Appendix H
Noise Technical Report

Noise Technical Report

Eddie Jones Industrial Way Project

OCTOBER 2023

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Oceanside
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
FTA	Federal Transit Administration
ips	inches per second
L_{dn}	day–night average noise level
L_{eq}	equivalent noise level
L_{max}	maximum sound level
L_{min}	minimum sound level
Eddie Jones Industrial Way	proposed project
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
SLM	Sound level meter
SPL	Sound pressure level
ST	Short-term
VdB	Velocity Decibel

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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 Eddie Jones Industrial Way project (project). 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 site is located on an approximately 31.79-acre site at 250 Eddie Jones Way in the City of Oceanside, California (City) as shown in Figure 1, Project Location. The project site is located within the Airport Neighborhood Planning Area and is bound by the Oceanside Municipal Airport to the south, Benet Road to the west, the San Luis Rey River and recreational trail to the north and vacant light industrial land to the east. The terminus of Alex Road also connects to the site at its northeast corner. The project site is approximately 900 feet north of the Highway 76 corridor. The property is currently occupied by an approximate 172,300 square foot industrial manufacturing facility which was vacated in the summer of 2021. The General Plan designation for the property is Light Industrial (LI) with the associated zoning category of Limited Industrial (IL).

1.3 Project Description

The proposed project consists of development of a new 566,905-square-foot warehouse and distribution facility (Figure 2, Site Plan). The proposed warehouse and distribution facility would consist of 369,415 square feet of warehouse area, 158,320 square feet of manufacturing space and 39,170 square feet of office area designed as a single building that could support multi-tenant occupancies. Separate office areas (with ground level and mezzanine level space) are planned at all four corners of the facility with associated warehouse/industrial space, adjacent parking, and access areas to facilitate multiple users. Development of the proposed project would include associated landscaping, stormwater features, 590 parking spaces for employee/visitor parking, 60 truck trailer parking stalls, and vehicle circulation area. Loading bays are proposed on the north and south sides of the building with a total of 114 truck terminals.

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 actually 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).

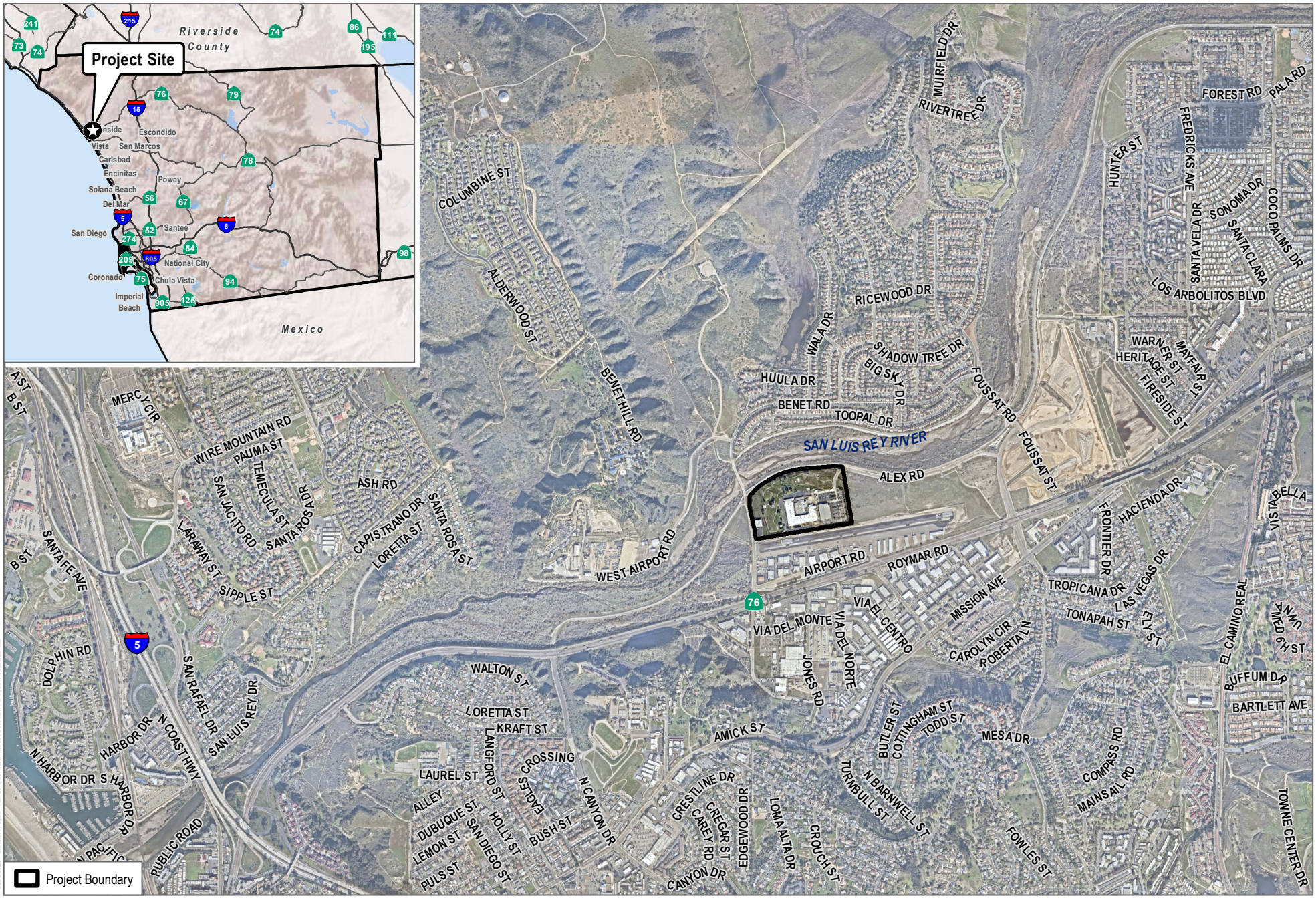

FIGURE 1

Project Location

Eddy Jones Way Industrial

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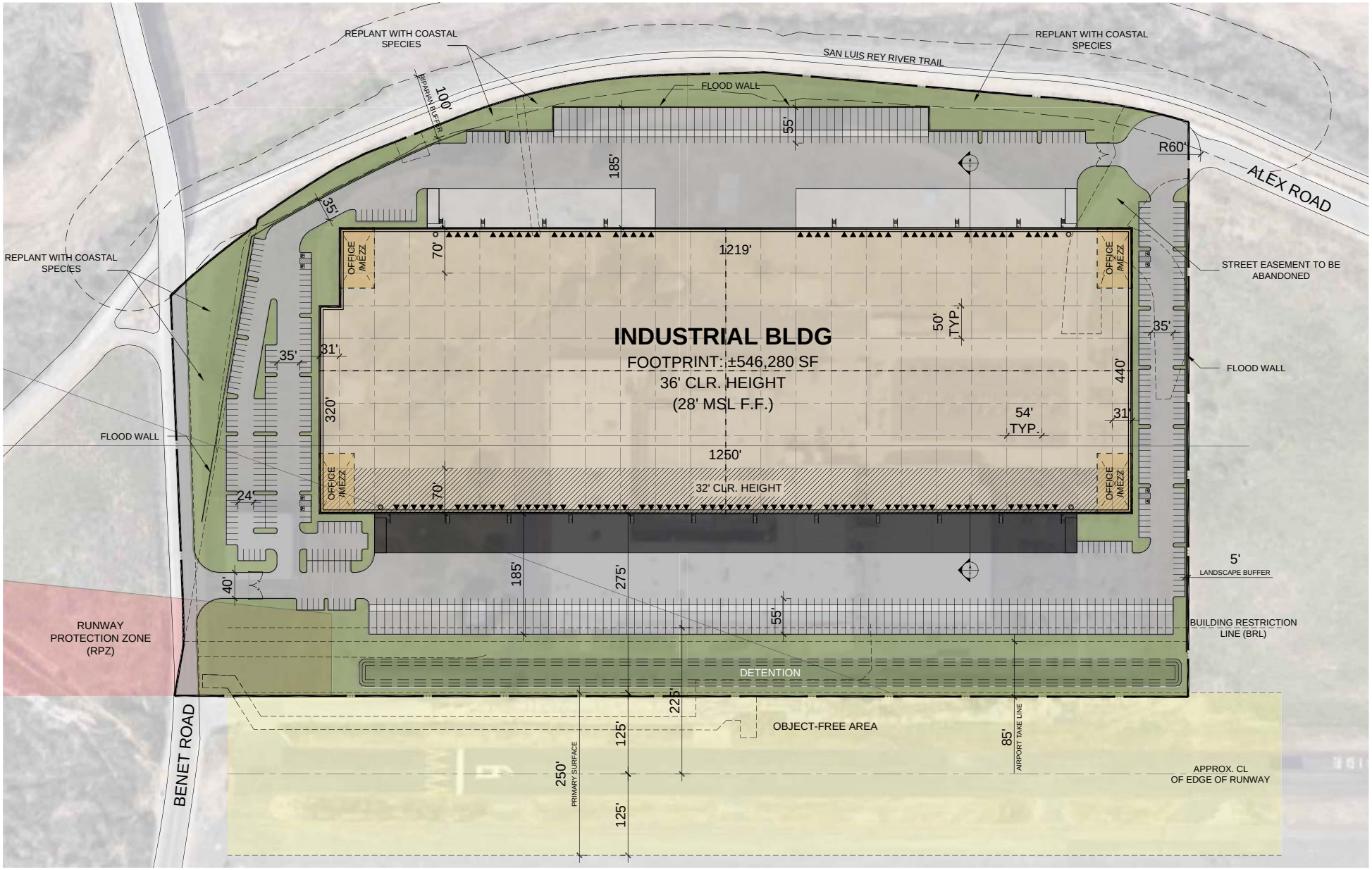

FIGURE 2
Site Plan
Eddy Jones Way Industrial

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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
—	110	Rock band
Jet fly over at 300 meters (1,000 feet)	100	—
Gas lawn mower at 1 meter (3 feet)	90	—
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 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)
—	10	Broadcast/Recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 2020.

