# Appendix I
Noise Technical Report

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# Jericho Road Residential Project

## City of La Mesa, California

**SEPTEMBER 2024**

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# Acronyms and Abbreviations

| Acronym/Abbreviation | Definition |
|---|---|
| Caltrans | California Department of Transportation |
| CEQA | California Environmental Quality Act |
| City | City of La Mesa |
| CNEL | Community Noise Equivalent Level |
| dB | decibel |
| dBA | A-weighted decibel |
| DOT | U.S. Department of Transportation |
| FHWA | Federal Highway Administration |
| FTA | Federal Transit Administration |
| ips | inches per second |
| ISO | International Organization for Standardization |
| $L_{eq}$ | equivalent noise level |
| $L_{eq}(h)$ | equivalent noise level during a 1-hour period |
| $L_{max}$ | maximum sound level |
| OPR | California Governor's Office of Planning and Research |
| PPV | peak particle velocity |
| RCNM | Roadway Construction Noise Model |
| RMS | root mean square |
| SANDAG | San Diego Association of Governments |
| Jericho Road Residential Project | Proposed Project |
| SLM | sound level meter |
| SPL | sound pressure level |
| ST | short-term |
| TFIC | Transportation Forecast Information Center |
| U.S. DOT | United States Department of Transportation |

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# 1 Introduction

## 1.1 Report Purpose and Scope

The purpose of this technical report is to assess the potential noise impacts associated with construction and operation of the Jericho Road Residential Project (Project) located in the City of La Mesa (City), California. This analysis uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.)

## 1.2 Regional and Local Setting

The project site is located at 9407 Jericho Road in the northeastern area of the City of La Mesa, California. The site is located roughly one mile east of State Route 125, and a half mile north of Interstate 8. The developed site is immediately surrounded by other existing development including paved streets, residential housing, and apartments.

## 1.3 Project Description

The project consists of up to 73 three story townhomes on the 3.49-acre site. The proposed townhomes would range in size from approximately 1,200-1,800 square feet and 2-4 bedrooms. The project site is located within one half-mile of a major transit stop and parking minimums do not apply; however, the project would include two garage spaces per unit plus approximately 5 guest spaces. The existing site is currently developed with the Cavalry Chapel, a parking lot, turf area, a playground, and associated church facilities/structures. The project site is surrounded by a single-family home to the north and east, and multi-family developments to the south and west.

## 1.4 Fundamentals of Noise and Vibration

The following is a brief discussion of fundamental noise concepts and terminology.

### 1.4.1 Sound, Noise, and Acoustics

Sound is a process that consists of three components: the sound source, sound path, and sound receiver. All three components must be present for sound to exist. Without a source to produce sound, there is no sound. Similarly, without a medium to transmit sound pressure waves, there is no sound. Finally, sound must be received; a hearing organ, sensor, or object must be present to perceive, register, or be affected by sound or noise. In most situations, there are many different sound sources, paths, and receptors rather than just one of each. Acoustics is the field of science that deals with the production, propagation, reception, effects, and control of sound. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired.

### 1.4.2 Sound Pressure Levels and Decibels

The amplitude of a sound determines its loudness. Loudness of sound increases with increasing amplitude. Sound pressure amplitude is measured in units of micronewton per square meter, also called micropascal. One micropascal is approximately one-hundred billionth (0.00000000001) of normal atmospheric pressure. The pressure of a very

loud sound may be 200 million micropascals, or 10 million times the pressure of the weakest audible sound. Because expressing sound levels in terms of micropascal would be very cumbersome, sound pressure level in logarithmic units is used instead to describe the ratio of actual sound pressure to a reference pressure squared. These units are called Bels. To provide a finer resolution, a Bel is subdivided into 10 decibels (dB).

### 1.4.3 A-Weighted Sound Level

Sound pressure level alone is not a reliable indicator of loudness. The frequency, or pitch, of a sound also has a substantial effect on how humans will respond. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness, or human response, is determined by the characteristics of the human ear.

Human hearing is limited not only in the range of audible frequencies, but also in the way it perceives the sound in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 and 5,000 hertz, and it perceives a sound within that range as more intense than a sound of higher or lower frequency with the same magnitude. To approximate the frequency response of the human ear, a series of sound level adjustments is usually applied to the sound measured by a sound level meter. The adjustments (referred to as a weighting network) are frequency dependent.

The A-scale weighting network approximates the frequency response of the average young ear when listening to ordinary sounds. When people make judgments about the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special situations (e.g., B-scale, C-scale, D-scale), but these scales are rarely used in conjunction with most environmental noise. Noise levels are typically reported in terms of A-weighted sound levels. All sound levels discussed in this report are A-weighted decibels (dBA). Examples of typical noise levels for common indoor and outdoor activities are depicted in Table 1.

**Table 1. Typical Sound Levels in the Environment and Industry**

| Common Outdoor Activities | Noise Level (dB) | Common Indoor Activities |
|---|---|---|
| Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 miles per hour) | 80 | Food blender at 1 meter (3 feet); garbage disposal at 1 meter (3 feet) |
| Noisy urban area, daytime; gas lawn mower at 30 meters (100 feet) | 70 | Vacuum cleaner at 3 meters (10 feet) |
| Commercial area; heavy traffic at 90 meters (300 feet) | 60 | Normal speech at 1 meter (3 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) |
| Lowest threshold of human hearing | 0 | Lowest threshold of human hearing |

**Source:** Caltrans 2013.


SOURCE: SanGIS 2023, Open Street Map 2019

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0 1,000 2,000 Feet

**FIGURE 1**

Project Location

9407 Jericho Road, La Mesa CA

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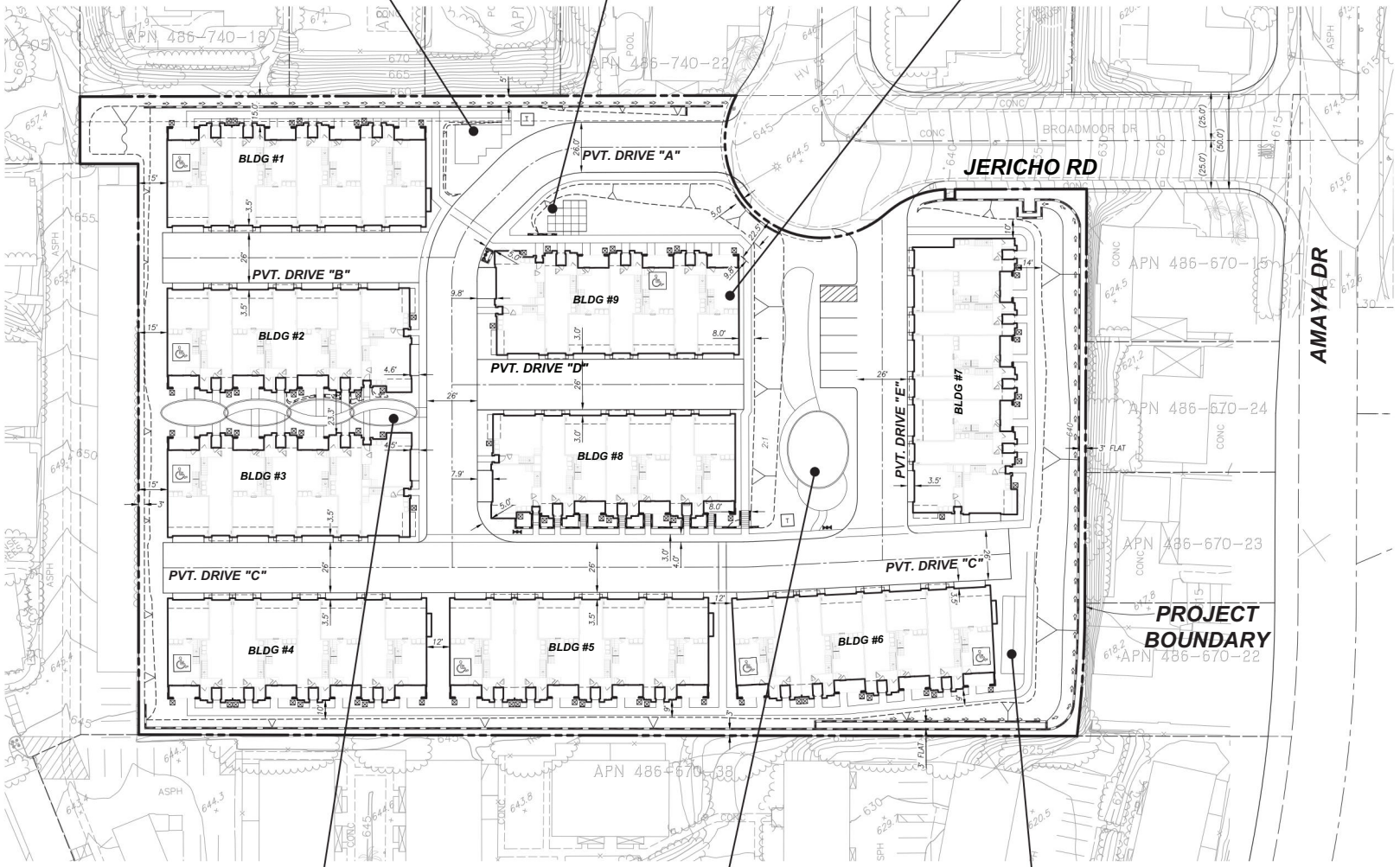
**Amenity Area A**
- ± 1,400 SF
- Fire feature with seating
- Decorative screen wall
- See Amenity Plan for additional details

**Amenity Area B**
- ± 4,500 SF
- BBQ counter with overhead shade structure
- Variety of seating options
- Passive grass open space area
- Walkway connection to Amenity Area D
- See Amenity Plan for additional details

**Typical Three-Story Townhome Building**
- 3 building types
- 1 elevation styles
- 3 floor plan variation
- Maximum height of 38.0 feet
- Oriented to provide front doors along streetscapes and paseos




**Amenity Area C**
- ± 2,800 SF
- Gathering space with water feature
- Decorative walkways and planting
- See Amenity Plan for additional details

**Amenity Area D**
- ± 4,500 SF
- BBQ area with shade sails and seating
- Tot lot and passive grass area for lawn games
- Enhanced with landscaping and special paving at crosswalks

**Amenity Area E**
- ± 1,800 SF
- DG Bocce Ball court
- Gather area with seating and umbrellas

SOURCE: Hunsaker 2023

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**FIGURE 2**
Site Plan
9407 Jericho Road, La Mesa CA

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### 1.4.4 Human Response to Changes in Noise Levels

Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern changes in sound levels of 1 dBA when exposed to steady, single-frequency signals in the mid-frequency range. But for outdoor conditions, a change of 3 dB is considered "barely perceptible" (Caltrans 2013). Since a doubling of sound energy results in a 3 dB increase in sound, this means that a doubling of sound energy (e.g., doubling the volume of traffic on a road) would result in a barely perceptible change in sound level. A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as twice (if a gain) or half (if a loss) as loud (Caltrans 2013).

