Surf Farm

NOISE ANALYSIS

CITY OF NEWPORT BEACH

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
PPV	Peak Particle Velocity
Project	Surf Farm
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for the Surf Farm ("Project"). The Project site is a 15.38-acre site located at 3100 Irvine Avenue in Newport Beach in Newport Beach. The Project would develop a develop a 5-acre wave lagoon with 3 warming pools and one spa, and a 50,170 square-foot (SF) three-story clubhouse, with 18,137 SF of basement storage and restroom, a 9,432 SF athlete accommodation building with 1,624 SF of ancillary restroom and storage space, totaling a gross floor area of 79,534 SF. The Project also includes 351 parking stalls, many of which are under PV solar canopies. Solar panels would also be installed on the roofs of both proposed buildings.

The results of this Surf Farm Noise Analysis are summarized below based on the significance criteria in Section 4 of this report, consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	6	*Less Than Significant*	-
Operational Noise	8	*Less Than Significant*	-
Construction Noise	9	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-
Airport Exposure	10	Less Than Significant	-

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the Surf Farm ("Project"). This Noise Analysis briefly describes the Project, provides information regarding noise fundamentals, describes the local regulatory setting, and provides the study methods and procedures for an analysis of the potential Project-related long-term operational noise and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The Project site is a 15.38-acre located at 3100 Irvine Avenue in Newport Beach, as shown in Exhibit 1-A. To the west and south of the site are residential uses, to the east are commercial uses, and to the north is the Newport Beach Golf Course.

1.2 PROJECT DESCRIPTION

The Project would develop a 5-acre wave lagoon with three warming pools and one spa, a 50,170 square foot (SF) three-story clubhouse with 18,137 SF of basement storage and restroom, a 9,218 SF athlete accommodation building with 1,624 SF of ancillary restroom and storage space, totaling a gross floor area of 79,534 SF. The Project also includes two parking lots with 351 parking stalls, many of which are covered with solar canopies. The primary noise sources of concern will include: roof-top air conditioning units, trash enclosure activity, loading activity, surf lagoon activity, satellite speakers, main announcement speakers, wave machine activity, water heating equipment, spectator activity, and parking lot vehicle movements.

The Project sound system will be designed to exceed on-site ambient noise levels by no more than 10 decibels. This ensures that announcements are audible and understandable on-site, ambient music near spectator areas and around surf lagoon is audible, and noise pollution to surrounding areas is minimized. The hours of music will be limited between the hours of 7:00 a.m. and 10:00 p.m.

EXHIBIT 1-A: LOCATION MAP

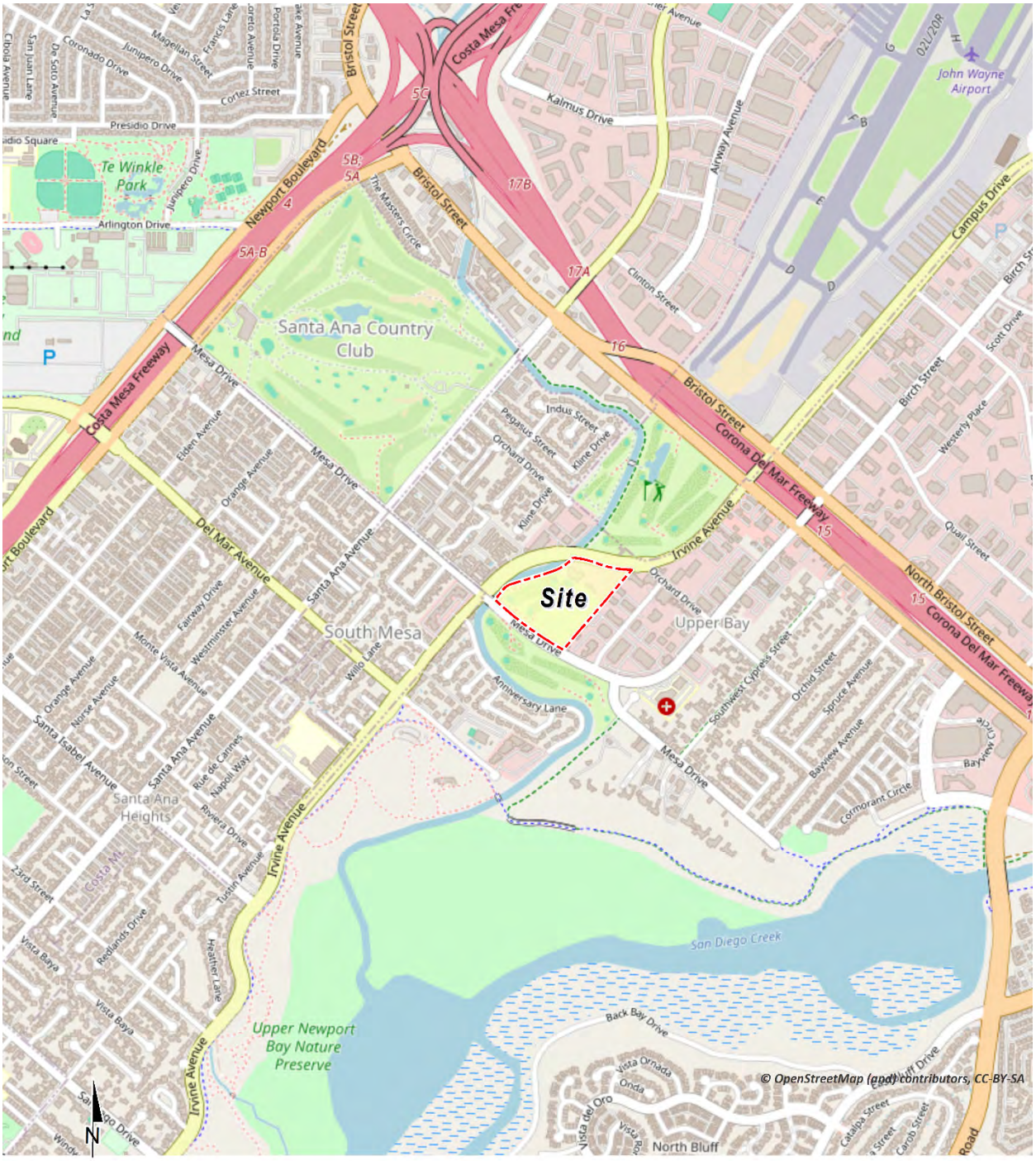
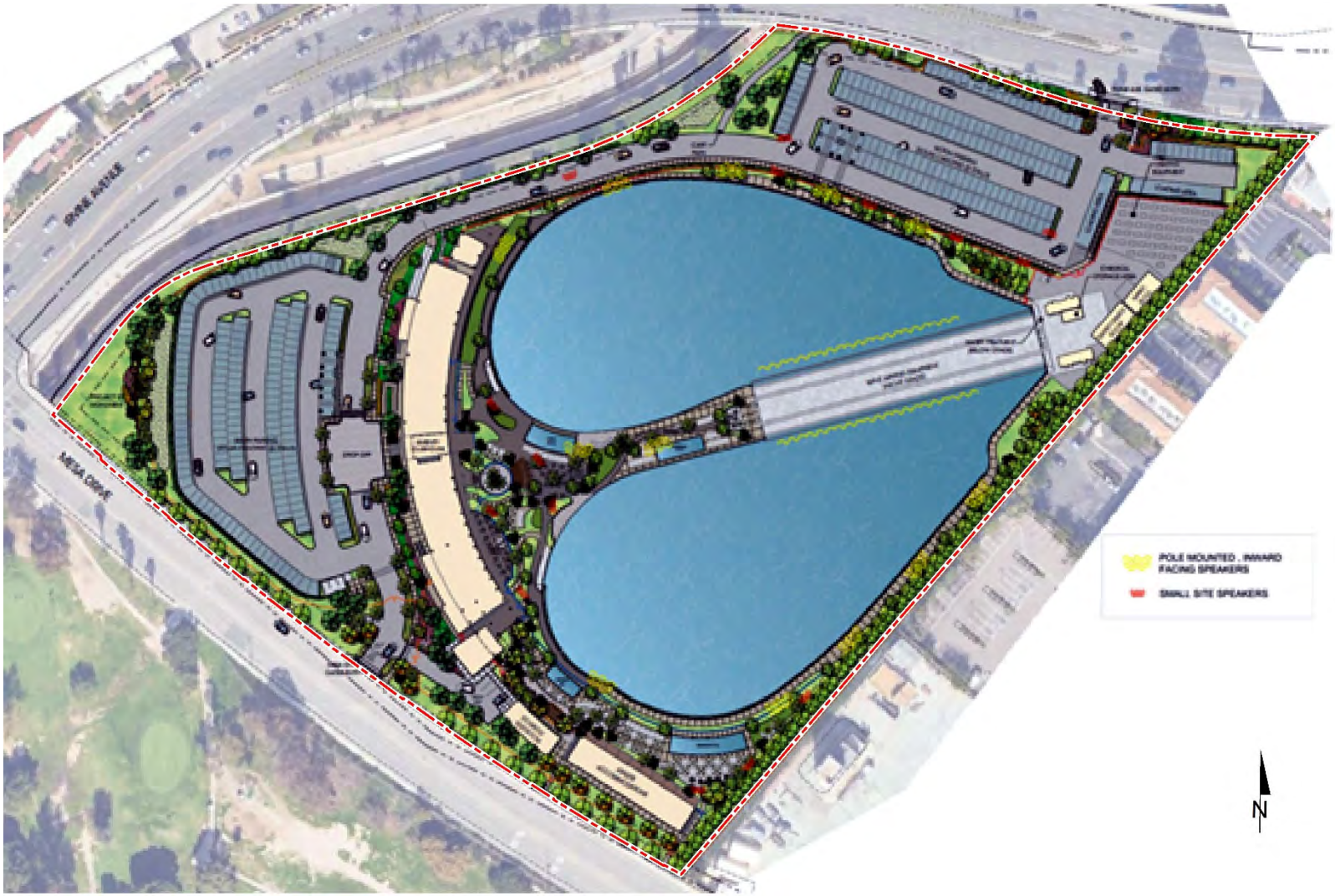


EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

Noise is simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm, or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects, which are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (2) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 100 feet, which can cause serious discomfort. (3) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most used figure is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady-state sound level containing the same total energy as a time-varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise-sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The City of Newport Beach relies on the 24-hour CNEL level to assess land use compatibility with transportation-related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (2)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those

sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (4)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors, such as air temperature, humidity, and turbulence, can also have significant effects. (2)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearest residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of-sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure. (4)

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by up to 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (4)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or

livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop, and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local governments to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway or that the developments are planned, designed, and constructed in such a way that noise impacts sensitive land uses are minimized. (5)

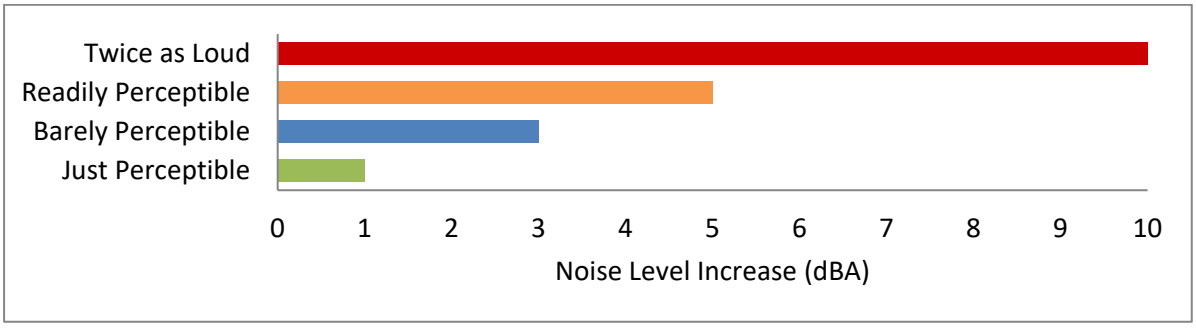
2.7 COMMUNITY RESPONSE TO NOISE

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise-producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (6) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (6) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels, as shown in Exhibit 2-B. A change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*, vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

Additionally, in contrast to airborne noise, ground-borne vibration outdoors is not a common environmental problem, and annoyance from ground-borne vibration is almost exclusively an indoor phenomenon (7). Therefore, the effects of vibrations should only be evaluated at a structure, and the effects of the building structure on the vibration should be considered. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings. In contrast, large masonry buildings with spread footings have a low response to ground vibration (7). In general, the heavier a building is, the lower the response will be to the incident vibration energy. However, all structures reduce vibration levels due to the coupling of the building to the soil.

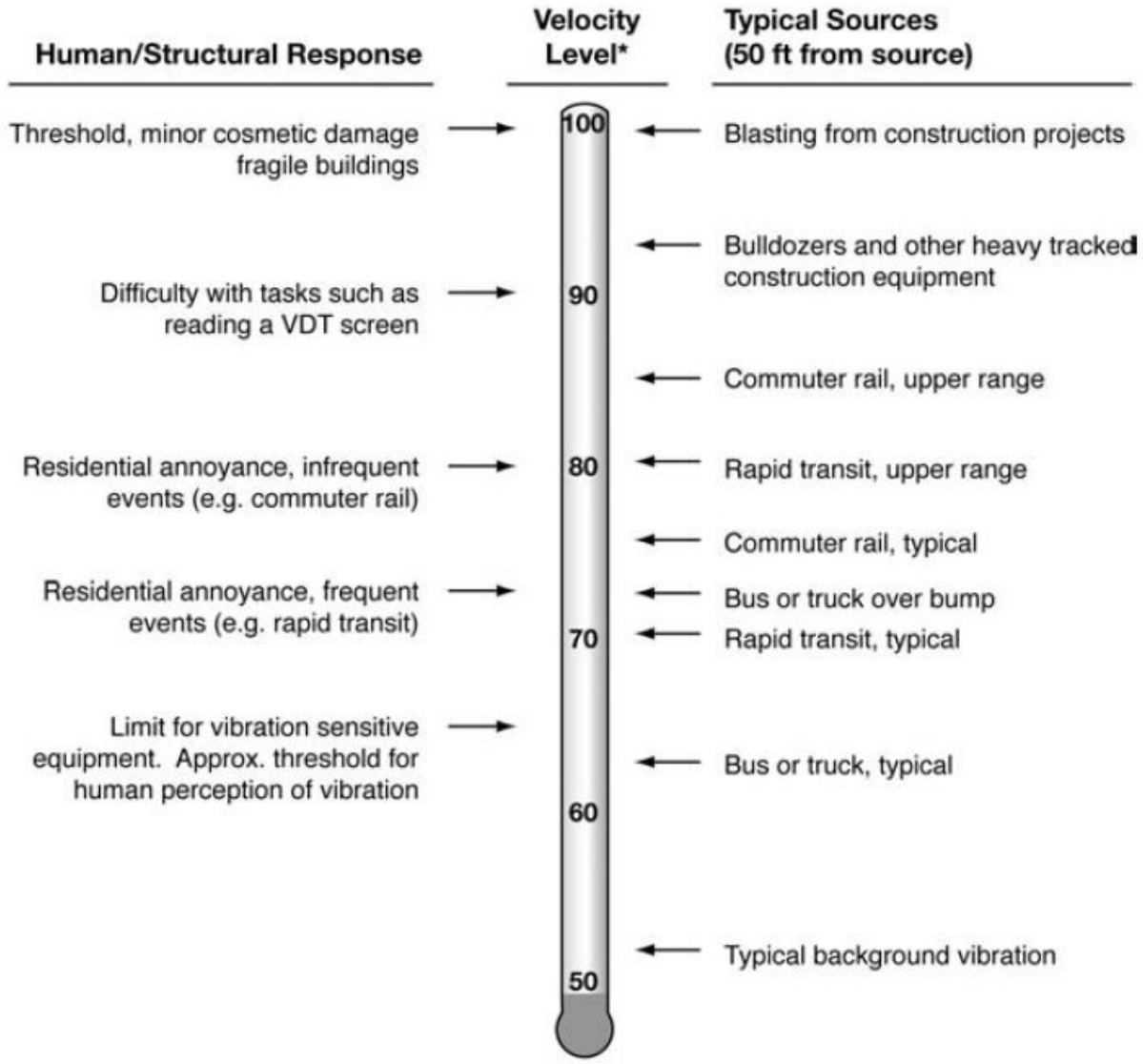
There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal (7). The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude, often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body (7). However, the RMS amplitude and PPV are related mathematically, and the RMS amplitude of equipment is typically calculated from the PPV reference level. The RMS amplitude is approximately 70% of the PPV (8). Thus, either can be used in the description of vibration impacts.

While not universally accepted, vibration decibel notation (VdB) is another vibration notation developed and used by the FTA in their guidance manual to describe vibration levels, provide a background of common vibration levels, and set vibration limits (9). Decibel notation (VdB) serves to reduce the range of numbers used to describe vibration levels and is used in this report to describe vibration levels.

As stated in the FTA guidance manual, the background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity

level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual.

3 REGULATORY SETTING

To limit population exposure to physical and/or psychological damage as well as intrusive noise levels, the federal government, the State of California, various City governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is generally left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each County and City adopt a General Plan that includes a Noise Element, which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (10) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 STATE OF CALIFORNIA BUILDING CODE

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, and the California Building Code. These noise standards are applied to new construction in California for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are developed near major transportation noise sources, and where such noise sources create an exterior noise level of 60 dBA CNEL or higher. Acoustical studies that accompany building plans for noise-sensitive land uses must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dBA CNEL. The Project is required to comply with this standard by State law and the City verifies compliance during the plan check process as ministerial process.

3.3 CITY OF NEWPORT BEACH GENERAL PLAN NOISE ELEMENT

The City of Newport Beach has adopted a Noise Element of the General Plan to control noise in the planning process in order to maintain compatible land use with environmental noise levels and to ensure that Newport Beach residents will be protected from excessive noise intrusion. (11)

3.3.1 NOISE POLICIES

To protect City of Newport Beach residents from excessive noise, the Noise Element contains the following policies related to the Project.

Noise and Land Use Compatibility

N 1.1 Noise Compatibility of New Development: Require that all proposed projects are compatible with the noise environment through use of Table N2 and enforce the interior and exterior noise standards shown in Table N3.

N 1.2 Noise Exposure Verification for New Development: Applicants for proposed residential or mixed-use projects located in areas projected to be exposed to 60 dBA CNEL and higher, as shown in Figures N1 through N6 must conduct a noise study to provide evidence that the depicted noise contours do not adequately account for local noise exposure circumstances due to such factors as, topography, variation in traffic speeds, and other applicable conditions. These findings shall be used to determine the level of exterior or interior noise, attenuation needed to attain an acceptable noise exposure level and the feasibility of such measures when other planning considerations are taken into account. (Imp 2.1)

N 1.4 New Developments in Urban Areas: Require that applicants of residential portions of mixed-use projects and high density residential developments in urban areas (such as the Airport Area and Newport Center) demonstrate that the design of the structure will adequately isolate noise between adjacent uses and units (common floor/ceilings) in accordance with the California Building Code. (Imp 7.1)

N 1.5 Infill Projects: Allow a higher exterior noise level standard for infill projects in existing residential areas adjacent to major arterials if it can be shown that there are no feasible mechanisms to meet the exterior noise levels. The interior standard of 45 dBA CNEL shall be enforced for any new residential project or mixed-use project containing a residential component. (Imp 2.1, 7.1)

N1.5A Airport Area Infill Projects: Allow infill residential projects proximate to John Wayne Airport to have a higher exterior noise level standard if it can be shown that there are no practical mechanisms or designs to meet the exterior noise levels. The interior standard of 45 dBA CNEL shall be enforced for any residential component of projects. No residential units may be located in the 70 dBA CNEL or higher noise contour areas.

N 1.8 Significant Noise Impacts: Require 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 table below.

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

Transportation-Related Noise

N 2.1 New Development: Require that proposed noise-sensitive uses in areas of 60 dBA and greater, as determined the analyses stipulated by Policy N1.1, demonstrate that they meet interior and exterior noise levels.

N 2.2 Design of Sensitive Land Uses: Require the use of walls, berms, interior noise insulation, double paned windows, advanced insulation systems, or other noise measures, as appropriate, in the design of new residential developments to attenuate noise levels to not exceed 45 dBA CNEL interior or other new noise sensitive land uses that are adjacent to arterials and located proximate to John Wayne Airport. Residential uses within the 65 dBA to 70 dBA CNEL noise contour area are required to be indoor-oriented to reduce noise impacts on outdoor living or recreational areas. Application of the Noise Standards in Table N2 shall govern this requirement.

Aircraft Noise

N 3.1 New Development: Ensure new development is compatible with the noise environment proximate to John Wayne Airport by not allowing residential units in areas subjected to noise exceeding 70 dBA CNEL as shown in Figures N1, N2, N4, and N5 of the Noise Element of the General Plan.

N 3.2 Residential Development: Require that residential development proximate to the John Wayne Airport shall not be located beyond the 70 dBA CNEL noise contour shown in Figures N1, N2, N4, and N5 of the Noise Element of the General Plan. Require developers of residential or mixed-use land uses with a residential component to notify prospective purchasers or tenants of aircraft noise. Additionally, require outdoor common areas or recreational areas of residential or mixed-used developments to be posted with signs notifying users regarding the proximity to John Wayne Airport and the presence of operating aircraft and noise. (Imp 2.1, 3.1, 4.1)

Nontransportation-Related Noise

N 4.1 Stationary Noise Sources: Enforce interior and exterior noise standards outlined in Table N3, and in the City's 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.

N 4.6 Maintenance or Construction Activities: Enforce the Noise Ordinance noise limits and limits on hours of maintenance or construction activity in or adjacent to residential areas, including noise that results from in-home hobby or work-related activities.

Construction Noise

N 5.1 Limiting Hours of Activity: Enforce the limits on hours of construction activity.

3.3.2 LAND USE COMPATIBILITY

The noise criteria identified in the City of Newport Beach Noise Element (Table N2) are guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Exhibit 3-A, provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels and prevent noise/land use conflicts. The *Land Use Noise Compatibility Matrix* in the City of Newport Beach General Plan provides guidelines to evaluate the acceptability of transportation-related noise level impacts.

EXHIBIT 3-A: LAND USE NOISE COMPATIBILITY MATRIX

Table N2 Land Use Noise Compatibility Matrix

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

SOURCE: Newport Beach, 2006

Zone A: Clearly Compatible—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Zone B: Normally Compatible**—New construction or development should be undertaken only after detailed analysis of the noise reduction requirements and are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Zone C: Normally Incompatible—New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

Zone D: Clearly Incompatible—New construction or development should generally not be undertaken.

3.4 CITY OF NEWPORT BEACH STATIONARY (NON-TRANSPORTATION) NOISE STANDARDS

In addition to the noise/land use compatibility guidelines contained in the General Plan Noise Element, the City of Newport Beach has adopted Community Noise Control policies and standards as part of its Municipal Code to limit unnecessary, excessive and annoying noise in the City. To analyze noise impacts originating from a designated fixed location or private property such as the Project, stationary-source noise such as the expected roof-top air conditioning units, trash enclosure activity, loading activity, surf lagoon activity, satellite speakers, main announcement speakers, wave machine activity, water heating equipment, spectator activity, and parking lot vehicle movements and noise from construction activities are typically evaluated against standards established under the City's Municipal Code.

3.4.1 OPERATIONAL NOISE STANDARDS

The City of Newport Beach Municipal Code, Chapter 10.26 *Community Noise Control*, establishes the permissible exterior noise levels that may intrude into a neighboring property. According to Section 10.26.025(A) exterior noise levels at single-, two or multiple-family residential land uses (Noise Zone 1) shall not exceed 55 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.). (12) For commercial uses, exterior noise levels shall not exceed 65 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 60 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.).

According to Section 10.26.025(C), in the event the ambient noise level exceeds the noise standard, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level. The City of Newport Beach Municipal Code, Chapter10.26 *Community Noise Control* exterior noise level standards are shown in Table 3-1 and are included in Appendix 3.1.

TABLE 3-1: OPERATIONAL NOISE STANDARDS

City	Land Use	Time Period	Base Exterior Noise Level Standards (dBA L_{eq})[2]
Newport Beach[1]	Residential (Noise Zone I)	Daytime	55
		Nighttime	50
	Commercial (Noise Zone II)	Daytime	65
		Nighttime	60

[1] Source: City of Newport Beach Municipal Code, Section 10.26.025 (Appendix 3.1).
[2] Base exterior noise level standards. If the ambient level exceeds allowable exterior Leq noise level, the ambient shall be the standard per Section 10.26.025 (C) of the City of Newport Beach Municipal Code.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

3.5 VIBRATION

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures, and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment, such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. (7) To analyze vibration impacts originating from the operation and construction of the Project, vibration-generating activities are appropriately evaluated against standards established under the Municipal Code if such standards exist. However, the City of Newport Beach does not identify specific construction vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual* (8), Table 19, vibration levels are used in this noise study to assess potential temporary construction-related impacts at adjacent building locations. This is considered the most appropriate standard and location for assessing vibration impacts, since vibration impacts are only assessed within structures, vibrations in outdoor environments are generally not an environmental concern, and temporary annoyance is not generally considered a substantial effect on the environment. The nearest vibration-sensitive buildings to the Project site can best be described as "older residential structures" with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

3.6 AIRPORT LAND USE COMPATIBILITY

John Wayne Airport (JWA) is located approximately 2,580 feet northeast of the Project site. The AELUP (13) prepared by the Orange County Airport Land Use Commission (ALUC), identifies noise compatibility policies *to safeguard the general welfare of the inhabitants within the vicinity of the airport and to ensure the continued operation of the airport. Specifically, the AELUP plan seeks to protect the public from the adverse effects of aircraft noise, to ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and to ensure that no structures or activities adversely affect navigable airspace.*

The basic function of the AELUP is to promote compatibility between the airport and the land uses that surround it. As required by State law, the AELUP provides guidance to affected local jurisdictions regarding airport land use compatibility. The main objective of the AELUP is to avoid future compatibility conflicts rather than to remedy existing incompatibilities. Also, the AELUP is aimed at addressing future land uses and development, not airport activity. The AELUP does not place any restrictions on the present and future role, configuration, or use of the airport. The AELUP establishes aircraft noise exposure exterior noise level compatibility thresholds for new developments by land use category. According to the exterior noise thresholds outlined in Exhibit 3-B, Commercial development is considered *normally consistent* with exterior noise levels of less than 70 dBA CNEL and *conditionally consistent* with exterior noise levels greater than 70 dBA CNEL. Noise level contours are available from three different sources: the first and most recent noise level contours are maintained on the airport's website and updated annually, the next most current is from the City's General Plan, and the oldest are included in the AELUP. As shown in Exhibit 3-C, based on the 2024 Annual CNEL Noise Level Contours issued by John Wayne Airport, the Project Site is located between the 70 dBA CNEL and 65 dBA CNEL aircraft noise level contours. (14) As shown in Exhibit 3-D, based on the City of Newport General Plan Noise Level Contours for John Wayne Airport, the Project Site is located between the 70 dBA CNEL and 60 dBA CNEL aircraft noise level contours and bisected by the 65 dBA CNEL noise level contour. (11) Finally, as shown in Exhibit 3-E, based

on the AELUP CNEL Noise Level Contours for the John Wayne Airport, the Project Site is located between the 75 dBA CNEL and 65 dBA CNEL noise level contours, with the 70 dBA CNEL contour clipping the northwestern tip of the on-site parking and equipment yard. (13) Thus, in all three sources, the main Project site is exposed to normally consistent noise levels from airport operations.

