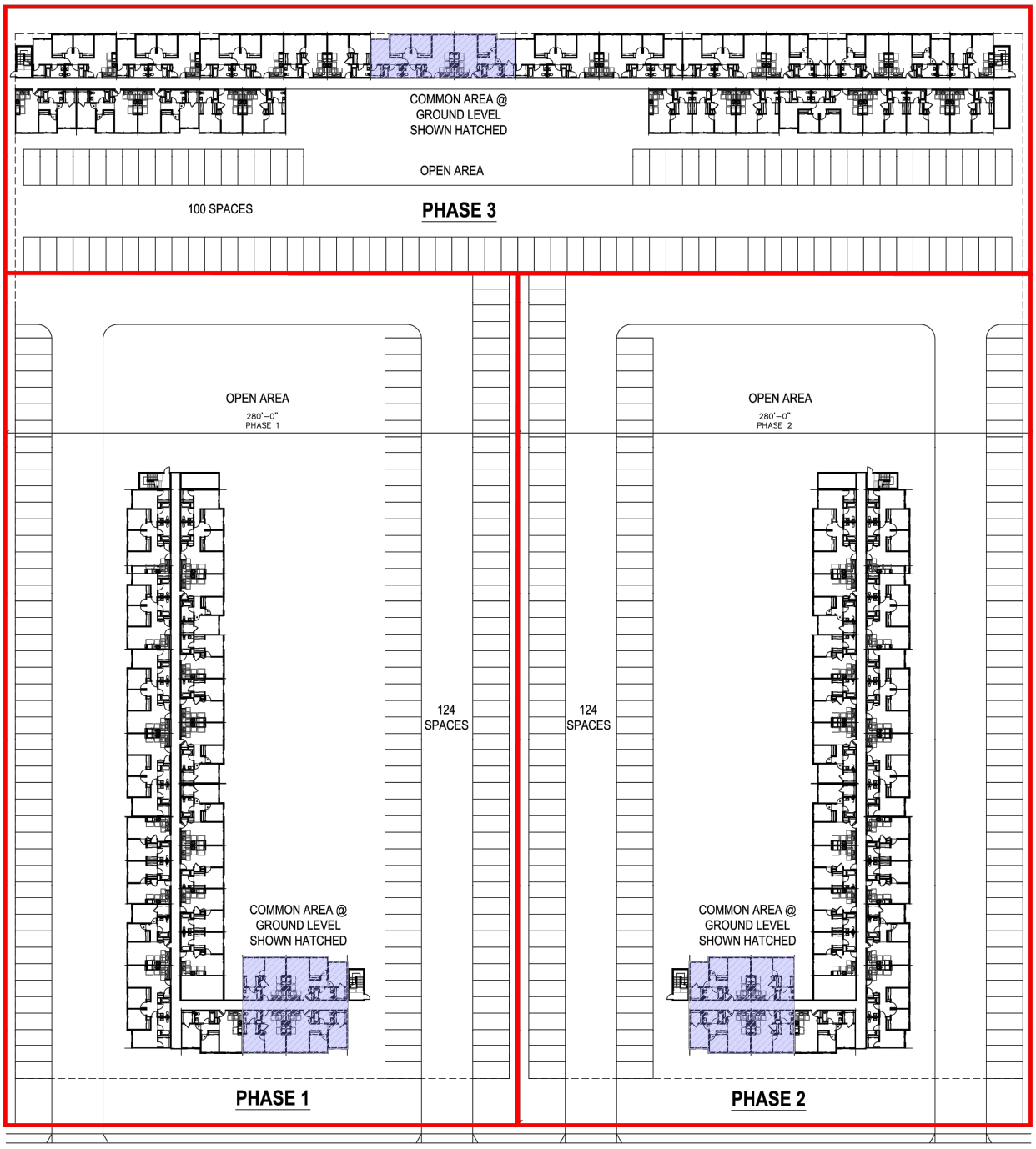
NEC Birch Street and Los Angeles Street Residential Project
NOISE IMPACT STUDY
City of Shafter, CA



NEC BIRCH STREET AND LOS ANGELES STREET RESIDENTIAL PROJECT NOISE IMPACT STUDY City of Shafter, California

Prepared for:

Ms. Leticia Ramirez
CESAR CHAVEZ FOUNDATION
555 North Broadway, Unit B103
Los Angeles, CA 90012

Prepared by:

RK ENGINEERING GROUP, INC.
1401 Dove Street, Suite 540
Newport Beach, CA 92660

Bryan Estrada, AICP
Becca Morrison

October 26, 2023

Table of Contents

Table of Contents – Cont.

List of Attachments

Exhibits

Tables

List of Attachments – Cont.

Appendices

1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

The purpose of this report is to evaluate the potential environmental noise impacts from the proposed NEC Birch Street and Los Angeles Street Residential Project (hereinafter referred to as "project") and provide recommendations, if necessary, to minimize any project noise impacts.

The assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.) and the standards and methodology follow the City of Shafter Municipal Code and General Plan requirements.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- Identification of the regulatory setting and applicable noise standards
- Establishment of the existing ambient noise environment at the project site
- Analysis of the project's operational noise impact to adjacent receptors
- Summary of recommended project design features to reduce noise level impacts.

1.2 Site Location

The proposed project is located on the northeast corner of Birch Street and Los Angeles Street in the City of Shafter, California. The project site is currently vacant and is bounded by residential land uses to the north, vacant land to the east, Los Angeles Street to the south, and Birch Street to the west.

The nearest noise-sensitive receptors to the project site include the following:

Receptor 1 Existing residential dwelling units located a minimum of approximately 974 feet east-southeast of the southeastern corner of the project site, along both the northern and southern sides of Los Angeles Street.

Receptor 2 Existing residential land uses located to the west of the project site, a minimum of approximately 68 feet from the project site's western boundary, along the western side of Birch Street and both the northern and southern sides of Los Angeles Street.

Receptor 3 Existing single-family residential dwellings located approximately 732 feet west of the project site's western boundary, approximately 436 feet north of the centerline of Los Angeles Street.

Receptor 4 Existing Casa Amelia Cadena Apartments located approximately 58 feet north of the project site's northern boundary, approximately 698 feet north of the centerline of Los Angeles Street.

Receptor 5 Existing medical offices located approximately 1,038 feet east-northeast of the northeastern corner of the project site, approximately 550 feet north of the centerline of Los Angeles Street.

The project site location map, including sensitive receptor locations, is provided in Exhibit A.

1.3 Project Description

The project proposes to construct and operate 174 total affordable apartment dwelling units on approximately 7.85 acres. The project will include a total of 348 on-site parking spaces. The project site is currently vacant, and no demolition will be required during construction.

The site plan used for this analysis, provided by Y&M ARCHITECTS, is illustrated in Exhibit B.

1.4 Summary of Findings

Table 1 provides a summary of the noise analysis results, per the CEQA impact criteria checklist.

Table 1
CEQA Noise Impact Criteria

Noise Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project 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?			X	
b) Generation of excessive groundborne vibration or groundborne noise levels?			X	
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?				X

1.5 Recommended Project Design Features (DF)

The following recommended project design features include standard rules and requirements, best practices, and recognized design guidelines for reducing noise levels. Project design features are typically included as part of the conditions of approval for the project but are not considered mitigation under CEQA.

Operational Design Features

DF-1 All ground-level HVAC equipment shall be fully shielded behind noise barrier walls from the line of sight of adjacent properties.

DF-2 The project should incorporate building construction techniques and insulation that is consistent with California Title 24 Building Standards to achieve the minimum interior noise standard of 45.0 dBA CNEL for all residential units.

DF-3 A "windows closed" condition with upgraded windows and sliding glass doors is expected to be required for all residential units facing Los Angeles

Avenue in order to meet the interior noise standard. See Section 6.3.2, Table 16, for details regarding window STC requirements.

DF-4 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum. Attic vents and opening should be oriented away from the adjacent roadways.

Construction Design Features

DF-5 The project shall comply with City of Shafter Municipal Code requirements. All construction shall take place during daytime hours (7:00 a.m. to 7:00 p.m.). No construction will take place during nighttime hours (7:00 p.m. to 7:00 a.m.).

DF-6 Post a public notice in a readily visible location along the perimeter of the construction site that indicates the expected dates and duration of construction activities, as well as provide a telephone number where neighbors can enquire about the construction process and register complaints to a designated construction noise disturbance coordinator.

DF-7 All construction equipment shall be equipped with mufflers and other suitable noise attenuation devices (e.g., engine shields).

DF-8 Establish an electric connection to the site to avoid the use of diesel- and gas-powered generators, to the extent feasible.

DF-9 Locate staging area, generators, and stationary construction equipment as far from the adjacent residential homes as feasible.

DF-10 Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

2.0 Fundamentals of Noise

This section of the report provides basic information about noise and presents some of the terms used within the report.

2.1 Sound, Noise and Acoustics

Sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. Sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic, or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases, as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels and abbreviated dB.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two (2) sounds of equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3 dB increase.

If two (2) sounds differ by approximately 10 dB the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud[1]. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway), would result in a barely perceptible change in sound level.

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant, while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels. Following are the most commonly used noise descriptors along with brief definitions.

A-Weighted Sound Level

The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level

The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

[1] Source: U.S. DOT Federal Highway Administration. Dec. 2011. Highway Traffic Noise: Analysis and Abatement Guidance.

Community Noise Equivalent Level (CNEL)

The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB)

A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A)

A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ)

The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level. The energy average noise level during the sample period.

Habitable Room

Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n)

The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 is the sound level exceeded 10 percent of the sample time. Similarly L50, L90 and L99, etc.

Noise

Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Outdoor Living Area

Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Percent Noise Levels

See L(n).

Sound Level (Noise Level)

The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter

An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL)

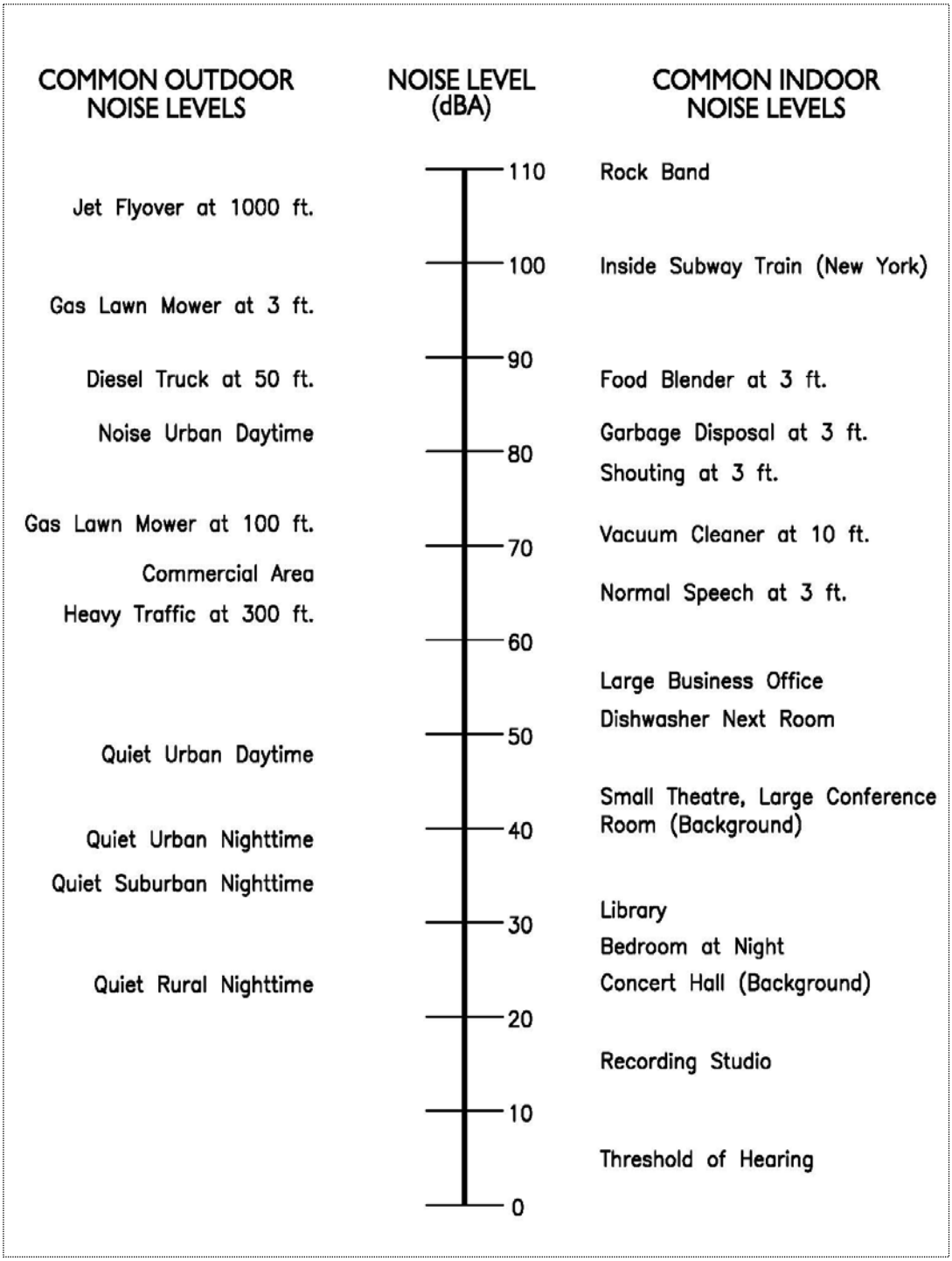
The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

2.7 Sound Propagation

As sound propagates from a source it spreads geometrically. Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at an additional rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 3 dB per doubling of distance for a line source and 6.0 dB per doubling of distance for a point source.

Figure 1
Typical Sound Levels from Indoor and Outdoor Noise Sources[2]



[2] Source: AASHSTO. 1993. Guide on Evaluation and Abatement of Traffic Noise

2.8 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration that only exists indoors since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV

Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS

Known as the root mean squared (RMS) can be used to denote vibration amplitude.

VdB

A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

2.9 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts.

2.10 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wavefront, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wavefront. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wavefront. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes in order to identify potential vibration impacts that may need to be studied through actual field tests.

2.11 Construction-Related Vibration Level Prediction[3]

Operational activities are separated into two different categories. The vibration can be transient or continuous in nature. Each category can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the project area site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. The thresholds from Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, in the table below provide general guidelines as to the maximum vibration limits for when vibration becomes potentially annoying.

[3] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020

Table 2
Vibration Annoyance Potential Criteria

Human Response	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts. The table below provides general vibration damage potential thresholds:

Table 3
Vibration Damage Potential Threshold Criteria

Structure and Condition	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings ruin ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Soil conditions have an impact on how vibration propagates through the ground. The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides suggested "n" values based on soil class. The table below outlines the manual's suggested values and description.

Table 4
Suggested "n" Values Based on Soil Classes

Soil Class	Description of Soil Material	Suggested Value of "n"
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, and weathered rock.	1.3
III	Hard soils: densely compacted sand, dry consolidated clay, consolidated glacial till, and some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

3.0 Regulatory Setting

The proposed project is located in the City of Shafter and noise regulations are addressed through various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

3.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three (3) purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was originally tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The Federal government and the State advocate that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government and the State have preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

3.2 State Regulations

The State of California has established noise insulation standards as outlined in Title 24 of the Building Standards Code which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold.

Noise insulation design standards for residential dwellings are established in the 2022 California Building Code, Title 24, Part 2, Volume 1, Section 1206 Sound Transmission. The City is required by the State Housing Law to adopt these State codes as minimum performance standards. The City may enact stricter noise standards throughout the city or on a case-by-case basis if deemed necessary. In brief, the Title 24 noise standards require the following for allowable interior noise levels:

1. Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

2. Party wall and floor-ceiling assembly designs must provide a minimum STC of 50, based on lab tests. Field tested assemblies must provide a minimum noise isolation class (NIC) of 45.

3. Floor-ceiling assembly designs must provide for a minimum impact insulation class (IIC) of 50, based on lab tests. Field tested assemblies must provide a minimum FIIC of 45.

4. Penetrations or openings in sound rated assemblies must be treated to maintain required ratings.

3.3 City of Shafter Noise Regulations

The proposed project is located in the City of Shafter and is subject to the standards and regulations established by the City of Shafter General Plan Environmental Hazards Program Element and Code of Ordinances Chapter 8.24 – Noise Control Regulations, as discussed below.

3.3.1 General Plan Noise Standards and Land Use Compatibility

The City of Shafter establishes the following objectives and policies for regulating noise in the General Plan Environmental Hazards Program Element, Section 7.7 – Noise. For the purposes of this analysis, the noise levels listed in Table 5 below are used to evaluate the

project's noise/land use compatibility and ensure that the project is consistent with the established plans, policies, and programs for noise control within the City. The City of Shafter General Plan Environmental Hazards Program Element is provided in Appendix A.

Objective Achieve and maintain exterior noise levels appropriate to planned land uses throughout Shafter, as described below.

Table 5
City of Shafter Noise-Compatibility Land Use Objectives[1]

Land Use	Allowable Exterior CNEL	Location
Single-Family Residential	60 – 65 dBA	Within rear yards
Multi-Family Residential	60 – 65 dBA	Within interior open space areas
Schools	60 dBA	Classrooms
	70 dBA	Play and sports areas
Hospitals, Libraries	60 dBA	--
Commercial/Industrial	65 – 70 dBA	At the front setback

[1] Source: City of Shafter General Plan Environmental Hazards Program Element, Section 7.7 – Noise.

Policies

1. Implementation of the General Plan noise objective policies shall be based on noise data contained in the General Plan EIR, unless a noise analysis conducted pursuant to the City's development and environmental review process provides more up-to-date and accurate noise projections, as determined by the City.

2. Maintain a pattern of land uses that separates noise-sensitive land uses from major noise sources to the extent possible, guiding noise-tolerant land uses into the noisier portions of the Planning Area so as to achieve the City's noise objectives.

3. Minimize motor vehicle noise in residential areas through proper route location and sensitive roadway design.

4. Provide planned industrial areas with truck access routes that are separated from residential areas to the maximum feasible extent.

5. Where new development (including construction and improvement of roadways) is proposed in areas exceeding the General Plan Noise Objective, or where the development of proposed uses could result in an increase in noise, require a detailed noise attenuation study to be prepared to determine appropriate mitigation needed to meet the City's noise objectives, and incorporate such mitigation into project design and implementation.

6. When new development proposes a potentially significant noise source, require a noise analysis to be prepared. Require appropriate noise mitigation when the proposed project will exceed General Plan noise objectives, or cause an audible 3.0 dBA increase in noise areas where General Plan noise objectives are already exceeded as the result of existing development.

7. Utilize site and architectural design features to mitigate noise impacts, where feasible. In addition to sound barriers, consider:

   - Increasing building setbacks to further separate the noise-sensitive use from the noise source.
   - Locating uses that are the most tolerant of noise closer to the noise source and the use the buildings housing these uses as noise barriers.
   - Orient delivery, loading docks, and outdoor work areas away from noise-sensitive uses.
   - Place noise-tolerant uses, such as parking areas, and noise-tolerant structures, such as garages, between the noise source and sensitive receptor.
   - Cluster office, commercial, or multi-family residential structures to reduce noise levels within interior open space areas.
   - Provide double-glazed and double-paned windows on the side of the structure facing a major noise source, and place entries away from the noise source to the extent possible.

8. Where feasible, use noise barriers (walls, berms, or a combination thereof) to reduce significant noise impacts. Where noise barriers are constructed, require appropriate landscaping treatment to be provided.

9. Continue enforcement of California Noise Insulation Standards (Title 25, Section 1092, California Administrative Code).

10. Regulate the hours of construction activities in order to avoid or mitigate noise impacts on adjacent noise-sensitive land uses.

3.3.2 Code of Ordinances Construction Noise Regulations

The City of Shafter Code of Ordinances Chapter 8.24 – Noise Control Regulations, Section 8.24.030 – Construction Work, establishes the following regulation on construction noise:

> Within a residential zone, or within a radius of five hundred feet therefrom, no person shall operate equipment, for the construction or repair of buildings, structures, or projects, which creates noise exceeding the ambient noise level beyond fifty feet from the source between the hours of seven p.m. and seven a.m.

4.0 Study Method and Procedures

The following section describes the noise measurement procedures and locations, noise modeling procedures, and assumptions used in this analysis.

4.1 Noise Measurement Procedures and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent to the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

RK conducted the sound level measurements in accordance with Caltrans technical noise specifications. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (ANSI S1.4: Specification for Sound Level Meter, 1983).

Piccolo-II Type 2 integrating-averaging level meters were used to conduct noise measurements at the project site and property boundaries.

The Leq, Lmin, Lmax, L2, L8, L25, and L50 statistical data were recorded over the measurement time intervals and the information was utilized to define the noise characteristics for the project. The following gives a brief description of the procedures for sound level measurements:

- Microphones for sound level meters were placed five (5) feet above the ground for long-term noise measurements
- Sound level meters were calibrated before each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on "A" and slow response
- Temperature and sky conditions were observed and documented

Appendix B includes photos, field sheets, and measured noise data.

4.2 Stationary Noise Source Modeling

On-site stationary noise source impacts are analyzed using SoundPLAN™ noise modeling software. SoundPLAN™ is a standards-based program that incorporates more than twenty national and international noise modeling guidelines.

Projected noise levels from SoundPLAN™ are based on the following key parameters:

- Developing three-dimensional noise models of the project,
- Predicting the project noise levels at the selected community locations and
- Comparing the predicted noise with the existing community ambient noise levels at the receptor locations.

The sides of buildings, walls, etc. were modeled as reflective surfaces and as diffractive bodies.

Most of the area surrounding the project site consists of roadways, residential properties, and vacant land and has been run as a hard site (Ground Factor=0). The elevation profile for the project site is derived from Google Earth and all the receptors are placed at 5 feet above ground level.

Sound Power and Sound Pressure Level

Sound power level is the acoustic energy emitted by a source that produces a sound pressure level at some distance. While the sound power level of a source is fixed, the sound pressure level depends upon the distance from the source and the acoustic characteristics of the area in which it is located.

SoundPLAN requires that the source noise level be input using sound power level and which must be back-calculated based on a measured sound pressure level. The sound power level is calculated using SoundPLAN software by calibrating the source noise level to equal the sound pressure level at an equal distance from the source in which the referenced measurement was taken.

4.2.1 Parking Lot Noise

Parking lot noise would occur from vehicles entering and exiting the site, idling, exhaust, doors slamming, tires screeching, general loading activities, people talking, and the occasional

horn honking. Parking lot noise would occur throughout the site and is assessed by using referenced noise levels in the SoundPLAN model. Parking lot noise is based on the type of vehicle and the number of movements per hour. Referenced noise levels for parking lot activities are based on the SoundPLAN™ standard *Parkplatzlärmstudie 2007*. Key inputs for parking lot noise include the size of the area source, number of movements per hour, type of vehicles, and number of parking spaces within each lot.

