APPENDIX J

NOISE AND VIBRATION TECHNICAL REPORT

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Noise and Vibration Technical Report

Northgate Town Square Project

DECEMBER 2023

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
ACC	air-cooled chiller
ADT	average daily traffic
AHU	air handling unit
ANSI	American National Standards Institute
APN	Assessor's Parcel Number
ARCHF	Architectural Finishes
BLDGE	Building Erection
CadnaA	Computer Aided Noise Abatement
Caltrans	California Department of Transportation
CBC	California Building Code
CEQA	California Environmental Quality Act
City	City of San Rafael
CNEL	community noise equivalent level
D	distance
dB	decibel
dBA	A-weighted decibel
DTS	draft traffic study
e.g.	for example
FHWA	Federal Highway Administration
FROAD	Final Roads
FTA	Federal Transit Administration
HVAC	heating, ventilating, and air-conditioning
Hz	Hertz (unit of cycles per second)
i.e.	that is
in/sec or ips	inches per second
ISO	International Organization of Standardization
kHz	kilohertz
L_{10}	sound level exceeded 10% of the time
L_{90}	sound level exceeded 90% of the time
L_{dn}	day-night sound level
L_{eq}	energy-equivalent sound level
$L_{eq[h]}$	hourly energy-equivalent sound level
L_{max}	maximum sound level during a period
L_{min}	minimum sound level during a period
LOG	base ten logarithm
LT	long-term
L_{xx}	statistical sound level (level exceed XX% of the time)
mPa	micro-Pascals (unit of pressure)
mph	miles per hour

Acronym/Abbreviation	Definition
n	Wiss exponent
NA	not applicable
NAC	noise abatement criteria
NSR	noise sensitive receiver (or receptor)
P1BS	Parcel 1 boundary south
P1BW	Parcel 1 boundary west
P2BS	Parcel 2 boundary south
P2BW	Parcel 2 boundary west
P3B	Parcel 3 boundary
PH	peak hour
PPV	peak particle velocity
PPV_{rcvr}	peak particle velocity level at the receiver
PPV_{ref}	peak particle velocity reference level
PPV_{ref}	peak particle velocity reference level
Project	Proposed Northgate Town Square Project
RCNM	Roadway Construction Noise Model
RLP1	La Perdiz Court receiver location #1
RLP2	La Perdiz Court receiver location #2
rms	root mean square
RNA1	Nova Albion Way receiver location #1
RND1	Northgate Drive receiver location #1
RROAD	Rough Roads
RSA1	Sao Augustine Way receiver location #1
RSA2	Sao Augustine Way receiver location #2
RSA3	Sao Augustine Way receiver location #3
SDEMO	Site Demolition
SGRAD	Site Grading
SLM	sound level meter
SN	serial number
SPL	sound pressure level
SPREP	Site Preparation
ST	short-term
VdB	rms vibration velocity decibel
VdB_{rcvr}	vibration velocity decibel at the receiver
VdB_{ref}	vibration velocity decibel reference quantity

Executive Summary

Purpose

The primary purpose of this Noise and Vibration Technical Report is to quantitatively assess potential environmental noise and vibration impacts of the proposed Northgate Town Square Project (a.k.a., Project) to its surrounding neighborhoods within the City of San Rafael, California (City). For informational purposes, portions of this study also address potential adverse noise effects to future onsite Project sensitive receptors (e.g., occupants of newly built residential buildings).

Project Overview

In summary, the Proposed Project represents redevelopment of the Northgate Mall commercial/retail site into a mixed-use property over two successive phases: a “Master Plan” with an expected build-out completion date of 2025, and a “Vision Plan” to be completed in 2040.

Environmental Noise and Vibration Impacts

Per California Environmental Quality Act (CEQA) Appendix G assessment criteria for noise and vibration, and on the basis of comparison with applicable local noise regulations, relevant policies and programs from the City’s recently adopted 2040 General Plan Noise Element, and State of California and federal guidance, the predictive analyses herein support findings of less than significant environmental impact to the nearest offsite existing noise-sensitive residential land uses surrounding the Project as they pertain to construction noise, construction vibration, operation noise from onsite Project sources (e.g., outdoor-exposed HVAC systems), and increases in proximate roadway traffic noise.

Project construction noise is predicted to be compliant with the City’s property boundary limit of 90 dBA Lmax; however, the allowable increase in outdoor ambient noise attributed to Project construction is predicted to exceed a 10 dB Leq impact significance threshold at several offsite noise-sensitive receptors (i.e., existing homes south of the Master Plan development area) for distinct time periods during which mitigation measure MM-NOI-1 would be needed. Additionally, during site demolition, site preparation, site grading, and rough roads phasing as part of Vision Plan (2040, a.k.a. Phase 2) construction, certain future onsite residential Parcel 4 receptors may be exposed to potentially significant increases in the outdoor ambient noise level that would require application of mitigation measure MM-NOI-1.

During project operations, the analysis addresses operation of onsite outdoor exposed heating and air-conditioning systems, subsurface parking level ventilation equipment, vehicle movements on and within parking areas, as well as conduct of occasional live performances or sound-reinforced events at the Town Square venue space. The impacts of these noise sources to off-site sensitive receptors would be less than significant. The impacts of these noise sources to new on-site sensitive receptors would also be less than significant during the day, but at night some on-site sensitive receptors would experience exceedances of the City’s noise standards. This would constitute a significant noise impact. Project-specific mitigation measure MM-NOI-2 would reduce nighttime noise levels but might not reduce noise at all of these on-site receptors to below the City’s noise thresholds. Accordingly, the nighttime stationary source noise impact at certain on-site sensitive receptors is considered significant and potentially unavoidable.

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1 Project Description

1.1 Location

The 44.76-acre Project site consists of the Northgate Mall (also referred to herein as the "Project site" or the "mall") located within the San Rafael Town center in northern portion of San Rafael, California. The Project site is bounded by Las Gallinas Avenue to the north and east, and Northgate Drive to the south and west. The Project site is comprised of the following Assessor's Parcel Numbers [APNs]: 175-060-12, -40, -59, -61, -66, and -67).

1.2 Project Description

The Proposed Project would result in the redevelopment of the existing mall through demolition and new construction with a mix of commercial and residential land uses. It would be developed in two (2) phases, and at full build-out would include a total of up to approximately 217,520 square feet of commercial uses and up to 1,422 residential units. The Project would entail several site improvements, including a town square, modifications to internal circulation and parking, and improvements to landscaping and infrastructure.

Phase 1 (also referred to as the 2025 Master Plan) would generally include the demolition of the Sears Anchor building, Sears Auto Center, Sears Seasonal Building (RH Outlet), HomeGoods, and approximately 144,432 square feet of the "Main Building" (i.e., "Major 2", Shops 2 and 2A, and a restaurant), and construction of new commercial uses and up to 922 residential units. Phase 2 (also referred to as the 2040 Vision Plan) would generally include the demolition of the Macy's, demolition of the Kohl's building, and the construction of new commercial uses and up to 500 additional residential units.

In total, the Proposed Project includes approximately 1,261,568 square feet of residential unit square footage within six (6) buildings that are identified herein as follows, based on the current plan for 1,422 residential units:

- **Parcel 1** – 96 units (four floors over podium)
- **Parcel 2** – 100 townhomes
- **Parcel 3** – 280 units (total of six floors)
- **Parcel 4** – 446 units (total of seven floors)
- **Parcel 5** – 251 units (total of five floors)
- **Parcel 6** – 249 units (total of seven floors)

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2 Assessment Framework

2.1 Acoustical Fundamentals

The following subsections provide the reader a summary of acoustical terminology and concepts that the foregoing analyses will use to evaluate potential noise and vibration impacts associated with the Project.

2.1.1 Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receptor determine the sound level and characteristics of the noise perceived by the receptor. The field of acoustics deals primarily with the propagation and control of sound.

Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this huge range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for people is about 0 dB, which corresponds to 20 mPa.

Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

A-weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. 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 in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of dBA) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of 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 problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with highway-traffic noise. Noise levels for traffic noise reports are typically reported in terms of A-weighted decibels or dBA. Table 1 describes typical A-weighted noise levels for various noise sources.

Table 1. Typical A-Weighted Noise Levels for Common Indoor and Outdoor Sources

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Diesel truck at 50 feet at 50 mph	85	Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime	75	—
Gas lawn mower, 100 feet	70	Vacuum cleaner at 10 feet
Commercial area	65	Normal speech at 3 feet
Heavy traffic at 300 feet	60	—
	55	Large business office
Quiet urban daytime	50	Dishwasher next room
	45	—
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime	35	—
	30	Library
Quiet rural nighttime	25	Bedroom at night, concert hall (background)

Source: Caltrans 2013a.

Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3-dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000 Hz–8,000 Hz) range (Caltrans 2013a). In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound, would generally be perceived as barely detectable.

Noise Descriptors

Noise in our daily environment fluctuates over time at varying rates. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors are utilized in this analysis.

- **Equivalent Sound Level** (L_{eq}): L_{eq} represents an energy average of the sound level occurring over a specified period. Section 8.13.040 of the City's municipal code refers to this descriptor as an "average level (Leq)" to evaluate "constant sound" (City of San Rafael 2002). Note that L_{eq} is not an arithmetic average of varying dB levels over a period of time, it accounts for greater sound energy represented by higher decibel contributions.
- **Percentile-Exceeded Sound Level** (L_{xx}): L_{xx} represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10% of the time, and L_{90} is the sound level exceeded 90% of the time).
- **Maximum Sound Level** (L_{max}): L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-Night Level** (L_{dn}): L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.
- **Community Noise Equivalent Level** (CNEL): Similar to L_{dn}, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5-dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

Calculated L_{dn} and CNEL values are often comparable. By way of illustration, for the same constant hourly L_{eq} value over a 24-hour period on which each might be based, the derived CNEL value would be greater than the L_{dn} value by only 0.3 dB due to the three evening hours of the former receiving the 5 dB penalty. For this reason, in practice and as presumed many jurisdictions, including the City of San Rafael as exemplified by the Noise Compatibility Guidelines in its 2040 General Plan Noise Element (City of San Rafael 2021a), CNEL and L_{dn} values are considered interchangeable and thus the latter (L_{dn}) will be used throughout this noise assessment unless a specific reference to CNEL is made or needed herein.

Sound Propagation

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

- **Geometric Spreading** – Sound from a localized source (i.e., an ideal point source) propagates uniformly outward in a spherical pattern (or hemispherical when near a surface). The sound level attenuates (or decreases) at a rate of 6 decibels for each doubling of distance from a point source. Roadways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 decibels for each doubling of distance from a line source.

- Ground Absorption – The propagation path of noise from a sound emission source to a receptor is usually horizontal and proximate to the ground. Under these conditions, noise attenuation from ground absorption and reflective-wave canceling can add to the attenuation associated with geometric spreading. For acoustically "hard" paths over which sound may traverse (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or "soft" sites (i.e., those sites with an absorptive ground surface between the source and the receptor, such as fresh-fallen snow, soft dirt, or dense vegetative ground cover), an additional ground-attenuation value of +1.5 decibels per doubling of distance is normally assumed. When added to cylindrical spreading for line source sound propagation, the excess ground attenuation results in an overall drop-off rate of 4.5 decibels per doubling of distance.
- Atmospheric Effects – Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound pressure levels can also be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects when distances between a source and receptor are large.
- Shielding by Natural or Human-Made Features – A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receptor specifically to reduce noise. A barrier that breaks the line of sight between a source and a receptor will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. While a line of trees may visually occlude the direct line between a source and a receptor, its actual noise-reducing effect is usually negligible because it does not create a solid barrier. Deep expanses of dense wooded areas, on the other hand, can offer noise reduction under the right conditions.

2.1.2 Vibration Characteristics

Vibration is oscillatory movement of mass (typically a solid) over time. It is described in terms of frequency and amplitude and, unlike sound, can be expressed as displacement, velocity, or acceleration. For environmental studies, vibration is often studied as a velocity that, akin to the discussion of sound pressure levels, can also be expressed in dB as a way to cast a large range of quantities into a more convenient scale. Vibration impacts to buildings are generally discussed in terms of inches per second (ips) peak particle velocity (PPV), which will be used herein to discuss vibration levels for ease of reading and comparison with relevant standards. Vibration can also be annoying and thereby impact occupants of structures, and vibration of sufficient amplitude can disrupt sensitive equipment and processes (Caltrans 2020a), such as those involving the use of electron microscopes and lithography equipment. Common sources of vibration within communities include construction activities and railroads. Groundborne vibration generated by construction projects is usually highest during pile driving, rock blasting, soil compacting, jack hammering, and demolition-related activities where sudden releases of subterranean energy or powerful impacts of tools on hard materials occur. Depending on their distances to a sensitive receptor, operation of large bulldozers, graders, loaded dump trucks, or other heavy construction equipment and vehicles on a construction site also have the potential to cause high vibration amplitudes.

2.2 Environmental Setting

The Project is surrounded by a mixture of residential neighborhoods to the west and south of Northgate Drive, commercial uses to the north that adjoin U.S. Highway 101 and the Manuel T. Freitas Parkway, and Mt. Olivet San Rafael (a cemetery) to the east. Observations and collected data from a field measurement survey of the outdoor ambient sound environment, summarized in the following subsection, support the assertion that the proximity of large volumes of roadway traffic on U.S. Highway 101 and its nearby ramps and arterial roadway segments are the dominant noise contributor to the Project vicinity.

2.2.1 Measured Outdoor Ambient Sound

Sound pressure level measurements were conducted proximate to the Project site on December 1, 2021 to quantify and characterize the existing outdoor ambient noise levels of the surrounding vicinity. Table 2 provides the location, date, and time the noise measurements were taken at four locations as illustrated in Figure 1, Noise Measurement Locations. The attending Dudek investigator used a SoftdB "Piccolo" Integrating Sound Level Meter (SLM, serial number [SN] P0221031805) equipped with a 0.5-inch, pre-polarized condenser microphone with pre-amplifier. This SLM meets the current American National Standards Institute (ANSI) standard for a "Type 2" precision sound level meter and had its calibration status checked with a portable calibrator (i.e., a reference signal generator) before and after the field measurement survey. Sound level measurements were conducted with the microphone positioned approximately four-to-five feet above the ground, consistent with appropriate industry standards and practice. Investigator field data sheets can be found in Appendix A.

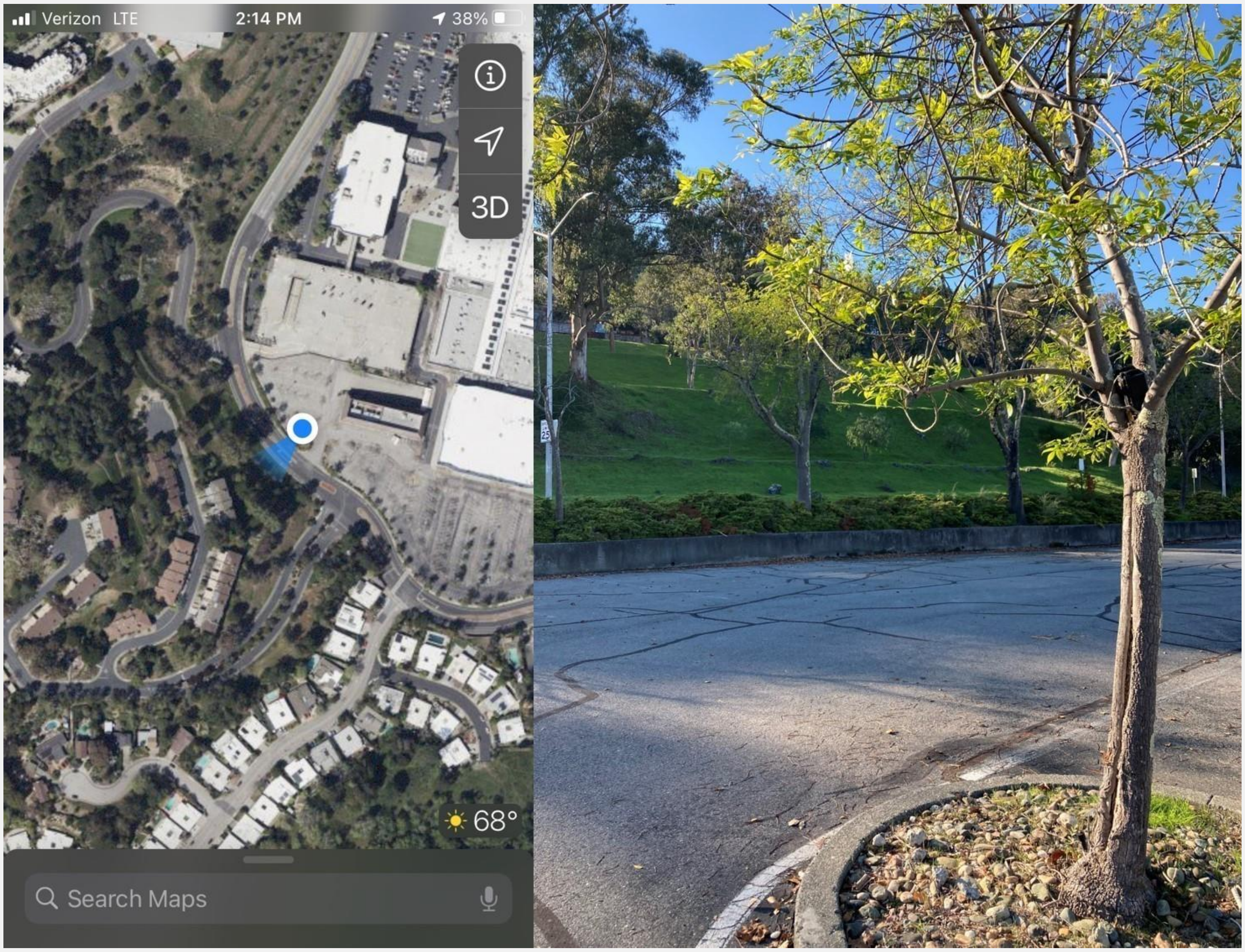
Table 2. December 1, 2021 Measurements of Outdoor Ambient Sound Level

Location Tag	Location Description	Time (hh:mm)	L_{eq}	L_{max}	L_{min}	L_{90}
ST1	AlmaVia of San Rafael	14:28 to 14:44	61.1	77.7	43.2	47.1
ST2	Nova Albion Way	14:52 to 15:08	62.0	74.9	44.3	52.9
ST3	Quail Hill Townhouses (on La Perdiz Court)	15:26 to 15:41	52.7	63.5	44.4	49.3
ST4	Villa Marin (on Thorndale Drive)	15:52 to 16:08	47.8	60.7	43.6	44.7

Source: Dudek 2021.

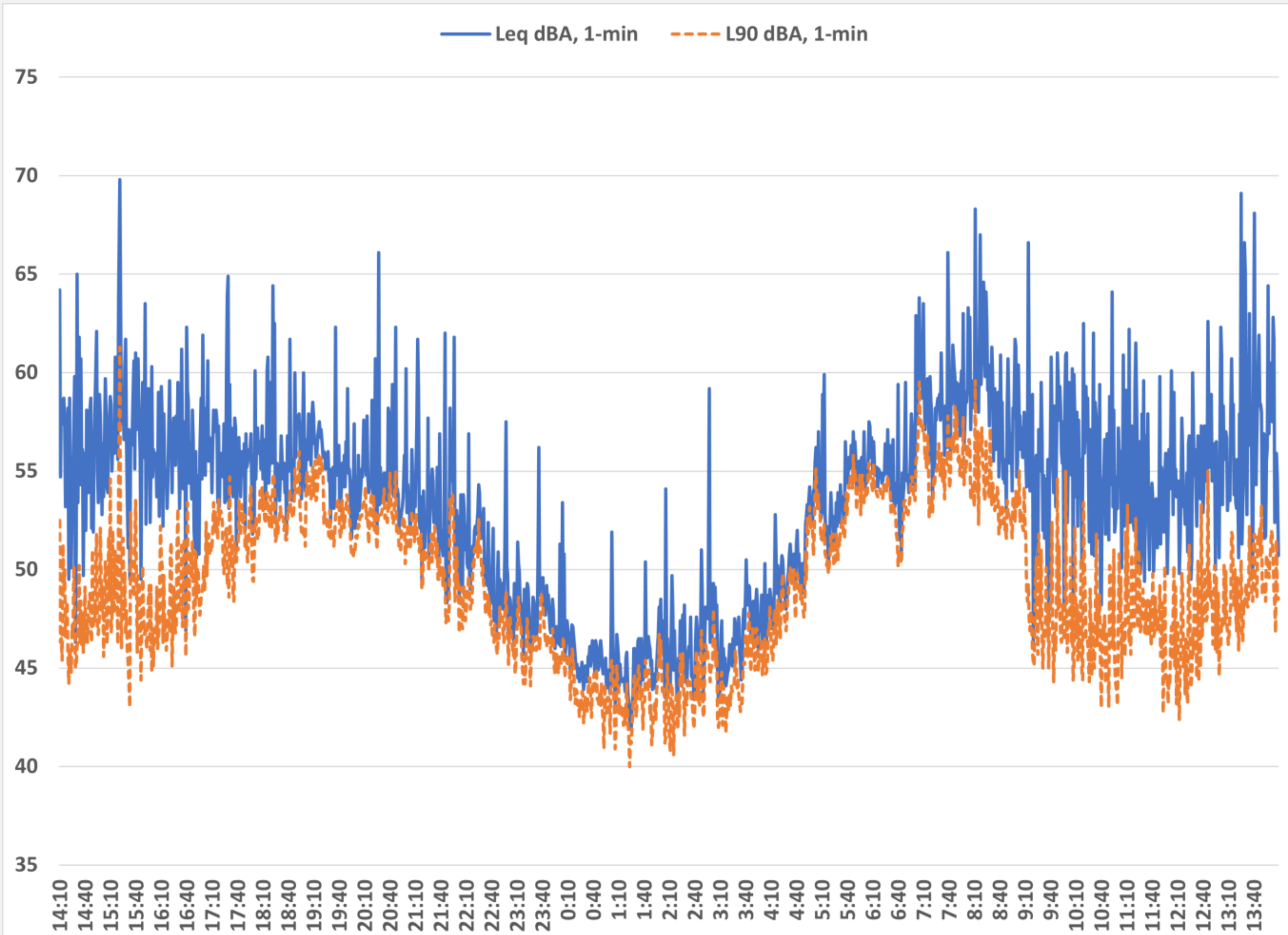
Outdoor ambient SPL was also measured over a continuous 24-hour period, at successive one-minute intervals, with an unattended ANSI Type 2 SLM that was deployed on December 1, 2021 at a position near Northgate Drive as displayed in Exhibit A and retrieved on the following afternoon of December 2, 2021. Exhibit B displays both the L_{eq} values and L_{90} values that were measured during this uninterrupted 24-hour period.

Exhibit A. Location of Long-term Sound Level Meter Deployment (LT1) on December 1-2, 2021



Source: Dudek 2021

Exhibit B. Outdoor Ambient Sound Levels Measured Onsite from December 1, 2021 to December 2, 2021



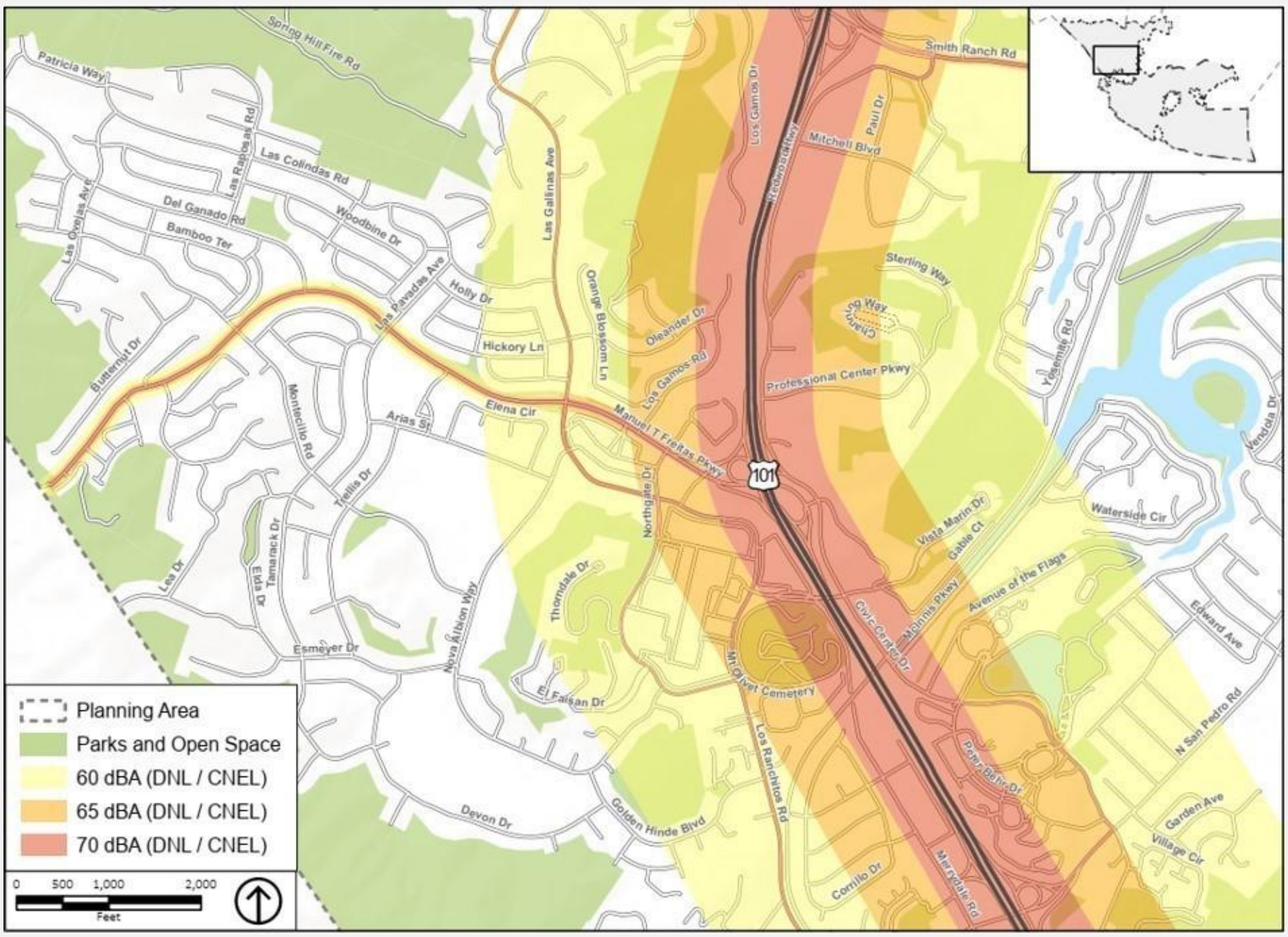
Source: Dudek 2021

Rising in the early morning and evening periods when roadway traffic volumes are likely greatest, and falling to lowest levels at night when traffic would be lowest, the trend of plotted L_{eq} and L_{90} values appearing in Exhibit B concurs with expectations for an outdoor sound environment dominated by nearby roadway traffic (i.e., U.S. Highway 101, its arterials, and connected local roadways) over the course of a 24-hour period between a Wednesday and Thursday afternoon. The displayed difference between L_{eq} and L_{90} values at nighttime tends to be less than what occurs during daytime hours, as there are likely to be one-minute intervals when few or no vehicle pass-bys happen within the one-minute measurement duration. In other words, because the L_{90} value is exceeded ninety percent of the time during a measurement period and is therefore a good indicator of a nearby continuous source of noise (e.g., an operating air-conditioner) or "background" noise from the aggregate of many but indistinct sources such as distant roadway traffic and HVAC units, the relatively smaller dB difference between the L_{eq} and L_{90} values during nighttime period intervals suggests there are fewer high-energy acoustic events (e.g., vehicle pass-bys) causing the L_{eq} to be greater than the L_{90} metric.

Expressed as a 24-hour L_{eq} value, 56.3 dBA was measured over the 24-hour period (2:30 p.m. on December 1st through 2:30 p.m. on December 2nd) at LT1. The corresponding L_{dn} value calculated from these intervals was 59.3

dBA, and the calculated CNEL value was 59.8 dBA. The arithmetic difference between these calculated Ldn and CNEL values is only 0.5 dB, and thus supports an assertion—consistent with the City's noise compatibility guidelines—that L_{dn} and CNEL may be considered interchangeable within this study. These calculated values from the measurement interval data are also generally consistent with the noise contours for U.S. Highway 101 exposure as displayed in Exhibit C, which reproduces Figure 4.13-4 from the 2040 General Plan Environmental Impact Report (City of San Rafael 2021); Figure 4.13-4 is based on traffic data collected in 2019, prior to any effects of COVID-19 on vehicle traffic in the vicinity. The 59.3 dBA L_{dn} identified in the 2021 study for LT1 is also consistent with the 60 dBA CNEL reported in the 2040 General Plan Environmental Impact Report for a nearby long-term measurement location. (See 2020 General Plan Environmental Impact Report pp. 4.13-12 (Figure 4.13-1) and 4.13-15 (Table 4.13-4), Monitoring Location LT-1.

Exhibit C. Existing Traffic Noise Contours from the San Rafael General Plan 2040 & Downtown Precise Plan Draft EIR (Figure 4.13-4)



Source: City of San Rafael 2021

2.2.2 Sensitive Receptors

Noise- and vibration-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Unless specifically defined by the local jurisdiction, residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would typically be considered noise- and vibration-sensitive and may warrant unique measures for protection from intruding noise. Based on this understanding and for purposes of CEQA impact significance assessment, the offsite sensitive receptors nearest to the Project area or surface roadway segments likely to experience changes in noise due to the Project are as follows:

- AlmaVia of San Rafael – an assisted living facility
- Single-family homes on Sao Augustine Way and Nova Albion Way near the southern end of the Project along Northgate Drive
- Quail Hill Townhouses on El Faisan Drive
- Villa Marin on Thorndale Drive
- The Northview Apartments and Terra Linda Manor on Las Gallinas Avenue
- Single-family homes between Elena Circle and Las Gallinas Avenue to the northwest of the Project
- Single-family homes between Orange Blossom Lane and Manuel T. Freitas Parkway to the north of the Project

Although directly east of the Proposed Project, across Las Gallinas Avenue, the Mt. Olivet Cemetery was not considered a noise-sensitive receptor (NSR) for the following reason. The City's 2040 General Plan (GP) Noise Element (NE) puts cemeteries in the same land use classification as "golf courses", with a "normally acceptable" exterior noise exposure level of 70 dBA Ldn—unlike 60 dBA Ldn for single-family residences or 65 dBA Ldn for multi-family. Policy N-1.2(b) from the 2040 GP NE would appear to set 70 dBA Ldn as the limit for the cemetery. Further, there is no special provision for cemeteries in the San Rafael noise regulations. Hypothetically, if it were considered a "public space", then 8.13.040.3.D from the City's code suggests it would have commercial property noise limits (not residential), since Mt. Olivet is surrounded by such commercial land uses.

At the completion of the Master Plan, onsite sensitive receptors would include occupants of multi-story buildings represented by Residential Parcels 1, 2, 3 and 4. Completion of the Vision Plan would generate additional onsite sensitive receptors represented by occupants of new buildings at Residential Parcels 5 and 6.

2.3 Regulatory Setting

2.3.1 Federal Regulations and Guidance

Federal Transit Administration

The City of San Rafael follows Federal Transit Administration (FTA) guidance to assess vibration impacts. Table 3 presents FTA guidance thresholds for assessing building damage risk and human annoyance.

Table 3. Federal Transit Administration Vibration Threshold Guidance

Vibration Receptor	Vibration Assessment Metric	
	Peak Particle Velocity (PPV, in/sec)	Approximate Root Mean Square VdB*
Potential Damage to Structures by Building/Structural Category		
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90
Residential Building Occupant Human Response		
Frequent events *(more than 70 events per day)*		72
Occasional events *(30-70 events per day)*		75
Infrequent events *(fewer than 30 events per day)*		80

Source: FTA 2018
Notes:
* root mean square (rms) vibration level in decibels (VdB) is calculated from the PPV using a crest factor of 4 and is with respect to one (1) micro-inch per second.

2.3.2 State Regulations

Government Code Section 65302(g)

California Government Code Section 65302(g) requires the preparation of a Noise Element in a general plan, which shall identify and appraise the noise problems in the community. The Noise Element shall recognize the guidelines adopted by the Office of Noise Control in the State Department of Health Services and shall quantify, to the extent practicable, current and projected noise levels for the following sources:

- Highways and freeways
- Primary arterials and major local streets
- Passenger and freight on-line railroad operations and ground rapid transit systems
- Aviation and airport-related operations
- Local industrial plants
- Other ground stationary noise sources contributing to the community noise environment.

California Code of Regulations Title 24

The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation. State regulations governing noise levels generated by individual motor vehicles and occupational noise control are not applicable to planning efforts, nor are these areas typically subject to CEQA analysis. State noise regulations and policies applicable to the Project include Title 24 requirements and noise exposure limits for various land use categories.

The 2019 California Building Code (CBC, Part 2, Title 24, Section 1204.6, California Code of Regulations) stipulates "interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (L_{dn}) or the community noise equivalent level (CNEL)" (ICC 2019).

2.3.3 Local Regulations and Guidance

City of San Rafael General Plan Noise Element

The Noise Element of The City of San Rafael General Plan 2040 (City of San Rafael 2021a) sets goals and policies for ensuring compatibility between outdoor ambient noise environments and existing and proposed land uses within. These goals include land use compatibility noise standards akin to State guidelines appearing in Table 4 and are presented in Exhibit D. The goals, policies, and programs that would relate to the Project are reproduced as follows (with reference to Exhibits C and D herein):

Goal N-1: Acceptable Noise Levels. Protect the public from excessive unnecessary, and unreasonable noise. Excessive noise is a concern for many residents of San Rafael. This concern can be addressed through the implementation of standards to protect public health and reduce noise conflicts in the community, including the Noise Ordinance.

Policy N-1.1. Land Use Compatibility Standards for Noise. Protect people from excessive noise by applying noise standards in land use decisions. The Land Use Compatibility standards in Exhibit D are adopted by reference as part of this General Plan and shall be applied in the determination of appropriate land uses in different ambient noise environments.

Program N-1.1A: Residential Noise Standards. Maintain a maximum noise standard of 70 Ldn dB for backyards, decks, and common/usable outdoor spaces in residential and mixed-use areas. As required by Title 24 insulation requirements, interior noise levels shall not exceed 45 Ldn in all habitable rooms in residential units.

Policy N-1.2. Maintaining Acceptable Noise Levels. Use the following performance standards to maintain an acceptable noise environment in San Rafael:

a) New development shall not increase noise levels by more than 3 dB L_{dn} in a residential area, or by more than 5 dB L_{dn} in a non-residential area.
b) New development shall not cause noise levels to increase above the "normally acceptable" levels shown in Exhibit D.
c) For larger projects, the noise levels in (a) and (b) should include any noise that would be generated by additional traffic associated with the new development.
d) Projects that exceed the thresholds above may be permitted if an acoustical study determines that there are mitigating circumstances (such as higher existing noise levels) and nearby uses will not be adversely affected.

Program N-1.2A: Acoustical Study Requirements. Require acoustical studies for new single-family residential projects within the projected 60 dB Ldn noise contour and for multi-family or mixed-use projects within the projected 65 dB Ldn contour (see Exhibit C). The studies should include projected noise from additional traffic, noise associated with the project itself, and cumulative noise resulting from other approved projects. Mitigation measures should be identified to ensure that noise levels remain at acceptable levels.

Policy N-1.3. Reducing Noise Through Planning and Design. Use a range of design, construction, site planning, and operational measures to reduce potential noise impacts.

Program N-1.3A: Site Planning. Where appropriate, require site planning methods that minimize potential noise impacts. By taking advantage of terrain and site dimensions, it may be possible to arrange buildings, parking, and other uses to reduce and possibly eliminate noise conflicts. Site planning techniques include:

a) Maximizing the distance between potential noise sources and the receiver.
b) Placing non-sensitive uses such as parking lots, maintenance facilities, and utility areas between the source and receiver.
c) Using non-sensitive uses such as garages to shield noise sensitive areas.
d) Orienting buildings to shield outdoor spaces from noise sources.
e) Incorporating landscaping and berms to absorb sound.

Program N-1.3B: Architectural Design. Where appropriate, reduce the potential for noise conflicts through the location of noise-sensitive spaces. Bedrooms, for example, should be placed away from freeways. Mechanical and motorized equipment (such as air conditioning units) should be located away from noise-sensitive rooms. Interior courtyards with water features can mask ambient noise and provide more comfortable outdoor spaces.

Policy N-1.5: Mixed Use. Mitigate the potential for noise-related conflicts in mixed use development combining residential and nonresidential uses.

Program N-1.5A: Disclosure Agreements. Where appropriate, require disclosure agreements for residents in mixed use projects advising of potential noise impacts from nearby commercial enterprises, such as restaurants and entertainment venues.

Policy N-1.9: Maintaining Peace and Quiet. Minimize noise conflicts resulting from everyday activities such as construction, sirens, yard equipment, business operations, night-time sporting events, and domestic activities.

Program N-1.9B: Construction Noise. Establish a list of construction best management practices (BMPs) for future projects and incorporate the list into San Rafael Municipal Code Chapter 8.13 (Noise). The City Building Division shall verify that appropriate BMPs are included on demolition, grading, and construction plans prior to the issuance of associated permits.

Policy N-1.11: Vibration. Ensure that the potential for vibration is addressed when transportation, construction, and nonresidential projects are proposed, and that measures are taken to mitigate potential impacts.

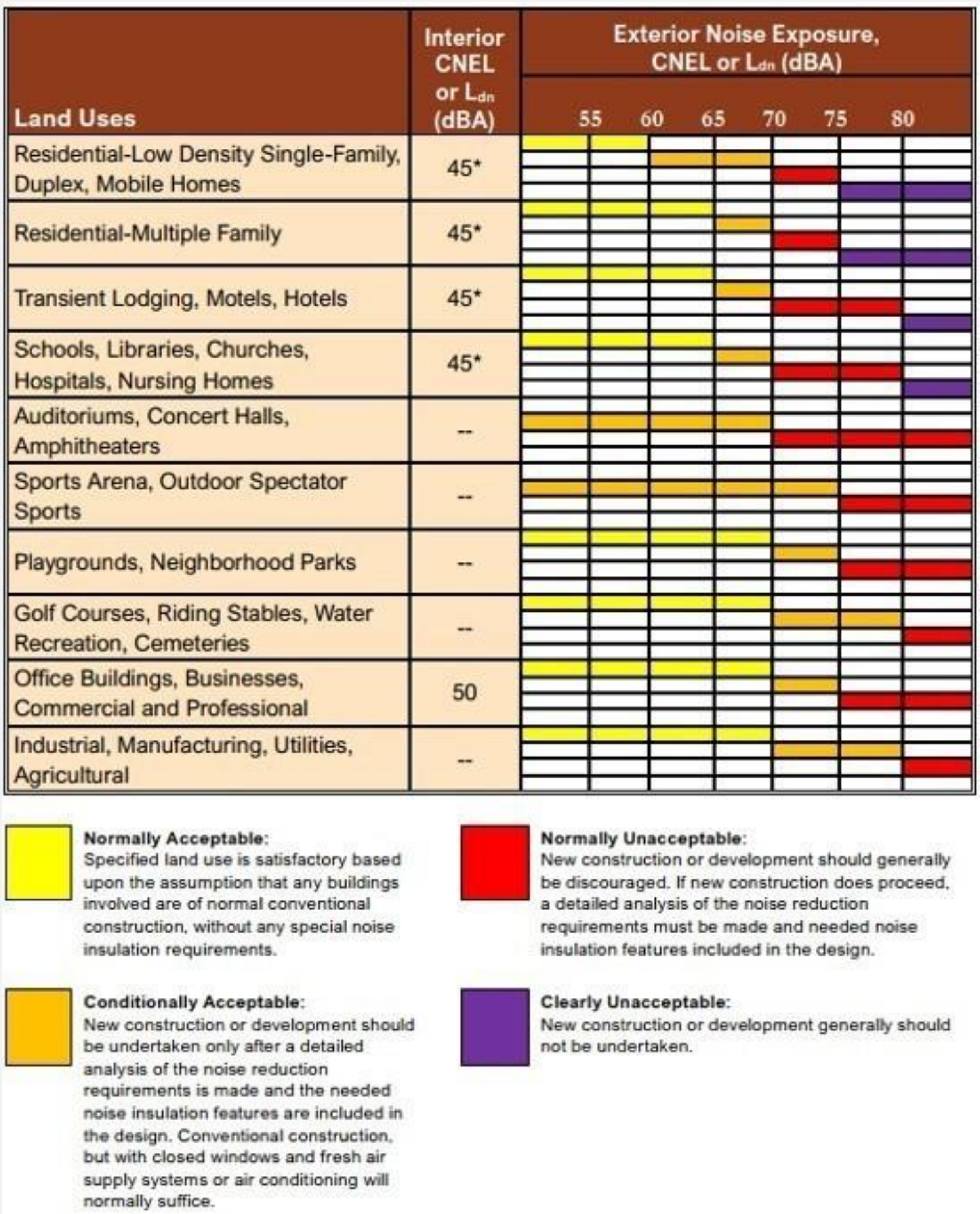
Program N-1.11A: Vibration-Related Conditions of Approval. Adopt Standard conditions of approval in San Rafael Municipal Code Chapter 8.13 (Noise) that apply Federal Transit

Administration (FTA) criteria for acceptable levels of groundborne vibration for various building types. These conditions should:

a) reduce the potential for vibration-related construction impacts for development projects near sensitive uses such as housing, schools, and historically significant buildings.
b) reduce the potential for operational impacts on existing or potential future sensitive uses such as uses with vibration-sensitive equipment (e.g., microscopes in hospitals and research facilities) or residences.

Vibration impacts shall be considered as part of project level environment al evaluation and approval for individual future projects. If vibration levels exceed FTA limits, conditions of approval shall identify construction and operational alternatives that mitigate impacts.

Exhibit D. Noise Compatibility Guidelines for San Rafael



Source: City of San Rafael 2021a

City of San Rafael Noise Ordinance

The City of San Rafael establishes its noise regulations in Chapter 8.13 of its municipal code. Exterior noise limits are based on what is measured at the property of the receiver, the time of day, and the type of sound as reproduced in Table 4 from Table 8.13-1 of Section 8.13.040. These two types of sound are defined in Section 8.13.020 as follows:

- "Constant noise" means a continuous noise produced where there is no noticeable change in the level of the noise source. Examples would include such noises as those associated with air conditioners and pool equipment.
- "Intermittent" noise means repetitive noises where there is a distinction between the onset and decay of the sound. Examples would include hammering and dog barking.

Table 4. City of San Rafael Exterior Noise Limits

Land Use Type(s)	Exterior Noise Limits (dBA) at the Receiving Land Use			
	Daytime[1]		Nighttime[2]	
	Constant[3]	Intermittent[4]	Constant[3]	Intermittent[4]
Residential property	50	60	40	50
Mixed-Use property	55	65	45	55
Commercial property	55	65	55	65
Industrial property	60	70	60	70
Public property	*	*	*	*

Source: City of San Rafael 2002

Notes:

1 Daytime is defined as 7:00 a.m. to 9:00 p.m. Sunday through Thursday and 7:00 a.m. to 10:00 p.m. on Friday and Saturday.

2 Nighttime is defined as 9:00 p.m. to 7:00 a.m. Sunday through Thursday and 10:00 p.m. to 7:00 a.m. on Friday and Saturday.

3 Measured as an energy-equivalent level (L_{eq}).

4 Measured as a maximum sound level (L_{max}).

* The limit is defined as the "most restrictive noise limit applicable to adjoining private property."

Per Section 8.13.050.A of the municipal code and treated as a standard exception to the exterior noise limits shown in Table 4, construction activity and its noise emission is allowed between the hours of seven a.m. (7:00 a.m.) and six p.m. (6:00 p.m.), Monday through Friday, and nine a.m. (9:00 a.m.) and six p.m. (6:00 p.m.) on Saturdays, provided that the noise level at any point outside of the property plane of the project shall not exceed 90 dBA L_{max} (City of San Rafael 2021b). Further, all such activities shall be precluded on Sundays and holidays.

Another exception to the Table 4 limits that would apply to the Project is Section 8.13.050.C that pertains to sound performances and states as follows: "Notwithstanding anything in this chapter to the contrary, on public property or any other open area to which the public has access, whether publicly or privately owned, sound-generating devices or instruments used for any indoor or outdoor sound performances, athletic events, and special events shall be permitted, provided they do not exceed a noise level of eighty (80) dBA measured at a distance of not less than fifty feet (50') from the property plane or such other limit as may be established by any required approvals and permits therefor obtained from the appropriate governmental entity. Except pursuant to an approved special event, street closure or parade permit, the use of any sound-generating device or instrument for such performances or events between the hours of ten p.m. (10:00 p.m.) and ten a.m. (10:00 a.m.) is unlawful."