EXHIBIT 3-B: AIRPORT COMPATIBILITY NOISE LEVELS BY LAND USE

AIRPORT LAND USE COMMISSION FOR ORANGE COUNTY
AIRPORT ENVIRONS LAND USE PLAN
LIMITATIONS ON LAND USE DUE TO NOISE
(Applicable to Aircraft Noise Sources)

LAND USE CATEGORY	COMMUNITY NOISE EQUIVALENT LEVEL dB						
	55	60	65	70	75	80	
Residential (all types): Single and Multi-Family Residences							
Community Facilities: Churches, Libraries, Schools, Preschools, Day-Care Centers, Hospitals, Nursing/Convalescent Homes, & Other noise sensitive uses							
Commercial: Retail, Office							
Industrial:							

NORMALLY CONSISTENT

Conventional construction methods used. No special noise reduction requirements.

CONDITIONALLY CONSISTENT

Must use sound attenuation as required by the California Noise Insulation Standards, Title 25, California Code of Regulations. Residential use sound attenuation required to ensure that the interior CNEL does not exceed 45 dB. Commercial and industrial structures shall be sound attenuated to meet Noise Impact Zone "1" criteria (refer to Section 3.2.3).

NORMALLY INCONSISTENT

All residential units are inconsistent unless are sound attenuated to ensure that the interior CNEL does not exceed 45 dB, and that all units are indoor oriented so as to preclude noise impingement on outdoor living areas.

EXHIBIT 3-C: JOHN WAYNE AIRPORT 2024 NOISE LEVEL CONTOUR BOUNDARIES

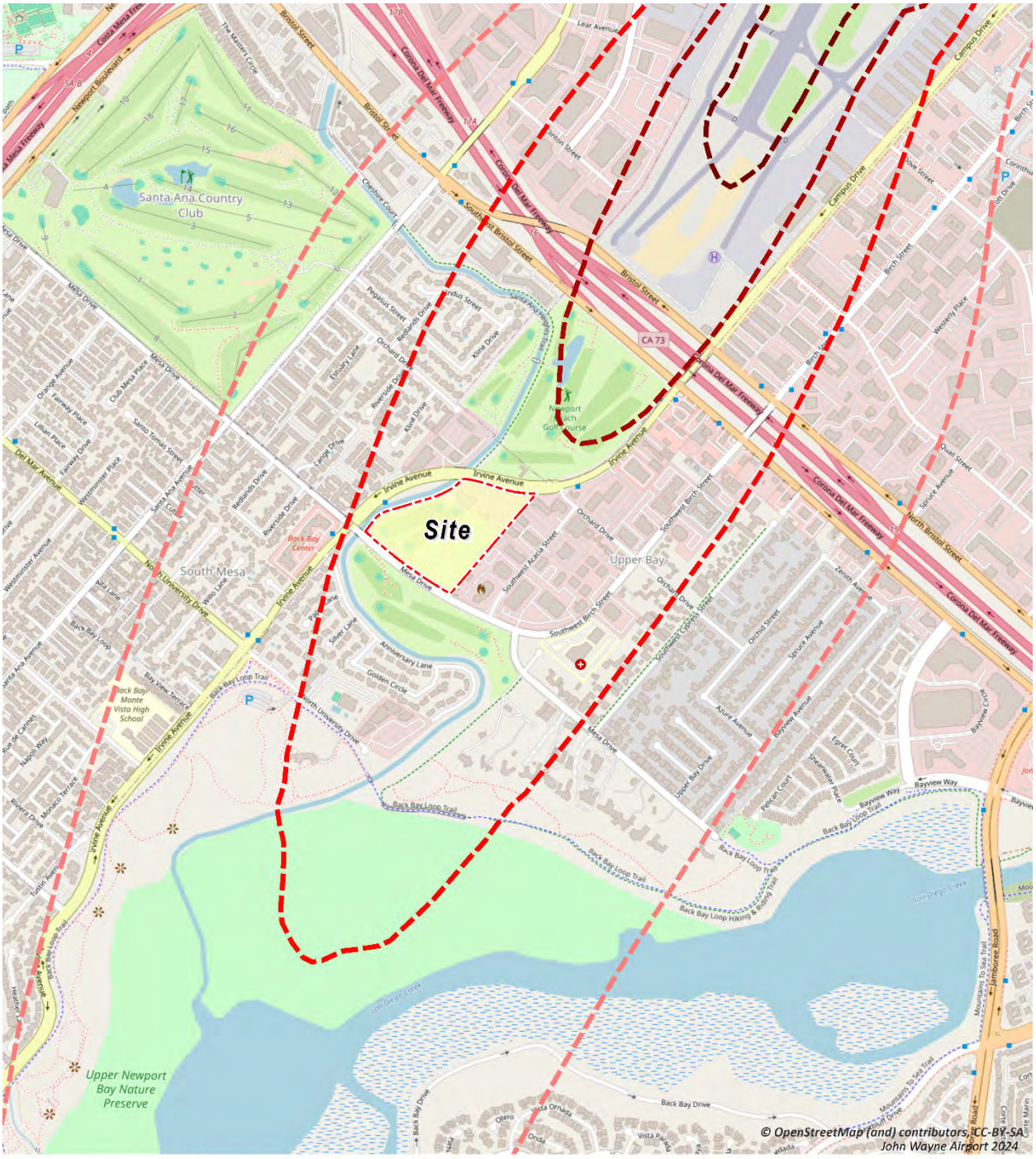
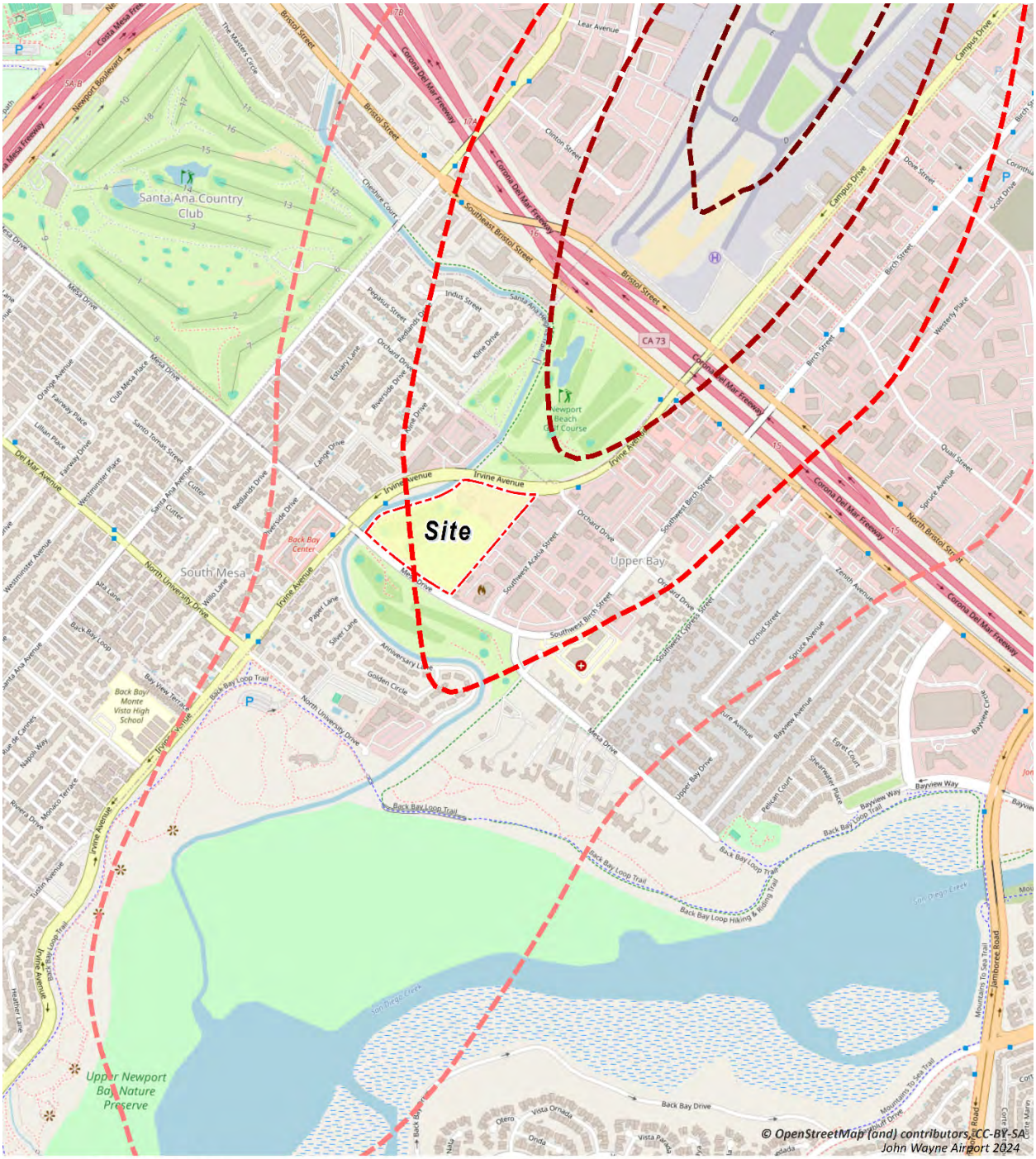


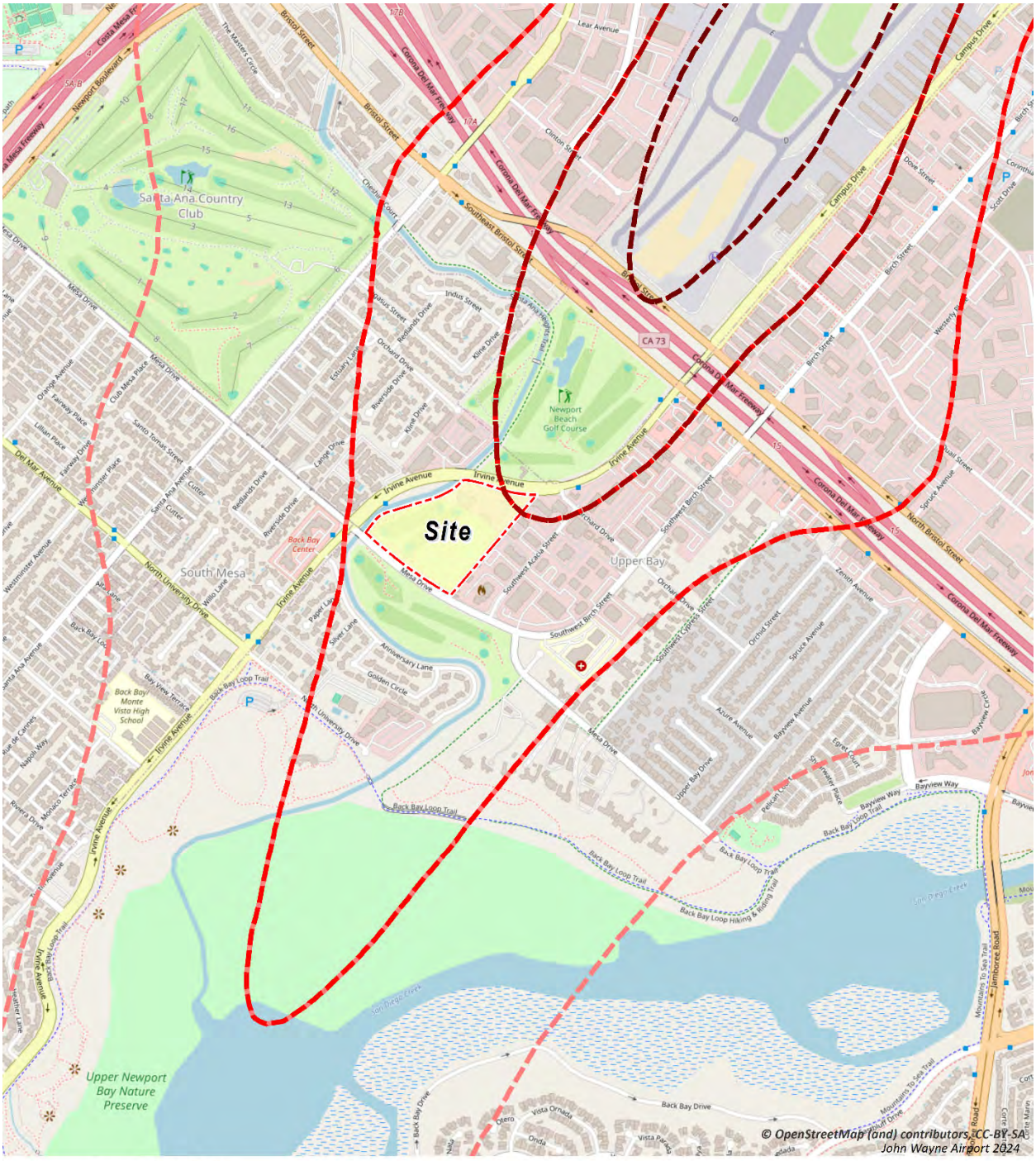
EXHIBIT 3-D: CITY OF NEWPORT GENERAL PLAN NOISE LEVEL CONTOUR BOUNDARIES - JOHN WAYNE AIRPORT



LEGEND:

60 dBA CNEL Noise Level Contour
65 dBA CNEL Noise Level Contour
70 dBA CNEL Noise Level Contour
75 dBA CNEL Noise Level Contour

EXHIBIT 3-E: AELUP 1985 NOISE LEVEL CONTOUR BOUNDARIES – JOHN WAYNE AIRPORT



LEGEND:

N

60 dBA CNEL Noise Level Contour
65 dBA CNEL Noise Level Contour
70 dBA CNEL Noise Level Contour
75 dBA CNEL Noise Level Contour

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

B. Generation of excessive ground-borne vibration or ground-borne noise levels?

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

While the City of Newport Beach General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts; they do not define the levels at which increases are considered substantial for use under Guideline A. CEQA Appendix G Guideline C applies to nearest public and private airports, if any, and the Project's land use compatibility.

4.1 NOISE LEVEL INCREASES (THRESHOLD A)

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines. Under CEQA, consideration must be given to the magnitude of the increase, the existing baseline ambient noise levels, and the location of receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (15) This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will typically be judged. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. The *ambient noise level* is the composite of noise from all sources, excluding the alleged offensive noise. In this context, it represents the normal or existing level of environmental noise at a given location for a specified time of day or night.

4.1.1 TRANSPORTATION NOISE (SUBSTANTIAL PERMANENT NOISE LEVEL INCREASE)

The Federal Interagency Committee on Noise (FICON) (16) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders a noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (15) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the without project noise levels are below 60 dBA. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance.

The FICON guidance provides an established source of criteria to assess the impacts of substantial permanent increase in baseline ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project (baseline) noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance at noise sensitive receiver locations are consistent with guidance provided by both the Federal Highway Administration (17 p. 9) and Caltrans (18 p. 2_48).

The City of Newport Beach General Plan Noise Element, *Noise Compatibility by Land Use Type* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the *completely compatible* exterior noise level for non-noise-sensitive land uses is 70 dBA CNEL. To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *barely perceptible* 3 dBA criteria is used. When the without Project noise levels are greater than the *completely compatible* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the City of Newport Beach General Plan Noise Element, *Noise Compatibility by Land Use Type completely compatible* 70 dBA CNEL exterior noise level criteria.

4.1.2 Non-Transportation Noise (Substantial Permanent Noise Level Increase)

The FICON criteria are also used to determine if Project-related stationary source (operational) noise level increases are significant at off-site receiver locations. For non-transportation noise source activities, a substantial permanent noise level increase consists of increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying ambient noise levels.

4.1.3 CONSTRUCTION NOISE (SUBSTANTIAL TEMPORARY NOISE LEVEL INCREASE)

To control the noise-generating construction activities, the temporary noise level increases over the existing ambient conditions must be considered under CEQA Significance Threshold A. Therefore, the Caltrans *Traffic Noise Analysis Protocol* 12 dBA L_{eq} *substantial* noise level increase threshold is used in this analysis to assess temporary noise level increases. (19) In California a substantial noise increase is considered to occur when the project's predicted noise level exceeds the existing noise level by 12 dBA or more. The use of 12 dB was established in California many years ago and is based on the concept that a 10 dB increase generally is perceived as a doubling of loudness. (2 pp. 3-2) Therefore, if the Project-related construction noise levels generate a temporary noise level increase above the existing ambient noise levels of up to 12 dBA L_{eq}, then the Project construction noise level increases will be considered a potentially significant impact.

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.5, the vibration impacts are appropriately evaluated using the Caltrans vibration damage thresholds to assess potential temporary construction-related impacts at adjacent building locations. The nearest vibration-sensitive buildings to the Project site can best be described as "older residential structures" with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

CEQA Noise Threshold C applies when there are nearby public and private airports and/or airstrips and focuses on land use compatibility of the Project to nearby airports and airstrips. The Project site is not located within two miles of an airport or airstrip. The closest airport is the John Wayne Airport (JWA), located roughly 2,580 feet northeast of the Project site. The Project site is exposed to normally compatible noise levels for commercial office and retail land uses. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Appendix G to the CEQA Guidelines, Noise Threshold C.

4.4 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-1 shows the significance criteria summary matrix.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY MATRIX

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Operational Noise	Residential[2]	Exterior Noise Level Standards	55 dBA L_{eq}	50 dBA L_{eq}
	Commercial[2]	Exterior Noise Level Standards	65 dBA L_{eq}	60 dBA L_{eq}
	Noise-Sensitive[3]	If ambient is < 55 dBA CNEL	≥ 3 dBA CNEL Project Increase	
		If ambient is 55 - 60 dBA CNEL	≥ 2 dBA CNEL Project Increase	
		If ambient is 60 - 75 dBA CNEL	≥ 1 dBA CNEL Project Increase	
		If ambient is > 75 dBA CNEL	Any Project Increase	
Construction	All	Noise Level Threshold	80 dBA L_{eq}	
		Noise Level Increase	≥ 12 dBA CNEL Project Increase	
	All[4]	Vibration Level Threshold	0.3 PPV (in/sec)	n/a
Airport Noise Exposure	All[5]	Exterior Noise Level Standards	Exhibit 3-B	
		Interior Noise Level Standards	Table 3-4	

[1] City of Newport Beach General Plan Noise Element Policy N 1.5.
[2] City of Newport Beach Municipal Code, Section 10.26.025 (Appendix 3.1).
[3] City of Newport Beach General Plan Policy N 1.8
[4] Caltrans Transportation and Construction Vibration Guidance Manual, 2020.
[5] Orange County Land Use Plan For John Wayne Airport.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.;
"n/a" = No nighttime construction activity is permitted, so no nighttime construction noise level limits are identified; "VdB" = Vibration Decibels

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at eight locations in the Project study area. The measurement locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Thursday, September 12th, 2024. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (20)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (2) Further, FTA guidance states, *that it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (7)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (7) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearest sensitive receiver locations allows for a comparison of the before and after Project noise levels

and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location.

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Located northwest of the site near the residence at 20352 Kline Dr.	71.3	50.9
L2	Located west of the site near the pool at 1619 Mesa Dr.	67.8	51.8
L3	Located west of the site near the residence at 1691 Mesa Dr.	72.4	62.5
L4	Located southwest of the site near the residence at 2698 Riverside Dr.	69.1	54.2
L5	Located southwest of the site near the residence at 2503 Anniversary Lane.	73.4	65.6
L6	Located south of the site near the residence at 2139 Anniversary Lane.	68.3	44.2
L7	Located southeast of the site near the park at 2081 Mesa Dr.	70.6	50.0
L8	Located east of the site near the residence at 20250 SW Acacia St.	73.7	53.5

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2. "Daytime" = 7:00 a.m. to 7:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

The background ambient noise levels in the Project study area are dominated by the overflight of airplanes from John Wayne Airport and transportation-related noise associated with surface streets, including the auto and heavy truck activities on study area roadway segments near the noise level measurement locations. The 24-hour existing noise level measurement results are shown in Table 5-1.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

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6 OFF-SITE TRANSPORTATION NOISE IMPACTS

The expected Project is anticipated to generate a net increase of 186 average daily trips (ADT), which would represent an incremental increase to the existing roadway volumes of 31,000 ADT and 6,000 ADT for Irvine Avenue and Mesa Drive respectively, and is not expected to double traffic or generate a perceptible noise level increase (i.e., less than 3 dBA CNEL) at nearby sensitive land uses adjacent to study area roadways. (21) Due to the low traffic volumes generated by the Project, the off-site traffic noise levels generated by the Project are considered *less than significant* and no further analysis is required.

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7 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following sensitive receiver locations, as shown in Exhibit 7-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include multi-family dwellings, hotels, motels, dormitories, outpatient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, eight receiver locations in the vicinity of the Project site were identified. All distances are measured from the Project site boundary to the outdoor living areas (e.g., private backyards) or at the building façade, whichever is closer to the Project site. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise analysis will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the Project boundary to each receiver location.

R1: Location R1 represents a noise-sensitive residence at 20352 Kline Drive, 399 feet northwest of the Project site. Receiver R1 is placed at the use area (backyard) facing the Project site.

R2: Location R2 represents a noise-sensitive residence at 1691 Mesa Drive, 256 feet northwest of the Project site. Receiver R2 is placed at the use area (pool) facing the Project site.

R3: Location R3 represents a noise-sensitive residence at 1691 Mesa Drive, 169 feet northwest of the Project site. Receiver R3 is placed at the building façade facing the Project site.

R4: Location R4 represents a noise-sensitive residence at 2698 Riverside Drive, 502 feet west of the Project site. Receiver R4 is placed at the building façade facing the Project site.

R5: Location R5 represents a noise-sensitive residence at 2916 Irvine Avenue, 284 feet southwest of the Project site. Receiver R5 is placed at the building façade facing the Project site.

R6: Location R6 represents a noise-sensitive residence at 2139 Anniversary Lane, 673 feet south of the Project site. Receiver R6 is placed at the building façade facing the Project site.

R7: Location R7 represents a noise-sensitive park at 2061 Mesa Drive, 797 feet southeast of the Project site. Receiver R7 is placed at the use area facing the Project site.

R8: Location R8 represents a noise-sensitive residence at 20250 SW Acacia Street, 386 feet east of the Project site. Receiver R8 is placed at the building façade facing the Project site.

EXHIBIT 6-A: RECEIVER LOCATIONS

8 OPERATIONAL NOISE IMPACTS

This section analyzes the potential on-site operational noise impacts at the nearby receiver locations, identified in Section 7. Exhibit 8-A identifies the representative noise source locations used to assess the operational noise levels. The on-site Project-related operational noise sources are expected to include: roof-top air conditioning units, trash enclosure activity, loading activity, surf lagoon activity, satellite speakers, main announcement speakers, wave machine activity, water heating equipment, spectator activity, and parking lot vehicle movements.

8.1 REFERENCE OPERATIONAL NOISE LEVELS

To estimate the Project's operational noise impacts, reference noise level measurements were collected from similar sources and types of activities to represent the noise levels expected with the development of the Project. This section provides a description of the reference noise levels shown in Table 8-1 used to estimate the Project's operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the roof-top air conditioning units, trash enclosure activity, loading activity, surf lagoon activity, satellite speakers, main announcement speakers, wave machine activity, water heating equipment, spectator activity, and parking lot vehicle movements. Appendix 8.1 includes the detailed calculations for the Project operational noise levels presented in this section.

8.1.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a combination of Type 1 and Type 2 sound level meters. Each sound level meter was programmed in "slow" mode to record noise levels in "A" weighted form and calibrated prior to each measurement. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (20)

8.1.2 ROOF-TOP AIR CONDITIONING UNIT

To assess the noise levels created by the roof-top air conditioning unit, reference noise levels were taken from a 3- to 12.5-ton Carrier Weathermaster Commercial Packaged Rooftop Unit model 48HC product datasheet. The product data sheet for Carrier model 48HC indicates that each air conditioning unit will produce a maximum sound power level of 57.4 dBA L_{eq} at 50 feet, based on a sound power rating of 89 dBA L_w. Each air conditioning unit was modeled as operating at full power for 45 minutes per hour during the daytime and 30 minutes during the nighttime. The manufacturer's specifications for the sample air conditioners are provided in Appendix 8.1.

EXHIBIT 8-A: OPERATIONAL NOISE SOURCES

TABLE 8-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Noise Source Height (Feet)	Min./Hour[4]		Reference Noise Level (dBA L_{eq})	Sound Power Level (dBA)[6]
		Day	Night		
Roof-Top Air Conditioning Unit[1]	3' [2]	45	30	57.4	89.0
Parking Lot Vehicle Movements[3]	0'	60	60	31.4	63.0
Tash Enclosure Activity[5]	8'	10	10	57.3	88.9
Loading Activity	8'	60	0	69.8	101.4
Satellite Speaker	2'	60	0	66.4	98.0
Main Announcement Speaker	15'	60	0	71.4	103.0
Wave Machine Activity[4]	8'	60	60	61.4	93.0
Water Heating Equipment	5'	60	0	50.0	81.6
Surf Lagoon Activity[5]	5'	60	0	57.8	89.4
Spectator Activity[5]	5'	60	60	43.4	75.0

[1] Reference noise level taken from Carrier model 48HC, Appendix 8.1.
[2] Height above the roof.
[3] Based on 63 dBA Lw per vehicle movement.
[4] Reference noise level taken from The Wave Bristol datasheet, Appendix 8.2.
[5] As measured by Urban Crossroads, Inc.
[6] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

8.1.3 PARKING LOT VEHICLE MOVEMENTS

Parking activities are based on the area of the parking spaces. The Project includes approximately 351 spaces, which are assumed to have and average of 2 movements per hour for a total of 702 events in an hour. Based on studies conducted in Europe and Australia, the average parking procedure, which included movement associated with either entering or exiting the parking area, parking the vehicles, and opening and closing doors, resulted in a sound power level of approximately 63 dBA L_w/square meter per event (22) (23). Parking lot activities were modeled at full activity during the daytime and nighttime hours.

8.1.4 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with trash enclosure activity, Urban Crossroads collected a reference noise level measurement at an existing trash enclosure containing two dumpster bins. The trash enclosure noise levels describe metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, and trash dropping into the metal dumpster. The reference noise levels describe trash enclosure noise activities when trash is dropped into an empty metal dumpster, as would occur at the Project site. The measured reference noise level at the uniform 50-foot reference distance is 57.4 dBA L_{eq} for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for the Project's proposed building. Typical trash enclosure activities are estimated to occur for 5 minutes per hour and may occur during either daytime or

nighttime hours. Therefore, rash collection activities are conservatively included in both daytime and nighttime noise level estimates.

8.1.5 LOADING ACTIVITY

The truck movements reference noise level measurement was collected over a period of 1 hour and 28 minutes and represents multiple heavy trucks entering and exiting the outdoor loading dock area producing a reference noise level of 69.8 dBA L_{eq} at 50 feet. The noise sources included at this measurement location account for trucks entering and existing the Project driveways and maneuvering in and out of the outdoor loading dock activity area.

8.1.6 SATELLITE SPEAKERS

The Project would include satellite speakers located near the seating and surf lagoon areas. To describe the worst-case reference noise level conditions, a reference noise level of 66.4 L_{eq} at a distance of 50 feet is used. This is considered conservative since the Project's goals are to create audible announcements within the seating areas and the average human raised voice is approximately 55 dBA at 10 feet, or approximately 41 dBA at 50 feet, thus the speaker is modeled at being approximately 4 times louder than the typical raised human voice. The will be limited to the hours of 7:00 a.m. to 10:00 p.m.