4.2.2 HVAC Noise

The project proposes to install one HVAC unit per dwelling unit at ground level for each of the apartment buildings. HVAC units will be clustered in groups of four or five and will be shielded behind a noise reduction enclosure. HVAC noise levels are assessed using referenced noise levels measured by RK. Table 6 below provides the referenced noise levels for on-site HVAC noise.

Table 6
Referenced Noise Levels – HVAC Units

Project Noise Source	Distance from Source (feet)	Noise Level (dBA Leq)[1]
HVAC Units	3.0	88.5

[1] Referenced noise level is representative of typical HVAC units used for multi-family residential developments. Noise level includes multiple units operating simultaneously.

To estimate the future noise levels during typical operational conditions, noise levels are input into SoundPLAN and projected to the nearest sensitive receptor locations. Adjusted noise levels are based on the distance of the receptor location relative to the noise source, local topography, and physical barriers including buildings and sound walls. The noise levels assume that the HVAC units are operating continuously during the daytime and intermittently during the nighttime.

4.3 Traffic Noise Modeling

Traffic noise from vehicular traffic was projected using a version of the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the key input parameters. The following outlines the key adjustments made to the computer model for the roadway inputs:

- Roadway classification – (e.g., freeway, major arterial, arterial, secondary, collector, etc.),

- Roadway Active Width – (distance between the center of the outer most travel lanes on each side of the roadway)
- Average Daily Traffic (ADT) Volumes, Travel Speeds, Percentages of automobiles, medium trucks, and heavy trucks
- Roadway grade and angle of view
- Site Conditions (e.g., soft vs. hard)
- Percentage of total ADT which flows each hour throughout a 24-hour period

The following outlines key adjustments to the computer model for the project site parameter inputs:

- Vertical and horizontal distances (Sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (Noise barrier distance from sound source and receptor).
- Traffic noise source spectra
- Topography

Table 7 shows the roadway parameters and traffic volume data that were utilized for this study.

Table 7
Roadway Parameters

Roadway	Segment	Posted Speed (MPH)	Site Conditions
1. Los Angeles Ave.	West of Birch St.	45	Hard
2. Los Angeles Ave.	Birch St. to S. Mannel St.	45	Hard
3. Los Angeles Ave.	East of S. Mannel St.	45	Hard
4. Birch St.	North of Los Angeles Ave.	25	Hard
5. S. Mannel St.	North of Los Angeles Ave.	25	Hard

Table 8 indicates the traffic volume data utilized for this study. Traffic volumes are referenced from the *NEC Birch Street and Los Angeles Avenue Residential Project Traffic Impact Study,* performed by RK Engineering Group.

Table 8
Traffic Volume Data[1]

Roadway	Segment	Existing ADT	Project ADT	Existing Plus Project ADT	Opening Year (2025) Without Project ADT	Opening Year (2025) With Project ADT
1. Los Angeles Ave.	West of Birch St.	4,500	108	4,608	4,680	4,788
2. Los Angeles Ave.	Birch St. to S. Mannel St.	4,500	552	5,052	4,680	5,232
3. Los Angeles Ave.	East of S. Mannel St.	4,500	636	5,136	4,680	5,316
4. Birch St.	North of Los Angeles Ave.	--	120	120	--	120
5. S. Mannel St.	North of Los Angeles Ave.	--	108	108	--	108

[1]Traffic volume data is referenced from the *NEC Birch Street and Los Angeles Avenue Residential Project Traffic Impact Study,* performed by RK Engineering Group.

Table 9 indicates the vehicle distribution and truck mix utilized for all roadways in this study area.

Table 9
Vehicle Distribution (Truck Mix) for Arterial Roadways[1]

Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	69.5	12.9	9.6	92
Medium Trucks	1.44	0.06	1.5	3
Heavy Trucks	2.4	0.1	2.5	5

[1] Vehicle distribution based on typical mix Arterial Roadways.

4.4 Interior Noise Modeling

The interior noise level is the difference between the projected exterior noise level at the structure's façade and the noise reduction provided by the structure itself. Typical building construction will provide a conservative 12 dBA noise level reduction with a "windows open" condition and a very conservative 20 dBA noise level reduction with "windows closed". The interior noise level is estimated by subtracting the building shell design from the estimated exterior noise level.

The interior noise analysis is based on industry standards for building noise reduction established by the Federal Highway Administration (FHWA), the 2013 Caltrans Technical Noise Supplement to the Traffic Noise Analysis Protocol (TeNS), the California Office of Noise Control Catalog of STC and IIC Ratings for Wall and Floor/Ceiling Assemblies, and the California Building Standards Code, Title 24.

The TeNS manual shows that the noise reduction due to building exteriors with ordinary sash windows (windows closed) is at least 20 decibels. By providing upgraded STC rated windows, the project design is considered adequate to meet interior noise standards. The building's exterior walls will be constructed per the latest building code insulation requirements and provide occupants with the most protection from exterior noise. Insulated exterior walls, designed per the latest California Building Standards, would provide a minimum of STC 35-40. Windows, on the other hand, are one of the acoustically weakest parts of the structure. Therefore, for a conservative estimate of preliminary interior noise, the building's noise reduction potential is limited to the STC of the windows.

4.5 Construction Noise Modeling

The construction noise vibration assessment is based on the General Assessment methodology set forth by the FTA's Transit Noise and Vibration Impact Assessment Manual, Section 7 – Noise and Vibration during Construction. This analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model, together with several key construction parameters, to estimate future construction noise levels during each phase of construction. Consistent with the FTA General Assessment methodology, the following assumptions have been utilized in the construction noise model:

- Noise emission level ($L_{emission}$) – Determine the emission level at 50 feet according to noise from typical construction equipment.
- Usage factor (Adj_{Usage}) – Assume a usage factor of one (1). This assumes a time period of one-hour with full power operation.
- Distance (D) – Assume that all equipment operates at the center of the project, or centerline for guideway or highway construction projects.
- Ground effect (G) – G equals zero (0) assuming free-field conditions and ignoring ground effects.
- The $L_{eq.equip}$ is determined only for the two noisiest pieces of equipment expected to be used in each phase of construction. The equipment noise levels are summed for each phase of construction using decibel addition.

Given that the proposed project consists of three separate lots, noise levels were projected from the center of the nearest plot to the closest sensitive receptor property line, at a distance of approximately 360 feet. While some construction activity may occur closer than 360 feet from the nearest property line, noise levels are based on an average distance from the center of the site per FTA General Assessment recommendations.

4.6 Construction Vibration Modeling

The construction vibration assessment is based on the methodology set forth within the Caltrans Transportation and Construction Induced Vibration Guidance Manual. The vibration impacts from vibratory rollers and compactors, heavy truck loading, and bulldozer activity are analyzed. All vibratory activity is analyzed as a continuous and/or frequent event and is required to comply with the applicable guidance threshold criteria. It is expected that vibration levels will be highest during the paving phase. No impact pile driving is expected as part of this project.

Vibratory impacts were calculated from the nearest expected location of on-site construction to the nearest sensitive receptors and structures using the reference vibration levels, soil conditions, and the reference equation *PPV= PPV ref (25/D)^n (in/sec)* (from Caltrans Manual) where:

PPV = reference measurement at 25 feet from vibration source
D = distance from equipment to property line
n= vibration attenuation rate through ground (n=1.0 was utilized for this study)

5.0 Existing Noise Environment

The existing noise environment for the project site and surrounding areas has been established based on noise measurement data collected by RK. The project setting is residential, and the primary environmental noise impacting the project site is roadway noise from Los Angeles Street.

5.1 Noise Measurement Results

To determine the existing noise level environment, RK conducted two (2) one-hour noise measurements near the adjacent residential noise receptors.

The City of Shafter has established noise level thresholds in terms of the ambient community noise equivalent level (CNEL). In order to establish existing ambient noise levels at the nearby receptors, the existing ambient community noise equivalent level (CNEL) is estimated using the results of the one-hour, short-term measurements. The CNEL is estimated based on typical hourly traffic distribution patterns to predict noise levels over a 24-hour period. For the purposes of this analysis, the results obtained at Noise Monitoring Location 1 (L-1) are representative of the ambient environment at Receptors 3 through 5, and the results obtained at Noise Monitoring Location 2 (L-2) are representative of the ambient environment at Receptors 1 and 2.

Noise levels were measured on August 23, 2023, using Piccolo-II Type 2 integrating-averaging sound level meters. The information was utilized to establish the noise characteristics of the existing ambient environment.

The noise monitoring locations were selected based on the proximity and location of adjacent sensitive receptors. Exhibit C graphically illustrates the location of the noise measurements.

- Noise Monitoring Location 1 (L-1) was taken near the northwest corner of the project site, approximately 19 feet south of Receptor 3's southern property line wall and approximately 662 feet north of the centerline of Los Angeles Street.

- Noise Monitoring Location 2 (L-2) was taken near the southwest corner of the project site, approximately 56 feet north of the centerline of Los Angeles Street.

Noise measurements were conducted at the above-selected locations to determine the existing ambient noise environment at the nearby sensitive receptors. Ambient noise

sources during the measurement period consisted of residential activity, roadway noise along Los Angeles Street, heavy truck horns, dogs barking, and nature/bird activity.

Results of the short-term ambient noise measurements are shown in Tables 10 and 11. Appendix B includes photographs, field sheets, and measured noise data.

Table 10
Short-Term Noise Measurement Results (dBA) – L-1[1]

Start Time	Leq	Lmax	Lmin	L_2	L_8	L_{25}	L_{50}	CNEL[2]
8:10 AM	43.3	58.1	36.8	50.0	46.6	43.1	41.4	45.9

[1] L-1 was measured on 08/23/2023 and is representative of the existing ambient environment at Receptors 3 through 5.
[2] CNEL estimated based on measured hourly Leq.

Table 11
Short-Term Noise Measurement Results (dBA) – L-2[1]

Start Time	Leq	Lmax	Lmin	L_2	L_8	L_{25}	L_{50}	CNEL[2]
8:22 AM	62.8	78.2	37.0	72.3	68.9	61.3	49.7	65.4

[1] L-2 was measured on 08/23/2023 and is representative of the existing ambient environment at Receptors 1 and 2.
[2] CNEL estimated based on measured hourly Leq.

As shown in Table 10, the existing ambient noise level at Receptors 1 and 2 is 65.4 CNEL, which exceeds the General Plan noise standard of 65.0 CNEL. Per the City of Shafter General Plan noise objectives, in areas where the General Plan noise standards are already exceeded as a result of the existing environment, new developments would be classified as having a significant impact if they cause an audible 3.0 dBA increase in ambient noise levels.

6.0 Operational Noise Impacts

A noise impact analysis has been performed to determine whether the proposed project would result in a substantial increase in ambient noise levels in the vicinity of the site. Additionally, the noise analysis examines whether the project can meet the City of Shafter and State of California requirements for residential exterior and interior noise exposure.

6.1 Stationary Source Noise Impacts

The City of Shafter General Plan establishes residential noise standards for the maximum allowable exterior community noise equivalent levels (CNEL). SoundPLAN™ noise modeling software is used to predict project-related noise impacts at each of the sensitive receptor locations during daytime and nighttime hours. Noise impacts are then compared to the City's noise standards by converting the daytime and nighttime noise levels to the CNEL at each sensitive receptor location.

This analysis considers all project noise sources operating simultaneously during daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) hours. The result is a worst-case assessment of future daytime noise levels, as not all noise sources would typically be in use at the same time.

The results of the daytime and nighttime noise impact analysis are graphically illustrated in Exhibit D. Exhibits E and F illustrate the daytime and nighttime noise contours, respectively.

The project's daytime, nighttime, and CNEL noise level impacts to off-site sensitive receptors (adjacent homes) are shown in Table 12 below. Appendix C provides the SoundPLAN calculation worksheets and CNEL calculation worksheets.

Table 12
Stationary Noise Source Impacts

Sensitive Receptor Location	SoundPLAN Receiver[1]	Daytime Exterior Noise Level (dBA)	Nighttime Exterior Noise Level (dBA)	24-Hour Exterior Noise Level (dBA CNEL)[2]	General Plan Exterior Noise Standard (dBA CNEL)[3,4]	Exceeds Standard (?)
Receptor 1	1	49.2	46.2	53.6	68.4	**No**
	2	50.9	47.9	55.3		**No**
Receptor 2	3	60.7	57.7	65.1		**No**
	4	57.1	54.1	61.8		**No**
Receptor 3	5	52.1	49.1	56.5	65.0	**No**
	6	51.6	48.7	56.1		**No**
	7	50.6	47.7	55.1		**No**
Receptor 4	8	54.6	51.6	59.0		**No**
	9	54.2	51.2	58.6		**No**
Receptor 5	10	50.7	47.7	55.1	60.0	**No**

[1] SoundPLAN receiver locations are graphically illustrated in Exhibit D.

[2] CNEL noise levels include a five (5) decibel penalty to sound levels in the evening from 7:00 to 10:00 PM and a ten (10) decibel penalty to sound levels in the night before 7:00 AM and after 10:00 PM.

[3] Source: City of Shafter General Plan Environmental Hazards Program Element, Section 7.7 – Noise.

[4] Pursuant to the City of Shafter General Plan noise standards, the noise level threshold at Receptors 1 and 2 is a 3.0 dB increase from the existing ambient noise level of 65.4 CNEL. Receptors 3 through 5 are assessed using the following General Plan thresholds:
Residential noise standard: 65.0 dBA CNEL.
Hospital noise standard: 60.0 dBA CNEL.

6.2 Mobile Source Noise Impacts

6.2.1 Roadway Noise

A roadway noise impact analysis has been prepared to determine whether the project would cause a substantial permanent increase in ambient noise levels at each sensitive receptor location due to changes increased traffic volume.

Per the City of Shafter General Plan, exterior noise levels should not exceed 65.0 dBA CNEL at residential land uses or 60.0 dBA CNEL at medical land uses. For the purposes of this analysis, a significant impact would occur if noise levels exceed the applicable noise standards and the project results in an increase of 3.0 dBA or more above "Without Project" conditions. It is assumed that all homes in the vicinity of the project site are equipped with fresh air supply or air conditioning systems and thus a windows closed

condition is applicable. Additionally, a change of 3 dBA is considered barely perceptible by the average health human ear[4].

Tables 13 and 14 show the roadway noise levels for Existing and Opening Year (2025) conditions, respectively. Operational roadway noise calculation sheets are provided in Appendix D.

Table 13
Existing Roadway Noise Levels (dBA CNEL)

Sensitive Receptor	Affected Roadway		Minimum Receptor Distance from Centerline (feet)	Existing Noise Levels (dBA CNEL)			Significant Impact (?)[1]
				Without Project	Plus Project	Change as a Result of Project	
Receptor-1	Los Angeles Ave.	East of S. Mannel St.	27	72.4	72.9		
	S. Mannel St.	North of Los Angeles Ave.	950	--	29.5		
		Total Noise Level at Receptor		***72.4***	***72.9***	***0.5***	***No***
Receptor-2	Los Angeles Ave.	West of Birch St.	23	73.5	73.6		
	Birch St.	North of Los Angeles Ave.	247	--	38.7		
		Total Noise Level at Receptor		***73.5***	***73.6***	***0.1***	***No***
Receptor-3	Los Angeles Ave.	West of Birch St.	441	54.0	54.1		
	Birch St.	North of Los Angeles Ave.	715	--	31.8		
		Total Noise Level at Receptor		***54.0***	***54.1***	***0.1***	***No***
Receptor-4 [2]	Los Angeles Ave.	Birch St. to S. Mannel St.	748	50.6	51.1		
	Birch St.	North of Los Angeles Ave.	121	--	43.4		
	S. Mannel St.	North of Los Angeles Ave.	132	--	42.3		
		Total Noise Level at Receptor		***50.6***	***52.2***	***1.6***	***No***
Receptor-5	Los Angeles Ave.	East of S. Mannel St.	556	52.5	53.1		
	S. Mannel St.	North of Los Angeles Ave.	998	--	29.1		
		Total Noise Level at Receptor		***52.5***	***53.1***	***0.6***	***No***

[1] A significant impact would occur if "Plus Project" noise levels exceed 65.0 dBA CNEL at Receptors 1-4 or 60.0 dBA CNEL at Receptor-5 and the change as a result of the project exceeds 3.0 dBA CNEL.

[2] Per the City of Shafter General Plan, exterior noise levels at multi-family residential land uses are assessed within interior open space areas.

[4] Caltrans Technical Noise Supplement to the Traffic Noise Analysis Protocol (Tens Manual). September 2013. Section 2.2.1.1 Human Response to Changes in Noise Levels.

Table 14
Opening Year (2025) Roadway Noise Levels (dBA CNEL)

Sensitive Receptor	Affected Roadway		Minimum Receptor Distance from Centerline (feet)	Opening Year Noise Levels (dBA CNEL)			Significant Impact (?)[1]
				Without Project	Plus Project	Change as a Result of Project	
Receptor-1	Los Angeles Ave.	East of S. Mannel St.	27	72.2	73.1		
	S. Mannel St.	North of Los Angeles Ave.	950	--	29.5		
		Total Noise Level at Receptor		***72.5***	***73.1***	***0.6***	***No***
Receptor-2	Los Angeles Ave.	West of Birch St.	23	73.6	73.7		
	Birch St.	North of Los Angeles Ave.	247	--	38.7		
		Total Noise Level at Receptor		***73.6***	***73.7***	***0.1***	***No***
Receptor-3	Los Angeles Ave.	West of Birch St.	441	54.2	54.3		
	Birch St.	North of Los Angeles Ave.	715	--	31.8		
		Total Noise Level at Receptor		***54.2***	***54.3***	***0.1***	***No***
Receptor-4 [2]	Los Angeles Ave.	Birch St. to S. Mannel St.	748	50.8	51.2		
	Birch St.	North of Los Angeles Ave.	121	--	43.4		
	S. Mannel St.	North of Los Angeles Ave.	132	--	42.3		
		Total Noise Level at Receptor		***50.8***	***52.3***	***1.5***	***No***
Receptor-5	Los Angeles Ave.	East of S. Mannel St.	556	52.7	53.2		
	S. Mannel St.	North of Los Angeles Ave.	998	--	29.1		
		Total Noise Level at Receptor		***52.7***	***53.2***	***0.5***	***No***

[1] A significant impact would occur if "Plus Project" noise levels exceed 65.0 dBA CNEL at Receptors 1-4 or 60.0 dBA CNEL at Receptor-5 and the change as a result of the project exceeds 3.0 dBA CNEL.

[2] Per the City of Shafter General Plan, exterior noise levels at multi-family residential land uses are assessed within interior open space areas.

As shown in Tables 13 and 14, the proposed project will not result in a significant permanent increase in roadway noise levels along adjacent roadways.

6.2.2 Airport Noise

The Minter Field Airport District, located in Shafter, California, is the nearest airport to the proposed project site, at a distance of approximately 4 miles. The project site is not located within the vicinity of the Minter Field Airport District or any others' private airstrip or airport land use plan, nor is it within two miles of a public or private use airport. Therefore, the project will have no impact on airport-adjacent land uses.

6.3 Noise/Land Use Compatibility

The project proposes to site new multi-family residential apartments near the northeast corner of Birch Street and Los Angeles Avenue. Traffic noise from Los Angeles Avenue, Birch Street, and South Mannel Street will be the primary source of noise impacting the project site and may expose future residents to noise levels above the City of Shafter exterior noise thresholds for residential uses.

6.3.1 Exterior Noise/Land Use Compatibility

A noise/land use compatibility assessment has been prepared to help determine whether existing exterior noise levels affecting the project site exceed the City's exterior noise thresholds for residential uses. Pursuant to the noise objectives outlined in the City of Shafter General Plan, exterior ambient noise levels are assessed within the on-site interior open space areas.

It is possible that increases in roadway volumes over time will result in increased ambient noise levels in the vicinity of the project site. Therefore, a 3 dB increase has been applied to the projected future exterior noise levels. This is a conservative estimate, as it would typically require a doubling of traffic volume along a roadway to result in a noise level increase of 3 dB or more.

Table 15 shows the results of the exterior noise/land use compatibility assessment. Noise/land use compatibility assessment worksheets are provided in Appendix E.

Table 15
Exterior Noise/Land Use Compatibility (dBA CNEL)

Receptor Location	Future Exterior Noise Levels[1]	Exterior Residential Noise Standard (dBA CNEL)[2]	Noise Level Exceeds Standard (?)
Interior open space adjacent to Los Angeles Ave.	65.7	65.0	**Yes**
Interior open space adjacent to Birch St.	48.2		**No**
Interior open space adjacent to S. Mannel St.	48.5		**No**

[1] Future exterior noise levels include a 3 dBA increase to account for future traffic growth.

As shown in Table 15, future ambient noise levels may exceed the City's exterior residential noise standard at the interior open areas along Los Angeles Avenue. Therefore, the

following interior noise/land use compatibility analysis has been prepared to ensure the project meets the applicable interior noise standards.

6.3.2 Interior Noise/Land Use Compatibility

The project must show that interior noise levels at the project site will not exceed the City of Shafter and State of California noise/land use compatibility threshold for residential land uses. A preliminary interior noise analysis has been performed for the first row of habitable dwellings facing the adjacent roadways using a typical "windows open" and "windows closed" condition. A "windows open" condition assumes 12 dBA of noise attenuation from the exterior noise level. A "windows closed" condition assumes 20 dBA of noise attenuation from the exterior noise level.

Table 16 indicates the future interior noise levels along the adjacent roadways.

Table 16
Future Interior Noise Levels (dBA CNEL)

Exterior Façade Study Location		Projected Exterior Noise Level at Façade	Required Building Shell Noise Reduction (dBA CNEL)	Interior Noise Level w/ Standard Windows (STC ~ 25)		Required STC Rating
				"Windows Open" [1]	"Windows Closed" [2]	
First row buildings along Los Angeles Ave.	First Floor	67.1	22.1	55.1	47.1	27
	Second Floor	67.0	22.0	55.0	47.0	27
	Third Floor	66.8	21.8	54.8	46.8	27
First row buildings along Birch St.	First Floor	44.9	--	32.9	24.9	--
	Second Floor	44.9	--	32.9	24.9	--
	Third Floor	44.8	--	32.8	24.8	--
First row buildings along S. Mannel St.	First Floor	44.0	--	32.0	24.0	--
	Second Floor	43.9	--	31.9	23.9	--
	Third Floor	43.9	--	31.9	23.9	--

[1] A minimum of 12 dBA noise reduction is assumed with the "windows open" condition.
[2] A minimum of 20 dBA noise reduction is assumed with the "windows closed" condition.

The project is expected to require a "windows closed" condition and upgraded STC-rated windows for all residential units facing Los Angeles Avenue in order to meet the City of Shafter and State of California interior noise standard of 45.0 dBA CNEL. To accommodate

windows closed conditions, all units facing Los Angeles Avenue shall be equipped with adequate fresh air ventilation.

Exterior walls, designed per the latest California Building Standards are typically rated between STC 35-40. In order to ensure adequate noise attenuation is provided from the building shell, exterior walls should be designed to meet the required sound attenuation targets. Attic vents and other openings should be baffled and oriented away from facing the adjacent roadways.
Furthermore, the project shall comply with California Title 24 insulation building requirements for multi-family dwelling units for common separating assemblies (e.g., floor/ceiling assemblies and demising walls).