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. Outside such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise. It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA. 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. A doubling of sound energy results in a 3-dBA increase in sound, which 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.

1.4.5 Noise Descriptors

Additional 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 "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) are peak particle velocity (PPV), in units of inches per second (ips), and velocity decibel (VdB) that is based on a root-mean square (RMS) of the vibration signal magnitude. 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

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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. Additionally, this exterior noise level limit is consistent with the City of Chula Vista General Plan Noise Element, which considers multi-family unit noise-sensitive land uses.

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 in the range of 0.2-0.6 ips PPV would find it “unpleasant or “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 Oceanside General Plan

2.3.1.1 Noise Level Compatibility Standards

The Noise Element of the City's General Plan (City of Oceanside 1974) establishes target maximum noise levels in the City. The Noise Element provides the following limitations on construction noise:

1. It should be unlawful for any person within any residential zone of 500 feet there from to operate any pile driver, power shovel, pneumatic, power hoist, or other construction equipment between 8:00 p.m. and 7:00 a.m. generating an ambient noise levels of 50 dBA at any property line unless an emergency exists.
2. It should be unlawful for any person to operate any construction equipment at a level in excess of 85 dBA at 100 feet from the source.
3. It should be unlawful for any person to engage in construction activities between 6:00 p.m. and 7:00 a.m. when such activities exceed the ambient noise level by 5 dBA. A special permit may be granted by the Director of Public Works if extenuating circumstances exist.

In addition, the Noise Element addresses nuisance noise and states that it should be unlawful for any person to make or continue any loud, unnecessary noise that causes annoyance to any reasonable person of normal sensitivity.

2.3.1.2 Transportation-Related Noise Standards

The City's Noise Element establishes a policy for exterior sensitive areas to be protected from high noise levels. The Noise Element sets 65 dBA CNEL for the outdoor areas and interior noise levels of less than 45 dBA CNEL as the "normally acceptable" level.

For interior noise, the Noise Element also establishes 45 dBA CNEL as the maximum acceptable level for habitable rooms when exterior noise levels are 60 dBA CNEL or more. If windows and doors are required to be closed to meet this standard, then mechanical ventilation (i.e., air conditioning) shall be included in the project design.

2.3.1.3 Noise Element Policies

- Noise levels shall not be so loud as to cause danger to public health in all zones except manufacturing zones where noise levels may be greater.
- Noise shall be controlled at the source where possible.
- Noise shall be intercepted by barriers or dissipated by space where other controls fail or are impractical.
- Noise levels shall be considered in any change to the Land Use and Circulation Elements of the General Plan.
- Noise levels of City vehicles, construction equipment, and garbage trucks shall be reduced to acceptable levels.

2.3.2 City of Oceanside Noise Ordinance

Chapter 38 of the Oceanside Municipal Code governs operational noise and contains the maximum one-hour average sound levels for various land uses for operational noise (Table 2) generated by sources within or affecting

each land use zone. The Noise Ordinance sets an allowed level for single-family and medium-density residential areas to 50 dBA L_{eq} from 7:00 a.m. to 9:59 p.m., and 45 dBA L_{eq} from 10:00 p.m. to 6:59 a.m. High density residential areas are limited to 55 dBA L_{eq} from 7:00 a.m. to 9:59 p.m. and 50 dBA L_{eq} form 10:00 p.m. to 6:59 a.m. In commercial zones, noise generation is limited to 65 dBA L_{eq} from 7:00 a.m. to 9:59 p.m. and 60 dBA L_{eq} form 10:00 p.m. to 6:59 a.m. Where two land use zones abut one another, the more restrictive noise limit is enforced along the common boundary between the two land uses.

Table 2. City of Oceanside Exterior Noise Standards

Zone	Applicable Limit (decibels)	Time Period
Residential Estate, Single-Family Residential, Medium Density Residential, Agricultural, Open Space	50 45	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
High Density, Residential Tourist	55 50	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Commercial	65 60	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Industrial	70 65	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Downtown	65 55	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.

Source: Oceanside Municipal Code, Section 38.12.

Construction activities are subject to Section 38.17 of the Noise Ordinance, which specifically prohibits the operation of any pneumatic or air hammer, pile driver, steam shovel, derrick, steam, or electric hoist, parking lot cleaning equipment or other appliance, the use of which is attended by loud or unusual noise, between the hours of 10:00 p.m. and 7:00 a.m.

Section 38.16 prohibits nuisance noise as recommended in the General Plan Noise Element. It is unlawful for any person to make, continue or cause to be made or continued, within the limits of the City of Oceanside, any disturbing, excessive, or offensive noise that causes discomfort or annoyance to reasonable persons of normal sensitivity.

2.3.3 City of Oceanside Engineering Manual

Construction noise in Oceanside is governed by the City Engineering Manual. Construction is normally limited to the hours between 7:00 a.m. and 6:00 p.m., Monday through Friday. However, Saturday construction is allowed by permit. More specifically, the City Engineering Manual (Engineers Design and Processing Manual Appendix Construction Guidelines and Requirements) states the following on pages 139 and 159:

- All operations conducted on the premises, including the warming up, repair, arrival, departure, or running of trucks, earthmoving equipment, construction equipment, and any other associated equipment shall be limited to the period between 7:00 a.m. and 6:00 p.m. each day, Monday through Friday, and no earthmoving or grading operations shall be conducted on the premises on Saturdays, Sundays or legal holidays, unless waived by the City Engineer.
- Hours of Operation (515)(34): 7:00 am to 6:00 p.m. M-F; including equipment warm-up.
- Saturday Operation: Requires filing a permit by 2:30 p.m. on the preceding Thursday.

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3 Existing Conditions

Field measurements of sound pressure level (SPL) were conducted near the proposed project site on February 24, 2022, to quantify and characterize the existing outdoor ambient sound levels. Table 3 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-52 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.

Three (3) short-term (ST) noise level measurement locations (ST1–ST3) that represent existing noise-sensitive receivers were selected on and near the proposed project site. These locations are depicted as receivers ST1–ST3 on Figure 3, Noise Measurement Locations. The measured L_{eq} and L_{max} noise levels are provided in Table 3. The primary noise sources at the sites identified in Table 3 consisted of traffic along adjacent roadways, Aircraft and helicopter noise, the sounds of leaves rustling, and birdsong. As shown in Table 3, the measured SPL ranged from approximately 53.9 dBA L_{eq} at ST3 to 73.9 dBA L_{eq} at ST1. Beyond the summarized information presented in Table 3, detailed noise measurement data is included in Appendix A, Baseline Noise Measurement Field Data.

Table 3. Measured Baseline Outdoor Ambient Noise Levels

Site	Location/Address	Date/Time	L_{eq} (dBA)	L_{max} (dBA)
ST1	Southern Cul-de-sac of Toopal Dr	2022-02-24, 12:00 PM to 12:15 PM	50.7	59.7
ST2	North of Eddy Jones Way	2022-02-24, 11:30 AM to 11:45 AM	73.9	91.6
ST3	West end of Alex Road	2022-02-24, 12:30 PM to 12:45 PM	53.9	70.2

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: ST1, ST2, and ST3 L_{eq} values are above 70 dBA due largely to proximity to the Oceanside Municipal Airport. ST1, however, is behind residential walls north of the boundary of the proposed project and more distant from these sources of aircraft noise, which results in a substantially lower sampled L_{eq} value.

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SOURCE: SANGIS 2020, 2022

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0 150 300 Feet

FIGURE 3

Noise Measurement Locations

Eddy Jones Way Industrial

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4 Thresholds of Significance

The following significance criteria are based on Appendix G of the California Environmental Quality Act Guidelines (14 CCR 15000 et seq.) and will be used to determine the significance of potential noise and vibration impacts. Impacts associated with noise and vibration would be significant if the proposed project would 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.
- Generation of excessive groundborne vibration or groundborne noise levels.
- 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 – Although Chapter 38 of the Oceanside Municipal Code does not quantify a threshold for allowable construction noise, the City's General Plan allows noise from construction equipment operation to be as high as 85 dBA at 100 feet from the source. Applying the principles of sound propagation for a point-type source, this level could be interpreted to mean 91 dBA at 50 feet, which is greater than the maximum sound levels of most operating heavy construction equipment (DOT 2006) and would thus imply all but the loudest construction activities (e.g., pile driving) could be compliant with this standard. However, the apparent proximity of existing residential receptors to the north of the proposed project site suggests that source-to-receiver distances could be as short as 10 feet. Additionally, most construction equipment and vehicles on a project site do not operate continuously. Therefore, consistent with the FTA guidance mentioned in Section 2, Regulatory Setting, this analysis will use 80 dBA L_{eq} over an 8-hour period as the construction noise impact criterion during daytime hours (7:00 a.m. to 6:00 p.m.). If construction work were to occur outside these hours, the impact threshold would align with the City's General Plan requirement during such hours: no more than a 5 dBA increase over existing ambient noise levels.
- Off-site project-attributed transportation noise – For purposes for 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 for 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 70 dBA hourly L_{eq} at the property line from 7:00 a.m. to 9:59 p.m., and 65 dBA hourly L_{eq} from 10:00 p.m. to 6:59 a.m. Note that these are the City's thresholds for the industrial zones that characterize the proposed project site and its adjoining lands east and west.
- 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 to an older residential structure.

