APPENDIX R

Noise Report

Noise Technical Report

Mission Bay Park Improvements Project

City of San Diego, California

SEPTEMBER 2025

Prepared for:

CITY OF SAN DIEGO
525 B Street, Suite 750
San Diego, California 92101
Contact: Nicholas Ferracone

Prepared by:

DUDEK

605 Third Street
Encinitas, California 92024
Contact: Nick Segovia

Table of Contents

SECTION **PAGE NO.**

TABLES

FIGURES

APPENDICES

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
ADT	average daily traffic
ANSI	American National Standards Institute
BMP	stormwater best management practices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of San Diego
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz (cycles per second)
Improvement Zone	Mission Bay Park Improvement Zone
ips	inches per second
ISO	International Organization of Standardization
L_{eq}	equivalent noise level
L_{max}	maximum sound level
LT	Long-term
MM	Mitigation measure
NE	northeast
NW	northwest
PER	Preliminary Engineering Report
Program	Mission Bay Park Improvements Program
PPV	Peak particle velocity
RCNM	Roadway Construction Noise Model
report	Noise Technical Report
RMS	root mean square
SANDAG	San Diego Association of Governments
SLM	Sound level meter
SLR	Sea Level Rise
SPL	Sound pressure level
ST	Short-term
SW	southwest
TFIC	Traffic Forecast Information Center

INTENTIONALLY LEFT BLANK

1 Introduction

1.1 Report Purpose and Scope

The purpose of this technical report is to assess potential noise and vibration impacts associated with the construction of the Mission Bay Park Improvements Program (Program) located in the City of San Diego, California. This analysis uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), the City's CEQA Significance Thresholds (City of San Diego 2022), and other applicable thresholds of significance (e.g. Caltrans).

1.2 Project Location

The Program is located within the Mission Bay Park Improvement Zone (Improvement Zone), as defined in City Charter Section 55.2 (refer to Section 3.2 of the Project Description to the Program EIR for more information). Regionally, the Improvement Zone is located in the westernmost portion of central City of San Diego, as shown in Figure 1. The Program is located at the coastline in the City of San Diego bounded by the communities of Pacific Beach to the north, Ocean Beach to the south, Mission Beach to the west, and Interstate 5 (I-5) to the east. The Improvement Zone encompasses the 4,235-acre Mission Bay Park along with additional areas in all directions; the specific extent of the Improvement Zone is shown in Figure 2. Within the Improvement Zone are various identified sites for known discrete improvement projects within the Program to be analyzed under this EIR. An overview map of these projects (grouped as "elements") is provided in Figure 3. Specific details of each location are described for each project in Section 3.4 of the Project Description to the Program EIR. Regional access to the Program site (Mission Bay) is provided by I-5 from the north and south, and Interstate 8 (I-8) from the east. Access to each individual projects of the Program is provided by local roadways throughout and surrounding Mission Bay Park.

1.3 Project Description

The proposed project is a Program that is intended to address issues related to water quality and water circulation improvements, habitat improvements, and visitor-serving improvements, in specifically identified areas. The Program includes the implementation of the following elements: Wetland and Water Quality Improvements, Shoreline Restoration, Expansion of Habitat Preserves, Bicycle and Pedestrian Improvements, and Restoration of Seawall Bulkhead activities. Wetland and Water Quality Improvements are focused within several specific areas, including:

- North Fiesta Island
- Tecolote Creek and Fiesta Island Causeway
- Cudahy Creek

Shoreline Restoration would occur at several locations including:

- Vacation Island NW
- Vacation Island NE
- Vacation Island SW
- Ventura Cove

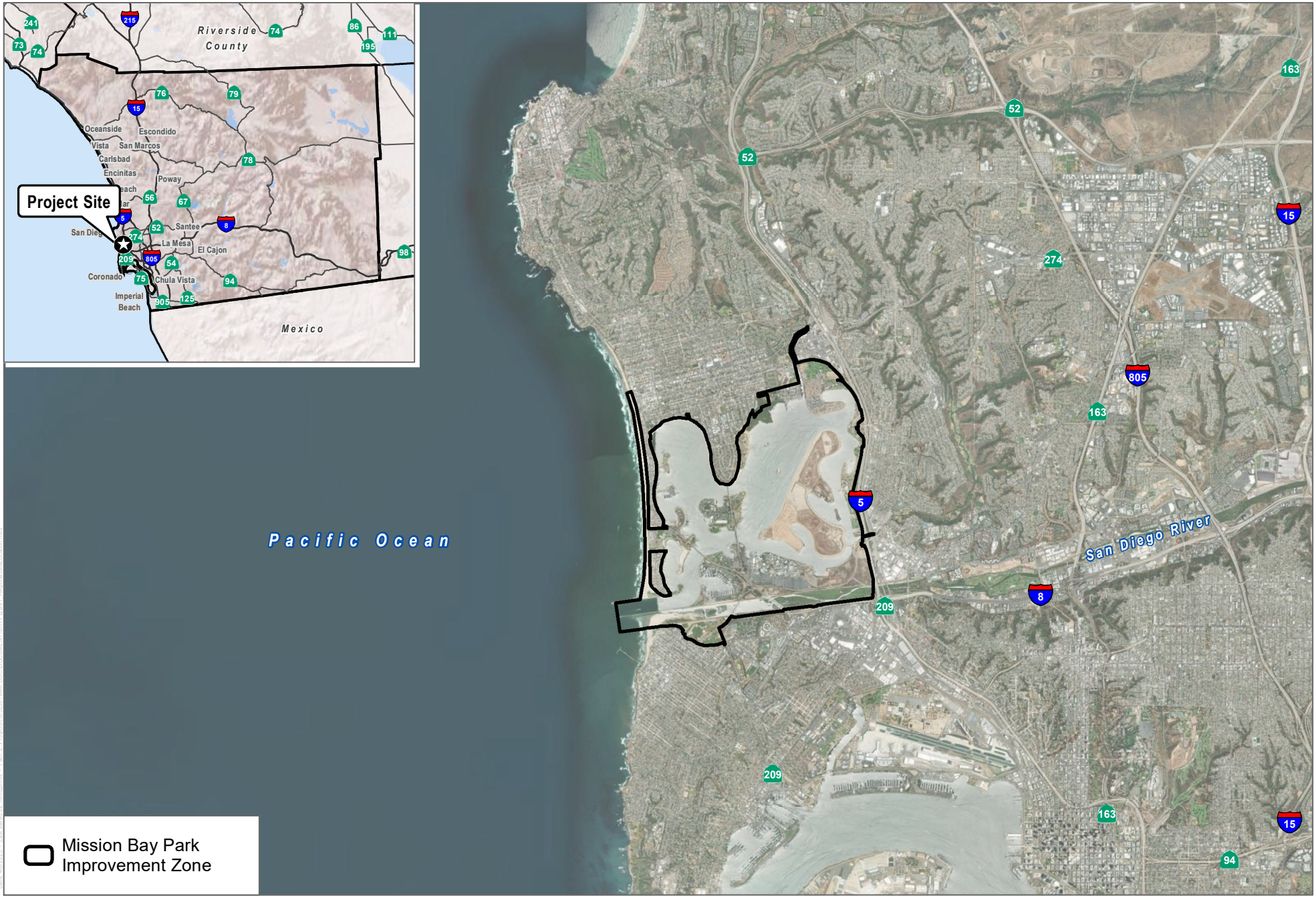
- Crown Point
- West Sail Bay
- Bonita Cove
- Bahia Point

Expansion of Habitat Preserves and Upland Habitats would occur at Fiesta Island and the area adjacent to Sea World Drive and the San Diego River. Bicycle and Pedestrian Improvements would occur across the multi-use paths surrounding Mission Bay with four main locations identified as key areas;

- Rose Creek Bike Path
- Fiesta Island Causeway
- Ocean Beach Bike Path

Bicycle and Pedestrian Improvements would include several improvement activities, including missing portions or gaps in bicycle and pedestrian paths, signage sustainable lighting, and parking lot repairs. The Restoration of the Seawall Bulkhead would occur along the oceanfront at Pacific Beach and Mission Beach at three distinct segments:

- Segment A
- Segment B
- Segment C



SOURCE: ESRI 2024

DUDEK

0 4,200 8,400 Feet

FIGURE 1

Mission Bay Park Improvements Program - Location

INTENTIONALLY LEFT BLANK

SOURCE: SANGIS 2023

DUDEK

0 900 1,800 Feet

FIGURE 2

Mission Bay Park Improvement Zone

Mission Bay Park Improvements Program

INTENTIONALLY LEFT BLANK

SOURCE: SANGIS 2023

DUDEK

0 900 1,800 Feet

FIGURE 3

Mission Bay Park Improvements Program Overview and Elements Locations

Mission Bay Park Improvements Program

INTENTIONALLY LEFT BLANK

2 Environmental Setting

Due to the technical nature of noise and vibration impact assessment, a brief overview of basic noise principles and descriptors is provided below, as well as a summary of the existing noise environment.

2.1 Noise and Vibration Basics

2.1.1 Sound

Noise is defined as unwanted sound. Sound may be described in terms of level or amplitude (measured in decibels [dB]), frequency or pitch (measured in hertz or cycles per second), and duration (measured in seconds or minutes). The standard unit of measurement of the amplitude of sound is the decibel. Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale is used to relate noise to human sensitivity. The dBA scale performs this compensation by discriminating against low and very high frequencies in a manner approximating the sensitivity of the human ear. Several descriptors of noise (noise metrics) exist to help predict average community reactions to the adverse effects of environmental noise, including traffic-generated noise, on a community. These descriptors include the equivalent noise level over a given period (L_{eq}), the statistical sound level, the day–night average noise level (L_{dn}), and the Community Noise Equivalent Level (CNEL). Each of these descriptors uses units of dBA. Table 1 provides examples of A-weighted noise levels from common sounds. In general, human sound perception is such that a change in sound level of 3 dBA is barely noticeable, a change of 5 dBA is clearly noticeable, and a change of 10 dBA is perceived as doubling or halving the sound level.

Table 1. Typical Exterior and Interior Sound Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
—	110	Rock band
Jet flyover at 300 meters (1,000 feet)	100	—
Gas lawn mower at 1 meter (3 feet)	90	—
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 mph)	80	Food blender at 1 meter (3 feet)
		Garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime	70	Vacuum cleaner at 3 meters (10 feet)
gas lawn mower at 30 meters (100 feet)		
Commercial area	60	Normal speech at 1 meter (3 feet)
Heavy traffic at 90 meters (300 feet)		
Quiet urban daytime	50	Large business office
		Dishwasher, next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime	30	Library
Quiet rural nighttime	20	Bedroom at night, concert hall (background)
—	10	Broadcast/recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 2013.
Note: dBA = A-weighted decibel.

The L_{eq} value is a sound level energy-averaged over a specified period (typically no less than 15 minutes for environmental studies). It is a single numerical value that, if constant over time, represents the same amount of variable sound energy received by a receptor during a time interval. For example, a 1-hour L_{eq} measurement would represent the average amount of energy contained in all the noise that occurred in that hour. The L_{eq} value is thus an effective noise descriptor because of its ability to assess the total time-varying effects of noise on sensitive receptors.

Unlike the L_{eq} metric that can be defined for any duration, L_{dn} and CNEL descriptors always represent 24-hour periods, often on an annualized basis. The L_{dn} and CNEL values also differ from L_{eq} because they apply a time-weighted dB adjustment designed to emphasize noise events that occur during the evening and nighttime hours (when speech and sleep disturbance is of more concern). "Time weighted" refers to the fact that L_{dn} and CNEL penalize noise that occurs during certain sensitive periods. In the case of CNEL, noise occurring during the daytime (7:00 a.m.–7:00 p.m.) receives no penalty. Noise during the evening (7:00 p.m.–10:00 p.m.) is penalized by adding 5 dB, while nighttime (10:00 p.m.–7:00 a.m.) noise is penalized by adding 10 dB. L_{dn} differs from CNEL in that the daytime period is defined as 7:00 a.m.–10:00 p.m., thus eliminating the evening period. L_{dn} and CNEL are the predominant criteria used to measure roadway noise affecting residential receptors. These two metrics generally differ from one another by no more than 0.5 dB to 1 dB and, as such, are often treated as equivalent to one another.

2.1.2 Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as blasting, pile driving, and heavy earthmoving equipment.

Several different methods are used to quantify vibration. Peak particle velocity (PPV), expressed in inches per second (ips), is defined as the maximum instantaneous peak of the vibration signal and is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body and is defined as the average of the squared amplitude of the signal.

The calculation to determine PPV at a given distance is as follows:

$$PPV_{rcvr} = PPV_{ref} * (25/D)^{n}$$

Where:

PPV_{rcvr} = the peak particle velocity in inches per second of the equipment adjusted for distance (i.e., at the receiver)

PPV_{ref} = the reference vibration level in inches per second at 25 feet

D = the distance from the equipment to the receiver

n = an exponent, for which a value of 1.1 would be consistent with Caltrans suggestion for class III "hard soils" composed of dense compacted sand or dry consolidated clay (Caltrans 2020).

2.1.3 Sensitive Receptors

Noise- and vibration-sensitive land uses are typically locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would be considered noise- and vibration-sensitive and may warrant unique measures for protection from intruding noise. Existing sensitive receptors in the vicinity of the Program location consist of residential single- and multi-family uses, guest lodging (i.e., hotels, resorts, motels), and schools, located across Mission Beach, Mission Bay Park, Pacific Beach, Bay Park, Morena, and Ocean Beach. At these residentially zoned land uses, the City's construction noise standard (75 dBA L_{eq} over a 12-hour period) applies. These nearby residential sensitive receptors studied herein have the greatest potential to be impacted by construction and/or operation of the various Program elements.

INTENTIONALLY LEFT BLANK

3 Regulatory Setting

The following subsections summarize relevant laws, ordinances, regulations, policies, standards, and guidance that establish noise and vibration impact significance assessment criteria for the proposed Project.

3.1 Federal

There are no applicable federal regulations related to noise and vibration that would apply to the Program. However, FTA offers guidance criteria for the assessment of construction noise at commercial and industrial receiving land uses, as well as ground-borne vibration standards with respect to building damage risk (FTA 2018). Because the Program implementation would be located entirely within the City of San Diego, the City's applicable regulations and relevant planning guidelines are described in this section.

3.2 State

3.2.1 California Department of Transportation – Vibration

In its Transportation and Construction Vibration Guidance Manual (Caltrans 2020), the California Department of Transportation (Caltrans) recommends 0.5 ips PPV as a threshold for the avoidance of structural damage to typical newer residential buildings exposed to continuous or frequent intermittent sources of ground-borne vibration. For transient vibration events, such as blasting, the damage risk threshold would be 1.0 ips PPV (Caltrans 2020) at the same type of newer residential structures. For older structures, these guidance thresholds would be more stringent: 0.3 ips PPV for continuous/intermittent vibration sources, and 0.5 ips PPV for transient vibration events. With respect to human annoyance, Caltrans guidance indicates that building occupants exposed to continuous ground-borne vibration in the range of 0.1 ips PPV ("strongly perceptible") to 0.4 ips PPV ("severe") would find it "annoying" at 0.2 ips PPV and "unpleasant" at the 0.4 ips PPV value. Although these Caltrans guidance thresholds are not regulations, they can serve as quantified standards in the absence of such limits at the local jurisdictional level.

3.3 Local

3.3.1 City of San Diego Noise Ordinance

The following are summarized portions or reproductions of relevant City of San Diego noise regulations, policies, and guidance with respect to assessing noise impact assessment for the proposed Project.

City of San Diego Municipal Code 59.5.0401 (Noise Ordinance, Sound Level Limits)

It shall be unlawful for any person to cause noise by any means to the extent that the 1-hour average sound level exceeds the applicable limits given in Table 2, Applicable Noise Limits, at any location in the City of San Diego on or beyond the boundaries of the property on which the noise is produced. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person.

Table 2. Applicable Noise Limits

Land Use	Time of Day	One-Hour A-weighted Average Sound Level (dBA)
Single-family residential	7:00 a.m. to 7:00 p.m.	50
	7:00 p.m. to 10:00 p.m.	45
	10:00 p.m. to 7:00 a.m.	40
Multifamily residential (up to a maximum density of 1/2,000)	7:00 a.m. to 7:00 p.m.	55
	7:00 p.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
All other residential	7:00 a.m. to 7:00 p.m.	60
	7:00 p.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50
Commercial	7:00 a.m. to 7:00 p.m.	65
	7:00 p.m. to 10:00 p.m.	60
	10:00 p.m. to 7:00 a.m.	60
Industrial or agricultural	Any time	75

Note: dB = decibels

City of San Diego Municipal Code 59.5.0402 (b) (Noise Ordinance, Motor Vehicles)

Section 59.5.0402 (b) of the SDMC states that nothing in the Noise Ordinance section shall apply to authorized emergency vehicles when being used in emergency situations, including the blowing of sirens and/or horns.

City of San Diego Municipal Code 59.5.0404 (Noise Ordinance, Construction Noise)

A. It shall be unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator. In granting such permit, the Administrator shall consider whether the construction noise in the vicinity of the proposed work site would be less objectionable at night than during the daytime because of different population densities or different neighboring activities; whether obstruction and interference with traffic particularly on streets of major importance, would be less objectionable at night than during the daytime; whether the type of work to be performed emits noises at such a low level as to not cause significant disturbances in the vicinity of the work site; the character and nature of the neighborhood of the proposed work site; whether great economic hardship would occur if the work were spread over a longer time; whether proposed night work is in the general public interest; and he shall prescribe such conditions, working times, types of construction equipment to be used, and permissible noise levels as he deems to be required in the public interest.

B. Except as provided in subsection C. hereof, it shall be unlawful for any person, including the City of San Diego, to conduct any construction activity so as to cause, at or beyond the property

lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m.

C. The provisions of subsection B. of this section shall not apply to construction equipment used in connection with emergency work, provided the Administrator is notified within 48 hours after commencement of work.

3.3.2 City of San Diego General Plan

The City's General Plan Noise Element identifies compatible exterior noise levels for various land use types (City of San Diego 2015). The maximum allowable noise exposure varies depending on the land use. The maximum acceptable exterior noise level for residential uses and other noise-sensitive uses (including schools, libraries, hospitals, daycare facilities, hotels, motels) is 65 dBA CNEL. Table 3 reproduces Table NE-3 from the City's General Plan Noise Element.

Table 3. City of San Diego Land Use – Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (dBA CNEL)				
	55–60	60–65	65–70	70–75	75–80
Parks and Recreational					
Parks, Active and Passive Recreation					
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities					
Agricultural					
Crop Raising and Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries and Greenhouses; Animal Raising, Maintain and Keeping; Commercial Stables					
Residential					
Single Dwelling Units; Mobile Homes		45			
Multiple Dwelling Units*		45	45*		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12Educational Facilities; Libraries; Museums; Child Care Facilities		45			
Other Educational Facilities including Vocational/Trade Schools and Colleges and Universities		45	45		
Cemeteries					
Retail Sales					
Building Supplies/Equipment; Food, Beverages and Groceries; Pets and Pet Supplies; Sundries, Pharmaceutical, and Convenience Sales; Wearing Apparel and Accessories			50	50	
Commercial Services					
Building Services; Business Support; Eating and Drinking; Financial Institutions; Maintenance and Repair; Personal Services; Assembly and Entertainment (includes public and			50	50	

Table 3. City of San Diego Land Use – Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (dBA CNEL)				
	55–60	60–65	65–70	70–75	75–80
religious assembly); Radio and Television Studios; Golf Course Support					
Visitor Accommodations		45	45	45	
Offices					
Business and Professional; Government; Medical, Dental and Health Practitioner; Regional and Corporate Headquarters			50	50	
Vehicle and Vehicular Equipment Sales and Services Use					
Commercial or Personal Vehicle Repair and Maintenance; Commercial or Personal Vehicle Sales and Rentals; Vehicle Equipment and Supplies Sales and Rentals; Vehicle Parking					
Wholesale, Distribution, Storage Use Category					
Equipment and Materials Storage Yards; Moving and Storage Facilities; Warehouse; Wholesale Distribution					
Industrial					
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking and Transportation Terminals; Mining and Extractive Industries					
Research and Development				50	

Table Shading Key			
	Compatible	Indoor Uses	Standard construction methods should attenuate exterior noise to an acceptable indoor noise level.
		Outdoor Uses	Activities associated with the land use may be carried out.
45, 50	Conditionally Compatible	Indoor Uses	Building structure must attenuate exterior noise to the indoor noise level indicated by the number for occupied areas.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable.
	Incompatible	Indoor Uses	New construction should not be undertaken.
		Outdoor Uses	Severe noise interference makes outdoor activities unacceptable.

Source: City of San Diego 2015.
* For uses affected by aircraft noise, refer to General Plan Noise Element Policies NE-D.2 and NE-D.3.

The City's General Plan Noise Element also lists the following policies with respect to noise and land use compatibility.

- **NE-A.1.** Separate excessive noise-generating uses from residential and other noise-sensitive land uses with a sufficient spatial buffer of less sensitive uses.
- **NE-A.2.** Assure the appropriateness of proposed developments relative to existing and future noise levels by consulting the guidelines for noise-compatible land use (shown on Table 3) to minimize the effects on noise-sensitive land uses.
- **NE-A.3.** Limit future residential and other noise-sensitive land uses in areas exposed to high levels of noise.

- **NE-A.4.** Require an acoustical study consistent with Acoustical Study Guidelines (Table NE-4) for proposed developments in areas where the existing or future noise level exceeds or would exceed the "compatible" noise level thresholds as indicated on the Land Use - Noise Compatibility Guidelines (Table 3), so that noise mitigation measures can be included in the Project design to meet the noise guidelines.
- **NE-A.5.** Prepare noise studies to address existing and future noise levels from noise sources that are specific to a community when updating community plans.

3.3.3 City CEQA Significance Determination Thresholds

The City's CEQA Significance Determination Thresholds address noise and vibration under different sections as follows:

- Section II.K – Significance Threshold 1 describes interior and exterior noise impact thresholds from traffic generated noise as appearing in Table 4, reproduced from Table K-2 in the City's CEQA Significance Determination Thresholds document.

Table 4. Traffic Noise Significance Thresholds

Structure or Proposed Use that would be impacted by Traffic Noise	Interior Space	Exterior Useable Space [A]	General Indication of Potential Significance
Single-family detached	45 dB	65 dB	Structure or outdoor useable area [B] is < 50 feet from the center of the closest (outside) lane on a street with existing or future ADTs >7500 [C]
Multi-family, schools, libraries, hospitals, day care, hotels, motels, parks, convalescent homes	Development Services Department (DSD) ensures 45 dB pursuant to Title 24		
Offices, Churches, Business, Professional Uses	n/a	70 dB	Structure or outdoor usable area is < 50 feet from the center of the closest lane on a street with existing or future ADTs > 20,000
Commercial, Retail, Industrial, Outdoor Spectator Sports Uses	n/a	75 dB	Structure or outdoor usable area is < 50 feet from the center of the closest lane on a street with existing or future ADTs > 40,000

Source: City of San Diego 2020.
Notes: n/a = not applicable; ADT = average daily traffic.

[A] If a project is currently at or exceeds the significance thresholds for traffic noise described above and noise levels would result in less than a 3 dB increase, then the impact is not considered significant.

[B] Exterior usable areas do not include residential front yards or balconies, unless the areas such as balconies are part of the required usable open space calculation for multi-family units.

[C] Traffic counts are available from San Diego Regional Association of Governments (SANDAG) Traffic Forecast Information Center (TFIC).

- Section II.K.6 – states with respect to construction noise:

  "Temporary construction noise which exceeds 75 dBA L_{eq} at a sensitive receptor would be considered significant. Construction noise levels measured at or beyond the property lines of any property zoned

residential shall not exceed an average sound level greater than 75 dBA during the 12-hour period from 7:00 a.m. to 7:00 p.m. In addition, construction activity is prohibited between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, that would create disturbing, excessive, or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator, in conformance with San Diego Municipal Code Section 59.5.0404.

Additionally, where temporary construction noise would substantially interfere with normal business communication, or affect sensitive receptors, a significant noise impact may be identified."

4 Existing Noise Conditions

Field measurements of sound pressure level (SPL) were conducted near and within the Program location on February 11, 2025, to quantify and characterize the existing outdoor ambient sound levels. Table 5 provides the location, date, and time at which these baseline sound level measurements were performed by an attending Dudek field investigator using a Rion-branded Model NL-62 sound level meter equipped with a 0.5-inch, pre-polarized condenser microphone with pre-amplifier. The sound level meter meets the current American National Standards Institute standard for a Type 1 (Precision Grade) sound level meter. The accuracy of the sound level meter was verified using a field calibrator before and after the measurements, and the measurements were conducted with the microphone positioned approximately 5 feet above the ground.

Twelve (12) short-term sound level measurement locations (ST1–ST12) that represent existing noise-sensitive receivers were selected near and within the Program location. These locations, depicted as receivers ST1–ST12 in Figure 4, Outdoor Ambient Sound Level Measurement Locations, were selected to characterize the baseline outdoor ambient sound levels for City of San Diego residential noise-sensitive receptors. The measured L_{eq} and maximum noise levels are provided in Table 5. The primary sound sources at the sites identified in Table 5 consisted of traffic along adjacent roadways, aircraft noise, and conversations/yelling.

Table 5. Measured Baseline Outdoor Ambient Sound Levels

Site	Location	Time	Average Noise Levels (dBA)	
			L_{eq}	L_{max}
ST1	Intersection of Capistrano Place and Ocean Front Walk near seawall	2025-02-11, 10:12 AM to 10:27 AM	63.7	70.6
ST2	Near Bonita Cove along Bayside Walk	2025-02-11, 10:35 AM to 10:50 AM	60.1	70.0
ST3	Near Ventura Cove adjacent to Bahia Resort Hotel parking lot	2025-02-11, 10:57 AM to 11:12 AM	59.7	70.4
ST4	Intersection of Seagirt Court and Strandway	2025-02-11, 11:23 AM to 11:38 AM	56.9	58.3
ST5	Immediately south of Catamaran Resort Hotel and Spa near Windemere Court	2025-02-11, 11:53 AM to 12:08 PM	59.1	62.7
ST6	Western edge of Crown Point at intersection of Riviera Drive and Edge Cliff Drive	2025-02-11, 12:19 PM to 12:34 PM	56.9	62.9
ST7	Northwestern edge of Vacation Isle along Sands Drive	2025-02-11, 12:42 PM to 12:57 PM	57.1	63.1
ST8	Along Rose Creek Trail at the western end of Magnolia Avenue	2025-02-11, 01:28 PM to 01:43 PM	54.8	58.5
ST9	East of Morena Boulevard along Lister Street	2025-02-11, 01:51 PM to 02:06 PM	68.4	71.0
ST10	South of Playa Pacifica Park and north of San Diego Mission Bay Resort	2025-02-11, 02:15 PM to 02:30 PM	54.2	54.9
ST11	Southern boundary of Ocean Beach Athletic Area Robb Field	2025-02-11, 02:43 PM to 02:58 PM	50.3	56.3
ST12	Along Ocean Beach Bike Path/San Diego River Bikeway, north of Ebb Tide Motel	2025-02-11, 03:05 PM to 03:20 PM	46.7	53.5

Source: Dudek 2025, Appendix A.

Notes: dBA = A-weighted decibels; L_{eq} = average equivalent noise level; L_{max} = maximum noise level.

As shown in Table 5, the measured sound pressure level ranged from approximately 46.7 dBA L_{eq} at ST12 to 68.4 dBA L_{eq} at ST9. Beyond the summarized information presented in Table 5, detailed sound measurement data are included in Appendix A.

Generally, the measured samples of daytime L_{eq} agree with expectations: at ST1, ST2, and ST9, L_{eq} values are above 60 dBA due largely to being close to moderately trafficked roadways (i.e., West Mission Boulevard, Morena Boulevard) and within the flight path of San Diego International Airport, whereas ST11 and ST12 were further from local roadways (i.e., Sunset Cliffs Boulevard, West Point Loma Boulevard) and within neighborhood parks.

