Noise Technical Report

Santa Clarita Commerce Center Project

MAY 2023

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CBC	California Building Code
CC&DG	City's Community Character & Design Guidelines
CEQA	California Environmental Quality Act
CNEL	community noise equivalent level
dB	decibel
dBA	A-weighted decibels
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
FTA	Federal Transit Administration
HVAC	heating, ventilation and air conditioning
ips	inches per second
Hz	hertz
kHz	kilohertz
L_{eq}	equivalent sound level
L_{dn}	day-night level
L_{max}	maximum sound level during measurement interval
L_{xx}	Percentile-exceeded sound level
LT	Long-term noise measurement location
MM	Mitigation Measure
mPA	micro-Pascals
OPR	California Governor's Office of Planning and Research
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
SPL	sound pressure level
ST	short-term noise measurement location
TNM	Traffic Noise Model

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1 Executive Summary

The purpose of this technical report is to assess the potential noise and vibration impacts associated with implementation of the proposed Santa Clarita Commerce Center Project (Project) in the City of Santa Clarita (City). This assessment utilizes the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), the City and other applicable thresholds of significance.

1.1 Project Summary

The approximately 22.31-gross-acre Project site is located in the western part of the City of Santa Clarita, in the northern portion of Los Angeles County. Locally, the Project site is located at the northeast corner of Railroad Avenue and Oak Ridge Drive, just east of the Metrolink rail line. The Project would include construction of four industrial/warehouse buildings totaling approximately 433,185 square feet and associated improvements including loading docks, tractor-trailers, passenger vehicle parking spaces, stormwater detention basins, and landscape area. A new public street, Springbrook Avenue, would be constructed from Oak Ridge Drive to provide access to each buildings parking and loading areas.

1.2 Summary of Findings

The results of this report are summarized below based on the significance criteria in Section 6 consistent with Appendix G of the CEQA Guidelines.

Table 1. Summary of Impact Determinations

Analysis	Report Section	Significance Determinations	
		Unmitigated	Mitigated
Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards during construction	7.1.1	Less-than-Significant	Not Applicable
Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards during operation	7.1.2	Less-than-Significant	Not Applicable
Generation of excessive groundborne vibration or groundborne noise levels during construction	7.2.1	Less-than-Significant	Not Applicable
Generation of excessive groundborne vibration or groundborne noise levels during operation	7.2.2	Less-than-Significant	Not Applicable
Exposure of people residing or working in the project area to excessive noise levels from a private airstrip or an airport	7.3	No Impact	Not Applicable

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2 Project Background

2.1 Project Location

The approximately 22.31-gross-acre Project site is located in the western part of the City of Santa Clarita, which is located in the northern portion of Los Angeles County (Figure 1). Locally, the Project site is located at the northeast corner of Railroad Avenue and Oak Ridge Drive, just east of the Metrolink rail line.

Regional access to the Project site is provided via I-5, located approximately 2 miles to the west. Local access to the Project is provided via Magic Mountain Parkway, Valencia Boulevard, Railroad Avenue and Wiley Canyon Road.

2.2 Existing Conditions

The Project site is currently undeveloped. Until recently, the Project site was used as a storage yard for recreational vehicles, trucks and shipping containers. There is currently no public roadway access within the site.

2.3 Project Characteristics

The Project would include construction and operation of four warehouse buildings totaling approximately 433,185 square feet of development on an approximately 22.3-acre site. The largest building located in the southeast corner of the site (referred to as "Building 1") would be 262,325 square feet; the southwestern building (referred to as "Building 2") would be 50,712 square feet; the northwestern building (referred to as "Building 3") would be 79,868 square feet; and the northeastern building (also referred to as "Building 4") would be 40,280 square feet. Each building would contain office/mezzanine space that would total approximately 26,000 square feet across the four buildings. Figure 2 provides a conceptual site plan of the proposed Project.

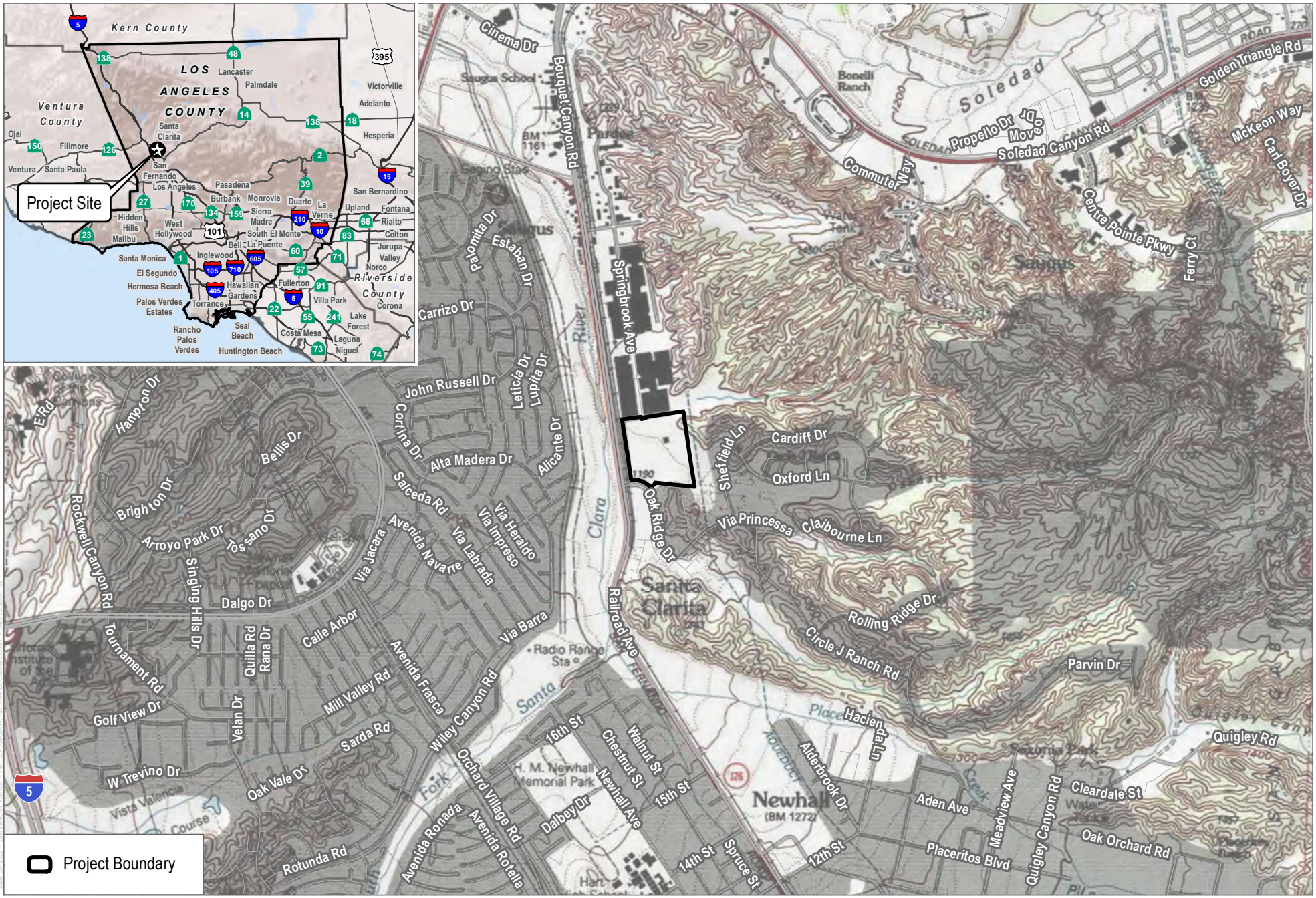
2.3.1 Operational Characteristics

The Project would support a variety of activities associated with the industrial/warehouse building, including the ingress and egress of passenger vehicles and trucks, the loading and unloading of trucks with designated truck courts/loading areas, and the internal and external movement of materials around the Project site via forklifts, pallet jacks, yard hostlers, and similar equipment. In addition, the office space would support general internal office activities related to the industrial/warehouse uses. It is assumed that the buildings would be operational 24 hours per day, seven days per week, with exterior loading and parking areas illuminated at night.

A tenant for the Project has not yet been identified. It is anticipated that the building would support standard warehousing uses. Cold storage, as well as the use of the warehouse to store acutely hazardous and/or toxic materials, is not anticipated.

2.3.2 Building Architecture

The Project's design would feature a contemporary and high-quality design that is consistent with the Newhall architectural style and would incorporate elements from the City's Community Character & Design Guidelines (CC&DG). The proposed building would be primarily constructed with concrete tilt-up panels. The building's exterior would feature varying textures, intrusions, and extrusions to create appropriately a scaled building façade. The building would be painted with a City-approved color palate and would feature accent colors to create visual interest. Building heights would range from 41 feet to 52 feet when measured from the base grade to the top of building parapets.



SOURCE: USGS 7.5-Minute Series Newhall Quadrangle

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0 1,000 2,000 Feet

FIGURE 1

Project Location

Santa Clarita Commerce Center Project

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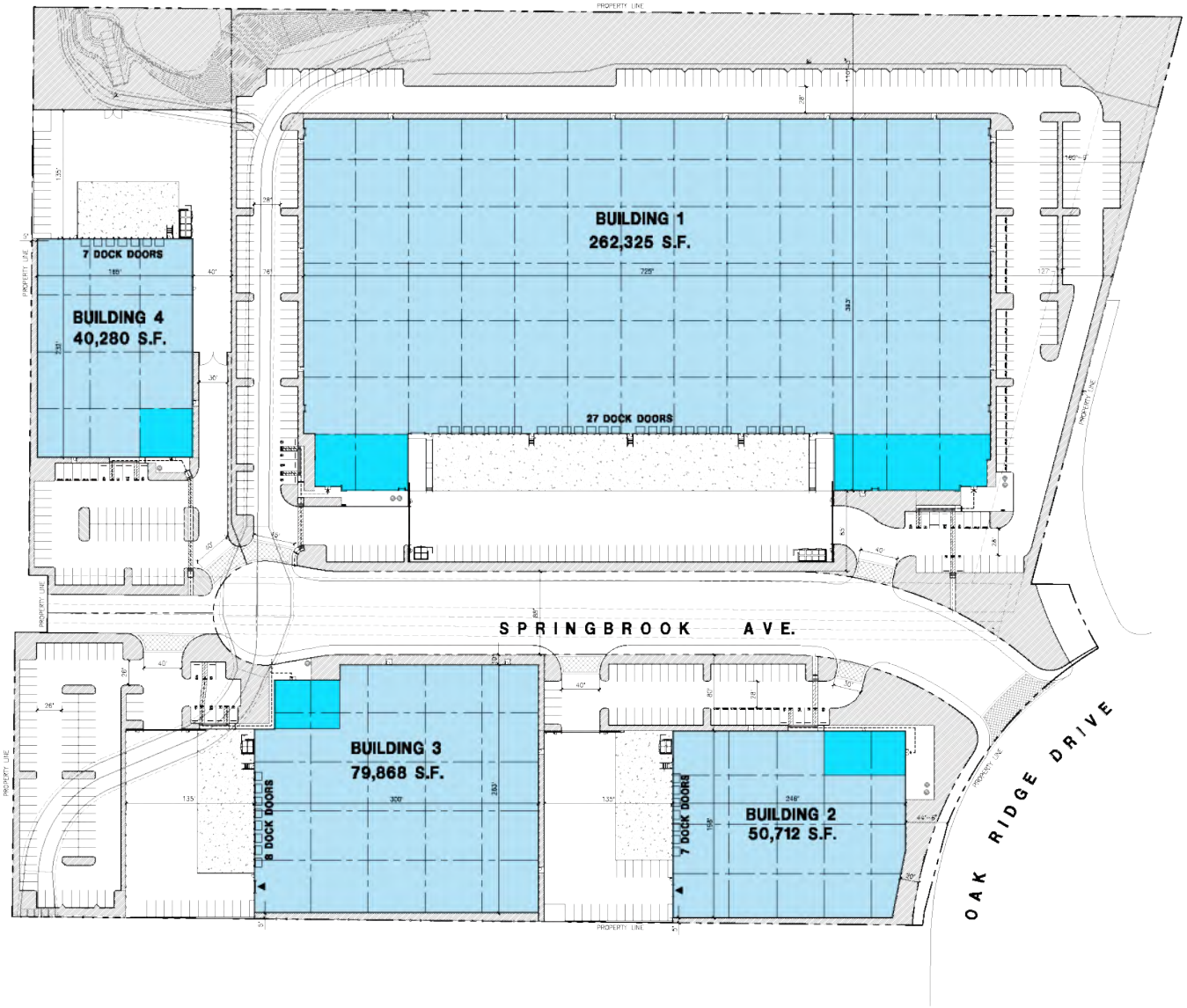

FIGURE 2

Site Plan

Santa Clarita Commerce Center Project

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3 Fundamentals of Noise and Vibration

3.1 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 young 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 receptor equidistant to each sound source 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-, D-, and G-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 (dBA). Table 2 provides typical outdoor and indoor noise sources against a decreasing linear scale of A-weighted sound levels.

Table 2. Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 2013.

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 2013). In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people can 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. The 1-hour A-weighted equivalent sound level ($L_{eq}[h]$) is the energy average of A-weighted sound levels occurring during a one-hour period and is the basis for noise abatement criteria used by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA). 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.

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 dB 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 dB 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 dB 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 dB per doubling of distance.
- Atmospheric Absorption – In addition to aforementioned geometric spreading, the fluid medium (i.e., the air) through which sound travels yields frequency-dependent attenuation that increases in magnitude with increasing frequency. The effect is influenced by temperature and relative humidity, and typically negligible over short source-to-receptor distances (e.g., less than 500 feet); but it helps explain why lower-frequency sound such as a thunderclap appears to "travel farther" over great distances.
- Meteorological 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 direct 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 ridgelines) 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 an acoustically solid barrier. Deep expanses of dense wooded areas, on the other hand, can offer noise reduction under the right conditions.

3.2 Vibration

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 2020), 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. The maximum vibration level standard used by Caltrans for the prevention of structural damage to typical residential buildings is 0.3 ips PPV (Caltrans 2020). For human annoyance, Caltrans guidance indicates that a more stringent threshold of 0.2 ips PPV due to continuous vibration (e.g., nearby roadway traffic) would be "annoying." Vibration velocity limits for transient or single events tend to be less stringent than those for continuous or "steady-state" vibration sources.

3.3 Sensitive Receptors

Noise- and vibration-sensitive land uses are typically considered locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, and hospitals are usual examples, with others depending on what the local jurisdiction may have defined or established. Based on context from the City of Santa Clarita General Plan Noise Element (City of Santa Clarita 2011), sensitive receptors include residences, schools, childcare facilities, senior housing, and community facilities. Residences and recreational uses are the nearest noise-sensitive land uses in the vicinity of the Project site. Existing multi-family residences and a park are located near the Project site's southern boundary, and single-family residences are located several hundred feet to the east. These existing sensitive receptors represent the nearest land uses with the potential to be impacted by construction and operation of the Project. In addition, residential land uses located further from the Project site may be impacted by noise associated with the addition of Project-related traffic on the local roadway network.

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4 Existing Noise Environment

Ambient noise measurements were conducted in the vicinity of Project site to characterize the existing noise environment. The measurements were conducted on June 8, 2022 using a Piccolo II Integrating Sound Level Meter equipped with a 0.5-inch, pre-polarized condenser microphone with pre-amplifier. The sound level meter meets the current American National Standards Institute (ANSI) standard for a Type 2 (General Use) sound level meter. The calibration of the sound level meter was verified before and after the measurements, and the measurements were conducted with the measurement microphone covered with a windscreen and positioned approximately five feet above the ground.

Five noise measurement locations were selected (ST1–ST5), representing existing noise-sensitive receptors in the Project vicinity. The measurement locations are shown in Figure 3, Noise Measurement and Modeling Locations,[1] and the measured average noise levels and measurement locations are provided in Table 3. Noise measurement data is also included in Appendix A. As shown in Table 3, measured ambient noise levels ranged from approximately 44 dBA L_{eq} at ST3 to 60 dBA L_{eq} at ST5. The primary noise source at the measurement locations consisted of traffic along the adjacent roadways. Secondary noise sources included distant traffic, distant rail noise, distant landscaping activities, and birdsong.

Table 3. Measured Noise Levels

Receptors	Location/Address	Date	Time	L_{eq} (dBA)	L_{max} (dBA)
ST1	South of Project site, adjacent to multi-family residences at 22900 Oak Ridge Drive	June 8, 2022	10:00 a.m. – 10:15 a.m.	53.6	68.7
ST2	South of Project site, adjacent to multi-family residences at 22605 Crown Point Court	June 8, 2022	10:24 a.m. – 10:38 a.m.	46.4	68.1
ST3	East of Project site, adjacent to single-family residence at 22751 Derby Place	June 8, 2022	11:27 a.m. – 11:42 a.m.	43.6	64.3
ST4	South of Project site, at vacant lot north of multi-family residences along Morrisey Way	June 8, 2022	10:50 a.m. – 11:05 a.m.	52.1	60.1
ST5	Northwest of Project site, adjacent to multi-family residences at 24701 Magic Mountain Parkway	June 8, 2022	12:15 p.m. – 12:30 p.m.	60.1	80.6

Source: Appendix A
Notes: L_{eq} = equivalent continuous sound level (time-averaged sound level); L_{max} = maximum sound level during the measurement interval.

[1] The purpose of the modeled (M) receptors shown in Figure 3 is for the assessment of offsite operational noise (i.e., traffic noise; see Section 7.1.2).

In addition, one long-term, unattended 24-hour noise measurement was taken from June 8-9, 2022. This measurement was intended to determine the existing noise levels in the Project vicinity near noise-sensitive land uses throughout a typical daytime/evening/nighttime cycle, resulting from traffic or from other sources. As shown in Table 4, the long-term hourly average noise levels ranged from approximately 42 dBA L_{eq} (from 1 AM to 2 AM) to approximately 58 dBA L_{eq} (from 1 PM to 2 PM). The 24-hour weighted average noise level at LT1 was approximately 57 dBA CNEL. The primary noise source was traffic on the local roadways.

Table 4. Measured Long-Term (LT1) Noise Levels 6/8/2022 to 6/8/2022

Time Interval	dBA L_{eq}
10:00 AM- 11:00 AM	57.1
11:00 AM- 12:00 PM	46.5
12:00 PM- 1:00 PM	46.5
1:00 PM- 2:00 PM	57.8
2:00 PM- 3:00 PM	47.0
3:00 PM- 4:00 PM	50.4
4:00 PM- 5:00 PM	52.4
5:00 PM- 6:00 PM	57.4
6:00 PM- 7:00 PM	50.1
7:00 PM- 8:00 PM	53.6
8:00 PM- 9:00 PM	50.6
9:00 PM- 10:00 PM	48.9
10:00 PM- 11:00 PM	50.2
11:00 PM- 12:00 AM	47.3
12:00 AM- 1:00 AM	45.1
1:00 AM- 2:00 AM	42.0
2:00 AM- 3:00 AM	57.9
3:00 AM- 4:00 AM	43.0
4:00 AM- 5:00 AM	47.9
5:00 AM- 6:00 AM	52.2
6:00 AM- 7:00 AM	53.7
7:00 AM- 8:00 AM	53.5
8:00 AM- 9:00 AM	53.0
9:00 AM- 10:00 AM	49.8
Lowest Hourly Average Noise Level: 42 dBA L_{eq} at 1 AM	
Highest Hourly Average Noise Level: 58 dBA L_{eq} at 1 PM	
24-Hour Average Noise Level: 52 dBA $L_{eq\ 24\text{-}Hr}$)	
24-Hour Weighted-Average Noise Level: 57 dBA CNEL	

Source: Appendix A

SOURCE: Bing Maps 2021

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0 650 1,300 Feet

FIGURE 3

Noise Measurement and Modeling Locations

Santa Clarita Commerce Center Project

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5 Regulatory Setting

5.1 Federal Regulations

Federal Transit Administration

Although no federal regulations are applicable to this Project, guidance and methodologies from the Federal Transit Administration's (FTA's) Transit Noise and Vibration Impact Assessment Manual (FTA 2018) pertaining to construction noise and vibration are used in this analysis. For example, in its Transit Noise and Vibration Impact Assessment guidance manual (FTA 2018), the Federal Transit Administration (FTA) offers guidance on the estimation of construction noise levels from a construction Project site. It also provides suggested thresholds that include no more than 80 dBA L_{eq} (over an 8-hour daytime period) as received at a residential land use. Since the City does not provide a quantified construction noise limit, this analysis adopts the 80 dBA $L_{eq\ 8\text{-}hr}$ FTA guidance for quantitative construction noise impact assessment.

Federal Interagency Committee on Noise

In 1992 the Federal Interagency Committee on Noise (FICON) assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations. Although the FICON recommendations were developed to address aircraft noise impacts, they are used in this analysis to define a substantial increase in community noise levels related to roadway traffic, as detailed in Section 6.1, Thresholds of Significance.

5.2 State Regulations

California Department of Transportation

In its Transportation and Construction Vibration Guidance Manual, Caltrans recommends a vibration velocity threshold of 0.2 ips PPV (Caltrans 2020) for assessing annoying vibration impacts to occupants of residential structures. Although this Caltrans guidance is not a regulation, it can serve as a quantified standard in the absence of such limits at the local jurisdictional level. Similarly, thresholds to assess building damage risk due to construction vibration vary with the type of structure and its fragility but tend to range between 0.2 ips and 0.3 ips PPV for typical residential structures (Caltrans 2020).

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 General Plan Guidelines

The California General Plan Guidelines, published by the Governor's Office of Planning and Research, provides guidance for the acceptability of specific land use types within areas of specific noise exposure. Table 5, Land Use Compatibility for Community Noise Environments, presents guidelines for determining acceptable and unacceptable community noise exposure limits for various land use categories. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution. The Office of Planning and Research guidelines are advisory in nature. Local jurisdictions, including the City of Pomona, have the responsibility to set specific noise standards based on local conditions.

Table 5. Land Use Compatibility for Community Noise Environments

Land Use Type	Community Noise Exposure (CNEL)			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Residential-low density, single-family, duplex, mobile homes	50–60	55–70	70–75	75–85
Residential – multiple-family	50–65	60–70	70–75	70–85
Transit lodging – motel, hotels	50–65	60–70	70–80	80–85
Schools, libraries, churches, hospitals, nursing homes	50–70	60–70	70–80	80–85
Auditoriums, concert halls, amphitheaters	NA	50–70	NA	65–85
Sports arenas, outdoor spectators' sports	NA	50–75	NA	70–85
Playgrounds, neighborhood parks	50–70	NA	67.5–77.5	72.5–85
Golf courses, riding stables, water recreation, cemeteries	50–70	NA	70–80	80–85
Office buildings, business commercial and professional	50–70	67.5–77.5	75–85	NA
Industrial, manufacturing, utilities, agriculture	50–75	70–80	75–85	NA

Source: OPR 2017

CNEL = Community Noise Equivalent Level; NA = not applicable

1 Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

2 Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features have been included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

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

4 Clearly Unacceptable: New construction or development should generally not be undertaken.

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 2022 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)."

5.3 Local Regulations

City of Santa Clarita General Plan Noise Element

The City of Santa Clarita General Plan Noise Element (City of Clarita 2011) is written to ensure compliance with state requirements through a comprehensive, long-range program of achieving acceptable noise levels throughout the City. The Noise Element identifies noise-generating uses and activities within City limits, the most dominant of which include major freeways and highways such as Interstate 5, State Route 14, and Sierra Highway; arterial streets; railroads; and attractions including Magic Mountain and the former Saugus Speedway (which currently is used for swap meets and special events). The City's Noise Element also identifies future growth and development within City limits as a major contributor to future noise increases, particularly with regard to increases in traffic, and mixed-use development. As development proposals are reviewed in the future, the City will evaluate each proposal in the context of the Noise Element to ensure that noise impacts are reduced through planning and Project design.

The following goals and policies from the Noise Element would be applicable to the Project:

Goal N 1: A healthy and safe noise environment for Santa Clarita Valley residents, employees, and visitors.

Objective N 1.1: Protect the health and safety of the residents of the Santa Clarita Valley by the elimination, mitigation, and prevention of significant existing and future noise levels.

Policy N 1.1.1: Use the Noise and Land Use Compatibility Guidelines [see Table 6, modified by the City to eliminate overlapping acceptability categories], which are consistent with State guidelines, as a policy basis for decisions on land use and development proposals related to noise.

Policy N 1.1.2: Continue to implement the adopted Noise Ordinance and other applicable code provisions, consistent with state and federal standards, which establish noise impact thresholds for noise abatement and attenuation, in order to reduce potential health hazards associated with high noise levels.

Policy N 1.1.3: Include consideration of potential noise impacts in land use planning and development review decisions.

Policy N 1.1.4: Control noise sources adjacent to residential, recreational, and community facilities, and those land uses classified as noise sensitive.

Goal N 2: Protect residents and sensitive receptors from traffic-generated noise.

Objective N 2.1: Prevent and mitigate adverse effects of noise generated from traffic on arterial streets and highways through implementing noise reduction standards and programs.

Policy N 2.1.2: Encourage the use of noise absorbing barriers, where appropriate.

Policy N 2.1.5: Encourage employers to develop van pool and other travel demand management programs to reduce vehicle trip-generated noise in the planning area.

Goal N 3: Protect residential neighborhoods from excessive noise.

Objective N 3.1: Prevent and mitigate significant noise levels in residential neighborhoods.

Policy N 3.1.3: Through enforcement of the applicable Noise Ordinance, protect residential neighborhoods from noise generated by machinery or activities that produce significant discernable noise exceeding recommended levels for residential uses.

Policy N 3.1.4: Require that those responsible for construction activities develop techniques to mitigate or minimize the noise impacts on residences and adopt standards that regulate noise from construction activities that occur in or near residential neighborhoods.

Goal N 4: Protection of sensitive uses from commercial and industrial noise generators.

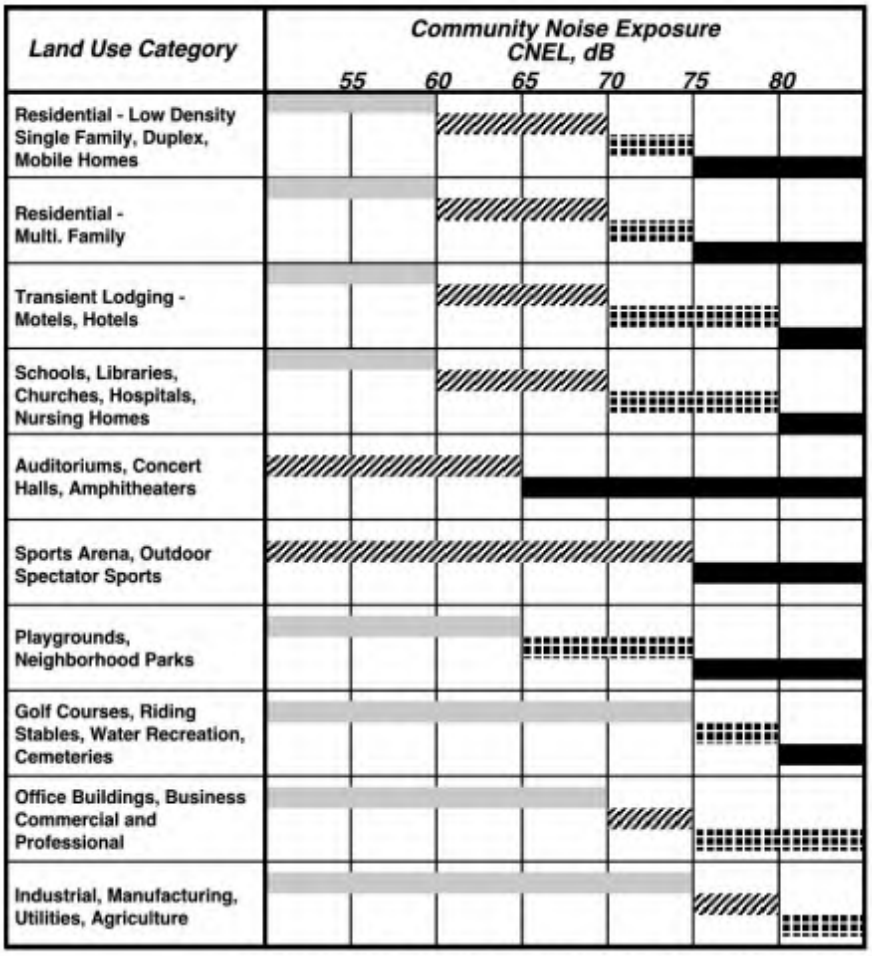
Objective N 4.1: Prevent, mitigate, and minimize noise spillover from commercial and industrial uses into adjacent residential neighborhoods and other noise sensitive uses.

Policy N 4.1.1: Implement and enforce the applicable Noise Ordinance to control noise from commercial and industrial sources that may adversely impact adjacent residential neighborhoods and other sensitive uses.

Policy N 4.1.2: Require appropriate noise buffering between commercial or industrial uses and residential neighborhoods and other sensitive uses.

Policy N 4.1.3: Adopt and enforce standards for the control of noise from commercial and entertainment establishments when adjacent to residential neighborhoods and other sensitive uses.

Table 6. City of Santa Clarita Noise/Land Use Compatibility Guidelines



LEGEND

NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Sound walls, window upgrades, and site design modifications may be needed in order to achieve City standards.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

CONSIDERATIONS IN DETERMINATION OF NOISE-COMPATIBLE LAND USE

A. NOISE EXPOSURE INFORMATION DESIRED

Where sufficient data exists, evaluate land use suitability with respect to a worst-case value of CNEL. Usually, a future projection of noise levels represents the worst case. Existing and future noise contours for freeway, roadway, airport and railroads are provided in the Noise Element.

B. NOISE SOURCE CHARACTERISTICS

The land use-noise compatibility recommendations should be viewed in relation to the specific source of the noise. For example, aircraft and railroad noise is normally made up of higher single noise events than auto traffic but occurs less frequently. Therefore, different sources yielding the same composite noise exposure do not necessarily create the same noise environment. The State Aeronautics Act uses 65 dB CNEL as the criterion which airports must eventually meet to protect existing residential communities from unacceptable exposure to aircraft noise. In order to facilitate the purposes of the Act, one of which is to encourage land uses compatible with the 65 dB CNEL criterion wherever possible, and in order to facilitate the ability of airports to comply with the Act, residential uses located in areas with an aircraft noise level greater than 65 CNEL should be discouraged and considered located within normally unacceptable areas.

C. SUITABLE INTERIOR ENVIRONMENTS

One objective of locating residential units relative to a known noise source is to maintain a suitable interior noise environment at no greater than 45 dB CNEL. This requirement, coupled with the measured or calculated noise reduction performance of the type of structure under consideration, should govern the minimum acceptable distance to a noise source.

D. ACCEPTABLE OUTDOOR ENVIRONMENTS

Another consideration, which in some communities is an overriding factor, is the desire for an acceptable outdoor noise environment. The acceptable outdoor noise level is 65 CNEL for rear yard areas, neighborhood parks, and pool recreation areas at multi-family developments.

City of Santa Clarita Municipal Code

The City of Santa Clarita Municipal Code (SCMC) Noise Ordinance provides exterior noise standards within the City, which are applicable to the proposed Project:

11.44.040 Noise Limits.

A. It shall be unlawful for any person within the City to produce or cause or allow to be produced noise which is received on property occupied by another person within the designated region, in excess of the following levels, except as expressly provided otherwise herein:

Region	Time	Sound Level dB
Residential Zone	Day	65
Residential Zone	Night	55
Commercial and Manufacturing	Day	80
Commercial and Manufacturing	Night	70

At the boundary line between a residential property and a commercial and manufacturing property, the noise level of the quieter zone shall be used.

B. Corrections to Noise Limits. The numerical limits given in subsection (A) of this section shall be adjusted by the following corrections, where the following noise conditions exist:

Noise Condition	Correction (in dB)
(1) Repetitive impulsive noise	-5
(2) Steady whine, screech or hum	-5
(3) Noise occurring more than 5 but less than 15 minutes per hour	+5
(4) Noise occurring more than 1 but less than 5 minutes per hour	**+10**
(5) Noise occurring less than 1 minute per hour	+20

11.44.070 Special Noise Sources—Machinery, Fans and Other Mechanical Devices.

Any noise level from the use or operation of any machinery, equipment, pump, fan, air conditioning apparatus, refrigerating equipment, motor vehicle, or other mechanical or electrical device, or in repairing or rebuilding any motor vehicle, which exceeds the noise limits as set forth in SCMC Section 11.44.040 at any property line, or, if a condominium or rental units, within any condominium unit or rental unit within the complex, shall be a violation of this chapter.

11.44.080 Special Noise Sources—Construction and Building.

No person shall engage in any construction work which requires a building permit from the City on sites within three hundred (300) feet of a residential-zoned property except between the hours of seven a.m. to seven p.m., Monday through Friday, and eight a.m. to six p.m. on Saturday. Further, no work shall be performed on the following public holidays: New Year's Day, Independence Day, Thanksgiving, Christmas, Memorial Day, and Labor Day. Emergency

work is permitted at all times. As defined in SCMC 11.44.020: Emergency work shall mean work made necessary to restore property to a safe condition following a public calamity, or work required to protect persons or property from an imminent exposure to danger, or work by private or public utilities when restoring utility service. The Department of Community Development may issue a permit for work to be done "after hours"; provided, that containment of construction noises is provided.

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6 Significance Criteria

6.1 Significance Thresholds

The following significance criteria, included in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), will determine the significance of a noise impact. Impacts related to noise would be significant if the proposed Project would result in:

a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
b. Generation of excessive groundborne vibration or groundborne noise levels.
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, the 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 polices and regulations described in Section 5.3 as well as those of federal and State agencies and are listed below.

- **Construction Noise:** During construction activities, an exceedance of the FTA's 80 dBA $L_{eq\ 8\text{-}hr}$ threshold is considered a significant noise impact.
- **Traffic Noise:** Guidance regarding the determination of a substantial permanent increase in transportation noise levels in the project vicinity above existing levels is provided by the 1992 findings of FICON, which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations. The FICON recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Annoyance is a qualitative measure of the adverse reaction of people to noise that generates speech interference, sleep disturbance, or interference with the desire for a tranquil environment.

The rationale for the FICON recommendations is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of L_{dn} (and, by extension, CNEL[2]). The changes in noise exposure that are shown in Table 7 are expected to result in equal changes in annoyance at sensitive land uses. Although the FICON recommendations were developed to address aircraft noise impacts, they are used in this analysis to define a substantial increase in community noise levels related to all transportation noise sources.[3]

2 As discussed in Section 3.1, the L_{dn} and CNEL noise metrics are very similar and often used interchangeably.
3 Traffic noise and other transportation noise sources are similar to aircraft/airport noise in that all of these noise sources can and do operate throughout the daytime and nighttime hours. The FICON recommendations use a weighted 24-hour noise metric, in which noise occurring during nighttime hours has a penalty applied to account for the increased sensitivity of persons to noise at night. Additionally, the graduated levels of the FICON guidance for substantial increase account for the diminishing tolerance of the typical person to noise increases as ambient noise levels are increased. Such is the case whether the dominant noise source is aircraft, or some other transportation source.

Table 7. Measures of Substantial Increase for Transportation Noise Sources

Ambient Noise Level Without Project (L_{dn}/CNEL)	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels by:
<60 dB	+ 5 dB or more
60–65 dB	+ 3 dB or more
>65 dB	+ 2 dB or more

Source: FICON 1992.

- **Project-Related Stationary Noise:** A noise impact would be considered significant if predicted noise from typical operation of heating, ventilation and air conditioning (HVAC) and other electro-mechanical systems exceeds the applicable SCMC standards as detailed in Section 5.3.
- **Construction Vibration:** Groundborne vibration from construction and operation of the Project would be considered significant if the Project resulted in vibration levels exceeding the Caltrans recommendations (i.e., 0.2 ips PPV for annoyance, during construction and operation).

7 Impact Analysis

7.1 Significance Threshold A

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

7.1.1 Construction

It is anticipated that the Project would be constructed in one major phase (with sub-phases for site preparation, fine grading, building construction and so on) and would begin in Spring 2023, lasting approximately 12 months. Given that the site has been previously graded, fine grading would be minimal and is anticipated to require approximately 2,500 cubic yards of cut and fill. No import or export is anticipated.

The types of construction equipment that would be used to construct the proposed Project include standard equipment that would be employed for any routine construction Project of this scale, such as graders, tractors, loaders, cranes, rubber-tired bulldozers, generators, and paving equipment. No blasting, on-site rock crushing or pile driving would be necessary.