6.5 Operational Project Design Features

The following recommendations are provided to help ensure the proposed project meets the City of Lancaster and State of California requirements for residential interior noise exposure:

DF-1 All ground-level HVAC equipment shall be fully shielded behind noise barrier walls from the line of sight of adjacent properties.

DF-2 The project should incorporate building construction techniques and insulation that is consistent with California Title 24 Building Standards to achieve the minimum interior noise standard of 45.0 dBA CNEL for all residential units.

DF-3 A "windows closed" condition with upgraded windows and sliding glass doors is expected to be required for all residential units facing Los Angeles Avenue in order to meet the interior noise standard. See Section 6.3.2, Table 16, for details regarding window STC requirements.

DF-4 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum. Attic vents and opening should be oriented away from the adjacent roadways.

7.0 Construction Noise and Vibration Impacts

Temporary construction noise and vibration impacts have been assessed from the project site to the surrounding adjacent land uses. The degree of construction noise and vibration will vary depending on the type of construction activity taking place and the location of the activity relative to the surrounding properties.

During the construction period, the contractors will be required to comply with the City of Shafter Code of Ordinances Section 8.24.030 – Construction Work which states the following:

> Within a residential zone, or within a radius of five hundred feet therefrom, no person shall operate equipment, for the construction or repair of buildings, structures or projects, which creates noise exceeding the ambient noise level beyond fifty feet from the source between the hours of seven p.m. and seven a.m.

No project-related construction will occur during the hours of 7:00 p.m. and 7:00 a.m. The City of Shafter does not establish specific noise level thresholds for construction activity during daytime hours (7:00 a.m. to 7:00 p.m.). Therefore, for purposes of this analysis, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria will be used. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 90 dBA Leq for a 1-hour period. In compliance with the City's Municipal Code, it is assumed construction would not occur during the noise-sensitive nighttime hours.

Construction phasing and equipment usage assumptions are referenced from the *NEC Birch Street and Los Angeles Street Residential Project Air Quality and Greenhouse Gas Impact Study, City of Shafter,* performed by RK Engineering Group.

7.1 Typical Construction Noise Levels

Table 17 shows typical construction noise levels compiled by the Environmental Protection Agency (EPA) for common-type construction equipment. Typical construction noise levels are used to estimate potential project construction noise levels at the adjacent sensitive receptors.

Table 17
Typical Construction Noise Levels[1]

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86
Impact Equipment	
Pneumatic Wrenches	82 - 87
Jack Hammers, Rock Drills	80 - 99
Pile Drivers (Peak)	95-105
Other	
Vibrators	68 - 82
Saws	71 - 82

[1] Referenced Noise Levels from the Environmental Protection Agency (EPA)

7.2 Construction Noise Impact Analysis

This assessment analyzes potential noise impacts of the two noisiest pieces of equipment during all expected phases of construction, including site preparation, grading, building construction, paving, and architectural coating. Noise levels are calculated based on an average distance of equipment over a 1-hour period to the nearest adjacent property. The project's estimated construction noise levels have been calculated using the Federal Highway Administration Roadway Construction Noise Model Version 1.1. Table 18 shows the noise level impacts from the center of the nearest plot to the nearest sensitive receptor property line.

Construction noise calculation worksheets are provided in Appendix F.

Table 18
Project Construction Noise Levels – at 360 Feet

Phase	Equipment	Quantity	Equipment Noise Level at 360 ft (dBA Leq)	Combined Noise Level (dBA Leq)
Site Preparation	Tractors/Loaders/Backhoes	2	66.9	69.9
Grading	Graders	1	67.9	70.4
	Tractors/Loaders/Backhoes	1	66.9	
Building Construction	Tractors/Loaders/Backhoes	2	66.9	69.9
Paving	Rollers	2	67.9	70.9
Architectural Coating	Air Compressors	1	60.6	60.7
Worst Case Construction Phase Noise Level (dBA Leq)				70.9
FTA Daytime General Assessment Construction Noise Criteria (dBA Leq)[1]				**90.0**
Noise level exceeds FTA criteria?				No

[1] Source: *Transit Noise and Vibration Impact Assessment Manual, Section 7 Noise and Vibration during Construction*, by the Federal Transit Administration.

The project is expected to generate a maximum noise level of 70.9 dBA. Based on the above table, the project's construction-related noise levels will not exceed the FTA General Assessment Construction Noise Criteria threshold.

7.3 Construction Vibration

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structures. The nearest adjacent structures to the project site are at Receptor 1, located approximately 58 feet north of the nearest location of on-site construction. All structures surrounding the project site are "new structures". No historical or fragile buildings are known to be located within the vicinity of the site.

The construction of the proposed project is not expected to require the use of substantial vibration-inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during the construction of the project would be the operation of equipment such as bulldozer activity during site preparation, loading trucks during grading and excavation, and vibratory rollers during paving.

The construction vibration assessment utilizes the referenced vibration levels and methodology set forth within the Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, September 2018. Table 19 shows the FTA-referenced vibration levels.

Table 19
Typical Construction Vibration Levels[1]

Equipment	Peak Particle Velocity (PPV) (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Piledriver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Piledriver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

Table 20 shows the project's construction-related vibration analysis at the nearest structures to the project construction area. Construction impacts are assessed at 58 feet from the nearest expected location of on-site construction to the nearest adjacent structure. Construction vibration calculations worksheets are provided in Appendix F.

Table 20
Construction Vibration Impact Analysis

Construction Activity	Distance to Nearest Structure (ft)	Duration	Calculated Vibration Level - PPV (in/sec)	Damage Potential Level	Annoyance Criteria Level
Large Bulldozer	58	Continuous/Frequent	0.035	Extremely fragile historic buildings, ruins, ancient monuments	Barely Perceptible
Vibratory Roller	58	Continuous/Frequent	0.083	Fragile buildings	Barely Perceptible
Loaded Trucks	58	Continuous/Frequent	0.030	Extremely fragile historic buildings, ruins, ancient monuments	Barely Perceptible

Based on the table above, project-related construction activity is not expected to cause any potential damage to the nearest structures. Hence, **the impact from construction-related vibration will be less than significant.**

7.4 Construction Project Design Features

The following recommended project design features include standard rules and requirements, best practices, and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into the site design and construction management plan.

Construction Design Features

DF-5 The project shall comply with City of Shafter Municipal Code requirements. All construction shall take place during daytime hours (7:00 a.m. to 7:00 p.m.). No construction will take place during nighttime hours (7:00 p.m. to 7:00 a.m.).

DF-6 Provide public notifications and signage in readily visible locations along the perimeter of construction sites that indicate the dates and duration of construction activities, as well as provide a telephone number where neighbors can enquire about the construction process and register complaints to a designated construction noise disturbance coordinator.

DF-7 All construction equipment shall be equipped with mufflers and other suitable noise attenuation devices (e.g., engine shields).

DF-8 Establish an electric connection to the site to avoid the use of diesel- and gas-powered generators, to the extent feasible.

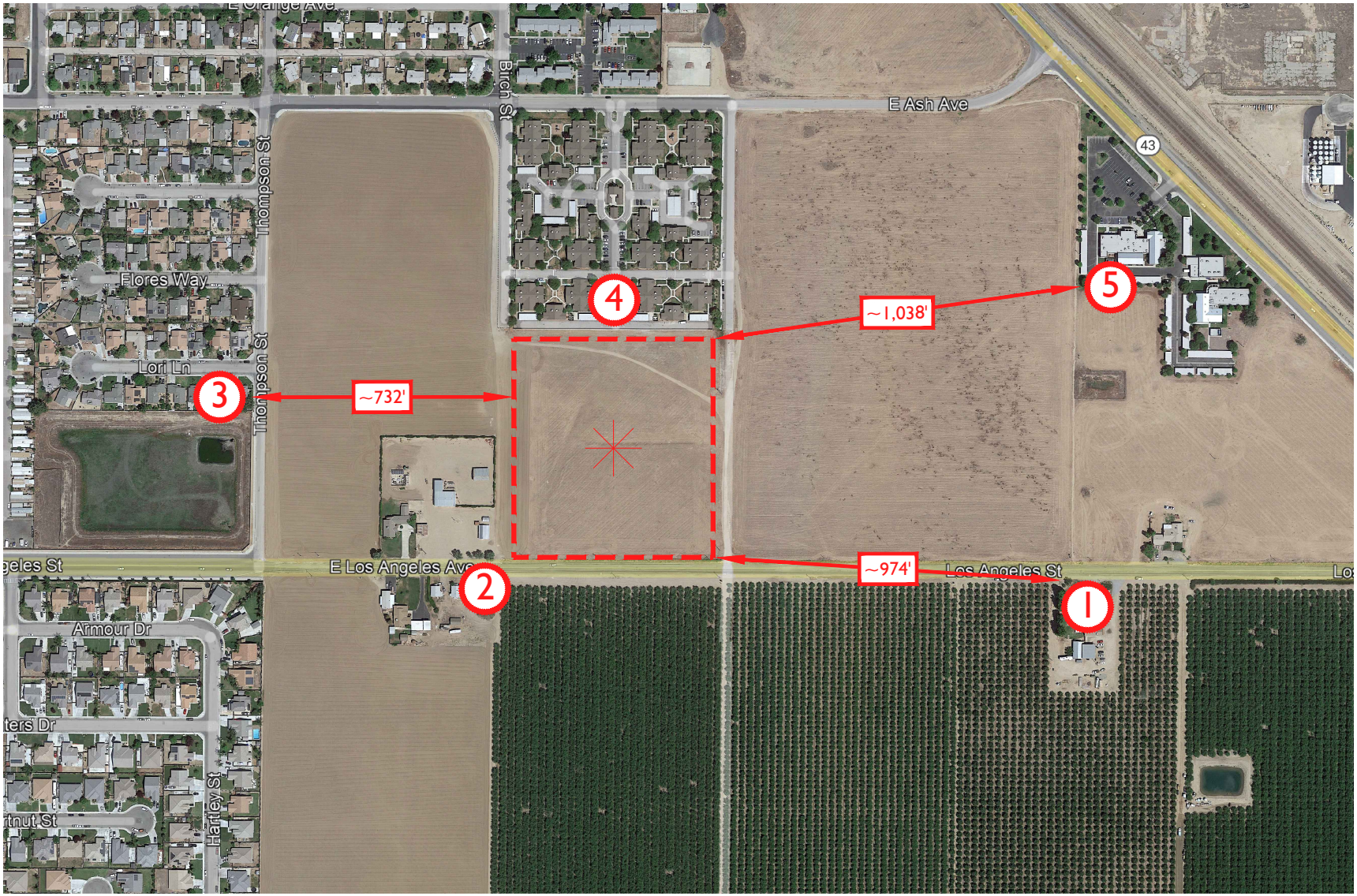
DF-9 Locate staging area, generators, and stationary construction equipment as far from the adjacent residential homes as feasible.

DF-10 Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

Exhibits

Exhibit A

Location Map



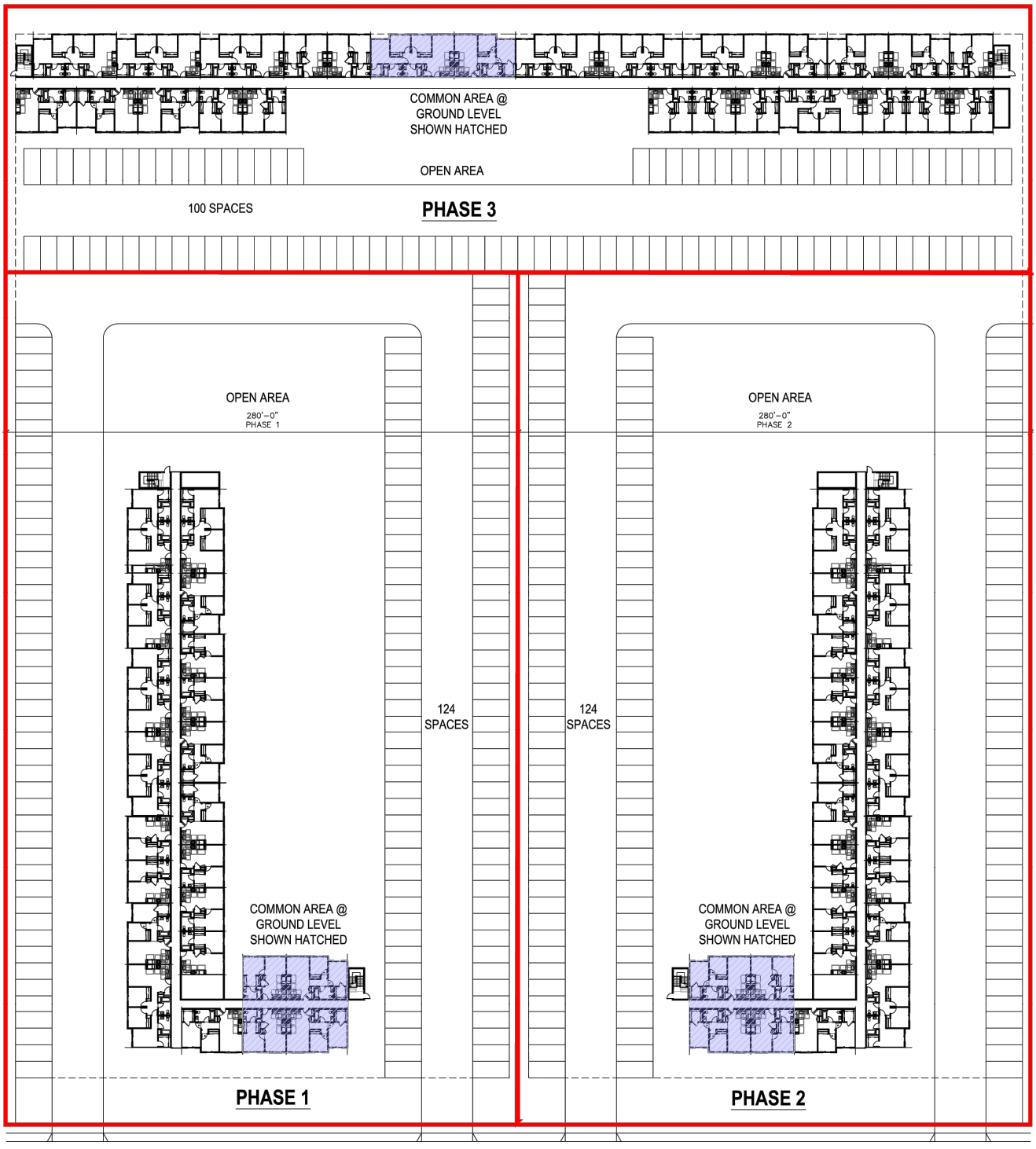
Legend:

- = Project Site Boundary
- = Project Site
- = Sensitive Receptor Location

N

Exhibit B

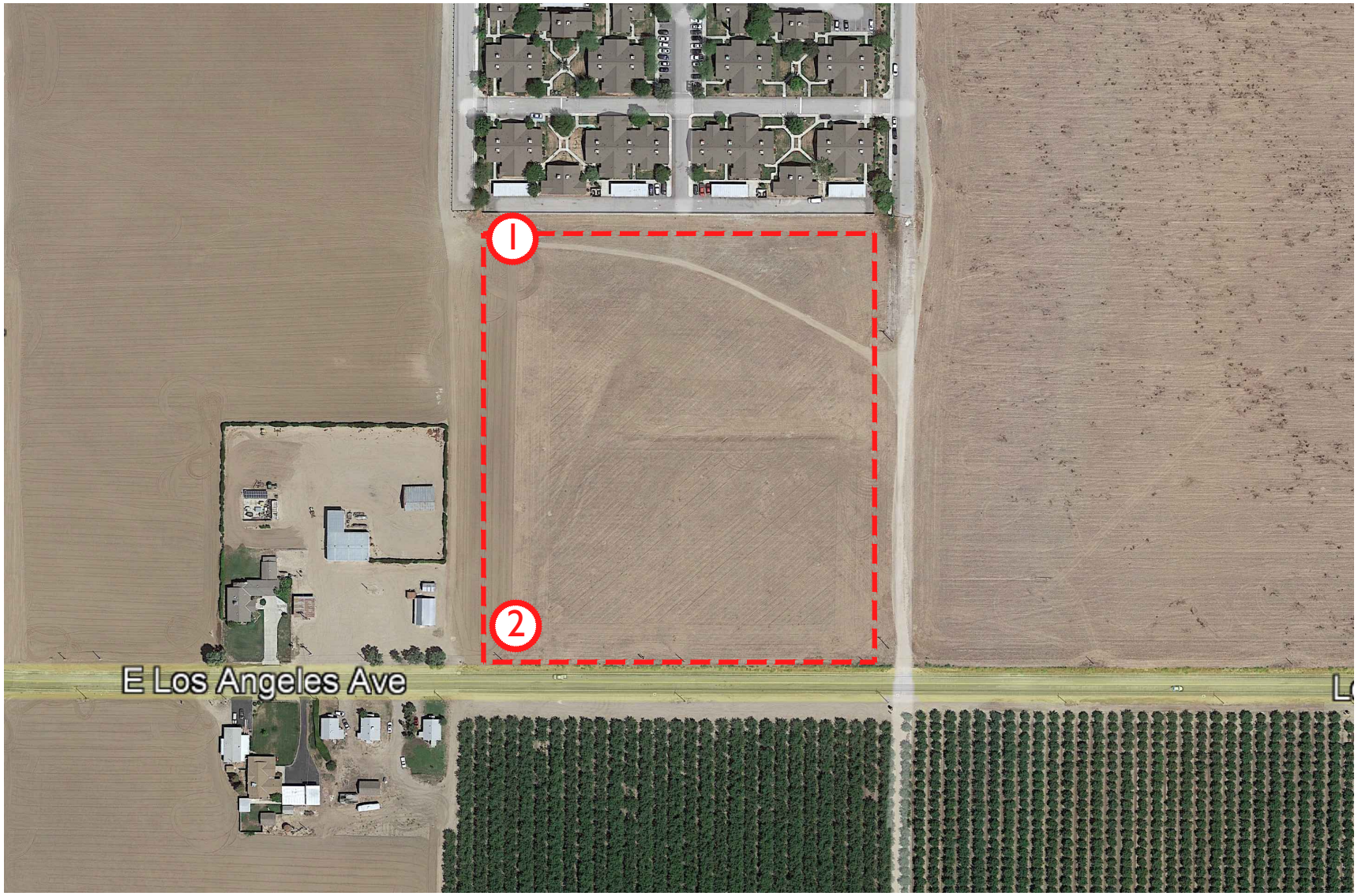
Site Plan



N

Exhibit C

Noise Monitoring Locations



Legend:

= Project Site Boundary

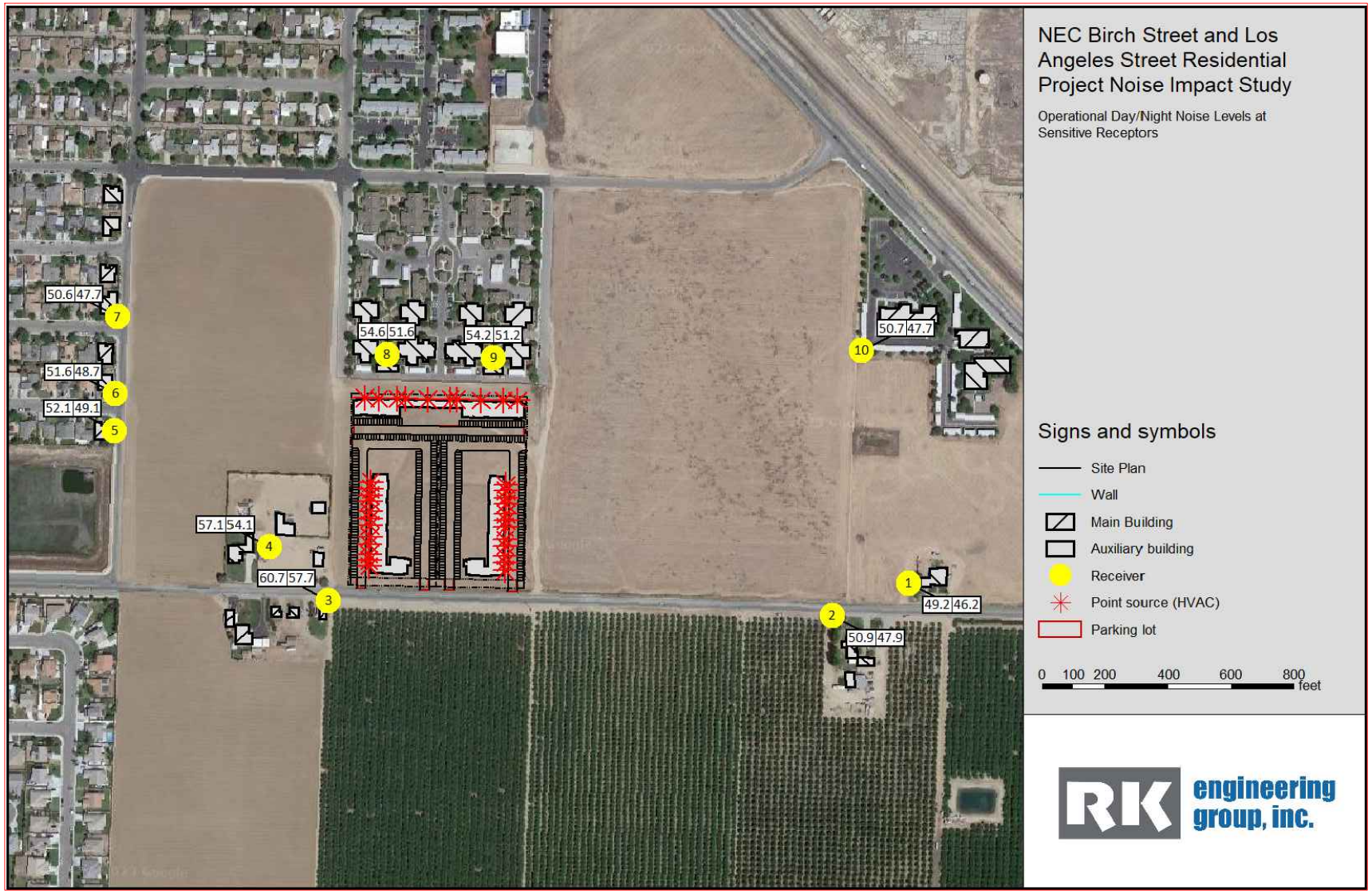
= Noise Monitoring Location

N

RK engineering group, inc.