For purposes of disclosure, since current CEQA noise criteria listed above do not consider it, this analysis also evaluates compatibility of on-site noise exposure levels (e.g., from roadway traffic) with the City of Oceanside exterior and interior noise standards of 65 dBA CNEL and 45 dBA CNEL, respectively.

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 4. Note that the equipment noise levels presented in Table 4 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 4. 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
Concrete Saw	90
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
Scraper	84
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 5 summarizes these two distances to the apparent closest noise-sensitive receptor for each of the five sequential construction phases. At the site boundary, this analysis assumes that all equipment of each listed type per phase will be involved in the construction activity for the full 8-hour period. For the acoustical centroid case, which intends to be a geographic average position for all equipment during the indicated phase, this analysis assumes that the equipment may be operating up to all 8 hours per day.

Table 5. 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)
Site Preparation (dozer, front end loader)	600	1095
Grading (excavator, grader, dozer, scraper backhoe)	600	1095
Building construction (crane, man-lift, generator, backhoe, welder)	600	1095
Paving (paver, roller, concrete mixer truck)	600	1095
Architectural Coating (compressor)	600	1095

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 4), 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 or structural shielding was assumed in the modeling. The RCNM has default duty-cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were used for this noise analysis, which is detailed in Appendix B, Construction Noise Modeling Input and Output, and produce the predicted results displayed in Table 6.

Table 6. 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)
Site Preparation (dozer, front end loader)	58.3	52.4
Grading (excavator, grader, dozer, scraper backhoe)	59.7	53.8
Building construction (crane, man-lift, generator, backhoe, welder)	49.9	44.1
Paving (paver, roller, concrete mixer truck)	53.6	47.7
Architectural Coating (compressor)	46.0	40.2

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

As presented in Table 6, the highest estimated construction noise levels are predicted to stay below 60 dBA L_{eq} over an 8-hour period at the nearest existing residences on Tishmal Court (as close as 600 feet away) when grading activities take place near the northern project boundaries. Short-term construction noise remains well the FTA guidance of 80 dBA L_{eq} over an 8-hour period, and therefore is less than significant.

Long-Term Operational

Off-Site Traffic Noise Exposure

The proposed project would result in the creation of additional vehicle trips on local arterial roadways (i.e., Benet Road, Alex Road and Eddy Jones Way), 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) for Benet Road, Alex Road and Eddy jones Way. In particular, the proposed project would create additional traffic along Benet Road Road, which according to the Traffic Impact Assessment prepared for the proposed project (LOS Engineering 2023) would add 1530 total average daily trips to adjacent to the project site.

According to Caltrans, a three-dBA change in sound is the beginning 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 2013a). Due to the

existing and proposed urban setting of the project area, a readily perceptible change in noise (five 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 2022), existing plus project, near-term (opening day) and near-term (opening day) 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. The receivers were modeled to be 5 feet above the local ground elevation. The noise model results are summarized in Table 7. Based on results of the model, implementation of the proposed project would not result in readily perceptible increases in traffic noise.

Table 7. Roadway Traffic Noise Modeling Results

Modeled Receiver No.	Existing (2022) Noise Level (dBA CNEL)	Existing with Project Noise Level (dBA CNEL)	Existing plus Cumulative Noise Level (dBA CNEL)	Existing plus Cumulative plus Project Noise Level (dBA CNEL)	Horizon (2050) without Project Noise Level (dBA CNEL)	Horizon (2050) with Project Noise Level (dBA CNEL)	Maximum Project-Related Noise Level Increase (dB)
ST1	44.3	44.3	45.3	45.3	45.4	45.4	0.0
ST2	55.4	55.6	56.3	56.4	56.1	56.3	0.2
ST3	42.8	42.9	43.6	43.8	43.6	43.8	0.2

Source: Appendix C.
Notes: dBA = A-weighted decibel; CNEL = community noise equivalent level; dB = decibel.

Table 7 shows that at all three listed representative receivers, the addition of proposed project traffic to the roadway network would result in an increase in the CNEL of less than 3 dB, which is below the discernible level of change for the average healthy human ear. Thus, a less-than-significant impact is expected for proposed project-related off-site traffic noise increases affecting existing residences in the vicinity.

On-site Outdoor Mechanical Equipment

The proposed warehouse spaces within the warehouse/office buildings would not be served by heating or air-conditioning equipment. However, the proposed office areas would be equipped with single-packaged rooftop HVAC units with air-handling capacity of 3 to 6 nominal tons. For the analysis of noise from this HVAC equipment operation, a York ZF-048 HVAC unit was used as a reference. Based upon the provided site plan, there would be one such HVAC unit for each of the four offices located within the proposed project (i.e., one office in each corner).

Noise level data provided by the manufacturer was used to determine the noise levels that would be generated by the HVAC equipment. The worst-case calculated noise levels at the nearest residential properties (to the north) and the property lines to south, east and west) are presented in Table 8. The calculations were performed at the worst-case locations of each of the subject property lines—that is, the

closest distances between the proposed office locations and the adjacent property lines, to ensure that the shortest distance from equipment to property line was examined.

As shown in Table 8, the maximum hourly noise level for the HVAC equipment operating at each examined point would be approximately 39 dBA L_{eq} at the nearest residential properties and approximately 50 dBA L_{eq} at the Project's property boundaries. The results of the mechanical equipment operations noise analysis indicate that the Project would comply with the City's Municipal Code threshold. Therefore, impacts associated with on-site HVAC noise would be less than significant.

Table 8. Mechanical Equipment (HVAC) Noise

Equipment	Receiver Location	Zone	HVAC Noise Level (dBA Leq)	Applicable Noise Standard1 (Base Ambient Noise Level + 5) (dBA) (Daytime (7 a.m. to 10 p.m.) / Nighttime (10 p.m. to 7 a.m.))	Applicable Noise Standard Exceeded?
HVAC	Northern Property Line	Industrial	26	70/65	No
HVAC	Nearest Sensitive Receptor	Residential	15	50/45	No

Source: Appendix F.

Note: HVAC = heating, ventilation and air conditioning; dBA = A-weighted decibel; L_{eq} = equivalent continuous sound level.

On-site Parking Lot Activity

Less Than Significant Impact. A comprehensive study of noise levels associated with surface parking lots was published in the Journal of Environmental Engineering and Landscape Management (Baltrënas et al. 2004). The study found that average noise levels for parking lots of similar size during the peak period of use of the parking lot (generally in the morning with arrival of commuters, and in the evening with the departure of commuters), was 47 dBA L_{eq} at 1 meter (3.28 feet) from the outside boundary of the parking lot. The parking area would function as a point source for noise, which means that noise would attenuate at a rate of 6 dBA with each doubling of distance. Employee parking lots are proposed to be distributed throughout the Project site adjacent to the warehouse/office buildings, no closer than 600 feet from the edge of the parking lot to the nearest residences to the North. At a distance of 600 feet, parking lot noise levels would not be audible to the human ear at the nearest residence.

On-Site Truck Loading Dock/Truck Yard Activity

Less Than Significant Impact. The aforementioned parking lot study (Baltrënas et al. 2004) also examined noise levels associated with cargo truck delivery activity. The study concluded that maximum noise levels from truck loading/unloading areas was 96 dBA at 1 meter (3.28 feet) from the boundary of the truck activity area. Time-averaged noise levels would be lower and would agree with a 64 dBA L_{eq} at 50 feet used to define these individual sources. Truck loading docks would be located not closer than 730 feet from the nearest residential property line (located to the north). Using the outdoor attenuation rate of 6 dBA with each doubling of distance, truck loading activity at residences to the north would produce noise levels of

approximately 39 dBA L_{eq}. Thus, the loading dock noise at the nearest residences would be approximately 6 dBA less, which would be below the City's Municipal Code standard for maximum noise levels during the nighttime hours for residential zones. Therefore, impacts associated with truck loading docks and truck yard noise would be less than significant.

Combination of Onsite Operations Noise Emission

The combination of the parking lot noise (<2 dBA L_{eq}),the HVAC equipment level (15 dBA L_{eq}), and the truck yard activity (39 dBA L_{eq}) would be 39 dBA L_{eq}[1], which is well below the applicable limits (i.e., the residential-zoned properties) of 50 dBA L_{eq} daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA L_{eq} nighttime (10:00 p.m. to 7:00 a.m.) Therefore, impacts associated with parking lot noise would be less than significant.

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 northern project boundary (i.e., 600 feet from the nearest occupied property) the estimated vibration velocity level would be 0.003 ips per the equation as follows (FTA 2006):

$PPV_{rcvr} = PPV_{ref} * (25/D)^{1.5} = 0.003 = 0.089 * (25/600)^{1.5}$

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 0.003 ips, which do not surpass the guidance limit of 0.2 to 0.3 ips PPV for preventing damage to residential structures (Caltrans 2020). Because the predicted vibration level at 600 feet is less than this guidance limit, the risk of vibration damage to nearby structures is considered less than significant.

1 Because noise levels are summed in the energy (that is, the logarithmic) domain, a noise level that is 10 decibels or more lower than another noise level becomes negligible, because the sound energy from the higher noise source is completely dominant.