2.4 Thresholds of Significance

The following significance criteria, included for analysis in this EIR, are based on Appendix G of the State CEQA Guidelines (14 CCR 15000 et seq.), and will be used to determine the significance of potential noise impacts. Noise impacts would be significant if the Project would:

A. 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;
B. Result in generation of excessive groundborne vibration or groundborne noise levels; and
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, result in exposure of people residing or working in the project area to excessive noise levels.

Quantitative thresholds of significance have been established for the purposes of this analysis based on the local policies and regulations described in Section 2.3 and are listed below.

- **Construction Noise** – 90 dBA L_{max} at the Project property line, per the City's noise ordinance. Additionally, the assessment herein evaluates an hourly L_{eq} value associated with predicted Project construction noise and compares it to pre-Project L_{eq} for the purpose of quantifying and disclosing the anticipated increase over baseline ambient environmental sound settings at offsite noise-sensitive receptors. In this context, an increase of more than 10 dB would be considered significant per CEQA impact assessment even if the City's 90 dBA L_{max} regulation was satisfied at the Project property boundary.
- **Construction Vibration** – 72 VdB within the interior of an offsite residential building, which is associated with "frequent events" threshold value per FTA guidance shown in Table 3. For building damage risk to these existing offsite residential buildings, the thresholds would vary by their known or anticipated structural type or condition as presented in Table 3. By way of example, a typical single-family home could reasonably be classified as a type III "non-engineered timber and masonry buildings" and thus have a 0.2 inches per second PPV threshold. Should a home or other receiving structure be classified as potentially historic and thus more sensitive to potential damage, the 0.12 inches per second PPV threshold per Table 3 may be more appropriate to use under the right conditions.
- **Project-attributed Change to Roadway Traffic Noise** – Consistent with the City's General Plan Policy N-1.2, a change to the outdoor noise environment due to Project-attributed changes to existing and future roadway traffic noise greater than 3 dB L_{dn} in a residential area or greater than 5 dB L_{dn} in a non-residential area, or that would cause outdoor ambient noise to exceed 60 dBA L_{dn} at the exteriors of single-family residences or 65 dBA L_{dn} for multi-family land uses unless existing outdoor ambient L_{dn} values already exceed these "normally acceptable" limits as shown in Exhibit D.
- **Project-attributed Stationary Source Noise Emission to the Community** – Consistent with the City's General Plan Policy N-1.2, a change to the outdoor sound environment due to Project-attributed stationary noise sources greater than 3 dB L_{dn} in a residential area or greater than 5 dB L_{dn} in a non-residential area, or that would cause outdoor ambient noise to exceed 60 dBA L_{dn} at the exteriors of single-family residences or 65 dBA L_{dn} for multi-family land uses unless existing outdoor ambient L_{dn} values already exceed these "normally acceptable" limits as shown in Exhibit D. Additionally, under the City's Noise Ordinance, project

stationary source noise as received by residential and mixed-use properties would need to comply with L_{eq} and L_{max} limits appearing in Table 4.

- **Project-attributed Sound Performance Emission to the Community** – When the Project onsite event venue features amplified live performances or playback of pre-recorded music or speech between the hours of 10:00 a.m. and 10:00 p.m., the threshold is 80 dBA Lmax at a distance of fifty feet (50') within the Project boundary. Per 8.13.050.C of the City's municipal code, this limit applies only to the "sound-generating devices" and not crowd noise from participants attending the event.

Quantitative thresholds with respect to evaluating potential adverse noise effects to newly created residential receptors on the Project site as a result of Master Plan and subsequent Vision Plan build-out and based on the local policies and regulations described in Section 2.3 and are listed below.

- **Construction Noise** – 90 dBA L_{max} at the Project property line, per the City's noise ordinance. Additionally, the assessment herein evaluates an hourly L_{eq} value associated with predicted Project construction noise and compares it to pre-Project L_{eq} for the purpose of quantifying and disclosing the anticipated increase over baseline ambient environmental sound settings at future onsite noise-sensitive receptors (i.e., exterior use areas of new residences). In this context, an increase of more than 10 dB would be considered significant per CEQA impact assessment even if the City's 90 dBA L_{max} regulation was satisfied.
- **Construction Vibration** – 72 VdB within the interior of an onsite residential building, which is associated with "frequent events" threshold value per FTA guidance shown in Table 3. Building damage risk to these new residential or mixed-use buildings would likely be associated with the "reinforced-concrete, steel or timber" structural type as presented in Table 3 and would thus have a 0.5 inches per second PPV threshold.
- **Received Roadway Traffic Noise** – Consistent with the City's General Plan Policy N-1.1A, 70 dBA L_{dn} is the maximum exposure level from this sound source.
- **Project-attributed Stationary Source Noise Emission to the Community** – Project stationary noise sources as received by onsite multi-family residential and mixed-use properties would need to comply with L_{eq} and L_{max} limits appearing in Table 4.
- **Project-attributed Sound Performance Emission to the Community** – When the Project onsite event venue features amplified live performances or playback of pre-recorded music or speech between the hours of 10:00 a.m. and 10:00 p.m., impacts to the exterior use areas of future onsite residences would be less than significant if the sound performance noise in those areas did not exceed 80 dBA L_{max}—the same magnitude as that of 8.13.050.C from the City's municipal code as it applies to the "sound-generating devices" from such events in progress.

3 Impact Assessment

3.1 Approach and Methodology

3.1.1 Construction

Noise

To reasonably estimate aggregate Project-attributed construction noise exposure at seven (7) nearest offsite NSR over the course of Project progress, and thus provide input to evaluate an increase in outdoor ambient noise at these positions, the following summarized methodology and assumptions were adopted. Detailed information on the reference source sound levels (from the Federal Highway Administration [FHWA] Roadway Construction Noise Model [RCNM] User's Guide [FHWA 2006]) and the prediction results calculated from a model that emulates RCNM appear in Appendix B.

The predictive analysis herein locates one or multiple sound-emitting sources (i.e., stationary and mobile equipment) associated with a distinct construction activity or phase as a collective single point at an approximate geographic position near the activity boundary considered closest to the set of studied NSR. While the exact positions of these pieces of equipment are unknown at any moment, they would not stray beyond the defined zone or area on which they are expected to work; hence, the single point approximation near the closest boundary to the NSR represents a conservative approach to estimate the aggregate noise level from the construction activity. This method is also used to determine whether or not the Project would comply with the City's limit of 90 dBA L_{max} at the Project boundary.

Due to the size of the Project area and its multiple parcels on which demolition and development activity is expected, this approach predicts noise from each distinct phase or activity when it is expected to occur across the Project schedule at a monthly level of granularity. The assumed schedule of activities is based on estimated time periods provided in the current Project Description. Therefore, the total concurrent noise level at an indicated NSR position for each month is estimated from the logarithmic sum of noise levels from nearby concurrent on-site construction activities associated with Phase 1 Residential Parcels 1, 2, and 3. The studied construction activity locations and the seven NSR appear in Exhibit E. The construction activities that could occur, depending on when they are scheduled as shown in Appendix B, include anticipated operating equipment shown in Table 5. Impact or vibratory pile driving is not needed for the Project and therefore is not included in Table 5. Piles anticipated as part of Project foundations would be cast-in-place and utilize an auger drill rig for installation, which is included in Table 5.

Table 5. Modeled Project Phase 1 Construction Activities and Equipment Types

Activity Name (Abbreviation)	Anticipated Operating Equipment Types*
Site Demolition (SDEMO)	excavator, dozer, hoe-ram, dump truck, welder/torch, jackhammer, flat-bed truck
Site Preparation (SPREP)	excavator, dozer, front-end loader, flat-bed truck
Site Grading (SGRAD)	grader, scraper, front-end loader, flat-bed truck
Rough Roads (RROAD)	grader, scraper, compactor, flat-bed truck
Building Erection (BLDGE)	crane, man-lift, auger drill rig, flat-bed truck, generator, welder/torch

Table 5. Modeled Project Phase 1 Construction Activities and Equipment Types

Activity Name (Abbreviation)	Anticipated Operating Equipment Types*
Final Roads (FROAD)	paver, roller, vacuum street sweeper
Architectural finishes (ARCHF)	air compressor, man-lift, flat-bed truck

Source: Dudek 2021
Notes:
* per Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) designations (FHWA 2006)

Predicted demonstration of compliance with applicable noise standards at the seven studied NSR for these three nearest Project parcels would, on the basis of sound propagation, imply that construction activities at more distant Project parcels or construction zones would also be compliant.

After completion of the Master Plan components of the Project, there would be newly occupied noise-sensitive residences onsite at the buildings represented by Residential Parcels 1, 2, 3 and 4. Residences on the northern façade of the Residential Parcel 1 building would be at least 360 feet horizontally from onsite construction associated with the closest Vision Plan feature: the mixed-use Residential Parcel 6 building. Residences on the northern façade of the Residential Parcel 4 building would be as close as 100 feet horizontally from onsite construction associated with the closest Vision Plan feature: the Residential Parcel 5 building. To assess potential exceedance of the City's noise thresholds at the exteriors or exterior use areas of these Residential Parcel 1 and Residential Parcel 4 buildings, and using the equipment types appearing in Table 5, this study applies an FHWA RCNM emulator to evaluate aggregate construction equipment noise levels by listed phase for both Lmax and Leq, whereby the latter includes application of the equipment "acoustical usage factor" (AUF) that describes—based on FHWA RNCM reference values—what portion of time that equipment is actually working under full load conditions or otherwise emitting noise at its L_{max} value. Construction of other Vision Plan structures and features would be further away and thus expected to cause lower noise exposure levels than these studied onsite assessment scenarios. Similarly, because new occupants of Residential Parcel 2 townhomes and the Residential Parcel 3 building would be more than 360 feet from the construction of nearest Vision Plan features, and new or renovated buildings associated with Master Plan implementation may occlude direct sound paths, construction noise exposure levels at these onsite locations would be lower than the studied scenarios for occupants of Residential Parcel 1. Furthermore, the seven offsite NSR studied for Phase 1 are even more distant and would likely be shielded from onsite noise by newly completed Master Plan buildings, so they are not considered in the Phase 2 construction noise assessment on the basis of expected substantial noise attenuation due to this greater distance and intervening building path occlusion. Prediction results calculated from this RCNM emulator for these two studied onsite scenarios appear in Appendix B.

Vibration

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 California Department of Transportation (Caltrans) guidance. To examine potential building damage risk and thus use PPV as the evaluation metric, vibration velocity level can be estimated with the following expression (FTA 2018): $PPV_{rcvr} = PPV_{ref} * (25/D)^n$ where PPV_{rcvr} is the predicted vibration velocity at the receiver position, PPV_{ref} is the reference value at 25 feet from the vibration source, D is the actual horizontal distance to the receiver, and "n" is the Wiss exponent that FTA defines as 1.5 to generally characterize the propagation of vibration through soil/strata between the source and the receptor position. For evaluating potential annoyance of a building occupant, FTA guidance provides an additional expression using the VdB metric (FTA 2018): $VdB_{rcvr} = VdB_{ref}$ –

30*LOG(D/25) where VdB_{rcvr} is the predicted rms vibration velocity at the receiver position, VdB_{ref} is the reference value at 25 feet from the vibration source, and D is the actual horizontal distance to the receiver.

Exhibit E. Modeled Project Construction Activity Locations (white rectangles) and Noise-Sensitive Receptors (NSR, green oval callouts)

Source: Dudek 2023

3.1.2 Operations

Roadway Traffic Noise

Existing and future roadway noise levels were predicted with algorithms based on the FHWA RD-77-108 report, with adjustments to reflect "Calveno" vehicle noise emission levels (Caltrans 1998) as adopted by Caltrans. From calculation worksheets appearing in Appendix C, key model inputs and assumptions are as follows:

- Existing, baseline, future, future plus Master Plan, and future plus Vision Plan, traffic noise levels are calculated from average daily traffic (ADT) volumes on roadway segments bounded by intersections appearing in the Final Traffic Study (FTS) prepared for the Project and are listed as follows:
  - **Northgate Drive** – Intersections 15 (Northgate Drive and Nova Albion Way) to 16 (Northgate Drive and Los Ranchitos Road)
  - **Northgate Drive** – Intersections 14 (Northgate Drive and El Faisan Drive) to 15 (Northgate Drive and Nova Albion Way)
  - **Northgate Drive** – Intersections 13 (Northgate Drive and Thorndale Drive) to 14 (Northgate Drive and El Faisan Drive)
  - **Northgate Drive** – Intersections 9 (Northgate Drive and Las Gallinas Avenue) to 13 (Northgate Drive and Thorndale Drive)
  - **Las Gallinas Avenue** – Intersections 10 (Del Presidio and Las Gallinas Avenue) to 11 (Merrydale Road and Las Gallinas Avenue)
  - **Las Gallinas Avenue** – Intersections 11 (Merrydale Road and Las Gallinas Avenue) to 16 (Northgate Drive and Las Gallinas Avenue)
  - **Las Gallinas Avenue** – Intersections 8 (Nova Albion Way and Las Gallinas Avenue) to 9 (Northgate Drive and Las Gallinas Avenue)
  - **Las Gallinas Avenue** – Intersections 1 (Las Gallinas Avenue and Manuel T. Freitas Parkway) to 8 (Northgate Drive and Los Ranchitos Road)
  - **Manuel T. Freitas Parkway** – Intersections 1 (Las Gallinas Avenue and Manuel T. Freitas Parkway) to 2 (Northgate Drive and Manuel T. Freitas Parkway)

These above-referenced intersections and roadways appear in Figure 2. Using Caltrans guidance, the ADT for each of the above roadway segments was calculated from morning peak hour (PH) traffic volumes appearing in the FTS. For purposes of this assessment, the proportions of automobile, medium truck, and heavy truck vehicle types of the forecasted traffic volumes on the studied roadway segments are expected to be comparable to those for U.S. Highway 101 (in the vicinity of the Manuel T. Freitas Parkway intersection) as provided by Caltrans (Caltrans 2020b).

- Consistent with Caltrans guidance as a "typical case" (Caltrans 1998, Caltrans 2013) and for purposes of Ldn calculation, this analysis assumes 85% of the ADT occurs during daytime hours (7:00 a.m. to 10:00 p.m.) and 15% during the nighttime hours (10:00 p.m. to 7:00 a.m.).

Stationary Source Noise

Expected sources of noise emission from within the boundary of the Project can include a variety of on-site intermittent acoustical contributors such as modest amplified music from outdoor dining or other commercial areas (or what may be the result of interior space music momentarily emanating from an open door), speech from pedestrians or patrons of an outdoor dining area, audible safety or security alarms, and occasional vehicle door closures and associated low-speed vehicle movements or idling engines on parking areas. But of larger concern are stationary sources of noise such as electro-mechanical equipment (e.g., rooftop heating, ventilating and air-conditioning [HVAC] systems) that must continuously operate to provide required ventilation and reliable indoor comfort for Project residential and non-residential uses. And, the Town Square area and its partially covered outdoor stage is configured to host occasional live musical performances or comparable events with substantial speech or music reinforcement. Therefore, this stationary operational noise analysis broadly considers five scenarios for each Project phase (i.e., Master Plan and Vision Plan) as follows:

- **Typical daytime conditions** – during daytime or "business hours" (i.e., between 7:00 a.m. and 9:00 p.m. on Sundays through Thursdays, and between 7:00 a.m. and 10:00 p.m. on Fridays and Saturdays), this includes steady-state noise emission from operating outdoor-exposed building HVAC (anticipated rooftop air handling unit [AHU] fans and air-cooled chiller [ACC] units) for all residential and non-residential buildings onsite.
- **Typical daytime conditions with a Town Square event in progress** – same as the above "typical daytime conditions" scenario, but with the added average acoustical contribution from the voices of up to 200 spectators at an average "raised normal speech" level (Hayne 2006) for a cumulative duration of half a given hour during a Town Square event. The operating sound-producing apparatus located at the stage area of the Town Square event venue space is not included as it would be subject to Section 8.13.050.C of the City's municipal code.
- **Sound generation from Typical daytime Town Square event in progress** – this scenario evaluates the sound production from a live-performing musical act (or playback of pre-recorded speech or music) with all speakers and related equipment that, in total, yield up to 123 dBA sound power level [e.g., based upon operation of one Mackie "Thump Go" 200-watt speaker at maximum setting or comparable acoustic energy from a distributed speaker set] from the Town Square event venue stage area.
- **Typical nighttime conditions** – during nighttime or "non-business hours" (i.e., between 9:00 p.m. and 7:00 a.m. on Sundays through Thursdays, and between 10:00 p.m. and 7:00 a.m. on Fridays and Saturdays), this includes steady-state noise emission from operating outdoor-exposed building HVAC (anticipated rooftop AHU fans and ACC units for only residential buildings onsite. This assessment assumes that major noise-producing mechanical equipment serving non-residential buildings would not be operating during these non-business hours, since such equipment is typically set to operate only when such structures are occupied or a short duration prior to occupancy to correct for interior temperature drift (Murphy and Maldeis 2009). Hence, these HVAC systems would not generate noise during these periods. There would neither be any Town Square event in progress (per the preceding scenario) during these nighttime hours.
- **Typical nighttime conditions with Occupied Cinema** – this is the same as the "typical nighttime conditions" scenario above, but includes operation of rooftop HVAC systems associated with the onsite Cinema—should its theatre spaces be occupied during final showings on a given night after 10:00 p.m.—as being a representative example (and the likely acoustically dominant one, given its anticipated larger and/or greater quantities of rooftop HVAC equipment) of the potential for some onsite commercial establishments (e.g. restaurants) to be operating or winding-down operations during a nighttime hour (i.e., after 10:00 p.m.)

Prediction of stationary operational noise from stationary major sources of sound-producing mechanical equipment (e.g., rooftop HVAC systems) attributed to the Project involved usage of the Datakustik Computer Aided Noise Abatement (CadnaA) sound propagation model. CadnaA is a commercially available software program for the calculation, presentation, assessment, and prediction of environmental noise based on algorithms and reference data per International Organization of Standardization (ISO) Standard 9613-2, "Attenuation of Sound During Propagation Outdoors, Part 2: General Method of Calculation" (ISO 1996).

Supported by design-level details of HVAC systems for new residential and non-residential buildings constructed as a result of implementing the Project phases available as of this time, this noise assessment presumes that most HVAC noise would be generated from rooftop equipment exposed to the outdoors. Hence, estimated reference sound pressure levels from AHU fans and ACC units were entered into the CadnaA computer model space as area-type sources of sound emission atop rendered "blocks" of building masses having heights consistent with elevations described in the Project Description. These AHU and ACC reference sound level estimates were calculated with mathematical expressions and reference data that rely upon expected Project building function and gross square footage (Storm 2018 and 2021).

In addition to the above-mentioned sound source inputs and building-block structures that define the three-dimensional sound propagation model space, the following assumptions and parameters are included in this CadnaA-supported stationary noise source assessment:

- Ground effect acoustical absorption coefficient equal to 0.5, which intends to represent an average or blending of ground covers that include hard reflective pavements and soft absorptive vegetated soils across the Project site and the surroundings;
- Reflection order of 1, which allows for a single reflection of sound paths on encountered structural surfaces such as the modeled building masses;
- Off-site residential structures and the commercial buildings have not been rendered in the model;
- Topography surrounding the Project site, such as the upward slope west of the Project site, has been approximated with a set of sample points featuring elevation values gleaned from online mapping tools; and
- Calm meteorological conditions (i.e., no wind) with 68 degrees Fahrenheit and 70% relative humidity.

Details of the CadnaA modeling input parameters (e.g., sources and buildings) and calculations for estimating equipment sound levels can be found in Appendix D.

Vibration

Once operational, the Project would not be expected to feature major onsite producers of groundborne vibration. Anticipated mechanical systems like HVAC systems and pumps are designed and manufactured to feature rotating and reciprocating components (e.g., engines, bladed fans, impellers) that are well-balanced with isolated vibration within or external to the equipment casings. On this basis, potential vibration impacts due to Project operation are not expected to be significant and have not been evaluated herein.

3.2 Analysis

The following noise and vibration impact analysis sections are arranged in the same order as the three aforementioned CEQA Appendix G checklist assessment criteria with abbreviated headings.

A. Generation of substantial temporary or permanent increase in noise levels?

Construction Noise (Temporary)

The noisiest expected onsite Project construction activities studied here are associated with the Site Demolition phase. This assessment conservatively assumes that during this phase, all seven listed anticipated equipment types as shown in Table 5 are operating concurrently at or near a single location or within a shared zone that is no closer than 50 feet to the Project boundary, consistent with the approach described in Appendix B. However, the noisiest two types of equipment, a hoe-ram and a jackhammer, would not be needed or used any closer to the Project boundary than 150 feet because there are no poured concrete buildings to be demolished in these areas. Therefore, the logarithmic sum of noise emission from these two equipment types at 150 feet and noise emission from the five other equipment types at a distance of 50 feet would not exceed 88 dBA L_{max} at the Project boundary. For this reason, and because all other phases or groupings of concurrently operating noise-emitting construction processes studied herein involve fewer and/or quieter pieces of equipment, the Project would comply with the City's significance threshold of 90 dBA L_{max} at the Project boundary.

While some construction equipment may actually operate onsite at distances closer than 50 feet to the Project boundary, they are expected to be smaller and/or less powerful than those studied in the listed phases appearing in Table 5. For example, and as elaborated within Appendix B, a typical equipment pair operating as close as 15 feet to the Project property line would comprise a 14-ton rated excavator and an 8-ton rated loader working together and be predicted to have a combined noise level of 79 dBA at the property line and thus well below the City's 90 dBA L_{max} standard. Furthermore, by having a predicted sound level 11 dB less than the City's standard, the combined noise from this pair of smaller equipment operating nearer to the project boundary than those listed in Table 5 would, on the basis of logarithmic addition, have a negligible cumulative effect that would not compromise Project construction noise compliance as discussed in the following paragraphs. By way of illustration, the site demolition phase 88 dBA L_{max} value at the Project property line estimated in the preceding paragraph added logarithmically to 79 dBA estimate for the smaller excavator-and-loader pairing would result in 88.5 dBA and thus still be compliant with the City's limit.

Table 6 presents highest predicted hourly L_{eq} construction noise level exposures for the indicated construction schedule periods at the seven studied NSR nearest to anticipated concurrent construction of features associated with Master Plan (a.k.a., Phase 1) Residential Parcels 1, 2, and 3.

Table 6. Predicted Phase 1 Construction Noise (hourly L_{eq}) at Nearest Offsite Noise Sensitive Receptors

Studied Receptor* (Description)	Range or Highest Predicted L_{eq} (dBA)	Anticipated Project Construction Month(s) during Highest L_{eq}
RND1 (AlmaVia of San Rafael)	80	August-October 2024
	78	March-July 2024

Table 6. Predicted Phase 1 Construction Noise (hourly L_{eq}) at Nearest Offsite Noise Sensitive Receptors

Studied Receptor* (Description)	Range or Highest Predicted L_{eq} (dBA)	Anticipated Project Construction Month(s) during Highest L_{eq}
	56 to 71	all other periods of schedule
RSA1 (Sao Augustine Way)	79	July-September 2024
	77	February-June 2024
	58 to 71	all other periods of schedule
RSA2 (Sao Augustine Way)	80	July-September 2024
	78	February-June 2024
	56 to 71	all other periods of schedule
RSA3 (Sao Augustine Way)	76 to 77	July-September 2024
	74 to 75	February-June 2024
	55 to 67	all other periods of schedule
RNA1 (Nova Albion Way)	79	July-September 2024
	77	February-June 2024
	69 to 70	November 2024 to June 2026
	54 to 63	all other periods of schedule
RLP1 (La Perdiz Court)	68 to 69	June-August 2024
	64 to 67	January-May 2024, Sept. 2024
	49 to 63	all other periods of schedule
RLP2 (La Perdiz Court)	69 to 72	January-August 2024
	66	September 2024
	49-63	all other periods of schedule

Source: Dudek 2023
Notes: dBA = A-weighted decibels, L_{eq} = energy-equivalent sound level.
* as appearing in Exhibit E, and assessed at apparent property boundary

Table 7 presents the estimated pre-Project hourly L_{eq} values at the same Table 6 listed studied offsite receptors, the predicted Project-attributed Phase 1 construction hourly L_{eq} values from Table 6, the logarithmic sums of these two values, and the corresponding hourly L_{eq} increases (i.e., the arithmetic difference between the log-sum value and the existing sound level).

Table 7. Predicted Phase 1 Increase of Outdoor Ambient Noise at Offsite Receptors

Studied Receptor* (Construction Period)	Existing Hourly L_{eq} (dBA)	Highest Phase 1 Hourly L_{eq} (dBA)	Log-sum of Existing and Phase 1 Hourly L_{eq} (dBA)	Increase over Existing (dB)	Potentially Significant Impact?
RND1 (August-October 2024)	63.4	80	80.1	16.7	yes
RND1 (March-July 2024)	63.4	78	78.1	14.7	yes
RND1 (remaining schedule)	63.4	71	71.7	8.3	no
RSA1 (July-September 2024)	64.3	79	79.1	14.8	yes
RSA1 (February-June 2024)	64.3	77	77.2	12.9	yes

Table 7. Predicted Phase 1 Increase of Outdoor Ambient Noise at Offsite Receptors

Studied Receptor* (Construction Period)	Existing Hourly L_{eq} (dBA)	Highest Phase 1 Hourly L_{eq} (dBA)	Log-sum of Existing and Phase 1 Hourly L_{eq} (dBA)	Increase over Existing (dB)	Potentially Significant Impact?
RSA1 (remaining schedule)	64.3	71	71.8	7.5	no
RSA2 (July-September 2024)	64.3	80	80.1	15.8	yes
RSA2 (February-June 2024)	64.3	78	78.2	13.9	yes
RSA2 (remaining schedule)	64.3	71	71.8	7.5	no
RSA3 (July-September 2024)	64.3	77	77.2	12.9	yes
RSA3 (February-June 2024)	64.3	75	75.4	11.1	yes
RSA3 (remaining schedule)	64.3	67	68.9	4.6	no
RNA1 (July-September 2024)	64.3	79	79.1	14.8	yes
RNA1 (February-June 2024)	64.3	77	77.2	12.9	yes
RNA1 (Nov. 2024 to June 2026)	64.3	70	71.0	6.7	no
RNA1 (remaining schedule)	64.3	63	66.7	2.4	no
RLP1 (June-August 2024)	53.6	69	69.1	15.5	yes
RLP1 (Jan.-May 2024, Sept. 2024)	53.6	67	67.2	13.6	yes
RLP1 (remaining schedule)	53.6	63	63.5	9.9	no
RLP2 (June-August 2024)	53.6	72	72.1	18.5	yes
RLP2 (January-May 2024)	53.6	70	70.1	16.5	yes
RLP2 (September 2024)	53.6	66	66.3	12.7	yes
RLP2 (remaining schedule)	53.6	63	63.5	9.9	no

Source: Dudek 2023
Notes: dBA = A-weighted decibels, L_{eq} = energy-equivalent sound level.
* as appearing in Exhibit E, and assessed at apparent property boundary

Table 7 illustrates at which studied offsite receptors, and within which construction periods, Project-attributed construction noise hourly L_{eq} would cause an increase in the outdoor ambient sound level to be greater than existing estimated hourly L_{eq} by more 10 dB and thereby result in a significant impact based on the 10 dB relative increase noise criterion. Application of mitigation measure MM NOI-1 would reduce these predicted increases in outdoor ambient noise level at these closest offsite noise-sensitive receptors to less than or equal to 10 dB and thus yield a less than significant impact.

Table 8 presents highest predicted L_{max} noise level exposures from onsite Vision Plan (Phase 2) construction activities at the two nearest onsite NSR: residences overlooking the activity from an upper floor Residential Parcel 1 unit, and an upper floor Residential Parcel 4 unit. These upper floor receptors were modeled to be conservative. Although the horizontal source-to-receptor distances may be comparable with respect to a noise source location, the Phase 2 construction noise prediction worksheets appearing in Appendix B demonstrate that the estimated exposure levels at a ground-floor receptor (i.e., at five feet above local grade) are slightly less than those predicted for an upper floor receptor because the latter receptor experiences less ground-based acoustical absorption effect.

Table 8. Predicted Project Phase 2 Construction Phase Noise Levels (L_{max}) at Phase 1 Onsite Receptors

Activity Name (Abbreviation)	Highest Predicted L_{max} (dBA)	
	Nearest Residential Parcel 1 Receiver	Nearest Residential Parcel 4 Receiver
Site Demolition (SDEMO)	73	86
Site Preparation (SPREP)	66	80
Site Grading (SGRAD)	69	82
Rough Roads (RROAD)	69	82
Building Erection (BLDGE)	67	80
Final Roads (FROAD)	64	78
Architectural finishes (ARCHF)	61	75

Source: Dudek 2023
Notes: dBA = A-weighted decibels, L_{max} = maximum sound level.

The predicted L_{max} values appearing in Table 8 are all less than the City's 90 dBA L_{max} construction noise limit and are hence compliant. Table 9 presents the following values at the same two studied sample upper floor onsite receptors associated with Residential Parcel 1 and Residential Parcel 4: 1) estimated pre-Project hourly L_{eq} values for 2025 as predicted in the forthcoming discussion of onsite traffic noise; 2) the predicted Phase 2 construction noise levels, and 3) the resulting increase in outdoor ambient noise level due to Phase 2 Project construction—i.e., the log-sum value of the preceding 1 (background) and 2 (construction), arithmetically minus the background-only value. As shown in Table 9, the Parcel 1 nearest residence is not predicted to experience more than a 4.6 dB increase to the outdoor ambient sound level and on that basis would experience a less than significant impact per the 10 dB L_{eq} relative increase noise criterion. At the nearest Parcel 4 residence, Table 9 shows that the first five phases of Phase 2 construction may cause an increase to the daytime outdoor ambient hourly L_{eq} of more than 10 dB, which means noise reduction options appearing in mitigation measure MM-NOI-1 would be needed to reduce this L_{eq} increase to no more than 10 dB and thus yield a less than significant impact.

Table 9. Predicted Project Phase 2 Construction Phase Noise Levels (hourly Leq) at Phase 1 Onsite Receptors

Activity Name (Abbreviation)	Occupied Phase 1 (Master Plan) Receptors					
	Nearest Residential Parcel 1			Nearest Residential Parcel 4		
	Estimated hourly L_{eq} in 2025 (dBA)	*Highest Predicted Construction Noise hourly L_{eq} (dBA)*	*Increase in Outdoor Ambient Noise (dB)*	*Estimated hourly L_{eq} in 2025 (dBA)*	*Highest Predicted Construction Noise hourly L_{eq} (dBA)*	*Increase in Outdoor Ambient Noise (dB)*
Site Demolition (SDEMO)	64.2	67	4.6	63.6	80	16.5
Site Preparation (SPREP)	64.2	62	2.0	63.6	76	12.6
Site Grading (SGRAD)	64.2	65	3.4	63.6	78	14.6
Rough Roads (RROAD)	64.2	65	3.4	63.6	78	14.6
Building Erection (BLDGE)	64.2	61	1.7	63.6	74	10.8
Final Roads (FROAD)	64.2	58	0.9	63.6	71	8.1

Table 9. Predicted Project Phase 2 Construction Phase Noise Levels (hourly Leq) at Phase 1 Onsite Receptors

Activity Name (Abbreviation)	Occupied Phase 1 (Master Plan) Receptors					
	Nearest Residential Parcel 1			Nearest Residential Parcel 4		
	Estimated hourly L_{eq} in 2025 (dBA)	*Highest Predicted Construction Noise hourly L_{eq} (dBA)*	*Increase in Outdoor Ambient Noise (dB)*	*Estimated hourly L_{eq} in 2025 (dBA)*	*Highest Predicted Construction Noise hourly L_{eq} (dBA)*	*Increase in Outdoor Ambient Noise (dB)*
Architectural finishes (ARCHF)	64.2	57	0.8	63.6	70	7.3

Source: Dudek 2023
Notes: dBA = A-weighted decibels, L_{eq} = energy-equivalent sound level.

Operation Noise (Durable)

Changes to Offsite Roadway Traffic

The following three Tables (10 through 12) present the prediction results for five evaluated scenarios as follows:

- **Baseline plus Master Plan** – a contrast of the predicted traffic noise levels at 50 feet from the listed studied roadway segment under baseline conditions versus baseline conditions that include traffic changes due to Master Plan build-out of the Project expected in 2025.
- **Future plus Master Plan** – a contrast of the predicted traffic noise levels at 50 feet from the listed studied roadway segment under future conditions versus baseline conditions that include traffic changes due to Master Plan build-out of the Project expected in 2025.
- **Future plus Vision Plan** – a contrast of the predicted traffic noise levels at 50 feet from the listed studied roadway segment under future conditions versus baseline conditions that include traffic changes due to Vision Plan build-out of the Project expected in 2040.

Table 10. Predicted Roadway Noise Change – Baseline plus Master Plan (2025)

Modeled Roadway Segment	Baseline L_{dn} at 50 feet (dBA)	Baseline + Master Plan L_{dn} at 50 feet (dBA)	Change in Traffic Noise Level (dB)	Compliant with City General Plan?
Northgate Drive (Intersections 15 to 16)	61.8	62.8	0.9	yes
Northgate Drive (Intersections 14 to 15)	62.0	62.9	0.9	yes
Northgate Drive (Intersections 13 to 14)	62.0	63.0	1.0	yes
Northgate Drive (Intersections 9 to 13)	62.8	63.5	0.6	yes
Las Gallinas Avenue (Intersections 8 to 9)	67.1	67.4	0.4	yes
Las Gallinas Avenue (Intersections 1 to 8)	65.8	65.9	0.1	yes
Manuel T. Freitas Parkway (Intersections 1 to 2)	74.3	74.4	0.1	yes

Source: Dudek 2023
Notes: dBA = A-weighted decibels, L_{dn} = day-night sound level.

Table 11. Predicted Roadway Noise Change – Future plus Master Plan (2025)

Modeled Roadway Segment	Future L_{dn} at 50 feet (dBA)	Future + Master Plan L_{dn} at 50 feet (dBA)	Change in Traffic Noise Level (dB)	Compliant with City General Plan?
Northgate Drive (Intersections 15 to 16)	62.9	63.6	0.7	yes
Northgate Drive (Intersections 14 to 15)	63.4	64.1	0.7	yes
Northgate Drive (Intersections 13 to 14)	63.4	64.2	0.7	yes
Northgate Drive (Intersections 9 to 13)	64.0	64.5	0.5	yes
Las Gallinas Avenue (Intersections 8 to 9)	67.9	68.2	0.3	yes
Las Gallinas Avenue (Intersections 1 to 8)	66.6	66.6	< 0.1	yes
Manuel T. Freitas Parkway (Intersections 1 to 2)	74.9	75.0	0.1	yes

Source: Dudek 2023
Notes: dBA = A-weighted decibels, L_{dn} = day-night sound level.

Table 12. Predicted Roadway Noise Change – Future plus Vision Plan (2040)

Modeled Roadway Segment	Future L_{dn} at 50 feet (dBA)	Future + Vision Plan L_{dn} at 50 feet (dBA)	Change in Traffic Noise Level (dB)	Compliant with City General Plan?
Northgate Drive (Intersections 15 to 16)	62.9	63.5	0.6	yes
Northgate Drive (Intersections 14 to 15)	63.4	63.9	0.5	yes
Northgate Drive (Intersections 13 to 14)	63.4	63.9	0.5	yes
Northgate Drive (Intersections 9 to 13)	64.0	64.2	0.1	yes
Las Gallinas Avenue (Intersections 8 to 9)	67.9	68.3	0.4	yes
Las Gallinas Avenue (Intersections 1 to 8)	66.6	66.7	0.1	yes
Manuel T. Freitas Parkway (Intersections 1 to 2)	74.9	75.0	0.1	yes

Source: Dudek 2023
Notes: dBA = A-weighted decibels, L_{dn} = day-night sound level.

For all three studied traffic noise scenarios that involve contribution from the Project, changes to the traffic noise levels (expressed as an L_{dn} value) at noise sensitive receivers along the studied roadway segments would be less than 3 dB and thus compliant with the City's 2040 General Plan. As such, these predictions indicate that Project changes to community traffic noise levels would represent a less than significant impact.

Future Occupant Exposures to Offsite Roadway Traffic: Information Only

The potential exposure of proposed project occupants to existing off-site conditions such as traffic noise is not a CEQA concern and is presented here only for informational purposes.

Sequential implementation of the Master Plan and Vision Plan will introduce new residential-type NSR on the Project site locations near all four of the Northgate Drive roadway segments studied in the preceding three Tables (10, 11, and 12). Several newly occupied units in upper floors of Project buildings associated with Residential Parcels 1, 2, 3, and 6 would have exterior facades or, in some cases, usable outdoor spaces located as horizontally close as fifty feet (50') to the Northgate Drive roadway centerline. Estimated traffic noise level exposures, in terms of L_{dn} value, from Northgate Drive would thus be comparable to the values in Tables 10, 11, and 12 for the four Northgate Drive segments. By way of example, from Table 12, the “Future + Vision Plan” L_{dn} values at 50 feet for the Northgate Drive segments between intersections 15-16, 14-15, 13-14, and 9-13 range from 62.9 to 64.0 L_{dn}.

As shown in Section 2.3.3., Program N-1.1A Residential Noise Standards from the City’s General Plan guidance expects maintenance of a maximum noise standard of 70 L_{dn} for backyards, decks, and common/usable outdoor spaces in residential and mixed-use areas. This City planning standard means that the predicted traffic noise exposure levels of 62.9 to 64.0 L_{dn} at nearest receiving onsite residences would be compliant.

Sequential implementation of the Master Plan and Vision Plan will also introduce new residential-type NSR on the Project site locations near Las Gallinas Avenue segments between Del Presidio (intersection 10) and Merrydale Road (intersection 11), and Merrydale Road and Northgate Drive (intersection 16). Several newly occupied units in upper floors of Project buildings associated with Residential Parcels 3, 4 and 5 would have exterior facades or, in some cases, usable outdoor spaces located as horizontally close as fifty feet (50’) to the Las Gallinas Avenue roadway centerline. Estimated traffic noise level exposures, in terms of L_{dn} value, from Las Gallinas at this distance appear in Appendix B calculations and range between 63.5 dBA and 63.9 dBA would thus be less than the City’s General Plan guidance standard of 70 L_{dn} for backyards, decks, and common/usable outdoor spaces in residential and mixed-use areas and correspondingly compliant.

Upper-floor occupied units of the Residential Parcel 5 building with eastern exteriors facing the U.S. 101 highway would be exposed to its traffic noise levels, but as predicted in Appendix B, the estimated exposure level is 69.5 dBA L_{dn} and thus also compliant with the City’s 70 dBA L_{dn} standard for compatibility.

As indicated in the City’s Noise Compatibility Guidelines, reproduced herein as Exhibit D, proposed multi-family residential development exposed to exterior noise levels ranging from 65 to 70 dBA L_{dn} would be considered “conditionally acceptable” and “conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice” with respect to ensuring a provided background interior sound level of 45 dBA L_{dn} for such inhabited spaces. Proposed Project residential units include such building shell components and interior comfort mechanical systems.

Stationary Sources

Offsite NSR

Table 13 presents the predicted noise exposure levels (expressed as hourly L_{eq} values) attributed to Project onsite stationary sources (i.e., rooftop HVAC and parking areas) at the four representative nearest offsite NSR for each of the ten studied scenarios: Master Plan (2025) daytime, Master Plan (2025) daytime with a Town Square Event, Master Plan (2025) Town Square Event Sound Reinforcement, Vision Plan (2040) daytime, Vision Plan (2040) daytime with a Town Square Event, Vision Plan (2040) Town Square Event Sound Reinforcement, Master Plan (2025) nighttime, Master Plan (2025) nighttime with Cinema operations, Vision Plan (2040) nighttime, and Vision Plan (2040) nighttime with Cinema operations. Figures 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 6A, and 6B correspondingly illustrate (for these same scenarios, respectively) predicted Project stationary equipment operation sound levels across a horizontal plane approximately five feet above grade (i.e., a typical pedestrian listening elevation). The nighttime-with-Cinema operation scenarios presume that the Cinema is fully occupied, and thus involves rooftop HVAC operating at capacities (and thus generating noise) comparable to that during daytime hours. While there may be other commercial establishments (e.g., restaurants) onsite and operating during a nighttime hour, their outdoor-exposed HVAC noise emissions are anticipated to be much less than that of the Cinema due primarily to their lesser occupancy levels and smaller enclosed building volumes.

Table 14 presents both the existing or pre-Project L_{dn} values at the same four offsite NSR and the Project operations L_{dn} values derived from the predicted hourly noise levels appearing in Table 13 for four cases representing the product of two pairs of possible conditions: with and without the Town Square Event in progress, and with and without the Cinema operating during a nighttime hour (i.e., after 10:00 p.m.).

Table 13. Predicted Project Stationary Source Hourly Noise Levels at Offsite Sensitive Receptors

Studied Scenario	Hourly L_{eq} (dBA) at Modeled Offsite Representative Receiver (and Baseline Survey Location from Table 2)			
	AlmaVia of San Rafael (ST1)	Nova Albion Way (ST2)	Quail Townhouses (ST3)	Villa Marin (ST4)
Master Plan (2025)				
Master Plan Daytime	39	39	40	38
Master Plan Daytime with Town Square Event in progress	39	39	40	38
Master Plan Town Square Event Sound Reinforcement*	45	49	58	56
Master Plan Nighttime	38	38	37	34
Master Plan Nighttime with Cinema	38	38	38	36
Vision Plan (2040)				
Vision Plan Daytime	39	39	41	39
Vision Plan Daytime with Town Square Event in progress	39	39	41	39
Vision Plan Town Square Event Sound Reinforcement*	44	49	57	56
Vision Plan Nighttime	38	38	40	37
Vision Plan Nighttime with Cinema	39	39	40	38

Source: Dudek 2023
Notes: dBA = A-weighted decibels.
*added here for informational purposes, since such sound reinforcement is subject to Section 8.13.050.C of the City's noise ordinance, not the exterior noise limits appearing in Table 4.

Table 14. Predicted Project Stationary Source Ldn Values at Offsite Sensitive Receptors

Studied Scenario and Ldn Calculation Parameter	L_{dn} (dBA) at Modeled Offsite Representative Receiver (and Baseline Survey Location from Table 2)			
	AlmaVia of San Rafael (ST1)	Nova Albion Way (ST2)	Quail Townhouses (ST3)	Villa Marin (ST4)
Existing Outdoor Ambient Ldn* (dBA)	**62.9**	**63.8**	**53.1**	**48.2**
Project Operations Noise - Master Plan (2025)				
Daytime w/out Town Square Event and Nighttime w/out Cinema operations	44.6	44.6	44.4	40.9
Daytime with Town Square Event and Nighttime w/out Cinema operations	44.9	45.5	49.3	46.8
Daytime w/out Town Square Event and Nighttime with Cinema operations	44.6	44.7	44.5	41.4
Daytime with Town Square Event and Nighttime with Cinema operations	44.9	45.5	49.4	47.0
Project Operations Noise - Vision Plan (2040)				
Daytime w/out Town Square Event and Nighttime w/out Cinema operations	44.9	45.0	46.6	43.7
Daytime with Town Square Event and Nighttime w/out Cinema operations	45.1	45.8	49.3	47.3
Daytime w/out Town Square Event and Nighttime with Cinema operations	44.9	45.0	46.7	43.9
Daytime with Town Square Event and Nighttime with Cinema operations	45.1	45.8	49.4	47.4

Source: Dudek 2023

Notes: dBA = A-weighted decibels, L_{dn} = day-night sound level.

*These Ldn values are derived from the baseline outdoor sound level measurement survey, by comparing the measured L_{eq} during concurrent timeframes between the ST1, ST2, ST3, and ST4 survey positions and the LT1 location and assume that these arithmetic decibel differences would—if largely attributed to background roadway traffic noise—correspondingly be consistent for each hour during the course of a 24-hour period and thus be a similar decibel add or reduction to the LT1 calculated Ldn of 59.3 dBA.

As modeled herein for purposes of this assessment, all predicted daytime hourly noise levels at the four nearest representative offsite NSR locations as presented in Table 13 are less than the City's 50 dBA threshold. At night, when operating HVAC systems and parking garage activities associated with the non-residential land uses are not contributing to the aggregate noise emission, predicted operation noise levels shown in Table 13 do not exceed the City's 40 dBA hourly L_{eq} threshold and would therefore comply with City's noise ordinance. When the Cinema may be occupied during a nighttime hour and thus contributes its rooftop HVAC noise to the nighttime operation scenario, the predicted levels are still compliant with the City's noise ordinance.

The predicted hourly L_{eq} values due to sound reinforcement (i.e., speakers) during a Town Square Event are presented for informational purposes in Table 13, since they are exempt from daytime and nighttime exterior noise thresholds presented in Table 4. Figures 4C and 5C show that the noise emission from these sound reinforcement systems at the Town Center stage area would be compliant with 80 dBA Lmax limit at a distance of 50 feet from the Project boundary, and thus compliant with Section 8.13.050.C of the City's municipal code.