8.1.7 MAIN ANNOUNCEMENT SPEAKERS

The Project would include several larger speakers located throughout the facility as shown in Exhibit 8-A, to provide announcements as well as music during outdoor events. To describe the worst-case reference noise level conditions, a reference noise level of 71.4 L_{eq} at a distance of 50 feet is used. This is considered conservative since the Project's goals are to create audible announcements, and the average human raised voice is 62.5 dBA at 10 feet or 48.6 dBA at 50 feet. Thus, the speaker is modeled as being approximately 4 times louder than the typical shouting human voice. The will be limited to the hours of 7:00 a.m. to 10:00 p.m.

8.1.8 WAVE MACHINE ACTIVITY

To assess the noise levels created by the wave generator, reference noise levels were taken from a reference sheet for, The Wave, Bristol. To describe the worst-case reference noise level conditions, the highest reference noise level describing each peak wave noise event of 61.4 L_{eq} at a distance of 50 feet is used. The wave basin/wave machine activities will be limited to the hours of 6:00 a.m. to 11:00 p.m. The manufacturer's specifications for the wave generator are provided in Appendix 8.2.

8.1.9 WATER HEATING EQUIPMENT

To determine the noise levels associated with water heating equipment, data was collected from AquaCal, which provides noise levels for its quietest unit against several other brands, based on the loudest reference noise level of 64.0 dBA at 10 feet. The measured reference noise level at 50 feet is 50.0 dBA L_{eq}. The water heating equipment noise levels will be limited to the daytime hours of 7:00 a.m. to 10:00 p.m. with no planned nighttime activities.

8.1.10 SURF LAGOON, WARMING POOLS, AND SPA ACTIVITY

To determine the noise levels associated with outdoor surf lagoon, warming pools, and spa activity, Urban Crossroads collected a reference noise level measurement at a swimming pool at a hotel. The measured reference noise level at 50 feet is 57.8 dBA L_{eq}. The outdoor pool/spa activity noise levels include a waterfall, people talking, and children and adults swimming and playing in a pool. The outdoor pool/spa activities will be limited to the daytime hours of 7:00 a.m. to 10:00 p.m. with no planned nighttime activities.

8.1.11 SPECTATOR ACTIVITY

To represent the potential noise level impacts associated with the Project's outdoor or beach club activities, a reference noise level measurement was collected at an existing park and is expected to overestimate the noise level activities within the beach and club areas at the Project site, since the reference noise level measurement includes parents speaking on cell phones, kids playing, and background youth soccer games, with coaches shouting instructions and people cheering and clapping. Using the uniform reference distance of 50 feet, the reference noise level is 43.4 dBA L_{eq}. The spectator activities will be limited to the hours of 6:00 a.m. to 11:00 p.m.

8.2 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Development Site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of the noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613 protocol, the CadnaA noise prediction model relies on the reference sound power level (PWL) to describe individual noise sources. While sound pressure levels (e.g., L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (PWL) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish from intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment. The operational noise level calculations provided in this noise analysis account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.5 was used in the CadnaA noise analysis to account for a mix of hard and soft site conditions. Appendix 8.3 includes the detailed noise model inputs.

8.3 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the Project operations that include roof-top air conditioning units, trash enclosure activity, loading activity, surf lagoon activity, satellite speakers, main announcement speakers, wave machine activity, water heating equipment, spectator activity, and parking lot vehicle movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Table 8-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 53.9 to 64.4 dBA L_{eq}.

Table 8-3 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the off-site receiver locations are expected to range from 40.0 to 45.7 dBA L_{eq}. The differences between the daytime and nighttime noise levels is largely related to the duration of noise activity (Table 8-1).

TABLE 8-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA L_{eq})							
	R1	R2	R3	R4	R5	R6	R7	R8
Roof-Top Air Conditioning Unit	41.5	42.5	43.3	38.7	40.8	37.1	36.1	37.7
Parking Lot Vehicle Movements	25.1	27.1	29.1	21.9	24.5	17.7	15.8	20.1
Tash Enclosure Activity	4.8	9.7	14.7	17.0	23.0	12.5	7.6	18.6
Loading Activity	41.0	39.0	39.0	36.2	30.0	34.7	33.2	43.3
Satellite Speakers	43.5	40.1	40.2	37.0	34.0	41.4	42.4	42.8
Main Announcement Speaker	58.9	55.6	53.9	50.0	48.3	55.1	56.0	58.5
Wave Machine Activity	37.6	33.5	32.1	28.0	25.5	33.5	34.3	36.2
Water Heater Activity	22.2	20.7	20.8	18.2	12.7	19.1	20.3	28.0
Pool Activity	34.5	25.6	25.3	25.3	31.3	33.5	34.5	34.3
Spectator Activity	34.2	25.9	24.0	24.1	32.6	32.0	35.9	36.0
Total (All Noise Sources)	**64.1**	**60.8**	**59.3**	**55.1**	**53.8**	**60.1**	**61.0**	**63.7**

[1] See Exhibit 8-A for the noise source locations. CadnaA noise model calculations are included in Appendix 8.3.

TABLE 8-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA L_{eq})							
	R1	R2	R3	R4	R5	R6	R7	R8
Roof-Top Air Conditioning Unit	38.3	39.3	40.0	35.5	37.6	33.8	32.8	34.4
Parking Lot Vehicle Movements	24.2	26.1	28.1	20.9	23.5	16.7	14.8	19.1
Tash Enclosure Activity	3.8	8.8	13.7	16.0	22.0	11.5	6.6	17.6
Loading Activity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Satellite Speakers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Main Announcement Speaker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wave Machine Activity	36.6	32.6	31.1	27.1	24.6	32.5	33.4	35.2
Water Heater Activity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pool Activity	30.6	21.6	21.4	21.3	27.3	29.6	30.5	30.3
Spectator Activity	33.2	24.9	23.0	23.1	31.6	31.0	34.9	35.0
Total (All Noise Sources)	**45.7**	**44.1**	**44.5**	**40.0**	**42.9**	**41.8**	**43.0**	**44.1**

[1] See Exhibit 8-A for the noise source locations. CadnaA noise model calculations are included in Appendix 8.3.

8.4 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against the City of Newport Beach exterior noise level standards at the nearest noise-sensitive receiver locations. For noise-sensitive residential land uses, the City of Newport Beach has established exterior noise level standards of 55 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.). (12) In the event the ambient noise level exceeds the noise standard, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level (Section 10.26.025(C)). Noise level limits in Table 8-4 have been adjusted based on the 24-hour noise level measurements in Table 5-1. Table 8-4 shows that the operational noise levels associated with the Project will satisfy the City of Newport Beach exterior noise level standards at all nearest receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearest noise-sensitive receiver locations.

TABLE 8-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Operational Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	64.1	45.7	71.3	50.0	No	No
R2	60.8	44.1	67.8	50.0	No	No
R3	59.3	44.5	72.4	62.5	No	No
R4	55.1	40.0	69.1	50.0	No	No
R5	53.8	42.9	73.4	65.6	No	No
R6	60.1	41.8	68.3	50.0	No	No
R7	61.0	43.0	70.6	50.0	No	No
R8	63.7	44.1	73.7	50.0	No	No

[1] See Exhibit 8-A for the noise source locations.
[2] Proposed Project operational noise levels as shown in Tables 8-3 and 8-4.
[3] Exterior noise level standards as shown in Table 3-1. If the ambient level exceeds allowable exterior Leq noise level, the ambient shall be the standard per Section 10.26.025 (C) of the City of Newport Beach Municipal Code.
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

8.6 PROJECT OPERATIONAL NOISE LEVEL INCREASE

To describe the Project operational noise level increase, the Project operational noise levels are combined with the existing ambient noise levels measurements for nearest receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (2) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level increase to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime ambient conditions are presented in Tables 8-5 and Table 8-6. As indicated in Table 8-5 and Table 8-6, the Project will generate daytime operational noise level increases ranging from less than 0.1 to 0.8 dBA L_{eq} and nighttime noise level increases ranging from 0.1 to 2.0 dBA L_{eq} at the nearby receiver locations. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented in Table 4-1. Therefore, the incremental Project operational noise level increase is considered *less than significant* at all receiver locations.

TABLE 8-5: PROJECT DAYTIME NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	64.1	L1	71.3	72.1	0.8	1.0	No
R2	60.8	L2	67.8	68.6	0.8	1.0	No
R3	59.3	L3	72.4	72.6	0.2	1.0	No
R4	55.1	L4	69.1	69.3	0.2	1.0	No
R5	53.8	L5	73.4	73.4	0.0	1.0	No
R6	60.1	L6	68.3	68.9	0.6	1.0	No
R7	61.0	L7	70.6	71.1	0.5	1.0	No
R8	63.7	L8	73.7	74.1	0.4	1.0	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project daytime operational noise levels as shown in Table 8-2.
[3] Reference noise level measurement locations as shown in Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown in Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown in Table 4-1.

TABLE 8-6: PROJECT NIGHTTIME NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	45.7	L1	50.9	52.0	1.1	3.0	No
R2	44.1	L2	51.8	52.5	0.7	3.0	No
R3	44.5	L3	62.5	62.6	0.1	2.0	No
R4	40.0	L4	54.2	54.4	0.2	3.0	No
R5	42.9	L5	65.6	65.6	0.0	1.0	No
R6	41.8	L6	44.2	46.2	2.0	3.0	No
R7	43.0	L7	50.0	50.8	0.8	3.0	No
R8	44.1	L8	53.5	54.0	0.5	3.0	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project nighttime operational noise levels as shown in Table 8-3.
[3] Reference noise level measurement locations as shown in Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown in Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown in Table 4-1.

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9 CONSTRUCTION NOISE IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 9-A shows the construction activity boundaries in relation to the nearest sensitive receiver locations.

9.1 CONSTRUCTION NOISE SOURCES

The FTA *Transit Noise and Vibration Impact Assessment Manual* recognizes that construction projects are accomplished in several different stages and outlines the procedures for assessing noise impacts during construction. Each stage has a specific equipment mix, depending on the work to be completed during that stage. As a result of the equipment mix, each stage has its own noise characteristics; some stages have higher continuous noise levels than others, and some have higher impact noise levels than others. The Project construction activities are expected to occur in the following stages:

- Demolition
- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

9.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe construction noise activities, this construction noise analysis was prepared using reference construction equipment noise levels from the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model (RCNM), which includes a national database of construction equipment reference noise emission levels. (24) The RCNM equipment database provides a comprehensive list of the noise-generating characteristics of specific types of construction equipment. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation. According to the EPA, FTA, and FHWA, the overall construction noise level is governed primarily by the noisiest pieces of equipment. The quieter pieces do not affect the overall level, but they do reduce the magnitude of the fluctuations in the noise level. Therefore, a rough estimate of the noise level need only include the noisiest pieces of equipment expected at the site. (25) (7) (26) Consistent with FHWA and FTA guidance for detailed construction noise assessment, Table 9-1 presents the combined noise levels for the loudest construction activities expected for each stage, assuming all equipment operates simultaneously.

EXHIBIT 9-A: CONSTRUCTION ACTIVITY AND RECEIVER LOCATIONS

TABLE 9-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Equipmnet[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Composite Reference Noise Level (dBA L_{eq})	Reference Power Level (dBA L_w)
Demolition	Concrete Saw	83.0	84.4	116.0
	Excavator	77.0		
	Backhoe	74.0		
Site Preparation	Tractor	80.0	82.9	114.5
	Front End Loader	75.0		
	Dozer	78.0		
Grading	Tractor	80.0	84.2	115.9
	Grader	81.0		
	Compactor (ground)	76.0		
Building Construction	Crane	73.0	82.1	113.7
	Generator	78.0		
	Gradall	79.0		
Paving	Paver	74.0	77.8	109.5
	Dump Truck	72.0		
	Roller	73.0		
Architectural Coating	Man Lift	68.0	76.2	107.8
	Compressor (air)	74.0		
	Generator (<25kVA)	70.0		

[1] FHWA Road Construction Noise Model.

9.3 CONSTRUCTION NOISE ANALYSIS

Construction projects involve various stages, and activities frequently shift from one location to another. For example, during site preparation and grading, noise-generating activities may concentrate in an area for a short period to remove an obstruction, while the majority of the grading involves the equipment moving back and forth in a predictable pattern throughout the site; building construction and foundation work generally concentrate near the building footprint, while paving generally involves a predictable pattern of movement throughout the site. Therefore, construction activities are best evaluated as multiple moving point sources within the construction area since the speed and power of the equipment vary, and the equipment constantly changes position in terms of its distance and direction relative to the receivers. (7) (27) Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts by phase at the nearby sensitive receiver locations were completed. To account for the dynamic nature of construction activities, the CadnaA construction noise analysis evaluates the noise source activities as multiple moving point sources, or construction crews, within the limits of construction. Construction impacts are based on the loudest activity and the highest noise level calculated at each receiver location. As shown in Table 9-2, the construction noise levels are expected to range from 50.0 to

63.8 dBA Leq at the nearby receiver locations. Appendix 9.1 includes the detailed CadnaA construction noise model inputs.

TABLE 9-2: CONSTRUCTION ACTIVITY NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	62.0	60.8	59.2	59.4	55.5	54.4	62.0
R2	62.5	61.3	59.7	59.9	56.0	54.9	62.5
R3	63.8	62.6	61.0	61.2	57.3	56.2	63.8
R4	58.7	57.5	55.9	56.1	52.2	51.1	58.7
R5	61.3	60.1	58.5	58.7	54.8	53.7	61.3
R6	57.7	56.5	54.9	55.1	51.2	50.1	57.7
R7	57.6	56.4	54.8	55.0	51.1	50.0	57.6
R8	60.3	59.1	57.5	57.7	53.8	52.7	60.3

[1] Noise receiver locations are shown on Exhibit 7-A.
[2] Construction noise level calculations based on distance from the construction activity, which is measured from the Project site boundary to the nearest receiver locations. CadnaA construction noise model inputs are included in Appendix 9.1.

9.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

The applicant has stated that they will abide by restrictions set by The City of Newport Beach to control noise impacts associated with the construction of the Project. According to the City of Newport Beach Municipal Code Section 10.28.040 (included in Appendix 3.2):

A. No person shall, while engaged in construction, remodeling, digging, grading, demolition, painting, plastering or any other related building activity, operate any tool, equipment or machine in a manner which produces loud noise that disturbs, or could disturb, a person of normal sensitivity who works or resides in the vicinity, unless authorized to do so in accordance with subsection (B) of this section.

B. The provisions of subsection (A) of this section shall not apply to the following:

   1. Work performed on any weekday, which is not a federal holiday, between the hours of 7:00 a.m. and 6:30 p.m.

   2. Work performed on a Saturday, in any area of the City that is not designated as a high-density area, between the hours of 8:00 a.m. and 6:00 p.m.

   3. Emergency work performed pursuant to written authorization of the Community Development Director, or his or her designee.

   4. Maintenance, repair or improvement of any public work or facility by public employees, by any person or persons acting pursuant to a public works contract, or by any person or persons performing such work or pursuant to the direction of, or on behalf of, any public agency; provided, however, this exception shall not apply to the City of Newport Beach, or its employees, contractors or agents, unless:

Construction activities are considered exempt from the noise standards of the noise ordinance and are limited to the hours of 7:00 a.m. to 6:30 p.m. on Mondays to Fridays and 8:00 a.m. to 6:00 p.m. on Saturdays, with no activity allowed on Sundays or national holidays. (28) For informational purposes, the Project's construction noise levels are compared against the FTA's acceptable construction noise level of 80 dBA L_{eq} for sensitive receiver locations. Table 9-3 shows the highest construction noise levels at the potentially impacted receiver locations, which are estimated to range from 57.6 to 63.8 dBA L_{eq}. The noise impact due to Project construction noise levels is considered a *less than significant* impact at all nearest sensitive receiver locations.

TABLE 9-3: CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE

Receiver Location[1]	Land Use[2]	Highest Construction Noise Levels (dBA L_{eq})[3]
R1	80	62.0
R2	80	62.5
R3	80	63.8
R4	80	58.7
R5	80	61.3
R6	80	57.7
R7	80	57.6
R8	80	60.3

[1] Noise receiver locations are shown on Exhibit 7-A.
[2] City of Newport Beach Interactive Map (Zoning)
[3] Estimated construction noise levels during peak operating conditions, as shown in Table 9-2.

These *less than significant* findings are consistent with the 2006 General Plan Environmental Impact Report (EIR) (29): *Construction activities would be an ongoing occurrence in the City and, in particular cases, could occur in close proximity to noise-sensitive uses. Although the proposed General Plan Update limits construction activities to specific days of the week and hours of the day, construction equipment generates high noise levels, as shown in Table 4.9-9, and may not always be reducible to the levels specified in the City Noise Ordinance. Section 10.26.035 of the Municipal Code (Exemptions), exempts "noise sources associated with construction, repair, remodeling, demolition, or grading of any real property." Section 10.26.035 also states that construction noise should fall under the provisions of Section 10.28 of the Code (Loud and Unreasonable Noise). Thus, construction noise is not subject to the noise standards in the Municipal Code, but only during limited hours of the day and days of the week. In sum, existing and future construction noise levels at individual construction sites may not substantially differ, but previously unexposed areas could experience new sources of construction noise. Both existing and future noise would be exempt from the City code and when construction noise occurs, impacts would be considered less than significant.*

9.5 TEMPORARY CONSTRUCTION NOISE LEVEL INCREASES

To describe the temporary Project construction noise level contributions to the existing ambient noise environment, the Project construction noise levels were combined with the existing ambient noise level measurements at the nearest off-site receiver locations. The difference between the combined Project-construction and ambient noise levels is used to describe the construction noise level contributions. Temporary noise level increases that would be experienced at sensitive receiver locations when Project construction-source noise is added to the ambient daytime conditions are presented in Table 9-4. A temporary noise level increase of 12 dBA is considered a *potentially significant* impact based on the typical difference in operational property line limits and construction noise level limits.

TABLE 9-4: DAYTIME CONSTRUCTION NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Construction Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	62.0	L1	71.3	71.8	0.5	12	No
R2	62.5	L2	67.8	68.9	1.1	12	No
R3	63.8	L3	72.4	73.0	0.6	12	No
R4	58.7	L4	69.1	69.5	0.4	12	No
R5	61.3	L5	73.4	73.7	0.3	12	No
R6	57.7	L6	68.3	68.7	0.4	12	No
R7	57.6	L7	70.6	70.8	0.2	12	No
R8	60.3	L8	73.7	73.9	0.2	12	No

[1] Construction noise source and receiver locations are shown on Exhibit 9-A.
[2] Total Project daytime construction noise levels as shown in Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown in Table 5-1.
[5] Represents the combined ambient conditions plus the Project construction activities.
[6] The noise level increase expected with the addition of the proposed Project construction activities.
[7] Caltrans Traffic Noise Analysis Protocol.

As indicated in Table 9-4, the Project construction will contribute to noise level increases ranging from 0.2 to 1.1 dBA L_{eq} during the daytime hours at the nearest receiver locations. The unmitigated construction noise analysis shows that the nearest receiver locations will not exceed the *substantial* 12 dBA L_{eq} noise level increase significance threshold during Project construction activities. The temporary construction noise level increase analysis shows that the noise impacts due to Project construction noise are considered *less than significant*.

9.5 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground

vibration levels associated with various types of construction equipment are summarized on Table 9-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential vibration ranges using the following vibration assessment methods defined by Caltrans. To describe the vibration impacts Caltrans provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.1}$

TABLE 9-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089

Caltrans Transportation and Construction Vibration Guidance Manual, 2020.

Using the vibration source level of construction equipment provided in Table 9-4 and the construction vibration assessment methodology published by Caltrans, it is possible to estimate the Project vibration impacts. Table 9-5 presents the expected Project-related vibration levels at the nearby receiver locations. At distances ranging from 169 to 797 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.00 to 0.01 PPV in/sec. Based on the maximum acceptable continuous vibration threshold of 0.30 PPV in/sec, the typical Project construction vibration levels will fall below the building damage thresholds at all the vibration-sensitive receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during construction activities at the Project site.

TABLE 9-5: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver Location[1]	Distance to Construction Activity (Feet)	Receiver Vibration Levels (PPV)[2]					Threshold (PPV)[3]	Threshold Exceeded?[4]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Highest Vibration Levels		
R1	399'	0.00	0.00	0.00	0.00	0.00	0.30	No
R2	256'	0.00	0.00	0.01	0.01	0.01	0.30	No
R3	169'	0.00	0.00	0.01	0.01	0.01	0.30	No
R4	502'	0.00	0.00	0.00	0.00	0.00	0.30	No
R5	284'	0.00	0.00	0.01	0.01	0.01	0.30	No
R6	673'	0.00	0.00	0.00	0.00	0.00	0.30	No
R7	797'	0.00	0.00	0.00	0.00	0.00	0.30	No
R8	386'	0.00	0.00	0.00	0.00	0.00	0.30	No

[1] Noise receiver locations are shown on Exhibit 7-A.
[2] Based on the Vibration Source Levels of Construction Equipment included in Table 8-4.
[3] Caltrans Transportation and Construction Vibration Guidance Manual, 2020. .
[4] Does the vibration level exceed the acceptable vibration level for the given land use?

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27. —. *FHWA Highway Construction Noise Handbook.* Final Report August 2006.

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29. —. *Draft Environmental Impact Report General Plan 2006 Update.* April 2006.

11 CERTIFICATION

The contents of this noise analysis report represent an accurate depiction of the noise environment and impacts associated with the Project. The information contained in this noise analysis report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (619) 778-1971.

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EDUCATION

Bachelor of Science in Urban and Regional Planning
California Polytechnic State University, Pomona • June 2000

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
INCE – Institute of Noise Control Engineers

PROFESSIONAL CERTIFICATIONS

Approved Acoustical Consultant • County of San Diego
FHWA Traffic Noise Model of Training • 2004
CadnaA Basic and Advanced Training • 2023

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APPENDIX 3.1:

CITY OF NEWPORT BEACH MUNICIPAL CODE CHAPTER 10.26

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Chapter 10.26
COMMUNITY NOISE CONTROL

Sections:

10.26.005 Declaration of Policy.

A. In order to control unnecessary, excessive and annoying noise in the City of Newport Beach, it is declared to be the policy of the City to prohibit such noise generated from or by all sources as specified in this chapter.

B. It is determined that certain noise levels are detrimental to the public health, welfare and safety and contrary to public interest; therefore, the City Council does ordain and declare that creating, maintaining, causing or allowing to be created, caused or maintained, any noise in a manner prohibited by, or not in conformity with, the provisions of this chapter, is a public nuisance and may be punished as a public nuisance. (Ord. 2023-22 § 447, 2023; Ord. 95-38 § 11 (part), 1995)

10.26.010 Definitions.

The following words, phrases and terms as used in this chapter shall have the meanings as indicated here:

“Agricultural property” means a parcel of real property which is undeveloped for any use other than agricultural purposes.

“Ambient noise level” means the all-encompassing noise level associated with a given environment, being a composite of sounds from all sources, excluding the alleged offensive noise, at the location and approximate time at which a comparison with the alleged offensive noise is to be made.

“A-weighted sound level” means the total sound level meter with a reference pressure of twenty (20) micropascals using the A-weighted network (scale) at slow response. The unit of measurement shall be defined as DBA.

“Code Enforcement Officer” means the Code Enforcement Officer of the City or his duly authorized deputy.

“Commercial property” means a parcel of real property which is used as either in part or in whole for commercial purposes.

“Cumulative period” means an additive period of time composed of individual time segments which may be continuous or interrupted.

“Decibel (Db)” means a unit which denotes the ratio between two quantities which are proportional to power: the number of decibels corresponding to the ratio of two amounts of power is ten times the logarithm to the base ten of this ratio.

“Dwelling unit” means any area within a structure on any parcel which:

1. Contains separate or independent living facilities for one or more persons, with an area or equipment for sleeping, sanitation and food preparation, and which has independent exterior access to ground level; or

2. Is being utilized for residential purposes by one or more persons separately or independently from occupants of other areas within the structure.

“Emergency machinery, vehicle, work or alarm” means any machinery, vehicle, work or alarm used, employed, performed or operated in an effort to protect, provide or restore safety conditions in the community or for the citizenry, or work by private or public utilities when restoring utility service.

“Equivalent, noise, level, leq.” means the sound level corresponding to a steady state noise level over a given measurement period with the same amount of acoustic energy as the actual time varying noise level. Also known as the energy average noise level during the measurement period. The measurement period shall be fifteen (15) minutes under the terms of this chapter.

“Fixed noise source” means a stationary device which creates sounds while fixed or motionless including but not limited to residential, agricultural, industrial and commercial machinery and equipment, pumps, fans, compressors, air conditioners and refrigeration equipment.

“Grading” means any excavating of filling of earth material or any combination thereof conducted at a site to prepare said site for construction or other improvements thereon.

“Health care institution” means any hospital, convalescent home or other similar facility excluding residential.

“Hertz (HZ)” means the unit which describes the frequency of a function periodic in time which is the reciprocal of the period.

“Impulsive noise” means a noise of short duration usually less than one second and of high intensity, with an abrupt onset and rapid decay.

“Industrial property” means a parcel of real property which is used either in part or in whole for manufacturing purposes.

“Intruding noise level” means the total sound level, in decibels, created, caused, maintained or originating from an alleged offensive source at a specified location while the alleged offensive source is in operation.

“Licensed” means the issuance of a formal license or permit by the appropriate jurisdictional authority, or where no permits or licenses are issued, the sanctioning of the activity by the jurisdiction as noted in public record.

“Major roadway” means any street, avenue, boulevard or highway used for motor vehicle traffic which is owned or controlled by a public government entity.

“Mobile noise source” means any noise source other than a fixed noise source.

“Residential property” means a parcel of real property which is used either in part or in whole for residential purposes, other than transient uses such as hotels and motels, and residential care facilities. Residential property includes the residential portion of mixed use properties.

“Simple tone noise” means a noise characterized by a predominant frequency or frequencies so that other frequencies cannot be readily distinguished. If measured, simple tone noise shall exist if the one-third octave band sound pressure levels in the band with the tone exceeds the arithmetic average of the sound pressure levels of the two continuous one-third octave bands as follows: five Db for frequencies of five hundred (500) Hertz (Hz) and above or, by fifteen (15) Db for frequencies less than or equal to one hundred twenty-three (123) Hz.

“Sound level meter” means an instrument meeting American National Standard Institute’s Standard S1.4-1971 or most recent revision thereof for Type 2 sound level meters or an instrument and the associated recording and analyzing equipment which will provide equivalent data.

“Sound pressure level” of a sound, in decibels, means twenty (20) times the logarithm to the base ten of the ratio of the pressure of the sound to a reference pressure which shall be explicitly stated.

“Vibration” means any movement of the earth, ground or other similar surface created by a temporal and spatial oscillation device or equipment located upon, affixed in conjunction with that surface. (Ord. 2023-22 § 448, 2023; Ord. 95-38 § 11 (part), 1995)

10.26.015 Decibel Measurement Criteria.

Any decibel measurement made pursuant to the provisions of this chapter shall be based on a reference sound pressure of twenty (20) micropascals as measured with a sound level meter using the A-weighted network (scale) at slow response. (Ord. 95-38 § 11 (part), 1995)

10.26.020 Designated Noise Zones.

The properties hereinafter described assigned to the following noise zones:

Noise Zone I	—	All single-, two- and multiple-family residential properties;

Noise Zone II	—	All commercial properties;
Noise Zone III	—	The residential portion of mixed-use properties;
Noise Zone IV	—	All manufacturing or industrial properties.