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 closest airport to the proposed project site is the Oceanside Municipal Airport, directly north of the airport property boundary. According to the Airport Land Use Compatibility Plan Exhibit IV-10, Compatibility Data Map: Noise, the project falls within both the 60 dB and 65 dB noise contours. However, since the Project is zoned as an industrial use there will be no exceedance in the City's applicable standards of 70 dB during the daytime hours and 65 dB during the nighttime hours. Therefore, the proposed project will not expose people residing or working in the project area to excessive noise levels (San Diego County Regional Airport Authority 2010. Impacts would be **less than significant.**

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6 Summary of Findings

This noise report was conducted for the proposed project. The results indicate that potential impacts during construction would **be less than significant**; nevertheless, construction best practices that incorporate noise reduction techniques would be incorporated into the project construction process. Noise impacts due to operation of the proposed project (including traffic noise) would be **less than significant**. No noise and vibration mitigation measures are anticipated at this time.

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Appendix A

Baseline Noise Measurement Field Data

FORMS DUDEK FIELD DATA REPORT

Field Noise Measurement Data

Record: 1408	
Project Name	*Eddy jones*
Observer(s)	*Connor Burke*
Date	*2022-02-24*

Monitoring	
Record #	*1*
Site ID	*ST1*
Site Location Lat/Long	*33.217593, -117.356473*
Begin (Time)	*11:30:00*
End (Time)	*11:45:00*
Leq	*73.9*
Lmax	*91.6*
Lmin	*48.5*
Other Lx?	*L90, L50, L10*
L90	*52.1*
L50	*56.9*
L10	*71.20*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Aircraft*
Other Noise Sources (Background)	*Birds, Distant Traffic*
Other Noise Sources Additional Description	*Helicopter on runway*
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	
	

Monitoring

Record #	*2*
Site ID	*ST2*
Site Location Lat/Long	*33.222106, -117.356386*
Begin (Time)	*12:00:00*
End (Time)	*12:15:00*
Leq	*50.7*
Lmax	*59.7*
Lmin	*45.9*
Other Lx?	*L90, L50, L10*
L90	*47.1*
L50	*49.5*
L10	*52.9*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Aircraft*
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	

Monitoring

Record #	*3*
Site ID	*ST3*
Site Location Lat/Long	*33.220164, -117.349877*
Begin (Time)	*12:30:00*
End (Time)	*12:45:00*
Leq	*53.9*
Lmax	*70.2*
Lmin	*42.6*
Other Lx?	*L90, L50, L10*
L90	*44.1*
L50	*46.5*
L10	*53.5*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Aircraft*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Traffic, Rustling Leaves*
Other Noise Sources Additional Description	*Bike trail*
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	
	

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 residential land use, per FTA guidance = 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)
Site Preparation	dozer	3	40	82		600	0.1		55.3	8	480	56	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	front end loader	4	40	79		600	0.1		52.3	8	480	54	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Site Preparation Phase:			**58.3**																
Grading	excavator	2	40	81		600	0.1		54.3	8	480	53	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	grader	1	40	85		600	0.1		58.3	8	480	54	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	1	40	82		600	0.1		55.3	8	480	51	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	scraper	2	40	84		600	0.1		57.3	5.5	330	55	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	backhoe	2	40	78		600	0.1		51.3	2	120	44	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Grading Phase:			**59.7**																
Building Construction	crane	1	16	81		600	0.1		54.3	7	420	46	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	man lift	3	20	75		600	0.1		48.3	4	240	43	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	generator	1	50	72		600	0.1		45.3	2	120	36	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	backhoe	3	40	78		600	0.1		51.3	1	60	43	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	welder / torch	1	40	73		600	0.1		46.3	8	480	42	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Building Construction Phase:			**49.9**																
Architectural Coating	compressor (air)	1	40	78		600	0.1		51.3	6	360	46	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Architectural Coating Phase:			**46.0**																
Paving	paver	2	50	77		600	0.1		50.3	8	480	50	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete mixer truck	1	40	79		600	0.1		52.3	6	360	47	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete pump truck	1	20	81		600	0.1		54.3	1	60	38	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	roller	2	20	80		600	0.1		53.3	6	360	48	5	5	0	595	5	600	595.0	7.1	600.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total for Paving Phase:			**53.6**																

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

noise level limit for construction phase at residential land use, per FTA guidance = 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)
Site Preparation	dozer	3	40	82		1095	0.1		49.4	8	480	50	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	front end loader	4	40	79		1095	0.1		46.4	8	480	48	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
								Total for Site Preparation Phase:				**52.4**																
Grading	excavator	2	40	81		1095	0.1		48.4	8	480	47	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	grader	1	40	85		1095	0.1		52.4	8	480	48	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	dozer	1	40	82		1095	0.1		49.4	8	480	45	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	scraper	2	40	84		1095	0.1		51.4	5.5	330	49	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	backhoe	2	40	78		1095	0.1		45.4	2	120	38	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
								Total for Grading Phase:				**53.8**																
Building Construction	crane	1	16	81		1095	0.1		48.4	7	420	40	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	man lift	3	20	75		1095	0.1		42.4	4	240	37	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	generator	1	50	72		1095	0.1		39.4	2	120	30	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	backhoe	3	40	78		1095	0.1		45.4	1	60	37	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	welder / torch	1	40	73		1095	0.1		40.4	8	480	36	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
								Total for Building Construction Phase:				**44.1**																
Architectural Coating	compressor (air)	1	40	78		1095	0.1		45.4	6	360	40	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
								Total for Architectural Coating Phase:				**40.2**																
Paving	paver	2	50	77		1095	0.1		44.4	8	480	44	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete mixer truck	1	40	79		1095	0.1		46.4	6	360	41	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	concrete pump truck	1	20	81		1095	0.1		48.4	1	60	32	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
	roller	2	20	80		1095	0.1		47.4	6	360	42	5	5	0	1090	5	1095	1090.0	7.1	1095.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
								Total for Paving Phase:				**47.7**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement 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 13 March 2023
CB TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Eddy Jones
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 Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Benet Rd	40.0	point1	1	6,757,951.0	1,539,792.8	0.00				Average	
		point2	2	6,757,911.5	1,539,642.5	0.00				Average	
		point3	3	6,757,918.5	1,539,486.9	0.00				Average	
		point4	4	6,757,942.0	1,539,372.0	0.00				Average	
		point5	5	6,757,990.0	1,539,245.9	0.00				Average	
		point6	6	6,758,045.0	1,539,130.4	0.00				Average	
		point7	7	6,758,095.5	1,539,025.2	0.00				Average	
		point8	8	6,758,134.5	1,538,907.4	0.00				Average	
		point9	9	6,758,166.0	1,538,770.0	0.00				Average	
		point10	10	6,758,201.0	1,538,604.2	0.00				Average	
		point11	11	6,758,247.5	1,538,387.2	0.00				Average	
		point12	12	6,758,277.5	1,538,240.4	0.00				Average	
		point13	13	6,758,290.0	1,538,127.6	0.00				Average	
		point14	14	6,758,300.5	1,537,957.9	0.00				Average	
		point15	15	6,758,302.0	1,537,763.5	0.00				Average	
		point16	16	6,758,305.5	1,537,577.1	0.00				Average	
		point17	17	6,758,302.0	1,537,283.6	0.00					
76 West	60.0	point18	18	6,760,134.5	1,537,868.2	0.00				Average	
		point19	19	6,759,875.5	1,537,781.2	0.00				Average	
		point20	20	6,759,536.5	1,537,668.4	0.00				Average	
		point21	21	6,759,250.0	1,537,571.2	0.00				Average	
		point22	22	6,758,927.0	1,537,462.8	0.00				Average	
		point23	23	6,758,523.0	1,537,333.0	0.00				Average	
		point24	24	6,758,287.0	1,537,251.2	0.00					
76 East	60.0	point31	31	6,758,322.5	1,537,206.5	0.00				Average	

		point32	32	6,758,430.5	1,537,246.6	0.00				Average	
		point33	33	6,758,756.5	1,537,351.0	0.00				Average	
		point34	34	6,759,040.5	1,537,447.0	0.00				Average	
		point35	35	6,759,662.0	1,537,649.8	0.00				Average	
		point36	36	6,760,155.5	1,537,807.4	0.00					
76 E	60.0	point37	37	6,756,730.5	1,536,739.9	0.00				Average	
		point38	38	6,757,021.5	1,536,821.4	0.00				Average	
		point39	39	6,757,272.0	1,536,889.8	0.00				Average	
		point40	40	6,757,547.0	1,536,966.1	0.00				Average	
		point41	41	6,757,837.0	1,537,055.8	0.00				Average	
		point42	42	6,758,293.5	1,537,197.1	0.00					
76 West-2	60.0	point43	43	6,758,287.0	1,537,251.2	0.00				Average	
		point25	25	6,758,127.0	1,537,204.0	0.00				Average	
		point26	26	6,757,834.0	1,537,108.8	0.00				Average	
		point27	27	6,757,445.0	1,536,997.2	0.00				Average	
		point28	28	6,757,231.5	1,536,937.9	0.00				Average	
		point29	29	6,756,954.5	1,536,862.9	0.00				Average	
		point30	30	6,756,715.0	1,536,796.0	0.00					