With respect to the City's General Plan Noise Element expectation of no more than a 3 dB increase to the pre-existing L_{dn} value, the calculated L_{dn} values for the Master Plan and Vision Plan operation scenarios shown in Table 14 are all less than the existing L_{dn} values for the four studied offsite receptors and would therefore, based on the principle of logarithmic addition, make no more than a 3 dB change to the existing L_{dn} values. For purposes of this L_{dn} calculation and value comparison with non-Project conditions, the sound from the Town Square event in progress is included (i.e., both spectator speech and from the speech/music reinforcement systems at the stage) and expected to last no more than two hours. Additionally, the Cinema is anticipated to operate for up to two hours at night when that condition occurs.

Onsite NSR

Table 15 presents the predicted hourly L_{eq} noise exposure levels attributed to Project onsite stationary sources (i.e., rooftop HVAC and parking areas) at a variety of nine (9) sample onsite NSR for each of the five studied Master Plan (2025) scenarios: daytime, daytime with a Town Square Event, Town Square Event Sound Speakers (informational only), nighttime, and nighttime with Cinema operations. These sample onsite receptors in Table 9 were selected at upper floors, since they would more likely be nearer to and (depending on line of sight) potentially directly exposed to modeled rooftop HVAC noise emission sources. Figures 3A, 3B, 3C, 5A, and 5B correspondingly illustrate (for these same scenarios, respectively) predicted Project stationary equipment operation sound levels across a horizontal plane approximately five feet above grade (i.e., a typical pedestrian listening elevation).

Table 15. Predicted Project Stationary Source Noise Levels at Sample Onsite Sensitive Receptors – Master Plan Scenarios

Modeled Onsite Representative Sensitive Receiver	Hourly L_{eq} (dBA) for Master Plan (2025) Studied Stationary Operations Noise Scenario				
	Daytime	Daytime with Town Square Event	Town Square Event Sound Speakers	Nighttime	Nighttime with Occupied Cinema
Res. Parcel 1 - upper floor, northern (RP1N)	47.1	47.1	62.8	44.8	46.4
Res. Parcel 1 - upper floor, southern (RP1S)	42.8	42.8	53.1	41.4	41.4
Res. Parcel 2 - upper floor, townhome #11 (RP2B11)	44.3	44.3	56.1	40.0	42.7
Res. Parcel 2 - upper floor, townhome #13 (RP2B13)	45.0	45.1	60.1	42.3	43.9
Res. Parcel 2 - upper floor, townhome #3 (RP2B3)	39.4	39.4	46.6	39.2	39.3
Res. Parcel 3 - upper floor northern (RP3N)	46.6	46.6	55.7	46.2	46.2
Res. Parcel 3 - upper floor southern (RP3S)	43.9	43.9	52.7	43.9	43.9
Res. Parcel 4 - upper floor eastern (RP4E)	48.5	48.6	58.8	48.4	48.5
Res. Parcel 4 - upper floor western (RP4W)	51.2	51.7	75.5	45.3	50.0

Source: Dudek 2023
Notes: dBA = A-weighted decibels, Leq = energy-equivalent sound level, Res. = residential.

As modeled herein for purposes of this assessment, all daytime sound levels at representative upper-floor onsite NSR locations listed in Table 15 comply with the City's 55 dBA threshold for "constant" type sounds (e.g., air-conditioning [see Section 2.3.3 bullets preceding Table 4]) as received by mixed-use land uses. Noise from daytime amplified Town Square events would exceed 55 dBA Leq at five of the on-site NSRs but do not exceed the significance threshold due to the City's exemption of these noise sources from its general 55 dBA Leq threshold. At night, four predicted operation noise levels received by onsite mixed-use land uses slightly exceed the City's 45 dBA hourly L_{eq} threshold and would therefore not comply with City's noise ordinance without some applied noise reduction or other project design feature. For these reasons, there is an apparent need for noise reduction of onsite outdoor-exposed HVAC systems, subsurface parking level ventilation systems, and/or at or above-grade exposed parking areas that is detailed under Section 5 of this study as MM-NOI-2. Nevertheless, such noise mitigation may not be sufficient to attain these predicted noise reduction needs at all of these affected future onsite residential receptors. The resulting impact is therefore considered significant and potentially unavoidable.

The loudest sound levels from Town Square speakers during an event are predicted to be less than 80 dBA and would thus be considered compliant with Section 8.13.050.C from the City's exterior noise level exception as it applies to such sound reinforcement systems.

Table 16 presents the predicted hourly L_{eq} noise exposure levels attributed to Project onsite stationary sources (i.e., rooftop HVAC and parking areas) at a variety of fifteen (15) sample onsite NSR for each of the five studied Vision Plan (2040) scenarios: daytime, daytime with a Town Square Event, Town Square Event Sound Reinforcement (information only), nighttime, and nighttime with Cinema operations. Figures 4A, 4B, 4C, 6A, and 6B correspondingly illustrate (for these same scenarios, respectively) predicted Project stationary equipment operation sound levels across a horizontal plane approximately five feet above grade (i.e., a typical pedestrian listening elevation).

Table 16. Predicted Project Stationary Source Noise Levels at Sample Onsite Sensitive Receptors – Vision Plan Scenarios

Modeled Onsite Representative Sensitive Receiver	Hourly L_{eq} (dBA) for Vision Plan (2040) Studied Stationary Operations Noise Scenario				
	Daytime	Daytime with Town Square Event	Town Square Event Sound Speakers	Nighttime	Nighttime with Occupied Cinema
Res. Parcel 1 - upper floor, northern (RP1N)	47.5	47.5	62.8	45.8	47.2
Res. Parcel 1 - upper floor, southern (RP1S)	43.6	43.6	53.1	43.3	43.4
Res. Parcel 2 - upper floor, townhome #11 (RP2B11)	44.0	44.0	56.1	41.0	43.3
Res. Parcel 2 - upper floor, townhome #13 (RP2B13)	44.6	44.7	59.9	42.5	44.0
Res. Parcel 2 - upper floor, townhome #3 (RP2B3)	39.4	39.4	46.0	39.3	39.3
Res. Parcel 3 - upper floor northern (RP3N)	46.4	46.4	56.5	46.4	46.4
Res. Parcel 3 - upper floor southern (RP3S)	43.9	43.9	46.4	43.9	43.9
Res. Parcel 4 - upper floor eastern (RP4E)	48.7	48.7	57.1	48.6	48.6
Res. Parcel 4 - upper floor western (RP4W)	51.1	51.6	75.3	46.2	50.3
Res. Parcel 5 - upper floor eastern (RP5E)	50.0	50.0	57.4	49.9	49.9
Res. Parcel 5 - upper floor northern (RP5N)	47.8	47.8	51.7	46.1	46.1

Table 16. Predicted Project Stationary Source Noise Levels at Sample Onsite Sensitive Receptors – Vision Plan Scenarios

Modeled Onsite Representative Sensitive Receiver	Hourly L_{eq} (dBA) for Vision Plan (2040) Studied Stationary Operations Noise Scenario				
	Daytime	Daytime with Town Square Event	Town Square Event Sound Speakers	Nighttime	Nighttime with Occupied Cinema
Res. Parcel 5 - upper floor western (RP5W)	48.2	49.2	74.5	43.9	44.8
Res. Parcel 6 - upper floor northern (RP6N)	48.8	49.1	73.8	44.9	46.5
Res. Parcel 6 - upper floor western (RP6W)	43.3	43.3	51.8	42.4	43.1
Res. Parcel 6 - upper floor southern (RP6S)	48.4	48.6	72.6	44.8	47.8

Source: Dudek 2023
Notes: dBA = A-weighted decibels, Leq = energy-equivalent sound level, Res. = residential.

As modeled herein for purposes of this assessment, all predicted daytime sound levels at representative upper-floor onsite NSR locations listed in Table 16 comply with the City's 55 dBA threshold for "constant" type sounds (e.g., air-conditioning [see Section 2.3.3 bullets preceding Table 4]) as received by mixed-use land uses. At night, some predicted operation noise levels received by onsite mixed-use land uses slightly exceed the City's 45 dBA hourly L_{eq} threshold and would therefore not comply with City's noise ordinance without some applied noise reduction or other project design feature. For these reasons, there is an apparent need for noise reduction of onsite outdoor-exposed HVAC systems, subsurface parking level ventilation systems, and/or at or above-grade exposed parking areas that is detailed under Section 5 of this study as MM-NOI-2. Nevertheless, such noise mitigation may not be sufficient to attain these predicted noise reduction needs at all of these affected future onsite residential receptors. The resulting impact is therefore considered significant and potentially unavoidable.

The loudest sound levels from Town Square speakers during an event are predicted to be less than 80 dBA and would thus be considered compliant with municipal code Section 8.13.050.C.

B. Generation of excessive groundborne vibration?

Construction

Offsite Receptors

Using the expressions described in Section 3.1.1, groundborne vibration velocity levels from the likely most vibratory equipment expected for construction of the Project can be estimated at the same seven studied NSR appearing in Table 6. Table 17 shows the approximate distances between the studied receptor position and an anticipated nearest location of construction equipment as shown in Exhibit E. All predicted vibration levels are lower than the occupant annoyance threshold of 72 VdB, and lower than the building damage risk threshold of 0.2 inches per second PPV. In fact, the predicted vibration levels are less than the FTA guidance threshold of 0.12 inches per second PPV for type IV structures (see Table 3) that are more sensitive to vibration. On the basis of compliance with these City-adopted vibration standards, impacts associated with construction vibration are expected to be less than significant.

Table 17. Predicted Construction Vibration at Nearest Noise Sensitive Receptors

Studied Receptor* (Description)	Anticipated Closest Distance (feet)	Predicted PPV (inches per second) and VdB (rms) for Indicated Equipment Type					
		Hoe-Ram[1] (during SDEMO phase); Caisson Drilling[2] (during BLDGE phase)		Dozer, Grader, Scraper[3] (during SPREP or SGRAD phases)		Roller[4] (during FROAD phase)	
		PPV	VdB	PPV	VdB	PPV	VdB
RND1 (AlmaVia of San Rafael)	157	0.006	63	0.006	63	0.013	70
RSA1 (Sao Augustine Way)	172	0.005	62	0.005	62	0.011	69
RSA2 (Sao Augustine Way)	162	0.005	63	0.005	63	0.013	70
RSA3 (Sao Augustine Way)	193	0.004	60	0.004	60	0.010	68
RNA1 (Nova Albion Way)	172	0.005	62	0.005	62	0.011	69
RLP1 (La Perdiz Court)	412	0.001	50	0.001	50	0.003	58
RLP2 (La Perdiz Court)	298	0.002	55	0.002	55	0.005	62

Source: Dudek 2022; FTA 2018
Notes: VdB = vibration velocity decibels, rms = root mean square, PPV = peak particle velocity.
1 expected to operate during the Site Demolition phase (SDEMO)
2 expected to operate for ground improvements and foundations during the Building Erection phase (BLDGE)
3 expected to operate during the Site Preparation or Grading phases (SPREP or SGRAD)
4 expected to operate during the Final Roads phase (FROAD)

<u>Onsite Receptors</u>

Akin to Table 17, and using the same FTA-based mathematical expressions, Table 18 shows that groundborne vibration from onsite construction activities was predicted at the closest anticipated Residential Parcel 1 and Residential Parcel 2 units on the assumption that they would be occupied just prior to Vision Plan build-out construction phasing.

Table 18. Predicted Construction Vibration at Nearest Onsite Sensitive Receptors

Studied Receptor (Description)	Anticipated Closest Distance (feet)	Predicted PPV (inches per second) and VdB (rms) for Indicated Equipment Type					
		Hoe-Ram[1] (during SDEMO phase); Caisson Drilling[2] (during BLDGE phase)		Dozer, Grader, Scraper[3] (during SPREP or SGRAD phases)		Roller[4] (during FROAD phase)	
		PPV	VdB	PPV	VdB	PPV	VdB
Residential Parcel 1, northern unit facade	360	0.001	48[5]	0.001	48[5]	0.002	56[5]
Residential Parcel 4, northern unit facade	100	0.007	65[5]	0.007	65[5]	0.016	72[5]

Source: Dudek 2023; FTA 2018
Notes: VdB = vibration velocity decibels, rms = root mean square, PPV = peak particle velocity.
1 expected to operate during the Site Demolition phase (SDEMO)
2 expected to operate for ground improvements and foundations during the Building Erection phase (BLDGE)

3 expected to operate during the Site Preparation or Grading phases (SPREP or SGRAD)
4 expected to operate during the Final Roads phase (FROAD)
5 includes net coupling loss of -4 VdB (-10 loss, but +6 for floor resonance amplification) for multi-story masonry buildings

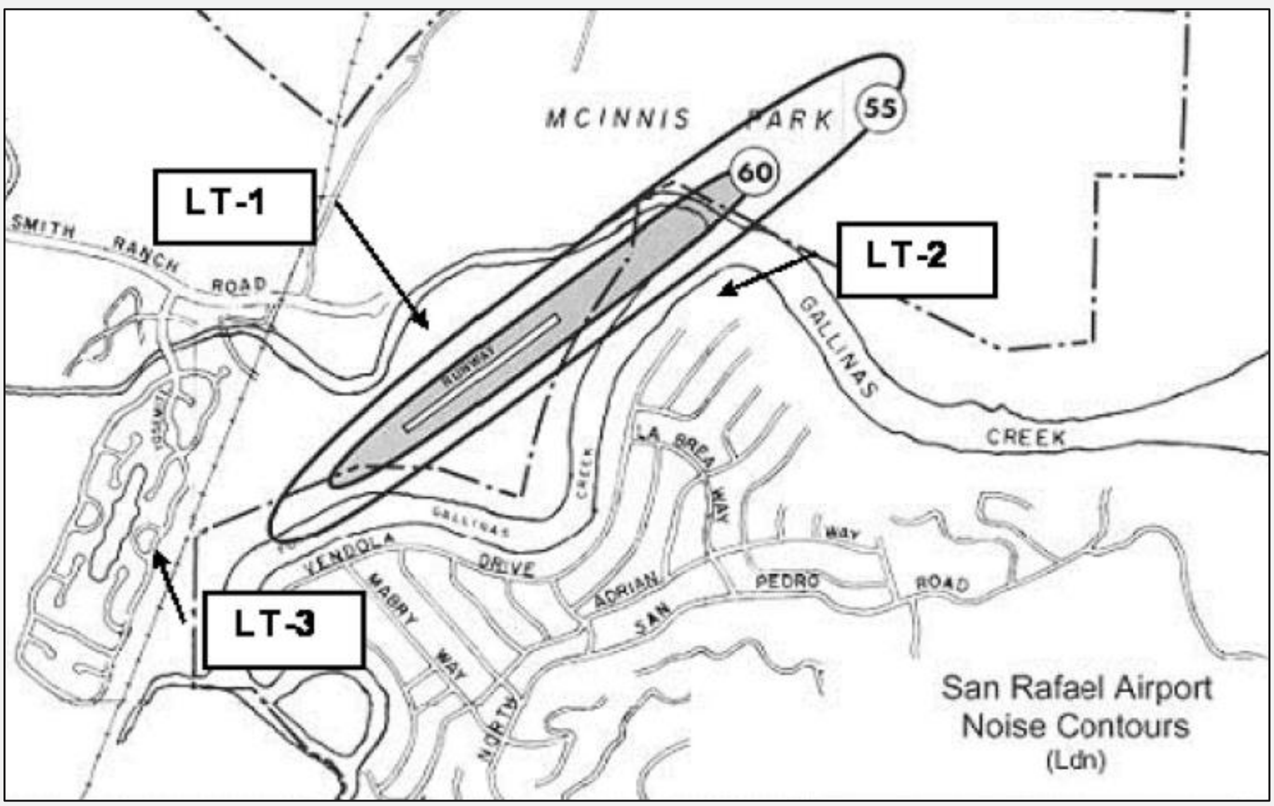
All predicted vibration levels do not exceed the occupant annoyance threshold of 72 VdB and are lower than the building damage risk threshold of 0.5 inches per second PPV. On the basis of compliance with these City-adopted vibration standards, impacts associated with construction vibration are expected to be less than significant.

C. Expose people to excessive aviation noise levels?

The Project is less than 2 miles southwest of the San Rafael Airport, but as Exhibit F displays, the 55 dBA L_{dn} contour is east of the rail line, and thus over 4,000 feet northeast of the Project; hence, aviation noise exposures from this facility would be less than 65 dBA L_{dn} and represent a less than significant impact.

Similarly, the Project is over 23 miles northwest of the nearest 65 dBA L_{dn} aviation noise contour of Oakland International Airport (Oakland Airport 2016) and over 25 miles beyond the nearest San Francisco International Airport 65 dBA L_{dn} contour (SFIA 2015). Hence, new occupants, workers, and visitors to the Project would not be exposed to excessive aviation noise levels, resulting in no impact.

Exhibit F. San Rafael Airport Aviation Noise Contours (60 L_{dn} and 55 L_{dn} depicted)



Source: City of San Rafael 2009

4 Cumulative Impacts

As explained above, both noise and vibration are localized impacts. For construction noise and vibration impacts, the only relevant cumulative projects would be probable future projects near the Project site that are anticipated to be under construction at the same time as the Project. The City's review of potential cumulative projects has not identified any Projects that meet these criteria. Accordingly, the Project would not contribute to any significant cumulative construction noise or vibration impact.

Regarding operational noise, the City similarly has not identified any potential cumulative projects in the vicinity of the Project site that could contribute to a cumulative stationary source or traffic noise impact. Potential impacts of generalized future traffic growth in combination with the Project are already captured by the analysis in Section 3.2 above, Tables 11 and 12. Accordingly, the Project would not contribute to any significant cumulative noise impact during Project operations.

5 Mitigation Measures

Based on the quantitative noise and vibration impact assessment detailed in this technical report, noise mitigation measures to reduce predicted impacts to less than significant levels are required only for the following circumstances:

- Predicted Project Phase 1 (Master Plan) construction activities occurring onsite but near the following offsite receptor positions shown in Exhibit E and for the predicted construction periods during which one or concurrent onsite construction activities may occur:
  - RND1 – August 2024 through October 2024, when 7 dB noise mitigation needed to reduce increase in outdoor ambient noise level to not more than 10 dB;
  - RND1 – March 2024 through July 2024, when 5 dB noise mitigation is needed;
  - RSA1 – July 2024 through September 2024, when 5 dB noise mitigation is needed;
  - RSA1 – February 2024 through June 2024, when 3 dB noise mitigation is needed;
  - RSA2 – July 2024 through September 2024, when 6 dB noise mitigation is needed;
  - RSA2 – February 2024 through June 2024, when 4 dB noise mitigation is needed;
  - RSA3 – July 2024 through September 2024, when 3 dB noise mitigation is needed;
  - RSA3 – February 2024 through June 2024, when 2 dB noise mitigation is needed;
  - RNA1 – July 2024 through September 2024, when 5 dB noise mitigation is needed;
  - RNA1 – February 2024 through June 2024, when 3 dB noise mitigation is needed;
  - RLP1 – June 2024 through August 2024, when 6 dB noise mitigation is needed;
  - RLP1 – January 2024 through May 2024 and September 2024 when 4 dB noise mitigation is needed;
  - RLP2 – June 2024 through August 2024, when 9 dB noise mitigation is needed;
  - RLP2 – January 2024 through May 2024, when 7 dB noise mitigation is needed; and
  - RLP2 – September 2024, when 3 dB noise mitigation needed.
- Predicted Project Phase 2 (Vision Plan) site demolition, site preparation, site grading, rough roads, and building erection construction activities occur near Residential Parcel 4 receptors, with a noise mitigation need of up to 7 dB to keep increase over pre-Project outdoor ambient noise levels at no more than 10 dB.

- Noise emission from stationary sources associated with Project building systems (e.g., HVAC) and onsite parking areas as received by newly created onsite mixed-use building occupants as a result of Project implementation.

Successful implementation of mitigation measures **MM-NOI-1** and **MM-NOI-2** as follows would reduce Project-attributed construction and operation noise levels, respectively, at nearby offsite and onsite residences.

MM-NOI-1 The following measure shall be implemented where need has been predicted in the Noise & Vibration Technical Report to reduce Project construction noise level exposures at potentially affected offsite and onsite receptors and thereby yield resulting increases in outdoor ambient sound level that are not greater than 10 dB:

- Install temporary noise barriers or shrouds (featuring materials and method of assembly and installation that yields a sound transmission class [STC] of 20 or better) near the operating equipment in a safe, feasible, and practical manner to occlude sound paths between it and the onsite noise-sensitive receptors (e.g., single or multi-family residences) of concern. Blocking direct line-of-sight (LoS) between the operating equipment and a distant receptor should yield a minimum of 3 to 5 dB noise reduction, but noise reduction of 9 dB or more can commonly be achieved with the right combination of installed barrier height with respect to source and receptor locations and barrier horizontal extent (to avoid "flanking" around its vertical edges).

Appendix B includes summarized methodology for the prediction of construction noise mitigation effects resulting from application of such temporary barriers and accompanying calculation sheets illustrating worked examples for Phase 1 and Phase 2.

The following additional best management practices (BMP) would be expected by the City consistent with its General Plan Noise Element:

- Utilize the best available and factory-approved noise control techniques (e.g., improved mufflers, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) on stationary and mobile construction equipment and vehicles.
- Require the contractor to use impact tools (e.g., jack hammers and hoe rams) that are hydraulically or electrically powered wherever possible. Where the use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used along with external noise jackets on the tools.
- Locate stationary equipment such as generators and air compressors as far as feasible from nearby noise-sensitive uses.
- Locate stockpiling as far as feasible from nearby noise-sensitive receptors.
- Limit construction traffic —to the extent feasible—to haul routes approved in advance of issuing building permits by the City.
- Require the telephone numbers of the authorized representatives for the City and the contractor that are assigned to respond in the event of a noise or vibration complaint to be displayed on construction signs

posted at the construction site. If the authorized contractor's representative receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City.

- Post signs at the job site entrance(s), within the on-site construction zones, and along queueing lanes (if any) to reinforce the prohibition of unnecessary engine idling. All other equipment shall be turned off if not in use for more than 5 minutes.

- Require the use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only, to the extent feasible. The construction manager shall use smart backup alarms, which automatically adjust the alarm level based on the background noise level or switch off back-up alarms and replace with human spotters in compliance with all safety requirements and laws.

MM-NOI-2 Prior to City approval of building permits, the Project applicant shall include in construction documents for City review building operation noise control and sound abatement features or considerations for stationary equipment during nighttime hours. The documentation shall include at least the following:

- equipment sound emission data (or sufficient engineering data from the manufacturer of equipment model[s]);

- architectural renderings and details depicting roof parapets, screens, walls, or other barriers that may directly or indirectly occlude, reflect, and/or absorb equipment noise emission—conveyed via airflows or via vibrating equipment casings or enclosures; and

- incorporation of dissipative duct silencers, shrouds, covers, acoustical louvers, acoustically lined ductwork, and other means to help attenuate noise from fans, pumps, compressors and other equipment featuring reciprocating or revolving components.

The documentation shall demonstrate whether these measures, or any additional feasible mitigation measures, will reduce the significant impact to less-than-significant at all on-site sensitive receptors. After City approval, information on subsequent Project design changes, equipment selections, or construction alterations that substantially deviate from these noise control and/or sound abatement details appearing in the construction documents must be reviewed by a qualified acoustician and provided to the City with respect to expected sufficiency of expected conformance with applicable City noise thresholds or as otherwise approved by the City.

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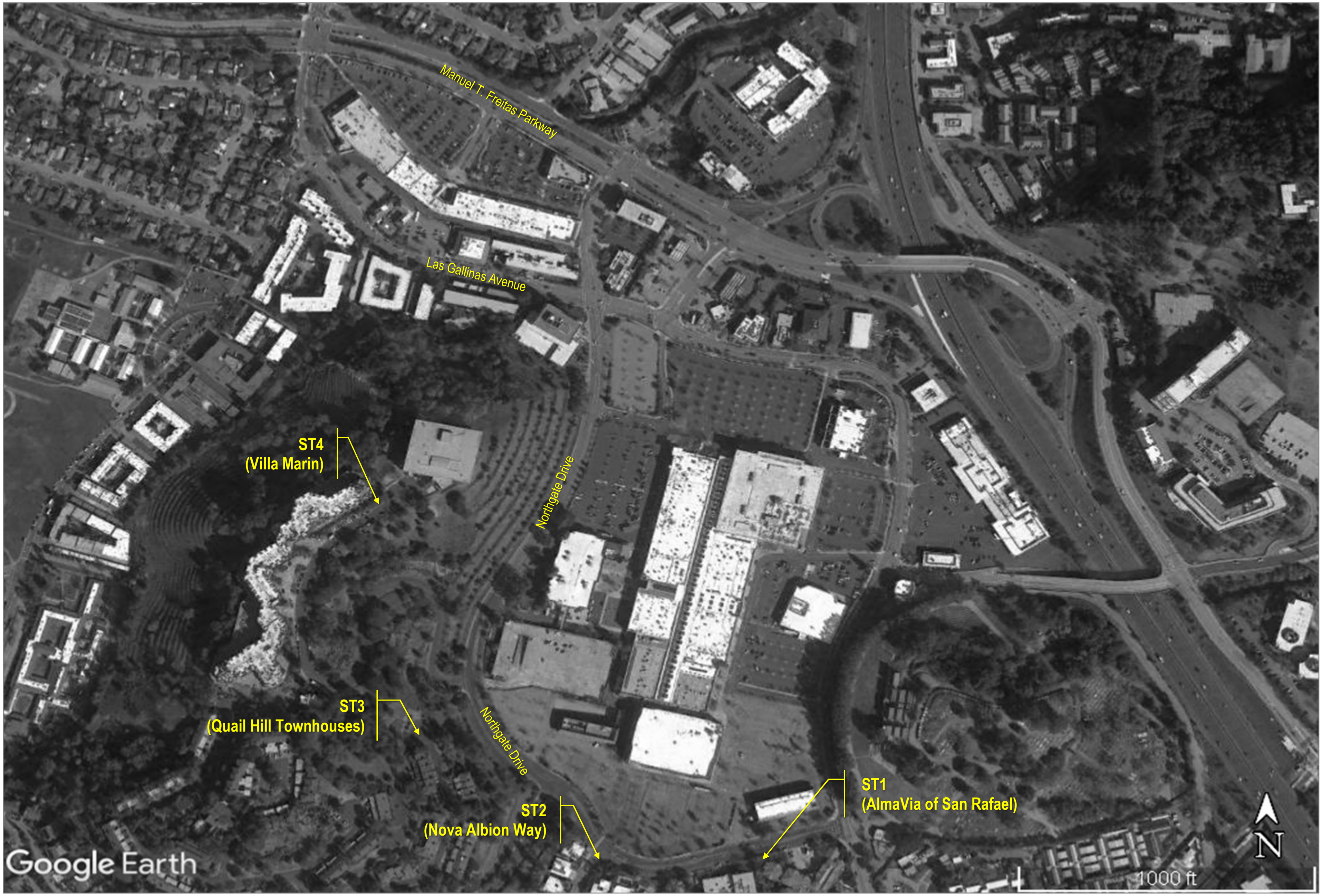

SOURCE: Google 2021; Dudek 2022

DUDEK

0 233 466 Feet

FIGURE 1

Baseline Outdoor Ambient Sound Level Measurement Locations

Northgate Town Square Project

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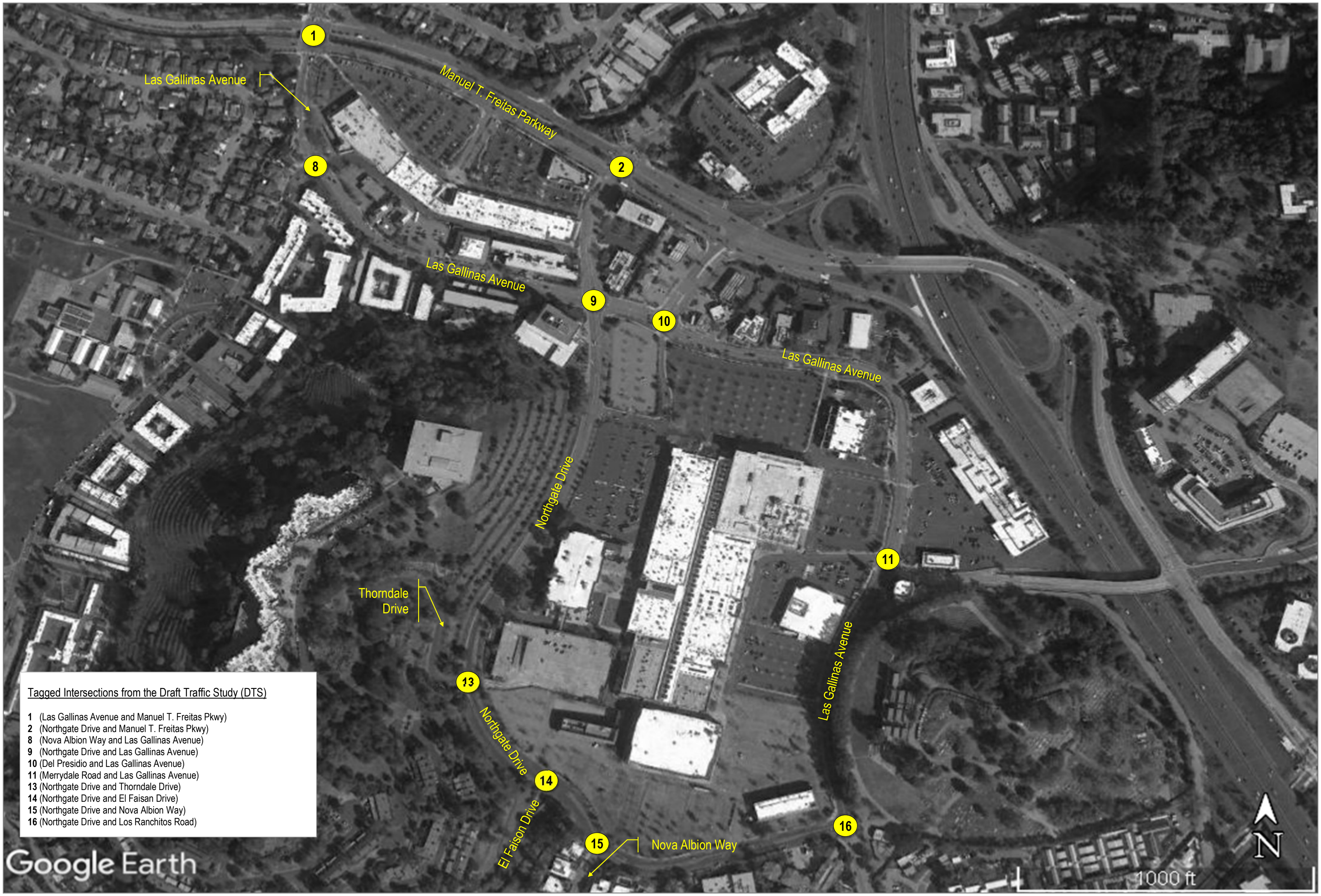

SOURCE: Google 2021; Dudek 2023

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FIGURE 2

Studied Roadway Segments Defined by Draft Traffic Study Intersection Tags

Northgate Town Square Project

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SOURCE: Google 2021; Dudek 2023

DUDEK

0 170.5 341 Feet

FIGURE 3A

Predicted Stationary Source Operation Noise from Proposed Project - Master Plan - Daytime

Northgate Town Square Project

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SOURCE: Google 2021; Dudek 2023

DUDEK

0 170.5 341 Feet

FIGURE 3B

Predicted Stationary Source Operation Noise from Proposed Project - Master Plan - Daytime (with Town Square Event in Progress)

Northgate Town Square Project

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SOURCE: Google 2021; Dudek 2023

DUDEK

0 170.5 341 Feet

FIGURE 3C

Master Plan -- Predicted Noise from Daytime Town Square Event Stage and Sound Reinforcement

Northgate Town Square Project

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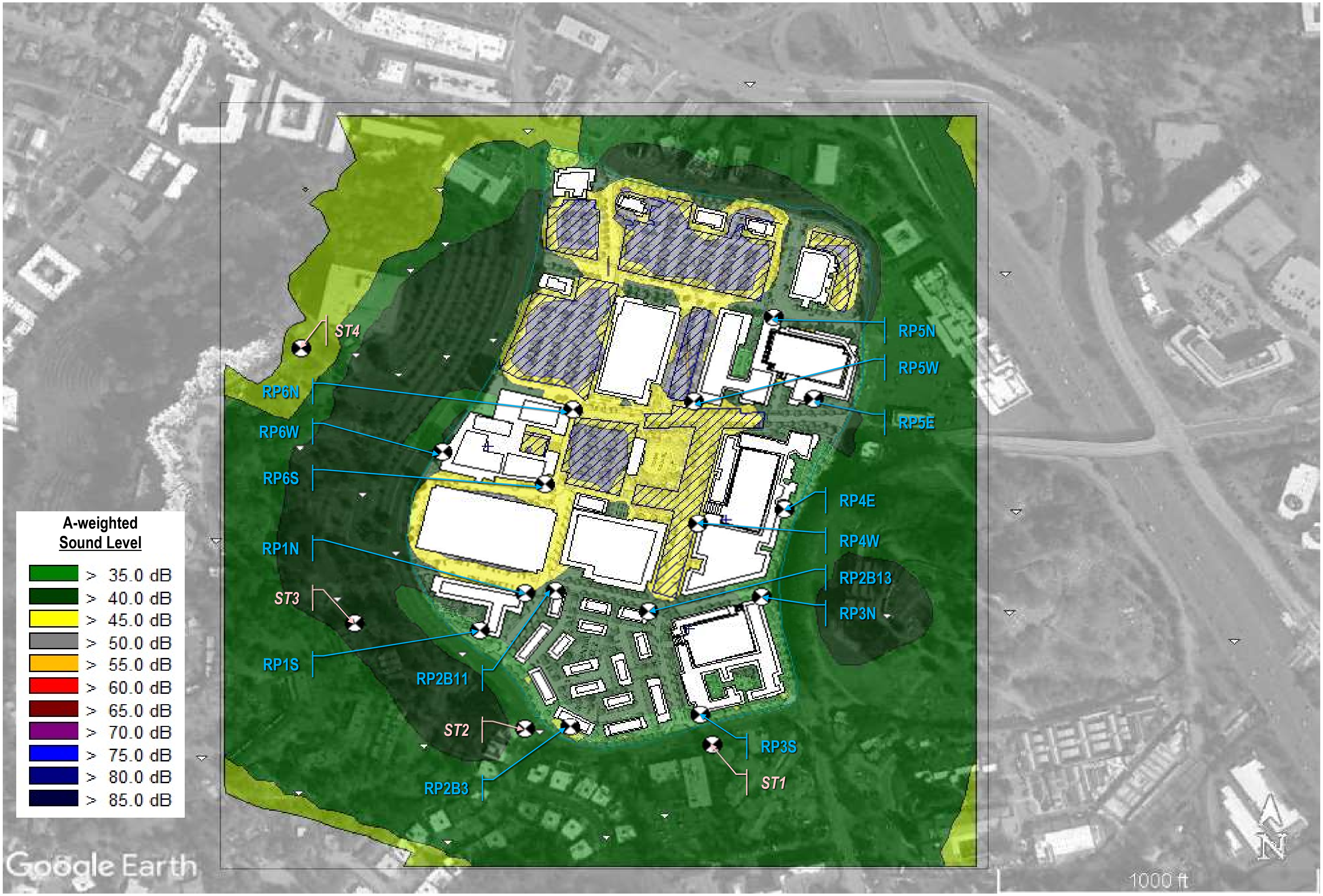

SOURCE: Google 2021; Dudek 2023

DUDEK

0 170.5 341 Feet

FIGURE 4A

Predicted Stationary Source Operation Noise from Proposed Project - Vision Plan - Daytime

Northgate Town Square Project

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SOURCE: Google 2021; Dudek 2023

DUDEK

0 170.5 341 Feet

FIGURE 4B

Predicted Stationary Source Operation Noise from Proposed Project - Vision Plan - Daytime (with Town Square Event in Progress)

Northgate Town Square Project

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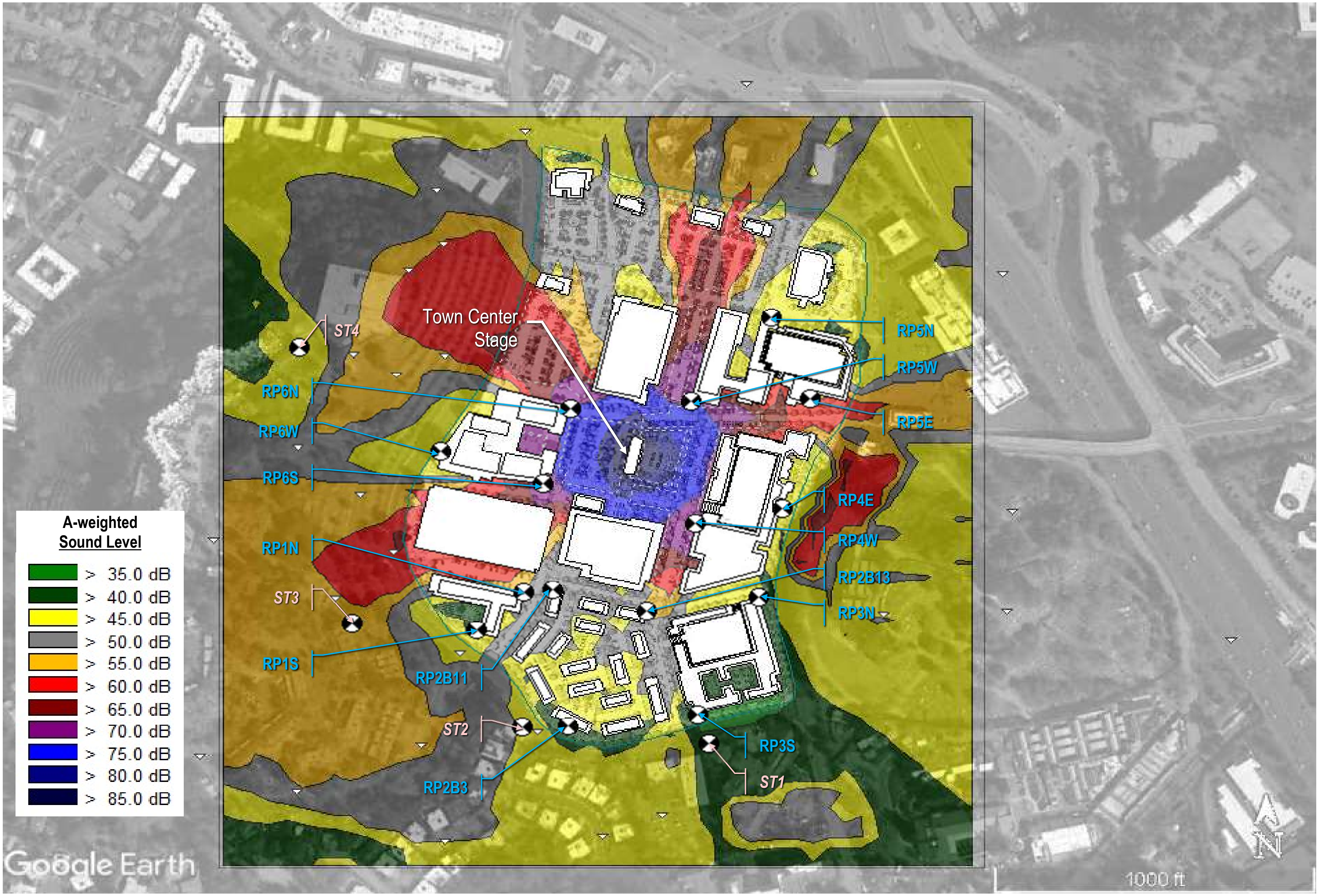

SOURCE: Google 2021; Dudek 2023

DUDEK

0 170.5 341 Feet

FIGURE 4C

Vision Plan -- Predicted Noise from Daytime Town Square Event Stage and Sound Reinforcement

Northgate Town Square Project

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SOURCE: Google 2021; Dudek 2023

DUDEK

0 170.5 341 Feet

FIGURE 5A

Predicted Stationary Source Operation Noise from Proposed Project - Master Plan - Nighttime

Northgate Town Square Project

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SOURCE: Google 2021; Dudek 2023

DUDEK

0 170.5 341 Feet

FIGURE 5B

Predicted Stationary Source Operation Noise from Proposed Project - Master Plan - Nighttime with Cinema Occupied

Northgate Town Square Project

INTENTIONALLY LEFT BLANK

SOURCE: Google 2021; Dudek 2023

DUDEK

0 170.5 341 Feet

FIGURE 6A

Predicted Stationary Source Operation Noise from Proposed Project - Vision Plan - Nighttime

Northgate Town Square Project

INTENTIONALLY LEFT BLANK

SOURCE: Google 2021; Dudek 2023

DUDEK

0 170.5 341 Feet

FIGURE 6B

Predicted Stationary Source Operation Noise from Proposed Project - Vision Plan - Nighttime with Cinema Occupied

Northgate Town Square Project

INTENTIONALLY LEFT BLANK

Appendix A
Field Measurement Data Sheets

DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT Northgate Town Square **PROJECT #** 13753
SITE ID ST-1
SITE ADDRESS Alma Via at San Rafael **OBSERVER(S)** DH
START DATE 12/1/21 **END DATE** 12/1/21
START TIME 2:28 pm **END TIME** 2:44 PM

METEOROLOGICAL CONDITIONS

TEMP 74 F **HUMIDITY** 44 % R.H. **WIND** (CALM) LIGHT MODERATE
WINDSPD 2 MPH **DIR.** N NE S SE S SW W (NW) VARIABLE STEADY GUSTY
SKY (SUNNY) CLEAR OVRCAST PRTLY CLDY FOG RAIN

ACOUSTIC MEASUREMENTS

MEAS. INSTRUMENT Picc. SN:P0221031805 **TYPE** 1 (2) **SERIAL #** -805
CALIBRATOR Reed R8090 SN: 200526321 **SERIAL #** -321
CALIBRATION CHECK PRE-MEASUREMENT 94.0 dBA SPL POST-MEASUREMENT 94.6 dBA SPL WINDSCRN ✓

SETTINGS (A-WTD) (SLOW) FAST (FRONTAL) RANDOM ANSI OTHER: 1-min intervals

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
0-16	2:28pm	2:44pm							

COMMENTS

SOURCE INFO AND TRAFFIC COUNTS

PRIMARY NOISE SOURCE (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: Arterial DIST. TO RDWY C/L OR (EOP) 2 feet
TRAFFIC COUNT DURATION: 15 MIN SPEED 25 MPH ___ MIN SPEED

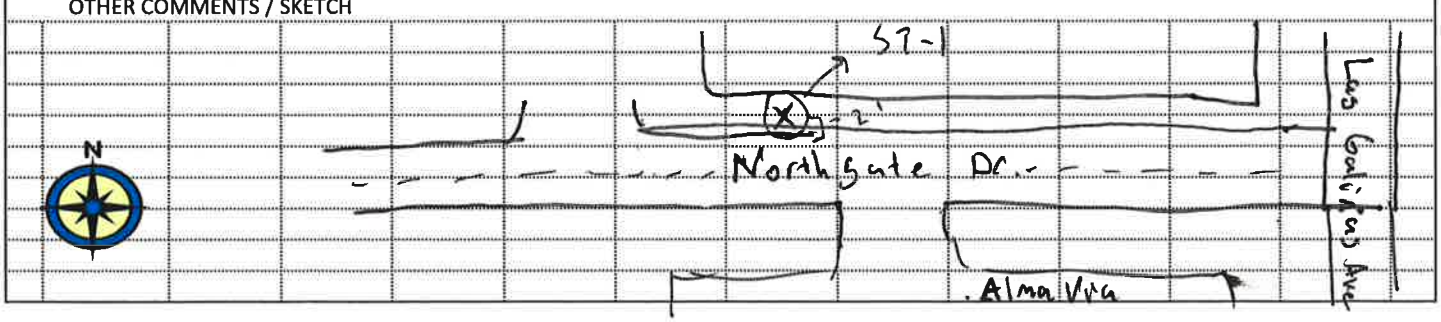
	DIRECTION	NB/EB	SB/WB	NB/EB	SB/WB	IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE		NB/EB	SB/WB	NB/EB	SB/WB
COUNT 1 (OR RDWY 1)	AUTOS	63				✓	COUNT 2 (OR RDWY 2)				
	MED TRKS										
	HVY TRKS										
	BUSES	1									
	MOTRCLS	1									

SPEEDS ESTIMATED BY: RADAR / (DRIVING THE PACE)
POSTED SPEED LIMIT SIGNS SAY:

OTHER NOISE SOURCES (BACKGROUND): DIST. AIRCRAFT RUSTLING LEAVES DIST. BARKING DOGS BIRDS DIST. INDUSTRIAL
DIST. KIDS PLAYING DIST. CONVRSTNS / YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DISTD GARDENERS/LANDSCAPING NOISE
OTHER: Pedestrians walking around meter and one airplane overhead

DESCRIPTION / SKETCH

TERRAIN HARD SOFT MIXED FLAT OTHER:
PHOTOS
OTHER COMMENTS / SKETCH



DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT Northgate Town Square PROJECT # 13753
SITE ID ST-2
SITE ADDRESS Nova Albion Wy & Northgate Dr. OBSERVER(S) DH
START DATE 12/1/21 END DATE 12/1/21
START TIME 2:52 pm END TIME 3:08 pm

METEOROLOGICAL CONDITIONS

TEMP 74 F HUMIDITY 44 % R.H. WIND (CALM) LIGHT MODERATE
WINDSPD 2 MPH DIR. N NE S SE S SW W (NW) VARIABLE STEADY GUSTY
SKY (SUNNY) CLEAR OVRCAST PRTLY CLDY FOG RAIN

ACOUSTIC MEASUREMENTS

MEAS. INSTRUMENT Pcb SN: P0221031805 TYPE 1 (2) SERIAL # -805
CALIBRATOR Reed R8090 SN: 200526321 SERIAL # -321
CALIBRATION CHECK PRE-MEASUREMENT 94.0 dBA SPL POST-MEASUREMENT 94.6 dBA SPL WINDSCRN ✓

SETTINGS (A-WTD) (SLOW) FAST (FRONTAL) RANDOM ANSI OTHER: 1-min Intervals

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
17-33	2:53PM	3:08PM							

COMMENTS

SOURCE INFO AND TRAFFIC COUNTS

PRIMARY NOISE SOURCE (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: Arterial DIST. TO RDWY C/L OR (EOP) 2 feet
TRAFFIC COUNT DURATION: 15 MIN SPEED 30 MIN SPEED

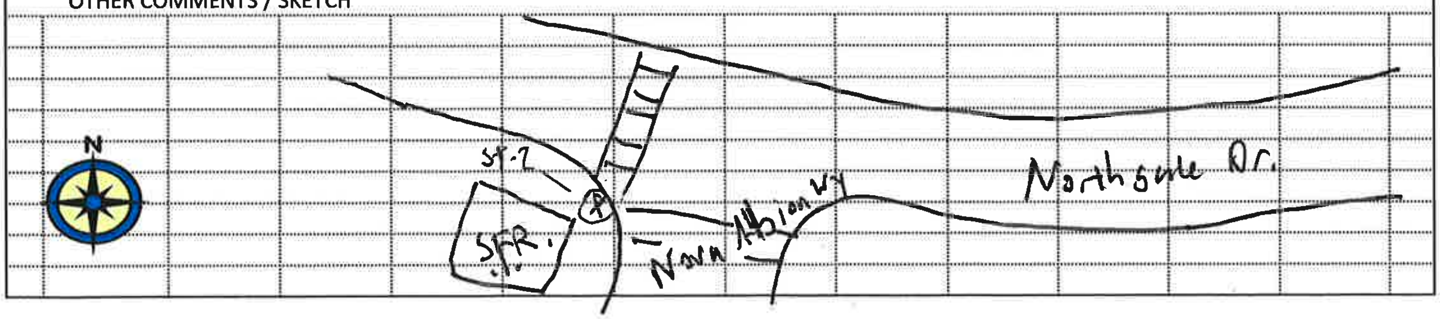
COUNT 1 (OR RDWY 1) DIRECTION	NB/EB	SB/WB	NB/EB	SB/WB		COUNT 2 (OR RDWY 2) NB/EB	SB/WB	NB/EB	SB/WB
AUTOS	116				IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE ✓				
MED TRKS	2								
HVY TRKS									
BUSES									
MOTRCLS									

SPEEDS ESTIMATED BY: RADAR / (DRIVING THE PACE)
POSTED SPEED LIMIT SIGNS SAY:

OTHER NOISE SOURCES (BACKGROUND): DIST. AIRCRAFT RUSTLING LEAVES DIST. BARKING DOGS BIRDS DIST. INDUSTRIAL
DIST. KIDS PLAYING DIST. CONVRSTNS / YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DISTD GARDENERS/LANDSCAPING NOISE
OTHER: N/A

DESCRIPTION / SKETCH

TERRAIN HARD SOFT MIXED FLAT OTHER:
PHOTOS
OTHER COMMENTS / SKETCH



DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT Northgate Town Square PROJECT # 13753
SITE ID ST-3
SITE ADDRESS Quail Hill Townhouses OBSERVER(S) DH
START DATE 12/1/21 END DATE 12/1/21
START TIME 3:26 PM END TIME 3:41 PM

METEOROLOGICAL CONDITIONS

TEMP 70 F HUMIDITY 44 % R.H. WIND (CALM) LIGHT MODERATE
WINDSPD 2 MPH DIR. N NE S SE S SW W (NW) VARIABLE STEADY GUSTY
SKY (SUNNY) CLEAR OVRCAST PRTLY CLDY FOG RAIN

ACOUSTIC MEASUREMENTS

MEAS. INSTRUMENT Picc. SN: PO221031805 TYPE 1 (2) SERIAL # - 805
CALIBRATOR Reed R8090 SN: 20052632I SERIAL # - 321
CALIBRATION CHECK PRE-MEASUREMENT 94.0 dBA SPL POST-MEASUREMENT 94.6 dBA SPL WINDSCRN ✓

SETTINGS A-WTD SLOW FAST FRONTAL RANDOM ANSI OTHER: 1 min intervals

REC. # S1	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
34-[illegible] (?)	3:26 PM	3:41 PM							

COMMENTS
Private Road; restricted (gated) access

SOURCE INFO AND TRAFFIC COUNTS

PRIMARY NOISE SOURCE (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: Arterial (Private) DIST. TO RDWY C/L OR (EOP): 2 feet
TRAFFIC COUNT DURATION: 15 MIN SPEED 20 MIN SPEED

COUNT 1 (OR RDWY 1)

DIRECTION	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS	0	Ø	Ø	
MED TRKS	0			
HVY TRKS	0			
BUSES	0			
MOTRCLS	0			

IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE ✓

COUNT 2 (OR RDWY 2)

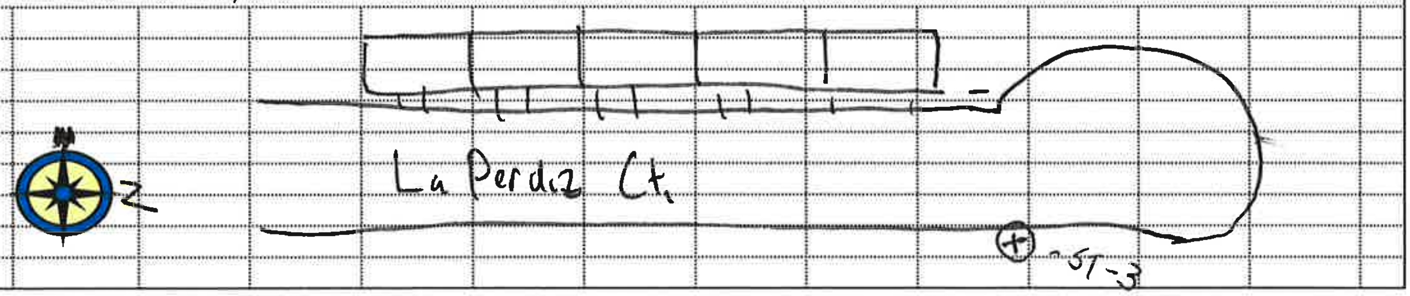
DIRECTION	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS				
MED TRKS				
HVY TRKS				
BUSES				
MOTRCLS				

SPEEDS ESTIMATED BY: RADAR / (DRIVING THE PACE)
POSTED SPEED LIMIT SIGNS SAY:

OTHER NOISE SOURCES (BACKGROUND): DIST. AIRCRAFT RUSTLING LEAVES DIST. BARKING DOGS BIRDS DIST. INDUSTRIAL DIST. KIDS PLAYING DIST. CONVRSTNS / YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DISTD GARDENERS/LANDSCAPING NOISE
OTHER: N/A

DESCRIPTION / SKETCH

TERRAIN HARD SOFT MIXED FLAT OTHER:
PHOTOS
OTHER COMMENTS / SKETCH



DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT: Northgate Town Square PROJECT #: 13753
SITE ID: ST-4
SITE ADDRESS: Villa Marin OBSERVER(S): DH
START DATE: 12/1/21 END DATE: 12/1/21
START TIME: 3:52 PM END TIME: ~~[illegible]~~ 4:08 PM

METEOROLOGICAL CONDITIONS

TEMP: 70 F HUMIDITY: 44 % R.H. WIND: (CALM) LIGHT MODERATE
WINDSPD: 2 MPH DIR. N NE S SE S SW W (NW) VARIABLE STEADY GUSTY
SKY: (SUNNY) CLEAR OVRCAST PRTLY CLDY FOG RAIN

ACOUSTIC MEASUREMENTS

MEAS. INSTRUMENT: Pcc. SN: P0221031805 TYPE 1 (2) SERIAL #: -805
CALIBRATOR: Rion NC-90 SN: 20052632 1 SERIAL #: -321
CALIBRATION CHECK PRE-MEASUREMENT: 94.0 dBA SPL POST-MEASUREMENT: 94.6 dBA SPL WINDSCRN: ✓

SETTINGS: A-WTD SLOW FAST FRONTAL RANDOM ANSI OTHER: 1 min intervals

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
51 - 65(1)	3:52PM	4:08PM							

COMMENTS

SOURCE INFO AND TRAFFIC COUNTS

PRIMARY NOISE SOURCE: (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: Arterial DIST. TO RDWY C/L OR (EOP): 0 feet
TRAFFIC COUNT DURATION: 15 MIN SPEED ___ ___ MIN SPEED

COUNT 1 (OR RDWY 1)

DIRECTION	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS	6 [illegible]			
MED TRKS				
HVY TRKS				
BUSES				
MOTRCLS				

IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE ✓

COUNT 2 (OR RDWY 2)

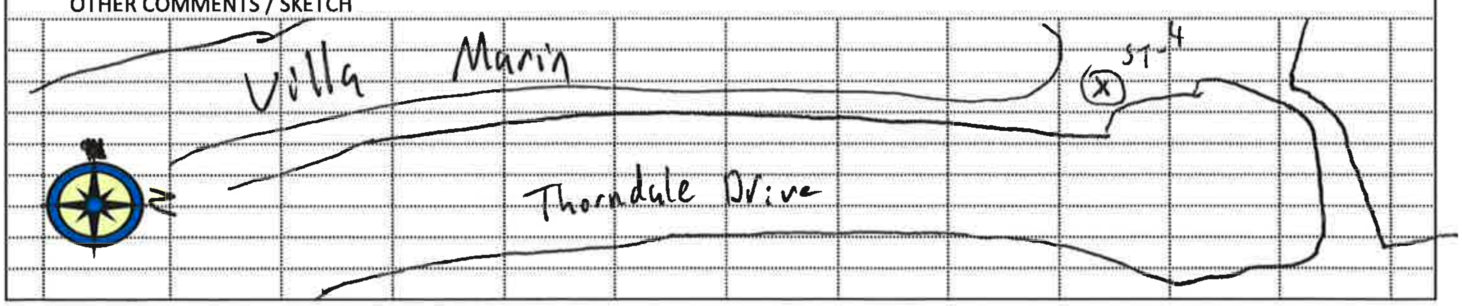
DIRECTION	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS				
MED TRKS				
HVY TRKS				
BUSES				
MOTRCLS				

SPEEDS ESTIMATED BY: RADAR / DRIVING THE PACE
POSTED SPEED LIMIT SIGNS SAY:

OTHER NOISE SOURCES (BACKGROUND): DIST. AIRCRAFT RUSTLING LEAVES DIST. BARKING DOGS BIRDS DIST. INDUSTRIAL DIST. KIDS PLAYING DIST. CONVRSTNS / YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DISTD GARDENERS/LANDSCAPING NOISE
OTHER:

DESCRIPTION / SKETCH

TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH



DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT: Northgate Town Square — PROJECT #: 13753
SITE ID: LT-1
SITE ADDRESS: Northgate Parkins Lot — OBSERVER(S): OH
START DATE: 12/1/21 — END DATE: 12/1/21
START TIME: 2:08PM — END TIME: 2:31PM

METEOROLOGICAL CONDITIONS

TEMP: 74 F — HUMIDITY: 44 % R.H. — WIND: (CALM) LIGHT MODERATE VARIABLE STEADY GUSTY
WINDSPD: 1 MPH — DIR. N NE S SE S SW W (NW)
SKY: (SUNNY) CLEAR OVRCAST PRTLY CLDY FOG RAIN

ACOUSTIC MEASUREMENTS

MEAS. INSTRUMENT: Picc. SN: P0221031804 — TYPE 1 (2) — SERIAL # -804
CALIBRATOR: Reed R8090 SN: 200526321 — SERIAL # -321
CALIBRATION CHECK: PRE-MEASUREMENT 94.0 dBA SPL — POST-MEASUREMENT 94.6 dBA SPL — WINDSCRN ✓

SETTINGS: (A-WTD) (SLOW) FAST (FRONTAL) RANDOM ANSI OTHER: 1-min Intervals

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
	2:08Pm	~~2:31PM~~ 2:31 Pm							

COMMENTS

SOURCE INFO AND TRAFFIC COUNTS N/A

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: — DIST. TO RDWY C/L OR EOP:
TRAFFIC COUNT DURATION: ___ MIN SPEED ___ — ___ MIN SPEED

COUNT 1 (OR RDWY 1) DIRECTION	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS				
MED TRKS				
HVY TRKS				
BUSES				
MOTRCLS				

IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE ___

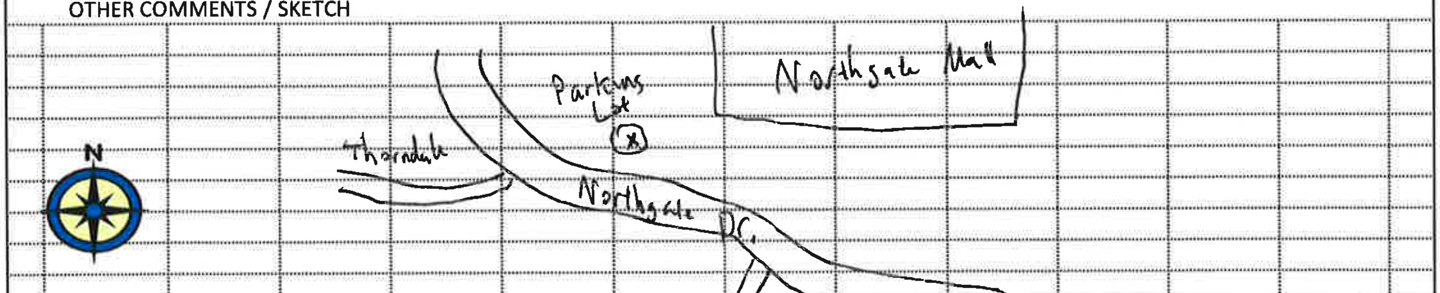
COUNT 2 (OR RDWY 2)	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS				
MED TRKS				
HVY TRKS				
BUSES				
MOTRCLS				

SPEEDS ESTIMATED BY: RADAR / DRIVING THE PACE
POSTED SPEED LIMIT SIGNS SAY:

OTHER NOISE SOURCES (BACKGROUND): DIST. AIRCRAFT RUSTLING LEAVES DIST. BARKING DOGS BIRDS DIST. INDUSTRIAL DIST. KIDS PLAYING DIST. CONVRSTNS / YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DISTD GARDENERS/LANDSCAPING NOISE
OTHER:

DESCRIPTION / SKETCH

TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH



Date	Start Time (hh:mm)	End Time (hh:mm)	hourly Leq
12/1/2021	14:09	15:09	57.5
12/1/2021	15:09	16:09	58.9
12/1/2021	16:09	17:09	56.9
12/1/2021	17:09	18:09	56.9
12/1/2021	18:09	19:09	57.2
12/1/2021	19:09	20:09	55.7
12/1/2021	20:09	21:09	56.3
12/1/2021	21:09	22:09	54.6
12/1/2021	22:09	23:09	50.9
12/1/2021	23:09	0:09	48.7
12/2/2021	0:09	1:09	45.7
12/2/2021	1:09	2:09	45.9
12/2/2021	2:09	3:09	47.7
12/2/2021	3:09	4:09	47.1
12/2/2021	4:09	5:09	51.6
12/2/2021	5:09	6:09	54.8
12/2/2021	6:09	7:09	56.6
12/2/2021	7:09	8:09	59.4
12/2/2021	8:09	9:09	60.0
12/2/2021	9:09	10:09	57.5
12/2/2021	10:09	11:09	56.5
12/2/2021	11:09	12:09	55.7
12/2/2021	12:09	13:09	56.1
12/2/2021	13:09	14:09	59.6
12/2/2021	14:09	14:31	63.6

Appendix B

Construction Noise Prediction Results

Construction Noise Prediction Methodology Narrative and Assumptions

Phase 1

To reasonably estimate aggregate Project-attributed construction noise exposure at seven (7) nearest offsite noise-sensitive receptors (NSR) over the course of Project progress (and from potentially concurrent scheduled activities), the following methodology and assumptions were adopted. Detailed information on the reference source sound levels and the prediction results appears on following pages.

SUMMARIZED METHODOLOGY

The predictive analysis herein locates one or multiple sound-emitting sources (i.e., stationary and mobile equipment) associated with a distinct construction activity or phase as a collective single point at an approximate geographic position of the activity considered closest to the set of studied NSR. While the exact positions of these equipment are unknown at any moment, they would not stray beyond the defined zone or area on which they are expect to work; hence, the collective equipment sound source single-point approximation is assumed to be located at a distance of 50 feet (unless otherwise noted) from the closest Project boundary position to the nearest studied NSR and represents a conservative approach to estimate the aggregate noise level from normally operating construction equipment.

As shown in the following pages that detail the Microsoft Excel workbook output, predicted noise from each distinct phase or activity—using the above approach—populates a matrix that depicts the Project schedule at a monthly level of granularity. The assumed schedule of listed activities is based on estimated time periods provided in the current Project Description. The total concurrent noise exposure level, expressed as an hourly energy-equivalent level (L_{eq}) at an indicated NSR position for each month is displayed for two scenarios, each of which represents the logarithmic sum of noise levels from nearby on-site construction activities associated with Phase 1 Residential Parcels 1, 2, and 3.

MODELED SOURCES

Figure B-1 displays the southern portion of the Project site and its surroundings with tags showing all considered construction activity point-source locations used in this predictive model. Table 1 lists the modeled construction activities and their associated noise-producing equipment. The location of the collected point of equipment sound emission varies with where the activity would be expected to occur. For instance, building erection would be modeled at “P2BS” as appearing in Figure B-1, which is closest the sample NSR along Sao Augustine Way. But the location “P2BW” would be better when evaluating noise exposure at the “RNA1” NSR location. The “P3B” location shown on Figure B-1 is where Residential Parcel 3 construction activity noises are sourced, as they may vary in character by phase and in time per the schedule, and is nearest to the offsite receiver “RND1” as evaluated herein.

The reference sound emission levels for the listed equipment used as model input parameters are based on maximum sound emission levels (L_{max}) and acoustical usage factor (AUF) values appearing in Table 1 of the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) User’s Guide.[1] For example, usage of the RCNM guide indicates 84 dBA L_{max} at a distance of 50 feet for an “auger drill rig”, which agrees with the range of sound levels at ten meters for continuous flight auger (CFA) pile installation[2] expected as part of Project foundation support. The AUF for the auger drill rig is 20%, which means that for

[1] https://oysterzone.files.wordpress.com/2012/03/fhwa-2006.pdf
[2] https://www.balfourbeatty.com/media/29528/cfa.pdf

only a cumulative twenty percent of the time the rig is working under full-load conditions or otherwise emitting noise at its maximum level (L_{max}); at other times, it may be idling or inactive.

MODELED TOPOGRAPHY

For purposes of this construction noise level assessment, topographical effects (i.e., potential sound path occlusion due to natural terrain variation or man-made structures) have conservatively been ignored.

Approximate Scale: side of one square = 25.3 feet

Figure B-1. Modeled Project Construction Activity Locations (white rectangles) and Noise-Sensitive Receptors (NSR, green oval callouts)

Table B-1. Modeled Project Phase 1 Construction Activities and Equipment Types

Activity Name (Abbreviation)	Operating Equipment Types*
Site Demolition (SDEMO)	excavator, dozer, hoe-ram**, dump truck, welder/torch, jackhammer**, flat-bed truck
Site Preparation (SPREP)	excavator, dozer, front-end loader, flat-bed truck
Site Grading (SGRAD)	grader, scraper, front-end loader, flat-bed truck
Rough Roads (RROAD)	grader, scraper, compactor, flat-bed truck
Building Erection (BLDGE)	crane, man-lift, auger drill rig, flat-bed truck, generator, welder/torch
Final Roads (FROAD)	paver, roller, vacuum street sweeper
Architectural finishes (ARCHF)	air compressor, man-lift, flat-bed truck

*per FHWA RCNM designations

**based on anticipated site demolition needs of the Project, and unlike others appearing in Table B-1 assumed to be located 50 feet from the Project boundary, this piece of equipment will not be closer than 150 feet to the Project boundary.

OPERATING EQUIPMENT CLOSER THAN 50 FEET TO PROPERTY LINE

For potential operating construction equipment within 50 feet of the Project property line, discussion with the Project Applicant indicates that from a practical standpoint, such activity would be limited to smaller and/or less powerful pieces of equipment than those conservatively studied for the phases shown in Table B-1 and that have reference noise levels per the FHWA RCNM User's Guide. For example, work within this 50-foot distance could involve a typical "pairing" of a relatively small 14-ton excavator and a corresponding 8-ton front-end loader, which have reference noise levels of only 70 dBA and 68 dBA at ten meters, respectively[3]. With such reference noise levels, and on the basis of sound propagation with distance, the following practical scenario illustrates a sample of compliance with the City's 90 dBA L_{max} value:

- The excavator could be situated at a distance of 15 feet to the property line, and due to the radial reach of its tool, perform work on affected grade as close as the property line. Under such conditions, the excavator L_{max} at the property line would be 77 dBA (i.e., 70 + 7 dB due to closer distance of 15 feet instead of 32.8 feet [10 meters]).
- The front-end loader could be working as close as 15 feet to the property line, and result in its L_{max} value of 75 dBA (i.e., 68 + 7 dB due to the distance reduction from 32.8 feet to 15 feet) at the property line.

The logarithmic sum of these two-above equipment, if noise was simultaneous, would be 79 dBA L_{max} and thus at least 10 dB less than what is required for compliance with the City's threshold. And such a noise level for the pair would, on the basis of logarithmic addition, have negligible additive effect to aggregate noise from the larger sets of onsite operating heavy equipment studied for each activity phase (per Table B-1).

MODELED NOISE-SENSITIVE RECEPTORS

Figure B-1 also presents (as green oval callouts) the seven studied NSR positions that include as follows:

- RND1 represents an apparent senior-living residential facility on Northgate Drive;
- RSA1, RSA2, and RSA3 represent existing residential properties on Sao Augustine Way;
- RNA1 represents an existing residential property on Nova Albion Way; and
- RLP1 and RLP2 represent existing residential properties on La Perdiz Court

Each NSR position assumes a listener elevation of five feet (5') above grade.

[3] https://fdocuments.net/document/defra-noise-database-for-construction-sites.html?page=5

SOUND PROPAGATION PARAMETERS

The predictive model assumes point-source sound propagation, and the following three attenuation terms:

- Geometric divergence (i.e., "6 dB per doubling of distance");
- Atmospheric absorption (1 dBA reduction per 1,000 feet of distance travelled); and,
- Distance-dependent acoustical ground absorption, per equation 10 from ISO 9613-2, that limits available noise reduction due to potentially porous ground surface at 0 to 4.8 dBA.

Phase 2

The nearest NSR at the time of Vision Plan (2040) construction start will be newly occupied onsite residences associated with Residential Parcel 1 (RP1) and Residential Parcel 4 (RP4) as a result of Master Plan implementation. The seven offsite NSR discussed in the preceding Phase 1 methodology will be much more distant from Phase 2 construction activities than these new RP1 and RP4 NSR; hence, construction noise assessment attention should transfer to these newer and closest receptor positions.

SUMMARIZED METHODOLOGY

To assess construction noise from Phase 2 onsite activities, an FHWA RCNM emulator is used to estimate aggregate noise emission from each anticipated phase or grouping of activities, which are for purposes of this analysis the same as those listed in Table B-1 and include the same listed equipment. Using RCNM reference AUF and L_{max} levels for the listed equipment, the emulator allows a direct predictive calculation of hourly L_{eq} for each of the seven listed phases that can then be compared with estimated outdoor ambient sound levels at the NSR in order to evaluate potential exceedance (i.e., with respect to a proposed 10 dB allowable increase of the outdoor ambient sound level) and—if needed—corresponding mitigation quantity (dB).

Construction Noise Mitigation Prediction Methodologies and Sample Results Summaries

The following sections of this narrative describe methodologies for predicting example construction noise mitigation for each of the two Project development phases: Phase 1 (Master Plan) and Phase 2 (Vision Plan).

Phase 1

SUMMARIZED METHODOLOGY

The predictive analysis herein uses the same prediction methodology as appearing in the preceding narrative for Construction Noise Prediction Methodology Narrative and Assumptions. What has now been added to the model are the positions of temporary noise barriers having an indicated top height with respect to grade.

MODELED NOISE SOURCES & TEMPORARY BARRIERS

Figure B-2 displays the southern portion of the Project site and its surroundings with tags showing all considered construction activity point-source locations used in this predictive model—again, the same as those considered in the Phase 1 construction noise prediction model without mitigation. Each point-source is assumed to be 6' above local grade, which represents the fuel-burning engines or electric-motor drivers for heavy equipment idealized at the position.

Figure B-2 also presents, in orange-colored highlight, contiguous squares in the grid that approximate the location of a solid, temporary barrier segment to occlude direct sound paths from the adjoining tagged location of potential construction activity. The temporary barriers could be sheets of thick plywood, acoustical blankets, or other commonly used materials or assemblies that are assumed to demonstrate at least sound transmission class (STC) 20 and be properly installed to avoid air gaps that would otherwise compromise their acoustical insertion loss performance.

MODELED TOPOGRAPHY

For purposes of this construction noise level assessment, topographical effects (i.e., potential sound path occlusion due to natural terrain variation or man-made structures) have conservatively been ignored.

MODELED NOISE-SENSITIVE RECEPTORS

Figure B-2 also presents (as green oval callouts) the same seven studied NSR positions from the NTR and include as follows:

- RND1 represents an apparent senior-living residential facility on Northgate Drive;
- RSA1, RSA2, and RSA3 represent existing residential properties on Sao Augustine Way;
- RNA1 represents an existing residential property on Nova Albion Way; and
- RLP1 and RLP2 represent existing residential properties on La Perdiz Court

Each NSR position assumes a listener elevation of five feet (5’) above grade.

SOUND PROPAGATION PARAMETERS

The predictive model assumes point-source sound propagation, and the following three attenuation terms:

- Geometric divergence (i.e., “6 dB per doubling of distance”);
- Atmospheric absorption (1 dBA reduction per 1,000 feet of distance travelled); and,
- Distance-dependent acoustical ground absorption, per equation 10 from ISO 9613-2, that limits available noise reduction due to potentially porous ground surface at 0 to 4.8 dBA.

Approximate Scale: side of one square = 25.3 feet

Figure B-2. Modeled Phase 1 Project Construction Activity Positions (white rectangles), Proposed Temporary Barrier Segment Extents (orange highlight), and Noise-Sensitive Receptors (NSR, green oval callouts)

Phase 2

SUMMARIZED METHODOLOGY

To assess construction noise exposure levels at a nearest Residential Parcel 4 receptor (and at two potential heights: 5’ [first floor occupied unit] and 65’ [seventh floor occupied unit]) from Phase 2 onsite activities mitigated by insertion of a temporary barrier, an FHWA RCNM emulator is used to estimate aggregate noise emission from each anticipated phase or grouping of activities, which are for purposes of this analysis the same as those listed in Table B-1 and include the same listed equipment. Using RCNM reference AUF and L_{max} levels for the listed equipment, the emulator allows a direct predictive calculation of hourly L_{eq} for each of the seven listed phases that can then be compared with the worksheet results without the effect of this implementation of temporary noise barriers.

Sample Mitigation Prediction Results

PHASE 1

Compared to the worksheets showing the non-mitigated construction noise level estimates, the worksheets that include installation of a temporary noise barrier at least ten feet (10’) tall and placed near the noise-producing activity show that 9 dB of noise mitigation can be expected, which would be sufficient to reduce noise exposures at the offsite receptors to levels that are no more than 10 dB above existing outdoor ambient conditions.

PHASE 2

Compared to the worksheets showing the non-mitigated construction noise level estimates, the worksheets that include installation of a temporary noise barrier at least eleven feet (11’) tall and placed near the noise-producing activity show that 7 dB of noise mitigation can be expected for the tallest nearby Residential Parcel 4 receptor, which would be sufficient to reduce noise exposures to levels that are no more than 10 dB above estimated future outdoor ambient conditions (i.e., after Phase 1 completion).

Construction Schedule

Construction Activity

Year / Month	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RND1 (Alma Via of San Rafael) *using P1BS and P2BS activity locations*

Site Demolition (SDEMO)	57.0	57.0	57.0	57.0	57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	63.1	63.1	63.1	63.1	63.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	77.3	77.3	77.3	77.3	77.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	52.8	52.8	52.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	58.9	58.9	58.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.1	73.1	73.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	55.1	55.1	55.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	61.3	61.3	61.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.5	75.5	75.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	54.9	54.9	54.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	61.1	61.1	61.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.3	75.3	75.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.2	48.2	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.4	54.4	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.6	68.6
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.0	47.0	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.2	53.2	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	67.4	67.4
Concurrent Total (dBA)	**57**	**64**	**78**	**78**	**78**	**78**	**78**	**80**	**80**	**80**	**56**	**56**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**71**	**71**

RND1 (Alma Via of San Rafael) *using P1BW and P2BW activity locations*

Site Demolition (SDEMO)	54.2	54.2	54.2	54.2	54.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	59.8	59.8	59.8	59.8	59.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	77.3	77.3	77.3	77.3	77.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	50.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	55.6	55.6	55.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.1	73.1	73.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	52.4	52.4	52.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	57.9	57.9	57.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.5	75.5	75.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	52.2	52.2	52.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	57.8	57.8	57.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.3	75.3	75.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.5	45.5	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.1	51.1	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.6	68.6
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.3	44.3	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.8	49.8	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	67.4	67.4
Concurrent Total (dBA)	**54**	**61**	**77**	**77**	**77**	**77**	**77**	**80**	**80**	**80**	**53**	**53**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**71**	**71**

Construction Schedule

Construction Activity

Year / Month	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RSA1 (Sao Augustine Way) *using P1BS and P2BS activity locations*

Activity	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	60.6	60.6	60.6	60.6	60.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	76.6	76.6	76.6	76.6	76.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	64.0	64.0	64.0	64.0	64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	56.3	56.3	56.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	72.4	72.4	72.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.8	59.8	59.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	58.7	58.7	58.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	74.8	74.8	74.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.2	62.2	62.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	58.5	58.5	58.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	74.6	74.6	74.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.0	62.0	62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.8	51.8	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	67.9	67.9	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.3	55.3
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.6	50.6	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	66.7	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.1	54.1
Concurrent Total (dBA)	**61**	**77**	**77**	**77**	**77**	**77**	**79**	**79**	**79**	**66**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**71**	**71**	**58**	**58**

RSA1 (Sao Augustine Way) *using P1BW and P2BW activity locations*

Activity	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	56.8	56.8	56.8	56.8	56.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	66.1	66.1	66.1	66.1	66.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	64.0	64.0	64.0	64.0	64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	52.6	52.6	52.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	61.9	61.9	61.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.8	59.8	59.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	54.9	54.9	54.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	64.2	64.2	64.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.2	62.2	62.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	54.8	54.8	54.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	64.0	64.0	64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.0	62.0	62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.1	48.1	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.4	57.4	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.3	55.3
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.8	46.8	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.1	56.1	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.1	54.1
Concurrent Total (dBA)	**57**	**67**	**68**	**68**	**68**	**69**	**70**	**71**	**70**	**66**	**59**	**59**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**	**58**	**58**

Construction Schedule

Construction Activity

Year / Month	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RSA2 (Sao Augustine Way) *using P1BS and P2BS activity locations*

	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	61.6	61.6	61.6	61.6	61.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	77.7	77.7	77.7	77.7	77.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	62.6	62.6	62.6	62.6	62.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	57.4	57.4	57.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	73.5	73.5	73.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.4	58.4	58.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	59.7	59.7	59.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	75.8	75.8	75.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.8	60.8	60.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	59.6	59.6	59.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	75.6	75.6	75.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.6	60.6	60.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.9	52.9	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.9	68.9	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.9	53.9
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.6	51.6	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	67.7	67.7	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.7	52.7
Concurrent Total (dBA)	**62**	**78**	**78**	**78**	**78**	**78**	**80**	**80**	**80**	**65**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**71**	**71**	**56**	**56**

RSA2 (Sao Augustine Way) *using P1BW and P2BW activity locations*

	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	57.5	57.5	57.5	57.5	57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	67.9	67.9	67.9	67.9	67.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	62.6	62.6	62.6	62.6	62.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	53.3	53.3	53.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	63.7	63.7	63.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.4	58.4	58.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	55.7	55.7	55.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	66.1	66.1	66.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.8	60.8	60.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	55.5	55.5	55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	65.9	65.9	65.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.6	60.6	60.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.8	48.8	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.2	59.2	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.9	53.9
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.6	47.6	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.0	58.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.7	52.7
Concurrent Total (dBA)	**58**	**68**	**69**	**69**	**69**	**70**	**71**	**72**	**71**	**65**	**60**	**60**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**56**	**56**

Construction Schedule

Year	2024												2025												2026							
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Construction Activity																																
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RSA3 (Sao Augustine Way) *using P1BS and P2BS activity locations*

Site Demolition (SDEMO)	62.6	62.6	62.6	62.6	62.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	73.9	73.9	73.9	73.9	73.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	61.3	61.3	61.3	61.3	61.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	58.4	58.4	58.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	69.7	69.7	69.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.1	57.1	57.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	60.8	60.8	60.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	72.1	72.1	72.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.5	59.5	59.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	60.6	60.6	60.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	71.9	71.9	71.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.3	59.3	59.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.9	53.9	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.2	65.2	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.6	52.6
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.7	52.7	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.0	64.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.3	51.3
Concurrent Total (dBA)	**63**	**74**	**74**	**74**	**74**	**75**	**77**	**77**	**76**	**64**	**66**	**66**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**68**	**68**	**55**	**55**

RSA3 (Sao Augustine Way) *using P1BW and P2BW activity locations*

Site Demolition (SDEMO)	58.3	58.3	58.3	58.3	58.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	69.5	69.5	69.5	69.5	69.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	61.3	61.3	61.3	61.3	61.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	54.1	54.1	54.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	65.3	65.3	65.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.1	57.1	57.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	56.5	56.5	56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	67.7	67.7	67.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.5	59.5	59.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	56.3	56.3	56.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	67.5	67.5	67.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.3	59.3	59.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.6	49.6	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.8	60.8	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.6	52.6
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.4	48.4	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.6	59.6	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.3	51.3
Concurrent Total (dBA)	**58**	**70**	**70**	**70**	**70**	**71**	**72**	**73**	**72**	**64**	**62**	**62**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**63**	**64**	**64**	**55**	**55**

Construction Schedule

Year / Month	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Construction Activity																																
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RNA1 (Nova Albion Way) *using P1BS and P2BS activity locations*

	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	66.8	66.8	66.8	66.8	66.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	69.0	69.0	69.0	69.0	69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	59.9	59.9	59.9	59.9	59.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	62.6	62.6	62.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	64.8	64.8	64.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.7	55.7	55.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	65.0	65.0	65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	67.2	67.2	67.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.0	58.0	58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	64.8	64.8	64.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	67.0	67.0	67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.9	57.9	57.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	61.2	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.1	58.1	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.3	60.3	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.2	51.2
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.9	56.9	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.1	59.1	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.9	49.9
Concurrent Total (dBA)	**67**	**71**	**71**	**71**	**71**	**72**	**73**	**74**	**72**	**64**	**63**	**63**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**63**	**63**	**54**	**54**

RNA1 (Nova Albion Way) *using P1BW and P2BW activity locations*

	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	60.9	60.9	60.9	60.9	60.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	76.6	76.6	76.6	76.6	76.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	59.9	59.9	59.9	59.9	59.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	56.7	56.7	56.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	72.4	72.4	72.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.7	55.7	55.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	59.1	59.1	59.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	74.8	74.8	74.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.0	58.0	58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	58.9	58.9	58.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	74.6	74.6	74.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.9	57.9	57.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.2	52.2	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	67.9	67.9	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.2	51.2
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.0	51.0	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	66.7	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.9	49.9
Concurrent Total (dBA)	**61**	**77**	**77**	**77**	**77**	**77**	**79**	**79**	**79**	**63**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**69**	**70**	**70**	**54**	**54**

Construction Schedule

Year	2024												2025												2026							
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Construction Activity																																
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RLP1 (La Perdiz Ct.) *using P1BS and P2BS activity locations*

Site Demolition (SDEMO)	64.9	64.9	64.9	64.9	64.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	60.2	60.2	60.2	60.2	60.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	55.5	55.5	55.5	55.5	55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	60.7	60.7	60.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	56.0	56.0	56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.3	51.3	51.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	63.0	63.0	63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	58.4	58.4	58.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.7	53.7	53.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	62.8	62.8	62.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	58.2	58.2	58.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.5	53.5	53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.1	56.1	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.5	51.5	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.8	46.8
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.9	54.9	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.3	50.3	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.6	45.6
Concurrent Total (dBA)	**65**	**66**	**67**	**67**	**67**	**68**	**69**	**69**	**65**	**60**	**58**	**58**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**60**	**60**	**55**	**55**	**49**	**49**

RLP1 (La Perdiz Ct.) *using P1BW and P2BW activity locations*

Site Demolition (SDEMO)	63.3	63.3	63.3	63.3	63.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	63.4	63.4	63.4	63.4	63.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	55.5	55.5	55.5	55.5	55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	59.1	59.1	59.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	59.2	59.2	59.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.3	51.3	51.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	61.4	61.4	61.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	61.6	61.6	61.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.7	53.7	53.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	61.3	61.3	61.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	61.4	61.4	61.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.5	53.5	53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.6	54.6	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.7	54.7	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.8	46.8
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.3	53.3	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.5	53.5	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.6	45.6
Concurrent Total (dBA)	**63**	**66**	**67**	**67**	**67**	**68**	**69**	**69**	**67**	**60**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**60**	**60**	**58**	**58**	**49**	**49**

Construction Schedule

Construction Activity	Jan 2024	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2025	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2026	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RLP2 (La Perdiz Ct.) *using P1BS and P2BS activity locations*

Construction Activity	Jan 2024	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2025	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2026	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	66.4	66.4	66.4	66.4	66.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	58.7	58.7	58.7	58.7	58.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	54.9	54.9	54.9	54.9	54.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	62.1	62.1	62.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	54.5	54.5	54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.7	50.7	50.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	64.5	64.5	64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	56.9	56.9	56.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.1	53.1	53.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	64.3	64.3	64.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	56.7	56.7	56.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.9	52.9	52.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.6	57.6	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.2	46.2
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.4	56.4	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.8	48.8	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0
Concurrent Total (dBA)	**66**	**67**	**67**	**67**	**67**	**69**	**69**	**69**	**64**	**61**	**59**	**59**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**61**	**61**	**54**	**54**	**49**	**49**

RLP2 (La Perdiz Ct.) *using P1BW and P2BW activity locations*

Construction Activity	Jan 2024	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2025	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2026	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	68.7	68.7	68.7	68.7	68.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	62.1	62.1	62.1	62.1	62.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	54.9	54.9	54.9	54.9	54.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	64.5	64.5	64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	57.9	57.9	57.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.7	50.7	50.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	66.9	66.9	66.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	60.3	60.3	60.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.1	53.1	53.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	66.7	66.7	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	60.1	60.1	60.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.9	52.9	52.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	54.3	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.0	60.0	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.4	53.4	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.2	46.2
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.8	58.8	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.2	52.2	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0
Concurrent Total (dBA)	**69**	**70**	**70**	**70**	**70**	**72**	**72**	**72**	**66**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**63**	**63**	**56**	**56**	**49**	**49**

Construction Schedule

Year	2024												2025												2026							
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Construction Activity																																
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RND1 (Alma Via of San Rafael) *using P1BS and P2BS activity locations*

Site Demolition (SDEMO)	48.6	48.6	48.6	48.6	48.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	63.2	63.2	63.2	63.2	63.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	63.5	63.5	63.5	63.5	63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	44.4	44.4	44.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	59.0	59.0	59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.3	59.3	59.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	46.7	46.7	46.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	61.4	61.4	61.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.7	61.7	61.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	46.5	46.5	46.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	61.2	61.2	61.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.5	61.5	61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.8	39.8	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.5	54.5	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.8	54.8
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.6	38.6	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.3	53.3	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.6	53.6
Concurrent Total (dBA)	**49**	**63**	**66**	**66**	**66**	**67**	**68**	**69**	**69**	**66**	**56**	**56**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**57**	**57**

RND1 (Alma Via of San Rafael) *using P1BW and P2BW activity locations*

Site Demolition (SDEMO)	54.4	54.4	54.4	54.4	54.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	60.2	60.2	60.2	60.2	60.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	63.5	63.5	63.5	63.5	63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	50.2	50.2	50.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	56.0	56.0	56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.3	59.3	59.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	52.6	52.6	52.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	58.4	58.4	58.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.7	61.7	61.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	52.4	52.4	52.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	58.2	58.2	58.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.5	61.5	61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	52.4	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.7	45.7	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.5	51.5	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.8	54.8
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.5	44.5	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.3	50.3	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.6	53.6
Concurrent Total (dBA)	**54**	**61**	**66**	**66**	**66**	**66**	**66**	**68**	**67**	**66**	**53**	**53**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**57**	**57**

Construction Schedule

Year	2024												2025												2026							
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Construction Activity																																
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RSA1 (Sao Augustine Way) *using P1BS and P2BS activity locations*

Site Demolition (SDEMO)	52.0	52.0	52.0	52.0	52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	63.7	63.7	63.7	63.7	63.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	55.8	55.8	55.8	55.8	55.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	47.8	47.8	47.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	59.5	59.5	59.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.6	51.6	51.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	50.2	50.2	50.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	61.8	61.8	61.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.0	54.0	54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	50.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	61.6	61.6	61.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.8	53.8	53.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.3	43.3	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.0	55.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.1	47.1
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.1	42.1	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.7	53.7	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.9	45.9
Concurrent Total (dBA)	**52**	**64**	**65**	**65**	**65**	**65**	**67**	**67**	**67**	**58**	**56**	**56**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**58**	**58**	**50**	**50**

RSA1 (Sao Augustine Way) *using P1BW and P2BW activity locations*

Site Demolition (SDEMO)	44.5	44.5	44.5	44.5	44.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	54.4	54.4	54.4	54.4	54.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	55.8	55.8	55.8	55.8	55.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	40.3	40.3	40.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	50.1	50.1	50.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.6	51.6	51.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	42.6	42.6	42.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	52.5	52.5	52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.0	54.0	54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	42.4	42.4	42.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	52.3	52.3	52.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.8	53.8	53.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.8	35.8	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.6	45.6	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.1	47.1
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.5	34.5	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.4	44.4	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.9	45.9
Concurrent Total (dBA)	**44**	**55**	**58**	**58**	**58**	**58**	**59**	**61**	**60**	**58**	**47**	**47**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**50**	**50**

Construction Schedule

Construction Activity	Jan 2024	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2025	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2026	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RSA2 (Sao Augustine Way) *using P1BS and P2BS activity locations*

Construction Activity	Jan 2024	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2025	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2026	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	50.6	50.6	50.6	50.6	50.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	64.6	64.6	64.6	64.6	64.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	50.2	50.2	50.2	50.2	50.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	46.3	46.3	46.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	60.4	60.4	60.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.0	46.0	46.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	48.7	48.7	48.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	62.8	62.8	62.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.4	48.4	48.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	48.5	48.5	48.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	62.6	62.6	62.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.2	48.2	48.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.8	41.8	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.9	55.9	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.5	41.5
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.6	40.6	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.7	54.7	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.3	40.3
Concurrent Total (dBA)	**51**	**65**	**65**	**65**	**65**	**65**	**67**	**67**	**67**	**53**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**58**	**58**	**44**	**44**