### 1.4.5 Noise Descriptors

Units of measure have been developed to evaluate the long-term characteristics of sound. The energy-equivalent sound level ($L_{eq}$) is also referred to as the time-average sound level. It is the equivalent steady-state or constant sound level that in a stated period of time would contain the same acoustical energy as the time-varying sound level during the same time period. For instance, the 1-hour A-weighted equivalent sound level, $L_{eq}(h)$, is the energy average of the A-weighted sound levels occurring during a 1-hour period, and is the basis for the City of La Mesa's "general sound level limits".

People are generally more sensitive to and thus potentially more annoyed by noise occurring during the evening and nighttime hours. Hence, another noise descriptor used in community noise assessments—the community noise equivalent level (CNEL)—represents a time-weighted, 24-hour average noise level based on the A-weighted sound level. However, unlike an unmodified 24-hour $L_{eq}$ value, the CNEL descriptor accounts for increased noise sensitivity during the evening (7 p.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) by adding 5 dBA and 10 dBA, respectively, to the average sound levels occurring during these defined hours within a 24-hour period.

### 1.4.6 Sound Propagation

Sound propagation (i.e., the traverse of sound from a noise emission source position to a receiver location) is influenced by multiple factors that include geometric spreading, ground absorption, atmospheric effects, and occlusion by natural terrain and/or features of the built environment.

Sound levels attenuate (or diminish) geometrically at a rate of approximately 6 dBA per doubling of distance from an outdoor point-type source due to the spherical spreading of sound energy with increasing distance travelled. The effects of atmospheric conditions such as humidity, temperature, and wind gradients are typically distance-dependent and can also temporarily either increase or decrease sound levels measured or perceived at a receptor location. In general, the greater the distance the receiver is from the source of sound emission, the greater the potential for variation in sound levels at the receptor due to these atmospheric effects. Additional attenuation can result from sound path occlusion and diffraction due to intervention of natural (ridgelines, dense forests, etc.) and built features (such as solid walls, buildings and other structures).

### 1.4.7 Groundborne Vibration Fundamentals

Groundborne vibration is fluctuating or oscillatory motion transmitted through the ground mass (i.e., soils, clays, and rock strata). The strength of groundborne vibration attenuates rapidly over distance. Some soil types transmit vibration quite efficiently; other types (primarily sandy soils) do not. Several basic measurement units are commonly used to describe the intensity of ground vibration. The descriptors used by the Federal Transit Administration (FTA) include peak particle velocity (PPV) that is in units of inches per second (ips). The calculation to determine PPV at a given distance is as follows:

$$PPV_{distance} = PPV_{ref}*(25/D)^{1.5}$$

Where:

$PPV_{distance}$ = the peak particle velocity in inches per second of the equipment adjusted for distance

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

D = the distance from the equipment to the receiver

# 2 Regulatory Setting

## 2.1 Federal

In its Transit Noise and Vibration Impact Assessment guidance manual, the Federal Transit Administration (FTA) recommends a daytime construction noise level threshold of 80 dBA $L_{eq}$ over an 8-hour period (FTA 2018) when detailed construction noise assessments are performed to evaluate potential impacts to community residences surrounding a project. Although this FTA guidance is not a regulation, it can serve as a quantified standard in the absence of such noise limits at the state and local jurisdictional levels.

## 2.2 State

### 2.2.1 California Code of Regulations, Title 24

Title 24 of the California Code of Regulations sets standards that new development in California must meet. According to Title 24, interior noise levels are not to exceed 45 dBA CNEL in any habitable room (ICC 2019).

### 2.2.2 California Department of Health Services Guidelines

The California Department of Health Services has developed guidelines of community noise acceptability for use by local agencies (OPR 2017). Selected relevant levels are listed here:

- Below 60 dBA CNEL: normally acceptable for low-density residential use
- 50 to 70 dBA: conditionally acceptable for low-density residential use
- Below 65 dBA CNEL: normally acceptable for high-density residential use and transient lodging
- 60 to 70 dBA CNEL: conditionally acceptable for high-density residential, transient lodging, churches, educational, and medical facilities.

The normally acceptable exterior noise level for high-density residential use is up to 65 dBA CNEL.

### 2.2.3 California Department of Transportation

In its Transportation and Construction Vibration Guidance Manual (Caltrans 2013b), 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 groundborne vibration. For transient vibration events, such as blasting, the damage risk threshold would be 1.0 ips PPV (Caltrans 2013b) 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 groundborne vibration above 0.2 ips PPV would find it “annoying” and thus a likely significant impact. 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.

# 2.3 Local

## 2.3.1 City of La Mesa

### 2.3.1.1 City of La Mesa General Plan

The goal of the Noise Element of the adopted La Mesa General Plan (City of La Mesa 2012) is to minimize the impact of noise on the community by identifying existing and potential noise sources and providing the policies and standards needed to keep noise from reducing the quality of life in La Mesa. The Noise Element establishes guidelines to evaluate the compatibility of land use and noise exposure levels in La Mesa. Table 2 summarizes the City's exterior land use-noise compatibility guidelines. Shading in this table represents the maximum noise exposure level considered compatible for each land use category. The goal for maximum outdoor noise levels in multi-family residential areas is 65 dBA CNEL. This level is intended to guide the design and location of future development and serve as a target for the reduction of noise in existing development. However, it is noted that 65 dBA CNEL is a goal which cannot necessarily be reached in all multi-family residential areas within the realm of economic or aesthetic feasibility.

**Table 2. City of La Mesa Land Use/Noise Compatibility Guidelines**

| Land Use Category | Annual CNEL (dBA) | | | | |
|---|---|---|---|---|---|
| | 55 | 60 | 65 | 70 | 75 |
| Residential – Low Density Single Family, Duplex, and Mobile homes | | | | | |
| Residential – Multiple Family | | | | | |
| Transient Lodging – Motels, Hotels | | | | | |
| Schools, Libraries, Churches, Hospitals, and Nursing Homes | | | | | |
| Auditoriums, Concert Halls, Amphitheatres | | | | | |
| Sports Arena, Outdoor Spectator Sports | | | | | |
| Playgrounds, Neighborhood Parks | | | | | |
| Golf Courses, Riding Stables, Water Recreation, Cemeteries | | | | | |
| Offices Buildings, Business, Commercial, and Professiona | | | | | |
| Industrial, Manufacturing, Utilities, Agriculture | | | | | |

**Note**: Shading represents the maximum noise exposure level considered normally acceptable for each land use category.
**Source**: City of La Mesa 2012

### 2.3.1.2 City of La Mesa Municipal Code

La Mesa Municipal Code Chapter 10.80, Noise Regulation, prohibits unnecessary, excessive, and annoying noises in the City of La Mesa. Section 10.80.040 establishes standards for exterior noise levels from non-transportation (stationary) noise sources. Limits in the noise ordinance are intended to apply to noise associated with proposed new development and are generally applied at the property boundary of the proposed development. The exterior noise limits for each zone classification are summarized in Table 3. These standards apply when the ambient noise level does not already exceed the noise limit. In cases where the ambient noise level already exceeds the noise limit, the ambient noise level becomes the applicable noise limit.

## Table 3. City of La Mesa Exterior Noise Limits

| Land Use Category | Noise Level (dBA)[1] | | |
|---|---|---|---|
| | Nighttime (10 p.m. to 7 a.m.) | Daytime (7 a.m. to 7 p.m.) | Evening (7 p.m. to 10 p.m.) |
| R1 (Urban Residential) and R2 (Medium Low Density Residential) | 50 | 60 | 55 |
| R3 (Multiple Unit Residential) and RB (Residential Business) | 55 | 60 | 60 |
| C (General Commercial), CN (Neighborhood Commercial), CD (Downtown Commercial), and CM (Light Industrial and Commercial Service) | 60 | 65 | 65 |
| M (Industrial Service and Manufacturing) | 70 | 70 | 70 |

[1] If the measured ambient base noise level exceeds the standard noise limit, the allowable noise exposure standard shall be the ambient base noise level.

**Source**: La Mesa Municipal Code Section 10.80.040

Section 10.80.090 states that it is unlawful for any person to install or operate any machinery, equipment, pump, fan, air conditioning apparatus, or similar mechanical device which can be or is operated in any manner so as to create noise which will cause the noise level at the property line of any property to exceed the ambient base noise level by more than five dBA. The installer of any such mechanical devices is required to furnish to the Department of Building Inspection and Housing a certificate of compliance indicating that the equipment installed as proposed can, without the addition of any baffling or construction, be operated within these sound limits.

Section 10.80.100 regulates construction noise, and states that it is unlawful for any person within a residential zone or CN (neighborhood commercial) zone, or within 500 feet of these zones, to operate equipment or perform any outside construction or repair work on buildings, structures, or projects or to operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or any other construction-type device between the hours of 10:00 p.m. of one day and 7:00 a.m. of the next day or on Sundays unless a special permit authorizing the activity has been duly obtained from the chief building official. The City's exterior noise limits identified in Table 3 do not apply to construction activities.

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# 3 Existing Conditions

Field measurements of sound pressure level (SPL) were conducted near the Proposed Project site on January 31, 2024, to quantify and characterize the existing outdoor ambient sound levels. Table 4 provides the location, date, and time period at which these baseline noise level measurements were performed by an attending Dudek field investigator using a Rion-branded Model NL-62 sound level meter (SLM) equipped with a 0.5 inch, pre-polarized condenser microphone with pre-amplifier. The SLM meets the current American National Standards Institute standard for a Type 1 (Precision Grade) sound level meter. The accuracy of the SLM 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.

Four (4) short-term (ST) noise level measurement locations (ST1–ST4) that represent existing noise-sensitive receivers were selected on and near the Proposed Project site. These locations are depicted as receivers ST1–ST4 on Figure 3, Noise Measurement and Modeling Locations, and were selected to characterize the baseline outdoor ambient sound levels for City residential noise-sensitive receptors (see Figure 3). The measured $L_{eq}$ and $L_{max}$ noise levels are provided in Table 4. The primary noise sources at the sites identified in Table 4 consisted of traffic along adjacent roadways, aircraft noise, the sounds of leaves rustling, and birdsong. As shown in Table 4, the measured SPL ranged from approximately 53.4 dBA $L_{eq}$ at ST3 to 64.3 dBA $L_{eq}$ at ST1. Beyond the summarized information presented in Table 4, detailed noise measurement data is included in Appendix A, Baseline Noise Measurement Field Data.

**Table 4. Measured Baseline Outdoor Ambient Noise Levels**

| Site | Location/Address | Date/Time | $L_{eq}$ (dBA) | $L_{max}$ (dBA) |
|---|---|---|---|---|
| ST1 | East of Project boundary, along Amaya Dr | 2024-01-31, 01:09 PM to 01:24 PM | 64.3 | 72.3 |
| ST2 | Northeastern Project boundary, along Jericho Rd | 2024-01-31, 01:29 PM to 01:44 PM | 55.6 | 62.3 |
| ST3 | Northwestern Project boundary, at adjacent Grossmont Village Condos | 2024-01-31, 01:53 PM to 02:08 PM | 53.4 | 55.4 |
| ST4 | Southern Project boundary, at adjacent Serena Vista Apartments | 2024-01-31, 02:15 PM to 02:30 PM | 54.1 | 64.2 |

**Source:** Appendix A.
**Notes**: $L_{eq}$ = equivalent continuous sound level (time-averaged sound level); $L_{max}$ = maximum sound level during the measurement interval; dBA = A-weighted decibels; ST = short-term noise measurement locations.