Dudek **13 March 2023**
CB **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **Eddy Jones**
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
Benet Rd	point1	1	431	45	8	45	4	45	0	0	0	0
	point2	2	431	45	8	45	4	45	0	0	0	0
	point3	3	431	45	8	45	4	45	0	0	0	0
	point4	4	431	45	8	45	4	45	0	0	0	0
	point5	5	431	45	8	45	4	45	0	0	0	0
	point6	6	431	45	8	45	4	45	0	0	0	0
	point7	7	431	45	8	45	4	45	0	0	0	0
	point8	8	431	45	8	45	4	45	0	0	0	0
	point9	9	431	45	8	45	4	45	0	0	0	0
	point10	10	431	45	8	45	4	45	0	0	0	0
	point11	11	431	45	8	45	4	45	0	0	0	0
	point12	12	431	45	8	45	4	45	0	0	0	0
	point13	13	431	45	8	45	4	45	0	0	0	0
	point14	14	431	45	8	45	4	45	0	0	0	0
	point15	15	431	45	8	45	4	45	0	0	0	0
	point16	16	431	45	8	45	4	45	0	0	0	0
	point17	17										
76 West	point18	18	2425	55	50	55	25	55	0	0	0	0
	point19	19	2425	55	50	55	25	55	0	0	0	0
	point20	20	2425	55	50	55	25	55	0	0	0	0
	point21	21	2425	55	50	55	25	55	0	0	0	0
	point22	22	2425	55	50	55	25	55	0	0	0	0
	point23	23	2425	55	50	55	25	55	0	0	0	0

	point24	24										
76 East	point31	31	2425	55	50	55	25	55	0	0	0	0
	point32	32	2425	55	50	55	25	55	0	0	0	0
	point33	33	2425	55	50	55	25	55	0	0	0	0
	point34	34	2425	55	50	55	25	55	0	0	0	0
	point35	35	2425	55	50	55	25	55	0	0	0	0
	point36	36										
76 E	point37	37	2425	55	50	55	25	55	0	0	0	0
	point38	38	2425	55	50	55	25	55	0	0	0	0
	point39	39	2425	55	50	55	25	55	0	0	0	0
	point40	40	2425	55	50	55	25	55	0	0	0	0
	point41	41	2425	55	50	55	25	55	0	0	0	0
	point42	42										
76 West-2	point43	43	2425	55	50	55	25	55	0	0	0	0
	point25	25	2425	55	50	55	25	55	0	0	0	0
	point26	26	2425	55	50	55	25	55	0	0	0	0
	point27	27	2425	55	50	55	25	55	0	0	0	0
	point28	28	2425	55	50	55	25	55	0	0	0	0
	point29	29	2425	55	50	55	25	55	0	0	0	0
	point30	30										

Dudek
CB

13 March 2023
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Eddy Jones
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	
ST2	1	1	6,758,518.0	1,538,240.5	0.00	4.92	73.90	66	10.0	8.0	Y
ST1	2	1	6,759,708.5	1,539,327.8	0.00	4.92	50.70	66	10.0	8.0	Y
ST3	3	1	6,758,565.5	1,539,907.2	0.00	4.92	53.90	66	10.0	8.0	Y

Dudek
CB
13 March 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Eddy Jones
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 Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST2	1	1	73.9	55.4	66	-18.5	10	----	55.4	0.0	8	-8.0
ST1	2	1	50.7	44.3	66	-6.4	10	----	44.3	0.0	8	-8.0
ST3	3	1	53.9	42.8	66	-11.1	10	----	42.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	3	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 13 March 2023
CB TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Eddy Jones
RUN: E + P

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	%		
Benet Rd	40.0	point1	1	6,757,951.0	1,539,792.8	0.00				Average	
		point2	2	6,757,911.5	1,539,642.5	0.00				Average	
		point3	3	6,757,918.5	1,539,486.9	0.00				Average	
		point4	4	6,757,942.0	1,539,372.0	0.00				Average	
		point5	5	6,757,990.0	1,539,245.9	0.00				Average	
		point6	6	6,758,045.0	1,539,130.4	0.00				Average	
		point7	7	6,758,095.5	1,539,025.2	0.00				Average	
		point8	8	6,758,134.5	1,538,907.4	0.00				Average	
		point9	9	6,758,166.0	1,538,770.0	0.00				Average	
		point10	10	6,758,201.0	1,538,604.2	0.00				Average	
		point11	11	6,758,247.5	1,538,387.2	0.00				Average	
		point12	12	6,758,277.5	1,538,240.4	0.00				Average	
		point13	13	6,758,290.0	1,538,127.6	0.00				Average	
		point14	14	6,758,300.5	1,537,957.9	0.00				Average	
		point15	15	6,758,302.0	1,537,763.5	0.00				Average	
		point16	16	6,758,305.5	1,537,577.1	0.00				Average	
		point17	17	6,758,302.0	1,537,283.6	0.00					
76 West	60.0	point18	18	6,760,134.5	1,537,868.2	0.00				Average	
		point19	19	6,759,875.5	1,537,781.2	0.00				Average	
		point20	20	6,759,536.5	1,537,668.4	0.00				Average	
		point21	21	6,759,250.0	1,537,571.2	0.00				Average	
		point22	22	6,758,927.0	1,537,462.8	0.00				Average	
		point23	23	6,758,523.0	1,537,333.0	0.00				Average	
		point24	24	6,758,287.0	1,537,251.2	0.00					
76 East	60.0	point31	31	6,758,322.5	1,537,206.5	0.00				Average	

		point32	32	6,758,430.5	1,537,246.6	0.00				Average	
		point33	33	6,758,756.5	1,537,351.0	0.00				Average	
		point34	34	6,759,040.5	1,537,447.0	0.00				Average	
		point35	35	6,759,662.0	1,537,649.8	0.00				Average	
		point36	36	6,760,155.5	1,537,807.4	0.00					
76 E	60.0	point37	37	6,756,730.5	1,536,739.9	0.00				Average	
		point38	38	6,757,021.5	1,536,821.4	0.00				Average	
		point39	39	6,757,272.0	1,536,889.8	0.00				Average	
		point40	40	6,757,547.0	1,536,966.1	0.00				Average	
		point41	41	6,757,837.0	1,537,055.8	0.00				Average	
		point42	42	6,758,293.5	1,537,197.1	0.00					
76 West-2	60.0	point43	43	6,758,287.0	1,537,251.2	0.00				Average	
		point25	25	6,758,127.0	1,537,204.0	0.00				Average	
		point26	26	6,757,834.0	1,537,108.8	0.00				Average	
		point27	27	6,757,445.0	1,536,997.2	0.00				Average	
		point28	28	6,757,231.5	1,536,937.9	0.00				Average	
		point29	29	6,756,954.5	1,536,862.9	0.00				Average	
		point30	30	6,756,715.0	1,536,796.0	0.00					

Dudek **13 March 2023**
CB **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **Eddy Jones**
RUN: **E + P**

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
Benet Rd	point1	1	472	45	9	45	4	45	0	0	0	0
	point2	2	472	45	9	45	4	45	0	0	0	0
	point3	3	472	45	9	45	4	45	0	0	0	0
	point4	4	472	45	9	45	4	45	0	0	0	0
	point5	5	472	45	9	45	4	45	0	0	0	0
	point6	6	472	45	9	45	4	45	0	0	0	0
	point7	7	472	45	9	45	4	45	0	0	0	0
	point8	8	472	45	9	45	4	45	0	0	0	0
	point9	9	472	45	9	45	4	45	0	0	0	0
	point10	10	472	45	9	45	4	45	0	0	0	0
	point11	11	472	45	9	45	4	45	0	0	0	0
	point12	12	472	45	9	45	4	45	0	0	0	0
	point13	13	472	45	9	45	4	45	0	0	0	0
	point14	14	472	45	9	45	4	45	0	0	0	0
	point15	15	472	45	9	45	4	45	0	0	0	0
	point16	16	472	45	9	45	4	45	0	0	0	0
	point17	17										
76 West	point18	18	2425	55	50	55	25	55	0	0	0	0
	point19	19	2425	55	50	55	25	55	0	0	0	0
	point20	20	2425	55	50	55	25	55	0	0	0	0
	point21	21	2425	55	50	55	25	55	0	0	0	0
	point22	22	2425	55	50	55	25	55	0	0	0	0
	point23	23	2425	55	50	55	25	55	0	0	0	0

	point24	24										
76 East	point31	31	2425	55	50	55	25	55	0	0	0	0
	point32	32	2425	55	50	55	25	55	0	0	0	0
	point33	33	2425	55	50	55	25	55	0	0	0	0
	point34	34	2425	55	50	55	25	55	0	0	0	0
	point35	35	2425	55	50	55	25	55	0	0	0	0
	point36	36										
76 E	point37	37	2425	55	50	55	25	55	0	0	0	0
	point38	38	2425	55	50	55	25	55	0	0	0	0
	point39	39	2425	55	50	55	25	55	0	0	0	0
	point40	40	2425	55	50	55	25	55	0	0	0	0
	point41	41	2425	55	50	55	25	55	0	0	0	0
	point42	42										
76 West-2	point43	43	2443	55	50	55	25	55	0	0	0	0
	point25	25	2443	55	50	55	25	55	0	0	0	0
	point26	26	2443	55	50	55	25	55	0	0	0	0
	point27	27	2443	55	50	55	25	55	0	0	0	0
	point28	28	2443	55	50	55	25	55	0	0	0	0
	point29	29	2443	55	50	55	25	55	0	0	0	0
	point30	30										

Dudek 13 March 2023
CB TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Eddy Jones
RUN: E + P

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	
ST2	1	1	6,758,518.0	1,538,240.5	0.00	4.92	73.90	66	10.0	8.0	Y
ST1	2	1	6,759,708.5	1,539,327.8	0.00	4.92	50.70	66	10.0	8.0	Y
ST3	3	1	6,758,565.5	1,539,907.2	0.00	4.92	53.90	66	10.0	8.0	Y