The actual use of the property shall be the determining factor in establishing whether a property is in Noise Zone I, II, III or IV provided that the actual use is a legal use in the City of Newport Beach. (Ord. 95-38 § 11 (part), 1995)

10.26.025 Exterior Noise Standards.

A. The following noise standards, unless otherwise specifically indicated, shall apply to all property with a designated noise zone:

		ALLOWABLE EXTERIOR NOISE LEVEL (Equivalent Noise Level, Leq)	
NOISE ZONE	**TYPE OF LAND USE**	**7 a.m. to 10 p.m.**	**10 p.m. to 7 a.m.**
I	Single-, two-or multiple-family residential	55 DBA	50 DBA
II	Commercial	65 DBA	60 DBA
III	Residential portions of mixed-use properties	60 DBA	50 DBA
IV	Industrial or manufacturing	70 DBA	70 DBA

If the ambient noise level exceeds the resulting standard, the ambient shall be the standard.

B. It is 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 person, which causes the noise level when measured on any other property, to exceed either of the following:

1. The noise standard for the applicable zone for any fifteen-minute period;

2. A maximum instantaneous noise level equal to the value of the noise standard plus twenty (20) DBA for any period of time (measured using A-weighted slow response).

C. In the event the ambient noise level exceeds the noise standard, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

D. The Noise Zone III standard shall apply to that portion of residential property falling within one hundred (100) feet of a commercial property, if the intruding noise originates from that commercial property.

E. If the measurement location is on boundary between two different noise zones, the lower noise level standard applicable to the noise zone shall apply. (Ord. 95-53 § 1, 1995; Ord. 95-38 § 11 (part), 1995)

10.26.030 Interior Noise Standards.

A. The following noise standard, unless otherwise specifically indicated, shall apply to all residential property within all noise zones:

		ALLOWABLE INTERIOR NOISE LEVEL (Equivalent Noise Level, Leq)	
NOISE ZONE	**TYPE OF LAND USE**	**7 a.m. to 10 p.m.**	**10 p.m. to 7 a.m.**
I	Residential	45 DBA	40 DBA
III	Residential portions of mixed-use properties	45 DBA	40 DBA

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:

1. The noise standard for the applicable zone for any fifteen-minute period;

2. A maximum instantaneous noise level equal to the value of the noise standard plus twenty (20) DBA for any period of time (measured using A-weighted slow response).

C. 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.

D. The Noise Zone III standard shall apply to that portion of residential property falling within one hundred (100) feet of a commercial property, if the intruding noise originates from that commercial property.

E. 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. (Ord. 95-53 § 2, 1995; Ord. 95-38 § 11 (part), 1995)

10.26.035 Exemptions.

The following activities shall be exempted from the provisions of this chapter:

A. Any activity conducted on public property, or on private properly with the consent of the owner, by any public entity, or its officers, employees, representatives, agents, subcontractors, permittees, licensees, or lessees, which are consistent with, and in furtherance of, the governmental functions or services the public entity has authorized, or responsible, to perform, activities which are exempt from the provisions of this chapter include, without limitation, sporting and recreational activities which are sponsored or co-sponsored by the City of Newport Beach or the Newport Mesa Unified School District;

B. 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;

C. Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle, work or warning alarm or bell, provided the sounding of any bell or alarm on any building or motor vehicle shall terminate its operation within forty-five (45) minutes in any hour of its being activated;

D. Noise sources associated with construction, repair, remodeling, demolition or grading of any real property. Such activities shall instead be subject to the provisions of Chapter 10.28 of this title;

E. Noise sources associated with construction, repair, remodeling, demolition or grading of public rights-of-way or during authorized seismic surveys;

F. All mechanical devices, apparatus or equipment associated with agriculture operations provided that:

1. Operations do not take place between eight p.m. and seven a.m. on weekdays, including Saturday, or at any time Sunday or a federal holiday, or

2. Such operations and equipment are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions, or

3. Such operations and equipment are associated with agricultural pest control through pesticide application, provided the application is made in accordance with permits issued by or regulations enforced by the California Department of Agriculture;

G. Noise sources associated with the maintenance of real property. Such activities shall instead be subject to the provisions of Chapter 10.28 of this title;

H. Any activity to the extent regulation thereof has been preempted by state or federal law. NOTE: Preemption may include motor vehicle, aircraft in flight, and railroad noise regulations;

I. Any noise sources associated with people and/or music associated with a party at a residential property. Such noise is difficult to measure under the terms of this chapter and instead shall be subject to the provisions of Chapters 10.28 and 10.58 of this title;

J. Any noise sources associated with barking dogs or other intermittent noises made by animals on any properly within the City of Newport Beach. Such noise is difficult to measure under the terms of this chapter and instead shall be subject to the provisions of Chapter 7.20 of this Code;

K. Any noise sources associated with the operation of a permanently installed heating, venting and air conditioning (HVAC) equipment on a residential property permitted under the provisions of Section 10.26.045(B) and (C);

L. Any noise sources specifically identified and mitigated under the provisions of a use permit, modification permit, development agreement or planned community district development plan adopted prior to the date of adoption of this chapter. (Ord. 95-53 § 3, 1995; Ord. 95-38 § 11 (part), 1995)

10.26.040 Schools, Day Care Centers, Churches, Libraries, Museums, Health Care Institutions—Special Provisions.
It is unlawful for any person to create any noise which causes the noise level at any school, day care center, hospital or similar health care institution, church, library or museum while the same is in use, to exceed the noise standards specified in Section 10.26.025 prescribed for the assigned Noise Zone I (residential uses). (Ord. 95-38 § 11 (part), 1995)

10.26.045 Heating, Venting and Air Conditioning—Special Provisions.
A. New HVAC Equipment. New permits for heating, venting and air conditioning (HVAC) equipment in or adjacent to residential areas shall be issued only where installations can be shown by computation, based on the sound rating of the proposed equipment, not to exceed an A-weighted sound pressure level of fifty (50) DBA or not to exceed an A-weighted sound pressure level of fifty-five (55) dBA and be installed with a timing device that will deactivate the equipment during the hours of ten p.m. to seven a.m. The method of computation used shall be that specified in “Standard Application of Sound Rated Outdoor Unitary Equipment,” Standard 275, Air conditioning and Refrigeration Institute, 1984 or latest revision thereof.

B. Existing HVAC Equipment.

1. HVAC equipment legally installed prior to April 22, 1981, shall be permitted to operate with an exterior noise limit of sixty-five (65) dBA until January 1, 1998.

2. HVAC equipment legally installed prior to April 22, 1981, shall be exempted from the interior noise level standard as specified in Section 10.26.030 of this chapter until January 1, 1998.

3. HVAC equipment legally installed after April 22, 1981, and prior to the date of adoption of this chapter shall not exceed a maximum exterior noise limit of fifty-five (55) dBA during the ninety-day compliance period set forth in Section 10.26.005.

C. In the event that HVAC equipment cannot meet the requirements set forth in this chapter, then the exterior noise limit for such equipment may be raised to sixty-five (65) dBA and exempted from the interior noise level standard as specified in Section 10.26.030 of this chapter, provided that the applicant obtains the written consent of all the owners of the affected properties. (Ord. 95-38 § 11 (part), 1995)

10.26.050 Sound-Amplifying Equipment.
Loudspeakers, sound amplifiers, public address systems or similar devices used to amplify sounds shall be subject to the provisions of Chapter 10.32 of this title. Such sound-amplifying equipment shall not be construed to include electronic devices,

including but not limited to, radios, tape players, tape recorders, compact disc players, electric keyboards, music synthesizers, record players or televisions, which are designed and operated for personal use, or used entirely within a building and are not designed or used to convey the human voice, music or any other sound to an audience outside such building, or which are used in vehicles and heard only by occupants of the vehicle in which installed, which shall be subject to the provisions of Chapter 10.28 of this title. (Ord. 95-38 § 11 (part), 1995)

10.26.055 Noise Level Measurement.

A. The location selected for measuring exterior noise levels in a residential area shall be at any part of a private yard, patio, deck or balcony normally used for human activity and identified by the owner of the affected property as suspected of exceeding the noise level standard. This location may be the closest point in the private yard or patio, or on the deck or balcony, to the noise source, but should not be located in nonhuman activity areas such as trash container storage areas, planter beds, above or contacting a property line fence, or other areas not normally used as part of the yard, patio, deck or balcony. The location selected for measuring exterior noise levels in a nonresidential area shall be at the closest point to the noise source. The measurement microphone height shall be five feet above finish elevation or, in the case of a deck or balcony, the measurement microphone height shall be five feet above the finished floor level.

B. The location selected for measuring interior noise levels shall be made within the affected residential unit. The measurements shall be made at a point at least four feet from the wall, ceiling or floor, or within the frame of a window opening, nearest the noise source. The measurements shall be made with windows in an open position. (Ord. 95-38 § 11 (part), 1995)

10.26.065 Proposed Developments.

Each department whose duty it is to review and approve new projects or changes to existing projects that result or may result in the creation of noise shall consult with the Code Enforcement Officer prior to any such approval. If at any time the Code Enforcement Officer has reason to believe that a standard, regulation, action, proposed standard, regulation or action of any department respecting noise does not conform to the provisions as specified in this chapter, the Code Enforcement Officer may request such department to consult with him on the advisability of revising such standard or regulation to obtain uniformity. (Ord. 95-38 § 11 (part), 1995)

10.26.070 Prima Facie Violation.

Any noise exceeding the noise level standard as specified in Section 10.26.025 and 10.26.030 of this chapter, shall be deemed to be prima facie evidence of a violation of the provisions of this chapter. (Ord. 95-38 § 11 (part), 1995)

10.26.075 Violations.

Any persons violating any of the provisions of this chapter shall be deemed guilty of an infraction. (Ord. 95-38 § 11 (part), 1995)

10.26.080 Violations—Additional Remedies—Injunctions.

A. As an additional remedy, the operation or maintenance of any device, instrument, vehicle or machinery in violation of any provisions of this chapter which operation or maintenance causes or creates sound levels exceeding the allowable standards as specified in this chapter shall be deemed and is declared to be a public nuisance and may be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction.

B. Any violation of this chapter is declared to be a public nuisance and may be abated in accordance with law. The expense of this chapter is declared to be public nuisance and may be by resolution of the City Council declared to be a lien against the

property on which such nuisance is maintained, and such lien shall be made a personal obligation of the property owner. (Ord. 95-38 § 11 (part), 1995)

10.26.085 City Manager Waiver.

The City Manager is authorized to grant a temporary waiver to the provisions of this chapter for a period of time not to exceed thirty (30) days if such temporary waiver would be in the public interest and there is no feasible and prudent alternative to the activity, or the method of conducting the activity, for which the temporary waiver is sought. (Ord. 95-38 § 11 (part), 1995)

10.26.090 Noise Abatement Programs.

A. In circumstances which adopted community-wide noise standards and policies prove impractical in controlling noise generated from a specific source, the City Council may establish a noise abatement program which recognizes the characteristics of the noise source and affected property and which incorporates specialized mitigation measures.

B. Noise abatement programs shall set forth in detail the approved terms, conditions and requirements for achieving maximum compliance with noise standards and policies. Said terms, conditions and requirements may include, but shall not be limited to, limitations, restrictions, or prohibitions on operating hours, location of operations, and the types of equipment. (Ord. 95-38 § 11 (part), 1995)

10.26.095 Manner of Enforcement.

A. The City Code Enforcement Officer is directed to enforce the provisions of this chapter and may issue citations for any violation of the provisions of this chapter or violations of this chapter may be prosecuted or enforced in the same manner as other infractions pursuant to this Code; provided, however, that in the event of an initial violation of the provisions of this chapter, a written notice may be given to the alleged violator which specifies the time by which the condition shall be corrected.

B. No person shall interfere with, oppose or resist any authorized person charged with the enforcement of this chapter while such person is engaged in the performance of his/her duty.

C. In the event the alleged violator cannot be located in order to serve any notice, the notice shall be deemed to be given upon mailing such notice by registered or certified mail to the alleged violator at his last known address or at the place where the violation occurred in which event the specified time period for abating the violation or applying for a variance shall commence at the date of the day following the mailing of such notice. (Ord. 95-38 § 11 (part), 1995)

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APPENDIX 3.2:

CITY OF NEWPORT BEACH MUNICIPAL CODE CHAPTER 10.28

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Chapter 10.28
LOUD AND UNREASONABLE NOISE*

Sections:

* Sound-amplifying equipment—See Chapter 10.32.

Prior history: 1949 Code § 4208; Ords. 1191, 1802, 87-11, 87-17 and 93-7.

10.28.005 Policy.

It is found and declared as follows:

A. The making, allowing, creation or maintenance of loud and unreasonable, unnecessary, or unusual noises which are prolonged, unusual, annoying, disturbing and/or unreasonable in their time, place and use are a detriment to public health, comfort, convenience, safety, general welfare and the peace and quiet of the City and its inhabitants.

B. The necessity in the public interest for the provisions and prohibitions contained and enacted is to declare as a matter of legislative determination and public policy, and it is further declared that the provisions and prohibitions contained and enacted are in pursuance of and for the purpose of securing and promoting the public health, comfort, convenience, safety, general welfare and property and the peace and quiet of the City and its inhabitants. (Ord. 2001-4 § 1, 2001)

10.28.007 Loud and Unreasonable Noise is Prohibited.

It is unlawful for any person or property owner to make, continue, cause or allow to be made any loud, unreasonable, unusual, penetrating or boisterous noise, disturbance or commotion which annoys, disturbs, injures or endangers the comfort, repose, health, peace and quiet within the limits of the City, and the acts and things listed in this chapter, among others, are declared to be loud, disturbing, injurious and unreasonable noises in violation of this Chapter, but shall not be deemed to be exclusive. (Ord. 2001-4 § 2, 2001)

10.28.010 Loud and Unreasonable Noise.

It is unlawful for any person or property owner to willfully make, allow, continue or cause to be made, allowed, or continued, any loud and unreasonable, unnecessary, or disturbing noise, including, but not limited to, yelling, shouting, hooting, whistling, singing, playing music, or playing a musical instrument, which disturbs the peace, comfort, quiet or repose of any area or which causes discomfort or annoyance to any reasonable person of normal sensitivities in the area, after a peace or code enforcement officer has first requested that the person or property owner cease and desist from making or continuing, or causing to make or continue, such loud, unreasonable, unnecessary, excessive or disturbing noise.

The factors, standards, and conditions which should be considered in determining whether a violation of the provisions of this section has been committed, include, but are not limited to, the following:

A. The level of the noise;

B. Whether the nature of the noise is usual or unusual;

C. Whether the origin of the noise is natural or unnatural;

D. The level and intensity of the background (ambient) noise, if any;

E. The proximity of the noise to residential or commercial sleeping areas;

F. The nature and zoning of the area within which the noise emanates;

G. The density of inhabitation of the area within which the noise emanates;

H. The time of day and night the noise occurs;

I. The duration of the noise;

J. Whether the noise is constant, or recurrent or intermittent; and

K. Whether the noise is produced by a commercial or noncommercial activity;

L. If the noise is produced by a commercial activity, whether the use is lawful under the provisions of Title 20 of this Code and whether the noise is one that could reasonably be expected from the commercial activity. (Ord. 2023-22 § 450, 2023; Ord. 2001-4 § 3 (part), 2001: Ord. 95-38 § 3 (part), 1995)

10.28.020 Loud and Raucous Noise from Sound-Making or Amplifying Devices Prohibited.

A. It is unlawful for any person to cause, allow or permit the emission or transmission of any loud or raucous noise from any sound-making or sound-amplifying device in his possession or under his control:

1. Upon any private property; or

2. Upon any public street, alley, sidewalk or thoroughfare; or

3. In or upon any public park, beach or other public place or property.

B. The words “loud and raucous noise,” as used herein, shall mean any sound or any recording thereof when amplified or increased by any electrical, mechanical or other device to such volume, intensity or carrying power as to unreasonably interfere with the peace and quiet of other persons within or upon any one or more of such places or areas, or as to unreasonably annoy, disturb, impair or endanger the comfort, repose, health, or safety of other persons within or upon any one or more such places or areas.

C. The word “unreasonably,” as used herein, shall include, but not be limited to, consideration of the hour, place, nature and circumstances of the emission or transmission of any such loud and raucous noise. (Ord. 2023-22 § 451, 2023; Ord. 2001-4 § 3 (part), 2001: Ord. 95-38 § 3 (part), 1995)

10.28.040 Construction Activity—Noise Regulations.

A. No person shall, while engaged in construction, remodeling, digging, grading, demolition, painting, plastering or any other related building activity, operate any tool, equipment or machine in a manner which produces loud noise that disturbs, or could disturb, a person of normal sensitivity who works or resides in the vicinity, unless authorized to do so in accordance with subsection (B) of this section.

B. The provisions of subsection (A) of this section shall not apply to the following:

1. Work performed on any weekday, which is not a Federal holiday, between the hours of 7:00 a.m. and 6:30 p.m.

2. Work performed on a Saturday, in any area of the City that is not designated as a high-density area, between the hours of 8:00 a.m. and 6:00 p.m.

3. Emergency work performed pursuant to written authorization of the Community Development Director.

4. Maintenance, repair or improvement of any public work or facility by public employees, by any person or persons acting pursuant to a public works contract, or by any person or persons performing such work or pursuant to the direction of, or on behalf of, any public agency; provided, however, this exception shall not apply to the City, or its employees, contractors or agents, unless:

a. The City Manager or department director determines that the maintenance, repair or improvement is immediately necessary to maintain public services;

b. The maintenance, repair or improvement is of a nature that cannot feasibly be conducted during normal business hours; or

c. The City Council has approved project specifications, contract provisions, or an environmental document that specifically authorizes construction during hours of the day which would otherwise be prohibited pursuant to this section.

C. No landowner, construction company owner, contractor, subcontractor, or employer shall permit or allow any person or persons working under their direction and control to operate any tool, equipment or machine in violation of the provisions of this section.

D. Designated High-Density Area. The term “designated high-density area” shall mean any shaded area on the map on file in the City Clerk’s office designated as a high-density area (High Density Map). The geographical boundaries of a homeowners’ association, as defined in subsection (E) of this section, shall be excluded from the definition of a “designated high-density area” if the City Council adopts a resolution pursuant to subsection (E) of this section.

E. A homeowners' association located within a designated high-density area may exclude the geographical boundaries of the homeowners' association from the definition of a designated high-density area if:

1. The board of directors of the homeowners' association votes to approve a resolution or letter declaring its desire to exempt its geographical boundaries from the definition of a designated high-density area;

2. The board of directors submits the approved resolution or letter to the City Clerk for consideration by the City Council; and

3. The City Council adopts a resolution finding that exempting the geographical boundaries of the homeowners' association from the definition of a designated high-density area will not negatively affect surrounding property owners.

For the purpose of this subsection, a "homeowners' association" means an organization consisting of at least thirty (30) voting members whose properties connect in a contiguous manner and whose operation is governed by a board of directors. (Ord. 2023-22 § 452, 2023; Ord. 2019-11 §§ 1, 2, 2019; Ord. 2019-9 § 1, 2019: Ord. 2013-11 § 35, 2013; Ord. 2001-4 § 3 (part), 2001: Ord. 95-38 § 3 (part), 1995)

10.28.045 Real Property Maintenance—Noise Regulations.

A. Weekdays and Saturdays. No person shall, while engaged in maintenance of real property, operate any tool, equipment or machine in a manner which produces loud noise that disturbs, or could disturb, a person of normal sensitivity who works or resides in the vicinity, except between the hours of seven a.m. and six-thirty p.m., Monday through Friday, nor on any Saturday, except between the hours of eight a.m. and six p.m.

B. Sundays and Holidays. No person shall, while engaged in maintenance of real property, operate any tool, equipment or machine in a manner which produces loud noise that disturbs, or could disturb, a person of normal sensitivity who works or resides in the vicinity, on any Sunday or any federal holiday.

C. No landowner, gardener, property maintenance service, contractor, subcontractor or employer shall permit or allow any person or persons working under their direction and control to operate any tool, equipment or machine in violation of the provisions of this section.

D. Mechanical blowers, as defined in Section 6.04.040, shall not be operated at a noise level that exceeds an A-weighted sound pressure level of sixty-five (65) dBA, as measured from a distance of fifty (50) feet.

E. Exceptions. The provisions of this section shall not apply to the following:

1. Emergency property maintenance authorized by the Community Development Director;

2. The maintenance, repair or improvement of any public work or facility by public employees, by any person or persons acting pursuant to a public works contract, or by any person or persons performing such work or pursuant to the direction of, or on behalf of, any public agency; provided, however, this exception shall not apply to the City of Newport Beach, or its employees, contractors or agents, unless:

a. The City Manager or department director determines that the maintenance, repair or improvement is immediately necessary to maintain public service,

b. The maintenance, repair or improvement is of a nature that cannot feasibly be conducted during normal business hours,

c. The City Council has approved project specifications, contract provisions, or an environmental document that specifically authorizes construction during hours of the day which would otherwise be prohibited pursuant to this section;

3. Greens maintenance on golf courses conducted between the hours of six a.m. and eight p.m. and all other types of golf course maintenance between the hours of seven a.m. and eight p.m., provided no maintenance activity commences before six a.m. (Ord. 2023-22 § 453, 2023; Ord. 2019-15 § 7, 2019; Ord. 2019-9 § 2, 2019; Ord. 2001-4 § 3 (part), 2001: Ord. 95-38 § 3 (part), 1995)

10.28.050 Exceptions.

The provisions of Sections 10.28.040 and 10.28.045 shall not be construed to prohibit such work at different hours by or under the direction of any other public agency in cases of necessity or emergency. (Ord. 2001-4 § 3 (part), 2001: Ord. 95-38 § 3 (part), 1995)

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APPENDIX 5.1:

STUDY AREA PHOTOS

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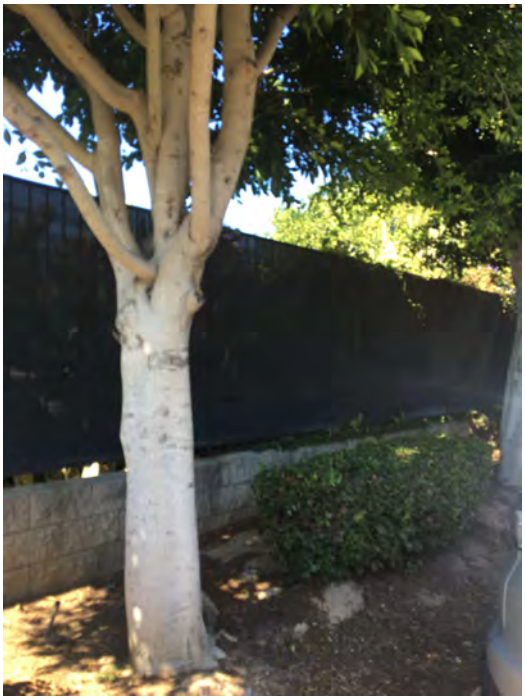
16241 - Surf Farm

16241_L1_A_East
33, 39' 36.350000",117, 52' 58.100000"

16241_L1_A_North
33, 39' 34.230000",117, 53' 1.640000"



16241_L1_A_South
33, 39' 36.350000",117, 52' 58.100000"

16241_L1_A_West
33, 39' 36.320000",117, 52' 58.210000"

16241 - Surf Farm

16241_L2_B_East
33, 39' 34.450000",117, 53' 1.670000"

16241_L2_B_North
33, 39' 33.770000",117, 53' 1.480000"

16241_L2_B_South
33, 39' 34.400000",117, 53' 1.640000"

16241_L2_B_West
33, 39' 34.310000",117, 53' 1.610000"

16241 - Surf Farm

16241_L3_C_East
33, 39' 33.760000",117, 53' 1.480000"

16241_L3_C_North
33, 39' 33.800000",117, 53' 1.560000"

16241_L3_C_South
33, 39' 33.750000",117, 53' 1.480000"

16241_L3_C_West
33, 39' 33.730000",117, 53' 1.510000"

16241 - Surf Farm

16241_L4_D_East
33, 39' 33.060000",117, 53' 6.470000"

16241_L4_D_North
33, 39' 33.050000",117, 53' 6.450000"

16241_L4_D_South
33, 39' 33.070000",117, 53' 6.470000"

16241_L4_D_West
33, 39' 33.060000",117, 53' 6.450000"

16241 - Surf Farm

16241_L5_P_East
33, 39' 29.670000",117, 53' 4.750000"

16241_L5_P_North
33, 39' 29.630000",117, 53' 4.750000"

16241_L5_P_South
33, 39' 29.670000",117, 53' 4.750000"

16241_L5_P_West
33, 39' 29.670000",117, 53' 4.720000"

16241 - Surf Farm

16241_L6_R_East
33, 39' 18.630000",117, 52' 51.830000"

16241_L6_R_North
33, 39' 19.560000",117, 52' 51.640000"

16241_L6_R_South
33, 39' 19.930000",117, 52' 51.120000"

16241_L6_R_West
33, 39' 19.960000",117, 52' 51.150000"

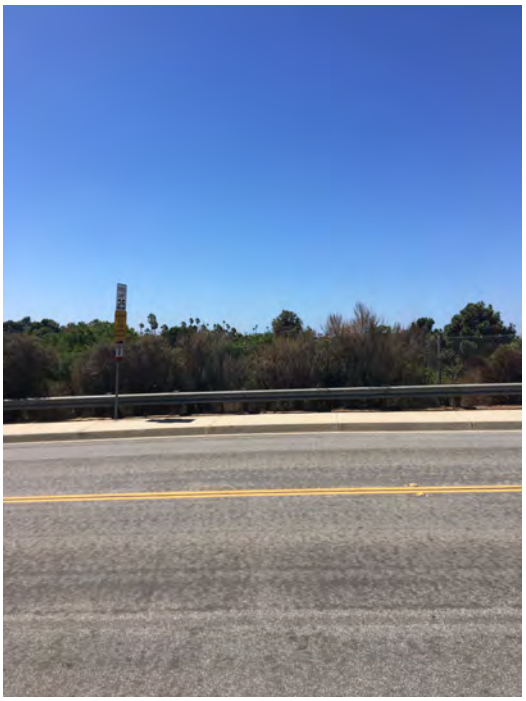
16241 - Surf Farm

16241_L7_U_East
33, 39' 21.410000",117, 52' 47.110000"

16241_L7_U_North
33, 39' 21.400000",117, 52' 47.110000"

16241_L7_U_South
33, 39' 21.400000",117, 52' 47.110000"

16241_L7_U_West
33, 39' 21.410000",117, 52' 47.110000"



16241 - Surf Farm

16241_L9_V_East
33, 39' 31.670000",117, 52' 42.690000"

16241_L9_V_North
33, 39' 31.670000",117, 52' 42.690000"

16241_L9_V_South
33, 39' 31.670000",117, 52' 42.690000"

16241_L9_V_West
33, 39' 31.670000",117, 52' 42.690000"

APPENDIX 5.2:

NOISE MEASUREMENT WORKSHEETS

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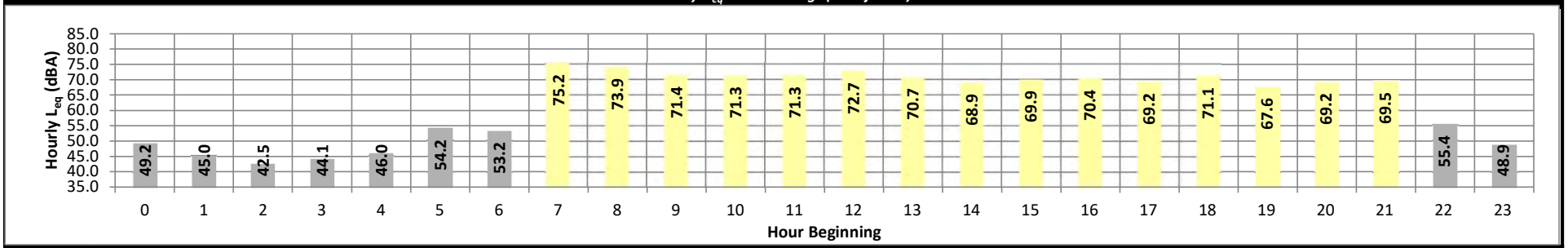
24-Hour Noise Level Measurement Summary

Date: Thursday, September 12, 2024 *Location:* L1 - Located northwest of the site near the residence at 20352 *Meter:* Piccolo II *JN:* 16241

Project: Surf Farm *Source:* Kline Dr. *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	49.2	57.1	44.2	56.5	55.9	54.3	53.1	49.1	47.2	45.6	44.8	44.4	49.2	10.0	59.2
	1	45.0	52.8	40.5	52.4	51.9	50.3	48.9	45.1	42.7	41.3	41.1	40.9	45.0	10.0	55.0
	2	42.5	50.2	35.6	50.0	49.6	48.3	47.4	43.6	38.4	36.0	35.9	35.7	42.5	10.0	52.5
	3	44.1	52.4	35.5	52.1	51.6	50.4	49.3	44.5	40.6	36.0	35.8	35.6	44.1	10.0	54.1
	4	46.0	52.1	40.5	51.9	51.5	50.5	49.8	47.2	44.2	41.2	40.9	40.6	46.0	10.0	56.0
	5	54.2	65.0	44.3	64.3	63.5	61.3	58.1	53.1	49.8	45.8	45.1	44.5	54.2	10.0	64.2
	6	53.2	58.5	46.5	58.3	58.0	57.4	56.8	54.5	52.1	48.0	47.3	46.7	53.2	10.0	63.2
Day	7	75.2	85.7	52.5	85.3	84.9	84.0	82.5	70.3	58.8	54.0	53.4	52.6	75.2	0.0	75.2
	8	73.9	84.1	52.2	83.9	83.6	82.6	81.2	69.5	59.0	53.7	53.0	52.4	73.9	0.0	73.9
	9	71.4	81.3	54.0	80.9	80.5	79.7	78.6	68.3	60.4	55.8	54.9	54.2	71.4	0.0	71.4
	10	71.3	80.9	52.9	80.6	80.3	79.5	78.5	68.8	59.3	54.6	53.8	53.0	71.3	0.0	71.3
	11	71.3	81.6	53.8	81.0	80.6	79.3	78.2	69.2	60.9	55.3	54.6	53.9	71.3	0.0	71.3
	12	72.7	83.2	54.2	82.7	82.1	81.0	79.7	70.2	60.4	55.7	55.0	54.3	72.7	0.0	72.7
	13	70.7	80.6	53.6	80.1	79.6	78.5	77.3	69.5	59.8	54.9	54.3	53.7	70.7	0.0	70.7
	14	68.9	78.4	53.4	78.0	77.5	76.6	75.8	67.7	59.2	55.1	54.4	53.6	68.9	0.0	68.9
	15	69.9	79.7	53.7	79.2	78.8	77.9	76.6	67.9	59.7	55.4	54.7	53.9	69.9	0.0	69.9
	16	70.4	79.9	53.4	79.5	79.2	78.3	77.4	68.9	59.8	55.1	54.4	53.6	70.4	0.0	70.4
	17	69.2	79.1	51.6	78.6	78.2	77.0	76.3	67.5	58.0	53.3	52.5	51.8	69.2	0.0	69.2
	18	71.1	80.6	52.1	80.3	80.0	79.1	77.9	69.5	58.9	53.9	53.0	52.3	71.1	0.0	71.1
	19	67.6	76.8	50.5	76.4	76.0	75.1	74.0	68.1	57.3	52.2	51.4	50.7	67.6	5.0	72.6
	20	69.2	78.3	50.0	77.9	77.7	77.2	76.2	68.0	56.6	51.7	50.9	50.1	69.2	5.0	74.2
	21	69.5	79.2	49.0	78.9	78.7	77.8	76.7	67.0	55.4	50.5	49.9	49.2	69.5	5.0	74.5
Night	22	55.4	63.4	44.0	63.2	62.9	62.2	61.3	55.3	50.3	46.0	44.9	44.2	55.4	10.0	65.4
	23	48.9	55.3	41.4	54.9	54.4	53.2	52.6	50.2	47.4	42.8	42.1	41.5	48.9	10.0	58.9

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	67.6	76.8	49.0	76.4	76.0	75.1	74.0	67.0	55.4	50.5	49.9	49.2
	Max	75.2	85.7	54.2	85.3	84.9	84.0	82.5	70.3	60.9	55.8	55.0	54.3
Energy Average		71.3	Average:		80.2	79.8	78.9	77.8	68.7	58.9	54.1	53.3	52.6
Night	Min	42.5	50.2	35.5	50.0	49.6	48.3	47.4	43.6	38.4	36.0	35.8	35.6
	Max	55.4	65.0	46.5	64.3	63.5	62.2	61.3	55.3	52.1	48.0	47.3	46.7
Energy Average		50.9	Average:		55.9	55.5	54.2	53.0	49.2	45.8	42.5	42.0	41.6

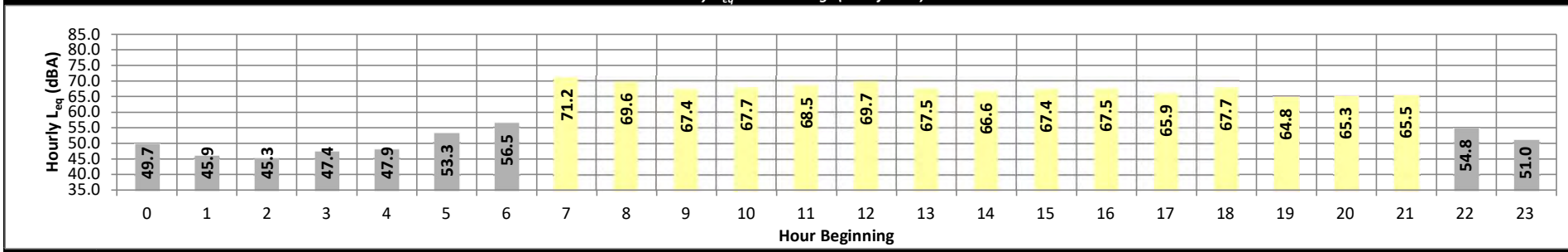
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
70.4	**71.3**	**50.9**

24-Hour Noise Level Measurement Summary

Date: Thursday, September 12, 2024 *Location:* L2 - Located west of the site near the pool at 1619 Mesa Dr. *Meter:* Piccolo II *JN:* 16241

Project: Surf Farm *Source:* *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	49.7	59.5	42.1	59.1	58.3	56.3	54.7	49.1	45.4	42.5	42.3	42.1	49.7	10.0	59.7
	1	45.9	56.8	40.2	56.2	55.2	52.3	50.1	44.3	41.6	40.4	40.3	40.2	45.9	10.0	55.9
	2	45.3	54.7	40.0	54.4	53.7	51.8	50.3	44.2	41.1	40.1	40.0	39.9	45.3	10.0	55.3
	3	47.4	57.2	39.7	56.9	56.1	54.4	53.1	46.6	42.4	39.8	39.7	39.7	47.4	10.0	57.4
	4	47.9	56.3	42.6	55.9	55.2	53.5	52.3	47.9	45.0	43.1	42.9	42.6	47.9	10.0	57.9
	5	53.3	60.7	45.5	60.4	59.9	58.7	57.8	54.1	50.8	46.6	46.1	45.6	53.3	10.0	63.3
	6	56.5	64.6	47.6	64.3	63.8	62.4	61.1	57.2	53.9	49.2	48.3	47.8	56.5	10.0	66.5
Day	7	71.2	80.9	53.6	80.6	80.3	79.5	78.4	67.5	60.5	55.3	54.4	53.8	71.2	0.0	71.2
	8	69.6	79.2	53.3	79.0	78.7	77.9	76.6	66.5	60.4	55.6	54.6	53.6	69.6	0.0	69.6
	9	67.4	76.9	53.0	76.6	76.3	75.4	74.3	64.8	59.4	54.6	53.9	53.2	67.4	0.0	67.4
	10	67.7	77.4	52.3	77.1	76.6	75.6	74.6	65.2	59.5	54.2	53.5	52.5	67.7	0.0	67.7
	11	68.5	78.3	53.2	77.8	77.4	76.3	75.2	66.9	60.4	55.2	54.2	53.4	68.5	0.0	68.5
	12	69.7	79.5	52.2	79.2	78.8	78.0	76.5	66.8	60.1	53.8	53.0	52.3	69.7	0.0	69.7
	13	67.5	76.9	53.4	76.4	76.0	75.0	74.1	66.3	59.9	55.0	54.3	53.6	67.5	0.0	67.5
	14	66.6	75.8	53.5	75.4	75.0	74.0	73.1	65.2	59.7	55.2	54.4	53.7	66.6	0.0	66.6
	15	67.4	77.1	53.4	76.5	76.0	74.7	73.7	65.8	60.2	55.7	54.8	53.7	67.4	0.0	67.4
	16	67.5	77.0	52.7	76.6	76.3	75.3	74.1	65.7	59.8	54.9	53.8	52.9	67.5	0.0	67.5
	17	65.9	75.0	51.5	74.8	74.4	73.7	72.6	64.3	57.7	53.0	52.3	51.7	65.9	0.0	65.9
	18	67.7	77.1	51.1	76.8	76.4	75.6	74.6	65.4	58.6	52.9	52.0	51.3	67.7	0.0	67.7
	19	64.8	74.4	49.5	73.8	73.2	72.1	71.4	63.7	56.8	51.5	50.6	49.7	64.8	5.0	69.8
	20	65.3	74.0	48.7	73.7	73.6	72.9	72.2	63.8	56.5	50.3	49.6	48.9	65.3	5.0	70.3
	21	65.5	74.7	47.9	74.5	74.3	73.5	72.6	63.2	54.9	49.3	48.6	48.0	65.5	5.0	70.5
Night	22	54.8	62.7	44.4	62.4	62.1	61.1	60.6	54.9	50.2	45.6	45.0	44.5	54.8	10.0	64.8
	23	51.0	59.5	42.8	59.1	58.6	57.1	55.8	51.5	47.6	43.6	43.2	42.8	51.0	10.0	61.0

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	64.8	74.0	47.9	73.7	73.2	72.1	71.4	63.2	54.9	49.3	48.6	48.0
	Max	71.2	80.9	53.6	80.6	80.3	79.5	78.4	67.5	60.5	55.7	54.8	53.8
Energy Average		67.8	Average:		76.6	76.2	75.3	74.3	65.4	58.9	53.8	52.9	52.1
Night	Min	45.3	54.7	39.7	54.4	53.7	51.8	50.1	44.2	41.1	39.8	39.7	39.7
	Max	56.5	64.6	47.6	64.3	63.8	62.4	61.1	57.2	53.9	49.2	48.3	47.8
Energy Average		51.8	Average:		58.7	58.1	56.4	55.1	50.0	46.4	43.4	43.1	42.8

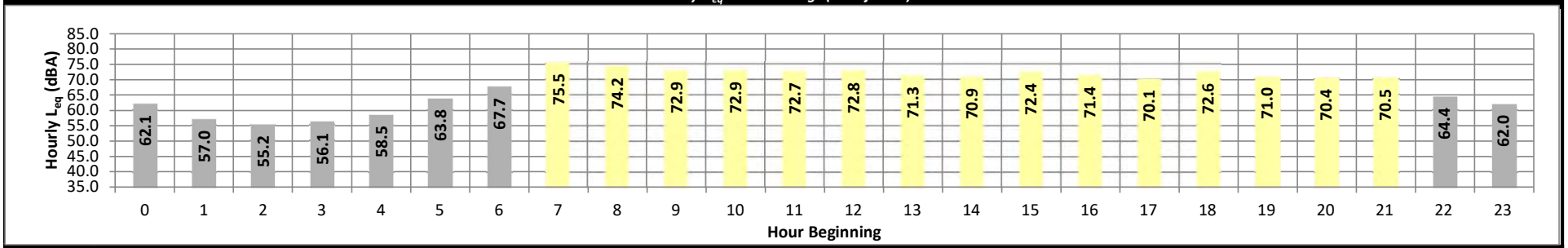
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
67.2	**67.8**	**51.8**

24-Hour Noise Level Measurement Summary

Date: Thursday, September 12, 2024 *Location:* L3 - Located west of the site near the residence at 1691 Mesa *Meter:* Piccolo II *JN:* 16241

Project: Surf Farm *Source:* Dr. *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*	*L_{eq}*	*Adj.*	*Adj. L_{eq}*
Night	0	62.1	73.9	47.1	73.1	72.0	69.2	67.3	61.0	54.6	48.2	47.7	47.2	62.1	10.0	72.1
	1	57.0	70.4	43.4	69.6	67.2	64.1	61.8	54.2	48.3	44.1	43.7	43.4	57.0	10.0	67.0
	2	55.2	65.5	45.3	65.0	64.6	63.0	61.2	53.4	47.8	45.7	45.6	45.4	55.2	10.0	65.2
	3	56.1	66.1	46.8	65.6	65.2	63.6	61.6	55.0	50.8	47.3	47.2	47.0	56.1	10.0	66.1
	4	58.5	67.5	49.5	67.1	66.7	65.3	63.8	58.4	53.7	50.2	49.9	49.6	58.5	10.0	68.5
	5	63.8	71.5	53.1	70.9	70.3	69.2	68.4	65.0	61.2	54.8	54.0	53.2	63.8	10.0	73.8
	6	67.7	75.6	56.3	75.2	74.6	73.4	72.3	68.6	65.4	58.7	57.5	56.5	67.7	10.0	77.7
Day	7	75.5	84.0	61.3	83.8	83.5	82.7	81.7	74.8	70.0	64.0	62.7	61.5	75.5	0.0	75.5
	8	74.2	82.1	61.5	81.9	81.7	80.9	80.0	74.2	69.8	63.9	62.7	61.7	74.2	0.0	74.2
	9	72.9	80.2	61.5	80.0	79.6	78.9	78.2	73.3	69.9	63.8	62.7	61.7	72.9	0.0	72.9
	10	72.9	81.0	60.4	80.7	80.2	79.1	78.0	73.4	69.5	63.0	61.8	60.5	72.9	0.0	72.9
	11	72.7	81.0	60.1	80.6	80.2	79.2	78.3	73.0	68.8	62.9	61.4	60.3	72.7	0.0	72.7
	12	72.8	81.2	59.5	80.8	80.6	79.6	78.8	73.0	68.0	61.7	60.6	59.7	72.8	0.0	72.8
	13	71.3	78.9	59.0	78.5	78.1	77.2	76.3	72.4	68.1	62.0	60.7	59.3	71.3	0.0	71.3
	14	70.9	77.7	59.2	77.4	77.0	76.3	75.6	72.2	68.2	61.9	60.6	59.4	70.9	0.0	70.9
	15	72.4	81.5	60.0	81.0	80.5	78.9	77.2	72.6	68.7	62.6	61.6	60.5	72.4	0.0	72.4
	16	71.4	79.2	58.7	79.0	78.4	77.5	76.7	72.1	67.9	61.8	60.2	59.0	71.4	0.0	71.4
	17	70.1	78.0	57.9	77.8	77.5	76.5	75.7	70.7	65.7	60.3	59.1	58.1	70.1	0.0	70.1
	18	72.6	80.0	59.6	79.7	79.4	78.6	77.9	73.4	68.7	61.9	60.8	59.8	72.6	0.0	72.6
	19	71.0	79.9	59.0	79.3	78.8	77.3	76.1	71.4	67.4	61.3	60.2	59.2	71.0	5.0	76.0
	20	70.4	77.8	58.2	77.4	77.1	76.4	75.8	71.3	66.6	60.6	59.4	58.4	70.4	5.0	75.4
	21	70.5	78.7	56.7	78.4	78.1	77.1	76.1	70.9	65.1	58.8	57.7	56.9	70.5	5.0	75.5
Night	22	64.4	71.7	52.1	71.3	71.0	70.0	69.2	65.9	61.4	54.6	53.5	52.3	64.4	10.0	74.4
	23	62.0	70.3	50.2	69.9	69.6	68.3	67.1	62.9	58.3	51.9	51.0	50.4	62.0	10.0	72.0

Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	70.1	77.7	56.7	77.4	77.0	76.3	75.6	70.7	65.1	58.8	57.7	56.9
	Max	75.5	84.0	61.5	83.8	83.5	82.7	81.7	74.8	70.0	64.0	62.7	61.7
Energy Average		72.4	Average:		79.7	79.4	78.4	77.5	72.6	68.2	62.0	60.8	59.7
Night	Min	55.2	65.5	43.4	65.0	64.6	63.0	61.2	53.4	47.8	44.1	43.7	43.4
	Max	67.7	75.6	56.3	75.2	74.6	73.4	72.3	68.6	65.4	58.7	57.5	56.5
Energy Average		62.5	Average:		69.7	69.0	67.4	65.9	60.5	55.7	50.6	50.0	49.4

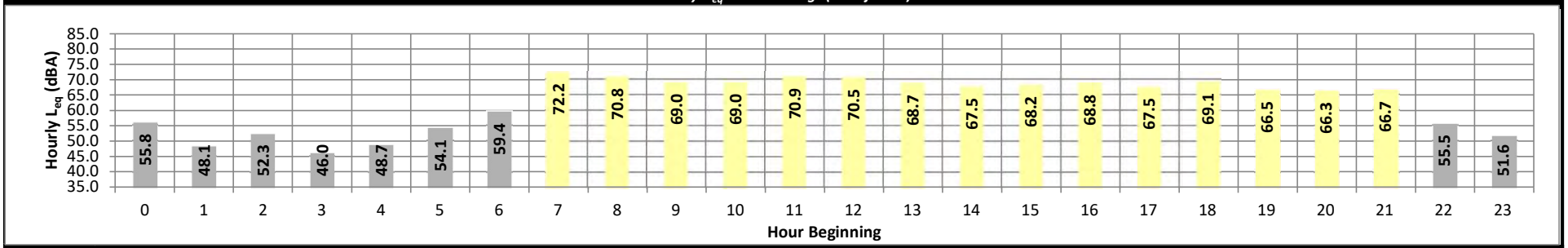
24-Hour CNEL	*Leq (dBA) Daytime (7am-10pm)*	*Leq (dBA) Nighttime (10pm-7am)*
73.1	**72.4**	**62.5**

24-Hour Noise Level Measurement Summary

Date: Thursday, September 12, 2024 *Location:* L4 - Located southwest of the site near the residence at 2698 *Meter:* Piccolo II *JN:* 16241

Project: Surf Farm *Source:* Riverside Dr. *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	55.8	67.7	38.7	67.4	66.6	64.3	62.1	50.5	42.9	39.3	39.0	38.8	55.8	10.0	65.8
	1	48.1	60.2	37.4	59.6	58.8	55.9	53.2	44.8	40.3	37.8	37.6	37.5	48.1	10.0	58.1
	2	52.3	61.4	36.9	60.9	60.3	58.0	56.8	54.3	47.5	37.3	37.1	37.0	52.3	10.0	62.3
	3	46.0	57.5	36.8	56.9	56.1	53.0	50.4	44.6	39.9	37.2	37.0	36.9	46.0	10.0	56.0
	4	48.7	60.3	40.0	59.7	58.6	55.4	53.0	47.4	43.4	40.5	40.3	40.1	48.7	10.0	58.7
	5	54.1	65.2	44.7	64.5	63.3	60.2	58.2	53.7	50.0	46.0	45.4	44.9	54.1	10.0	64.1
	6	59.4	69.5	47.8	69.1	68.4	66.2	64.1	58.9	55.0	49.7	48.8	48.0	59.4	10.0	69.4
Day	7	72.2	81.4	54.1	81.0	80.7	79.8	78.8	72.0	62.6	56.2	55.3	54.4	72.2	0.0	72.2
	8	70.8	79.8	54.7	79.5	79.2	78.3	77.3	70.0	62.3	56.9	55.9	54.9	70.8	0.0	70.8
	9	69.0	77.8	56.5	77.4	77.0	76.2	75.1	68.9	62.4	57.9	57.2	56.7	69.0	0.0	69.0
	10	69.0	78.2	53.7	77.8	77.4	76.1	75.0	69.0	61.3	55.8	54.9	54.0	69.0	0.0	69.0
	11	70.9	82.0	54.1	81.3	80.7	78.1	76.7	69.5	62.2	55.9	55.1	54.3	70.9	0.0	70.9
	12	70.5	80.4	53.6	79.7	79.2	78.1	77.1	70.1	61.3	55.5	54.7	53.9	70.5	0.0	70.5
	13	68.7	78.2	53.2	77.7	77.2	75.9	74.5	69.1	61.5	55.3	54.3	53.4	68.7	0.0	68.7
	14	67.5	76.6	53.3	76.2	75.6	74.3	73.2	68.4	60.7	55.5	54.4	53.5	67.5	0.0	67.5
	15	68.2	77.6	53.9	77.2	76.6	75.2	73.9	68.6	61.2	55.8	54.9	54.1	68.2	0.0	68.2
	16	68.8	77.9	54.1	77.5	77.1	75.9	74.6	69.3	62.5	56.6	55.5	54.3	68.8	0.0	68.8
	17	67.5	76.1	54.4	75.7	75.2	73.9	73.0	67.9	62.1	56.7	55.6	54.6	67.5	0.0	67.5
	18	69.1	79.0	52.7	78.4	77.8	76.4	75.2	68.8	61.0	55.0	54.1	53.1	69.1	0.0	69.1
	19	66.5	76.8	50.3	76.4	75.7	73.7	72.0	67.2	58.3	52.3	51.4	50.5	66.5	5.0	71.5
	20	66.3	74.5	47.5	74.2	73.9	73.1	72.4	67.6	56.6	49.7	48.8	47.6	66.3	5.0	71.3
	21	66.7	75.8	46.4	75.5	75.0	74.0	72.9	67.2	55.1	48.5	47.5	46.6	66.7	5.0	71.7
Night	22	55.5	65.2	42.4	64.8	64.1	62.2	60.9	55.8	50.4	44.2	43.4	42.5	55.5	10.0	65.5
	23	51.6	62.1	39.6	61.6	60.9	58.5	56.7	50.9	46.6	41.3	40.3	39.8	51.6	10.0	61.6

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	66.3	74.5	46.4	74.2	73.9	73.1	72.0	67.2	55.1	48.5	47.5	46.6
	Max	72.2	82.0	56.5	81.3	80.7	79.8	78.8	72.0	62.6	57.9	57.2	56.7
Energy Average		69.1	Average:		77.7	77.2	75.9	74.8	68.9	60.7	54.9	54.0	53.0
Night	Min	46.0	57.5	36.8	56.9	56.1	53.0	50.4	44.6	39.9	37.2	37.0	36.9
	Max	59.4	69.5	47.8	69.1	68.4	66.2	64.1	58.9	55.0	49.7	48.8	48.0
Energy Average		54.2	Average:		62.7	61.9	59.3	57.3	51.2	46.2	41.5	41.0	40.6

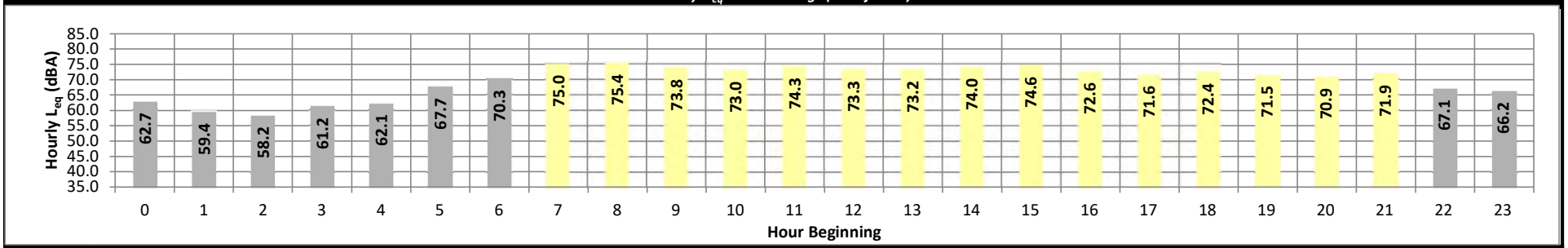
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
68.6	**69.1**	**54.2**

24-Hour Noise Level Measurement Summary

Date: Thursday, September 12, 2024 *Location:* L5 - Located southwest of the site near the residence at 2503 *Meter:* Piccolo II *JN:* 16241

Project: Surf Farm *Source:* Anniversary Lane. *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*	*L_{eq}*	*Adj.*	*Adj. L_{eq}*
Night	0	62.7	74.3	44.9	73.9	73.4	71.1	68.5	59.6	51.9	45.8	45.5	45.0	62.7	10.0	72.7
	1	59.4	71.9	44.0	71.5	70.6	67.2	64.6	54.6	47.3	44.3	44.1	44.0	59.4	10.0	69.4
	2	58.2	70.9	43.5	70.5	69.8	66.7	63.6	52.0	45.5	43.6	43.5	43.4	58.2	10.0	68.2
	3	61.2	74.5	43.6	74.1	73.0	69.3	66.0	54.3	46.5	43.7	43.6	43.5	61.2	10.0	71.2
	4	62.1	74.4	45.0	74.0	73.2	70.1	67.8	58.1	49.6	45.7	45.3	45.0	62.1	10.0	72.1
	5	67.7	78.4	51.0	78.0	77.4	74.9	73.2	67.0	61.0	53.0	52.0	51.2	67.7	10.0	77.7
	6	70.3	79.3	55.1	79.0	78.3	76.5	75.4	71.3	66.2	57.8	56.4	55.3	70.3	10.0	80.3
Day	7	75.0	83.3	61.5	82.9	82.2	80.3	79.1	76.1	72.9	65.2	63.7	61.8	75.0	0.0	75.0
	8	75.4	85.6	63.3	85.2	84.2	80.8	78.8	75.8	72.9	66.4	64.9	63.6	75.4	0.0	75.4
	9	73.8	81.4	60.6	81.0	80.6	79.4	78.3	75.0	71.7	64.2	62.4	60.9	73.8	0.0	73.8
	10	73.0	81.1	59.8	80.8	80.2	78.4	77.4	74.3	70.5	63.2	61.3	60.0	73.0	0.0	73.0
	11	74.3	84.5	61.3	84.0	83.2	80.6	78.7	74.5	70.9	63.9	62.8	61.5	74.3	0.0	74.3
	12	73.3	81.6	60.3	81.3	80.8	78.9	77.5	74.2	70.7	63.7	62.0	60.6	73.3	0.0	73.3
	13	73.2	81.5	60.1	81.1	80.4	78.6	77.6	74.4	70.8	63.7	62.0	60.3	73.2	0.0	73.2
	14	74.0	83.1	60.7	82.6	82.1	79.9	78.2	74.8	71.1	63.9	62.4	61.0	74.0	0.0	74.0
	15	74.6	83.9	61.2	83.6	83.0	81.5	80.0	74.4	71.2	64.9	63.1	61.5	74.6	0.0	74.6
	16	72.6	80.5	59.9	80.2	79.6	77.7	76.6	73.7	70.7	63.2	61.4	60.1	72.6	0.0	72.6
	17	71.6	80.9	59.3	80.4	79.6	77.4	76.2	72.4	68.2	61.3	60.5	59.5	71.6	0.0	71.6
	18	72.4	80.5	58.9	80.1	79.6	77.9	76.8	73.6	69.8	62.6	60.9	59.2	72.4	0.0	72.4
	19	71.5	80.6	56.8	80.0	79.2	77.1	75.8	72.4	68.8	60.6	58.7	57.2	71.5	5.0	76.5
	20	70.9	79.4	55.1	79.0	78.5	76.8	75.6	71.9	67.9	58.5	56.7	55.3	70.9	5.0	75.9
	21	71.9	84.2	53.4	83.8	82.5	78.5	75.8	70.7	66.3	56.3	54.8	53.6	71.9	5.0	76.9
Night	22	67.1	76.8	49.9	76.5	75.9	73.9	72.3	67.7	62.0	52.4	51.2	50.0	67.1	10.0	77.1
	23	66.2	78.9	46.4	78.3	77.3	73.5	70.9	63.8	56.8	47.6	46.9	46.4	66.2	10.0	76.2

Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	70.9	79.4	53.4	79.0	78.5	76.8	75.6	70.7	66.3	56.3	54.8	53.6
	Max	75.4	85.6	63.3	85.2	84.2	81.5	80.0	76.1	72.9	66.4	64.9	63.6
Energy Average		73.4	Average:		81.7	81.0	78.9	77.5	73.9	70.3	62.8	61.2	59.7
Night	Min	58.2	70.9	43.5	70.5	69.8	66.7	63.6	52.0	45.5	43.6	43.5	43.4
	Max	70.3	79.3	55.1	79.0	78.3	76.5	75.4	71.3	66.2	57.8	56.4	55.3
Energy Average		65.6	Average:		75.1	74.3	71.5	69.1	60.9	54.1	48.2	47.6	47.1

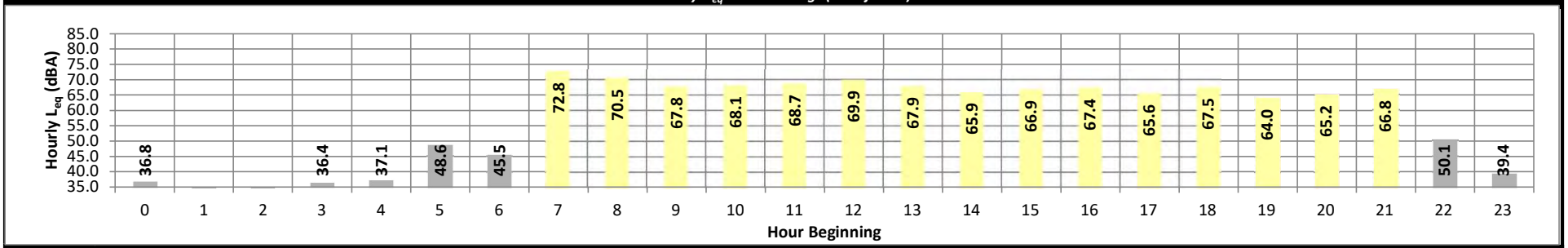
24-Hour CNEL	*Leq (dBA) Daytime (7am-10pm)*	*Leq (dBA) Nighttime (10pm-7am)*
74.9	**73.4**	**65.6**

24-Hour Noise Level Measurement Summary

Date: Thursday, September 12, 2024 *Location:* L6 - Located south of the site near the residence at 2139 *Meter:* Piccolo II *JN:* 16241

Project: Surf Farm *Source:* Anniversry Lane. *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	36.8	41.1	34.1	40.7	40.4	39.8	39.3	37.6	36.0	34.6	34.4	34.2	36.8	10.0	46.8
	1	34.4	37.3	33.4	37.0	36.6	35.9	35.5	34.6	34.0	33.6	33.6	33.5	34.4	10.0	44.4
	2	34.4	38.5	33.1	38.2	37.8	36.9	36.3	34.6	33.7	33.3	33.3	33.2	34.4	10.0	44.4
	3	36.4	46.3	33.5	45.0	44.3	42.1	39.0	35.7	34.2	33.8	33.7	33.6	36.4	10.0	46.4
	4	37.1	40.5	35.3	40.2	39.9	39.3	38.7	37.7	36.8	35.6	35.5	35.4	37.1	10.0	47.1
	5	48.6	53.6	45.8	53.3	52.8	51.2	50.4	49.1	48.2	46.6	46.4	45.9	48.6	10.0	58.6
	6	45.5	53.7	41.3	53.1	52.4	50.1	48.5	45.5	43.9	42.1	41.8	41.4	45.5	10.0	55.5
Day	7	72.8	82.8	46.0	82.7	82.4	81.0	79.6	70.5	59.3	48.1	46.9	46.2	72.8	0.0	72.8
	8	70.5	80.4	43.8	80.0	79.7	78.6	77.6	68.1	52.0	45.1	44.6	44.0	70.5	0.0	70.5
	9	67.8	77.2	44.1	77.0	76.7	75.8	74.8	66.4	52.1	45.2	44.7	44.3	67.8	0.0	67.8
	10	68.1	77.9	46.4	77.5	77.1	75.9	74.9	66.9	54.4	47.7	47.1	46.7	68.1	0.0	68.1
	11	68.7	77.9	52.8	77.6	77.3	76.0	75.0	67.7	61.5	55.0	54.2	53.1	68.7	0.0	68.7
	12	69.9	79.6	44.3	79.3	78.9	77.9	76.6	67.9	55.3	45.8	45.1	44.5	69.9	0.0	69.9
	13	67.9	77.9	44.1	77.5	77.0	75.8	74.6	66.6	54.6	45.2	44.8	44.3	67.9	0.0	67.9
	14	65.9	75.3	44.1	75.0	74.6	73.5	72.6	65.4	50.1	45.4	44.8	44.2	65.9	0.0	65.9
	15	66.9	76.8	48.1	76.3	75.7	74.0	73.2	66.4	56.7	49.9	48.9	48.2	66.9	0.0	66.9
	16	67.4	76.8	49.8	76.4	76.0	74.8	73.9	67.2	58.0	52.3	50.9	50.1	67.4	0.0	67.4
	17	65.6	74.8	42.6	74.4	74.2	73.1	72.4	65.4	53.5	44.8	43.7	42.9	65.6	0.0	65.6
	18	67.5	77.5	40.9	77.2	76.7	75.4	74.4	65.2	52.3	42.3	41.7	41.1	67.5	0.0	67.5
	19	64.0	72.5	39.2	72.3	72.0	71.1	70.4	64.6	51.2	40.6	40.0	39.4	64.0	5.0	69.0
	20	65.2	73.7	40.0	73.5	73.3	72.5	72.1	65.5	52.0	41.2	40.6	40.2	65.2	5.0	70.2
	21	66.8	76.4	39.0	76.2	75.9	74.6	73.6	65.6	48.3	40.0	39.6	39.2	66.8	5.0	71.8
Night	22	50.1	59.0	35.1	58.7	58.3	57.2	56.3	49.9	39.2	35.7	35.4	35.2	50.1	10.0	60.1
	23	39.4	44.5	34.6	44.0	43.7	42.8	42.3	40.5	38.6	35.6	35.1	34.7	39.4	10.0	49.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	64.0	72.5	39.0	72.3	72.0	71.1	70.4	64.6	48.3	40.0	39.6	39.2
	Max	72.8	82.8	52.8	82.7	82.4	81.0	79.6	70.5	61.5	55.0	54.2	53.1
Energy Average		68.3	Average:		76.9	76.5	75.3	74.4	66.6	54.1	45.9	45.2	44.5
Night	Min	34.4	37.3	33.1	37.0	36.6	35.9	35.5	34.6	33.7	33.3	33.3	33.2
	Max	50.1	59.0	45.8	58.7	58.3	57.2	56.3	49.9	48.2	46.6	46.4	45.9
Energy Average		44.2	Average:		45.6	45.1	43.9	42.9	40.6	38.3	36.8	36.6	36.3

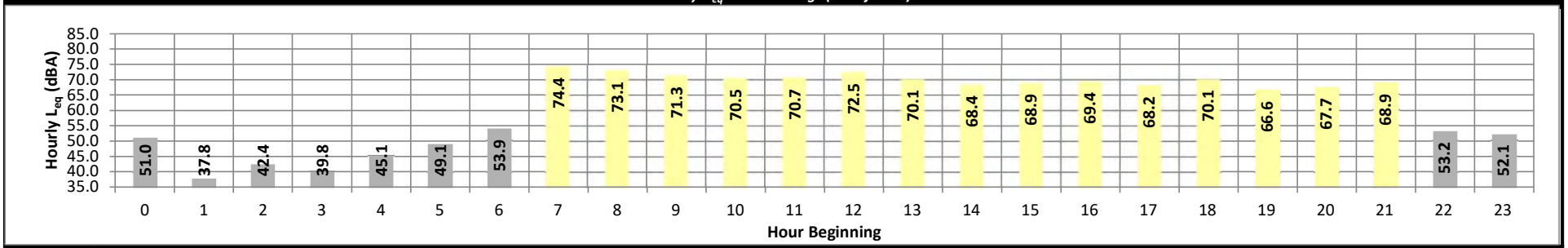
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
67.2	**68.3**	**44.2**

24-Hour Noise Level Measurement Summary

Date: Thursday, September 12, 2024 *Location:* L7 - Located southeast of the site near the park at 2081 Mesa *Meter:* Piccolo II *JN:* 16241

Project: Surf Farm *Source:* Dr. *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*	*L_{eq}*	*Adj.*	*Adj. L_{eq}*
Night	0	51.0	53.6	49.4	53.4	53.2	52.8	52.5	52.0	50.5	49.6	49.5	49.4	51.0	10.0	61.0
	1	37.8	44.2	36.1	43.9	43.4	41.3	40.0	37.5	36.7	36.4	36.3	36.2	37.8	10.0	47.8
	2	42.4	53.7	36.1	53.4	52.9	49.7	46.7	39.0	36.9	36.3	36.2	36.1	42.4	10.0	52.4
	3	39.8	48.2	36.5	47.7	47.0	45.1	43.5	39.3	37.3	36.8	36.7	36.6	39.8	10.0	49.8
	4	45.1	57.0	38.6	56.6	55.8	52.1	48.5	42.1	40.2	38.9	38.8	38.7	45.1	10.0	55.1
	5	49.1	59.4	43.7	58.9	58.2	55.4	52.9	47.6	45.8	44.3	44.1	43.8	49.1	10.0	59.1
	6	53.9	64.7	43.0	64.3	63.7	61.5	59.3	52.4	47.7	44.0	43.6	43.1	53.9	10.0	63.9
Day	7	74.4	84.6	48.9	84.3	84.0	83.0	81.6	69.9	58.5	50.7	49.8	49.0	74.4	0.0	74.4
	8	73.1	83.1	49.2	82.8	82.5	81.5	80.2	69.5	59.5	51.3	50.2	49.3	73.1	0.0	73.1
	9	71.3	81.3	49.3	81.0	80.7	79.7	78.4	68.6	57.9	51.0	50.2	49.5	71.3	0.0	71.3
	10	70.5	80.2	48.7	79.8	79.5	78.7	77.6	68.3	57.2	50.6	49.8	49.0	70.5	0.0	70.5
	11	70.7	80.6	52.4	80.2	79.9	79.0	77.8	68.0	60.0	53.6	53.0	52.5	70.7	0.0	70.7
	12	72.5	82.8	50.1	82.4	82.1	81.0	79.8	69.2	58.5	52.1	51.3	50.4	72.5	0.0	72.5
	13	70.1	80.1	50.0	79.7	79.2	78.4	77.3	67.8	57.6	51.6	50.9	50.1	70.1	0.0	70.1
	14	68.4	77.9	49.8	77.6	77.3	76.4	75.4	66.9	56.9	51.3	50.6	50.0	68.4	0.0	68.4
	15	68.9	78.5	49.3	78.2	77.8	76.9	75.9	67.6	57.0	50.6	50.0	49.5	68.9	0.0	68.9
	16	69.4	79.0	48.9	78.7	78.4	77.5	76.4	67.6	57.6	50.6	49.7	49.1	69.4	0.0	69.4
	17	68.2	77.5	49.0	77.2	77.0	76.2	75.3	66.7	58.3	50.8	50.0	49.1	68.2	0.0	68.2
	18	70.1	79.8	46.8	79.5	79.3	78.4	77.2	67.7	57.0	48.5	47.7	47.0	70.1	0.0	70.1
	19	66.6	75.7	44.1	75.4	75.1	74.4	73.6	65.5	54.1	45.8	44.8	44.2	66.6	5.0	71.6
	20	67.7	76.7	43.4	76.5	76.3	75.7	74.8	66.6	53.7	45.4	44.3	43.5	67.7	5.0	72.7
	21	68.9	78.5	42.3	78.3	78.1	77.3	76.3	65.6	51.3	43.5	42.9	42.4	68.9	5.0	73.9
Night	22	53.2	62.7	38.2	62.5	62.1	60.9	59.6	53.0	43.0	38.8	38.5	38.3	53.2	10.0	63.2
	23	52.1	59.0	49.5	58.7	58.1	56.0	54.7	52.6	51.0	49.6	49.5	49.5	52.1	10.0	62.1

Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	66.6	75.7	42.3	75.4	75.1	74.4	73.6	65.5	51.3	43.5	42.9	42.4
	Max	74.4	84.6	52.4	84.3	84.0	83.0	81.6	69.9	60.0	53.6	53.0	52.5
Energy Average		70.6	Average:		79.4	79.2	78.3	77.2	67.7	57.0	49.8	49.0	48.3
Night	Min	37.8	44.2	36.1	43.9	43.4	41.3	40.0	37.5	36.7	36.3	36.2	36.1
	Max	53.9	64.7	49.5	64.3	63.7	61.5	59.6	53.0	51.0	49.6	49.5	49.5
Energy Average		50.0	Average:		55.5	55.0	52.7	50.9	46.2	43.2	41.6	41.5	41.3

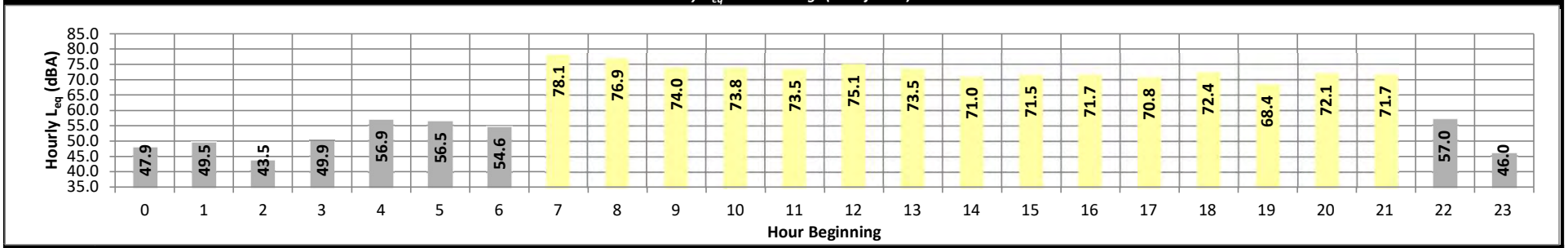
24-Hour CNEL	*Leq (dBA) Daytime (7am-10pm)*	*Leq (dBA) Nighttime (10pm-7am)*
69.6	**70.6**	**50.0**

24-Hour Noise Level Measurement Summary

Date: Thursday, September 12, 2024 *Location:* L9 - Located east of the site near the residence at 20250 SW *Meter:* Piccolo II *JN:* 16241

Project: Surf Farm *Source:* Acacia St. *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	47.9	52.6	45.4	52.3	52.0	51.0	50.3	48.6	47.2	45.7	45.5	45.4	47.9	10.0	57.9
	1	49.5	58.5	45.4	58.3	58.0	55.7	53.5	48.2	47.0	45.5	45.5	45.4	49.5	10.0	59.5
	2	43.5	49.9	41.3	49.4	48.9	47.4	46.2	43.4	42.0	41.5	41.4	41.3	43.5	10.0	53.5
	3	49.9	58.7	45.6	58.3	57.8	55.4	53.3	49.5	47.5	45.9	45.7	45.6	49.9	10.0	59.9
	4	56.9	70.3	43.5	70.2	69.7	63.9	61.3	47.0	44.9	43.8	43.6	43.5	56.9	10.0	66.9
	5	56.5	69.4	46.3	68.8	68.2	64.3	61.0	50.2	48.1	46.7	46.6	46.4	56.5	10.0	66.5
	6	54.6	64.6	48.4	64.2	63.5	61.0	59.0	53.5	50.9	49.1	48.9	48.6	54.6	10.0	64.6
Day	7	78.1	89.5	52.6	89.2	88.8	87.2	84.9	71.3	60.1	53.8	53.3	52.7	78.1	0.0	78.1
	8	76.9	87.7	51.8	87.5	87.2	85.7	83.7	72.0	59.7	53.1	52.5	51.9	76.9	0.0	76.9
	9	74.0	84.6	50.6	84.4	84.1	82.9	81.1	68.9	58.0	51.7	51.2	50.7	74.0	0.0	74.0
	10	73.8	84.2	50.1	84.0	83.7	82.4	81.0	70.8	56.6	51.2	50.7	50.2	73.8	0.0	73.8
	11	73.5	83.9	51.2	83.6	83.2	81.9	80.5	69.7	60.1	52.5	52.0	51.4	73.5	0.0	73.5
	12	75.1	85.5	51.6	85.1	84.8	83.5	82.1	71.5	60.1	52.8	52.3	51.8	75.1	0.0	75.1
	13	73.5	84.2	50.6	83.9	83.4	82.0	80.3	70.8	58.7	51.7	51.1	50.7	73.5	0.0	73.5
	14	71.0	80.8	50.4	80.4	80.1	79.3	78.1	68.9	55.9	51.2	50.8	50.5	71.0	0.0	71.0
	15	71.5	81.9	50.4	81.6	81.2	79.9	78.5	68.8	57.2	51.5	51.0	50.5	71.5	0.0	71.5
	16	71.7	81.5	51.3	81.1	80.9	79.8	78.6	69.9	58.7	52.7	52.0	51.4	71.7	0.0	71.7
	17	70.8	81.1	49.9	80.8	80.5	79.5	77.9	67.2	56.6	51.1	50.6	50.1	70.8	0.0	70.8
	18	72.4	82.6	48.2	82.3	82.0	81.0	79.5	69.4	56.2	49.3	48.8	48.4	72.4	0.0	72.4
	19	68.4	77.8	46.9	77.4	77.2	76.3	75.2	67.5	54.5	48.3	47.5	47.0	68.4	5.0	73.4
	20	72.1	83.7	46.9	83.6	82.9	80.5	78.2	67.4	53.6	47.7	47.3	47.0	72.1	5.0	77.1
	21	71.7	82.6	46.1	82.4	82.1	80.6	78.6	66.6	53.8	46.7	46.4	46.2	71.7	5.0	76.7
Night	22	57.0	66.8	43.3	66.5	66.1	65.0	63.7	55.2	46.2	43.8	43.6	43.3	57.0	10.0	67.0
	23	46.0	53.6	42.2	53.3	52.8	50.8	49.2	46.0	44.3	42.6	42.4	42.3	46.0	10.0	56.0

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	68.4	77.8	46.1	77.4	77.2	76.3	75.2	66.6	53.6	46.7	46.4	46.2
	Max	78.1	89.5	52.6	89.2	88.8	87.2	84.9	72.0	60.1	53.8	53.3	52.7
Energy Average		73.7	Average:		83.2	82.8	81.5	79.9	69.4	57.3	51.0	50.5	50.0
Night	Min	43.5	49.9	41.3	49.4	48.9	47.4	46.2	43.4	42.0	41.5	41.4	41.3
	Max	57.0	70.3	48.4	70.2	69.7	65.0	63.7	55.2	50.9	49.1	48.9	48.6
Energy Average		53.5	Average:		60.1	59.7	57.2	55.3	49.1	46.4	45.0	44.8	44.6

24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
72.7	**73.7**	**53.5**

APPENDIX 8.1:

HVAC

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Carrier

Turn to the experts

Product Data

WeatherMaster®
Gas Heat/Electric Cooling
Packaged Rooftop Units

3 to 12.5 Nominal Tons

WeatherMaster®

48HC Sizes 04 to 14
Packaged Rooftop Units with Gas Heat and Optional EnergyX® Energy Recovery Ventilator

Model number nomenclature

48HC MODEL NUMBER NOMENCLATURE

48 HC D E 09 A 2 A 6 A 0 A 3 B 0

Unit Heat Type
48 - Gas Heat Packaged Rooftop

Model Series - WeatherMaster®
HC - High Efficiency

Heat Options
D = Low Gas Heat
E = Medium Gas Heat
F = High Gas Heat
L = Low NOx - Low Gas Heat
M = Low NOx - Medium Gas Heat
N = Low NOx - High Gas Heat
S = Low Heat with Stainless Steel Exchanger
R = Medium Heat with Stainless Steel Exchanger
T = High Heat with Stainless Steel Exchanger
(Low NOx models include – Stainless Steel HX)

Refrig. Systems Options
A = Single-stage cooling models
B = Single-stage cooling models with Humidi-MiZer®
D = Two-stage cooling models
E = Two-stage cooling models with Humidi-MiZer
F = Single-stage cooling models with Motormaster® Low Ambient Controller
G = Two-stage cooling models with Motormaster Low Ambient Controller

Cooling Tons

04 - 3 ton	09 - 8.5 ton
05 - 4 ton	11 - 10 ton (12.0 EER)*
06 - 5 ton	12 - 10 ton (11.5 EER)*
07 - 6 ton	14 - 12.5 ton
08 - 7.5 ton	

Sensor Options
A = None
B = RA Smoke Detector
C = SA Smoke Detector
D = RA + SA Smoke Detector
E = CO_2
F = RA Smoke Detector and CO_2
G = SA Smoke Detector and CO_2
H = RA + SA Smoke Detector and CO_2
J = Condensate Overflow Switch
K = Condensate Overflow Switch and RA Smoke Detectors
L = Condensate Overflow Switch and RA + SA Smoke Detectors

Indoor Fan Options 3, 4, 5 Ton Models Only
0 = Electric (Direct) Drive x13 Motor
2 = Medium Static Option - Belt Drive
3 = High Static Option - Belt Drive
Indoor Fan Options 6-12.5 Ton Models Only
1 = Standard Static Option - Belt Drive
2 = Medium Static Option - Belt Drive
3 = High Static Option - Belt Drive
C = High Static Option with High-Efficiency Motor, Belt Drive (Size 14 only)

Coil Options (RTPF) (Outdoor - Indoor - Hail Guard)
A = Al/Cu - Al/Cu
B = Precoat Al/Cu - Al/Cu
C = E-coat Al/Cu - Al/Cu
D = E-coat Al/Cu - E-coat Al/Cu
E = Cu/Cu - Al/Cu
F = Cu/Cu - Cu/Cu
M = Al/Cu -Al/Cu — Louvered Hail Guard
N = Precoat Al/Cu - Al/Cu — Louvered Hail Guard
P = E-coat Al/Cu - Al/Cu — Louvered Hail Guard
Q = E-coat Al/Cu - E-coat Al/Cu — Louvered Hail Guard
R = Cu/Cu - Al/Cu — Louvered Hail Guard
S = Cu/Cu - Cu/Cu — Louvered Hail Guard

Factory Assigned
0 = Standard
1 = LTL
3 = California Seismic Complaint - OSHPD
4 = California Seismic Complaint - OSHPD plus LTL

Electrical Options†
A = None
B = HACR Breaker
C = Non-Fused Disconnect
D = Thru-the-Base Connections
E = HACR and Thru-the-Base Connections
F = Non-Fused Disconnect and Thru-the-Base Connections
G = 2-Speed Indoor Fan (VFD) Controller
H = 2-Speed Fan Controller (VFD) and HACR Breaker
J = 2-Speed Fan Controller (VFD) and Non-Fused Disconnect
K = 2-Speed Fan Controller (VFD) and Thru-the-Base Connections
L = 2-Speed Fan Controller (VFD) w/ HACR Breaker and Thru-the-Base Connections
M = 2-Speed Fan Controller (VFD) with Non-Fused Disconnect and Thru-the-Base Connections

Service Options
0 = None
1 = Unpowered Convenience Outlet
2 = Powered Convenience Outlet
3 = Hinged Panels
4 = Hinged Panels and Unpowered Convenience Outlet
5 = Hinged Panels and Powered Convenience Outlet
C = Foil Faced Insulation
D = Foil Faced Insulation with Unpowered Convenience Outlet
E = Foil Faced Insulation with Powered Convenience Outlet
F = Foil Faced Insulation and Hinged Panels
G = Foil Faced Insulation and Hinged Panels with Unpowered Convenience Outlet
H = Foil Faced Insulation and Hinged Panels with Powered Convenience Outlet

Intake / Exhaust Options
A = None
B = Temperature Economizer with Barometric Relief
F = Enthalpy Economizer with Barometric Relief
K = 2-Position Damper
Q = EnergyX® only
R = EnergyX + Economizer only**
S = EnergyX + Frost Protection only**
T = EnergyX + Economizer + Frost Protection**
U = Low Leak Temperature Economizer w/ Barometric Relief
W = Low Leak Enthalpy Economizer with Barometric Relief

Base Unit Controls
0 = Electromechanical Controls can be used with W7212 Controller (Non-Fault Detection and Diagnostic)
1 = PremierLink™ Controller
2 = RTU Open Multi-Protocol Controller
6 = Electro-mechanical with 2-speed fan and W7220 controller (w/ Fault Detection & Diagnostic). Can be used with EconoMi$er®X
D = ComfortLink Controls (Not available on 2-stage cooling 07 size models or size 11 with Humidi-Mizer®)

Design Revision
A = Factory Design Revision

Voltage††

1 = 575/3/60	5 = 208-230/3/60
3 = 208-230/1/60	6 = 460/3/60

* Staged Air Volume (SAV) is required on sizes 11 and 12 units to meet DOE-2018 minimum efficiency requirements.

† Units sold in the US require a 2-speed fan.

** Includes ComfortLink controls.

†† On single phase models (-3 voltage code), the following are not available as factory-installed options:
- Humidi-MiZer System
- Coated Coils or Cu Fin Coils
- Louvered Hail Guards
- Economizer or Two-Position Damper
- Powered 115v Convenience Outlet

Puron

ASHRAE 90.1 COMPLIANT

For California Residents:
For installation in SCAQMD only: This furnace does not meet the SCAQMD Rule 1111 14 ng/J NOx emission limit, and thus is subject to a mitigation fee of up to $450. This furnace is not eligible for the Clean Air Furnace Rebate Program: www.CleanAirFurnaceRebate.com.