Construction noise is difficult to quantify because of the many variables involved, including the specific equipment types, size of equipment used, percentage of time each piece is in operation, condition of each piece of equipment, and number of pieces that would operate on the site. The range of maximum noise levels for various types of construction equipment at a distance of 50 feet is shown in Table 8. The noise values represent maximum noise generation, or full- power operation of the equipment. As an example, a loader and two dozers, all operating at full power and relatively close together, would generate a maximum sound level of approximately 90 dBA at 50 feet from their operations. As one increases the distance between equipment or separation of areas with simultaneous construction activity, dispersion and distance attenuation reduce the effects of separate noise sources added together. In addition, typical operating cycles may involve 2 minutes of full-power operation, followed by 3 or 4 minutes at lower levels. The average noise level during construction activities is generally lower (typical levels of approximately 88 dBA L_{eq} at a distance of 50 feet) since maximum noise generation may only occur up to 50% of the time. Noise levels from construction operations decrease at a rate of approximately 6 dBA per doubling of distance from the source.

Table 8. Typical Construction Equipment Noise Emission Levels

Equipment	Typical Sound Level (dBA) 50 Feet from Source
Air compressor	81
Backhoe	80
Compactor	82
Concrete mixer	85
Concrete pump	82
Concrete vibrator	76
Crane, mobile	83

Table 8. Typical Construction Equipment Noise Emission Levels

Equipment	Typical Sound Level (dBA) 50 Feet from Source
Dozer	85
Generator	81
Grader	85
Impact wrench	85
Jackhammer	88
Loader	85
Paver	89
Pneumatic tool	85
Pump	76
Roller	74
Saw	76
Truck	88

Source: FTA 2018.

Using specific construction equipment assumptions similar to those as used for the air quality analysis for this Project, a noise analysis was performed using a model emulating the Roadway Construction Noise Model (RCNM) that was developed by the Federal Highway Administration (FHWA 2008). Input variables for the RCNM consist of the receiver/land use types, the equipment type (i.e., backhoe, crane, truck, etc.), the number of equipment pieces, the duty cycle for each piece of equipment (i.e., percentage of each time period the equipment typically is in operation and operating at full load or power level), and the distance between the construction noise source and the sensitive receiver. The Roadway Construction Noise Model has default duty-cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were adopted for this noise analysis.

Table 9 provides a summary of the predicted construction noise exposure levels by each phase at the nearest noise-sensitive receptor locations. The input and output data are provided in Appendix B. Noise-sensitive land uses in the vicinity of the Project site include existing residences to the south and east and a church to the southwest of the Project site. Consequently, Project construction noise exposure levels at other receivers further away from the site would be less, due primarily to natural distance-dependent attenuation factors such as geometric divergence, air absorption, ground surface absorption, and potential path-occluding structures and topography.

Table 9. Construction Noise Model Results Summary

Land Use	Off-site Receptor Location	Distance from Construction Activity to Noise Receptor (feet)	Estimated Construction Noise Levels (dBA $L_{eq\ 8\text{-}hr}$)				
			Site Preparation	Grading	Building Construction	Paving	Architectural Coating
Residential and Recreational	South of the Project	Typical Construction Activity / Receiver Distance (600 - 625')	64	66	61	61	51
		Nearest Construction Activity / Receiver Distance (50' - 150')	79	79	67	75	63
Residential	East of the Project	Typical Construction Activity / Receiver Distance (800' - 850')	62	63	59	58	48
		Nearest Construction Activity / Receiver Distance (350' - 450')	65	67	61	62	54

Source: Appendix B
Notes: L_{eq} = equivalent continuous sound level; dBA = A-weighted decibel.
* Typical construction noise levels are calculated based on the acoustic center distances between the nearest sensitive receptors and the construction phase.
** The estimated noise levels are generally lower than those shown in Table 8 (at a reference distance of 50 feet) because the noise levels shown in Table 9 represent an 8-hour average with varying duty cycles, and not all equipment would be operating for the full 8 hours, or at a distance of 50 feet.

As shown in Table 9, typical construction noise levels at the nearest noise-sensitive land uses (multi-family residences and a park to the south) are estimated to range from approximately 51 dBA $L_{eq\ 8\text{-}hr}$ during the architectural coating phase to approximately 66 dBA $L_{eq\ 8\text{-}hr}$ during the grading phase. As detailed on the worksheets in Appendix B, this 15 dB range of predicted construction noise levels is due to the intensity of construction activity, expected quantities and types of involved construction equipment, and distance. Consistent with the FTA "general assessment" technique (FTA 2018), the presented distance range (600 to 625 feet) in Table 9 describes the varying horizontal proximity between the common noise-sensitive receptor fixed location and the "acoustical centroid" that represents uniquely for each of the six studied activity phases the time-averaged position of a full set of multiple operating pieces of construction equipment and vehicles. Table 9 and Appendix B worksheets also show construction noise level predictions at distances between the noise-sensitive receptor position and the anticipated nearest boundary associated with a construction phase, which are thus shorter than those with respect to the acoustic centroid for the same phase; however, these scenarios assume that equipment would be operating at a range of distances (because not all equipment for a phase would be operating at the same distance simultaneously) and result in levels that would range from approximately 63 dBA $L_{eq\ 8\text{-}hr}$ during the architectural coating phase to approximately 79 dBA $L_{eq\ 8\text{-}hr}$ during the site preparation phase. These noise levels would not exceed the 80 dBA $L_{eq\ 8\text{-}hr}$ suggested FTA threshold for construction noise.

The next-nearest noise-sensitive receivers (the single-family residences located to the east) are located further from the Project site. Thus, estimated construction noise levels would be lower, ranging from approximately 48 dBA $L_{eq\ 8\text{-}hr}$ during the architectural coating phase to approximately 63 dBA $L_{eq\ 8\text{-}hr}$ during the site preparation and grading phases under typical conditions. During the relatively brief periods of time when construction would be focused near the eastern Project boundary, noise from construction activities is estimated to range from approximately 54 to 67 dBA $L_{eq\ 8\text{-}hr}$. These noise levels would not exceed the 80 dBA $L_{eq\ 8\text{-}hr}$ suggested FTA threshold for construction noise.

As discussed previously, SCMC Section 11.44.080 does not permit construction work within 300 feet of a residential-zoned property between the hours of 7:00 p.m. and 7:00 a.m., 6:00 p.m. and 8:00 a.m. on Saturdays, at any time on Sundays or on designated public holidays. The proposed Project would not conduct noisy construction activities between the specified hours or days, and the estimated noise levels would not exceed the FTA's advisory noise standard of 80 dBA $L_{eq\ 8\text{-}hr}$. Therefore, noise from Project construction would be **less than significant**.

Although the predicted impact due to construction noise is less than significant, good construction practice (or as required by City regulations, policies, or expectations) would include providing off-site residences advance notice of expected construction periods.

Off-Site Construction Activities

The Project would result in local, short-term increases in roadway noise as a result of construction traffic. Based on information developed as part of the Project's air quality analysis, Project-related traffic would include workers commuting to and from the Project site as well as vendor and haul trucks bringing or removing materials. The highest number of average daily worker trips would be 348 trips, occurring during the building construction phase. The highest number of average daily vendor truck trips would be 136 trips, also occurring during the building construction phase. No haul truck trips would occur during Project construction because no soil would be imported or exported from the Project site.

Based upon available data provided as part of the Project's transportation analysis, Oak Ridge Drive carries approximately 8,300 daily trips in the Project vicinity, and Railroad Avenue carries approximately 32,200 daily trips in this area[4]. Comparing the maximum number of daily construction-related trips (348 worker trips and 136 vendor trips) to the average daily traffic volume of the lowest-volume street (8,300 daily trips on Oak Ridge Drive), the additional vehicle trips would amount to an increase of approximately 6 percent. Based upon the fundamentals of acoustics, a doubling (i.e., a 100 percent increase) would be needed to result in a 3-dB increase in noise levels, which is the level corresponding to an audible change to the typical human listener. An increase in traffic volumes (all other things being equal) would amount to an increase of well under 1 dB. Therefore, traffic related to construction activities would not result in 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. Impacts from Project-related construction traffic noise would be **less than significant.** No mitigation measures are required.

7.1.2 Operation

On-Site Operational Noise

Outdoor Mechanical Equipment

While operational hours are anticipated to follow typical working hours (e.g., 8-12 hours per day during the day), this analysis assumes that the facility could be operated 24 hours a day, 7 days a week. The proposed warehouse spaces overall would not be served by heating or air conditioning equipment. However, the floor plans includes office spaces at designated corners of each of the four buildings. Office space within each building would range from approximately 2,000 to 5,000 square feet, for a total of 26,000 square feet (13,000 square feet on the buildings first floors and 13,000 square feet on the buildings second floors). For the analysis of noise from HVAC equipment operation, a York

[4] Average daily volumes (ADTs) were estimated using the peak-hour traffic volumes provided and the assumption that peak-hour volumes are approximately 10 percent of the ADT.

Model ZF-048 package HVAC unit was used as a reference. Based upon the square footage of the office and mezzanine spaces (8,000 square feet total), it was assumed that two such units would be required for each of the office areas. The York Model ZF-048 package HVAC unit has a sound power rating of 80 dBA (Johnson Controls 2015). Based on the warehouse roof design information provided, there will be a minimum 2.8-foot-high parapet extending along the perimeter of the roof, which would minimize sound from the HVAC unit at nearby noise-sensitive land uses

The combined noise levels from the HVAC equipment at the Project property lines, the nearest adjacent land uses, and the nearest residential uses were calculated and are presented in Table 10. As shown, the maximum hourly noise level (assuming the equipment would run continuously) for the HVAC equipment operating at each examined location would range from approximately 14 dBA L_{eq} at the residential uses to the east to 26 dBA L_{eq} at the Project's western, property boundary. These levels are less than the SCMC noise standards and are well below the measured ambient noise levels in the Project area. The results of the mechanical equipment operations noise analysis indicate that the Project would comply with the City of Santa Clarita Municipal Code noise ordinance. Mechanical equipment operation would result in noise at the Project site property boundaries/nearest noise-sensitive receiver boundaries that are less than the applicable noise standards and are thus less than significant.

Table 10. Mechanical Equipment (HVAC) Noise

Equipment	Noise Level at Specified Location		Applicable Noise Standard[1] (dBA L_{eq}) - Daytime (7 a.m. to 10 p.m.) / Nighttime (10 p.m. to 7 a.m.)	Applicable Noise Standard Exceeded?
	Location	Average Noise Level (dBA L_{eq})		
HVAC	Northern Property Boundary	20	80/70	No
HVAC	Southern Residential Property Boundary	22	65/55	No
HVAC	Eastern Residential Property Boundary	27	65/55	No
HVAC	Western Property Boundary	26	80/70	No

Source: Appendix C

1 Applicable noise standard per City of Santa Clarita Municipal Code Section 11.44.040, as described in Section 5.3.

Parking Lot Activity

A comprehensive study of noise levels associated with surface parking lots was published in the Journal of Environmental Engineering and Landscape Management (Baltrënas et al. 2004). The study found that average noise levels during the peak period of use of the parking lot (generally in the morning with arrival of commuters, and in the evening with the departure of commuters), was 47 dBA at 1 meter (3.28 feet) from the outside boundary of the parking lot. The parking area would function as a point source for noise, which means that noise would attenuate at a rate of 6 dBA with each doubling of distance. The employee parking lot adjacent to the nearest noise-sensitive receivers (residences and a park to the south) is proposed to be situated on the south side of Building 1, no closer than 55 feet from the center of drive-aisle to the residential property boundary. At a distance of 55 feet, parking lot noise levels would be approximately 23 dBA L_{eq}. Parking lot activity noise levels at each of the four property boundary locations are summarized in Table 11 (below).

Truck Loading Dock / Truck Yard Activity

The parking lot study (Baltrënas et al. 2004) also examined noise levels associated with cargo truck delivery activity. The study concluded that average noise levels from truck loading/unloading areas was 96 dBA at one meter (3.28 feet) from the boundary of the truck activity area. Truck loading docks as part of Building 1 would be located not closer than 450 feet from the nearest noise-sensitive receivers (residences to the south). Using the outdoor attenuation rate of 6 dBA with each doubling of distance, truck loading activity at residences to the south would produce noise levels of approximately 53 dBA L_{eq}. However, the proposed design of Building 1 would provide a substantial amount of noise reduction by blocking the direct line-of-sight between the truck loading dock area and the residences to the south. Accounting for this acoustical shielding, the truck loading dock noise at the southern residential boundaries is estimated to be approximately 35 dBA L_{eq}. Perimeter noise barriers 8 feet in height would also be constructed as part of the Project design at the loading dock areas for Buildings 1 and 2 as shown in Figure 4. At Building 4, a loading dock area with 7 bays is proposed which would face to the east. Although the loading docks would be over 600 feet from the nearest noise-sensitive uses (residences to the east), the residences would have a direct view of the loading docks because they are elevated relative to the Project site; therefore, no acoustical shielding was assumed for this location. Accounting for the noise reduction from distance, the truck loading dock noise at the residences to the east is estimated to be approximately 50 dBA L_{eq}. At the northern and western property boundaries, the estimated noise levels would be approximately 66 dBA L_{eq}; however, there are no noise-sensitive receivers at these locations, and they are zoned as commercial/manufacturing uses. Truck loading dock activity noise levels are summarized in Table 11 and combined with the other on-site noise sources. As shown in Table 11, the combined on-site activities noise at the four property boundaries would be below the applicable City of Santa Clarita noise exposure limits. Based upon these results, parking lot noise and truck loading dock/truck yard activity noise impacts would be less than significant.

Table 11. Combined On-Site Noise Summary of Results – Noise Levels (dBA L_{eq}) at Property Boundaries

Location	Zoning	Applicable Noise Standard[1] - Daytime (7 a.m. to 10 p.m.) / Nighttime (10 p.m. to 7 a.m.)	HVAC	Parking Lot Activity	Truck Loading Dock Activity	Combined HVAC, Parking Lot and Truck Loading Dock Activities Noise	Applicable Noise Standard Exceeded?
Northern Property Boundary	Commercial / Manufacturing	80/70	20	23	66	66	No
Southern Residential Property Boundary	Residential	65/55	22	23	35	35	No
Eastern Residential Property Boundary	Residential	65/55	27	4	50	50	No
Western Property Boundary	Commercial / Manufacturing	80/70	26	24	66	66	No

Source: Appendix C

1 Applicable noise standard per City of Santa Clarita Municipal Code Section 11.44.040, as described in Section 5.3.

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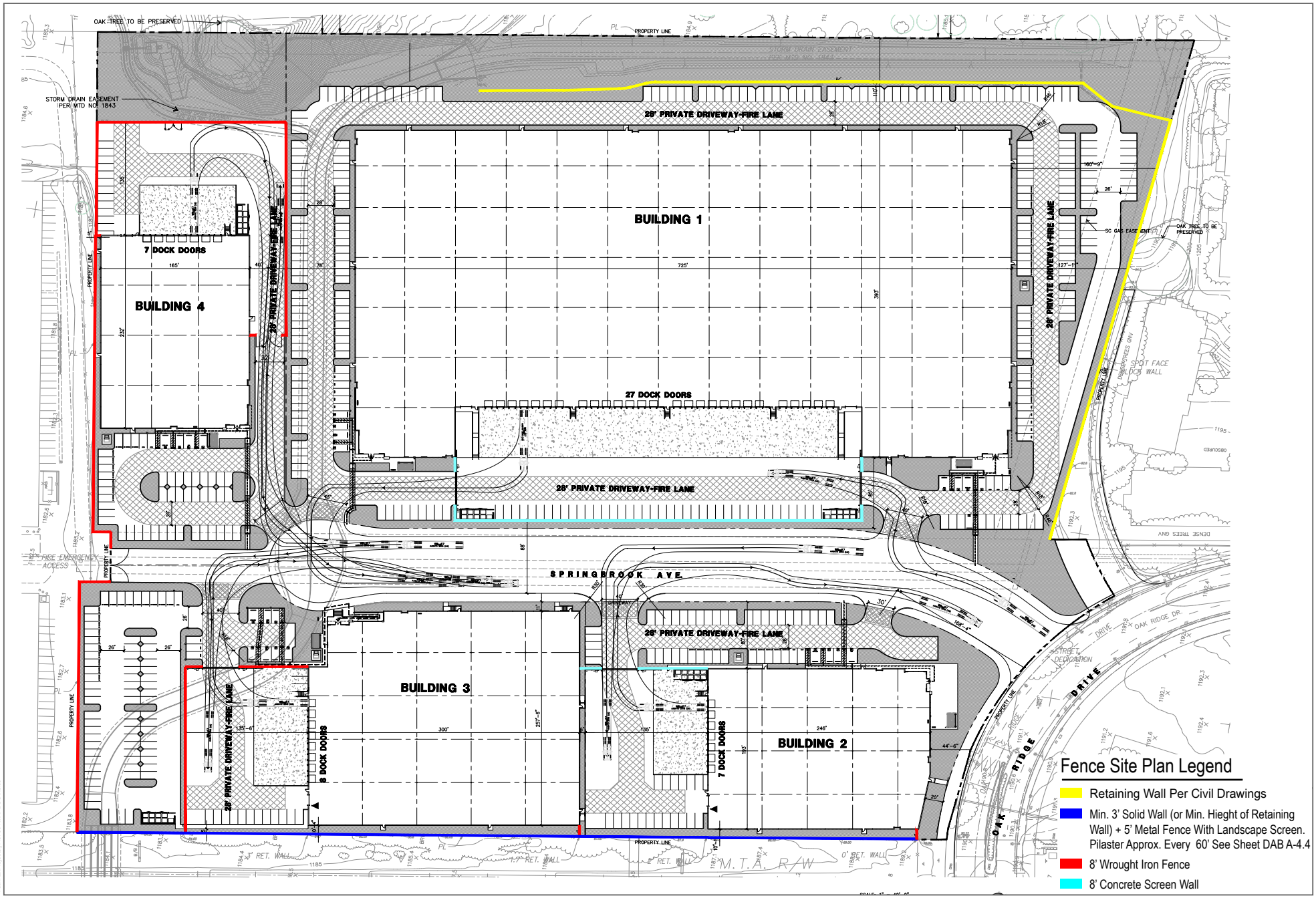

SOURCE: HPA 2022

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FIGURE 4

Screen Wall Plan

Santa Clarita Commerce Center Project

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Off-Site Operational Noise

The Project would result in the creation of additional vehicle trips on local roadways (i.e., Oak Ridge Drive, Railroad Avenue, Via Princessa/Wiley Canyon Road, Magic Mountain Parkway), which could result in increased traffic noise levels at adjacent noise-sensitive land uses. Potential noise effects from vehicular traffic were assessed using the FHWA's Traffic Noise Model (TNM) version 2.5 (FHWA 2004). Information used in the model included the site geometry, existing, existing plus project, future (Year 2024) without project, and future (Year 2024) with project traffic volumes[5] and posted traffic speeds. Noise levels were modeled at representative noise-sensitive receivers ST1 through ST5 as well as an additional modeled-only locations (M1 through M3) as shown in Figure 3. The receivers were modeled to be 5 feet above the local ground elevation. The noise model results are summarized in Table 12. Detailed traffic noise modeling input and output is provided in Appendix D.

Table 12 shows that the maximum noise level increase would be 1 dB (when rounded to whole numbers), occurring at receivers ST1, ST4 and ST5. At receivers ST2 and ST3, traffic noise levels are predicted to decrease somewhat because the proposed warehouse buildings would obstruct the direct noise path (i.e., the line-of-sight) between roadway traffic and the receiver. An increase of 1 dB or less would typically not be a perceptible change in the context of community noise. The proposed Project would not result in an increase in noise levels of 5 dB or more in locations with an ambient noise level of less than 60 dBA CNEL; nor would the proposed Project result in an increase of 3 dB or more in locations with an ambient noise level of 60 to 65 dBA CNEL or an increase of 2 dB or more in locations with an ambient noise level greater than 65 dBA CNEL. Based upon these results, off-site traffic noise impacts would be **less than significant**. No mitigation measures are required.

Table 12. Off-Site Traffic Noise Modeling Results

Modeled Receptor	Existing Noise Level (dBA CNEL)	Existing Plus Project Noise Level (dBA CNEL)	Noise Level Increase (dB)	Future Noise Level (dBA CNEL)	Future Plus Project Noise Level (dBA CNEL)	Noise Level Increase (dB)
ST1	56	57	1	57	57	0
ST2	50	48	-2	50	49	-1
ST3	46	42	-4	46	43	-3
ST4	54	55	1	54	55	1
ST5	63	64	1	64	64	0
M1	64	64	0	64	64	0
M2	62	62	0	62	62	0
M3	64	64	0	64	64	0

Source: Appendix D

[5] Traffic volumes derived from the Santa Clarita Commerce Center Project Transportation Impact Analysis (Dudek 2023)

7.2 Significance Threshold B

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

7.2.1 Construction

Construction activities that might expose persons to excessive ground-borne vibration or ground-borne noise could cause a potentially significant impact. Groundborne vibration from construction activities is typically attenuated over short distances. The heavier pieces of construction equipment used at this site could include graders, tractors, loaders, cranes, rubber-tired bulldozers, generators, and paving equipment.

Based on published vibration data, the anticipated heavy construction equipment would generate a vibration level of approximately 0.089 inches per second peak particle velocity (PPV) at a distance of 25 feet from the source; lighter construction equipment, such as a small bulldozer, would generate a substantially lower vibration level of approximately 0.003 inches per second PPV at a distance of 25 feet from the source.[6] Although heavy equipment would operate throughout the Project site at various construction phases, it is anticipated that heavy equipment would occasionally operate as close as approximately 50 feet from existing residences. At the distance from the nearest vibration-sensitive receivers (residences located to the south) to where construction activity would be occurring on the Project site, the peak particle velocity vibration level would be approximately 0.032 inches per second. As such, vibration levels would be less than the Caltrans threshold of 0.20 inches per second for human annoyance or the standard used by Caltrans for the prevention of structural damage to typical residential buildings of 0.3 ips PPV (Caltrans 2020). Because groundborne vibration from Project construction would not exceed recognized standards, and due to the temporary and intermittent occurrence of vibration levels, vibration impacts would be **less than significant**. No mitigation measures are required.

7.2.2 Operation

While operational hours are anticipated to follow typical working hours (e.g., 8-12 hours per day during the day), this analysis assumes that the facility could be operated 24 hours a day, 7 days a week. During operation, no major sources of groundborne vibration are anticipated. While heavy trucks and buses create vibration while traveling on paved roads, the vibration levels are typically low except in close proximity or over rough, discontinuous or poorly maintained roads. This is because roadgoing vehicles are supported by pneumatic tires and flexible suspensions (Caltrans 2020). Furthermore, as stated in Section 7.2.1, groundborne vibration typically attenuates relatively rapidly with distance from the source. Project-related trucks would enter and exit the project site from the access road at a distance of more than 150 feet from the nearest noise-sensitive receiver immediately to the south of the Project site, resulting in minimal vibration. Therefore, **less than significant** impacts related to groundborne vibration would occur from operation of the Project. No mitigation measures are required.

[6] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 7-4, page 184, 2018.

7.3 Significance Threshold C

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

No private airstrips exist in the Project vicinity. The nearest airport is Whiteman Airport, located approximately 12 miles to the southeast of the Project site. The Project site is not located within 2 miles of any public airport, nor is it located within the boundaries of any airport land use plans. Therefore, the proposed Project would not expose or result in excessive noise for people residing or working in the Project area, and **no impact** would occur. No mitigation measures are required.

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8 Mitigation Measures

Threshold A: Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Short-Term Construction Impacts

The Project would result in less-than-significant impacts with regard to short-term construction noise. No mitigation is required.

Long-Term Operational Impacts

The Project would result in less-than-significant on-site operational impacts as well as less-than-significant off-site operational traffic noise impacts. As such, no mitigation is required.

Threshold B: Would the Project result in generation of excessive groundborne vibration or groundborne noise levels?

The Project would result in less-than-significant impacts with regard to groundborne vibration and groundborne noise levels. No mitigation is required.

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

The Project would result in no impact with regard to excessive airport noise levels. No mitigation is required.

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9 References

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OPR (Governor's Office of Planning and Research). 2017. State of California General Plan Guidelines 2017: Appendix D, Noise Element Guidelines: Guidelines for the Preparation and Content of the Noise Element of the General Plan.

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10 Preparers

Mike Greene, Environmental Specialist, Acoustician

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Appendix A
Field Noise Measurement Data

DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT COVINGTON SPRING BROOK INDUSTRIAL PROJECT # 14378
SITE ID
SITE ADDRESS
START DATE 6/8/22 END DATE 6/9/22 OBSERVER(S) PEYE VITAIZ
START TIME END TIME

METEOROLOGICAL CONDITIONS
TEMP — F HUMIDITY — % R.H. WIND CALM LIGHT MODERATE
WINDSPD — MPH DIR. N NE E SE S SW W NW VARIABLE STEADY GUSTY
SKY SUNNY CLEAR OVRCAST PRTLY CLDY FOG RAIN

ACOUSTIC MEASUREMENTS
MEAS. INSTRUMENT PICCOLO II TYPE 1 2 SERIAL # P0218091404
CALIBRATOR REED R-8090 SERIAL #
CALIBRATION CHECK PRE-TEST ____ dBA SPL POST-TEST ____ dBA SPL WINDSCRN YES

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

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
(LT1) 1									

COMMENTS
READING TAKE AT NORTH END OF RESIDENTIAL COMPLEX AT 22900 OAK RIDGE AVE; NOISE SOURCES ARE TRAFFIC ALONG OAK RIDGE AVE AND TRAFFIC ALONG RAILROAD AVE TO THE NORTH;

SOURCE INFO AND TRAFFIC COUNTS
PRIMARY NOISE SOURCE TRAFFIC AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: ASPHALT DIST. TO RDWY (C/L) OR EOP: APX. 180' TO C/L OF
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

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 4206; 4207; 4208; 4209; 4210
OTHER COMMENTS / SKETCH

FIELD NOISE MEASUREMENT DATA

DUDEK

PROJECT: COVINGTON SPRING BROOK INDUSTRIAL — PROJECT #: 14378
SITE ID:
SITE ADDRESS:
OBSERVER(S): PETE VITAR
START DATE: 6/8/22 — END DATE: 6/8/22
START TIME: — END TIME:

METEOROLOGICAL CONDITIONS

TEMP: 83 F — HUMIDITY: 24 % R.H. — WIND: CALM (LIGHT) MODERATE
WINDSPD: 5 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: PICCOLO SLM-P3 — TYPE 1 2 — SERIAL # 130927046
CALIBRATOR: REED R8090 — SERIAL #:
CALIBRATION CHECK: PRE-TEST ____ dBA SPL — POST-TEST ____ dBA SPL — WINDSCRN: YES

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

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
(ST1) 1-16	10:00	10:15							

COMMENTS: RECORD TAKEN NEAR NW CORNER OF RESIDENTIAL COMPLEX AT 22900 OAK RIDGE DR; PRIMARY NOISE SOURCE IS TRAFFIC ON OAK RIDGE DR; AUDIBLE TRAFFIC ON RAILROAD AVE TO THE NORTH;

SOURCE INFO AND TRAFFIC COUNTS

PRIMARY NOISE SOURCE: (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: ASPHALT — DIST. TO RDWY C/L OR EOP: APX 95' TO C/L ON OAK RIDGE DR.
TRAFFIC COUNT DURATION: 15 MIN — SPEED: ____ MIN

COUNT 1 (OR RDWY 1)	DIRECTION	NB/EB	SB/WB	NB/EB SPEED	SB/WB SPEED
	AUTOS	144			
	MED TRKS	0			
	HVY TRKS	0			
	BUSES	0			
	MOTRCLS	1			

IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE ✓

COUNT 2 (OR RDWY 2)	NB/EB	SB/WB	NB/EB SPEED	SB/WB SPEED

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: 4212; 4213; 4214; 4215
OTHER COMMENTS / SKETCH

DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT COVINGTON SPRING BROOK INDUSTRIAL PROJECT # 14378
SITE ID
SITE ADDRESS
START DATE 6/8/22 END DATE 6/8/22 OBSERVER(S) PETE VITAL
START TIME END TIME

METEOROLOGICAL CONDITIONS
TEMP 84 F HUMIDITY 24 % R.H. WIND CALM (LIGHT) MODERATE
WINDSPD 5 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 PICCOLO SLM R3 TYPE 1 2 SERIAL # 130927046
CALIBRATOR TEED TC 8090 SERIAL #
CALIBRATION CHECK PRE-TEST dBA SPL POST-TEST dBA SPL WINDSCRN YES

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

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
(ST2) 17-32	10:24	10:39							

COMMENTS
READING TAKEN BEHIND 22605 CROWN POINT CT (RESIDENTIAL); PRIMARY NOISE SOURCE IS DISTANT TRAFFIC ON OAK RIDGE DR & ON RAILROAD AVE;

SOURCE INFO AND TRAFFIC COUNTS
PRIMARY NOISE SOURCE (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: AS PER C DIST. TO RDWY C/L OR EOP: APX 625'-TO C/L ON OAK RIDGE DR

TRAFFIC COUNT DURATION: — 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) — ___ MIN SPEED	NB/EB	SB/WB	NB/EB	SB/WB

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) (DIST'D GARDENERS/LANDSCAPING NOISE)
OTHER: AMTRAK PASSENGER TRAIN AT 10:26 AM;

DESCRIPTION / SKETCH
TERRAIN HARD SOFT (MIXED) FLAT OTHER:
PHOTOS 4217; 4218; 4219; 4220
OTHER COMMENTS / SKETCH

DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT COVINGTON SPRING BROOK INDUSTRIAL PROJECT # 14378
SITE ID
SITE ADDRESS
OBSERVER(S) PETE VITAIC
START DATE 6/8/22 END DATE 6/8/22
START TIME END TIME

METEOROLOGICAL CONDITIONS
TEMP 88 F HUMIDITY 20 % R.H. WIND CALM LIGHT (MODERATE)
WINDSPD 7 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 PICCOLO SLM-P3 TYPE 1 2 SERIAL # 13927046
CALIBRATOR REED R8090 SERIAL #
CALIBRATION CHECK PRE-TEST dBA SPL POST-TEST dBA SPL WINDSCRN YES

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

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
(ST3) 49-64	11:27	11:42							

COMMENTS

SOURCE INFO AND TRAFFIC COUNTS
PRIMARY NOISE SOURCE TRAFFIC AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: ASPHALT DIST. TO RDWY C/L OR EOP:
TRAFFIC COUNT DURATION: 15 MIN SPEED

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

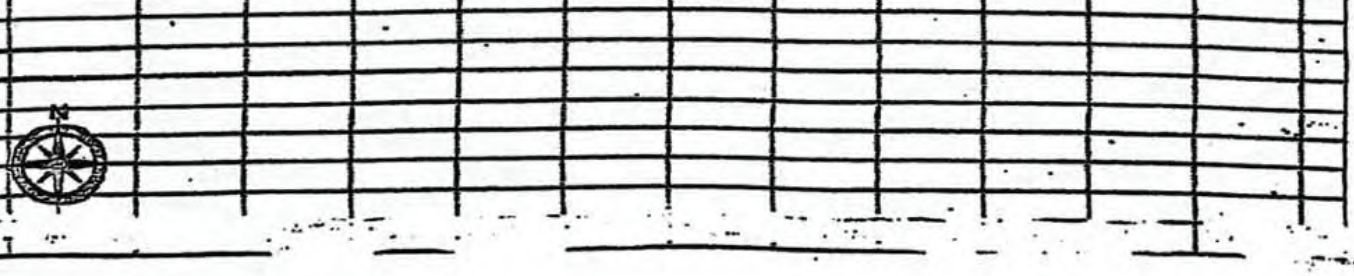
IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE ✓

COUNT 2 (OR RDWY 2) ___ MIN	NB/EB	SB/WB	NB/EB	SB/WB
SPEED				

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: FLAG ON FLAGPOLE FLAPPING IN THE WIND IN BACKGROUND

DESCRIPTION / SKETCH
TERRAIN (HARD) SOFT MIXED FLAT OTHER:
PHOTOS 4231; 4232; 4233; 4234
OTHER COMMENTS / SKETCH



DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT: COVINGTON SPRING BROOK INDUSTRIAL — PROJECT #: 14378
SITE ID:
SITE ADDRESS:
OBSERVER(S): PEYE VITAR
START DATE: 6/8/22 — END DATE: 6/8/22
START TIME: — END TIME:

METEOROLOGICAL CONDITIONS

TEMP: 89 F — HUMIDITY: 20 % R.H. — WIND: CALM (LIGHT) MODERATE
WINDSPD: 5 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: PICCOLO SLM- P3 — TYPE 1 2 — SERIAL # 130927046
CALIBRATOR: LOUD TL8090 — SERIAL #:
CALIBRATION CHECK: PRE-TEST ____ dBA SPL — POST-TEST ____ dBA SPL — WINDSCRN FRS

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

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
33-48	10:50	11:05							

$44 AT SITE

COMMENTS: READING TAKEN AT VACANT LOT BETWEEN OAK RIDGE DR AND RAILROAD AVE; PRIMARY NOISE SOURCE IS TRAFFIC ALONG OAK RIDGE DR AND TRAFFIC ALONG RAILROAD AVE

SOURCE INFO AND TRAFFIC COUNTS

PRIMARY NOISE SOURCE: (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: ASPHALT — DIST. TO RDWY C/L OR EOP: APX 250 TO C/L ON OAK RIDGE DR
TRAFFIC COUNT DURATION: 15 MIN — SPEED ____ MIN ____ SPEED

	DIRECTION	NB/EB	SB/WB	NB/EB	SB/WB
COUNT 1 (OR RDWY 1)	AUTOS	155			
	MED TRKS	0			
	HVY TRKS	1			
	BUSES	0			
	MOTRCLS	0			

IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE ✓

COUNT 2 (OR RDWY 2)	NB/EB	SB/WB	NB/EB	SB/WB

SPEEDS ESTIMATED BY: RADAR / DRIVING THE PACE
POSTED SPEED LIMIT SIGNS SAY: ← TRAFFIC COUNT ON OAK RIDGE DR.