Generally, the measured samples of daytime $L_{eq}$ agree with expectations: at each measurement location, $L_{eq}$ values are above 50 dBA due largely to being within proximity to a roadway or driveway.

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SOURCE: SanGIS 2023, Open Street Map 2019

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0 50 100 Feet

**FIGURE 3**

Noise Monitoring Locations

9407 Jericho Road, La Mesa CA

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# 4 Thresholds of Significance

The following significance criteria are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) and the City of La Mesa's municipal code and will be used to determine the significance of potential noise impacts. Such potential noise and vibration impacts to the community would be considered 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 groundborne vibration or groundborne noise levels; or,
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** – A noise impact would be considered significant if construction activities were to occur outside the hours of 7:00 a.m. to 10:00 p.m., per Section 10.80.100 of the City's Municipal Code, and/or if construction noise levels exceed the FTA's daytime construction noise level threshold of 80 dBA $L_{eq}$ over an 8-hour period.
- **Off-site Project-attributed transportation noise** – For purposes of this analysis, a direct roadway noise impact would be considered significant if increases in roadway traffic noise levels attributed to the Proposed Project were greater than 3 dBA CNEL at an existing noise-sensitive land use.
- **Off-site Project-attributed stationary noise** – For purposes of this analysis, a noise impact would be considered significant if noise from typical operation of heating, ventilation, and air conditioning and other electro-mechanical systems associated with the Proposed Project exceeded 60 dBA hourly $L_{eq}$ from 7:00 a.m. to 7:00 p.m., 55 dBA hourly $L_{eq}$ from 7:00 p.m. to 10:00 p.m., and 50 dBA hourly $L_{eq}$ from 10:00 p.m. to 7:00 a.m.
- **Construction vibration** – Guidance from Caltrans indicates that a vibration velocity level of 0.2 ips PPV received at a structure would be considered annoying by occupants within (Caltrans 2013b). As for the receiving structure itself, aforementioned Caltrans guidance from Section 2 recommends that a vibration level of 0.3 ips PPV would represent the threshold for building damage risk.

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# 5 Impact Discussion

Potential noise and vibration impacts attributed to Project construction and operation are studied in the following subsections that are categorized by the CEQA Guidelines Appendix G significance for noise.

*a) 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?*

### Short-Term Construction

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 5. Note that the equipment noise levels presented in Table 5 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 5. 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 Proposed Project 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 geographic center of the construction

site, which serves as the time-averaged location or geographic acoustical centroid of active construction equipment for the phase under study. 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 for some period of time, which would be most appropriate for phases such as site preparation, grading, and paving. 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 construction 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, all the equipment for a construction phase is assumed to operate—on average—from the acoustical centroid position. Table 6 summarizes these two distances to the closest noise-sensitive receptor for each of the five sequential construction phases. At the site boundary, this analysis assumes that up to only one piece of equipment of each listed type per phase would be involved in the construction activity for a limited portion of the 8-hour period. In other words, at such proximity, the operating equipment cannot "stack" or crowd the vicinity and still operate normally. For the acoustical centroid case, which intends to be a geographic average position for all equipment during the indicated phase, this analysis assumes that all equipment for the indicated activity will be operating in a given hour over the 8-hour assessment period.

### Table 6. Estimated Distances between Construction Activities and the Nearest Noise-sensitive Receptors

| Construction Phase (and Equipment Types Involved) | Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet) | Distance from Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (Feet) |
|---|---|---|
| Demolition (dozer, backhoe) | 15 | 75 |
| Grading (grader, scraper, dozer, front end loader) | 15 | 75 |
| Building construction (crane, man-lift, generator, backhoe, welder/torch) | 30 | 125 |
| Architectural finishes (air compressor) | 30 | 125 |
| Paving (paver, roller, other equipment) | 30 | 125 |

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 use. (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 5), 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. However, modeling does include a temporary 8-foot-high construction noise barrier on the property lines that connects with the nearby single-family homes. 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 Modeling Input and Output, and produce the predicted results displayed in Table 6.

### Table 7. Predicted Construction Noise Levels per Activity Phase

| Construction Phase (and Equipment Types Involved) | 8-Hour $L_{eq}$ at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA) | 8-Hour $L_{eq}$ at Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (dBA) |
|---|---|---|
| Demolition (dozer, backhoe) | 77.5 | 64.8 |
| Grading (grader, scraper, dozer, front end loader) | 80.0 | 71.3 |
| Building construction (crane, man-lift, generator, backhoe, welder/torch) | 74.9 | 59.8 |
| Architectural finishes (air compressor) | 63.8 | 50.1 |
| Paving (paver, roller, other equipment) | 74.8 | 61.8 |

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

As presented in Table 7, the estimated construction noise levels are predicted to be as high as 80 dBA $L_{eq}$ over an 8-hour period at the nearest existing residences (as close as 15 feet away) when grading activities take place near the northern property boundaries. Note that these estimated noise levels at a source-to-receiver distance of 15 feet would occur when noted pieces of heavy equipment would each operate for a cumulative period of less than six (6) hours a day. By way of example, a grader might make multiple passes on site that are this close to a receiver; but, for the remaining time during the day, the grader is sufficiently farther away, performing work at a more distant location, or simply not operating. On an average construction workday, heavy equipment would be operating sporadically throughout the Project site and more frequently away from the property line edge. At more typical distances closer to the center of the Project site (approximately 75 feet from the nearest existing residence), construction noise levels are estimated to range from approximately 50 dBA $L_{eq}$ to 71 dBA $L_{eq}$ at the nearest existing residence. For these instances when operation of construction equipment and processes are sufficiently proximate to potentially cause activity noise levels to exceed 80 dBA $L_{eq}$, which the FTA uses as guidance for construction noise exposure at a residential receptor, mitigation measure **MM-NOI-1** shall be implemented as indicated site conditions may warrant. Proper application of 8-foot temporary noise barriers or comparable sound abatement due to implementation of **MM-NOI-1** has the ability to reduce noise levels by up to 16 dB, which would correspondingly reduce the estimated non-mitigated construction noise levels to 80 dBA $L_{eq}$, which would make the level compliant with the 80 dBA guidance.

In summary, construction noise during allowable daytime hours (between 7:00 a.m. and 10:00 p.m.) has the potential for noise to equal but not exceed the 80 dBA $L_{eq}$ 8-hour FTA guidance at the nearest residential receiver on occasion. Therefore, incorporation of **MM-NOI-1** is recommended to reduce construction noise

exposure levels. Thus, under such conditions, temporary construction-related noise would be considered **less than significant**.

The outcome of the King & Gardiner Farms versus Kern County judge's decision established a requirement for construction noise analyses to disclose the relative increase of construction noise over ambient noise levels. construction noise levels would cause a temporary increase of 0 to 24 dBA $L_{eq}$ over existing ambient noise levels; ranging from an imperceptible difference in the sound magnitude to a double-digit difference that would be perceived as being two to- three times as loud to average healthy hearing.

## Long-Term Operational

### Off-Site Traffic Noise Exposure

**Less Than Significant Impact.** The proposed Project would result in the creation of additional vehicle trips on local arterial roadways (i.e., Amaya Drive), which could result in increased traffic noise levels at adjacent noise-sensitive land uses. Appendix C, Traffic Noise Modeling Input and Output, contains a spreadsheet with traffic volume data (average daily traffic) on Amaya Drive. In particular, the proposed Project would create additional traffic along Amaya Drive, which according to the Traffic Impact Assessment prepared for the proposed Project (CR Associates 2024) would add 438 total average daily trips to the site's vicinity.

According to the California Department of Transportation (Caltrans), a three-dBA change in sound is the point at which humans generally notice a barely perceptible change in sound, a five-dBA change is generally readily perceptible, and a 10-dBA increase is perceived by most people as a doubling of the existing noise level (Caltrans 2013). Due to the existing and proposed urban setting of the Project area, a readily perceptible change in noise (5 dBA) would be the appropriate threshold to determine significant increases in traffic noise.

Potential noise effects from vehicular traffic were assessed using the Federal Highway Administration's Traffic Noise Model version 2.5 (FHWA 2004). Information used in the model included the roadway geometry, Existing Year (2024), Existing Plus Project, Horizon Year (2050), and Horizon Year Plus Project traffic volumes and posted traffic speeds. Noise levels were modeled at representative noise-sensitive receivers ST1 through ST3, as shown in Figure 3. Since the prepared traffic assessment did not include future traffic volumes, Horizon Year traffic numbers were estimated using the SANDAG Transportation Forecast Information Center. The receivers were modeled to be 5 feet above the local ground elevation. The noise model results are summarized in Table 8. Based on results of the model, implementation of the proposed Project would not result in readily perceptible increases in traffic noise.

**Table 8. Roadway Traffic Noise Modeling Results**

| Modeled Receiver | Existing (2024) Noise Level (dBA CNEL) | Existing (2024) Plus Project Noise Level (dBA CNEL) | Horizon Year (2050) without Project Noise Level (dBA CNEL) | Horizon Year (2050) with Project Noise Level (dBA CNEL) | Maximum Project-Related Noise Level Increase (dB) |
|---|---|---|---|---|---|
| ST1 | 62.5 | 62.6 | 64.5 | 64.7 | 0.2 |
| ST2 | 53.3 | 55.5 | 54.1 | 56.1 | 2.2 |

**Table 8. Roadway Traffic Noise Modeling Results**

| Modeled Receiver | Existing (2024) Noise Level (dBA CNEL) | Existing (2024) Plus Project Noise Level (dBA CNEL) | Horizon Year (2050) without Project Noise Level (dBA CNEL) | Horizon Year (2050) with Project Noise Level (dBA CNEL) | Maximum Project-Related Noise Level Increase (dB) |
|---|---|---|---|---|---|
| ST3 | 39.5 | 40 | 41.2 | 41.6 | 0.5 |
| ST4 | 50 | 50.2 | 51.9 | 52.1 | 0.2 |

**Source:** Appendix C
**Notes:** dBA = A-weighted decibel; CNEL = Community Noise Equivalent Level; dB = decibel.

Table 8 shows that at all three listed representative receivers, the addition of Project-related traffic to the roadway network would result in a CNEL increase of less than 3 dB, which is below the discernible level of change for the average healthy human ear. At all on-site exterior locations, the predicted CNEL values are less than 65 dBA, and compatible with the City's guidance for exterior noise levels. Thus, a **less-than-significant** impact is expected for Project-related off-site traffic noise increases affecting existing residences in the vicinity.

### Stationary Noise Sources

**Less Than Significant Impact.** The incorporation of new multi-family homes and a mix of open space uses attributed to development of the proposed Project would add a variety of noise-producing electro-mechanical equipment that include those presented and discussed in the following paragraphs. Most of these noise-producing equipment or sound sources would be considered stationary or limited in mobility to a defined area. Using a Microsoft Excel–based outdoor sound propagation prediction model, Project-attributed operational noise at nearby community receptors was predicted using several assumptions: 1) Treatment of exposed at grade air-cooled condensing units as point-type sound emission sources; and 2) Point-source sound propagation (i.e., 6 dB per doubling of distance) that conservatively ignores acoustical absorption from atmospheric and ground surface effects. See Appendix D for quantitative details of the inputs and outputs that form the basis of the following assessment presentations.