Dudek
CB
13 March 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Eddy Jones
RUN: E + P
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 Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST2	1	1	73.9	55.6	66	-18.3	10	----	55.6	0.0	8	-8.0
ST1	2	1	50.7	44.3	66	-6.4	10	----	44.3	0.0	8	-8.0
ST3	3	1	53.9	42.9	66	-11.0	10	----	42.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	3	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 13 March 2023
CB TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Eddy Jones
RUN: E + P

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	%		
Benet Rd	40.0	point1	1	6,757,951.0	1,539,792.8	0.00				Average	
		point2	2	6,757,911.5	1,539,642.5	0.00				Average	
		point3	3	6,757,918.5	1,539,486.9	0.00				Average	
		point4	4	6,757,942.0	1,539,372.0	0.00				Average	
		point5	5	6,757,990.0	1,539,245.9	0.00				Average	
		point6	6	6,758,045.0	1,539,130.4	0.00				Average	
		point7	7	6,758,095.5	1,539,025.2	0.00				Average	
		point8	8	6,758,134.5	1,538,907.4	0.00				Average	
		point9	9	6,758,166.0	1,538,770.0	0.00				Average	
		point10	10	6,758,201.0	1,538,604.2	0.00				Average	
		point11	11	6,758,247.5	1,538,387.2	0.00				Average	
		point12	12	6,758,277.5	1,538,240.4	0.00				Average	
		point13	13	6,758,290.0	1,538,127.6	0.00				Average	
		point14	14	6,758,300.5	1,537,957.9	0.00				Average	
		point15	15	6,758,302.0	1,537,763.5	0.00				Average	
		point16	16	6,758,305.5	1,537,577.1	0.00				Average	
		point17	17	6,758,302.0	1,537,283.6	0.00					
76 West	60.0	point18	18	6,760,134.5	1,537,868.2	0.00				Average	
		point19	19	6,759,875.5	1,537,781.2	0.00				Average	
		point20	20	6,759,536.5	1,537,668.4	0.00				Average	
		point21	21	6,759,250.0	1,537,571.2	0.00				Average	
		point22	22	6,758,927.0	1,537,462.8	0.00				Average	
		point23	23	6,758,523.0	1,537,333.0	0.00				Average	
		point24	24	6,758,287.0	1,537,251.2	0.00					
76 East	60.0	point31	31	6,758,322.5	1,537,206.5	0.00				Average	

		point32	32	6,758,430.5	1,537,246.6	0.00				Average	
		point33	33	6,758,756.5	1,537,351.0	0.00				Average	
		point34	34	6,759,040.5	1,537,447.0	0.00				Average	
		point35	35	6,759,662.0	1,537,649.8	0.00				Average	
		point36	36	6,760,155.5	1,537,807.4	0.00					
76 E	60.0	point37	37	6,756,730.5	1,536,739.9	0.00				Average	
		point38	38	6,757,021.5	1,536,821.4	0.00				Average	
		point39	39	6,757,272.0	1,536,889.8	0.00				Average	
		point40	40	6,757,547.0	1,536,966.1	0.00				Average	
		point41	41	6,757,837.0	1,537,055.8	0.00				Average	
		point42	42	6,758,293.5	1,537,197.1	0.00					
76 West-2	60.0	point43	43	6,758,287.0	1,537,251.2	0.00				Average	
		point25	25	6,758,127.0	1,537,204.0	0.00				Average	
		point26	26	6,757,834.0	1,537,108.8	0.00				Average	
		point27	27	6,757,445.0	1,536,997.2	0.00				Average	
		point28	28	6,757,231.5	1,536,937.9	0.00				Average	
		point29	29	6,756,954.5	1,536,862.9	0.00				Average	
		point30	30	6,756,715.0	1,536,796.0	0.00					

Dudek 13 March 2023
CB TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Eddy Jones
RUN: E + P

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
Benet Rd	point1	1	507	45	10	45	5	45	0	0	0	0
	point2	2	507	45	10	45	5	45	0	0	0	0
	point3	3	507	45	10	45	5	45	0	0	0	0
	point4	4	507	45	10	45	5	45	0	0	0	0
	point5	5	507	45	10	45	5	45	0	0	0	0
	point6	6	507	45	10	45	5	45	0	0	0	0
	point7	7	507	45	10	45	5	45	0	0	0	0
	point8	8	507	45	10	45	5	45	0	0	0	0
	point9	9	507	45	10	45	5	45	0	0	0	0
	point10	10	507	45	10	45	5	45	0	0	0	0
	point11	11	507	45	10	45	5	45	0	0	0	0
	point12	12	507	45	10	45	5	45	0	0	0	0
	point13	13	507	45	10	45	5	45	0	0	0	0
	point14	14	507	45	10	45	5	45	0	0	0	0
	point15	15	507	45	10	45	5	45	0	0	0	0
	point16	16	507	45	10	45	5	45	0	0	0	0
	point17	17										
76 West	point18	18	3106	55	64	55	32	55	0	0	0	0
	point19	19	3106	55	64	55	32	55	0	0	0	0
	point20	20	3106	55	64	55	32	55	0	0	0	0
	point21	21	3106	55	64	55	32	55	0	0	0	0
	point22	22	3106	55	64	55	32	55	0	0	0	0
	point23	23	3106	55	64	55	32	55	0	0	0	0

	point24	24										
76 East	point31	31	3106	55	64	55	32	55	0	0	0	0
	point32	32	3106	55	64	55	32	55	0	0	0	0
	point33	33	3106	55	64	55	32	55	0	0	0	0
	point34	34	3106	55	64	55	32	55	0	0	0	0
	point35	35	3106	55	64	55	32	55	0	0	0	0
	point36	36										
76 E	point37	37	2870	55	59	55	29	55	0	0	0	0
	point38	38	2870	55	59	55	29	55	0	0	0	0
	point39	39	2870	55	59	55	29	55	0	0	0	0
	point40	40	2870	55	59	55	29	55	0	0	0	0
	point41	41	2870	55	59	55	29	55	0	0	0	0
	point42	42										
76 West-2	point43	43	2870	55	59	55	29	55	0	0	0	0
	point25	25	2870	55	59	55	29	55	0	0	0	0
	point26	26	2870	55	59	55	29	55	0	0	0	0
	point27	27	2870	55	59	55	29	55	0	0	0	0
	point28	28	2870	55	59	55	29	55	0	0	0	0
	point29	29	2870	55	59	55	29	55	0	0	0	0
	point30	30										

Dudek
CB

13 March 2023
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Eddy Jones
RUN: E + P

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	
ST2	1	1	6,758,518.0	1,538,240.5	0.00	4.92	73.90	66	10.0	8.0	Y
ST1	2	1	6,759,708.5	1,539,327.8	0.00	4.92	50.70	66	10.0	8.0	Y
ST3	3	1	6,758,565.5	1,539,907.2	0.00	4.92	53.90	66	10.0	8.0	Y

Dudek
CB
13 March 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Eddy Jones
RUN: E + P
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 Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST2	1	1	73.9	56.3	66	-17.6	10	----	56.3	0.0	8	-8.0
ST1	2	1	50.7	45.3	66	-5.4	10	----	45.3	0.0	8	-8.0
ST3	3	1	53.9	43.6	66	-10.3	10	----	43.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	3	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 13 March 2023
CB TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Eddy Jones
RUN: E + P

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	%		
Benet Rd	40.0	point1	1	6,757,951.0	1,539,792.8	0.00				Average	
		point2	2	6,757,911.5	1,539,642.5	0.00				Average	
		point3	3	6,757,918.5	1,539,486.9	0.00				Average	
		point4	4	6,757,942.0	1,539,372.0	0.00				Average	
		point5	5	6,757,990.0	1,539,245.9	0.00				Average	
		point6	6	6,758,045.0	1,539,130.4	0.00				Average	
		point7	7	6,758,095.5	1,539,025.2	0.00				Average	
		point8	8	6,758,134.5	1,538,907.4	0.00				Average	
		point9	9	6,758,166.0	1,538,770.0	0.00				Average	
		point10	10	6,758,201.0	1,538,604.2	0.00				Average	
		point11	11	6,758,247.5	1,538,387.2	0.00				Average	
		point12	12	6,758,277.5	1,538,240.4	0.00				Average	
		point13	13	6,758,290.0	1,538,127.6	0.00				Average	
		point14	14	6,758,300.5	1,537,957.9	0.00				Average	
		point15	15	6,758,302.0	1,537,763.5	0.00				Average	
		point16	16	6,758,305.5	1,537,577.1	0.00				Average	
		point17	17	6,758,302.0	1,537,283.6	0.00					
76 West	60.0	point18	18	6,760,134.5	1,537,868.2	0.00				Average	
		point19	19	6,759,875.5	1,537,781.2	0.00				Average	
		point20	20	6,759,536.5	1,537,668.4	0.00				Average	
		point21	21	6,759,250.0	1,537,571.2	0.00				Average	
		point22	22	6,758,927.0	1,537,462.8	0.00				Average	
		point23	23	6,758,523.0	1,537,333.0	0.00				Average	
		point24	24	6,758,287.0	1,537,251.2	0.00					
76 East	60.0	point31	31	6,758,322.5	1,537,206.5	0.00				Average	

		point32	32	6,758,430.5	1,537,246.6	0.00				Average	
		point33	33	6,758,756.5	1,537,351.0	0.00				Average	
		point34	34	6,759,040.5	1,537,447.0	0.00				Average	
		point35	35	6,759,662.0	1,537,649.8	0.00				Average	
		point36	36	6,760,155.5	1,537,807.4	0.00					
76 E	60.0	point37	37	6,756,730.5	1,536,739.9	0.00				Average	
		point38	38	6,757,021.5	1,536,821.4	0.00				Average	
		point39	39	6,757,272.0	1,536,889.8	0.00				Average	
		point40	40	6,757,547.0	1,536,966.1	0.00				Average	
		point41	41	6,757,837.0	1,537,055.8	0.00				Average	
		point42	42	6,758,293.5	1,537,197.1	0.00					
76 West-2	60.0	point43	43	6,758,287.0	1,537,251.2	0.00				Average	
		point25	25	6,758,127.0	1,537,204.0	0.00				Average	
		point26	26	6,757,834.0	1,537,108.8	0.00				Average	
		point27	27	6,757,445.0	1,536,997.2	0.00				Average	
		point28	28	6,757,231.5	1,536,937.9	0.00				Average	
		point29	29	6,756,954.5	1,536,862.9	0.00				Average	
		point30	30	6,756,715.0	1,536,796.0	0.00					