RSA2 (Sao Augustine Way) *using P1BW and P2BW activity locations*

Construction Activity	Jan 2024	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2025	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2026	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	46.1	46.1	46.1	46.1	46.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	57.2	57.2	57.2	57.2	57.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	50.2	50.2	50.2	50.2	50.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	41.9	41.9	41.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	53.0	53.0	53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.0	46.0	46.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	44.2	44.2	44.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	55.3	55.3	55.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.4	48.4	48.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	44.1	44.1	44.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	55.2	55.2	55.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.2	48.2	48.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.4	37.4	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.5	48.5	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.5	41.5
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.1	36.1	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.2	47.2	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.3	40.3
Concurrent Total (dBA)	**46**	**58**	**58**	**58**	**58**	**58**	**60**	**60**	**60**	**53**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**51**	**51**	**51**	**51**	**44**	**44**

Construction Schedule

Construction Activity	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RSA3 (Sao Augustine Way) *using P1BS and P2BS activity locations*

Activity	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	52.1	52.1	52.1	52.1	52.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	61.0	61.0	61.0	61.0	61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	52.6	52.6	52.6	52.6	52.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	47.9	47.9	47.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	56.8	56.8	56.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.4	48.4	48.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	50.3	50.3	50.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	59.2	59.2	59.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.8	50.8	50.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	50.1	50.1	50.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	59.0	59.0	59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.6	50.6	50.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.4	43.4	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.3	52.3	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.9	43.9
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.2	42.2	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.1	51.1	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.7	42.7
Concurrent Total (dBA)	**52**	**62**	**62**	**62**	**62**	**62**	**64**	**64**	**64**	**55**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**55**	**55**	**46**	**46**

RSA3 (Sao Augustine Way) *using P1BW and P2BW activity locations*

Activity	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	58.6	58.6	58.6	58.6	58.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	58.8	58.8	58.8	58.8	58.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	52.6	52.6	52.6	52.6	52.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	54.3	54.3	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	54.6	54.6	54.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.4	48.4	48.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	56.7	56.7	56.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	56.9	56.9	56.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.8	50.8	50.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	56.5	56.5	56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	56.7	56.7	56.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.6	50.6	50.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.8	49.8	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.9	43.9
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.6	48.6	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.8	48.8	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.7	42.7
Concurrent Total (dBA)	**59**	**62**	**62**	**62**	**62**	**63**	**64**	**64**	**62**	**56**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**55**	**55**	**53**	**53**	**46**	**46**

Construction Schedule

Construction Activity	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RNA1 (Nova Albion Way) *using P1BS and P2BS activity locations*

Construction Activity	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	56.5	56.5	56.5	56.5	56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	68.9	68.9	68.9	68.9	68.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	59.8	59.8	59.8	59.8	59.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	52.2	52.2	52.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	64.7	64.7	64.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.6	55.6	55.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	54.6	54.6	54.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	67.1	67.1	67.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.9	57.9	57.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	54.4	54.4	54.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	66.9	66.9	66.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.7	57.7	57.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.7	47.7	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.2	60.2	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.0	51.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.5	46.5	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.0	59.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.8	49.8
Concurrent Total (dBA)	**56**	**69**	**70**	**70**	**70**	**70**	**72**	**72**	**72**	**62**	**61**	**61**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**62**	**63**	**63**	**53**	**53**

RNA1 (Nova Albion Way) *using P1BW and P2BW activity locations*

Construction Activity	2024 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2025 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2026 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Site Demolition (SDEMO)	50.2	50.2	50.2	50.2	50.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	62.4	62.4	62.4	62.4	62.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	59.8	59.8	59.8	59.8	59.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	46.0	46.0	46.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	58.2	58.2	58.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.6	55.6	55.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	48.3	48.3	48.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	60.6	60.6	60.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.9	57.9	57.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	48.1	48.1	48.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	60.4	60.4	60.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.7	57.7	57.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.4	41.4	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.7	53.7	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.0	51.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.2	40.2	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.5	52.5	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.8	49.8
Concurrent Total (dBA)	**50**	**63**	**64**	**64**	**64**	**65**	**66**	**67**	**67**	**62**	**55**	**55**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**57**	**58**	**58**	**53**	**53**

Construction Schedule

Year	2024												2025												2026							
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Construction Activity																																
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RLP1 (La Perdiz Ct.) *using P1BS and P2BS activity locations*

Site Demolition (SDEMO)	54.3	54.3	54.3	54.3	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	54.4	54.4	54.4	54.4	54.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	46.9	46.9	46.9	46.9	46.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	50.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	50.2	50.2	50.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.7	42.7	42.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	52.4	52.4	52.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	52.5	52.5	52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.1	45.1	45.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	52.2	52.2	52.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	52.3	52.3	52.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.9	44.9	44.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.5	45.5	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.6	45.6	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.2	38.2
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.3	44.3	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.4	44.4	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.0	37.0
Concurrent Total (dBA)	**54**	**57**	**58**	**58**	**58**	**59**	**60**	**60**	**58**	**51**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**51**	**51**	**49**	**49**	**41**	**41**

RLP1 (La Perdiz Ct.) *using P1BW and P2BW activity locations*

Site Demolition (SDEMO)	53.8	53.8	53.8	53.8	53.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	52.9	52.9	52.9	52.9	52.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	46.9	46.9	46.9	46.9	46.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	49.6	49.6	49.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	48.7	48.7	48.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.7	42.7	42.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	51.9	51.9	51.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	51.1	51.1	51.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.1	45.1	45.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	51.7	51.7	51.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	50.9	50.9	50.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.9	44.9	44.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.1	45.1	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.2	44.2	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.2	38.2
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.8	43.8	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.0	43.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.0	37.0
Concurrent Total (dBA)	**54**	**56**	**57**	**57**	**57**	**58**	**59**	**59**	**56**	**51**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**50**	**50**	**47**	**47**	**41**	**41**

Construction Schedule

Year	2024												2025												2026							
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Construction Activity																																
Site Demolition (SDEMO)	SDEMO1	SDEMO1	SDEMO1	SDEMO1	SDEMO1																											
Site Demolition (SDEMO)		SDEMO2	SDEMO2	SDEMO2	SDEMO2	SDEMO2																										
Site Demolition (SDEMO)			SDEMO3	SDEMO3	SDEMO3	SDEMO3	SDEMO3																									
Site Preparation (SPREP)						SPREP1	SPREP1	SPREP1																								
Site Preparation (SPREP)							SPREP2	SPREP2	SPREP2																							
Site Preparation (SPREP)								SPREP3	SPREP3	SPREP3																						
Site Grading (SGRAD)						SGRAD1	SGRAD1	SGRAD1																								
Site Grading (SGRAD)							SGRAD2	SGRAD2	SGRAD2																							
Site Grading (SGRAD)								SGRAD3	SGRAD3	SGRAD3																						
Rough Roads (RROAD)						RROAD1	RROAD1	RROAD1																								
Rough Roads (RROAD)							RROAD2	RROAD2	RROAD2																							
Rough Roads (RROAD)								RROAD3	RROAD3	RROAD3																						
Building Erection (BLDGE)									BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1	BLDGE1						
Building Erection (BLDGE)											BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2	BLDGE2				
Building Erection (BLDGE)													BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3	BLDGE3		
Final Roads (FROAD)																											FROAD1	FROAD1				
Final Roads (FROAD)																													FROAD2	FROAD2		
Final Roads (FROAD)																															FROAD3	FROAD3
Architectural Finishing (ARCHF)																											ARCHF1	ARCHF1				
Architectural Finishing (ARCHF)																													ARCHF2	ARCHF2		
Architectural Finishing (ARCHF)																															ARCHF3	ARCHF3

RLP2 (La Perdiz Ct.) *using P1BS and P2BS activity locations*

Site Demolition (SDEMO)	56.5	56.5	56.5	56.5	56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	57.2	57.2	57.2	57.2	57.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	54.9	54.9	54.9	54.9	54.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	52.2	52.2	52.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	53.0	53.0	53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.7	50.7	50.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	54.6	54.6	54.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	55.3	55.3	55.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.1	53.1	53.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	54.4	54.4	54.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	55.1	55.1	55.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.9	52.9	52.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	48.7	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.7	47.7	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.5	48.5	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.2	46.2
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.5	46.5	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.2	47.2	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0
Concurrent Total (dBA)	**56**	**60**	**61**	**61**	**61**	**62**	**63**	**63**	**62**	**58**	**52**	**52**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**54**	**54**	**52**	**52**	**49**	**49**

RLP2 (La Perdiz Ct.) *using P1BW and P2BW activity locations*

Site Demolition (SDEMO)	58.4	58.4	58.4	58.4	58.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	52.3	52.3	52.3	52.3	52.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Demolition (SDEMO)	0.0	0.0	54.9	54.9	54.9	54.9	54.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	54.2	54.2	54.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	48.1	48.1	48.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Preparation (SPREP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.7	50.7	50.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	56.6	56.6	56.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	50.4	50.4	50.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site Grading (SGRAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.1	53.1	53.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	56.4	56.4	56.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	50.2	50.2	50.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rough Roads (RROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.9	52.9	52.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	0.0	0.0	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	0.0	0.0	0.0	0.0
Building Erection (BLDGE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	47.1	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.7	49.7	0.0	0.0	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.5	43.5	0.0	0.0
Final Roads (FROAD)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.2	46.2
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.5	48.5	0.0	0.0	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.3	42.3	0.0	0.0
Architectural Finishing (ARCHF)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0
Concurrent Total (dBA)	**58**	**59**	**61**	**61**	**61**	**62**	**62**	**63**	**60**	**58**	**52**	**52**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**54**	**54**	**50**	**50**	**49**	**49**

To User: bordered cells are inputs, unbordered cells have formulae
enter "0" to turn off air or grnd absorption terms, "1" to turn on

air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = 90
allowable hours over which Leq is to be averaged = 1

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	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 1-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)
1	Site Demolition	excavator	1	100	81	360	0		59.2	1	60	59	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		dozer	1	100	82	360	0		60.2	1	60	60	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		mounted impact hammer (hoe ram)	1	100	90	360	0		68.2	1	60	68	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		dump truck	1	100	76	360	0		54.2	1	60	54	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		welder / torch	1	100	73	360	0		51.2	1	60	51	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		jackhammer	1	100	85	360	0		63.2	1	60	63	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	360	0		52.2	1	60	52	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Site Demolition Phase	**70.5**																
2	Site Preparation	excavator	1	100	81	360	0		59.2	1	60	59	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		dozer	1	100	82	360	0		60.2	1	60	60	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		front end loader	1	100	79	360	0		57.2	1	60	57	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	360	0		52.2	1	60	52	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Site Preparation Phase	**64.1**																
3	Site Grading	grader	1	100	85	360	0		63.2	1	60	63	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		scraper	1	100	84	360	0		62.2	1	60	62	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		front end loader	1	100	79	360	0		57.2	1	60	57	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	360	0		52.2	1	60	52	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Site Grading Phase	**66.5**																
4	Rough Roads	grader	1	100	85	360	0		63.2	1	60	63	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		scraper	1	100	84	360	0		62.2	1	60	62	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		compactor (ground)	1	100	80	360	0		58.2	1	60	58	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	360	0		52.2	1	60	52	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Rough Roads Phase	**66.6**																
5	Building Erection	crane	1	100	81	360	0		59.2	1	60	59	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		man lift	1	100	75	360	0		53.2	1	60	53	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		auger drill rig	1	100	84	360	0		62.2	1	60	62	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	360	0		52.2	1	60	52	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		generator	1	100	72	360	0		50.2	1	60	50	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		welder / torch	1	100	73	360	0		51.2	1	60	51	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Building Erection Phase	**64.9**																
6	Final Roads	paver	1	100	77	360	0		55.2	1	60	55	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		roller	1	100	80	360	0		58.2	1	60	58	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		vacuum street sweeper	1	100	80	360	0		58.2	1	60	58	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Final Roads Phase	**62.2**																
7	Architectural Finishes	compressor (air)	1	100	78	360	0		56.2	1	60	56	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		man lift	1	100	75	360	0		53.2	1	60	53	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	360	0		52.2	1	60	52	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Architectural Finishes Phase	**59.0**																

To User: bordered cells are inputs, unbordered cells have formulae
enter "0" to turn off air or grnd absorption terms, "1" to turn on

air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = 90
allowable hours over which Leq is to be averaged = 1

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	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 1-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)
1	Site Demolition	excavator	1	100	81	360	0		61.5	1	60	62	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		dozer	1	100	82	360	0		62.5	1	60	63	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		mounted impact hammer (hoe ram)	1	100	90	360	0		70.5	1	60	71	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		dump truck	1	100	76	360	0		56.5	1	60	57	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		welder / torch	1	100	73	360	0		53.5	1	60	54	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		jackhammer	1	100	85	360	0		65.5	1	60	66	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	100	74	360	0		54.5	1	60	55	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Site Demolition Phase	**72.8**																
2	Site Preparation	excavator	1	100	81	360	0		61.5	1	60	62	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		dozer	1	100	82	360	0		62.5	1	60	63	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		front end loader	1	100	79	360	0		59.5	1	60	60	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	100	74	360	0		54.5	1	60	55	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Site Preparation Phase	**66.4**																
3	Site Grading	grader	1	100	85	360	0		65.5	1	60	66	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		scraper	1	100	84	360	0		64.5	1	60	65	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		front end loader	1	100	79	360	0		59.5	1	60	60	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	100	74	360	0		54.5	1	60	55	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Site Grading Phase	**68.8**																
4	Rough Roads	grader	1	100	85	360	0		65.5	1	60	66	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		scraper	1	100	84	360	0		64.5	1	60	65	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		compactor (ground)	1	100	80	360	0		60.5	1	60	61	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	100	74	360	0		54.5	1	60	55	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Rough Roads Phase	**68.9**																
5	Building Erection	crane	1	100	81	360	0		61.5	1	60	62	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		man lift	1	100	75	360	0		55.5	1	60	56	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		auger drill rig	1	100	84	360	0		64.5	1	60	65	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	100	74	360	0		54.5	1	60	55	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		generator	1	100	72	360	0		52.5	1	60	53	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		welder / torch	1	100	73	360	0		53.5	1	60	54	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Building Erection Phase	**67.3**																
6	Final Roads	paver	1	100	77	360	0		57.5	1	60	58	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		roller	1	100	80	360	0		60.5	1	60	61	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		vacuum street sweeper	1	100	80	360	0		60.5	1	60	61	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Final Roads Phase	**64.5**																
7	Architectural Finishes	compressor (air)	1	100	78	360	0		58.5	1	60	59	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		man lift	1	100	75	360	0		55.5	1	60	56	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	100	74	360	0		54.5	1	60	55	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Architectural Finishes Phase	**61.3**																

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air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = 90
allowable hours over which Leq is to be averaged = 1

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	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 1-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)
1	Site Demolition	excavator	1	100	81	100	0		73.0	1	60	73	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		dozer	1	100	82	100	0		74.0	1	60	74	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		mounted impact hammer (hoe ram)	1	100	90	100	0		82.0	1	60	82	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		dump truck	1	100	76	100	0		68.0	1	60	68	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		welder / torch	1	100	73	100	0		65.0	1	60	65	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		jackhammer	1	100	85	100	0		77.0	1	60	77	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	100	0		66.0	1	60	66	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Site Demolition Phase	**84.2**																
2	Site Preparation	excavator	1	100	81	100	0		73.0	1	60	73	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		dozer	1	100	82	100	0		74.0	1	60	74	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		front end loader	1	100	79	100	0		71.0	1	60	71	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	100	0		66.0	1	60	66	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Site Preparation Phase	**77.9**																
3	Site Grading	grader	1	100	85	100	0		77.0	1	60	77	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		scraper	1	100	84	100	0		76.0	1	60	76	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		front end loader	1	100	79	100	0		71.0	1	60	71	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	100	0		66.0	1	60	66	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Site Grading Phase	**80.2**																
4	Rough Roads	grader	1	100	85	100	0		77.0	1	60	77	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		scraper	1	100	84	100	0		76.0	1	60	76	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		compactor (ground)	1	100	80	100	0		72.0	1	60	72	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	100	0		66.0	1	60	66	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Rough Roads Phase	**80.4**																
5	Building Erection	crane	1	100	81	100	0		73.0	1	60	73	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		man lift	1	100	75	100	0		67.0	1	60	67	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		auger drill rig	1	100	84	100	0		76.0	1	60	76	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	100	0		66.0	1	60	66	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		generator	1	100	72	100	0		64.0	1	60	64	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		welder / torch	1	100	73	100	0		65.0	1	60	65	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Building Erection Phase	**78.7**																
6	Final Roads	paver	1	100	77	100	0		69.0	1	60	69	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		roller	1	100	80	100	0		72.0	1	60	72	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		vacuum street sweeper	1	100	80	100	0		72.0	1	60	72	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Final Roads Phase	**75.9**																
7	Architectural Finishes	compressor (air)	1	100	78	100	0		70.0	1	60	70	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		man lift	1	100	75	100	0		67.0	1	60	67	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	100	74	100	0		66.0	1	60	66	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Architectural Finishes Phase	**72.8**																

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air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = 90
allowable hours over which Leq is to be averaged = 1

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	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 1-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)
1	Site Demolition	excavator	1	100	81	100	0		74.8	1	60	75	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		dozer	1	100	82	100	0		75.8	1	60	76	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		mounted impact hammer (hoe ram)	1	100	90	100	0		83.8	1	60	84	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		dump truck	1	100	76	100	0		69.8	1	60	70	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		welder / torch	1	100	73	100	0		66.8	1	60	67	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		jackhammer	1	100	85	100	0		78.8	1	60	79	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		flat bed truck	1	100	74	100	0		67.8	1	60	68	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
											Total Aggregate Noise Exposure from Site Demolition Phase	**86.1**																
2	Site Preparation	excavator	1	100	81	100	0		74.8	1	60	75	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		dozer	1	100	82	100	0		75.8	1	60	76	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		front end loader	1	100	79	100	0		72.8	1	60	73	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		flat bed truck	1	100	74	100	0		67.8	1	60	68	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
											Total Aggregate Noise Exposure from Site Preparation Phase	**79.7**																
3	Site Grading	grader	1	100	85	100	0		78.8	1	60	79	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		scraper	1	100	84	100	0		77.8	1	60	78	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		front end loader	1	100	79	100	0		72.8	1	60	73	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		flat bed truck	1	100	74	100	0		67.8	1	60	68	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
											Total Aggregate Noise Exposure from Site Grading Phase	**82.1**																
4	Rough Roads	grader	1	100	85	100	0		78.8	1	60	79	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		scraper	1	100	84	100	0		77.8	1	60	78	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		compactor (ground)	1	100	80	100	0		73.8	1	60	74	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		flat bed truck	1	100	74	100	0		67.8	1	60	68	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
											Total Aggregate Noise Exposure from Rough Roads Phase	**82.2**																
5	Building Erection	crane	1	100	81	100	0		74.8	1	60	75	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		man lift	1	100	75	100	0		68.8	1	60	69	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		auger drill rig	1	100	84	100	0		77.8	1	60	78	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		flat bed truck	1	100	74	100	0		67.8	1	60	68	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		generator	1	100	72	100	0		65.8	1	60	66	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		welder / torch	1	100	73	100	0		66.8	1	60	67	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
											Total Aggregate Noise Exposure from Building Erection Phase	**80.5**																
6	Final Roads	paver	1	100	77	100	0		70.8	1	60	71	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		roller	1	100	80	100	0		73.8	1	60	74	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		vacuum street sweeper	1	100	80	100	0		73.8	1	60	74	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
											Total Aggregate Noise Exposure from Final Roads Phase	**77.8**																
7	Architectural Finishes	compressor (air)	1	100	78	100	0		71.8	1	60	72	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		man lift	1	100	75	100	0		68.8	1	60	69	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		flat bed truck	1	100	74	100	0		67.8	1	60	68	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
											Total Aggregate Noise Exposure from Architectural Finishes Phase	**74.6**																

To User: bordered cells are inputs, unbordered cells have formulae
enter "0" to turn off air or grnd absorption terms, "1" to turn on

air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = varies
allowable hours over which Leq is to be averaged = 1

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	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 1-hour Leq
1	Site Demolition	excavator	1	40	81	360	0		59.2	1	60	55
		dozer	1	40	82	360	0		60.2	1	60	56
		mounted impact hammer (hoe ram)	1	20	90	360	0		68.2	1	60	61
		dump truck	1	40	76	360	0		54.2	1	60	50
		welder / torch	1	40	73	360	0		51.2	1	60	47
		jackhammer	1	20	85	360	0		63.2	1	60	56
		flat bed truck	1	40	74	360	0		52.2	1	60	48
									Total Aggregate Noise Exposure from Site Demolition Phase			**64.4**
2	Site Preparation	excavator	1	40	81	360	0		59.2	1	60	55
		dozer	1	40	82	360	0		60.2	1	60	56
		front end loader	1	40	79	360	0		57.2	1	60	53
		flat bed truck	1	40	74	360	0		52.2	1	60	48
									Total Aggregate Noise Exposure from Site Preparation Phase			**60.2**
3	Site Grading	grader	1	40	85	360	0		63.2	1	60	59
		scraper	1	40	84	360	0		62.2	1	60	58
		front end loader	1	40	79	360	0		57.2	1	60	53
		flat bed truck	1	40	74	360	0		52.2	1	60	48
									Total Aggregate Noise Exposure from Site Grading Phase			**62.5**
4	Rough Roads	grader	1	40	85	360	0		63.2	1	60	59
		scraper	1	40	84	360	0		62.2	1	60	58
		compactor (ground)	1	20	80	360	0		58.2	1	60	51
		flat bed truck	1	40	74	360	0		52.2	1	60	48
									Total Aggregate Noise Exposure from Rough Roads Phase			**62.3**
5	Building Erection	crane	1	16	81	360	0		59.2	1	60	51
		man lift	1	20	75	360	0		53.2	1	60	46
		auger drill rig	1	20	84	360	0		62.2	1	60	55
		flat bed truck	1	40	74	360	0		52.2	1	60	48
		generator	1	50	72	360	0		50.2	1	60	47
		welder / torch	1	40	73	360	0		51.2	1	60	47
									Total Aggregate Noise Exposure from Building Erection Phase			**58.3**
6	Final Roads	paver	1	50	77	360	0		55.2	1	60	52
		roller	1	20	80	360	0		58.2	1	60	51
		vacuum street sweeper	1	10	80	360	0		58.2	1	60	48
									Total Aggregate Noise Exposure from Final Roads Phase			**55.6**
7	Architectural Finishes	compressor (air)	1	40	78	360	0		56.2	1	60	52
		man lift	1	20	75	360	0		53.2	1	60	46
		flat bed truck	1	40	74	360	0		52.2	1	60	48
									Total Aggregate Noise Exposure from Architectural Finishes Phase			**54.4**

Project Phase No.	Comparable FHWA RCNM Construction Equipment Type	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)
1	excavator	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	dozer	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	mounted impact hammer (hoe ram)	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	dump truck	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	welder / torch	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	jackhammer	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	flat bed truck	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
2	excavator	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	dozer	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	front end loader	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	flat bed truck	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
3	grader	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	scraper	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	front end loader	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	flat bed truck	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
4	grader	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	scraper	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	compactor (ground)	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	flat bed truck	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
5	crane	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	man lift	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	auger drill rig	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	flat bed truck	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	generator	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	welder / torch	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
6	paver	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	roller	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	vacuum street sweeper	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
7	compressor (air)	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	man lift	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
	flat bed truck	6	5	0	5	355	360	7.8	355.0	360.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1

To User: bordered cells are inputs, unbordered cells have formulae
enter "0" to turn off air or grnd absorption terms, "1" to turn on

air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = varies
allowable hours over which Leq is to be averaged = 1

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	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 1-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)
1	Site Demolition	excavator	1	40	81	360	0		61.5	1	60	58	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		dozer	1	40	82	360	0		62.5	1	60	59	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		mounted impact hammer (hoe ram)	1	20	90	360	0		70.5	1	60	64	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		dump truck	1	40	76	360	0		56.5	1	60	53	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		welder / torch	1	40	73	360	0		53.5	1	60	50	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		jackhammer	1	20	85	360	0		65.5	1	60	59	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	40	74	360	0		54.5	1	60	51	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Site Demolition Phase	**66.7**																
2	Site Preparation	excavator	1	40	81	360	0		61.5	1	60	58	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		dozer	1	40	82	360	0		62.5	1	60	59	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		front end loader	1	40	79	360	0		59.5	1	60	56	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	40	74	360	0		54.5	1	60	51	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Site Preparation Phase	**62.5**																
3	Site Grading	grader	1	40	85	360	0		65.5	1	60	62	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		scraper	1	40	84	360	0		64.5	1	60	61	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		front end loader	1	40	79	360	0		59.5	1	60	56	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	40	74	360	0		54.5	1	60	51	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Site Grading Phase	**64.8**																
4	Rough Roads	grader	1	40	85	360	0		65.5	1	60	62	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		scraper	1	40	84	360	0		64.5	1	60	61	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		compactor (ground)	1	20	80	360	0		60.5	1	60	54	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	40	74	360	0		54.5	1	60	51	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Rough Roads Phase	**64.6**																
5	Building Erection	crane	1	16	81	360	0		61.5	1	60	54	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		man lift	1	20	75	360	0		55.5	1	60	49	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		auger drill rig	1	20	84	360	0		64.5	1	60	58	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	40	74	360	0		54.5	1	60	51	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		generator	1	50	72	360	0		52.5	1	60	50	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		welder / torch	1	40	73	360	0		53.5	1	60	50	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Building Erection Phase	**60.6**																
6	Final Roads	paver	1	50	77	360	0		57.5	1	60	55	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		roller	1	20	80	360	0		60.5	1	60	54	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		vacuum street sweeper	1	10	80	360	0		60.5	1	60	51	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Final Roads Phase	**57.9**																
7	Architectural Finishes	compressor (air)	1	40	78	360	0		58.5	1	60	55	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		man lift	1	20	75	360	0		55.5	1	60	49	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
		flat bed truck	1	40	74	360	0		54.5	1	60	51	6	47	0	5	355	360	7.8	358.1	362.3	0.00	0.1	26.5	26.5	0.3	0.3	0.1
											Total Aggregate Noise Exposure from Architectural Finishes Phase	**56.7**																

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air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = varies
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Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	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 1-hour Leq
1	Site Demolition	excavator	1	40	81	100	0		73.0	1	60	69
		dozer	1	40	82	100	0		74.0	1	60	70
		mounted impact hammer (hoe ram)	1	20	90	100	0		82.0	1	60	75
		dump truck	1	40	76	100	0		68.0	1	60	64
		welder / torch	1	40	73	100	0		65.0	1	60	61
		jackhammer	1	20	85	100	0		77.0	1	60	70
		flat bed truck	1	40	74	100	0		66.0	1	60	62
									Total Aggregate Noise Exposure from Site Demolition Phase			**78.1**
2	Site Preparation	excavator	1	40	81	100	0		73.0	1	60	69
		dozer	1	40	82	100	0		74.0	1	60	70
		front end loader	1	40	79	100	0		71.0	1	60	67
		flat bed truck	1	40	74	100	0		66.0	1	60	62
									Total Aggregate Noise Exposure from Site Preparation Phase			**73.9**
3	Site Grading	grader	1	40	85	100	0		77.0	1	60	73
		scraper	1	40	84	100	0		76.0	1	60	72
		front end loader	1	40	79	100	0		71.0	1	60	67
		flat bed truck	1	40	74	100	0		66.0	1	60	62
									Total Aggregate Noise Exposure from Site Grading Phase			**76.3**
4	Rough Roads	grader	1	40	85	100	0		77.0	1	60	73
		scraper	1	40	84	100	0		76.0	1	60	72
		compactor (ground)	1	20	80	100	0		72.0	1	60	65
		flat bed truck	1	40	74	100	0		66.0	1	60	62
									Total Aggregate Noise Exposure from Rough Roads Phase			**76.1**
5	Building Erection	crane	1	16	81	100	0		73.0	1	60	65
		man lift	1	20	75	100	0		67.0	1	60	60
		auger drill rig	1	20	84	100	0		76.0	1	60	69
		flat bed truck	1	40	74	100	0		66.0	1	60	62
		generator	1	50	72	100	0		64.0	1	60	61
		welder / torch	1	40	73	100	0		65.0	1	60	61
									Total Aggregate Noise Exposure from Building Erection Phase			**72.1**
6	Final Roads	paver	1	50	77	100	0		69.0	1	60	66
		roller	1	20	80	100	0		72.0	1	60	65
		vacuum street sweeper	1	10	80	100	0		72.0	1	60	62
									Total Aggregate Noise Exposure from Final Roads Phase			**69.4**
7	Architectural Finishes	compressor (air)	1	40	78	100	0		70.0	1	60	66
		man lift	1	20	75	100	0		67.0	1	60	60
		flat bed truck	1	40	74	100	0		66.0	1	60	62
									Total Aggregate Noise Exposure from Architectural Finishes Phase			**68.2**

Comparable FHWA RCNM Construction Equipment Type	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)
excavator	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
dozer	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
mounted impact hammer (hoe ram)	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
dump truck	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
welder / torch	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
jackhammer	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
flat bed truck	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
excavator	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
dozer	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
front end loader	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
flat bed truck	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
grader	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
scraper	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
front end loader	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
flat bed truck	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
grader	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
scraper	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
compactor (ground)	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
flat bed truck	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
crane	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
man lift	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
auger drill rig	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
flat bed truck	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
generator	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
welder / torch	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
paver	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
roller	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
vacuum street sweeper	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
compressor (air)	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
man lift	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
flat bed truck	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1

To User: bordered cells are inputs, unbordered cells have formulae
enter "0" to turn off air or grnd absorption terms, "1" to turn on

air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = varies
allowable hours over which Leq is to be averaged = 1

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	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 1-hour Leq
1	Site Demolition	excavator	1	40	81	100	0		74.8	1	60	71
		dozer	1	40	82	100	0		75.8	1	60	72
		mounted impact hammer (hoe ram)	1	20	90	100	0		83.8	1	60	77
		dump truck	1	40	76	100	0		69.8	1	60	66
		welder / torch	1	40	73	100	0		66.8	1	60	63
		jackhammer	1	20	85	100	0		78.8	1	60	72
		flat bed truck	1	40	74	100	0		67.8	1	60	64
								Total Aggregate Noise Exposure from Site Demolition Phase				**80.0**
2	Site Preparation	excavator	1	40	81	100	0		74.8	1	60	71
		dozer	1	40	82	100	0		75.8	1	60	72
		front end loader	1	40	79	100	0		72.8	1	60	69
		flat bed truck	1	40	74	100	0		67.8	1	60	64
								Total Aggregate Noise Exposure from Site Preparation Phase				**75.7**
3	Site Grading	grader	1	40	85	100	0		78.8	1	60	75
		scraper	1	40	84	100	0		77.8	1	60	74
		front end loader	1	40	79	100	0		72.8	1	60	69
		flat bed truck	1	40	74	100	0		67.8	1	60	64
								Total Aggregate Noise Exposure from Site Grading Phase				**78.1**
4	Rough Roads	grader	1	40	85	100	0		78.8	1	60	75
		scraper	1	40	84	100	0		77.8	1	60	74
		compactor (ground)	1	20	80	100	0		73.8	1	60	67
		flat bed truck	1	40	74	100	0		67.8	1	60	64
								Total Aggregate Noise Exposure from Rough Roads Phase				**77.9**
5	Building Erection	crane	1	16	81	100	0		74.8	1	60	67
		man lift	1	20	75	100	0		68.8	1	60	62
		auger drill rig	1	20	84	100	0		77.8	1	60	71
		flat bed truck	1	40	74	100	0		67.8	1	60	64
		generator	1	50	72	100	0		65.8	1	60	63
		welder / torch	1	40	73	100	0		66.8	1	60	63
								Total Aggregate Noise Exposure from Building Erection Phase				**73.9**
6	Final Roads	paver	1	50	77	100	0		70.8	1	60	68
		roller	1	20	80	100	0		73.8	1	60	67
		vacuum street sweeper	1	10	80	100	0		73.8	1	60	64
								Total Aggregate Noise Exposure from Final Roads Phase				**71.2**
7	Architectural Finishes	compressor (air)	1	40	78	100	0		71.8	1	60	68
		man lift	1	20	75	100	0		68.8	1	60	62
		flat bed truck	1	40	74	100	0		67.8	1	60	64
								Total Aggregate Noise Exposure from Architectural Finishes Phase				**70.0**

Project Phase No.	Comparable FHWA RCNM Construction Equipment Type	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)
1	excavator	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	dozer	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	mounted impact hammer (hoe ram)	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	dump truck	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	welder / torch	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	jackhammer	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	flat bed truck	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
2	excavator	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	dozer	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	front end loader	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	flat bed truck	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
3	grader	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	scraper	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	front end loader	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	flat bed truck	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
4	grader	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	scraper	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	compactor (ground)	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	flat bed truck	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
5	crane	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	man lift	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	auger drill rig	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	flat bed truck	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	generator	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	welder / torch	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
6	paver	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	roller	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	vacuum street sweeper	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
7	compressor (air)	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	man lift	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
	flat bed truck	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1

To User: bordered cells are inputs, unbordered cells have formulae
enter "0" to turn off air or grnd absorption terms, "1" to turn on

air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = varies
allowable hours over which Leq is to be averaged = 1

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	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 1-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)
1	Site Demolition	excavator	1	40	81	100	14		58.6	1	60	55	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		dozer	1	40	82	100	14		59.6	1	60	56	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		mounted impact hammer (hoe ram)	1	20	90	100	14		67.6	1	60	61	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		dump truck	1	40	76	100	14		53.6	1	60	50	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		welder / torch	1	40	73	100	14		50.6	1	60	47	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		jackhammer	1	20	85	100	14		62.6	1	60	56	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		flat bed truck	1	40	74	100	14		51.6	1	60	48	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
											Total Aggregate Noise Exposure from Site Demolition Phase	**63.8**																
2	Site Preparation	excavator	1	40	81	100	14		58.6	1	60	55	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		dozer	1	40	82	100	14		59.6	1	60	56	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		front end loader	1	40	79	100	14		56.6	1	60	53	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		flat bed truck	1	40	74	100	14		51.6	1	60	48	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
											Total Aggregate Noise Exposure from Site Preparation Phase	**59.5**																
3	Site Grading	grader	1	40	85	100	14		62.6	1	60	59	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		scraper	1	40	84	100	14		61.6	1	60	58	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		front end loader	1	40	79	100	14		56.6	1	60	53	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		flat bed truck	1	40	74	100	14		51.6	1	60	48	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
											Total Aggregate Noise Exposure from Site Grading Phase	**61.9**																
4	Rough Roads	grader	1	40	85	100	14		62.6	1	60	59	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		scraper	1	40	84	100	14		61.6	1	60	58	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		compactor (ground)	1	20	80	100	14		57.6	1	60	51	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
		flat bed truck	1	40	74	100	14		51.6	1	60	48	6	5	11	5	95	100	7.1	95.2	100.0	2.26	15.0	16.5	5.5	0.5	0.7	14.4
											Total Aggregate Noise Exposure from Rough Roads Phase	**61.7**																
5	Building Erection	crane	1	16	81	100	0		73.0	1	60	65	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		man lift	1	20	75	100	0		67.0	1	60	60	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		auger drill rig	1	20	84	100	0		76.0	1	60	69	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	40	74	100	0		66.0	1	60	62	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		generator	1	50	72	100	0		64.0	1	60	61	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		welder / torch	1	40	73	100	0		65.0	1	60	61	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Building Erection Phase	**72.1**																
6	Final Roads	paver	1	50	77	100	0		69.0	1	60	66	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		roller	1	20	80	100	0		72.0	1	60	65	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		vacuum street sweeper	1	10	80	100	0		72.0	1	60	62	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Final Roads Phase	**69.4**																
7	Architectural Finishes	compressor (air)	1	40	78	100	0		70.0	1	60	66	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		man lift	1	20	75	100	0		67.0	1	60	60	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
		flat bed truck	1	40	74	100	0		66.0	1	60	62	6	5	0	5	95	100	7.8	95.1	100.0	0.00	0.1	5.5	5.5	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Architectural Finishes Phase	**68.2**																

To User: bordered cells are inputs, unbordered cells have formulae
enter "0" to turn off air or grnd absorption terms, "1" to turn on

air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = varies
allowable hours over which Leq is to be averaged = 1

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	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 1-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)
1	Site Demolition	excavator	1	40	81	100	7		68.2	1	60	64	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		dozer	1	40	82	100	7		69.2	1	60	65	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		mounted impact hammer (hoe ram)	1	20	90	100	7		77.2	1	60	70	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		dump truck	1	40	76	100	7		63.2	1	60	59	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		welder / torch	1	40	73	100	7		60.2	1	60	56	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		jackhammer	1	20	85	100	7		72.2	1	60	65	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		flat bed truck	1	40	74	100	7		61.2	1	60	57	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
											Total Aggregate Noise Exposure from Site Demolition Phase	**73.4**																
2	Site Preparation	excavator	1	40	81	100	7		68.2	1	60	64	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		dozer	1	40	82	100	7		69.2	1	60	65	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		front end loader	1	40	79	100	7		66.2	1	60	62	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		flat bed truck	1	40	74	100	7		61.2	1	60	57	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
											Total Aggregate Noise Exposure from Site Preparation Phase	**69.2**																
3	Site Grading	grader	1	40	85	100	7		72.2	1	60	68	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		scraper	1	40	84	100	7		71.2	1	60	67	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		front end loader	1	40	79	100	7		66.2	1	60	62	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		flat bed truck	1	40	74	100	7		61.2	1	60	57	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
											Total Aggregate Noise Exposure from Site Grading Phase	**71.5**																
4	Rough Roads	grader	1	40	85	100	7		72.2	1	60	68	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		scraper	1	40	84	100	7		71.2	1	60	67	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		compactor (ground)	1	20	80	100	7		67.2	1	60	60	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		flat bed truck	1	40	74	100	7		61.2	1	60	57	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
											Total Aggregate Noise Exposure from Rough Roads Phase	**71.3**																
5	Building Erection	crane	1	16	81	100	7		68.2	1	60	60	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		man lift	1	20	75	100	7		62.2	1	60	55	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		auger drill rig	1	20	84	100	7		71.2	1	60	64	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		flat bed truck	1	40	74	100	7		61.2	1	60	57	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		generator	1	50	72	100	7		59.2	1	60	56	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
		welder / torch	1	40	73	100	7		60.2	1	60	56	6	65	11	5	95	100	7.1	109.3	116.1	0.24	7.0	46.5	35.5	0.0	0.1	6.6
											Total Aggregate Noise Exposure from Building Erection Phase	**67.4**																
6	Final Roads	paver	1	50	77	100	0		70.8	1	60	68	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		roller	1	20	80	100	0		73.8	1	60	67	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		vacuum street sweeper	1	10	80	100	0		73.8	1	60	64	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
											Total Aggregate Noise Exposure from Final Roads Phase	**71.2**																
7	Architectural Finishes	compressor (air)	1	40	78	100	0		71.8	1	60	68	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		man lift	1	20	75	100	0		68.8	1	60	62	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
		flat bed truck	1	40	74	100	0		67.8	1	60	64	6	65	0	5	95	100	7.8	115.1	116.1	0.00	0.1	35.5	35.5	0.1	0.1	0.1
											Total Aggregate Noise Exposure from Architectural Finishes Phase	**70.0**																

Appendix C
Roadway Traffic Noise Prediction Worksheets

W-Trans Feb. 14, 2023 TIA reference:

Intersection		Fig. 6 Existing Peak Hour (AM)	Fig. 7 Baseline Peak Hour (AM)	Fig. 8 Future Peak Hour (AM)	Fig. 4 Master Plan Peak Hour (AM)	Fig. 5 Vision Plan Peak Hour (AM)	Fig. 9 Baseline + Master Plan Peak Hour	Fig. 10 Future + Master Plan Peak Hour	Fig. 11 Future + Vision Plan Peak Hour
Intersection 16 (Northgate Drive and Los Ranchitos Road)									
	SB	129	129	129	7	22	136	136	151
	SBL	1	1	1	0	0	1	1	1
	SBR	106	108	114	19	17	127	133	131
	WB	0	0	0	0	0	0	0	0
	WBL	0	0	0	0	0	0	0	0
	WBR	0	0	0	0	0	0	0	0
	NB	87	87	87	-3	2	84	84	89
	NBL	52	53	57	0	-8	53	57	49
	NBR	0	0	0	0	0	0	0	0
	EB	0	0	0	0	0	0	0	0
	EBL	82	90	113	48	42	138	161	155
	EBR	121	141	199	20	14	161	219	213
Intersection 15 (Northgate Drive and Nova Albion Way)									
	SB	0	0	0	0	0	0	0	0
	SBL	0	0	0	0	0	0	0	0
	SBR	0	0	0	0	0	0	0	0
	WB	40	44	57	57	40	101	114	97
	WBL	103	103	103	7	11	110	110	114
	WBR	0	0	0	0	0	0	0	0
	NB	0	0	9	0	0	0	9	9
	NBL	70	70	70	-1	-3	69	69	67
	NBR	105	105	105	-1	1	104	104	106
	EB	106	144	259	37	24	181	296	283
	EBL	0	0	0	0	0	0	0	0
	EBR	140	149	174	2	0	151	176	174
Intersection 14 (Northgate Drive and El Faisan Drive)									
	SB	0	0	0	0	0	0	0	0
	SBL	0	0	0	33	31	33	33	31
	SBR	0	0	0	37	24	37	37	24
	WB	96	98	104	52	41	150	156	145
	WBL	13	13	13	0	0	13	13	13
	WBR	0	0	0	4	-4	4	4	-4
	NB	0	0	0	0	0	0	0	0
	NBL	22	22	22	0	0	22	22	22
	NBR	12	13	14	0	0	13	14	14
	EB	233	284	437	6	0	290	443	437
	EBL	0	0	0	9	-4	9	9	-4
	EBR	10	10	11	0	0	10	11	11
Intersection 13 (Northgate Drive and Thorndale Drive)									
	SB	233	284	438	15	1	299	453	439
	SBL	3	3	3	-7	-23	-4	-4	-20
	SBR	35	35	35	0	0	35	35	35
	WB	0	0	0	0	0	0	0	0
	WBL	0	0	0	0	-5	0	0	-5
	WBR	0	0	0	-6	-17	-6	-6	-17
	NB	107	109	113	91	79	200	204	192
	NBL	6	6	6	0	0	6	6	6
	NBR	0	0	0	-2	-7	-2	-2	-7
	EB	0	0	0	0	0	0	0	0
	EBL	11	11	11	0	0	11	11	11
	EBR	8	8	8	0	0	8	8	8
Intersection 10 (Del Presidio and Las Gallinas Avenue)									
	SB	33	33	33	-2	-12	31	31	21
	SBL	82	134	202	-2	9	132	200	211
	SBR	48	188	291	-3	-15	185	288	276
	WB	94	94	94	20	55	114	114	149
	WBL	0	0	0	0	0	0	0	0
	WBR	65	65	65	17	52	82	82	117
	NB	0	0	0	0	0	0	0	0
	NBL	0	0	0	0	0	0	0	0
	NBR	0	0	0	0	0	0	0	0
	EB	140	155	201	0	0	155	201	201
	EBL	218	218	218	63	0	281	281	218
	EBR	4	4	4	11	0	15	15	4
Intersection 11 (Merrydale Road and Las Gallinas Avenue)									
	SB	121	132	163	15	28	147	178	191
	SBL	95	119	189	-6	-9	113	183	180
	SBR	7	8	10	-10	1	-2	0	11
	WB	19	19	19	-9	-8	10	10	11
	WBL	121	121	121	26	20	147	147	141
	WBR	80	83	91	-13	-4	70	78	87
	NB	83	83	83	54	59	137	137	142
	NBL	2	2	2	-4	-3	-2	-2	-1
	NBR	79	79	80	85	83	164	165	163
	EB	3	3	3	-5	10	-2	-2	13
	EBL	2	2	2	-9	17	-7	-7	19
	EBR	1	1	1	-3	5	-2	-2	6
Intersection 9 (Northgate Drive and Las Gallinas Avenue)									
	SB	117	117	117	-9	-34	108	108	83
	SBL	82	82	82	0	0	82	82	82
	SBR	48	48	48	0	0	48	48	48
	WB	96	110	153	17	47	127	170	200
	WBL	101	122	184	-4	-16	118	180	168
	WBR	54	54	54	0	0	54	54	54
	NB	42	42	42	60	47	102	102	89
	NBL	38	39	43	15	13	54	58	56
	NBR	92	92	92	-1	-1	91	91	91
	EB	201	216	262	-3	0	213	259	262
	EBL	23	23	23	0	0	23	23	23
	EBR	106	137	228	0	-11	137	228	217
Intersection 8 (Nova Albion Way and Las Gallinas Avenue)									
	SB	138	175	287	0	-5	175	287	282
	SBL	2	2	2	0	0	2	2	2
	SBR	409	413	425	0	0	413	425	425
	WB	29	29	29	0	0	29	29	29
	WBL	4	4	4	0	0	4	4	4
	WBR	0	0	0	0	0	0	0	0
	NB	64	79	122	11	33	90	133	155
	NBL	108	109	112	21	27	130	133	139
	NBR	1	1	1	0	0	1	1	1
	EB	1	1	1	0	0	1	1	1
	EBL	260	267	287	0	0	267	287	287
	EBR	175	184	209	-3	-6	181	206	203
Intersection 2 (Northgate Drive and Manuel T. Freitas Pkwy)									
	SB	11	11	11	0	0	11	11	11
	SBL	31	34	44	0	0	34	44	44
	SBR	17	17	17	0	0	17	17	17
	WB	1014	1074	1252	0	0	1074	1252	1252
	WBL	296	300	311	-10	-26	290	301	285
	WBR	73	76	85	0	0	76	85	85
	NB	4	4	4	0	0	4	4	4
	NBL	18	18	18	32	24	50	50	42
	NBR	40	43	51	28	23	71	79	74
	EB	997	1041	1174	-5	2	1036	1169	1176
	EBL	22	22	22	0	0	22	22	22
	EBR	26	26	26	1	-8	27	27	18
Intersection 1 (Las Gallinas Avenue and Manuel T. Freitas Pkwy)									
	SB	221	244	311	0	-5	244	311	306
	SBL	167	184	233	-2	1	182	231	234
	SBR	26	29	36	0	0	29	36	36
	WB	579	611	705	21	17	632	726	722
	WBL	361	381	440	0	0	381	440	440
	WBR	129	152	221	11	7	163	232	228
	NB	114	129	175	4	12	133	179	187
	NBL	46	47	50	7	21	54	57	71
	NBR	167	171	181	0	0	171	181	181
	EB	634	649	694	-2	-7	647	692	687
	EBL	28	32	43	0	0	32	43	43
	EBR	69	71	76	0	0	71	76	76
Studied Segment									
	Northgate Drive (Intersections 15 to 16)	715	788	1007	187	141	975	1194	1148
	Northgate Drive (Intersections 14 to 15)	710	815	1128	190	129	1005	1318	1257
	Northgate Drive (Intersections 13 to 14)	715	821	1139	208	129	1029	1347	1268
	Northgate Drive (Intersections 9 to 13)	885	991	1306	154	38	1145	1460	1344
	Las Gallinas Avenue (Intersections 8 to 9)	2295	2626	3206	239	306	2865	3445	3512
	Las Gallinas Avenue (Intersections 10 to 11)	667	762	956	42	172	1091	1265	1259
	Las Gallinas Avenue (Intersections 11 to 16)	812	833	894	244	275	998	1181	1163
	Las Gallinas Avenue (Intersections 1 to 8)	1851	1979	2356	22	56	2001	2378	2412
	Manuel T. Freitas Parkway (Intersections 1 to 2)	4131	4346	4983	56	36	4402	5039	5019