#### *Residential Unit Heating, Ventilation, and Air Conditioning Noise*

For purposes of this analysis, each of the new occupied residential units would be expected to feature a split-system type air-conditioning unit, with an air-cooled refrigeration (2-ton capacity) condenser unit. Assuming each condenser unit has a sound pressure level (SPL) of 68 dBA at 3 feet based on available data from a likely manufacturer (Carrier 2012), and the units would generally be installed at grade on or near rear porches. Therefore, the closest existing noise-sensitive residential receptor to the west of the proposed Project's western unit would be as close as 30 horizontal feet to the nearest of these condenser units. The predicted sound emission level from the combination of all operating condenser units as received by this off-site single-family home would be 48 dBA $L_{eq}$ and thus be compliant with the City's nighttime threshold of 50 dBA hourly $L_{eq}$. Under such conditions, the operation of residential air-conditioning units would result in a **less-than-significant** impact.

*b) Would the project result in generation of excessive groundborne vibration or groundborne noise levels?*

**Less Than Significant Impact.** Construction activities may expose persons to excessive groundborne vibration or groundborne noise, causing a potentially significant impact. Caltrans has collected groundborne vibration information related to construction activities (Caltrans 2020). 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 bulldozer that may be expected on the Project site, have peak particle velocities of approximately 0.089 ips or less at a reference distance of 25 feet (DOT 2006).

Groundborne vibration attenuates rapidly, even over short distances. The attenuation of groundborne 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. By way of example, for a bulldozer operating on site and as close as the western Project boundary (i.e., 15 feet from the nearest occupied property) the estimated vibration velocity level would be 0.19 ips per the equation as follows (FTA 2006):

$$PPV_{rcvr} = PPV_{ref} * (25/D)^{1.5} = 0.19 = 0.089 * (25/15)^{1.5}$$

In the above equation, $PPV_{rcvr}$ is the predicted vibration velocity at the receiver position, $PPV_{ref}$ is the reference value at 25 feet from the vibration source (the bulldozer), and D is the actual horizontal distance to the receiver. Therefore, at this predicted PPV, the impact of vibration-induced annoyance to occupants of nearby existing homes would be less than significant.

Construction vibration, at sufficiently high levels, can also present a building damage risk. However, anticipated construction vibration associated with the proposed Project would yield levels of 0.19 ips, which do not surpass the guidance limit of 0.3 ips PPV for building damage risk to older residential structures. Because the predicted vibration level at 15 feet is less than this guidance limit, the risk of vibration damage to nearby structures is considered less than significant.

Once operational, the Proposed Project would not be expected to feature major producers of groundborne vibration. Anticipated mechanical systems like heating, ventilation, and air-conditioning units are designed and manufactured to feature rotating (fans, motors) and reciprocating (compressors) components that are well-balanced with isolated vibration within or external to the equipment casings. On this basis, potential vibration impacts due to Proposed Project operation would be **less than significant**.

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

There are no private airstrips within the vicinity of the Project site. The project site is located approximately 4.5 miles from Gillespie Field airport. The project site is not located within the 60 dBA CNEL noise contour of Gillespie Field (SDCRAA 2010). Thus, the project site is not exposed to excessive noise levels generated by airports. Impacts would be less than significant.

# 6 Mitigation Measures

The following mitigation measure, introduced in Section 4, Impact Analysis, would apply during construction activities.

MM-NOI-1 Temporary Construction Noise Reduction. The Project applicant or its contractor would implement one or more of the following options for on-site noise control and sound abatement means that, in aggregate, would yield a minimum of approximately 16 dBA of construction noise reduction during the site preparation phase of the Project:

- 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 [speed, capacity, etc.], or install features or elements that otherwise reduce equipment noise emission [e.g., upgrade engine exhaust mufflers]).
- Install noise abatement 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.

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# 7 Conclusions

This Memorandum was conducted to predictively quantify construction and operation noise and vibration attributed to the proposed Project. The results indicate that potential impacts during construction site preparation activities would be less than significant with the incorporation of **MM-NOI-1**. No mitigation is required.

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# 8 References Cited


Caltrans (California Department of Transportation). 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.

Carrier. 2012. CA16NA 018-061 Single-Stage Air Conditioner w/ Puron Refrigerant. Catalog No: CA16NA-06PD. https://resource.carrierenterprise.com/is/content/Watscocom/carrier_ca16na04200g_article_1404816230343_en_ss

City of La Mesa. 2010. City of La Mesa Municipal Code, Chapter 10.80 – Noise Regulation. https://library.municode.com/ca/la_mesa/codes/code_of_ordinances?nodeId=TIT10PUPESAMO_CH10.80NORE

City of La Mesa. 2012. La Mesa General Plan – Noise Element. https://www.cityoflamesa.us/DocumentCenter/View/6202/08LaMesaGPNoise-CD?bidId=

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. August 2006.

FHWA (Federal Highway Administration). 2004. FHWA Traffic Noise Model Version 2.5.

FHWA. 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. December 8, 2008.

FHWA. 2011. Highway Traffic Noise: Analysis and Abatement Guidance. FHWA-HEP-10-025. December. https://www.codot.gov/programs/environmental/noise/guidelines-policies/fhwa-noise-guidance-dec-2011

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

International Organization of Standardization (ISO). 1996. 9613-2: "Attenuation of Sound During Propagation Outdoors, Part 2: General Method of Calculation". December. https://www.iso.org/standard/20649.html

OPR (Governor's Office of Planning and Research). 2017. *State of California General Plan Guidelines*. http://www.opr.ca.gov/planning/general-plan/guidelines.html

Sanchez, J., PE, TE, PTOE, & Belmudez, C. (2023, September 15). Jericho Road Multi-Family Housing Project – Traffic Assessment Letter. CR Associates.

SANDAG (San Diego Association of Governments). *Transportation Forecast Information Center (TFIC)*. July 10, 2015.

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# Appendix A

Baseline Noise Measurement Field Data

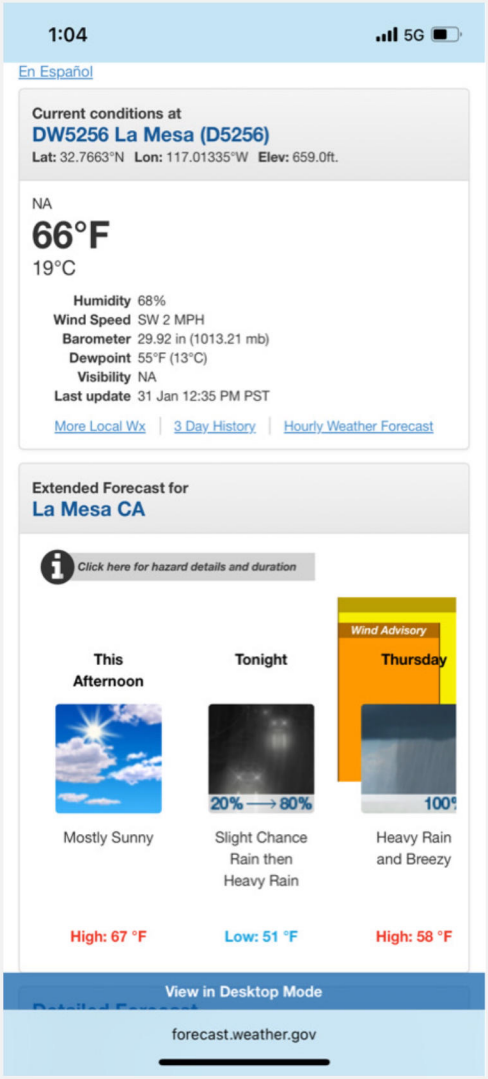
FORMS DUDEK FIELD DATA REPORT

# Field Noise Measurement Data

| Record: 1818 | |
|---|---|
| **Project Name** | *Jericho Road Residential (Meritage Homes)* |
| **Project #** | *15823* |
| **Observer(s)** | |
| **Date** | *2024-01-31* |

## Meteorological Conditions

**Upload NOAA Forecast**



| | |
|---|---|
| **Temp (F)** | *66* |
| **Humidity % (R.H.)** | *68* |
| **Wind** | *Gusty* |
| **Wind Speed (MPH)** | *2* |
| **Wind Direction** | *South West* |
| **Sky** | *Clear* |

| **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** | *7/16/2018* |
| **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)** | *94.1* |
| **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** | *32.786146, -116.993378* |
| **Begin (Time)** | *13:09:00* |
| **End (Time)** | *13:24:00* |
| **Leq** | *64.3* |
| **Lmax** | *72.3* |
| **Lmin** | *53* |
| **Other Lx?** | *L90, L50, L10* |
| **L90** | *53.4* |
| **L50** | *56.7* |
| **L10** | *70.1* |
| **Other Lx (Specify Metric)** | *L* |
| **Primary Noise Source** | *Traffic* |
| **Other Noise Sources (Background)** | *Birds, Distant Aircraft, Distant Dog Barking, Distant Gardener / Landscape Noise* |
| **Other Noise Sources Additional Description** | *Landscapers across the street operating equipment, occasional helicopter flyovers* |
| **Is the same instrument and calibrator being used as previously noted?** | *Yes* |

| | |
|---|---|
| **Are the meteorological conditions the same as previously noted?** | *Yes* |

| **Source Info and Traffic Counts** | |
|---|---|
| **Number of Lanes** | *2* |
| **Lane Width (feet)** | *10* |
| **Roadway Width (feet)** | *20* |
| **Roadway Width (m)** | *6.1* |
| **Distance to Roadway (feet)** | *35* |
| **Distance to Roadway (m)** | *10.7* |
| **Distance Measured to Centerline or Edge of Pavement?** | *Centerline* |
| **Roadway Type** | *Arterial* |
| **Estimated Vehicle Speed (MPH)** | *30* |
| **Speeds Estimated by:** | *Driving the Pace* |
| **Posted Speed Limit Sign (MPH)** | *30* |

| **Traffic Counts** | |
|---|---|
| **Vehicle Count Summary** | *A 59, MT 0, HT 0, B 1, MC 0* |
| **Select Method for Recording Count Duration** | *Enter Manually* |
| **Counting Both Directions?** | *No* |
| **Count Duration (minutes)** | *15* |
| **Direction** | *WB* |
| **Vehicle Count Tally** | |

| | |
|---|---|
| **Select Method for Vehicle Counts** | *Enter Manually* |
| **Number of Vehicles - Autos** | *59* |
| **Number of Vehicles - Medium Trucks** | *0* |
| **Number of Vehicles - Heavy Trucks** | *0* |
| **Number of Vehicles - Buses** | *1* |
| **Number of Vehicles - Motorcyles** | *0* |

| **Traffic Counts** | |
|---|---|
| **Vehicle Count Summary** | *A 51, MT 1, HT 0, B 2, MC 0* |
| **Select Method for Recording Count Duration** | *Enter Manually* |
| **Counting Both Directions?** | *No* |
| **Count Duration (minutes)** | *15* |
| **Direction** | *EB* |
| **Vehicle Count Tally** | |
| **Select Method for Vehicle Counts** | *Enter Manually* |
| **Number of Vehicles - Autos** | *51* |
| **Number of Vehicles - Medium Trucks** | *1* |
| **Number of Vehicles - Heavy Trucks** | *0* |
| **Number of Vehicles - Buses** | *2* |
| **Number of Vehicles - Motorcyles** | *0* |