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) DIST'D GARDENERS/LANDSCAPING NOISE
OTHER:

DESCRIPTION / SKETCH

TERRAIN: HARD SOFT (MIXED) FLAT OTHER:
PHOTOS: 4223; 4224; 4225; 4226; 4227
OTHER COMMENTS / SKETCH

DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT: COVINGTON SPRING BROOK INDUSTRIAL — PROJECT #: 14378
SITE ID:
SITE ADDRESS: — OBSERVER(S): PEYE VITAIR
START DATE: 6/8/22 — END DATE: 6/8/22
START TIME: — END TIME:

METEOROLOGICAL CONDITIONS
TEMP: 89 F — HUMIDITY: 24 % R.H. — WIND: CALM LIGHT (MODERATE) VARIABLE STEADY GUSTY
WINDSPD: 7 MPH — DIR. N NE S SE S SW W NW
SKY: (SUNNY) (CLEAR) OVRCAST PRTLY CLDY FOG RAIN

ACOUSTIC MEASUREMENTS
MEAS. INSTRUMENT: PICCOLO SLM-P3 — TYPE 1 2 — SERIAL #: 13927096
CALIBRATOR: NORSA R8090 — SERIAL #:
CALIBRATION CHECK — PRE-TEST: ____ dBA SPL — POST-TEST: ____ dBA SPL — WINDSCRN: YES

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

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
(ST5) 65-80	12:15	12:30							

COMMENTS
READING TAKEN ALONG MAGIC MOUNTAIN PKWY IN FRONT OF 24701 MAGIC MOUNTAIN PKWY (RESIDENTIAL CONDOS); PRIMARY NOISE SOURCE IS TRAFFIC ON MAGIC MOUNTAIN PARKWAY;

SOURCE INFO AND TRAFFIC COUNTS
PRIMARY NOISE SOURCE: (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: ASPHALT — DIST. TO RDWY C/L OR EOP: APX 125' TO C/L OF MAGIC MOUNTAIN PKWY
TRAFFIC COUNT DURATION: 15 MIN — SPEED MIN — SPEED

COUNT 1 (OR RDWY 1) DIRECTION	NB/EB	SB/WB	NB/EB SPEED	SB/WB SPEED
AUTOS	525			
MED TRKS	10			
HVY TRKS	8			
BUSES	0			
MOTRCLS	1			

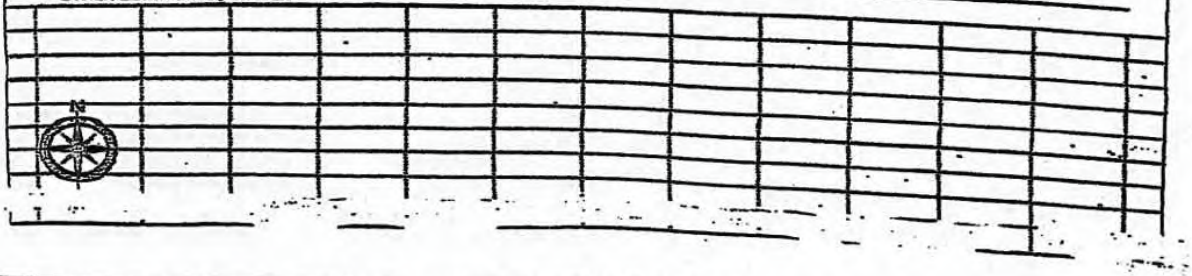
IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE ✓

COUNT 2 (OR RDWY 2)	NB/EB	SB/WB	NB/EB SPEED	SB/WB SPEED

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) DIST. GARDENERS/LANDSCAPING NOISE
OTHER: EMERGENCY VEHICLE SIREN PASSING AT 12:24;

DESCRIPTION / SKETCH
TERRAIN: (HARD) SOFT MIXED FLAT OTHER:
PHOTOS: 4237; 4238; 4239; 4240
OTHER COMMENTS / SKETCH



ST1

Rec 1 to 16	Slow Response		dBA weighting		2.0 dB resc
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin
6/8/2022 10:00	1.0 min	51.2	69	57.4	43.5
6/8/2022 10:01	1.0 min	54.4	72.2	58.5	43.3
6/8/2022 10:02	1.0 min	54.5	72.3	59.8	45.2
6/8/2022 10:03	1.0 min	50.3	68.1	54.7	38.6
6/8/2022 10:04	1.0 min	52.4	70.2	56.7	46.1
6/8/2022 10:05	1.0 min	53.6	71.4	65.3	41.9
6/8/2022 10:06	1.0 min	53	70.8	57.2	47.7
6/8/2022 10:07	1.0 min	51.7	69.5	58.9	39.1
6/8/2022 10:08	1.0 min	54	71.8	63	42.5
6/8/2022 10:09	1.0 min	53.5	71.3	59.5	42.9
6/8/2022 10:10	1.0 min	55	72.8	59.8	45.7
6/8/2022 10:11	1.0 min	57.2	75	68.7	43.9
6/8/2022 10:12	1.0 min	50.8	68.6	60.6	40.6
6/8/2022 10:13	1.0 min	52	69.8	58.2	42
6/8/2022 10:14	1.0 min	54.7	72.5	58.1	42.6
6/8/2022 10:15	7 sec	54.4	62.9	57.1	53.2

	L_{eq}	L_{max}	L_{min}
	53.6	68.7	38.6

ST2

Rec 17 to 32	Slow Response		dBA weighting		2.0 dB resc
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin
6/8/2022 10:24	1.0 min	43.3	61.1	50.4	37.5
6/8/2022 10:25	1.0 min	57	74.8	68.1	37.5
6/8/2022 10:26	1.0 min	41.2	59	49.8	36.7
6/8/2022 10:27	1.0 min	40.3	58.1	45.9	36
6/8/2022 10:28	1.0 min	39.6	57.4	49.1	36.4
6/8/2022 10:29	1.0 min	39.8	57.6	43.9	36.6
6/8/2022 10:30	1.0 min	40.8	58.6	47.1	36.1
6/8/2022 10:31	1.0 min	38.9	56.7	49.1	36.3
6/8/2022 10:32	1.0 min	40.8	58.6	44.3	38.2
6/8/2022 10:33	1.0 min	38.1	55.9	40.1	36.9
6/8/2022 10:34	1.0 min	38.9	56.7	42.8	36.5
6/8/2022 10:35	1.0 min	37.3	55.1	41.1	34.7
6/8/2022 10:36	1.0 min	37.5	55.3	42.2	35.2
6/8/2022 10:37	1.0 min	42.2	60	55.9	36.3
6/8/2022 10:38	1.0 min	40.9	58.7	50.1	35.4
6/8/2022 10:39	7 sec	48.6	57.1	53.9	41.4

	L_{eq}	L_{max}	L_{min}
	46.4	68.1	34.7

ST3

Rec 49 to 64	Slow Response		dBA weighting		2.0 dB resc
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin
6/8/2022 11:27	1.0 min	41.4	59.2	48	39.6
6/8/2022 11:28	1.0 min	42.3	60.1	48.9	38.8
6/8/2022 11:29	1.0 min	43.2	61	48.1	38.5
6/8/2022 11:30	1.0 min	42	59.8	49.9	38.2
6/8/2022 11:31	1.0 min	43.9	61.7	53.4	38.7
6/8/2022 11:32	1.0 min	43.7	61.5	51.6	38.8
6/8/2022 11:33	1.0 min	40.3	58.1	45.7	38.2
6/8/2022 11:34	1.0 min	48.2	66	64.3	38.6
6/8/2022 11:35	1.0 min	42.7	60.5	55	38
6/8/2022 11:36	1.0 min	40.6	58.4	44.7	38.2
6/8/2022 11:37	1.0 min	47.1	64.9	51.5	40.3
6/8/2022 11:38	1.0 min	43.2	61	48.8	39.7
6/8/2022 11:39	1.0 min	42.1	59.9	47.2	38.6
6/8/2022 11:40	1.0 min	39.2	57	41.9	37.5
6/8/2022 11:41	1.0 min	43.9	61.7	52.8	37.6
6/8/2022 11:42	13 sec	43.9	55	47.9	40.5

	L_{eq}	L_{max}	L_{min}
	43.6	64.3	37.5

ST4

Rec 33 to 48	Slow Response		dBA weighting		2.0 dB resc
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin
6/8/2022 10:50	1.0 min	55.2	73	60.1	49.3
6/8/2022 10:51	1.0 min	49.1	66.9	54.2	46.1
6/8/2022 10:52	1.0 min	53.3	71.1	56.5	47.6
6/8/2022 10:53	1.0 min	50.9	68.7	54	46.4
6/8/2022 10:54	1.0 min	51.5	69.3	54.7	46.7
6/8/2022 10:55	1.0 min	51.6	69.4	55.4	45.7
6/8/2022 10:56	1.0 min	51.3	69.1	54.9	45.3
6/8/2022 10:57	1.0 min	50.7	68.5	53.2	46.2
6/8/2022 10:58	1.0 min	50.9	68.7	57.7	43.8
6/8/2022 10:59	1.0 min	53.4	71.2	57.2	49.8
6/8/2022 11:00	1.0 min	51.6	69.4	55.6	47.6
6/8/2022 11:01	1.0 min	52	69.8	56.5	44.4
6/8/2022 11:02	1.0 min	50.1	67.9	53.8	45.8
6/8/2022 11:03	1.0 min	54.4	72.2	59.4	47.5
6/8/2022 11:04	1.0 min	50.7	68.5	55.6	46.4
6/8/2022 11:05	27 sec	57.1	71.4	68	46.1

L_{eq}	L_{max}	L_{min}
52.1	60.1	43.8

ST5

Rec 65 to 80	Slow Response		dBA weighting		2.0 dB resc
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin
6/8/2022 12:15	1.0 min	57.2	75	63.7	48.2
6/8/2022 12:16	1.0 min	58.6	76.4	63.7	50
6/8/2022 12:17	1.0 min	60	77.8	66.2	47.2
6/8/2022 12:18	1.0 min	56	73.8	61.7	47.3
6/8/2022 12:19	1.0 min	59.4	77.2	65.8	51.6
6/8/2022 12:20	1.0 min	59.2	77	64.9	52.2
6/8/2022 12:21	1.0 min	55.8	73.6	62.7	47.4
6/8/2022 12:22	1.0 min	58.8	76.6	66.1	49.5
6/8/2022 12:23	1.0 min	67.4	85.2	80.6	51.9
6/8/2022 12:24	1.0 min	57.6	75.4	63.1	46.5
6/8/2022 12:25	1.0 min	55.3	73.1	62	48.7
6/8/2022 12:26	1.0 min	60.3	78.1	66	49.9
6/8/2022 12:27	1.0 min	57.3	75.1	63	46.3
6/8/2022 12:28	1.0 min	59.9	77.7	65.8	49.5
6/8/2022 12:29	1.0 min	59.5	77.3	64.5	47.1
6/8/2022 12:30	14 sec	56.8	68.3	60.2	46.4

	L_{eq}	L_{max}	L_{min}
	60.1	80.6	46.3

LT1

End Time	Duration	LAeq	LAmax	LAmin
9:47:00 AM	0:00:17	57.7	65.9	45.5
9:48:00 AM	0:01:00	82.9	94.8	54.7
9:49:00 AM	0:01:00	71.3	89.4	46.9
9:50:00 AM	0:01:00	61.9	74.4	43.7
9:51:00 AM	0:01:00	51.6	59.6	42.9
9:52:00 AM	0:01:00	46.5	57.3	40.8
9:53:00 AM	0:01:00	43	48.7	37.8
9:54:00 AM	0:01:00	45.8	49	41.4
9:55:00 AM	0:01:00	44.2	48.3	38.5
9:56:00 AM	0:01:00	46.6	52.4	38.3
9:57:00 AM	0:01:00	47.3	52.9	41.4
9:58:00 AM	0:01:00	47.6	53.5	42.8
9:59:00 AM	0:01:00	47.8	52	38.5
10:00:00 AM	0:01:00	44.3	49.7	37.3
10:01:00 AM	0:01:00	42.8	47.2	38.5
10:02:00 AM	0:01:00	45.8	50	39
10:03:00 AM	0:01:00	46.5	49.8	40.9
10:04:00 AM	0:01:00	44.9	49.8	37.9
10:05:00 AM	0:01:00	45.3	49.1	39.4
10:06:00 AM	0:01:00	45.3	51.7	38.1
10:07:00 AM	0:01:00	46.1	49.1	38.3
10:08:00 AM	0:01:00	44.1	49.2	37
10:09:00 AM	0:01:00	45.6	52.8	36.9
10:10:00 AM	0:01:00	52	60.2	39.2
10:11:00 AM	0:01:00	48.8	52.4	43.3
10:12:00 AM	0:01:00	49.6	59.3	41.6
10:13:00 AM	0:01:00	46	53.1	35.8
10:14:00 AM	0:01:00	44.8	47.9	40.7
10:15:00 AM	0:01:00	45.9	52.4	39
10:16:00 AM	0:01:00	49.2	53	44.2
10:17:00 AM	0:01:00	42.8	48.3	38.4
10:18:00 AM	0:01:00	49.5	55.9	41.1
10:19:00 AM	0:01:00	49.5	60.5	41.9
10:20:00 AM	0:01:00	51.3	57.5	45.6
10:21:00 AM	0:01:00	45.4	50.4	39.7
10:22:00 AM	0:01:00	48.1	57.2	39.8
10:23:00 AM	0:01:00	50.9	55.9	40.9
10:24:00 AM	0:01:00	48.9	53.8	42
10:25:00 AM	0:01:00	49	53.8	44.1
10:26:00 AM	0:01:00	49.1	58.1	38.8
10:27:00 AM	0:01:00	64.5	77	38.6
10:28:00 AM	0:01:00	46.6	52.9	37.9
10:29:00 AM	0:01:00	44.6	51.9	36.6
10:30:00 AM	0:01:00	44.2	50.3	39

10:31:00 AM	0:01:00	45.6	51.3	37.1
10:32:00 AM	0:01:00	45.9	50.5	38.3
10:33:00 AM	0:01:00	43.8	49.8	35.5
10:34:00 AM	0:01:00	47.2	52.7	36.5
10:35:00 AM	0:01:00	42	48.2	35.8
10:36:00 AM	0:01:00	47.3	51.9	40.2
10:37:00 AM	0:01:00	45.1	58.1	35.4
10:38:00 AM	0:01:00	44.3	48.5	39.1
10:39:00 AM	0:01:00	41.6	46.7	36.5
10:40:00 AM	0:01:00	65.7	78.9	40.1
10:41:00 AM	0:01:00	50	62.1	42.6
10:42:00 AM	0:01:00	44.8	48.7	36.2
10:43:00 AM	0:01:00	45	49.2	40.1
10:44:00 AM	0:01:00	40.8	45.8	35.1
10:45:00 AM	0:01:00	73.3	84.2	40.7
10:46:00 AM	0:01:00	48.1	60.2	39.7
10:47:00 AM	0:01:00	51	59.6	38.2
10:48:00 AM	0:01:00	49.8	54.2	38.7
10:49:00 AM	0:01:00	45.6	50.5	37.8
10:50:00 AM	0:01:00	43.5	48.9	36.6
10:51:00 AM	0:01:00	47.1	50.4	37.7
10:52:00 AM	0:01:00	43.5	49.8	38.3
10:53:00 AM	0:01:00	45.8	49.9	39
10:54:00 AM	0:01:00	44.3	48.2	40.2
10:55:00 AM	0:01:00	46.7	51.4	39
10:56:00 AM	0:01:00	50.1	61.7	39.7
10:57:00 AM	0:01:00	42.8	50.8	34.7
10:58:00 AM	0:01:00	44	49.6	37.7
10:59:00 AM	0:01:00	43.5	56.8	34.3
11:00:00 AM	0:01:00	50.9	64.9	34.3
11:01:00 AM	0:01:00	44.3	49.9	37.7
11:02:00 AM	0:01:00	46.6	55.5	36.2
11:03:00 AM	0:01:00	42.3	50.7	35.9
11:04:00 AM	0:01:00	46.5	54.4	36.5
11:05:00 AM	0:01:00	44.7	49	37.6
11:06:00 AM	0:01:00	42.1	47.8	35.1
11:07:00 AM	0:01:00	43.2	48.7	37
11:08:00 AM	0:01:00	43.4	46.8	36.3
11:09:00 AM	0:01:00	48.1	53.2	39.8
11:10:00 AM	0:01:00	42.2	47.8	36.7
11:11:00 AM	0:01:00	44.6	47.5	39.7
11:12:00 AM	0:01:00	42.9	51.9	38.6
11:13:00 AM	0:01:00	46.1	51.3	40.9
11:14:00 AM	0:01:00	44.1	46.7	39.5
11:15:00 AM	0:01:00	43.9	47.9	39.1
11:16:00 AM	0:01:00	45.3	48.8	40.1
11:17:00 AM	0:01:00	44.6	48.6	39.7

11:18:00 AM	0:01:00	44.2	50	38.6
11:19:00 AM	0:01:00	45.5	50.5	38.3
11:20:00 AM	0:01:00	44.8	49.5	38.7
11:21:00 AM	0:01:00	47.7	53.9	37.8
11:22:00 AM	0:01:00	47.2	52.5	43
11:23:00 AM	0:01:00	48.5	53.4	41.9
11:24:00 AM	0:01:00	47.1	54.2	42.5
11:25:00 AM	0:01:00	46.4	51	41.8
11:26:00 AM	0:01:00	46.8	54.2	41.4
11:27:00 AM	0:01:00	47.2	52.2	43.1
11:28:00 AM	0:01:00	45.6	52.2	40.5
11:29:00 AM	0:01:00	40.9	43.1	37.9
11:30:00 AM	0:01:00	44.1	47.9	38.6
11:31:00 AM	0:01:00	47.8	57.4	42.6
11:32:00 AM	0:01:00	42.3	46.8	37.5
11:33:00 AM	0:01:00	46.1	50.4	39.7
11:34:00 AM	0:01:00	46.5	55.6	39.9
11:35:00 AM	0:01:00	44.6	49.7	39.2
11:36:00 AM	0:01:00	45.3	50.5	41
11:37:00 AM	0:01:00	49.8	62.1	39.5
11:38:00 AM	0:01:00	46.4	53.4	39
11:39:00 AM	0:01:00	49.6	53.7	40.5
11:40:00 AM	0:01:00	47.4	52	41.8
11:41:00 AM	0:01:00	50.2	63.6	41.6
11:42:00 AM	0:01:00	50	64.3	39.3
11:43:00 AM	0:01:00	44.2	48.1	38.8
11:44:00 AM	0:01:00	45.6	48.8	40.6
11:45:00 AM	0:01:00	43.9	48	39.6
11:46:00 AM	0:01:00	47.9	53.7	39.5
11:47:00 AM	0:01:00	46.8	53.1	41.1
11:48:00 AM	0:01:00	53.7	60.9	45.9
11:49:00 AM	0:01:00	46.7	56.1	36.9
11:50:00 AM	0:01:00	42.8	48.4	38
11:51:00 AM	0:01:00	45.9	50.3	40
11:52:00 AM	0:01:00	43.5	47.5	39.2
11:53:00 AM	0:01:00	44.5	50.9	38.6
11:54:00 AM	0:01:00	43.3	47.7	39.2
11:55:00 AM	0:01:00	43.8	49.4	37.2
11:56:00 AM	0:01:00	52.7	63.8	39.9
11:57:00 AM	0:01:00	44.1	48.6	39.3
11:58:00 AM	0:01:00	47.2	53.8	41.1
11:59:00 AM	0:01:00	43.7	48.8	37.2
12:00:00 PM	0:01:00	43.3	47.3	38.9
12:01:00 PM	0:01:00	43.4	47	37.7
12:02:00 PM	0:01:00	47.8	55.6	40.3
12:03:00 PM	0:01:00	45.9	51.9	37.8
12:04:00 PM	0:01:00	45.7	51.2	39.9

12:05:00 PM	0:01:00	43.2	46.6	39.8
12:06:00 PM	0:01:00	45.6	50.7	39.2
12:07:00 PM	0:01:00	41.3	45.8	37.2
12:08:00 PM	0:01:00	43.4	47.7	39
12:09:00 PM	0:01:00	44	51.9	38.6
12:10:00 PM	0:01:00	47.3	54.8	39.7
12:11:00 PM	0:01:00	43.9	48.3	38.6
12:12:00 PM	0:01:00	44.2	50	39.4
12:13:00 PM	0:01:00	46.8	50.8	41.1
12:14:00 PM	0:01:00	49.9	56.3	40.3
12:15:00 PM	0:01:00	46.2	50.4	41.9
12:16:00 PM	0:01:00	42.9	47.2	35.8
12:17:00 PM	0:01:00	45.2	49.9	40.3
12:18:00 PM	0:01:00	44.6	48.6	38.7
12:19:00 PM	0:01:00	44.9	48.6	38.1
12:20:00 PM	0:01:00	46.4	49.3	41.2
12:21:00 PM	0:01:00	45.3	52.2	38.7
12:22:00 PM	0:01:00	46.6	52.7	39.8
12:23:00 PM	0:01:00	44.1	50.4	37.6
12:24:00 PM	0:01:00	43.2	46.4	37.9
12:25:00 PM	0:01:00	46.4	55.5	38.8
12:26:00 PM	0:01:00	45.4	50.6	40.1
12:27:00 PM	0:01:00	46	52.7	37.8
12:28:00 PM	0:01:00	49	56.1	40.6
12:29:00 PM	0:01:00	45.9	50.8	39.1
12:30:00 PM	0:01:00	51.9	57.9	41.4
12:31:00 PM	0:01:00	43.4	48.6	38.3
12:32:00 PM	0:01:00	44.5	49.9	37.9
12:33:00 PM	0:01:00	45.2	52.3	39.8
12:34:00 PM	0:01:00	42.2	47.7	35.1
12:35:00 PM	0:01:00	47.9	52.1	42
12:36:00 PM	0:01:00	44.4	52.4	36.7
12:37:00 PM	0:01:00	45.1	51.4	39.6
12:38:00 PM	0:01:00	40.7	48	35.5
12:39:00 PM	0:01:00	46.1	49.8	41
12:40:00 PM	0:01:00	46	54.2	39.6
12:41:00 PM	0:01:00	45.4	50.8	38.5
12:42:00 PM	0:01:00	42.8	47.5	37.6
12:43:00 PM	0:01:00	43.7	48.4	38.1
12:44:00 PM	0:01:00	42.2	45.8	37.6
12:45:00 PM	0:01:00	44.8	50.8	35.6
12:46:00 PM	0:01:00	45.8	51.5	39.8
12:47:00 PM	0:01:00	45.7	52	38
12:48:00 PM	0:01:00	50.5	60.2	40.9
12:49:00 PM	0:01:00	43	47.9	37.9
12:50:00 PM	0:01:00	46.6	51.8	40.3
12:51:00 PM	0:01:00	50	55.9	43

12:52:00 PM	0:01:00	47.1	53	43.2
12:53:00 PM	0:01:00	45.2	51.8	37.3
12:54:00 PM	0:01:00	44.5	49.4	37.2
12:55:00 PM	0:01:00	44.5	49.5	39.1
12:56:00 PM	0:01:00	49.3	62.5	40
12:57:00 PM	0:01:00	46.2	51.8	40.4
12:58:00 PM	0:01:00	52.3	53.4	51.1
12:59:00 PM	0:01:00	50.4	57.9	41.4
1:00:00 PM	0:01:00	49.9	56.8	41.1
1:01:00 PM	0:01:00	48	55.1	40.7
1:02:00 PM	0:01:00	46.4	52.4	39.8
1:03:00 PM	0:01:00	50.3	58.8	41.1
1:04:00 PM	0:01:00	44.3	49.8	39.3
1:05:00 PM	0:01:00	47.2	54.2	39.6
1:06:00 PM	0:01:00	46.3	53.8	37.4
1:07:00 PM	0:01:00	43.7	52.4	36.5
1:08:00 PM	0:01:00	49.2	62.8	39.5
1:09:00 PM	0:01:00	74.5	86	39.9
1:10:00 PM	0:01:00	56.3	59.7	51.2
1:11:00 PM	0:01:00	55.8	60.1	52.1
1:12:00 PM	0:01:00	63	71.6	42.8
1:13:00 PM	0:01:00	50	55.6	42.1
1:14:00 PM	0:01:00	47.6	52	41
1:15:00 PM	0:01:00	46.2	55	38.3
1:16:00 PM	0:01:00	42.4	47.6	37.4
1:17:00 PM	0:01:00	47.5	52.5	40.8
1:18:00 PM	0:01:00	45.4	51.1	36.8
1:19:00 PM	0:01:00	43.6	49.3	37.8
1:20:00 PM	0:01:00	41.6	50.1	36.7
1:21:00 PM	0:01:00	45.8	50.8	39.2
1:22:00 PM	0:01:00	45.2	50.7	36.1
1:23:00 PM	0:01:00	49.1	56.4	41.4
1:24:00 PM	0:01:00	59.8	73.6	37.6
1:25:00 PM	0:01:00	46.6	53.6	40.3
1:26:00 PM	0:01:00	43.9	51.4	37.7
1:27:00 PM	0:01:00	43.1	50.2	39.3
1:28:00 PM	0:01:00	50.5	58.4	42.8
1:29:00 PM	0:01:00	62.3	77.3	46.1
1:30:00 PM	0:01:00	47.5	53.2	43.6
1:31:00 PM	0:01:00	46.2	50.8	37.2
1:32:00 PM	0:01:00	48	53	39.8
1:33:00 PM	0:01:00	42.1	47.3	36.9
1:34:00 PM	0:01:00	48.4	55.6	38.1
1:35:00 PM	0:01:00	42.7	48.6	36.3
1:36:00 PM	0:01:00	45.8	52.6	35.8
1:37:00 PM	0:01:00	43.6	49.3	38.4
1:38:00 PM	0:01:00	47	53.1	37

1:39:00 PM	0:01:00	47.7	53.5	41
1:40:00 PM	0:01:00	47.2	54.8	40.1
1:41:00 PM	0:01:00	46.7	51.6	40.2
1:42:00 PM	0:01:00	42.4	48.4	36.2
1:43:00 PM	0:01:00	46.5	52	41.9
1:44:00 PM	0:01:00	48.1	57.3	38.9
1:45:00 PM	0:01:00	52.7	65.8	44
1:46:00 PM	0:01:00	45.6	52.3	37.5
1:47:00 PM	0:01:00	51.1	59.6	40.6
1:48:00 PM	0:01:00	46.5	52	41.2
1:49:00 PM	0:01:00	46.8	55.8	39.5
1:50:00 PM	0:01:00	48	55.4	41.2
1:51:00 PM	0:01:00	47.5	55.2	39.5
1:52:00 PM	0:01:00	46.1	51.5	38
1:53:00 PM	0:01:00	46.5	56.3	37.5
1:54:00 PM	0:01:00	46.5	52.6	40.1
1:55:00 PM	0:01:00	43.9	48.8	39.9
1:56:00 PM	0:01:00	44.9	50	38.1
1:57:00 PM	0:01:00	43.6	50.8	36.8
1:58:00 PM	0:01:00	46.2	52.3	41.2
1:59:00 PM	0:01:00	43.1	49.9	36.8
2:00:00 PM	0:01:00	52	57.4	42.5
2:01:00 PM	0:01:00	48.5	56.9	38.9
2:02:00 PM	0:01:00	43.8	48.9	36.8
2:03:00 PM	0:01:00	47.3	53.6	39.9
2:04:00 PM	0:01:00	43.5	50.4	37.4
2:05:00 PM	0:01:00	50	54.7	41.9
2:06:00 PM	0:01:00	40.5	46.6	37
2:07:00 PM	0:01:00	47.1	50.8	39.7
2:08:00 PM	0:01:00	47.4	54.9	38.3
2:09:00 PM	0:01:00	45.6	52.6	39.8
2:10:00 PM	0:01:00	48.6	54.1	38
2:11:00 PM	0:01:00	41.4	49.2	36.8
2:12:00 PM	0:01:00	44.9	49.4	37
2:13:00 PM	0:01:00	46.2	50.8	37.6
2:14:00 PM	0:01:00	47	52.3	39.3
2:15:00 PM	0:01:00	43.4	48.2	38.9
2:16:00 PM	0:01:00	45.9	50	40.9
2:17:00 PM	0:01:00	43.4	49.2	37.7
2:18:00 PM	0:01:00	47.3	51.2	38.3
2:19:00 PM	0:01:00	45.5	50.9	38.2
2:20:00 PM	0:01:00	47.4	52.3	39.4
2:21:00 PM	0:01:00	47.2	51.4	41.7
2:22:00 PM	0:01:00	47.9	52.8	42.2
2:23:00 PM	0:01:00	46.5	51.9	39.6
2:24:00 PM	0:01:00	45.8	51.5	36.6
2:25:00 PM	0:01:00	46.3	50.8	37.9

2:26:00 PM	0:01:00	46	52.3	35.6
2:27:00 PM	0:01:00	47.7	52.8	40.2
2:28:00 PM	0:01:00	43.9	49.4	36.8
2:29:00 PM	0:01:00	44.7	49.5	39.5
2:30:00 PM	0:01:00	44.3	48.7	39.1
2:31:00 PM	0:01:00	46	52.3	38.7
2:32:00 PM	0:01:00	48.5	60.8	40.7
2:33:00 PM	0:01:00	50.1	56.9	40.1
2:34:00 PM	0:01:00	51.8	59.4	40
2:35:00 PM	0:01:00	45.3	50.5	37.2
2:36:00 PM	0:01:00	49	54.7	40.5
2:37:00 PM	0:01:00	44.8	49.3	39.1
2:38:00 PM	0:01:00	47.3	52.2	40.8
2:39:00 PM	0:01:00	52	62.7	42.7
2:40:00 PM	0:01:00	46.4	53.1	40
2:41:00 PM	0:01:00	44	51.3	38.7
2:42:00 PM	0:01:00	48.8	57.3	38.5
2:43:00 PM	0:01:00	45.2	52.1	36.7
2:44:00 PM	0:01:00	45.1	50.9	34.8
2:45:00 PM	0:01:00	46.7	52.5	38.4
2:46:00 PM	0:01:00	45.1	53.4	37
2:47:00 PM	0:01:00	44.7	49.1	39.4
2:48:00 PM	0:01:00	42.7	47.9	36.5
2:49:00 PM	0:01:00	45.9	51.6	36.8
2:50:00 PM	0:01:00	46.9	51	36.2
2:51:00 PM	0:01:00	47.6	53.6	40.8
2:52:00 PM	0:01:00	46.7	54.8	36.1
2:53:00 PM	0:01:00	48	55.1	40.7
2:54:00 PM	0:01:00	47.8	51.8	39.3
2:55:00 PM	0:01:00	46.6	50.5	39.4
2:56:00 PM	0:01:00	45.3	50.2	38.9
2:57:00 PM	0:01:00	51.5	62.4	36.9
2:58:00 PM	0:01:00	47.7	53.9	39.6
2:59:00 PM	0:01:00	45.8	52.8	36.9
3:00:00 PM	0:01:00	46.4	52.1	35.6
3:01:00 PM	0:01:00	45.6	51.4	36.7
3:02:00 PM	0:01:00	45.2	49.1	39.2
3:03:00 PM	0:01:00	45.3	50.2	39.3
3:04:00 PM	0:01:00	46.9	52	39
3:05:00 PM	0:01:00	45.9	53.5	38.1
3:06:00 PM	0:01:00	48.6	55.1	38.8
3:07:00 PM	0:01:00	44.2	50.9	37.4
3:08:00 PM	0:01:00	48.1	58.8	37.4
3:09:00 PM	0:01:00	47.5	53.2	37.9
3:10:00 PM	0:01:00	47.5	52.1	39.9
3:11:00 PM	0:01:00	44.1	47.7	40.9
3:12:00 PM	0:01:00	48.8	56.3	39.2

3:13:00 PM	0:01:00	46.6	52.3	40.8
3:14:00 PM	0:01:00	45.2	51.7	37.2
3:15:00 PM	0:01:00	46.8	54.7	40.4
3:16:00 PM	0:01:00	49.5	57.3	41.1
3:17:00 PM	0:01:00	50.2	57.9	40.8
3:18:00 PM	0:01:00	54.6	68.8	37.8
3:19:00 PM	0:01:00	50.7	65.9	38.4
3:20:00 PM	0:01:00	46.4	55.6	39.8
3:21:00 PM	0:01:00	46.6	51.5	39
3:22:00 PM	0:01:00	43.2	46.9	36.2
3:23:00 PM	0:01:00	45.4	49.7	37.5
3:24:00 PM	0:01:00	44.3	53.1	38.6
3:25:00 PM	0:01:00	45.3	49.7	37.9
3:26:00 PM	0:01:00	43.7	48.7	36.7
3:27:00 PM	0:01:00	42.7	48.8	35.8
3:28:00 PM	0:01:00	44.1	48.3	37.7
3:29:00 PM	0:01:00	42.3	46.8	37.3
3:30:00 PM	0:01:00	45.8	48.8	39.4
3:31:00 PM	0:01:00	45.3	51.4	37.8
3:32:00 PM	0:01:00	46	51.6	39.3
3:33:00 PM	0:01:00	42.7	46.3	37.5
3:34:00 PM	0:01:00	43.1	48.9	36.9
3:35:00 PM	0:01:00	44.6	49.4	38.7
3:36:00 PM	0:01:00	44.7	51.7	38.1
3:37:00 PM	0:01:00	43.8	50.6	39.9
3:38:00 PM	0:01:00	49	55.8	40.2
3:39:00 PM	0:01:00	40.6	44.7	37.1
3:40:00 PM	0:01:00	45.4	48.9	42
3:41:00 PM	0:01:00	46.4	54.5	38.6
3:42:00 PM	0:01:00	46.3	54.9	35.9
3:43:00 PM	0:01:00	44.8	51.6	37.6
3:44:00 PM	0:01:00	42.4	46.8	37.8
3:45:00 PM	0:01:00	48.3	53.5	39.7
3:46:00 PM	0:01:00	46.4	51	41.2
3:47:00 PM	0:01:00	44.8	51	34.6
3:48:00 PM	0:01:00	44.3	52.5	38.3
3:49:00 PM	0:01:00	43.9	47.5	40.4
3:50:00 PM	0:01:00	44.6	47.6	41.4
3:51:00 PM	0:01:00	45.5	50.6	40.9
3:52:00 PM	0:01:00	47	54.9	41.3
3:53:00 PM	0:01:00	45	52.2	41.9
3:54:00 PM	0:01:00	44.8	49.3	41.2
3:55:00 PM	0:01:00	62	75.4	44.8
3:56:00 PM	0:01:00	55.8	74	42.3
3:57:00 PM	0:01:00	47.3	51.7	43.7
3:58:00 PM	0:01:00	47.3	58.1	40.6
3:59:00 PM	0:01:00	49.7	60.4	40.7

4:00:00 PM	0:01:00	63.1	76	43.7
4:01:00 PM	0:01:00	47.9	60.4	37.2
4:02:00 PM	0:01:00	42.7	49.3	35.8
4:03:00 PM	0:01:00	45.2	50.8	38.1
4:04:00 PM	0:01:00	43.2	49.2	36.9
4:05:00 PM	0:01:00	42.1	45.7	38.2
4:06:00 PM	0:01:00	46.4	54.3	38.7
4:07:00 PM	0:01:00	43.7	49.5	35.1
4:08:00 PM	0:01:00	41.8	50	38.2
4:09:00 PM	0:01:00	45.6	50.6	37
4:10:00 PM	0:01:00	46.2	54.6	38.8
4:11:00 PM	0:01:00	51.6	61.2	39.9
4:12:00 PM	0:01:00	44.5	50.3	39.7
4:13:00 PM	0:01:00	43.6	48.4	37
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4:17:00 PM	0:01:00	41.2	45.9	37.8
4:18:00 PM	0:01:00	47.5	54.5	40.8
4:19:00 PM	0:01:00	44.3	55.3	38.8
4:20:00 PM	0:01:00	47.1	54.7	38.1
4:21:00 PM	0:01:00	49.2	59.2	37.6
4:22:00 PM	0:01:00	49.1	56.7	43.6
4:23:00 PM	0:01:00	50.7	60.6	42
4:24:00 PM	0:01:00	49.9	60	42
4:25:00 PM	0:01:00	48.3	57.7	43.4
4:26:00 PM	0:01:00	49.1	54.2	42.7
4:27:00 PM	0:01:00	53	59.5	41.6
4:28:00 PM	0:01:00	54	68.4	39.8
4:29:00 PM	0:01:00	44.2	48.9	37.1
4:30:00 PM	0:01:00	44.4	49.6	38.8
4:31:00 PM	0:01:00	53.2	61.3	38.5
4:32:00 PM	0:01:00	45	54.6	40.1
4:33:00 PM	0:01:00	47.7	54.8	41.6
4:34:00 PM	0:01:00	43.8	49.7	37.4
4:35:00 PM	0:01:00	48.2	55.1	40.2
4:36:00 PM	0:01:00	62.9	76.7	36.1
4:37:00 PM	0:01:00	47	52.4	35.8
4:38:00 PM	0:01:00	44.7	48.3	39.1
4:39:00 PM	0:01:00	46.4	52.4	38.4
4:40:00 PM	0:01:00	44.7	48.2	38.3
4:41:00 PM	0:01:00	50.8	57.2	37.7
4:42:00 PM	0:01:00	42.6	52.4	37.5
4:43:00 PM	0:01:00	45.5	50	40.2
4:44:00 PM	0:01:00	48	50.6	43.6
4:45:00 PM	0:01:00	48.8	52.5	44
4:46:00 PM	0:01:00	49.5	54.4	45.2

