	68.1	464	174	57	--	--
South of 16th St	45	1.84%	0.74%	1	22,710	H			54'	70.7	498	190	61	--	--
North of West Coast Hwy	45	1.84%	0.74%	1	25,190	H			60'	70.6	540	209	67	--	--
IRVINE AVENUE															
North of 19th St/Dover Dr	35	1.84%	0.74%	1	24,720	H			49'	68.4	306	104	--	--	--
South of 19th St/Dover Dr	35	1.84%	0.74%	1	21,810	H			57'	67.1	274	92	--	--	--
North of 17th St/Westcliff Dr	35	1.84%	0.74%	1	21,760	H			56'	67.2	273	92	--	--	--
South of 17th St/Westcliff Dr	35	1.84%	0.74%	1	17,700	H			43'	67.5	229	74	--	--	--
JAMBOREE ROAD															
North of San Joaquin Hills Rd	55	1.84%	0.74%	1	41,730	H			109'	72.7	>985	512	200	64	--
South of San Joaquin Hills Rd	55	1.84%	0.74%	1	35,910	H			124'	71.5	>985	457	173	57	--
North of Santa Barbara Dr	55	1.84%	0.74%	1	35,670	H			230'	68.6	>985	455	172	57	--
South of Santa Barbara Dr	55	1.84%	0.74%	1	32,210	H			139'	70.5	974	420	156	52	--
North of East Coast Hwy	55	1.84%	0.74%	1	30,020	H			100'	71.7	926	399	146	49	--
South of East Coast Hwy	35	1.84%	0.74%	1	10,640	H			55'	64.2	143	46	--	--	--

Table II-3, cont. Distance to Existing (2014) + Growth (2017) + Approved Projects CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
MACARTHUR BOULEVARD															
North of San Joaquin Hills Rd	55	1.84%	0.74%	1	54,450	H			122'	73.4	>985	624	251	85	--
South of San Joaquin Hills Rd	55	1.84%	0.74%	1	33,910	H			93'	72.5	>985	437	163	54	--
North of San Miguel Dr	55	1.84%	0.74%	1	32,640	H			102'	72.0	984	424	158	53	--
South of San Miguel Dr	55	1.84%	0.74%	1	26,680	H			112'	70.7	855	365	129	43	--
North of E. Coast Hwy	55	1.84%	0.74%	1	25,240	H			95'	71.2	819	349	123	41	--
NEWPORT BOULEVARD (SR-55)															
North of W. Coast Hwy	50	2.55%	1.05%	1	16,900	H			144'	66.5	523	202	64	--	--
NEWPORT CENTER DRIVE															
North of E. Coast Hwy	45	1.84%	0.74%	1	13,460	H			95'	65.8	328	115	37	--	--
NEWPORTER WAY															
West of Jamboree Rd	25	1.84%	0.74%	1	1,890	H			54'	53.4	--	--	--	--	--
RIVERSIDE AVENUE															
North of W. Coast Hwy	30	1.84%	0.74%	1	8,480	H			40'	62.9	77	--	--	--	--
SAN JOAQUIN HILLS ROAD															
West of Jamboree Rd	35	1.84%	0.74%	1	4,200	H			67'	59.1	56	--	--	--	--
East of Jamboree Rd	50	1.84%	0.74%	1	11,540	H			140'	64.8	373	133	45	--	--
West of Santa Cruz Dr	50	1.84%	0.74%	1	18,510	H			74'	69.7	538	210	67	--	--
East of Santa Cruz Dr	50	1.84%	0.74%	1	12,550	H			73'	68.0	398	145	49	--	--
West of Santa Rosa Dr	50	1.84%	0.74%	1	14,440	H			137'	65.9	444	165	55	--	--
East of Santa Rosa Dr	50	1.84%	0.74%	1	18,820	H			119'	67.7	545	213	69	--	--
West of MacArthur Blvd	50	1.84%	0.74%	1	19,380	H			73'	69.9	556	218	71	--	--
East of MacArthur Blvd	50	1.84%	0.74%	1	17,700	H			113'	67.6	521	202	65	--	--
SAN MIGUEL DRIVE															
West of MacArthur Blvd	35	1.84%	0.74%	1	20,290	H				N/A	257	86	--	--	--
East of MacArthur Blvd	40	1.84%	0.74%	1	10,470	H			66'	64.7	198	63	--	--	--
SANTA BARBARA DRIVE															
East of Jamboree Rd	45	1.84%	0.74%	1	10,790	H			80'	65.6	273	92	--	--	--
SANTA CRUZ DRIVE															
South of San Joaquin Hills Rd	35	1.84%	0.74%	1	9,250	H				N/A	124	39	--	--	--