Dudek 13 March 2023
CB TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Eddy Jones
RUN: E + P

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
Benet Rd	point1	1	548	45	11	45	5	45	0	0	0	0
	point2	2	548	45	11	45	5	45	0	0	0	0
	point3	3	548	45	11	45	5	45	0	0	0	0
	point4	4	548	45	11	45	5	45	0	0	0	0
	point5	5	548	45	11	45	5	45	0	0	0	0
	point6	6	548	45	11	45	5	45	0	0	0	0
	point7	7	548	45	11	45	5	45	0	0	0	0
	point8	8	548	45	11	45	5	45	0	0	0	0
	point9	9	548	45	11	45	5	45	0	0	0	0
	point10	10	548	45	11	45	5	45	0	0	0	0
	point11	11	548	45	11	45	5	45	0	0	0	0
	point12	12	548	45	11	45	5	45	0	0	0	0
	point13	13	548	45	11	45	5	45	0	0	0	0
	point14	14	548	45	11	45	5	45	0	0	0	0
	point15	15	548	45	11	45	5	45	0	0	0	0
	point16	16	548	45	11	45	5	45	0	0	0	0
	point17	17										
76 West	point18	18	3106	55	64	55	32	55	0	0	0	0
	point19	19	3106	55	64	55	32	55	0	0	0	0
	point20	20	3106	55	64	55	32	55	0	0	0	0
	point21	21	3106	55	64	55	32	55	0	0	0	0
	point22	22	3106	55	64	55	32	55	0	0	0	0
	point23	23	3106	55	64	55	32	55	0	0	0	0

	point24	24										
76 East	point31	31	3106	55	64	55	32	55	0	0	0	0
	point32	32	3106	55	64	55	32	55	0	0	0	0
	point33	33	3106	55	64	55	32	55	0	0	0	0
	point34	34	3106	55	64	55	32	55	0	0	0	0
	point35	35	3106	55	64	55	32	55	0	0	0	0
	point36	36										
76 E	point37	37	2889	55	59	55	29	55	0	0	0	0
	point38	38	2889	55	59	55	29	55	0	0	0	0
	point39	39	2889	55	59	55	29	55	0	0	0	0
	point40	40	2889	55	59	55	29	55	0	0	0	0
	point41	41	2889	55	59	55	29	55	0	0	0	0
	point42	42										
76 West-2	point43	43	2889	55	59	55	29	55	0	0	0	0
	point25	25	2889	55	59	55	29	55	0	0	0	0
	point26	26	2889	55	59	55	29	55	0	0	0	0
	point27	27	2889	55	59	55	29	55	0	0	0	0
	point28	28	2889	55	59	55	29	55	0	0	0	0
	point29	29	2889	55	59	55	29	55	0	0	0	0
	point30	30										

Dudek
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13 March 2023
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Eddy Jones
RUN: E + P

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	
ST2	1	1	6,758,518.0	1,538,240.5	0.00	4.92	73.90	66	10.0	8.0	Y
ST1	2	1	6,759,708.5	1,539,327.8	0.00	4.92	50.70	66	10.0	8.0	Y
ST3	3	1	6,758,565.5	1,539,907.2	0.00	4.92	53.90	66	10.0	8.0	Y

Dudek
CB
13 March 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Eddy Jones
RUN: E + P
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 Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST2	1	1	73.9	56.4	66	-17.5	10	----	56.4	0.0	8	-8.0
ST1	2	1	50.7	45.3	66	-5.4	10	----	45.3	0.0	8	-8.0
ST3	3	1	53.9	43.8	66	-10.1	10	----	43.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	3	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 13 March 2023
CB TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Eddy Jones
RUN: Horizon

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Benet Rd	40.0	point1	1	6,757,951.0	1,539,792.8	0.00				Average	
		point2	2	6,757,911.5	1,539,642.5	0.00				Average	
		point3	3	6,757,918.5	1,539,486.9	0.00				Average	
		point4	4	6,757,942.0	1,539,372.0	0.00				Average	
		point5	5	6,757,990.0	1,539,245.9	0.00				Average	
		point6	6	6,758,045.0	1,539,130.4	0.00				Average	
		point7	7	6,758,095.5	1,539,025.2	0.00				Average	
		point8	8	6,758,134.5	1,538,907.4	0.00				Average	
		point9	9	6,758,166.0	1,538,770.0	0.00				Average	
		point10	10	6,758,201.0	1,538,604.2	0.00				Average	
		point11	11	6,758,247.5	1,538,387.2	0.00				Average	
		point12	12	6,758,277.5	1,538,240.4	0.00				Average	
		point13	13	6,758,290.0	1,538,127.6	0.00				Average	
		point14	14	6,758,300.5	1,537,957.9	0.00				Average	
		point15	15	6,758,302.0	1,537,763.5	0.00				Average	
		point16	16	6,758,305.5	1,537,577.1	0.00				Average	
		point17	17	6,758,302.0	1,537,283.6	0.00					
76 West	60.0	point18	18	6,760,134.5	1,537,868.2	0.00				Average	
		point19	19	6,759,875.5	1,537,781.2	0.00				Average	
		point20	20	6,759,536.5	1,537,668.4	0.00				Average	
		point21	21	6,759,250.0	1,537,571.2	0.00				Average	
		point22	22	6,758,927.0	1,537,462.8	0.00				Average	
		point23	23	6,758,523.0	1,537,333.0	0.00				Average	
		point24	24	6,758,287.0	1,537,251.2	0.00					
76 East	60.0	point31	31	6,758,322.5	1,537,206.5	0.00				Average	

		point32	32	6,758,430.5	1,537,246.6	0.00				Average	
		point33	33	6,758,756.5	1,537,351.0	0.00				Average	
		point34	34	6,759,040.5	1,537,447.0	0.00				Average	
		point35	35	6,759,662.0	1,537,649.8	0.00				Average	
		point36	36	6,760,155.5	1,537,807.4	0.00					
76 E	60.0	point37	37	6,756,730.5	1,536,739.9	0.00				Average	
		point38	38	6,757,021.5	1,536,821.4	0.00				Average	
		point39	39	6,757,272.0	1,536,889.8	0.00				Average	
		point40	40	6,757,547.0	1,536,966.1	0.00				Average	
		point41	41	6,757,837.0	1,537,055.8	0.00				Average	
		point42	42	6,758,293.5	1,537,197.1	0.00					
76 West-2	60.0	point43	43	6,758,287.0	1,537,251.2	0.00				Average	
		point25	25	6,758,127.0	1,537,204.0	0.00				Average	
		point26	26	6,757,834.0	1,537,108.8	0.00				Average	
		point27	27	6,757,445.0	1,536,997.2	0.00				Average	
		point28	28	6,757,231.5	1,536,937.9	0.00				Average	
		point29	29	6,756,954.5	1,536,862.9	0.00				Average	
		point30	30	6,756,715.0	1,536,796.0	0.00					

Dudek 13 March 2023
CB TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Eddy Jones
RUN: Horizon

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
Benet Rd	point1	1	455	45	9	45	4	45	0	0	0	0
	point2	2	455	45	9	45	4	45	0	0	0	0
	point3	3	455	45	9	45	4	45	0	0	0	0
	point4	4	455	45	9	45	4	45	0	0	0	0
	point5	5	455	45	9	45	4	45	0	0	0	0
	point6	6	455	45	9	45	4	45	0	0	0	0
	point7	7	455	45	9	45	4	45	0	0	0	0
	point8	8	455	45	9	45	4	45	0	0	0	0
	point9	9	455	45	9	45	4	45	0	0	0	0
	point10	10	455	45	9	45	4	45	0	0	0	0
	point11	11	455	45	9	45	4	45	0	0	0	0
	point12	12	455	45	9	45	4	45	0	0	0	0
	point13	13	455	45	9	45	4	45	0	0	0	0
	point14	14	455	45	9	45	4	45	0	0	0	0
	point15	15	455	45	9	45	4	45	0	0	0	0
	point16	16	455	45	9	45	4	45	0	0	0	0
	point17	17										
76 West	point18	18	3196	55	65	55	32	55	0	0	0	0
	point19	19	3196	55	65	55	32	55	0	0	0	0
	point20	20	3196	55	65	55	32	55	0	0	0	0
	point21	21	3196	55	65	55	32	55	0	0	0	0
	point22	22	3196	55	65	55	32	55	0	0	0	0
	point23	23	3196	55	65	55	32	55	0	0	0	0

	point24	24										
76 East	point31	31	3196	55	65	55	32	55	0	0	0	0
	point32	32	3196	55	65	55	32	55	0	0	0	0
	point33	33	3196	55	65	55	32	55	0	0	0	0
	point34	34	3196	55	65	55	32	55	0	0	0	0
	point35	35	3196	55	65	55	32	55	0	0	0	0
	point36	36										
76 E	point37	37	3196	55	65	55	32	55	0	0	0	0
	point38	38	3196	55	65	55	32	55	0	0	0	0
	point39	39	3196	55	65	55	32	55	0	0	0	0
	point40	40	3196	55	65	55	32	55	0	0	0	0
	point41	41	3196	55	65	55	32	55	0	0	0	0
	point42	42										
76 West-2	point43	43	3196	55	65	55	32	55	0	0	0	0
	point25	25	3196	55	65	55	32	55	0	0	0	0
	point26	26	3196	55	65	55	32	55	0	0	0	0
	point27	27	3196	55	65	55	32	55	0	0	0	0
	point28	28	3196	55	65	55	32	55	0	0	0	0
	point29	29	3196	55	65	55	32	55	0	0	0	0
	point30	30										