## Description / Photos

### Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing SW* |

## Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing E* |

## Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing N* |

## Monitoring

| | |
|---|---|
| **Record #** | *2* |
| **Site ID** | *ST2* |
| **Site Location Lat/Long** | *32.786713, -116.993495* |

| | |
|---|---|
| **Begin (Time)** | *13:29:00* |
| **End (Time)** | *13:44:00* |
| **Leq** | *55.6* |
| **Lmax** | *62.3* |
| **Lmin** | *51.9* |
| **Other Lx?** | *L90, L50, L10* |
| **L90** | *52.2* |
| **L50** | *54.2* |
| **L10** | *58.7* |
| **Other Lx (Specify Metric)** | *L* |
| **Primary Noise Source** | *Traffic* |
| **Other Noise Sources (Background)** | *Birds, Distant Aircraft, Distant Traffic* |
| **Other Noise Sources Additional Description** | *Occasional aircraft flyovers* |
| **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 E* |

## Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing W + project site* |

## Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing S* |

## Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing N* |

| **Monitoring** | |
|---|---|
| **Record #** | *3* |
| **Site ID** | *ST3* |
| **Site Location Lat/Long** | *32.787471, -116.994777* |

| | |
|---|---|
| **Begin (Time)** | *13:53:00* |
| **End (Time)** | *14:08:00* |
| **Leq** | *53.4* |
| **Lmax** | *55.4* |
| **Lmin** | *52.5* |
| **Other Lx?** | *L90, L50, L10* |
| **L90** | *52.8* |
| **L50** | *53.2* |
| **L10** | *54.3* |
| **Other Lx (Specify Metric)** | *L* |
| **Primary Noise Source** | *Traffic* |
| **Other Noise Sources (Background)** | *Birds, Distant Aircraft, Distant Traffic, 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

## Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing S* |

## Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing N* |

## Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing E + project site* |

| **Monitoring** | |
|---|---|
| **Record #** | *4* |
| **Site ID** | *ST4* |
| **Site Location Lat/Long** | *32.785990, -116.994251* |

| | |
|---|---|
| **Begin (Time)** | *14:15:00* |
| **End (Time)** | *14:30:00* |
| **Leq** | *54.1* |
| **Lmax** | *64.2* |
| **Lmin** | *51.4* |
| **Other Lx?** | *L90, L50, L10* |
| **L90** | *51.9* |
| **L50** | *53.1* |
| **L10** | *55* |
| **Other Lx (Specify Metric)** | *L* |
| **Primary Noise Source** | *Traffic* |
| **Other Noise Sources (Background)** | *Birds, Distant Traffic, Rustling Leaves* |
| **Other Noise Sources Additional Description** | *Distant rail (SD MTS)* |
| **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 NE + project site* |

## Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing SW* |

## Site Photos

| | |
|---|---|
| **Photo** |  |
| **Comments / Description** | *Facing W/NW* |

# Appendix B

Construction Noise Modeling Input and Output

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

noise level limit for construction phase at "occupied property", per FTA= 80

allowable hours over which Leq is to be averaged = 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 8-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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | backhoe | 1 | 40 | 78 | | 15 | 14.8 | | 73.7 | 8 | 480 | 70 | 5 | 5 | 8 | 10 | 5 | 15 | 10.4 | 5.8 | 15.0 | 1.27 | 14.0 | 13.0 | 5.0 | 0.5 | 0.7 | 14.8 |
| | dozer | 1 | 40 | 82 | | 15 | 14.8 | | 77.7 | 8 | 480 | 74 | 5 | 5 | 8 | 10 | 5 | 15 | 10.4 | 5.8 | 15.0 | 1.27 | 14.0 | 13.0 | 5.0 | 0.5 | 0.7 | 14.8 |
| | | | | | | | | | Total for Demolition Phase: | | | **75.1** | | | | | | | | | | | | | | | | |
| Grading | grader | 1 | 40 | 85 | | 15 | 14.8 | | 80.7 | 6 | 360 | 75 | 5 | 5 | 8 | 10 | 5 | 15 | 10.4 | 5.8 | 15.0 | 1.27 | 14.0 | 13.0 | 5.0 | 0.5 | 0.7 | 14.8 |
| | scraper | 1 | 40 | 84 | | 15 | 14.8 | | 79.7 | 6 | 360 | 74 | 5 | 5 | 8 | 10 | 5 | 15 | 10.4 | 5.8 | 15.0 | 1.27 | 14.0 | 13.0 | 5.0 | 0.5 | 0.7 | 14.8 |
| | dozer | 1 | 40 | 82 | | 15 | 14.8 | | 77.7 | 6 | 360 | 72 | 5 | 5 | 8 | 10 | 5 | 15 | 10.4 | 5.8 | 15.0 | 1.27 | 14.0 | 13.0 | 5.0 | 0.5 | 0.7 | 14.8 |
| | front end loader | 1 | 40 | 79 | | 15 | 14.8 | | 74.7 | 6 | 360 | 69 | 5 | 5 | 8 | 10 | 5 | 15 | 10.4 | 5.8 | 15.0 | 1.27 | 14.0 | 13.0 | 5.0 | 0.5 | 0.7 | 14.8 |
| | | | | | | | | | Total for Grading Phase: | | | **79.5** | | | | | | | | | | | | | | | | |
| Building Construction | crane | 1 | 16 | 81 | | 30 | 13.4 | | 72.1 | 8 | 480 | 64 | 5 | 5 | 8 | 25 | 5 | 30 | 25.2 | 5.8 | 30.0 | 1.01 | 13.0 | 13.0 | 5.0 | 0.5 | 0.7 | 13.4 |
| | man lift | 1 | 20 | 75 | | 30 | 13.4 | | 66.1 | 8 | 480 | 59 | 5 | 5 | 8 | 25 | 5 | 30 | 25.2 | 5.8 | 30.0 | 1.01 | 13.0 | 13.0 | 5.0 | 0.5 | 0.7 | 13.4 |
| | all other equipment > 5 HP | 1 | 50 | 85 | | 30 | 13.4 | | 76.1 | 8 | 480 | 73 | 5 | 5 | 8 | 25 | 5 | 30 | 25.2 | 5.8 | 30.0 | 1.01 | 13.0 | 13.0 | 5.0 | 0.5 | 0.7 | 13.4 |
| | generator | 1 | 50 | 72 | | 30 | 13.4 | | 63.1 | 8 | 480 | 60 | 5 | 5 | 8 | 25 | 5 | 30 | 25.2 | 5.8 | 30.0 | 1.01 | 13.0 | 13.0 | 5.0 | 0.5 | 0.7 | 13.4 |
| | backhoe | 1 | 40 | 78 | | 30 | 13.4 | | 69.1 | 8 | 480 | 65 | 5 | 5 | 8 | 25 | 5 | 30 | 25.2 | 5.8 | 30.0 | 1.01 | 13.0 | 13.0 | 5.0 | 0.5 | 0.7 | 13.4 |
| | compressor (air) | 1 | 40 | 78 | | 30 | 13.4 | | 69.1 | 8 | 480 | 65 | 5 | 5 | 8 | 25 | 5 | 30 | 25.2 | 5.8 | 30.0 | 1.01 | 13.0 | 13.0 | 5.0 | 0.5 | 0.7 | 13.4 |
| | | | | | | | | | Total for Building Construction Phase: | | | **74.9** | | | | | | | | | | | | | | | | |
| Paving | concrete mixer truck | 1 | 40 | 79 | | 30 | 13.4 | | 70.1 | 8 | 480 | 66 | 5 | 5 | 8 | 25 | 5 | 30 | 25.2 | 5.8 | 30.0 | 1.01 | 13.0 | 13.0 | 5.0 | 0.5 | 0.7 | 13.4 |
| | paver | 1 | 50 | 77 | | 30 | 13.4 | | 68.1 | 8 | 480 | 65 | 5 | 5 | 8 | 25 | 5 | 30 | 25.2 | 5.8 | 30.0 | 1.01 | 13.0 | 13.0 | 5.0 | 0.5 | 0.7 | 13.4 |
| | all other equipment > 5 HP | 1 | 50 | 85 | | 30 | 13.4 | | 76.1 | 8 | 480 | 73 | 5 | 5 | 8 | 25 | 5 | 30 | 25.2 | 5.8 | 30.0 | 1.01 | 13.0 | 13.0 | 5.0 | 0.5 | 0.7 | 13.4 |
| | roller | 1 | 20 | 80 | | 30 | 13.4 | | 71.1 | 8 | 480 | 64 | 5 | 5 | 8 | 25 | 5 | 30 | 25.2 | 5.8 | 30.0 | 1.01 | 13.0 | 13.0 | 5.0 | 0.5 | 0.7 | 13.4 |
| | | | | | | | | | Total for Paving Phase: | | | **74.8** | | | | | | | | | | | | | | | | |