SOURCE: SANGIS 2023

DUDEK

0 900 1,800 Feet

FIGURE 4

Outdoor Ambient Sound Level Measurement Locations

Mission Bay Park Improvements Program

INTENTIONALLY LEFT BLANK

5 Thresholds of Significance

The following significance criteria are based on Appendix G of the California Environmental Quality Act Guidelines (14 CCR 15000 et seq.) and will be used to determine the significance of potential noise impacts. Impacts to noise would be significant if the proposed Project would result in the following:

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. Expose people residing or working in the project area to excessive noise levels (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 2 miles of a public airport or public use airport).

In light of these above significance criteria, this analysis uses the following standards to evaluate potential noise and vibration impacts.

- Construction noise - Temporary construction noise that exceeds 75 dBA L_{eq} at a sensitive receptor would be considered significant. In particular, per SDMC 59.5.0404(c), construction noise levels measured at or beyond the property lines of any property zoned residential shall not exceed an average sound level greater than 75 dB L_{eq} during the 12-hour period from 7:00 a.m. to 7:00 p.m. In addition, construction activity is prohibited between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in SDMC Section 21.04, with the exception of Columbus Day and Washington's Birthday, or on Sundays, which would create disturbing, excessive, or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator, in conformance with SDMC Section 59.5.0404. Additionally, where temporary construction noise would substantially interfere with normal business communication, or affect sensitive receptors, such as educational facilities, a significant noise impact may be identified.
- Off-site Program-attributed transportation noise – According to Section II.K of the City's CEQA Significance Determination Thresholds, Program-generated traffic noise would be considered significant if exposure levels exceed 65 dB at an exterior usable space of noise-sensitive receptors including, but not limited to, single-family and multi-family residences, hotels, motels, parks, and convalescent homes (as shown in Table 4). In cases where existing traffic noise levels exceed the City's traffic noise significance thresholds, an increase in traffic noise greater than 3 dB would be considered significant.
- Off-site Program-attributed operational noise – The City's Noise Ordinance also limits property line noise levels for various land uses by time of day for noise generated by on-site sources associated with project operation (see the Table of Allowable Limits in Section 59.5.0401 of the San Diego Municipal Code [SDMC]). By way of illustration, the limit for multifamily residential land uses is 55 dBA L_{eq} from 7:00 a.m. to 7:00 p.m., 50 dBA L_{eq} from 7:00 p.m. to 10:00 p.m., and 45 dBA L_{eq} from 10:00 p.m. to 7:00 a.m. A project that would generate noise levels at the property line that exceeds the City's Noise Ordinance Standards is considered potentially significant (such as potentially a carwash or projects operating generators or noisy equipment). If a nonresidential use, such as a commercial, industrial, or school use, is proposed to abut an existing residential use, the decibel level at the property line should be the arithmetic mean of the decibel levels allowed for each use as set forth in SDMC Section 59.5.0401.

- Construction vibration – Guidance from Caltrans indicates that a vibration velocity of 0.2 ips PPV received at a structure would be considered annoying by occupants within (Caltrans 2020). As for the receiving structure itself, aforementioned Caltrans guidance recommends that a vibration magnitude of 0.3 ips PPV would represent the threshold for building damage risk of older residential structures exposed to continuous or frequently intermittent sources of ground-borne vibration.
- Airport noise - The San Diego International Airport is approximately 1.75 miles from the Program boundary at its nearest (i.e., from the southern boundary of Sea World Drive/San Diego River Site No. 3 – Triangle Restoration Area), or 4.9 miles at its furthest (i.e., from the northern boundary of Rose Creek Bike Path). The project site is located outside the 65 dB CNEL contour shown in the San Diego International Airport Land Use Compatibility Plan (SDCRAA 2014), and therefore would not expose people residing or working in the Program area to excessive noise levels associated with aircraft.

6 Impact Analysis

Would the Project result in 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?

6.1 Short-Term Construction Noise

Construction noise and vibration are temporary phenomena, with emission levels varying from hour to hour and day to day, depending on the equipment in use, the operations performed, and the distance between the source and receptor. Equipment that would be in use during construction would include, in part, graders, backhoes, rubber-tired dozers, loaders, cranes, forklifts, pavers, rollers, and air compressors. The typical maximum noise levels at a distance of 50 feet from various pieces of construction equipment and activities anticipated for use on the Proposed Project site are presented in Table 6. Note that the equipment noise levels presented in Table 6 are maximum noise levels. Usually, construction equipment operates in alternating cycles of full power and low power, producing average noise levels over time that are less than the maximum noise level. The average sound level of construction activity also depends on the amount of time that the equipment operates and the intensity of construction activities during that time.

Table 6. Typical Construction Equipment Maximum Noise Levels

Equipment Type	Typical Equipment (L_{max}, dBA at 50 Feet)
All Other Equipment > 5 HP	85
Backhoe	78
Compressor (air)	78
Crane	81
Dozer	82
Excavator	81
Flat Bed Truck	74
Front End Loader	79
Generator	72
Grader	85
Man Lift	75
Paver	77
Roller	80
Welder / Torch	73

Source: DOT 2006.
Note: L_{max} = maximum sound level; dBA = A-weighted decibels.

Aggregate noise emission from Program construction activities, broken down by sequential phase, was predicted at two evaluation distances to the nearest existing noise-sensitive receptor: 1) from the nearest position of the construction site boundary and 2) from the active construction equipment for a phase at two distinct locations dependent on construction progress along a linear path. The intent of the former distance is to help evaluate anticipated construction noise from a limited quantity of equipment or vehicle activity expected to be at the boundary of construction for some period of time, which would be most appropriate for elements such as Wetland

and Water Quality Improvements, Restoration of Shoreline, and Upland Habitat and Preserve Expansion due to each elements' proximity to the nearest noise-sensitive receptors, respectively. Specifically, the activity phases analyzed using the former distance do not span across a linear path of construction for thousands of feet but are defined within an area (i.e., component boundary), and therefore, the nearest individual noise-sensitive receptor(s) do not change as construction progresses. The latter distance is used in a manner similar to the general assessment technique as described in the FTA guidance for construction noise assessment, when the location of individual equipment for a given activity phase is uncertain over some extent of (or the entirety of) the construction site area. In this studied scenario, because of the equipment location uncertainty, construction noise exposure at a noise-sensitive receptor is studied at two distinct distances along a linear path of construction progress: a perpendicular (P) nearest distance (i.e., between the midpoint of estimated project activity phase progress and the receiver location) and a hypotenuse (H) distance (i.e., where the equipment is either near the lead point or trailing point of the construction progress). The latter distance would be most appropriate for elements such as Bicycle and Pedestrian Improvements and Restoration of Seawall Bulkhead. The distances between the construction of Program elements and the respective nearest sensitive receptors are detailed in Appendix B, Construction Noise Prediction Model Worksheets.

A Microsoft Excel–based noise prediction model emulating and using reference data from the Federal Highway Administration Roadway Construction Noise Model (RCNM) (FHWA 2008) was used to estimate construction noise levels at the nearest occupied noise-sensitive land uses to each Program element. (Although the RCNM was funded and promulgated by the Federal Highway Administration, it is often used for non-roadway projects, because the same types of construction equipment used for roadway projects are often used for other types of construction.) Input variables for the predictive modeling consist of the equipment type and number of each (e.g., two graders, a loader, a tractor), the duty cycle for each piece of equipment (e.g., percentage of time within a specific time period, such as an hour, when the equipment is expected to operate at full power or capacity and thus make noise at a level comparable to what is presented in Table 6), and the distance from the noise-sensitive receiver. The predictive model also considers how many hours that equipment may be on site and operating (or idling) within an established work shift. Conservatively, no topographical shielding was assumed in the modeling. The RCNM has default duty-cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were used for this noise analysis, which is detailed in Appendix B, Construction Noise Prediction Model Worksheets.

Wetland and Water Quality Improvements Element

North Fiesta Island Component

Table 7 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during construction activities at the North Fiesta Island Component. The studied nearest noise-sensitive receptor is the Tecolote Shores South Mission Bay Playground.

Table 7. Predicted Construction Noise Levels per Activity Phase – North Fiesta Island Component

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor)	50.6	860

Table 7. Predicted Construction Noise Levels per Activity Phase – North Fiesta Island Component

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Earthwork (excavator, loader, dozer, off-road trucks, scraper, tugboat, barge)	59.5	860
Plantings (tractor, excavator)	50.2	860
Bridge Construction (crane, bore/drill rigs, dredge, pumps, excavator, dump truck)	51.3	860
Demobilization (dozer, tractor)	50.6	860

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 7, the estimated construction noise levels are predicted to be up to 59.5 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 860 feet away) when Earthwork activities take place near the eastern element boundaries. Measured existing noise levels at measurement location ST10 (see Table 5), representative of the studied nearest noise-sensitive receptor to the North Fiesta Island Component construction activities, were 54.2 dBA L_{eq}; thus, temporary construction noise levels would be approximately 5.3 dBA higher than the measured outdoor ambient noise levels.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, for the North Fiesta Island Component, temporary construction-related noise would be considered **less than significant**.

Tecolote Creek and Fiesta Island Causeway Component

Table 8 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during construction activities at the Tecolote Creek and Fiesta Island Component. The studied nearest noise-sensitive receptor is the Tecolote Shores South Mission Bay Playground.

Table 8. Predicted Construction Noise Levels per Activity Phase – Tecolote Creek and Fiesta Island Causeway Component – Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor)	80.3	50
Earthwork (excavator, loader, dozer, off-road trucks, scraper)	87.6	50
Plantings (tractor, excavator)	79.9	50
Bridge Construction (crane, bore/drill rigs, dredge, pumps, excavator, dump truck)	79.7	50

Table 8. Predicted Construction Noise Levels per Activity Phase – Tecolote Creek and Fiesta Island Causeway Component – Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Demobilization (dozer, tractor)	80.3	50

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 8, the estimated construction noise levels are predicted to be up to 87.6 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 50 feet away) when Earthwork activities take place near the northeastern element boundaries, and all other activities would yield construction noise levels greater than 75 dBA L_{eq} over a 12-hour period. Therefore, construction activities at the Tecolote Creek and Fiesta Island Component would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement location ST10 (see Table 5), representative of the studied nearest noise-sensitive receptor to the North Fiesta Island Component construction activities, were 54.2 dBA L_{eq}. Thus, temporary construction noise levels would be approximately 33.4 dBA higher than the measured outdoor ambient noise levels at the noise-sensitive receptor nearest to the construction of the Tecolote Creek and Fiesta Island Component.

Thus, Mitigation Measure (MM) NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 12.9 dB if a 9-foot-tall temporary construction noise barrier is implemented during each activity phase along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor. Implementation of MM-NOI-1 would correspondingly reduce the highest predicted estimated non-mitigated construction noise level from 87.6 to 74.8 dBA L_{eq} during the Earthwork phase, which would be within the applicable 75 dBA L_{eq} 12-hour City threshold for construction noise.

Table 9 shows the predicted aggregate noise levels for construction activities when a 9-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during the five (5) studied activity phases, strategically placed along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor.

Table 9. Predicted Construction Noise Levels per Activity Phase – Tecolote Creek and Fiesta Island Causeway Component – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor)	67.5	50
Earthwork (excavator, loader, dozer, off-road trucks, scraper)	74.8	50
Plantings (tractor, excavator)	67.1	50
Bridge Construction (crane, bore/drill rigs, dredge, pumps, excavator, dump truck)	66.9	50
Demobilization (dozer, tractor)	67.5	50

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 9, the estimated construction noise levels are predicted to be up to 74.8 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 50 feet away) when Earthwork activities take place near the southern/eastern element boundaries, which would be 20.6 dBA L_{eq} higher than the measured noise levels at measurement location ST10 (see Table 5). In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at the Tecolote Creek and Fiesta Island Causeway Component, temporary construction-related noise would be considered **less than significant with mitigation incorporated**.

Cudahy Creek Component

Table 10 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during construction activities at the Cudahy Creek Component. The studied nearest noise-sensitive receptors are single-family residences east of Morena Boulevard.

Table 10. Predicted Construction Noise Levels per Activity Phase – Cudahy Creek Component

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor)	54.7	575
Import and Rough Grading (excavator, loader, dozer, off-road trucks, scraper, tugboat, barge)	63.6	575
Fine Grading (loader, grader, dozer)	57.6	575
Plantings (tractors)	55.6	575
Demobilization (dozer, tractor)	54.7	575

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 10, the estimated construction noise levels are predicted to be up to 63.6 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 575 feet away) when import and rough grading activities take place near the eastern element boundaries. Measured noise levels at measurement location ST9 (see Table 5), representative of the studied nearest noise-sensitive receptor to the Cudahy Creek Component construction activities, were 68.4 dBA L_{eq}; thus, temporary construction noise levels, in the worst case, may result in an ambient level increase of 2 dBA or less. An increase of at least 3 dBA is required to be considered noticeable, and although such an increase would not be noticeable to most people, construction noise may still be audible to some due to the frequency content and hearing sensitivity variations.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, for the Cudahy Creek Component, temporary construction-related noise would be considered **less than significant**.

Restoration of Shoreline Element

Vacation Island Northwest (NW)

Table 11 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction activities at Vacation Island Northwest (NW). The studied nearest noise-sensitive receptors are lodging facilities along Sunset Road and Sands Drive, associated with Paradise Point Resort & Spa.

Table 11. Predicted Construction Noise Levels per Activity Phase – Vacation Island NW - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor)	78.7	60
Beach Nourishment (tractor, dozer, excavator)	79.8	60
Construct Groins (tractor)	76.6	60
Demobilization (dozer, tractor)	78.7	60

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 11, the estimated construction noise levels are predicted to be up to 79.8 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 60 feet away) when Beach Nourishment activities take place near the southern/eastern element boundaries, and therefore would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement location ST7 (see Table 5), representative of the studied nearest noise-sensitive receptor to construction activities at Vacation Island NW, were 57.1 dBA L_{eq}; thus, temporary construction noise levels would be approximately 22.7 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 7.4 dB if an 8-foot-tall temporary construction noise barrier is implemented during each activity phase along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor. Implementation of MM-NOI-1 would correspondingly reduce the highest predicted estimated non-mitigated construction noise level from 79.8 to 72.5 dBA L_{eq} during the Beach Nourishment phase, which would be within the applicable 75 dBA L_{eq} 12-hour City threshold for construction noise.

Table 12 shows the predicted aggregate noise levels for construction activities when an 8-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during the four (4) studied activity phases, strategically placed along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor.

Table 12. Predicted Construction Noise Levels per Activity Phase – Vacation Island NW – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor)	71.3	60
Beach Nourishment (tractor, dozer, excavator)	72.5	60
Construct Groins (tractor)	69.2	60
Demobilization (dozer, tractor)	71.3	60

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 12, the estimated construction noise levels are predicted to be up to 72.5 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 60 feet away) when Beach Nourishment activities take place near the southern/eastern element boundaries, which would be 15.4 dBA L_{eq} higher than the measured noise levels at measurement location ST7 (see Table 5). In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Vacation Island NW, temporary construction-related noise would be considered **less than significant with mitigation incorporated**.

Vacation Island Northeast (NE) – Ingraham Street

Table 13 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction activities at Vacation Island Northeast (NE) – Ingraham Street. The studied nearest noise-sensitive receptors are lodging facilities along Hummingbird Lane, associated with Paradise Point Resort & Spa.

Table 13. Predicted Construction Noise Levels per Activity Phase – Vacation Island NE (Ingraham Street) - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor)	77.3	70
Recover Existing Rip Rap (tractor)	75.2	70
Construct New Revetment (loader, excavators, dump truck)	76.9	70
Install Oyster Habitat (tractor, excavator)	78.0	70
Demobilization (dozer, tractor)	77.3	70

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 13, the estimated construction noise levels are predicted to be up to 78.0 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 70 feet away) when Install Oyster Habitat activities take place near the southern/eastern element boundaries, and all other activities would yield construction noise levels greater than 75 dBA L_{eq} over a 12-hour period. Therefore, construction activities at Vacation Island Northeast (NE) – Ingraham Street would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement location ST7 (see Table 5) would be representative of the studied nearest noise-sensitive receptor to construction activities at Vacation Island NE – Ingraham Street and were measured to be 57.1 dBA L_{eq}; thus, temporary construction noise levels would be approximately 20.9 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 3.7 dB if a 7-foot-tall temporary construction noise barrier is implemented during each activity phase along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor. Implementation of MM-NOI-1 would correspondingly reduce the highest predicted estimated non-mitigated construction noise level from 77.3 to 73.7 dBA L_{eq} during the Mobilization/SWPPP/Site Preparation and Demobilization phases, which would be within the applicable 75 dBA L_{eq} 12-hour City threshold for construction noise.

Table 14 shows the predicted aggregate noise levels for construction activities when a 7-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during the five (5) studied activity phases, strategically placed along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor.

Table 14. Predicted Construction Noise Levels per Activity Phase – Vacation Island NE (Ingraham Street) – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor)	73.7	70
Recover Existing Rip Rap (tractor)	71.6	70
Construct New Revetment (loader, excavators, dump truck)	73.3	70
Install Oyster Habitat (tractor, excavator)	74.3	70
Demobilization (dozer, tractor)	73.7	70

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 14, the estimated construction noise levels are predicted to be up to 74.3 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 70 feet away) when Install Oyster Habitat activities take place near the southern/eastern element boundaries, which would be 17.2 dBA L_{eq} higher than the measured noise levels at measurement location ST7 (see Table 5). In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed

the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Vacation Island NE – Ingraham Street, temporary construction-related noise would be considered **less than significant with mitigation incorporated**.

Vacation Island Northeast (NE) – Ski Beach

Table 15 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction activities at Vacation Island Northeast (NE) – Ski Beach. The studied nearest noise-sensitive receptors are lodging facilities along Hummingbird Lane, associated with Paradise Point Resort & Spa.

Table 15. Predicted Construction Noise Levels per Activity Phase – Vacation Island NE (Ski Beach)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor)	52.9	660
Cobble Berm (tractor, excavator)	52.5	660
Beach Nourishment (tractor, dozer, excavator)	52.5	660
Demobilization (dozer, tractor)	52.9	660

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 15, the estimated construction noise levels are predicted to be up to 52.9 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 660 feet away) when Mobilization/SWPPP/Site Preparation and Demobilization activities take place near the southern/western element boundaries. Measured noise levels at measurement location ST7 (see Table 5) would be representative of the studied nearest noise-sensitive receptor to construction activities at Vacation Island NE – Ski Beach and were measured to be 57.1 dBA L_{eq}; thus, temporary construction noise levels, in the worst case, may result in an ambient level increase of 2 dBA or less. An increase of at least 3 dBA is required to be considered noticeable, and although such an increase would not be noticeable to most people, construction noise may still be audible to some due to the frequency content and hearing sensitivity variations.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Vacation Island NE – Ski Beach, temporary construction-related noise would be considered **less than significant**.

Vacation Island Southwest (SW)

Table 16 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction activities at Vacation Island Southwest (SW). The studied nearest noise-sensitive receptors are lodging facilities south of Vacation Road, associated with Paradise Point Resort & Spa.

Table 16. Predicted Construction Noise Levels per Activity Phase – Vacation Island SW

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor)	53.2	640
Recover Existing Rip Rap (tractor, excavator)	52.8	640
Construct New Revetment (loader, excavators, dump truck)	52.7	640
Install Oyster Habitat (tractor, excavator)	55.0	640
Demobilization (dozer, tractor)	53.2	640

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 16, the estimated construction noise levels are predicted to be up to 55.0 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 640 feet away) when Install Oyster Habitat activities take place near the northern element boundaries. Measured noise levels at measurement location ST7 (see Table 5) would be representative of the studied nearest noise-sensitive receptor to construction activities at Vacation Island SW and were measured to be 57.1 dBA L_{eq}; thus, temporary construction noise levels, in the worst case, may result in an ambient level increase of 2 dBA or less. An increase of at least 3 dBA is required to be considered noticeable, and although such an increase would not be noticeable to most people, construction noise may still be audible to some due to the frequency content and hearing sensitivity variations.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Vacation Island SW, temporary construction-related noise would be considered **less than significant**.

Ventura Cove Park

Table 17 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction activities at Ventura Cove Park. The studied nearest noise-sensitive receptor is the Bahia Resort Hotel.

Table 17. Predicted Construction Noise Levels per Activity Phase – Ventura Cove Park

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor)	50.4	850
Recover Existing Rip Rap (tractor)	48.3	850

Table 17. Predicted Construction Noise Levels per Activity Phase – Ventura Cove Park

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Construct New Revetment (loader, excavators)	47.4	850
Install Oyster Habitat (tractor, excavator, tugboat, barge)	52.2	850
Construct Sidewalk (loader, excavator, concrete mixer truck, concrete saw, pumps)	54.5	850
Demobilization (dozer, tractor)	50.4	850

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 17, the estimated construction noise levels are predicted to be up to 54.5 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 850 feet away) when Construct Sidewalk activities take place near the northern element boundaries. Measured noise levels at measurement location ST3 (see Table 5) would be representative of the studied nearest noise-sensitive receptor to construction activities at Ventura Cove Park and were measured to be 59.7 dBA L_{eq}; thus, temporary construction noise levels, in the worst case, may result in an ambient level increase of 2 dBA or less. An increase of at least 3 dBA is required to be considered noticeable, and although such an increase would not be noticeable to most people, construction noise may still be audible to some due to the frequency content and hearing sensitivity variations.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Ventura Cove Park, temporary construction-related noise would be considered **less than significant**.

Crown Point

Table 18 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction activities at Crown Point. The studied nearest noise-sensitive receptors are single-family residences along Riviera Drive.

Table 18. Predicted Construction Noise Levels per Activity Phase – Crown Point - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor, impact pile driver, vibratory pile driver, jetting equipment, concrete mixer truck, pumps)	83.0	110
Excavation (excavator)	68.2	110

Table 18. Predicted Construction Noise Levels per Activity Phase – Crown Point - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Shoreline Stabilization (tractor, impact pile driver, vibratory pile driver, jetting equipment, concrete mixer truck, pumps)	82.8	110
Install Oyster Habitat (tractor, excavator)	73.0	110
Demobilization (dozer, tractor)	73.4	110

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 18, the estimated construction noise levels are predicted to be up to 83.0 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 110 feet away) when Mobilization activities take place near the eastern element boundaries, and therefore would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement location ST6 (see Table 5), representative of the studied nearest noise-sensitive receptor to construction activities at Crown Point, were measured to be 56.9 dBA L_{eq}; thus, temporary construction noise levels would be approximately 26.1 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 9.2 dB if an 11-foot-tall temporary construction noise barrier is implemented during the Mobilization and Shoreline Stabilization activity phases along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor. Implementation of MM-NOI-1 would correspondingly reduce the highest predicted estimated non-mitigated construction noise levels from 83.0 and 82.8 dBA L_{eq} to 73.9 and 73.7 dBA L_{eq} during the Mobilization and Shoreline Stabilization phases, respectively, which would be within the applicable 75 dBA L_{eq} 12-hour City threshold for construction noise.

Table 19 shows the predicted aggregate noise levels for construction activities when an 11-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during the Mobilization and Shoreline Stabilization activity phases, strategically placed along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor.

Table 19. Predicted Construction Noise Levels per Activity Phase – Crown Point – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor, impact pile driver, vibratory pile driver, jetting equipment, concrete mixer truck, pumps)	73.9	110

Table 19. Predicted Construction Noise Levels per Activity Phase – Crown Point – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Excavation (excavator)	68.2	110
Shoreline Stabilization (tractor, impact pile driver, vibratory pile driver, jetting equipment, concrete mixer truck, pumps)	73.7	110
Install Oyster Habitat (tractor, excavator)	73.0	110
Demobilization (dozer, tractor)	73.4	110

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 19, the estimated construction noise levels are predicted to be up to 73.9 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 110 feet away) when Mobilization activities take place near the eastern element boundaries, which would be 17.0 dBA L_{eq} higher than the measured noise levels at measurement location ST6 (see Table 5). In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Crown Point, temporary construction-related noise would be considered **less than significant with mitigation incorporated**.

West Sail Bay

Table 20 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction activities at West Sail Bay. The studied nearest noise-sensitive receptors are single-family residences along Bayside Walk, east of Mission Boulevard.

Table 20. Predicted Construction Noise Levels per Activity Phase – West Sail Bay - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor, excavator)	87.7	30
Beach Nourishment (tractor, dozer, excavator)	87.7	30
Demobilization (tractor, dozer, excavator)	87.7	30

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 20, the estimated construction noise levels are predicted to be up to 87.7 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 30 feet away) when all three (3) construction

activities take place along the western element boundaries, and therefore would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement location ST5 (see Table 5), representative of the studied nearest noise-sensitive receptor to construction activities at West Sail Bay, were measured to be 59.1 dBA L_{eq}; thus, temporary construction noise levels would be approximately 28.6 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 14.0 dB if a 9-foot-tall temporary construction noise barrier is implemented during all three (3) activity phases along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor. Implementation of MM-NOI-1 would correspondingly reduce the highest predicted estimated non-mitigated construction noise levels from 87.7 to 73.8 dBA L_{eq} during each activity phase, which would be within the applicable 75 dBA L_{eq} 12-hour City threshold for construction noise.

Table 21 shows the predicted aggregate noise levels for construction activities when a 9-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during all three (3) activity phases, strategically placed along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor.

Table 21. Predicted Construction Noise Levels per Activity Phase – West Sail Bay – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor, excavator)	73.8	30
Beach Nourishment (tractor, dozer, excavator)	73.8	30
Demobilization (tractor, dozer, excavator)	73.8	30

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 21, the estimated construction noise levels are predicted to be up to 73.8 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 30 feet away), which would be 14.7 dBA L_{eq} higher than the measured noise levels at measurement location ST5 (see Table 5). In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at West Sail Bay, temporary construction-related noise would be considered **less than significant with mitigation incorporated**.

Bonita Cove

Table 22 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction activities at Bonita Cove. The studied nearest noise-sensitive receptors are single-family residences along Bayside Lane and San Fernando Place, west of the element boundary.

Table 22. Predicted Construction Noise Levels per Activity Phase – Bonita Cove - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor, water compaction truck, pumps)	82.5	45
Demolish Existing Sidewalk (concrete saw, dozer, excavator, backhoe)	84.9	45
Construct New Sidewalk (loader, excavator, off-road truck, concrete saw, pumps)	84.9	45
Cobble Berm (tractor, excavator)	80.8	45
Beach Nourishment (tractor, water compaction truck)	80.3	45
Demobilization (tractor, dozer)	81.2	45

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 22, the estimated construction noise levels are predicted to be up to 84.9 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 45 feet away) when Demolish Existing Sidewalk and Construct New Sidewalk activities take place along the western element boundaries, and therefore would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement location ST2 (see Table 5), representative of the studied nearest noise-sensitive receptor to construction activities at Bonita Cove, were measured to be 60.1 dBA L_{eq}; thus, temporary construction noise levels would be approximately 24.8 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 10.2 dB if a 9-foot-tall temporary construction noise barrier is implemented during each activity phase along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor. Implementation of MM-NOI-1 would correspondingly reduce the highest predicted estimated non-mitigated construction noise levels from 84.9 to 74.9 dBA L_{eq} during the Demolish Existing Sidewalk and Construct New Sidewalk activity phases, which would be within the applicable 75 dBA L_{eq} 12-hour City threshold for construction noise.

Table 23 shows the predicted aggregate noise levels for construction activities when a 9-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during each activity phase, strategically placed along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor.

Table 23. Predicted Construction Noise Levels per Activity Phase – Bonita Cove – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor, water compaction truck, pumps)	72.4	45
Demolish Existing Sidewalk (concrete saw, dozer, excavator, backhoe)	74.9	45
Construct New Sidewalk (loader, excavator, off-road truck, concrete saw, pumps)	74.9	45
Cobble Berm (tractor, excavator)	70.7	45
Beach Nourishment (tractor, water compaction truck)	70.2	45
Demobilization (tractor, dozer)	71.1	45

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 23, the estimated construction noise levels are predicted to be up to 74.9 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 45 feet away), which would be 14.8 dBA L_{eq} higher than the measured noise levels at measurement location ST2 (see Table 5). In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Bonita Cove, temporary construction-related noise would be considered **less than significant with mitigation incorporated**.

Bahia Point

Table 24 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction activities at Bahia Point. The studied nearest noise-sensitive receptor is the Bahia Resort Hotel.