Roadway Traffic Noise Prediction (Ldn)
(FHWA RD-77-108, using Calveno curves)

Project: Northgate Square

User Inputs (boxed cells)

Auto %	95.60%	Day (7am-10pm)	85.00%
MT (%)	2.36%	Evening	0.00%
HT (%)	2.04%	Night (10pm-7am)	15.00%

Traffic Percentages by Vehicle Type

	Day	Evening	Nighttime	Equivalent
Auto	81.26%	0.00%	14.34%	224.7%
MT	2.00%	0.00%	0.35%	5.5%
HT	1.74%	0.00%	0.31%	4.8%

Study Year or Condition	Roadway Segment and Direction of Traffic	Average Weekday Traffic (AWT)	Speed (mph)	Auto Noise (at 15m)	MT Noise (at 15m)	HT Noise (at 15m)	Ldn Total (at 15m)	Ldn Total (at 140m)
Existing	Highway 101 (at Manuel T. Freitas Parkway intersection)	170,000	65	82.9	73.0	75.9	84.0	69.5
	Northgate Drive (Intersections 15 to 16)	7,150	25	57.2	52.8	58.3	61.4	
	Northgate Drive (Intersections 14 to 15)	7,100	25	57.2	52.7	58.2	61.4	
	Northgate Drive (Intersections 13 to 14)	7,150	25	57.2	52.8	58.3	61.4	
	Northgate Drive (Intersections 9 to 13)	8,850	25	58.1	53.7	59.2	62.3	
	Las Gallinas Avenue (Intersections 8 to 9)	22,950	25	62.2	57.8	63.3	66.5	
	Las Gallinas Avenue (Intersections 10 to 11)	6,670	25	56.9	52.4	58.0	61.1	
	Las Gallinas Avenue (Intersections 11 to 16)	8,120	25	57.7	53.3	58.8	62.0	
	Las Gallinas Avenue (Intersections 1 to 8)	18,510	25	61.3	56.9	62.4	65.5	
	Manuel T. Freitas Parkway (Intersections 1 to 2)	41,310	45	72.2	64.4	68.2	74.1	

data below from 2020 Caltrans truck AADT

Route	District	County	Postmile	Leg	Description of Intersection	Total AADT	Truck AADT	Truck %	Trk 2-axle	Trk 3-axle	Trk 4-axle	Trk 5-axle	Trk 2-axle %	Trk 3-axle %	Trk 4-axle %	Trk 5-axle %
101	4	MRN	13.713	B	Manuel Freitas Parkway	170000	7480	4.4	4,009	987	217	2,266	53.60	13.20	2.90	30.30

"medium truck" (MT, 2-axle) percentage: 2.3584 "heavy truck" (HT) %: 2.0416

Roadway Traffic Noise Prediction (Ldn)
(FHWA RD-77-108, using Calveno curves)

Project: Northgate Square

User Inputs (boxed cells)

Auto %	95.60%	Day (7am-10pm)	85.00%
MT (%)	2.36%	Evening	0.00%
HT (%)	2.04%	Night (10pm-7am)	15.00%

Traffic Percentages by Vehicle Type

	Day	Evening	Nighttime	Equivalent
Auto	81.26%	0.00%	14.34%	224.7%
MT	2.00%	0.00%	0.35%	5.5%
HT	1.74%	0.00%	0.31%	4.8%

Study Year or Condition	Roadway Segment and Direction of Traffic	Average Weekday Traffic (AWT)	Speed (mph)	Auto Noise (at 15m)	MT Noise (at 15m)	HT Noise (at 15m)	Ldn Total (at 15m)
Baseline							
	Northgate Drive (Intersections 15 to 16)	7,880	25	57.6	53.2	58.7	61.8
	Northgate Drive (Intersections 14 to 15)	8,150	25	57.8	53.3	58.8	62.0
	Northgate Drive (Intersections 13 to 14)	8,210	25	57.8	53.4	58.9	62.0
	Northgate Drive (Intersections 9 to 13)	9,910	25	58.6	54.2	59.7	62.8
	Las Gallinas Avenue (Intersections 8 to 9)	26,260	25	62.8	58.4	63.9	67.1
	Las Gallinas Avenue (Intersections 10 to 11)	7,620	25	57.5	53.0	58.6	61.7
	Las Gallinas Avenue (Intersections 11 to 16)	8,330	25	57.8	53.4	58.9	62.1
	Las Gallinas Avenue (Intersections 1 to 8)	19,790	25	61.6	57.2	62.7	65.8
	Manuel T. Freitas Parkway (Intersections 1 to 2)	43,460	45	72.4	64.6	68.5	74.3

data below from 2020 Caltrans truck AADT

Route	District	County	Postmile	Leg	Description of Intersection	Total AADT	Truck AADT	Truck %	Trk 2-axle	Trk 3-axle	Trk 4-axle	Trk 5-axle	Trk 2-axle %	Trk 3-axle %	Trk 4-axle %	Trk 5-axle %
101	4	MRN	13.713	B	Manuel Freitas Parkway	170000	7480	4.4	4,009	987	217	2,266	53.60	13.20	2.90	30.30

"medium truck" (MT, 2-axle) percentage: 2.3584 "heavy truck" (HT) %: 2.0416

Roadway Traffic Noise Prediction (Ldn)
(FHWA RD-77-108, using Calveno curves)

Project: Northgate Square

User Inputs (boxed cells)

Auto %	**95.60%**	Day (7am-10pm)	**85.00%**
MT (%)	**2.36%**	Evening	**0.00%**
HT (%)	**2.04%**	Night (10pm-7am)	**15.00%**

Traffic Percentages by Vehicle Type

	Day	Evening	Nighttime	Equivalent
Auto	81.26%	0.00%	14.34%	224.7%
MT	2.00%	0.00%	0.35%	5.5%
HT	1.74%	0.00%	0.31%	4.8%

Study Year or Condition	Roadway Segment and Direction of Traffic	Average Weekday Traffic (AWT)	Speed (mph)	Auto Noise (at 15m)	MT Noise (at 15m)	HT Noise (at 15m)	Ldn Total (at 15m)
Future							
	Northgate Drive (Intersections 15 to 16)	10,070	25	58.7	54.2	59.8	62.9
	Northgate Drive (Intersections 14 to 15)	11,280	25	59.2	54.7	60.3	63.4
	Northgate Drive (Intersections 13 to 14)	11,390	25	59.2	54.8	60.3	63.4
	Northgate Drive (Intersections 9 to 13)	13,060	25	59.8	55.4	60.9	64.0
	Las Gallinas Avenue (Intersections 8 to 9)	32,060	25	63.7	59.3	64.8	67.9
	Las Gallinas Avenue (Intersections 10 to 11)	9,560	25	58.4	54.0	59.5	62.7
	Las Gallinas Avenue (Intersections 11 to 16)	8,940	25	58.2	53.7	59.2	62.4
	Las Gallinas Avenue (Intersections 1 to 8)	23,560	25	62.4	57.9	63.5	66.6
	Manuel T. Freitas Parkway (Intersections 1 to 2)	49,830	45	73.0	65.2	69.1	74.9

data below from 2020 Caltrans truck AADT

Route	District	County	Postmile	Leg	Description of Intersection	Total AADT	Truck AADT	Truck %	Trk 2-axle	Trk 3-axle	Trk 4-axle	Trk 5-axle	Trk 2-axle %	Trk 3-axle %	Trk 4-axle %	Trk 5-axle %
101	4	MRN	13.713	B	Manuel Freitas Parkway	170000	7480	4.4	4,009	987	217	2,266	53.60	13.20	2.90	30.30

"medium truck" (MT, 2-axle) percentage: 2.3584 "heavy truck" (HT) %: 2.0416

Roadway Traffic Noise Prediction (Ldn)
(FHWA RD-77-108, using Calveno curves)

Project: Northgate Square

User Inputs (boxed cells)

Auto %	95.60%	Day (7am-10pm)	85.00%
MT (%)	2.36%	Evening	0.00%
HT (%)	2.04%	Night (10pm-7am)	15.00%

Traffic Percentages by Vehicle Type

	Day	Evening	Nighttime	Equivalent
Auto	81.26%	0.00%	14.34%	224.7%
MT	2.00%	0.00%	0.35%	5.5%
HT	1.74%	0.00%	0.31%	4.8%

Study Year or Condition	Roadway Segment and Direction of Traffic	Average Weekday Traffic (AWT)	Speed (mph)	Auto Noise (at 15m)	MT Noise (at 15m)	HT Noise (at 15m)	Ldn Total (at 15m)
Baseline plus Master Plan							
	Northgate Drive (Intersections 15 to 16)	9,750	25	58.5	54.1	59.6	62.8
	Northgate Drive (Intersections 14 to 15)	10,050	25	58.7	54.2	59.8	62.9
	Northgate Drive (Intersections 13 to 14)	10,290	25	58.8	54.3	59.9	63.0
	Northgate Drive (Intersections 9 to 13)	11,450	25	59.2	54.8	60.3	63.5
	Las Gallinas Avenue (Intersections 8 to 9)	28,650	25	63.2	58.8	64.3	67.4
	Las Gallinas Avenue (Intersections 10 to 11)	10,910	25	59.0	54.6	60.1	63.2
	Las Gallinas Avenue (Intersections 11 to 16)	9,980	25	58.6	54.2	59.7	62.9
	Las Gallinas Avenue (Intersections 1 to 8)	20,010	25	61.7	57.2	62.7	65.9
	Manuel T. Freitas Parkway (Intersections 1 to 2)	44,020	45	72.4	64.6	68.5	74.4

data below from 2020 Caltrans truck AADT

Route	District	County	Postmile	Leg	Description of Intersection	Total AADT	Truck AADT	Truck %	Trk 2-axle	Trk 3-axle	Trk 4-axle	Trk 5-axle	Trk 2-axle %	Trk 3-axle %	Trk 4-axle %	Trk 5-axle %
101	4	MRN	13.713	B	Manuel Freitas Parkway	170000	7480	4.4	4,009	987	217	2,266	53.60	13.20	2.90	30.30

"medium truck" (MT, 2-axle) percentage: 2.3584 "heavy truck" (HT) %: 2.0416

Northgate Drive (Intersections 15 to 16)	0.9	0.9	0.9	0.9
Northgate Drive (Intersections 14 to 15)	0.9	0.9	0.9	0.9
Northgate Drive (Intersections 13 to 14)	1.0	1.0	1.0	1.0
Northgate Drive (Intersections 9 to 13)	0.6	0.6	0.6	0.6
Las Gallinas Avenue (Intersections 8 to 9)	0.4	0.4	0.4	0.4
Las Gallinas Avenue (Intersections 1 to 8)	0.0	0.0	0.0	0.0
Manuel T. Freitas Parkway (Intersections 1 to 2)	0.1	0.1	0.1	0.1

Roadway Traffic Noise Prediction (Ldn)
(FHWA RD-77-108, using Calveno curves)

Project: Northgate Square

User Inputs (boxed cells)

Auto %	**95.60%**	Day (7am-10pm)	**85.00%**
MT (%)	**2.36%**	Evening	**0.00%**
HT (%)	**2.04%**	Night (10pm-7am)	**15.00%**

Traffic Percentages by Vehicle Type

	Day	Evening	Nighttime	Equivalent
Auto	81.26%	0.00%	14.34%	224.7%
MT	2.00%	0.00%	0.35%	5.5%
HT	1.74%	0.00%	0.31%	4.8%

Study Year or Condition	Roadway Segment and Direction of Traffic	Average Weekday Traffic (AWT)	Speed (mph)	Auto Noise (at 15m)	MT Noise (at 15m)	HT Noise (at 15m)	Ldn Total (at 15m)
Future plus Master Plan							
	Northgate Drive (Intersections 15 to 16)	11,940	25	59.4	55.0	60.5	63.6
	Northgate Drive (Intersections 14 to 15)	13,180	25	59.8	55.4	60.9	64.1
	Northgate Drive (Intersections 13 to 14)	13,470	25	59.9	55.5	61.0	64.2
	Northgate Drive (Intersections 9 to 13)	14,600	25	60.3	55.9	61.4	64.5
	Las Gallinas Avenue (Intersections 8 to 9)	34,450	25	64.0	59.6	65.1	68.2
	Las Gallinas Avenue (Intersections 10 to 11)	12,650	25	59.7	55.2	60.8	63.9
	Las Gallinas Avenue (Intersections 11 to 16)	11,810	25	59.4	54.9	60.5	63.6
	Las Gallinas Avenue (Intersections 1 to 8)	23,780	25	62.4	58.0	63.5	66.6
	Manuel T. Freitas Parkway (Intersections 1 to 2)	50,390	45	73.0	65.2	69.1	75.0

data below from 2020 Caltrans truck AADT

Route	District	County	Postmile	Leg	Description of Intersection	Total AADT	Truck AADT	Truck %	Trk 2-axle	Trk 3-axle	Trk 4-axle	Trk 5-axle	Trk 2-axle %	Trk 3-axle %	Trk 4-axle %	Trk 5-axle %
101	4	MRN	13.713	B	Manuel Freitas Parkway	170000	7480	4.4	4,009	987	217	2,266	53.60	13.20	2.90	30.30

"medium truck" (MT, 2-axle) percentage: 2.3584 "heavy truck" (HT) %: 2.0416

Northgate Drive (Intersections 15 to 16)	0.7	0.7	0.7	0.7
Northgate Drive (Intersections 14 to 15)	0.7	0.7	0.7	0.7
Northgate Drive (Intersections 13 to 14)	0.7	0.7	0.7	0.7
Northgate Drive (Intersections 9 to 13)	0.5	0.5	0.5	0.5
Las Gallinas Avenue (Intersections 8 to 9)	0.3	0.3	0.3	0.3
Las Gallinas Avenue (Intersections 1 to 8)	0.0	0.0	0.0	0.0
Manuel T. Freitas Parkway (Intersections 1 to 2)	0.0	0.0	0.0	0.0

Roadway Traffic Noise Prediction (Ldn)
(FHWA RD-77-108, using Calveno curves)

Project: Northgate Square

User Inputs (boxed cells)

Auto %	**95.60%**	Day (7am-10pm)	85.00%
MT (%)	**2.36%**	Evening	0.00%
HT (%)	**2.04%**	Night (10pm-7am)	15.00%

Traffic Percentages by Vehicle Type

	Day	Evening	Nighttime	Equivalent
Auto	81.26%	0.00%	14.34%	224.7%
MT	2.00%	0.00%	0.35%	5.5%
HT	1.74%	0.00%	0.31%	4.8%

Study Year or Condition	Roadway Segment and Direction of Traffic	Average Weekday Traffic (AWT)	Speed (mph)	Auto Noise (at 15m)	MT Noise (at 15m)	HT Noise (at 15m)	Ldn Total (at 15m)
Future plus Vision Plan							
	Northgate Drive (Intersections 15 to 16)	11,480	25	59.2	54.8	60.3	63.5
	Northgate Drive (Intersections 14 to 15)	12,570	25	59.6	55.2	60.7	63.9
	Northgate Drive (Intersections 13 to 14)	12,680	25	59.7	55.2	60.8	63.9
	Northgate Drive (Intersections 9 to 13)	13,440	25	59.9	55.5	61.0	64.2
	Las Gallinas Avenue (Intersections 8 to 9)	35,120	25	64.1	59.7	65.2	68.3
	Las Gallinas Avenue (Intersections 10 to 11)	12,590	25	59.6	55.2	60.7	63.9
	Las Gallinas Avenue (Intersections 11 to 16)	11,630	25	59.3	54.9	60.4	63.5
	Las Gallinas Avenue (Intersections 1 to 8)	24,120	25	62.5	58.0	63.6	66.7
	Manuel T. Freitas Parkway (Intersections 1 to 2)	50,190	45	73.0	65.2	69.1	75.0

data below from 2020 Caltrans truck AADT

Route	District	County	Postmile	Leg	Description of Intersection	Total AADT	Truck AADT	Truck %	Trk 2-axle	Trk 3-axle	Trk 4-axle	Trk 5-axle	Trk 2-axle %	Trk 3-axle %	Trk 4-axle %	Trk 5-axle %
101	4	MRN	13.713	B	Manuel Freitas Parkway	170000	7480	4.4	4,009	987	217	2,266	53.60	13.20	2.90	30.30

"medium truck" (MT, 2-axle) percentage: 2.3584 "heavy truck" (HT) %: 2.0416

Northgate Drive (Intersections 15 to 16)	0.6	0.6	0.6	0.6
Northgate Drive (Intersections 14 to 15)	0.5	0.5	0.5	0.5
Northgate Drive (Intersections 13 to 14)	0.5	0.5	0.5	0.5
Northgate Drive (Intersections 9 to 13)	0.1	0.1	0.1	0.1
Las Gallinas Avenue (Intersections 8 to 9)	0.4	0.4	0.4	0.4
Las Gallinas Avenue (Intersections 1 to 8)	0.1	0.1	0.1	0.1
Manuel T. Freitas Parkway (Intersections 1 to 2)	0.0	0.0	0.0	0.0

Appendix D
Stationary Source Operations Noise Input Parameters

AHUs (plenum-type return fan only, no condenser units [see separate worksheet]):
Master Plan (2025)

		63	125	250	500	1000	2000	4000	8000
A-weighting adjustments		26	13	9	3	0	-1	-1	1
average of values for the two fan diameter ranges, per Guyer (Table 12)	plug	40	40	38	34	29	23	19	16
average of values for the two fan diameter ranges, per Guyer (Table 12)	tube	47	44	46	47	44	45	38	35
per Guyer (Table 12, presumed based on Bies & Hansen ENC)	prop	46	48	55	53	52	48	43	38

percent adjustment for studied unit count: 0

Phase	Building Tag	GSF	Avg. SF/unit	Units	Adjusted Units	Stories	m^2	facility function	CFM pksf*	m^3/s per 1,000 m^2	Pressure (Pa)	Q (m^3/s)	fantype = plug, tube, or prop	A-weighted PWL (for CadnaA inputs) 63	125	250	500	1000	2000	4000	8000	OA dB	Q (cfm)
return air fans in building rooftop AHUs:																							
MP	Residential Parcel 1	91423	952.3	96	96	4	8498	residence	250	1.27	625	11	plug	60	72	75	80	82	81	79	77	**88**	23000
MP	Residential Parcel 2	155325	1553.3	100	100	3	14438	residence	250	1.27	625	18	plug	63	75	78	83	85	84	82	80	**90**	39000
MP	Residential Parcel 3	325144	1161.2	280	280	6	30222	residence	250	1.27	625	38	plug	66	78	81	86	88	87	85	83	**93**	82000
MP	Residential Parcel 4	540964	1212.9	446	446	7	50283	residence	250	1.27	625	64	plug	68	80	83	88	90	89	87	85	**95**	136000
MP	Cinema	65000					6042	theater	2250	11.42	625	69	plug	68	80	83	88	90	89	87	85	**96**	147000
MP	Shops 3	5000					465	retail	300	1.52	625	1	plug	48	60	63	68	70	69	67	65	**76**	2000
MP	Shops 4	6200					576	retail	300	1.52	625	1	plug	49	61	64	69	71	70	68	66	**77**	2000
MP	Pad 1	8400					781	retail	300	1.52	625	1	plug	51	63	66	71	73	72	70	68	**78**	3000
MP	Pad 2	4300					400	retail	300	1.52	625	1	plug	48	60	63	68	70	69	67	65	**75**	2000
Exist	Macy's	254015					23611	retail	300	1.52	625	36	plug	65	77	80	85	87	86	84	82	**93**	77000
Exist	Kohl's (Major1)	79051					7348	retail	300	1.52	625	11	plug	60	72	75	80	82	81	79	77	**88**	24000
Exist	Rite-Aid	17340					1612	retail	300	1.52	625	2	plug	54	66	69	74	76	75	73	71	**81**	6000
Exist	Main Building	55360					5146	retail	300	1.52	625	8	plug	59	71	74	79	81	80	78	76	**86**	17000
Exist	Shops 1	6795					632	retail	300	1.52	625	1	plug	50	62	65	70	72	71	69	67	**77**	3000

*per Loren Cook "Engineering Cookbook" (2nd ed., 1999) pg. 42

	63	125	250	500	1000	2000	4000	8000
fan or AHU cabinet liner/interior attenuation (excludes inlet/outlet PWL split, already in calcs above:	2	3	4	5	6	8	10	10

Residential Parcel 2:	*units*	*dB adjust*
Building 1	8	-11
Building 2	7	-12
Building 3	7	-12
Building 4	7	-12
Building 5	8	-11
Building 6	5	-13
Building 7	6	-12
Building 8	6	-12
Building 9	6	-12
Building 10	5	-13
Building 11	7	-12
Building 12	7	-12
Building 13	7	-12
Building 14	7	-12
Building 15	7	-12
	100	

ACCs (air-cooled chillers on rooftops):
Master Plan (2025)

with or without sound insulation? (enter Y/N): y

unweighted PWL (dB) per OCBF (Hz) at full load (100%)

ACC Mfr. and Model	tons	LWA	63	125	250	500	1000	2000	4000	8000
Bryant BH16-018	1.5	67	66.2	66.2	63.9	63.8	62.3	58.4	56.4	50.3
Bryant BH16-024	2	71	65	65	63.7	63.4	68.5	64.7	58.7	52.8
Bryant BH16-036	3	71	68.2	68.2	66.4	67.5	68.4	59.6	58.2	52.4
Bryant BH16-048	4	71	68.4	68.4	67.7	69.7	67.6	59.4	56.4	50
Bryant BH16-060	5	69	63.7	63.7	65.4	67.3	64.9	58.3	56.2	51.9
Daikin AGZ-E 30	30	85	84	84	83	84	77	75	74	70
Daikin AGZ-E 40	40	85	84	84	83	84	77	75	74	70
Daikin AGZ-E 50	50	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 60	60	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 70	70	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 80	80	88	88	85	87	86	81	81	77	71
Daikin AGZ-E 90	90	88	88	87	87	86	83	80	77	71
Daikin AGZ-E 120	120	89	91	85	88	86	82	81	79	72
Daikin AGZ-E 240	241	94	94	88	91	90	91	84	82	75

data for models "without sound insulation" or no "sound blankets"

ACC Mfr. and Model	LWA	63	125	250	500	1000	2000	4000	8000
Bryant BH16-018	68	*66.2*	66.2	63.8	64.1	64.6	59.9	57.7	53.6
Bryant BH16-024	72	*63.4*	63.4	63.3	63.3	70.4	64.5	59.3	55.5
Bryant BH16-036	72	*67.7*	67.7	66.8	68.1	69.9	62.8	60.3	55.2
Bryant BH16-048	73	*67.5*	67.5	67.8	70.1	70.6	63.1	58.5	53.3
Bryant BH16-060	70	*61.7*	61.7	65.6	68.1	65.8	59.8	58.4	56.1
Daikin AGZ-E 30	88	92	91	88	87	83	78	73	68
Daikin AGZ-E 40	89	92	91	90	88	84	79	74	69
Daikin AGZ-E 50	90	93	93	91	89	85	79	74	69
Daikin AGZ-E 60	91	94	93	94	89	86	81	76	71
Daikin AGZ-E 70	92	95	95	94	89	87	81	76	71
Daikin AGZ-E 80	92	95	95	95	89	87	81	76	71
Daikin AGZ-E 90	93	94	95	92	91	89	83	81	81
Daikin AGZ-E 120	95	93	96	92	92	90	84	84	82
Daikin AGZ-E 240	100	98	98	98	95	96	90	90	86

data for models "with sound insulation" or "sound blankets"

ACC Mfr. and Model	LWA	63	125	250	500	1000	2000	4000	8000
Bryant BH16-018	67	*66.2*	66.2	63.9	63.8	62.3	58.4	56.4	50.3
Bryant BH16-024	71	*65*	65	63.7	63.4	68.5	64.7	58.7	52.8
Bryant BH16-036	71	*68.2*	68.2	66.4	67.5	68.4	59.6	58.2	52.4
Bryant BH16-048	71	*68.4*	68.4	67.7	69.7	67.6	59.4	56.4	50
Bryant BH16-060	69	*63.7*	63.7	65.4	67.3	64.9	58.3	56.2	51.9
Daikin AGZ-E 30	85	84	84	83	84	77	75	74	70
Daikin AGZ-E 40	85	84	84	83	84	77	75	74	70
Daikin AGZ-E 50	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 60	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 70	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 80	88	88	85	87	86	81	81	77	71
Daikin AGZ-E 90	88	88	87	87	86	83	80	77	71
Daikin AGZ-E 120	89	91	85	88	86	82	81	79	72
Daikin AGZ-E 240	94	94	88	91	90	91	84	82	75

actual percent of GSF occupied: 100

Phase	Building Tag	GSF	Avail. SF	comparable facility function	Avg. GSF per ton*	tons of refrig.	Approx. Qty. of ACCs	tons per ACC	Approx. Total PWL (dBA)
MP	Residential Parcel 1	91423	91423	residential, medium	700	130.6	33	4.0	**86**
MP	Residential Parcel 2	155325	155325	residential, medium	700	221.9	100	2.2	**91**
MP	Residential Parcel 3	325144	325144	residential, medium	700	464.5	96	4.8	**91**
MP	Residential Parcel 4	540964	540964	residential, medium	700	772.8	200	3.9	**94**
MP	Cinema	65000	65000	theater, low	400	162.5	30	5.4	**84**
MP	Shops 3	5000	5000	malls, low	365	13.7	2	6.8	**72**
MP	Shops 4	6200	6200	malls, low	365	17.0	3	5.7	**74**
MP	Pad 1	8400	8400	malls, low	365	23.0	4	5.8	**75**
MP	Pad 2	4300	4300	malls, low	365	11.8	2	5.9	**72**
Exist	Macy's	254015	254015	malls, low	365	695.9	5	139.2	**96**
Exist	Kohl's (Major1)	79051	79051	malls, low	365	216.6	6	36.1	**93**
Exist	Rite-Aid	17340	17340	malls, low	365	47.5	9	5.3	**79**
Exist	Main Building	55360	55360	malls, low	365	151.7	30	5.1	**84**
Exist	Shops 1	6795	6795	malls, low	365	18.6	3	6.2	**74**

unweighted PWL (dB) per OCBF (Hz) at full load (100%)

Building Tag	63	125	250	500	1000	2000	4000	8000	qty adj
Residential Parcel 1	83	83	82	83	84	75	73	68	15
Residential Parcel 2	85	85	84	83	89	85	79	73	20
Residential Parcel 3	88	88	88	90	87	79	76	70	20
Residential Parcel 4	91	91	89	91	91	83	81	75	23
Cinema	78	78	80	82	80	73	71	67	15
Shops 3	67	67	68	70	68	61	59	55	3
Shops 4	68	68	70	72	70	63	61	57	5
Pad 1	70	70	71	73	71	64	62	58	6
Pad 2	67	67	68	70	68	61	59	55	3
Macy's	98	92	95	93	89	88	86	79	7
Kohl's (Major1)	92	92	91	92	85	83	82	78	8
Rite-Aid	73	73	75	77	74	68	66	61	10
Main Building	78	78	80	82	80	73	71	67	15
Shops 1	68	68	70	72	70	63	61	57	5

*based upon values per Loren Cook's "Engineering Cookbook" (2nd ed., 1999), pp. 59-60

Exhaust units (tubeaxial fans only):
Master Plan

			63	125	250	500	1000	2000	4000	8000
A-weighting adjustments			26	13	9	3	0	-1	-1	1
average of values for the two fan diameter ranges, per Guyer (Table 12)	plug		40	40	38	34	29	23	19	16
average of values for the two fan diameter ranges, per Guyer (Table 12)	tube		47	44	46	47	44	45	38	35
per Guyer (Table 12, presumed based on Bies & Hansen ENC)	prop		46	48	55	53	52	48	43	38

0.75 = CFM per square foot of parking

ID	Building Tag	Parking Spaces	SF per pkg space	GSF	m^2	facility function	CFM	Pressure (Pa)	Q (m^3/s)	fantype = plug, tube, or prop	A-weighted PWL 63	125	250	500	1000	2000	4000	8000	OA dB
fans exhausting at above-bldg roof level (near ingress and egress)																			
MP	Parcel 4 Structure (2 underground levels)	99.1	120	11893.3	1105	parking	9000	375	4	tube	61	71	77	84	84	86	79	74	**90**
MP	Parcel 3 Structure (1 underground level)	40.0	120	4800.0	446	parking	4000	376	2	tube	57	67	73	80	80	82	75	70	**87**

Surface or Outdoor Parking Movement Noise: Master Plan

Trip Generation Summary (from W-Trans TIS, dated Feb. 14, 2023; Table 2)

	PM peak hour
Shopping center	1795
Apartments	345

Parking Area Description	Parking Spaces	Portion of Trips	dB adjust
Rite-Aid	61	59	17.7
East of Macy's	188	182	22.6
North of Macy's	412	398	26.0
Pad 1	93	90	19.5
West of Major 2	305	295	24.7
West of Major 1	36	35	15.4
East of Major 1	135	130	21.2
South of Major 1 (level 1 of two)	237	229	23.6
South of Major 1 (level 2 of two)	237	229	23.6
East of Town Square and Cinema	154	149	21.7
total Shopping center parking	1857		
Residential Parcel 1	96	48	16.9
Residential Parcel 3 (level 2 of 7 levels)	40	20	13.1
Residential Parcel 3 (level 3 of 7 levels)	40	20	13.1
Residential Parcel 3 (level 4 of 7 levels)	40	20	13.1
Residential Parcel 3 (level 5 of 7 levels)	40	20	13.1
Residential Parcel 3 (level 6 of 7 levels)	40	20	13.1
Residential Parcel 3 (level 7 of 7 levels)	40	20	13.1
Residential Parcel 4 (level 3 of 9 levels)	50	25	14.0
Residential Parcel 4 (level 4 of 9 levels)	50	25	14.0
Residential Parcel 4 (level 5 of 9 levels)	50	25	14.0
Residential Parcel 4 (level 6 of 9 levels)	50	25	14.0
Residential Parcel 4 (level 7 of 9 levels)	50	25	14.0
Residential Parcel 4 (level 8 of 9 levels)	50	25	14.0
Residential Parcel 4 (level 9 of 9 levels)	50	25	14.0
		25	14.0
total Apartments parking	683		

AHUs (plenum-type return fan only, no condenser units [see separate worksheet]):
Vision Plan

		63	125	250	500	1000	2000	4000	8000
A-weighting adjustments		26	13	9	3	0	-1	-1	1
average of values for the two fan diameter ranges, per Guyer (Table 12)	plug	40	40	38	34	29	23	19	16
average of values for the two fan diameter ranges, per Guyer (Table 12)	tube	47	44	46	47	44	45	38	35
per Guyer (Table 12, presumed based on Bies & Hansen ENC)	prop	46	48	55	53	52	48	43	38

percent adjustment for studied unit count: 0

Phase	Building Tag	GSF	Avg. SF/unit	Units	Adjusted Units	Stories	m^2	facility function	CFM pksf*	m^3/s per 1,000 m^2	Pressure (Pa)	Q (m^3/s)	fantype = plug, tube, or prop	A-weighted PWL (for CadnaA inputs) 63	125	250	500	1000	2000	4000	8000	OA dB	Q (cfm)
return air fans in building rooftop AHUs:																							
VP	Residential Parcel 1	91423	952.3	96	96	4	8498	residence	250	1.27	625	11	plug	60	72	75	80	82	81	79	77	**88**	23000
VP	Residential Parcel 2	155325	1553.3	100	100	3	14438	residence	250	1.27	625	18	plug	63	75	78	83	85	84	82	80	**90**	39000
VP	Residential Parcel 3	325144	1161.2	280	280	6	30222	residence	250	1.27	625	38	plug	66	78	81	86	88	87	85	83	**93**	82000
VP	Residential Parcel 4	540964	1212.9	446	446	7	50283	residence	250	1.27	625	64	plug	68	80	83	88	90	89	87	85	**95**	136000
VP	Residential Parcel 5	311186	1169.9	266	266	5	28925	residence	250	1.27	625	37	plug	66	78	81	86	88	87	85	83	**93**	78000
VP	Residential Parcel 6	322984	2197.2	147	147	7	30022	residence	250	1.27	625	38	plug	66	78	81	86	88	87	85	83	**93**	81000
VP	Cinema	65000					6042	theater	2250	11.42	625	69	plug	68	80	83	88	90	89	87	85	**96**	147000
VP	Shops 3	5000					465	retail	300	1.52	625	1	plug	48	60	63	68	70	69	67	65	**76**	2000
VP	Shops 4	6200					576	retail	300	1.52	625	1	plug	49	61	64	69	71	70	68	66	**77**	2000
VP	Shops 5	3500					325	retail	300	1.52	625	0	plug	47	59	62	67	69	68	66	64	**74**	2000
VP	Shops 6	5000					465	retail	300	1.52	625	0.7	plug	48	60	63	68	70	69	67	65	**76**	2000
VP	Pad 1	8400					781	retail	300	1.52	625	1	plug	51	63	66	71	73	72	70	68	**78**	3000
VP	Pad 2	4300					400	retail	300	1.52	625	1	plug	48	60	63	68	70	69	67	65	**75**	2000
VP	Pad 3	5000					465	retail	300	1.52	625	1	plug	48	60	63	68	70	69	67	65	**76**	2000
VP	Pad 4	3800					353	retail	300	1.52	625	1	plug	47	59	62	67	69	68	66	64	**75**	2000
VP	Pad 5	5000					465	retail	300	1.52	625	1	plug	48	60	63	68	70	69	67	65	**76**	2000
Exist	Rite-Aid	17340					1612	retail	300	1.52	625	2	plug	54	66	69	74	76	75	73	71	**81**	6000
Exist	Main Building	55360					5146	retail	300	1.52	625	8	plug	59	71	74	79	81	80	78	76	**86**	17000
VP	Major 3	10000					930	retail	300	1.52	625	1	plug	51	63	66	71	73	72	70	68	**79**	3000
VP	Major 4	23140					2151	retail	300	1.52	625	3	plug	55	67	70	75	77	76	74	72	**83**	7000

*per Loren Cook "Engineering Cookbook" (2nd ed., 1999) pg. 42

	63	125	250	500	1000	2000	4000	8000
fan or AHU cabinet liner/interior attenuation (excludes inlet/outlet PWL split, already in calcs above:	2	3	4	5	6	8	10	10

ACCs (air-cooled chillers on rooftops):
Vision Plan (2040)

with or without sound insulation? (enter Y/N): y

unweighted PWL (dB) per OCBF (Hz) at full load (100%)

	tons	LWA	63	125	250	500	1000	2000	4000	8000
Bryant BH16-018	1.5	67	66.2	66.2	63.9	63.8	62.3	58.4	56.4	50.3
Bryant BH16-024	2	71	65	65	63.7	63.4	68.5	64.7	58.7	52.8
Bryant BH16-036	3	71	68.2	68.2	66.4	67.5	68.4	59.6	58.2	52.4
Bryant BH16-048	4	71	68.4	68.4	67.7	69.7	67.6	59.4	56.4	50
Bryant BH16-060	5	69	63.7	63.7	65.4	67.3	64.9	58.3	56.2	51.9
Daikin AGZ-E 30	30	85	84	84	83	84	77	75	74	70
Daikin AGZ-E 40	40	85	84	84	83	84	77	75	74	70
Daikin AGZ-E 50	50	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 60	60	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 70	70	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 80	80	88	88	85	87	86	81	81	77	71
Daikin AGZ-E 90	90	88	88	87	87	86	83	80	77	71
Daikin AGZ-E 120	120	89	91	85	88	86	82	81	79	72
Daikin AGZ-E 240	241	94	94	88	91	90	91	84	82	75

data for models "without sound insulation" or no "sound blankets"

	LWA	63	125	250	500	1000	2000	4000	8000
Bryant BH16-018	68	*66.2*	66.2	63.8	64.1	64.6	59.9	57.7	53.6
Bryant BH16-024	72	*63.4*	63.4	63.3	63.3	70.4	64.5	59.3	55.5
Bryant BH16-036	72	*67.7*	67.7	66.8	68.1	69.9	62.8	60.3	55.2
Bryant BH16-048	73	*67.5*	67.5	67.8	70.1	70.6	63.1	58.5	53.3
Bryant BH16-060	70	*61.7*	61.7	65.6	68.1	65.8	59.8	58.4	56.1
Daikin AGZ-E 30	88	92	91	88	87	83	78	73	68
Daikin AGZ-E 40	89	92	91	90	88	84	79	74	69
Daikin AGZ-E 50	90	93	93	91	89	85	79	74	69
Daikin AGZ-E 60	91	94	93	94	89	86	81	76	71
Daikin AGZ-E 70	92	95	95	94	89	87	81	76	71
Daikin AGZ-E 80	92	95	95	95	89	87	81	76	71
Daikin AGZ-E 90	93	94	95	92	91	89	83	81	81
Daikin AGZ-E 120	95	93	96	92	92	90	84	84	82
Daikin AGZ-E 240	100	98	98	98	95	96	90	90	86

data for models "with sound insulation" or "sound blankets"

	LWA	63	125	250	500	1000	2000	4000	8000
Bryant BH16-018	67	*66.2*	66.2	63.9	63.8	62.3	58.4	56.4	50.3
Bryant BH16-024	71	*65*	65	63.7	63.4	68.5	64.7	58.7	52.8
Bryant BH16-036	71	*68.2*	68.2	66.4	67.5	68.4	59.6	58.2	52.4
Bryant BH16-048	71	*68.4*	68.4	67.7	69.7	67.6	59.4	56.4	50
Bryant BH16-060	69	*63.7*	63.7	65.4	67.3	64.9	58.3	56.2	51.9
Daikin AGZ-E 30	85	84	84	83	84	77	75	74	70
Daikin AGZ-E 40	85	84	84	83	84	77	75	74	70
Daikin AGZ-E 50	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 60	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 70	87	85	85	85	86	80	77	75	70
Daikin AGZ-E 80	88	88	85	87	86	81	81	77	71
Daikin AGZ-E 90	88	88	87	87	86	83	80	77	71
Daikin AGZ-E 120	89	91	85	88	86	82	81	79	72
Daikin AGZ-E 240	94	94	88	91	90	91	84	82	75

actual percent of GSF occupied: 100

Phase	Building Tag	GSF	Avail. SF	comparable facility function	Avg. GSF per ton*	tons of refrig.	Approx. Qty. of ACCs	tons per ACC	Approx. Total PWL (dBA)
VP	Residential Parcel 1	91423	91423	residential, medium	700	130.6	33	4.0	**86**
VP	Residential Parcel 2	155325	155325	residential, medium	700	221.9	100	2.2	**91**
VP	Residential Parcel 3	325144	325144	residential, medium	700	464.5	96	4.8	**91**
VP	Residential Parcel 4	540964	540964	residential, medium	700	772.8	200	3.9	**94**
VP	Residential Parcel 5	311186	311186	residential, medium	700	444.6	96	4.6	**91**
VP	Residential Parcel 6	322984	322984	residential, medium	700	461.4	90	5.1	**89**
VP	Cinema	65000	65000	theater, low	400	162.5	30	5.4	**84**
VP	Shops 3	5000	5000	malls, low	365	13.7	2	6.8	**72**
VP	Shops 4	6200	6200	malls, low	365	17.0	3	5.7	**74**
VP	Shops 5	3500	3500	malls, low	365	9.6	2	4.8	**74**
VP	Shops 6	5000	5000	malls, low	365	13.7	4	3.4	**77**
VP	Pad 1	8400	8400	malls, low	365	23.0	4	5.8	**75**
VP	Pad 2	4300	4300	malls, low	365	11.8	2	5.9	**72**
VP	Pad 3	5000	5000	malls, low	365	13.7	3	4.6	**76**
VP	Pad 4	3800	3800	malls, low	365	10.4	2	5.2	**72**
VP	Pad 5	5000	5000	malls, low	365	13.7	3	4.6	**76**
Exist	Rite-Aid	17340	17340	malls, low	365	47.5	9	5.3	**79**
Exist	Main Building	55360	55360	malls, low	365	151.7	30	5.1	**84**
VP	Major 3	10000	10000	malls, low	365	27.4	6	4.6	**79**
VP	Major 4	23140	23140	malls, low	365	63.4	12	5.3	**80**

unweighted PWL (dB) per OCBF (Hz) at full load (100%)

Building Tag	63	125	250	500	1000	2000	4000	8000	qty adj
Residential Parcel 1	83	83	82	83	84	75	73	68	15
Residential Parcel 2	85	85	84	83	89	85	79	73	20
Residential Parcel 3	88	88	88	90	87	79	76	70	20
Residential Parcel 4	91	91	89	91	91	83	81	75	23
Residential Parcel 5	88	88	88	90	87	79	76	70	20
Residential Parcel 6	83	83	85	87	84	78	76	71	20
Cinema	78	78	80	82	80	73	71	67	15
Shops 3	67	67	68	70	68	61	59	55	3
Shops 4	68	68	70	72	70	63	61	57	5
Shops 5	71	71	71	73	71	62	59	53	3
Shops 6	74	74	72	74	74	66	64	58	6
Pad 1	70	70	71	73	71	64	62	58	6
Pad 2	67	67	68	70	68	61	59	55	3
Pad 3	73	73	72	74	72	64	61	55	5
Pad 4	67	67	68	70	68	61	59	55	3
Pad 5	73	73	72	74	72	64	61	55	5
Rite-Aid	73	73	75	77	74	68	66	61	10
Main Building	78	78	80	82	80	73	71	67	15
Major 3	76	76	75	77	75	67	64	58	8
Major 4	74	74	76	78	76	69	67	63	11

*based upon values per Loren Cook's "Engineering Cookbook" (2nd ed., 1999), pp. 59-60

Exhaust units (tubeaxial fans only):
Vision Plan

		63	125	250	500	1000	2000	4000	8000
A-weighting adjustments		26	13	9	3	0	-1	-1	1
average of values for the two fan diameter ranges, per Guyer (Table 12)	plug	40	40	38	34	29	23	19	16
average of values for the two fan diameter ranges, per Guyer (Table 12)	tube	47	44	46	47	44	45	38	35
per Guyer (Table 12, presumed based on Bies & Hansen ENC)	prop	46	48	55	53	52	48	43	38