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

noise level limit for construction phase at "occupied property", per FTA= 80

allowable hours over which Leq is to be averaged = 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 8-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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | backhoe | 3 | 40 | 78 | | 75 | 0.1 | | 73.6 | 8 | 480 | 74 | 5 | 5 | 0 | 70 | 5 | 75 | 70.2 | 7.1 | 75.0 | 0.00 | 0.1 | 5.0 | 5.0 | 0.7 | 0.7 | 0.1 |
| | dozer | 1 | 40 | 82 | | 75 | 12.3 | | 65.4 | 8 | 480 | 61 | 5 | 5 | 8 | 70 | 5 | 75 | 70.1 | 5.8 | 75.0 | 0.90 | 12.5 | 13.0 | 5.0 | 0.5 | 0.7 | 12.3 |
| | | | | | | | | | Total for Demolition Phase: | | | **74.6** | | | | | | | | | | | | | | | | |
| Grading | grader | 1 | 40 | 85 | | 75 | 12.3 | | 68.4 | 8 | 480 | 64 | 5 | 5 | 8 | 70 | 5 | 75 | 70.1 | 5.8 | 75.0 | 0.90 | 12.5 | 13.0 | 5.0 | 0.5 | 0.7 | 12.3 |
| | scraper | 4 | 40 | 84 | | 75 | 12.3 | | 67.4 | 8 | 480 | 69 | 5 | 5 | 8 | 70 | 5 | 75 | 70.1 | 5.8 | 75.0 | 0.90 | 12.5 | 13.0 | 5.0 | 0.5 | 0.7 | 12.3 |
| | dozer | 1 | 40 | 82 | | 75 | 12.3 | | 65.4 | 8 | 480 | 61 | 5 | 5 | 8 | 70 | 5 | 75 | 70.1 | 5.8 | 75.0 | 0.90 | 12.5 | 13.0 | 5.0 | 0.5 | 0.7 | 12.3 |
| | front end loader | 1 | 40 | 79 | | 75 | 12.3 | | 62.4 | 8 | 480 | 58 | 5 | 5 | 8 | 70 | 5 | 75 | 70.1 | 5.8 | 75.0 | 0.90 | 12.5 | 13.0 | 5.0 | 0.5 | 0.7 | 12.3 |
| | | | | | | | | | Total for Grading Phase: | | | **71.3** | | | | | | | | | | | | | | | | |
| Building Construction | crane | 2 | 16 | 81 | | 125 | 11.8 | | 58.3 | 4 | 240 | 50 | 5 | 5 | 8 | 120 | 5 | 125 | 120.0 | 5.8 | 125.0 | 0.87 | 12.4 | 13.0 | 5.0 | 0.5 | 0.7 | 11.8 |
| | man lift | 1 | 20 | 75 | | 125 | 11.8 | | 52.3 | 8 | 480 | 45 | 5 | 5 | 8 | 120 | 5 | 125 | 120.0 | 5.8 | 125.0 | 0.87 | 12.4 | 13.0 | 5.0 | 0.5 | 0.7 | 11.8 |
| | all other equipment > 5 HP | 1 | 50 | 85 | | 125 | 11.8 | | 62.3 | 4 | 240 | 56 | 5 | 5 | 8 | 120 | 5 | 125 | 120.0 | 5.8 | 125.0 | 0.87 | 12.4 | 13.0 | 5.0 | 0.5 | 0.7 | 11.8 |
| | generator | 1 | 50 | 72 | | 125 | 11.8 | | 49.3 | 8 | 480 | 46 | 5 | 5 | 8 | 120 | 5 | 125 | 120.0 | 5.8 | 125.0 | 0.87 | 12.4 | 13.0 | 5.0 | 0.5 | 0.7 | 11.8 |
| | backhoe | 1 | 40 | 78 | | 125 | 11.8 | | 55.3 | 4 | 240 | 48 | 5 | 5 | 8 | 120 | 5 | 125 | 120.0 | 5.8 | 125.0 | 0.87 | 12.4 | 13.0 | 5.0 | 0.5 | 0.7 | 11.8 |
| | compressor (air) | 2 | 40 | 78 | | 125 | 11.8 | | 55.3 | 8 | 480 | 54 | 5 | 5 | 8 | 120 | 5 | 125 | 120.0 | 5.8 | 125.0 | 0.87 | 12.4 | 13.0 | 5.0 | 0.5 | 0.7 | 11.8 |
| | | | | | | | | | Total for Building Construction Phase: | | | **59.8** | | | | | | | | | | | | | | | | |
| Paving | concrete mixer truck | 1 | 40 | 79 | | 125 | 11.8 | | 56.3 | 8 | 480 | 52 | 5 | 5 | 8 | 120 | 5 | 125 | 120.0 | 5.8 | 125.0 | 0.87 | 12.4 | 13.0 | 5.0 | 0.5 | 0.7 | 11.8 |
| | paver | 2 | 50 | 77 | | 125 | 11.8 | | 54.3 | 8 | 480 | 54 | 5 | 5 | 8 | 120 | 5 | 125 | 120.0 | 5.8 | 125.0 | 0.87 | 12.4 | 13.0 | 5.0 | 0.5 | 0.7 | 11.8 |
| | all other equipment > 5 HP | 1 | 50 | 85 | | 125 | 11.8 | | 62.3 | 8 | 480 | 59 | 5 | 5 | 8 | 120 | 5 | 125 | 120.0 | 5.8 | 125.0 | 0.87 | 12.4 | 13.0 | 5.0 | 0.5 | 0.7 | 11.8 |
| | roller | 2 | 20 | 80 | | 125 | 11.8 | | 57.3 | 8 | 480 | 53 | 5 | 5 | 8 | 120 | 5 | 125 | 120.0 | 5.8 | 125.0 | 0.87 | 12.4 | 13.0 | 5.0 | 0.5 | 0.7 | 11.8 |
| | | | | | | | | | Total for Paving Phase: | | | **61.8** | | | | | | | | | | | | | | | | |

| 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 |

# Appendix C
## Traffic Noise Modeling Input and Output

dudek 9 April 2024
nas TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: jericho rd
RUN: cal

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

| Roadway | | Points | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Width | Name | No. | Coordinates (pavement) | | | Flow Control | | | Segment | |
| | | | | X | Y | Z | Control Device | Speed Constraint | Percent Vehicles Affected | Pvmt Type | On Struct? |
| | ft | | | ft | ft | ft | | mph | % | | |
| EB Amaya Dr | 25.0 | point11 | 11 | 6,331,940.5 | 1,866,367.9 | 0.00 | | | | Average | |
| | | point10 | 10 | 6,332,593.0 | 1,866,241.2 | 0.00 | | | | Average | |
| | | point9 | 9 | 6,332,676.0 | 1,866,243.1 | 0.00 | | | | Average | |
| | | point8 | 8 | 6,332,796.0 | 1,866,260.6 | 0.00 | | | | Average | |
| | | point7 | 7 | 6,332,950.0 | 1,866,321.8 | 0.00 | | | | Average | |
| | | point6 | 6 | 6,333,027.0 | 1,866,367.2 | 0.00 | | | | Average | |
| | | point5 | 5 | 6,333,087.5 | 1,866,417.5 | 0.00 | | | | Average | |
| | | point4 | 4 | 6,333,139.5 | 1,866,468.1 | 0.00 | | | | Average | |
| | | point3 | 3 | 6,333,192.0 | 1,866,524.5 | 0.00 | | | | Average | |
| | | point2 | 2 | 6,333,249.0 | 1,866,603.4 | 0.00 | | | | Average | |
| | | point25 | 25 | 6,333,348.5 | 1,866,751.0 | 0.00 | | | | | |
| WB Amaya Dr | 25.0 | point20 | 20 | 6,333,544.5 | 1,867,077.5 | 0.00 | | | | Average | |
| | | point26 | 26 | 6,333,321.5 | 1,866,760.8 | 0.00 | | | | | |
| Jericho Rd | 36.0 | point21 | 21 | 6,333,221.0 | 1,867,070.1 | 0.00 | | | | Average | |
| | | point22 | 22 | 6,333,127.0 | 1,866,933.2 | 0.00 | | | | Average | |
| | | point23 | 23 | 6,333,129.0 | 1,866,897.9 | 0.00 | | | | Average | |
| | | point24 | 24 | 6,333,310.5 | 1,866,774.5 | 0.00 | | | | | |
| EB Amaya Dr-2 | 25.0 | point28 | 28 | 6,333,348.5 | 1,866,751.0 | 0.00 | | | | Average | |
| | | point1 | 1 | 6,333,564.0 | 1,867,063.5 | 0.00 | | | | | |
| WB Amaya Dr-2 | 25.0 | point29 | 29 | 6,333,321.5 | 1,866,760.8 | 0.00 | | | | Average | |
| | | point19 | 19 | 6,333,176.5 | 1,866,553.1 | 0.00 | | | | Average | |
| | | point18 | 18 | 6,333,083.0 | 1,866,457.8 | 0.00 | | | | Average | |
| | | point17 | 17 | 6,332,986.0 | 1,866,385.6 | 0.00 | | | | Average | |
| | | point16 | 16 | 6,332,875.0 | 1,866,325.9 | 0.00 | | | | Average | |
| | | point15 | 15 | 6,332,764.0 | 1,866,284.5 | 0.00 | | | | Average | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | point14 | 14 | 6,332,698.0 | 1,866,273.1 | 0.00 | | | | Average | |
| | | point13 | 13 | 6,332,556.5 | 1,866,274.0 | 0.00 | | | | Average | |
| | | point12 | 12 | 6,331,950.0 | 1,866,391.8 | 0.00 | | | | | |

**dudek** **9 April 2024**
**nas** **TNM 2.5**

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**PROJECT/CONTRACT:** **jericho rd**
**RUN:** **cal**

| Roadway | Points | | Segment | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Name | No. | Autos | | MTrucks | | HTrucks | | Buses | | Motorcycles | |
| | | | V | S | V | S | V | S | V | S | V | S |
| | | | veh/hr | mph | veh/hr | mph | veh/hr | mph | veh/hr | mph | veh/hr | mph |
| EB Amaya Dr | point11 | 11 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point10 | 10 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point9 | 9 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point8 | 8 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point7 | 7 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point6 | 6 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point5 | 5 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point4 | 4 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point3 | 3 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point2 | 2 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point25 | 25 | | | | | | | | | | |
| WB Amaya Dr | point20 | 20 | 247 | 30 | 5 | 30 | 2 | 30 | 0 | 0 | 0 | 0 |
| | point26 | 26 | | | | | | | | | | |
| Jericho Rd | point21 | 21 | 32 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point22 | 22 | 32 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point23 | 23 | 32 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point24 | 24 | | | | | | | | | | |
| EB Amaya Dr-2 | point28 | 28 | 247 | 30 | 5 | 30 | 2 | 30 | 0 | 0 | 0 | 0 |
| | point1 | 1 | | | | | | | | | | |
| WB Amaya Dr-2 | point29 | 29 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point19 | 19 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point18 | 18 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point17 | 17 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | point16 | 16 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point15 | 15 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point14 | 14 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point13 | 13 | 291 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point12 | 12 | | | | | | | | | | |

dudek 9 April 2024
nas TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: jericho rd
RUN: cal

| Receiver Name | No. | #DUs | Coordinates (ground) X | Y | Z | Height above Ground | Input Sound Levels and Criteria Existing LAeq1h | Impact Criteria LAeq1h | Impact Criteria Sub'l | NR Goal | Active in Calc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ft | ft | ft | ft | dBA | dBA | dB | dB | |
| ST1 | 1 | 1 | 6,333,135.0 | 1,866,543.8 | 0.00 | 4.92 | 64.30 | 66 | 10.0 | 8.0 | Y |
| ST2 | 2 | 1 | 6,333,167.5 | 1,866,839.5 | 0.00 | 4.92 | 55.60 | 66 | 10.0 | 8.0 | Y |
| ST3 | 3 | 1 | 6,332,725.5 | 1,867,076.2 | 0.00 | 4.92 | 53.40 | 66 | 10.0 | 8.0 | Y |
| ST4 | 4 | 1 | 6,332,950.5 | 1,866,627.1 | 0.00 | 4.92 | 54.10 | 66 | 10.0 | 8.0 | Y |

dudek
nas
9 April 2024
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: jericho rd
RUN: cal
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h | | Increase over existing | | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Calculated | Crit'n | Calculated | Crit'n Sub'l Inc | | | Calculated | Goal | Calculated minus Goal |
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| ST1 | 1 | 1 | 64.3 | 62.5 | 66 | -1.8 | 10 | ---- | 62.5 | 0.0 | 8 | -8.0 |
| ST2 | 2 | 1 | 55.6 | 53.3 | 66 | -2.3 | 10 | ---- | 53.3 | 0.0 | 8 | -8.0 |
| ST3 | 3 | 1 | 53.4 | 39.5 | 66 | -13.9 | 10 | ---- | 39.5 | 0.0 | 8 | -8.0 |
| ST4 | 4 | 1 | 54.1 | 50.0 | 66 | -4.1 | 10 | ---- | 50.0 | 0.0 | 8 | -8.0 |

| Dwelling Units | # DUs | Noise Reduction | | |
|---|---|---|---|---|
| | | Min | Avg | Max |
| | | dB | dB | dB |
| All Selected | 4 | 0.0 | 0.0 | 0.0 |
| All Impacted | 0 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

dudek 9 April 2024
nas TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: jericho rd
RUN: Existing + Project