Table II-3, cont. Distance to Existing (2014) + Growth (2017) + Approved Projects CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
SANTA ROSA DRIVE															
South of San Joaquin Hills Rd.	35	1.84%	0.74%	1	13,720	H				N/A	182	58	--	--	--
TUSTIN AVENUE															
North of W. Coast Hwy	30	1.84%	0.74%	1	1,730	H				N/A	--	--	--	--	--
WESTCLIFF DRIVE															
East of Irvine Ave	35	1.84%	0.74%	1	14,640	H			60'	65.1	193	61	--	--	--
West of Dover Dr	35	1.84%	0.74%	1	13,000	H			56'	65.0	173	55	--	--	--

* The following summarizes the traffic distributions used in the analysis:

Traffic Distribution No.	Day			Evening			Night		
	A	MT	HT	A	MT	HT	A	MT	HT
1	75.51%	1.56%	0.64%	12.57%	0.09%	0.02%	9.34%	0.19%	0.08%
2	65.83%	2.92%	2.10%	17.98%	0.20%	0.23%	9.49%	0.50%	0.75%
3	73.60%	0.90%	0.35%	13.60%	0.04%	0.04%	10.22%	0.90%	0.35%
4	69.50%	1.44%	2.40%	12.90%	0.06%	0.10%	9.60%	1.50%	2.50%
5	64.81%	1.27%	4.49%	17.70%	0.09%	0.49%	9.34%	0.22%	1.60%
6	63.80%	1.53%	5.24%	17.42%	0.10%	0.57%	9.20%	0.26%	1.87%
7	57.86%	3.19%	9.57%	15.80%	0.22%	1.05%	8.34%	0.55%	3.42%
8	64.91%	2.39%	3.44%	17.73%	0.16%	0.38%	9.36%	0.41%	1.23%
9	66.18%	2.28%	2.30%	18.07%	0.16%	0.25%	9.54%	0.39%	0.82%
10	74.04%	0.79%	0.18%	13.68%	0.04%	0.02%	10.28%	0.79%	0.18%
11	71.85%	1.94%	0.44%	13.28%	0.09%	0.05%	9.98%	1.94%	0.44%

A = automobiles; MT = medium (2-axle) trucks; HT = heavy (3+ axle) trucks

The above values are adjusted as needed so that the overall medium truck and heavy truck percentages for a traffic distribution number agree with the values entered into the "% Trucks" columns on the summary table.

** For street segments with barriers, noise levels and contour distances are only reported for locations 10m (approx. 30') or more beyond the noise barrier.

Table II-4. Distance to Existing (2014) + Growth (2017) + Approved Projects + Cumulative Projects CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
16TH STREET															
West of Dover Dr	35	1.84%	0.74%	1	3,950	H			55'	59.9	54	--	--	--	--
17TH STREET															
West of Irvine Ave	35	1.84%	0.74%	1	26,430	H				N/A	325	112	34	--	--
19TH STREET															
West of Irvine Ave	25	1.84%	0.74%	1	5,780	H			33'	60.2	35	--	--	--	--
AVOCADO AVENUE															
North of E. Coast Hwy	45	1.84%	0.74%	1	9,210	H				N/A	237	79	--	--	--
South of E. Coast Hwy	30	1.84%	0.74%	1	5,850	H			53'	60.1	54	--	--	--	--
BAY SHORE DRIVE															
South of W. Coast Hwy	25	1.84%	0.74%	1	2,200	H			33'	56.0	--	--	--	--	--
BAYSIDE DRIVE															
North of E. Coast Hwy	25	1.84%	0.74%	1	4,500	H			33'	59.1	--	--	--	--	--
South of E. Coast Hwy	40	1.84%	0.74%	1	10,410	H			37'	67.3	197	63	--	--	--
BIG CANYON DRIVE															
North entry, N/O San Joaquin Hills	25	1.84%	0.74%	1	1,450	H			53'	52.4	--	--	--	--	--
South entry, N/O San Joaquin Hills	25	1.84%	0.74%	1	3,140	H			45'	56.4	--	--	--	--	--
CASTAWAYS LANE															
East of Dover Dr.	25	1.84%	0.74%	1	2,750	H			45'	55.9	--	--	--	--	--
COAST HIGHWAY (WEST), SR-1															
West of Newport Blvd	45	0.55%	0.25%	1	42,410	H			118'	69.4	730	302	104	--	--
East of Newport Blvd	40	0.88%	0.26%	1	50,120	H			263'	65.0	650	261	88	--	--
West of Riverside Ave	40	0.88%	0.26%	1	55,600	H				N/A	700	285	97	--	--
East of Riverside Ave	40	0.88%	0.26%	1	49,500	H				N/A	644	258	87	--	--
West of Tustin Ave	40	0.88%	0.26%	1	49,500	H				N/A	644	258	87	--	--
East of Tustin Ave	40	0.88%	0.26%	1	49,310	H			115'	68.8	643	257	86	--	--
West of Dover Dr	40	0.88%	0.26%	1	46,700	H			69'	70.7	617	245	82	--	--
East of Dover Dr.	50	0.88%	0.26%	1	66,630	H			163'	71.4	>985	557	220	72	--