4:47:00 PM	0:01:00	66.5	75.6	45.4
4:48:00 PM	0:01:00	48.9	52.8	43.5
4:49:00 PM	0:01:00	45.3	48.2	41.5
4:50:00 PM	0:01:00	47.8	51.4	42.1
4:51:00 PM	0:01:00	47.5	51.1	44.1
4:52:00 PM	0:01:00	47.6	56.8	42.3
4:53:00 PM	0:01:00	47.4	50.3	43.6
4:54:00 PM	0:01:00	47	53.9	42.6
4:55:00 PM	0:01:00	49.2	53.6	43.3
4:56:00 PM	0:01:00	47.8	52.7	43.9
4:57:00 PM	0:01:00	49.1	53.7	42.9
4:58:00 PM	0:01:00	53.1	61.2	43.8
4:59:00 PM	0:01:00	49.2	53.9	45.8
5:00:00 PM	0:01:00	55.7	59.9	46.1
5:01:00 PM	0:01:00	57.8	58.6	57.1
5:02:00 PM	0:01:00	57.3	57.9	56.8
5:03:00 PM	0:01:00	57.6	59.1	56.8
5:04:00 PM	0:01:00	57.2	57.8	56.8
5:05:00 PM	0:01:00	57.4	57.9	57
5:06:00 PM	0:01:00	57.4	58.3	57
5:07:00 PM	0:01:00	57.1	57.8	56.7
5:08:00 PM	0:01:00	57.5	58.1	57
5:09:00 PM	0:01:00	57.8	61	56.9
5:10:00 PM	0:01:00	57.4	58.1	56.7
5:11:00 PM	0:01:00	57.4	57.8	56.9
5:12:00 PM	0:01:00	57.8	61.3	57
5:13:00 PM	0:01:00	57.4	58.1	56.8
5:14:00 PM	0:01:00	58	60.4	57.1
5:15:00 PM	0:01:00	57.5	58	57.2
5:16:00 PM	0:01:00	57.6	59.1	57
5:17:00 PM	0:01:00	57.4	58.4	56.9
5:18:00 PM	0:01:00	57.3	57.7	57
5:19:00 PM	0:01:00	57.2	57.7	56.8
5:20:00 PM	0:01:00	57.3	57.8	56.9
5:21:00 PM	0:01:00	57.3	57.7	56.9
5:22:00 PM	0:01:00	57.4	60.7	56.9
5:23:00 PM	0:01:00	57.1	57.5	56.7
5:24:00 PM	0:01:00	57.5	59.9	56.7
5:25:00 PM	0:01:00	57.2	57.7	56.9
5:26:00 PM	0:01:00	57.3	58.3	56.9
5:27:00 PM	0:01:00	57.3	58.2	56.9
5:28:00 PM	0:01:00	57.6	61.1	56.9
5:29:00 PM	0:01:00	57.1	57.6	56.8
5:30:00 PM	0:01:00	57.2	57.7	56.9
5:31:00 PM	0:01:00	57.9	62.4	57.1
5:32:00 PM	0:01:00	57.1	57.6	56.9
5:33:00 PM	0:01:00	57.3	57.9	56.9

5:34:00 PM	0:01:00	57.1	57.4	56.8
5:35:00 PM	0:01:00	57.9	61.5	56.9
5:36:00 PM	0:01:00	58.7	66.6	57
5:37:00 PM	0:01:00	57.7	58.5	56.8
5:38:00 PM	0:01:00	57.4	57.8	57.2
5:39:00 PM	0:01:00	57.4	58.2	57
5:40:00 PM	0:01:00	58.9	69.3	57
5:41:00 PM	0:01:00	62.8	75	57
5:42:00 PM	0:01:00	57.7	60.1	57.2
5:43:00 PM	0:01:00	58	62.1	57.1
5:44:00 PM	0:01:00	59.8	66.6	57
5:45:00 PM	0:01:00	57.2	57.7	56.8
5:46:00 PM	0:01:00	57.8	61.3	56.8
5:47:00 PM	0:01:00	58.4	64.4	57
5:48:00 PM	0:01:00	59.3	66.5	57.1
5:49:00 PM	0:01:00	58.2	63.3	56.8
5:50:00 PM	0:01:00	58.2	65	57
5:51:00 PM	0:01:00	57.2	57.8	56.8
5:52:00 PM	0:01:00	57.9	66.7	56.9
5:53:00 PM	0:01:00	57.2	58.2	56.7
5:54:00 PM	0:01:00	55.8	59.7	36.2
5:55:00 PM	0:01:00	45	52.1	35.8
5:56:00 PM	0:01:00	46.2	59.2	39.9
5:57:00 PM	0:01:00	44.2	48.8	38.9
5:58:00 PM	0:01:00	42.3	48.3	36.9
5:59:00 PM	0:01:00	44.3	49.3	37.7
6:00:00 PM	0:01:00	42.7	47.3	35.7
6:01:00 PM	0:01:00	43.7	49.2	35.8
6:02:00 PM	0:01:00	45.6	52.6	38.6
6:03:00 PM	0:01:00	43.3	47.5	36
6:04:00 PM	0:01:00	45	49.6	41.1
6:05:00 PM	0:01:00	42.2	47.2	36.5
6:06:00 PM	0:01:00	43.4	48.3	36.4
6:07:00 PM	0:01:00	42.8	46.9	37.8
6:08:00 PM	0:01:00	42.9	47.6	37.4
6:09:00 PM	0:01:00	45.2	51.7	38.7
6:10:00 PM	0:01:00	45.3	51.4	39
6:11:00 PM	0:01:00	44.4	51.7	37.7
6:12:00 PM	0:01:00	45.8	50.1	36
6:13:00 PM	0:01:00	45.9	52.9	36.8
6:14:00 PM	0:01:00	42.9	48.7	37.3
6:15:00 PM	0:01:00	44.3	48.2	39.3
6:16:00 PM	0:01:00	43.1	48.2	36.7
6:17:00 PM	0:01:00	43.2	48.5	38.4
6:18:00 PM	0:01:00	45.6	51.8	38.3
6:19:00 PM	0:01:00	45.5	50.3	35.1
6:20:00 PM	0:01:00	43.7	47.5	37.8

6:21:00 PM	0:01:00	41.7	46	34.9
6:22:00 PM	0:01:00	44.5	49.6	39.4
6:23:00 PM	0:01:00	45.5	50.4	37.8
6:24:00 PM	0:01:00	43	48.1	35.9
6:25:00 PM	0:01:00	41.6	46.9	36.9
6:26:00 PM	0:01:00	40.4	44.5	35.9
6:27:00 PM	0:01:00	44.5	48.6	38
6:28:00 PM	0:01:00	44.2	52.1	38.6
6:29:00 PM	0:01:00	42.6	48.9	36.6
6:30:00 PM	0:01:00	51.4	60.8	38.9
6:31:00 PM	0:01:00	46	50.5	40.2
6:32:00 PM	0:01:00	54.7	69.4	37.2
6:33:00 PM	0:01:00	44	48	36.4
6:34:00 PM	0:01:00	44.3	50.5	38.5
6:35:00 PM	0:01:00	44.5	56.3	37.3
6:36:00 PM	0:01:00	44.2	49.7	36.4
6:37:00 PM	0:01:00	66	78.3	44.6
6:38:00 PM	0:01:00	48.3	56.1	34.5
6:39:00 PM	0:01:00	42.2	47.4	35.4
6:40:00 PM	0:01:00	45	50.7	40.6
6:41:00 PM	0:01:00	43.4	47.7	37.3
6:42:00 PM	0:01:00	41.5	46.6	36.7
6:43:00 PM	0:01:00	43.3	46.6	37.6
6:44:00 PM	0:01:00	43.2	50.3	37.2
6:45:00 PM	0:01:00	46.1	54.9	37.7
6:46:00 PM	0:01:00	50	63.8	37.4
6:47:00 PM	0:01:00	41.6	46.3	35.5
6:48:00 PM	0:01:00	43.9	48.9	38.4
6:49:00 PM	0:01:00	39.8	45.5	33.6
6:50:00 PM	0:01:00	47.8	58	33.1
6:51:00 PM	0:01:00	46.3	50	37.6
6:52:00 PM	0:01:00	46.6	53.1	38.2
6:53:00 PM	0:01:00	47.4	51	39
6:54:00 PM	0:01:00	43.9	49.2	37.5
6:55:00 PM	0:01:00	44.1	50.6	36.5
6:56:00 PM	0:01:00	45.9	50.3	38.3
6:57:00 PM	0:01:00	45.3	51.9	37.8
6:58:00 PM	0:01:00	45.3	51.1	37.2
6:59:00 PM	0:01:00	46.4	51.8	37.8
7:00:00 PM	0:01:00	43.4	52	38.6
7:01:00 PM	0:01:00	43.2	48.8	37.6
7:02:00 PM	0:01:00	42.8	47.4	38.6
7:03:00 PM	0:01:00	45.7	52.4	39.1
7:04:00 PM	0:01:00	48.1	52.1	43.2
7:05:00 PM	0:01:00	42.2	50.7	36.2
7:06:00 PM	0:01:00	43.7	48	36.1
7:07:00 PM	0:01:00	53.3	70	37.6

7:08:00 PM	0:01:00	45.2	50.2	38.1
7:09:00 PM	0:01:00	46.7	52.3	41.1
7:10:00 PM	0:01:00	52	66.2	40.5
7:11:00 PM	0:01:00	57.9	72.5	45.4
7:12:00 PM	0:01:00	53	60.2	43.6
7:13:00 PM	0:01:00	50.1	57.7	45.5
7:14:00 PM	0:01:00	42.8	46.9	37.2
7:15:00 PM	0:01:00	50	54.4	43.5
7:16:00 PM	0:01:00	42	47.7	37.9
7:17:00 PM	0:01:00	45.9	50.3	38.3
7:18:00 PM	0:01:00	46.3	51.1	35.8
7:19:00 PM	0:01:00	46.5	53.6	35.9
7:20:00 PM	0:01:00	49.1	54.9	43
7:21:00 PM	0:01:00	51.1	66.8	38.5
7:22:00 PM	0:01:00	47.9	52.5	44.8
7:23:00 PM	0:01:00	46	53.6	35.4
7:24:00 PM	0:01:00	49.1	58.2	43.1
7:25:00 PM	0:01:00	56	69.3	37.4
7:26:00 PM	0:01:00	66.5	78.3	36.2
7:27:00 PM	0:01:00	43.1	48.3	37.5
7:28:00 PM	0:01:00	44.6	49.4	38.8
7:29:00 PM	0:01:00	45.5	48.7	40.3
7:30:00 PM	0:01:00	45.8	50.6	40.3
7:31:00 PM	0:01:00	53.3	63.6	39.6
7:32:00 PM	0:01:00	46.9	52.7	38.8
7:33:00 PM	0:01:00	48.2	52.1	43.1
7:34:00 PM	0:01:00	47.3	52.7	36.3
7:35:00 PM	0:01:00	66.9	80.7	44.5
7:36:00 PM	0:01:00	46.5	50.7	39.4
7:37:00 PM	0:01:00	47.4	52.5	41.4
7:38:00 PM	0:01:00	49.4	53.5	41.2
7:39:00 PM	0:01:00	43.7	50.4	37
7:40:00 PM	0:01:00	48.1	52.4	41.9
7:41:00 PM	0:01:00	53.4	61	42.6
7:42:00 PM	0:01:00	43.6	49	38.9
7:43:00 PM	0:01:00	42.4	47.9	37.5
7:44:00 PM	0:01:00	46.9	53.5	39
7:45:00 PM	0:01:00	45.3	53.5	37.8
7:46:00 PM	0:01:00	45.9	49.7	41.2
7:47:00 PM	0:01:00	44.4	54.3	38.1
7:48:00 PM	0:01:00	46.8	54.9	42.3
7:49:00 PM	0:01:00	46.3	51.4	40.3
7:50:00 PM	0:01:00	46.2	50.8	38.7
7:51:00 PM	0:01:00	44.7	48.8	37.3
7:52:00 PM	0:01:00	53	63.2	37.1
7:53:00 PM	0:01:00	46.8	58.6	41.9
7:54:00 PM	0:01:00	45.7	50.4	37.2

7:55:00 PM	0:01:00	46.1	50.3	41.1
7:56:00 PM	0:01:00	42.5	46.1	39.2
7:57:00 PM	0:01:00	51.7	63.7	42.7
7:58:00 PM	0:01:00	45	51.2	36.2
7:59:00 PM	0:01:00	45.4	50.1	37.5
8:00:00 PM	0:01:00	41.5	45.4	38.3
8:01:00 PM	0:01:00	46.7	53	39.4
8:02:00 PM	0:01:00	44.9	49.3	38.6
8:03:00 PM	0:01:00	49.2	62.4	35.5
8:04:00 PM	0:01:00	47.1	62.3	36
8:05:00 PM	0:01:00	45.6	55.2	35.3
8:06:00 PM	0:01:00	44	52	36.3
8:07:00 PM	0:01:00	38.3	46.6	32.9
8:08:00 PM	0:01:00	44.5	50.2	38.1
8:09:00 PM	0:01:00	40.2	46.8	35.7
8:10:00 PM	0:01:00	47.8	53.6	40.5
8:11:00 PM	0:01:00	38.4	45.1	34.6
8:12:00 PM	0:01:00	47	52.5	34.9
8:13:00 PM	0:01:00	42.2	46.4	35.6
8:14:00 PM	0:01:00	44.1	48.9	36.5
8:15:00 PM	0:01:00	46.4	51.3	35.7
8:16:00 PM	0:01:00	48.9	57.6	36.4
8:17:00 PM	0:01:00	51.3	57.2	41.2
8:18:00 PM	0:01:00	54.1	69.7	42.2
8:19:00 PM	0:01:00	43.4	48.6	36.3
8:20:00 PM	0:01:00	41.7	51.6	34.9
8:21:00 PM	0:01:00	44.1	48	37.6
8:22:00 PM	0:01:00	53	68.3	39.9
8:23:00 PM	0:01:00	49.6	56.5	41.4
8:24:00 PM	0:01:00	46.3	51.4	39.7
8:25:00 PM	0:01:00	45.7	50.2	39.2
8:26:00 PM	0:01:00	47.2	55.3	37.3
8:27:00 PM	0:01:00	43.4	53.3	37.3
8:28:00 PM	0:01:00	48.1	56.4	38.2
8:29:00 PM	0:01:00	44.5	50.5	38.5
8:30:00 PM	0:01:00	43.1	47.1	37.2
8:31:00 PM	0:01:00	47.7	53.4	41.6
8:32:00 PM	0:01:00	50.9	57.8	45.8
8:33:00 PM	0:01:00	46.8	49.7	45.6
8:34:00 PM	0:01:00	50	55.2	47.7
8:35:00 PM	0:01:00	50	55.2	48
8:36:00 PM	0:01:00	48.1	49.3	47.1
8:37:00 PM	0:01:00	54	64.9	47.3
8:38:00 PM	0:01:00	48.5	54.3	47
8:39:00 PM	0:01:00	64.2	79.2	49.5
8:40:00 PM	0:01:00	50.3	57.5	40.8
8:41:00 PM	0:01:00	46.1	53.6	39

8:42:00 PM	0:01:00	46.9	53.3	44.8
8:43:00 PM	0:01:00	59.4	71.5	43.7
8:44:00 PM	0:01:00	46.5	64.4	38.4
8:45:00 PM	0:01:00	44.9	50.1	38.4
8:46:00 PM	0:01:00	43.3	48.2	39.7
8:47:00 PM	0:01:00	46.6	54.2	41.1
8:48:00 PM	0:01:00	43.2	48.4	38.8
8:49:00 PM	0:01:00	42.6	46.6	39.4
8:50:00 PM	0:01:00	48.5	56.4	39.7
8:51:00 PM	0:01:00	41.2	44.3	39.2
8:52:00 PM	0:01:00	46.3	52.6	41.1
8:53:00 PM	0:01:00	50.3	65.7	40.2
8:54:00 PM	0:01:00	48.5	55.8	42.5
8:55:00 PM	0:01:00	45.2	50.3	41.2
8:56:00 PM	0:01:00	47.5	53.4	40.9
8:57:00 PM	0:01:00	44.9	49.8	40
8:58:00 PM	0:01:00	44.3	51.3	39.9
8:59:00 PM	0:01:00	43.6	49.2	40.6
9:00:00 PM	0:01:00	50	65.3	40
9:01:00 PM	0:01:00	45.6	50.9	40.3
9:02:00 PM	0:01:00	45	49.8	40.2
9:03:00 PM	0:01:00	44.3	50.6	40.9
9:04:00 PM	0:01:00	48.1	58	40.9
9:05:00 PM	0:01:00	46.6	56.6	41.3
9:06:00 PM	0:01:00	51.6	67.6	40.1
9:07:00 PM	0:01:00	43.8	52.6	40.2
9:08:00 PM	0:01:00	43.1	47.5	40.3
9:09:00 PM	0:01:00	44.7	48.8	41.7
9:10:00 PM	0:01:00	47.1	53.6	42.7
9:11:00 PM	0:01:00	47.5	55.4	43.2
9:12:00 PM	0:01:00	49.7	58.1	43.4
9:13:00 PM	0:01:00	50.3	55.5	43.2
9:14:00 PM	0:01:00	62.8	79.7	42.7
9:15:00 PM	0:01:00	44.3	47.2	42.2
9:16:00 PM	0:01:00	44.2	48.6	41.2
9:17:00 PM	0:01:00	46.8	52.9	42.4
9:18:00 PM	0:01:00	45.8	52.2	41.2
9:19:00 PM	0:01:00	43.6	48.3	41.4
9:20:00 PM	0:01:00	45.7	49.9	42.5
9:21:00 PM	0:01:00	44.9	49.2	41.3
9:22:00 PM	0:01:00	46.2	51.8	41.7
9:23:00 PM	0:01:00	48.4	55	41.5
9:24:00 PM	0:01:00	48.9	55.1	42.3
9:25:00 PM	0:01:00	46.1	49.5	43.6
9:26:00 PM	0:01:00	48.9	56.2	42.9
9:27:00 PM	0:01:00	47.7	53.6	43.7
9:28:00 PM	0:01:00	42.4	46.2	41.1

9:29:00 PM	0:01:00	44.5	49.8	40.3
9:30:00 PM	0:01:00	47.1	53.7	40.1
9:31:00 PM	0:01:00	48.4	57.1	42
9:32:00 PM	0:01:00	45.4	49.7	42.1
9:33:00 PM	0:01:00	44.8	48.5	42.3
9:34:00 PM	0:01:00	44.4	52.9	41.8
9:35:00 PM	0:01:00	45.6	50.4	43
9:36:00 PM	0:01:00	46.4	54.4	42.3
9:37:00 PM	0:01:00	47	52.2	41.9
9:38:00 PM	0:01:00	46.5	52.8	42.6
9:39:00 PM	0:01:00	44.8	48.3	41.2
9:40:00 PM	0:01:00	44.1	49.3	40.1
9:41:00 PM	0:01:00	43.2	46.8	40.2
9:42:00 PM	0:01:00	45.2	51.3	41.5
9:43:00 PM	0:01:00	48.2	54.7	42.8
9:44:00 PM	0:01:00	53	65.2	42.5
9:45:00 PM	0:01:00	46.8	63.3	42.3
9:46:00 PM	0:01:00	47.4	59.5	40.1
9:47:00 PM	0:01:00	50.8	63	41.9
9:48:00 PM	0:01:00	44.4	51.1	41
9:49:00 PM	0:01:00	45.7	51.4	41.5
9:50:00 PM	0:01:00	46.7	53	42.3
9:51:00 PM	0:01:00	44	46.9	41.8
9:52:00 PM	0:01:00	43.1	46.1	40.8
9:53:00 PM	0:01:00	43.9	49.5	40.5
9:54:00 PM	0:01:00	45.2	50.7	41.1
9:55:00 PM	0:01:00	44.7	50.7	40
9:56:00 PM	0:01:00	44.5	49	41.1
9:57:00 PM	0:01:00	44.3	49.2	41.1
9:58:00 PM	0:01:00	42.6	45.8	40.3
9:59:00 PM	0:01:00	42.1	45.3	40.1
10:00:00 PM	0:01:00	44.8	48.7	40.7
10:01:00 PM	0:01:00	45.8	53.4	41.4
10:02:00 PM	0:01:00	44.8	48.2	41.2
10:03:00 PM	0:01:00	45.6	51.8	41.3
10:04:00 PM	0:01:00	42.9	45.4	40.6
10:05:00 PM	0:01:00	44.7	48.6	41.3
10:06:00 PM	0:01:00	45.5	51	41.6
10:07:00 PM	0:01:00	44.3	49.9	40.7
10:08:00 PM	0:01:00	45.9	53.5	41
10:09:00 PM	0:01:00	42.8	46.2	40.1
10:10:00 PM	0:01:00	44.8	49.3	42.4
10:11:00 PM	0:01:00	46.9	50.8	41.9
10:12:00 PM	0:01:00	45.7	55.2	41.9
10:13:00 PM	0:01:00	44.6	48.3	41.9
10:14:00 PM	0:01:00	44.5	48.4	40.7
10:15:00 PM	0:01:00	43.4	47.4	40.3

10:16:00 PM	0:01:00	48.2	56.7	41.7
10:17:00 PM	0:01:00	44.3	46.8	41.8
10:18:00 PM	0:01:00	46.2	51.1	42.1
10:19:00 PM	0:01:00	44	47.2	40.9
10:20:00 PM	0:01:00	44.5	49	41.7
10:21:00 PM	0:01:00	42.8	45.8	40.5
10:22:00 PM	0:01:00	44.1	54.1	41.4
10:23:00 PM	0:01:00	44.3	52.7	41.2
10:24:00 PM	0:01:00	44.9	47.7	41.7
10:25:00 PM	0:01:00	44.2	52.3	41.5
10:26:00 PM	0:01:00	42.4	45.1	40.7
10:27:00 PM	0:01:00	44.8	47.8	40.4
10:28:00 PM	0:01:00	44	47.6	40.1
10:29:00 PM	0:01:00	43.6	47.7	39.9
10:30:00 PM	0:01:00	43.6	49.1	41.7
10:31:00 PM	0:01:00	46	51.4	41.7
10:32:00 PM	0:01:00	46.1	53.7	42.3
10:33:00 PM	0:01:00	51.3	67	41.8
10:34:00 PM	0:01:00	49.2	52.9	43.6
10:35:00 PM	0:01:00	64.5	78.3	49.3
10:36:00 PM	0:01:00	53.5	63.1	42.2
10:37:00 PM	0:01:00	46.8	53.6	42.8
10:38:00 PM	0:01:00	46.5	49.7	43.5
10:39:00 PM	0:01:00	47.9	54	44.3
10:40:00 PM	0:01:00	45.4	47.7	42.2
10:41:00 PM	0:01:00	46.5	49.1	42.2
10:42:00 PM	0:01:00	47.6	53.7	43.6
10:43:00 PM	0:01:00	50.4	59.5	44.8
10:44:00 PM	0:01:00	48.4	62.3	42
10:45:00 PM	0:01:00	43.6	47.8	40.6
10:46:00 PM	0:01:00	51.3	65.8	42.4
10:47:00 PM	0:01:00	45.3	49.3	43.5
10:48:00 PM	0:01:00	43.1	47	40.9
10:49:00 PM	0:01:00	55.3	64.4	40.3
10:50:00 PM	0:01:00	56.8	57.8	46.8
10:51:00 PM	0:01:00	43.1	46.7	39.7
10:52:00 PM	0:01:00	44.3	46.6	41.5
10:53:00 PM	0:01:00	44	50	41.2
10:54:00 PM	0:01:00	43.7	48.8	41
10:55:00 PM	0:01:00	51.7	63.7	43
10:56:00 PM	0:01:00	44.8	48.3	41.2
10:57:00 PM	0:01:00	45.4	48.1	42.5
10:58:00 PM	0:01:00	48.9	57.3	42.5
10:59:00 PM	0:01:00	45.5	49.4	42
11:00:00 PM	0:01:00	52.3	61.5	42.4
11:01:00 PM	0:01:00	46.8	51.4	44.4
11:02:00 PM	0:01:00	46.1	49.1	43.3

11:03:00 PM	0:01:00	43.2	47	41.4
11:04:00 PM	0:01:00	45.4	50.1	41.7
11:05:00 PM	0:01:00	47.9	54.2	44.2
11:06:00 PM	0:01:00	47.1	51.6	42.2
11:07:00 PM	0:01:00	54	69.6	42
11:08:00 PM	0:01:00	45.7	50	42.9
11:09:00 PM	0:01:00	44.8	48	42.3
11:10:00 PM	0:01:00	45.6	50.4	41.1
11:11:00 PM	0:01:00	45.1	49.3	39.5
11:12:00 PM	0:01:00	43.5	46.2	40.4
11:13:00 PM	0:01:00	50.6	59.8	41.2
11:14:00 PM	0:01:00	43.4	47.7	39.7
11:15:00 PM	0:01:00	43.8	47.3	40.9
11:16:00 PM	0:01:00	44.3	46.2	41.9
11:17:00 PM	0:01:00	43.4	45.1	41.9
11:18:00 PM	0:01:00	58.2	70.6	40.1
11:19:00 PM	0:01:00	54.7	63.1	46.2
11:20:00 PM	0:01:00	47.3	50.5	41.4
11:21:00 PM	0:01:00	43.3	47.1	40.4
11:22:00 PM	0:01:00	45.1	51.3	40.6
11:23:00 PM	0:01:00	46.1	52.4	41.5
11:24:00 PM	0:01:00	56.6	64.5	43.2
11:25:00 PM	0:01:00	42.7	44.6	41
11:26:00 PM	0:01:00	45.4	50.1	42.2
11:27:00 PM	0:01:00	45.6	51.1	42.8
11:28:00 PM	0:01:00	43.7	48.6	41.6
11:29:00 PM	0:01:00	46.3	51.6	42.5
11:30:00 PM	0:01:00	42.5	47.6	39.8
11:31:00 PM	0:01:00	40.6	41.8	39.3
11:32:00 PM	0:01:00	45.4	52	39.2
11:33:00 PM	0:01:00	45.2	50.3	41.4
11:34:00 PM	0:01:00	45.6	49.9	42.2
11:35:00 PM	0:01:00	44.5	48.7	41.1
11:36:00 PM	0:01:00	44.7	50.2	41.1
11:37:00 PM	0:01:00	40.9	42.1	40.2
11:38:00 PM	0:01:00	43	51.1	40.1
11:39:00 PM	0:01:00	44.8	48.5	40.2
11:40:00 PM	0:01:00	47	53.9	41.9
11:41:00 PM	0:01:00	41.7	43.7	39.9
11:42:00 PM	0:01:00	42.4	48.7	39.1
11:43:00 PM	0:01:00	41.4	45.6	39
11:44:00 PM	0:01:00	43.1	49.1	39.8
11:45:00 PM	0:01:00	41.8	45	39.4
11:46:00 PM	0:01:00	41.3	43	39.5
11:47:00 PM	0:01:00	42.3	49.2	39.4
11:48:00 PM	0:01:00	41.4	42.8	40.2
11:49:00 PM	0:01:00	41.4	42.8	40.3

11:50:00 PM	0:01:00	41.9	44.7	39.9
11:51:00 PM	0:01:00	42.9	51	39.9
11:52:00 PM	0:01:00	43.3	49.4	40.3
11:53:00 PM	0:01:00	43.7	47.1	41.7
11:54:00 PM	0:01:00	42	44.7	40.2
11:55:00 PM	0:01:00	42.9	45.9	40.3
11:56:00 PM	0:01:00	42.4	45.2	40.9
11:57:00 PM	0:01:00	42.8	49.3	41.1
11:58:00 PM	0:01:00	42.7	45.3	41.5
11:59:00 PM	0:01:00	41.6	44.1	40.6
12:00:00 AM	0:01:00	42.4	48.1	40.3
12:01:00 AM	0:01:00	41.7	45.9	40.4
12:02:00 AM	0:01:00	41.7	44.5	39.8
12:03:00 AM	0:01:00	43.4	47.9	39.9
12:04:00 AM	0:01:00	45.5	50.7	40.8
12:05:00 AM	0:01:00	41.4	45.2	39.3
12:06:00 AM	0:01:00	41.9	45	39.6
12:07:00 AM	0:01:00	41.8	43.9	40.8
12:08:00 AM	0:01:00	43.1	45.5	40.6
12:09:00 AM	0:01:00	43.2	47.2	40.4
12:10:00 AM	0:01:00	41.1	43.3	40
12:11:00 AM	0:01:00	42.5	45.7	41.3
12:12:00 AM	0:01:00	42.4	46.2	40.7
12:13:00 AM	0:01:00	41.4	43.9	39.4
12:14:00 AM	0:01:00	42.2	45.7	39.4
12:15:00 AM	0:01:00	42.7	45.3	41.4
12:16:00 AM	0:01:00	43.4	46.9	41.4
12:17:00 AM	0:01:00	42.5	46	40.8
12:18:00 AM	0:01:00	41.3	43.6	40.1
12:19:00 AM	0:01:00	41.9	43.4	41
12:20:00 AM	0:01:00	42.5	46.4	39.1
12:21:00 AM	0:01:00	42.5	44.9	40.2
12:22:00 AM	0:01:00	43.9	47.9	41.6
12:23:00 AM	0:01:00	44.2	47.2	42.2
12:24:00 AM	0:01:00	44.3	45.8	41.1
12:25:00 AM	0:01:00	42.4	46	40.2
12:26:00 AM	0:01:00	43.6	45.5	41.2
12:27:00 AM	0:01:00	43.1	46.3	41.2
12:28:00 AM	0:01:00	42	44.2	40.9
12:29:00 AM	0:01:00	43	46.9	40.1
12:30:00 AM	0:01:00	41.6	45.3	40.3
12:31:00 AM	0:01:00	41.8	47.2	39.7
12:32:00 AM	0:01:00	52.9	62.1	38.9
12:33:00 AM	0:01:00	41.1	43.2	38.4
12:34:00 AM	0:01:00	41.3	46.2	38.8
12:35:00 AM	0:01:00	45.2	50.1	40.8
12:36:00 AM	0:01:00	44.5	54.4	40.1

12:37:00 AM	0:01:00	42.6	46.9	40.7
12:38:00 AM	0:01:00	42.4	44.4	39.7
12:39:00 AM	0:01:00	42.2	44	40.2
12:40:00 AM	0:01:00	40.3	41.3	39.3
12:41:00 AM	0:01:00	41	42.5	39.9
12:42:00 AM	0:01:00	41.2	42.6	40.3
12:43:00 AM	0:01:00	41.2	44.1	40
12:44:00 AM	0:01:00	40.1	41.1	38.8
12:45:00 AM	0:01:00	42.4	43.9	40.7
12:46:00 AM	0:01:00	42.7	46.4	40.6
12:47:00 AM	0:01:00	41.9	46.5	39.8
12:48:00 AM	0:01:00	40.7	44.2	38.8
12:49:00 AM	0:01:00	41.7	46.1	40.1
12:50:00 AM	0:01:00	41.3	42.6	40.2
12:51:00 AM	0:01:00	41.4	43.4	40.3
12:52:00 AM	0:01:00	40.5	41.3	39.5
12:53:00 AM	0:01:00	40.8	45.8	39.4
12:54:00 AM	0:01:00	40.5	41.8	39.7
12:55:00 AM	0:01:00	41.5	46.2	40
12:56:00 AM	0:01:00	45.7	51.6	41
12:57:00 AM	0:01:00	58	68.5	42
12:58:00 AM	0:01:00	40.2	42.4	38.4
12:59:00 AM	0:01:00	45	56.4	38.4
1:00:00 AM	0:01:00	49.8	60.5	40
1:01:00 AM	0:01:00	41.2	42.3	40.4
1:02:00 AM	0:01:00	42.3	47.6	40.3
1:03:00 AM	0:01:00	42.2	47.5	39.9
1:04:00 AM	0:01:00	41	42.7	39.7
1:05:00 AM	0:01:00	40.9	45.9	37.9
1:06:00 AM	0:01:00	40.6	42.5	38
1:07:00 AM	0:01:00	42.8	45.9	40.4
1:08:00 AM	0:01:00	41.3	43.3	39.2
1:09:00 AM	0:01:00	43.1	46.7	39
1:10:00 AM	0:01:00	42.8	46.8	41
1:11:00 AM	0:01:00	43	49.5	39.2
1:12:00 AM	0:01:00	40.7	43.6	38.9
1:13:00 AM	0:01:00	42.2	45.8	40
1:14:00 AM	0:01:00	41.3	42.5	39.9
1:15:00 AM	0:01:00	41	46.2	39.7
1:16:00 AM	0:01:00	42.8	47.3	39.9
1:17:00 AM	0:01:00	40	41.2	38.8
1:18:00 AM	0:01:00	41.3	42.5	39.8
1:19:00 AM	0:01:00	42.1	44.7	40.3
1:20:00 AM	0:01:00	41.3	46.3	39.1
1:21:00 AM	0:01:00	40.8	44.5	38.7
1:22:00 AM	0:01:00	41.2	42.6	39.9
1:23:00 AM	0:01:00	40.7	42	40.1

1:24:00 AM	0:01:00	42.3	45.6	40.4
1:25:00 AM	0:01:00	41.7	44.8	39.9
1:26:00 AM	0:01:00	42	44.7	40.8
1:27:00 AM	0:01:00	42.3	44.9	40.3
1:28:00 AM	0:01:00	42	45.6	40.2
1:29:00 AM	0:01:00	40.9	43.5	39.9
1:30:00 AM	0:01:00	45.1	51.3	41
1:31:00 AM	0:01:00	39.8	42.6	38.2
1:32:00 AM	0:01:00	40.8	43.2	38.8
1:33:00 AM	0:01:00	42.4	47.9	40.6
1:34:00 AM	0:01:00	44.8	52.8	40.2
1:35:00 AM	0:01:00	42.5	44.8	40.8
1:36:00 AM	0:01:00	42.8	47.1	40
1:37:00 AM	0:01:00	39.3	40.3	38.6
1:38:00 AM	0:01:00	40.9	43.4	38.4
1:39:00 AM	0:01:00	42.7	46.4	40.9
1:40:00 AM	0:01:00	41.4	42.8	39.8
1:41:00 AM	0:01:00	41.9	45.6	39.3
1:42:00 AM	0:01:00	42.1	45	39.3
1:43:00 AM	0:01:00	41.9	46.8	39.5
1:44:00 AM	0:01:00	40.8	43.8	39
1:45:00 AM	0:01:00	42.4	47.6	39.2
1:46:00 AM	0:01:00	42.9	46.7	40.9
1:47:00 AM	0:01:00	44.1	49.9	41
1:48:00 AM	0:01:00	42.8	46.1	41.4
1:49:00 AM	0:01:00	43.7	49.5	41
1:50:00 AM	0:01:00	42.5	46.4	39.1
1:51:00 AM	0:01:00	41.8	44.6	39.6
1:52:00 AM	0:01:00	42.6	47.2	40.3
1:53:00 AM	0:01:00	41.5	44.4	39.1
1:54:00 AM	0:01:00	41.4	43.4	39.6
1:55:00 AM	0:01:00	42.2	46.5	40.3
1:56:00 AM	0:01:00	44.4	52.3	39.6
1:57:00 AM	0:01:00	39.1	41.5	38.2
1:58:00 AM	0:01:00	39.7	41	38.4
1:59:00 AM	0:01:00	40.8	43.2	38.9
2:00:00 AM	0:01:00	41.1	43.9	39.1
2:01:00 AM	0:01:00	41.9	44.7	40.2
2:02:00 AM	0:01:00	42.8	57.2	40.3
2:03:00 AM	0:01:00	40.7	42	39.9
2:04:00 AM	0:01:00	41.6	45.4	40.1
2:05:00 AM	0:01:00	43.9	47.6	41
2:06:00 AM	0:01:00	42.1	47	40.1
2:07:00 AM	0:01:00	40.5	42.9	39.5
2:08:00 AM	0:01:00	43.4	49.8	39.5
2:09:00 AM	0:01:00	41.6	45.1	39.1
2:10:00 AM	0:01:00	40.2	45.5	39

2:11:00 AM	0:01:00	42.3	46.9	39.5
2:12:00 AM	0:01:00	44.5	49.7	39.5
2:13:00 AM	0:01:00	41.1	48.6	38.9
2:14:00 AM	0:01:00	39.9	40.8	38.7
2:15:00 AM	0:01:00	40	41.8	39
2:16:00 AM	0:01:00	40.2	42	39
2:17:00 AM	0:01:00	40.6	44.1	38.7
2:18:00 AM	0:01:00	41.7	48.3	38
2:19:00 AM	0:01:00	53.5	63	37.6
2:20:00 AM	0:01:00	56.1	56.5	52.6
2:21:00 AM	0:01:00	57.5	60.3	55.1
2:22:00 AM	0:01:00	58.6	63.3	55.2
2:23:00 AM	0:01:00	57.4	64.2	41.9
2:24:00 AM	0:01:00	41.2	42.6	39.7
2:25:00 AM	0:01:00	43.4	46.2	41.1
2:26:00 AM	0:01:00	41.7	45.1	40
2:27:00 AM	0:01:00	41	45.1	38.5
2:28:00 AM	0:01:00	39.4	41.2	38.4
2:29:00 AM	0:01:00	41	50.4	38.2
2:30:00 AM	0:01:00	48.5	56	39.3
2:31:00 AM	0:01:00	41.7	47.9	38.7
2:32:00 AM	0:01:00	41.9	44.2	38.7
2:33:00 AM	0:01:00	41.4	43.1	39.1
2:34:00 AM	0:01:00	43.9	49.7	40.3
2:35:00 AM	0:01:00	41.3	42.3	40.4
2:36:00 AM	0:01:00	40.5	41.5	39.4
2:37:00 AM	0:01:00	41.6	44.1	39.6
2:38:00 AM	0:01:00	40.7	43.9	39.4
2:39:00 AM	0:01:00	44.3	49.9	40.7
2:40:00 AM	0:01:00	41.7	46.7	38.4
2:41:00 AM	0:01:00	40.1	41	38.8
2:42:00 AM	0:01:00	42.3	44.2	40.3
2:43:00 AM	0:01:00	43.6	50.3	40.2
2:44:00 AM	0:01:00	40.7	42.5	39.4
2:45:00 AM	0:01:00	43.6	45.9	42
2:46:00 AM	0:01:00	42.3	46.1	40.6
2:47:00 AM	0:01:00	41.6	43.2	40.2
2:48:00 AM	0:01:00	42.6	46.4	40.5
2:49:00 AM	0:01:00	41.7	42.7	40.8
2:50:00 AM	0:01:00	41.2	42.6	40.2
2:51:00 AM	0:01:00	40.8	42.7	39.8
2:52:00 AM	0:01:00	41.3	42.8	40
2:53:00 AM	0:01:00	43.7	48.8	41
2:54:00 AM	0:01:00	41.5	42.5	40.6
2:55:00 AM	0:01:00	42.1	44.4	40.5
2:56:00 AM	0:01:00	42.1	44.4	40.5
2:57:00 AM	0:01:00	40.7	43	39.6