Table 24. Predicted Construction Noise Levels per Activity Phase – Bahia Point

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization/SWPPP/Site Preparation (dozer, tractor, water truck, dump truck)	71.0	130
Storm Drain Improvement/Install Pilot Groins (tractor, excavator, dump truck)	72.0	130
Excavation (excavator)	64.8	130
Cobble Berm (tractor)	67.8	130
Beach Nourishment (tractor, dump truck, tugboat, barge)	70.1	130

Table 24. Predicted Construction Noise Levels per Activity Phase – Bahia Point

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Construct Vehicle Access Ways (loader, excavator, concrete mixer truck, concrete saw, pumps, water truck)	73.5	130
Demobilization (dozer, tractor)	69.9	130

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 24, the estimated construction noise levels are predicted to be up to 73.5 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 130 feet away) when Construct Vehicle Access Ways activities take place near the western element boundaries. Measured noise levels at measurement location ST3 (see Table 5) would be representative of the studied nearest noise-sensitive receptor to construction activities at Bahia Point and were measured to be 59.7 dBA L_{eq}; thus, temporary construction noise levels would be approximately 13.8 dBA higher than the measured outdoor ambient noise levels.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Bahia Point, temporary construction-related noise would be considered **less than significant**.

Upland Habitat and Preserve Expansion Element

Tables 25–28 present the predicted 12-hour L_{eq} levels and source-to-receiver distances for each activity phase during the construction activities at Fiesta Island Sites No. 1, No. 3, No. 4, and No. 5. Tables 29–31 present the predicted 12-hour L_{eq} levels and source-to-receiver distances for each activity phase during the construction activities at Sea World Drive/San Diego River Sites No. 1a, No. 3c, and No. 4d. The studied noise-sensitive receptors nearest to each element are detailed below.

Fiesta Island Site No.1 – South

Table 25 presents the predicted construction noise levels at the studied noise-sensitive receptors nearest to Fiesta Island Site No. 1 (i.e., Tecolote Shores South Mission Bay Playground).

Table 25. Predicted Construction Noise Levels per Activity Phase – Fiesta Island Site No. 1 - South

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Clearing and Grubbing/Non-Native Eradication (pickup truck, dump truck, dozer, chipper)	48.7	1400
Plantings (pickup truck, excavator)	40.2	1400

Table 25. Predicted Construction Noise Levels per Activity Phase – Fiesta Island Site No. 1 - South

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Seeding (pickup truck, dozer)	41.2	1400

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 25, the estimated construction noise levels are predicted to be up to 48.7 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptors (as close as 1400 feet away) when Clearing and Grubbing/Non-Native Eradication activities take place near the eastern element boundaries. Measurement location ST10 (see Table 5), representative of the nearest noise-sensitive receptor to Fiesta Island Site No. 1 due to its proximity to I-5, was 54.2 dBA L_{eq}. Thus, temporary construction noise levels, in the worst case, may result in an ambient level increase of 2 dBA or less. An increase of at least 3 dBA is required to be considered noticeable, and although such an increase would not be noticeable to most people, construction noise may still be audible to some due to the frequency content and hearing sensitivity variations.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Fiesta Island Site No. 1, temporary construction-related noise would be considered **less than significant**.

Fiesta Island Site No. 3 – Near Youth Camping

Table 26 presents the predicted construction noise levels at the studied noise-sensitive receptors nearest to Fiesta Island Site No. 3 (i.e., San Diego Mission Bay Resort).

Table 26. Predicted Construction Noise Levels per Activity Phase – Fiesta Island Site No. 3 – Near Youth Camping

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Clearing and Grubbing/Non-Native Eradication (pickup truck, dump truck, dozer, chipper)	56.7	620
Site Grading and Sand Import/Export (dozer, haul truck, water truck, pickup truck)	55.0	620
Plantings (pickup truck, excavator)	48.3	620
Seeding (pickup truck, dozer)	49.2	620

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 26, the estimated construction noise levels are predicted to be up to 56.7 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptors (as close as 620 feet away) when Clearing and Grubbing/Non-

Native Eradication activities take place near the eastern element boundaries. Measurement location ST10 (see Table 5), representative of the nearest noise-sensitive receptor to Fiesta Island Site No. 3, was 54.2 dBA L_{eq}. Thus, temporary construction noise levels would be approximately 2.5 dBA higher than the measured outdoor ambient noise levels.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Fiesta Island Site No. 3, temporary construction-related noise would be considered **less than significant**.

Fiesta Island Site No. 4 – North Central

Table 27 presents the predicted construction noise levels at the studied noise-sensitive receptors nearest to Fiesta Island Site No. 4 (i.e., San Diego Mission Bay Resort).

Table 27. Predicted Construction Noise Levels per Activity Phase – Fiesta Island Site No. 4 – North Central

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Clearing and Grubbing/Non-Native Eradication (pickup truck, dump truck, dozer, chipper)	44.6	2070
Plantings (pickup truck, excavator)	36.1	2070
Seeding (pickup truck, dozer)	37.1	2070

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 27, the estimated construction noise levels are predicted to be up to 44.6 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptors (as close as 2070 feet away) when Clearing and Grubbing/Non-Native Eradication activities take place near the eastern element boundaries. Measurement location ST10 (see Table 5), representative of the nearest noise-sensitive receptor to Fiesta Island Site No. 4, was 54.2 dBA L_{eq}. Thus, temporary construction noise levels, in the worst case, may result in an ambient level increase of 2 dBA or less. An increase of at least 3 dBA is required to be considered noticeable, and although such an increase would not be noticeable to most people, construction noise may still be audible to some due to the frequency content and hearing sensitivity variations.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Fiesta Island Site No. 4, temporary construction-related noise would be considered **less than significant**.

Fiesta Island Site No. 5 – Least Tern Preserve Area

Table 28 presents the predicted construction noise levels at the studied noise-sensitive receptors nearest to Fiesta Island Site No. 5 (i.e., San Diego Mission Bay Resort).

Table 28. Predicted Construction Noise Levels per Activity Phase – Fiesta Island Site No. 5 – Least Tern Preserve Area

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Clearing and Grubbing/Non-Native Eradication (pickup truck, dump truck, dozer, chipper)	43.4	2300
Site Grading (scraper, dozer, water truck, pickup truck)	42.6	2300
Concrete and Asphalt Demo and Disposal (loader, excavator, haul truck, pickup truck)	38.5	2300
Sand Import/Placement (dozer, haul truck, water truck, pickup truck)	41.7	2300
Plantings (pickup truck, excavator)	35.0	2300

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 28, the estimated construction noise levels are predicted to be up to 43.4 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptors (as close as 2300 feet away) when Clearing and Grubbing/Non-Native Eradication activities take place near the eastern element boundaries. Measurement location ST10 (see Table 5), representative of the nearest noise-sensitive receptor to Fiesta Island Site No. 5, was 54.2 dBA L_{eq}. Thus, temporary construction noise levels, in the worst case, may result in an ambient level increase of 2 dBA or less. An increase of at least 3 dBA is required to be considered noticeable, and although such an increase would not be noticeable to most people, construction noise may still be audible to some due to the frequency content and hearing sensitivity variations.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Fiesta Island Site No. 5, temporary construction-related noise would be considered **less than significant**.

Sea World Drive/San Diego River Site No. 1 – Cloverleaf Least Tern Preserve Area

Table 29 presents the predicted construction noise levels at the studied noise-sensitive receptors nearest to Sea World Drive/San Diego River Site No. 1a (i.e., single- and multi-family residences within the Loma Riviera Community Association condominiums).

Table 29. Predicted Construction Noise Levels per Activity Phase – Sea World Drive/San Diego River Site No. 1a – Cloverleaf Least Tern Preserve Area

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Clearing and Grubbing/Non-Native Eradication (pickup truck, dump truck, dozer, chipper)	50.5	1170

Table 29. Predicted Construction Noise Levels per Activity Phase – Sea World Drive/San Diego River Site No. 1a – Cloverleaf Least Tern Preserve Area

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Site Grading and Sand Import/Placement (dozer, haul truck, water truck, pickup truck)	48.8	1170
Plantings (pickup truck, excavator)	42.0	1170
Seeding (pickup truck, dozer)	43.0	1170

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 29, the estimated construction noise levels are predicted to be up to 50.5 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptors (as close as 1170 feet away) when Clearing and Grubbing/Non-Native Eradication activities take place near the southern element boundaries. Measurement location ST11 (see Table 5), representative of the nearest noise-sensitive receptor to Sea World Drive/San Diego River Site No. 1a due to its proximity to the I-8, was 50.3 dBA L_{eq}. Thus, temporary construction noise levels would be approximately 0.2 dBA higher than the measured outdoor ambient noise levels.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Sea World Drive/San Diego River Site No. 1a, temporary construction-related noise would be considered **less than significant**.

Sea World Drive/San Diego River Site No. 3c – Triangle Restoration Area

Table 30 presents the predicted construction noise levels at the studied noise-sensitive receptors nearest to Sea World Drive/San Diego River Site No. 3c (i.e., 1646 Front Street San Diego hotel).

Table 30. Predicted Construction Noise Levels per Activity Phase – Sea World Drive/San Diego River Site No. 3c – Triangle Restoration Area

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Clearing and Grubbing/Non-Native Eradication (pickup truck, dump truck, dozer, chipper)	44.4	2100
Seeding (pickup truck, dozer)	36.9	2100

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 30, the estimated construction noise levels are predicted to be up to 44.4 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptors (as close as 2100 feet away) when Clearing and Grubbing/Non-Native Eradication activities take place near the southern element boundaries. Measurement location ST11 (see

Table 5), representative of the nearest noise-sensitive receptor to Sea World Drive/San Diego River Site No. 1 due to its proximity to the I-8, was 50.3 dBA L_{eq}. Thus, temporary construction noise levels would be approximately 5.9 dBA lower than the measured outdoor ambient noise levels.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Sea World Drive/San Diego River Site No. 3c, temporary construction-related noise would be considered **less than significant**.

Sea World Drive/San Diego River Site No. 4d – South Shores East Area

Table 31 presents the predicted construction noise levels at the studied noise-sensitive receptors nearest to Sea World Drive/San Diego River Site No. 4d (i.e., Tecolote Shores South Mission Bay Playground).

Table 31. Predicted Construction Noise Levels per Activity Phase – Sea World Drive/San Diego River Site No. 4d – South Shores East Area

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Clearing and Grubbing/Non-Native Eradication (pickup truck, dump truck, dozer, chipper)	48.4	1440
Site Grading (dozer, haul truck, water truck, pickup truck)	46.6	1440
Plantings (pickup truck, excavator)	39.9	1440
Seeding (pickup truck, dozer)	40.9	1440

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 31, the estimated construction noise levels are predicted to be up to 48.4 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptors (as close as 1440 feet away) when Clearing and Grubbing/Non-Native Eradication activities take place near the southern element boundaries. Measurement location ST10 (see Table 5), representative of the nearest noise-sensitive receptor to Sea World Drive/San Diego River Site No. 4, was 54.2 dBA L_{eq}. Thus, temporary construction noise levels, in the worst case, may result in an ambient level increase of 2 dBA or less. An increase of at least 3 dBA is required to be considered noticeable, and although such an increase would not be noticeable to most people, construction noise may still be audible to some due to the frequency content and hearing sensitivity variations.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Sea World Drive/San Diego River Site No. 4d, temporary construction-related noise would be considered **less than significant**.

Bicycle and Pedestrian Improvements Element

Tables 32–36 present the predicted 12-hour L_{eq} levels and source-to-receiver distances for each activity phase during the construction of the Bicycle and Pedestrian Improvements Element. The studied noise-sensitive receptors

nearest to each element are detailed below. In the following studied scenarios, because of the equipment location uncertainty, construction noise exposure at a noise-sensitive receptor is studied at two distinct distances along a linear path of construction progress: a perpendicular (P) nearest distance (i.e., between the midpoint of estimated project activity phase progress and the receiver location) and a hypotenuse (H) distance (i.e., where the equipment is either near the lead point or trailing point of the construction progress).

Rose Creek Bike Path

Table 32 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction of the Rose Creek Bike Path, where the project alignment's total length over which construction equipment makes daily progress is approximately 4075 feet. The studied nearest noise-sensitive receptors are single-family residences along Figueroa Boulevard, Magnolia Avenue, and Hornblend Street, east of the element boundary.

Table 32. Predicted Construction Noise Levels per Activity Phase – Rose Creek Bike Path - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor)	85.3	20	408
Clearing and Grubbing (dozer, tractor)	85.3	20	137
Place Chain Link Fence (skidsteer)	79.2	20	137
Demolition of AC Paving (dozer, excavator, concrete saw)	88.7	20	510
Proposed Grading (loader, excavator)	85.7	20	137
BMP Installation (skidsteer, excavator)	85.7	20	137
Place AC Pavement (concrete saw, paver, paving equipment, roller)	87.8	20	137
Form & Pour Concrete (concrete mixer truck, concrete saw, pumps	87.2	20	679
Remove Existing Striping & Place New Striping and Signage (air compressor)	77.1	20	1019

Table 32. Predicted Construction Noise Levels per Activity Phase – Rose Creek Bike Path - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Demobilization / Project Closeout (dozer, tractor)	85.3	20	147

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 32, the estimated construction noise levels are predicted to be up to 88.7 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 20 feet away) when Demolition of AC Paving activities take place, and therefore would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement location ST8 (see Table 5), representative of the studied nearest noise-sensitive receptor to construction activities along Rose Creek Bike Path, were measured to be 54.8 dBA L_{eq}. Thus, temporary construction noise levels would be approximately 33.9 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 15.5 dB if a 9-foot-tall temporary construction noise barrier is implemented during each activity phase along the project boundary, when construction activities take place at the perpendicular (P) distance (i.e., 20 feet) from a noise-sensitive receptor. By way of example, when Demolition of AC Paving activities take place at a 20-foot perpendicular distance from a noise-sensitive receptor along Magnolia Avenue, a 9-foot-tall temporary construction noise barrier placed along the eastern project boundary would reduce noise levels by up to 15.5 dB. Thus, Implementation of MM-NOI-1 would correspondingly reduce the highest predicted estimated non-mitigated construction noise levels from 88.7 to 73.3 dBA L_{eq} during the Demolition of AC Paving activity phase, which would be within the applicable 75 dBA L_{eq} 12-hour City threshold for construction noise.

Table 33 shows the predicted aggregate noise levels for construction activities when a 9-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during each activity phase, strategically placed along the eastern project boundary when construction activities take place at the perpendicular (P) distance (i.e., 20 feet) from a noise-sensitive receptor (see Appendix B for detailed model input/output).

Table 33. Predicted Construction Noise Levels per Activity Phase – Rose Creek Bike Path – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor)	69.9	20	408
Clearing and Grubbing (dozer, tractor)	71.1	20	137
Place Chain Link Fence (skidsteer)	65.0	20	137
Demolition of AC Paving (dozer, excavator, concrete saw)	73.3	20	510
Proposed Grading (loader, excavator)	71.6	20	137
BMP Installation (skidsteer, excavator)	71.6	20	137
Place AC Pavement (concrete saw, paver, paving equipment, roller)	73.6	20	137
Form & Pour Concrete (concrete mixer truck, concrete saw, pumps	71.8	20	679
Remove Existing Striping & Place New Striping and Signage (air compressor)	61.7	20	1019
Demobilization / Project Closeout (dozer, tractor)	71.0	20	147

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 33, the estimated construction noise levels are predicted to be up to 73.3 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 20 feet away), which would be 18.5 dBA L_{eq} higher than the measured noise levels at measurement location ST8 (see Table 5). In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Rose Creek Bike Path, temporary construction-related noise would be considered **less than significant with mitigation incorporated**.

Fiesta Island Causeway Path

Table 34 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction of the Fiesta Island Causeway Path, where the project alignment's total length over which construction equipment makes daily progress is approximately 900 feet. The studied nearest noise-sensitive receptor is the Tecolote Shores South Mission Bay Playground, north of the element boundary.

Table 34. Predicted Construction Noise Levels per Activity Phase – Fiesta Island Causeway Path

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor)	52.5	670	676
Clearing and Grubbing (dozer, tractor)	51.8	670	807
Demolition of AC Paving (dozer, excavator, concrete saw)	56.0	670	679
Excavation of Retaining Wall (loader, excavator)	49.5	670	679
Retaining Wall Foundation Construction (skidsteer, excavator)	53.0	670	676
Retaining Wall Construction (skidsteer, excavator)	53.0	670	670
Grading (loader, excavator)	53.0	670	676
Sawcut Existing Roadway, Pave Asphalt Concrete & Place K-Rail (concrete saw, paver, paving equipment, roller)	55.0	670	676
Form & Pour Concrete (concrete mixer truck, concrete saw, pumps	54.5	670	672
Remove Existing Striping & Place New Striping and Signage (air compressor)	43.7	670	807
Demobilization / Project Closeout (dozer, tractor)	52.6	670	671

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 34, the estimated construction noise levels are predicted to be up to 55.0 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 670 feet away) when Sawcut Existing Roadway,

Pave Asphalt Concrete & Place K-Rail activities take place. Measured noise levels at measurement location ST10 (see Table 5), representative of the studied nearest noise-sensitive receptor to construction activities at the Fiesta Island Causeway Path due to its proximity to I-5, were measured to be 54.2 dBA L_{eq}. Thus, temporary construction noise levels would be approximately 0.8 dBA higher than the measured outdoor ambient noise levels.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at the Fiesta Island Causeway Path, temporary construction-related noise would be considered **less than significant**.

Ocean Beach Bike Path

Table 35 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the construction of the Ocean Beach Bike Path, where the project alignment's total length over which construction equipment makes daily progress is approximately 5000 feet. The studied nearest noise-sensitive receptors are single-family residences along Point Loma Boulevard, south of the element boundary.

Table 35. Predicted Construction Noise Levels per Activity Phase – Ocean Beach Bike Path - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor)	74.0	70	505
Clearing and Grubbing, Removing Existing Trees (dozer, tractor)	74.0	70	505
Remove and Relocate/Salvage Existing Bollards & Benches (skidsteer)	67.8	70	2501
Demolition of AC Paving (dozer, excavator, concrete saw)	77.5	70	505
Proposed Grading (loader, excavator)	71.2	70	181
BMP Installation Including Storm Drain Design (skidsteer, excavator)	74.7	70	181
Place AC Pavement (concrete saw, paver, paving equipment, roller)	76.7	70	181

Table 35. Predicted Construction Noise Levels per Activity Phase – Ocean Beach Bike Path - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Form & Pour Concrete (concrete mixer truck, concrete saw, pumps	75.9	70	836
Remove Existing Striping & Place New Striping and Signage (air compressor)	65.8	70	1252
Demobilization / Project Closeout (dozer, tractor)	74.2	70	192

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 35, the estimated construction noise levels are predicted to be up to 77.5 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 70 feet away) when Demolition of AC Paving activities take place, and therefore would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement location ST12 (see Table 5), representative of the studied nearest noise-sensitive receptor to construction activities along the Ocean Beach Bike Path, were measured to be 46.7 dBA L_{eq}. Thus, temporary construction noise levels would be approximately 30.8 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 9.9 dB if an 8-foot-tall temporary construction noise barrier is implemented during the Demolition of AC Paving, Place AC Pavement, and Form & Pour Concrete phases, when construction activities take place at the perpendicular (P) distance (i.e., 70 feet) from a noise-sensitive receptor. By way of example, when Demolition of AC Paving activities take place along Ocean Beach Bike Path at a 70-foot perpendicular distance from a noise-sensitive receptor along Point Loma Boulevard, an 8-foot-tall temporary construction noise barrier placed along the southern project boundary would reduce noise levels by up to 9.9 dB. Thus, Implementation of MM-NOI-1 would correspondingly reduce the highest predicted estimated non-mitigated construction noise levels from 77.5 to 67.8 dBA L_{eq} during the Demolition of AC Paving activity phase, which would be within the applicable 75 dBA L_{eq} 12-hour City threshold for construction noise.

Table 36 shows the predicted aggregate noise levels for construction activities when an 8-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during the Demolition of AC Paving, Place AC Pavement, and Form & Pour Concrete phases, strategically placed along the southern project boundary when construction activities take place at the perpendicular (P) distance (i.e., 70 feet) from a noise-sensitive receptor (see Appendix B for detailed model input/output).

Table 36. Predicted Construction Noise Levels per Activity Phase – Ocean Beach Bike Path – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Mobilization (dozer, tractor)	74.0	70	505
Clearing and Grubbing, Removing Existing Trees (dozer, tractor)	74.0	70	505
Remove and Relocate/Salvage Existing Bollards & Benches (skidsteer)	67.8	70	2501
Demolition of AC Paving (dozer, excavator, concrete saw)	67.8	70	505
Proposed Grading (loader, excavator)	71.2	70	181
BMP Installation Including Storm Drain Design (skidsteer, excavator)	74.7	70	181
Place AC Pavement (concrete saw, paver, paving equipment, roller)	68.8	70	181
Form & Pour Concrete (concrete mixer truck, concrete saw, pumps	66.1	70	836
Remove Existing Striping & Place New Striping and Signage (air compressor)	65.8	70	1252
Demobilization / Project Closeout (dozer, tractor)	74.2	70	192

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 36, the estimated construction noise levels are predicted to be up to 74.7 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 70 feet away), which would be 28.0 dBA L_{eq} higher than the measured noise levels at measurement location ST12 (see Table 5). In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during construction activities at Ocean Beach Bike Path, temporary construction-related noise would be considered **less than significant with mitigation incorporated**.

Restoration of the Seawall Bulkhead Element

Tables 37–44 present the predicted 12-hour L_{eq} levels and source-to-receiver distances for each activity phase during the construction of the Restoration of the Seawall Bulkhead Element. The studied noise-sensitive receptors nearest to each element are detailed below, and each element is discussed individually (i.e., Replace Segment A, Replace Segment B, and New Segment C). In the following studied scenarios, because of the equipment location uncertainty, construction noise exposure at a noise-sensitive receptor is studied at two distinct distances along a linear path of construction progress: a perpendicular (P) nearest distance (i.e., between the midpoint of estimated project activity phase progress and the receiver location) and a hypotenuse (H) distance (i.e., where the equipment is either near the lead point or trailing point of the construction progress).

Replace Segment A

Table 37 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during construction activities along Segment A, where the project alignment's total length over which construction equipment makes daily progress is approximately 9035 feet. The studied nearest noise-sensitive receptors are residences along Ocean Front Walk/Mission Beach Boardwalk, east of the element boundary.

Table 37. Predicted Construction Noise Levels per Activity Phase – Replace Segment A - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Replace Parapet (Option 1)			
Clearing and Grubbing (dozer, tractor)	83.3	25	302
Demolition (concrete saw, dozer, excavator)	86.9	25	103
Parapet Replacement (crane, excavator, concrete mixer truck, concrete saw, man lift, pumps, air compressor)	89.2	25	28
Void Repairs (Option 1a)			
Void Repairs (concrete saw, excavator, concrete mixer truck, pumps)	86.8	25	56

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 37, the estimated construction noise levels are predicted to be up to 89.2 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 25 feet away) when Parapet Replacement activities take place along the eastern element boundaries, and therefore would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement locations ST1 and ST4 (see

Table 5), representative of the studied nearest noise-sensitive receptors to construction activities along Segment A, were measured to be 63.7 dBA L_{eq} and 56.9 dBA L_{eq}, respectively. Thus, temporary construction noise levels would be up to approximately 32.3 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 15.7 dB if a 13-foot-tall temporary construction noise barrier is implemented during each activity phase along the project boundary, when construction activities take place at the perpendicular (P) distance (i.e., 25 feet) from a noise-sensitive receptor. By way of example, when Parapet Replacement activities take place along Segment A at a 25-foot perpendicular distance from a noise-sensitive receptor along Ocean Front Walk/Mission Beach Boardwalk, a 13-foot-tall temporary construction noise barrier placed along the eastern project boundary (where construction activities take place) would reduce noise levels by up to 15.7 dB, resulting in construction noise levels of 73.9 dBA L_{eq} (12-hour) during the phase.

Table 38 shows the predicted aggregate noise levels for construction activities when a 13-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during each activity phase, strategically placed along the eastern project boundary when construction activities take place at the perpendicular (P) distance (i.e., 25 feet) from a noise-sensitive receptor (see Appendix B for detailed model input/output).

Table 38. Predicted Construction Noise Levels per Activity Phase – Replace Segment A – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Replace Parapet (Option 1)			
Clearing and Grubbing (dozer, tractor)	68.0	25	302
Demolition (concrete saw, dozer, excavator)	74.7	25	103
Parapet Replacement (crane, excavator, concrete mixer truck, concrete saw, man lift, pumps, air compressor)	73.9	25	28
Void Repairs (Option 1a)			
Void Repairs (concrete saw, excavator, concrete mixer truck, pumps)	79.6	25	56

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 38, with the implementation of MM-NOI-1, the estimated construction noise levels are predicted to be up to 79.6 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 25 feet away) during Void Repairs activities, which would be up to 22.7 dBA L_{eq} higher than the measured noise levels

at measurement location ST4 (see Table 5), and 4.6 dBA L_{eq} over the 75 dBA L_{eq} 12-hour City guidance; all other activity phases would be below 75 dBA L_{eq} (12-hour).

In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would still exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor during Void Repairs activities at Segment A. Therefore, during construction activities along Segment A, temporary construction-related noise impacts would be considered **significant and unavoidable**.

Replace Segment B

Table 39 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during construction activities along Segment B, where the project alignment's total length over which construction equipment makes daily progress is approximately 1050 feet. The studied nearest noise-sensitive receptors are residences along Ocean Front Walk/Mission Beach Boardwalk, east of the element boundary.

Table 39. Predicted Construction Noise Levels per Activity Phase – Replace Segment B - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Replace Parapet			
Clearing and Grubbing (dozer, tractor)	83.6	25	79
Demolition (concrete saw, dozer, excavator)	87.9	25	45
Parapet Replacement (crane, excavator, concrete mixer truck, concrete saw, man lift, pumps, air compressor)	89.4	25	27
Void Repairs			
Void Repairs (concrete saw, excavator, concrete mixer truck, pumps)	88.9	25	26

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 39, the estimated construction noise levels are predicted to be up to 89.4 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 25 feet away) when Parapet Replacement activities take place along the eastern element boundaries, and therefore would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement locations ST4 and ST5 (see Table 5), representative of the studied nearest noise-sensitive receptors to construction activities along Segment B, were measured to be 56.9 dBA L_{eq} and 59.1 dBA L_{eq}, respectively. Thus, temporary construction noise levels would be up to approximately 32.5 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 15.7 dB if a 13-foot-tall temporary construction noise barrier is implemented during each activity phase along the project boundary, when construction activities take place at the perpendicular (P) distance (i.e., 25 feet) from a noise-sensitive receptor. By way of example, when Parapet Replacement activities take place along Segment B at a 25-foot perpendicular distance from a noise-sensitive receptor along Ocean Front Walk/Mission Beach Boardwalk, a 13-foot-tall temporary construction noise barrier placed along the eastern project boundary (where construction activities take place) would reduce noise levels by up to 15.7 dB, resulting in construction noise levels of 73.8 dBA L_{eq} (12-hour) during the phase.

Table 40 shows the predicted aggregate noise levels for construction activities when a 13-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during each activity phase, strategically placed along the eastern project boundary when construction activities take place at the perpendicular (P) distance (i.e., 25 feet) from a noise-sensitive receptor (see Appendix B for detailed model input/output).

Table 40. Predicted Construction Noise Levels per Activity Phase – Replace Segment B – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Replace Parapet (Option 1)			
Clearing and Grubbing (dozer, tractor)	73.5	25	79
Demolition (concrete saw, dozer, excavator)	82.0	25	45
Parapet Replacement (crane, excavator, concrete mixer truck, concrete saw, man lift, pumps, air compressor)	73.8	25	27
Void Repairs (Option 1a)			
Void Repairs (concrete saw, excavator, concrete mixer truck, pumps)	73.3	25	26

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 40, with the implementation of MM-NOI-1, the estimated construction noise levels are predicted to be up to 82.0 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 25 feet away) during Demolition activities, which would be up to 25.1 dBA L_{eq} higher than the measured noise levels at measurement location ST5 (see Table 5), and 7.0 dBA L_{eq} over the 75 dBA L_{eq} 12-hour City guidance; all other activity phases would be below 75 dBA L_{eq} (12-hour).