Table II-4, cont. Distance to Existing (2014) + Growth (2017) + Approved Projects + Cumulative Projects CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
COAST HIGHWAY (EAST), SR-1															
West of Bayside Dr	50	0.88%	0.26%	1	67,390	H			336'	67.9	>985	562	222	73	--
East of Bayside Dr	50	0.88%	0.26%	1	58,520	H			83'	73.9	>985	506	197	63	--
West of Jamboree Rd	50	0.88%	0.26%	1	60,430	H			140'	71.7	>985	520	203	65	--
East of Jamboree Rd	50	0.88%	0.26%	1	49,230	H			90'	72.8	>985	444	166	55	--
West of Newport Center Dr	50	0.88%	0.26%	1	45,690	H			81'	72.9	963	421	155	52	--
East of Newport Center Dr	50	0.88%	0.26%	1	38,540	H			143'	69.6	857	367	131	44	--
West of Avocado Ave	50	0.88%	0.26%	1	35,190	H			143'	69.2	808	341	121	40	--
East of Avocado Ave	40	0.88%	0.26%	1	36,230	H				N/A	511	197	63	--	--
West of MacArthur Blvd	40	0.88%	0.26%	1	38,580	H				N/A	536	208	66	--	--
East of MacArthur Blvd	40	0.88%	0.26%	1	52,680	H			127'	68.6	674	272	92	--	--
DOVER DRIVE															
East of Irvine Avenue	30	1.84%	0.74%	1	7,780	H			33'	63.1	69	--	--	--	--
North of Westcliff Dr	35	1.84%	0.74%	1	11,620	H			33'	66.6	156	50	--	--	--
South of Westcliff Dr	45	1.84%	0.74%	1	21,000	H			93'	67.9	469	176	58	--	--
North of 16th St	45	1.84%	0.74%	1	21,650	H			87'	68.3	481	182	59	--	--
South of 16th St	45	1.84%	0.74%	1	23,690	H			54'	70.9	514	198	63	--	--
North of West Coast Hwy	45	1.84%	0.74%	1	26,210	H			60'	70.8	557	216	70	--	--
IRVINE AVENUE															
North of 19th St/Dover Dr	35	1.84%	0.74%	1	24,780	H			49'	68.4	306	104	--	--	--
South of 19th St/Dover Dr	35	1.84%	0.74%	1	21,840	H			57'	67.1	274	92	--	--	--
North of 17th St/Westcliff Dr	35	1.84%	0.74%	1	21,790	H			56'	67.2	274	92	--	--	--
South of 17th St/Westcliff Dr	35	1.84%	0.74%	1	17,700	H			43'	67.5	229	74	--	--	--
JAMBOREE ROAD															
North of San Joaquin Hills Rd	55	1.84%	0.74%	1	44,150	H			109'	73.0	>985	534	210	68	--
South of San Joaquin Hills Rd	55	1.84%	0.74%	1	38,380	H			124'	71.8	>985	481	185	60	--
North of Santa Barbara Dr	55	1.84%	0.74%	1	38,130	H			230'	68.9	>985	478	184	60	--
South of Santa Barbara Dr	55	1.84%	0.74%	1	34,670	H			139'	70.8	>985	445	167	56	--
North of East Coast Hwy	55	1.84%	0.74%	1	32,480	H			100'	72.0	980	423	157	53	--
South of East Coast Hwy	35	1.84%	0.74%	1	10,800	H			55'	64.2	145	47	--	--	--