2:58:00 AM	0:01:00	42.4	46.2	40
2:59:00 AM	0:01:00	42.5	45.1	41.1
3:00:00 AM	0:01:00	45.2	49.1	42.5
3:01:00 AM	0:01:00	41.6	42.8	40.9
3:02:00 AM	0:01:00	44.8	50.7	40.7
3:03:00 AM	0:01:00	44.4	51.1	41.4
3:04:00 AM	0:01:00	46.5	52.6	41.2
3:05:00 AM	0:01:00	42.1	43.5	40.5
3:06:00 AM	0:01:00	42.8	46.2	41.3
3:07:00 AM	0:01:00	43.7	46.2	40.6
3:08:00 AM	0:01:00	43.5	47.8	40.8
3:09:00 AM	0:01:00	42.6	43.6	41.5
3:10:00 AM	0:01:00	41.4	43.8	39.5
3:11:00 AM	0:01:00	42.5	45.4	40.6
3:12:00 AM	0:01:00	40.5	42.7	39.4
3:13:00 AM	0:01:00	41.8	44.8	40.5
3:14:00 AM	0:01:00	40.6	42.2	39.1
3:15:00 AM	0:01:00	40.5	42.6	38.9
3:16:00 AM	0:01:00	41.3	44	39.6
3:17:00 AM	0:01:00	43.3	48.3	40.5
3:18:00 AM	0:01:00	41.6	43.9	40.3
3:19:00 AM	0:01:00	40.8	43.3	39.6
3:20:00 AM	0:01:00	41.7	43.2	40.4
3:21:00 AM	0:01:00	42.5	45.4	41
3:22:00 AM	0:01:00	44.6	48.3	40.5
3:23:00 AM	0:01:00	41.9	44.5	40.5
3:24:00 AM	0:01:00	43.6	47	40.4
3:25:00 AM	0:01:00	43.7	47.1	41.1
3:26:00 AM	0:01:00	44	48.1	41
3:27:00 AM	0:01:00	45.7	52.1	40.8
3:28:00 AM	0:01:00	46.6	52.3	40
3:29:00 AM	0:01:00	41.5	44.2	39.2
3:30:00 AM	0:01:00	39.8	42.4	38.1
3:31:00 AM	0:01:00	43.8	50.2	38.8
3:32:00 AM	0:01:00	41.4	45.6	39.4
3:33:00 AM	0:01:00	40.9	43	39.6
3:34:00 AM	0:01:00	43.4	47.6	41
3:35:00 AM	0:01:00	46.1	54.2	39.8
3:36:00 AM	0:01:00	42.8	48.5	39.2
3:37:00 AM	0:01:00	41.4	44.5	38.9
3:38:00 AM	0:01:00	42.6	45.7	39.7
3:39:00 AM	0:01:00	45.5	53.8	38.4
3:40:00 AM	0:01:00	43.6	48.5	39
3:41:00 AM	0:01:00	45.6	51.7	38.6
3:42:00 AM	0:01:00	41.3	43.9	39.4
3:43:00 AM	0:01:00	39.6	42.9	37.6
3:44:00 AM	0:01:00	44.3	48.3	39.4

3:45:00 AM	0:01:00	42	45.9	39.6
3:46:00 AM	0:01:00	41.7	43.9	39.4
3:47:00 AM	0:01:00	43.3	47.9	39.6
3:48:00 AM	0:01:00	41.5	42.9	39.9
3:49:00 AM	0:01:00	42.8	45.5	40
3:50:00 AM	0:01:00	43.5	47.2	40.7
3:51:00 AM	0:01:00	41.7	45.5	40.3
3:52:00 AM	0:01:00	42.2	47.1	40
3:53:00 AM	0:01:00	43.4	49.4	40.3
3:54:00 AM	0:01:00	40.9	43.3	39.9
3:55:00 AM	0:01:00	44.3	50.6	40.7
3:56:00 AM	0:01:00	43.5	48.9	40.7
3:57:00 AM	0:01:00	42.6	46.1	40.8
3:58:00 AM	0:01:00	40.9	42.7	39.5
3:59:00 AM	0:01:00	42.7	46.8	40.2
4:00:00 AM	0:01:00	42.1	44.1	40
4:01:00 AM	0:01:00	45.1	50.1	41.4
4:02:00 AM	0:01:00	46.6	53.1	42.1
4:03:00 AM	0:01:00	42.7	49.8	40.6
4:04:00 AM	0:01:00	47.2	56.1	39.6
4:05:00 AM	0:01:00	46.6	55	40.8
4:06:00 AM	0:01:00	41.2	42.5	40
4:07:00 AM	0:01:00	43	44.3	41.4
4:08:00 AM	0:01:00	44.1	47.5	41
4:09:00 AM	0:01:00	45.4	48.5	43
4:10:00 AM	0:01:00	45.7	51.4	41.9
4:11:00 AM	0:01:00	43.5	47.1	41.7
4:12:00 AM	0:01:00	43.7	46.9	41.7
4:13:00 AM	0:01:00	42.5	45.5	41
4:14:00 AM	0:01:00	44.6	48.4	42.2
4:15:00 AM	0:01:00	41.9	43.3	40.7
4:16:00 AM	0:01:00	43.7	49.4	41.2
4:17:00 AM	0:01:00	42.7	44.9	41.4
4:18:00 AM	0:01:00	42.3	45.9	41.1
4:19:00 AM	0:01:00	43.4	45.9	41.8
4:20:00 AM	0:01:00	42.6	44.5	41.2
4:21:00 AM	0:01:00	46.5	53.8	42.1
4:22:00 AM	0:01:00	43.3	46.7	41.4
4:23:00 AM	0:01:00	43.8	47.2	40.6
4:24:00 AM	0:01:00	42.6	46.5	41
4:25:00 AM	0:01:00	42.3	44.8	41
4:26:00 AM	0:01:00	45.7	50.4	41.6
4:27:00 AM	0:01:00	43.5	44.4	42.7
4:28:00 AM	0:01:00	44.7	48.3	42.2
4:29:00 AM	0:01:00	44	45.9	43
4:30:00 AM	0:01:00	44.2	45.8	42.9
4:31:00 AM	0:01:00	44.3	45.5	43.3

4:32:00 AM	0:01:00	44.3	47.4	42.4
4:33:00 AM	0:01:00	46.3	52.8	42.7
4:34:00 AM	0:01:00	51	59.2	42.8
4:35:00 AM	0:01:00	50.6	60.9	42.8
4:36:00 AM	0:01:00	43.7	46	41.9
4:37:00 AM	0:01:00	45.8	50.9	42
4:38:00 AM	0:01:00	46.7	52.9	42.7
4:39:00 AM	0:01:00	44.2	48	42.4
4:40:00 AM	0:01:00	49.4	56.3	43.7
4:41:00 AM	0:01:00	47.3	49.9	44.8
4:42:00 AM	0:01:00	44.5	47	42.5
4:43:00 AM	0:01:00	44.9	47.5	43
4:44:00 AM	0:01:00	44.7	46.6	43
4:45:00 AM	0:01:00	45.5	48.5	43.4
4:46:00 AM	0:01:00	45.5	48.8	43.3
4:47:00 AM	0:01:00	44.6	48.7	41.9
4:48:00 AM	0:01:00	43.4	45.3	42.1
4:49:00 AM	0:01:00	43.6	45.4	41.9
4:50:00 AM	0:01:00	47.2	53.5	42.4
4:51:00 AM	0:01:00	49.7	60.5	43
4:52:00 AM	0:01:00	61.9	74.3	44.9
4:53:00 AM	0:01:00	47.8	53.3	44.2
4:54:00 AM	0:01:00	45.5	51.6	43.1
4:55:00 AM	0:01:00	44.3	46.1	43
4:56:00 AM	0:01:00	44.8	47	42.5
4:57:00 AM	0:01:00	45.3	49.2	42.7
4:58:00 AM	0:01:00	46.2	49	43.3
4:59:00 AM	0:01:00	45.9	49.8	43.3
5:00:00 AM	0:01:00	48.5	53	43.7
5:01:00 AM	0:01:00	59.7	65.9	47.8
5:02:00 AM	0:01:00	47	50.6	44.1
5:03:00 AM	0:01:00	47.8	52.8	44.7
5:04:00 AM	0:01:00	48.7	51.3	45.2
5:05:00 AM	0:01:00	46.4	49.8	44.5
5:06:00 AM	0:01:00	45.2	47.6	43.6
5:07:00 AM	0:01:00	47.7	54.3	44.8
5:08:00 AM	0:01:00	46.9	50.3	45
5:09:00 AM	0:01:00	48.8	52.4	43.6
5:10:00 AM	0:01:00	45.4	48.4	42.3
5:11:00 AM	0:01:00	48	53.2	45.7
5:12:00 AM	0:01:00	46.8	52.7	44.1
5:13:00 AM	0:01:00	47.7	51.7	44.3
5:14:00 AM	0:01:00	45.6	49.3	43.4
5:15:00 AM	0:01:00	44.4	46.6	43.3
5:16:00 AM	0:01:00	45.4	49.2	43.1
5:17:00 AM	0:01:00	46.1	48.5	43.5
5:18:00 AM	0:01:00	46.1	48.3	43.8

5:19:00 AM	0:01:00	47.6	52.5	44.6
5:20:00 AM	0:01:00	46	51.4	43.4
5:21:00 AM	0:01:00	46.5	49.7	43.9
5:22:00 AM	0:01:00	44.3	45.6	43.3
5:23:00 AM	0:01:00	45.8	48.2	43.7
5:24:00 AM	0:01:00	47.2	50.2	43.5
5:25:00 AM	0:01:00	45.5	47.8	43.9
5:26:00 AM	0:01:00	48.5	51.1	45.2
5:27:00 AM	0:01:00	47.3	50.7	45.6
5:28:00 AM	0:01:00	47.9	52.6	45.3
5:29:00 AM	0:01:00	45.2	49.5	43.4
5:30:00 AM	0:01:00	47.7	52.4	44.4
5:31:00 AM	0:01:00	46.8	48.4	45.6
5:32:00 AM	0:01:00	47.9	51.3	45.5
5:33:00 AM	0:01:00	46.8	48.9	45.6
5:34:00 AM	0:01:00	48.7	55.3	46.4
5:35:00 AM	0:01:00	51.6	57.7	46
5:36:00 AM	0:01:00	49.4	52.9	47.3
5:37:00 AM	0:01:00	48.6	50.7	46.1
5:38:00 AM	0:01:00	48.9	51.1	47.6
5:39:00 AM	0:01:00	52.7	57.8	46.9
5:40:00 AM	0:01:00	50.9	54.1	47.2
5:41:00 AM	0:01:00	50.9	54.4	47.1
5:42:00 AM	0:01:00	48.1	50.6	46.3
5:43:00 AM	0:01:00	49.2	54	45.5
5:44:00 AM	0:01:00	47.9	52.8	45.4
5:45:00 AM	0:01:00	48	51.5	46.2
5:46:00 AM	0:01:00	48.6	52.8	45.1
5:47:00 AM	0:01:00	47.9	50.8	45
5:48:00 AM	0:01:00	51.2	59.1	47.2
5:49:00 AM	0:01:00	50.6	58.7	47
5:50:00 AM	0:01:00	49.2	51.8	46.7
5:51:00 AM	0:01:00	50	51.7	48.6
5:52:00 AM	0:01:00	49.3	53	47.5
5:53:00 AM	0:01:00	50.7	57.9	46.2
5:54:00 AM	0:01:00	60.9	73.3	48.7
5:55:00 AM	0:01:00	65.9	81.1	45.1
5:56:00 AM	0:01:00	49.6	59.5	44.1
5:57:00 AM	0:01:00	50.8	53.2	47.4
5:58:00 AM	0:01:00	49	53.5	46.4
5:59:00 AM	0:01:00	49	52.1	45.6
6:00:00 AM	0:01:00	47.6	50	46.7
6:01:00 AM	0:01:00	47.4	51.6	45
6:02:00 AM	0:01:00	48.5	52.1	45
6:03:00 AM	0:01:00	53.6	65.6	48
6:04:00 AM	0:01:00	52.7	63	48.9
6:05:00 AM	0:01:00	50.6	54.5	48.5

6:06:00 AM	0:01:00	50.6	53.2	47.2
6:07:00 AM	0:01:00	48	58.1	45
6:08:00 AM	0:01:00	48.6	54.6	45
6:09:00 AM	0:01:00	53.2	69.3	45.2
6:10:00 AM	0:01:00	46.2	47.8	45
6:11:00 AM	0:01:00	48.5	52.9	46
6:12:00 AM	0:01:00	48.9	52.9	46.5
6:13:00 AM	0:01:00	47.9	51	45.3
6:14:00 AM	0:01:00	47.1	49.6	45.4
6:15:00 AM	0:01:00	46.7	49.1	44.8
6:16:00 AM	0:01:00	47.6	49.9	46.1
6:17:00 AM	0:01:00	49.6	55.2	45.6
6:18:00 AM	0:01:00	49.5	54.7	45.6
6:19:00 AM	0:01:00	49	50.8	46.5
6:20:00 AM	0:01:00	49.9	55	46.9
6:21:00 AM	0:01:00	47.9	49.9	45.7
6:22:00 AM	0:01:00	48.2	51	45.6
6:23:00 AM	0:01:00	48.2	51.3	45.8
6:24:00 AM	0:01:00	46.9	55.4	44.5
6:25:00 AM	0:01:00	53.6	62.4	44.1
6:26:00 AM	0:01:00	69.4	80.4	45.6
6:27:00 AM	0:01:00	54.8	66.4	45.8
6:28:00 AM	0:01:00	48.3	50.6	46.1
6:29:00 AM	0:01:00	49.2	52.8	45.7
6:30:00 AM	0:01:00	49.4	52	45.6
6:31:00 AM	0:01:00	49.7	56.2	45.6
6:32:00 AM	0:01:00	56.9	69.4	47.4
6:33:00 AM	0:01:00	52.4	56.5	45.6
6:34:00 AM	0:01:00	47.2	50.4	43.7
6:35:00 AM	0:01:00	48	54.8	44.1
6:36:00 AM	0:01:00	47.3	49.6	44.5
6:37:00 AM	0:01:00	47.8	51.2	44.3
6:38:00 AM	0:01:00	47	50.5	44.1
6:39:00 AM	0:01:00	45.6	49.2	42.9
6:40:00 AM	0:01:00	48	52	45.3
6:41:00 AM	0:01:00	46.4	50.5	43.6
6:42:00 AM	0:01:00	46.8	51.9	44.8
6:43:00 AM	0:01:00	48	52.7	45.3
6:44:00 AM	0:01:00	48.4	52.5	45.9
6:45:00 AM	0:01:00	47.9	50.6	44.7
6:46:00 AM	0:01:00	48	54.3	45.4
6:47:00 AM	0:01:00	47.9	50.5	44.8
6:48:00 AM	0:01:00	46.2	49.6	44
6:49:00 AM	0:01:00	47	51.4	44.3
6:50:00 AM	0:01:00	50.1	53.6	46.3
6:51:00 AM	0:01:00	48.4	51.7	46.5
6:52:00 AM	0:01:00	48.8	53.9	44.4

6:53:00 AM	0:01:00	52.9	68.9	45.4
6:54:00 AM	0:01:00	48.3	51.8	46.1
6:55:00 AM	0:01:00	51.8	59.7	46.8
6:56:00 AM	0:01:00	49.1	51.7	46.2
6:57:00 AM	0:01:00	47.2	51.4	44.5
6:58:00 AM	0:01:00	47.4	51.5	44
6:59:00 AM	0:01:00	47.9	51.5	43.1
7:00:00 AM	0:01:00	46.8	50	44.6
7:01:00 AM	0:01:00	48.5	51.4	44.9
7:02:00 AM	0:01:00	46.6	49.9	44.7
7:03:00 AM	0:01:00	47.4	50.6	42.9
7:04:00 AM	0:01:00	46.3	49.4	43.6
7:05:00 AM	0:01:00	48.5	52.8	43.5
7:06:00 AM	0:01:00	52.1	65.4	42.6
7:07:00 AM	0:01:00	48.7	54	44.1
7:08:00 AM	0:01:00	50.5	53.7	43.4
7:09:00 AM	0:01:00	47.8	52.2	43.9
7:10:00 AM	0:01:00	48.2	51.5	44.1
7:11:00 AM	0:01:00	47.8	50.5	44.9
7:12:00 AM	0:01:00	47.7	53	42
7:13:00 AM	0:01:00	47.3	50.7	44.8
7:14:00 AM	0:01:00	48.1	51.4	44
7:15:00 AM	0:01:00	47.4	50.7	43.4
7:16:00 AM	0:01:00	47.2	51.4	43.5
7:17:00 AM	0:01:00	48.2	53.6	43.6
7:18:00 AM	0:01:00	48.3	53	43.7
7:19:00 AM	0:01:00	50.2	55.2	46.2
7:20:00 AM	0:01:00	46.9	50.6	42.6
7:21:00 AM	0:01:00	47.6	50.8	43.3
7:22:00 AM	0:01:00	47.5	50.5	44.6
7:23:00 AM	0:01:00	46.3	51.3	41.7
7:24:00 AM	0:01:00	52.4	63.6	44.5
7:25:00 AM	0:01:00	45.9	52.5	41.5
7:26:00 AM	0:01:00	48.8	55.5	43.7
7:27:00 AM	0:01:00	46.9	52.6	42.1
7:28:00 AM	0:01:00	48.7	52.6	45.6
7:29:00 AM	0:01:00	46.6	50.3	43.6
7:30:00 AM	0:01:00	47.5	50.7	43.5
7:31:00 AM	0:01:00	47.4	50.8	44.3
7:32:00 AM	0:01:00	47.1	51.5	42.1
7:33:00 AM	0:01:00	48.8	51.9	45.3
7:34:00 AM	0:01:00	45.8	51.7	42
7:35:00 AM	0:01:00	50.8	56.2	45.1
7:36:00 AM	0:01:00	64.5	79.2	44.1
7:37:00 AM	0:01:00	49.2	53.9	43.3
7:38:00 AM	0:01:00	48.3	51.1	43.6
7:39:00 AM	0:01:00	48.8	56.3	43.3

7:40:00 AM	0:01:00	47.3	51	43.9
7:41:00 AM	0:01:00	48.9	53.9	43.8
7:42:00 AM	0:01:00	48.3	51.1	44.4
7:43:00 AM	0:01:00	51.7	58.1	46.4
7:44:00 AM	0:01:00	51.3	57.7	45.8
7:45:00 AM	0:01:00	47.5	54.5	43.3
7:46:00 AM	0:01:00	50.8	59	45.6
7:47:00 AM	0:01:00	48.6	50.5	45.1
7:48:00 AM	0:01:00	48.3	51.7	42.4
7:49:00 AM	0:01:00	52.2	55.6	44.8
7:50:00 AM	0:01:00	49.9	54.1	44.9
7:51:00 AM	0:01:00	47.7	53	43.1
7:52:00 AM	0:01:00	50.1	54.1	44.2
7:53:00 AM	0:01:00	49.7	54.5	45
7:54:00 AM	0:01:00	67.9	79.2	44.2
7:55:00 AM	0:01:00	49.5	52.9	46.5
7:56:00 AM	0:01:00	51.1	53.6	46.9
7:57:00 AM	0:01:00	48.9	53.3	45.3
7:58:00 AM	0:01:00	46.1	49.9	42.3
7:59:00 AM	0:01:00	47.9	53	43.6
8:00:00 AM	0:01:00	50.9	55.1	45.1
8:01:00 AM	0:01:00	66.5	80.9	46.8
8:02:00 AM	0:01:00	54.6	67.4	44.6
8:03:00 AM	0:01:00	49.7	55.4	43.7
8:04:00 AM	0:01:00	47.2	53	41.1
8:05:00 AM	0:01:00	49.1	51.6	43.2
8:06:00 AM	0:01:00	46.8	50.1	41.2
8:07:00 AM	0:01:00	46.9	50.4	42.5
8:08:00 AM	0:01:00	51.6	55.9	44.8
8:09:00 AM	0:01:00	47.2	51.7	40.6
8:10:00 AM	0:01:00	46.1	49.1	40.9
8:11:00 AM	0:01:00	44.8	47.6	42.3
8:12:00 AM	0:01:00	48.3	53.3	42.2
8:13:00 AM	0:01:00	46.5	50.8	42.4
8:14:00 AM	0:01:00	49.9	55.2	44.2
8:15:00 AM	0:01:00	47.6	50.9	42.1
8:16:00 AM	0:01:00	47.4	50.9	41
8:17:00 AM	0:01:00	45.8	48.4	43.3
8:18:00 AM	0:01:00	47.7	52.8	41.2
8:19:00 AM	0:01:00	48.1	51.9	43.4
8:20:00 AM	0:01:00	48.1	51.8	43.9
8:21:00 AM	0:01:00	47.3	53.1	41.5
8:22:00 AM	0:01:00	48.1	54.2	43.1
8:23:00 AM	0:01:00	46.8	51.9	41.1
8:24:00 AM	0:01:00	50.8	62	43.3
8:25:00 AM	0:01:00	47.3	53.4	41.1
8:26:00 AM	0:01:00	46.5	50.6	42.4

8:27:00 AM	0:01:00	64.2	78.6	42.2
8:28:00 AM	0:01:00	53.4	65	39.4
8:29:00 AM	0:01:00	48.3	52.8	41.4
8:30:00 AM	0:01:00	47.6	52.5	43.3
8:31:00 AM	0:01:00	50.6	57.7	41.1
8:32:00 AM	0:01:00	47.6	55.7	40.2
8:33:00 AM	0:01:00	44.8	48.2	40.3
8:34:00 AM	0:01:00	46.4	50.7	40.6
8:35:00 AM	0:01:00	47.4	56.7	42.6
8:36:00 AM	0:01:00	46.1	53.3	41
8:37:00 AM	0:01:00	46.8	53.2	42.6
8:38:00 AM	0:01:00	47.2	52.8	40.8
8:39:00 AM	0:01:00	43.6	47.7	40.1
8:40:00 AM	0:01:00	43.7	47	39.1
8:41:00 AM	0:01:00	44.6	49.4	40.9
8:42:00 AM	0:01:00	45.9	52.8	41.6
8:43:00 AM	0:01:00	47.7	54.8	42
8:44:00 AM	0:01:00	47.2	51.6	42.2
8:45:00 AM	0:01:00	50.8	56.8	42
8:46:00 AM	0:01:00	52.1	58.5	43.8
8:47:00 AM	0:01:00	60.8	75	44.2
8:48:00 AM	0:01:00	47.3	53.1	42.4
8:49:00 AM	0:01:00	46	50.6	42.3
8:50:00 AM	0:01:00	48	51.8	43.6
8:51:00 AM	0:01:00	46.4	51.4	42
8:52:00 AM	0:01:00	46.3	52.2	42.6
8:53:00 AM	0:01:00	46.9	50.8	42.1
8:54:00 AM	0:01:00	47.5	49.5	44.3
8:55:00 AM	0:01:00	46.6	50.6	44.3
8:56:00 AM	0:01:00	48.3	50.7	44.8
8:57:00 AM	0:01:00	47.6	52.9	44.6
8:58:00 AM	0:01:00	47.4	55	44.2
8:59:00 AM	0:01:00	49.1	56.2	43.9
9:00:00 AM	0:01:00	45.9	49.3	43.1
9:01:00 AM	0:01:00	52.8	57.9	44.7
9:02:00 AM	0:01:00	47.7	55.6	42.3
9:03:00 AM	0:01:00	50.4	54.7	43.8
9:04:00 AM	0:01:00	43.8	49.5	40.1
9:05:00 AM	0:01:00	46.9	56.4	40.1
9:06:00 AM	0:01:00	47	52.9	42.6
9:07:00 AM	0:01:00	45.5	49.3	41
9:08:00 AM	0:01:00	48.3	55	41
9:09:00 AM	0:01:00	43.9	50	39
9:10:00 AM	0:01:00	46.7	50.4	39.8
9:11:00 AM	0:01:00	44.4	48.1	38.7
9:12:00 AM	0:01:00	44.8	51.4	38.1
9:13:00 AM	0:01:00	47.1	52.1	40.8

9:14:00 AM	0:01:00	48.9	56.4	41
9:15:00 AM	0:01:00	46.1	51.4	41.4
9:16:00 AM	0:01:00	44.5	54	39.8
9:17:00 AM	0:01:00	44.5	48.6	40.6
9:18:00 AM	0:01:00	46.5	52.6	39.7
9:19:00 AM	0:01:00	46.2	49.9	38.7
9:20:00 AM	0:01:00	42.3	47.5	37.9
9:21:00 AM	0:01:00	44.6	50.5	40.7
9:22:00 AM	0:01:00	47.3	54.6	40.1
9:23:00 AM	0:01:00	43.4	46.2	37.6
9:24:00 AM	0:01:00	44.1	47.3	41.3
9:25:00 AM	0:01:00	48	54.1	39.9
9:26:00 AM	0:01:00	46.9	51.2	42.2
9:27:00 AM	0:01:00	48.9	56.3	40.5
9:28:00 AM	0:01:00	65.3	77.4	42.3
9:29:00 AM	0:01:00	44.9	48.5	37.3
9:30:00 AM	0:01:00	44	50.2	36.3
9:31:00 AM	0:01:00	46.2	51.5	40.1
9:32:00 AM	0:01:00	46.8	51.5	43
9:33:00 AM	0:01:00	48.6	59.4	37.1
9:34:00 AM	0:01:00	45.6	48.6	41.9
9:35:00 AM	0:01:00	44	49.3	36.2
9:36:00 AM	0:01:00	46	51.9	35.7
9:37:00 AM	0:01:00	46.7	51.4	39.4
9:38:00 AM	0:01:00	45.1	50.8	38.9
9:39:00 AM	0:01:00	46	50.1	39.8
9:40:00 AM	0:01:00	42.9	48	37.4
9:41:00 AM	0:01:00	45	50.2	37.6
9:42:00 AM	0:01:00	41.8	45	36.6
9:43:00 AM	0:01:00	42.2	48.1	35.4
9:44:00 AM	0:01:00	42.4	46.6	35.5
9:45:00 AM	0:01:00	43.1	47.3	35.1
9:46:00 AM	0:01:00	48.7	58.2	38.3
9:47:00 AM	0:01:00	44	49.4	38.2
9:48:00 AM	0:01:00	44.3	48.7	39.5
9:49:00 AM	0:01:00	42.5	46.6	36.2
9:50:00 AM	0:01:00	45.3	49.7	37.9
9:51:00 AM	0:01:00	42.3	46.3	36.6
9:52:00 AM	0:01:00	44.3	49.8	36.8
9:53:00 AM	0:01:00	44.5	52.3	37.8
9:54:00 AM	0:01:00	43.2	48	37.2
9:55:00 AM	0:01:00	41	48.2	33.2
9:56:00 AM	0:01:00	41.1	45.8	32.2
9:57:00 AM	0:01:00	42.7	49.2	35
9:58:00 AM	0:01:00	43.1	50.8	34.9
9:59:00 AM	0:01:00	46.7	51	39.4
10:00:00 AM	0:01:00	47.1	50.8	40.9

10:01:00 AM	0:01:00	45.4	49.6	39.6
10:02:00 AM	0:01:00	38.1	43.9	33.4
10:03:00 AM	0:01:00	44.6	49.6	38.2
10:04:00 AM	0:01:00	39.8	45.8	34.6
10:05:00 AM	0:01:00	46.9	51.4	38.3
10:06:00 AM	0:01:00	44.3	50.3	38.8
10:07:00 AM	0:01:00	45.5	49.8	39.1
10:08:00 AM	0:01:00	44.6	50.7	36.6
10:09:00 AM	0:01:00	49	54.8	40.3
10:10:00 AM	0:01:00	45.8	50	42.8
10:11:00 AM	0:01:00	49.5	55.2	43.7
10:12:00 AM	0:01:00	48.2	55	42.9
10:13:00 AM	0:01:00	44.5	47.8	43
10:14:00 AM	0:01:00	46.7	50.6	43
10:15:00 AM	0:01:00	44.4	47.5	42.8
10:16:00 AM	0:01:00	48.2	51.3	44
10:17:00 AM	0:01:00	45.2	47.9	42.5
10:18:00 AM	0:01:00	47	52	42.2
10:19:00 AM	0:01:00	44.2	47.1	42.6
10:20:00 AM	0:01:00	45.3	49.4	42.5
10:21:00 AM	0:01:00	44.7	47	42.6
10:22:00 AM	0:01:00	46.3	50.1	43.8
10:23:00 AM	0:01:00	47.9	50.9	43.5
10:24:00 AM	0:01:00	50.7	56.9	45.6
10:25:00 AM	0:01:00	51.6	57.3	45.5
10:26:00 AM	0:01:00	52.1	62.5	43.7
10:27:00 AM	0:01:00	65.3	80	41.2
10:28:00 AM	0:01:00	47.3	53.1	42.7
10:29:00 AM	0:01:00	47.8	51.6	43.4
10:30:00 AM	0:01:00	46.7	53.3	42.8
10:31:00 AM	0:01:00	48.4	53.1	43.4
10:32:00 AM	0:01:00	48	52.5	44.6
10:33:00 AM	0:01:00	46.8	52.2	42.3
10:34:00 AM	0:01:00	48.7	57.1	43.6
10:35:00 AM	0:01:00	47.1	51.7	43.1
10:36:00 AM	0:01:00	50	61.2	44.5
10:37:00 AM	0:01:00	43.7	58.8	41.7
10:38:00 AM	0:01:00	49.5	54.1	43.1
10:39:00 AM	0:01:00	68.9	81.7	42.2
10:40:00 AM	0:01:00	45.7	49.5	42.4
10:41:00 AM	0:01:00	46.9	53.6	42.6
10:42:00 AM	0:01:00	45.5	53.8	40.9
10:43:00 AM	0:01:00	71.2	84.7	41.8
10:44:00 AM	0:01:00	47	51.1	41.7
10:45:00 AM	0:01:00	46.8	50	43.2
10:46:00 AM	0:01:00	45.9	49.8	42.6
10:47:00 AM	0:01:00	46.6	53	42.7

10:48:00 AM	0:01:00	46.2	49.9	42.2
10:49:00 AM	0:01:00	48.3	52	44.9
10:50:00 AM	0:01:00	46.5	50.2	42.8
10:51:00 AM	0:01:00	47.5	50.7	44.1
10:52:00 AM	0:01:00	46.4	51.1	43.3
10:53:00 AM	0:01:00	46.1	49.2	43.2
10:54:00 AM	0:01:00	47	51.4	41.8
10:55:00 AM	0:01:00	44.8	49.1	41.4
10:56:00 AM	0:01:00	45.3	49	42
10:57:00 AM	0:01:00	44.1	48.7	42
10:58:00 AM	0:01:00	48.3	52.1	42.1
10:59:00 AM	0:01:00	44.3	48.4	41.1
11:00:00 AM	0:01:00	49.2	55.8	42.2
11:01:00 AM	0:01:00	48	56	41
11:02:00 AM	0:01:00	44.9	50.6	40.6
11:03:00 AM	0:01:00	46.3	50.7	41.3
11:04:00 AM	0:01:00	50	55.4	42.3
11:05:00 AM	0:01:00	46.8	56	42.5
11:06:00 AM	0:01:00	45	50.2	41.7
11:07:00 AM	0:01:00	48.1	53.2	43
11:08:00 AM	0:01:00	46.1	51.7	42.1
11:09:00 AM	0:01:00	46.4	50.5	43.8
11:10:00 AM	0:01:00	44.5	50.5	41.4
11:11:00 AM	0:01:00	46.2	49.2	41.6
11:12:00 AM	0:01:00	44.2	47.4	42.2
11:13:00 AM	0:01:00	46.5	50.2	42.6
11:14:00 AM	0:01:00	48.1	51.6	42.8
11:15:00 AM	0:01:00	47.4	52.3	43.2
11:16:00 AM	0:01:00	45.8	50.7	42.1
11:17:00 AM	0:01:00	44.1	50.4	41.5
11:18:00 AM	0:01:00	46.8	54.6	41.9
11:19:00 AM	0:01:00	44.7	48.1	42.3
11:20:00 AM	0:01:00	46.3	50.7	43
11:21:00 AM	0:01:00	48.8	55.3	42.3
11:22:00 AM	0:01:00	53.3	63.5	42.8
11:23:00 AM	0:01:00	49.8	58.8	43.1
11:24:00 AM	0:01:00	51.9	60.1	42.1
11:25:00 AM	0:01:00	50.9	57.8	43.6
11:26:00 AM	0:01:00	43.6	46.6	41.3
11:27:00 AM	0:01:00	45.9	51.1	42.2
11:28:00 AM	0:01:00	44.3	49.8	41.3
11:29:00 AM	0:01:00	48.7	58.5	43.9
11:30:00 AM	0:01:00	48.6	59.5	41.8
11:31:00 AM	0:01:00	45.2	50.7	41.3
11:32:00 AM	0:01:00	53.5	63.5	42.2
11:33:00 AM	0:01:00	53.6	68.8	42.7
11:34:00 AM	0:01:00	49.9	63.1	42.3

11:35:00 AM	0:01:00	57	62	49.1
11:36:00 AM	0:01:00	55.7	58.2	53.8
11:37:00 AM	0:01:00	54.4	55.8	53.6
11:38:00 AM	0:01:00	54.3	55.1	53.9
11:39:00 AM	0:01:00	56.4	61.4	53.4
11:40:00 AM	0:01:00	53.3	54.5	52.5
11:41:00 AM	0:01:00	53.2	53.7	52.7
11:42:00 AM	0:01:00	53.4	54	53
11:43:00 AM	0:01:00	53.3	53.7	52.9
11:44:00 AM	0:01:00	53.6	54	53.2
11:45:00 AM	0:01:00	53.4	54.3	52.9
11:46:00 AM	0:01:00	56.3	65.7	52.9
11:47:00 AM	0:01:00	53.7	54.5	53.1
11:48:00 AM	0:01:00	53.4	54.6	52.9
11:49:00 AM	0:01:00	53.6	54.9	52.9
11:50:00 AM	0:01:00	53.5	54.7	52.8
11:51:00 AM	0:01:00	53.5	54.5	52.8
11:52:00 AM	0:01:00	53.6	55.3	52.7
11:53:00 AM	0:01:00	53.3	54.4	52.8
11:54:00 AM	0:01:00	53.3	54.2	52.8
11:55:00 AM	0:01:00	53.1	53.7	52.7
11:56:00 AM	0:01:00	51.5	53.7	46
11:57:00 AM	0:01:00	45.1	48.8	41.1
11:58:00 AM	0:01:00	44.5	46.7	42.8
11:59:00 AM	0:01:00	46.3	51.6	42
12:00:00 PM	0:01:00	45.1	48.5	42.7
12:01:00 PM	0:01:00	43.8	49.1	41.5
12:02:00 PM	0:01:00	45.5	49	42.6
12:03:00 PM	0:01:00	44.6	48.1	42.1
12:04:00 PM	0:01:00	46	49.9	41.7
12:05:00 PM	0:01:00	44.1	47.3	42.3
12:06:00 PM	0:01:00	45.7	50.2	42.2
12:07:00 PM	0:01:00	45.1	53	41.7
12:08:00 PM	0:01:00	45.2	50.1	41.9
12:09:00 PM	0:01:00	47	50.6	42.1
12:10:00 PM	0:01:00	48	50.8	44.7
12:11:00 PM	0:01:00	46.2	49.2	42.3
12:12:00 PM	0:01:00	47.9	55.4	41.1
12:13:00 PM	0:01:00	52.6	63.8	42.6
12:14:00 PM	0:01:00	44.6	50.7	41.1
12:15:00 PM	0:01:00	47.3	51.6	42.9
12:16:00 PM	0:01:00	45.5	51.2	42.2
12:17:00 PM	0:01:00	46.7	49.9	42.9
12:18:00 PM	0:01:00	45.4	51.2	41.1
12:19:00 PM	0:01:00	45.7	49.4	41.3
12:20:00 PM	0:01:00	46.8	51.2	42.5
12:21:00 PM	0:01:00	46	53.1	41.6