In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would still exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor during Demolition activities at Segment B. Therefore, during construction activities along Segment B, temporary construction-related noise impacts would be considered **significant and unavoidable**.

New Segment C

Table 41 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during construction activities along Segment C, where the project alignment's total length over which construction equipment makes daily progress is approximately 255 feet. The studied nearest noise-sensitive receptors are residences along Ocean Boulevard and Thomas Avenue, east of the element boundary.

Table 41. Predicted Construction Noise Levels per Activity Phase – New Segment C - Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Decorative Seawall (Option 2)			
Construct Seawall (crane, excavator, concrete mixer truck, concrete saw, pumps, air compressor)	89.6	25	25
Beach Access Driveway			
Clearing and Grubbing (dozer, tractor)	83.8	25	68
Demolition of AC Paving (concrete saw, dozer, excavator)	87.3	25	68
Proposed Grading (loader, excavator)	82.0	25	36
Place AC Pavement (concrete saw, paver, paving equipment, roller)	87.5	25	36
Form & Pour Concrete (concrete mixer truck, concrete saw, pumps)	86.2	25	49
Striping and Signage (air compressor)	75.7	25	68

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 41, the estimated construction noise levels are predicted to be up to 89.6 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 25 feet away) when Construct Seawall activities

take place along the eastern element boundaries, and therefore would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement location ST5 (see Table 5), representative of the studied nearest noise-sensitive receptor to construction activities along Segment C, were measured to be 59.1 dBA L_{eq}. Thus, temporary construction noise levels would be up to approximately 30.5 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 15.5 dB if a 10-foot-tall temporary construction noise barrier is implemented during each activity phase along the project boundary, when construction activities take place at the perpendicular (P) distance (i.e., 25 feet) from a noise-sensitive receptor. By way of example, when Construct Seawall activities take place along Segment C at a 25-foot perpendicular distance from a noise-sensitive receptor Ocean Boulevard and Thomas Avenue, a 10-foot-tall temporary construction noise barrier placed along the eastern project boundary (where construction activities take place) would reduce noise levels by up to 15.5 dB, resulting in construction noise levels of 74.2 dBA L_{eq} (12-hour) during the phase.

Table 42 shows the predicted aggregate noise levels for construction activities when a 10-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during each activity phase, strategically placed along the eastern project boundary when construction activities take place at the perpendicular (P) distance (i.e., 25 feet) from a noise-sensitive receptor (see Appendix B for detailed model input/output).

Table 42. Predicted Construction Noise Levels per Activity Phase – New Segment C – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Decorative Seawall (Option 2)			
Construct Seawall (crane, excavator, concrete mixer truck, concrete saw, pumps, air compressor)	74.2	25	25
Beach Access Driveway			
Clearing and Grubbing (dozer, tractor)	75.2	25	68
Demolition of AC Paving (concrete saw, dozer, excavator)	78.6	25	68
Proposed Grading (loader, excavator)	77.4	25	36
Place AC Pavement (concrete saw, paver,	82.9	25	36

Table 42. Predicted Construction Noise Levels per Activity Phase – New Segment C – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Perpendicular (P) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Hypotenuse (H) Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Decorative Seawall (Option 2)			
paving equipment, roller)			
Form & Pour Concrete (concrete mixer truck, concrete saw, pumps)	79.8	25	49
Striping and Signage (air compressor)	67.1	25	68

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 42, with the implementation of MM-NOI-1, the estimated construction noise levels are predicted to be up to 82.9 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 25 feet away) during Place AC Pavement activities, which would be up to 23.8 dBA L_{eq} higher than the measured noise levels at measurement location ST5 (see Table 5), and 7.9 dBA L_{eq} over the 75 dBA L_{eq} 12-hour City guidance; additionally, the Demolition of AC Paving, Proposed Grading, and Form & Pour Concrete phases would also exceed the 75 dBA L_{eq} (12-hour) City guidance.

In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would still exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor during all phases except Construct Seawall, Clearing and Grubbing, and Striping and Signage activities at Segment C. Therefore, during construction activities along Segment C, temporary construction-related noise impacts would be considered **significant and unavoidable**.

Access Improvements

Table 43 presents the predicted 12-hour L_{eq} and source-to-receiver distance for each activity phase during the Access Improvements construction activities. The studied nearest noise-sensitive receptors are residences along Ocean Front Walk/Mission Beach Boardwalk, east of the element activities.

Table 43. Predicted Construction Noise Levels per Activity Phase – Access Improvements – Unmitigated

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Pedestrian Beach Access Improvements (Stairs)		
Demolition (concrete saw, dozer, excavator)	80.8	90
Stairway Construction (excavator, concrete mixer truck, concrete saw, pumps)	80.7	90
Pedestrian Beach Access Improvements (Pedestrian Ramp)		
Demolition (concrete saw, dozer, excavator)	80.8	90
Stairway Construction (excavator, concrete mixer truck, concrete saw, pumps)	80.7	90

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 43, the estimated construction noise levels are predicted to be up to 80.8 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 90 feet away) when Demolition activities take place near the eastern element boundaries, and therefore would result in an exceedance of the 75 dBA L_{eq} 12-hour City threshold for construction noise. Measured noise levels at measurement locations ST1 and ST4 (see Table 5), representative of the studied nearest noise-sensitive receptor to Access Improvements construction activities, were measured to be 63.7 dBA L_{eq} and 56.9 dBA L_{eq}, respectively. Thus, temporary construction noise levels would be approximately 23.9 dBA higher than the measured outdoor ambient noise levels.

Thus, MM-NOI-1 is required, which would require the Program to implement certain noise reduction measures as site conditions warrant. Proper implementation of MM-NOI-1 would reduce noise levels by up to 7.9 dB if an 8-foot-tall temporary construction noise barrier is implemented during each activity phase along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor. Implementation of MM-NOI-1 would correspondingly reduce the highest predicted estimated non-mitigated construction noise level from 80.8 to 73.0 dBA L_{eq} during Demolition activities, which would be within the applicable 75 dBA L_{eq} 12-hour City threshold for construction noise.

Table 44 shows the predicted aggregate noise levels for construction activities when an 8-foot-tall temporary construction noise barrier described in MM-NOI-1 is implemented during the four (4) studied activity phases, strategically placed along the project boundary where the direct line-of-sight is blocked between active construction equipment and a receiving noise-sensitive receptor.

Table 44. Predicted Construction Noise Levels per Activity Phase – Access Improvements – Mitigated (MM-NOI-1)

Activity Phase (and Equipment Types Involved)	12-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)
Pedestrian Beach Access Improvements (Stairs)		
Demolition (concrete saw, dozer, excavator)	73.0	90
Stairway Construction (excavator, concrete mixer truck, concrete saw, pumps)	72.9	90
Pedestrian Beach Access Improvements (Pedestrian Ramp)		
Demolition (concrete saw, dozer, excavator)	73.0	90
Stairway Construction (excavator, concrete mixer truck, concrete saw, pumps)	72.9	90

Notes: L_{eq} = equivalent noise level; dBA = A-weighted decibels.

As presented in Table 44, the estimated construction noise levels are predicted to be up to 73.0 dBA L_{eq} over a 12-hour period at the nearest noise-sensitive receptor (as close as 90 feet away) when Demolition activities take place near the eastern element boundaries, which would be 16.1 dBA L_{eq} higher than the measured noise levels at measurement location ST4 (see Table 5). In summary, with the implementation of MM-NOI-1, construction noise during allowable daytime hours (between 7:00 a.m. and 7:00 p.m.) would not exceed the 75 dBA L_{eq} 12-hour City guidance at the nearest noise-sensitive receptor. Therefore, during Access Improvements construction activities, temporary construction-related noise would be considered **less than significant with mitigation incorporated**.

6.2 Long-Term Off-Site Traffic Noise Exposure

The Program is not anticipated to result in a significant increase in long-term off-site traffic noise. According to Section II.K of the City's CEQA Significance Determination Thresholds, Program-generated traffic noise would be considered significant if exposure levels exceed 65 dB at an exterior usable space of noise-sensitive receptors including, but not limited to, single-family and multi-family residences, hotels, motels, parks, and convalescent homes (as shown in Table 4). In cases where existing traffic noise levels exceed the City's traffic noise significance thresholds, an increase in traffic noise greater than 3 dB would be considered significant.

Based upon the San Diego Association of Governments (SANDAG) Traffic Forecast Information Center (TFIC), the existing (2025) Average Daily Traffic (ADT) volume on West Mission Bay Drive from Mission Boulevard to Bayside Lane is approximately 25,400 per day. Based upon the fundamentals of acoustics, a 100% increase in ADT volumes, or a doubling of the existing 25,400 vehicles, would be needed to result in a 3-dB increase in noise levels, which would be just audible to the average human listener.

Such an increase in ADT volumes on off-site roadways attributable to the Program is not expected. The Program would focus on existing park maintenance and would not involve the addition of new park and recreational assets that could introduce additional visitors or residents to the area. It is expected that these improvements would serve

the existing residents in the San Diego area, as well as visitors, and would not increase traffic volumes in the area. Therefore, impacts related to off-site traffic noise exposure would be **less than significant**.

6.3 Long-Term Operational Noise Exposure

Wetland and Water Quality Improvements Element

Operations and maintenance would be required for the North Fiesta Island, Tecolote Creek and Fiesta Island Causeway, and Cudahy Creek components. The most intensive actions would include trash removal, weed removal from transitional habitat areas, channel and culvert maintenance, perimeter fence repair, and Sea Level Rise (SLR) adaptive management. Although maintenance is anticipated to be regular, such operations would not generate substantial noise and would be comparable to existing operations and maintenance activities in the component areas. Any noise attributed to the operations and maintenance of the Wetland and Water Quality Improvements Element components are likely to be below the City's applicable exterior noise limits established in Section 59.5.0401 of the Municipal Code (Table 2), and operational noise would be considered **less than significant**.

Restoration of Shoreline Element

Operation and maintenance activities would be limited for the shoreline restoration element. However, slow, continuous erosion would occur over time and some areas would need to be re-nourished in the future. For the West Sail Bay component, for example, beach grooming may be required to redistribute the sand as it collects to the north and south of West Sail Bay, though noise produced during such activities would be unlikely to exceed the City's applicable exterior noise limits established in Section 59.5.0401 of the Municipal Code (Table 2). Thus, due to the anticipated limited operations and maintenance under the Restoration of Shoreline Element, operational noise would be considered **less than significant**.

Upland Habitat and Preserve Expansion Element

Long-term maintenance is required for habitat restoration activities for 25 months post-construction. Maintenance vehicles (i.e. pick-up trucks) and the size of the maintenance crews would vary depending on the location being maintained. Crews are expected to be small, with likely no more than two trucks and a crew of from four to eight laborers and one to two supervisors. Additionally, the maintenance and control of non-native exotic species would be an ongoing effort, which may involve a combination of hand pulling and vegetation thinning, for example. Operational noise associated with these activities would be negligible and unlikely to exceed the City's applicable exterior noise limits established in Section 59.5.0401 of the Municipal Code (Table 2). Thus, operational noise associated with the Upland Habitat and Preserve Expansion Element would be considered **less than significant**.

Bicycle and Pedestrian Improvements Element

The operation of the bicycle and pedestrian paths would generally be limited to cleaning, clearing, and repairs as necessary, which is unlikely to generate substantial noise, particularly in exceedance of the City's applicable exterior noise limits established in Section 59.5.0401 of the Municipal Code (Table 2). Thus, operational noise associated with the Bicycle and Pedestrian Improvements Element would be considered **less than significant**.

Restoration of the Seawall Bulkhead Element

Upon completion of the Restoration of the Seawall Bulkhead element, operation and maintenance activities would be minimal and consistent with the City's standard routine maintenance requirements, and therefore be consistent with the applicable exterior noise limits established in Section 59.5.0401 of the Municipal Code (Table 2). Operational noise associated with the Restoration of the Seawall Bulkhead Element would be considered **less than significant**.

Would the project result in generation of excessive ground-borne vibration or ground-borne noise levels?

6.4 Construction Vibration

Construction activities associated with the Program elements may expose people to excessive ground-borne vibration or ground-borne noise, causing a potentially significant impact. Caltrans has collected ground-borne vibration information related to construction activities (Caltrans 2013). Information from Caltrans indicates that continuous vibrations with a PPV of approximately 0.2 ips is considered annoying. For context, heavier pieces of construction equipment, such as a roller that may be used during construction, have peak particle velocities of approximately 0.21 ips or less at a reference distance of 25 feet (FTA 2018). Additionally, construction vibration, at sufficiently high levels, can also present a building damage risk. Caltrans guidance recommends that a vibration magnitude of 0.3 ips PPV would represent the threshold for building damage risk of older residential structures exposed to continuous or frequently intermittent sources of ground-borne vibration, or 0.5 ips PPV for transient vibration events.

Ground-borne vibration attenuates rapidly, even over short distances. The attenuation of ground-borne vibration as it propagates from source to receptor through intervening soils and rock strata can be estimated with expressions found in FTA and Caltrans guidance.

The following worst-case construction vibration activities are studied: 1) during construction activities at Crown Point (Restoration of Shoreline Element), where an impact pile driver may operate as close as 110 feet from the nearest sensitive receptor; 2) during the construction of Rose Creek Bike Path (Bicycle and Pedestrian Improvements Element), where a roller may operate as close as 20 feet from the nearest sensitive receptor; and 3) during New Segment C (Restoration of the Seawall Bulkhead Element) construction activities, where a roller may operate as close as 25 feet from the nearest sensitive receptor.

By way of example, for a roller operating along the eastern boundary of Rose Creek Bike Path construction activities (i.e., 20 feet from the nearest receiving sensitive land use), the estimated vibration velocity would be 0.27 ips per the equation as follows (FTA 2018) but applying the Caltrans recommended exponent of 1.1:

$$PPV_{rcvr} = PPV_{ref} * (25/D)^{1.1} = 0.27 = 0.21 * (25/20)^{1.1};$$

Where PPV_{rcvr} is the predicted vibration velocity at the receiver position, PPV_{ref} is the reference value at 25 feet from the vibration source (the roller), and D is the actual horizontal distance to the receiver. Table 45 displays the Program's predicted worst-case construction vibration levels at the nearest noise-sensitive receptors, during construction activities at Rose Creek Bike Path (Bicycle and Pedestrian Improvements Element), New Segment C (Restoration of the Seawall Bulkhead Element), and Crown Point (Restoration of Shoreline Element).

Table 45. Predicted Worst-Case Construction Vibration at Nearest Sensitive Receptors

Program Element Component / Activity Phase	Anticipated Vibration Source Closest Distance (feet)	Predicted PPV (inches per second) for Indicated Equipment Type	
		Roller	Impact Pile Driver
		PPV	PPV
Crown Point / Mobilization	110	n/a	0.13
Rose Creek Bike Path / Place AC Pavement	20	0.27	n/a
New Segment C / Place AC Pavement	25	0.21	n/a

Source: FTA 2018
Notes: VdB = vibration velocity decibels, rms = root mean square, PPV = peak particle velocity.

As shown in Table 45, during construction activities at Rose Creek Bike Path (Bicycle and Pedestrian Improvements Element), New Segment C (Restoration of the Seawall Bulkhead Element), and Crown Point (Restoration of Shoreline Element), construction vibration at the nearest residential receivers from onsite operation of a roller or impact pile driver would not surpass the guidance limit of 0.3 to 0.5 ips PPV for preventing damage to residential structures (Caltrans 2013). Onsite operation of a roller during the Place AC Pavement activity phases for Rose Creek Bike Path and New Segment C would be greater than the Caltrans guidance of 0.2 ips PPV for building occupant annoyance; however, construction vibration and noise would be temporary.

Because the Program's predicted worst-case vibration levels during construction activities at Rose Creek Bike Path (Bicycle and Pedestrian Improvements Element), New Segment C (Restoration of the Seawall Bulkhead Element), and Crown Point (Restoration of Shoreline Element) would be less than the established building damage risk thresholds, vibration from Program construction activities would be considered **less than significant**.

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?

6.5 Aviation Noise

The San Diego International Airport is approximately 1.75 miles from the Program boundary at its nearest (i.e., from the southern boundary of Sea World Drive/San Diego River Site No. 3 – Triangle Restoration Area), or 4.9 miles at its furthest (i.e., from the northern boundary of Rose Creek Bike Path). The project site is located outside the 65 dB CNEL contour shown in the San Diego International Airport Land Use Compatibility Plan (SDCRAA 2014). Therefore, construction workers and post-construction project operational or maintenance staff on-site would not be exposed to excessive noise levels, and there would be a **less than significant impact** associated with aviation noise levels.

INTENTIONALLY LEFT BLANK

7 Mitigation Measures

The following mitigation measure (MM-NOI-1) specifically pertains to the construction activities that are predicted to exceed the 75 dBA L_{eq} 12-hour City guidance at a studied nearest noise-sensitive receptor, thus requiring temporary construction noise reduction measures during the construction of a respective Program element component. Figure 5, Temporary Construction Noise Barrier Extent Calculations, provides calculations to determine the extent/length of the temporary noise barriers required for MM-NOI-1. Table 46 summarizes the required noise abatement standards for each respective component's mitigation measure.

MM-NOI-1 Noise Abatement. During the construction of the following Program components, the City shall install noise abatement in order to result in adequate noise reduction at the nearest-noise sensitive receptor, in accordance with Table 46, Noise Abatement Component Requirements.

Table 46. Noise Abatement Component Requirements

Component (Construction Phase)	Minimum Construction Noise Reduction (dBA)	Nearest Noise-Sensitive Receptors	Minimum Barrier Height Required (Feet)
Tecolote Creek and Fiesta Island Causeway Component (All 5 Phases)	12.9	Along Ocean Front Walk/Mission Beach Boardwalk, east of the element	9
Vacation Island Northwest (All 4 Phases)	7.4	On Sunset Road and Sands Drive, along the southern and eastern component boundaries	8
Vacation Island Northeast – Ingraham Street (All 5 Phases)	3.7	On Hummingbird Lane, along the southern and eastern component boundaries	7
Crown Point (Mobilization and Shoreline Stabilization)	9.2	On Riviera Drive, along the eastern component boundaries	11
West Sail Bay (All 3 Phases)	14	Along Bayside Walk, east of Mission Boulevard	9
Bonita Cove (All 6 Phases)	10.2	Along Bayside Lane and San Fernando Place, west of the element boundary	9
Rose Creek Bike Path (All 10 Phases)	15.5	Along Figueroa Boulevard, Magnolia Avenue, and Hornblend Street, east of the element boundary	9
Ocean Beach Bike Path (Demolition of AC Paving, Place AC Pavement, Form and Pour Concrete)	9.9	Along Point Loma Boulevard, south of the element boundary	8
Replace Segment A (All 4 Phases)	15.7	Along Ocean Front Walk/Mission Beach Boardwalk, east of the element boundary	13
Replace Segment B (All 4 Phases)	15.7	Along Ocean Front Walk/Mission Beach	13

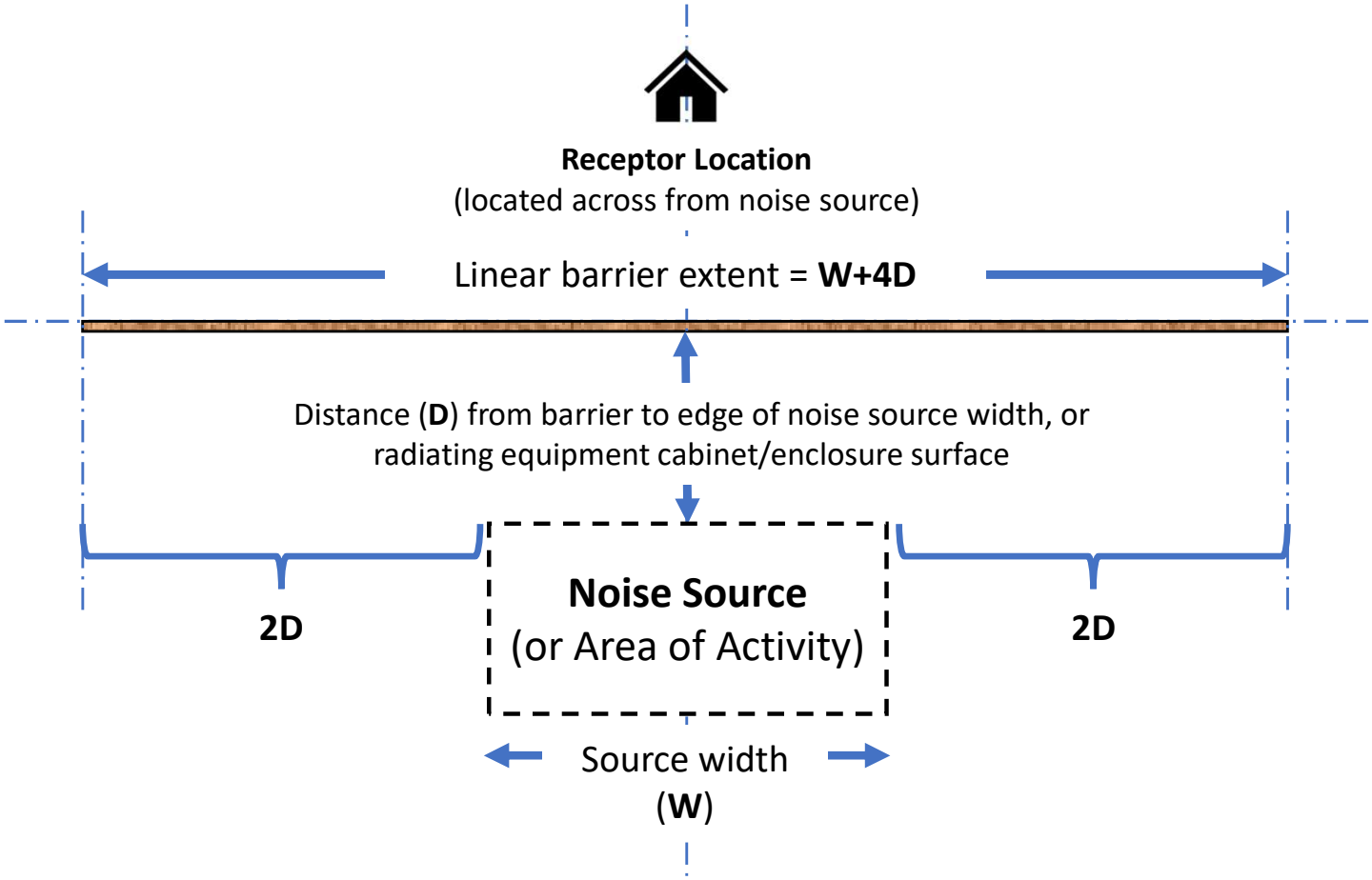
Table 46. Noise Abatement Component Requirements

Component (Construction Phase)	Minimum Construction Noise Reduction (dBA)	Nearest Noise-Sensitive Receptors	Minimum Barrier Height Required (Feet)
		Boardwalk, east of the element boundary	
New Segment C (All 7 Phases)	15.5	Along Ocean Boulevard and Thomas Avenue, east of the element boundary	10
Access Improvements (All 4 Phases)	7.9	Along Ocean Front Walk/Mission Beach Boardwalk	8

The City shall install noise abatement during the construction of each element listed in Table 46 during the respective phases specified in Section 6.1, Short-Term Construction Noise on the site boundary fencing (or within, as practical and appropriate) in the form of sound blankets or comparable temporary solid barriers to occlude construction noise emission between the site (or specific equipment operation as the situation may define) and the noise-sensitive receptor(s) of concern (i.e., where the line-of-sight is blocked). By way of example, suspended sound blankets, field-erected plywood sheeting, or comparable temporary solid or flexible but sufficiently massive barriers (of minimum sound transmission class [STC] rating of 25) would occlude construction noise emission between the site and the noise-sensitive receptor(s) of concern.

In addition to the noise abatement component standards presented in Table 46 and discussed above, the following measures should be considered as supplemental abatement strategies to sufficiently reduce construction noise emission:

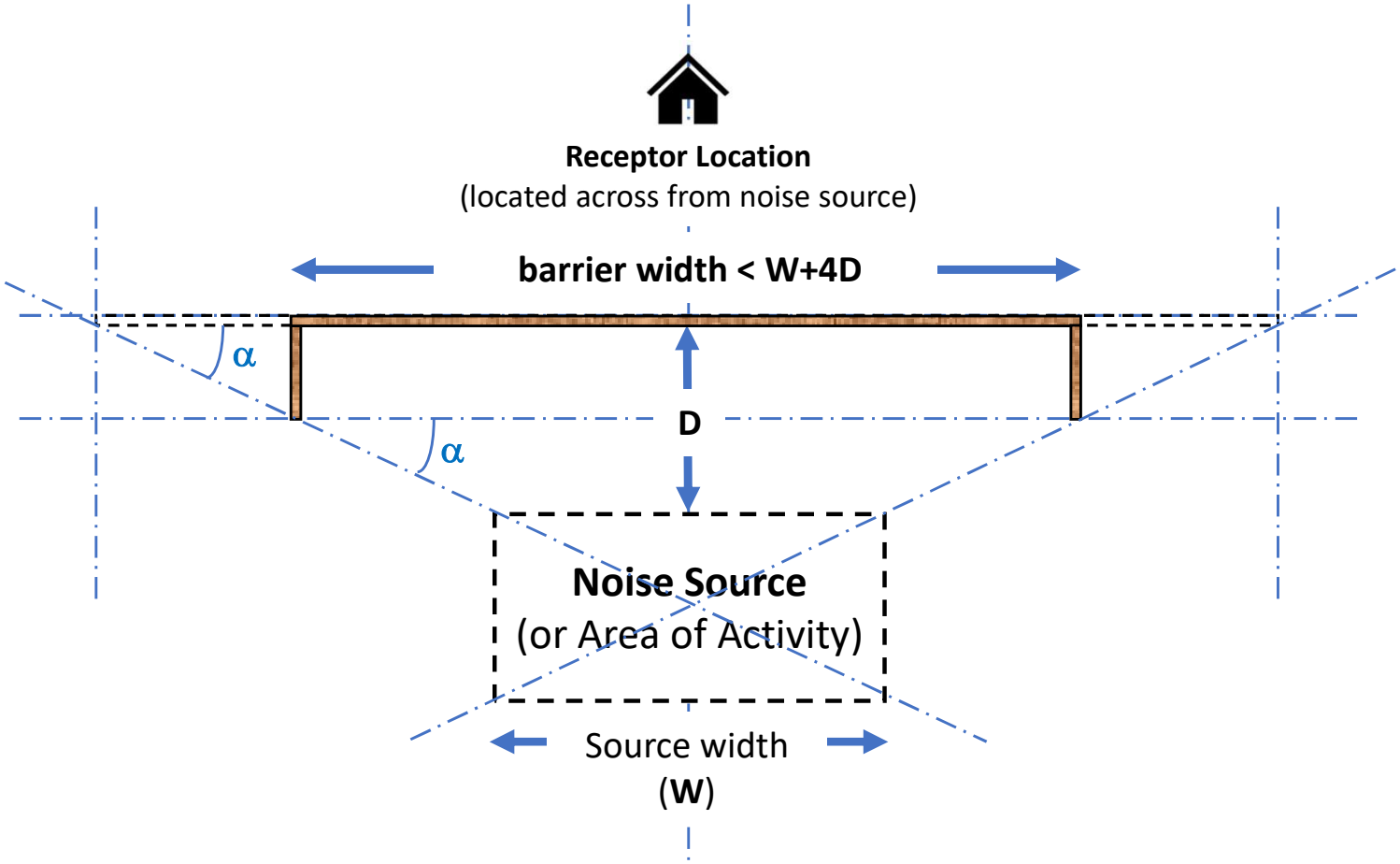
- ***Administrative controls*** (e.g., reduce operating time of equipment and/or prohibit usage of equipment type[s] within certain distances to a nearest receiving occupied off-site property).
- ***Engineering controls*** (change equipment operating parameters [e.g., speed, capacity], or install features or elements that otherwise reduce equipment noise emission [e.g., upgrade engine exhaust mufflers]).



DUDEK

Source: Mission Bay Park Improvements Program EIR 2025; Dudek 2025

Figure 5
Temporary Construction Noise Barrier Extent Calculations



DUDEK

Source: Mission Bay Park Improvements Program EIR 2025; Dudek 2025

Figure 5
Temporary Construction Noise Barrier Extent Calculations

INTENTIONALLY LEFT BLANK

8 References Cited

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Caltrans. 2020. Transportation and Construction Vibration Guidance Manual. Division of Environmental Analysis, Environmental Engineering, Hazardous Waste, Air, Noise, Paleontology Office. Sacramento, California. April.