Table II-4, cont. Distance to Existing (2014) + Growth (2017) + Approved Projects + Cumulative Projects CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
MACARTHUR BOULEVARD															
North of San Joaquin Hills Rd	55	1.84%	0.74%	1	56,060	H			122'	73.5	>985	638	257	88	--
South of San Joaquin Hills Rd	55	1.84%	0.74%	1	35,520	H			93'	72.7	>985	453	171	57	--
North of San Miguel Dr	55	1.84%	0.74%	1	34,250	H			102'	72.2	>985	441	165	55	--
South of San Miguel Dr	55	1.84%	0.74%	1	28,880	H			112'	71.0	899	388	140	47	--
North of E. Coast Hwy	55	1.84%	0.74%	1	27,440	H			95'	71.5	869	373	133	45	--
NEWPORT BOULEVARD (SR-55)															
North of W. Coast Hwy	50	2.55%	1.05%	1	17,490	H			144'	66.7	536	208	66	--	--
NEWPORT CENTER DRIVE															
North of E. Coast Hwy	45	1.84%	0.74%	1	13,470	H			95'	65.8	328	115	37	--	--
NEWPORTER WAY															
West of Jamboree Rd	25	1.84%	0.74%	1	1,890	H			54'	53.4	--	--	--	--	--
RIVERSIDE AVENUE															
North of W. Coast Hwy	30	1.84%	0.74%	1	9,190	H			40'	63.2	84	--	--	--	--
SAN JOAQUIN HILLS ROAD															
West of Jamboree Rd	35	1.84%	0.74%	1	4,200	H			67'	59.1	56	--	--	--	--
East of Jamboree Rd	50	1.84%	0.74%	1	11,590	H			140'	64.8	375	134	45	--	--
West of Santa Cruz Dr	50	1.84%	0.74%	1	18,560	H			74'	69.7	539	210	68	--	--
East of Santa Cruz Dr	50	1.84%	0.74%	1	12,600	H			73'	68.0	400	146	49	--	--
West of Santa Rosa Dr	50	1.84%	0.74%	1	14,490	H			137'	65.9	445	166	55	--	--
East of Santa Rosa Dr	50	1.84%	0.74%	1	19,020	H			119'	67.7	549	215	70	--	--
West of MacArthur Blvd	50	1.84%	0.74%	1	19,580	H			73'	70.0	560	220	72	--	--
East of MacArthur Blvd	50	1.84%	0.74%	1	17,900	H			113'	67.7	526	204	65	--	--
SAN MIGUEL DRIVE															
West of MacArthur Blvd	35	1.84%	0.74%	1	20,880	H				N/A	264	88	--	--	--
East of MacArthur Blvd	40	1.84%	0.74%	1	10,470	H			66'	64.7	198	63	--	--	--
SANTA BARBARA DRIVE															
East of Jamboree Rd	45	1.84%	0.74%	1	10,790	H			80'	65.6	273	92	--	--	--
SANTA CRUZ DRIVE															
South of San Joaquin Hills Rd	35	1.84%	0.74%	1	9,250	H				N/A	124	39	--	--	--

Table II-4, cont. Distance to Existing (2014) + Growth (2017) + Approved Projects + Cumulative Projects CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
SANTA ROSA DRIVE															
South of San Joaquin Hills Rd.	35	1.84%	0.74%	1	13,870	H				N/A	184	59	--	--	--
TUSTIN AVENUE															
North of W. Coast Hwy	30	1.84%	0.74%	1	1,730	H				N/A	--	--	--	--	--
WESTCLIFF DRIVE															
East of Irvine Ave	35	1.84%	0.74%	1	16,940	H			60'	65.7	221	70	--	--	--
West of Dover Dr	35	1.84%	0.74%	1	13,860	H			56'	65.2	184	59	--	--	--

* The following summarizes the traffic distributions used in the analysis:

Traffic Distribution No.	Day			Evening			Night		
	A	MT	HT	A	MT	HT	A	MT	HT
1	75.51%	1.56%	0.64%	12.57%	0.09%	0.02%	9.34%	0.19%	0.08%
2	65.83%	2.92%	2.10%	17.98%	0.20%	0.23%	9.49%	0.50%	0.75%
3	73.60%	0.90%	0.35%	13.60%	0.04%	0.04%	10.22%	0.90%	0.35%
4	69.50%	1.44%	2.40%	12.90%	0.06%	0.10%	9.60%	1.50%	2.50%
5	64.81%	1.27%	4.49%	17.70%	0.09%	0.49%	9.34%	0.22%	1.60%
6	63.80%	1.53%	5.24%	17.42%	0.10%	0.57%	9.20%	0.26%	1.87%
7	57.86%	3.19%	9.57%	15.80%	0.22%	1.05%	8.34%	0.55%	3.42%
8	64.91%	2.39%	3.44%	17.73%	0.16%	0.38%	9.36%	0.41%	1.23%
9	66.18%	2.28%	2.30%	18.07%	0.16%	0.25%	9.54%	0.39%	0.82%
10	74.04%	0.79%	0.18%	13.68%	0.04%	0.02%	10.28%	0.79%	0.18%
11	71.85%	1.94%	0.44%	13.28%	0.09%	0.05%	9.98%	1.94%	0.44%

A = automobiles; MT = medium (2-axle) trucks; HT = heavy (3+ axle) trucks

The above values are adjusted as needed so that the overall medium truck and heavy truck percentages for a traffic distribution number agree with the values entered into the "% Trucks" columns on the summary table.

** For street segments with barriers, noise levels and contour distances are only reported for locations 10m (approx. 30') or more beyond the noise barrier.

Table II-5. Distance to Existing (2014) + Growth (2017) + Approved Projects + Cumulative Projects + Project CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
16TH STREET															
West of Dover Dr	35	1.84%	0.74%	1	4,000	H			55'	59.9	54	--	--	--	--
17TH STREET															
West of Irvine Ave	35	1.84%	0.74%	1	26,500	H				N/A	325	112	35	--	--
19TH STREET															
West of Irvine Ave	25	1.84%	0.74%	1	5,780	H			33'	60.2	35	--	--	--	--
AVOCADO AVENUE															
North of E. Coast Hwy	45	1.84%	0.74%	1	9,210	H				N/A	237	79	--	--	--
South of E. Coast Hwy	30	1.84%	0.74%	1	5,850	H			53'	60.1	54	--	--	--	--
BAY SHORE DRIVE															
South of W. Coast Hwy	25	1.84%	0.74%	1	2,200	H			33'	56.0	--	--	--	--	--
BAYSIDE DRIVE															
North of E. Coast Hwy	25	1.84%	0.74%	1	4,610	H			33'	59.2	--	--	--	--	--
South of E. Coast Hwy	40	1.84%	0.74%	1	10,590	H			37'	67.4	200	63	--	--	--
BIG CANYON DRIVE															
North entry, N/O San Joaquin Hills	25	1.84%	0.74%	1	1,450	H			53'	52.4	--	--	--	--	--
South entry, N/O San Joaquin Hills	25	1.84%	0.74%	1	3,140	H			45'	56.4	--	--	--	--	--
CASTAWAYS LANE															
East of Dover Dr.	25	1.84%	0.74%	1	2,750	H			45'	55.9	--	--	--	--	--
COAST HIGHWAY (WEST), SR-1															
West of Newport Blvd	45	0.55%	0.25%	1	42,480	H			118'	69.5	731	302	104	--	--
East of Newport Blvd	40	0.88%	0.26%	1	50,260	H			263'	65.0	652	261	88	--	--
West of Riverside Ave	40	0.88%	0.26%	1	55,820	H				N/A	702	286	97	--	--
East of Riverside Ave	40	0.88%	0.26%	1	49,720	H				N/A	647	259	87	--	--
West of Tustin Ave	40	0.88%	0.26%	1	49,720	H				N/A	647	259	87	--	--
East of Tustin Ave	40	0.88%	0.26%	1	49,530	H			115'	68.8	645	258	87	--	--
West of Dover Dr	40	0.88%	0.26%	1	46,920	H			69'	70.7	619	246	82	--	--
East of Dover Dr.	50	0.88%	0.26%	1	67,110	H			163'	71.4	>985	560	221	73	--