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

| Roadway | | Points | | | | | Flow Control | | | Segment | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Width | Name | No. | Coordinates (pavement) X | Y | Z | Control Device | Speed Constraint | Percent Vehicles Affected | Pvmt Type | On Struct? |
| | ft | | | ft | ft | ft | | mph | % | | |
| EB Amaya Dr | 25.0 | point11 | 11 | 6,331,940.5 | 1,866,367.9 | 0.00 | | | | Average | |
| | | point10 | 10 | 6,332,593.0 | 1,866,241.2 | 0.00 | | | | Average | |
| | | point9 | 9 | 6,332,676.0 | 1,866,243.1 | 0.00 | | | | Average | |
| | | point8 | 8 | 6,332,796.0 | 1,866,260.6 | 0.00 | | | | Average | |
| | | point7 | 7 | 6,332,950.0 | 1,866,321.8 | 0.00 | | | | Average | |
| | | point6 | 6 | 6,333,027.0 | 1,866,367.2 | 0.00 | | | | Average | |
| | | point5 | 5 | 6,333,087.5 | 1,866,417.5 | 0.00 | | | | Average | |
| | | point4 | 4 | 6,333,139.5 | 1,866,468.1 | 0.00 | | | | Average | |
| | | point3 | 3 | 6,333,192.0 | 1,866,524.5 | 0.00 | | | | Average | |
| | | point2 | 2 | 6,333,249.0 | 1,866,603.4 | 0.00 | | | | Average | |
| | | point25 | 25 | 6,333,348.5 | 1,866,751.0 | 0.00 | | | | | |
| WB Amaya Dr | 25.0 | point20 | 20 | 6,333,544.5 | 1,867,077.5 | 0.00 | | | | Average | |
| | | point26 | 26 | 6,333,321.5 | 1,866,760.8 | 0.00 | | | | | |
| Jericho Rd | 36.0 | point21 | 21 | 6,333,221.0 | 1,867,070.1 | 0.00 | | | | Average | |
| | | point22 | 22 | 6,333,127.0 | 1,866,933.2 | 0.00 | | | | Average | |
| | | point23 | 23 | 6,333,129.0 | 1,866,897.9 | 0.00 | | | | Average | |
| | | point24 | 24 | 6,333,310.5 | 1,866,774.5 | 0.00 | | | | | |
| EB Amaya Dr-2 | 25.0 | point28 | 28 | 6,333,348.5 | 1,866,751.0 | 0.00 | | | | Average | |
| | | point1 | 1 | 6,333,564.0 | 1,867,063.5 | 0.00 | | | | | |
| WB Amaya Dr-2 | 25.0 | point29 | 29 | 6,333,321.5 | 1,866,760.8 | 0.00 | | | | Average | |
| | | point19 | 19 | 6,333,176.5 | 1,866,553.1 | 0.00 | | | | Average | |
| | | point18 | 18 | 6,333,083.0 | 1,866,457.8 | 0.00 | | | | Average | |
| | | point17 | 17 | 6,332,986.0 | 1,866,385.6 | 0.00 | | | | Average | |
| | | point16 | 16 | 6,332,875.0 | 1,866,325.9 | 0.00 | | | | Average | |
| | | point15 | 15 | 6,332,764.0 | 1,866,284.5 | 0.00 | | | | Average | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | point14 | 14 | 6,332,698.0 | 1,866,273.1 | 0.00 | | | | Average | |
| | | point13 | 13 | 6,332,556.5 | 1,866,274.0 | 0.00 | | | | Average | |
| | | point12 | 12 | 6,331,950.0 | 1,866,391.8 | 0.00 | | | | | |

dudek 9 April 2024
nas TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: jericho rd
RUN: Existing + Project

| Roadway | Points | | Segment | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Name | No. | Autos | | MTrucks | | HTrucks | | Buses | | Motorcycles | |
| | | | V | S | V | S | V | S | V | S | V | S |
| | | | veh/hr | mph | veh/hr | mph | veh/hr | mph | veh/hr | mph | veh/hr | mph |
| EB Amaya Dr | point11 | 11 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point10 | 10 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point9 | 9 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point8 | 8 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point7 | 7 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point6 | 6 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point5 | 5 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point4 | 4 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point3 | 3 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point2 | 2 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point25 | 25 | | | | | | | | | | |
| WB Amaya Dr | point20 | 20 | 256 | 30 | 5 | 30 | 2 | 30 | 0 | 0 | 0 | 0 |
| | point26 | 26 | | | | | | | | | | |
| Jericho Rd | point21 | 21 | 77 | 30 | 1 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point22 | 22 | 77 | 30 | 1 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point23 | 23 | 77 | 30 | 1 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point24 | 24 | | | | | | | | | | |
| EB Amaya Dr-2 | point28 | 28 | 256 | 30 | 5 | 30 | 2 | 30 | 0 | 0 | 0 | 0 |
| | point1 | 1 | | | | | | | | | | |
| WB Amaya Dr-2 | point29 | 29 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point19 | 19 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point18 | 18 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point17 | 17 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | point16 | 16 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point15 | 15 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point14 | 14 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point13 | 13 | 304 | 30 | 6 | 30 | 3 | 30 | 0 | 0 | 0 | 0 |
| | point12 | 12 | | | | | | | | | | |

dudek 9 April 2024
nas TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: jericho rd
RUN: Existing + Project

| Receiver Name | No. | #DUs | Coordinates (ground) X | Y | Z | Height above Ground | Input Sound Levels and Criteria Existing LAeq1h | Impact Criteria LAeq1h | Impact Criteria Sub'l | NR Goal | Active in Calc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ft | ft | ft | ft | dBA | dBA | dB | dB | |
| ST1 | 1 | 1 | 6,333,135.0 | 1,866,543.8 | 0.00 | 4.92 | 64.30 | 66 | 10.0 | 8.0 | Y |
| ST2 | 2 | 1 | 6,333,167.5 | 1,866,839.5 | 0.00 | 4.92 | 55.60 | 66 | 10.0 | 8.0 | Y |
| ST3 | 3 | 1 | 6,332,725.5 | 1,867,076.2 | 0.00 | 4.92 | 53.40 | 66 | 10.0 | 8.0 | Y |
| ST4 | 4 | 1 | 6,332,950.5 | 1,866,627.1 | 0.00 | 4.92 | 54.10 | 66 | 10.0 | 8.0 | Y |

dudek
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9 April 2024
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: jericho rd
RUN: Existing + Project
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h | | Increase over existing | | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Calculated | Crit'n | Calculated | Crit'n Sub'l Inc | | | Calculated | Goal | Calculated minus Goal |
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| ST1 | 1 | 1 | 64.3 | 62.6 | 66 | -1.7 | 10 | ---- | 62.6 | 0.0 | 8 | -8.0 |
| ST2 | 2 | 1 | 55.6 | 55.5 | 66 | -0.1 | 10 | ---- | 55.5 | 0.0 | 8 | -8.0 |
| ST3 | 3 | 1 | 53.4 | 40.0 | 66 | -13.4 | 10 | ---- | 40.0 | 0.0 | 8 | -8.0 |
| ST4 | 4 | 1 | 54.1 | 50.2 | 66 | -3.9 | 10 | ---- | 50.2 | 0.0 | 8 | -8.0 |

| Dwelling Units | # DUs | Noise Reduction | | |
|---|---|---|---|---|
| | | Min | Avg | Max |
| | | dB | dB | dB |
| All Selected | 4 | 0.0 | 0.0 | 0.0 |
| All Impacted | 0 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

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nas TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: jericho rd
RUN: Future

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

| Roadway | | Points | | | | | Flow Control | | | Segment | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Width | Name | No. | Coordinates (pavement) X | Y | Z | Control Device | Speed Constraint | Percent Vehicles Affected | Pvmt Type | On Struct? |
| | ft | | | ft | ft | ft | | mph | % | | |
| EB Amaya Dr | 25.0 | point11 | 11 | 6,331,940.5 | 1,866,367.9 | 0.00 | | | | Average | |
| | | point10 | 10 | 6,332,593.0 | 1,866,241.2 | 0.00 | | | | Average | |
| | | point9 | 9 | 6,332,676.0 | 1,866,243.1 | 0.00 | | | | Average | |
| | | point8 | 8 | 6,332,796.0 | 1,866,260.6 | 0.00 | | | | Average | |
| | | point7 | 7 | 6,332,950.0 | 1,866,321.8 | 0.00 | | | | Average | |
| | | point6 | 6 | 6,333,027.0 | 1,866,367.2 | 0.00 | | | | Average | |
| | | point5 | 5 | 6,333,087.5 | 1,866,417.5 | 0.00 | | | | Average | |
| | | point4 | 4 | 6,333,139.5 | 1,866,468.1 | 0.00 | | | | Average | |
| | | point3 | 3 | 6,333,192.0 | 1,866,524.5 | 0.00 | | | | Average | |
| | | point2 | 2 | 6,333,249.0 | 1,866,603.4 | 0.00 | | | | Average | |
| | | point25 | 25 | 6,333,348.5 | 1,866,751.0 | 0.00 | | | | | |
| WB Amaya Dr | 25.0 | point20 | 20 | 6,333,544.5 | 1,867,077.5 | 0.00 | | | | Average | |
| | | point26 | 26 | 6,333,321.5 | 1,866,760.8 | 0.00 | | | | | |
| Jericho Rd | 36.0 | point21 | 21 | 6,333,221.0 | 1,867,070.1 | 0.00 | | | | Average | |
| | | point22 | 22 | 6,333,127.0 | 1,866,933.2 | 0.00 | | | | Average | |
| | | point23 | 23 | 6,333,129.0 | 1,866,897.9 | 0.00 | | | | Average | |
| | | point24 | 24 | 6,333,310.5 | 1,866,774.5 | 0.00 | | | | | |
| EB Amaya Dr-2 | 25.0 | point28 | 28 | 6,333,348.5 | 1,866,751.0 | 0.00 | | | | Average | |
| | | point1 | 1 | 6,333,564.0 | 1,867,063.5 | 0.00 | | | | | |
| WB Amaya Dr-2 | 25.0 | point29 | 29 | 6,333,321.5 | 1,866,760.8 | 0.00 | | | | Average | |
| | | point19 | 19 | 6,333,176.5 | 1,866,553.1 | 0.00 | | | | Average | |
| | | point18 | 18 | 6,333,083.0 | 1,866,457.8 | 0.00 | | | | Average | |
| | | point17 | 17 | 6,332,986.0 | 1,866,385.6 | 0.00 | | | | Average | |
| | | point16 | 16 | 6,332,875.0 | 1,866,325.9 | 0.00 | | | | Average | |
| | | point15 | 15 | 6,332,764.0 | 1,866,284.5 | 0.00 | | | | Average | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | point14 | 14 | 6,332,698.0 | 1,866,273.1 | 0.00 | | | | Average | |
| | | point13 | 13 | 6,332,556.5 | 1,866,274.0 | 0.00 | | | | Average | |
| | | point12 | 12 | 6,331,950.0 | 1,866,391.8 | 0.00 | | | | | |

dudek 9 April 2024
nas TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: jericho rd
RUN: Future