0.75 = CFM per square foot of parking

Phase	Building Tag	Parking Spaces	SF per pkg space	GSF	m^2	facility function	CFM	Pressure (Pa)	Q (m^3/s)	fantype = plug, tube, or prop	A-weighted PWL 63	125	250	500	1000	2000	4000	8000	OA dB
fans exhausting at above-bldg roof level (near ingress and egress)																			
VP	Parcel 4 Structure (2 underground levels)	99.1	120	11893.3	1105	parking	9000	375	4	tube	61	71	77	84	84	86	79	74	**90**
VP	Parcel 3 Structure (1 underground level)	40.0	120	4800.0	446	parking	4000	376	2	tube	57	67	73	80	80	82	75	70	**87**
VP	Parcel 6 Structure (1 underground level)	103.0	120	12360.0	1149	parking	10000	377	5	tube	61	71	77	84	84	86	79	74	**91**

Surface or Outdoor Parking Movement Noise:
Vision Plan (2040)

Trip Generation Summary (from W-Trans TIS, dated Feb. 14, 2023; Table 3)

	PM peak hour
Shopping center	1012
Apartments	519

Parking Area Description	Parking Spaces	Portion of Trips	dB adjust
Rite-Aid	61	44	16.4
North of Macy's (Pad 2, 3, and 4)	259	185	22.7
Pad 1	93	67	18.2
West of Major 2	248	177	22.5
East of Major 1	135	97	19.8
South of Major 1 (level 1 of two)	237	169	22.3
South of Major 1 (level 2 of two)	237	169	22.3
East of Town Square and Cinema	146	104	20.2
total Shopping center parking	1415		
Residential Parcel 1	96	37	15.7
Residential Parcel 3 (level 2 of 7 levels)	40	15	11.9
Residential Parcel 3 (level 3 of 7 levels)	40	15	11.9
Residential Parcel 3 (level 4 of 7 levels)	40	15	11.9
Residential Parcel 3 (level 5 of 7 levels)	40	15	11.9
Residential Parcel 3 (level 6 of 7 levels)	40	15	11.9
Residential Parcel 3 (level 7 of 7 levels)	40	15	11.9
Residential Parcel 4 (level 3 of 9 levels)	50	19	12.8
Residential Parcel 4 (level 4 of 9 levels)	50	19	12.8
Residential Parcel 4 (level 5 of 9 levels)	50	19	12.8
Residential Parcel 4 (level 6 of 9 levels)	50	19	12.8
Residential Parcel 4 (level 7 of 9 levels)	50	19	12.8
Residential Parcel 4 (level 8 of 9 levels)	50	19	12.8
Residential Parcel 4 (level 9 of 9 levels)	50	19	12.8
Residential Parcel 5 (level 1 of 5 levels)	92	35	15.5
Residential Parcel 5 (level 2 of 5 levels)	92	35	15.5
Residential Parcel 5 (level 3 of 5 levels)	92	35	15.5
Residential Parcel 5 (level 4 of 5 levels)	92	35	15.5
Residential Parcel 5 (level 5 of 5 levels)	92	35	15.5
Residential Parcel 6 (level 2 of 3 levels)	103	40	16.0
Residential Parcel 6 (level 3 of 3 levels)	103	40	16.0
total Apartments parking	1349		

CadnaA - Point Sources ***Master Plan (Daytime with Town Square event)***

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (ft²)	Attenuatio	Operating Time Day (min)	Special (min)	Night (min)	K0 (dB)	Freq. (Hz)	Direct.	Height (ft)	Coordinates X (ft)	Y (ft)	Z (ft)
Res Parcel 3 Pkg Garage Exhaust		RP3PGE	84.5	84.5	84.5	Lw	RP3XF		0	0	0			3				0		(none)	68 r	2151.29	921.92	68
Res Parcel 4 Pkg Garage Exhaust		RP4PGE	88.5	88.5	88.5	Lw	RP4XF		0	0	0			3				0		(none)	78 r	2267.86	1296.45	78

CadnaA - Sound Levels (local)

Name	ID	Type	Oktave Spectrum (dB) Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	Source
BH16-024 2-ton OBCF with sound blankets	BH024	Lw		65	65	65	64	63	68	65	59	53	71.1	73.9	Bryant
BH16-036 3-ton OBCF with sound blankets	BH036	Lw		68	68	68	66	67	68	60	58	52	70.7	75.6	Bryant
BH16-048 4-ton OBCF with sound blankets	BH048	Lw		68	68	68	68	69	68	59	56	50	71.1	76.1	Bryant
BH16-060 5-ton OBCF with sound blankets	BH060	Lw		64	64	64	65	67	65	58	56	52	68.8	73	Bryant
Daikin AGZ-E 30-ton OBCF with sound blankets	AGZ30	Lw		84	84	84	83	84	77	75	74	70	84.6	91.2	Daikin
Daikin AGZ-E 120-ton OBCF with sound blankets	AGZ120	Lw		91	91	85	88	86	82	81	79	72	88.6	96.3	Daikin
Res Parcel 1 aggregate AHU	RP1AHU	Lw	A	60	60	72	75	80	82	81	79	77	87.5	100.2	Dudek calcs from GSF
Res Parcel 2 aggregate AHU	RP2AHU	Lw	A	63	63	75	78	83	85	84	82	80	90.5	103.2	Dudek calcs from GSF
Res Parcel 3 aggregate AHU	RP3AHU	Lw	A	66	66	78	81	86	88	87	85	83	93.5	106.2	Dudek calcs from GSF
Res Parcel 4 aggregate AHU	RP4AHU	Lw	A	68	68	80	83	88	90	89	87	85	95.5	108.2	Dudek calcs from GSF
Cinema aggregate AHU	CINAHU	Lw	A	68	68	80	83	88	90	89	87	85	95.5	108.2	Dudek calcs from GSF
Shops3 aggregate AHU	S3AHU	Lw	A	48	48	60	63	68	70	69	67	65	75.5	88.2	Dudek calcs from GSF
Shops4 aggregate AHU	S4AHU	Lw	A	49	49	61	64	69	71	70	68	66	76.5	89.2	Dudek calcs from GSF
Pad1 aggregate AHU	P1AHU	Lw	A	51	51	63	66	71	73	72	70	68	78.5	91.2	Dudek calcs from GSF
Pad2 aggregate AHU	P2AHU	Lw	A	48	48	60	63	68	70	69	67	65	75.5	88.2	Dudek calcs from GSF
Macys aggregate AHU	MAHU	Lw	A	65	65	77	80	85	87	86	84	82	92.5	105.2	Dudek calcs from GSF
Kohls (Major1) aggregate AHU	KAHU	Lw	A	60	60	72	75	80	82	81	79	77	87.5	100.2	Dudek calcs from GSF
RiteAid aggregate AHU	RAAHU	Lw	A	54	54	66	69	74	76	75	73	71	81.5	94.2	Dudek calcs from GSF
Main Bldg aggregate AHU	MBAHU	Lw	A	59	59	71	74	79	81	80	78	76	86.5	99.2	Dudek calcs from GSF
Shops1 aggregate AHU	S1AHU	Lw	A	50	50	62	65	70	72	71	69	67	77.5	90.2	Dudek calcs from GSF
Single low-speed passenger car spectra	SLSPCS	Lw	A	77	81	92	97	97	97	93	84	74	102.8	117.8	ENC 2nd ed, med low PD muff, 15kW
Res Parcel 3 pkg garage exhaust fan	RP3XF	Lw	A	57	57	67	82	80	80	82	75	70	87.5	98.1	ENC 2nd ed. calcs
Res Parcel 4 pkg garage exhaust fan	RP4XF	Lw	A	61	61	71	86	84	84	86	79	74	91.5	102.1	ENC 2nd ed. calcs
speech spectrum	HAYNE	Lw	A	-13	-10	-7	-5	-5	-8	-14	-20	-26	5.6	33	Hayne 2006 paper figure 5

CadnaA - Area Sources

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Result. PWL'' Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (ft²)	Attenuatio	Operating Time Day (min)	Special (min)	Night (min)	K0 (dB)	Freq. (Hz)	Direct.	Moving Pt. Src Number Day	Evening	Night
Res Parcel 1 rooftop chillers		RP1RC	86.1	86.1	86.1	57.2	57.2	57.2	Lw	BH048		0	0	0			-15				0		(none)			
Res Parcel 1 rooftop air handlers		RP1RA	87.5	87.5	87.5	58.6	58.6	58.6	Lw	RP1AHU		0	0	0							0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers		RP2RC	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	79.5	79.5	79.5	61.5	61.5	61.5	Lw	RP2AHU		0	0	0			11				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	79.5	79.5	79.5	61.5	61.5	61.5	Lw	RP2AHU		0	0	0			11				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	77.5	77.5	77.5	59.5	59.5	59.5	Lw	RP2AHU		0	0	0			13				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	77.5	77.5	77.5	59.5	59.5	59.5	Lw	RP2AHU		0	0	0			13				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers		RP2RA	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 3 south rooftop chillers		RP3SRC	90.1	90.1	90.1	58.4	58.4	58.4	Lw	BH048		0	0	0			-19				0		(none)			
Res Parcel 3 south rooftop air handlers		RP3SRA	92.5	92.5	92.5	60.8	60.8	60.8	Lw	RP3AHU		0	0	0			1				0		(none)			
Res Parcel 3 north ooftop air handlers		RP3NRA	84.5	84.5	84.5	63.9	63.9	63.9	Lw	RP3AHU		0	0	0			9				0		(none)			
Res Parcel 3 north rooftop chillers		RP3NRC	79.1	79.1	79.1	58.5	58.5	58.5	Lw	BH048		0	0	0			-8				0		(none)			
Res Parcel 4 rooftop chillers		RP4RC	93.7	93.7	93.7	59	59	59	Lw	BH036		0	0	0			-23				0		(none)			
Res Parcel 4 rooftop air handlers		RP4RA	95.5	95.5	95.5	60.8	60.8	60.8	Lw	RP4AHU		0	0	0							0		(none)			
Shops4 rooftop air handlers	+	S4RA	76.5	76.5	76.5	51	51	51	Lw	S4AHU		0	0	0							0		(none)			
Shops4 rooftop air chillers	+	S4RC	73.8	73.8	73.8	48.3	48.3	48.3	Lw	BH060		0	0	0			-5				0		(none)			
Cinema rooftop air chillers	+	CINRC	83.8	83.8	83.8	49	49	49	Lw	BH060		0	0	0			-15				0		(none)			
Cinema rooftop air handlers	+	CINRA	95.5	95.5	95.5	60.7	60.7	60.7	Lw	CINAHU		0	0	0							0		(none)			
Shops3 rooftop air handlers	+	S3RA	75.5	75.5	75.5	53.3	53.3	53.3	Lw	S3AHU		0	0	0							0		(none)			
Shops3 rooftop chillers	+	S3RC	71.8	71.8	71.8	49.6	49.6	49.6	Lw	BH060		0	0	0			-3				0		(none)			
Kohls (Major1) rooftop chillers	+	KRC	92.6	92.6	92.6	60.5	60.5	60.5	Lw	AGZ30		0	0	0			-8				0		(none)			
Kohls (Major1) rooftop air handlers	+	KRA	87.5	87.5	87.5	55.5	55.5	55.5	Lw	KAHU		0	0	0							0		(none)			
Shops1 rooftop air handlers	+	S1RA	77.5	77.5	77.5	55.4	55.4	55.4	Lw	S1AHU		0	0	0							0		(none)			
Shops1 rooftop air chillers	+	S1RC	73.8	73.8	73.8	51.6	51.6	51.6	Lw	BH060		0	0	0			-5				0		(none)			
Macys rooftop air chillers	+	MACYSRC	95.6	95.6	95.6	58.9	58.9	58.9	Lw	AGZ120		0	0	0			-7				0		(none)			
Macys rooftop air handlers	+	MACYSRA	92.5	92.5	92.5	55.8	55.8	55.8	Lw	MAHU		0	0	0							0		(none)			
Major2 rooftop air handlers	+	M2RA	86.5	86.5	86.5	51.7	51.7	51.7	Lw	MBAHU		0	0	0							0		(none)			
Major2 rooftop chillers	+	M2RC	83.8	83.8	83.8	48.9	48.9	48.9	Lw	BH060		0	0	0			-15				0		(none)			
RiteAid rooftop chillers	+	RARC	78.8	78.8	78.8	51.4	51.4	51.4	Lw	BH060		0	0	0			-10				0		(none)			
RiteAid rooftop air handlers	+	RARA	81.5	81.5	81.5	54.1	54.1	54.1	Lw	RAAHU		0	0	0							0		(none)			
Pad2 rooftop air handlers	+	P2RA	75.5	75.5	75.5	54.8	54.8	54.8	Lw	P2AHU		0	0	0							0		(none)			
Pad2 rooftop chillers	+	P2RC	71.8	71.8	71.8	51.1	51.1	51.1	Lw	BH060		0	0	0			-3				0		(none)			
Pad1 rooftop chillers	+	P1RC	74.8	74.8	74.8	51.4	51.4	51.4	Lw	BH060		0	0	0			-6				0		(none)			
Pad1 rooftop air handlers	+	P1RA	78.5	78.5	78.5	55.1	55.1	55.1	Lw	P1AHU		0	0	0							0		(none)			
Res Parcel 1 pkg PH 40		RP1P40	79.1	79.1	79.1	46.4	46.4	46.4	Lw	SLSPCS		0	0	0			39.8-16.1				0		(none)			
Town Square pkg - PH 149	+	TS149	84.7	84.7	84.7	45.9	45.9	45.9	Lw	SLSPCS		0	0	0			39.8-21.7				0		(none)			
East of Major1 pkg PH 130	+	EM1P130	84.2	84.2	84.2	47.8	47.8	47.8	Lw	SLSPCS		0	0	0			39.8-21.2				0		(none)			
existing pkg area lvl 1 PH 229	+	EPA473L1	86.6	86.6	86.6	49.2	49.2	49.2	Lw	SLSPCS		0	0	0			39.8-23.6				0		(none)			
existing pkg area lvl 2 PH 229	+	EPA473L2	86.6	86.6	86.6	49.2	49.2	49.2	Lw	SLSPCS		0	0	0			39.8-23.6				0		(none)			
Major 1 pkg area PH 35	+	M1P35	78.4	78.4	78.4	48.6	48.6	48.6	Lw	SLSPCS		0	0	0			39.8-15.4				0		(none)			
West of Major 2 pkg PH 295	+	WM2P295	87.7	87.7	87.7	47.8	47.8	47.8	Lw	SLSPCS		0	0	0			39.8-24.7				0		(none)			
Pad 1 pkg area PH 90	+	P1P90	82.5	82.5	82.5	48.2	48.2	48.2	Lw	SLSPCS		0	0	0			39.8-19.5				0		(none)			
Macys north pkg area PH 398	+	MNPA398	89	89	89	48.3	48.3	48.3	Lw	SLSPCS		0	0	0			39.8-26				0		(none)			
Rite Aid pkg - 59 PH	+	RAP59	80.7	80.7	80.7	48.1	48.1	48.1	Lw	SLSPCS		0	0	0			39.8-17.7				0		(none)			
Macys pkg area 182 PH	+	MCYSA182	85.6	85.6	85.6	48.6	48.6	48.6	Lw	SLSPCS		0	0	0			39.8-22.6				0		(none)			
Res Parcel 3 pkg level 2 PH 40		RP3P2	76.1	76.1	76.1	47.1	47.1	47.1	Lw	SLSPCS		0	0	0			39.8-13.1				0		(none)			
Res Parcel 3 pkg level 3 PH 40		RP3P3	76.1	76.1	76.1	47.1	47.1	47.1	Lw	SLSPCS		0	0	0			39.8-13.1				0		(none)			
Res Parcel 3 pkg level 4 PH 40		RP3P4	76.1	76.1	76.1	47.1	47.1	47.1	Lw	SLSPCS		0	0	0			39.8-13.1				0		(none)			
Res Parcel 3 pkg level 5 PH 40		RP3P5	76.1	76.1	76.1	47.1	47.1	47.1	Lw	SLSPCS		0	0	0			39.8-13.1				0		(none)			
Res Parcel 3 pkg level 6 PH 40		RP3P6	76.1	76.1	76.1	47.1	47.1	47.1	Lw	SLSPCS		0	0	0			39.8-13.1				0		(none)			
Res Parcel 3 pkg level 7 PH 40		RP3P7	76.1	76.1	76.1	47.1	47.1	47.1	Lw	SLSPCS		0	0	0			39.8-13.1				0		(none)			
Res Parcel 4 pkg level 3 PH 50		RP4P3	77	77	77	48	48	48	Lw	SLSPCS		0	0	0			39.8-14				0		(none)			
Res Parcel 4 pkg level 4 PH 50		RP4P4	77	77	77	48	48	48	Lw	SLSPCS		0	0	0			39.8-14				0		(none)			
Res Parcel 4 pkg level 5 PH 50		RP4P5	77	77	77	48	48	48	Lw	SLSPCS		0	0	0			39.8-14				0		(none)			
Res Parcel 4 pkg level 6 PH 50		RP4P6	77	77	77	48	48	48	Lw	SLSPCS		0	0	0			39.8-14				0		(none)			
Res Parcel 4 pkg level 7 PH 50		RP4P7	77	77	77	48	48	48	Lw	SLSPCS		0	0	0			39.8-14				0		(none)			
Res Parcel 4 pkg level 8 PH 50		RP4P8	77	77	77	48	48	48	Lw	SLSPCS		0	0	0			39.8-14				0		(none)			
Res Parcel 4 pkg level 9 PH 50		RP4P9	77	77	77	48	48	48	Lw	SLSPCS		0	0	0			39.8-14				0		(none)			
TwnSq - 200ppl "raised normal" speech half-time	+	TS200RNSI	88	88	88	54.8	54.8	54.8	Lw	HAYNE		0	0	0			-82.4				0		(none)			

CadnaA - Buildings   *Master Plan (Daytime)*

Name	M.	ID	RB	Residents	Absorption	Height Begin (ft)	
Rite Aid		RiteAid		0	0.1	23	r
Macys		Macys		0	0.1	56	r
Pad1		Pad1		0	0.1	20	r
Pad2		Pad2		0	0.1	20	r
Major2		Major2		0	0.1	39	r
Shops2	+	Shops2		0	0.1	39	r
Residential Parcel 3 South	+	RP3S		0	0.1	60	r
Residential Parcel 3 North	+	RP3N		0	0.1	60	r
Residential Parcel 2 North1	+	RP2N1		0	0.1	30	r
Shops4	+	Shops4		0	0.1	23	r
Cinema	+	Cinema		0	0.1	39	r
Kohls	+	Kohls		0	0.1	36	r
Shops1	+	Shops1		0	0.1	23	r
Residential Parcel 1	+	RP1		0	0.1	40	r
Shops3	+	Shops3		0	0.1	23	r
Residential Parcel 4	+	RP4		0	0.1	70	r
Residential Parcel 2 North2	+	RP2N2		0	0.1	30	r
Residential Parcel 2 North3	+	RP2N3		0	0.1	30	r
Residential Parcel 2 North4	+	RP2N4		0	0.1	30	r
Residential Parcel 2 North5	+	RP2N5		0	0.1	30	r
Residential Parcel 2 North7	+	RP2N7		0	0.1	30	r
Residential Parcel 2 North8	+	RP2N8		0	0.1	30	r
Residential Parcel 2 South3	+	RP2S3		0	0.1	30	r
Residential Parcel 2 South4	+	RP2S4		0	0.1	30	r
Residential Parcel 2 South1	+	RP2S1		0	0.1	30	r
Residential Parcel 2 South2	+	RP2S2		0	0.1	30	r
Residential Parcel 2 West1	+	RP2W1		0	0.1	30	r
Residential Parcel 2 West2	+	RP2W2		0	0.1	30	r
Residential Parcel 2 North6	+	RP2N6		0	0.1	30	r

CadnaA - Point Sources

Vision Plan (Daytime with Town Square event)

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuatio	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		(ft)		(ft)	(ft)	(ft)
Res Parcel 3 Pkg Garage Exhaust		RP3PGE	84.5	84.5	84.5	Lw	RP3XF		0	0	0			3				0		(none)	68	r	2151.29	921.92	68
Res Parcel 4 Pkg Garage Exhaust		RP4PGE	88.5	88.5	88.5	Lw	RP4XF		0	0	0			3				0		(none)	78	r	2267.86	1296.45	78
Res Parcel 6 Pkg Garage Exhaust		RP6PGE	88.5	88.5	88.5	Lw	RP6XF		0	0	0			3				0		(none)	78	r	1520.94	1555.84	78

CadnaA - Line Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuatio	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			Speed
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(mph)
Pad2 vehicle drive-thru		P2VDT	80.5	80.5	80.5	61.3	61.3	61.3	SET												0		(none)				
Pad4 vehicle drive-thru		P4VDT	80.5	80.5	80.5	61.9	61.9	61.9	SET												0		(none)				

CadnaA - Area Sources

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuatio	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Res Parcel 1 rooftop chillers		RP1RC	86.1	86.1	86.1	57.2	57.2	57.2	Lw	BH048		0	0	0			-15				0		(none)			
Res Parcel 1 rooftop air handlers		RP1RA	87.5	87.5	87.5	58.6	58.6	58.6	Lw	RP1AHU		0	0	0							0		(none)			
Res Parcel 2 rooftop air handlers b11		RP2RA11	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop chillers b11		RP2RC11	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b12		RP2RC12	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b13		RP2RC13	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b15		RP2RC15	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b14		RP2RC14	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b7		RP2RC7	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b5		RP2RC5	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b4		RP2RC4	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b6		RP2RC6	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b8		RP2RC8	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b3		RP2RC3	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b9		RP2RC9	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b10		RP2RC10	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b1		RP2RC1	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop chillers b2		RP2RC2	79.1	79.1	79.1	61.1	61.1	61.1	Lw	BH024		0	0	0			-8				0		(none)			
Res Parcel 2 rooftop air handlers b1		RP2RA1	79.5	79.5	79.5	61.5	61.5	61.5	Lw	RP2AHU		0	0	0			11				0		(none)			
Res Parcel 2 rooftop air handlers b2		RP2RA2	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers b3		RP2RA3	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers b4		RP2RA4	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers b5		RP2RA5	79.5	79.5	79.5	61.5	61.5	61.5	Lw	RP2AHU		0	0	0			11				0		(none)			
Res Parcel 2 rooftop air handlers b6		RP2RA6	77.5	77.5	77.5	59.5	59.5	59.5	Lw	RP2AHU		0	0	0			13				0		(none)			
Res Parcel 2 rooftop air handlers b8		RP2RA8	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers b9		RP2RA9	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers b7		RP2RA7	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers b10		RP2RA10	77.5	77.5	77.5	59.5	59.5	59.5	Lw	RP2AHU		0	0	0			13				0		(none)			
Res Parcel 2 rooftop air handlers b15		RP2RA15	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers b12		RP2RA12	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers b13		RP2RA13	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 2 rooftop air handlers b14		RP2RA14	78.5	78.5	78.5	60.5	60.5	60.5	Lw	RP2AHU		0	0	0			12				0		(none)			
Res Parcel 3 south rooftop chillers		RP3SRC	90.1	90.1	90.1	58.4	58.4	58.4	Lw	BH048		0	0	0			-19				0		(none)			
Res Parcel 3 south rooftop air handlers		RP3SRA	92.5	92.5	92.5	60.8	60.8	60.8	Lw	RP3AHU		0	0	0			1				0		(none)			
Res Parcel 3 north rooftop air handlers		RP3NRA	84.5	84.5	84.5	63.9	63.9	63.9	Lw	RP3AHU		0	0	0			9				0		(none)			
Res Parcel 3 north rooftop chillers		RP3NRC	79.1	79.1	79.1	58.5	58.5	58.5	Lw	BH048		0	0	0			-8				0		(none)			
Res Parcel 4 rooftop chillers		RP4RC	93.7	93.7	93.7	59	59	59	Lw	BH036		0	0	0			-23				0		(none)			
Res Parcel 4 rooftop air handlers		RP4RA	95.5	95.5	95.5	60.8	60.8	60.8	Lw	RP4AHU		0	0	0							0		(none)			
Shops4 rooftop air handlers	+	S4RA	76.5	76.5	76.5	51	51	51	Lw	S4AHU		0	0	0							0		(none)			
Shops4 rooftop air chillers	+	S4RC	73.8	73.8	73.8	48.3	48.3	48.3	Lw	BH060		0	0	0			-5				0		(none)			
Cinema rooftop air chillers	+	CINRC	83.8	83.8	83.8	49	49	49	Lw	BH060		0	0	0			-15				0		(none)			
Cinema rooftop air handlers	+	CINRA	95.5	95.5	95.5	60.7	60.7	60.7	Lw	CINAHU		0	0	0							0		(none)			
Shops3 rooftop air handlers	+	S3RA	75.5	75.5	75.5	53.3	53.3	53.3	Lw	S3AHU		0	0	0							0		(none)			
Shops3 rooftop chillers	+	S3RC	71.8	71.8	71.8	49.6	49.6	49.6	Lw	BH060		0	0	0			-3				0		(none)			
Res Parcel 6 rooftop chillers NE		RP6ACCNE	82.8	82.8	82.8	57.2	57.2	57.2	Lw	BH060		0	0	0			-14				0		(none)			
Res Parcel 6 rooftop air handlers NE		RP6NE	87.5	87.5	87.5	63	63	63	Lw	RP6AHU		0	0	0			6				0		(none)			
Res Parcel 5 AC chillers west		RP5ACCW	88.1	88.1	88.1	58.4	58.4	58.4	Lw	BH048		0	0	0			-17				0		(none)			
Res Parcel 5 AHU west		ResP5AHUW	90.5	90.5	90.5	57.7	57.7	57.7	Lw	RP5AHU		0	0	0			3				0		(none)			
Major2 rooftop air handlers	+	M2RA	86.5	86.5	86.5	51.7	51.7	51.7	Lw	MBAHU		0	0	0							0		(none)			
Major2 rooftop chillers	+	M2RC	83.8	83.8	83.8	48.9	48.9	48.9	Lw	BH060		0	0	0			-15				0		(none)			
RiteAid rooftop chillers	+	RARC	78.8	78.8	78.8	51.4	51.4	51.4	Lw	BH060		0	0	0			-10				0		(none)			
RiteAid rooftop air handlers	+	RARA	81.5	81.5	81.5	54.1	54.1	54.1	Lw	RAAHU		0	0	0							0		(none)			
Pad2 rooftop air handlers	+	P2RA	75.5	75.5	75.5	54.8	54.8	54.8	Lw	P2AHU		0	0	0							0		(none)			
Pad2 rooftop chillers	+	P2RC	71.8	71.8	71.8	51.1	51.1	51.1	Lw	BH060		0	0	0			-3				0		(none)			
Pad1 rooftop chillers	+	P1RC	74.8	74.8	74.8	51.4	51.4	51.4	Lw	BH060		0	0	0			-6				0		(none)			
Pad1 rooftop air handlers	+	P1RA	78.5	78.5	78.5	55.1	55.1	55.1	Lw	P1AHU		0	0	0							0		(none)			
Res Parcel 1 pkg PS96 PH37	+	RP1P	78.7	78.7	78.7	47.3	47.3	47.3	Lw	SLSPCS		0	0	0			39.8-15.7				0		(none)			
Town Square pkg - PS146 PH104	+	TSpkg	83.2	83.2	83.2	44.5	44.5	44.5	Lw	SLSPCS		0	0	0			39.8-20.2				0		(none)			
East of Major1 pkg PS135 PH97	+	EM1Pkg	82.8	82.8	82.8	46.4	46.4	46.4	Lw	SLSPCS		0	0	0			39.8-19.8				0		(none)			
existing pkg area lvl 1 PS237 PH169	+	EPA473L1	85.3	85.3	85.3	47.9	47.9	47.9	Lw	SLSPCS		0	0	0			39.8-22.3				0		(none)			
existing pkg area lvl 2 PS237 PH169	+	EPA473L2	85.3	85.3	85.3	47.9	47.9	47.9	Lw	SLSPCS		0	0	0			39.8-22.3				0		(none)			
West of Major 2 pkg PS248 PH177	+	WM2Pkg	85.5	85.5	85.5	46.2	46.2	46.2	Lw	SLSPCS		0	0	0			39.8-22.5				0		(none)			
Pad 1 pkg area PS93 PH67	+	P1P67	81.2	81.2	81.2	46.9	46.9	46.9	Lw	SLSPCS		0	0	0			39.8-18.2				0		(none)			
Pad 2 3 4 parking area PS259 PH185	+	P234pkg	85.7	85.7	85.7	46.1	46.1	46.1	Lw	SLSPCS		0	0	0			39.8-22.7				0		(none)			
Rite Aid pkg - PS61 PH44	+	RAP44	79.4	79.4	79.4	46.8	46.8	46.8	Lw	SLSPCS		0	0	0			39.8-16.4				0		(none)			
Res Parcel 3 pkg level 2 PS40 PS15		RP3P2	74.9	74.9	74.9	45.9	45.9	45.9	Lw	SLSPCS		0	0	0			39.8-11.9				0		(none)			
Res Parcel 3 pkg level 3 PS40 PH15		RP3P3	74.9	74.9	74.9	45.9	45.9	45.9	Lw	SLSPCS		0	0	0			39.8-11.9				0		(none)			
Res Parcel 3 pkg level 4 PS40 PH15		RP3P4	74.9	74.9	74.9	45.9	45.9	45.9	Lw	SLSPCS		0	0	0			39.8-11.9				0		(none)			
Res Parcel 3 pkg level 5 PS40 PH15		RP3P5	74.9	74.9	74.9	45.9	45.9	45.9	Lw	SLSPCS		0	0	0			39.8-11.9				0		(none)			
Res Parcel 3 pkg level 6 PS40 PH15		RP3P6	74.9	74.9	74.9	45.9	45.9	45.9	Lw	SLSPCS		0	0	0			39.8-11.9				0		(none)			
Res Parcel 3 pkg level 7 PS40 PH15		RP3P7	74.9	74.9	74.9	45.9	45.9	45.9	Lw	SLSPCS		0	0	0			39.8-11.9				0		(none)			
Res Parcel 4 pkg level 3 PS50 PH19		RP4P3	75.8	75.8	75.8	46.8	46.8	46.8	Lw	SLSPCS		0	0	0			39.8-12.8				0		(none)			
Res Parcel 4 pkg level 4 PS50 PH19		RP4P4	75.8	75.8	75.8	46.8	46.8	46.8	Lw	SLSPCS		0	0	0			39.8-12.8				0		(none)			
Res Parcel 4 pkg level 5 PS50 PH19		RP4P5	75.8	75.8	75.8	46.8	46.8	46.8	Lw	SLSPCS		0	0	0			39.8-12.8				0		(none)			
Res Parcel 4 pkg level 6 PS50 PH19		RP4P6	75.8	75.8	75.8	46.8	46.8	46.8	Lw	SLSPCS		0	0	0			39.8-12.8				0		(none)			
Res Parcel 4 pkg level 7 PS50 PH19		RP4P7	75.8	75.8	75.8	46.8	46.8	46.8	Lw	SLSPCS		0	0	0			39.8-12.8				0		(none)			
Res Parcel 4 pkg level 8 PS50 PH19		RP4P8	75.8	75.8	75.8	46.8	46.8	46.8	Lw	SLSPCS		0	0	0			39.8-12.8				0		(none)			
Res Parcel 4 pkg level 9 PS50 PH19		RP4P9	75.8	75.8	75.8	46.8	46.8	46.8	Lw	SLSPCS		0	0	0			39.8-12.8				0		(none)			
TwnSq - 200ppl raised normal speech half-time	+	TS200RNSH	88	88	88	54.8	54.8	54.8	Lw	HAYNE		0	0	0			-82.4				0		(none)			
Res Parcel 5 pkg level 1 PS92 PH35		RP5P1	78.5	78.5	78.5	45.1	45.1	45.1	Lw	SLSPCS		0	0	0			39.8-15.5				0		(none)			
Res Parcel 5 pkg level 2 PS92 PH35		RP5P2	78.5	78.5	78.5	45.1	45.1	45.1	Lw	SLSPCS		0	0	0			39.8-15.5				0		(none)			
Res Parcel 5 pkg level 3 PS92 PH35		RP5P3	78.5	78.5	78.5	45.1	45.1	45.1	Lw	SLSPCS		0	0	0			39.8-15.5				0		(none)			
Res Parcel 5 pkg level 4 PS92 PH35		RP5P4	78.5	78.5	78.5	45.1	45.1	45.1	Lw	SLSPCS		0	0	0			39.8-15.5				0		(none)			
Res Parcel 5 pkg level 5 PS92 PH35		RP5P5	78.5	78.5	78.5	45.1	45.1	45.1	Lw	SLSPCS		0	0	0			39.8-15.5				0		(none)			
Res Parcel 5 AHU east		ResP5AHUE	90.5	90.5	90.5	62.2	62.2	62.2	Lw	RP5AHU		0	0	0			3				0		(none)			
Res Parcel 5 AC chillers east		RP5ACCE	88.1	88.1	88.1	63.2	63.2	63.2	Lw	BH048		0	0	0			-17				0		(none)			
Res Parcel 6 rooftop air handlers SE		RP6SE	87.5	87.5	87.5	62	62	62	Lw	RP6AHU		0	0	0			6				0		(none)			
Res Parcel 6 rooftop chillers SE		RP6ACCSE	82.8	82.8	82.8	57.7	57.7	57.7	Lw	BH060		0	0	0			-14				0		(none)			
Pad3 rooftop chillers	+	P3RC	76.1	76.1	76.1	55.4	55.4	55.4	Lw	BH048		0	0	0			-5				0		(none)			
Pad3 rooftop air handlers	+	P3RA	75.5	75.5	75.5	54.8	54.8	54.8	Lw	P3AHU		0	0	0							0		(none)			
Pad4 rooftop air handlers	+	P4RA	74.5	74.5	74.5	55.7	55.7	55.7	Lw	P4AHU		0	0	0							0		(none)			
Pad4 rooftop chillers	+	P4RC	71.8	71.8	71.8	54.1	54.1	54.1	Lw	BH060		0	0	0			-3				0		(none)			
Pad5 rooftop chillers	+	P5RC	76.1	76.1	76.1	58.4	58.4	58.4	Lw	BH048		0	0	0			-5				0		(none)			
Pad5 rooftop air handlers	+	P5RA	75.5	75.5	75.5	56.7	56.7	56.7	Lw	P5AHU		0	0	0							0		(none)			
East of Major2 pkg PH 130	+	EM1P130	84.2	84.2	84.2	51.9	51.9	51.9	Lw	SLSPCS		0	0	0			39.8-21.2				0		(none)			
Res Parcel 6 pkg lvl 2 of 3 PS103 PH40		RP6P2 PH40	79	79	79	42.9	42.9	42.9	Lw	SLSPCS		0	0	0			39.8-16				0		(none)			
Res Parcel 6 pkg lvl 3 of 3 PS103 PH40		RP6P3 PH30	79	79	79	42.9	42.9	42.9	Lw	SLSPCS		0	0	0			39.8-16				0		(none)			
Res Parcel 6 rooftop air handlers NW		RP6NW	87.5	87.5	87.5	64.4	64.4	64.4	Lw	RP6AHU		0	0	0			6				0		(none)			
Res Parcel 6 rooftop chillers NW		RP6ACCNW	82.8	82.8	82.8	59.7	59.7	59.7	Lw	BH060		0	0	0			-14				0		(none)			
Res Parcel 6 rooftop chillers SW		RP6ACCSW	82.8	82.8	82.8	57.7	57.7	57.7	Lw	BH060		0	0	0			-14				0		(none)			
Res Parcel 6 rooftop air handlers SW		RP6SW	87.5	87.5	87.5	62	62	62	Lw	RP6AHU		0	0	0			6				0		(none)			
Shops5 AHU	+	S5AHU	74.5	74.5	74.5	54.6	54.6	54.6	Lw	S5AHU		0	0	0							0		(none)			
Shops5 rooftop chillers	+	S5RACC	74.1	74.1	74.1	53.7	53.7	53.7	Lw	BH048		0	0	0			-3				0		(none)			
Shops6 AHU	+	S6AHU	75.5	75.5	75.5	55.6	55.6	55.6	Lw	S6AHU		0	0	0							0		(none)			
Shops6 rooftop chillers	+	S6RACC	76.7	76.7	76.7	56.3	56.3	56.3	Lw	BH036		0	0	0			-6				0		(none)			
Major3 rooftop chillers	+	M3ACC	79.1	79.1	79.1	58.7	58.7	58.7	Lw	BH048		0	0	0			-8				0		(none)			
Major3 AHU	+	M3AHU	78.5	78.5	78.5	58.6	58.6	58.6	Lw	M3AHU		0	0	0							0		(none)			
Major 4 AHU	+	M4AHU	82.5	82.5	82.5	62.6	62.6	62.6	Lw	M4AHU		0	0	0							0		(none)			
Major 4 rooftop chillers	+	M4RACC	79.8	79.8	79.8	59.4	59.4	59.4	Lw	BH060		0	0	0			-11				0		(none)			

CadnaA - Sound Levels (local)

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
BH16-024 2-ton OBCF with sound blankets	BH024	Lw		65	65	65	64	63	68	65	59	53	71.1	73.9	Bryant
BH16-036 3-ton OBCF with sound blankets	BH036	Lw		68	68	68	66	67	68	60	58	52	70.7	75.6	Bryant
BH16-048 4-ton OBCF with sound blankets	BH048	Lw		68	68	68	68	69	68	59	56	50	71.1	76.1	Bryant
BH16-060 5-ton OBCF with sound blankets	BH060	Lw		64	64	64	65	67	65	58	56	52	68.8	73	Bryant
Daikin AGZ-E 30-ton OBCF with sound blankets	AGZ30	Lw		84	84	84	83	84	77	75	74	70	84.6	91.2	Daikin
Daikin AGZ-E 120-ton OBCF with sound blankets	AGZ120	Lw		91	91	85	88	86	82	81	79	72	88.6	96.3	Daikin
Res Parcel 1 aggregate AHU	RP1AHU	Lw	A	60	60	72	75	80	82	81	79	77	87.5	100.2	Dudek calcs from GSF
Res Parcel 2 aggregate AHU	RP2AHU	Lw	A	63	63	75	78	83	85	84	82	80	90.5	103.2	Dudek calcs from GSF
Res Parcel 3 aggregate AHU	RP3AHU	Lw	A	66	66	78	81	86	88	87	85	83	93.5	106.2	Dudek calcs from GSF
Res Parcel 4 aggregate AHU	RP4AHU	Lw	A	68	68	80	83	88	90	89	87	85	95.5	108.2	Dudek calcs from GSF
Res Parcel 5 aggregate AHU	RP5AHU	Lw	A	66	66	78	81	86	88	87	85	83	93.5	106.2	Dudek calcs from GSF
Res Parcel 6 aggregate AHU	RP6AHU	Lw	A	66	66	78	81	86	88	87	85	83	93.5	106.2	Dudek calcs from GSF
Cinema aggregate AHU	CINAHU	Lw	A	68	68	80	83	88	90	89	87	85	95.5	108.2	Dudek calcs from GSF
Shops3 aggregate AHU	S3AHU	Lw	A	48	48	60	63	68	70	69	67	65	75.5	88.2	Dudek calcs from GSF
Shops4 aggregate AHU	S4AHU	Lw	A	49	49	61	64	69	71	70	68	66	76.5	89.2	Dudek calcs from GSF
Shops5 aggregate AHU	S5AHU	Lw	A	47	47	59	62	67	69	68	66	64	74.5	87.2	Dudek calcs from GSF
Shops6 aggregate AHU	S6AHU	Lw	A	48	48	60	63	68	70	69	67	65	75.5	88.2	Dudek calcs from GSF
Pad1 aggregate AHU	P1AHU	Lw	A	51	51	63	66	71	73	72	70	68	78.5	91.2	Dudek calcs from GSF
Pad2 aggregate AHU	P2AHU	Lw	A	48	48	60	63	68	70	69	67	65	75.5	88.2	Dudek calcs from GSF
Pad3 aggregate AHU	P3AHU	Lw	A	48	48	60	63	68	70	69	67	65	75.5	88.2	Dudek calcs from GSF
Pad4 aggregate AHU	P4AHU	Lw	A	47	47	59	62	67	69	68	66	64	74.5	87.2	Dudek calcs from GSF
Pad5 aggregate AHU	P5AHU	Lw	A	48	48	60	63	68	70	69	67	65	75.5	88.2	Dudek calcs from GSF
RiteAid aggregate AHU	RAAHU	Lw	A	54	54	66	69	74	76	75	73	71	81.5	94.2	Dudek calcs from GSF
Main Bldg aggregate AHU	MBAHU	Lw	A	59	59	71	74	79	81	80	78	76	86.5	99.2	Dudek calcs from GSF
Major 3 aggregate AHU	M3AHU	Lw	A	51	51	63	66	71	73	72	70	68	78.5	91.2	Dudek calcs from GSF
Major 4 aggregate AHU	M4AHU	Lw	A	55	55	67	70	75	77	76	74	72	82.5	95.2	Dudek calcs from GSF
Single low-speed passenger car spectra	SLSPCS	Lw	A	77	81	92	97	97	97	93	84	74	102.8	117.8	ENC 2nd ed, med low PD muff, 15kW
Res Parcel 3 pkg garage exhaust fan	RP3XF	Lw	A	57	57	67	82	80	80	82	75	70	87.5	98.1	ENC 2nd ed. calcs
Res Parcel 4 pkg garage exhaust fan	RP4XF	Lw	A	61	61	71	86	84	84	86	79	74	91.5	102.1	ENC 2nd ed. calcs
Res Parcel 6 pkg garage exhaust fan	RP6XF	Lw	A	61	61	71	86	84	84	86	79	74	91.5	102.1	ENC 2nd ed. calcs
speech spectrum	HAYNE	Lw	A	-13	-10	-7	-5	-5	-8	-14	-20	-26	5.6	33	Hayne 2006 paper figure 5

CadnaA - Buildings *Vision Plan (Daytime)*

Name	M.	ID	RB	Residents	Absorption	Height Begin (ft)	
Rite Aid		RiteAid		0	0.1	23	r
Res Parcel 5 west	+	RP5W		0	0.1	54	r
Pad1	+	Pad1		0	0.1	20	r
Pad2		Pad2		0	0.1	20	r
Major2		Major2		0	0.1	39	r
Res Parcel 3 south	+	RP3S		0	0.1	62	r
Res Parcel 3 north	+	RP3N		0	0.1	62	r
Res Parcel 4 west	+	RP4w		0	0.1	72	r
Cinema	+	Cinema		0	0.1	39	r
Res Parcel 6	+	RP6		0	0.1	72	r
Res Parcel 1	+	RP1		0	0.1	54	r
Shops3	+	Shops3		0	0.1	24	r
Res Parcel 4 east	+	RP4e		0	0.1	72	r
Res Parcel 2 bldg 13	+	RP2B13		0	0.1	29	r
Res Parcel 2 bldg 14	+	RP2B14		0	0.1	29	r
Res Parcel 2 bldg 2	+	RP2B2		0	0.1	29	r
Res Parcel 2 bldg 12	+	RP2B12		0	0.1	29	r
Res Parcel 2 bldg 11	+	RP2B11		0	0.1	29	r
Res Parcel 2 bldg 1	+	RP2B1		0	0.1	29	r
Res Parcel 2 bldg 3	+	RP2B3		0	0.1	29	r
Res Parcel 2 bldg 4	+	RP2B4		0	0.1	29	r
Res Parcel 2 bldg 5	+	RP2B5		0	0.1	29	r
Res Parcel 2 bldg 6	+	RP2B6		0	0.1	29	r
Res Parcel 2 bldg 7	+	RP2B7		0	0.1	29	r
Res Parcel 2 bldg 8	+	RP2B8		0	0.1	29	r
Res Parcel 2 bldg 9	+	RP2B9		0	0.1	29	r
Res Parcel 2 bldg 10	+	RP2B10		0	0.1	29	r
Res Parcel 2 bldg 15	+	RP2B15		0	0.1	29	r
Town Square stage	+	TSSTG		0	0.1	5	r
Res Parcel 5 east	+	RP5E		0	0.1	54	r
Pad3	+	Pad3		0	0.1	20	r
Pad4		Pad4		0	0.1	20	r
Pad5		Pad5		0	0.1	20	r

Appendix E

Selected References:

Screening Noise Analysis with Preliminary Building Project Information

Air-cooled chiller screening noise analysis with preliminary building project information

Screening Noise Analysis with Preliminary Building Project Information

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ABSTRACT

Long-term program-level planning of academic, commercial, and institutional campus development often requires the assessment of potential noise impacts to on-campus and off-campus sensitive receptors due to anticipated sequential or even concurrent capital improvement projects that may change in design, function, and location over the course of the planning timeframe. Unfortunately, individual project details typically needed for robust and accurate acoustical and vibration propagation analysis are usually lacking at this early planning stage, and can thus confound or delay valuable assessment demanded by agencies responsible for program and project permitting. Thus, this paper presents proposed techniques to derive reasonable preliminary estimates of building project stationary noise emission levels from sparse but available data that may seem unrelated to noise or vibration such as gross square footage, expected occupancy, and land use or function. Results from these predictions can also be used to support or refine established buffer distances between noise sources and nearby sensitive receptors, which can help planners (who are often tasked with ambitious infill or growth goals) better fit projects into the complicated campus development puzzles they face.