Exhibit D

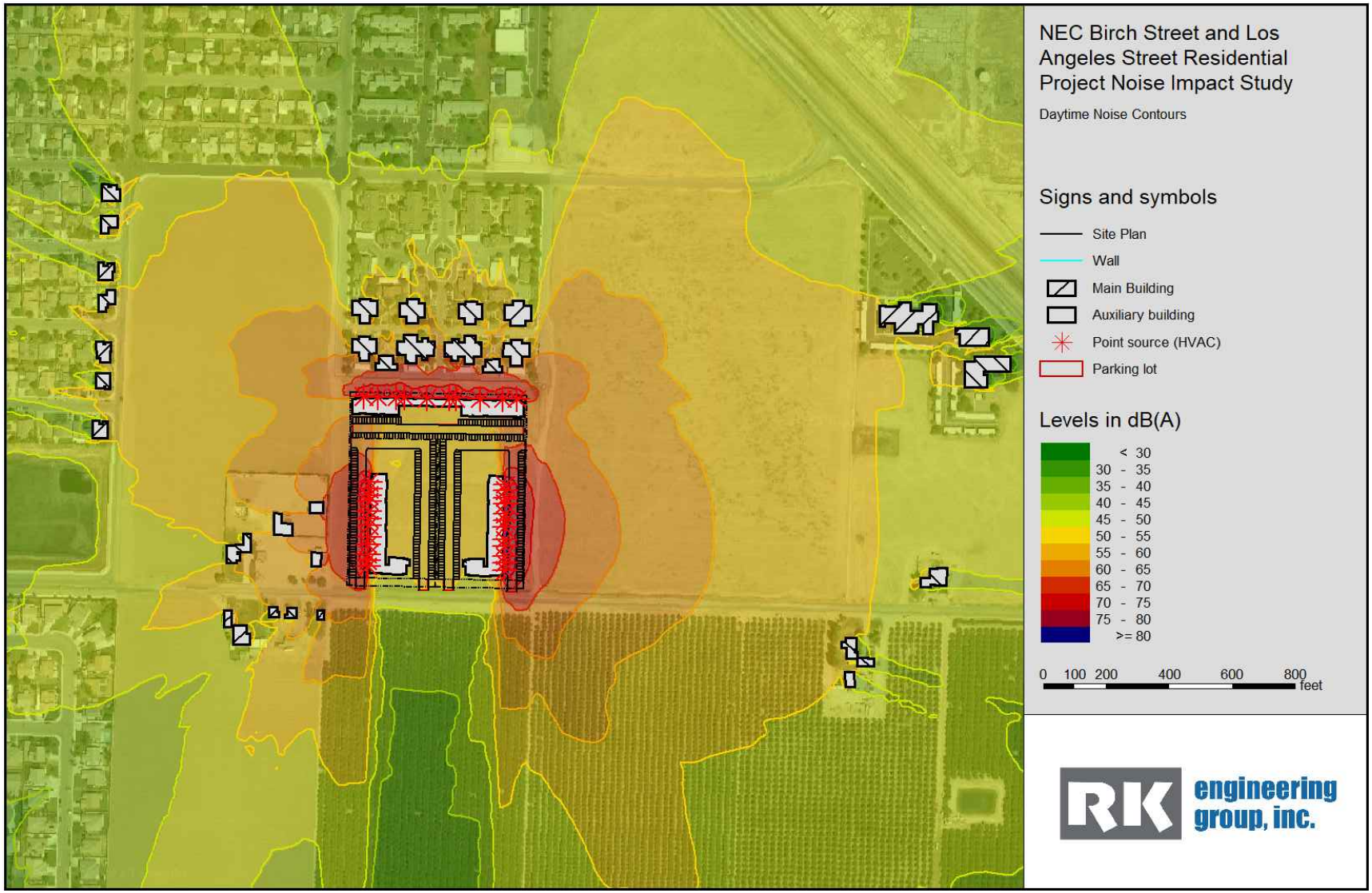
Operational Day/Night Noise Levels (dBA)



N

Exhibit E

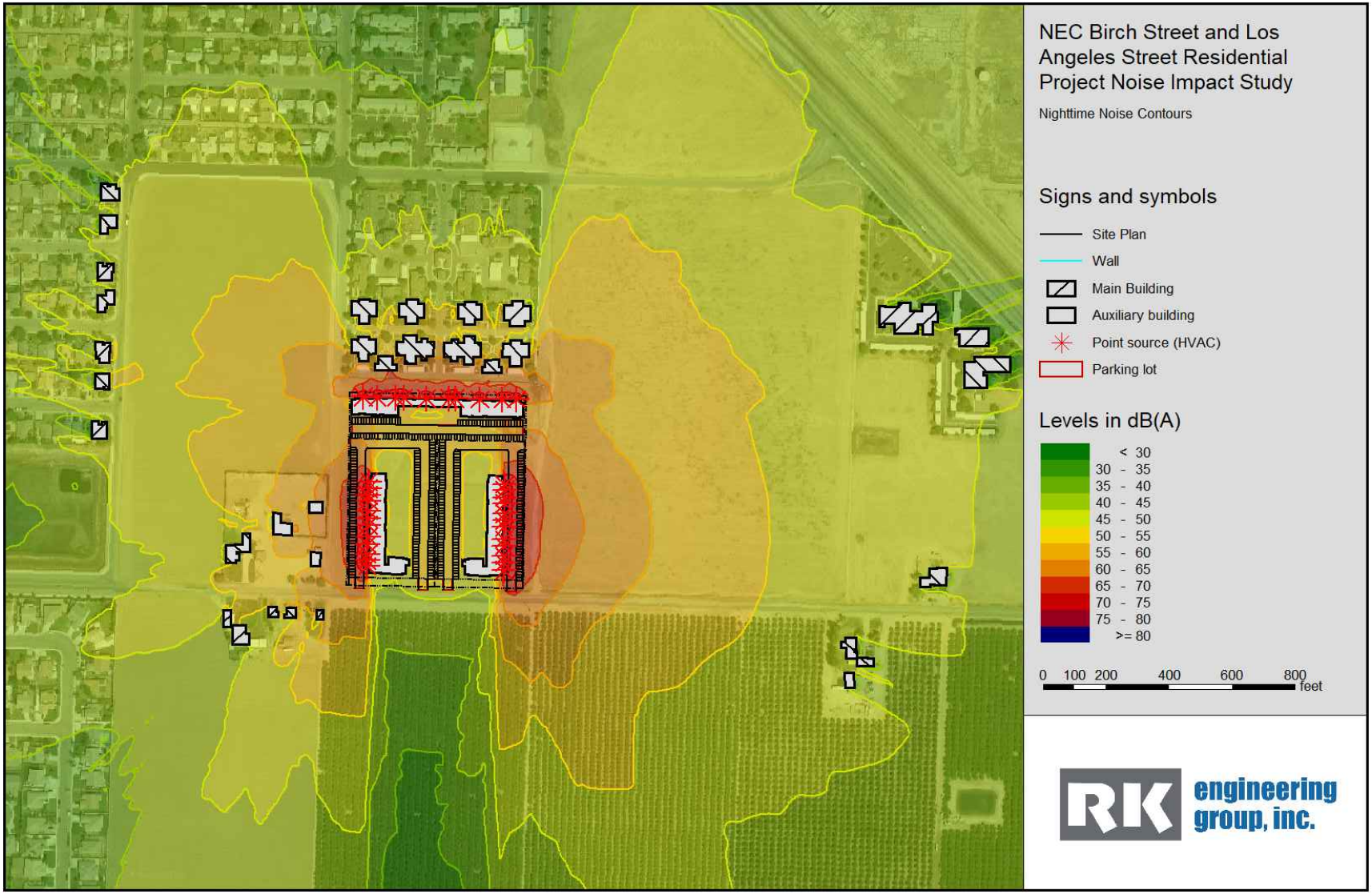
Operational Noise Contours - Daytime



N

Exhibit F

Operational Noise Contours - Nighttime



N

Appendices

Appendix A

City of Shafter
General Plan Environmental Hazards Program Element
and Code of Ordinances Chapter 8.24 – Noise Control Regulations

7.0 Environmental Hazards Program

GOAL

Minimize the potential for loss of life, injury, property damage, and economic disruption resulting from natural and man-made hazards, and ensure the ability of emergency services to respond rapidly and effectively following a disaster.

7.1 Introduction

The Environmental Hazards Program contains an evaluation of natural and man-made conditions that may pose health and safety hazards to life and property in Shafter, along with a comprehensive program to mitigate those hazards. Inherent in this Program is a determination of "acceptable risk," which involves balancing the severity of potential hazards and resulting risks to property and pubic health against the feasibility and cost of hazard mitigation. In many cases, the level of acceptable risk is widely shared throughout the State and nation. For example, the standard for protection from flooding is a nationally accepted standard, while standards for protection from earthquake damage are based on the Uniform Building Code.

7.2 Geology and Seismicity

The Shafter Planning Area is surrounded on three sides by active fault systems, several of which are less than 10 miles from the Planning Area. In addition, there are faults outside the San Joaquin Valley, but close enough that a major earthquake could affect Shafter.

The Shafter Planning Area is subject to moderate to severe ground shaking as a result of the alluvial soils that underlie the area and its proximity to active faults. Additionally, the thick sedimentary deposits in the Planning Area create the likelihood that a strong earthquake or other disturbance in the area could cause ground subsidence (typically a gradual settling or sinking of the ground surface with little or no horizontal movement).

Objective

Minimize the potential for loss of life, physical injury, property damage, and economic disruption resulting from an earthquake and other geologic events.

Policies

1. Require that all new developments comply with the most recent Uniform Building Code's seismic design standards.
2. Promote earthquake survival and ability to function after a major earthquake as the primary objective in the siting, design, and construction of emergency services facilities (e.g., fire stations, police stations, and medical facilities).
3. Encourage the retrofitting of emergency services and high occupancy structures which could be vulnerable to seismic activity to meet existing code requirements.
4. Require geologic and soils reports to be prepared for proposed development sites (including specialized soils reports in areas suspected of having problems with potential bearing strength, expansion, settlement, or subsidence), and incorporate the findings and recommendations of these studies into project development standards.
    - The objective of these studies is to ensure that the standards of the Uniform Building code are met, and that structures designed for human occupancy are not in danger of collapse or significant structural damage with corresponding hazards to human occupants.
    - Where structural damage can be mitigated through structural design, ensure that potential soils hazards do not pose risks of human injury or loss of life in outdoor areas of a development site
5. Provide information and establish incentives for property owners to rehabilitate existing buildings using updated construction

techniques to protect against seismic hazards.

6. Encourage the purchase of earthquake insurance by residents and businesses.
7. Work with PG&E, pipeline companies, and industrial uses to implement measures to safeguard the public from seismic hazards associated with high voltage transmission lines, caustic and toxic gas and fuel lines, and flammable storage facilities
8. Encourage continued investigation by State agencies of geologic conditions within the area to promote public awareness of potential geologic and seismic hazards.

7.3 Flooding and Drainage

The National Flood Insurance Act of 1968 calls for identification and mapping of areas prone to flooding in major storms. These flood hazard maps, known as Flood Insurance Rate Maps (FIRMS), are used by the Federal Emergency Management Agency (FEMA) to determine eligibility areas for inclusion in the federal flood insurance program. Except for small areas located within the 100-year flood hazard zones, the majority of Shafter is defined by FEMA as being subject to minimal or no flooding. Areas subject to flooding are mainly found on the northeast side of State Route 43 between Tulare Avenue and Los Angeles Street and between Burbank Street and 7th Standard Road. There are some small areas in the southern, developed areas of the City that are also subject to flooding.

Objective

Minimize the potential for loss of life, physical injury, property damage, and social disruption resulting from a 100-year flood.

Policies

1. Ensure that structures designed for human occupancy are constructed outside of the 100-year floodplain as specified by FEMA, unless a special study has been conducted to ensure that the base floor elevation of the structure is located above the 100-year floodplain, and that the structure is flood-proofed below that level.
2. Through the development review process, require construction and dedication of needed drainage and flood control facilities.
3. On a regular basis, review and update the City's Storm Drain Master Plan to ensure that street and storm drain flood control systems are designed to accommodate identified storm flows.
4. Where construction of a retention or detention basin is needed to support new development, require the development to provide for its construction and maintenance.

7.4 Airport Installation Land Use Compatibility

Shafter Airport/Minter Field, providing general aviation facilities and services, is located approximately 5 miles east of downtown Shafter, just west of State Route 99. The airport is an important asset for the City, providing services such as flight training; supporting area agricultural and business operations; and aircraft fueling, storage, and maintenance. Based on demand, aircraft hangars are constructed at the Shafter Airport/Minter Field for on-site aircraft storage and maintenance purposes.

As is typical of most general aviation airports, the dominant type of aircraft based at Shafter Airport/Minter Field is the single-engine, propeller-driven, airplane, comprising 87 percent of the total. Although the number of helicopters and twin-engine airplanes has grown, they account for only 3 percent of the total. Additionally, ultralights are based at the airport, but are not counted as aircraft. Currently, there are no business jets based at Shafter Airport/Minter Field. The Shafter Airport/Minter Field Master Plan projects that aircraft based at the field will increase by approximately 60 percent between 2000 and 2020.

Meadows Field/Kern County Airport is located east of State Route 99, south of 7th Standard Road. The airfield comprises 1,400 acres and serves both commuter airlines and general aviation. Expansion plans for the airfield include runway expansion and improvements, as well as construction of a new passenger terminal northwest of the existing terminal.

Compatibility between an airport and the land uses located in the surrounding area can be defined in terms of two considerations: hazards to flight and safety on the ground. The concern with respect to flight hazards is to avoid land uses that would contribute to aviation accidents. There are two potential flight hazards: physical obstructions to the navigable airspace and other land use considerations that can affect flight safety. The objective in providing safety on the ground is to reduce the risk to the occupants of aircraft, as well as to people on the ground in the event that an accident occurs. Standards for the maximum allowable height of structures and other objects around airports are set forth in Part 77 of the Federal Aviation Regulations, "Objects Affecting Navigable Airspace." Regulations required by the FAA safeguard the airport's long-term usability, preventing encroachment of objects into the surrounding airspace as well as protecting lives from the possibility of aircraft accidents. Compatibility issues and future airport objectives for Shafter Airport/Minter Field are provided in the August 2001 Shafter Airport/Minter Field Master Plan Update

Objective

Ensure that the land uses surrounding Shafter Airport/Minter Field are compatible with airport operations, and do not pose a safety hazard.

Policies

1. Manage the uses surrounding airport facilities at Shafter Airport/Minter Field and Meadows Field/Kern County Airport to ensure their continued safe operation consistent with the provisions of Tables 7.A and 7.B (see also Figure 7-1 for airport land use compatibility zones surrounding Shafter Airport/Minter Field).
2. Facilitate adequate notification regarding aircraft and airport activities to new businesses and residents in areas subject to aircraft overflights.
3. Implement provisions of State regulations addressing airport land uses.

7.5 Hazardous Materials

Tens of thousands of different chemical compounds are currently in use in California, with annual introduction of many new and/or modified chemical substances. Many of these compounds are potential contaminates which, if improperly handled, transported, stored, utilized or disposed of, can exert harmful effects to humans and the environment. Potential contaminants can enter the environment through a variety of pathways such as improper use or application, improper storage or disposal, and accidental discharge. Hazardous materials are commonly used by all segments of society including manufacturing and service industries, commercial enterprises, agriculture, petroleum extraction, hospitals, schools, and households.

One method by which local jurisdictions may regulate the transport of hazardous materials is the designation of trucking routes through areas within their control and the implementation of land use patterns that discourage industrial access through or adjacent to residential areas. Designated truck routes in the Planning Area include State Routes 99 and 43. Because of the location of Shafter's major industrial areas, Lerdo Highway and 7th Standard Road also carry large numbers of trucks. Two major rail corridors pass through the Planning Area. The Burlington Northern-Santa Fe (BNSF) Railroad parallels State Route 43 through downtown Shafter. On the eastern edge of the Planning Area, Union Pacific (UP) Railroad parallels State Route 99. Hazardous material transport on railroads, because of the substantial volumes involved, poses a significant hazard should an accident occur.

The Kern County Fire Department's Hazardous Materials Team (located at Station 67 in Rosedale) would respond to any hazardous materials incident within the Planning Area. Additional fire department units would respond as necessary.

Table 7.A – Airport Land Use Compatibility

Zones	*Prohibited Uses*	*Other Development Conditions*	*Normally Accepted Uses*[1]	*Uses Not Normally Acceptable*[2]
A	▪ All structures except ones with location set by aeronautical function ▪ Assemblages of people ▪ Objects exceeding FAR Part 77 height limits ▪ Hazards to flight[3]	▪ Dedication of avigation easement	▪ Aircraft tie-down apron ▪ Pastures, field crops, vineyards ▪ Automobile parking	▪ Heavy poles, large trees, etc.
B1 and B2	▪ Schools, day care centers, libraries ▪ Hospitals, nursing homes ▪ Highly noise-sensitive uses ▪ Storage of highly flammable materials ▪ Hazards to flight[3]	▪ Large structures along the extended runway centerline ▪ Minimum NLR[4] of 25 dBA in residential and office buildings ▪ Dedication of avigation easement	▪ Uses in Zone A ▪ Any agricultural use, except ones attracting bird flocks ▪ Warehousing, truck terminals ▪ Single story offices	▪ Residential subdivisions ▪ Intensive retail uses ▪ Intensive manufacturing or food processing uses ▪ Multistory offices ▪ Hotels and motels
C	▪ Schools ▪ Hospitals, nursing homes ▪ Hazards to flight[3]	▪ Dedication of overflight easement for residential uses	▪ Uses in Zone B ▪ Parks, playgrounds ▪ Low-intensity retail, offices, etc. ▪ Low-intensity manufacturing, food processing ▪ Two-story motels	▪ Large shopping centers ▪ Theaters, auditoriums ▪ Large sports stadiums ▪ High-rise office buildings
D	▪ Hazards to flight[3]	▪ Dedication of overflight easement for residential uses	▪ All except uses hazardous to flight	

Notes:

1. These uses can typically be designed to meet the density requirements and other identified development conditions.
2. These uses typically doe not meet the density and other identified development conditions.
3. See Policy ___.
4. NLR = Noise Level Reduction, which represents the attenuation of sound levels from outside to inside that is provided by the structure. Thus, NLR 25 means that the structure will provide a 25 dBA reduction in interior noise levels from exterior noise sources.

Table 7.B – Description of Compatibility Zones

The following general guidelines are used in establishing the compatibility zone boundaries for a civilian airport. Modifications to the boundaries may be made to reflect specific local conditions, such as existing roadways, property lines, and land uses.

A. The boundaries of this Zone are defined by runway protection zones and the airfield's building restriction lines.

Runway protection zone dimensions and locations are set in accordance with FAA standards for proposed future runway location, length, width, and approach type as indicated on an approved Airport Layout Plan. If no plan is approved, the existing runway configuration is used.

The building restriction line indicated on an approved Airport Layout Plan is used where such a plan exists. Where no Airport Layout Plan exists, the zone boundary is set at the following distances measured laterally from the runway centerline.

Visual runway for small airplanes:	370 feet
Visual runway for large airplanes:	500 feet
Non-precision instrument runway for large airplanes:	500 feet
Precision instrument runway:	750 feet

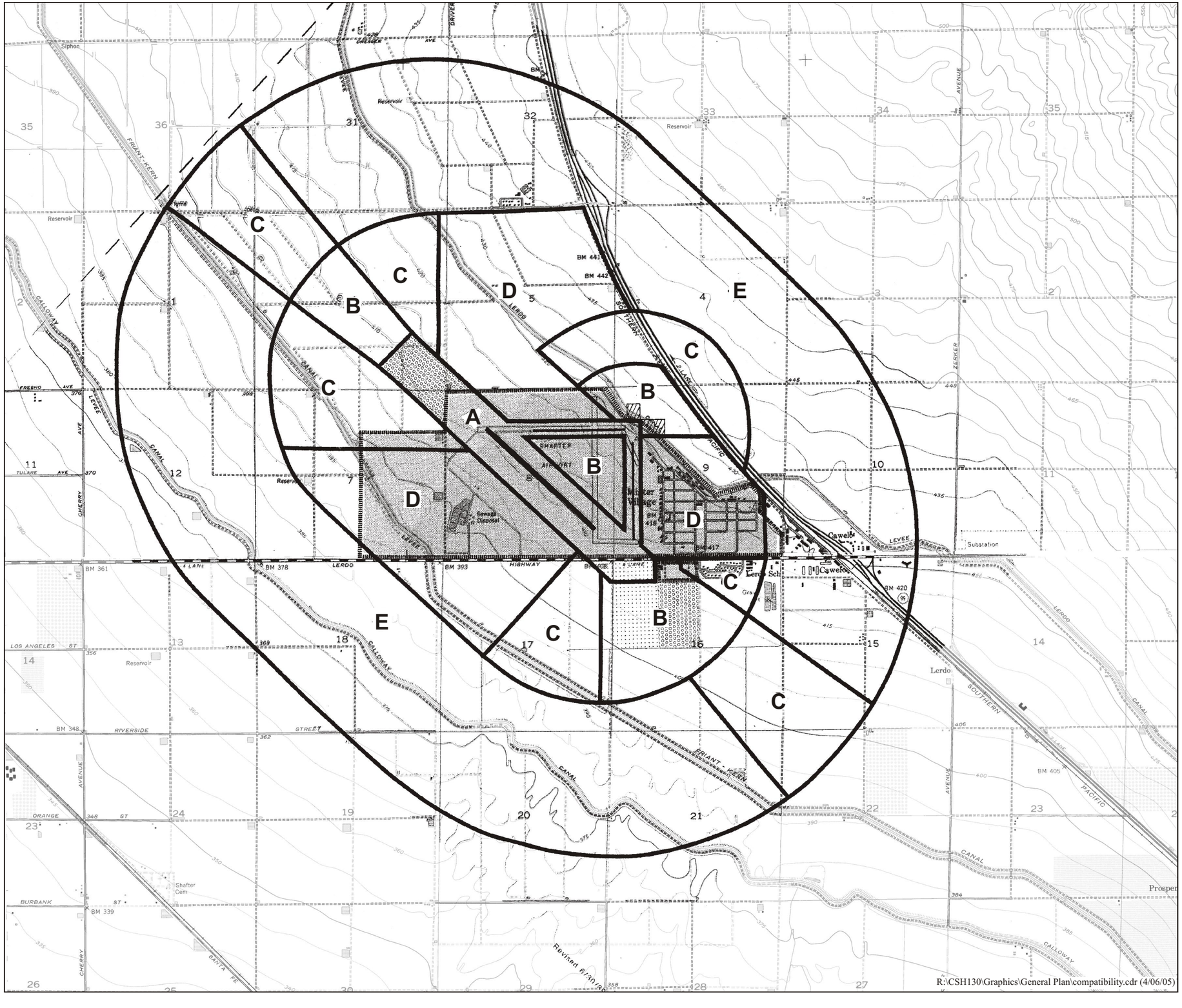
These distances allow structures up to approximately 35 feet in height to remain below the airspace surfaces defined by FAR Part 77.

B1. The outer boundary of the Approach/Departure Zone is defined as the area where aircraft are commonly below 400 feet above ground level (AGL). For visual runways, this location encompasses the base leg of the traffic pattern as commonly flown. On instrument runways, the altitudes established by approach procedures are used. Zone B1 also includes areas within 1,000 feet laterally from the runway centerline.