12:22:00 PM	0:01:00	45.4	50.5	42.7
12:23:00 PM	0:01:00	46	50.9	40.8
12:24:00 PM	0:01:00	48.4	54.6	42.1
12:25:00 PM	0:01:00	44.2	48.7	41.8
12:26:00 PM	0:01:00	48.2	56.5	43.9
12:27:00 PM	0:01:00	45.9	48.1	43.3
12:28:00 PM	0:01:00	48.1	54.8	44.1
12:29:00 PM	0:01:00	45.3	50.9	42.1
12:30:00 PM	0:01:00	46.3	52	41.9
12:31:00 PM	0:01:00	46.5	48.1	45.3
12:32:00 PM	0:01:00	48.1	51.4	45.1
12:33:00 PM	0:01:00	52	57	48
12:34:00 PM	0:01:00	59.7	74.6	41.6
12:35:00 PM	0:01:00	46.6	51.3	41.5
12:36:00 PM	0:01:00	46.9	51.9	42.9
12:37:00 PM	0:01:00	45	47.8	42.4
12:38:00 PM	0:01:00	47.7	52.6	42
12:39:00 PM	0:01:00	71.7	84.7	43.4
12:40:00 PM	0:01:00	74.9	89	51.1
12:41:00 PM	0:01:00	54.1	59.6	51
12:42:00 PM	0:01:00	53.2	59.9	50.7
12:43:00 PM	0:01:00	51.3	55	45.9
12:44:00 PM	0:01:00	47.4	52.4	42.7
12:45:00 PM	0:01:00	42.2	46.9	35.9
12:46:00 PM	0:01:00	45.1	49	39.3
12:47:00 PM	0:01:00	46.2	51.8	36.3
12:48:00 PM	0:01:00	46.3	51.2	40.9
12:49:00 PM	0:01:00	40.3	44.9	35.7
12:50:00 PM	0:01:00	44.9	52	37.9
12:51:00 PM	0:01:00	46.8	51.8	40
12:52:00 PM	0:01:00	44.8	51.2	38.4
12:53:00 PM	0:01:00	44	48.5	38.5
12:54:00 PM	0:01:00	50.6	56.9	41.8
12:55:00 PM	0:01:00	46.6	51.3	38.7
12:56:00 PM	0:01:00	39.9	44.3	35.3
12:57:00 PM	0:01:00	50.4	58.3	41.9
12:58:00 PM	0:01:00	44.4	48.3	38.1
12:59:00 PM	0:01:00	44.8	49.8	37.7
1:00:00 PM	0:01:00	45	51.7	35.2
1:01:00 PM	0:01:00	46.5	56.2	36.2
1:02:00 PM	0:01:00	41.6	46.4	36.2
1:03:00 PM	0:01:00	46	52.6	36.4
1:04:00 PM	0:01:00	48.9	61.5	40.5
1:05:00 PM	0:01:00	42.2	49.5	34.5
1:06:00 PM	0:01:00	44.4	50	38.7
1:07:00 PM	0:01:00	43	48.6	34.7
1:08:00 PM	0:01:00	44.6	50.1	38.3

1:09:00 PM	0:01:00	44.8	50.4	37.6
1:10:00 PM	0:01:00	47.1	53.4	44.7
1:11:00 PM	0:01:00	51.7	54	45.1
1:12:00 PM	0:01:00	50.6	53.7	45
1:13:00 PM	0:01:00	49.1	52.5	39.9
1:14:00 PM	0:01:00	72.9	87	44.7
1:15:00 PM	0:01:00	63.5	74.8	38.8
1:15:03 PM	0:00:03	43.5	51.9	43.2

Appendix B
Construction Noise Model Input / Output

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

noise level limit for construction phase at occupied building, per FTA guidance = **80**

allowable hours over which Leq is to be averaged (example: 8 per FTA guidance) = **8**

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Barrier / Topo Insertion Loss (dB)*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq
Site Preparation	Dozer	1	40	82		600		60.4	8	480	56
	Front End Loader	1	40	79		600		57.4	8	480	53
	Dozer	1	40	82		600		60.4	8	480	56
	Tractor	1	40	84		600		62.4	8	480	58
	Front End Loader	1	40	79		600		57.4	8	480	53
	Dozer	1	40	82		600		60.4	8	480	56
	Backhoe	1	40	78		600		56.4	8	480	52
										Total for Site Preparation Phase:	**64.2**
Grading	Excavator	1	40	81		600		59.4	8	480	55
	Grader	1	40	85		600		63.4	8	480	59
	Scraper	1	40	84		600		62.4	8	480	58
	Backhoe	1	40	78		600		56.4	8	480	52
	Dozer	1	40	82		600		60.4	8	480	56
	Excavator	1	40	81		600		59.4	8	480	55
	Front End Loader	1	40	79		600		57.4	8	480	53
	Scraper	1	40	84		600		62.4	8	480	58
										Total for Grading Phase:	**65.8**
Building Construction	Front End Loader	1	40	79		625		57.1	7	420	53
	Crane	1	16	81		625		59.1	7	420	51
	Man Lift	1	20	75		625		53.1	8	480	46
	Generator	1	50	72		625		50.1	8	480	47
	Tractor	1	40	84		625		62.1	8	480	58
	Man Lift	1	20	75		625		53.1	8	480	46
	Backhoe	1	40	78		625		56.1	7	420	52
	Welder / Torch	1	40	73		625		51.1	8	480	47
	Man Lift	1	20	75		625		53.1	8	480	46
											61.1
Paving	Paver	1	50	77		600		55.4	8	480	52
	Concrete Mixer Truck	1	40	79		600		57.4	8	480	53
	Paver	1	50	77		600		55.4	8	480	52
	Roller	1	20	80		600		58.4	8	480	51
	Concrete Mixer Truck	1	40	79		600		57.4	8	480	53
	Roller	1	20	80		600		58.4	8	480	51
	Roller	1	20	80		600		58.4	8	480	51
										Total for Paving Phase:	**60.8**
Architectural Coating	Compressor (air)	1	40	78		625		56.1	6	360	51
										Total for Architectural Coating Phase:	**50.8**

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

noise level limit for construction phase at occupied building, per FTA guidance = **80**

allowable hours over which Leq is to be averaged (example: 8 per FTA guidance) = **8**

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Barrier / Topo Insertion Loss (dB)*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq
Site Preparation	Dozer	1	40	82		50		82.0	8	480	78
	Front End Loader	1	40	79		150		69.5	8	480	65
	Dozer	1	40	82		250		68.0	8	480	64
	Tractor	1	40	84		350		67.1	8	480	63
	Front End Loader	1	40	79		450		59.9	8	480	56
	Dozer	1	40	82		550		61.2	8	480	57
	Backhoe	1	40	78		650		55.7	8	480	52
										Total for Site Preparation Phase:	**78.6**
Grading	Excavator	1	40	81		50		81.0	8	480	77
	Grader	1	40	85		150		75.5	8	480	71
	Scraper	1	40	84		250		70.0	8	480	66
	Backhoe	1	40	78		350		61.1	8	480	57
	Dozer	1	40	82		450		62.9	8	480	59
	Excavator	1	40	81		550		60.2	8	480	56
	Front End Loader	1	40	79		650		56.7	8	480	53
	Scraper	1	40	84		250		70.0	8	480	66
										Total for Grading Phase:	**78.7**
Building Construction	Front End Loader	1	40	79		150		69.5	7	420	65
	Crane	1	16	81		250		67.0	7	420	58
	Man Lift	1	20	75		350		58.1	8	480	51
	Generator	1	50	72		450		52.9	8	480	50
	Tractor	1	40	84		550		63.2	8	480	59
	Man Lift	1	20	75		650		52.7	8	480	46
	Backhoe	1	40	78		250		64.0	7	420	59
	Welder / Torch	1	40	73		450		53.9	8	480	50
	Man Lift	1	20	75		550		54.2	8	480	47
											67.7
Paving	Paver	1	50	77		50		77.0	8	480	74
	Concrete Mixer Truck	1	40	79		150		69.5	8	480	65
	Paver	1	50	77		250		63.0	8	480	60
	Roller	1	20	80		350		63.1	8	480	56
	Concrete Mixer Truck	1	40	79		450		59.9	8	480	56
	Roller	1	20	80		550		59.2	8	480	52
	Roller	1	20	80		650		57.7	8	480	51
										Total for Paving Phase:	**74.9**
Architectural Coating	Compressor (air)	1	40	78		150		68.5	6	360	63
										Total for Architectural Coating Phase:	**63.2**

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

noise level limit for construction phase at occupied building, per FTA guidance = **80**

allowable hours over which Leq is to be averaged (example: 8 per FTA guidance) = **8**

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Barrier / Topo Insertion Loss (dB)*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq
Site Preparation	Dozer	1	40	82		800		57.9	8	480	54
	Front End Loader	1	40	79		800		54.9	8	480	51
	Dozer	1	40	82		800		57.9	8	480	54
	Tractor	1	40	84		800		59.9	8	480	56
	Front End Loader	1	40	79		800		54.9	8	480	51
	Dozer	1	40	82		800		57.9	8	480	54
	Backhoe	1	40	78		800		53.9	8	480	50
										Total for Site Preparation Phase:	**61.7**
Grading	Excavator	1	40	81		800		56.9	8	480	53
	Grader	1	40	85		800		60.9	8	480	57
	Scraper	1	40	84		800		59.9	8	480	56
	Backhoe	1	40	78		800		53.9	8	480	50
	Dozer	1	40	82		800		57.9	8	480	54
	Excavator	1	40	81		800		56.9	8	480	53
	Front End Loader	1	40	79		800		54.9	8	480	51
	Scraper	1	40	84		800		59.9	8	480	56
										Total for Grading Phase:	**63.3**
Building Construction	Front End Loader	1	40	79		850		54.4	7	420	50
	Crane	1	16	81		850		56.4	7	420	48
	Man Lift	1	20	75		850		50.4	8	480	43
	Generator	1	50	72		850		47.4	8	480	44
	Tractor	1	40	84		850		59.4	8	480	55
	Man Lift	1	20	75		850		50.4	8	480	43
	Backhoe	1	40	78		850		53.4	7	420	49
	Welder / Torch	1	40	73		850		48.4	8	480	44
	Man Lift	1	20	75		850		50.4	8	480	43
											58.5
Paving	Paver	1	50	77		800		52.9	8	480	50
	Concrete Mixer Truck	1	40	79		800		54.9	8	480	51
	Paver	1	50	77		800		52.9	8	480	50
	Roller	1	20	80		800		55.9	8	480	49
	Concrete Mixer Truck	1	40	79		800		54.9	8	480	51
	Roller	1	20	80		800		55.9	8	480	49
	Roller	1	20	80		800		55.9	8	480	49
										Total for Paving Phase:	**58.3**
Architectural Coating	Compressor (air)	1	40	78		850		53.4	6	360	48
										Total for Architectural Coating Phase:	**48.2**

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

noise level limit for construction phase at occupied building, per FTA guidance = **80**

allowable hours over which Leq is to be averaged (example: 8 per FTA guidance) = **8**

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Barrier / Topo Insertion Loss (dB)*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq
Site Preparation	Dozer	1	40	82		350		65.1	8	480	61
	Front End Loader	1	40	79		450		59.9	8	480	56
	Dozer	1	40	82		550		61.2	8	480	57
	Tractor	1	40	84		650		61.7	8	480	58
	Front End Loader	1	40	79		750		55.5	8	480	51
	Dozer	1	40	82		850		57.4	8	480	53
	Backhoe	1	40	78		950		52.4	8	480	48
										Total for Site Preparation Phase:	**65.1**
Grading	Excavator	1	40	81		350		64.1	8	480	60
	Grader	1	40	85		450		65.9	8	480	62
	Scraper	1	40	84		550		63.2	8	480	59
	Backhoe	1	40	78		650		55.7	8	480	52
	Dozer	1	40	82		750		58.5	8	480	54
	Excavator	1	40	81		850		56.4	8	480	52
	Front End Loader	1	40	79		950		53.4	8	480	49
	Scraper	1	40	84		550		63.2	8	480	59
										Total for Grading Phase:	**66.9**
Building Construction	Front End Loader	1	40	79		450		59.9	7	420	55
	Crane	1	16	81		550		60.2	7	420	52
	Man Lift	1	20	75		650		52.7	8	480	46
	Generator	1	50	72		750		48.5	8	480	45
	Tractor	1	40	84		850		59.4	8	480	55
	Man Lift	1	20	75		950		49.4	8	480	42
	Backhoe	1	40	78		550		57.2	7	420	53
	Welder / Torch	1	40	73		750		49.5	8	480	45
	Man Lift	1	20	75		850		50.4	8	480	43
											60.7
Paving	Paver	1	50	77		350		60.1	8	480	57
	Concrete Mixer Truck	1	40	79		450		59.9	8	480	56
	Paver	1	50	77		550		56.2	8	480	53
	Roller	1	20	80		650		57.7	8	480	51
	Concrete Mixer Truck	1	40	79		750		55.5	8	480	51
	Roller	1	20	80		850		55.4	8	480	48
	Roller	1	20	80		950		54.4	8	480	47
										Total for Paving Phase:	**61.7**
Architectural Coating	Compressor (air)	1	40	78		450		58.9	6	360	54
										Total for Architectural Coating Phase:	**53.7**

Appendix C
Mechanical Noise Calculations

MECHANICAL EQUIPMENT NOISE LEVEL

Input:

Equipment Locations / Source Noise Data

Site	X	Y	Elev. At Roof or Ground	Source Height	LwA Single Source	Number of Units	Sound Level at 50 feet Total	Equip. Location Site / Number
Bldg 1 SW Corner HVAC 1	5826.9	5579.5	48	3	80	1	62	1 SW Corner HV York ZF-048
Bldg 1 SW Corner HVAC 2	5812.0	5643.0	48	3	80	1	48	1 SW Corner HV York ZF-048
Bldg 1 NW Corner HVAC 1	5717.9	6230.5	48	3	80	1	48	1 NW Corner HV York ZF-048
Bldg 1 NW Corner HVAC 2	5707.4	6282.3	48	3	80	1	48	1 NW Corner HV York ZF-048
Bldg 2 SE Corner HVAC 1	5490.8	5591.4	43	3	80	1	48	2 SE Corner HV. York ZF-048
Bldg 2 SE Corner HVAC 2	5483.5	5631.0	43	3	80	1	48	2 SE Corner HV. York ZF-048
Bldg 3 NE Corner HVAC 1	5453.3	6262.5	42	3	80	1	48	3 NE Corner HV York ZF-048
Bldg 3 NE Corner HVAC 2	5449.6	6288.1	42	3	80	1	48	3 NE Corner HV York ZF-048
Bldg 4 SW Corner HVAC 1	5711.7	6481.7	42	3	80	1	48	4 SW Corner HV York ZF-048
Bldg 4 SW Corner HVAC 2	5707.6	6503.2	42	3	80	1	48	4 SW Corner HV York ZF-048

Frequency (in Hz) 500

Receivers at P.L. and Vicinity				Applicable Standard	Building Elevation	Roof Elevation
N1	5662.198	6689.954	0	70	0	36.5
S1	5882.68	5404.554	0	55		
E1	6594.834	5761.746	59	55		
W1	5468.198	5768.511	0	70		

Output:

Location: N1 5662.2 6690.0 0 Applicable Standard 70

Equip Site	Source Coordinates X	Y	Z	Receiver Coordinates X	Y	Location-Equipment	Leq (h) at 50' (dBA)	Receiver Elevation (feet)	Source Elevation (feet)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Barrier (base) (feet)	Barrier Height (feet)	Fresnel No. at 500 Hz	Barrier Attenuation (dBA)	Leq w/o Barrier (dBA)	Leq w/Barrier (dBA)
Bldg 1 SW Corner HVAC 1	5826.9	5579.5	48.0	5662.2	6690.0	York ZF-048	62	5	51.0	1,123	765	358	48	2.8	1.77	16	35	19
Bldg 1 SW Corner HVAC 2	5812.0	5643.0	48.0	5662.2	6690.0	York ZF-048	48	5	51.0	1,058	695	363	48	2.8	1.68	16	22	6
Bldg 1 NW Corner HVAC 1	5717.9	6230.5	48.0	5662.2	6690.0	York ZF-048	48	5	51.0	463	84	379	48	2.8	0.43	11	29	18
Bldg 1 NW Corner HVAC 2	5707.4	6282.3	48.0	5662.2	6690.0	York ZF-048	48	5	51.0	410	33	377	48	2.8	0.18	8	30	22
Bldg 2 SE Corner HVAC 1	5490.8	5591.4	43.0	5662.2	6690.0	York ZF-048	48	5	46.0	1,112	250	862	43	2.8	0.19	8	21	13
Bldg 2 SE Corner HVAC 2	5483.5	5631.0	43.0	5662.2	6690.0	York ZF-048	48	5	46.0	1,074	205	869	43	2.8	0.16	8	22	14
Bldg 3 NE Corner HVAC 1	5453.3	6262.5	42.0	5662.2	6690.0	York ZF-048	48	5	45.0	476	55	421	42	2.8	0.18	8	29	21
Bldg 3 NE Corner HVAC 2	5449.6	6288.1	42.0	5662.2	6690.0	York ZF-048	48	5	45.0	455	30	425	42	2.8	0.09	7	29	22
Bldg 4 SW Corner HVAC 1	5711.7	6481.7	42.0	5662.2	6690.0	York ZF-048	48	5	45.0	214	155	59	42	2.8	7.55	22	36	16
Bldg 4 SW Corner HVAC 2	5707.6	6503.2	42.0	5662.2	6690.0	York ZF-048	48	5	45.0	192	144	48	42	2.8	9.10	23	37	17
																TOTAL Leq:	35	20
																	Without Barrier	With Barrier/ Parapet

MECHANICAL EQUIPMENT NOISE LEVEL

Input:

Equipment Locations / Source Noise Data

Site	X	Y	Elev. At Roof or Ground	Source Height	LwA Single Source	Number of Units	Sound Level at 50 feet Total	Equip. Location Site / Number
Bldg 1 SW Corner HVAC 1	5826.9	5579.5	48	3	80	1	48	1 SW Corner HV York ZF-048
Bldg 1 SW Corner HVAC 2	5812.0	5643.0	48	3	80	1	48	1 SW Corner HV York ZF-048
Bldg 1 NW Corner HVAC 1	5717.9	6230.5	48	3	80	1	48	1 NW Corner HV York ZF-048
Bldg 1 NW Corner HVAC 2	5707.4	6282.3	48	3	80	1	48	1 NW Corner HV York ZF-048
Bldg 2 SE Corner HVAC 1	5490.8	5591.4	43	3	80	1	48	2 SE Corner HV. York ZF-048
Bldg 2 SE Corner HVAC 2	5483.5	5631.0	43	3	80	1	48	2 SE Corner HV. York ZF-048
Bldg 3 NE Corner HVAC 1	5453.3	6262.5	42	3	80	1	48	3 NE Corner HV York ZF-048
Bldg 3 NE Corner HVAC 2	5449.6	6288.1	42	3	80	1	48	3 NE Corner HV York ZF-048
Bldg 4 SW Corner HVAC 1	5711.7	6481.7	42	3	80	1	48	4 SW Corner HV York ZF-048
Bldg 4 SW Corner HVAC 2	5707.6	6503.2	42	3	80	1	48	4 SW Corner HV York ZF-048

Frequency (in Hz) 500

Receivers at P.L. and Vicinity				Applicable Standard	Building Elevation	Roof Elevation
N1	5662.198	6689.954	0	70	0	36.5
S1	5882.68	5404.554	0	55		
E1	6594.834	5761.746	59	55		
W1	5468.198	5768.511	0	70		

Output:

Location: S1 5882.7 5404.6 0 Applicable Standard 55

Equip Site	Source Coordinates X	Y	Z	Receiver Coordinates X	Y	Location-Equipment	Leq (h) at 50' (dBA)	Receiver Elevation (feet)	Source Elevation (feet)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Barrier (base) (feet)	Barrier Height (feet)	Fresnel No. at 500 Hz	Barrier Attenuation (dBA)	Leq w/o Barrier (dBA)	Leq w/Barrier (dBA)
Bldg 1 SW Corner HVAC 1	5826.9	5579.5	48.0	5882.7	5404.6	York ZF-048	48	5	51.0	184	50	134	48	2.8	1.75	16	37	21
Bldg 1 SW Corner HVAC 2	5812.0	5643.0	48.0	5882.7	5404.6	York ZF-048	48	5	51.0	249	115	134	48	2.8	3.04	18	34	16
Bldg 1 NW Corner HVAC 1	5717.9	6230.5	48.0	5882.7	5404.6	York ZF-048	48	5	51.0	842	715	127	48	2.8	6.02	21	24	4
Bldg 1 NW Corner HVAC 2	5707.4	6282.3	48.0	5882.7	5404.6	York ZF-048	48	5	51.0	895	765	130	48	2.8	5.94	21	23	3
Bldg 2 SE Corner HVAC 1	5490.8	5591.4	43.0	5882.7	5404.6	York ZF-048	48	5	46.0	434	35	399	43	2.8	0.13	8	30	22
Bldg 2 SE Corner HVAC 2	5483.5	5631.0	43.0	5882.7	5404.6	York ZF-048	48	5	46.0	459	75	384	43	2.8	0.30	10	29	20
Bldg 3 NE Corner HVAC 1	5453.3	6262.5	42.0	5882.7	5404.6	York ZF-048	48	5	45.0	959	255	704	42	2.8	0.26	9	23	14
Bldg 3 NE Corner HVAC 2	5449.6	6288.1	42.0	5882.7	5404.6	York ZF-048	48	5	45.0	984	285	699	42	2.8	0.29	9	22	13
Bldg 4 SW Corner HVAC 1	5711.7	6481.7	42.0	5882.7	5404.6	York ZF-048	48	5	45.0	1,091	20	1,071	42	2.8	0.01	5	22	17
Bldg 4 SW Corner HVAC 2	5707.6	6503.2	42.0	5882.7	5404.6	York ZF-048	48	5	45.0	1,113	45	1,068	42	2.8	0.02	5	21	16
																TOTAL Leq:	39	22
																	Without Barrier	With Barrier/ Parapet

MECHANICAL EQUIPMENT NOISE LEVEL

Input:

Equipment Locations / Source Noise Data

Site	X	Y	Elev. At Roof or Ground	Source Height	LwA Single Source	Number of Units	Sound Level at 50 feet Total	Equip. Location Site / Number
Bldg 1 SW Corner HVAC 1	5826.9	5579.5	48	3	80	1	48	1 SW Corner HV York ZF-048
Bldg 1 SW Corner HVAC 2	5812.0	5643.0	48	3	80	1	48	1 SW Corner HV York ZF-048
Bldg 1 NW Corner HVAC 1	5717.9	6230.5	48	3	80	1	48	1 NW Corner HV York ZF-048
Bldg 1 NW Corner HVAC 2	5707.4	6282.3	48	3	80	1	48	1 NW Corner HV York ZF-048
Bldg 2 SE Corner HVAC 1	5490.8	5591.4	43	3	80	1	48	2 SE Corner HV. York ZF-048
Bldg 2 SE Corner HVAC 2	5483.5	5631.0	43	3	80	1	48	2 SE Corner HV. York ZF-048
Bldg 3 NE Corner HVAC 1	5453.3	6262.5	42	3	80	1	48	3 NE Corner HV York ZF-048
Bldg 3 NE Corner HVAC 2	5449.6	6288.1	42	3	80	1	48	3 NE Corner HV York ZF-048
Bldg 4 SW Corner HVAC 1	5711.7	6481.7	42	3	80	1	48	4 SW Corner HV York ZF-048
Bldg 4 SW Corner HVAC 2	5707.6	6503.2	42	3	80	1	48	4 SW Corner HV York ZF-048

Frequency (in Hz) 500

Receivers at P.L. and Vicinity				Applicable Standard	Building Elevation	Roof Elevation
N1	5662.198	6689.954	0	70	0	36.5
S1	5882.68	5404.554	0	55		
E1	6594.834	5761.746	59	55		
W1	5468.198	5768.511	0	70		

Output:

Location: E1 6594.8 5761.7 59 Applicable Standard 55

	Source Coordinates			Receiver Coordinates		Location-Equipment	Leq (h) at 50' (dBA)	Receiver Elevation (feet)	Source Elevation (feet)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Barrier (base) (feet)	Barrier Height (feet)	Fresnel No. at 500 Hz	Barrier Attenuation (dBA)	Leq w/o Barrier (dBA)	Leq w/Barrier (dBA)
Equip Site	X	Y	Z	X	Y													
Bldg 1 SW Corner HVAC 1	5826.9	5579.5	48.0	6594.8	5761.7	York ZF-048	48	64	51.0	789	350	439	48	2.8	Line of Sight	0	24	24
Bldg 1 SW Corner HVAC 2	5812.0	5643.0	48.0	6594.8	5761.7	York ZF-048	48	64	51.0	792	350	442	48	2.8	Line of Sight	0	24	24
Bldg 1 NW Corner HVAC 1	5717.9	6230.5	48.0	6594.8	5761.7	York ZF-048	48	64	51.0	994	350	644	48	2.8	Line of Sight	0	22	22
Bldg 1 NW Corner HVAC 2	5707.4	6282.3	48.0	6594.8	5761.7	York ZF-048	48	64	51.0	1,029	350	679	48	2.8	Line of Sight	0	22	22
Bldg 2 SE Corner HVAC 1	5490.8	5591.4	43.0	6594.8	5761.7	York ZF-048	48	64	46.0	1,117	35	1,082	43	2.8	Line of Sight	0	21	21
Bldg 2 SE Corner HVAC 2	5483.5	5631.0	43.0	6594.8	5761.7	York ZF-048	48	64	46.0	1,119	35	1,084	43	2.8	Line of Sight	0	21	21
Bldg 3 NE Corner HVAC 1	5453.3	6262.5	42.0	6594.8	5761.7	York ZF-048	48	64	45.0	1,247	25	1,222	42	2.8	Line of Sight	0	20	20
Bldg 3 NE Corner HVAC 2	5449.6	6288.1	42.0	6594.8	5761.7	York ZF-048	48	64	45.0	1,260	25	1,235	42	2.8	Line of Sight	0	20	20
Bldg 4 SW Corner HVAC 1	5711.7	6481.7	42.0	6594.8	5761.7	York ZF-048	48	64	45.0	1,139	205	934	42	2.8	Line of Sight	0	21	21
Bldg 4 SW Corner HVAC 2	5707.6	6503.2	42.0	6594.8	5761.7	York ZF-048	48	64	45.0	1,156	250	906	42	2.8	Line of Sight	0	21	21
																TOTAL Leq:	27	27
																	Without Barrier	With Barrier/ Parapet

MECHANICAL EQUIPMENT NOISE LEVEL

Input:

Equipment Locations / Source Noise Data

Site	X	Y	Elev. At Roof or Ground	Source Height	LwA Single Source	Number of Units	Sound Level at 50 feet Total	Equip. Location Site / Number
Bldg 1 SW Corner HVAC 1	5826.9	5579.5	48	3	80	1	48	1 SW Corner HV York ZF-048
Bldg 1 SW Corner HVAC 2	5812.0	5643.0	48	3	80	1	48	1 SW Corner HV York ZF-048
Bldg 1 NW Corner HVAC 1	5717.9	6230.5	48	3	80	1	48	1 NW Corner HV York ZF-048
Bldg 1 NW Corner HVAC 2	5707.4	6282.3	48	3	80	1	48	1 NW Corner HV York ZF-048
Bldg 2 SE Corner HVAC 1	5490.8	5591.4	43	3	80	1	48	2 SE Corner HV. York ZF-048
Bldg 2 SE Corner HVAC 2	5483.5	5631.0	43	3	80	1	48	2 SE Corner HV. York ZF-048
Bldg 3 NE Corner HVAC 1	5453.3	6262.5	42	3	80	1	48	3 NE Corner HV York ZF-048
Bldg 3 NE Corner HVAC 2	5449.6	6288.1	42	3	80	1	48	3 NE Corner HV York ZF-048
Bldg 4 SW Corner HVAC 1	5711.7	6481.7	42	3	80	1	48	4 SW Corner HV York ZF-048
Bldg 4 SW Corner HVAC 2	5707.6	6503.2	42	3	80	1	48	4 SW Corner HV York ZF-048

Frequency (in Hz) 500

Receivers at P.L. and Vicinity				Applicable Standard	Building Elevation	Roof Elevation
N1	5662.198	6689.954	0	70	0	36.5
S1	5882.68	5404.554	0	55		
E1	6594.834	5761.746	59	55		
W1	5468.198	5768.511	0	70		

Output:

Location: W1 5468.2 5768.5 0 Applicable Standard 70

Equip Site	Source Coordinates X	Y	Z	Receiver Coordinates X	Y	Location-Equipment	Leq (h) at 50' (dBA)	Receiver Elevation (feet)	Source Elevation (feet)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Barrier (base) (feet)	Barrier Height (feet)	Fresnel No. at 500 Hz	Barrier Attenuation (dBA)	Leq w/o Barrier (dBA)	Leq w/Barrier (dBA)
Bldg 1 SW Corner HVAC 1	5826.9	5579.5	48.0	5468.2	5768.5	York ZF-048	48	5	51.0	405	25	380	48	2.8	0.13	7	30	23
Bldg 1 SW Corner HVAC 2	5812.0	5643.0	48.0	5468.2	5768.5	York ZF-048	48	5	51.0	366	25	341	48	2.8	0.16	8	31	23
Bldg 1 NW Corner HVAC 1	5717.9	6230.5	48.0	5468.2	5768.5	York ZF-048	48	5	51.0	525	30	495	48	2.8	0.09	7	28	21
Bldg 1 NW Corner HVAC 2	5707.4	6282.3	48.0	5468.2	5768.5	York ZF-048	48	5	51.0	567	30	537	48	2.8	0.08	7	27	21
Bldg 2 SE Corner HVAC 1	5490.8	5591.4	43.0	5468.2	5768.5	York ZF-048	48	5	46.0	179	160	19	43	2.8	19.31	26	37	17
Bldg 2 SE Corner HVAC 2	5483.5	5631.0	43.0	5468.2	5768.5	York ZF-048	48	5	46.0	138	160	-22	43	2.8	55.25	30	39	19
Bldg 3 NE Corner HVAC 1	5453.3	6262.5	42.0	5468.2	5768.5	York ZF-048	48	5	45.0	494	220	274	42	2.8	1.12	14	28	14
Bldg 3 NE Corner HVAC 2	5449.6	6288.1	42.0	5468.2	5768.5	York ZF-048	48	5	45.0	520	220	300	42	2.8	0.98	14	28	14
Bldg 4 SW Corner HVAC 1	5711.7	6481.7	42.0	5468.2	5768.5	York ZF-048	48	5	45.0	754	25	729	42	2.8	0.02	5	25	19
Bldg 4 SW Corner HVAC 2	5707.6	6503.2	42.0	5468.2	5768.5	York ZF-048	48	5	45.0	773	25	748	42	2.8	0.02	5	25	19
																TOTAL Leq:	34	26
																	Without Barrier	With Barrier/ Parapet

Truck Loading Dock Activities Noise

Ref: 96 dBA at 3.3 feet (Baltrënas, P., D. Kazlauskas, and E. Petraitis. 2004. “Testing on Noise Level Prevailing at Motor Vehicle Parking Lots and Numeral Simulation of its Dispersion.” Journal of Environmental Engineering and Landscape Management 12(2): 63-70.0

Receiver/ Location	Distance	Noise Level w/o Shielding	Noise Level w/ Shielding
N1	110	65.5	60.3
S1	450	53.3	35.0
E1	650	50.1	50.1
W1	110	65.5	34.0

Parking Lot Activities Noise

Ref: 47 dBA at 3.3 feet (Baltrënas, P., D. Kazlauskas, and E. Petraitis. 2004. “Testing on Noise Level Prevailing at Motor Vehicle Parking Lots and Numeral Simulation of its Dispersion.” Journal of Environmental Engineering and Landscape Management 12(2): 63-70.0

Receiver/ Location	Distance	Noise Level w/o Shielding	Noise Level w/ Shielding
N1	55	22.6	22.6
S1	55	22.6	22.6
E1	450	4.3	4.3
W1	45	24.3	24.3

RAY-TRACE PROGRAM (FOR A POINT-SOURCE)

Uses the Equation: $(A_{e4})_{point}=20*\log[(2*pi*N)^{1/2}/\tanh(2*pi*N)^{1/2}]+5dB$

(Ref. Pg.174, Noise and Vibration Control, L.L. Beranek Editor, 1971 Ed.

Project: Springbrook Avenue Warehouse Project
Date: 3/28/23
By: MG

Please Enter: Using English (E) units or Metric (M) units ? E

Ray Trace Number/Description	Source-Receiver Distance (ft. or m)	Source Base Elev. (ft. or m)	Source Height above Ground (ft. or m)	Receiver Base Elev. (ft. or m)	Receiver Height above Ground (ft. or m)	Horizontal Barrier Dist. (in ref. to source) (ft. or m)	Barrier Base Elev. (ft. or m)	Barrier Height (ft. or m)	Dominant Freq.(Hz)	Source-Rcvr Straight-Line Dist. (ft. or m)	Source-Top-of-Barrier Dist. (ft. or m)	Receiver-Top-of-Barrier Dist. (ft. or m)	Lambda	N_{max}	$AE_{(barriers)}$ (dB)
1. Source -Truck Noise at N. PL	110.0	0.0	10.0	0.0	5.0	65.0	0.0	8.0	500.0	110.1	65.0	45.1	2.3	0.0	**5.3**
2. Source -Truck Noise at S. PL	450.0	0.0	10.0	0.0	5.0	150.0	0.0	36.0	500.0	450.0	152.2	301.6	2.3	3.4	**18.3**
3. Source -Truck Noise at E. PL	650.0	0.0	10.0	59.0	5.0	150.0	0.0	8.0	501.0	652.2	150.0	503.1	2.3	0.8	**0.0**
4. Source -Truck Noise at W. PL	110.0	0.0	10.0	0.0	5.0	150.0	0.0	14.0	501.0	110.1	150.1	41.0	2.3	71.9	**31.5**

TECHNICAL GUIDE

R-410A
ZE/ZF/ZR/XN/XP SERIES
3 - 6 TON
60 Hertz

Description

YORK® ZE/ZF/ZR/XN/XP Series units are convertible single package high efficiency rooftops with a common roof curb for the 3, 4, 5 and 6 Ton sizes (ZE, ZR, XN, XP not available in 6 Ton). Although the units are primarily designed for curb mounting on a roof, they can also be slab-mounted at ground level or set on steel beams above a finished roof.

All ZE/ZF/ZR/XN/XP Series units are self-contained and assembled on rigid full perimeter base rails allowing for overhead rigging. Every unit is completely charged, wired, piped and tested at the factory to provide a quick and easy field installation.

All models (including those with an economizer) are convertible between bottom and horizontal duct connections.

ZE/ZF/ZR Series units are available in the following configurations: cooling only, cooling with electric heat, and cooling with one or two stage gas heat. Electric heaters are available as factory-installed option or field installed accessory.

XN/XP Series units are available in the following configurations: cooling and heating only and cooling and heating with electric heat.

Tested in accordance with:

DESIGN CERTIFIED

C SA US

CERTIFIED

AHRI CERTIFIED www.ahridirectory.org Unitary Small AC AHRI Standard 210/240

AHRI CERTIFIED www.ahridirectory.org Unitary Small HP AHRI Standard 210/240

Sound Performance

ZF/ZR/XP Indoor Sound Power Levels

Size (Tons)	CFM	ESP (IWG)	Blower		Sound Power, dB (10^{-12}) Watts							
					Sound Rating[1] dB (A)	Octave Band Centerline Frequency (Hz)						
			RPM	BHP		63	125	250	500	1000	2000	4000	8000
036 (3.0)	1200	0.2	630	0.41	63	82	77	59	50	43	42	40	45
048 (4.0)	1600	0.2	791	0.54	72	95	84	58	54	46	44	45	44
060 (5.0)	2000	0.2	840	0.67	62	84	71	58	53	50	49	49	49
072 (6.0)	2200	0.3	920	1.45	76	61	71	68	67	72	66	61	54

1. These values have been accessed using a model of sound propagation from a point source into the hemispheric/free field. The dBA values provided are to be used for reference only. Calculation of dBA values cover matters of system design and the fan manufacture has no way of knowing the details of each system. This constitutes an exception to any specification or guarantee requiring a dBA value of sound data in any other form than sound power level ratings.