Capacity ratings

AHRI RATINGS (1-STAGE COOLING) [a, b, c, d]

48HC UNIT	COOLING STAGES	NOMINAL CAPACITY (TONS)	NET COOLING CAPACITY (MBH)	TOTAL POWER (kW)	SEER	EER	IEER
A04	1	3	35.4	2.8	15.00	12.50	—
A05	1	4	48.5	3.7	15.60	13.00	—
A06	1	5	57.5	4.6	15.20	12.45	—
A07	1	6	73.0	6.0	—	12.00	13.00

NOTE(S):
a. Rated in accordance with AHRI Standards 210/240 (04-06 size) and 340/360 (07-14 size).
b. Ratings are based on:
Cooling Standard: 80°F (27°C) db, 67°F (19°C) wb indoor air temperature and 95°F (35°C) db outdoor air temperature.
IEER Standard: A measure that expresses cooling part-load EER efficiency for commercial unitary air-conditioning and heat pump equipment on the basis of weighted operation at various load capacities.
c. All 48HC units comply with ASHRAE 90.1-2016 (American Society of Heating, Refrigeration, and Air-Conditioning Engineers) and DOE-2018 (Department of Energy) Energy Standard for minimum SEER and EER requirements.
d. 48HC units comply with US Energy Policy Act (2005). To evaluate code compliance requirements, refer to state and local codes.

LEGEND
AHRI — Air-Conditioning, Heating, and Refrigeration Institute
COP — Coefficient of Performance
EER — Energy Efficiency Ratio
IEER — Integrated Energy Efficiency Ratio
SEER — Seasonal Energy Efficiency Ratio

AHRI RATINGS (2-STAGE COOLING) [a, b, c, d]

48HC UNIT	COOLING STAGES	NOMINAL CAPACITY (TONS)	NET COOLING CAPACITY (MBH)	TOTAL POWER (kW)	EER	IEER WITH SINGLE-SPEED INDOOR MOTOR	IEER WITH 2-SPEED INDOOR MOTOR
D07	2	6.0	72.0	6.0	12.0	14.0	16.0
D08	2	7.5	89.0	7.4	12.0	13.0	13.8
D09	2	8.5	97.0	8.1	12.0	13.0	13.8
D11 [e]	2	10.0	111.0	9.3	12.0	12.6	14.3
D12 [e]	2	10.5	115.0	10.0	11.5	12.0	12.7
D14	2	12.5	146.0	11.9	12.2	13.0	13.9

NOTE(S):
a. Rated in accordance with AHRI Standards 210/240 (04-06 size) and 340/360 (07-14 size).
b. Ratings are based on:
Cooling Standard: 80°F (27°C) db, 67°F (19°C) wb indoor air temperature and 95°F (35°C) db outdoor air temperature.
IEER Standard: A measure that expresses cooling part-load EER efficiency for commercial unitary air-conditioning and heat pump equipment on the basis of weighted operation at various load capacities.
c. All 48HC units comply with ASHRAE 90.1-2016 (American Society of Heating, Refrigeration, and Air-Conditioning Engineers) and DOE-2018 (Department of Energy) Energy Standard for minimum SEER and EER requirements.
d. 48HC units comply with US Energy Policy Act (2005). To evaluate code compliance requirements, refer to state and local codes.
e. Two-speed fan is required to meet DOE-2018 standards.

LEGEND
AHRI — Air-Conditioning, Heating, and Refrigeration Institute
COP — Coefficient of Performance
EER — Energy Efficiency Ratio
IEER — Integrated Energy Efficiency Ratio
SEER — Seasonal Energy Efficiency Ratio

Capacity ratings (cont)

SOUND RATINGS TABLE [a, b, c]

48HC UNIT	COOLING STAGES	OUTDOOR SOUND (dB) AT 60 HZ								
		A-WEIGHTED	63	125	250	500	1000	2000	4000	8000
A04	1	76	78.2	78.0	74.2	73.3	70.6	66.0	62.4	56.9
A05	1	78	84.7	83.6	77.1	74.6	72.3	68.3	64.7	60.9
A06	1	77	87.5	82.5	76.1	73.6	71.3	67.1	64.1	60.0
A07	1	82	90.1	82.6	81.0	79.4	77.0	73.0	70.4	66.7
D07	2	82	90.1	82.6	81.0	79.4	77.0	73.0	70.4	66.7
D08	2	82	90.6	84.3	80.2	79.3	77.1	72.2	67.4	63.7
D09	2	82	88.6	85.0	81.6	79.5	77.4	74.1	71.0	66.3
D11	2	87	85.9	87.9	85.6	84.4	82.8	78.5	74.9	72.5
D12	2	87	85.9	87.9	85.6	84.4	82.8	78.5	74.9	72.5
D14	2	83	89.3	86.0	82.9	80.7	78.5	73.6	69.6	64.5

NOTE(S):

a. Outdoor sound data is measured in accordance with AHRI.
b. Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
c. A-weighted sound ratings filter out very high and very low frequencies, to better approximate the response of “average” human ear. A-weighted measurements for Carrier units are taken in accordance with AHRI.

LEGEND

dB — Decibel

APPENDIX 8.2:

WAVE POOL GENERATOR

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TECHNICAL DESIGN NOTE

Project name	The Wave, Bristol		
Design note title	The Wave, Bristol- Detailed Measurement Assessment		
Document reference	23919-HYD-ZZ-XX-TN-1001-P01		
Author	Vince Taylor BSc MSc MIOA/ Elena De Juan Romero MSc		
Revision	P01		
Date	29 September 2022	Approved	☐

1. INTRODUCTION

Hydrock have been appointed by Wavegarden to provide a detailed analysis of noise specifically waves generation at The Wave, Bristol in relation to noise modelling of potential future domestic and international schemes where wave noise itself may be a concern for operators and patrons.

For example, urban installations near existing sensitive receptors or new accommodation, or those installations featuring an enclosing roof structure which will result in potential noise build up within the facility itself impacting patrons.

Short term noise measurements were undertaken at a range of locations to capture expected sound pressure levels immediately near the pool surface during various modes of operation.

Additional long term noise monitoring was undertaken at the site boundary in two locations to inform noise modelling and extrapolation of distance attenuation of wave generated noise because of the development at the site boundaries.

2. SITE SURVEY SUMMARY

2.1 Overview

The survey measurement locations, operational modes captured, measurement summary and commentary are provided below.

2.1.1 Equipment

Noise measurements were made at a free-field location using Class 1, integrating sound level meters.

Microphones were positioned on a tripod with extendable horizontal boom arm at least 2m out over the lake surface for measurements, 2m above the surf lake surface for positions STM4-9.

Positions STM1-3 were measured on a vertical boom at 2m height above the beach area.

The sound level meters were calibrated to a reference level of 94 dB at 1kHz both prior to, and on completion of, the noise survey. No significant drift in calibration was noted during the survey (≤ 0.5 dB).

All measurement equipment has been laboratory calibrated within the appropriate calibration interval.

Details of the equipment used for the environmental noise measurements are shown in Table 1.

Table 1: Survey Equipment

Measurement location	Manufacturer	Instrument	Type	Serial No. / Version	Audible description
LTM 1	B&K	Sound Level Meter	2250	3009207	Trains, distant traffic, the wave activity
	B&K	Pre-Amplifier	ZC 0034	3037389	
	B&K	Microphone	4952	3037389	
LTM 2	01dB	Sound Level Meter	Fusion	14018	
	01dB	Pre-Amplifier	pre22 n°	2105046	
	01dB	Microphone	40CD	428504	
STM 1-9	01dB	Sound Level Meter	Fusion	14016	Waves breaking, some people activity
	01dB	Pre-Amplifier	pre22 n°	2105045	
	01dB	Microphone	40CD	415846	
B&K	Acoustic Calibrator	4231	3015450	TCRT22/1570	94dB @ 1 KHz

2.1.2 Weather Conditions

Weather conditions were generally calm, and dry, with wind speeds below <5m/s, on this basis conditions are not considered to have significantly impacted measurements.

2.1.3 Measurement Location Plan

Figures 1 and 2 below outline the long term and short-term measurement positions respectively.

LTM 1 and 2 represent boundary positions to identify and model noise emanation from the lake horizontally at a known distance within the noise models.

Figure 1: Site Measurement Plan-Long Term Measurement Locations

Positions STM1-9 were undertaken to capture noise levels vertically above the lake surface to inform noise modelling of the lake noise generated.

Figure 2 Site Measurement Plan-Short Term Measurements

2.2 Short Term Measurements

2.2.1 B2 (Expert Mode)

Table 2:Short Term Measurements-Expert B2

Position	Measurement Duration	Wave Mode in Operation	dB $L_{Aeq,T}$	dB L_{AFMax}	dB L_{A90}
1	1 minute (60 seconds) Per position.	Expert (B 2)	68	74	65
2		Expert (B 2)	70	77	64
3		Expert (B 2)	70	77	62
4		Expert (B 2)	75	94	57
5		Expert (B 2)	75	82	70
6		Expert (B 2)	79	87	72
7		Expert (B 2)	68	77	65
8		Expert (B 2)	68	71	66
9		Expert (B 2)	69	73	67

2.2.2 B6 (Beast Mode)

Table 3:Short Term Measurements-Expert B6

Position	Measurement Duration	Wave Mode in Operation	dB $L_{Aeq, T}$	dB L_{AFMax}	dB L_{A90}
1	1 minute (60 seconds per position)	Beast (B 6)	70	75	67
2		Beast (B 6)	71	78	66
3		Beast (B 6)	71	79	69
4		Beast (B 6)	72	82	68
5		Beast (B 6)	75	81	71
6		Beast (B 6)	79	88	69
7		Beast (B 6)	70	79	66
8		Beast (B 6)	68	70	66
9		Beast (B 6)	69	78	67

2.3 Long Term Measurements

The data set for long term measurements is presented in the tables below.

2.3.1 Long Term Measurement Position 1

Table 4: Long Term Measurement Position 1-Survey Data-Summary-31st August 2022

Start Time	L_{Aeq}	L_{AMax}	L_{A90}	L_{A10}
Wed 31/08/2022 17	48	58	50	45
Wed 31/08/2022 17:15	49	60	50	46
Wed 31/08/2022 17:30	48	57	50	46
Wed 31/08/2022 17:45	47	63	48	45
Wed 31/08/2022 18	48	57	49	45
Wed 31/08/2022 18:15	49	61	50	47
Wed 31/08/2022 18:30	49	66	49	45
Wed 31/08/2022 18:45	49	65	51	45
Wed 31/08/2022 19	48	62	50	45
Wed 31/08/2022 19:15	48	57	50	45
Wed 31/08/2022 19:30	47	54	49	45
Wed 31/08/2022 19:45	48	57	50	46
Wed 31/08/2022 20	47	56	48	45
Wed 31/08/2022 20:15	48	63	49	45
Wed 31/08/2022 20:30	48	57	50	45
Wed 31/08/2022 20:45	46	57	47	43
Wed 31/08/2022 21	45	58	48	42
Wed 31/08/2022 21:15	43	51	44	41
Wed 31/08/2022 21:30	44	57	45	41
Wed 31/08/2022 21:45	49	64	52	41
Wed 31/08/2022 22	44	56	45	41
Wed 31/08/2022 22:15	44	58	45	41
Wed 31/08/2022 22:30	44	58	46	41
Wed 31/08/2022 22:45	43	60	44	40
Wed 31/08/2022 23	44	59	44	38
Wed 31/08/2022 23:15	44	61	45	39
Wed 31/08/2022 23:30	51	71	47	40
Wed 31/08/2022 23:45	42	50	44	39

2.3.2 Long Term Measurement Position 2

Table 5: Long Term Measurement Position 2-Survey Data-Summary-31st August-1st September 2022

Start Time	L_{Aeq}	L_{AMax}	L_{A90}	L_{A10}
31/08/2022 18:45	49	68	40	52
31/08/2022 19:00	47	64	41	49
31/08/2022 19:15	45	63	41	46
31/08/2022 19:30	45	61	41	45
31/08/2022 19:45	48	64	42	50
31/08/2022 20:00	46	66	41	47
31/08/2022 20:15	47	65	40	47
31/08/2022 20:30	48	67	40	50
31/08/2022 20:45	45	61	39	43
31/08/2022 21:00	47	65	38	46
31/08/2022 21:15	39	48	37	40
31/08/2022 21:30	43	64	37	40
31/08/2022 21:45	51	68	38	53
31/08/2022 22:00	43	63	38	40
31/08/2022 22:15	45	64	38	44
31/08/2022 22:30	44	67	38	43
31/08/2022 22:45	42	63	37	41
31/08/2022 23:00	46	64	36	41
31/08/2022 23:15	48	68	37	45
31/08/2022 23:30	47	70	38	49
31/08/2022 23:45	41	57	37	41
01/09/2022 00:00	43	59	37	41
01/09/2022 00:15	47	64	37	49
01/09/2022 00:30	45	59	38	46
01/09/2022 00:45	39	44	36	40
01/09/2022 01:00	39	49	37	40
01/09/2022 01:15	40	52	37	41
01/09/2022 01:30	46	67	36	41
01/09/2022 01:45	37	42	35	38
01/09/2022 02:00	37	42	35	38
01/09/2022 02:15	37	55	35	38
01/09/2022 02:30	48	66	35	43
01/09/2022 02:45	37	48	36	38
01/09/2022 03:00	37	42	36	39
01/09/2022 03:15	44	59	36	48
01/09/2022 03:30	46	62	37	49
01/09/2022 03:45	38	45	37	39
01/09/2022 04:00	38	52	37	39
01/09/2022 04:15	58	75	37	56
01/09/2022 04:30	40	53	38	41
01/09/2022 04:45	40	55	39	41
01/09/2022 05:00	40	57	39	41
01/09/2022 05:15	44	62	39	44
01/09/2022 05:30	44	61	40	42
01/09/2022 05:45	44	70	41	43
01/09/2022 06:00	46	65	41	45
01/09/2022 06:15	45	64	41	45
01/09/2022 06:30	44	65	42	45
01/09/2022 06:45	50	73	41	51
01/09/2022 07:00	47	63	42	47
01/09/2022 07:15	47	64	42	47
01/09/2022 07:30	47	64	42	49
01/09/2022 07:45	46	63	42	47
01/09/2022 08:00	50	68	42	52
01/09/2022 08:15	50	71	40	50

Start Time	L_{Aeq}	L_{AMax}	L_{A90}	L_{A10}
01/09/2022 08:30	53	67	41	55

3. EXTRAPOLATED NOISE MODELLING EXERCISE

Based on the noise survey undertaken noise models have been produced for The Wave, Bristol, observations are such that as anticipated, in areas closer to the wave generation areas, there is an increase in noise levels with levels up to 79dB $L_{Aeq,\,T}$ at 2m. Other areas indicated lower noise levels form 68-75dBA above the lake surface.

The measurements undertaken have been reviewed to produce a predicted sound power level area source for the pool in a segmented approach, spread across the surface area of the pool. Which was then aligned to the measurements undertaken immediately above the lake surface.

This was further calibrated against both the measured sound pressure levels near the lake surface, as well as the distanced remote long term noise loggers at the site boundary for the cumulative result.

Based on the measurements undertaken there is little difference in average noise levels circa 1-2dB between Expert B2 and B6, on this basis the noise models for B6 have been presented as worst case.

Figures 3 and 4 below, show a plan view of the predicted sound pressure levels in the horizontal plane because of the Wave, Bristol, as well as a sectional view of the predicted sound pressure levels emanating in the vertical axis.

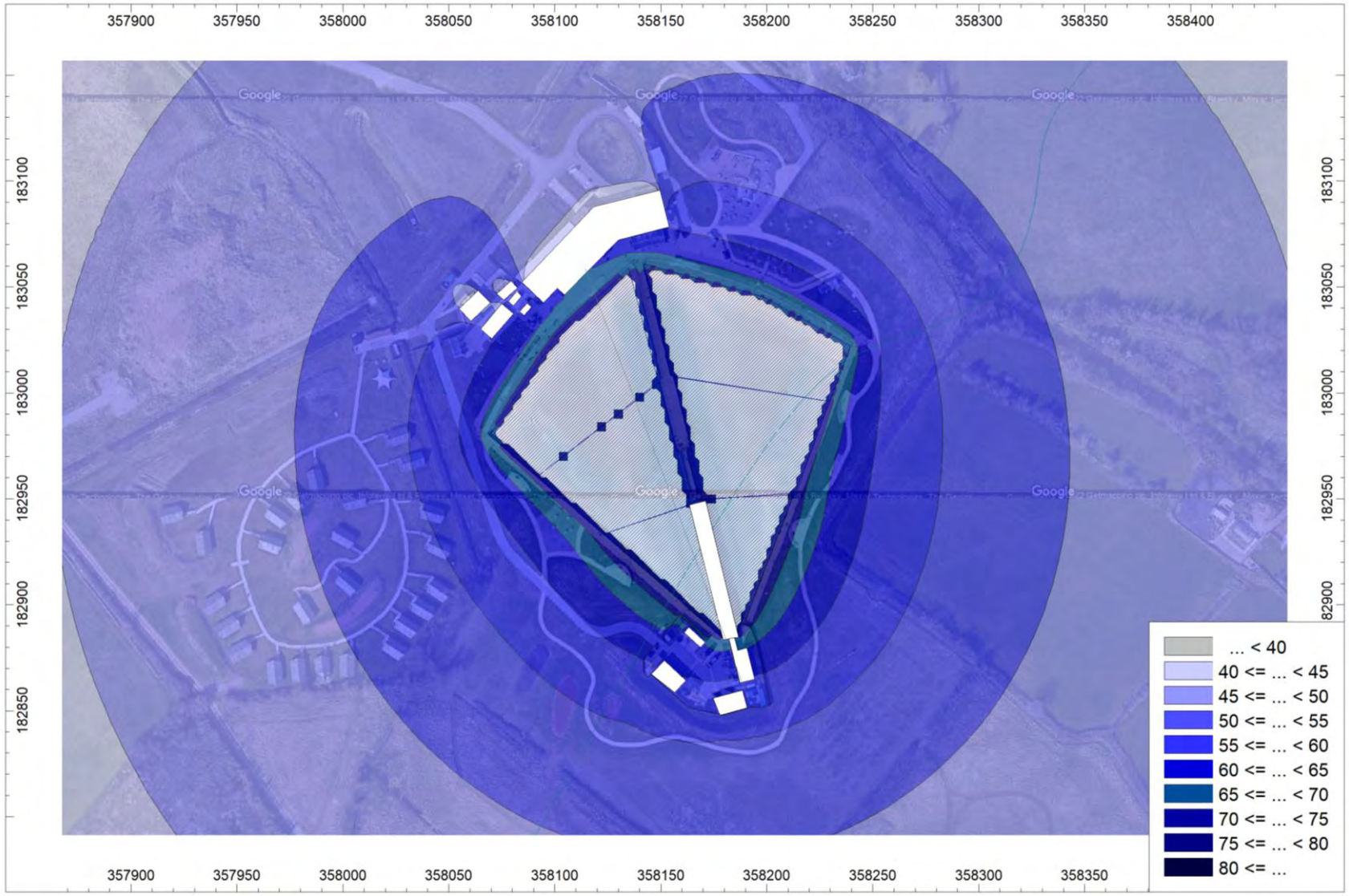

Figure 3: Expert B6-Plan View Noise Map

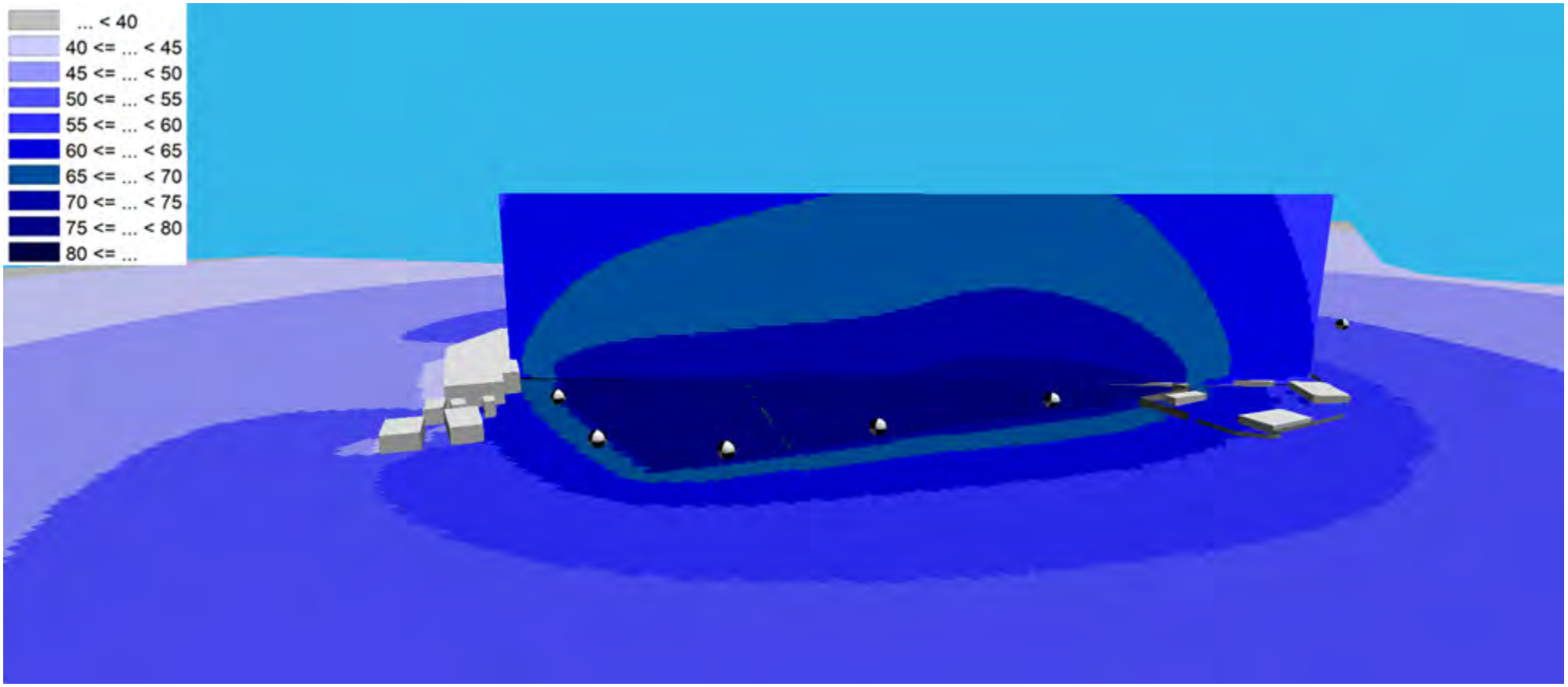

Figure 4: Expert B6-3D Sectional View

4. CONCLUSION

A noise survey was undertaken to define in greater detail noise generated because of wave noise itself at The Wave Bristol.

A combination of short-term measurements over the surf lake, as well as boundary measurements at the site for the purposes of model calibration were undertaken.

A noise model has then been produced which could later be developed or modified to estimate the expected wave noise generation at other Wavegarden sites domestically and internationally.

The full data set, and noise model files are available upon request.

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APPENDIX 8.3:

OPERATIONAL NOISE LEVEL CALCULATIONS

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16241 - Surf Farm

CadnaA Noise Prediction Model: 16241-04_Operation.cna
Date: 15.04.25
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (ft)	**6561.70**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (ft)	**3280.80**
Min. Length of Section (ft)	**3.30**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**328.08**
Search Radius Rcvr	**328.08**
Max. Distance Source - Rcvr	**3280.84 3280.84**
Min. Distance Rvcr - Reflector	**3.28 3.28**
Min. Distance Source - Reflector	**0.33**
Industrial (ISO 9613 (1996))	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (°F)	**50**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (mph)	**6.7**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	59.2	41.7	56.8	0.0	0.0	0.0		x	Total	5.00	r	6064802.05	2187760.55	5.00
R2		R2	56.0	40.5	53.9	0.0	0.0	0.0		x	Total	5.00	r	6064485.03	2187496.57	5.00
R3		R3	54.6	40.9	52.8	0.0	0.0	0.0		x	Total	5.00	r	6064490.76	2187399.48	5.00
R4		R4	50.7	36.6	48.8	0.0	0.0	0.0		x	Total	5.00	r	6064059.69	2187387.24	5.00
R5		R5	49.4	39.2	48.8	0.0	0.0	0.0		x	Total	5.00	r	6064275.18	2186994.91	5.00
R6		R6	55.4	38.1	53.0	0.0	0.0	0.0		x	Total	5.00	r	6065290.98	2185972.06	5.00
R7		R7	56.3	39.2	53.9	0.0	0.0	0.0		x	Total	5.00	r	6065826.14	2186150.44	5.00
R8		R8	58.8	40.2	56.3	0.0	0.0	0.0		x	Total	5.00	r	6066167.28	2187185.60	5.00
OS1		OS1	77.0	66.3	76.2	0.0	0.0	0.0		x	Total	5.00	a	6065043.49	2187061.79	5.00
OS2		OS2	74.0	61.1	72.4	0.0	0.0	0.0		x	Total	5.00	a	6065005.30	2187138.18	5.00
OS3		OS3	72.1	66.8	74.1	0.0	0.0	0.0		x	Total	5.00	a	6065137.24	2186786.62	5.00
OS4		OS4	71.1	62.0	70.9	0.0	0.0	0.0		x	Total	5.00	a	6064994.88	2186994.95	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
AC01		AC01	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064917.16	2187254.80	35.00
AC02		AC02	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064937.93	2186976.68	35.00
AC03		AC03	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064945.75	2186961.92	35.00
AC04		AC04	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6065141.41	2186726.79	19.00
AC05		AC05	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064946.41	2186951.19	35.00
AC06		AC06	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064916.68	2187267.64	35.00
AC07		AC07	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6065130.42	2186732.39	19.00
AC08		AC08	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064966.53	2187319.20	19.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
AC09		AC09	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064915.38	2187278.40	35.00
AC10		AC10	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064931.01	2187280.13	35.00
AC11		AC11	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064932.30	2187269.38	35.00
AC12		AC12	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064932.79	2187256.54	35.00
AC13		AC13	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064954.95	2186977.72	35.00
AC14		AC14	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064963.42	2186952.23	35.00
AC15		AC15	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064962.76	2186962.96	35.00
AC16		AC16	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064954.03	2186961.90	35.00
AC17		AC17	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064924.06	2187267.98	35.00
AC18		AC18	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6065023.56	2186790.70	19.00
AC19		AC19	89.0	89.0	89.0	Lw	89.0		675.00	0.00	240.00	5.00	g	6064969.92	2186876.12	19.00
OUT01		OUT01	91.5	91.5	91.5	Lw	91.5		900.00	0.00	540.00	5.00	r	6065009.26	2187025.74	5.00
OUT02		OUT02	91.5	91.5	91.5	Lw	91.5		900.00	0.00	540.00	5.00	r	6064988.00	2187098.66	5.00
OUT03		OUT03	91.5	91.5	91.5	Lw	91.5		900.00	0.00	540.00	5.00	r	6065063.95	2187069.15	5.00
OUT04		OUT04	91.5	91.5	91.5	Lw	91.5		900.00	0.00	540.00	5.00	r	6065256.22	2187135.99	5.00
OUT05		OUT05	91.5	91.5	91.5	Lw	91.5		900.00	0.00	540.00	5.00	r	6065156.24	2186782.06	5.00
OUT06		OUT06	91.5	91.5	91.5	Lw	91.5		900.00	0.00	540.00	5.00	r	6065094.39	2186813.53	5.00
SATSPKR01		SATSPRK01	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065340.87	2186829.41	2.00
SATSPKR02		SATSPRK02	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065302.16	2187405.80	2.00
SATSPKR03		SATSPRK03	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065404.07	2187370.21	2.00
SATSPKR04		SATSPRK04	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065500.07	2187333.40	2.00
SATSPKR05		SATSPRK05	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6064985.84	2187035.48	2.00
SATSPKR06		SATSPRK06	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065054.76	2187045.38	2.00
SATSPKR07		SATSPRK07	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065605.23	2187339.16	2.00
SATSPKR08		SATSPRK08	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065308.35	2187443.67	2.00
SATSPKR09		SATSPRK09	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065034.88	2187087.22	2.00
SATSPKR10		SATSPRK10	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065016.31	2186939.65	2.00
SATSPKR11		SATSPRK11	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6064983.93	2187147.55	2.00
SATSPKR12		SATSPRK12	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065218.26	2186723.07	2.00
SATSPKR13		SATSPRK13	98.0	98.0	98.0	Lw	98		900.00	0.00	0.00	2.00	r	6065274.90	2186751.93	2.00
TRASH1		TRASH1	88.9	88.9	88.9	Lw	88.9		150.00	0.00	90.00	8.00	r	6064996.37	2186826.31	8.00
SWIM01		SWIM01	89.4	89.4	89.4	Lw	89.4		900.00	0.00	270.00	15.00	r	6065050.19	2187108.25	15.00
SWIM02		SWIM02	89.4	89.4	89.4	Lw	89.4		900.00	0.00	270.00	15.00	r	6065064.69	2186840.81	15.00
SWIM03		SWIM03	89.4	89.4	89.4	Lw	89.4		900.00	0.00	270.00	15.00	r	6065229.10	2186771.05	15.00
SWIM04		SWIM04	89.4	89.4	89.4	Lw	89.4		900.00	0.00	270.00	15.00	r	6065194.87	2187100.24	15.00
MAINSPKR01		MAINSPKR01	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065526.35	2187051.07	15.00
MAINSPKR02		MAINSPKR02	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065458.99	2186970.52	15.00
MAINSPKR03		MAINSPKR03	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065385.86	2186886.14	15.00
MAINSPKR04		MAINSPKR04	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065306.00	2186814.61	15.00
MAINSPKR05		MAINSPKR05	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065105.30	2186840.31	15.00
MAINSPKR06		MAINSPKR06	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065169.19	2187104.89	15.00
MAINSPKR07		MAINSPKR07	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065081.00	2187097.95	15.00
MAINSPKR08		MAINSPKR08	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6064992.80	2187321.56	15.00
MAINSPKR09		MAINSPKR09	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065121.27	2187391.70	15.00
MAINSPKR10		MAINSPKR10	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065251.83	2187406.28	15.00
MAINSPKR11		MAINSPKR11	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065356.00	2187382.67	15.00
MAINSPKR12		MAINSPKR12	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	15.00	r	6065458.08	2187343.78	15.00
MAINSPKR13		MAINSPKR13	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065521.19	2187163.06	6.00
MAINSPKR14		MAINSPKR14	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065494.28	2187154.81	6.00
MAINSPKR15		MAINSPKR15	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065465.20	2187147.00	6.00
MAINSPKR16		MAINSPKR16	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065440.03	2187140.05	6.00
MAINSPKR17		MAINSPKR17	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065419.20	2187135.28	6.00
MAINSPKR18		MAINSPKR18	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065397.50	2187128.77	6.00
MAINSPKR19		MAINSPKR19	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065374.93	2187122.26	6.00
MAINSPKR20		MAINSPKR20	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065353.66	2187116.61	6.00
MAINSPKR21		MAINSPKR21	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065332.39	2187110.54	6.00
MAINSPKR22		MAINSPKR22	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065311.56	2187104.03	6.00
MAINSPKR23		MAINSPKR23	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065349.97	2187203.64	6.00
MAINSPKR24		MAINSPKR24	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065469.33	2187236.19	6.00
MAINSPKR25		MAINSPKR25	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065496.24	2187244.44	6.00
MAINSPKR26		MAINSPKR26	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065415.07	2187221.43	6.00
MAINSPKR27		MAINSPKR27	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065440.25	2187228.38	6.00
MAINSPKR28		MAINSPKR28	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065372.54	2187210.15	6.00
MAINSPKR29		MAINSPKR29	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065394.24	2187216.66	6.00
MAINSPKR30		MAINSPKR30	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065286.60	2187185.41	6.00
MAINSPKR31		MAINSPKR31	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065307.43	2187191.92	6.00
MAINSPKR32		MAINSPKR32	103.0	103.0	103.0	Lw	103		900.00	0.00	0.00	6.00	r	6065328.70	2187197.99	6.00
HEAT01		HEAT01	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065674.69	2187330.42	5.00
HEAT02		HEAT02	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065686.67	2187329.64	5.00
HEAT03		HEAT03	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065696.57	2187329.12	5.00
HEAT04		HEAT04	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065708.29	2187327.04	5.00
HEAT05		HEAT05	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065719.75	2187325.48	5.00
HEAT06		HEAT06	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065730.94	2187324.95	5.00
HEAT07		HEAT07	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065743.18	2187323.13	5.00
HEAT08		HEAT08	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065753.60	2187321.83	5.00
HEAT09		HEAT09	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065741.62	2187312.98	5.00
HEAT10		HEAT10	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065729.64	2187314.02	5.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
HEAT11		HEAT11	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065717.92	2187315.06	5.00
HEAT12		HEAT12	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065706.73	2187316.62	5.00
HEAT13		HEAT13	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065696.05	2187318.18	5.00
HEAT14		HEAT14	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065729.64	2187304.38	5.00
HEAT15		HEAT15	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065737.72	2187336.15	5.00
HEAT16		HEAT16	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065681.47	2187341.62	5.00
HEAT17		HEAT17	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065693.44	2187340.84	5.00
HEAT18		HEAT18	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065760.37	2187333.03	5.00
HEAT19		HEAT19	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065749.96	2187334.33	5.00
HEAT20		HEAT20	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065715.06	2187338.24	5.00
HEAT21		HEAT21	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065726.52	2187336.67	5.00
HEAT22		HEAT22	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065703.34	2187340.32	5.00
HEAT23		HEAT23	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065738.50	2187345.79	5.00
HEAT24		HEAT24	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065682.25	2187351.26	5.00
HEAT25		HEAT25	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065750.74	2187343.96	5.00
HEAT26		HEAT26	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065761.15	2187342.66	5.00
HEAT27		HEAT27	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065704.12	2187349.95	5.00
HEAT28		HEAT28	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065727.30	2187346.31	5.00
HEAT29		HEAT29	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065694.23	2187350.48	5.00
HEAT30		HEAT30	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065715.84	2187347.87	5.00
HEAT31		HEAT31	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065709.85	2187359.85	5.00
HEAT32		HEAT32	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065744.23	2187355.68	5.00
HEAT33		HEAT33	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065721.57	2187357.77	5.00
HEAT34		HEAT34	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065699.96	2187360.37	5.00
HEAT35		HEAT35	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065766.88	2187352.56	5.00
HEAT36		HEAT36	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065733.03	2187356.20	5.00
HEAT37		HEAT37	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065756.47	2187353.86	5.00
HEAT38		HEAT38	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065687.98	2187361.15	5.00
HEAT39		HEAT39	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065734.59	2187367.66	5.00
HEAT40		HEAT40	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065711.41	2187371.31	5.00
HEAT41		HEAT41	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065758.03	2187365.32	5.00
HEAT42		HEAT42	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065768.44	2187364.02	5.00
HEAT43		HEAT43	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065745.79	2187367.14	5.00
HEAT44		HEAT44	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065701.52	2187371.83	5.00
HEAT45		HEAT45	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065689.54	2187372.61	5.00
HEAT46		HEAT46	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065723.13	2187369.23	5.00
HEAT47		HEAT47	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065773.91	2187342.14	5.00
HEAT48		HEAT48	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065778.34	2187352.04	5.00
HEAT49		HEAT49	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065779.38	2187361.93	5.00
HEAT50		HEAT50	81.6	81.6	81.6	Lw	81.6		900.00	0.00	0.00	5.00	r	6065791.10	2187361.15	5.00

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
PARK01		PARK01	77.0	77.0	77.0	49.6	49.6	49.6	Lw	77		900.00	0.00	540.00	0.	r
PARK02		PARK02	77.0	77.0	77.0	47.8	47.8	47.8	Lw	77		900.00	0.00	540.00	0.	r
PARK03		PARK03	77.0	77.0	77.0	53.5	53.5	53.5	Lw	77		900.00	0.00	540.00	0.	r
PARK04		PARK04	77.0	77.0	77.0	53.1	53.1	53.1	Lw	77		900.00	0.00	540.00	0.	r
PARK05		PARK05	77.0	77.0	77.0	47.7	47.7	47.7	Lw	77		900.00	0.00	540.00	0.	r
PARK06		PARK06	77.0	77.0	77.0	57.9	57.9	57.9	Lw	77		900.00	0.00	540.00	0.	r
PARK07		PARK07	77.0	77.0	77.0	55.6	55.6	55.6	Lw	77		900.00	0.00	540.00	0.	r
PARK08		PARK08	77.0	77.0	77.0	51.8	51.8	51.8	Lw	77		900.00	0.00	540.00	0.	r
PARK09		PARK09	77.0	77.0	77.0	55.4	55.4	55.4	Lw	77		900.00	0.00	540.00	0.	r
PARK10		PARK10	77.0	77.0	77.0	50.1	50.1	50.1	Lw	77		900.00	0.00	540.00	0.	r
PARK11		PARK11	77.0	77.0	77.0	50.0	50.0	50.0	Lw	77		900.00	0.00	540.00	0.	r
PARK12		PARK12	77.0	77.0	77.0	50.0	50.0	50.0	Lw	77		900.00	0.00	540.00	0.	r
PARK13		PARK13	77.0	77.0	77.0	50.0	50.0	50.0	Lw	77		900.00	0.00	540.00	0.	r
SURF1		SURF1	93.0	93.0	93.0	52.7	52.7	52.7	Lw	93		900.00	0.00	540.00	8	r
SURF2		SURF2	93.0	93.0	93.0	53.0	53.0	53.0	Lw	93		900.00	0.00	540.00	8	r
LOAD2		LOAD2	101.4	101.4	101.4	79.1	79.1	79.1	Lw	101.4		900.00	0.00	0.00	4	r
LOAD1		LOAD1	101.4	101.4	101.4	79.5	79.5	79.5	Lw	101.4		900.00	0.00	0.00	4	r

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
PARK01	PARK01	0.00	r			6064681.71	2187245.15	0.00	0.00
						6064700.25	2187245.25	0.00	0.00
						6064700.46	2187251.11	0.00	0.00
						6064716.87	2187251.14	0.00	0.00
						6064711.07	2187174.28	0.00	0.00
						6064714.28	2187069.96	0.00	0.00
						6064697.47	2187069.96	0.00	0.00
						6064697.08	2187083.69	0.00	0.00
						6064677.45	2187084.29	0.00	0.00
						6064676.76	2187164.16	0.00	0.00
PARK02	PARK02	0.00	r			6064747.07	2187267.63	0.00	0.00
						6064765.77	2187266.77	0.00	0.00
						6064765.77	2187269.37	0.00	0.00
						6064780.14	2187269.10	0.00	0.00
						6064774.23	2187228.57	0.00	0.00
						6064771.41	2187153.05	0.00	0.00
						6064775.53	2187077.10	0.00	0.00
						6064787.47	2187008.74	0.00	0.00
						6064768.59	2187008.52	0.00	0.00
						6064768.81	2187024.14	0.00	0.00
						6064750.02	2187024.23	0.00	0.00
						6064738.97	2187083.36	0.00	0.00
						6064734.05	2187161.73	0.00	0.00
						6064739.94	2187230.52	0.00	0.00
PARK03	PARK03	0.00	r			6064809.11	2187264.33	0.00	0.00
						6064825.08	2187263.29	0.00	0.00
						6064816.40	2187207.04	0.00	0.00
						6064816.06	2187142.81	0.00	0.00
						6064794.18	2187142.11	0.00	0.00
						6064796.61	2187213.99	0.00	0.00
PARK04	PARK04	0.00	r			6064670.57	2187275.79	0.00	0.00
						6064663.97	2187290.38	0.00	0.00
						6064782.03	2187326.14	0.00	0.00
						6064821.26	2187317.81	0.00	0.00
						6064820.92	2187302.18	0.00	0.00
						6064784.81	2187308.78	0.00	0.00
PARK05	PARK05	0.00	r			6064663.97	2187290.38	0.00	0.00
						6064670.57	2187275.79	0.00	0.00
						6064658.07	2187264.33	0.00	0.00
						6064653.12	2187229.79	0.00	0.00
						6064652.47	2187198.75	0.00	0.00
						6064651.85	2187095.76	0.00	0.00
						6064654.19	2187070.36	0.00	0.00
						6064659.92	2187064.37	0.00	0.00
						6064785.15	2186957.04	0.00	0.00
						6064800.56	2186956.97	0.00	0.00
						6064831.46	2186967.04	0.00	0.00
						6064833.89	2186947.25	0.00	0.00
						6064799.86	2186938.22	0.00	0.00
						6064777.17	2186939.68	0.00	0.00
						6064631.01	2187065.55	0.00	0.00
						6064628.23	2187123.19	0.00	0.00
						6064629.28	2187216.59	0.00	0.00
						6064635.85	2187247.67	0.00	0.00
						6064644.18	2187274.75	0.00	0.00
PARK06	PARK06	0.00	r			6064816.61	2187001.92	0.00	0.00
						6064804.53	2187049.83	0.00	0.00
						6064822.51	2187054.87	0.00	0.00
						6064833.01	2187005.83	0.00	0.00
PARK07	PARK07	0.00	r			6065330.57	2187536.73	0.00	0.00
						6065347.94	2187529.78	0.00	0.00
						6065320.85	2187457.21	0.00	0.00
						6065302.80	2187464.50	0.00	0.00
PARK08	PARK08	0.00	r			6065475.02	2187541.93	0.00	0.00
						6065648.98	2187475.61	0.00	0.00
						6065642.73	2187457.56	0.00	0.00
						6065468.42	2187524.23	0.00	0.00
PARK09	PARK09	0.00	r			6065816.99	2187440.97	0.00	0.00
						6065818.03	2187423.61	0.00	0.00
						6065725.92	2187430.26	0.00	0.00
						6065726.02	2187447.22	0.00	0.00
PARK10	PARK10	0.00	r			6065349.67	2187456.52	0.00	0.00
						6065614.95	2187354.78	0.00	0.00
						6065607.66	2187337.42	0.00	0.00
						6065343.07	2187439.85	0.00	0.00
PARK11	PARK11	0.00	r			6065356.96	2187473.88	0.00	0.00
						6065622.24	2187372.49	0.00	0.00

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
						6065614.95	2187354.78	0.00	0.00
						6065349.67	2187456.52	0.00	0.00
PARK12	PARK12	0.00	r			6065375.71	2187512.07	0.00	0.00
						6065640.64	2187410.34	0.00	0.00
						6065633.35	2187392.63	0.00	0.00
						6065369.46	2187494.36	0.00	0.00
PARK13	PARK13	0.00	r			6065382.66	2187530.13	0.00	0.00
						6065647.59	2187428.04	0.00	0.00
						6065640.64	2187410.34	0.00	0.00
						6065375.71	2187512.07	0.00	0.00
SURF1	SURF1	8.00	r			6065237.57	2186798.68	8.00	0.00
						6065202.41	2186798.42	8.00	0.00
						6065174.81	2186803.89	8.00	0.00
						6065150.85	2186812.22	8.00	0.00
						6065127.67	2186825.50	8.00	0.00
						6065116.18	2186836.10	8.00	0.00
						6065096.94	2186841.65	8.00	0.00
						6065075.59	2186855.19	8.00	0.00
						6065056.06	2186880.45	8.00	0.00
						6065042.52	2186916.91	8.00	0.00
						6065043.04	2186957.53	8.00	0.00
						6065056.58	2186998.94	8.00	0.00
						6065086.79	2187040.09	8.00	0.00
						6065121.53	2187063.82	8.00	0.00
						6065143.13	2187073.13	8.00	0.00
						6065225.77	2187094.59	8.00	0.00
						6065275.34	2187109.88	8.00	0.00
						6065292.02	2187114.64	8.00	0.00
						6065604.21	2187195.67	8.00	0.00
						6065605.22	2187188.07	8.00	0.00
						6065541.85	2187115.15	8.00	0.00
						6065540.15	2187106.78	8.00	0.00
						6065540.50	2187078.11	8.00	0.00
						6065380.78	2186894.08	8.00	0.00
						6065314.13	2186836.18	8.00	0.00
						6065278.19	2186811.18	8.00	0.00
SURF2	SURF2	8.00	r			6065239.56	2187404.51	8.00	0.00
						6065295.12	2187395.14	8.00	0.00
						6065473.37	2187327.70	8.00	0.00
						6065483.71	2187321.15	8.00	0.00
						6065490.82	2187303.74	8.00	0.00
						6065500.20	2187293.33	8.00	0.00
						6065586.91	2187259.99	8.00	0.00
						6065589.78	2187251.92	8.00	0.00
						6065280.76	2187173.13	8.00	0.00
						6065266.01	2187171.39	8.00	0.00
						6065206.28	2187145.18	8.00	0.00
						6065147.14	2187126.65	8.00	0.00
						6065116.11	2187121.00	8.00	0.00
						6065080.52	2187120.14	8.00	0.00
						6065051.87	2187126.00	8.00	0.00
						6065025.61	2187140.75	8.00	0.00
						6065002.39	2187161.59	8.00	0.00
						6064988.81	2187188.26	8.00	0.00
						6064984.03	2187217.68	8.00	0.00
						6064986.12	2187252.95	8.00	0.00
						6064996.75	2187283.76	8.00	0.00
						6065010.97	2187309.77	8.00	0.00
						6065030.63	2187338.58	8.00	0.00
						6065051.53	2187359.44	8.00	0.00
						6065089.36	2187381.81	8.00	0.00
						6065119.47	2187393.97	8.00	0.00
						6065150.82	2187402.12	8.00	0.00
						6065179.37	2187405.26	8.00	0.00
LOAD2	LOAD2	4.00	r			6065803.41	2187398.58	4.00	0.00
						6065802.02	2187380.52	4.00	0.00
						6065699.93	2187391.63	4.00	0.00
						6065700.63	2187408.99	4.00	0.00
LOAD1	LOAD1	4.00	r			6065667.99	2187413.85	4.00	0.00
						6065686.74	2187408.30	4.00	0.00
						6065655.49	2187327.05	4.00	0.00
						6065637.43	2187333.99	4.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height				Coordinates			
				left	right		horz.	vert.	Begin		End		x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
BARRIERPLANNED			0						10.00	r			6065804.12	2187368.43	10.00	0.00
													6065734.59	2187287.70	10.00	0.00
													6065715.58	2187304.63	10.00	0.00
													6065661.15	2187325.20	10.00	0.00
													6065682.77	2187381.45	10.00	0.00
													6065804.12	2187368.43	10.00	0.00

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING			BUILDING00001	x	0		30.00	a	6064917.03	2187306.86	30.00	0.00
									6064958.58	2187291.18	30.00	0.00
									6064946.08	2187251.60	30.00	0.00
									6064939.83	2187227.64	30.00	0.00
									6064933.23	2187193.61	30.00	0.00
									6064931.50	2187146.74	30.00	0.00
									6064934.39	2187105.13	30.00	0.00
									6064946.08	2187048.82	30.00	0.00
									6064957.88	2187012.36	30.00	0.00
									6064974.90	2186974.86	30.00	0.00
									6064999.55	2186930.76	30.00	0.00
									6064944.69	2186893.61	30.00	0.00
									6064898.98	2186975.27	30.00	0.00
									6064889.95	2187007.21	30.00	0.00
									6064879.53	2187056.52	30.00	0.00
									6064875.37	2187114.16	30.00	0.00
									6064877.45	2187169.02	30.00	0.00
									6064889.95	2187236.38	30.00	0.00
									6064906.62	2187281.52	30.00	0.00
BUILDING			BUILDING00002	x	0		14.00	a	6065082.72	2186782.73	14.00	0.00
									6065211.59	2186703.32	14.00	0.00
									6065193.77	2186674.92	14.00	0.00
									6065065.30	2186756.86	14.00	0.00
BUILDING			BUILDING00003	x	0		14.00	a	6065010.09	2186821.10	14.00	0.00
									6065059.62	2186780.42	14.00	0.00
									6065046.43	2186758.19	14.00	0.00
									6064996.55	2186799.92	14.00	0.00
BUILDING			BUILDING00004	x	0		14.00	a	6064947.47	2187340.14	14.00	0.00
									6064976.29	2187326.25	14.00	0.00
									6064962.93	2187297.02	14.00	0.00
									6064935.79	2187310.18	14.00	0.00
BUILDING			BUILDING00005	x	0		14.00	a	6064976.22	2186901.84	14.00	0.00
									6064997.49	2186876.23	14.00	0.00
									6064961.89	2186846.28	14.00	0.00
									6064937.16	2186877.53	14.00	0.00

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Contour(s)

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'		Train Class	Correct.	Vmax
				Day	Night		Track	
				(dBA)	(dBA)		(dB)	(km(mph)

Sound Level Spectra

Name	ID	Type	Oktave Spectrum (dB)											Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)

RoadsGeo

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		

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APPENDIX 9.1:

CONSTRUCTION NOISE LEVEL CALCULATIONS

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16241 - Surf Farm

CadnaA Noise Prediction Model: 16241-02_Construction.cna
Date: 10.10.24
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	60.8	-42.2	57.8	0.0	0.0	0.0		x	Total	5.00	r	6064802.05	2187760.55	5.00
R2		R2	61.3	-41.7	58.3	0.0	0.0	0.0		x	Total	5.00	r	6064485.03	2187496.57	5.00
R3		R3	62.6	-40.4	59.6	0.0	0.0	0.0		x	Total	5.00	r	6064490.76	2187399.48	5.00
R4		R4	57.5	-45.5	54.5	0.0	0.0	0.0		x	Total	5.00	r	6064059.69	2187387.24	5.00
R5		R5	60.1	-42.9	57.1	0.0	0.0	0.0		x	Total	5.00	r	6064275.18	2186994.91	5.00
R6		R6	56.5	-46.5	53.5	0.0	0.0	0.0		x	Total	5.00	r	6065290.98	2185972.06	5.00
R7		R7	56.4	-46.6	53.4	0.0	0.0	0.0		x	Total	5.00	r	6065826.14	2186150.44	5.00
R8		R8	59.1	-43.9	56.1	0.0	0.0	0.0		x	Total	5.00	r	6066167.28	2187185.60	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)	

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
CONSTRUCTIONAREA1		CONSTRUCTIONAREA1	119.6	16.6	16.6	71.6	-31.4	-31.4	PWL-Pt	116.6					8	r

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
CONSTRUCTIONAREA1	CONSTRUCTIONAREA1	8.00	r			6065306.54	2187578.00	8.00	0.00
						6065355.72	2187571.57	8.00	0.00
						6065404.49	2187562.61	8.00	0.00
						6065452.74	2187551.15	8.00	0.00
						6065500.33	2187537.21	8.00	0.00
						6065547.14	2187520.82	8.00	0.00
						6065590.44	2187505.49	8.00	0.00
						6065634.37	2187492.08	8.00	0.00
						6065678.85	2187480.63	8.00	0.00
						6065723.79	2187471.15	8.00	0.00
						6065769.11	2187463.66	8.00	0.00
						6065814.72	2187458.18	8.00	0.00
						6065860.52	2187454.72	8.00	0.00
						6065906.43	2187453.28	8.00	0.00
						6065905.11	2187451.75	8.00	0.00
						6065897.91	2187443.36	8.00	0.00
						6065897.87	2187443.36	8.00	0.00
						6065776.23	2187301.61	8.00	0.00
						6065776.25	2187301.60	8.00	0.00
						6065724.80	2187241.65	8.00	0.00
						6065698.75	2187211.29	8.00	0.00
						6065647.30	2187151.35	8.00	0.00
						6065561.29	2187051.13	8.00	0.00
						6065432.26	2186900.79	8.00	0.00
						6065389.26	2186850.69	8.00	0.00
						6065199.74	2186629.86	8.00	0.00
						6065180.67	2186640.65	8.00	0.00
						6065180.17	2186639.78	8.00	0.00
						6065118.22	2186675.88	8.00	0.00
						6065057.00	2186713.22	8.00	0.00
						6065057.53	2186714.07	8.00	0.00
						6065032.40	2186729.88	8.00	0.00
						6065031.89	2186729.02	8.00	0.00
						6064984.55	2186759.62	8.00	0.00
						6064937.69	2186790.96	8.00	0.00
						6064938.25	2186791.79	8.00	0.00
						6064889.47	2186825.55	8.00	0.00
						6064888.90	2186824.73	8.00	0.00
						6064810.83	2186881.32	8.00	0.00
						6064734.31	2186939.99	8.00	0.00
						6064734.93	2186940.77	8.00	0.00
						6064711.71	2186959.23	8.00	0.00
						6064711.09	2186958.44	8.00	0.00
						6064668.91	2186992.79	8.00	0.00
						6064627.26	2187027.77	8.00	0.00
						6064627.91	2187028.53	8.00	0.00
						6064618.90	2187036.25	8.00	0.00
						6064605.24	2187047.96	8.00	0.00
						6064604.59	2187047.21	8.00	0.00
						6064552.08	2187092.30	8.00	0.00
						6064551.76	2187096.53	8.00	0.00
						6064498.13	2187142.57	8.00	0.00
						6064498.82	2187143.49	8.00	0.00
						6064572.59	2187240.91	8.00	0.00
						6064585.72	2187256.45	8.00	0.00
						6064600.40	2187270.54	8.00	0.00
						6064616.46	2187283.02	8.00	0.00
						6064633.74	2187293.76	8.00	0.00
						6064652.05	2187302.64	8.00	0.00
						6064671.18	2187309.56	8.00	0.00
						6065063.17	2187428.71	8.00	0.00
						6065096.99	2187440.19	8.00	0.00
						6065130.01	2187453.82	8.00	0.00
						6065162.08	2187469.55	8.00	0.00
						6065193.07	2187487.31	8.00	0.00
						6065222.85	2187507.03	8.00	0.00
						6065251.31	2187528.62	8.00	0.00
						6065278.32	2187552.00	8.00	0.00
						6065286.95	2187559.98	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	Coordinates			
							Begin	x	y	z	Ground
							(ft)	(ft)	(ft)	(ft)	(ft)

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Contour(s)

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'		Train Class	Correct.	Vmax
				Day	Night		Track	
				(dBA)	(dBA)		(dB)	(km(mph)

Sound Level Spectra

Name	ID	Type	Oktave Spectrum (dB)											Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)

RoadsGeo

Name	Height		Coordinates				Dist	LSlope
	Begin	End	x	y	z	Ground	(ft)	(%)
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		

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