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1 INTRODUCTION

Large university campuses and medical institutions, as well as corporations with long-term capital improvement plans, and growing municipalities, struggle with the challenge of developing and upgrading real estate to align with forecasted growth objectives. For example, a university may have fixed geographic boundaries, but seek to increase student enrollment and corresponding housing capacity by substantial percentages over a time period that may exceed fifteen years. Planning such growth over the long term often requires coarse, top-line assessment of available space and how such space is utilized. At this programmatic level of study and resulting planning of capital expenditures, new and renovated buildings are proposed and discussed at a level of detail that enables conceptual goal setting and determination. By way of illustration, a major medical organization may decide that a new children's hospital (and connected parking structure and physical plant) needs to replace an aging administrative office building on its existing campus.

In such planning exercises, which are then documented as long-range development or capital improvement plans, as one would reasonably expect the lexicon is usually limited to cost estimates, gross square feet (GSF) quantities, facility or land use purpose or function, and approximate on-campus location. When implementation of such careful planning adheres to the set objectives and development timelines, the built environment transforms by introducing new and renovated occupied structures to meet on-campus growth and related forecasted needs.

The outdoor environment also changes as an outcome of this transformation, since implemented development introduces new and/or different stationary noise sources that contribute to the ambient on-campus sound level. Additionally, such growth—especially infill—often introduces new noise-sensitive receptors (NSR) to the campus environment and introduces new sources of significant noise in proximity to pre-existing on-campus NSR. Many jurisdictions recognize this potential for environmental consequences, and therefore require that predictive assessments of environmental impact be performed as part of the planning process. California, for instance, expects that such program-level environmental impact reports (EIR) are prepared and submitted for public review and comment… even if the details of individual future building projects are murky at best.

So how does an acoustician make and report reasonable, quantified assessments of noise (and vibration) impact to on-campus and off-campus NSR at this programmatic EIR level when little is known about the locations and features of new and renovated building projects meant to "tier" under the long term plan? Often, due to a perceived lack of input data, a detailed predictive analysis is deferred and thus prescribed as a task to be performed for the environmental assessment of each project that would tier under the long-range plan—presumably when more design information about a specific building is available. However, even for such a program-level plan for a community or campus-wide development in the State of California, Section 15151 of the California Code of Regulations (CCR) provides the following guidance: "an EIR should be prepared with a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences."[1]

As a result, one usually finds in a program-level EIR only qualitative or coarsely quantitative noise emission analyses to broadly assess where, and under what conditions, mitigation may be needed to address predicted noise impacts or the potential for such impacts. For example, the following sentence described stationary noise sources in a long-range development plan EIR for a major urban campus of a state university: "new major mechanical

HVAC equipment located on the ground or on rooftops of new buildings have the potential to generate noise levels which average 69 to 73 dBA CNEL at 50 feet when equipment is operating constantly for 24 hours."[2] To a layperson, this sort of statement may seem adequate for quantifying this category of stationary noise sources, and thereby help comply with the aforementioned guidance on environmental assessment provision to decision-makers.

But to an acoustician, and in the opinion of this author, this sample statement may not accurately represent HVAC noise from what could be a wide variety of building projects. Further, a scan of the noise technical report that supported this EIR noise chapter and its "69 to 73 dBA CNEL at 50 feet" assertion found no additional analytic detail.[3] In other words, on what basis was this dBA range predicted? In an effort to answer this specific question, and in a larger context aid non-acousticians, such as the planners responsible for preparing and submitting such EIR documents, the following presents proposed techniques to derive reasonable preliminary estimates of building HVAC noise emission levels from scarce planning-level data that are unrelated to noise or vibration. Proper application of these tools can then help planners and decision-makers identify potential noise impacts or needs for acoustical upgrading earlier in the campus/community planning process, resulting in expedited or more accurate assessments that will lead to more environmentally-compatible campus transformations and likely more efficient usage of capital investment for their long-range development.

2 METHODOLOGY

The aggregate outdoor noise level from operating HVAC systems on a new or renovated building depends on a number of factors that include the size or capacity of the structure, and its expected purpose or usage. For example, two buildings may share the same GSF of potentially usable space, but one designed for healthcare (including bedding for patients) is likely to require substantially greater air-conditioning and ventilation loads than one intended to be an office occupied primarily during business hours. Other factors include the method for providing cold water that air handling units (AHU) will use to cool supply airflows into a building interior: is it chilled water from a remote refrigeration plant, or local air-cooled condensers connected to direct-expansion refrigeration systems? Regardless of which type of cooling may be employed, and how well they may be acoustically insulated, a building has to be ventilated, which means some quantity of fans will be involved.

Using applicable American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards as adopted by industry, such as Standard 62-2012 "Ventilation for Acceptable Indoor Air Quality"[4], one can coarsely assume an average building occupancy rate based on its expected purpose and GSP, then estimate a minimally required outside air quantity (e.g., in cubic feet per minute [CFM]) that can be used to size rooftop AHU and their inherent noise-producing fans. Noise from these fans can then be estimated, resulting in reference sound levels at a standard distance that may be used to calculate propagated sound levels at NSR and then directly compared with applicable criteria to assess potential noise impact requiring mitigation measures. This process can be described as sequential steps per the following subsections.

2.1 Determine the Airflow

Table 1 presents a list of occupied building functions and their corresponding minimum ventilation requirements. While these values may not reflect airflow rates attributed to recirculating building air (i.e., applying heating or cooling to control interior temperatures), they do show how much air a building needs to breathe in and out for its occupants.

Table 1 – Ventilation Rates for Acceptable Indoor Air Quality.

Space	Outdoor Air Required (cubic feet per minute [CFM] per person)	Outdoor Air Required (cubic meters per second[m^3/s] per person)	Occupancy (People per 1,000 square feet [SF])	Occupancy (People per 1,000 square meters [m^2])	CFM per 1,000 SF	m^3/s per 1,000 m^2
Auditorium	5	0.0023	150	1,614	750	3.7116
Ballroom	20	0.0094	100	1,076	2,000	10.1129
Classroom	10	0.0047	25	269	250	1.2641
Conference Room	5	0.0023	50	538	250	1.2372
Dormitory Sleeping Room	5	0.0023	20	215	100	0.4949
Hospital Operating Room*	30	0.0142	20	215	600	3.0554
Hospital Patient Room	25	0.0118	10	108	250	1.2695
Laboratory	20	0.0094	30	323	600	3.0339
Library	5	0.0023	20	215	100	0.4949
Medical Procedure Room*	15	0.0071	20	215	300	1.5277
Office	5	0.0023	5	54	25	0.1237
Restaurant Dining Area	7.5	0.0035	70	753	525	2.6358
Retail	7.5	0.0035	15	161	113	0.5648
Sporting Spectator Area	7.5	0.0035	150	1,614	1,125	5.6482
Theater	10	0.0047	150	1,614	1,500	7.5847

* from ASHRAE Standard 62-1989, others from Standard 62.1-2012

Other facility types not on the list in Table 1, such as a parking garage, still have minimum airflow rates. For parking garages, mechanical ventilation must be provided at a minimum rate of 0.75 CFM per square foot (0.0038 m/s) as specified by the International Mechanical Code (IMC) and adopted by industry (INTEC Controls 2015).[6] The reader may be familiar with other guidance or applicable code requirements for determining HVAC or industrial exhaust minimum airflow rate on an unlisted building project type or application that would yield a comparable CFM per 1,000 SF value or its metric equivalent.

With the building GSF known, one needs only to multiply the value by the CFM per 1,000 SF quantity to arrive at the minimum needed air flow rate in CFM. Since many buildings are typically mixed-use in nature, one can either calculate the minimum CFM per floor, and then do a sum; or, one could conservatively identify the function with the highest required CFM per 1,000 SF rate and apply it to the entire GSF of the building.

2.2 Determine the Fan Type and Pressure

In general, one can assume that the majority of rooftop and interior AHU utilize backward-curved, airfoil-bladed plenum fans (a.k.a., “plug fans”). When used for outdoor air (i.e., “make-up air unit”) supply, the minimum external static pressure can typically range from 500 Pascals (2 inches water gauge [iwg]) to 1,500 Pascals (6 iwg), depending on how much flow resistance (e.g., ductwork, filters, heat transfer coil fins, dampers, sound traps, etc.) represents the system load on the installed fans.

For parking garages, or other building applications designed primarily to exhaust air, tubeaxial fans or propeller-bladed units may be more commonly applied, as they are typically more efficient at moving large quantities of air volume at lower pressure.

2.3 Calculate the Sound Pressure

Of course, not all fans are the same, with sound power levels (L_w) varying by type as presented in known industry texts such as Engineering Noise Control.[5]

$$L_{p\ 1kHz}, \text{plenum fan} = 33 + 10 * LOG(Q) + 20 * LOG(P) + 33 - 48 - 8 \qquad (1)$$

$$L_{p\ 1kHz}, \text{tubeaxial fan} = 44 + 10 * LOG(Q) + 20 * LOG(P) + 33 - 48 - 8 \qquad (2)$$

$$L_{p\ 1kHz}, \text{propeller fan} = 55 + 10 * LOG(Q) + 20 * LOG(P) + 33 - 48 - 8 \qquad (3)$$

In these sound pressure level (L_p) expressions for (1), (2), and (3), Q is the fan airflow rate in cubic meters per second (m^3/s), and P is fan total static pressure in Pascals. The final constant has been added to convert the calculated L_w into L_p at a distance of one meter (assuming hemispherical propagation). The first constant in each of these equations is based on the indicated fan type, for sound at 1,000 Hz (1 kHz). For purposes of this analysis and its intended usage to support A-weighted environmental noise assessment of building HVAC systems, it is assumed that fan sound at 1 kHz is representative of the overall A-weighted sound level.

After applying Q and P to the expression appropriate for the fan type under consideration, one now has a reference L_p value on which further adjustments might be made to better represent the building being studied and the estimated fan noise level at the NSR of concern. Aside from sound attenuation due to geometric divergence, one such adjustment could be sound attenuation due to installation of the AHU behind a solid and sufficiently tall roof parapet that would occlude direct sound paths between the fans and the NSR at some distance to the building.

3 FACILITY EXAMPLES

The following subsections provide the reader examples on how limited knowledge of a building project and application of equations (1), (2), or (3) can yield useful preliminary estimates of HVAC fan noise levels that can inform decision-makers during the campus planning process.

3.1 Mixed-Use Learning Laboratory

This first case supposes that a university wants to erect a new engineering building to house classrooms and student laboratories. The GSF is expected to be 200,000 square feet (18,587 m^2), spread evenly over five floors, and topped by rooftop HVAC systems. The proportion of classroom space to laboratory space is likely to be fifty-fifty. Therefore, usage of Table 1 enables the following calculations of minimum ventilation as follows:

$$Q_{classrooms} = \frac{200,000}{1000} * 0.5 * 250 = 200 * 0.5 * 250 = 25,000 \text{ CFM} \qquad (4)$$

$$\text{Q}_{\text{laboratories}} = \frac{200{,}000}{1000} * 0.5 * 600 = 200 * 0.5 * 600 = 60{,}000 \text{ CFM} \quad (5)$$

$$\text{Q}_{\text{combined}} = \text{Q}_{\text{classrooms}} + \text{Q}_{\text{laboratories}} = 25{,}000 + 60{,}000 = 85{,}000 \text{ CFM } (40.12 \text{ m}^3/\text{s}) \quad (6)$$

Equations (4), (5), and (6) illustrate that for this example, the minimum ventilation for the entire building is to be considered a combination of what is expected to be needed for the sum of occupied classrooms and laboratories, respectively. Additional assumptions to be made are as follows:

- the anticipated fan total static pressure will be an average of 1,250 Pascals (about 5 iwg);
- the fans will be plenum type, contained within AHU cabinets having large outside air openings on the plena containing the single or multiple fans (each having less than one meter wheel diameter) per AHU;
- the AHUs are to be on the building rooftop, behind a visual screen of solid panels that should occlude direct sound paths and thus offer 5 dBA of barrier-type noise reduction;
- the nearest NSR of concern (the façade of an existing neighboring dormitory on campus) is 250 feet (76.2 m) away; and,
- for purposes of this analysis, the AHUs will be treated as a common point-type source on the rooftop of the proposed new building (i.e., simplifying the consideration of distance from multiple AHUs to be an average and thus requiring just one source-to-receiver path calculation).

Using the above input data and assumptions, the following expressions demonstrate that the L_p attributed to HVAC fan noise from this proposed new learning laboratory can be estimated at the neighboring NSR. For reader convenience, the minimum ventilation airflow rate ($Q_{combined}$) calculated in equation (6) has already been converted to an m^3/s value.

$$\text{L}_{\text{p 1kHz}}, \text{plenum fan} = 33 + 10 * \text{LOG}(40.1) + 20 * \text{LOG}(1{,}250) + 33 - 48 - 8 \quad (7)$$

$$\text{L}_{\text{p 1kHz}}, \text{plenum fan} = 33 + 16 + 62 + 33 - 48 - 8 = 88 \text{ dBA at 1 meter} \quad (8)$$

$$\text{L}_{\text{p 1kHz}}, \text{at NSR} = 88 - 20 * \text{LOG}\left(\frac{250}{3.28}\right) - 5 = 88 - 38 - 5 = 45 \text{ dBA} \quad (9)$$

If this estimated L_p of 45 dBA at the NSR was well below the local noise ordinance limit, then the campus development planner would have reasonable confidence that HVAC noise from the future next-door building would be compliant and unlikely to cause an impactful environmental effect.

3.2 Parking Garage

This second case conjectures that, as part of maximizing infill potential within its limited property boundary, a major health provider wants to build a multi-level underground parking garage beneath an existing courtyard. Like the previous case described under Section 3.1, the GSF is expected to be 200,000 square feet (18,587 m^2). Therefore, application of the IMC requirement of 0.75 CFM per GSF yields the following estimate of minimum ventilation airflow rate:

$$Q_{\text{parking garage}} = 200{,}000 * 0.75 = 150{,}000 \text{ CFM } (70.79 \text{ m}^3/\text{s}) \tag{10}$$

Additional assumptions to be made are as follows:

- the anticipated fan total static pressure will be an average of 750 Pascals (about 3 iwg);
- the fans will be tubeaxial type, ducted to inlet and outlet ports on the surface;
- conservatively, this calculation will assume no added sound attenuation;
- the nearest NSR of concern (the façade of an existing neighboring dormitory on campus) is 100 feet (30.5 m) away; and,
- for purposes of this analysis, the multiple exhaust fan intakes and discharges will be treated as a common point-type source on the ground above the planned garage beneath the courtyard space (i.e., simplifying the consideration of distance from multiple fans to be an average and thus requiring just one source-to-receiver path calculation).

Using the above input data and assumptions, the following expressions demonstrate that the L_p attributed to exhaust fan noise from this proposed new subterranean garage can be estimated at the neighboring NSR. For reader convenience, the minimum ventilation airflow rate (Q) calculated in equation (10) has already been converted to an m^3/s value.

$$L_{p\ 1kHz}, \text{tubeaxial fan} = 44 + 10 * \text{LOG}(70.8) + 20 * \text{LOG}(750) + 33 - 48 - 8 \tag{11}$$

$$L_{p\ 1kHz}, \text{tubeaxial fan} = 44 + 18.5 + 57.5 + 33 - 48 - 8 = 97 \text{ dBA at 1 meter} \tag{12}$$

$$L_{p\ 1kHz}, \text{at NSR} = 97 - 20 * \text{LOG}\left(\frac{100}{3.28}\right) - 0 = 97 - 30 = 67 \text{ dBA} \tag{13}$$

If this estimated L_p of 67 dBA at the NSR was higher than the appropriate outdoor noise level standard, then the hospital's planner would realize that these exhaust fans would probably require some noise control or sound-abating treatment in order to avoid adverse environmental effects.

3.3 Utility Plant Cooling Tower

For the third and last case, consider that a major corporation wants to build a new "innovation center", which will have its own new utility plant and include a large, mechanical draft cooling tower featuring propeller-type fans for moving airflow. Hence, not only will the HVAC system noise need to be evaluated in a manner similar to the example described in Section 3.1 (and will thus not be considered here), in this case the new utility plant also deserves attention. Estimating the minimum airflow for such a mechanical system may be trickier at the planning stage of a project, and may require consultation of the mechanical engineer responsible for making program-level estimates of cooling loads that would help define the needed fan airflow capacities. For purposes of illustration, this case will assume that the cooling tower(s) will convey a total airflow of 300,000 CFM (141.58 m^3/s). Additional assumptions to be made are as follows:

- the anticipated fan total static pressure will be an average of 250 Pascals (about 1 iwg);
- the fans will be propeller-type, and exposed to the outdoors (hence, this calculation will assume no added sound attenuation);
- the nearest NSR of concern (the façade of an existing neighboring dormitory on campus) is 500 feet (152.4 m) away; and,
- for purposes of this analysis, the single or combined fan upblast will be treated as a common point-type source.

Using the above input data and assumptions, the following expressions demonstrate that the L_p attributed to cooling tower fan noise can be estimated at the neighboring NSR. For reader convenience, the assumed minimum ventilation airflow rate (Q) has already been converted to an m^3/s value.

$$L_{p\ 1kHz}, \text{propeller fan} = 55 + 10 * \text{LOG}(141.6) + 20 * \text{LOG}(250) + 33 - 48 - 8 \qquad (14)$$

$$L_{p\ 1kHz}, \text{propeller fan} = 55 + 21.5 + 48 + 33 - 48 - 8 = 101.5 \text{ dBA at 1 meter} \qquad (15)$$

$$L_{p\ 1kHz}, \text{at NSR} = 101.5 - 20 * \text{LOG}\left(\frac{500}{3.28}\right) - 0 = 101.5 - 44 = 57.5 \text{ dBA} \qquad (16)$$

Whether or not the estimated L_p of 57.5 dBA at the NSR is "okay" would depend on comparing it with the appropriate outdoor noise level standards for the local jurisdiction, and what may be the company's own specifications—if any.

4 CONCLUSIONS

The relatively straightforward mathematical techniques presented in this paper show that reasonable estimates of building HVAC fan noise can be predicted for purposes of making preliminary assessments of adverse noise effects to potential NSR in the vicinity of anticipated long-term campus infrastructure development. While these methods should not be considered substitutes for conducting project-specific noise analyses of new or renovated individual facility systems, nor are they meant to serve as detailed design of mechanical systems and corresponding noise control engineering for such proposed new or renovated facilities, they at least furnish a documentable mathematical basis, and the underlying input parameters and assumptions, for preliminary analyses to support program-level EIR documents. Application of these proposed noise estimation techniques can also provide valuable "heads-up" information to campus planners and decision-makers, so that building projects or their major mechanical/HVAC systems likely needing substantial noise control or sound abatement are discovered at the programmatic design stage, when funding allocation and planning decisions are far easier to make than during detailed project design or implementation.

5 ACKNOWLEDGEMENTS

The author acknowledges his colleagues at AECOM for involving him in several program-level environmental noise assessments, which inspired the development of the HVAC and fan noise technique described herein.

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Air-cooled chiller screening noise analysis with preliminary building project information

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ABSTRACT

For Inter-noise 2018, the author submitted a paper proposing techniques to derive reasonable preliminary estimates of building project stationary noise emission levels from sparse but available data that may seem unrelated to noise or vibration such as gross square footage (GSF), expected occupancy, and land use or function. Results from these predictions would be used to support or refine established buffer distances between exposed outdoor heating, ventilating, and air-conditioning (HVAC) system noise sources and nearby noise-sensitive receptors, helping planners tasked with ambitious infill or growth goals better fit building projects into complicated campus development puzzles. This paper provides supplemental guidance by linking the same preliminary building project GSF, occupancy, and function information to estimates of cooling load (expressed as refrigeration tonnage) and thus an additional HVAC consideration not discussed in the author's previous study. When such refrigeration relies upon air-cooled condensers installed outdoors on building rooftops or at grade, substantial noise sources are introduced to the environment. Thus, this new study shares data and methodology to help expand the value and utility of the previous work and potentially provide more comprehensive building HVAC noise estimates for use by building developers and planners.

1. INTRODUCTION

Long-term planning of real estate development for commercial, academic, medical, and government entities often requires consideration of potential environmental noise effects to onsite and offsite receptors resulting from implementation of site-specific capital improvement projects. At such a programmatic level of noise study, available information on individual proposed new building construction or facility renovation is usually limited to coarse cost estimates, GSF quantities, facility or land use purpose or function, and approximate location within the boundaries of the understood study area. In other words, detailed design of site-specific projects may be incomplete and not provide an acoustician convenient inputs for outdoor sound propagation modeling, such as schedules of anticipated mechanical equipment (e.g., HVAC systems) that either include manufacturer-supplied sound level data or other engineering information (power consumption, air/fluid flow rates and pressures, etc.) from which estimated reference sound levels may be calculated. The lack of such customary detailed input parameters for the predictive evaluation of noise emission from operating building HVAC systems makes it challenging to quantitatively assess potential effects at onsite and offsite receptors.

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To help surmount this environmental noise assessment difficulty due to input data scarcity, in 2018 the author described a set of techniques to quantify estimates of noise emission levels from outdoor-exposed HVAC fans associated with an occupied new building using only GSF and expected interior space usage or function as project-specific input parameters.[1] While these methods should not be considered substitutes for conducting project-specific noise analyses of new or renovated individual facility systems when detailed design information is available, they do provide a documentable mathematical basis to support program-level noise assessments that can inform planners and decision-makers. For instance, findings from such analyses can help identify—at an early stage in planning when funding allocations are easier to make or alter—what proposed building projects may feature outdoor fans likely needing substantial noise control or sound abatement.

In like manner, the techniques proposed herein provide supplemental guidance by linking the same preliminary building project GSF, occupancy, and interior function information to estimates of expected cooling load ("CL", expressed as refrigeration tonnage or kilowatts) and thus an additional building HVAC consideration not discussed in the author's previous study, which focused on fans delivering building ventilation or the fan components of HVAC equipment such as cooling towers. When building CL for interior occupant comfort is expected to be delivered not by chilled water piped from a remote central utility plant but from air-cooled condensers or chillers (ACC) installed locally outdoors on either the studied building rooftop or at grade, substantial noise sources are introduced to the outdoor sound environment. Thus, estimation of both HVAC fan noise and ACC noise using program-level building information as inputs should help provide a more comprehensive and conservative preliminary estimate of building-specific aggregate HVAC operational noise emission that can better inform planners and decision-makers with respect to potential noise control and sound abatement needs. The proceeding methodology and calculation examples focus on this ACC-related supplement, and presumes that one evaluating building HVAC noise from air handling unit, exhaust, or evaporative cooling tower fans would refer to the earlier guidance described in the author's 2018 paper.

2. METHODOLOGY

The aggregate outdoor noise level from operating HVAC systems attributed to a new or renovated building depends on a number of factors that include the size or capacity of the structure, and its expected purpose or usage. For example, two buildings may share the same GSF of potentially usable space, but one designed to enclose product manufacturing (and thus heat-generating machinery, among other heating loads requiring cooling or ventilation) is likely to require substantially greater air-conditioning and ventilation loads than one intended for residential occupancy. The former of these two demands of the building's HVAC system requires either chilled water from a remote refrigeration plant, or local ACC featuring direct-expansion (DX) refrigeration systems. For purposes of this presentation of equipment noise estimation technique, it is assumed the studied building relies on the latter method for a supply of cooling capacity that may be expressed in a number of metrics, such as kilowatts or refrigeration tonnage.

Estimation techniques for the total refrigeration need of a building have long been established and updated by organizations such as the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and their participating members, which traditionally have included manufacturers of HVAC equipment. These methods consider a variety of CL contributors and can be calculated at a very granular level of detail, which helps facilitate equipment selection and system layout for a mechanical designer. But because such detailed input parameters are unlikely to be available at the planning stages of a long-term development plan involving several proposed site-specific capital improvements, the following sequential steps instead utilize industry-accepted "cooling load check figures" to approximate building cooling demand, which then determines a quantity of ACC units having known sound power (L_w) or sound pressure (L_p) levels that in aggregate represent building operation noise emission due to its meeting interior cooling needs. These CL "check figures" appear to have been introduced by Carrier Corporation as early as 1966,[2] and have been referenced and reproduced by a variety of sources. For instance, the 2nd edition (1999) of the Loren Cook Company "Engineering Cookbook" featured these data.

2.1. Determine the Cooling Load

Table 1 presents a list of sample occupied building usage classifications and their corresponding CL check figures on the basis of estimated refrigeration need—on either a square-foot per ton or square-meter per kilowatt (kW) basis. Cooling load values presented are "low", "average", and "high" to show the anticipated range for the listed building type, and thus provide the reader some discretion as to what selected value (or a value within the high and low bounds) may be considered appropriate for the particular building under study.

Table 1: Cooling Load (CL) Check Figures by Building Usage or Application.[2]

	Refrigeration (square feet per ton)			**Refrigeration (square meters per kW)**		
Building Classification	***Low***	***Average***	***High***	***Low***	***Average***	***High***
Apartment, high-rise	450	400	350	11.9	10.6	9.3
Auditorium, Church, Theater	400	250	90	10.6	6.6	2.4
Educational Facility	240	185	150	6.3	4.9	4.0
Factory (assembly area)	240	150	90	6.3	4.0	2.4
Factory (light manufacturing)	200	150	100	5.3	4.0	2.6
Factory (heavy manufacturing)	100	80	60	2.6	2.1	1.6
Hospital (patient rooms)	275	220	165	7.3	5.8	4.4
Hospital (public areas)	175	140	110	4.6	3.7	2.9
Hotel, Motel, Dormitory	350	300	250	9.3	7.9	6.6
Library or Museum	340	280	200	9.0	7.4	5.3
Office Building	360	280	190	9.5	7.4	5.0
Residential (large)	600	500	380	15.9	13.2	10.0
Residential (medium)	700	550	400	18.5	14.5	10.6
Retail - Department Store (basement floor)	340	285	225	9.0	7.5	5.9
Retail - Department Store (main floor)	350	285	225	9.3	6.5	4.0
Retail - Department Store (upper floor)	400	340	280	10.6	9.0	7.4

With the building GSF known, one needs only to multiply its value by the appropriate quantity in Table 1 to arrive at the estimated cooling load for the entire building. Since many buildings typically contain spaces representing a variety of different functions, if GSF for each of these interior uses is known then one could calculate individual CL and arithmetically sum them for the building as a whole.

2.2. Estimate Aggregate ACC Unit Sound Emission

Several manufacturers offer ACC models in sizes ranging from smaller units suitable for individual single-family residences to commercial packaged systems composed of connected modular units. Hence, while Section 2.1 provides the reader a way to estimate the CL for a studied building project, estimating the aggregate noise emission from rooftop (or otherwise outdoor-exposed, such as at grade level) ACC depends on the expected design approach for quantity of equipment and their distribution across a rooftop. In general, this could be characterized as two ends of a design layout spectrum:

- The building will feature many low-capacity individual ACC units, allowing for variable operation and control by interior zone or occupied room; or,
- The building will feature a minimal number of large ACC units, as the cooling need is for a corresponding large common interior volume or other requirement.

The approach of the first bullet would tend to be characteristic of a multi-family residential building containing dozens of individual dwelling units featuring interior comfort settings controlled by the occupants. Usage of fewer but much larger ACC units would tend to reflect commercial applications such as warehouses or distribution centers. Actual design, selection, and layout of ACC equipment will likely reflect emphasis towards one of these approaches, based on acoustical and non-acoustical considerations.

For purposes of illustration, L_W values from sample ACC units are presented in Table 2, but by no means are considered exhaustive or intended to discourage the reader to seek and use sound data associated with ACC units from a different trusted manufacturer or supplier.

Table 2: Sample Air-Cooled Chiller Sound Power Data.[3,4,5]

	Equipment Refrigeration Capacity		**Overall A-weighted Sound Power (L_W) decibels (dB) by Equipment Load**			
Manufacturer and Model	***Tons***	***kW***	***100%***	***75%***	***50%***	***25%***
Daikin Trailblazer (AGZ-E), *without* sound insulation	30	106	88	87	85	84
Daikin AGZ-E, *without* sound insulation	60	211	91	90	88	87
Daikin AGZ-E, *without* sound insulation	120	422	95	94	92	91
Daikin AGZ-E, *without* sound insulation	241	848	100	99	97	96
Daikin AGZ-E, *with* sound insulation	30	106	85	84	82	81
Daikin AGZ-E, *with* sound insulation	60	211	87	86	84	83
Daikin AGZ-E, *with* sound insulation	120	422	89	88	86	85
Daikin AGZ-E, *with* sound insulation	241	848	94	93	91	90

Trane CGA 040	4	14.6	72	n/a	n/a	n/a
Trane CGA 080	8	29	74	n/a	n/a	n/a
Trane Flex 155Z	16	55.1	79	n/a	n/a	n/a
Trane Flex 1110Z	30	106	86	n/a	n/a	n/a
Bryant BH16 018	1.5	5.4	68	n/a	n/a	n/a
Bryant BH16 024	2	7	72	n/a	n/a	n/a
Bryant BH16 018 (with sound blanket)	1.5	5.4	67	n/a	n/a	n/a
Bryant BH16 024 (with sound blanket)	2	7	71	n/a	n/a	n/a

The reader may seek to optimize ACC selection from the list of samples in Table 2, or from other discoverable ACC equipment sound data, to arrive at a quietest total L_w value that will deliver the anticipated CL for the studied building. For example, the L_w from one Daikin AGZ-E rated for 241 tons (848 kW) of refrigeration featuring sound insulation would be 94 dBA, while the total sound power from combined operation of one-hundred-twenty (120) 2-ton (7 kw) rated Bryant BH16-024 models would be 93 dBA—just a decibel difference favoring the set of smaller ACC units. And if the studied building needed only 30 tons (106 kW) of refrigeration, the L_w value difference between a single Trane Flex 1110Z exhibiting 86 dBA and fifteen (15) of the Bryant BH16-024 model units operating at a combined L_w of 84 is only 2 dB.

With L_w values potentially being so comparable between ACC layout alternatives, the more important consideration may be the location of the ACC units on the rooftop of the studied building, since the aggregate L_p level would be assessed at the property line or an offsite sensitive receptor position. Figure 1 shows a hypothetical application of thirty (30) 8-ton (29 kW) units (CGA 080 model from Table 2) evenly distributed across a warehouse building rooftop.

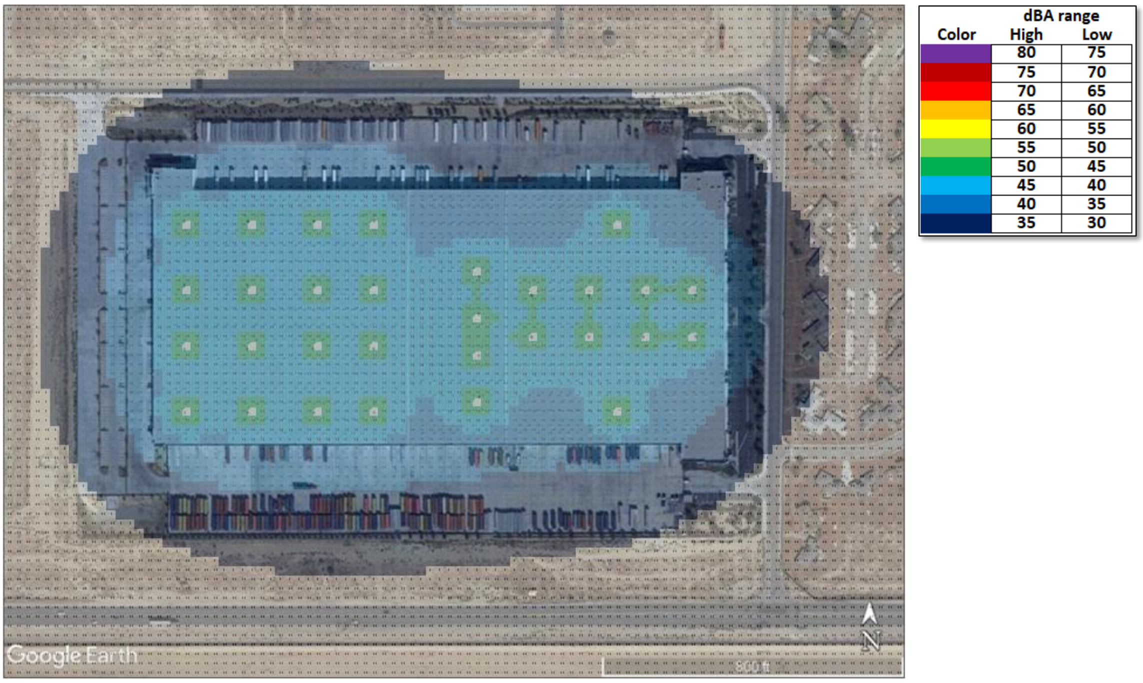
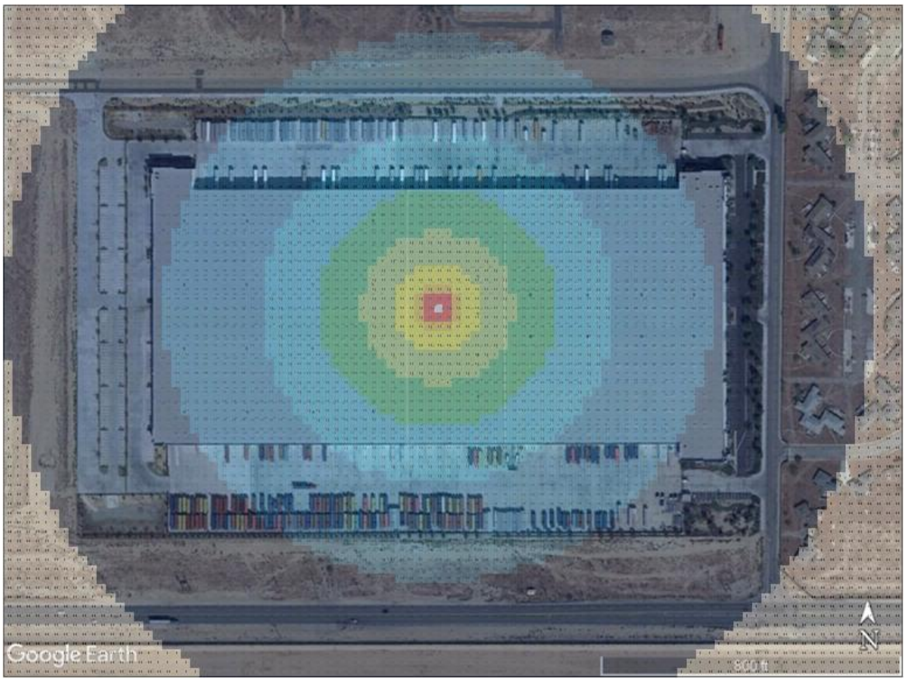


Figure 1: Aggregate operating sound emission from thirty (30) 8-ton (29 kW) air-cooled chillers (ACC) on a hypothetical warehouse rooftop.

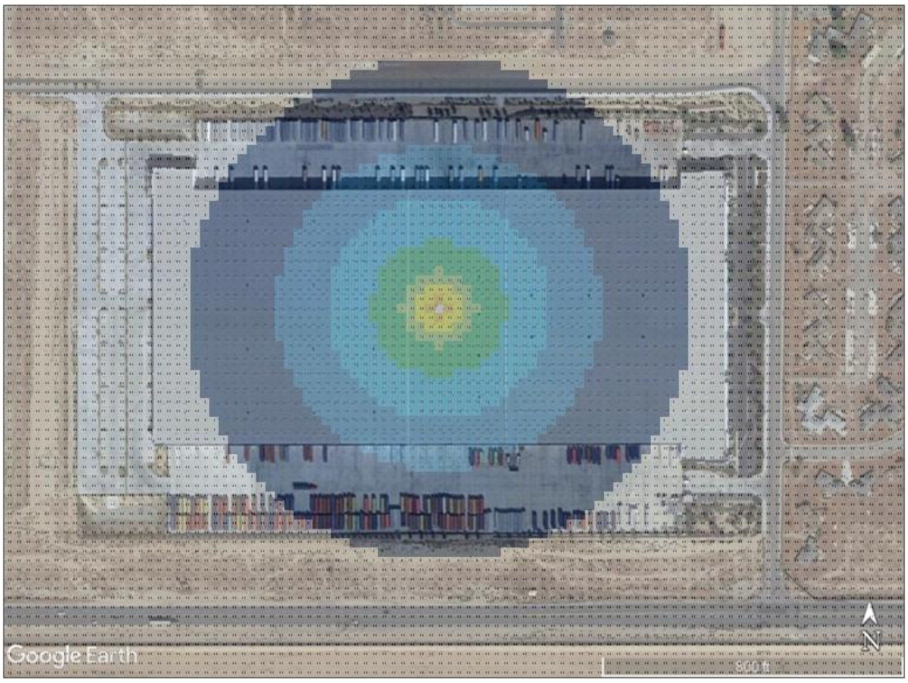
In contrast, Figure 2 locates a single 241-ton (848 kw) capacity ACC (the AGZ-E with sound insulation) at the approximate geographic center of the same rooftop.



Color	dBA range High	Low
	80	75
	75	70
	70	65
	65	60
	60	55
	55	50
	50	45
	45	40
	40	35
	35	30

Figure 2: Aggregate operating sound emission from a single 240-ton (844 kW) air-cooled chiller (ACC) on a hypothetical warehouse rooftop.

The aggregate L_w of the thirty 8-ton (29 kW) ACC units shown in Figure 1 is 6 dB less than the L_w of the single 241-ton (848 kW) ACC shown in Figure 2, and helps explain its lower predicted L_p at various distances from the rooftop perimeter. However, if the single ACC application were to feature 6 dB of additional sound abatement (and thus render its effective L_w equivalent to the L_w combination of Figure 1), then Figure 3 illustrates that its predicted L_p levels beyond the roof perimeter would appear to be less than those shown in Figure 1.



Color	dBA range High	Low
	80	75
	75	70
	70	65
	65	60
	60	55
	55	50
	50	45
	45	40
	40	35
	35	30

Figure 3: Aggregate operating sound emission from a single 241-ton (848 kW) air-cooled chiller (ACC) on a hypothetical warehouse rooftop, having 6 dB less sound power (L_w) than that of the source in Figure 2 and equivalent to the aggregate L_w of the ACC layout in Figure 1.

In summary, the preceding three figures showing scenarios of outdoor sound propagation for a hypothetical warehouse served by ACC units delivering a total of approximately 240 tons of refrigeration demonstrate that the reader should probably consider at least two ACC layout alternatives when estimating aggregate noise emission with the technique described herein. If the reader has no information to suggest what ACC rooftop or on-grade layout would be appropriate for a studied building project, then a conservative approach would be to generate estimates for multiple ACC layouts (and corresponding ACC unit sizing) and inform planners of the one yielding the highest expected noise exposure levels at the sensitive receptor(s) of interest.

The total L_w values attributed to ACC units gained from these techniques can be used to perform a variety of sound propagation predictions, such as the two-dimensional estimated L_p contour planes in the three figures or simple source-to-receptor single-path calculations, that can help evaluate noise exposure levels at offsite receptors and determine whether or not applicable L_p thresholds would be exceeded—or otherwise result in determination of adverse effect.

3. FACILITY EXAMPLES

The following subsections provide the reader examples on how limited knowledge of a building project and application of the preceding guidance can yield useful preliminary estimates of HVAC cooling equipment noise levels that can help inform decision-makers during long-range capital improvement planning activities.

3.1. Warehousing/Distribution Center

The hypothetical warehouse used as an example application for aggregate ACC noise emission in the preceding Section 2.2 was presumed to require a CL of 240 tons (844 kW) of refrigeration. Working backwards using the data from Table 1, and if we assume such a warehouse would resemble a "Factory (assembly area)" building classification facility, this means the GSF of the warehouse could range from 21,600 square feet (2,008 square meters) to 57,600 square feet (5,254 square meters) using the "low" and "high" values that relate building space to cooling load.

3.2. Mixed-Use Learning Laboratory

To show how data from Tables 1 and 2 can be used to estimate cooling load and consequently aggregate ACC sound power for a building with multiple interior functions, the following expressions show the individual calculations for the same 200,000 GSF ("mixed-use learning laboratory" facility example appearing in the aforementioned 2018 Inter-noise paper from the author.[1] In this example, the building GSF was equally divided between usable interior space for "classrooms" and "laboratories", which for purposes of this illustration with respect to CL will be considered "educational facility" and "factory (light manufacturing)" building classifications from Table 1. This exercise will also assume "average" area-to-CL conversion values from Table 1. (Equations 1, 3, and 5 are expressed in English units, while equations 2, 4, and 6 are comparable expressions in SI units.)

$$CL_{classrooms} = 100{,}000 \text{ GSF} / 185 = 540 \text{ tons of refrigeration} \quad (1)$$

$$CL_{classrooms} = 9{,}295 \text{ square meters} / 4.9 = 1{,}901 \text{ kW of refrigeration} \quad (2)$$

$$CL_{laboratories} = 100{,}000 \text{ GSF} / 150 = 667 \text{ tons of refrigeration} \quad (3)$$

$$CL_{laboratories} = 9{,}295 \text{ square meters} / 4.0 = 2{,}344 \text{ kW of refrigeration} \quad (4)$$

$$CL_{total} = 540 + 667 = 1{,}207 \text{ tons of refrigeration} \quad (5)$$

$$CL_{total} = 1{,}901 + 2{,}344 = 4{,}245 \text{ kW of refrigeration} \quad (6)$$

This total CL estimate for the mixed-use learning laboratory building could be served by five (5) 241-ton (848 kW) Daikin AGZ-E chiller units or any combination of smaller ACCs that, in aggregate, could meet the same cooling demand. (Equations 7 and 9 show samples of each design approach in English units, and equations 8 and 10 show the same samples in SI units.)

$$\text{Total } L_w \text{ from five 240-ton AGZ-E (with sound insulation)} = 94 + 10*LOG(5) = 101 \text{ dBA} \quad (7)$$

$$\text{Total } L_w \text{ from five 844-kW AGZ-E (with sound insulation)} = 94 + 10*LOG(5) = 101 \text{ dBA} \quad (8)$$

$$\text{Total } L_w \text{ from forty 30-ton Flex 1110Z} = 86 + 10*LOG(40) = 102 \text{ dBA} \quad (9)$$

$$\text{Total } L_w \text{ from forty 106-kW Flex 1110Z} = 86 + 10*LOG(40) = 102 \text{ dBA} \quad (10)$$

With the total calculated L_w values being less than a decibel apart, and aside from ACC layout considerations discussed in Section 2.2, these two considered ACC alternatives suggest that 102 dBA would be a conservative estimate for aggregate operating rooftop ACC noise for this building project. This 102 dBA value for L_w can then be used as an input for a sound propagation model, such as the method utilized to generate the images in the figures of the preceding Section 2.2, so as to assess where the L_p at some distance could be compared with an applicable noise limit to determine whether or not the change to the sound environment would be considered an exceedance or otherwise an adverse effect.

4. CONCLUSIONS

The techniques and manufacturer data samples presented in this paper show that reasonable estimates of total sound power level (L_w) from air-cooled chillers (i.e., DX-type chilling plants exposed to the outdoors, as opposed to chiller plants located indoors that are piped to remote outdoor-exposed evaporative cooling towers) can be predicted for purposes of making preliminary assessments of potential adverse effects to noise-sensitive receptors in the vicinity of a new or renovated building projects for which detailed design information is scarce at the preliminary program level of long-term development. Like the author's earlier proposed technique for estimating noise emission levels from a building's HVAC fans (based on minimum ventilation needs),[1] the method described herein should not be considered a substitute for conducting project-specific noise analyses of new or renovated individual facility mechanical systems.

Used appropriately, this method of estimating total building CL and corresponding aggregate ACC L_w enables the reader to estimate a potentially substantial source of building mechanical system noise that the author's previous paper did not discuss, as it assumed chilled water to meet a building's cooling load was either provided remotely (e.g., via central utility plant) or from onsite chillers not exposed to the outdoors. Hence, and from usage of the same scant input information (GSF and building function) as input parameters, the combination of the estimation technique herein for ACC L_w and the author's previous proposed method to estimate sound contribution from ventilation systems (i.e., air-handling units and exhaust fans) allows the reader to generate a more complete and quantitatively conservative estimate of aggregate outdoor sound source emission for a studied building. Application of these proposed noise estimation techniques can thus provide valuable insight to real estate planners, developers or others who may want to be made aware of substantial cost inputs to capital improvement projects that may be implemented as part of a long-range development plan.

5. ACKNOWLEDGEMENTS

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