B2. The Extended Approach/Departure Zone includes areas where aircraft are commonly below 800 feet AGL on straight-in approach or straight-out departure. It applies to runways with more than 500 operations per year by large aircraft (over 12,500 pounds maximum gross takeoff weight) and/or runway ends with more than 10,000 total annual takeoffs.

C. The outer boundary of the Common Traffic Pattern Zone is defined as the area where aircraft are commonly below 1,000 feet AGL (i.e., the traffic pattern and pattern entry points). This area is considered to extend 5,000 to 10,000 feet longitudinally from the end of the runway primary surface. The length depends upon the runway classification (visual versus instrument) and the type and volume of aircraft accommodated. For runways having an established traffic solely on one side, the shape of the zone is modified accordingly.

D The outer boundary of the Other Airport Environs Zone conforms to the adopted Planning Area for each airport.



AIRPORT PROPERTY LINE

CONSERVATION EASEMENT: FIELD CROPS, NO STRUCTURES

CONSERVATION EASEMENT: AGRICULTURAL USES ONLY

AVIGATION EASEMENTS

A — COMPATIBILITY ZONES

RUNWAY

ZONE CLASSIFICATION

A RUNWAY PROTECTION ZONE OR WITHIN BUILDING RESTRICTION LINE

B1 APPROACH/DEPARTURE ZONE AND ADJACENT TO RUNWAY

B2 EXTENDED APPROACH/DEPARTURE ZONE

C COMMON TRAFFIC PATTERN

D OTHER AIRPORT ENVIRONS

E AIRPORT COMPATIBILITY ZONE

N

0 1500 3000

FEET

SOURCE: USGS 7.5' QUAD - ROSEDALE AND FAMOSO, REV. 1968 AND SHUTT MOEN ASSOCIATES, 10/24/01

LSA

FIGURE 7-1

City of Shafter General Plan

Airport Land Use Compatibility

Objective

Minimize the negative impacts associated with the storage, use, generation, transport, and disposal of hazardous materials.

Policies

1. Implement the provisions of the Kern County Integrated Waste Management Plan and the Household Hazardous Waste component of the City's Source Reduction and Recycling Element, including, but not limited to, provisions for pretreatment and disposal, storage, handling, and emergency response.
2. Promote the reduction, recycling, and safe disposal of household hazardous wastes through public education and awareness.
3. Require large hazardous materials users to reduce the amount of hazardous waste generated through:
   - Submittal of a waste minimization plan for a new large facility or expansion of an existing large facility creating additional hazardous wastes.[1]
   - Encouraging existing large facilities to prepare waste minimization plans.
   - Requiring new large hazardous waste-producing facilities to provide on-site treatment of recycling of wastes generated to the maximum extent feasible, and thereby minimize the amount of hazardous waste being transferred off-site for treatment or disposal.
4. Encourage reductions in the amount of hazardous waste being generated within Shafter through incentives and other methods.
   - Provide educational and technical assistance to all hazardous materials users and waste generators to aid in their source reduction efforts (e.g., substitution of less hazardous products and modifications to operating procedures). These services will primarily be provided by the County.
   - Provide public recognition to hazardous materials users and waste generators who meet or exceed source reduction goals.
   - Provide penalties for facilities failing to meet minimization objectives, and place funds from these penalties in a revolving account for use in educational and emergency services efforts.
   - Require hazardous waste generators to recycle wastes to the maximum extent feasible.
5. Locate large hazardous waste users and processors only in areas designated for "industrial" use. Smaller generators (e.g., service stations) and medical facilities may be sited in other industrial and commercial areas, consistent with applicable General Plan policies and zoning regulations. The compatibility of small facilities will be determined by the types and amounts of hazardous materials involved and the nature of the surrounding area.
6. Locate hazardous materials facilities at a sufficient distance from populated areas to reduce potential health and safety impacts.
   - Require risk assessment studies to determine potential health impacts for all proposed hazardous waste processors and large generators as part of permit application submittals.
   - Maintain a 2,000-foot buffer zone around all new hazardous waste processors within which no residences, schools, hospitals, or other immobile populations, existing, proposed, or otherwise, would be located, unless evidence is presented in the risk assessment study that a larger buffer is needed.
7. Permit hazardous waste processors based on their relative need in conjunction with the "fair share" approach to facilities siting contained in the Kern County Hazardous Waste Management Plan.

[1] Large facilities are those routinely generating more than 1,000 kilograms of solid hazardous per waste month or 275 gallons of liquid hazardous waste per month.

- Require a needs assessment as part of use permit applications for a waste processor, demonstrating the proposed facility will serve a need that cannot be better met in any other manner (e.g., source reduction) or at any other location.
- Discourage proposed hazardous waste facilities processing materials similar to those treated or stored at existing facilities within the County, unless the need for the new facility can be adequately demonstrated.

8. Carefully review and require appropriate mitigation for pipelines and other channels for hazardous materials.
9. Ensure adequate provision is made for emergency response to all crises involving hazardous materials.
   - Require emergency response plans for all hazardous waste processors and large generators to be submitted as part of use permit applications.
   - Require training of employees of all facilities in emergency procedures, and that they be acquainted with the properties and health effects of the hazardous materials involved in the facilities' operations.
10. Promote the safest possible transport of hazardous materials through Shafter.
    - Maintain formally designated hazardous material carrier routes to direct hazardous materials away from populated and other sensitive areas.
    - Locate hazardous waste processors as near to waste generators as possible, in order to minimize the need for transport.
    - Require transportation analyses for all new large generators and processors to determine the effect of each facility on Shafter's transportation system, and assess and provide mitigation for potential safety impacts associated with hazardous materials transported to and from the site.
    - Prohibit the parking of vehicles transporting hazardous materials on City streets.
11. Require that hazardous materials facilities within Shafter operate in a safe manner.
    - As a condition of approval for new hazardous materials facilities, require access for vehicles carrying hazardous materials to be restricted to hazardous materials carrier routes.
    - Undertake inspections of hazardous materials facilities as needed (e.g., when an unauthorized discharge into City sewers is made), and assist Kern County in their inspections as requested.
    - Work with LAFCO to require that sites for proposed hazardous materials facilities annex into the City before necessary municipal services are provided.
12. Require appropriate design features be incorporated into each facility's layout to increase safety and minimize potential adverse effects on public health.
    - Require the provision of spill containment facilities and monitoring devices in all facilities.
    - Ensure that pipelines and other hazardous waste channels are properly designed to minimize leakage and require above ground pipelines to be surrounded by spill containment basins.
    - Give priority to underground storage of hazardous materials, unless this method is shown to be infeasible.
    - Require hazardous materials storage areas to be located as far from existing pipelines and electrical transmission lines as possible.
13. Facilitate public awareness of hazardous materials by preparing and distributing in conjunction with Kern County public information regarding uniform symbols used to identify hazardous wastes, Shafter's household hazardous waste collection

programs, and hazardous waste source reduction programs.

7.6 Emergency Services

Shafter maintains an emergency plan for response to disasters, including but not limited to earthquakes, floods, fires, hazardous spills or leaks, major industrial accidents, major transportation accidents, major storms, airplane crashes, civil unrest, and national security emergencies. In a disaster, Shafter could experience significant casualties, property damage, and utility service interruptions, potentially exceeding the response capabilities of both the City and the County.

The plan outlines the general authority, organization, and response actions for City staff to undertake, in compliance with existing law, when disasters happen. The objectives of the plan are to reduce loss of life, injury, and property losses through effective management of emergency forces, and:

- Identifying who is in charge during disaster response.
- Defining the necessary jobs for disaster response and who is responsible.
- Ensuring the availability of public services and the continuity of government.
- Providing guidance for disaster education and training.

Objective

Maintain a level of preparedness to respond adequately to emergency situations to save lives, protect property, and facilitate recovery with minimal disruption.

Policies

1. Maintain and update, as appropriate, the City's emergency preparedness programs, plans, and procedures to ensure the health and safety of the community in the event of an earthquake or other disaster.
2. Disseminate disaster information to local residents and businesses, describing how emergency response will be coordinated, how evacuation, if needed, will proceed, and what residents and businesses can do to prepare for emergency situations. Provide information to the public about:
   - Existing environmental hazards in the area;
   - The costs of doing nothing to mitigate hazards and why all hazards cannot be eliminated;
   - What the public can and cannot do to assist; and
   - What the public can do to protect itself.
3. Maintain ongoing emergency response coordination with surrounding jurisdictions.
4. Encourage private businesses and industrial uses to be self-sufficient in an emergency by:
   - Maintaining a fire control plan, including on-site firefighting capability and volunteer response teams to respond to and extinguish small fires; and
   - Identifying personnel who are capable of and certified in first aid and CPR.
5. Regularly review and clarify emergency evacuation plans for dam failure, fire, and hazardous materials releases

7.7 Noise

Introduction to "Noise." Noise is usually defined as "unwanted sound," and is measured in decibels (dB), typically through an "A-weighted" scale, which emulates human hearing.[1] A-weighted decibels (dBA) are measured on a logarithmic scale, representing points on a sharply rising curve. An increase of 10 dBA represents a ten times increase in sound energy, and is perceived by the human ear as a doubling of loudness. Thus, a 70 dBA noise level has 10 times the sound energy as a 60 dBA noise, and will be perceived as being twice as loud.

Except under special conditions, changes in sound levels of less than 1.0 dBA cannot be perceived by the human ear. "Audible increases" in noise levels generally refer to a

[1] All sound levels in the General Plan are A-weighted, unless specified otherwise.

change of 3.0 dBA or more, since this level has been found to be barely perceptible in typical exterior environments. A 5.0 dBA change in noise levels is generally the threshold at which a noticeable change in community response occurs.

For environmental and land use planning purposes, several methods of expressing the average noise level over a given period of time have been developed. The predominant average noise measurement scales in California are the "Equivalent-Continuous Sound Level" (L_{eq}) and the "Community Noise Equivalent Level" (CNEL), both of which are based on A-weighted decibels. L_{eq} is the total sound energy of time-varying noise over a given sample period. CNEL is the average sound level occurring over a 24-hour period, with a weighting factor of 5.0 dBA applied to the hourly L_{eq} for noise occurring from 7:00 p.m. to 10:00 p.m. ("relaxation hours"), and a 10 dBA adjustment for noise occurring between 10:00 p.m. and 7:00 a.m. ("sleeping hours"). The noise adjustments are added to the noise events occurring during the more quiet evening and nighttime hours to compensate for the added intrusiveness that noise has during these hours.

Other noise rating scales that are commonly used include the maximum noise level (L_{max}), which is the highest time-averaged sound level that occurs during a stated time period, and noise standard in terms of percentile exceedance noise levels (L_n). L_{max} reflects peak noise operating conditions, and addresses the annoying aspects of intermittent noise. The percentile exceedance noise levels are the levels exceeded during a stated period of time. For example, an L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level (exceeded 50 percent of the time). The L_{90} noise level represents the noise level exceeded 90 percent of the time, and is considered the lowest noise level experienced during a monitoring period. It is normally referred to as the background or ambient noise level.

Physical damage to human hearing occurs with prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire human body, with prolonged noise exposure in excess of 75 dBA increasing tension, and thereby affecting blood pressure, functions of the heart, and the nervous system. In comparison, extended periods of noise exposure above 90 dBA result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 130 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 140 dBA will rupture the eardrum and permanently damage the inner ear. Figure 7-2 identifies common sound levels and their sources along with information on the measurement of noise.

Noise in Shafter. Major noise sources within Shafter include "mobile sources" such as traffic along State Route 99, 7th Standard Road, Central Valley Highway, Lerdo Highway, and other major roadways; rail lines; and Shafter Airport/Minter Field. Traffic noise depends primarily on the speed of traffic and percentage of trucks along the route. The amount of traffic along a roadway has a lesser influence on noise levels. Significant "stationary" sources of noise within Shafter include industrial and commercial development, as well as construction activities.

Objective

Achieve and maintain exterior noise levels appropriate to planned land uses throughout Shafter, as described below.

- Residential

  Single-Family: 60-65 dBA CNEL within rear yards

  Multifamily: 60-65 dBA CNEL within interior open space areas

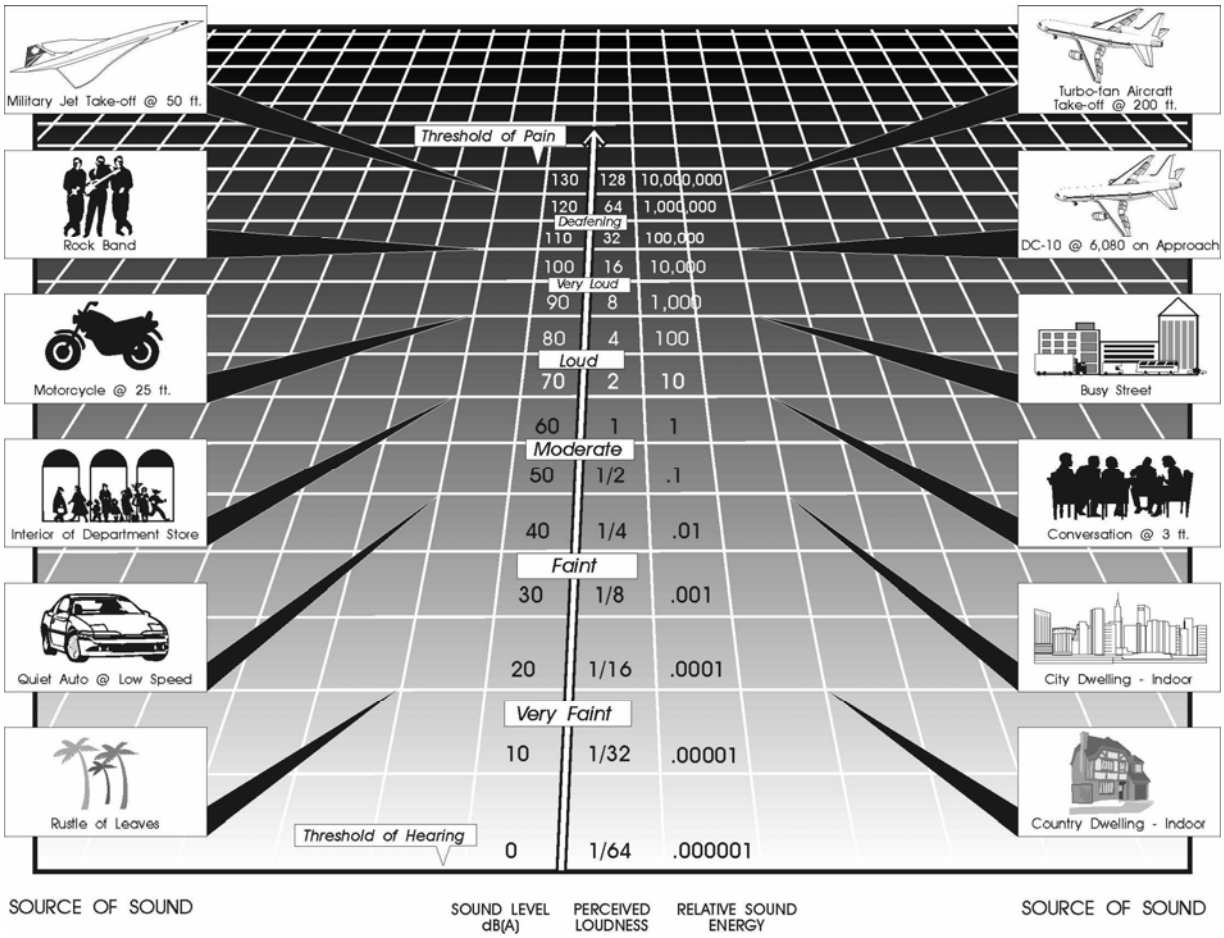
- Schools

  Classrooms: 60 dBA CNEL

  Play and sports areas: 70 dBA CNEL

- Hospitals, Libraries: 60 dBA CNEL

Figure 7-2 – Noise Levels



- Commercial/Industrial: 65-70 dBA CNEL at the front setback.

Policies

1. Implementation of the General Plan noise objective policies shall be based on noise data contained in the General Plan EIR, unless a noise analysis conducted pursuant to the City's development and environmental review process provides more up-to-date and accurate noise projections, as determined by the City.
2. Maintain a pattern of land uses that separates noise-sensitive land uses from major noise sources to the extent possible, guiding noise-tolerant land uses into the noisier portions of the Planning Area so as to achieve the City's noise objectives.
3. Minimize motor vehicle noise in residential areas through proper route location and sensitive roadway design.
4. Provide planned industrial areas with truck access routes that are separated from residential areas to the maximum feasible extent.
5. Where new development (including construction and improvement of roadways) is proposed in areas exceeding the General Plan Noise Objective, or where the development of proposed uses could result in an increase in noise, require a detailed noise attenuation study to be prepared to determine appropriate mitigation needed to meet the City's noise objectives, and incorporate such mitigation into project design and implementation.

6. When new development proposes a potentially significant noise source, require a noise analysis to be prepared. Require appropriate noise mitigation when the proposed project will exceed General Plan noise objectives, or cause an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development.
7. Utilize site and architectural design features to mitigate noise impacts, where feasible. In addition to sound barriers, consider:
    - Increasing building setbacks to further separate the noise-sensitive use from the noise source.
    - Locating uses that are the most tolerant of noise closer to the noise source and use the buildings housing these uses as noise barriers.
    - Orient delivery, loading docks, and outdoor work areas away from noise-sensitive uses.
    - Place noise-tolerant uses, such as parking areas, and noise-tolerant structures, such as garages, between the noise source and sensitive receptor.
    - Cluster office, commercial, or multi-family residential structures to reduce noise levels within interior open space areas.
    - Provide double-glazed and double-paned windows on the side of the structure facing a major noise source, and place entries away from the noise source to the extent possible.
8. Where feasible, use noise barriers (walls, berms, or a combination thereof) to reduce significant noise impacts. Where noise barriers are constructed, require appropriate landscaping treatment to be provided.
9. Continue enforcement of California Noise Insulation Standards (Title 25, Section 1092, California Administrative Code).
10. Regulate the hours of construction activities in order to avoid or mitigate noise impacts on adjacent noise-sensitive land uses.

Chapter 8.24 - NOISE CONTROL REGULATIONS

Sections:

8.24.010 - Sound-amplifying equipment—Defined.

"Sound-amplifying equipment" means any machine or device for the amplification and/or reproduction of the human voice, music or any other sound. Sound-amplifying equipment as used in this chapter shall not include warning devices on authorized emergency vehicles or horns or other warning devices.

(Prior code § 9-13-1)

8.24.020 - Sound-amplifying equipment—Use restrictions.

It is unlawful for any person within a residential zone to use or operate any sound-amplifying equipment in such a manner that the sound exceeds the ambient noise level at a distance of fifty feet or more where the sound emanates from a device while on public property and at a distance of twenty feet or more from a private property line when the sound emanates from a device on private property.

(Prior code § 9-13-2)

8.24.030 - Construction work.

Within a residential zone, or within a radius of five hundred feet therefrom, no person shall operate equipment, for the construction or repair of buildings, structures or projects, which creates noise exceeding the ambient noise level beyond fifty feet from the source between the hours of seven p.m. and seven a.m.

(Prior code § 9-13-3)

Appendix B

Field Data and Photos

Field Sheet

Project: NEC Birch Street and Los Angeles Street Residential Project	**Engineer:** B. Morrison	**Date:**	08/23/2023
		JN:	2832-2023-03
Measurement Address: Northeast corner of Birch Street and Los Angeles Street	**City:** Shafter, CA	**Site No.:**	1

Sound Level Meter:
Piccolo II
Serial # P0222082204
P0222082205
P0221010801

Calibrator:
BSWA
Serial # 500732

Calibration Record:

	Input, dB/	Time
1	94.0	8:07 a.m.
2	94.0	8:13 a.m.
3	94.0	8:16 a.m.
4	/	/
5	/	/

Conditions:

Temp:	72 Deg. F.
Windspeed:	4 m.p.h.
Direction:	Southeast
Skies:	Clear

Meter Settings:
☑ A-WTD ☐ C-WTD ☐ LINEAR ☐ IMPULSE ☑ SLOW ☐ FAST ☐ 1/1 OCT ☐ 1/3 OCT ☐ ___ MINUTE INTERVALS ☑ L(N) PERCENTILE VALUES

Notes:
Noise measurements were taken for a duration of 60 minutes. Ambient noise sources during the measurement period included residential activity, roadway noise along Los Angeles Street, heavy truck horns, dogs barking, and nature/bird activity.