| Roadway | Points | | Segment | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Name | No. | Autos | | MTrucks | | HTrucks | | Buses | | Motorcycles | |
| | | | V | S | V | S | V | S | V | S | V | S |
| | | | veh/hr | mph | veh/hr | mph | veh/hr | mph | veh/hr | mph | veh/hr | mph |
| EB Amaya Dr | point11 | 11 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point10 | 10 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point9 | 9 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point8 | 8 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point7 | 7 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point6 | 6 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point5 | 5 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point4 | 4 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point3 | 3 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point2 | 2 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point25 | 25 | | | | | | | | | | |
| WB Amaya Dr | point20 | 20 | 228 | 30 | 5 | 30 | 2 | 30 | 0 | 0 | 0 | 0 |
| | point26 | 26 | | | | | | | | | | |
| Jericho Rd | point21 | 21 | 32 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point22 | 22 | 32 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point23 | 23 | 32 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point24 | 24 | | | | | | | | | | |
| EB Amaya Dr-2 | point28 | 28 | 228 | 30 | 5 | 30 | 2 | 30 | 0 | 0 | 0 | 0 |
| | point1 | 1 | | | | | | | | | | |
| WB Amaya Dr-2 | point29 | 29 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point19 | 19 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point18 | 18 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point17 | 17 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | point16 | 16 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point15 | 15 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point14 | 14 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point13 | 13 | 466 | 30 | 9 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point12 | 12 | | | | | | | | | | |

dudek 9 April 2024
nas TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: jericho rd
RUN: Future

| Receiver Name | No. | #DUs | Coordinates (ground) X | Y | Z | Height above Ground | Input Sound Levels and Criteria Existing LAeq1h | Impact Criteria LAeq1h | Impact Criteria Sub'l | NR Goal | Active in Calc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ft | ft | ft | ft | dBA | dBA | dB | dB | |
| ST1 | 1 | 1 | 6,333,135.0 | 1,866,543.8 | 0.00 | 4.92 | 64.30 | 66 | 10.0 | 8.0 | Y |
| ST2 | 2 | 1 | 6,333,167.5 | 1,866,839.5 | 0.00 | 4.92 | 55.60 | 66 | 10.0 | 8.0 | Y |
| ST3 | 3 | 1 | 6,332,725.5 | 1,867,076.2 | 0.00 | 4.92 | 53.40 | 66 | 10.0 | 8.0 | Y |
| ST4 | 4 | 1 | 6,332,950.5 | 1,866,627.1 | 0.00 | 4.92 | 54.10 | 66 | 10.0 | 8.0 | Y |

dudek
nas

9 April 2024
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: jericho rd
RUN: Future
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h | | Increase over existing | | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Calculated | Crit'n | Calculated | Crit'n Sub'l Inc | | | Calculated | Goal | Calculated minus Goal |
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| ST1 | 1 | 1 | 64.3 | 64.5 | 66 | 0.2 | 10 | ---- | 64.5 | 0.0 | 8 | -8.0 |
| ST2 | 2 | 1 | 55.6 | 54.1 | 66 | -1.5 | 10 | ---- | 54.1 | 0.0 | 8 | -8.0 |
| ST3 | 3 | 1 | 53.4 | 41.2 | 66 | -12.2 | 10 | ---- | 41.2 | 0.0 | 8 | -8.0 |
| ST4 | 4 | 1 | 54.1 | 51.9 | 66 | -2.2 | 10 | ---- | 51.9 | 0.0 | 8 | -8.0 |

| Dwelling Units | # DUs | Noise Reduction | | |
|---|---|---|---|---|
| | | Min | Avg | Max |
| | | dB | dB | dB |
| All Selected | 4 | 0.0 | 0.0 | 0.0 |
| All Impacted | 0 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

dudek 9 April 2024
nas TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: jericho rd
RUN: Future + Project

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

| Roadway | | Points | | | | | Flow Control | | | Segment | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Width | Name | No. | Coordinates (pavement) X | Y | Z | Control Device | Speed Constraint | Percent Vehicles Affected | Pvmt Type | On Struct? |
| | ft | | | ft | ft | ft | | mph | % | | |
| EB Amaya Dr | 25.0 | point11 | 11 | 6,331,940.5 | 1,866,367.9 | 0.00 | | | | Average | |
| | | point10 | 10 | 6,332,593.0 | 1,866,241.2 | 0.00 | | | | Average | |
| | | point9 | 9 | 6,332,676.0 | 1,866,243.1 | 0.00 | | | | Average | |
| | | point8 | 8 | 6,332,796.0 | 1,866,260.6 | 0.00 | | | | Average | |
| | | point7 | 7 | 6,332,950.0 | 1,866,321.8 | 0.00 | | | | Average | |
| | | point6 | 6 | 6,333,027.0 | 1,866,367.2 | 0.00 | | | | Average | |
| | | point5 | 5 | 6,333,087.5 | 1,866,417.5 | 0.00 | | | | Average | |
| | | point4 | 4 | 6,333,139.5 | 1,866,468.1 | 0.00 | | | | Average | |
| | | point3 | 3 | 6,333,192.0 | 1,866,524.5 | 0.00 | | | | Average | |
| | | point2 | 2 | 6,333,249.0 | 1,866,603.4 | 0.00 | | | | Average | |
| | | point25 | 25 | 6,333,348.5 | 1,866,751.0 | 0.00 | | | | | |
| WB Amaya Dr | 25.0 | point20 | 20 | 6,333,544.5 | 1,867,077.5 | 0.00 | | | | Average | |
| | | point26 | 26 | 6,333,321.5 | 1,866,760.8 | 0.00 | | | | | |
| Jericho Rd | 36.0 | point21 | 21 | 6,333,221.0 | 1,867,070.1 | 0.00 | | | | Average | |
| | | point22 | 22 | 6,333,127.0 | 1,866,933.2 | 0.00 | | | | Average | |
| | | point23 | 23 | 6,333,129.0 | 1,866,897.9 | 0.00 | | | | Average | |
| | | point24 | 24 | 6,333,310.5 | 1,866,774.5 | 0.00 | | | | | |
| EB Amaya Dr-2 | 25.0 | point28 | 28 | 6,333,348.5 | 1,866,751.0 | 0.00 | | | | Average | |
| | | point1 | 1 | 6,333,564.0 | 1,867,063.5 | 0.00 | | | | | |
| WB Amaya Dr-2 | 25.0 | point29 | 29 | 6,333,321.5 | 1,866,760.8 | 0.00 | | | | Average | |
| | | point19 | 19 | 6,333,176.5 | 1,866,553.1 | 0.00 | | | | Average | |
| | | point18 | 18 | 6,333,083.0 | 1,866,457.8 | 0.00 | | | | Average | |
| | | point17 | 17 | 6,332,986.0 | 1,866,385.6 | 0.00 | | | | Average | |
| | | point16 | 16 | 6,332,875.0 | 1,866,325.9 | 0.00 | | | | Average | |
| | | point15 | 15 | 6,332,764.0 | 1,866,284.5 | 0.00 | | | | Average | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | point14 | 14 | 6,332,698.0 | 1,866,273.1 | 0.00 | | | | Average | |
| | | point13 | 13 | 6,332,556.5 | 1,866,274.0 | 0.00 | | | | Average | |
| | | point12 | 12 | 6,331,950.0 | 1,866,391.8 | 0.00 | | | | | |

dudek 9 April 2024
nas TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: jericho rd
RUN: Future + Project

| Roadway | Points | | Segment | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Name | No. | Autos | | MTrucks | | HTrucks | | Buses | | Motorcycles | |
| | | | V | S | V | S | V | S | V | S | V | S |
| | | | veh/hr | mph | veh/hr | mph | veh/hr | mph | veh/hr | mph | veh/hr | mph |
| EB Amaya Dr | point11 | 11 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point10 | 10 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point9 | 9 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point8 | 8 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point7 | 7 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point6 | 6 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point5 | 5 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point4 | 4 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point3 | 3 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point2 | 2 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point25 | 25 | | | | | | | | | | |
| WB Amaya Dr | point20 | 20 | 237 | 30 | 5 | 30 | 2 | 30 | 0 | 0 | 0 | 0 |
| | point26 | 26 | | | | | | | | | | |
| Jericho Rd | point21 | 21 | 77 | 30 | 1 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point22 | 22 | 77 | 30 | 1 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point23 | 23 | 77 | 30 | 1 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| | point24 | 24 | | | | | | | | | | |
| EB Amaya Dr-2 | point28 | 28 | 237 | 30 | 5 | 30 | 2 | 30 | 0 | 0 | 0 | 0 |
| | point1 | 1 | | | | | | | | | | |
| WB Amaya Dr-2 | point29 | 29 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point19 | 19 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point18 | 18 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point17 | 17 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | point16 | 16 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point15 | 15 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point14 | 14 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point13 | 13 | 478 | 30 | 10 | 30 | 5 | 30 | 0 | 0 | 0 | 0 |
| | point12 | 12 | | | | | | | | | | |

dudek 9 April 2024
nas TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: jericho rd
RUN: Future + Project

| Receiver Name | No. | #DUs | Coordinates (ground) X | Y | Z | Height above Ground | Input Sound Levels and Criteria Existing LAeq1h | Impact Criteria LAeq1h | Impact Criteria Sub'l | NR Goal | Active in Calc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ft | ft | ft | ft | dBA | dBA | dB | dB | |
| ST1 | 1 | 1 | 6,333,135.0 | 1,866,543.8 | 0.00 | 4.92 | 64.30 | 66 | 10.0 | 8.0 | Y |
| ST2 | 2 | 1 | 6,333,167.5 | 1,866,839.5 | 0.00 | 4.92 | 55.60 | 66 | 10.0 | 8.0 | Y |
| ST3 | 3 | 1 | 6,332,725.5 | 1,867,076.2 | 0.00 | 4.92 | 53.40 | 66 | 10.0 | 8.0 | Y |
| ST4 | 4 | 1 | 6,332,950.5 | 1,866,627.1 | 0.00 | 4.92 | 54.10 | 66 | 10.0 | 8.0 | Y |

dudek
nas

9 April 2024
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: jericho rd
RUN: Future + Project
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h | | Increase over existing | | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Calculated | Crit'n | Calculated | Crit'n Sub'l Inc | | | Calculated | Goal | Calculated minus Goal |
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| ST1 | 1 | 1 | 64.3 | 64.7 | 66 | 0.4 | 10 | ---- | 64.7 | 0.0 | 8 | -8.0 |
| ST2 | 2 | 1 | 55.6 | 56.1 | 66 | 0.5 | 10 | ---- | 56.1 | 0.0 | 8 | -8.0 |
| ST3 | 3 | 1 | 53.4 | 41.6 | 66 | -11.8 | 10 | ---- | 41.6 | 0.0 | 8 | -8.0 |
| ST4 | 4 | 1 | 54.1 | 52.1 | 66 | -2.0 | 10 | ---- | 52.1 | 0.0 | 8 | -8.0 |

| Dwelling Units | # DUs | Noise Reduction | | |
|---|---|---|---|---|
| | | Min | Avg | Max |
| | | dB | dB | dB |
| All Selected | 4 | 0.0 | 0.0 | 0.0 |
| All Impacted | 0 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

# Appendix D
## Operational Noise Model Input and Output


SOURCE: Dudek 2024

DUDEK

0 91 182 Feet

**Appendix D**

HVAC Noise Levels

**Jericho**