City of San Diego. 2010. *Article 9.5: Noise Abatement and Control*. Section 59.5.0401. Accessed September 2019. http://docs.sandiego.gov/municode/MuniCodeChapter05/Ch05Art9.5Division04.pdf.

City of San Diego. 2018. "Official Zoning Map." May 18, 2018. Accessed September 2024. https://www.sandiego.gov/sites/default/files/legacy/development-services/zoning/pdf/maps/grid39.pdf.

City of San Diego. 2024. City of San Diego General Plan (Blueprint SD). July 2024. Accessed February 2025. https://www.sandiego.gov/blueprint-sd.

City of San Diego. 2022. *California Environmental Quality Act Significance Determination Thresholds.* Accessed February 2022.https://www.sandiego.gov/sites/default/files/september_2022_ceqa_thresholds_final.pdf.

DOT (U.S. Department of Transportation). 2006. FHWA Roadway Construction Noise Model: User's Guide. Final Report. FHWA-HEP-06-015. DOT-VNTSC-FHWA-06-02. Cambridge, Massachusetts: DOT, Research and Innovative Technology Administration. Final Report. August.

FHWA. December 8, 2008. Roadway Construction Noise Model (RCNM), Software Version 1.1. U.S. Department of Transportation, Research and Innovative Technology Administration, John A. Volpe National Transportation Systems Center, Environmental Measurement and Modeling Division. Washington, D.C.

FTA (Federal Transit Administration). 2018. Transit Noise and Vibration Impact Assessment. FTA Report No. 0123. September.

International Organization of Standardization (ISO). 1996. Standard 9613-2 (Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation). Geneva.

SANDAG (San Diego Association of Governments). 2015. Transportation Forecast Information Center (TFIC). July 10, 2015. https://sdforwarddata-sandag.hub.arcgis.com/apps/SANDAG::transportation-forecast-information-center-tfic/explore

SDCRAA (San Diego County Regional Airport Authority). 2014. San Diego International Airport; Airport Land Use Compatibility Plan. May 1, 2014. https://www.san.org/DesktopModules/Bring2mind/DMX/API/Entries/Download?EntryId=2990&Command=Core_Download&language=en-US&PortalId=0&TabId=807.

INTENTIONALLY LEFT BLANK

Appendix A

Baseline Field SPL Measurement Data

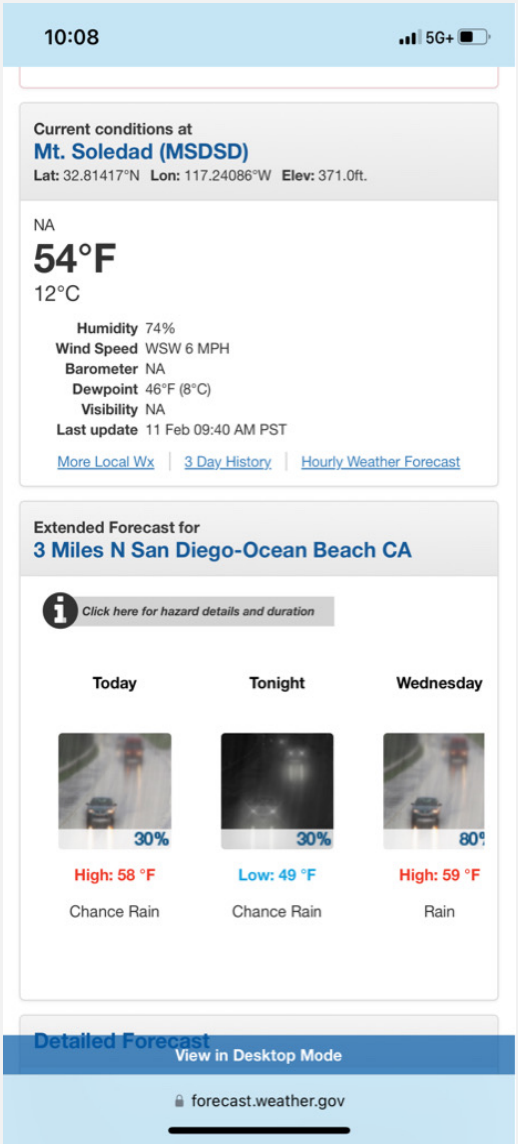
FORMS FIELD DATA REPORT

Field Noise Measurement Data

Record: 2041	
Project Name	*Misson Bay Park Improvements Program EIR*
Project #	*10523*
Observer(s)	
Date	*2025-02-11*

Meteorological Conditions

Upload NOAA Forecast



Temp (F)	*54*
Humidity % (R.H.)	*74*
Wind	*Calm*
Wind Speed (MPH)	*6*
Wind Direction	*West*
Sky	*Partly Cloudy*

Instrument and Calibrator Information	
Instrument Name List	*(SAC) NL-62*
Instrument Name	*(SAC) NL-62*
Instrument Name Lookup Key	*(SAC) NL-62*
Manufacturer	*Rion*
Model	*NL-62*
Serial Number	*350815*
Calibration Date	
Calibrator Name	*(SAC) Rion NC-74*
Calibrator Name	*(SAC) Rion NC-74*
Calibrator Name Lookup Key	*(SAC) Rion NC-74*
Calibrator Manufacturer	*Rion*
Calibrator Model	*NC-74*
Calibrator Serial #	*34167529*
Pre-Test (dBA SPL)	*93.7*
Post-Test (dBA SPL)	*94*

Windscreen	*Yes*
Weighting?	*A-WTD*
Slow/Fast?	*Slow*
ANSI?	*Yes*

Monitoring	
Record #	*1*
Site ID	*ST1*
Site Location Lat/Long	*32.763520, -117.252344*
Begin (Time)	*10:12:00*
End (Time)	*10:27:00*
Leq	*63.7*
Lmax	*70.6*
Lmin	*57.2*
Other Lx?	*L90, L50, L10*
L90	*57.5*
L50	*58.6*
L10	*68.4*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Wind, Waves Crashing*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling*
Other Noise Sources Additional Description	*Prevailing winds and waves crashing on Mission Beach, aircraft flyovers from SDIA, pedestrians on boardwalk, distant construction noise on Mission Blvd*

Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Mixed*

Site Photos	
Photo	

Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Monitoring	
Record #	*2*
Site ID	*ST2*
Site Location Lat/Long	*32.767712, -117.249205*

Begin (Time)	*10:35:00*
End (Time)	*10:50:00*
Leq	*60.1*
Lmax	*70*
Lmin	*50.1*
Other Lx?	*L90, L50, L10*
L90	*50.4*
L50	*51.7*
L10	*65.8*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Aircraft*
Other Noise Sources (Background)	*Distant Aircraft, Distant Conversations / Yelling, Rustling Leaves*
Other Noise Sources Additional Description	*Pedestrians on bayside boardwalk, distant traffic on Mission Blvd and W Mission Bay Dr, active construction activity on Mission Blvd—measurement taken near laydown area immediately south of parking lot (trucks reversing, loading/unloading materials). Aircraft flyovers from SDIA*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Mixed*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Monitoring	
Record #	*3*
Site ID	*ST3*
Site Location Lat/Long	*32.772635, -117.245402*

Begin (Time)	*10:57:00*
End (Time)	*11:12:00*
Leq	*59.7*
Lmax	*70.4*
Lmin	*49.8*
Other Lx?	*L90, L50, L10*
L90	*50.2*
L50	*52.4*
L10	*62.4*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling, Distant Gardener / Landscape Noise, Distant Traffic, Rustling Leaves*
Other Noise Sources Additional Description	*Birds on bay shore, aircraft flyovers from SDIA, distant traffic on W Mission Bay Dr, traffic in parking lot, distant tree cutting, distant maintenance at entrance of Bahia Resort Hotel*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Mixed*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Monitoring	
Record #	*4*
Site ID	*ST4*
Site Location Lat/Long	*32.785210, -117.253757*

Begin (Time)	*11:23:00*
End (Time)	*11:38:00*
Leq	*56.9*
Lmax	*58.3*
Lmin	*55.1*
Other Lx?	*L90, L50, L10*
L90	*55.9*
L50	*57*
L10	*57.9*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Wind, Waves Crashing*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling, Distant Traffic*
Other Noise Sources Additional Description	*Traffic in alleyway, prevailing winds and waves crashing on Mission Beach, pedestrians on boardwalk, aircraft from SDIA, distant drilling/cutting*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Hard*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Monitoring	
Record #	*5*
Site ID	*ST5*
Site Location Lat/Long	*32.789015, -117.252555*

Begin (Time)	*11:53:00*
End (Time)	*12:08:00*
Leq	*59.1*
Lmax	*62.7*
Lmin	*53.3*
Other Lx?	*L90, L50, L10*
L90	*54.4*
L50	*58.6*
L10	*61.8*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Conversations, Distant Aircraft, Birds, Wind*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling, Distant Traffic, Rustling Leaves*
Other Noise Sources Additional Description	*Birds, table setup/breakdown at Catamaran resort, pedestrians on bayside boardwalk, distant traffic on Mission Blvd, rustling leaves, wind, aircraft from SDIA, ATV driveby*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Mixed*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Monitoring	
Record #	*6*
Site ID	*ST6*
Site Location Lat/Long	*32.780693, -117.238087*

Begin (Time)	*12:19:00*
End (Time)	*12:34:00*
Leq	*56.9*
Lmax	*62.9*
Lmin	*53*
Other Lx?	*L90, L50, L10*
L90	*53.4*
L50	*55.4*
L10	*60.3*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling, Distant Dog Barking, Rustling Leaves*
Other Noise Sources Additional Description	*Traffic on Riviera Dr, aircraft (multiple directly overhead flyovers of SDPD Helicopter), wind, rustling leaves*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Hard*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Site Photos

Photo	
Comments / Description	*Facing N*

Monitoring	
Record #	*7*
Site ID	*ST7*
Site Location Lat/Long	*32.776746, -117.241478*

Begin (Time)	*12:42:00*
End (Time)	*12:57:00*
Leq	*57.1*
Lmax	*63.1*
Lmin	*51.6*
Other Lx?	*L90, L50, L10*
L90	*52.1*
L50	*53.6*
L10	*61.3*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Wind, Rustling Leaves*
Other Noise Sources (Background)	*Distant Aircraft, Distant Traffic*
Other Noise Sources Additional Description	*Rustling leaves near bungalows, distant aircraft*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Monitoring	
Record #	*8*
Site ID	*ST8*
Site Location Lat/Long	*32.803714, -117.222539*

Begin (Time)	*13:28:00*
End (Time)	*13:43:00*
Leq	*54.8*
Lmax	*58.5*
Lmin	*49.4*
Other Lx?	*L90, L50, L10*
L90	*50*
L50	*54.4*
L10	*57.4*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Conversations / Yelling, Distant Kids Playing, Distant Traffic, Rustling Leaves*
Other Noise Sources Additional Description	*Kids playing at nearby school, maintenance work at nearby school, dog barking, pedestrians on Rose Creek Bike Path, distant traffic on Grand Ave, wind, person yelling nearby*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Mixed*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing S*

Site Photos

Photo	
Comments / Description	*Facing S*

Monitoring	
Record #	*9*
Site ID	*ST9*
Site Location Lat/Long	*32.787117, -117.205607*

Begin (Time)	*13:51:00*
End (Time)	*14:06:00*
Leq	*68.4*
Lmax	*71*
Lmin	*65.9*
Other Lx?	*L90, L50, L10*
L90	*66.1*
L50	*68.7*
L10	*69.6*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Distant Aircraft, Distant Traffic*
Other Noise Sources Additional Description	*I-5 traffic predominant noise source, traffic on Morena Blvd*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Hard*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Monitoring	
Record #	*10*
Site ID	*ST10*
Site Location Lat/Long	*32.780678, -117.211119*

Begin (Time)	*14:15:00*
End (Time)	*14:30:00*
Leq	*54.2*
Lmax	*54.9*
Lmin	*53.5*
Other Lx?	*L90, L50, L10*
L90	*53.7*
L50	*54.1*
L10	*54.8*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling, Distant Traffic, Rustling Leaves*
Other Noise Sources Additional Description	*Distant traffic on I-5, aircraft from SDIA, pedestrians on bay boardwalk*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Mixed*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Monitoring	
Record #	*11*
Site ID	*ST11*
Site Location Lat/Long	*32.751930, -117.242747*

Begin (Time)	*14:43:00*
End (Time)	*14:58:00*
Leq	*50.3*
Lmax	*56.3*
Lmin	*47.2*
Other Lx?	*L90, L50, L10*
L90	*47.4*
L50	*48.8*
L10	*52.7*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling, Distant Dog Barking, Distant Gardener / Landscape Noise, Distant Kids Playing, Distant Traffic, Rustling Leaves*
Other Noise Sources Additional Description	*Distant traffic on Sunset Cliffs Blvd, direct overhead flyovers of aircraft from SDIA, distant conversations / yelling, landscape in nearby residence backyard*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Mixed*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Site Photos

Photo	
Comments / Description	*Facing E*

Monitoring	
Record #	*12*
Site ID	*ST12*
Site Location Lat/Long	*32.754636, -117.246886*

Begin (Time)	*15:05:00*
End (Time)	*15:20:00*
Leq	*46.7*
Lmax	*53.5*
Lmin	*42.5*
Other Lx?	*L90, L50, L10*
L90	*42.8*
L50	*45.2*
L10	*50.1*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Aircraft*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Conversations / Yelling, Distant Dog Barking, Rustling Leaves*
Other Noise Sources Additional Description	*Aircraft from SDIA, distant traffic on Point Loma Blvd, pedestrians on bike path*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Terrain	*Mixed*

Site Photos

Photo	
Comments / Description	*Facing W*

Site Photos

Photo	
Comments / Description	*Facing N*

Site Photos

Photo	
Comments / Description	*Facing E*

Site Photos

Photo	
Comments / Description	*Facing S*

Appendix B

Construction Noise Prediction Model Worksheets

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization	dozer	1	40	82		860	0.1		52.2	8	480	46	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	860	0.1		54.2	8	480	48	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
									Total for Mobilization Phase:			**50.6**																
Earthwork	excavator	4	40	81		860	0.1		51.2	8	480	51	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	front end loader	5	40	79		860	0.1		49.2	8	480	50	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	dozer	5	40	82		860	0.1		52.2	8	480	53	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	pickup truck	12	40	55	"off-road trucks"	860	0.1		25.2	8	480	30	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	crane	1	16	81	barge crane	860	0.1		51.2	8	480	41	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	tug	1	50	82	tugboat	860	0.1		52.2	8	480	47	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	scraper	5	40	84		860	0.1		54.2	8	480	55	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
									Total for Earthwork Phase:			**59.5**																
Plantings	tractor	1	40	84	"tractor/loader/backhoe"	860	0.1		54.2	8	480	48	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	excavator	1	40	81	"off-road trucks"	860	0.1		51.2	8	480	45	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
									Total for Plantings Phase:			**50.2**																
Bridge Construction	crane	1	16	81		860	0.1		51.2	8	480	41	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	drill rig truck	1	20	79	"bore/drill rigs"	860	0.1		49.2	8	480	40	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	slurry trenching machine	1	50	80	"dredge"	860	0.1		50.2	8	480	45	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	pumps	1	50	77		860	0.1		47.2	8	480	42	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	excavator	1	40	81		860	0.1		51.2	8	480	45	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	dump truck	2	40	76		860	0.1		46.2	8	480	43	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
									Total for Bridge Construction Phase:			**51.3**																
Demobilization	dozer	1	40	82		860	0.1		52.2	8	480	46	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	860	0.1		54.2	8	480	48	25	5	0	10	850	860	26.9	850.0	860.2	0.00	0.1	15.0	15.0	0.5	0.5	0.1
									Total for Demobilization Phase:			**50.6**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scrafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization	dozer	1	40	82		50	0.1		81.9	8	480	76	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	50	0.1		83.9	8	480	78	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Mobilization Phase:			80.3																
Earthwork	scraper	4	40	84		50	0.1		83.9	8	480	84	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	front end loader	5	40	79		50	0.1		78.9	8	480	80	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	5	40	82		50	0.1		81.9	8	480	83	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	pickup truck	12	40	55	"off-road trucks"	50	0.1		54.9	8	480	60	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Earthwork Phase:			87.6																
Plantings	tractor	1	40	84		50	0.1		83.9	8	480	78	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	1	40	81		50	0.1		80.9	8	480	75	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Plantings Phase:			79.9																
Bridge Construction	crane	1	16	81		50	0.1		80.9	8	480	71	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	drill rig truck	1	20	79	"bore/drill rigs"	50	0.1		78.9	8	480	70	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	pumps	1	50	77		50	0.1		76.9	8	480	72	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	1	40	81		50	0.1		80.9	8	480	75	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	2	40	76		50	0.1		75.9	8	480	73	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Bridge Construction Phase:			79.7																
Demobilization	dozer	1	40	82		50	0.1		81.9	8	480	76	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	50	0.1		83.9	8	480	78	5	5	0	10	40	50	11.2	40.3	50.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Demobilization Phase:			80.3																

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

9 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization	dozer	1	40	82		50	12.9		69.1	8	480	63	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
	tractor	1	40	84	"tractor/loader/backhoe"	50	12.9		71.1	8	480	65	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
									Total for Mobilization Phase:			**67.5**																
Earthwork	scraper	4	40	84		50	12.9		71.1	8	480	71	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
	front end loader	5	40	79		50	12.9		66.1	8	480	67	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
	dozer	5	40	82		50	12.9		69.1	8	480	70	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
	pickup truck	12	40	55	"off-road trucks"	50	12.9		42.1	8	480	47	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
									Total for Earthwork Phase:			**74.8**																
Plantings	tractor	1	40	84		50	12.9		71.1	8	480	65	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
	excavator	1	40	81		50	12.9		68.1	8	480	62	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
									Total for Plantings Phase:			**67.1**																
Bridge Construction	crane	1	16	81		50	12.9		68.1	8	480	58	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
	drill rig truck	1	20	79	"bore/drill rigs"	50	12.9		66.1	8	480	57	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
	pumps	1	50	77		50	12.9		64.1	8	480	59	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
	excavator	1	40	81		50	12.9		68.1	8	480	62	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
	dump truck	2	40	76		50	12.9		63.1	8	480	60	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
									Total for Bridge Construction Phase:			**66.9**																
Demobilization	dozer	1	40	82		50	12.9		69.1	8	480	63	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
	tractor	1	40	84	"tractor/loader/backhoe"	50	12.9		71.1	8	480	65	5	5	9	10	40	50	10.8	40.2	50.0	0.97	12.9	14.0	5.0	0.5	0.7	12.9
									Total for Demobilization Phase:			**67.5**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization	dozer	1	40	82		575	0.1		56.3	8	480	51	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	575	0.1		58.3	8	480	53	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
									Total for Mobilization Phase:			**54.7**																
Import and Rough Grading	scraper	5	40	84		575	0.1		58.3	8	480	60	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	excavator	4	40	81		575	0.1		55.3	8	480	56	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	pickup truck	12	40	55	"off-road trucks"	575	0.1		29.3	8	480	34	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	front end loader	5	40	79		575	0.1		53.3	8	480	55	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	crane	1	16	81	barge crane	575	0.1		55.3	8	480	46	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	tug	1	50	82	tugboat	575	0.1		56.3	8	480	52	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	dozer	5	40	82		575	0.1		56.3	8	480	58	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
									Total for Import and Rough Grading Phase:			**63.6**																
Fine Grading	front end loader	2	40	79		575	0.1		53.3	8	480	51	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	grader	1	40	85		575	0.1		59.3	8	480	54	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	dozer	2	40	82		575	0.1		56.3	8	480	54	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
									Total for Fine Grading Phase:			**57.6**																
Plantings	tractor	2	40	84	"tractor/loader/backhoe"	575	0.1		58.3	8	480	56	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
									Total for Plantings Phase:			**55.6**																
Demobilization	dozer	1	40	82		575	0.1		56.3	8	480	51	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	575	0.1		58.3	8	480	53	5	25	0	10	565	575	11.2	565.6	575.3	0.00	0.1	15.0	15.0	0.5	0.5	0.1
									Total for Demobilization Phase:			**54.7**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scrafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	1	40	82		60	0.1		80.3	8	480	75	5	10	0	10	50	60	11.2	51.0	60.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	60	0.1		82.3	8	480	77	5	10	0	10	50	60	11.2	51.0	60.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
										Total for Mobilization/SWPPP/Site Preparation Phase:		78.7																
Beach Nourishment	tractor	1	40	84	"tractor/loader/backhoe"	60	0.1		82.3	8	480	77	5	10	0	10	50	60	11.2	51.0	60.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	dozer	1	40	82		60	0.1		80.3	8	480	75	5	10	0	10	50	60	11.2	51.0	60.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		60	0.1		79.3	8	480	74	5	10	0	10	50	60	11.2	51.0	60.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
										Total for Beach Nourishment Phase:		79.8																
Construct Groins	tractor	1	40	84	"tractor/loader/backhoe"	60	0.1		82.3	8	480	77	5	10	0	10	50	60	11.2	51.0	60.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
										Total for Construct Groins Phase:		76.6																
Demobilization	dozer	1	40	82		60	0.1		80.3	8	480	75	5	10	0	10	50	60	11.2	51.0	60.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	60	0.1		82.3	8	480	77	5	10	0	10	50	60	11.2	51.0	60.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
										Total for Demobilization Phase:		78.7																

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

8 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	1	40	82		60	7.4		73.0	8	480	67	5	10	8	10	50	60	10.4	50.0	60.2	0.27	7.5	15.5	7.5	0.5	0.6	7.4
	tractor	1	40	84	"tractor/loader/backhoe"	60	7.4		75.0	8	480	69	5	10	8	10	50	60	10.4	50.0	60.2	0.27	7.5	15.5	7.5	0.5	0.6	7.4
Beach Nourishment	tractor	1	40	84	"tractor/loader/backhoe"	60	7.4		75.0	8	480	69	5	10	8	10	50	60	10.4	50.0	60.2	0.27	7.5	15.5	7.5	0.5	0.6	7.4
	dozer	1	40	82		60	7.4		73.0	8	480	67	5	10	8	10	50	60	10.4	50.0	60.2	0.27	7.5	15.5	7.5	0.5	0.6	7.4
	excavator	1	40	81		60	7.4		72.0	8	480	66	5	10	8	10	50	60	10.4	50.0	60.2	0.27	7.5	15.5	7.5	0.5	0.6	7.4
Construct Groins	tractor	1	40	84	"tractor/loader/backhoe"	60	7.4		75.0	8	480	69	5	10	8	10	50	60	10.4	50.0	60.2	0.27	7.5	15.5	7.5	0.5	0.6	7.4
Demobilization	dozer	1	40	82		60	7.4		73.0	8	480	67	5	10	8	10	50	60	10.4	50.0	60.2	0.27	7.5	15.5	7.5	0.5	0.6	7.4
	tractor	1	40	84	"tractor/loader/backhoe"	60	7.4		75.0	8	480	69	5	10	8	10	50	60	10.4	50.0	60.2	0.27	7.5	15.5	7.5	0.5	0.6	7.4

Total for Mobilization/SWPPP/Site Preparation Phase: **71.3**

Total for Beach Nourishment Phase: **72.5**

Total for Construct Groins Phase: **69.2**

Total for Demobilization Phase: **71.3**

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	1	40	82		70	0.1		78.9	8	480	73	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	70	0.1		80.9	8	480	75	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Mobilization/SWPPP/Site Preparation Phase:				77.3																
Recover Existing Rip Rap	tractor	1	40	84	"tractor/loader/backhoe"	70	0.1		80.9	8	480	75	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
Construct New Revetment	front end loader	1	40	79	"skid steer loader"	70	0.1		75.9	8	480	70	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		70	0.1		77.9	8	480	72	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		70	0.1		77.9	8	480	72	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	dump truck	1	40	76	"large rock haul truck"	70	0.1		72.9	8	480	67	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Phase:				76.9																
Install Oyster Habitat	tractor	1	40	84	"tractor/loader/backhoe"	70	0.1		80.9	8	480	75	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	crane	1	16	81	barge crane	100	0.1		74.0	8	480	64	5	10	0	10	90	100	11.2	90.6	100.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tug	1	50	82	tugboat	100	0.1		75.0	8	480	70	5	10	0	10	90	100	11.2	90.6	100.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		70	0.1		77.9	8	480	72	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Install Oyster Habitat Phase:				78.0																
Demobilization	dozer	1	40	82		70	0.1		78.9	8	480	73	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	70	0.1		80.9	8	480	75	5	10	0	10	60	70	11.2	60.8	70.2	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Demobilization Phase:				77.3																