Table II-5, cont. Distance to Existing (2014) + Growth (2017) + Approved Projects + Cumulative Projects + Project CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
COAST HIGHWAY (EAST), SR-1															
West of Bayside Dr	50	0.88%	0.26%	1	67,610	H			336'	67.9	>985	564	223	74	--
East of Bayside Dr	50	0.88%	0.26%	1	58,710	H			83'	73.9	>985	507	197	64	--
West of Jamboree Rd	50	0.88%	0.26%	1	60,620	H			140'	71.7	>985	522	203	65	--
East of Jamboree Rd	50	0.88%	0.26%	1	49,310	H			90'	72.8	>985	444	166	55	--
West of Newport Center Dr	50	0.88%	0.26%	1	45,760	H			81'	72.9	964	422	155	52	--
East of Newport Center Dr	50	0.88%	0.26%	1	38,610	H			143'	69.6	858	368	131	44	--
West of Avocado Ave	50	0.88%	0.26%	1	35,260	H			143'	69.2	809	342	121	40	--
East of Avocado Ave	40	0.88%	0.26%	1	36,300	H				N/A	512	197	63	--	--
West of MacArthur Blvd	40	0.88%	0.26%	1	38,660	H				N/A	537	209	66	--	--
East of MacArthur Blvd	40	0.88%	0.26%	1	52,720	H			127'	68.6	675	273	92	--	--
DOVER DRIVE															
East of Irvine Avenue	30	1.84%	0.74%	1	7,830	H			33'	63.2	70	--	--	--	--
North of Westcliff Dr	35	1.84%	0.74%	1	11,690	H			33'	66.6	156	50	--	--	--
South of Westcliff Dr	45	1.84%	0.74%	1	21,190	H			93'	67.9	473	178	58	--	--
North of 16th St	45	1.84%	0.74%	1	21,830	H			87'	68.3	484	183	60	--	--
South of 16th St	45	1.84%	0.74%	1	23,920	H			54'	70.9	518	199	64	--	--
North of West Coast Hwy	45	1.84%	0.74%	1	26,470	H			60'	70.8	561	218	71	--	--
IRVINE AVENUE															
North of 19th St/Dover Dr	35	1.84%	0.74%	1	24,880	H			49'	68.4	307	105	--	--	--
South of 19th St/Dover Dr	35	1.84%	0.74%	1	21,890	H			57'	67.1	275	92	--	--	--
North of 17th St/Westcliff Dr	35	1.84%	0.74%	1	21,840	H			56'	67.2	274	92	--	--	--
South of 17th St/Westcliff Dr	35	1.84%	0.74%	1	17,700	H			43'	67.5	229	74	--	--	--
JAMBOREE ROAD															
North of San Joaquin Hills Rd	55	1.84%	0.74%	1	44,220	H			109'	73.0	>985	535	210	68	--
South of San Joaquin Hills Rd	55	1.84%	0.74%	1	38,490	H			124'	71.8	>985	482	185	60	--
North of Santa Barbara Dr	55	1.84%	0.74%	1	38,230	H			230'	68.9	>985	479	184	60	--
South of Santa Barbara Dr	55	1.84%	0.74%	1	34,770	H			139'	70.8	>985	446	167	56	--
North of East Coast Hwy	55	1.84%	0.74%	1	32,590	H			100'	72.0	983	424	157	53	--
South of East Coast Hwy	35	1.84%	0.74%	1	10,800	H			55'	64.2	145	47	--	--	--