Measurement Type:
☐ Long-term
☑ Short-term

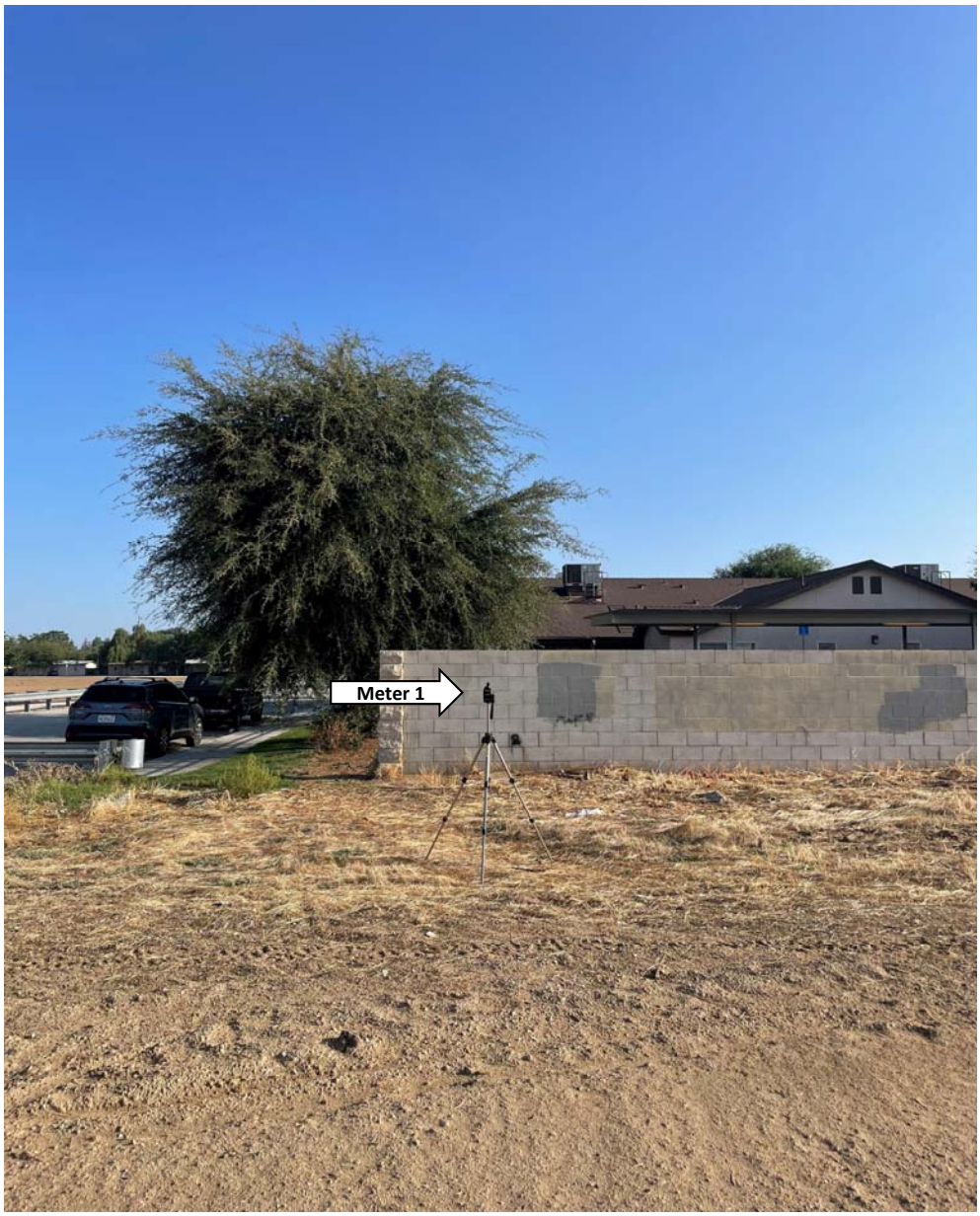
		Start Time	Stop Time	Leq	Lmax	Lmin	L2	L8	L25	L50
Interval	1	8:10 a.m.	9:10 a.m.	43.3	58.1	36.8	50.0	46.6	43.1	41.4
		Comments: Noise measurement was taken near the northwest corner of the project site, approximately 19 feet south of Receptor 3's southern property line wall and approximately 662 feet north of the centerline of Los Angeles Street.								
	2	8:22 a.m.	9:22 a.m.	62.8	78.2	37.0	72.3	68.9	61.3	49.7
		Comments: Noise measurement was taken at the southwestern corner of the project site, approximately 56 feet north of the centerline of Los Angeles Street.								
	3	8:24 a.m.	9:24 a.m.	54.2	69.5	36.3	62.7	60	54.3	44.7
		Comments: Noise measurement was taken within the project site, approximately 134 feet north of the centerline of Los Angeles Street.								
	4									
		Comments:								
	5									
		Comments:								

1 = Noise Monitoring Location

RK engineering group, inc.

Field Sheet - Photos

Project: NEC Birch Street and Los Angeles Street Residential Project	**Engineer:** B. Morrison	**Date:**	08/23/2023
		JN:	2832-2023-03
Measurement Address: Northeast corner of Birch Street and Los Angeles Street	**City:** Shafter, CA	**Location No.:**	1



RK engineering group, inc.

Field Sheet - Photos

Project: NEC Birch Street and Los Angeles Street Residential Project	**Engineer:** B. Morrison	**Date:**	08/23/2023
		JN:	2832-2023-03
Measurement Address: Northeast corner of Birch Street and Los Angeles Street	**City:** Shafter, CA	**Location No.:**	2

RK engineering group, inc.

Field Sheet - Photos

Project: NEC Birch Street and Los Angeles Street Residential Project	**Engineer:** B. Morrison	**Date:**	08/23/2023
		JN:	2832-2023-03
Measurement Address: Northeast corner of Birch Street and Los Angeles Street	**City:** Shafter, CA	**Location No.:**	3

RK engineering group, inc.

Appendix C

SoundPLAN Calculation Worksheets
and Future CNEL Calculation Worksheets

Contribution levels of the receivers

Source name	Traffic lane	Level Day	Level Night
		dB(A)	
1 1.Fl		49.2	46.2
1	-	26.9	26.5
HVAC1	-	13.1	10.0
HVAC1	-	13.0	10.0
HVAC3	-	13.1	10.1
HVAC4	-	13.3	10.3
HVAC4	-	13.1	10.1
HVAC4	-	13.1	10.1
HVAC4	-	13.1	10.1
HVAC4	-	13.1	10.1
HVAC4	-	13.2	10.1
HVAC4	-	13.2	10.2
HVAC4	-	13.2	10.2
HVAC4	-	37.5	34.5
HVAC4	-	13.2	10.2
HVAC4	-	38.6	35.6
HVAC4	-	38.7	35.7
HVAC4	-	38.4	35.4
HVAC4	-	37.9	34.9
HVAC4	-	38.2	35.2
HVAC4	-	38.5	35.5
HVAC4	-	37.3	34.3
HVAC4	-	38.9	35.9
HVAC4	-	38.0	35.0
HVAC4	-	38.9	35.9
HVAC4	-	39.1	36.1
HVAC25	-	12.6	9.6
HVAC26	-	12.8	9.8
HVAC27	-	13.1	10.1
HVAC28	-	13.2	10.2
HVAC29	-	15.8	12.8
HVAC30	-	14.0	11.0
HVAC31	-	14.1	11.1
HVAC32	-	14.6	11.6
HVAC33	-	15.0	12.0
HVAC34	-	15.3	12.3
2 1.Fl		50.9	47.9
1	-	27.4	26.9
HVAC1	-	14.3	11.3
HVAC1	-	14.3	11.3
HVAC3	-	14.4	11.3
HVAC4	-	14.6	11.6
HVAC4	-	14.4	11.4
HVAC4	-	14.5	11.4
HVAC4	-	14.5	11.5
HVAC4	-	14.5	11.5
HVAC4	-	14.5	11.5
HVAC4	-	14.6	11.6
HVAC4	-	14.6	11.6
HVAC4	-	40.4	37.4
HVAC4	-	14.6	11.6
HVAC4	-	40.0	37.0
HVAC4	-	40.1	37.0
HVAC4	-	39.9	36.9
HVAC4	-	39.4	36.4
HVAC4	-	39.7	36.7
HVAC4	-	40.3	37.3
HVAC4	-	39.1	36.1
HVAC4	-	40.3	37.3
HVAC4	-	39.8	36.7
HVAC4	-	40.7	37.7
HVAC4	-	40.9	37.9
HVAC25	-	13.6	10.6

Contribution levels of the receivers

Source name	Traffic lane	Level Day	Level Night
		dB(A)	
HVAC26	-	13.9	10.9
HVAC27	-	14.2	11.2
HVAC28	-	14.3	11.3
HVAC29	-	16.9	13.8
HVAC30	-	15.2	12.2
HVAC31	-	15.3	12.3
HVAC32	-	15.7	12.7
HVAC33	-	16.2	13.2
HVAC34	-	16.5	13.5
3 1.Fl		60.7	57.7
1	-	37.4	37.0
HVAC1	-	47.9	44.9
HVAC1	-	47.3	44.3
HVAC3	-	47.6	44.6
HVAC4	-	49.6	46.6
HVAC4	-	48.3	45.3
HVAC4	-	48.6	45.6
HVAC4	-	52.4	49.4
HVAC4	-	49.8	46.8
HVAC4	-	49.1	46.1
HVAC4	-	50.5	47.5
HVAC4	-	51.4	48.4
HVAC4	-	21.9	18.9
HVAC4	-	52.1	49.1
HVAC4	-	22.3	19.3
HVAC4	-	22.2	19.2
HVAC4	-	22.6	19.6
HVAC4	-	22.8	19.8
HVAC4	-	22.8	19.8
HVAC4	-	24.5	21.5
HVAC4	-	23.2	20.2
HVAC4	-	22.0	19.0
HVAC4	-	23.1	20.1
HVAC4	-	23.4	20.3
HVAC4	-	23.6	20.6
HVAC25	-	22.2	19.1
HVAC26	-	22.0	19.0
HVAC27	-	21.8	18.8
HVAC28	-	21.7	18.7
HVAC29	-	21.4	18.3
HVAC30	-	23.3	20.3
HVAC31	-	20.8	17.8
HVAC32	-	20.3	17.3
HVAC33	-	19.8	16.8
HVAC34	-	19.5	16.5
4 1.Fl		57.1	54.1
1	-	32.7	32.2
HVAC1	-	41.4	38.4
HVAC1	-	42.2	39.2
HVAC3	-	42.9	39.9
HVAC4	-	48.1	45.1
HVAC4	-	47.7	44.7
HVAC4	-	46.7	43.7
HVAC4	-	49.6	46.6
HVAC4	-	47.4	44.4
HVAC4	-	47.0	44.0
HVAC4	-	47.1	44.1
HVAC4	-	41.8	38.8
HVAC4	-	22.2	19.2
HVAC4	-	43.8	40.8
HVAC4	-	22.2	19.2
HVAC4	-	22.2	19.2
HVAC4	-	20.9	17.9

Contribution levels of the receivers

Source name	Traffic lane	Level Day	Level Night
		dB(A)	
HVAC4	-	20.9	17.9
HVAC4	-	21.0	18.0
HVAC4	-	21.4	18.4
HVAC4	-	21.1	18.1
HVAC4	-	22.3	19.2
HVAC4	-	21.0	17.9
HVAC4	-	20.9	17.9
HVAC4	-	21.1	18.1
HVAC25	-	23.5	20.5
HVAC26	-	23.1	20.1
HVAC27	-	22.6	19.6
HVAC28	-	22.3	19.3
HVAC29	-	21.7	18.7
HVAC30	-	23.3	20.2
HVAC31	-	20.8	17.8
HVAC32	-	20.1	17.1
HVAC33	-	19.5	16.5
HVAC34	-	19.1	16.1
5 1.Fl		52.1	49.1
1	-	31.9	31.5
HVAC1	-	43.9	40.9
HVAC1	-	42.2	39.1
HVAC3	-	41.6	38.6
HVAC4	-	43.0	40.0
HVAC4	-	43.3	40.3
HVAC4	-	36.0	33.0
HVAC4	-	40.9	37.9
HVAC4	-	36.4	33.4
HVAC4	-	42.2	39.2
HVAC4	-	40.7	37.7
HVAC4	-	37.6	34.6
HVAC4	-	18.6	15.6
HVAC4	-	37.6	34.6
HVAC4	-	18.6	15.6
HVAC4	-	18.7	15.7
HVAC4	-	18.6	15.6
HVAC4	-	18.5	15.5
HVAC4	-	18.5	15.5
HVAC4	-	18.3	15.3
HVAC4	-	18.4	15.4
HVAC4	-	18.8	15.8
HVAC4	-	18.4	15.4
HVAC4	-	18.2	15.2
HVAC4	-	18.4	15.3
HVAC25	-	24.7	21.7
HVAC26	-	22.2	19.2
HVAC27	-	21.6	18.6
HVAC28	-	21.4	18.3
HVAC29	-	20.7	17.7
HVAC30	-	20.1	17.0
HVAC31	-	19.9	16.9
HVAC32	-	19.3	16.3
HVAC33	-	18.7	15.7
HVAC34	-	18.4	15.4
6 1.Fl		51.6	48.7
1	-	29.8	29.3
HVAC1	-	41.0	37.9
HVAC1	-	39.6	36.6
HVAC3	-	40.6	37.6
HVAC4	-	39.8	36.8
HVAC4	-	40.2	37.2
HVAC4	-	39.4	36.4
HVAC4	-	34.9	31.8

Contribution levels of the receivers

Source name	Traffic lane	Level Day	Level Night
		dB(A)	
HVAC4	-	38.9	35.9
HVAC4	-	34.2	31.2
HVAC4	-	38.8	35.8
HVAC4	-	38.8	35.8
HVAC4	-	16.0	13.0
HVAC4	-	38.9	35.9
HVAC4	-	16.1	13.1
HVAC4	-	16.2	13.2
HVAC4	-	16.0	13.0
HVAC4	-	15.9	12.9
HVAC4	-	15.9	12.9
HVAC4	-	15.6	12.6
HVAC4	-	15.8	12.8
HVAC4	-	16.4	13.4
HVAC4	-	15.7	12.7
HVAC4	-	15.5	12.5
HVAC4	-	15.7	12.7
HVAC25	-	39.6	36.6
HVAC26	-	39.2	36.2
HVAC27	-	38.7	35.7
HVAC28	-	38.4	35.4
HVAC29	-	34.8	31.8
HVAC30	-	34.3	31.3
HVAC31	-	34.8	31.8
HVAC32	-	33.3	30.3
HVAC33	-	33.0	30.0
HVAC34	-	32.5	29.5
7 1.Fl		50.6	47.7
1	-	28.2	27.7
HVAC1	-	39.3	36.3
HVAC1	-	38.1	35.1
HVAC3	-	37.5	34.4
HVAC4	-	36.8	33.8
HVAC4	-	38.5	35.5
HVAC4	-	33.5	30.4
HVAC4	-	36.8	33.8
HVAC4	-	34.1	31.1
HVAC4	-	28.7	25.7
HVAC4	-	28.5	25.5
HVAC4	-	28.7	25.7
HVAC4	-	15.5	12.5
HVAC4	-	31.6	28.6
HVAC4	-	15.3	12.3
HVAC4	-	15.4	12.4
HVAC4	-	15.2	12.2
HVAC4	-	15.1	12.1
HVAC4	-	15.2	12.2
HVAC4	-	14.8	11.8
HVAC4	-	15.0	12.0
HVAC4	-	15.5	12.4
HVAC4	-	14.9	11.9
HVAC4	-	14.7	11.7
HVAC4	-	14.8	11.8
HVAC25	-	39.3	36.3
HVAC26	-	38.9	35.9
HVAC27	-	41.0	38.0
HVAC28	-	40.8	37.8
HVAC29	-	40.0	37.0
HVAC30	-	36.9	33.9
HVAC31	-	36.7	33.7
HVAC32	-	35.9	32.9
HVAC33	-	35.8	32.8
HVAC34	-	31.2	28.2

Contribution levels of the receivers

Source name		Traffic lane	Level Day	Level Night
			dB(A)	
8	1.Fl		54.6	51.6
1		-	21.4	20.9
HVAC1		-	25.9	22.9
HVAC1		-	32.3	29.3
HVAC3		-	25.5	22.5
HVAC4		-	24.9	21.9
HVAC4		-	25.1	22.1
HVAC4		-	24.1	21.1
HVAC4		-	23.2	20.2
HVAC4		-	23.8	20.8
HVAC4		-	22.8	19.8
HVAC4		-	22.4	19.4
HVAC4		-	22.1	19.1
HVAC4		-	23.5	20.5
HVAC4		-	21.9	18.9
HVAC4		-	22.8	19.8
HVAC4		-	23.0	20.0
HVAC4		-	22.5	19.5
HVAC4		-	22.0	19.0
HVAC4		-	22.2	19.2
HVAC4		-	20.6	17.6
HVAC4		-	21.6	18.6
HVAC4		-	23.3	20.3
HVAC4		-	21.3	18.3
HVAC4		-	20.8	17.8
HVAC4		-	21.0	18.0
HVAC25		-	46.7	43.7
HVAC26		-	46.0	42.9
HVAC27		-	46.1	43.1
HVAC28		-	47.1	44.1
HVAC29		-	41.6	38.6
HVAC30		-	44.1	41.1
HVAC31		-	43.7	40.7
HVAC32		-	42.0	39.0
HVAC33		-	42.0	39.0
HVAC34		-	39.8	36.7
9	1.Fl		54.2	51.2
1		-	21.3	20.9
HVAC1		-	23.4	20.4
HVAC1		-	23.6	20.6
HVAC3		-	23.1	20.1
HVAC4		-	22.5	19.5
HVAC4		-	22.9	19.9
HVAC4		-	22.3	19.3
HVAC4		-	21.6	18.6
HVAC4		-	22.0	19.0
HVAC4		-	21.4	18.4
HVAC4		-	21.0	18.0
HVAC4		-	20.8	17.8
HVAC4		-	33.3	30.3
HVAC4		-	20.6	17.6
HVAC4		-	25.5	22.5
HVAC4		-	25.9	22.9
HVAC4		-	25.0	22.0
HVAC4		-	24.2	21.2
HVAC4		-	24.6	21.6
HVAC4		-	22.2	19.2
HVAC4		-	23.6	20.6
HVAC4		-	29.2	26.2
HVAC4		-	23.3	20.3
HVAC4		-	22.5	19.5
HVAC4		-	22.8	19.8
HVAC25		-	40.9	37.9

Contribution levels of the receivers

Source name	Traffic lane	Level Day	Night
		dB(A)	
HVAC26	-	41.8	38.8
HVAC27	-	45.1	42.1
HVAC28	-	42.7	39.6
HVAC29	-	44.1	41.1
HVAC30	-	41.5	38.5
HVAC31	-	41.8	38.8
HVAC32	-	45.6	42.6
HVAC33	-	45.9	42.9
HVAC34	-	46.5	43.5
10 1.Fl		50.7	47.7
1	-	27.5	27.0
HVAC1	-	13.7	10.7
HVAC1	-	13.8	10.7
HVAC3	-	13.7	10.7
HVAC4	-	13.8	10.8
HVAC4	-	13.6	10.6
HVAC4	-	13.5	10.5
HVAC4	-	13.4	10.4
HVAC4	-	13.5	10.5
HVAC4	-	13.4	10.4
HVAC4	-	13.3	10.3
HVAC4	-	13.3	10.2
HVAC4	-	39.8	36.8
HVAC4	-	13.2	10.2
HVAC4	-	38.8	35.8
HVAC4	-	39.1	36.1
HVAC4	-	38.4	35.3
HVAC4	-	37.5	34.5
HVAC4	-	38.2	35.2
HVAC4	-	37.6	34.6
HVAC4	-	36.6	33.6
HVAC4	-	39.5	36.5
HVAC4	-	37.3	34.3
HVAC4	-	38.3	35.3
HVAC4	-	38.8	35.8
HVAC25	-	33.7	30.7
HVAC26	-	33.9	30.9
HVAC27	-	34.2	31.2
HVAC28	-	34.3	31.3
HVAC29	-	34.9	31.9
HVAC30	-	35.3	32.3
HVAC31	-	35.5	32.4
HVAC32	-	35.9	32.9
HVAC33	-	36.4	33.3
HVAC34	-	36.8	33.8

Appendix D

Roadway Noise
Calculation Worksheets

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (East of South Mannel Street) - Existing Conditions	DATE:	10/5/2023
LOCATION:	Receptor-1	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,500	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	450	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		27
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		27
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	26.50	- -
MEDIUM TRUCKS	4.0	26.34	- -
HEAVY TRUCKS	8.0	26.50	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.5	64.6	63.2	57.1	65.6	66.2
MEDIUM TRUCKS	60.0	56.0	48.2	57.4	63.6	63.6
HEAVY TRUCKS	66.7	62.7	54.9	64.1	70.3	70.3
NOISE LEVELS (dBA)	70.0	67.1	63.9	65.6	72.2	72.4

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.5	64.6	63.2	57.1	65.6	66.2
MEDIUM TRUCKS	60.0	56.0	48.2	57.4	63.6	63.6
HEAVY TRUCKS	66.7	62.7	54.9	64.1	70.3	70.3
NOISE LEVELS (dBA)	70.0	67.1	63.9	65.6	72.2	72.4

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	39	84	180	388
LDN	38	81	175	378

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Existing Conditions	DATE:	10/5/2023
LOCATION:	Receptor-1	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		950
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		950
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	949.97	- -
MEDIUM TRUCKS	4.0	949.97	- -
HEAVY TRUCKS	8.0	949.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Los Angeles Avenue (West of Birch Street) - Existing Conditions
LOCATION: Receptor-2
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,500
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST	12
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	450

RECEIVER INPUT DATA

RECEIVER DISTANCE =	23
DIST C/L TO WALL =	0
RECEIVER HEIGHT =	5.0
WALL DISTANCE FROM RECEIVER =	23
PAD ELEVATION =	0.0
ROADWAY VIEW: LF ANGLE=	-90
RT ANGLE=	90
DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0
AMBIENT=	0.0
BARRIER =	0 (0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	22.41	- -
MEDIUM TRUCKS	4.0	22.23	- -
HEAVY TRUCKS	8.0	22.41	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.6	65.7	64.3	58.2	66.7	67.3
MEDIUM TRUCKS	61.1	57.1	49.3	58.5	64.7	64.7
HEAVY TRUCKS	67.8	63.8	56.0	65.2	71.4	71.4
NOISE LEVELS (dBA)	71.1	68.2	65.0	66.7	73.3	73.5

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.6	65.7	64.3	58.2	66.7	67.3
MEDIUM TRUCKS	61.1	57.1	49.3	58.5	64.7	64.7
HEAVY TRUCKS	67.8	63.8	56.0	65.2	71.4	71.4
NOISE LEVELS (dBA)	71.1	68.2	65.0	66.7	73.3	73.5

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	39	84	181	391
LDN	38	82	177	380

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Existing Conditions	DATE:	10/5/2023
LOCATION:	Receptor-2	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		247
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		247
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	246.89	- -
MEDIUM TRUCKS	4.0	246.87	- -
HEAVY TRUCKS	8.0	246.89	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (West of Birch Street) - Existing Conditions	DATE:	10/5/2023
LOCATION:	Receptor-3	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,500	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	450	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		441
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		441
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	440.97	- -
MEDIUM TRUCKS	4.0	440.96	- -
HEAVY TRUCKS	8.0	440.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	48.2	46.3	44.9	38.8	47.3	47.9
MEDIUM TRUCKS	41.6	37.6	29.8	39.1	45.2	45.2
HEAVY TRUCKS	48.3	44.4	36.6	45.8	51.9	52.0
NOISE LEVELS (dBA)	51.7	48.8	45.6	47.3	53.9	54.0

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	48.2	46.3	44.9	38.8	47.3	47.9
MEDIUM TRUCKS	41.6	37.6	29.8	39.1	45.2	45.2
HEAVY TRUCKS	48.3	44.4	36.6	45.8	51.9	52.0
NOISE LEVELS (dBA)	51.7	48.8	45.6	47.3	53.9	54.0

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	38	82	176	380
LDN	37	80	172	370

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Existing Conditions	DATE:	10/5/2023
LOCATION:	Receptor-3	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		715
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		715
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	714.96	- -
MEDIUM TRUCKS	4.0	714.96	- -
HEAVY TRUCKS	8.0	714.96	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Los Angeles Avenue (Birch St. to S. Mannel St.) - Existing Conditions
LOCATION: Receptor-4
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,500
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST	12
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	450

RECEIVER INPUT DATA

RECEIVER DISTANCE =	748
DIST C/L TO WALL =	0
RECEIVER HEIGHT =	5.0
WALL DISTANCE FROM RECEIVER =	748
PAD ELEVATION =	0.0
ROADWAY VIEW: LF ANGLE=	-90
RT ANGLE=	90
DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	747.98	- -
MEDIUM TRUCKS	4.0	747.98	- -
HEAVY TRUCKS	8.0	747.98	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	44.7	42.9	41.4	35.4	43.9	44.5
MEDIUM TRUCKS	38.2	34.2	26.4	35.6	41.8	41.8
HEAVY TRUCKS	44.9	40.9	33.1	42.3	48.5	48.5
NOISE LEVELS (dBA)	48.3	45.3	42.2	43.8	50.4	50.6