Total for Recover Existing Rip Rap Phase: **75.2**

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

7 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	1	40	82		70	3.7		75.3	8	480	70	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
	tractor	1	40	84	"tractor/loader/backhoe"	70	3.7		77.3	8	480	72	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
								Total for Mobilization/SWPPP/Site Preparation Phase:				**73.7**																
Recover Existing Rip Rap	tractor	1	40	84	"tractor/loader/backhoe"	70	3.7		77.3	8	480	72	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
								Total for Recover Existing Rip Rap Phase:				**71.6**																
Construction New Revetment	front end loader	1	40	79	"skid steer loader"	70	3.7		72.3	8	480	67	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
	excavator	1	40	81		70	3.7		74.3	8	480	69	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
	excavator	1	40	81		70	3.7		74.3	8	480	69	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
	dump truck	1	40	76	"large rock haul truck"	70	3.7		69.3	8	480	64	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
								Total for Phase:				**73.3**																
Install Oyster Habitat	tractor	1	40	84	"tractor/loader/backhoe"	70	3.7		77.3	8	480	72	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
	crane	1	16	81	barge crane	100	4.3		69.8	8	480	60	5	10	7	10	90	100	10.2	90.0	100.1	0.12	4.7	14.5	7.5	0.5	0.6	4.3
	tug	1	50	82	tugboat	100	4.3		70.8	8	480	66	5	10	7	10	90	100	10.2	90.0	100.1	0.12	4.7	14.5	7.5	0.5	0.6	4.3
	excavator	1	40	81		70	3.7		74.3	8	480	69	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
								Total for Install Oyster Habitat Phase:				**74.3**																
Demobilization	dozer	1	40	82		70	3.7		75.3	8	480	70	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
	tractor	1	40	84	"tractor/loader/backhoe"	70	3.7		77.3	8	480	72	5	10	7	10	60	70	10.2	60.1	70.2	0.09	3.9	14.5	7.5	0.5	0.6	3.7
								Total for Demobilization Phase:				**73.7**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scrafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	1	40	82		660	0.1		54.5	8	480	49	5	10	0	10	650	660	11.2	650.1	660.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	660	0.1		56.5	8	480	51	5	10	0	10	650	660	11.2	650.1	660.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Mobilization/SWPPP/Site Preparation Phase:				**52.9**																
Cobble Berm	tractor	1	40	84	"tractor/loader/backhoe"	660	0.1		56.5	8	480	51	5	10	0	10	650	660	11.2	650.1	660.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81	"tractor/loader/backhoe"	660	0.1		53.5	8	480	48	5	10	0	10	650	660	11.2	650.1	660.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Cobble Berm Phase:				**52.5**																
Beach Nourishment	tractor	1	40	84	"tractor/loader/backhoe"	660	0.1		56.5	8	480	51	5	10	0	10	650	660	11.2	650.1	660.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81	"tractor/loader/backhoe"	660	0.1		53.5	8	480	48	5	10	0	10	650	660	11.2	650.1	660.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Beach Nourishment Phase:				**52.5**																
Demobilization	dozer	1	40	82		660	0.1		54.5	8	480	49	5	10	0	10	650	660	11.2	650.1	660.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	660	0.1		56.5	8	480	51	5	10	0	10	650	660	11.2	650.1	660.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Demobilization Phase:				**52.9**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	1	40	82		640	0.1		54.8	8	480	49	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	640	0.1		56.8	8	480	51	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Mobilization/SWPPP/Site Preparation Phase:				**53.2**																
Recover Existing Rip Rap	tractor	1	40	84	"tractor/loader/backhoe"	640	0.1		56.8	8	480	51	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81	"tractor/loader/backhoe"	640	0.1		53.8	8	480	48	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
Construction New Revetment	front end loader	1	40	79	"skid steer loader"	640	0.1		51.8	8	480	46	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		640	0.1		53.8	8	480	48	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		640	0.1		53.8	8	480	48	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	dump truck	1	40	76	"large rock haul truck"	640	0.1		48.8	8	480	43	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Phase:				**52.7**																
Install Oyster Habitat	tractor	1	40	84	"tractor/loader/backhoe"	640	0.1		56.8	8	480	51	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	crane	1	16	81	barge crane	640	0.1		53.8	8	480	44	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tug	1	50	82	tugboat	640	0.1		54.8	8	480	50	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		640	0.1		53.8	8	480	48	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Install Oyster Habitat Phase:				**55.0**																
Demobilization	dozer	1	40	82		640	0.1		54.8	8	480	49	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	640	0.1		56.8	8	480	51	5	10	0	10	630	640	11.2	630.1	640.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Demobilization Phase:				**53.2**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scrafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	1	40	82		850	0.1		52.0	8	480	46	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	850	0.1		54.0	8	480	48	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Mobilization/SWPPP/Site Preparation Phase:			**50.4**																
Recover Existing Rip Rap	tractor	1	40	84		850	0.1		54.0	8	480	48	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Recover Existing Rip Rap Phase:			**48.3**																
Construct New Revetement	front end loader	1	40	79	"skid steer loader"	850	0.1		49.0	8	480	43	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		850	0.1		51.0	8	480	45	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Construct New Revetement Phase:			**47.4**																
Install Oyster Habitat	tractor	1	40	84	"tractor/loader/backhoe"	850	0.1		54.0	8	480	48	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	crane	1	16	81	barge crane	850	0.1		51.0	8	480	41	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tug	1	50	82	tugboat	850	0.1		52.0	8	480	47	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		850	0.1		51.0	8	480	45	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Install Oyster Habitat Phase:			**52.2**																
Construct Sidewalk	front end loader	2	40	79	"skid steer loader"	850	0.1		49.0	8	480	46	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	2	40	81		850	0.1		51.0	8	480	48	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete mixer truck	1	40	79		850	0.1		49.0	8	480	43	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete saw	1	20	90		850	0.1		60.0	8	480	51	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	pumps	1	50	77		850	0.1		47.0	8	480	42	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Construct Sidewalk Phase:			**54.5**																
Demobilization	dozer	1	40	82		850	0.1		52.0	8	480	46	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	850	0.1		54.0	8	480	48	5	10	0	10	840	850	11.2	840.1	850.0	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Demobilization Phase:			**50.4**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scrafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization	dozer	1	40	82		110	0.1		75.0	8	480	69	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	110	0.1		77.0	8	480	71	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	impact pile driver	1	20	95		110	0.1		88.0	8	480	79	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	vibratory pile driver	1	20	95		110	0.1		88.0	8	480	79	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	compressor (air)	1	40	78	"jetting equipment"	110	0.1		71.0	8	480	65	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	concrete mixer truck	1	40	79		110	0.1		72.0	8	480	66	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	pumps	1	50	77		110	0.1		70.0	8	480	65	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
									Total for Mobilization Phase:			**83.0**																
Excavation	excavator	1	40	81		110	0.1		74.0	8	480	68	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
									Total for Excavation Phase:			**68.2**																
Shoreline Stablization	tractor	1	40	84	"tractor/loader/backhoe"	110	0.1		77.0	8	480	71	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	impact pile driver	1	20	95		110	0.1		88.0	8	480	79	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	vibratory pile driver	1	20	95		110	0.1		88.0	8	480	79	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	compressor (air)	1	40	78	"jetting equipment"	110	0.1		71.0	8	480	65	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	concrete mixer truck	1	40	79		110	0.1		72.0	8	480	66	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	pumps	1	50	77		110	0.1		70.0	8	480	65	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
									Total for Shoreline Stablization Phase:			**82.8**																
Install Oyster Habitat	tractor	1	40	84	"tractor/loader/backhoe"	110	0.1		77.0	8	480	71	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	excavator	1	40	81		110	0.1		74.0	8	480	68	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
									Total for Install Oyster Habitat Phase:			**73.0**																
Demobilization	dozer	1	40	82		110	0.1		75.0	8	480	69	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	110	0.1		77.0	8	480	71	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
									Total for Demobilization Phase:			**73.4**																

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

11 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization	dozer	1	40	82		110	9.2		65.8	8	480	60	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	tractor	1	40	84	"tractor/loader/backhoe"	110	9.2		67.8	8	480	62	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	impact pile driver	1	20	95		110	9.2		78.8	8	480	70	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	vibratory pile driver	1	20	95		110	9.2		78.8	8	480	70	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	compressor (air)	1	40	78	"jetting equipment"	110	9.2		61.8	8	480	56	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	concrete mixer truck	1	40	79		110	9.2		62.8	8	480	57	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	pumps	1	50	77		110	9.2		60.8	8	480	56	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
									Total for Mobilization Phase:			**73.9**																
Excavation	excavator	1	40	81		110	0.1		74.0	8	480	68	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
									Total for Excavation Phase:			**68.2**																
Shoreline Stablization	tractor	1	40	84	"tractor/loader/backhoe"	110	9.2		67.8	8	480	62	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	impact pile driver	1	20	95		110	9.2		78.8	8	480	70	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	vibratory pile driver	1	20	95		110	9.2		78.8	8	480	70	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	compressor (air)	1	40	78	"jetting equipment"	110	9.2		61.8	8	480	56	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	concrete mixer truck	1	40	79		110	9.2		62.8	8	480	57	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
	pumps	1	50	77		110	9.2		60.8	8	480	56	5	35	11	10	100	110	11.7	102.8	114.0	0.48	9.9	31.0	20.0	0.2	0.4	9.2
									Total for Shoreline Stablization Phase:			**73.7**																
Install Oyster Habitat	tractor	1	40	84	"tractor/loader/backhoe"	110	0.1		77.0	8	480	71	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	excavator	1	40	81		110	0.1		74.0	8	480	68	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
									Total for Install Oyster Habitat Phase:			**73.0**																
Demobilization	dozer	1	40	82		110	0.1		75.0	8	480	69	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	110	0.1		77.0	8	480	71	5	35	0	10	100	110	11.2	105.9	114.0	0.00	0.1	20.0	20.0	0.4	0.4	0.1
									Total for Demobilization Phase:			**73.4**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	2	40	82		30	0.1		86.3	8	480	84	5	5	0	10	20	30	11.2	20.6	30.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	30	0.1		88.3	8	480	83	5	5	0	10	20	30	11.2	20.6	30.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	2	40	81	"tractor/loader/backhoe"	30	0.1		85.3	8	480	83	5	5	0	10	20	30	11.2	20.6	30.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
								Total for Mobilization/SWPPP/Site Preparation Phase:				87.7																
Beach Nourishment	tractor	1	40	84	"tractor/loader/backhoe"	30	0.1		88.3	8	480	83	5	5	0	10	20	30	11.2	20.6	30.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	2	40	82	"tractor/loader/backhoe"	30	0.1		86.3	8	480	84	5	5	0	10	20	30	11.2	20.6	30.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	2	40	81	"tractor/loader/backhoe"	30	0.1		85.3	8	480	83	5	5	0	10	20	30	11.2	20.6	30.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
								Total for Beach Nourishment Phase:				87.7																
Demobilization	dozer	2	40	82		30	0.1		86.3	8	480	84	5	5	0	10	20	30	11.2	20.6	30.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	30	0.1		88.3	8	480	83	5	5	0	10	20	30	11.2	20.6	30.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	2	40	81	"tractor/loader/backhoe"	30	0.1		85.3	8	480	83	5	5	0	10	20	30	11.2	20.6	30.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
								Total for Demobilization Phase:				87.7																

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

9 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	2	40	82		30	14.0		72.4	8	480	70	5	5	9	10	20	30	10.8	20.4	30.0	1.17	13.7	14.0	5.0	0.5	0.7	14.0
	tractor	1	40	84	"tractor/loader/backhoe"	30	14.0		74.4	8	480	69	5	5	9	10	20	30	10.8	20.4	30.0	1.17	13.7	14.0	5.0	0.5	0.7	14.0
	excavator	2	40	81	"tractor/loader/backhoe"	30	14.0		71.4	8	480	69	5	5	9	10	20	30	10.8	20.4	30.0	1.17	13.7	14.0	5.0	0.5	0.7	14.0
								Total for Mobilization/SWPPP/Site Preparation Phase:				**73.8**																
Beach Nourishment	tractor	1	40	84	"tractor/loader/backhoe"	30	14.0		74.4	8	480	69	5	5	9	10	20	30	10.8	20.4	30.0	1.17	13.7	14.0	5.0	0.5	0.7	14.0
	dozer	2	40	82	"tractor/loader/backhoe"	30	14.0		72.4	8	480	70	5	5	9	10	20	30	10.8	20.4	30.0	1.17	13.7	14.0	5.0	0.5	0.7	14.0
	excavator	2	40	81	"tractor/loader/backhoe"	30	14.0		71.4	8	480	69	5	5	9	10	20	30	10.8	20.4	30.0	1.17	13.7	14.0	5.0	0.5	0.7	14.0
								Total for Beach Nourishment Phase:				**73.8**																
Demobilization	dozer	2	40	82		30	14.0		72.4	8	480	70	5	5	9	10	20	30	10.8	20.4	30.0	1.17	13.7	14.0	5.0	0.5	0.7	14.0
	tractor	1	40	84	"tractor/loader/backhoe"	30	14.0		74.4	8	480	69	5	5	9	10	20	30	10.8	20.4	30.0	1.17	13.7	14.0	5.0	0.5	0.7	14.0
	excavator	2	40	81	"tractor/loader/backhoe"	30	14.0		71.4	8	480	69	5	5	9	10	20	30	10.8	20.4	30.0	1.17	13.7	14.0	5.0	0.5	0.7	14.0
								Total for Demobilization Phase:				**73.8**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	1	40	82		45	0.1		82.8	8	480	77	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	45	0.1		84.8	8	480	79	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete mixer truck	1	40	79	"water compaction truck"	45	0.1		79.8	8	480	74	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	pumps	1	50	77	"dewatering pump & tank"	45	0.1		77.8	8	480	73	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Mobilization/SWPPP/Site Preparation Phase:			82.5																
Demolish Existing Sidewalk	concrete saw	1	20	90		45	0.1		90.8	8	480	82	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	dozer	1	40	82		45	0.1		82.8	8	480	77	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	2	40	81		45	0.1		81.8	8	480	79	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	backhoe	1	40	78		45	0.1		78.8	8	480	73	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Demolish Existing Sidewalk Phase:			84.9																
Construct New Sidewalk	front end loader	2	40	79	"skid steer loader"	45	0.1		79.8	8	480	77	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	2	40	81		45	0.1		81.8	8	480	79	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	pickup truck	1	40	55	"off-road trucks"	45	0.1		55.8	8	480	50	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete saw	1	20	90		45	0.1		90.8	8	480	82	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	pumps	1	50	77		45	0.1		77.8	8	480	73	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Construct New Sidewalk Phase:			84.9																
Cobble Berm	tractor	1	40	84	"tractor/loader/backhoe"	45	0.1		84.8	8	480	79	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		45	0.1		81.8	8	480	76	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Cobble Berm Phase:			80.8																
Beach Nourishment	tractor	1	40	84	"tractor/loader/backhoe"	45	0.1		84.8	8	480	79	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete mixer truck	1	40	79	"water compaction truck"	45	0.1		79.8	8	480	74	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Beach Nourishment Phase:			80.3																
Demobilization	dozer	1	40	82		45	0.1		82.8	8	480	77	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	45	0.1		84.8	8	480	79	5	10	0	10	35	45	11.2	36.4	45.3	0.00	0.1	7.5	7.5	0.6	0.6	0.1
									Total for Demobilization Phase:			81.2																

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

9 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	1	40	82		45	10.2		72.7	8	480	67	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	tractor	1	40	84	"tractor/loader/backhoe"	45	10.2		74.7	8	480	69	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	concrete mixer truck	1	40	79	"water compaction truck"	45	10.2		69.7	8	480	64	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	pumps	1	50	77	"dewatering pump & tank"	45	10.2		67.7	8	480	63	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
								Total for Mobilization/SWPPP/Site Preparation Phase:				**72.4**																
Demolish Existing Sidewalk	concrete saw	1	20	90		45	10.2		80.7	8	480	72	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	dozer	1	40	82		45	10.2		72.7	8	480	67	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	excavator	2	40	81		45	10.2		71.7	8	480	69	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	backhoe	1	40	78		45	10.2		68.7	8	480	63	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
								Total for Demolish Existing Sidewalk Phase:				**74.9**																
Construct New Sidewalk	front end loader	2	40	79	"skid steer loader"	45	10.2		69.7	8	480	67	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	excavator	2	40	81		45	10.2		71.7	8	480	69	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	pickup truck	1	40	55	"off-road trucks"	45	10.2		45.7	8	480	40	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	concrete saw	1	20	90		45	10.2		80.7	8	480	72	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	pumps	1	50	77		45	10.2		67.7	8	480	63	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
								Total for Construct New Sidewalk Phase:				**74.9**																
Cobble Berm	tractor	1	40	84	"tractor/loader/backhoe"	45	10.2		74.7	8	480	69	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	excavator	1	40	81		45	10.2		71.7	8	480	66	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
								Total for Cobble Berm Phase:				**70.7**																
Beach Nourishment	tractor	1	40	84	"tractor/loader/backhoe"	45	10.2		74.7	8	480	69	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	concrete mixer truck	1	40	79	"water compaction truck"	45	10.2		69.7	8	480	64	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
								Total for Beach Nourishment Phase:				**70.2**																
Demobilization	dozer	1	40	82		45	10.2		72.7	8	480	67	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
	tractor	1	40	84	"tractor/loader/backhoe"	45	10.2		74.7	8	480	69	5	10	9	10	35	45	10.8	35.0	45.3	0.51	10.1	16.5	7.5	0.5	0.6	10.2
								Total for Demobilization Phase:				**71.1**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Mobilization/SWPPP/Site Preparation	dozer	1	40	82		130	0.1		71.5	8	480	66	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	130	0.1		73.5	8	480	68	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete mixer truck	1	40	79	"water truck"	130	0.1		68.5	8	480	63	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	dump truck	1	40	76	"large rock haul truck"	130	0.1		65.5	8	480	60	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Mobilization/SWPPP/Site Preparation Phase:				**71.0**																
Storm Drain Improvements/Install Pilot Groins	tractor	2	40	84	"tractor/loader/backhoe"	130	0.1		73.5	8	480	71	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		130	0.1		70.5	8	480	65	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	dump truck	1	40	76	"large rock haul truck"	130	0.1		65.5	8	480	60	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Storm Drain Improvements/Install Pilot Groins Phase:				**72.0**																
Excavation	excavator	1	40	81		130	0.1		70.5	8	480	65	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Excavation Phase:				**64.8**																
Cobble Berm	tractor	1	40	84	"tractor/loader/backhoe"	130	0.1		73.5	8	480	68	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Cobble Berm Phase:				**67.8**																
Beach Nourishment	tractor	1	40	84	"tractor/loader/backhoe"	130	0.1		73.5	8	480	68	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	crane	1	16	81	barge crane	160	0.1		68.0	8	480	58	5	10	0	10	150	160	11.2	150.3	160.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tug	1	50	82	tugboat	160	0.1		69.0	8	480	64	5	10	0	10	150	160	11.2	150.3	160.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	dump truck	1	40	76		130	0.1		65.5	8	480	60	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Beach Nourishment Phase:				**70.1**																
Construct Vehicle Access Ways	front end loader	1	40	79	"skid steer loader"	130	0.1		68.5	8	480	63	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	1	40	81		130	0.1		70.5	8	480	65	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete mixer truck	1	40	79		130	0.1		68.5	8	480	63	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete saw	1	20	90		130	0.1		79.5	8	480	71	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	pumps	1	50	77		130	0.1		66.5	8	480	62	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete mixer truck	1	40	79	"water truck"	130	0.1		68.5	8	480	63	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Construct Vehicle Access Ways Phase:				**73.5**																
Demobilization	dozer	1	40	82		130	0.1		71.5	8	480	66	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	tractor	1	40	84	"tractor/loader/backhoe"	130	0.1		73.5	8	480	68	5	10	0	10	120	130	11.2	120.4	130.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Demobilization Phase:				**69.9**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scrafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = **75**

allowable hours over which Leq is to be averaged, City of San Diego = **12**

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Site 1: 38.83 acres Middle Fiesta Island (West of Causeway)																												
Clearing and Grubbing/Non-native Eradication	pickup truck	4	40	55		1400	0.1		19.9	8	480	20	5	5	0	10	1390	1400	11.2	1390.0	1400.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	2	40	76		1400	0.1		40.9	8	480	38	5	5	0	10	1390	1400	11.2	1390.0	1400.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	2	40	82	"tracked skidsteer/dozer"	1400	0.1		46.9	8	480	44	5	5	0	10	1390	1400	11.2	1390.0	1400.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete saw	1	20	90	"chipper"	1400	0.1		54.9	8	480	46	5	5	0	10	1390	1400	11.2	1390.0	1400.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Clearing and Grubbing/Non-native Eradication Phase:					**48.7**																
Plantings	pickup truck	4	40	55		1400	0.1		19.9	8	480	20	5	5	0	10	1390	1400	11.2	1390.0	1400.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	1	40	81		1400	0.1		45.9	8	480	40	5	5	0	10	1390	1400	11.2	1390.0	1400.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Plantings Phase:					**40.2**																
Seeding	pickup truck	4	40	55		1400	0.1		19.9	8	480	20	5	5	0	10	1390	1400	11.2	1390.0	1400.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	1	40	82	"tracked skidsteer/dozer"	1400	0.1		46.9	8	480	41	5	5	0	10	1390	1400	11.2	1390.0	1400.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Seeding Phase:					**41.2**																
Site 3: 12.43 acres (@ Youth Camping Facility)																												
Clearing and Grubbing/Non-native Eradication	pickup truck	4	40	55		620	0.1		27.9	8	480	28	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	2	40	76		620	0.1		48.9	8	480	46	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	2	40	82	"tracked skidsteer/dozer"	620	0.1		54.9	8	480	52	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete saw	1	20	90		620	0.1		62.9	8	480	54	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Clearing and Grubbing/Non-native Eradication Phase:					**56.7**																
Site Grading and Sand Import/Placement	dozer	2	40	82		620	0.1		54.9	8	480	52	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	5	40	76	"haul truck"	620	0.1		48.9	8	480	50	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete mixer truck	1	40	79	"water truck"	620	0.1		51.9	8	480	46	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	pickup truck	4	40	55		620	0.1		27.9	8	480	28	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Site Grading and Sand Import/Placement Phase:					**55.0**																
Plantings	pickup truck	4	40	55		620	0.1		27.9	8	480	28	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	1	40	81		620	0.1		53.9	8	480	48	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Plantings Phase:					**48.3**																
Seeding	pickup truck	4	40	55		620	0.1		27.9	8	480	28	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	1	40	82	"tracked skidsteer/dozer"	620	0.1		54.9	8	480	49	5	5	0	10	610	620	11.2	610.0	620.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Seeding Phase:					**49.2**																
Site 4: 14.94 acres (North Central Fiesta Island)																												
Clearing and Grubbing/Non-native Eradication	pickup truck	4	40	55		2070	0.1		15.8	8	480	16	5	5	0	10	2060	2070	11.2	2060.0	2070.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	2	40	76		2070	0.1		36.8	8	480	34	5	5	0	10	2060	2070	11.2	2060.0	2070.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	2	40	82	"tracked skidsteer/dozer"	2070	0.1		42.8	8	480	40	5	5	0	10	2060	2070	11.2	2060.0	2070.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete saw	1	20	90	"chipper"	2070	0.1		50.8	8	480	42	5	5	0	10	2060	2070	11.2	2060.0	2070.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Clearing and Grubbing/Non-native Eradication Phase:					**44.6**																
Plantings	pickup truck	4	40	55		2070	0.1		15.8	8	480	16	5	5	0	10	2060	2070	11.2	2060.0	2070.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	1	40	81		2070	0.1		41.8	8	480	36	5	5	0	10	2060	2070	11.2	2060.0	2070.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Plantings Phase:					**36.1**																
Seeding	pickup truck	4	40	55		2070	0.1		15.8	8	480	16	5	5	0	10	2060	2070	11.2	2060.0	2070.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	1	40	82	"tracked skidsteer/dozer"	2070	0.1		42.8	8	480	37	5	5	0	10	2060	2070	11.2	2060.0	2070.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Seeding Phase:					**37.1**																
Site 5: 28.6 acres (NFI California Least Tern Preserve)																												
Clearing and Grubbing/Non-native Eradication	pickup truck	4	40	55		2300	0.1		14.7	8	480	15	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	2	40	76		2300	0.1		35.7	8	480	33	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	2	40	82	"tracked skidsteer/dozer"	2300	0.1		41.7	8	480	39	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete saw	1	20	90		2300	0.1		49.7	8	480	41	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Clearing and Grubbing/Non-native Eradication Phase:					**43.4**																
Site Grading	scraper	2	40	84		2300	0.1		43.7	8	480	41	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	1	40	82		2300	0.1		41.7	8	480	36	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete mixer truck	1	40	79	"water truck"	2300	0.1		38.7	8	480	33	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	pickup truck	4	40	55		2300	0.1		14.7	8	480	15	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Site Grading Phase:					**42.6**																
Concrete and Asphalt Demo and Disposal	front end loader	1	40	79		2300	0.1		38.7	8	480	33	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	1	40	81		2300	0.1		40.7	8	480	35	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	2	40	76	"haul truck"	2300	0.1		35.7	8	480	33	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	pickup truck	4	40	55		2300	0.1		14.7	8	480	15	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Concrete and Asphalt Demo and Disposal Phase:					**38.5**																
Sand Import/Placement	dozer	2	40	82		2300	0.1		41.7	8	480	39	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	5	40	76	"haul truck"	2300	0.1		35.7	8	480	37	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete mixer truck	1	40	79	"water truck"	2300	0.1		38.7	8	480	33	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	pickup truck	4	40	55		2300	0.1		14.7	8	480	15	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Sand Import/Placement Phase:					**41.7**																
Plantings	pickup truck	4	40	55		2300	0.1		14.7	8	480	15	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	1	40	81		2300	0.1		40.7	8	480	35	5	5	0	10	2290	2300	11.2	2290.0	2300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Plantings Phase:					**35.0**																

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Site 1a: 17.38 acres (Western CLT and alkali wetland)																												
Clearing and Grubbing/Non-native Eradication	pickup truck	4	40	55		1170	0.1		21.7	8	480	22	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	2	40	76		1170	0.1		42.7	8	480	40	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	2	40	82	"tracked skidsteer/dozer"	1170	0.1		48.7	8	480	46	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete saw	1	20	90	"chipper"	1170	0.1		56.7	8	480	48	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Clearing and Grubbing/Non-native Eradication Phase:					**50.5**																
Site Grading and Sand Import/Placement	dozer	2	40	82		1170	0.1		48.7	8	480	46	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	5	40	76	"haul truck"	1170	0.1		42.7	8	480	44	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete mixer truck	1	40	79	"water truck"	1170	0.1		45.7	8	480	40	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	pickup truck	4	40	55		1170	0.1		21.7	8	480	22	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Site Grading and Sand Import/Placement Phase:					**48.8**																
Plantings	pickup truck	4	40	55		1170	0.1		21.7	8	480	22	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	1	40	81		1170	0.1		47.7	8	480	42	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Plantings Phase:			**42.0**																
Seeding	pickup truck	4	40	55		1170	0.1		21.7	8	480	22	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	1	40	82	"tracked skidsteer/dozer"	1170	0.1		48.7	8	480	43	5	5	0	10	1160	1170	11.2	1160.0	1170.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Seeding Phase:			**43.0**																
Site 3c: 6.29 acres (Audubon Mitigation Site)																												
Clearing and Grubbing/Non-native Eradication	pickup truck	4	40	55		2100	0.1		15.7	8	480	16	5	5	0	10	2090	2100	11.2	2090.0	2100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	2	40	76		2100	0.1		36.7	8	480	34	5	5	0	10	2090	2100	11.2	2090.0	2100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	2	40	82	"tracked skidsteer/dozer"	2100	0.1		42.7	8	480	40	5	5	0	10	2090	2100	11.2	2090.0	2100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete saw	1	20	90	"chipper"	2100	0.1		50.7	8	480	42	5	5	0	10	2090	2100	11.2	2090.0	2100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Clearing and Grubbing/Non-native Eradication Phase:					**44.4**																
Seeding	pickup truck	4	40	55		2100	0.1		15.7	8	480	16	5	5	0	10	2090	2100	11.2	2090.0	2100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	1	40	82	"tracked skidsteer/dozer"	2100	0.1		42.7	8	480	37	5	5	0	10	2090	2100	11.2	2090.0	2100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Seeding Phase:			**36.9**																
Site 4d: 51.57 acres (@ South Shores)																												
Clearing and Grubbing/Non-native Eradication	pickup truck	4	40	55		1440	0.1		19.6	8	480	20	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	2	40	76		1440	0.1		40.6	8	480	38	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	2	40	82	"tracked skidsteer/dozer"	1440	0.1		46.6	8	480	44	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete saw	1	20	90	"chipper"	1440	0.1		54.6	8	480	46	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
							Total for Clearing and Grubbing/Non-native Eradication Phase:					**48.4**																
Site Grading	dozer	2	40	82		1440	0.1		46.6	8	480	44	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dump truck	5	40	76	"haul truck"	1440	0.1		40.6	8	480	42	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete mixer truck	1	40	79	"water truck"	1440	0.1		43.6	8	480	38	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	pickup truck	4	40	55		1440	0.1		19.6	8	480	20	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Site Grading Phase:			**46.6**																
Plantings	pickup truck	4	40	55		1440	0.1		19.6	8	480	20	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	excavator	1	40	81		1440	0.1		45.6	8	480	40	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Plantings Phase:			**39.9**																
Seeding	pickup truck	4	40	55		1440	0.1		19.6	8	480	20	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	1	40	82	"tracked skidsteer/dozer"	1440	0.1		46.6	8	480	41	5	5	0	10	1430	1440	11.2	1430.0	1440.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Seeding Phase:			**40.9**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

Notes to User: *1) Bordered cells are inputs, unbordered cells have formulae*
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = 75
allowable hours over which Leq is to be averaged, City of San Diego = 12