Dudek
CB

13 March 2023
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Eddy Jones
RUN: Horizon

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	
ST2	1	1	6,758,518.0	1,538,240.5	0.00	4.92	73.90	66	10.0	8.0	Y
ST1	2	1	6,759,708.5	1,539,327.8	0.00	4.92	50.70	66	10.0	8.0	Y
ST3	3	1	6,758,565.5	1,539,907.2	0.00	4.92	53.90	66	10.0	8.0	Y

Dudek
CB
13 March 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Eddy Jones
RUN: Horizon
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 Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST2	1	1	73.9	56.1	66	-17.8	10	----	56.1	0.0	8	-8.0
ST1	2	1	50.7	45.4	66	-5.3	10	----	45.4	0.0	8	-8.0
ST3	3	1	53.9	43.6	66	-10.3	10	----	43.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	3	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 13 March 2023
CB TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Eddy Jones
RUN: Horizon + P

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Benet Rd	40.0	point1	1	6,757,951.0	1,539,792.8	0.00				Average	
		point2	2	6,757,911.5	1,539,642.5	0.00				Average	
		point3	3	6,757,918.5	1,539,486.9	0.00				Average	
		point4	4	6,757,942.0	1,539,372.0	0.00				Average	
		point5	5	6,757,990.0	1,539,245.9	0.00				Average	
		point6	6	6,758,045.0	1,539,130.4	0.00				Average	
		point7	7	6,758,095.5	1,539,025.2	0.00				Average	
		point8	8	6,758,134.5	1,538,907.4	0.00				Average	
		point9	9	6,758,166.0	1,538,770.0	0.00				Average	
		point10	10	6,758,201.0	1,538,604.2	0.00				Average	
		point11	11	6,758,247.5	1,538,387.2	0.00				Average	
		point12	12	6,758,277.5	1,538,240.4	0.00				Average	
		point13	13	6,758,290.0	1,538,127.6	0.00				Average	
		point14	14	6,758,300.5	1,537,957.9	0.00				Average	
		point15	15	6,758,302.0	1,537,763.5	0.00				Average	
		point16	16	6,758,305.5	1,537,577.1	0.00				Average	
		point17	17	6,758,302.0	1,537,283.6	0.00					
76 West	60.0	point18	18	6,760,134.5	1,537,868.2	0.00				Average	
		point19	19	6,759,875.5	1,537,781.2	0.00				Average	
		point20	20	6,759,536.5	1,537,668.4	0.00				Average	
		point21	21	6,759,250.0	1,537,571.2	0.00				Average	
		point22	22	6,758,927.0	1,537,462.8	0.00				Average	
		point23	23	6,758,523.0	1,537,333.0	0.00				Average	
		point24	24	6,758,287.0	1,537,251.2	0.00					
76 East	60.0	point31	31	6,758,322.5	1,537,206.5	0.00				Average	

		point32	32	6,758,430.5	1,537,246.6	0.00				Average	
		point33	33	6,758,756.5	1,537,351.0	0.00				Average	
		point34	34	6,759,040.5	1,537,447.0	0.00				Average	
		point35	35	6,759,662.0	1,537,649.8	0.00				Average	
		point36	36	6,760,155.5	1,537,807.4	0.00					
76 E	60.0	point37	37	6,756,730.5	1,536,739.9	0.00				Average	
		point38	38	6,757,021.5	1,536,821.4	0.00				Average	
		point39	39	6,757,272.0	1,536,889.8	0.00				Average	
		point40	40	6,757,547.0	1,536,966.1	0.00				Average	
		point41	41	6,757,837.0	1,537,055.8	0.00				Average	
		point42	42	6,758,293.5	1,537,197.1	0.00					
76 West-2	60.0	point43	43	6,758,287.0	1,537,251.2	0.00				Average	
		point25	25	6,758,127.0	1,537,204.0	0.00				Average	
		point26	26	6,757,834.0	1,537,108.8	0.00				Average	
		point27	27	6,757,445.0	1,536,997.2	0.00				Average	
		point28	28	6,757,231.5	1,536,937.9	0.00				Average	
		point29	29	6,756,954.5	1,536,862.9	0.00				Average	
		point30	30	6,756,715.0	1,536,796.0	0.00					

Dudek **13 March 2023**
CB **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **Eddy Jones**
RUN: **Horizon + P**

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
Benet Rd	point1	1	497	45	10	45	5	45	0	0	0	0
	point2	2	497	45	10	45	5	45	0	0	0	0
	point3	3	497	45	10	45	5	45	0	0	0	0
	point4	4	497	45	10	45	5	45	0	0	0	0
	point5	5	497	45	10	45	5	45	0	0	0	0
	point6	6	497	45	10	45	5	45	0	0	0	0
	point7	7	497	45	10	45	5	45	0	0	0	0
	point8	8	497	45	10	45	5	45	0	0	0	0
	point9	9	497	45	10	45	5	45	0	0	0	0
	point10	10	497	45	10	45	5	45	0	0	0	0
	point11	11	497	45	10	45	5	45	0	0	0	0
	point12	12	497	45	10	45	5	45	0	0	0	0
	point13	13	497	45	10	45	5	45	0	0	0	0
	point14	14	497	45	10	45	5	45	0	0	0	0
	point15	15	497	45	10	45	5	45	0	0	0	0
	point16	16	497	45	10	45	5	45	0	0	0	0
	point17	17										
76 West	point18	18	3196	55	65	55	32	55	0	0	0	0
	point19	19	3196	55	65	55	32	55	0	0	0	0
	point20	20	3196	55	65	55	32	55	0	0	0	0
	point21	21	3196	55	65	55	32	55	0	0	0	0
	point22	22	3196	55	65	55	32	55	0	0	0	0
	point23	23	3196	55	65	55	32	55	0	0	0	0

	point24	24										
76 East	point31	31	3196	55	65	55	32	55	0	0	0	0
	point32	32	3196	55	65	55	32	55	0	0	0	0
	point33	33	3196	55	65	55	32	55	0	0	0	0
	point34	34	3196	55	65	55	32	55	0	0	0	0
	point35	35	3196	55	65	55	32	55	0	0	0	0
	point36	36										
76 E	point37	37	3214	55	66	55	33	55	0	0	0	0
	point38	38	3214	55	66	55	33	55	0	0	0	0
	point39	39	3214	55	66	55	33	55	0	0	0	0
	point40	40	3214	55	66	55	33	55	0	0	0	0
	point41	41	3214	55	66	55	33	55	0	0	0	0
	point42	42										
76 West-2	point43	43	3214	55	66	55	33	55	0	0	0	0
	point25	25	3214	55	66	55	33	55	0	0	0	0
	point26	26	3214	55	66	55	33	55	0	0	0	0
	point27	27	3214	55	66	55	33	55	0	0	0	0
	point28	28	3214	55	66	55	33	55	0	0	0	0
	point29	29	3214	55	66	55	33	55	0	0	0	0
	point30	30										

Dudek
CB

13 March 2023
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Eddy Jones
RUN: Horizon + P

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	
ST2	1	1	6,758,518.0	1,538,240.5	0.00	4.92	73.90	66	10.0	8.0	Y
ST1	2	1	6,759,708.5	1,539,327.8	0.00	4.92	50.70	66	10.0	8.0	Y
ST3	3	1	6,758,565.5	1,539,907.2	0.00	4.92	53.90	66	10.0	8.0	Y
Office 1	5	1	6,758,429.0	1,538,654.1	0.00	4.92	0.00	66	10.0	8.0	Y
Office 2	6	1	6,758,401.5	1,538,961.9	0.00	4.92	0.00	66	10.0	8.0	Y

Dudek
CB
13 March 2023
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Eddy Jones
RUN: Horizon + P
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 Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST2	1	1	73.9	56.3	66	-17.6	10	----	56.3	0.0	8	-8.0
ST1	2	1	50.7	45.4	66	-5.3	10	----	45.4	0.0	8	-8.0
ST3	3	1	53.9	43.8	66	-10.1	10	----	43.8	0.0	8	-8.0
Office 1	5	1	0.0	55.2	66	55.2	10	----	55.2	0.0	8	-8.0
Office 2	6	1	0.0	52.8	66	52.8	10	----	52.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	5	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

HVAC Noise Prediction

SOURCES: Ware Malcomb 2022; Dudek 2022

DUDEK

0 213.5 427 Feet

Appendix D

Aggregate Project Operations Noise Prediction Results

Eddie Jones Way Industrial Project (Dudek No. 14031)