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	44.7	42.9	41.4	35.4	43.9	44.5
MEDIUM TRUCKS	38.2	34.2	26.4	35.6	41.8	41.8
HEAVY TRUCKS	44.9	40.9	33.1	42.3	48.5	48.5
NOISE LEVELS (dBA)	48.3	45.3	42.2	43.8	50.4	50.6

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	38	82	176	380
LDN	37	80	172	370

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Birch Street (North of Los Angeles Street) - Existing Conditions
LOCATION: Receptor-4
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		121
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		121
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	120.77	- -
MEDIUM TRUCKS	4.0	120.74	- -
HEAVY TRUCKS	8.0	120.77	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Existing Conditions	DATE:	10/5/2023
LOCATION:	Receptor-4	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		132
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		132
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	131.79	- -
MEDIUM TRUCKS	4.0	131.76	- -
HEAVY TRUCKS	8.0	131.79	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (East of South Mannel Street) - Existing Conditions	DATE:	10/5/2023
LOCATION:	Receptor-5	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,500	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	450	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		556
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		556
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	555.98	- -
MEDIUM TRUCKS	4.0	555.97	- -
HEAVY TRUCKS	8.0	555.98	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	46.7	44.8	43.4	37.3	45.8	46.4
MEDIUM TRUCKS	40.1	36.1	28.3	37.5	43.7	43.7
HEAVY TRUCKS	46.8	42.9	35.1	44.3	50.4	50.5
NOISE LEVELS (dBA)	50.2	47.3	44.1	45.8	52.4	52.5

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	46.7	44.8	43.4	37.3	45.8	46.4
MEDIUM TRUCKS	40.1	36.1	28.3	37.5	43.7	43.7
HEAVY TRUCKS	46.8	42.9	35.1	44.3	50.4	50.5
NOISE LEVELS (dBA)	50.2	47.3	44.1	45.8	52.4	52.5

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	38	82	176	380
LDN	37	80	172	370

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Existing Conditions	DATE:	10/5/2023
LOCATION:	Receptor-5	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		998
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		998
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	997.97	- -
MEDIUM TRUCKS	4.0	997.97	- -
HEAVY TRUCKS	8.0	997.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Los Angeles Avenue (East of South Mannel Street) - Existing Plus Project Conditions
LOCATION: Receptor-1
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,136
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST	12
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	514

RECEIVER INPUT DATA

RECEIVER DISTANCE =		27
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		27
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	26.50	- -
MEDIUM TRUCKS	4.0	26.34	- -
HEAVY TRUCKS	8.0	26.50	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.1	65.2	63.8	57.7	66.2	66.8
MEDIUM TRUCKS	60.5	56.6	48.8	58.0	64.1	64.2
HEAVY TRUCKS	67.2	63.3	55.5	64.7	70.8	70.9
NOISE LEVELS (dBA)	70.6	67.7	64.5	66.2	72.8	72.9

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.1	65.2	63.8	57.7	66.2	66.8
MEDIUM TRUCKS	60.5	56.6	48.8	58.0	64.1	64.2
HEAVY TRUCKS	67.2	63.3	55.5	64.7	70.8	70.9
NOISE LEVELS (dBA)	70.6	67.7	64.5	66.2	72.8	72.9

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	42	91	197	423
LDN	41	89	191	412

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Existing Plus Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-1	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	108	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	11	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		950
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		950
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	949.97	- -
MEDIUM TRUCKS	4.0	949.97	- -
HEAVY TRUCKS	8.0	949.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	19.6	17.7	16.3	10.3	18.8	19.4
MEDIUM TRUCKS	16.4	12.4	4.7	13.9	20.0	20.1
HEAVY TRUCKS	24.8	20.8	13.0	22.2	28.4	28.4
NOISE LEVELS (dBA)	26.4	23.0	18.2	23.1	29.4	29.5

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	19.6	17.7	16.3	10.3	18.8	19.4
MEDIUM TRUCKS	16.4	12.4	4.7	13.9	20.0	20.1
HEAVY TRUCKS	24.8	20.8	13.0	22.2	28.4	28.4
NOISE LEVELS (dBA)	26.4	23.0	18.2	23.1	29.4	29.5

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	19
LDN	2	4	9	19

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (West of Birch Street) - Existing Plus Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-2	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,608	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	461	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		23
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		23
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	22.41	- -
MEDIUM TRUCKS	4.0	22.23	- -
HEAVY TRUCKS	8.0	22.41	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.7	65.8	64.4	58.3	66.8	67.4
MEDIUM TRUCKS	61.2	57.2	49.4	58.6	64.8	64.8
HEAVY TRUCKS	67.9	63.9	56.1	65.3	71.5	71.5
NOISE LEVELS (dBA)	71.2	68.3	65.1	66.8	73.4	73.6

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.7	65.8	64.4	58.3	66.8	67.4
MEDIUM TRUCKS	61.2	57.2	49.4	58.6	64.8	64.8
HEAVY TRUCKS	67.9	63.9	56.1	65.3	71.5	71.5
NOISE LEVELS (dBA)	71.2	68.3	65.1	66.8	73.4	73.6

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	40	85	184	397
LDN	39	83	179	387

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Existing Plus Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-2	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	120	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	12	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		247
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		247
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	246.89	- -
MEDIUM TRUCKS	4.0	246.87	- -
HEAVY TRUCKS	8.0	246.89	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	28.9	27.0	25.6	19.5	28.0	28.6
MEDIUM TRUCKS	25.7	21.7	13.9	23.1	29.3	29.3
HEAVY TRUCKS	34.0	30.1	22.3	31.5	37.6	37.7
NOISE LEVELS (dBA)	35.6	32.2	27.4	32.3	38.6	38.7

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	28.9	27.0	25.6	19.5	28.0	28.6
MEDIUM TRUCKS	25.7	21.7	13.9	23.1	29.3	29.3
HEAVY TRUCKS	34.0	30.1	22.3	31.5	37.6	37.7
NOISE LEVELS (dBA)	35.6	32.2	27.4	32.3	38.6	38.7

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	20
LDN	2	4	9	20

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Los Angeles Avenue (West of Birch Street) - Existing Plus Project Conditions
LOCATION: Receptor-3
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,608
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST	12
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	461

RECEIVER INPUT DATA

RECEIVER DISTANCE =		441
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		441
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	440.97	- -
MEDIUM TRUCKS	4.0	440.96	- -
HEAVY TRUCKS	8.0	440.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	48.3	46.4	45.0	38.9	47.4	48.0
MEDIUM TRUCKS	41.7	37.7	29.9	39.2	45.3	45.3
HEAVY TRUCKS	48.4	44.5	36.7	45.9	52.0	52.1
NOISE LEVELS (dBA)	51.8	48.9	45.7	47.4	54.0	54.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	48.3	46.4	45.0	38.9	47.4	48.0
MEDIUM TRUCKS	41.7	37.7	29.9	39.2	45.3	45.3
HEAVY TRUCKS	48.4	44.5	36.7	45.9	52.0	52.1
NOISE LEVELS (dBA)	51.8	48.9	45.7	47.4	54.0	54.1

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	39	83	179	386
LDN	38	81	175	376

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Birch Street (North of Los Angeles Street) - Existing Plus Project Conditions
LOCATION: Receptor-3
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	120
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST	16
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	12

RECEIVER INPUT DATA

RECEIVER DISTANCE =	715
DIST C/L TO WALL =	0
RECEIVER HEIGHT =	5.0
WALL DISTANCE FROM RECEIVER =	715
PAD ELEVATION =	0.0
ROADWAY VIEW: LF ANGLE=	-90
RT ANGLE=	90
DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0
AMBIENT=	0.0
BARRIER =	0 (0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	714.96	- -
MEDIUM TRUCKS	4.0	714.96	- -
HEAVY TRUCKS	8.0	714.96	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	22.0	20.1	18.6	12.6	21.1	21.7
MEDIUM TRUCKS	18.7	14.8	7.0	16.2	22.3	22.4
HEAVY TRUCKS	27.1	23.1	15.3	24.6	30.7	30.7
NOISE LEVELS (dBA)	28.7	25.3	20.5	25.4	31.7	31.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	22.0	20.1	18.6	12.6	21.1	21.7
MEDIUM TRUCKS	18.7	14.8	7.0	16.2	22.3	22.4
HEAVY TRUCKS	27.1	23.1	15.3	24.6	30.7	30.7
NOISE LEVELS (dBA)	28.7	25.3	20.5	25.4	31.7	31.8

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	20
LDN	2	4	9	20

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (Birch St. to S. Mannel St.) - Existing Plus Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-4	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,052	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	505	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		748
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		748
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	747.98	- -
MEDIUM TRUCKS	4.0	747.98	- -
HEAVY TRUCKS	8.0	747.98	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	45.3	43.4	41.9	35.9	44.4	45.0
MEDIUM TRUCKS	38.7	34.7	26.9	36.1	42.3	42.3
HEAVY TRUCKS	45.4	41.4	33.6	42.8	49.0	49.0
NOISE LEVELS (dBA)	48.8	45.9	42.7	44.3	50.9	51.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	45.3	43.4	41.9	35.9	44.4	45.0
MEDIUM TRUCKS	38.7	34.7	26.9	36.1	42.3	42.3
HEAVY TRUCKS	45.4	41.4	33.6	42.8	49.0	49.0
NOISE LEVELS (dBA)	48.8	45.9	42.7	44.3	50.9	51.1

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	41	88	191	411
LDN	40	86	186	400

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Existing Plus Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-4	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	120	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	12	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		121
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		121
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	120.77	- -
MEDIUM TRUCKS	4.0	120.74	- -
HEAVY TRUCKS	8.0	120.77	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	33.5	31.6	30.2	24.2	32.6	33.3
MEDIUM TRUCKS	30.3	26.3	18.6	27.8	33.9	34.0
HEAVY TRUCKS	38.7	34.7	26.9	36.1	42.3	42.3
NOISE LEVELS (dBA)	40.3	36.9	32.1	37.0	43.3	43.4

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	33.5	31.6	30.2	24.2	32.6	33.3
MEDIUM TRUCKS	30.3	26.3	18.6	27.8	33.9	34.0
HEAVY TRUCKS	38.7	34.7	26.9	36.1	42.3	42.3
NOISE LEVELS (dBA)	40.3	36.9	32.1	37.0	43.3	43.4

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	20
LDN	2	4	9	20

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Existing Plus Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-4	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	108	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	11	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		132
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		132
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	131.79	- -
MEDIUM TRUCKS	4.0	131.76	- -
HEAVY TRUCKS	8.0	131.79	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	32.5	30.6	29.2	23.1	31.6	32.2
MEDIUM TRUCKS	29.3	25.3	17.5	26.7	32.9	32.9
HEAVY TRUCKS	37.7	33.7	25.9	35.1	41.3	41.3
NOISE LEVELS (dBA)	39.3	35.8	31.1	35.9	42.2	42.3

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	32.5	30.6	29.2	23.1	31.6	32.2
MEDIUM TRUCKS	29.3	25.3	17.5	26.7	32.9	32.9
HEAVY TRUCKS	37.7	33.7	25.9	35.1	41.3	41.3
NOISE LEVELS (dBA)	39.3	35.8	31.1	35.9	42.2	42.3

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	19
LDN	2	4	9	19

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Los Angeles Avenue (East of South Mannel Street) - Existing Plus Project Conditions
LOCATION: Receptor-5
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,136
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST	12
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	514

RECEIVER INPUT DATA

RECEIVER DISTANCE =		556
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		556
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	555.98	- -
MEDIUM TRUCKS	4.0	555.97	- -
HEAVY TRUCKS	8.0	555.98	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	47.3	45.4	43.9	37.9	46.4	47.0
MEDIUM TRUCKS	40.7	36.7	28.9	38.1	44.3	44.3
HEAVY TRUCKS	47.4	43.4	35.6	44.9	51.0	51.0
NOISE LEVELS (dBA)	50.8	47.9	44.7	46.4	52.9	53.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	47.3	45.4	43.9	37.9	46.4	47.0
MEDIUM TRUCKS	40.7	36.7	28.9	38.1	44.3	44.3
HEAVY TRUCKS	47.4	43.4	35.6	44.9	51.0	51.0
NOISE LEVELS (dBA)	50.8	47.9	44.7	46.4	52.9	53.1

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	42	89	193	415
LDN	40	87	188	404

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Existing Plus Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-5	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	108	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	11	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		998
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		998
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	997.97	- -
MEDIUM TRUCKS	4.0	997.97	- -
HEAVY TRUCKS	8.0	997.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	19.3	17.4	16.0	9.9	18.4	19.1
MEDIUM TRUCKS	16.1	12.1	4.3	13.5	19.7	19.7
HEAVY TRUCKS	24.5	20.5	12.7	21.9	28.1	28.1
NOISE LEVELS (dBA)	26.1	22.6	17.9	22.7	29.1	29.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	19.3	17.4	16.0	9.9	18.4	19.1
MEDIUM TRUCKS	16.1	12.1	4.3	13.5	19.7	19.7
HEAVY TRUCKS	24.5	20.5	12.7	21.9	28.1	28.1
NOISE LEVELS (dBA)	26.1	22.6	17.9	22.7	29.1	29.1

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	19
LDN	2	4	9	19

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (East of South Mannel Street) - Opening Year Without Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-1	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,680	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	468	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		27
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		27
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	26.50	- -
MEDIUM TRUCKS	4.0	26.34	- -
HEAVY TRUCKS	8.0	26.50	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.7	64.8	63.4	57.3	65.8	66.4
MEDIUM TRUCKS	60.1	56.1	48.4	57.6	63.7	63.8
HEAVY TRUCKS	66.8	62.9	55.1	64.3	70.4	70.5
NOISE LEVELS (dBA)	70.2	67.3	64.1	65.8	72.4	72.5

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.7	64.8	63.4	57.3	65.8	66.4
MEDIUM TRUCKS	60.1	56.1	48.4	57.6	63.7	63.8
HEAVY TRUCKS	66.8	62.9	55.1	64.3	70.4	70.5
NOISE LEVELS (dBA)	70.2	67.3	64.1	65.8	72.4	72.5

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	40	86	185	398
LDN	39	84	180	388

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Opening Year Without Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-1	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		950
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		950
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	949.97	- -
MEDIUM TRUCKS	4.0	949.97	- -
HEAVY TRUCKS	8.0	949.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (West of Birch Street) - Opening Year Without Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-2	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,680	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	468	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		23
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		23
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	22.41	- -
MEDIUM TRUCKS	4.0	22.23	- -
HEAVY TRUCKS	8.0	22.41	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.8	65.9	64.5	58.4	66.9	67.5
MEDIUM TRUCKS	61.2	57.3	49.5	58.7	64.8	64.9
HEAVY TRUCKS	67.9	63.9	56.2	65.4	71.5	71.6
NOISE LEVELS (dBA)	71.3	68.4	65.2	66.9	73.4	73.6

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.8	65.9	64.5	58.4	66.9	67.5
MEDIUM TRUCKS	61.2	57.3	49.5	58.7	64.8	64.9
HEAVY TRUCKS	67.9	63.9	56.2	65.4	71.5	71.6
NOISE LEVELS (dBA)	71.3	68.4	65.2	66.9	73.4	73.6

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	40	86	186	401
LDN	39	84	181	391

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Opening Year Without Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-2	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		247
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		247
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	246.89	- -
MEDIUM TRUCKS	4.0	246.87	- -
HEAVY TRUCKS	8.0	246.89	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (West of Birch Street) - Opening Year Without Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-3	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,680	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	468	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		441
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		441
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	440.97	- -
MEDIUM TRUCKS	4.0	440.96	- -
HEAVY TRUCKS	8.0	440.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	48.4	46.5	45.1	39.0	47.5	48.1
MEDIUM TRUCKS	41.8	37.8	30.0	39.2	45.4	45.4
HEAVY TRUCKS	48.5	44.5	36.8	46.0	52.1	52.1
NOISE LEVELS (dBA)	51.9	49.0	45.8	47.5	54.0	54.2

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	48.4	46.5	45.1	39.0	47.5	48.1
MEDIUM TRUCKS	41.8	37.8	30.0	39.2	45.4	45.4
HEAVY TRUCKS	48.5	44.5	36.8	46.0	52.1	52.1
NOISE LEVELS (dBA)	51.9	49.0	45.8	47.5	54.0	54.2

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	39	84	181	390
LDN	38	82	176	380

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Opening Year Without Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-3	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		715
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		715
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	714.96	- -
MEDIUM TRUCKS	4.0	714.96	- -
HEAVY TRUCKS	8.0	714.96	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (Birch St. to S. Mannel St.) - Opening Year Without Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-4	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,680
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST	12
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	468

RECEIVER INPUT DATA

RECEIVER DISTANCE =		748
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		748
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	(10 = HARD SITE, 15 = SOFT SITE)
MEDIUM TRUCKS =	15	
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	747.98	- -
MEDIUM TRUCKS	4.0	747.98	- -
HEAVY TRUCKS	8.0	747.98	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	44.9	43.0	41.6	35.5	44.0	44.7
MEDIUM TRUCKS	38.3	34.4	26.6	35.8	41.9	42.0
HEAVY TRUCKS	45.1	41.1	33.3	42.5	48.7	48.7
NOISE LEVELS (dBA)	48.5	45.5	42.3	44.0	50.6	50.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	44.9	43.0	41.6	35.5	44.0	44.7
MEDIUM TRUCKS	38.3	34.4	26.6	35.8	41.9	42.0
HEAVY TRUCKS	45.1	41.1	33.3	42.5	48.7	48.7
NOISE LEVELS (dBA)	48.5	45.5	42.3	44.0	50.6	50.8

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	39	84	181	390
LDN	38	82	176	380

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Birch Street (North of Los Angeles Street) - Opening Year Without Project Conditions
LOCATION: Receptor-4
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST	16
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	0

RECEIVER INPUT DATA

RECEIVER DISTANCE =	121
DIST C/L TO WALL =	0
RECEIVER HEIGHT =	5.0
WALL DISTANCE FROM RECEIVER =	121
PAD ELEVATION =	0.0
ROADWAY VIEW: LF ANGLE=	-90
RT ANGLE=	90
DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	120.77	- -
MEDIUM TRUCKS	4.0	120.74	- -
HEAVY TRUCKS	8.0	120.77	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Opening Year Without Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-4	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		132
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		132
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	131.79	- -
MEDIUM TRUCKS	4.0	131.76	- -
HEAVY TRUCKS	8.0	131.79	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (East of South Mannel Street) - Opening Year Without Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-5	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,680	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	468	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		556
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		556
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	555.98	- -
MEDIUM TRUCKS	4.0	555.97	- -
HEAVY TRUCKS	8.0	555.98	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	46.9	45.0	43.5	37.5	46.0	46.6
MEDIUM TRUCKS	40.3	36.3	28.5	37.7	43.9	43.9
HEAVY TRUCKS	47.0	43.0	35.2	44.4	50.6	50.6
NOISE LEVELS (dBA)	50.4	47.5	44.3	46.0	52.5	52.7

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	46.9	45.0	43.5	37.5	46.0	46.6
MEDIUM TRUCKS	40.3	36.3	28.5	37.7	43.9	43.9
HEAVY TRUCKS	47.0	43.0	35.2	44.4	50.6	50.6
NOISE LEVELS (dBA)	50.4	47.5	44.3	46.0	52.5	52.7

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	39	84	181	390
LDN	38	82	176	380

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Opening Year Without Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-5	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	0	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	0	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		998
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		998
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	997.97	- -
MEDIUM TRUCKS	4.0	997.97	- -
HEAVY TRUCKS	8.0	997.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
MEDIUM TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
HEAVY TRUCKS	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
NOISE LEVELS (dBA)	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	#NUM!	#NUM!	#NUM!	#NUM!
LDN	#NUM!	#NUM!	#NUM!	#NUM!