Table II-5, cont. Distance to Existing (2014) + Growth (2017) + Approved Projects + Cumulative Projects + Project CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
MACARTHUR BOULEVARD															
North of San Joaquin Hills Rd	55	1.84%	0.74%	1	56,100	H			122'	73.5	>985	639	257	88	--
South of San Joaquin Hills Rd	55	1.84%	0.74%	1	35,560	H			93'	72.7	>985	453	171	57	--
North of San Miguel Dr	55	1.84%	0.74%	1	34,290	H			102'	72.2	>985	441	165	55	--
South of San Miguel Dr	55	1.84%	0.74%	1	28,920	H			112'	71.0	900	388	140	47	--
North of E. Coast Hwy	55	1.84%	0.74%	1	27,480	H			95'	71.5	870	373	133	45	--
NEWPORT BOULEVARD (SR-55)															
North of W. Coast Hwy	50	2.55%	1.05%	1	17,560	H			144'	66.7	538	209	67	--	--
NEWPORT CENTER DRIVE															
North of E. Coast Hwy	45	1.84%	0.74%	1	13,470	H			95'	65.8	328	115	37	--	--
NEWPORTER WAY															
West of Jamboree Rd	25	1.84%	0.74%	1	1,890	H			54'	53.4	--	--	--	--	--
RIVERSIDE AVENUE															
North of W. Coast Hwy	30	1.84%	0.74%	1	9,190	H			40'	63.2	84	--	--	--	--
SAN JOAQUIN HILLS ROAD															
West of Jamboree Rd	35	1.84%	0.74%	1	4,200	H			67'	59.1	56	--	--	--	--
East of Jamboree Rd	50	1.84%	0.74%	1	11,630	H			140'	64.8	376	134	45	--	--
West of Santa Cruz Dr	50	1.84%	0.74%	1	18,600	H			74'	69.7	540	211	68	--	--
East of Santa Cruz Dr	50	1.84%	0.74%	1	12,640	H			73'	68.1	401	146	49	--	--
West of Santa Rosa Dr	50	1.84%	0.74%	1	14,530	H			137'	65.9	446	167	55	--	--
East of Santa Rosa Dr	50	1.84%	0.74%	1	19,060	H			119'	67.7	549	215	70	--	--
West of MacArthur Blvd	50	1.84%	0.74%	1	19,610	H			73'	70.0	561	220	72	--	--
East of MacArthur Blvd	50	1.84%	0.74%	1	17,930	H			113'	67.7	527	204	65	--	--
SAN MIGUEL DRIVE															
West of MacArthur Blvd	35	1.84%	0.74%	1	20,880	H				N/A	264	88	--	--	--
East of MacArthur Blvd	40	1.84%	0.74%	1	10,470	H			66'	64.7	198	63	--	--	--
SANTA BARBARA DRIVE															
East of Jamboree Rd	45	1.84%	0.74%	1	10,790	H			80'	65.6	273	92	--	--	--
SANTA CRUZ DRIVE															
South of San Joaquin Hills Rd	35	1.84%	0.74%	1	9,250	H				N/A	124	39	--	--	--

Table II-5, cont. Distance to Existing (2014) + Growth (2017) + Approved Projects + Cumulative Projects + Project CNEL Contour Lines, Balboa Marina West

Arterial / Reach	Speed Limit, mph	% Trucks		Traffic Dist.*	Avg. Daily Traffic	Hard (H) or Soft (S) Site?	Barrier Details** (leave blank if none)		Dist., Sens. Rec. to C/L	CNEL at Sens. Rec.	Distance to CNEL Contours From Roadway Centerline, feet				
		Med.	Hvy.				Height (2-10m)	Distance (10/30m)			60dB	65dB	70dB	75dB	80dB
SANTA ROSA DRIVE															
South of San Joaquin Hills Rd.	35	1.84%	0.74%	1	13,870	H				N/A	184	59	--	--	--
TUSTIN AVENUE															
North of W. Coast Hwy	30	1.84%	0.74%	1	1,730	H				N/A	--	--	--	--	--
WESTCLIFF DRIVE															
East of Irvine Ave	35	1.84%	0.74%	1	17,060	H			60'	65.8	222	71	--	--	--
West of Dover Dr	35	1.84%	0.74%	1	13,980	H			56'	65.3	185	59	--	--	--

* The following summarizes the traffic distributions used in the analysis:

Traffic Distribution No.	Day			Evening			Night		
	A	MT	HT	A	MT	HT	A	MT	HT
1	75.51%	1.56%	0.64%	12.57%	0.09%	0.02%	9.34%	0.19%	0.08%
2	65.83%	2.92%	2.10%	17.98%	0.20%	0.23%	9.49%	0.50%	0.75%
3	73.60%	0.90%	0.35%	13.60%	0.04%	0.04%	10.22%	0.90%	0.35%
4	69.50%	1.44%	2.40%	12.90%	0.06%	0.10%	9.60%	1.50%	2.50%
5	64.81%	1.27%	4.49%	17.70%	0.09%	0.49%	9.34%	0.22%	1.60%
6	63.80%	1.53%	5.24%	17.42%	0.10%	0.57%	9.20%	0.26%	1.87%
7	57.86%	3.19%	9.57%	15.80%	0.22%	1.05%	8.34%	0.55%	3.42%
8	64.91%	2.39%	3.44%	17.73%	0.16%	0.38%	9.36%	0.41%	1.23%
9	66.18%	2.28%	2.30%	18.07%	0.16%	0.25%	9.54%	0.39%	0.82%
10	74.04%	0.79%	0.18%	13.68%	0.04%	0.02%	10.28%	0.79%	0.18%
11	71.85%	1.94%	0.44%	13.28%	0.09%	0.05%	9.98%	1.94%	0.44%

A = automobiles; MT = medium (2-axle) trucks; HT = heavy (3+ axle) trucks

The above values are adjusted as needed so that the overall medium truck and heavy truck percentages for a traffic distribution number agree with the values entered into the "% Trucks" columns on the summary table.