ZE/ZF/ZR Outdoor Sound Power Levels

Size (Tons)	Sound Rating[1] dB (A)	Octave Band Centerline Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
036 (3.0)	81	87.5	86.0	81.0	77.0	75.0	69.5	65.5	70.5
048 (4.0)	80	84.5	81.0	80.0	78.0	75.0	70.0	67.0	70.5
060 (5.0)	82	86.5	87.5	81.5	77.5	75.0	71.5	68.0	70.5
072 (6.0)	83	-	84.0	85.0	79.0	80.0	72.0	67.5	62.5

1. Rated in accordance with AHRI 270 standard.

XN/XP Outdoor Sound Power Levels

Size (Tons)	Sound Rating[1] dB (A)	Octave Band Centerline Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
036 (3.0)	76	83.5	84.5	76.5	72.0	68.0	66.0	60.0	56.0
048 (4.0)	80	85.0	83.0	81.0	77.5	75.5	71.5	67.5	61.5
060 (5.0)	80	86.0	84.0	81.0	77.0	75.5	71.0	66.5	60.5

1. Rated in accordance with AHRI 270 standard.

Appendix D
Traffic Noise Modeling Input/Output

Dudek					**8 July 2022**							
MG					**TNM 2.5**							
INPUT: ROADWAYS								**Average pavement type shall be used unless**				
PROJECT/CONTRACT:	**14378**							**a State highway agency substantiates the use**				
RUN:	**Springbrook Santa Clarita - Existing**							**of a different type with the approval of FHWA**				
Roadway		**Points**										
Name	**Width**	**Name**	**No.**	**Coordinates (pavement)**				**Flow Control**			**Segment**	
				X	**Y**	**Z**		**Control Device**	**Speed Constraint**	**Percent Vehicles Affected**	**Pvmt Type**	**On Struct?**
	ft			ft	ft	ft			mph	%		
Magic Mountain Parkway	80.0	point78	78	480.3	13,192.9	1,000.00					Average	
		point61	61	1,320.8	12,862.2	1,000.00					Average	
		point62	62	1,825.2	12,636.2	1,000.00					Average	
		point63	63	2,425.9	12,363.4	1,000.00					Average	
		point64	64	2,629.8	12,278.0	1,000.00					Average	
		point65	65	3,145.2	12,082.3	1,000.00					Average	
		point66	66	4,392.0	11,631.7	1,000.00					Average	
		point67	67	6,509.9	10,821.9	1,000.00						
Valencia Blvd	90.0	point80	80	5,080.4	9,681.8	1,000.00					Average	
		point70	70	5,482.8	9,703.7	1,000.00					Average	
		point71	71	5,697.2	9,778.0	1,000.00					Average	
		point72	72	5,942.2	9,891.8	1,000.00					Average	
		point73	73	6,156.5	10,093.0	1,000.00					Average	
		point74	74	6,287.8	10,289.8	1,000.00					Average	
		point75	75	6,432.1	10,556.7	1,000.00					Average	
		point76	76	6,513.3	10,818.5	1,000.00						
Oak Ridge Drive	50.0	point82	82	6,290.7	4,011.3	1,000.00					Average	
		point43	43	6,035.8	4,251.0	1,000.00						
Via Princessa -w. of Orchard Village Rd	90.0	point84	84	1,992.9	1,050.9	1,000.00					Average	
		point5	5	2,451.2	1,543.9	1,000.00						
Railroad Cyn Rd - s. of Via Princessa	105.0	point86	86	5,982.4	1,915.1	1,000.00					Average	
		point30	30	5,430.3	2,741.5	1,000.00					Average	
		point31	31	5,249.7	3,029.7	1,000.00					Average	
		point32	32	5,124.7	3,265.8	1,000.00					Average	
		point33	33	5,057.7	3,488.7	1,000.00						

Orchard Village Road -s.of Via Princess	80.0	point88	88	2,895.9	1,001.7	1,000.00				Average	
		point23	23	2,449.7	1,535.4	1,000.00					
Future Springbrook Ave	70.0	point90	90	5,565.1	5,443.0	1,000.00				Average	
		point57	57	5,627.6	5,536.7	1,000.00				Average	
		point58	58	5,645.0	5,713.8	1,000.00				Average	
		point59	59	5,537.4	6,345.7	1,000.00					
Valencia Blvd-n. of Magic Mtn Pkwy	90.0	point91	91	6,515.1	10,828.4	1,000.00				Average	
		point2	2	6,797.4	11,786.0	1,000.00					
Magic Mountain Parkway- e. of Valencia	80.0	point92	92	6,509.9	10,821.9	1,000.00				Average	
		point68	68	8,127.9	10,211.6	1,000.00					
Railroad Cyn Rd-n. of Oak Ridge Dr.	105.0	point93	93	5,176.8	5,428.9	1,000.00				Average	
		point40	40	4,953.7	6,911.8	1,000.00				Average	
		point41	41	4,831.2	7,734.2	1,000.00					
Oak Ridge Drive-n. of Via Princessa	50.0	point94	94	6,027.2	4,256.5	1,000.00				Average	
		point44	44	5,944.9	4,344.7	1,000.00				Average	
		point45	45	5,869.1	4,424.7	1,000.00				Average	
		point46	46	5,823.6	4,515.6	1,000.00				Average	
		point47	47	5,797.5	4,599.6	1,000.00				Average	
		point48	48	5,764.4	4,800.8	1,000.00				Average	
		point49	49	5,701.9	5,144.5	1,000.00				Average	
		point50	50	5,655.0	5,272.7	1,000.00				Average	
		point51	51	5,623.4	5,334.7	1,000.00				Average	
		point52	52	5,550.3	5,416.0	1,000.00					
Via Princessa -e. of Oak Ridge Dr	90.0	point95	95	6,027.9	4,250.1	1,000.00				Average	
		point18	18	6,317.2	4,556.0	1,000.00				Average	
		point19	19	6,554.2	4,737.9	1,000.00				Average	
		point20	20	6,716.8	4,842.6	1,000.00				Average	
		point21	21	6,912.5	4,925.2	1,000.00					
Via Princessa -e. of Railroad Cyun Rd	90.0	point96	96	5,058.4	3,497.9	1,000.00				Average	
		point14	14	5,263.3	3,596.8	1,000.00				Average	
		point15	15	5,369.2	3,655.9	1,000.00				Average	
		point16	16	5,671.0	3,887.7	1,000.00				Average	
		point17	17	6,027.9	4,250.1	1,000.00					
Railroad Cyn Rd	105.0	point97	97	5,055.5	3,505.4	1,000.00				Average	
		point34	34	5,058.8	3,779.6	1,000.00				Average	
		point35	35	5,131.7	4,092.1	1,000.00				Average	
		point36	36	5,242.8	4,425.4	1,000.00				Average	
		point37	37	5,277.5	4,637.2	1,000.00				Average	
		point38	38	5,277.5	4,862.9	1,000.00				Average	

		point39	39	5,176.8	5,428.9	1,000.00					
Via Princessa	90.0	point98	98	2,451.2	1,543.9	1,000.00				Average	
		point6	6	2,729.0	1,835.6	1,000.00				Average	
		point7	7	2,941.2	2,098.1	1,000.00				Average	
		point8	8	3,133.6	2,426.2	1,000.00				Average	
		point9	9	3,409.2	2,787.0	1,000.00				Average	
		point10	10	3,785.4	3,108.6	1,000.00				Average	
		point11	11	4,104.8	3,255.1	1,000.00				Average	
		point12	12	4,485.3	3,362.3	1,000.00				Average	
		point13	13	5,058.4	3,497.9	1,000.00					
Orchard Village Road	80.0	point99	99	2,441.6	1,542.6	1,000.00				Average	
		point24	24	2,149.4	1,835.8	1,000.00				Average	
		point25	25	1,995.0	2,042.4	1,000.00				Average	
		point26	26	1,791.1	2,359.3	1,000.00				Average	
		point27	27	1,658.8	2,563.3	1,000.00				Average	
		point28	28	1,228.9	3,208.1	1,000.00					
Oak Ridge Drive-e. of Via Railroad Ave.	50.0	point100	100	5,550.3	5,416.0	1,000.00				Average	
		point53	53	5,475.9	5,460.1	1,000.00				Average	
		point54	54	5,394.6	5,479.4	1,000.00				Average	
		point55	55	5,194.8	5,450.4	1,000.00					

Dudek **8 July 2022**
MG **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Existing

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Magic Mountain Parkway	point78	78	1710	50	35	50	18	45	0	0	0	0
	point61	61	1710	50	35	50	18	45	0	0	0	0
	point62	62	1710	50	35	50	18	45	0	0	0	0
	point63	63	1710	50	35	50	18	45	0	0	0	0
	point64	64	1710	50	35	50	18	45	0	0	0	0
	point65	65	1710	50	35	50	18	45	0	0	0	0
	point66	66	1710	50	35	50	18	45	0	0	0	0
	point67	67										
Valencia Blvd	point80	80	3022	45	62	45	31	40	0	0	0	0
	point70	70	3022	45	62	45	31	40	0	0	0	0
	point71	71	3022	45	62	45	31	40	0	0	0	0
	point72	72	3022	45	62	45	31	40	0	0	0	0
	point73	73	3022	45	62	45	31	40	0	0	0	0
	point74	74	3022	45	62	45	31	40	0	0	0	0
	point75	75	3022	45	62	45	31	40	0	0	0	0
	point76	76										
Oak Ridge Drive	point82	82	55	25	1	25	1	20	0	0	0	0
	point43	43										
Via Princessa -w. of Orchard Village Rd	point84	84	743	45	15	45	8	40	0	0	0	0
	point5	5										
Railroad Cyn Rd - s. of Via Princessa	point86	86	2533	50	52	50	26	45	0	0	0	0
	point30	30	2533	50	52	50	26	45	0	0	0	0
	point31	31	2533	50	52	50	26	45	0	0	0	0

	point32	32	2533	50	52	50	26	45	0	0	0	0
	point33	33										
Orchard Village Road -s.of Via Princess	point88	88	0	0	0	0	0	0	0	0	0	0
	point23	23										
Future Springbrook Ave	point90	90	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59										
Valencia Blvd-n. of Magic Mtn Pkwy	point91	91	3577	45	74	45	37	40	0	0	0	0
	point2	2										
Magic Mountain Parkway- e. of Valencia	point92	92	1265	50	26	50	13	45	0	0	0	0
	point68	68										
Railroad Cyn Rd-n. of Oak Ridge Dr.	point93	93	3127	50	64	50	32	45	0	0	0	0
	point40	40	3127	50	64	50	32	45	0	0	0	0
	point41	41										
Oak Ridge Drive-n. of Via Princessa	point94	94	761	35	16	35	8	30	0	0	0	0
	point44	44	761	35	16	35	8	30	0	0	0	0
	point45	45	761	35	16	35	8	30	0	0	0	0
	point46	46	761	35	16	35	8	30	0	0	0	0
	point47	47	761	35	16	35	8	30	0	0	0	0
	point48	48	761	35	16	35	8	30	0	0	0	0
	point49	49	761	35	16	35	8	30	0	0	0	0
	point50	50	761	35	16	35	8	30	0	0	0	0
	point51	51	761	35	16	35	8	30	0	0	0	0
	point52	52										
Via Princessa -e. of Oak Ridge Dr	point95	95	337	45	7	45	3	40	0	0	0	0
	point18	18	337	45	7	45	3	40	0	0	0	0
	point19	19	337	45	7	45	3	40	0	0	0	0
	point20	20	337	45	7	45	3	40	0	0	0	0
	point21	21										
Via Princessa -e. of Railroad Cyun Rd	point96	96	743	45	15	45	8	40	0	0	0	0
	point14	14	743	45	15	45	8	40	0	0	0	0
	point15	15	743	45	15	45	8	40	0	0	0	0
	point16	16	743	45	15	45	8	40	0	0	0	0
	point17	17										
Railroad Cyn Rd	point97	97	2533	50	52	50	26	45	0	0	0	0

	point34	34	2533	50	52	50	26	45	0	0	0	0
	point35	35	2533	50	52	50	26	45	0	0	0	0
	point36	36	2533	50	52	50	26	45	0	0	0	0
	point37	37	2533	50	52	50	26	45	0	0	0	0
	point38	38	2533	50	52	50	26	45	0	0	0	0
	point39	39										
Via Princessa	point98	98	743	45	15	45	8	40	0	0	0	0
	point6	6	743	45	15	45	8	40	0	0	0	0
	point7	7	743	45	15	45	8	40	0	0	0	0
	point8	8	743	45	15	45	8	40	0	0	0	0
	point9	9	743	45	15	45	8	40	0	0	0	0
	point10	10	743	45	15	45	8	40	0	0	0	0
	point11	11	743	45	15	45	8	40	0	0	0	0
	point12	12	743	45	15	45	8	40	0	0	0	0
	point13	13										
Orchard Village Road	point99	99	0	0	0	0	0	0	0	0	0	0
	point24	24	0	0	0	0	0	0	0	0	0	0
	point25	25	0	0	0	0	0	0	0	0	0	0
	point26	26	0	0	0	0	0	0	0	0	0	0
	point27	27	0	0	0	0	0	0	0	0	0	0
	point28	28										
Oak Ridge Drive-e. of Via Railroad Ave.	point100	100	811	35	17	35	8	30	0	0	0	0
	point53	53	811	35	17	35	8	30	0	0	0	0
	point54	54	811	35	17	35	8	30	0	0	0	0
	point55	55										

Dudek
MG

8 July 2022
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Existing

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1	1	1	5,818.9	5,348.1	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST2	2	1	6,101.8	5,363.6	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST3	3	1	6,429.4	6,514.9	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST4	4	1	5,462.3	4,881.2	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST5	5	1	1,661.8	12,954.2	1,000.00	5.00	0.00	66	10.0	8.0	Y
M1	6	1	7,051.1	10,424.7	1,000.00	5.00	0.00	66	10.0	8.0	Y
M2	7	1	2,436.7	1,703.5	1,000.00	5.00	0.00	66	10.0	8.0	Y
M3	8	1	5,900.7	4,294.0	1,000.00	5.00	0.00	66	10.0	8.0	Y

Dudek 8 July 2022
MG TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Existing

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht	Perturbs		On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1	W	0.00	99.99	0.00				0.00	point1	1	5,795.3	9,485.1	1,000.00	24.00	0.00	0	0		
									point3	3	6,218.9	9,679.6	1,000.00	24.00	0.00	0	0		
									point4	4	6,461.9	9,999.0	1,000.00	24.00	0.00	0	0		
									point5	5	6,725.8	10,512.9	1,000.00	24.00	0.00	0	0		
									point6	6	7,809.1	10,113.6	1,000.00	24.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point31	31	1,187.5	12,757.9	1,000.00	24.00	0.00	0	0		
									point8	8	2,520.8	12,216.3	1,000.00	24.00	0.00	0	0		
									point9	9	2,638.9	11,306.6	1,000.00	24.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point33	33	5,837.4	4,862.4	1,000.00	24.00	0.00	0	0		
									point11	11	5,732.4	5,286.7	1,000.00	24.00	0.00	0	0		
									point12	12	6,279.2	5,321.7	1,000.00	24.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point35	35	5,274.2	3,872.1	1,000.00	24.00	0.00	0	0		
									point14	14	5,462.3	4,637.7	1,000.00	24.00	0.00	0	0		
									point15	15	5,716.0	4,637.7	1,000.00	24.00	0.00	0	0		
									point16	16	5,847.3	4,300.9	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point37	37	5,847.3	4,602.7	1,000.00	24.00	0.00	0	0		
									point18	18	6,017.8	4,349.0	1,000.00	24.00	0.00	0	0		
									point19	19	6,188.5	4,515.2	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point39	39	1,860.6	2,425.1	1,000.00	24.00	0.00	0	0		
									point21	21	2,332.8	1,803.6	1,000.00	24.00	0.00	0	0		
									point22	22	2,464.7	1,748.0	1,000.00	24.00	0.00	0	0		
									point23	23	2,867.5	2,241.1	1,000.00	24.00	0.00	0	0		
									point24	24	3,249.5	2,817.5	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point41	41	2,625.0	1,516.2	1,000.00	24.00	0.00	0	0		
									point26	26	3,076.4	1,981.5	1,000.00	24.00	0.00	0	0		
									point27	27	3,187.5	2,377.3	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point43	43	5,338.2	3,540.5	1,000.00	24.00	0.00	0	0		
									point29	29	6,088.2	4,103.0	1,000.00	24.00	0.00	0	0		
									point2	2	6,338.2	3,866.9	1,000.00	24.00					

Dudek			**8 July 2022**	
MG			**TNM 2.5**	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	**14378**			
RUN:	**Springbrook Santa Clarita - Existing**			
Terrain Line	**Points**			
Name	**No.**	**Coordinates (ground)**		
		X	**Y**	**Z**
		ft	ft	ft
Terrain Line1	1	5,433.9	4,595.9	1,020.00
	2	5,387.6	4,873.7	1,020.00
	3	5,331.0	5,321.3	1,020.00
	4	5,289.8	5,408.7	1,020.00

Dudek
MG
8 July 2022
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1	1	1	0.0	56.3	66	56.3	10	----	56.3	0.0	8	-8.0
ST2	2	1	0.0	49.7	66	49.7	10	----	49.7	0.0	8	-8.0
ST3	3	1	0.0	45.5	66	45.5	10	----	45.5	0.0	8	-8.0
ST4	4	1	0.0	54.1	66	54.1	10	----	54.1	0.0	8	-8.0
ST5	5	1	0.0	63.2	66	63.2	10	----	63.2	0.0	8	-8.0
M1	6	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0
M2	7	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
M3	8	1	0.0	64.1	66	64.1	10	----	64.1	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	8	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek					**8 July 2022**							
MG					**TNM 2.5**							
INPUT: ROADWAYS								**Average pavement type shall be used unless**				
PROJECT/CONTRACT:	**14378**							**a State highway agency substantiates the use**				
RUN:	**Springbrook Santa Clarita - Exist w Proj**							**of a different type with the approval of FHWA**				
Roadway		**Points**										
Name	**Width**	**Name**	**No.**	**Coordinates (pavement)**				**Flow Control**			**Segment**	
				X	**Y**	**Z**		**Control Device**	**Speed Constraint**	**Percent Vehicles Affected**	**Pvmt Type**	**On Struct?**
	ft			ft	ft	ft			mph	%		
Magic Mountain Parkway	80.0	point78	78	480.3	13,192.9	1,000.00					Average	
		point61	61	1,320.8	12,862.2	1,000.00					Average	
		point62	62	1,825.2	12,636.2	1,000.00					Average	
		point63	63	2,425.9	12,363.4	1,000.00					Average	
		point64	64	2,629.8	12,278.0	1,000.00					Average	
		point65	65	3,145.2	12,082.3	1,000.00					Average	
		point66	66	4,392.0	11,631.7	1,000.00					Average	
		point67	67	6,509.9	10,821.9	1,000.00						
Valencia Blvd	90.0	point80	80	5,080.4	9,681.8	1,000.00					Average	
		point70	70	5,482.8	9,703.7	1,000.00					Average	
		point71	71	5,697.2	9,778.0	1,000.00					Average	
		point72	72	5,942.2	9,891.8	1,000.00					Average	
		point73	73	6,156.5	10,093.0	1,000.00					Average	
		point74	74	6,287.8	10,289.8	1,000.00					Average	
		point75	75	6,432.1	10,556.7	1,000.00					Average	
		point76	76	6,513.3	10,818.5	1,000.00						
Oak Ridge Drive	50.0	point82	82	6,290.7	4,011.3	1,000.00					Average	
		point43	43	6,035.8	4,251.0	1,000.00						
Via Princessa -w. of Orchard Village Rd	90.0	point84	84	1,992.9	1,050.9	1,000.00					Average	
		point5	5	2,451.2	1,543.9	1,000.00						
Railroad Cyn Rd - s. of Via Princessa	105.0	point86	86	5,982.4	1,915.1	1,000.00					Average	
		point30	30	5,430.3	2,741.5	1,000.00					Average	
		point31	31	5,249.7	3,029.7	1,000.00					Average	
		point32	32	5,124.7	3,265.8	1,000.00					Average	
		point33	33	5,057.7	3,488.7	1,000.00						

Orchard Village Road -s.of Via Princess	80.0	point88	88	2,895.9	1,001.7	1,000.00				Average	
		point23	23	2,449.7	1,535.4	1,000.00					
Future Springbrook Ave	70.0	point90	90	5,565.1	5,443.0	1,000.00				Average	
		point57	57	5,627.6	5,536.7	1,000.00				Average	
		point58	58	5,645.0	5,713.8	1,000.00				Average	
		point59	59	5,537.4	6,345.7	1,000.00					
Valencia Blvd-n. of Magic Mtn Pkwy	90.0	point91	91	6,515.1	10,828.4	1,000.00				Average	
		point2	2	6,797.4	11,786.0	1,000.00					
Magic Mountain Parkway- e. of Valencia	80.0	point92	92	6,509.9	10,821.9	1,000.00				Average	
		point68	68	8,127.9	10,211.6	1,000.00					
Railroad Cyn Rd-n. of Oak Ridge Dr.	105.0	point93	93	5,176.8	5,428.9	1,000.00				Average	
		point40	40	4,953.7	6,911.8	1,000.00				Average	
		point41	41	4,831.2	7,734.2	1,000.00					
Oak Ridge Drive-n. of Via Princessa	50.0	point94	94	6,027.2	4,256.5	1,000.00				Average	
		point44	44	5,944.9	4,344.7	1,000.00				Average	
		point45	45	5,869.1	4,424.7	1,000.00				Average	
		point46	46	5,823.6	4,515.6	1,000.00				Average	
		point47	47	5,797.5	4,599.6	1,000.00				Average	
		point48	48	5,764.4	4,800.8	1,000.00				Average	
		point49	49	5,701.9	5,144.5	1,000.00				Average	
		point50	50	5,655.0	5,272.7	1,000.00				Average	
		point51	51	5,623.4	5,334.7	1,000.00				Average	
		point52	52	5,550.3	5,416.0	1,000.00					
Via Princessa -e. of Oak Ridge Dr	90.0	point95	95	6,027.9	4,250.1	1,000.00				Average	
		point18	18	6,317.2	4,556.0	1,000.00				Average	
		point19	19	6,554.2	4,737.9	1,000.00				Average	
		point20	20	6,716.8	4,842.6	1,000.00				Average	
		point21	21	6,912.5	4,925.2	1,000.00					
Via Princessa -e. of Railroad Cyun Rd	90.0	point96	96	5,058.4	3,497.9	1,000.00				Average	
		point14	14	5,263.3	3,596.8	1,000.00				Average	
		point15	15	5,369.2	3,655.9	1,000.00				Average	
		point16	16	5,671.0	3,887.7	1,000.00				Average	
		point17	17	6,027.9	4,250.1	1,000.00					
Railroad Cyn Rd	105.0	point97	97	5,055.5	3,505.4	1,000.00				Average	
		point34	34	5,058.8	3,779.6	1,000.00				Average	
		point35	35	5,131.7	4,092.1	1,000.00				Average	
		point36	36	5,242.8	4,425.4	1,000.00				Average	
		point37	37	5,277.5	4,637.2	1,000.00				Average	
		point38	38	5,277.5	4,862.9	1,000.00				Average	

		point39	39	5,176.8	5,428.9	1,000.00					
Via Princessa	90.0	point98	98	2,451.2	1,543.9	1,000.00				Average	
		point6	6	2,729.0	1,835.6	1,000.00				Average	
		point7	7	2,941.2	2,098.1	1,000.00				Average	
		point8	8	3,133.6	2,426.2	1,000.00				Average	
		point9	9	3,409.2	2,787.0	1,000.00				Average	
		point10	10	3,785.4	3,108.6	1,000.00				Average	
		point11	11	4,104.8	3,255.1	1,000.00				Average	
		point12	12	4,485.3	3,362.3	1,000.00				Average	
		point13	13	5,058.4	3,497.9	1,000.00					
Orchard Village Road	80.0	point99	99	2,441.6	1,542.6	1,000.00				Average	
		point24	24	2,149.4	1,835.8	1,000.00				Average	
		point25	25	1,995.0	2,042.4	1,000.00				Average	
		point26	26	1,791.1	2,359.3	1,000.00				Average	
		point27	27	1,658.8	2,563.3	1,000.00				Average	
		point28	28	1,228.9	3,208.1	1,000.00					
Oak Ridge Drive-e. of Railroad Ave	50.0	point100	100	5,550.3	5,416.0	1,000.00				Average	
		point53	53	5,475.9	5,460.1	1,000.00				Average	
		point54	54	5,394.6	5,479.4	1,000.00				Average	
		point55	55	5,194.8	5,450.4	1,000.00					

Dudek **8 July 2022**
MG **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Exist w Proj

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Magic Mountain Parkway	point78	78	1716	50	35	50	38	45	0	0	0	0
	point61	61	1716	50	35	50	38	45	0	0	0	0
	point62	62	1716	50	35	50	38	45	0	0	0	0
	point63	63	1716	50	35	50	38	45	0	0	0	0
	point64	64	1716	50	35	50	38	45	0	0	0	0
	point65	65	1716	50	35	50	38	45	0	0	0	0
	point66	66	1716	50	35	50	38	45	0	0	0	0
	point67	67										
Valencia Blvd	point80	80	3033	45	62	45	31	40	0	0	0	0
	point70	70	3033	45	62	45	31	40	0	0	0	0
	point71	71	3033	45	62	45	31	40	0	0	0	0
	point72	72	3033	45	62	45	31	40	0	0	0	0
	point73	73	3033	45	62	45	31	40	0	0	0	0
	point74	74	3033	45	62	45	31	40	0	0	0	0
	point75	75	3033	45	62	45	31	40	0	0	0	0
	point76	76										
Oak Ridge Drive	point82	82	55	25	1	25	1	20	0	0	0	0
	point43	43										
Via Princessa -w. of Orchard Village Rd	point84	84	747	45	15	45	11	40	0	0	0	0
	point5	5										
Railroad Cyn Rd - s. of Via Princessa	point86	86	2539	50	52	50	46	45	0	0	0	0
	point30	30	2539	50	52	50	46	45	0	0	0	0
	point31	31	2539	50	52	50	46	45	0	0	0	0

	point32	32	2539	50	52	50	46	45	0	0	0	0
	point33	33										
Orchard Village Road -s.of Via Princess	point88	88	0	0	0	0	0	0	0	0	0	0
	point23	23										
Future Springbrook Ave	point90	90	103	25	0	0	50	20	0	0	0	0
	point57	57	103	25	0	0	50	20	0	0	0	0
	point58	58	103	25	0	0	50	20	0	0	0	0
	point59	59										
Valencia Blvd-n. of Magic Mtn Pkwy	point91	91	3577	45	74	45	37	40	0	0	0	0
	point2	2										
Magic Mountain Parkway- e. of Valencia	point92	92	1282	50	26	50	33	45	0	0	0	0
	point68	68										
Railroad Cyn Rd-n. of Oak Ridge Dr.	point93	93	3156	50	64	50	52	45	0	0	0	0
	point40	40	3156	50	64	50	52	45	0	0	0	0
	point41	41										
Oak Ridge Drive-n. of Via Princessa	point94	94	765	35	16	35	11	30	0	0	0	0
	point44	44	765	35	16	35	11	30	0	0	0	0
	point45	45	765	35	16	35	11	30	0	0	0	0
	point46	46	765	35	16	35	11	30	0	0	0	0
	point47	47	765	35	16	35	11	30	0	0	0	0
	point48	48	765	35	16	35	11	30	0	0	0	0
	point49	49	765	35	16	35	11	30	0	0	0	0
	point50	50	765	35	16	35	11	30	0	0	0	0
	point51	51	765	35	16	35	11	30	0	0	0	0
	point52	52										
Via Princessa -e. of Oak Ridge Dr	point95	95	337	45	7	45	3	40	0	0	0	0
	point18	18	337	45	7	45	3	40	0	0	0	0
	point19	19	337	45	7	45	3	40	0	0	0	0
	point20	20	337	45	7	45	3	40	0	0	0	0
	point21	21										
Via Princessa -e. of Railroad Cyun Rd	point96	96	747	45	15	45	11	40	0	0	0	0
	point14	14	747	45	15	45	11	40	0	0	0	0
	point15	15	747	45	15	45	11	40	0	0	0	0
	point16	16	747	45	15	45	11	40	0	0	0	0
	point17	17										
Railroad Cyn Rd	point97	97	2539	50	52	50	46	45	0	0	0	0

	point34	34	2539	50	52	50	46	45	0	0	0	0
	point35	35	2539	50	52	50	46	45	0	0	0	0
	point36	36	2539	50	52	50	46	45	0	0	0	0
	point37	37	2539	50	52	50	46	45	0	0	0	0
	point38	38	2539	50	52	50	46	45	0	0	0	0
	point39	39										
Via Princessa	point98	98	747	45	15	45	11	40	0	0	0	0
	point6	6	747	45	15	45	11	40	0	0	0	0
	point7	7	747	45	15	45	11	40	0	0	0	0
	point8	8	747	45	15	45	11	40	0	0	0	0
	point9	9	747	45	15	45	11	40	0	0	0	0
	point10	10	747	45	15	45	11	40	0	0	0	0
	point11	11	747	45	15	45	11	40	0	0	0	0
	point12	12	747	45	15	45	11	40	0	0	0	0
	point13	13										
Orchard Village Road	point99	99	0	0	0	0	0	0	0	0	0	0
	point24	24	0	0	0	0	0	0	0	0	0	0
	point25	25	0	0	0	0	0	0	0	0	0	0
	point26	26	0	0	0	0	0	0	0	0	0	0
	point27	27	0	0	0	0	0	0	0	0	0	0
	point28	28										
Oak Ridge Drive-e. of Railroad Ave	point100	100	846	35	17	35	48	30	0	0	0	0
	point53	53	846	35	17	35	48	30	0	0	0	0
	point54	54	846	35	17	35	48	30	0	0	0	0
	point55	55										

Dudek 8 July 2022
MG TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Exist w Proj

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1	1	1	5,818.9	5,348.1	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST2	2	1	6,101.8	5,363.6	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST3	3	1	6,429.4	6,514.9	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST4	4	1	5,462.3	4,881.2	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST5	5	1	1,661.8	12,954.2	1,000.00	5.00	0.00	66	10.0	8.0	Y
M1	6	1	7,051.1	10,424.7	1,000.00	5.00	0.00	66	10.0	8.0	Y
M2	7	1	2,436.7	1,703.5	1,000.00	5.00	0.00	66	10.0	8.0	Y
M3	8	1	5,900.7	4,294.0	1,000.00	5.00	0.00	66	10.0	8.0	Y

Dudek 8 July 2022
MG TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Exist w Proj

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht	Perturbs		On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1	W	0.00	99.99	0.00				0.00	point1	1	5,795.3	9,485.1	1,000.00	24.00	0.00	0	0		
									point3	3	6,218.9	9,679.6	1,000.00	24.00	0.00	0	0		
									point4	4	6,461.9	9,999.0	1,000.00	24.00	0.00	0	0		
									point5	5	6,725.8	10,512.9	1,000.00	24.00	0.00	0	0		
									point6	6	7,809.1	10,113.6	1,000.00	24.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point31	31	1,187.5	12,757.9	1,000.00	24.00	0.00	0	0		
									point8	8	2,520.8	12,216.3	1,000.00	24.00	0.00	0	0		
									point9	9	2,638.9	11,306.6	1,000.00	24.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point33	33	5,837.4	4,862.4	1,000.00	24.00	0.00	0	0		
									point11	11	5,732.4	5,286.7	1,000.00	24.00	0.00	0	0		
									point12	12	6,279.2	5,321.7	1,000.00	24.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point35	35	5,274.2	3,872.1	1,000.00	24.00	0.00	0	0		
									point14	14	5,462.3	4,637.7	1,000.00	24.00	0.00	0	0		
									point15	15	5,716.0	4,637.7	1,000.00	24.00	0.00	0	0		
									point16	16	5,847.3	4,300.9	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point37	37	5,847.3	4,602.7	1,000.00	24.00	0.00	0	0		
									point18	18	6,017.8	4,349.0	1,000.00	24.00	0.00	0	0		
									point19	19	6,188.5	4,515.2	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point39	39	1,860.6	2,425.1	1,000.00	24.00	0.00	0	0		
									point21	21	2,332.8	1,803.6	1,000.00	24.00	0.00	0	0		
									point22	22	2,464.7	1,748.0	1,000.00	24.00	0.00	0	0		
									point23	23	2,867.5	2,241.1	1,000.00	24.00	0.00	0	0		
									point24	24	3,249.5	2,817.5	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point41	41	2,625.0	1,516.2	1,000.00	24.00	0.00	0	0		
									point26	26	3,076.4	1,981.5	1,000.00	24.00	0.00	0	0		
									point27	27	3,187.5	2,377.3	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point43	43	5,338.2	3,540.5	1,000.00	24.00	0.00	0	0		
									point29	29	6,088.2	4,103.0	1,000.00	24.00	0.00	0	0		
									point2	2	6,338.2	3,866.9	1,000.00	24.00					
Barrier16	W	0.00	99.99	0.00				0.00	point44	44	5,226.9	6,299.2	1,000.00	36.00	0.00	0	0		
									point46	46	5,275.6	5,965.9	1,000.00	36.00	0.00	0	0		
									point47	47	5,532.5	6,012.8	1,000.00	36.00	0.00	0	0		
									point48	48	5,499.5	6,247.2	1,000.00	36.00	0.00	0	0		
									point49	49	5,431.8	6,233.3	1,000.00	36.00	0.00	0	0		
									point50	50	5,415.4	6,332.2	1,000.00	36.00					

Barrier16-2-2	W	0.00	99.99	0.00				0.00	point74	74	5,481.8	6,245.2	1,000.00	36.00	0.00	0	0		
									point71	71	5,470.0	6,321.5	1,000.00	36.00	0.00	0	0		
									point72	72	5,419.7	6,312.1	1,000.00	36.00					
Barrier16-2-2	W	0.00	99.99	0.00				0.00	point76	76	5,663.5	6,638.4	1,000.00	36.00	0.00	0	0		
									point67	67	5,689.7	6,457.9	1,000.00	36.00	0.00	0	0		
									point68	68	5,917.1	6,496.5	1,000.00	36.00	0.00	0	0		
									point69	69	5,889.5	6,685.2	1,000.00	36.00					
Barrier16-2-2	W	0.00	99.99	0.00				0.00	point78	78	5,335.2	5,549.7	1,000.00	36.00	0.00	0	0		
									point52	52	5,402.9	5,546.2	1,000.00	36.00	0.00	0	0		
									point53	53	5,533.1	5,565.3	1,000.00	36.00	0.00	0	0		
									point54	54	5,486.2	5,837.8	1,000.00	36.00	0.00	0	0		
									point55	55	5,297.0	5,804.8	1,000.00	36.00					
Barrier16-2-2-2-2	W	0.00	99.99	0.00				0.00	point80	80	5,800.5	5,518.4	1,000.00	36.00	0.00	0	0		
									point57	57	6,180.6	5,584.4	1,000.00	36.00	0.00	0	0		
									point58	58	6,057.4	6,395.1	1,000.00	36.00	0.00	0	0		
									point59	59	5,732.8	6,337.8	1,000.00	36.00	0.00	0	0		
									point60	60	5,734.5	6,318.7	1,000.00	36.00	0.00	0	0		
									point61	61	5,677.2	6,311.8	1,000.00	36.00	0.00	0	0		
									point62	62	5,694.5	6,197.2	1,000.00	36.00	0.00	0	0		
									point63	63	5,751.8	6,205.9	1,000.00	36.00	0.00	0	0		
									point64	64	5,823.0	5,707.6	1,000.00	36.00	0.00	0	0		
									point65	65	5,767.5	5,699.0	1,000.00	36.00					

Dudek			8 July 2022	
MG			TNM 2.5	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	14378			
RUN:	Springbrook Santa Clarita - Exist w Proj			
Terrain Line	Points			
Name	No.	Coordinates (ground)		
		X	Y	Z
		ft	ft	ft
Terrain Line1	1	5,433.9	4,595.9	1,020.00
	2	5,387.6	4,873.7	1,020.00
	4	5,331.0	5,321.3	1,020.00
	3	5,289.8	5,408.7	1,020.00