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (East of South Mannel Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-1	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,316	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	532	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		27
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		27
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	26.50	- -
MEDIUM TRUCKS	4.0	26.34	- -
HEAVY TRUCKS	8.0	26.50	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.2	65.3	63.9	57.9	66.3	67.0
MEDIUM TRUCKS	60.7	56.7	48.9	58.1	64.3	64.3
HEAVY TRUCKS	67.4	63.4	55.6	64.8	71.0	71.0
NOISE LEVELS (dBA)	70.8	67.8	64.6	66.3	72.9	73.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.2	65.3	63.9	57.9	66.3	67.0
MEDIUM TRUCKS	60.7	56.7	48.9	58.1	64.3	64.3
HEAVY TRUCKS	67.4	63.4	55.6	64.8	71.0	71.0
NOISE LEVELS (dBA)	70.8	67.8	64.6	66.3	72.9	73.1

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	43	93	201	433
LDN	42	91	196	422

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-1	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	108	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	11	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		950
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		950
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	949.97	- -
MEDIUM TRUCKS	4.0	949.97	- -
HEAVY TRUCKS	8.0	949.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	19.6	17.7	16.3	10.3	18.8	19.4
MEDIUM TRUCKS	16.4	12.4	4.7	13.9	20.0	20.1
HEAVY TRUCKS	24.8	20.8	13.0	22.2	28.4	28.4
NOISE LEVELS (dBA)	26.4	23.0	18.2	23.1	29.4	29.5

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	19.6	17.7	16.3	10.3	18.8	19.4
MEDIUM TRUCKS	16.4	12.4	4.7	13.9	20.0	20.1
HEAVY TRUCKS	24.8	20.8	13.0	22.2	28.4	28.4
NOISE LEVELS (dBA)	26.4	23.0	18.2	23.1	29.4	29.5

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	19
LDN	2	4	9	19

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (West of Birch Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-2	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,788
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST	12
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	479

RECEIVER INPUT DATA

RECEIVER DISTANCE =		23
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		23
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	22.41	- -
MEDIUM TRUCKS	4.0	22.23	- -
HEAVY TRUCKS	8.0	22.41	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.9	66.0	64.6	58.5	67.0	67.6
MEDIUM TRUCKS	61.3	57.4	49.6	58.8	64.9	65.0
HEAVY TRUCKS	68.0	64.0	56.3	65.5	71.6	71.7
NOISE LEVELS (dBA)	71.4	68.5	65.3	67.0	73.5	73.7

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.9	66.0	64.6	58.5	67.0	67.6
MEDIUM TRUCKS	61.3	57.4	49.6	58.8	64.9	65.0
HEAVY TRUCKS	68.0	64.0	56.3	65.5	71.6	71.7
NOISE LEVELS (dBA)	71.4	68.5	65.3	67.0	73.5	73.7

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	41	88	189	407
LDN	40	85	184	397

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-2	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	120	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	12	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		247
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		247
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	246.89	- -
MEDIUM TRUCKS	4.0	246.87	- -
HEAVY TRUCKS	8.0	246.89	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	28.9	27.0	25.6	19.5	28.0	28.6
MEDIUM TRUCKS	25.7	21.7	13.9	23.1	29.3	29.3
HEAVY TRUCKS	34.0	30.1	22.3	31.5	37.6	37.7
NOISE LEVELS (dBA)	35.6	32.2	27.4	32.3	38.6	38.7

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	28.9	27.0	25.6	19.5	28.0	28.6
MEDIUM TRUCKS	25.7	21.7	13.9	23.1	29.3	29.3
HEAVY TRUCKS	34.0	30.1	22.3	31.5	37.6	37.7
NOISE LEVELS (dBA)	35.6	32.2	27.4	32.3	38.6	38.7

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	20
LDN	2	4	9	20

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (West of Birch Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-3	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,788	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	479	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		441
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		441
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	440.97	- -
MEDIUM TRUCKS	4.0	440.96	- -
HEAVY TRUCKS	8.0	440.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	48.5	46.6	45.2	39.1	47.6	48.2
MEDIUM TRUCKS	41.9	37.9	30.1	39.3	45.5	45.5
HEAVY TRUCKS	48.6	44.6	36.8	46.1	52.2	52.2
NOISE LEVELS (dBA)	52.0	49.1	45.9	47.6	54.1	54.3

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	48.5	46.6	45.2	39.1	47.6	48.2
MEDIUM TRUCKS	41.9	37.9	30.1	39.3	45.5	45.5
HEAVY TRUCKS	48.6	44.6	36.8	46.1	52.2	52.2
NOISE LEVELS (dBA)	52.0	49.1	45.9	47.6	54.1	54.3

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	40	85	184	396
LDN	39	83	179	386

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Birch Street (North of Los Angeles Street) - Opening Year With Project Conditions
LOCATION: Receptor-3
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	120
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST	16
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	12

RECEIVER INPUT DATA

RECEIVER DISTANCE =	715
DIST C/L TO WALL =	0
RECEIVER HEIGHT =	5.0
WALL DISTANCE FROM RECEIVER =	715
PAD ELEVATION =	0.0
ROADWAY VIEW: LF ANGLE=	-90
RT ANGLE=	90
DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	714.96	- -
MEDIUM TRUCKS	4.0	714.96	- -
HEAVY TRUCKS	8.0	714.96	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	22.0	20.1	18.6	12.6	21.1	21.7
MEDIUM TRUCKS	18.7	14.8	7.0	16.2	22.3	22.4
HEAVY TRUCKS	27.1	23.1	15.3	24.6	30.7	30.7
NOISE LEVELS (dBA)	28.7	25.3	20.5	25.4	31.7	31.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	22.0	20.1	18.6	12.6	21.1	21.7
MEDIUM TRUCKS	18.7	14.8	7.0	16.2	22.3	22.4
HEAVY TRUCKS	27.1	23.1	15.3	24.6	30.7	30.7
NOISE LEVELS (dBA)	28.7	25.3	20.5	25.4	31.7	31.8

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	20
LDN	2	4	9	20

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Los Angeles Avenue (Birch St. to S. Mannel St.) - Opening Year With Project Conditions
LOCATION: Receptor-4
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,232
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST	12
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	523

RECEIVER INPUT DATA

RECEIVER DISTANCE =		748
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		748
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	747.98	- -
MEDIUM TRUCKS	4.0	747.98	- -
HEAVY TRUCKS	8.0	747.98	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	45.4	43.5	42.1	36.0	44.5	45.1
MEDIUM TRUCKS	38.8	34.8	27.1	36.3	42.4	42.5
HEAVY TRUCKS	45.6	41.6	33.8	43.0	49.2	49.2
NOISE LEVELS (dBA)	48.9	46.0	42.8	44.5	51.1	51.2

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	45.4	43.5	42.1	36.0	44.5	45.1
MEDIUM TRUCKS	38.8	34.8	27.1	36.3	42.4	42.5
HEAVY TRUCKS	45.6	41.6	33.8	43.0	49.2	49.2
NOISE LEVELS (dBA)	48.9	46.0	42.8	44.5	51.1	51.2

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	42	91	195	420
LDN	41	88	190	409

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: NEC Birch Street and Los Angeles Avenue Residential Project
ROADWAY: Birch Street (North of Los Angeles Street) - Opening Year With Project Conditions
LOCATION: Receptor-4
JOB #: 2832-2023-03
DATE: 10/5/2023
ENGINEER: B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	120
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST	16
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	12

RECEIVER INPUT DATA

RECEIVER DISTANCE =	121
DIST C/L TO WALL =	0
RECEIVER HEIGHT =	5.0
WALL DISTANCE FROM RECEIVER =	121
PAD ELEVATION =	0.0
ROADWAY VIEW: LF ANGLE=	-90
RT ANGLE=	90
DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	120.77	- -
MEDIUM TRUCKS	4.0	120.74	- -
HEAVY TRUCKS	8.0	120.77	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	33.5	31.6	30.2	24.2	32.6	33.3
MEDIUM TRUCKS	30.3	26.3	18.6	27.8	33.9	34.0
HEAVY TRUCKS	38.7	34.7	26.9	36.1	42.3	42.3
NOISE LEVELS (dBA)	40.3	36.9	32.1	37.0	43.3	43.4

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	33.5	31.6	30.2	24.2	32.6	33.3
MEDIUM TRUCKS	30.3	26.3	18.6	27.8	33.9	34.0
HEAVY TRUCKS	38.7	34.7	26.9	36.1	42.3	42.3
NOISE LEVELS (dBA)	40.3	36.9	32.1	37.0	43.3	43.4

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	20
LDN	2	4	9	20

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-4	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	108	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	11	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		132
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		132
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	131.79	- -
MEDIUM TRUCKS	4.0	131.76	- -
HEAVY TRUCKS	8.0	131.79	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	32.5	30.6	29.2	23.1	31.6	32.2
MEDIUM TRUCKS	29.3	25.3	17.5	26.7	32.9	32.9
HEAVY TRUCKS	37.7	33.7	25.9	35.1	41.3	41.3
NOISE LEVELS (dBA)	39.3	35.8	31.1	35.9	42.2	42.3

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	32.5	30.6	29.2	23.1	31.6	32.2
MEDIUM TRUCKS	29.3	25.3	17.5	26.7	32.9	32.9
HEAVY TRUCKS	37.7	33.7	25.9	35.1	41.3	41.3
NOISE LEVELS (dBA)	39.3	35.8	31.1	35.9	42.2	42.3

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	19
LDN	2	4	9	19

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (East of South Mannel Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-5	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,316	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	532	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		556
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		556
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	555.98	- -
MEDIUM TRUCKS	4.0	555.97	- -
HEAVY TRUCKS	8.0	555.98	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	47.4	45.5	44.1	38.0	46.5	47.1
MEDIUM TRUCKS	40.8	36.8	29.1	38.3	44.4	44.5
HEAVY TRUCKS	47.6	43.6	35.8	45.0	51.2	51.2
NOISE LEVELS (dBA)	50.9	48.0	44.8	46.5	53.1	53.2

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	47.4	45.5	44.1	38.0	46.5	47.1
MEDIUM TRUCKS	40.8	36.8	29.1	38.3	44.4	44.5
HEAVY TRUCKS	47.6	43.6	35.8	45.0	51.2	51.2
NOISE LEVELS (dBA)	50.9	48.0	44.8	46.5	53.1	53.2

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	42	92	197	425
LDN	41	89	192	414

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Receptor-5	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	108	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	11	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		998
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		998
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	997.97	- -
MEDIUM TRUCKS	4.0	997.97	- -
HEAVY TRUCKS	8.0	997.97	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	19.3	17.4	16.0	9.9	18.4	19.1
MEDIUM TRUCKS	16.1	12.1	4.3	13.5	19.7	19.7
HEAVY TRUCKS	24.5	20.5	12.7	21.9	28.1	28.1
NOISE LEVELS (dBA)	26.1	22.6	17.9	22.7	29.1	29.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	19.3	17.4	16.0	9.9	18.4	19.1
MEDIUM TRUCKS	16.1	12.1	4.3	13.5	19.7	19.7
HEAVY TRUCKS	24.5	20.5	12.7	21.9	28.1	28.1
NOISE LEVELS (dBA)	26.1	22.6	17.9	22.7	29.1	29.1

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	19
LDN	2	4	9	19

Appendix E

Noise/Land Use Compatibility Assessment
Calculation Worksheets

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (Birch Street to South Mannel Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise/Land Use Compatibility - Onsite Interior Open Space	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,232	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	523	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		129
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		129
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	128.90	- -
MEDIUM TRUCKS	4.0	128.86	- -
HEAVY TRUCKS	8.0	128.90	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	56.9	55.0	53.5	47.5	56.0	56.6
MEDIUM TRUCKS	50.3	46.3	38.5	47.7	53.9	53.9
HEAVY TRUCKS	57.0	53.0	45.2	54.5	60.6	60.6
NOISE LEVELS (dBA)	60.4	57.5	54.3	56.0	62.5	62.7

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	56.9	55.0	53.5	47.5	56.0	56.6
MEDIUM TRUCKS	50.3	46.3	38.5	47.7	53.9	53.9
HEAVY TRUCKS	57.0	53.0	45.2	54.5	60.6	60.6
NOISE LEVELS (dBA)	60.4	57.5	54.3	56.0	62.5	62.7

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	42	91	195	421
LDN	41	88	190	410

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise/Land Use Compatibility - Onsite Interior Open Space	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	120	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	12	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		91
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		91
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	90.70	- -
MEDIUM TRUCKS	4.0	90.65	- -
HEAVY TRUCKS	8.0	90.70	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	35.4	33.5	32.1	26.0	34.5	35.1
MEDIUM TRUCKS	32.2	28.2	20.4	29.6	35.8	35.8
HEAVY TRUCKS	40.6	36.6	28.8	38.0	44.2	44.2
NOISE LEVELS (dBA)	42.2	38.7	34.0	38.8	45.1	45.2

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	35.4	33.5	32.1	26.0	34.5	35.1
MEDIUM TRUCKS	32.2	28.2	20.4	29.6	35.8	35.8
HEAVY TRUCKS	40.6	36.6	28.8	38.0	44.2	44.2
NOISE LEVELS (dBA)	42.2	38.7	34.0	38.8	45.1	45.2

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	20
LDN	2	4	9	20

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise/Land Use Compatibility - Onsite Interior Open Space	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	108	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	11	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		82
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		82
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	81.66	- -
MEDIUM TRUCKS	4.0	81.61	- -
HEAVY TRUCKS	8.0	81.66	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	35.6	33.7	32.3	26.3	34.7	35.4
MEDIUM TRUCKS	32.4	28.4	20.7	29.9	36.0	36.0
HEAVY TRUCKS	40.8	36.8	29.0	38.2	44.4	44.4
NOISE LEVELS (dBA)	42.4	38.9	34.2	39.1	45.4	45.5

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	35.6	33.7	32.3	26.3	34.7	35.4
MEDIUM TRUCKS	32.4	28.4	20.7	29.9	36.0	36.0
HEAVY TRUCKS	40.8	36.8	29.0	38.2	44.4	44.4
NOISE LEVELS (dBA)	42.4	38.9	34.2	39.1	45.4	45.5

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	19
LDN	2	4	9	19

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (Birch Street to South Mannel Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise Levels at Building Façade - First Floor	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,232
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST	12
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	523

RECEIVER INPUT DATA

RECEIVER DISTANCE =		66
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		66
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	(10 = HARD SITE, 15 = SOFT SITE)
MEDIUM TRUCKS =	15	
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	65.80	- -
MEDIUM TRUCKS	4.0	65.73	- -
HEAVY TRUCKS	8.0	65.80	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	61.2	59.3	57.9	51.9	60.3	61.0
MEDIUM TRUCKS	54.7	50.7	42.9	52.1	58.3	58.3
HEAVY TRUCKS	61.4	57.4	49.6	58.8	65.0	65.0
NOISE LEVELS (dBA)	64.8	61.8	58.6	60.3	66.9	67.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	61.2	59.3	57.9	51.9	60.3	61.0
MEDIUM TRUCKS	54.7	50.7	42.9	52.1	58.3	58.3
HEAVY TRUCKS	61.4	57.4	49.6	58.8	65.0	65.0
NOISE LEVELS (dBA)	64.8	61.8	58.6	60.3	66.9	67.1

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	42	91	196	422
LDN	41	88	191	411

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (Birch Street to South Mannel Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise Levels at Building Façade - Second Floor	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,232	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	523	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		66
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		15.0
WALL DISTANCE FROM RECEIVER =		66
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	67.00	- -
MEDIUM TRUCKS	4.0	66.64	- -
HEAVY TRUCKS	8.0	66.10	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	61.1	59.2	57.8	51.7	60.2	60.9
MEDIUM TRUCKS	54.6	50.6	42.8	52.0	58.2	58.2
HEAVY TRUCKS	61.4	57.4	49.6	58.8	65.0	65.0
NOISE LEVELS (dBA)	64.7	61.8	58.5	60.3	66.9	67.0

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	61.1	59.2	57.8	51.7	60.2	60.9
MEDIUM TRUCKS	54.6	50.6	42.8	52.0	58.2	58.2
HEAVY TRUCKS	61.4	57.4	49.6	58.8	65.0	65.0
NOISE LEVELS (dBA)	64.7	61.8	58.5	60.3	66.9	67.0

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	42	90	194	418
LDN	41	88	189	407

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Los Angeles Avenue (Birch Street to South Mannel Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise Levels at Building Façade - Third Floor	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,232	
SPEED =	45	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	12	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	523	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		66
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		25.0
WALL DISTANCE FROM RECEIVER =		66
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	69.63	- -
MEDIUM TRUCKS	4.0	69.00	- -
HEAVY TRUCKS	8.0	67.89	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	60.9	59.0	57.6	51.5	60.0	60.6
MEDIUM TRUCKS	54.3	50.4	42.6	51.8	57.9	58.0
HEAVY TRUCKS	61.2	57.2	49.4	58.6	64.8	64.8
NOISE LEVELS (dBA)	64.5	61.5	58.3	60.1	66.7	66.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	60.9	59.0	57.6	51.5	60.0	60.6
MEDIUM TRUCKS	54.3	50.4	42.6	51.8	57.9	58.0
HEAVY TRUCKS	61.2	57.2	49.4	58.6	64.8	64.8
NOISE LEVELS (dBA)	64.5	61.5	58.3	60.1	66.7	66.8

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	41	87	188	405
LDN	39	85	183	395

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise Levels at Building Façade - First Floor	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	120	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	12	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		95
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		95
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	94.71	- -
MEDIUM TRUCKS	4.0	94.67	- -
HEAVY TRUCKS	8.0	94.71	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	35.1	33.2	31.8	25.7	34.2	34.9
MEDIUM TRUCKS	31.9	27.9	20.1	29.4	35.5	35.5
HEAVY TRUCKS	40.3	36.3	28.5	37.7	43.9	43.9
NOISE LEVELS (dBA)	41.9	38.4	33.7	38.5	44.9	44.9

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	35.1	33.2	31.8	25.7	34.2	34.9
MEDIUM TRUCKS	31.9	27.9	20.1	29.4	35.5	35.5
HEAVY TRUCKS	40.3	36.3	28.5	37.7	43.9	43.9
NOISE LEVELS (dBA)	41.9	38.4	33.7	38.5	44.9	44.9

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	20
LDN	2	4	9	20

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise Levels at Building Façade - Second Floor	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	120	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	12	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		95
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		15.0
WALL DISTANCE FROM RECEIVER =		95
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	95.55	- -
MEDIUM TRUCKS	4.0	95.30	- -
HEAVY TRUCKS	8.0	94.92	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	35.1	33.2	31.8	25.7	34.2	34.8
MEDIUM TRUCKS	31.9	27.9	20.1	29.3	35.5	35.5
HEAVY TRUCKS	40.3	36.3	28.5	37.7	43.9	43.9
NOISE LEVELS (dBA)	41.9	38.4	33.6	38.5	44.8	44.9

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	35.1	33.2	31.8	25.7	34.2	34.8
MEDIUM TRUCKS	31.9	27.9	20.1	29.3	35.5	35.5
HEAVY TRUCKS	40.3	36.3	28.5	37.7	43.9	43.9
NOISE LEVELS (dBA)	41.9	38.4	33.6	38.5	44.8	44.9

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	20
LDN	2	4	9	20

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	Birch Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise Levels at Building Façade - Third Floor	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	120	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	12	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		95
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		25.0
WALL DISTANCE FROM RECEIVER =		95
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	97.42	- -
MEDIUM TRUCKS	4.0	96.96	- -
HEAVY TRUCKS	8.0	96.18	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	34.9	33.0	31.6	25.6	34.0	34.7
MEDIUM TRUCKS	31.7	27.8	20.0	29.2	35.3	35.4
HEAVY TRUCKS	40.2	36.2	28.4	37.6	43.8	43.8
NOISE LEVELS (dBA)	41.8	38.3	33.5	38.4	44.7	44.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	34.9	33.0	31.6	25.6	34.0	34.7
MEDIUM TRUCKS	31.7	27.8	20.0	29.2	35.3	35.4
HEAVY TRUCKS	40.2	36.2	28.4	37.6	43.8	43.8
NOISE LEVELS (dBA)	41.8	38.3	33.5	38.4	44.7	44.8

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	20
LDN	2	4	9	20

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise Levels at Building Façade - First Floor	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	108	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	11	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		103
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		103
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	102.73	- -
MEDIUM TRUCKS	4.0	102.69	- -
HEAVY TRUCKS	8.0	102.73	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	34.1	32.2	30.8	24.8	33.2	33.9
MEDIUM TRUCKS	30.9	26.9	19.2	28.4	34.5	34.6
HEAVY TRUCKS	39.3	35.3	27.5	36.7	42.9	42.9
NOISE LEVELS (dBA)	40.9	37.5	32.7	37.6	43.9	44.0

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	34.1	32.2	30.8	24.8	33.2	33.9
MEDIUM TRUCKS	30.9	26.9	19.2	28.4	34.5	34.6
HEAVY TRUCKS	39.3	35.3	27.5	36.7	42.9	42.9
NOISE LEVELS (dBA)	40.9	37.5	32.7	37.6	43.9	44.0

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	19
LDN	2	4	9	19

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise Levels at Building Façade - Second Floor	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	108	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	11	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		103
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		15.0
WALL DISTANCE FROM RECEIVER =		103
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	103.51	- -
MEDIUM TRUCKS	4.0	103.28	- -
HEAVY TRUCKS	8.0	102.93	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	34.1	32.2	30.8	24.7	33.2	33.8
MEDIUM TRUCKS	30.9	26.9	19.1	28.3	34.5	34.5
HEAVY TRUCKS	39.3	35.3	27.5	36.7	42.9	42.9
NOISE LEVELS (dBA)	40.9	37.4	32.6	37.5	43.9	43.9

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	34.1	32.2	30.8	24.7	33.2	33.8
MEDIUM TRUCKS	30.9	26.9	19.1	28.3	34.5	34.5
HEAVY TRUCKS	39.3	35.3	27.5	36.7	42.9	42.9
NOISE LEVELS (dBA)	40.9	37.4	32.6	37.5	43.9	43.9

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	19
LDN	2	4	9	19

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	NEC Birch Street and Los Angeles Avenue Residential Project	JOB #:	2832-2023-03
ROADWAY:	South Mannel Street (North of Los Angeles Street) - Opening Year With Project Conditions	DATE:	10/5/2023
LOCATION:	Exterior Noise Levels at Building Façade - Third Floor	ENGINEER:	B. Morrison

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	108	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIST	16	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	11	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		103
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		25.0
WALL DISTANCE FROM RECEIVER =		103
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	105.23	- -
MEDIUM TRUCKS	4.0	104.81	- -
HEAVY TRUCKS	8.0	104.09	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	34.0	32.1	30.7	24.6	33.1	33.7
MEDIUM TRUCKS	30.8	26.8	19.0	28.2	34.4	34.4
HEAVY TRUCKS	39.2	35.2	27.4	36.6	42.8	42.8
NOISE LEVELS (dBA)	40.8	37.3	32.6	37.5	43.8	43.9

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	34.0	32.1	30.7	24.6	33.1	33.7
MEDIUM TRUCKS	30.8	26.8	19.0	28.2	34.4	34.4
HEAVY TRUCKS	39.2	35.2	27.4	36.6	42.8	42.8
NOISE LEVELS (dBA)	40.8	37.3	32.6	37.5	43.8	43.9

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	2	4	9	19
LDN	2	4	9	18

Appendix F

Construction Noise and Vibration
Calculation Worksheets

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/24/2023
Case Description: NEC Birch Street and Los Angeles Street Residential Project

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site Preparation	Residential	43.3	43.3	43.3

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	100	84		360	0
Tractor	No	100	84		360	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Tractor		66.9	66.9
Tractor		66.9	66.9
	Total	66.9	69.9

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/24/2023
Case Description: NEC Birch Street and Los Angeles Street Residential Project

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Grading	Residential	43.3	43.3	43.3

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	100	85		360	0
Tractor	No	100	84		360	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Grader		67.9	67.9
Tractor		66.9	66.9
	Total	67.9	70.4

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/24/2023
Case Description: NEC Birch Street and Los Angeles Street Residential Project

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Building Construction	Residential	43.3	43.3	43.3

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	100	84		360	0
Tractor	No	100	84		360	0

Results

	Calculated (dBA)	
Equipment	*Lmax	Leq
Tractor	66.9	66.9
Tractor	66.9	66.9
Total	66.9	69.9

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/24/2023
Case Description: NEC Birch Street and Los Angeles Street Residential Project

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Paving	Residential	43.3	43.3	43.3

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Roller	No	100	85		360	0
Roller	No	100	85		360	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Roller		67.9	67.9
Roller		67.9	67.9
	Total	67.9	70.9

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/24/2023
Case Description: NEC Birch Street and Los Angeles Street Residential Project

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Architectural Coating	Residential	43.3	43.3	43.3

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	100		77.7	360	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		60.6	60.6
	Total	60.6	60.6

*Calculated Lmax is the Loudest value.

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	NEC Birch St. and Los Angeles St.	JOB #:	2832-2023-03
ACTIVITY:	Vibration Impact Study	DATE:	08/18/2023
LOCATION:	Receptors at 58 feet	ENGINEER:	Becca Morrison

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.035 in/sec**

Equipment Type =	2	Large Bulldozer
PPV_{ref} =	0.089	Reference PPV at 25 ft.
D =	58.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	NEC Birch St. and Los Angeles St.	JOB #:	2832-2023-03
ACTIVITY:	Vibration Impact Study	DATE:	08/18/2023
LOCATION:	Receptors at 58 feet	ENGINEER:	Becca Morrison

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.083 in/sec**

Equipment Type =	1	Vibratory Roller
PPV_{ref} =	0.210	Reference PPV at 25 ft.
D =	58.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	NEC Birch St. and Los Angeles St.	JOB #:	2832-2023-03
ACTIVITY:	Vibration Impact Study	DATE:	08/18/2023
LOCATION:	Receptors at 58 feet	ENGINEER:	Becca Morrison

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.030 in/sec**

Equipment Type =	4	Loaded Trucks
PPV_{ref} =	0.076	Reference PPV at 25 ft.
D =	58.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400