4075 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
5	Mobilization	P	dozer	1	40	82		20	0.1		89.9	4	240	81	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	dozer	1	40	82		408	0.1		59.0	4	240	50	5	5	0	10	10	408	11.2	11.2	408.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	tractor	1	40	84	"tractor/loader/backhoe"	20	0.1		91.9	4	240	83	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	tractor	1	40	84	"tractor/loader/backhoe"	408	0.1		61.0	4	240	52	5	5	0	10	10	408	11.2	11.2	408.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Mobilization Phase:			85.3																
15	Clearing and Grubbing	P	dozer	1	40	82		20	0.1		89.9	4	240	81	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	dozer	1	40	82		137	0.1		70.0	4	240	61	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	tractor	1	40	84	"tractor/loader/backhoe"	20	0.1		91.9	4	240	83	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	tractor	1	40	84	"tractor/loader/backhoe"	137	0.1		72.0	4	240	63	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Clearing and Grubbing Phase:			85.3																
15	Place Chain Link Fence	P	skidsteer*	1	40	80		20	0.1		87.9	4	240	79	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	skidsteer*	1	40	80		137	0.1		68.0	4	240	59	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Place Chain Link Fence Phase:			79.2																
4	Demolition of AC Paving	P	dozer	1	40	82		20	0.1		89.9	4	240	81	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		H	dozer	1	40	82		510	0.1		56.8	4	240	48	5	5	0	10	10	510	11.2	11.2	509.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		P	excavator	2	40	81		20	0.1		88.9	4	240	83	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		H	excavator	2	40	81		510	0.1		55.8	4	240	50	5	5	0	10	10	510	11.2	11.2	509.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		P	concrete saw	1	20	90		20	0.1		97.9	4	240	86	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		H	concrete saw	1	20	90		510	0.1		64.8	4	240	53	5	5	0	10	10	510	11.2	11.2	509.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Demolition of AC Paving Phase:			88.7																
15	Proposed Grading	P	skidsteer*	2	40	80	"skid steer loader"	20	0.1		87.9	4	240	82	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	skidsteer*	2	40	80	"skid steer loader"	137	0.1		68.0	4	240	62	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	excavator	2	40	81		20	0.1		88.9	4	240	83	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	excavator	2	40	81		137	0.1		69.0	4	240	63	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Proposed Grading Phase:			85.7																
15	BMP Installation	P	skidsteer*	2	40	80	"skid steer loader"	20	0.1		87.9	4	240	82	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	skidsteer*	2	40	80	"skid steer loader"	137	0.1		68.0	4	240	62	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	excavator	2	40	81		20	0.1		88.9	4	240	83	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	excavator	2	40	81		137	0.1		69.0	4	240	63	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for BMP Installation Phase:			85.7																
15	Place AC Pavement	P	concrete saw	1	20	90		20	0.1		97.9	4	240	86	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	concrete saw	1	20	90		137	0.1		78.0	4	240	66	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	paver	1	50	77		20	0.1		84.9	4	240	77	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	paver	1	50	77		137	0.1		65.0	4	240	57	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	paver	1	50	77	"paving equipment"	20	0.1		84.9	4	240	77	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	paver	1	50	77	"paving equipment"	137	0.1		65.0	4	240	57	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	roller	2	20	80		20	0.1		87.9	4	240	79	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	roller	2	20	80		137	0.1		68.0	4	240	59	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Place AC Pavement Phase:			87.8																
3	Form & Pour Concrete	P	concrete mixer truck	1	40	79		20	0.1		86.9	4	240	78	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		H	concrete mixer truck	1	40	79		679	0.1		51.1	4	240	42	5	5	0	10	10	679	11.2	11.2	679.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	concrete saw	1	20	90		20	0.1		97.9	4	240	86	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		H	concrete saw	1	20	90		679	0.1		62.1	4	240	50	5	5	0	10	10	679	11.2	11.2	679.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	pumps	1	50	77		20	0.1		84.9	4	240	77	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		H	pumps	1	50	77		679	0.1		49.1	4	240	41	5	5	0	10	10	679	11.2	11.2	679.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Form & Pour Concrete Phase:			87.2																
2	Remove Existing Striping & Place New Striping and Signage	P	Compressor (air)	1	40	78		20	0.1		85.9	4	240	77	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		H	Compressor (air)	1	40	78		1019	0.1		46.1	4	240	37	5	5	0	10	10	1019	11.2	11.2	1018.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Remove Existing Striping & Place New Striping and Signage Phase:			77.1																
14	Demobilization / Project Closeout	P	dozer	1	40	82		20	0.1		89.9	4	240	81	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	dozer	1	40	82		147	0.1		69.2	4	240	60	5	5	0	10	10	147	11.2	11.2	146.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		P	tractor	1	40	84	"tractor/loader/backhoe"	20	0.1		91.9	4	240	83	5	5	0	10	10	20	11.2	11.2	20.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	tractor	1	40	84	"tractor/loader/backhoe"	147	0.1		71.2	4	240	62	5	5	0	10	10	147	11.2	11.2	146.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Demobilization / Project Closeout Phase:			85.3																

Notes to User: 1) Bordered cells are inputs, unbordered cells have formulae
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = 75
allowable hours over which Leq is to be averaged, City of San Diego = 12

4075 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	lLbarr (dB)
5	Mobilization	P	dozer	1	40	82		20	15.5		74.4	4	240	66	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
5		H	dozer	1	40	82		408	0.1		59.0	4	240	50	5	5	0	10	10	408	11.2	11.2	408.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	tractor	1	40	84	"tractor/loader/backhoe"	20	15.5		76.4	4	240	68	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
5		H	tractor	1	40	84	"tractor/loader/backhoe"	408	0.1		61.0	4	240	52	5	5	0	10	10	408	11.2	11.2	408.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Mobilization Phase:			**69.9**															
15	Clearing and Grubbing	P	dozer	1	40	82		20	15.5		74.4	4	240	66	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	dozer	1	40	82		137	0.1		70.0	4	240	61	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	tractor	1	40	84	"tractor/loader/backhoe"	20	15.5		76.4	4	240	68	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	tractor	1	40	84	"tractor/loader/backhoe"	137	0.1		72.0	4	240	63	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Clearing and Grubbing Phase:			**71.1**															
15	Place Chain Link Fence	P	skidsteer*	1	40	80		20	15.5		72.4	4	240	64	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	skidsteer*	1	40	80		137	0.1		68.0	4	240	59	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Place Chain Link Fence Phase:			**65.0**															
4	Demolition of AC Paving	P	dozer	1	40	82		20	15.5		74.4	4	240	66	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
4		H	dozer	1	40	82		510	0.1		56.8	4	240	48	5	5	0	10	10	510	11.2	11.2	509.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		P	excavator	2	40	81		20	15.5		73.4	4	240	68	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
4		H	excavator	2	40	81		510	0.1		55.8	4	240	50	5	5	0	10	10	510	11.2	11.2	509.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		P	concrete saw	1	20	90		20	15.5		82.4	4	240	71	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
4		H	concrete saw	1	20	90		510	0.1		64.8	4	240	53	5	5	0	10	10	510	11.2	11.2	509.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Demolition of AC Paving Phase:			**73.3**															
15	Proposed Grading	P	skidsteer*	2	40	80	"skid steer loader"	20	15.5		72.4	4	240	67	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	skidsteer*	2	40	80	"skid steer loader"	137	0.1		68.0	4	240	62	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	excavator	2	40	81		20	15.5		73.4	4	240	68	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	excavator	2	40	81		137	0.1		69.0	4	240	63	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Proposed Grading Phase:			**71.6**															
15	BMP Installation	P	skidsteer*	2	40	80	"skid steer loader"	20	15.5		72.4	4	240	67	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	skidsteer*	2	40	80	"skid steer loader"	137	0.1		68.0	4	240	62	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	excavator	2	40	81		20	15.5		73.4	4	240	68	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	excavator	2	40	81		137	0.1		69.0	4	240	63	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for BMP Installation Phase:			**71.6**															
15	Place AC Pavement	P	concrete saw	1	20	90		20	15.5		82.4	4	240	71	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	concrete saw	1	20	90		137	0.1		78.0	4	240	66	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	paver	1	50	77		20	15.5		69.4	4	240	62	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	paver	1	50	77		137	0.1		65.0	4	240	57	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	paver	1	50	77	"paving equipment"	20	15.5		69.4	4	240	62	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	paver	1	50	77	"paving equipment"	137	0.1		65.0	4	240	57	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	roller	2	20	80		20	15.5		72.4	4	240	64	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
15		H	roller	2	20	80		137	0.1		68.0	4	240	59	5	5	0	10	10	137	11.2	11.2	137.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Place AC Pavement Phase:			**73.6**															
3	Form & Pour Concrete	P	concrete mixer truck	1	40	79		20	15.5		71.4	4	240	63	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
3		H	concrete mixer truck	1	40	79		679	0.1		51.1	4	240	42	5	5	0	10	10	679	11.2	11.2	679.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	concrete saw	1	20	90		20	15.5		82.4	4	240	71	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
3		H	concrete saw	1	20	90		679	0.1		62.1	4	240	50	5	5	0	10	10	679	11.2	11.2	679.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	pumps	1	50	77		20	15.5		69.4	4	240	62	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
3		H	pumps	1	50	77		679	0.1		49.1	4	240	41	5	5	0	10	10	679	11.2	11.2	679.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Form & Pour Concrete Phase:			**71.8**															
2	Remove Existing Striping & Place New Striping and Signage	P	Compressor (air)	1	40	78		20	15.5		70.4	4	240	62	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
2		H	Compressor (air)	1	40	78		1019	0.1		46.1	4	240	37	5	5	0	10	10	1019	11.2	11.2	1018.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Remove Existing Striping & Place New Striping and Signage Phase:			**61.7**															
14	Demobilization / Project Closeout	P	dozer	1	40	82		20	15.5		74.4	4	240	66	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
14		H	dozer	1	40	82		147	0.1		69.2	4	240	60	5	5	0	10	10	147	11.2	11.2	146.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		P	tractor	1	40	84	"tractor/loader/backhoe"	20	15.5		76.4	4	240	68	5	5	9	10	10	20	10.8	10.8	20.0	1.54	14.9	14.0	5.0	0.5	0.7	15.5
14		H	tractor	1	40	84	"tractor/loader/backhoe"	147	0.1		71.2	4	240	62	5	5	0	10	10	147	11.2	11.2	146.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Demobilization / Project Closeout Phase:			**71.0**															

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Skidsteer*	*No*	*40*	*80*	-- *N/A* --	-- *N/A* --
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

Notes to User: 1) Bordered cells are inputs, unbordered cells have formulae
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = 75
allowable hours over which Leq is to be averaged, City of San Diego = 12

900 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
5	Mobilization	P	dozer	1	40	82		670	0.1		54.2	4	240	45	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	dozer	1	40	82		676	0.1		54.1	4	240	45	5	5	0	10	660	676	11.2	660.0	676.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	tractor	1	40	84	"tractor/loader/backhoe"	670	0.1		56.2	4	240	47	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	tractor	1	40	84	"tractor/loader/backhoe"	676	0.1		56.1	4	240	47	5	5	0	10	660	676	11.2	660.0	676.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Mobilization Phase:				**52.5**															
1	Clearing and Grubbing	P	dozer	1	40	82		670	0.1		54.2	4	240	45	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
1		H	dozer	1	40	82		807	0.1		52.4	4	240	44	5	5	0	10	660	807	11.2	660.0	807.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
1		P	tractor	1	40	84	"tractor/loader/backhoe"	670	0.1		56.2	4	240	47	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
1		H	tractor	1	40	84	"tractor/loader/backhoe"	807	0.1		54.4	4	240	46	5	5	0	10	660	807	11.2	660.0	807.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Clearing and Grubbing Phase:				**51.8**															
4	Demolition of AC Paving	P	dozer	1	40	82		670	0.1		54.2	4	240	45	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		H	dozer	1	40	82		679	0.1		54.1	4	240	45	5	5	0	10	660	679	11.2	660.0	679.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		P	excavator	2	40	81		670	0.1		53.2	4	240	47	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		H	excavator	2	40	81		679	0.1		53.1	4	240	47	5	5	0	10	660	679	11.2	660.0	679.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		P	concrete saw	1	20	90		670	0.1		62.2	4	240	50	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		H	concrete saw	1	20	90		679	0.1		62.1	4	240	50	5	5	0	10	660	679	11.2	660.0	679.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Demolition of AC Paving Phase:				**56.0**															
4	Excavation of Retaining Wall	P	front end loader	1	40	79		670	0.1		51.2	4	240	42	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		H	front end loader	1	40	79		679	0.1		51.1	4	240	42	5	5	0	10	660	679	11.2	660.0	679.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		P	excavator	1	40	81		670	0.1		53.2	4	240	44	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
4		H	excavator	1	40	81		679	0.1		53.1	4	240	44	5	5	0	10	660	679	11.2	660.0	679.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Excavation of Retaining Wall Phase:				**49.5**															
5	Retaining Wall Foundation Construction	P	skidsteer*	2	40	80	"skid steer loader"	670	0.1		52.2	4	240	46	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	skidsteer*	2	40	80	"skid steer loader"	676	0.1		52.1	4	240	46	5	5	0	10	660	676	11.2	660.0	676.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	excavator	2	40	81		670	0.1		53.2	4	240	47	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	excavator	2	40	81		676	0.1		53.1	4	240	47	5	5	0	10	660	676	11.2	660.0	676.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Retaining Wall Foundation Construction Phase:				**53.0**															
20	Retaining Wall Construction	P	skidsteer*	2	40	80	"skid steer loader"	670	0.1		52.2	4	240	46	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
20		H	skidsteer*	2	40	80	"skid steer loader"	670	0.1		52.2	4	240	46	5	5	0	10	660	670	11.2	660.0	670.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
20		P	excavator	2	40	81		670	0.1		53.2	4	240	47	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
20		H	excavator	2	40	81		670	0.1		53.2	4	240	47	5	5	0	10	660	670	11.2	660.0	670.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Retaining Wall Construction Phase:				**53.0**															
5	Grading	P	skidsteer*	2	40	80	"skid steer loader"	670	0.1		52.2	4	240	46	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	skidsteer*	2	40	80	"skid steer loader"	676	0.1		52.1	4	240	46	5	5	0	10	660	676	11.2	660.0	676.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	excavator	2	40	81		670	0.1		53.2	4	240	47	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	excavator	2	40	81		676	0.1		53.1	4	240	47	5	5	0	10	660	676	11.2	660.0	676.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Grading Phase:				**53.0**															
5	Sawcut Existing Roadway, Pave Asphalt Concrete & Place K-Rail	P	concrete saw	1	20	90		670	0.1		62.2	4	240	50	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	concrete saw	1	20	90		676	0.1		62.1	4	240	50	5	5	0	10	660	676	11.2	660.0	676.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	paver	1	50	77		670	0.1		49.2	4	240	41	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	paver	1	50	77		676	0.1		49.1	4	240	41	5	5	0	10	660	676	11.2	660.0	676.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	paver	1	50	77	"paving equipment"	670	0.1		49.2	4	240	41	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	paver	1	50	77	"paving equipment"	676	0.1		49.1	4	240	41	5	5	0	10	660	676	11.2	660.0	676.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	roller	2	20	80		670	0.1		52.2	4	240	43	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	roller	2	20	80		676	0.1		52.1	4	240	43	5	5	0	10	660	676	11.2	660.0	676.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Sawcut Existing Roadway, Pave Asphalt Concrete & Place K-Rail Phase:				**55.0**															
10	Form & Pour Concrete	P	concrete mixer truck	1	40	79		670	0.1		51.2	4	240	42	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
10		H	concrete mixer truck	1	40	79		672	0.1		51.2	4	240	42	5	5	0	10	660	672	11.2	660.0	671.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
10		P	concrete saw	1	20	90		670	0.1		62.2	4	240	50	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
10		H	concrete saw	1	20	90		672	0.1		62.2	4	240	50	5	5	0	10	660	672	11.2	660.0	671.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
10		P	pumps	1	50	77		670	0.1		49.2	4	240	41	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
10		H	pumps	1	50	77		672	0.1		49.2	4	240	41	5	5	0	10	660	672	11.2	660.0	671.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Form & Pour Concrete Phase:				**54.5**															
1	Remove Existing Striping & Place New Striping and Signage	P	Compressor (air)	1	40	78		670	0.1		50.2	4	240	41	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
1		H	Compressor (air)	1	40	78		807	0.1		48.4	4	240	40	5	5	0	10	660	807	11.2	660.0	807.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Remove Existing Striping & Place New Striping and Signage Phase:				**43.7**															
14	Demobilization / Project Closeout	P	dozer	1	40	82		670	0.1		54.2	4	240	45	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	dozer	1	40	82		671	0.1		54.2	4	240	45	5	5	0	10	660	671	11.2	660.0	670.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		P	tractor	1	40	84	"tractor/loader/backhoe"	670	0.1		56.2	4	240	47	5	5	0	10	660	670	11.2	660.0	670.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	tractor	1	40	84	"tractor/loader/backhoe"	671	0.1		56.2	4	240	47	5	5	0	10	660	671	11.2	660.0	670.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
										Total for Demobilization / Project Closeout Phase:				**52.6**															

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scrafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Skidsteer*	*No*	*40*	*80*	*-- N/A --*	*-- N/A --*
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

Notes to User: 1) Bordered cells are inputs, unbordered cells have formulae
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = 75
allowable hours over which Leq is to be averaged, City of San Diego = 12

5000 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
5	Mobilization	P	dozer	1	40	82		70	0.1		78.6	4	240	70	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	dozer	1	40	82		505	0.1		56.9	4	240	48	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	tractor	1	40	84	"tractor/loader/backhoe"	70	0.1		80.6	4	240	72	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	tractor	1	40	84	"tractor/loader/backhoe"	505	0.1		58.9	4	240	50	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Mobilization Phase:			**74.0**																
5	Clearing and Grubbing, Removing Existing Trees	P	dozer	1	40	82		70	0.1		78.6	4	240	70	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	dozer	1	40	82		505	0.1		56.9	4	240	48	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	tractor	1	40	84	"tractor/loader/backhoe"	70	0.1		80.6	4	240	72	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	tractor	1	40	84	"tractor/loader/backhoe"	505	0.1		58.9	4	240	50	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Clearing and Grubbing, Removing Existing Trees Phase:			**74.0**																
1	Remove and Relocate/Salvage Existing Bollards & Benches	P	skidsteer*	1	40	80	"skid steer loader"	70	0.1		76.6	4	240	68	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
1		H	skidsteer*	1	40	80	"skid steer loader"	2501	0.1		38.7	4	240	30	5	5	0	10	60	2501	11.2	60.2	2501.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Remove and Relocate/Salvage Existing Bollards & Benches Phase:			**67.8**																
5	Demolition of AC Paving	P	dozer	1	40	82		70	0.1		78.6	4	240	70	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	dozer	1	40	82		505	0.1		56.9	4	240	48	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	excavator	2	40	81		70	0.1		77.6	4	240	72	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	excavator	2	40	81		505	0.1		55.9	4	240	50	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	concrete saw	1	20	90		70	0.1		86.6	4	240	75	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	concrete saw	1	20	90		505	0.1		64.9	4	240	53	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Demolition of AC Paving Phase:			**77.5**																
15	Proposed Grading	P	front end loader	1	40	79		70	0.1		75.6	4	240	67	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	front end loader	1	40	79		181	0.1		64.0	4	240	55	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	excavator	1	40	81		70	0.1		77.6	4	240	69	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	excavator	1	40	81		181	0.1		66.0	4	240	57	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15	BMP Installation Including Storm Drain Design	P	skidsteer*	2	40	80	"skid steer loader"	70	0.1		76.6	4	240	71	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	skidsteer*	2	40	80	"skid steer loader"	181	0.1		65.0	4	240	59	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	excavator	2	40	81		70	0.1		77.6	4	240	72	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	excavator	2	40	81		181	0.1		66.0	4	240	60	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for BMP Installation Including Storm Drain Design Phase:			**74.7**																
15	Place AC Pavement	P	concrete saw	1	20	90		70	0.1		86.6	4	240	75	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	concrete saw	1	20	90		181	0.1		75.0	4	240	63	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	paver	1	50	77		70	0.1		73.6	4	240	66	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	paver	1	50	77		181	0.1		62.0	4	240	54	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	paver	1	50	77	"paving equipment"	70	0.1		73.6	4	240	66	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	paver	1	50	77	"paving equipment"	181	0.1		62.0	4	240	54	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	roller	2	20	80		70	0.1		76.6	4	240	68	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	roller	2	20	80		181	0.1		65.0	4	240	56	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Place AC Pavement Phase:			**76.7**																
3	Form & Pour Concrete	P	concrete mixer truck	1	40	79		70	0.1		75.6	4	240	67	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		H	concrete mixer truck	1	40	79		836	0.1		49.0	4	240	40	5	5	0	10	60	836	11.2	60.2	836.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	concrete saw	1	20	90		70	0.1		86.6	4	240	75	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		H	concrete saw	1	20	90		836	0.1		60.0	4	240	48	5	5	0	10	60	836	11.2	60.2	836.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	pumps	1	50	77		70	0.1		73.6	4	240	66	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		H	pumps	1	50	77		836	0.1		47.0	4	240	39	5	5	0	10	60	836	11.2	60.2	836.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Form & Pour Concrete Phase:			**75.9**																
2	Remove Existing Striping & Place New Striping and Signage	P	Compressor (air)	1	40	78		70	0.1		74.6	4	240	66	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		H	Compressor (air)	1	40	78		1252	0.1		44.1	4	240	35	5	5	0	10	60	1252	11.2	60.2	1252.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Remove Existing Striping & Place New Striping and Signage Phase:			**65.8**																
14	Demobilization / Project Closeout	P	dozer	1	40	82		70	0.1		78.6	4	240	70	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	dozer	1	40	82		192	0.1		66.4	4	240	58	5	5	0	10	60	192	11.2	60.2	191.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		P	tractor	1	40	84	"tractor/loader/backhoe"	70	0.1		80.6	4	240	72	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	tractor	1	40	84	"tractor/loader/backhoe"	192	0.1		68.4	4	240	60	5	5	0	10	60	192	11.2	60.2	191.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Demobilization / Project Closeout Phase:			**74.2**																

Notes to User: 1) Bordered cells are inputs, unbordered cells have formulae
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = 75
allowable hours over which Leq is to be averaged, City of San Diego = 12

5000 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
5	Mobilization	P	dozer	1	40	82		70	0.1		78.6	4	240	70	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	dozer	1	40	82		505	0.1		56.9	4	240	48	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	tractor	1	40	84	"tractor/loader/backhoe"	70	0.1		80.6	4	240	72	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	tractor	1	40	84	"tractor/loader/backhoe"	505	0.1		58.9	4	240	50	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Mobilization Phase:			**74.0**																
5	Clearing and Grubbing, Removing Existing Trees	P	dozer	1	40	82		70	0.1		78.6	4	240	70	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	dozer	1	40	82		505	0.1		56.9	4	240	48	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	tractor	1	40	84	"tractor/loader/backhoe"	70	0.1		80.6	4	240	72	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	tractor	1	40	84	"tractor/loader/backhoe"	505	0.1		58.9	4	240	50	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Clearing and Grubbing, Removing Existing Trees Phase:			**74.0**																
1	Remove and Relocate/Salvage Existing Bollards & Benches	P	skidsteer*	1	40	80	"skid steer loader"	70	0.1		76.6	4	240	68	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
1		H	skidsteer*	1	40	80	"skid steer loader"	2501	0.1		38.7	4	240	30	5	5	0	10	60	2501	11.2	60.2	2501.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Remove and Relocate/Salvage Existing Bollards & Benches Phase:			**67.8**																
5	Demolition of AC Paving	P	dozer	1	40	82		70	9.9		68.7	4	240	60	5	5	8	10	60	70	10.4	60.1	70.0	0.52	10.1	13.0	5.0	0.5	0.7	9.9
5		H	dozer	1	40	82		505	0.1		56.9	4	240	48	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	excavator	2	40	81		70	9.9		67.7	4	240	62	5	5	8	10	60	70	10.4	60.1	70.0	0.52	10.1	13.0	5.0	0.5	0.7	9.9
5		H	excavator	2	40	81		505	0.1		55.9	4	240	50	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	concrete saw	1	20	90		70	9.9		76.7	4	240	65	5	5	8	10	60	70	10.4	60.1	70.0	0.52	10.1	13.0	5.0	0.5	0.7	9.9
5		H	concrete saw	1	20	90		505	0.1		64.9	4	240	53	5	5	0	10	60	505	11.2	60.2	504.9	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Demolition of AC Paving Phase:			**67.8**																
15	Proposed Grading	P	front end loader	1	40	79		70	0.1		75.6	4	240	67	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	front end loader	1	40	79		181	0.1		64.0	4	240	55	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	excavator	1	40	81		70	0.1		77.6	4	240	69	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	excavator	1	40	81		181	0.1		66.0	4	240	57	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15	BMP Installation Including Storm Drain Design	P	skidsteer*	2	40	80	"skid steer loader"	70	0.1		76.6	4	240	71	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	skidsteer*	2	40	80	"skid steer loader"	181	0.1		65.0	4	240	59	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	excavator	2	40	81		70	0.1		77.6	4	240	72	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	excavator	2	40	81		181	0.1		66.0	4	240	60	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for BMP Installation Including Storm Drain Design Phase:			**74.7**																
15	Place AC Pavement	P	concrete saw	1	20	90		70	9.9		76.7	4	240	65	5	5	8	10	60	70	10.4	60.1	70.0	0.52	10.1	13.0	5.0	0.5	0.7	9.9
15		H	concrete saw	1	20	90		181	0.1		75.0	4	240	63	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	paver	1	50	77		70	9.9		63.7	4	240	56	5	5	8	10	60	70	10.4	60.1	70.0	0.52	10.1	13.0	5.0	0.5	0.7	9.9
15		H	paver	1	50	77		181	0.1		62.0	4	240	54	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	paver	1	50	77	"paving equipment"	70	9.9		63.7	4	240	56	5	5	8	10	60	70	10.4	60.1	70.0	0.52	10.1	13.0	5.0	0.5	0.7	9.9
15		H	paver	1	50	77	"paving equipment"	181	0.1		62.0	4	240	54	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	roller	2	20	80		70	9.9		66.7	4	240	58	5	5	8	10	60	70	10.4	60.1	70.0	0.52	10.1	13.0	5.0	0.5	0.7	9.9
15		H	roller	2	20	80		181	0.1		65.0	4	240	56	5	5	0	10	60	181	11.2	60.2	180.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Place AC Pavement Phase:			**68.8**																
3	Form & Pour Concrete	P	concrete mixer truck	1	40	79		70	9.9		65.7	4	240	57	5	5	8	10	60	70	10.4	60.1	70.0	0.52	10.1	13.0	5.0	0.5	0.7	9.9
3		H	concrete mixer truck	1	40	79		836	0.1		49.0	4	240	40	5	5	0	10	60	836	11.2	60.2	836.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	concrete saw	1	20	90		70	9.9		76.7	4	240	65	5	5	8	10	60	70	10.4	60.1	70.0	0.52	10.1	13.0	5.0	0.5	0.7	9.9
3		H	concrete saw	1	20	90		836	0.1		60.0	4	240	48	5	5	0	10	60	836	11.2	60.2	836.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	pumps	1	50	77		70	9.9		63.7	4	240	56	5	5	8	10	60	70	10.4	60.1	70.0	0.52	10.1	13.0	5.0	0.5	0.7	9.9
3		H	pumps	1	50	77		836	0.1		47.0	4	240	39	5	5	0	10	60	836	11.2	60.2	836.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Form & Pour Concrete Phase:			**66.1**																
2	Remove Existing Striping & Place New Striping and Signage	P	Compressor (air)	1	40	78		70	0.1		74.6	4	240	66	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		H	Compressor (air)	1	40	78		1252	0.1		44.1	4	240	35	5	5	0	10	60	1252	11.2	60.2	1252.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Remove Existing Striping & Place New Striping and Signage Phase:			**65.8**																
14	Demobilization / Project Closeout	P	dozer	1	40	82		70	0.1		78.6	4	240	70	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	dozer	1	40	82		192	0.1		66.4	4	240	58	5	5	0	10	60	192	11.2	60.2	191.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		P	tractor	1	40	84	"tractor/loader/backhoe"	70	0.1		80.6	4	240	72	5	5	0	10	60	70	11.2	60.2	70.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	tractor	1	40	84	"tractor/loader/backhoe"	192	0.1		68.4	4	240	60	5	5	0	10	60	192	11.2	60.2	191.8	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Demobilization / Project Closeout Phase:			**74.2**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Skidsteer*	*No*	*40*	*80*	-- *N/A* --	-- *N/A* --
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

Notes to User: *1) Bordered cells are inputs, unbordered cells have formulae*
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = 75
allowable hours over which Leq is to be averaged, City of San Diego = 12