Dudek
MG
8 July 2022
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Exist w Proj
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1	1	1	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0
ST2	2	1	0.0	48.3	66	48.3	10	----	48.3	0.0	8	-8.0
ST3	3	1	0.0	42.4	66	42.4	10	----	42.4	0.0	8	-8.0
ST4	4	1	0.0	54.7	66	54.7	10	----	54.7	0.0	8	-8.0
ST5	5	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
M1	6	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
M2	7	1	0.0	62.0	66	62.0	10	----	62.0	0.0	8	-8.0
M3	8	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	8	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek					**8 July 2022**							
MG					**TNM 2.5**							
INPUT: ROADWAYS							**Average pavement type shall be used unless**					
PROJECT/CONTRACT:	**14378**						**a State highway agency substantiates the use**					
RUN:	**Springbrook Santa Clarita - Year 2024**						**of a different type with the approval of FHWA**					
Roadway		**Points**										
Name	**Width**	**Name**	**No.**	**Coordinates (pavement)**			**Flow Control**			**Segment**		
				X	**Y**	**Z**	**Control Device**	**Speed Constraint**	**Percent Vehicles Affected**	**Pvmt Type**	**On Struct?**	
	ft			ft	ft	ft		mph	%			
Magic Mountain Parkway	80.0	point78	78	480.3	13,192.9	1,000.00				Average		
		point61	61	1,320.8	12,862.2	1,000.00				Average		
		point62	62	1,825.2	12,636.2	1,000.00				Average		
		point63	63	2,425.9	12,363.4	1,000.00				Average		
		point64	64	2,629.8	12,278.0	1,000.00				Average		
		point65	65	3,145.2	12,082.3	1,000.00				Average		
		point66	66	4,392.0	11,631.7	1,000.00				Average		
		point67	67	6,509.9	10,821.9	1,000.00						
Valencia Blvd	90.0	point80	80	5,080.4	9,681.8	1,000.00				Average		
		point70	70	5,482.8	9,703.7	1,000.00				Average		
		point71	71	5,697.2	9,778.0	1,000.00				Average		
		point72	72	5,942.2	9,891.8	1,000.00				Average		
		point73	73	6,156.5	10,093.0	1,000.00				Average		
		point74	74	6,287.8	10,289.8	1,000.00				Average		
		point75	75	6,432.1	10,556.7	1,000.00				Average		
		point76	76	6,513.3	10,818.5	1,000.00						
Oak Ridge Drive	50.0	point82	82	6,290.7	4,011.3	1,000.00				Average		
		point43	43	6,035.8	4,251.0	1,000.00						
Via Princessa -w. of Orchard Village Rd	90.0	point84	84	1,992.9	1,050.9	1,000.00				Average		
		point5	5	2,451.2	1,543.9	1,000.00						
Railroad Cyn Rd - s. of Via Princessa	105.0	point86	86	5,982.4	1,915.1	1,000.00				Average		
		point30	30	5,430.3	2,741.5	1,000.00				Average		
		point31	31	5,249.7	3,029.7	1,000.00				Average		
		point32	32	5,124.7	3,265.8	1,000.00				Average		
		point33	33	5,057.7	3,488.7	1,000.00						

Orchard Village Road -s.of Via Princess	80.0	point88	88	2,895.9	1,001.7	1,000.00				Average	
		point23	23	2,449.7	1,535.4	1,000.00					
Future Springbrook Ave	70.0	point90	90	5,565.1	5,443.0	1,000.00				Average	
		point57	57	5,627.6	5,536.7	1,000.00				Average	
		point58	58	5,645.0	5,713.8	1,000.00				Average	
		point59	59	5,537.4	6,345.7	1,000.00					
Valencia Blvd-n. of Magic Mtn Pkwy	90.0	point91	91	6,515.1	10,828.4	1,000.00				Average	
		point2	2	6,797.4	11,786.0	1,000.00					
Magic Mountain Parkway- e. of Valencia	80.0	point92	92	6,509.9	10,821.9	1,000.00				Average	
		point68	68	8,127.9	10,211.6	1,000.00					
Railroad Cyn Rd-n. of Oak Ridge Dr.	105.0	point93	93	5,176.8	5,428.9	1,000.00				Average	
		point40	40	4,953.7	6,911.8	1,000.00				Average	
		point41	41	4,831.2	7,734.2	1,000.00					
Oak Ridge Drive-n. of Via Princessa	50.0	point94	94	6,027.2	4,256.5	1,000.00				Average	
		point44	44	5,944.9	4,344.7	1,000.00				Average	
		point45	45	5,869.1	4,424.7	1,000.00				Average	
		point46	46	5,823.6	4,515.6	1,000.00				Average	
		point47	47	5,797.5	4,599.6	1,000.00				Average	
		point48	48	5,764.4	4,800.8	1,000.00				Average	
		point49	49	5,701.9	5,144.5	1,000.00				Average	
		point50	50	5,655.0	5,272.7	1,000.00				Average	
		point51	51	5,623.4	5,334.7	1,000.00				Average	
		point52	52	5,550.3	5,416.0	1,000.00					
Via Princessa -e. of Oak Ridge Dr	90.0	point95	95	6,027.9	4,250.1	1,000.00				Average	
		point18	18	6,317.2	4,556.0	1,000.00				Average	
		point19	19	6,554.2	4,737.9	1,000.00				Average	
		point20	20	6,716.8	4,842.6	1,000.00				Average	
		point21	21	6,912.5	4,925.2	1,000.00					
Via Princessa -e. of Railroad Cyun Rd	90.0	point96	96	5,058.4	3,497.9	1,000.00				Average	
		point14	14	5,263.3	3,596.8	1,000.00				Average	
		point15	15	5,369.2	3,655.9	1,000.00				Average	
		point16	16	5,671.0	3,887.7	1,000.00				Average	
		point17	17	6,027.9	4,250.1	1,000.00					
Railroad Cyn Rd	105.0	point97	97	5,055.5	3,505.4	1,000.00				Average	
		point34	34	5,058.8	3,779.6	1,000.00				Average	
		point35	35	5,131.7	4,092.1	1,000.00				Average	
		point36	36	5,242.8	4,425.4	1,000.00				Average	
		point37	37	5,277.5	4,637.2	1,000.00				Average	
		point38	38	5,277.5	4,862.9	1,000.00				Average	

		point39	39	5,176.8	5,428.9	1,000.00					
Via Princessa	90.0	point98	98	2,451.2	1,543.9	1,000.00				Average	
		point6	6	2,729.0	1,835.6	1,000.00				Average	
		point7	7	2,941.2	2,098.1	1,000.00				Average	
		point8	8	3,133.6	2,426.2	1,000.00				Average	
		point9	9	3,409.2	2,787.0	1,000.00				Average	
		point10	10	3,785.4	3,108.6	1,000.00				Average	
		point11	11	4,104.8	3,255.1	1,000.00				Average	
		point12	12	4,485.3	3,362.3	1,000.00				Average	
		point13	13	5,058.4	3,497.9	1,000.00					
Orchard Village Road	80.0	point99	99	2,441.6	1,542.6	1,000.00				Average	
		point24	24	2,149.4	1,835.8	1,000.00				Average	
		point25	25	1,995.0	2,042.4	1,000.00				Average	
		point26	26	1,791.1	2,359.3	1,000.00				Average	
		point27	27	1,658.8	2,563.3	1,000.00				Average	
		point28	28	1,228.9	3,208.1	1,000.00					
Oak Ridge Drive-e. of Via Railroad Ave.	50.0	point100	100	5,550.3	5,416.0	1,000.00				Average	
		point53	53	5,475.9	5,460.1	1,000.00				Average	
		point54	54	5,394.6	5,479.4	1,000.00				Average	
		point55	55	5,194.8	5,450.4	1,000.00					

Dudek **8 July 2022**
MG **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Year 2024

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Magic Mountain Parkway	point78	78	1851	50	38	50	19	45	0	0	0	0
	point61	61	1851	50	38	50	19	45	0	0	0	0
	point62	62	1851	50	38	50	19	45	0	0	0	0
	point63	63	1851	50	38	50	19	45	0	0	0	0
	point64	64	1851	50	38	50	19	45	0	0	0	0
	point65	65	1851	50	38	50	19	45	0	0	0	0
	point66	66	1851	50	38	50	19	45	0	0	0	0
	point67	67										
Valencia Blvd	point80	80	3282	45	68	45	34	40	0	0	0	0
	point70	70	3282	45	68	45	34	40	0	0	0	0
	point71	71	3282	45	68	45	34	40	0	0	0	0
	point72	72	3282	45	68	45	34	40	0	0	0	0
	point73	73	3282	45	68	45	34	40	0	0	0	0
	point74	74	3282	45	68	45	34	40	0	0	0	0
	point75	75	3282	45	68	45	34	40	0	0	0	0
	point76	76										
Oak Ridge Drive	point82	82	58	25	1	25	1	20	0	0	0	0
	point43	43										
Via Princessa -w. of Orchard Village Rd	point84	84	777	45	16	45	8	40	0	0	0	0
	point5	5										
Railroad Cyn Rd - s. of Via Princessa	point86	86	2785	50	57	50	29	45	0	0	0	0
	point30	30	2785	50	57	50	29	45	0	0	0	0
	point31	31	2785	50	57	50	29	45	0	0	0	0

	point32	32	2785	50	57	50	29	45	0	0	0	0
	point33	33										
Orchard Village Road -s.of Via Princess	point88	88	0	0	0	0	0	0	0	0	0	0
	point23	23										
Future Springbrook Ave	point90	90	114	25	2	25	1	20	0	0	0	0
	point57	57	114	25	2	25	1	20	0	0	0	0
	point58	58	114	25	2	25	1	20	0	0	0	0
	point59	59										
Valencia Blvd-n. of Magic Mtn Pkwy	point91	91	3822	45	79	45	39	40	0	0	0	0
	point2	2										
Magic Mountain Parkway- e. of Valencia	point92	92	1427	50	29	50	15	45	0	0	0	0
	point68	68										
Railroad Cyn Rd-n. of Oak Ridge Dr.	point93	93	3404	50	70	50	35	45	0	0	0	0
	point40	40	3404	50	70	50	35	45	0	0	0	0
	point41	41										
Oak Ridge Drive-n. of Via Princessa	point94	94	792	35	16	35	8	30	0	0	0	0
	point44	44	792	35	16	35	8	30	0	0	0	0
	point45	45	792	35	16	35	8	30	0	0	0	0
	point46	46	792	35	16	35	8	30	0	0	0	0
	point47	47	792	35	16	35	8	30	0	0	0	0
	point48	48	792	35	16	35	8	30	0	0	0	0
	point49	49	792	35	16	35	8	30	0	0	0	0
	point50	50	792	35	16	35	8	30	0	0	0	0
	point51	51	792	35	16	35	8	30	0	0	0	0
	point52	52										
Via Princessa -e. of Oak Ridge Dr	point95	95	354	45	7	45	4	40	0	0	0	0
	point18	18	354	45	7	45	4	40	0	0	0	0
	point19	19	354	45	7	45	4	40	0	0	0	0
	point20	20	354	45	7	45	4	40	0	0	0	0
	point21	21										
Via Princessa -e. of Railroad Cyun Rd	point96	96	777	45	16	45	8	40	0	0	0	0
	point14	14	777	45	16	45	8	40	0	0	0	0
	point15	15	777	45	16	45	8	40	0	0	0	0
	point16	16	777	45	16	45	8	40	0	0	0	0
	point17	17										
Railroad Cyn Rd	point97	97	2785	50	57	50	29	45	0	0	0	0

	point34	34	2785	50	57	50	29	45	0	0	0	0
	point35	35	2785	50	57	50	29	45	0	0	0	0
	point36	36	2785	50	57	50	29	45	0	0	0	0
	point37	37	2785	50	57	50	29	45	0	0	0	0
	point38	38	2785	50	57	50	29	45	0	0	0	0
	point39	39										
Via Princessa	point98	98	777	45	16	45	8	40	0	0	0	0
	point6	6	777	45	16	45	8	40	0	0	0	0
	point7	7	777	45	16	45	8	40	0	0	0	0
	point8	8	777	45	16	45	8	40	0	0	0	0
	point9	9	777	45	16	45	8	40	0	0	0	0
	point10	10	777	45	16	45	8	40	0	0	0	0
	point11	11	777	45	16	45	8	40	0	0	0	0
	point12	12	777	45	16	45	8	40	0	0	0	0
	point13	13										
Orchard Village Road	point99	99	0	0	0	0	0	0	0	0	0	0
	point24	24	0	0	0	0	0	0	0	0	0	0
	point25	25	0	0	0	0	0	0	0	0	0	0
	point26	26	0	0	0	0	0	0	0	0	0	0
	point27	27	0	0	0	0	0	0	0	0	0	0
	point28	28										
Oak Ridge Drive-e. of Via Railroad Ave.	point100	100	843	35	17	35	9	30	0	0	0	0
	point53	53	843	35	17	35	9	30	0	0	0	0
	point54	54	843	35	17	35	9	30	0	0	0	0
	point55	55										

Dudek 8 July 2022
MG TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Year 2024

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1	1	1	5,818.9	5,348.1	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST2	2	1	6,101.8	5,363.6	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST3	3	1	6,429.4	6,514.9	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST4	4	1	5,462.3	4,881.2	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST5	5	1	1,661.8	12,954.2	1,000.00	5.00	0.00	66	10.0	8.0	Y
M1	6	1	7,051.1	10,424.7	1,000.00	5.00	0.00	66	10.0	8.0	Y
M2	7	1	2,436.7	1,703.5	1,000.00	5.00	0.00	66	10.0	8.0	Y
M3	8	1	5,900.7	4,294.0	1,000.00	5.00	0.00	66	10.0	8.0	Y

Dudek 8 July 2022
MG TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Year 2024

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht	Perturbs		On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1	W	0.00	99.99	0.00				0.00	point1	1	5,795.3	9,485.1	1,000.00	24.00	0.00	0	0		
									point3	3	6,218.9	9,679.6	1,000.00	24.00	0.00	0	0		
									point4	4	6,461.9	9,999.0	1,000.00	24.00	0.00	0	0		
									point5	5	6,725.8	10,512.9	1,000.00	24.00	0.00	0	0		
									point6	6	7,809.1	10,113.6	1,000.00	24.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point31	31	1,187.5	12,757.9	1,000.00	24.00	0.00	0	0		
									point8	8	2,520.8	12,216.3	1,000.00	24.00	0.00	0	0		
									point9	9	2,638.9	11,306.6	1,000.00	24.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point33	33	5,837.4	4,862.4	1,000.00	24.00	0.00	0	0		
									point11	11	5,732.4	5,286.7	1,000.00	24.00	0.00	0	0		
									point12	12	6,279.2	5,321.7	1,000.00	24.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point35	35	5,274.2	3,872.1	1,000.00	24.00	0.00	0	0		
									point14	14	5,462.3	4,637.7	1,000.00	24.00	0.00	0	0		
									point15	15	5,716.0	4,637.7	1,000.00	24.00	0.00	0	0		
									point16	16	5,847.3	4,300.9	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point37	37	5,847.3	4,602.7	1,000.00	24.00	0.00	0	0		
									point18	18	6,017.8	4,349.0	1,000.00	24.00	0.00	0	0		
									point19	19	6,188.5	4,515.2	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point39	39	1,860.6	2,425.1	1,000.00	24.00	0.00	0	0		
									point21	21	2,332.8	1,803.6	1,000.00	24.00	0.00	0	0		
									point22	22	2,464.7	1,748.0	1,000.00	24.00	0.00	0	0		
									point23	23	2,867.5	2,241.1	1,000.00	24.00	0.00	0	0		
									point24	24	3,249.5	2,817.5	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point41	41	2,625.0	1,516.2	1,000.00	24.00	0.00	0	0		
									point26	26	3,076.4	1,981.5	1,000.00	24.00	0.00	0	0		
									point27	27	3,187.5	2,377.3	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point43	43	5,338.2	3,540.5	1,000.00	24.00	0.00	0	0		
									point29	29	6,088.2	4,103.0	1,000.00	24.00	0.00	0	0		
									point2	2	6,338.2	3,866.9	1,000.00	24.00					

Dudek			8 July 2022	
MG			TNM 2.5	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	14378			
RUN:	Springbrook Santa Clarita - Year 2024			
Terrain Line	Points			
Name	No.	Coordinates (ground)		
		X	Y	Z
		ft	ft	ft
Terrain Line1	1	5,433.9	4,595.9	1,020.00
	2	5,387.6	4,873.7	1,020.00
	3	5,331.0	5,321.3	1,020.00
	4	5,289.8	5,408.7	1,020.00

Dudek
MG
8 July 2022
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Year 2024
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1	1	1	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0
ST2	2	1	0.0	50.0	66	50.0	10	----	50.0	0.0	8	-8.0
ST3	3	1	0.0	45.9	66	45.9	10	----	45.9	0.0	8	-8.0
ST4	4	1	0.0	54.4	66	54.4	10	----	54.4	0.0	8	-8.0
ST5	5	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
M1	6	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
M2	7	1	0.0	62.0	66	62.0	10	----	62.0	0.0	8	-8.0
M3	8	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	8	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek					**8 July 2022**							
MG					**TNM 2.5**							
INPUT: ROADWAYS							**Average pavement type shall be used unless**					
PROJECT/CONTRACT:	**14378**						**a State highway agency substantiates the use**					
RUN:	**Springbrook Santa Clarita - Yr 2024 w Prj**						**of a different type with the approval of FHWA**					
Roadway		**Points**										
Name	**Width**	**Name**	**No.**	**Coordinates (pavement)**			**Flow Control**			**Segment**		
				X	**Y**	**Z**	**Control Device**	**Speed Constraint**	**Percent Vehicles Affected**	**Pvmt Type**	**On Struct?**	
	ft			ft	ft	ft		mph	%			
Magic Mountain Parkway	80.0	point78	78	480.3	13,192.9	1,000.00				Average		
		point61	61	1,320.8	12,862.2	1,000.00				Average		
		point62	62	1,825.2	12,636.2	1,000.00				Average		
		point63	63	2,425.9	12,363.4	1,000.00				Average		
		point64	64	2,629.8	12,278.0	1,000.00				Average		
		point65	65	3,145.2	12,082.3	1,000.00				Average		
		point66	66	4,392.0	11,631.7	1,000.00				Average		
		point67	67	6,509.9	10,821.9	1,000.00						
Valencia Blvd	90.0	point80	80	5,080.4	9,681.8	1,000.00				Average		
		point70	70	5,482.8	9,703.7	1,000.00				Average		
		point71	71	5,697.2	9,778.0	1,000.00				Average		
		point72	72	5,942.2	9,891.8	1,000.00				Average		
		point73	73	6,156.5	10,093.0	1,000.00				Average		
		point74	74	6,287.8	10,289.8	1,000.00				Average		
		point75	75	6,432.1	10,556.7	1,000.00				Average		
		point76	76	6,513.3	10,818.5	1,000.00						
Oak Ridge Drive	50.0	point82	82	6,290.7	4,011.3	1,000.00				Average		
		point43	43	6,035.8	4,251.0	1,000.00						
Via Princessa -w. of Orchard Village Rd	90.0	point84	84	1,992.9	1,050.9	1,000.00				Average		
		point5	5	2,451.2	1,543.9	1,000.00						
Railroad Cyn Rd - s. of Via Princessa	105.0	point86	86	5,982.4	1,915.1	1,000.00				Average		
		point30	30	5,430.3	2,741.5	1,000.00				Average		
		point31	31	5,249.7	3,029.7	1,000.00				Average		
		point32	32	5,124.7	3,265.8	1,000.00				Average		
		point33	33	5,057.7	3,488.7	1,000.00						

Orchard Village Road -s.of Via Princess	80.0	point88	88	2,895.9	1,001.7	1,000.00				Average	
		point23	23	2,449.7	1,535.4	1,000.00					
Future Springbrook Ave	70.0	point90	90	5,565.1	5,443.0	1,000.00				Average	
		point57	57	5,627.6	5,536.7	1,000.00				Average	
		point58	58	5,645.0	5,713.8	1,000.00				Average	
		point59	59	5,537.4	6,345.7	1,000.00					
Valencia Blvd-n. of Magic Mtn Pkwy	90.0	point91	91	6,515.1	10,828.4	1,000.00				Average	
		point2	2	6,797.4	11,786.0	1,000.00					
Magic Mountain Parkway- e. of Valencia	80.0	point92	92	6,509.9	10,821.9	1,000.00				Average	
		point68	68	8,127.9	10,211.6	1,000.00					
Railroad Cyn Rd-n. of Oak Ridge Dr.	105.0	point93	93	5,176.8	5,428.9	1,000.00				Average	
		point40	40	4,953.7	6,911.8	1,000.00				Average	
		point41	41	4,831.2	7,734.2	1,000.00					
Oak Ridge Drive-n. of Via Princessa	50.0	point94	94	6,027.2	4,256.5	1,000.00				Average	
		point44	44	5,944.9	4,344.7	1,000.00				Average	
		point45	45	5,869.1	4,424.7	1,000.00				Average	
		point46	46	5,823.6	4,515.6	1,000.00				Average	
		point47	47	5,797.5	4,599.6	1,000.00				Average	
		point48	48	5,764.4	4,800.8	1,000.00				Average	
		point49	49	5,701.9	5,144.5	1,000.00				Average	
		point50	50	5,655.0	5,272.7	1,000.00				Average	
		point51	51	5,623.4	5,334.7	1,000.00				Average	
		point52	52	5,550.3	5,416.0	1,000.00					
Via Princessa -e. of Oak Ridge Dr	90.0	point95	95	6,027.9	4,250.1	1,000.00				Average	
		point18	18	6,317.2	4,556.0	1,000.00				Average	
		point19	19	6,554.2	4,737.9	1,000.00				Average	
		point20	20	6,716.8	4,842.6	1,000.00				Average	
		point21	21	6,912.5	4,925.2	1,000.00					
Via Princessa -e. of Railroad Cyun Rd	90.0	point96	96	5,058.4	3,497.9	1,000.00				Average	
		point14	14	5,263.3	3,596.8	1,000.00				Average	
		point15	15	5,369.2	3,655.9	1,000.00				Average	
		point16	16	5,671.0	3,887.7	1,000.00				Average	
		point17	17	6,027.9	4,250.1	1,000.00					
Railroad Cyn Rd	105.0	point97	97	5,055.5	3,505.4	1,000.00				Average	
		point34	34	5,058.8	3,779.6	1,000.00				Average	
		point35	35	5,131.7	4,092.1	1,000.00				Average	
		point36	36	5,242.8	4,425.4	1,000.00				Average	
		point37	37	5,277.5	4,637.2	1,000.00				Average	
		point38	38	5,277.5	4,862.9	1,000.00				Average	

		point39	39	5,176.8	5,428.9	1,000.00					
Via Princessa	90.0	point98	98	2,451.2	1,543.9	1,000.00				Average	
		point6	6	2,729.0	1,835.6	1,000.00				Average	
		point7	7	2,941.2	2,098.1	1,000.00				Average	
		point8	8	3,133.6	2,426.2	1,000.00				Average	
		point9	9	3,409.2	2,787.0	1,000.00				Average	
		point10	10	3,785.4	3,108.6	1,000.00				Average	
		point11	11	4,104.8	3,255.1	1,000.00				Average	
		point12	12	4,485.3	3,362.3	1,000.00				Average	
		point13	13	5,058.4	3,497.9	1,000.00					
Orchard Village Road	80.0	point99	99	2,441.6	1,542.6	1,000.00				Average	
		point24	24	2,149.4	1,835.8	1,000.00				Average	
		point25	25	1,995.0	2,042.4	1,000.00				Average	
		point26	26	1,791.1	2,359.3	1,000.00				Average	
		point27	27	1,658.8	2,563.3	1,000.00				Average	
		point28	28	1,228.9	3,208.1	1,000.00					
Oak Ridge Drive-e. of Via Railroad Ave.	50.0	point100	100	5,550.3	5,416.0	1,000.00				Average	
		point53	53	5,475.9	5,460.1	1,000.00				Average	
		point54	54	5,394.6	5,479.4	1,000.00				Average	
		point55	55	5,194.8	5,450.4	1,000.00					

Dudek **8 July 2022**
MG **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Yr 2024 w Prj

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Magic Mountain Parkway	point78	78	1857	50	38	50	39	45	0	0	0	0
	point61	61	1857	50	38	50	39	45	0	0	0	0
	point62	62	1857	50	38	50	39	45	0	0	0	0
	point63	63	1857	50	38	50	39	45	0	0	0	0
	point64	64	1857	50	38	50	39	45	0	0	0	0
	point65	65	1857	50	38	50	39	45	0	0	0	0
	point66	66	1857	50	38	50	39	45	0	0	0	0
	point67	67										
Valencia Blvd	point80	80	3293	45	68	45	34	40	0	0	0	0
	point70	70	3293	45	68	45	34	40	0	0	0	0
	point71	71	3293	45	68	45	34	40	0	0	0	0
	point72	72	3293	45	68	45	34	40	0	0	0	0
	point73	73	3293	45	68	45	34	40	0	0	0	0
	point74	74	3293	45	68	45	34	40	0	0	0	0
	point75	75	3293	45	68	45	34	40	0	0	0	0
	point76	76										
Oak Ridge Drive	point82	82	58	25	1	25	1	20	0	0	0	0
	point43	43										
Via Princessa -w. of Orchard Village Rd	point84	84	781	45	16	45	11	40	0	0	0	0
	point5	5										
Railroad Cyn Rd - s. of Via Princessa	point86	86	2791	50	57	50	49	45	0	0	0	0
	point30	30	2791	50	57	50	49	45	0	0	0	0
	point31	31	2791	50	57	50	49	45	0	0	0	0

	point32	32	2791	50	57	50	49	45	0	0	0	0
	point33	33										
Orchard Village Road -s.of Via Princess	point88	88	0	0	0	0	0	0	0	0	0	0
	point23	23										
Future Springbrook Ave	point90	90	217	25	2	25	51	20	0	0	0	0
	point57	57	217	25	2	25	51	20	0	0	0	0
	point58	58	217	25	2	25	51	20	0	0	0	0
	point59	59										
Valencia Blvd-n. of Magic Mtn Pkwy	point91	91	3822	45	79	45	39	40	0	0	0	0
	point2	2										
Magic Mountain Parkway- e. of Valencia	point92	92	1444	50	29	50	35	45	0	0	0	0
	point68	68										
Railroad Cyn Rd-n. of Oak Ridge Dr.	point93	93	3433	50	70	50	55	45	0	0	0	0
	point40	40	3433	50	70	50	55	45	0	0	0	0
	point41	41										
Oak Ridge Drive-n. of Via Princessa	point94	94	796	35	16	35	11	30	0	0	0	0
	point44	44	796	35	16	35	11	30	0	0	0	0
	point45	45	796	35	16	35	11	30	0	0	0	0
	point46	46	796	35	16	35	11	30	0	0	0	0
	point47	47	796	35	16	35	11	30	0	0	0	0
	point48	48	796	35	16	35	11	30	0	0	0	0
	point49	49	796	35	16	35	11	30	0	0	0	0
	point50	50	796	35	16	35	11	30	0	0	0	0
	point51	51	796	35	16	35	11	30	0	0	0	0
	point52	52										
Via Princessa -e. of Oak Ridge Dr	point95	95	354	45	7	45	4	40	0	0	0	0
	point18	18	354	45	7	45	4	40	0	0	0	0
	point19	19	354	45	7	45	4	40	0	0	0	0
	point20	20	354	45	7	45	4	40	0	0	0	0
	point21	21										
Via Princessa -e. of Railroad Cyun Rd	point96	96	781	45	16	45	11	40	0	0	0	0
	point14	14	781	45	16	45	11	40	0	0	0	0
	point15	15	781	45	16	45	11	40	0	0	0	0
	point16	16	781	45	16	45	11	40	0	0	0	0
	point17	17										
Railroad Cyn Rd	point97	97	2791	50	57	50	49	45	0	0	0	0

	point34	34	2791	50	57	50	49	45	0	0	0	0
	point35	35	2791	50	57	50	49	45	0	0	0	0
	point36	36	2791	50	57	50	49	45	0	0	0	0
	point37	37	2791	50	57	50	49	45	0	0	0	0
	point38	38	2791	50	57	50	49	45	0	0	0	0
	point39	39										
Via Princessa	point98	98	781	45	16	45	11	40	0	0	0	0
	point6	6	781	45	16	45	11	40	0	0	0	0
	point7	7	781	45	16	45	11	40	0	0	0	0
	point8	8	781	45	16	45	11	40	0	0	0	0
	point9	9	781	45	16	45	11	40	0	0	0	0
	point10	10	781	45	16	45	11	40	0	0	0	0
	point11	11	781	45	16	45	11	40	0	0	0	0
	point12	12	781	45	16	45	11	40	0	0	0	0
	point13	13										
Orchard Village Road	point99	99	0	0	0	0	0	0	0	0	0	0
	point24	24	0	0	0	0	0	0	0	0	0	0
	point25	25	0	0	0	0	0	0	0	0	0	0
	point26	26	0	0	0	0	0	0	0	0	0	0
	point27	27	0	0	0	0	0	0	0	0	0	0
	point28	28										
Oak Ridge Drive-e. of Via Railroad Ave.	point100	100	878	35	17	35	49	30	0	0	0	0
	point53	53	878	35	17	35	49	30	0	0	0	0
	point54	54	878	35	17	35	49	30	0	0	0	0
	point55	55										

Dudek
MG

8 July 2022
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Yr 2024 w Prj

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1	1	1	5,818.9	5,348.1	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST2	2	1	6,101.8	5,363.6	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST3	3	1	6,429.4	6,514.9	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST4	4	1	5,462.3	4,881.2	1,000.00	5.00	0.00	66	10.0	8.0	Y
ST5	5	1	1,661.8	12,954.2	1,000.00	5.00	0.00	66	10.0	8.0	Y
M1	6	1	7,051.1	10,424.7	1,000.00	5.00	0.00	66	10.0	8.0	Y
M2	7	1	2,436.7	1,703.5	1,000.00	5.00	0.00	66	10.0	8.0	Y
M3	8	1	5,900.7	4,294.0	1,000.00	5.00	0.00	66	10.0	8.0	Y

Dudek 8 July 2022
MG TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Yr 2024 w Prj

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht	Perturbs		On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1	W	0.00	99.99	0.00				0.00	point1	1	5,795.3	9,485.1	1,000.00	24.00	0.00	0	0		
									point3	3	6,218.9	9,679.6	1,000.00	24.00	0.00	0	0		
									point4	4	6,461.9	9,999.0	1,000.00	24.00	0.00	0	0		
									point5	5	6,725.8	10,512.9	1,000.00	24.00	0.00	0	0		
									point6	6	7,809.1	10,113.6	1,000.00	24.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point31	31	1,187.5	12,757.9	1,000.00	24.00	0.00	0	0		
									point8	8	2,520.8	12,216.3	1,000.00	24.00	0.00	0	0		
									point9	9	2,638.9	11,306.6	1,000.00	24.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point33	33	5,837.4	4,862.4	1,000.00	24.00	0.00	0	0		
									point11	11	5,732.4	5,286.7	1,000.00	24.00	0.00	0	0		
									point12	12	6,279.2	5,321.7	1,000.00	24.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point35	35	5,274.2	3,872.1	1,000.00	24.00	0.00	0	0		
									point14	14	5,462.3	4,637.7	1,000.00	24.00	0.00	0	0		
									point15	15	5,716.0	4,637.7	1,000.00	24.00	0.00	0	0		
									point16	16	5,847.3	4,300.9	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point37	37	5,847.3	4,602.7	1,000.00	24.00	0.00	0	0		
									point18	18	6,017.8	4,349.0	1,000.00	24.00	0.00	0	0		
									point19	19	6,188.5	4,515.2	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point39	39	1,860.6	2,425.1	1,000.00	24.00	0.00	0	0		
									point21	21	2,332.8	1,803.6	1,000.00	24.00	0.00	0	0		
									point22	22	2,464.7	1,748.0	1,000.00	24.00	0.00	0	0		
									point23	23	2,867.5	2,241.1	1,000.00	24.00	0.00	0	0		
									point24	24	3,249.5	2,817.5	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point41	41	2,625.0	1,516.2	1,000.00	24.00	0.00	0	0		
									point26	26	3,076.4	1,981.5	1,000.00	24.00	0.00	0	0		
									point27	27	3,187.5	2,377.3	1,000.00	24.00					
Barrier1-2-2-2-2-2-2-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point43	43	5,338.2	3,540.5	1,000.00	24.00	0.00	0	0		
									point29	29	6,088.2	4,103.0	1,000.00	24.00	0.00	0	0		
									point2	2	6,338.2	3,866.9	1,000.00	24.00					
Barrier16	W	0.00	99.99	0.00				0.00	point44	44	5,226.9	6,299.2	1,000.00	36.00	0.00	0	0		
									point46	46	5,275.6	5,965.9	1,000.00	36.00	0.00	0	0		
									point47	47	5,532.5	6,012.8	1,000.00	36.00	0.00	0	0		
									point48	48	5,499.5	6,247.2	1,000.00	36.00	0.00	0	0		
									point49	49	5,431.8	6,233.3	1,000.00	36.00	0.00	0	0		
									point50	50	5,415.4	6,332.2	1,000.00	36.00					

Barrier16-2-2	W	0.00	99.99	0.00				0.00	point74	74	5,482.4	6,245.1	1,000.00	36.00	0.00	0	0		
									point71	71	5,470.6	6,321.4	1,000.00	36.00	0.00	0	0		
									point72	72	5,419.7	6,312.1	1,000.00	36.00					
Barrier16-2-2	W	0.00	99.99	0.00				0.00	point76	76	5,663.5	6,638.4	1,000.00	36.00	0.00	0	0		
									point67	67	5,689.7	6,457.9	1,000.00	36.00	0.00	0	0		
									point68	68	5,917.1	6,496.5	1,000.00	36.00	0.00	0	0		
									point69	69	5,889.5	6,685.2	1,000.00	36.00					
Barrier16-2-2	W	0.00	99.99	0.00				0.00	point78	78	5,335.2	5,549.7	1,000.00	36.00	0.00	0	0		
									point52	52	5,402.9	5,546.2	1,000.00	36.00	0.00	0	0		
									point53	53	5,533.1	5,565.3	1,000.00	36.00	0.00	0	0		
									point54	54	5,486.2	5,837.8	1,000.00	36.00	0.00	0	0		
									point55	55	5,297.0	5,804.8	1,000.00	36.00					
Barrier16-2-2-2-2	W	0.00	99.99	0.00				0.00	point80	80	5,800.5	5,518.4	1,000.00	36.00	0.00	0	0		
									point57	57	6,180.6	5,584.4	1,000.00	36.00	0.00	0	0		
									point58	58	6,057.4	6,395.1	1,000.00	36.00	0.00	0	0		
									point59	59	5,732.8	6,337.8	1,000.00	36.00	0.00	0	0		
									point60	60	5,734.5	6,318.7	1,000.00	36.00	0.00	0	0		
									point61	61	5,677.2	6,311.8	1,000.00	36.00	0.00	0	0		
									point62	62	5,694.5	6,197.2	1,000.00	36.00	0.00	0	0		
									point63	63	5,751.8	6,205.9	1,000.00	36.00	0.00	0	0		
									point64	64	5,823.0	5,707.6	1,000.00	36.00	0.00	0	0		
									point65	65	5,767.5	5,699.0	1,000.00	36.00					

Dudek			**8 July 2022**	
MG			**TNM 2.5**	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	**14378**			
RUN:	**Springbrook Santa Clarita - Yr 2024 w Prj**			
Terrain Line	**Points**			
Name	**No.**	**Coordinates (ground)**		
		X	**Y**	**Z**
		ft	ft	ft
Terrain Line1	1	5,433.9	4,595.9	1,020.00
	2	5,387.6	4,873.7	1,020.00
	3	5,331.0	5,321.3	1,020.00
	4	5,289.8	5,408.7	1,020.00

Dudek
MG
8 July 2022
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 14378
RUN: Springbrook Santa Clarita - Yr 2024 w Prj
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ST1	1	1	0.0	56.9	66	56.9	10	----	56.9	0.0	8	-8.0
ST2	2	1	0.0	48.6	66	48.6	10	----	48.6	0.0	8	-8.0
ST3	3	1	0.0	42.7	66	42.7	10	----	42.7	0.0	8	-8.0
ST4	4	1	0.0	54.9	66	54.9	10	----	54.9	0.0	8	-8.0
ST5	5	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
M1	6	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0
M2	7	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0
M3	8	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	8	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0