** For street segments with barriers, noise levels and contour distances are only reported for locations 10m (approx. 30') or more beyond the noise barrier.

Table II-6. Analysis of Unmitigated Average Hourly Daytime Traffic Noise Levels at Façade, from E. Coast Hwy

ADT: 67,360 ***No. of Lanes:*** 7 ***Site Conditions:*** Hard ***Noise Emission Curves:*** Calveno ***Date:*** May 14, 2014

Autos:	Total %:	98.86%	Daytime %:	76.63%	Evening %:	12.76%	Nighttime %:	9.48%
Med. Trucks:	Total %:	0.88%	Daytime %:	0.75%	Evening %:	0.04%	Nighttime %:	0.09%
Heavy Trucks	Total %:	0.26%	Daytime %:	0.22%	Evening %:	0.01%	Nighttime %:	0.03%

Elevations:	Source:	0.0 ft.	Barrier:	0.0 ft.	Receiver:	0.0 ft.	Gradient of Near Lane:	0 %
Heights:	Source:	varies	Barrier:	0.0 ft.	Receiver:	5.0 ft.		

	Eastbound												Westbound											
Lane No.:	**1**			**2**			**3**			**4**			**5**			**6**			**7**			**8**		
Parameter	**Autos**	**Med. Trk.**	**Hvy. Trk.**	**Autos**	**Med. Trk.**	**Hvy. Trk.**	**Autos**	**Med. Trk.**	**Hvy. Trk.**	**Autos**	**Med. Trk.**	**Hvy. Trk.**	**Autos**	**Med. Trk.**	**Hvy. Trk.**	**Autos**	**Med. Trk.**	**Hvy. Trk.**	**Autos**	**Med. Trk.**	**Hvy. Trk.**	**Autos**	**Med. Trk.**	**Hvy. Trk.**
Veh. per hour	951	8	3	951	8	3	951	8	3				951	8	3	951	8	3	951	8	3	951	8	3
Speed, mph	50.0			50.0			50.0						50.0			50.0			50.0			50.0		
Distance S-R	198.0			210.0			222.0						240.0			252.0			264.0			276.0		
Barr.-Rec. Dist	0.0			0.0			0.0						0.0			0.0			0.0			0.0		
Left Angle	-90.0			-90.0			-90.0						-90.0			-90.0			-90.0			-90.0		
Right Angle	90.0			90.0			90.0						90.0			90.0			90.0			90.0		
L0E, dB(A)	71.1	78.8	83.0	71.1	78.8	83.0	71.1	78.8	83.0				71.1	78.8	83.0	71.1	78.8	83.0	71.1	78.8	83.0	71.1	78.8	83.0
10Log(ND/S)	22.5	2.0	-3.3	22.5	2.0	-3.3	22.5	2.0	-3.3				22.5	2.0	-3.3	22.5	2.0	-3.3	22.5	2.0	-3.3	22.5	2.0	-3.3
Dist. Corr.	-6.0			-6.3			-6.5						-6.9			-7.1			-7.3			-7.5		
10Log(Phi), dB	0.0			0.0			0.0						0.0			0.0			0.0			0.0		
Left Barr. Ang	-90.0			-90.0			-90.0						-90.0			-90.0			-90.0			-90.0		
Rt. Barr. Ang.	90.0			90.0			90.0						90.0			90.0			90.0			90.0		
Barr. Atten.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Constant, dB	-25.0			-25.0			-25.0						-25.0			-25.0			-25.0			-25.0		
Calib., dB(A)	-0.9			-0.9			-0.9						-0.9			-0.9			-0.9			-0.9		
Leq(h), dB(A)	61.7	48.8	47.7	61.4	48.6	47.5	61.2	48.3	47.2				60.8	48.0	46.9	60.6	47.8	46.7	60.4	47.6	46.5	60.2	47.4	46.3
Leq(h), dB(A)	62.1			61.8			61.6						61.2			61.0			60.8			60.6		
Leq(h), dB(A)	66.6												66.9											
Leq(h), dB(A)	69.8																							