9035 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
	Segment A: Replace Parapet (Option 1)																													
15	Clearing and Grubbing	P	dozer	1	40	82		25	0.1		87.9	4	240	79	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	dozer	1	40	82		302	0.1		61.9	4	240	53	5	5	0	10	15	302	11.2	15.8	302.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	tractor	1	40	84	"tractor/loader/backhoe"	25	0.1		89.9	4	240	81	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		H	tractor	1	40	84	"tractor/loader/backhoe"	302	0.1		63.9	4	240	55	5	5	0	10	15	302	11.2	15.8	302.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Clearing and Grubbing Phase:		83.3																
45	Demolition	P	concrete saw	1	20	90		25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
45		H	concrete saw	1	20	90		103	0.1		81.3	4	240	70	5	5	0	10	15	103	11.2	15.8	103.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
45		P	dozer	1	40	82		25	0.1		87.9	4	240	79	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
45		H	dozer	1	40	82		103	0.1		73.3	4	240	65	5	5	0	10	15	103	11.2	15.8	103.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
45		P	excavator	2	40	81		25	0.1		86.9	4	240	81	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
45		H	excavator	2	40	81		103	0.1		72.3	4	240	67	5	5	0	10	15	103	11.2	15.8	103.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Demolition Phase:		86.9																
334	Parapet Replacement	P	crane	1	16	81		25	0.1		86.9	4	240	74	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		H	crane	1	16	81		28	0.1		85.8	4	240	73	5	5	0	10	15	28	11.2	15.8	28.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		P	excavator	1	40	81		25	0.1		86.9	4	240	78	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		H	excavator	1	40	81		28	0.1		85.8	4	240	77	5	5	0	10	15	28	11.2	15.8	28.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		P	concrete mixer truck	1	40	79		25	0.1		84.9	4	240	76	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		H	concrete mixer truck	1	40	79		28	0.1		83.8	4	240	75	5	5	0	10	15	28	11.2	15.8	28.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		P	concrete saw	1	20	90		25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		H	concrete saw	1	20	90		28	0.1		94.8	4	240	83	5	5	0	10	15	28	11.2	15.8	28.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		P	man lift	1	20	75		25	0.1		80.9	4	240	69	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		H	man lift	1	20	75		28	0.1		79.8	4	240	68	5	5	0	10	15	28	11.2	15.8	28.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		P	pumps	1	50	77		25	0.1		82.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		H	pumps	1	50	77		28	0.1		81.8	4	240	74	5	5	0	10	15	28	11.2	15.8	28.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		P	compressor (air)	1	40	78		25	0.1		83.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
334		H	compressor (air)	1	40	78		28	0.1		82.8	4	240	74	5	5	0	10	15	28	11.2	15.8	28.4	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Parapet Replacement Phase:		89.2																
	Segment A: Void Repairs (Option 1A)																													
91	Void Repairs	P	concrete saw	1	20	90		25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	concrete saw	1	20	90		56	0.1		89.0	4	240	77	5	5	0	10	15	56	11.2	15.8	55.6	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	excavator	1	40	81		25	0.1		86.9	4	240	78	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	excavator	1	40	81		56	0.1		80.0	4	240	71	5	5	0	10	15	56	11.2	15.8	55.6	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	concrete mixer truck	1	40	79		25	0.1		84.9	4	240	76	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	concrete mixer truck	1	40	79		56	0.1		78.0	4	240	69	5	5	0	10	15	56	11.2	15.8	55.6	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	pumps	1	50	77		25	0.1		82.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	pumps	1	50	77		56	0.1		76.0	4	240	68	5	5	0	10	15	56	11.2	15.8	55.6	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Void Repairs Phase:		86.8																

Notes to User: *1) Bordered cells are inputs, unbordered cells have formulae*
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = **75**
allowable hours over which Leq is to be averaged, City of San Diego = **12**

9035 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
	Segment A: Replace Parapet (Option 1)																													
15	Clearing and Grubbing	P	dozer	1	40	82		25	15.7		72.3	4	240	64	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
15		H	dozer	1	40	82		302	0.1		61.9	4	240	53	5	5	0	10	15	302	11.2	15.8	302.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
15		P	tractor	1	40	84	"tractor/loader/backhoe"	25	15.7		74.3	4	240	66	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
15		H	tractor	1	40	84	"tractor/loader/backhoe"	302	0.1		63.9	4	240	55	5	5	0	10	15	302	11.2	15.8	302.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Clearing and Grubbing Phase:		**68.0**																
45	Demolition	P	concrete saw	1	20	90		25	15.7		80.3	4	240	69	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
45		H	concrete saw	1	20	90		103	0.1		81.3	4	240	70	5	5	0	10	15	103	11.2	15.8	103.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
45		P	dozer	1	40	82		25	15.7		72.3	4	240	64	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
45		H	dozer	1	40	82		103	0.1		73.3	4	240	65	5	5	0	10	15	103	11.2	15.8	103.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
45		P	excavator	2	40	81		25	15.7		71.3	4	240	66	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
45		H	excavator	2	40	81		103	0.1		72.3	4	240	67	5	5	0	10	15	103	11.2	15.8	103.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Demolition Phase:		**74.7**																
334	Parapet Replacement	P	crane	1	16	81		25	15.7		71.3	4	240	59	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
334		H	crane	1	16	81		28	15.0		70.9	4	240	58	5	5	13	10	15	28	12.8	17.0	28.4	1.38	14.4	18.0	5.0	0.4	0.7	15.0
334		P	excavator	1	40	81		25	15.7		71.3	4	240	63	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
334		H	excavator	1	40	81		28	15.0		70.9	4	240	62	5	5	13	10	15	28	12.8	17.0	28.4	1.38	14.4	18.0	5.0	0.4	0.7	15.0
334		P	concrete mixer truck	1	40	79		25	15.7		69.3	4	240	61	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
334		H	concrete mixer truck	1	40	79		28	15.0		68.9	4	240	60	5	5	13	10	15	28	12.8	17.0	28.4	1.38	14.4	18.0	5.0	0.4	0.7	15.0
334		P	concrete saw	1	20	90		25	15.7		80.3	4	240	69	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
334		H	concrete saw	1	20	90		28	15.0		79.9	4	240	68	5	5	13	10	15	28	12.8	17.0	28.4	1.38	14.4	18.0	5.0	0.4	0.7	15.0
334		P	man lift	1	20	75		25	15.7		65.3	4	240	54	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
334		H	man lift	1	20	75		28	15.0		64.9	4	240	53	5	5	13	10	15	28	12.8	17.0	28.4	1.38	14.4	18.0	5.0	0.4	0.7	15.0
334		P	pumps	1	50	77		25	15.7		67.3	4	240	60	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
334		H	pumps	1	50	77		28	15.0		66.9	4	240	59	5	5	13	10	15	28	12.8	17.0	28.4	1.38	14.4	18.0	5.0	0.4	0.7	15.0
334		P	compressor (air)	1	40	78		25	15.7		68.3	4	240	60	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
334		H	compressor (air)	1	40	78		28	15.0		67.9	4	240	59	5	5	13	10	15	28	12.8	17.0	28.4	1.38	14.4	18.0	5.0	0.4	0.7	15.0
												Total for Parapet Replacement Phase:		**73.9**																
	Segment A: Void Repairs (Option 1A)																													
91	Void Repairs	P	concrete saw	1	20	90		25	15.7		80.3	4	240	69	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
91		H	concrete saw	1	20	90		56	0.1		89.0	4	240	77	5	5	0	10	15	56	11.2	15.8	55.6	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	excavator	1	40	81		25	15.7		71.3	4	240	63	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
91		H	excavator	1	40	81		56	0.1		80.0	4	240	71	5	5	0	10	15	56	11.2	15.8	55.6	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	concrete mixer truck	1	40	79		25	15.7		69.3	4	240	61	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
91		H	concrete mixer truck	1	40	79		56	0.1		78.0	4	240	69	5	5	0	10	15	56	11.2	15.8	55.6	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	pumps	1	50	77		25	15.7		67.3	4	240	60	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
91		H	pumps	1	50	77		56	0.1		76.0	4	240	68	5	5	0	10	15	56	11.2	15.8	55.6	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Void Repairs Phase:		**79.6**																

Notes to User: *1) Bordered cells are inputs, unbordered cells have formulae*
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = 75
allowable hours over which Leq is to be averaged, City of San Diego = 12

1050 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Segment B: Replace Parapet																														
7	Clearing and Grubbing	P	dozer	1	40	82		25	0.1		87.9	4	240	79	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
7		H	dozer	1	40	82		79	0.1		76.8	4	240	68	5	5	0	10	15	79	11.2	15.8	79.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
7		P	tractor	1	40	84	"tractor/loader/backhoe"	25	0.1		89.9	4	240	81	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
7		H	tractor	1	40	84	"tractor/loader/backhoe"	79	0.1		78.8	4	240	70	5	5	0	10	15	79	11.2	15.8	79.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Clearing and Grubbing Phase:		83.6																
14	Demolition	P	concrete saw	1	20	90		25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	concrete saw	1	20	90		45	0.1		90.8	4	240	79	5	5	0	10	15	45	11.2	15.8	45.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		P	dozer	1	40	82		25	0.1		87.9	4	240	79	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	dozer	1	40	82		45	0.1		82.8	4	240	74	5	5	0	10	15	45	11.2	15.8	45.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		P	excavator	2	40	81		25	0.1		86.9	4	240	81	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		H	excavator	2	40	81		45	0.1		81.8	4	240	76	5	5	0	10	15	45	11.2	15.8	45.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Demolition Phase:		87.9																
49	Parapet Replacement	P	crane	1	16	81		25	0.1		86.9	4	240	74	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		H	crane	1	16	81		27	0.1		86.2	4	240	73	5	5	0	10	15	27	11.2	15.8	27.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		P	excavator	1	40	81		25	0.1		86.9	4	240	78	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		H	excavator	1	40	81		27	0.1		86.2	4	240	77	5	5	0	10	15	27	11.2	15.8	27.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		P	concrete mixer truck	1	40	79		25	0.1		84.9	4	240	76	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		H	concrete mixer truck	1	40	79		27	0.1		84.2	4	240	75	5	5	0	10	15	27	11.2	15.8	27.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		P	concrete saw	1	20	90		25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		H	concrete saw	1	20	90		27	0.1		95.2	4	240	83	5	5	0	10	15	27	11.2	15.8	27.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		P	man lift	1	20	75		25	0.1		80.9	4	240	69	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		H	man lift	1	20	75		27	0.1		80.2	4	240	68	5	5	0	10	15	27	11.2	15.8	27.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		P	pumps	1	50	77		25	0.1		82.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		H	pumps	1	50	77		27	0.1		82.2	4	240	74	5	5	0	10	15	27	11.2	15.8	27.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		P	compressor (air)	1	40	78		25	0.1		83.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
49		H	compressor (air)	1	40	78		27	0.1		83.2	4	240	74	5	5	0	10	15	27	11.2	15.8	27.2	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Parapet Replacement Phase:		89.4																
Segment B: Void Repairs																														
91	Void Repairs	P	concrete saw	1	20	90		25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	concrete saw	1	20	90		26	0.1		95.7	4	240	84	5	5	0	10	15	26	11.2	15.8	25.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	excavator	1	40	81		25	0.1		86.9	4	240	78	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	excavator	1	40	81		26	0.1		86.7	4	240	78	5	5	0	10	15	26	11.2	15.8	25.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	concrete mixer truck	1	40	79		25	0.1		84.9	4	240	76	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	concrete mixer truck	1	40	79		26	0.1		84.7	4	240	76	5	5	0	10	15	26	11.2	15.8	25.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	pumps	1	50	77		25	0.1		82.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	pumps	1	50	77		26	0.1		82.7	4	240	75	5	5	0	10	15	26	11.2	15.8	25.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
												Total for Void Repairs Phase:		88.9																

Notes to User: *1) Bordered cells are inputs, unbordered cells have formulae*
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = **75**
allowable hours over which Leq is to be averaged, City of San Diego = **12**

1050 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Segment B: Replace Parapet																														
7	Clearing and Grubbing	P	dozer	1	40	82		25	15.7		72.3	4	240	64	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
7		H	dozer	1	40	82		79	0.1		76.8	4	240	68	5	5	0	10	15	79	11.2	15.8	79.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
7		P	tractor	1	40	84	"tractor/loader/backhoe"	25	15.7		74.3	4	240	66	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
7		H	tractor	1	40	84	"tractor/loader/backhoe"	79	0.1		78.8	4	240	70	5	5	0	10	15	79	11.2	15.8	79.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Clearing and Grubbing Phase:			**73.5**																
14	Demolition	P	concrete saw	1	20	90		25	15.7		80.3	4	240	69	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
14		H	concrete saw	1	20	90		45	0.1		90.8	4	240	79	5	5	0	10	15	45	11.2	15.8	45.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		P	dozer	1	40	82		25	15.7		72.3	4	240	64	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
14		H	dozer	1	40	82		45	0.1		82.8	4	240	74	5	5	0	10	15	45	11.2	15.8	45.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
14		P	excavator	2	40	81		25	15.7		71.3	4	240	66	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
14		H	excavator	2	40	81		45	0.1		81.8	4	240	76	5	5	0	10	15	45	11.2	15.8	45.1	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Demolition Phase:			**82.0**																
49	Parapet Replacement	P	crane	1	16	81		25	15.7		71.3	4	240	59	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
49		H	crane	1	16	81		27	15.6		70.6	4	240	58	5	5	13	10	15	27	12.8	17.0	27.2	2.61	15.0	18.0	5.0	0.4	0.7	15.6
49		P	excavator	1	40	81		25	15.7		71.3	4	240	63	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
49		H	excavator	1	40	81		27	15.6		70.6	4	240	62	5	5	13	10	15	27	12.8	17.0	27.2	2.61	15.0	18.0	5.0	0.4	0.7	15.6
49		P	concrete mixer truck	1	40	79		25	15.7		69.3	4	240	61	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
49		H	concrete mixer truck	1	40	79		27	15.6		68.6	4	240	60	5	5	13	10	15	27	12.8	17.0	27.2	2.61	15.0	18.0	5.0	0.4	0.7	15.6
49		P	concrete saw	1	20	90		25	15.7		80.3	4	240	69	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
49		H	concrete saw	1	20	90		27	15.6		79.6	4	240	68	5	5	13	10	15	27	12.8	17.0	27.2	2.61	15.0	18.0	5.0	0.4	0.7	15.6
49		P	man lift	1	20	75		25	15.7		65.3	4	240	54	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
49		H	man lift	1	20	75		27	15.6		64.6	4	240	53	5	5	13	10	15	27	12.8	17.0	27.2	2.61	15.0	18.0	5.0	0.4	0.7	15.6
49		P	pumps	1	50	77		25	15.7		67.3	4	240	60	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
49		H	pumps	1	50	77		27	15.6		66.6	4	240	59	5	5	13	10	15	27	12.8	17.0	27.2	2.61	15.0	18.0	5.0	0.4	0.7	15.6
49		P	compressor (air)	1	40	78		25	15.7		68.3	4	240	60	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
49		H	compressor (air)	1	40	78		27	15.6		67.6	4	240	59	5	5	13	10	15	27	12.8	17.0	27.2	2.61	15.0	18.0	5.0	0.4	0.7	15.6
											Total for Parapet Replacement Phase:			**73.8**																
Segment B: Void Repairs																														
91	Void Repairs	P	concrete saw	1	20	90		25	15.7		80.3	4	240	69	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
91		H	concrete saw	1	20	90		26	15.7		80.1	4	240	68	5	5	13	10	15	26	12.8	17.0	25.7	4.15	15.0	18.0	5.0	0.4	0.7	15.7
91		P	excavator	1	40	81		25	15.7		71.3	4	240	63	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
91		H	excavator	1	40	81		26	15.7		71.1	4	240	62	5	5	13	10	15	26	12.8	17.0	25.7	4.15	15.0	18.0	5.0	0.4	0.7	15.7
91		P	concrete mixer truck	1	40	79		25	15.7		69.3	4	240	61	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
91		H	concrete mixer truck	1	40	79		26	15.7		69.1	4	240	60	5	5	13	10	15	26	12.8	17.0	25.7	4.15	15.0	18.0	5.0	0.4	0.7	15.7
91		P	pumps	1	50	77		25	15.7		67.3	4	240	60	5	5	13	10	15	25	12.8	17.0	25.0	4.81	15.0	18.0	5.0	0.4	0.7	15.7
91		H	pumps	1	50	77		26	15.7		67.1	4	240	59	5	5	13	10	15	26	12.8	17.0	25.7	4.15	15.0	18.0	5.0	0.4	0.7	15.7
											Total for Void Repairs Phase:			**73.3**																

Notes to User: 1) Bordered cells are inputs, unbordered cells have formulae
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = 75
allowable hours over which Leq is to be averaged, City of San Diego = 12

255 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Segment C: Decorative Seawall (Option 2)																														
91	Construct Seawall	P	crane	1	16	81		25	0.1		86.9	4	240	74	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	crane	1	16	81		25	0.1		86.9	4	240	74	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	excavator	1	40	81		25	0.1		86.9	4	240	78	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	excavator	1	40	81		25	0.1		86.9	4	240	78	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	concrete mixer truck	1	40	79		25	0.1		84.9	4	240	76	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	concrete mixer truck	1	40	79		25	0.1		84.9	4	240	76	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	concrete saw	1	20	90		25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	concrete saw	1	20	90		25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	pumps	1	50	77		25	0.1		82.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	pumps	1	50	77		25	0.1		82.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		P	compressor (air)	1	40	78		25	0.1		83.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
91		H	compressor (air)	1	40	78		25	0.1		83.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
													Total for Construct Seawall Phase:	89.6																	
Segment C: Beach Access Driveway																														
2	Clearing and Grubbing	P	dozer	1	40	82		25	0.1		87.9	4	240	79	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		H	dozer	1	40	82		68	0.1		78.9	4	240	70	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		P	tractor	1	40	84	"tractor/loader/backhoe"	25	0.1		89.9	4	240	81	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		H	tractor	1	40	84	"tractor/loader/backhoe"	68	0.1		80.9	4	240	72	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
													Total for Clearing and Grubbing Phase:	83.8																	
2	Demolition of AC Paving	P	concrete saw	1	20	90		25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		H	concrete saw	1	20	90		68	0.1		86.9	4	240	75	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		P	dozer	1	40	82		25	0.1		87.9	4	240	79	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		H	dozer	1	40	82		68	0.1		78.9	4	240	70	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		P	excavator	2	40	81		25	0.1		86.9	4	240	81	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		H	excavator	2	40	81		68	0.1		77.9	4	240	72	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
													Total for Demolition of AC Paving Phase:	87.3																	
5	Proposed Grading	P	front end loader	1	40	79		25	0.1		84.9	4	240	76	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	front end loader	1	40	79		36	0.1		81.8	4	240	73	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	excavator	1	40	81		25	0.1		86.9	4	240	78	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	excavator	1	40	81		36	0.1		83.8	4	240	75	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
													Total for Proposed Grading Phase:	82.0																	
5	Place AC Pavement	P	concrete saw	1	20	90		25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	concrete saw	1	20	90		36	0.1		92.8	4	240	81	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	paver	1	50	77		25	0.1		82.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	paver	1	50	77		36	0.1		79.8	4	240	72	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	paver	1	50	77	"paving equipment"	25	0.1		82.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	paver	1	50	77	"paving equipment"	36	0.1		79.8	4	240	72	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	roller	2	20	80		25	0.1		85.9	4	240	77	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		H	roller	2	20	80		36	0.1		82.8	4	240	74	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
													Total for Place AC Pavement Phase:	87.5																	
3	Form & Pour Concrete	P	concrete mixer truck	1	40	79		25	0.1		84.9	4	240	76	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		H	concrete mixer truck	1	40	79		49	0.1		79.0	4	240	70	5	5	0	10	15	49	11.2	15.8	49.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	concrete saw	1	20	90	"paving equipment"	25	0.1		95.9	4	240	84	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		H	concrete saw	1	20	90	"paving equipment"	49	0.1		90.0	4	240	78	5	5	0	10	15	49	11.2	15.8	49.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	pumps	1	50	77		25	0.1		82.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		H	pumps	1	50	77		49	0.1		77.0	4	240	69	5	5	0	10	15	49	11.2	15.8	49.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
													Total for Form & Pour Concrete Phase:	86.2																	
2	Striping and Signage	P	compressor (air)	1	40	78		25	0.1		83.9	4	240	75	5	5	0	10	15	25	11.2	15.8	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		H	compressor (air)	1	40	78		68	0.1		74.9	4	240	66	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
													Total for Striping and Signage Phase:	75.7																	

Notes to User: *1) Bordered cells are inputs, unbordered cells have formulae*
2) Only apply barriers to Perpendicular (P) sound paths

noise level limit for construction phase at residential land use, per City of San Diego = 75
allowable hours over which Leq is to be averaged, City of San Diego = 12

255 = total length (feet) of project feature alignment (over which construction equipment make daily progress)

Days of Activity	Construction Activity	Perpendicular (P) or Hypoteneuse (H) Sound Path	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Perp. Source to Barr. ("A") Horiz. (ft)	Perp. Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Segment C: Decorative Seawall (Option 2)																														
91	Construct Seawall	P	crane	1	16	81		25	15.5		71.5	4	240	59	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
91		H	crane	1	16	81		25	15.5		71.4	4	240	59	5	5	10	10	15	25	11.2	15.8	25.0	1.95	15.0	15.0	5.0	0.5	0.7	15.5
91		P	excavator	1	40	81		25	15.5		71.5	4	240	63	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
91		H	excavator	1	40	81		25	15.5		71.4	4	240	63	5	5	10	10	15	25	11.2	15.8	25.0	1.95	15.0	15.0	5.0	0.5	0.7	15.5
91		P	concrete mixer truck	1	40	79		25	15.5		69.5	4	240	61	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
91		H	concrete mixer truck	1	40	79		25	15.5		69.4	4	240	61	5	5	10	10	15	25	11.2	15.8	25.0	1.95	15.0	15.0	5.0	0.5	0.7	15.5
91		P	concrete saw	1	20	90		25	15.5		80.5	4	240	69	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
91		H	concrete saw	1	20	90		25	15.5		80.4	4	240	69	5	5	10	10	15	25	11.2	15.8	25.0	1.95	15.0	15.0	5.0	0.5	0.7	15.5
91		P	pumps	1	50	77		25	15.5		67.5	4	240	60	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
91		H	pumps	1	50	77		25	15.5		67.4	4	240	60	5	5	10	10	15	25	11.2	15.8	25.0	1.95	15.0	15.0	5.0	0.5	0.7	15.5
91		P	compressor (air)	1	40	78		25	15.5		68.5	4	240	60	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
91		H	compressor (air)	1	40	78		25	15.5		68.4	4	240	60	5	5	10	10	15	25	11.2	15.8	25.0	1.95	15.0	15.0	5.0	0.5	0.7	15.5
											Total for Construct Seawall Phase:			**74.2**																
Segment C: Beach Access Driveway																														
2	Clearing and Grubbing	P	dozer	1	40	82		25	15.5		72.5	4	240	64	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
2		H	dozer	1	40	82		68	0.1		78.9	4	240	70	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		P	tractor	1	40	84	"tractor/loader/backhoe"	25	15.5		74.5	4	240	66	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
2		H	tractor	1	40	84	"tractor/loader/backhoe"	68	0.1		80.9	4	240	72	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2	Demolition of AC Paving	P	concrete saw	1	20	90		25	15.5		80.5	4	240	69	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
2		H	concrete saw	1	20	90		68	0.1		86.9	4	240	75	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		P	dozer	1	40	82		25	15.5		72.5	4	240	64	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
2		H	dozer	1	40	82		68	0.1		78.9	4	240	70	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
2		P	excavator	2	40	81		25	15.5		71.5	4	240	66	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
2		H	excavator	2	40	81		68	0.1		77.9	4	240	72	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Demolition of AC Paving Phase:			**78.6**																
5	Proposed Grading	P	front end loader	1	40	79		25	15.5		69.5	4	240	61	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
5		H	front end loader	1	40	79		36	0.1		81.8	4	240	73	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	excavator	1	40	81		25	15.5		71.5	4	240	63	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
5		H	excavator	1	40	81		36	0.1		83.8	4	240	75	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Proposed Grading Phase:			**77.4**																
5	Place AC Pavement	P	concrete saw	1	20	90		25	15.5		80.5	4	240	69	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
5		H	concrete saw	1	20	90		36	0.1		92.8	4	240	81	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	paver	1	50	77		25	15.5		67.5	4	240	60	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
5		H	paver	1	50	77		36	0.1		79.8	4	240	72	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	paver	1	50	77	"paving equipment"	25	15.5		67.5	4	240	60	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
5		H	paver	1	50	77	"paving equipment"	36	0.1		79.8	4	240	72	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
5		P	roller	2	20	80		25	15.5		70.5	4	240	62	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
5		H	roller	2	20	80		36	0.1		82.8	4	240	74	5	5	0	10	15	36	11.2	15.8	35.7	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Place AC Pavement Phase:			**82.9**																
3	Form & Pour Concrete	P	concrete mixer truck	1	40	79		25	15.5		69.5	4	240	61	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
3		H	concrete mixer truck	1	40	79		49	0.1		79.0	4	240	70	5	5	0	10	15	49	11.2	15.8	49.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	concrete saw	1	20	90	"paving equipment"	25	15.5		80.5	4	240	69	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
3		H	concrete saw	1	20	90	"paving equipment"	49	0.1		90.0	4	240	78	5	5	0	10	15	49	11.2	15.8	49.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
3		P	pumps	1	50	77		25	15.5		67.5	4	240	60	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
3		H	pumps	1	50	77		49	0.1		77.0	4	240	69	5	5	0	10	15	49	11.2	15.8	49.3	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Form & Pour Concrete Phase:			**79.8**																
2	Striping and Signage	P	compressor (air)	1	40	78		25	15.5		68.5	4	240	60	5	5	10	10	15	25	11.2	15.8	25.0	1.99	15.0	15.0	5.0	0.5	0.7	15.5
2		H	compressor (air)	1	40	78		68	0.1		74.9	4	240	66	5	5	0	10	15	68	11.2	15.8	68.5	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total for Striping and Signage Phase:			**67.1**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scrafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Skidsteer*	*No*	*40*	*80*	*-- N/A --*	*-- N/A --*
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

0 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Pedestrian Beach Access Improvements (Stairs)																												
Demolition	concrete saw	2	20	90		90	0.1		84.6	8	480	79	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	dozer	2	40	82		90	0.1		76.6	8	480	74	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	2	40	81		90	0.1		75.6	8	480	73	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Demolition Phase:				80.8																
Stairway Construction	excavator	2	40	81		90	0.1		75.6	8	480	73	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete mixer truck	2	40	79		90	0.1		73.6	8	480	71	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete saw	2	20	90		90	0.1		84.6	8	480	79	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	pumps	2	50	77		90	0.1		71.6	8	480	70	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Stairway Construction Phase:				80.7																
Pedestrian Beach Access Improvements (Pedestrian Ramp)																												
Demolition	concrete saw	2	20	90		90	0.1		84.6	8	480	79	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	dozer	2	40	82		90	0.1		76.6	8	480	74	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	excavator	2	40	81		90	0.1		75.6	8	480	73	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Demolition Phase:				80.8																
Stairway Construction	excavator	2	40	81		90	0.1		75.6	8	480	73	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete mixer truck	2	40	79		90	0.1		73.6	8	480	71	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	concrete saw	2	20	90		90	0.1		84.6	8	480	79	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
	pumps	2	50	77		90	0.1		71.6	8	480	70	5	10	0	10	80	90	11.2	80.6	90.1	0.00	0.1	7.5	7.5	0.6	0.6	0.1
								Total for Stairway Construction Phase:				80.7																

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per City of San Diego = 75

allowable hours over which Leq is to be averaged, City of San Diego = 12

8 = temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Pedestrian Beach Access Improvements (Stairs)																												
Demolition	concrete saw	2	20	90		90	7.9		76.8	8	480	71	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
	dozer	2	40	82		90	7.9		68.8	8	480	66	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
	excavator	2	40	81		90	7.9		67.8	8	480	65	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
										Total for Demolition Phase:		**73.0**																
Stairway Construction	excavator	2	40	81		90	7.9		67.8	8	480	65	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
	concrete mixer truck	2	40	79		90	7.9		65.8	8	480	63	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
	concrete saw	2	20	90		90	7.9		76.8	8	480	71	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
	pumps	2	50	77		90	7.9		63.8	8	480	62	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
										Total for Stairway Construction Phase:		**72.9**																
Pedestrian Beach Access Improvements (Pedestrian Ramp)																												
Demolition	concrete saw	2	20	90		90	7.9		76.8	8	480	71	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
	dozer	2	40	82		90	7.9		68.8	8	480	66	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
	excavator	2	40	81		90	7.9		67.8	8	480	65	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
										Total for Demolition Phase:		**73.0**																
Stairway Construction	excavator	2	40	81		90	7.9		67.8	8	480	65	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
	concrete mixer truck	2	40	79		90	7.9		65.8	8	480	63	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
	concrete saw	2	20	90		90	7.9		76.8	8	480	71	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
	pumps	2	50	77		90	7.9		63.8	8	480	62	5	10	8	10	80	90	10.4	80.0	90.1	0.33	8.2	15.5	7.5	0.5	0.6	7.9
										Total for Stairway Construction Phase:		**72.9**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74